A CHARACTERIZATION OF WOODPECKER DAMAGE TO HOUSES IN EAST TENNESSEE

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INTRODUCTION

Each year homeowners report damage and/or annoyance from woodpecker excavation and drumming activities on houses. Among the species that may be involved are the yellow-shafted flicker *(Colaptes auratus)*, pileated woodpecker *(Dryocopus pileatus)*, red-bellied woodpecker *(Melanerpes carolinus)*, red-headed woodpecker *(M. erythrocephalus)*, red-cockaded woodpecker *(Picoides borealis)*, hairy woodpecker *(P. villosus)*, and downy woodpecker *(P. pubescens)* (Carlton 1975).

Several studies have been conducted in respect to woodpecker damage to utility poles (Dennis 1964, Jorgensen et al. 1957, Rumsey 1973a, b), and to irrigation pipes (Morgan 1977, Wolf 1973). However, with the exception of wildlife extension pamphlets published by various state Cooperative Extension Services, no information is available on woodpecker damage to houses.

Because of the lack of information and the apparent extent of the reported problem, the present study was initiated. Information was gathered from 68 people reporting woodpecker damage and/or annoyance in an attempt to measure the extent of the problem, characterize the problem, and gain information on possible control measures.

MATERIALS AND METHODS

On March 6, 1983, in his column in the Knoxville (Tennessee) News-Sentinel, J.B. Owens, in cooperation with the University of Tennessee Department of Forestry, Wildlife, and Fisheries, solicited reports of woodpecker damage to houses. Reports concerning both existing and past problems were requested.

As calls were received, information regarding species involved, type of problem, extent and kind of damage, and characteristics of the house and surrounding area was gathered via telephone and recorded on a survey form (Appendix). Seventeen of the 68 reported sites were visited to verify the information obtained by phone. In a number of cases, the following were evaluated as possible control measures:

(1) Mirror-type trap
(2) Magnifying mirrors
(3) Artificial owls
(4) Artificial snakes

Chi-square tests (Ambrose and Ambrose 1981) were used on all appropriate characterization variables to determine the level of significance.

RESULTS AND DISCUSSION

Many variables in this study showed significant results. However, owing to the method of data collection, caution must be used in interpretation, because only houses with woodpecker problems were surveyed rather than a random sample of all houses in the area.

HOUSE TYPE AND LOCATION

The mean age ± SE of damaged houses was 15.10 ± 1.81 years, with damage occurring for an average of 3.31 ± 0.54 years. Ninety-one percent of the damaged houses were located in subdivisions (Table 1), with only a few damaged houses located on farm sites. This may not reflect a woodpecker preference for houses located in subdivisions but may reflect a disruption of habitat.

Dennis (1964) concluded that attacks on utility poles, especially in respect to pileated woodpeckers, were

Table 1. Location and house type involved in woodpecker damage to houses in East Tennessee.

	Percent
Location:	
House in subdivision	91
House in farm area	9
House type:	
Contemporary	32
Ranch	26
Split Foyer	10
Chalet	10
All Others	22
Damage to:	
Wood	88
Metal	8
Clay, Tile, etc.	4
Other:	
Damage in prior years	81
Knows others with similar damage	43
Woods within 0.50 miles of house	88
Woods within 0.50 miles of house with mature hardwood trees	95

related to bird population density and defense of territory. He stated that the clearing of the utility pole right-of-way is a disturbing factor that aggravates territorial bickering. A similar situation may occur with regard to attacks on houses. Another possible explanation is that the article requesting reports of woodpecker damage may have circulated to a predominantly urban audience. The mean age ± SE of subdivisions containing damaged houses was 20.98 ± 1.90 years.

The house types receiving the most damage were contemporary and ranch styles (Table 1). These two house types accounted for 58% of the damaged houses. While it is not easy to explain the high incidence of damaged ranch style houses, the contemporary category may have served as a "catch-all" for people who were not sure of their house style. However, homeowners were not asked to pick a category but were asked for the house type. The "all others" category, while accounting for a rather high percentage of the damaged houses, is comprised of 11 different house types.

As might be expected, the most frequently attacked surface was wood, accounting for 88% of the attacked surfaces. Most attacks to metal surfaces consisted of drumming activities on house guttering.

As an indication that woodpecker damage to houses is a very extensive problem, 43% of those people reporting damage also knew of other people who had experienced damage. Most people experiencing woodpecker damage lived in a woods or within 0.50 miles of a woods, and 95% of those woods contained large hardwood trees. Fifty-one percent of respondents reporting damage had very abundant and large shade trees in the yard. Eighteen percent reported moderately abundant large shade trees in the yard, while 10% reported no trees present in the yard.

SPECIES INVOLVED AND NATURE OF PROBLEM

The yellow-shafted flicker and pileated woodpecker accounted for 70% of the damage to houses (Table 2). This may be only a reflection of the predominance of these 2 species in the study area. Studies conducted in other geographic areas may yield different results.

Most of the damage to houses consisted of complete penetration of the surface, leaving a cone-shaped hole often large enough for the bird to enter (Table 2). The high incidence (48%) of complete penetration may indicate an effort to excavate roosting or nesting cavities. The "all other" category is comprised mostly of incidences of woodpeckers apparently foraging for carpenter bee larvae, leaving longitudinal cavities in the wood. Also included in this category was damage to window frames and doors, which resulted in wood being removed in longitudinal strips. This type of damage, especially in relation to window frames, appeared to be related to territorial behavior (damage as a result of the bird seeing its reflection in the window).

Table 2. Species involved and nature of woodpecker problem in woodpecker damage to houses in East Tennessee.

	Percent
Species of woodpecker involved:	
Flicker	39
Pileated	31
Red-bellied	10
Downy	8
Red-headed	8
Hairy	3
Nature of problem:	
Penetration; hole large enough for bird to enter	31
Penetration; hole too small for bird to enter	17
Noise only; no holes	15
Shotgue effect	7
Cone-shaped hole; incomplete penetration	6
All others	25

WOODPECKER DAMAGE SITE CHARACTERISTICS

The most frequently damaged areas of the house were the sides and eaves (Table 3). There were no significant differences among the other categories ($X^2 = 1.97$, df = 3, $P > 0.05$). However, if all 8 directional categories are considered, there is a high level of significance ($X^2 = 51.23$, df = 7, $P < 0.001$). This would seem to indicate a tendency of people to report major (N., S., E., W.) directions, rather than a tendency of the woodpecker to select a particular direction. Conner (1975) found that woodpecker nest entrances had a predominantly northeasterly orientation. This conflicted with previous studies of nest orientation, and

Table 3. Woodpecker damage site characteristics involved in woodpecker damage to houses in East Tennessee.

	Percent
Part of house affected:	
Sides of house	36
Eaves; house trimmings	29
Deck	10
Windows; window frames	9
Roof; chimney; guttering	8
Doors; door trimmings	4
Columns	4
Orientation of reported problem:	
North	24
South	24
West	18
East	17
Northwest	7
Northeast	4
Southwest	3
Southeast	3
Time of day of reported problem:	
Daylight to 9:00 a.m.	40
9:00 a.m. to noon	27
Noon to 3:00 p.m.	16
3:00 p.m. to dark	16

Conner concluded that factors other than sun warmth determined nest orientation. Information from the present study also conflicts with a study done by Turcek (1959) in which he observed that 60% of the holes in power or telephone poles had a southeast to southwest orientation, and there were no holes on the north side of the pole. It should be kept in mind that the present study dealt with all types of woodpecker attacks—not just nest excavations. Although the majority (53%) of reported damage occurred at a height of 10 to 20 feet, height selection varied among the woodpecker species involved (Fig. 1). Turcek

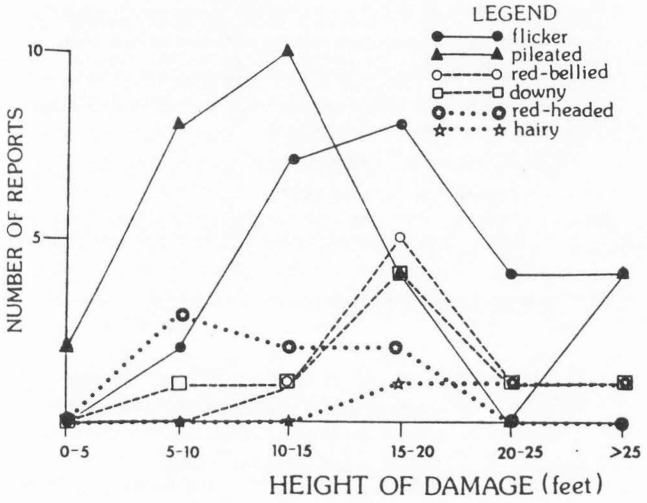

Fig. 1. Height of woodpecker damage (by species) to houses in east Tennessee.

(1959) reported that most of holes he observed in power or telephone poles were located at a height greater than 20 feet. However, Turcek made no attempt to correlate height of damage with the species involved. Also, since houses are not as tall as utility poles, it might be expected that damage would occur proportionally lower.

TIME OF DAMAGE

Most (67%) of the reported damage occurred between daylight and noon (Table 3). This may reflect a tendency to notice the damage early in the morning, particularly if the woodpecker activity awakened the occupants of the house.

Ninety-four percent of all woodpecker problems were initiated in the months of February through May. This corresponds to the breeding season and territory establishment of most woodpecker species (Kilham 1958, 1959).

CHARACTERISTICS OF DAMAGED WOOD

The most frequently damaged species of wood was cedar (Table 4). There was no significant difference among the other wood types ($X^2 = 10.78$, df = 5, $P > 0.05$). The reason for the high incidence of damaged cedar is not clear. It may reflect woodpecker selection, but it may also reflect a selection of cedar as a building material in wooded areas.

Table 4. Characteristics of damaged wood involved in woodpecker damage to houses in East Tennessee.

	Percent
Type of wood:	
Cedar	46
Redwood	21
Cypress	10
Pine	8
Poplar	6
Fir	4
Plywood	4
Treatment of wood:	
Painted	31
New paint	24
Old paint	7
Natural	69
Stained only	32
Untreated; planed or smooth	23
Untreated; rough or sawed	8
Stained and clear finish	3
Clear finish only	3
Color of wood:	
Brown	34
Natural	34
White	8
Tan	6
Grey	6
Yellow	6
Red	3
Black	2
Green	2

A high level of significance ($X^2 = 36.21$, df = 6, $P < 0.001$) was found among wood treatments, with natural surfaces being damaged more than twice as often as painted surfaces (Table 4). New paint received more damage than old paint. New paint was defined as paint not cracked, chipped, or peeling, while old paint was defined as cracked, chipped, or peeling. The apparent preference for new paint may reflect a tendency of people to report the paint in better condition than it may have been. Also, there is no evidence that there are an equal number of houses with old and new paint in areas where woodpeckers are likely to be found.

Among the natural surfaces, those woods that received only stain and those receiving no treatment but having a smooth finish were the most frequently damaged.

The most commonly damaged wood was brown (34%) or natural (34%) in color (Table 4). However, this may reflect a predominance of this color in areas where woodpecker damage is likely to occur. This information appears to conflict with work done by Jorgensen et al. (1957), who found that utility poles painted white, red, green, or yellow, received more damage than unpainted (brown) poles.

CONTROL EFFORTS

At present, there is no known, practical, consistently effective technique for preventing woodpecker damage. While studying woodpecker damage to utility poles, Jorgensen et al. (1957) tested 75 chemical and commercial repellent materials under aviary conditions and found that 8 substances were effective. Information concerning the testing of these 8 compounds under field conditions could not be found. Rumsey (1970) reported failure of hardware cloth in preventing woodpecker damage. Dennis (1963) reported the development of a repellent compound; however, no information could be found on its acceptance or current manufacture.

During the present study, a mirror-type trap, similar to those used in trapping grouse (Tanner and Bowers 1948), was tested in an attempt to remove pileated woodpeckers that were causing damage. The trap was tested at 3 sites where the damage appeared to be caused by territorial related behavior, but the trap was not effective at any location.

Common shaving mirrors, 7.25 inches in diameter with magnifying surfaces, were tested as a possible repellent mechanism. Four sites were tested, all of which had damage caused by the yellow-shafted flicker. At all locations, the problem bird ceased the damage. However, at one location the bird continued to drum on a chimney covering where no mirror had been placed. More tests of a magnifying mirror as a repellent should be conducted before final conclusions can be drawn. Also, testing the effectiveness of this technique on other woodpecker species would add valuable information.

Nine cases were observed in which the homeowner used artificial snakes and/or owls in an attempt to repel woodpeckers. In no observed case was this technique effective. It was hypothesized that moving the frightening device to different locations at varying intervals would increase its effectiveness. In cases observed in this study, this only resulted in the woodpecker's moving to another part of the house and continuing the damage.

SUMMARY

Several characteristics of woodpecker damage were identified by this study:

(1) The majority of the damaged houses were either contemporary or ranch style and were located in subdivisions.

(2) The houses commonly had woods located within 0.50 miles of the house.

(3) The most frequently damaged parts of the house were the sides and eaves.

(4) Most of the damage occurred at heights of 10 to 20 feet.

(5) Damage was most commonly caused by either yellow-shafted flickers or pileated woodpeckers.

(6) Damage usually occurred between daylight and noon.

(7) The majority of damaged sites revealed cone-shaped holes that completely penetrated the damaged surface.

(8) Unpainted surfaces received more damage than painted surfaces.

(9) Surfaces that were brown or natural in color were most frequently damaged.

(10) Cedar was the wood species most often damaged.

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APPENDIX

Woodpecker Damage Survey
Department Forestry, Wildlife, and Fisheries
3/17/83

Date _____ Owner _____
Address _____
Phone number _____
Species _____ ; if #4, list _____ Sex _____
Time of day bird(s) do damage _____
Date damage started this year _____ Date damage ended this year _____
Hove you had damage in prior years? _____
How many years? _____
Did woodpeckers stop during cold weather? _____
Nature of problem _____ ; if #6, describe _____
Part of house attacked _____
Which side of house _____
Height of damage _____
Kind of material _____ ; if #3, describe _____
If wood, type of treatment _____
Species of wood _____
If painted, color _____
If stained, color _____ ; shade, dark _____ med _____ light _____
If clear finish, type _____
Age of house _____
Type of house _____
Color of house _____
Estimate of damage (owner) _____
Estimate of damage (observer) _____
Do you know other people who have damage? _____

Describe surroundings:

(1) Subdivision or farm?

(2) Subdivision, how old?

(3) Relative abundance and size of shade trees?

(4) How close to woods?

(5) Do woods have large hardwood trees?

(6) How close is your house to nearest house?