PERFORMANCE REPORT

STATE:	VIRGINIA	PROJECT NO.:	W-77-R-4
PROJECT TYPE:	Research and/or survey	STUDY NO.:	X
PROJECT TITLE:	NONGAME AND ENDANGERED SPECIES INVESTIGATIONS	JOB NOS.:	A-C
STUDY TITLE:	BARN OWL INVESTIGATIONS		
JOB TITLE:	Evaluation of Barn Owl Habitat Use, Provision of Nest Boxes, and Survey of Breeding Population.		
PERIOD COVERED:	July 1, 1986 - June 30, 1987		
JOB X-A OBJECTIVE:	To determine the habitat requirements of barn owls so that the selection of sites for nest boxes can be made efficiently and effectively.		
JOB X-B OBJECTIVE:	To determine the status of barn owls in Virginia, select suitable locations for nest boxes, construct and erect nest boxes in appropriate areas.		
JOB X-C OBJECTIVE:	To monitor and evaluate the use of erected nest boxes.		

SUMMARY:

Barn owl (Tyto alba) habitat use and food habits were investigated in an intensively farmed area near Richmond, Virginia to evaluate the effects of agricultural land use on barn owl populations. The results of 784 radiotelemetry samples from six barn owls, 1061 prey item identifications, 6480 small mammal trap nights, and 260 vegetation density samples were used to evaluate where barn owls hunted, what they ate, and what influenced their foraging. Mean home range size was 851 hectares (95 percent confidence ellipse method) and 414 hectares (minimum home range method). Each owl used idle grassland more than expected, based on habitat availability, and fed mostly on Microtus pennsylvanicus. One owl used small grain more than expected and consumed large numbers of Mus musculus.

Heavily grazed pasture and tame hay were used in proportion to their availability. Corn, soybean, woods (except for the blackbird roost), and residential habitats were used less than expected.

Prey density, species composition, and prey accessibility in different habitats apparently influenced barn owl foraging. Scarcity of dense grassland limits barn owl populations in heavily cultivated areas.

Barn owl nest box utilization was evaluated as was the general status of the barn owl in Virginia.

JOB X-A - To determine habitat requirements of barn owls in order that the selection of sites for nest boxes can be made efficiently and effectively.

A scarcity of secure nesting sites has reduced the breeding potential of barn owls. It is difficult to evaluate the loss of tree cavities but trends towards increased firewood cutting, short rotation forest management, and fence row removal suggest that they are less abundant.

The gradual deterioration and disappearance of old-style barns and silos has eliminated many previously used nest sites. These old buildings are typically replaced by sheet metal sheds and glass-lined silos which have no openings for owl access and lack platforms for owl nesting sites. Old-style barns and silos are still abundant in some areas, but most of them are no longer suitable for nesting. Many are impervious because they have been closed or screened against pigeon access. Most old silos remain empty year round and therefore owls can not nest on top of silage as they once did. Also, few old barns and silos offer nest sites which are secure from mammalian predation. Raccoon population increases may be preventing breeding in sites where barn owls successfully nested at one time. Hay bales, barn platforms, cupolas, silo platforms, and tree cavities are frequented by raccoons; barn owl nests in these sites are vulnerable to predation.

The chief management technique for increasing barn owl populations has concentrated on alleviating the problem of a scarcity of secure nesting sites.

HABITAT LOSS

Habitat loss appears to be an important contributor to the barn owl decline throughout the barn owl's range. Habitat changes in agricultural areas have been evident, but the consequences of these changes for barn owls have been less obvious. Habitat has been lost primarily from the development of farmland into residential areas and the intensification of agricultural practices on remaining farmland. The US Department of Commerce (1980) summarizes changes in land use made in Virginia between 1945 and 1978. Virginia had over 9.5 million acres of open farmland in 1945; today less than 6.5 million acres are farmed. Whereas 61 percent of the open farmland in 1945 was in cropland, 74 percent was in cropland in 1978. Most of the land lost to development was ultimately removed from pasture, wild hayfields, and idle areas. The total acreage of these predominantly grass habitats in Virginia has been reduced 55 percent since 1945. These habitats are frequently hunted by raptors. Also, pasture is more heavily grazed today; the number of cattle per acre of pasture in Virginia has risen 364 percent since 1945. Heavily grazed pasture has little protective cover and therefore supports few small mammals. It should be noted that these habitat changes have been most dramatic in

Virginia's coastal plain counties.

The US Department of Commerce does not monitor the availability of hedgerows and fencerows, habitats that are important for many raptor species. These habitat features appear to be much less plentiful today than earlier this century.

Little study has been directed towards learning how modern agricultural land use affects barn owl populations. The barn owl relies heavily upon dense grassland and is therefore expected to survive poorly in heavily farmed areas where grassland has been nearly eliminated. It is difficult to make irrefutable conclusions, however, because barn owl habitat use has not been studied thoroughly enough and over a wide enough range of habitat availability to affirm that cultivated habitats, some of which support high rodent populations, are not utilized.

An investigation of barn owl habitat use in an area with an abundance of cultivated land and little dense grassland may resolve uncertainties regarding the area of grassland needed by barn owls and the ability of this predator to forage successfully in habitats other than grassland. In light of this possibility, this study was undertaken. Radiotelemetry was used to monitor barn owl movements in an intensively farmed area near Richmond, Virginia. Home range size, flight characteristics, habitat use, and food habits were identified to describe how barn owls foraged amongst agricultural habitats. In addition, habitat characteristics were measured to investigate the factors which influenced barn owl foraging patterns.

Four farmsteads near Richmond, Virginia were chosen as the specific study sites for this research (Fig. 1). These farms were chosen on the basis of the presence of a breeding pair of barn owls, the surrounding habitat, and landowner cooperativeness. Three of the sites are surrounded by rowcrops while the fourth is a dairy farm surrounded by rowcrops and heavily grazed pasture.

Westover Plantation is in Charles City county, Curles Neck Farm and Riverview Farm are in Henrico county, and Townsend Farm is in King William county. The total size of these three county study areas is approximately 2000 km^2. Mean annual precipitation for the region is 108 cm, and mean temperatures range from -2 C in January to 31 C in July (National Oceanic and Atmospheric Administration [NOAA] 1980).

Vegetation types within the study area were grouped into several major habitat categories on the basis of the composition and structure of the vegetation and the way in which the vegetation was managed.

Eight habitat categories were established:

1. Small Grain - cultivated with wheat (Triticum aestivum) or barley (Hordeum vulgare). Planted in October and harvested in early June.

2. Corn - cultivated with corn (Zea mays). Planted in late April and

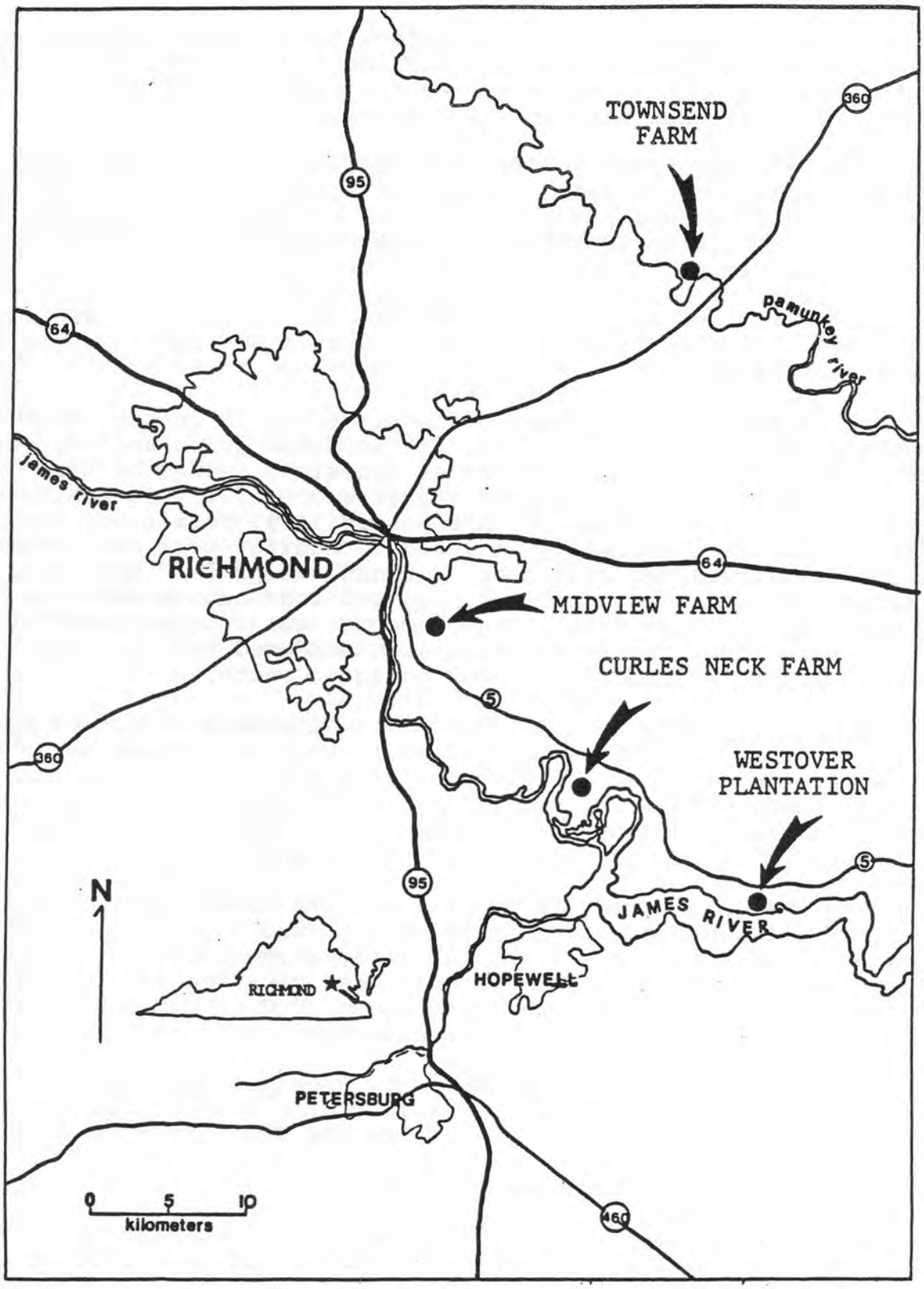

Figure 1. Distribution of the four study farmsteads within the eastern Virginia barn owl study area.

harvested in early September.

3. Soybean - cultivated with soybean (Glycine soja). One hybrid planted in early May, another planted into small grain stubble in mid June. Harvest in early November.

4. Tame Hay - cultivated with alfalfa (Medicago sativa) or sudan grass (Sorghum sudanense). Alfalfa planted in April and cut several times before final harvest in October. Sudan grass planted in June and either grazed or harvested for silage by November.

5. Pasture - uncultivated mixture of Canada bluegrass (Poa compressa), orchard grass (Dactylis glomerata), and redtop (Agrostis alba). The pasture studied was cropped close to the ground from heavy grazing.

6. Idle Grassland - uncultivated areas dominated by ungrazed grasses. This category included grassy fields (infrequently mowed), barnyards (infrequently mowed), and wild hayfields (harvested once or twice a year) composed chiefly of bluegrass (Poa sp.), purpletop (Tridens flavus), timothy (Phleum pratense), sweet vernalgrass (Anthoxanthum odoratum), yellow bristlegrass Setaria lutescens), and red clover (Trifolium pratense); a five year old clearcut with ryegrass (Lolium temulentum), bulrush (Scirpus sp.), sedges (Carex sp.), Japanese honeysuckle (Lonicera japonica), blackberry (Rubus sp.), loblolly pine (Pinus taeda,, and red maple (Acer rubrum); marsh vegetated with sedges (Carex sp.), arrow arum (Peltandra virginica), and pickerelweed (Pontederia cordata); and residential areas, gravel mine land, or pasture which were too small to occupy separate categories.

7. Woods - forests of loblolly pine, baldcypress (Taxodium distichum), tulip-popular (Lireodendron tulipifera), white oak Quercus alba), southern red oak (Quercus falcata), sweetgum Liquidambar styraciflua), flowering dogwood (Cornus florida), and American holly (Ilex opaca); brushy areas composed of blackberry, Hercules' Club (Aralia spinosa), winged sumac (Rhus capallina), and red-osier dogwood (Cornus stolonifera).

8. Residential - parking lots, houses, schools, and other buildings surrounded by manicured lots.

In order to determine habitat utilization, radiotelemetry was used.

Age and sex of six captured barn owls was determined. Each owl was fitted with either a 10 gram Wildlife Materials Transmitter or an 18 gram Telemetry Systems transmitter.

Pairs of location bearings were used to determine owl locations on 1:7920 aerial photographs (obtained from Agricultural Stabilization and Conservation Service, Salt Lake City, Utah; Virginia Department of Highways and Transportation, Richmond, Virginia). All habitat types

and observation points were marked on the photographs and each photograph was covered with a transparent vinyl sheet on which a .635 cm (quarter inch) grid system had been drawn. Location bearings were transferred onto the vinyl sheet using a 360 degree protractor and a water-soluble transparency pen. Owl locations were determined from these two location bearings by triangulation. The location was recorded as the grid number in which it fell. The habitat associated with this location and the owl's activity state (perched if slow pulse rate, flying if fast rate) at the time of the bearing were also recorded.

Barn owl movements were monitored during four two month time periods (1 July-31 August 1984, 1 July-31 August 1985), 1 September-31 October 1985, and 1 May-30 June 1986). These time periods correspond in general to seasonal changes in barn owl breeding and agricultural land use. Each farmstead was visited for an entire night approximately once a week. An exception to this occurred during the September-October time period when owls were monitored for half night (dusk to 0100, 0100 to dawn). The location, associated habitat, and activity state of each owl was sampled once every half hour throughout the night. Sampling began at the first quarter hour following an owl's initial flight. If two owls were monitored at a given farmstead, sampling for the second owl began at the next quarter hour. Subsequent samples were taken until the owl(s) went to roost for the day (determined by the cessation of flight).

Roost sites were identified prior to hunting flights and after completion of hunting in order to determine barn owl roost site selection. Also, owls were periodically located during daylight hours to determine whether daylight hunting or roost relocation occurred.

Home Range Evaluation

Barn owl location data were used to estimate a home range for each owl during each two month time period. Home range is defined here as the smallest region which has a 95 percent probability of enclosing the owl's location at any time during a two month time period. Location data were analysed following the procedure described by Dunn and Gipson (1977) which utilizes the multivariate Ornstein-Uhlenbeck diffusion process to account for lack of independence between location samples; their computer program produced a 95 percent confidence ellipse to describe the home range of each owl during each time period. Home ranges were also identified using the minimum home range method (Mohr and Stumpf 1966) for comparison to home ranges identified by other radiotelemetry studies of the barn owl.

The habitat composition of each home range was determined by transferring each ellipse to the appropriate 1:7920 aerial photograph and calculating the percentage of each habitat type within the ellipse. This was accomplished by enlarging the ellipses to 1:7920 scale on acetate sheets, positioning each sheet over the photograph, and tracing habitat boundaries. The area within each boundary was computed using a Lasico polar planimeter. Areas of extensive open

water, such as the James River, were excluded from habitat composition calculations.

Habitat Use Evaluation

In order to evaluate barn owl habitat use, comparisons were made between the availability of each habitat and the percentage of time spent in that habitat. The habitats deemed available were all that were present within an owl's home range except extensive water surfaces. G-tests (Sokal and Rohlf 1981) were used to test the null hypothesis that owls used each habitat type in exact proportion to its availability. The expected number of locations for each habitat was calculated by multiplying the total number of observations times the percentage of the owl's home range occupied by that habitat. During G test calculations, habitats with zero observed locations were assigned a value of one since a zero results in an erroneous G value.

Whenever the null hypothesis of habitat use in each proportion to its availability was rejected, utilization-availability analyses (Neu et al. 1974) were conducted to determine which habitats were used significantly (P0.05) more or less than expected. These analyses construct ninety-five percent confidence intervals around the observed proportion of locations in each habitat category. Experimentwise error rate is included in each confidence interval calculation since multiple comparisons are being made (Neu et al. 1974, Sokal and Rohlf 1981). The following formula was used to calculate the confidence intervals:

$$p_i + t_{.05'} \; p_i(1-p_i)/n$$

where p_i is the proportion of locations in the i^{th} habitat category $t_{.05'}$ is the experimentwise error rate critical value for t at the .05 significance level (from Table 13, Sokal and Rohlf 1981) and n is the total number of locations for the owl during that time period (Neu et al. 1974).

Habitat preferences and avoidances were determined by comparing the confidence limits for the observed proportion of locations to the expected proportion of locations. Habitat preference occurred when the lower confidence limit for observed locations was greater than the expected proportion of locations. Preference is therefore defined here as significantly greater use of a habitat than expected. Habitat avoidance occurred when the upper confidence limit for observed locations was less than the expected proportion of locations. Avoidance is therefore defined here as significantly less use of a habitat than expected.

Based on telemetry data, the percent of time that barn owls spent in flight at different times of the night is shown in Table 1. Barn owl home range composition and size is indicated in Table 2.

Sample home range confidence ellipses are shown in Figures 2 and 3 for Westover Plantation and Curles Neck Farm.

Table 1. Percentage of time barn owls spent in flight at different hours of the night near Richmond, Virginia. Numbers represent the percentage of telemetry samples from each two hour period during which the owl was flying.

		HOUR						
OWL#	TIME PERIOD	1900-2059	2100-2259	2300-0059	0100-0259	0300-0459	0500-0659	TOTAL
206	1 Jul-31 Aug '84	--	5	4	32	15	10	16
	1 Jul-31 Aug '85	--	35	32	26	29	--	30
	1 Sep-31 Oct '85	50	20	26	35	20	24	27
208	1 Jul-31 Aug '84	--	9	0	11	0	10	6
	1 Jul-31 Aug '85	--	22	17	15	0	--	14
215	1 Jul-31 Aug '85	--	23	20	29	25	--	24
	1 Sep-31 Oct '85	100	10	25	25	0	50	26
217	1 Jul-31 Aug '85	--	0	17	0	0	0	4
	1 Sep-31 Oct '85	0	0	18	27	0	0	10
224	1 Jul-31 Aug '85	0	17	25	44	14	0	27
	1 Sep-31 Oct '85	36	14	30	50	13	18	27
226	1 May-30 Jun '86	0	30	30	29	50	100	33
	$\bar{Y}$ (n)	37 (27)	16 (181)	20 (232)	30 (225)	15 (145)	16 (61)	20 (871)

Table 2. Barn owl home range composition and size near Richmond, Virginia, 1984 - 1986.

OWL #	TIME PERIOD	HABITAT COMPOSITION (% OF HOME RANGE)[1]									HOME RANGE SIZE
		Small grain	Corn	Soy-bean	Wood	Pas-ture	Tame hay	Idle grass[2]		Resi-dent.	(hectares)
206	1 Jul-31 Aug 1984	---	14.7	34.6	29.1	0.0	0.0	7.2	(4.4)	14.4	960
	1 Jul-31 Aug 1985	---	19.2	37.6	20.6	0.0	0.0	5.2	(3.2)	17.4	224
	1 Sep-31 Oct 1985	---	22.1	36.0	25.9	0.0	0.0	6.1	(3.0)	9.9	257
208	1 Jul-31 Aug 1984	---	21.1	21.2	32.9	0.0	0.0	12.3	(10.8)	12.5	421
	1 Jul-31 Aug 1985	---	14.2	14.5	39.8	0.0	0.0	9.8	(7.6)	21.7	367
215	1 Jul-31 Aug 1985	---	24.9	11.1	54.8	0.0	0.0	9.2	(4.9)	0.0	644[3]
	1 Sep-31 Oct 1985	---	36.8	11.6	34.5	0.0	0.0	17.1	(8.3)	0.0	363[4]
217	1 Jul-31 Aug 1985	---	5.1	19.4	31.2	10.9	12.8	20.6	(20.0)	0.0	358
	1 Sep-31 Oct 1985	---	9.0	29.8	27.8	10.1	5.4	17.9	(17.7)	0.0	1043
224	1 Jul-31 Aug 1985	---	21.6	24.4	36.7	0.0	0.0	17.3	(8.3)	0.0	1670[5]
	1 Sep-31 Oct 1985	---	24.2	17.9	40.1	0.0	0.0	17.8	(8.9)	0.0	1597[6]
226	1 May-30 Jun 1986	4.6	16.9	18.1	39.5	0.0	0.0	20.9	(11.2)	0.0	2306[7]
	$\bar{Y}$	4.6	19.0	23.0	34.4	1.8	1.5	13.5	(9.3)	6.3	851
	s	---	8.6	9.4	8.8	4.1	3.9	5.8	(5.5)	8.3	680
	v[8]	---	46	42	26	233	265	44	(56)	132	82

1 habitat composition calculations did not include water surfaces
2 number in parentheses is percentage of home range composed of dense grassland
3 home range size excluding water surfaces = 523 hectares
4 " " " " " " = 252 hectares
5 " " " " " " = 1438 hectares
6 " " " " " " = 1468 hectares
7 " " " " " " = 1979 hectares
8 v= coefficiant of variation in percent

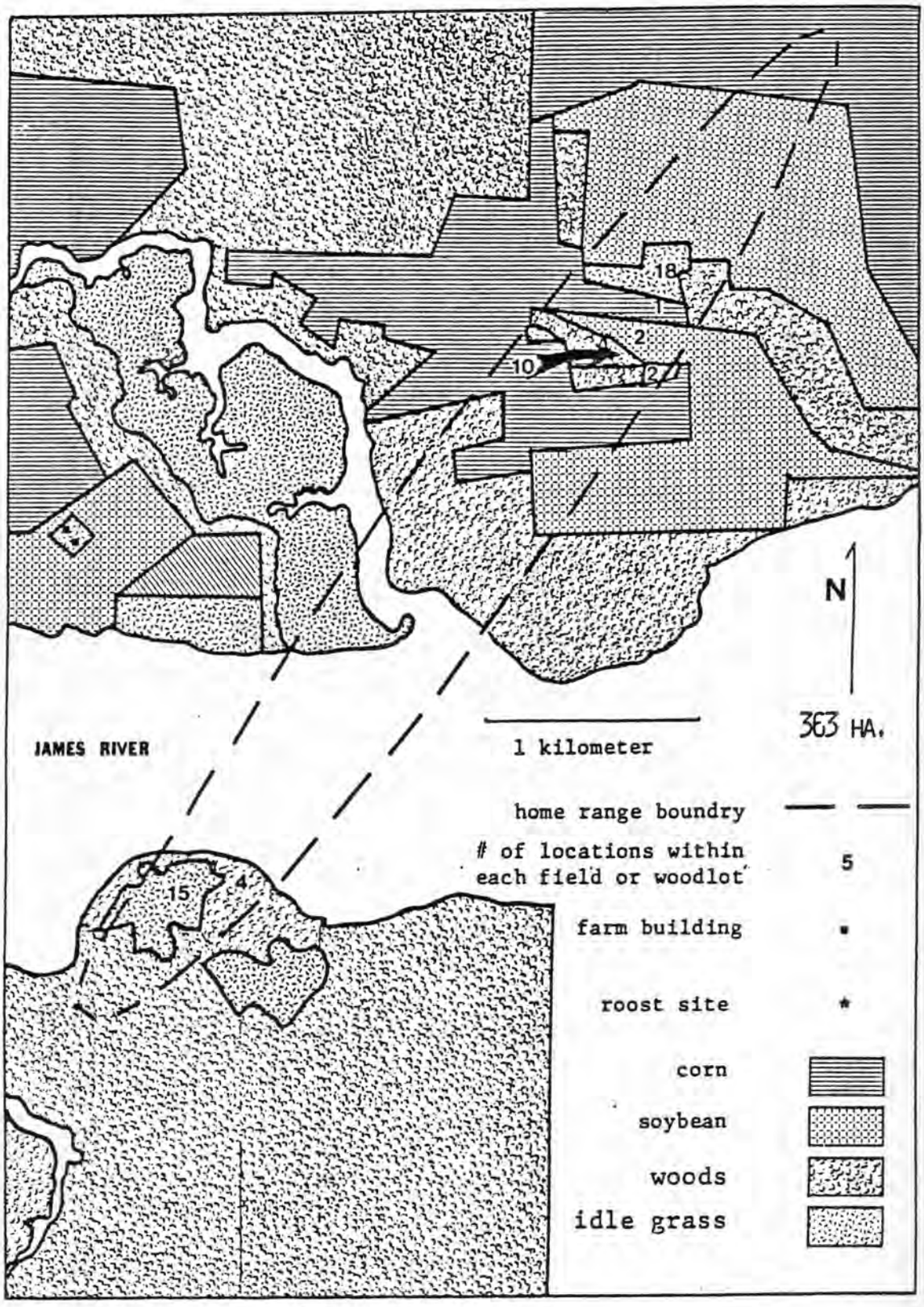

Figure 2. Ninety-five percent confidence ellipse and the distribution of telemetry locations for Westover #215, September - October 1985.

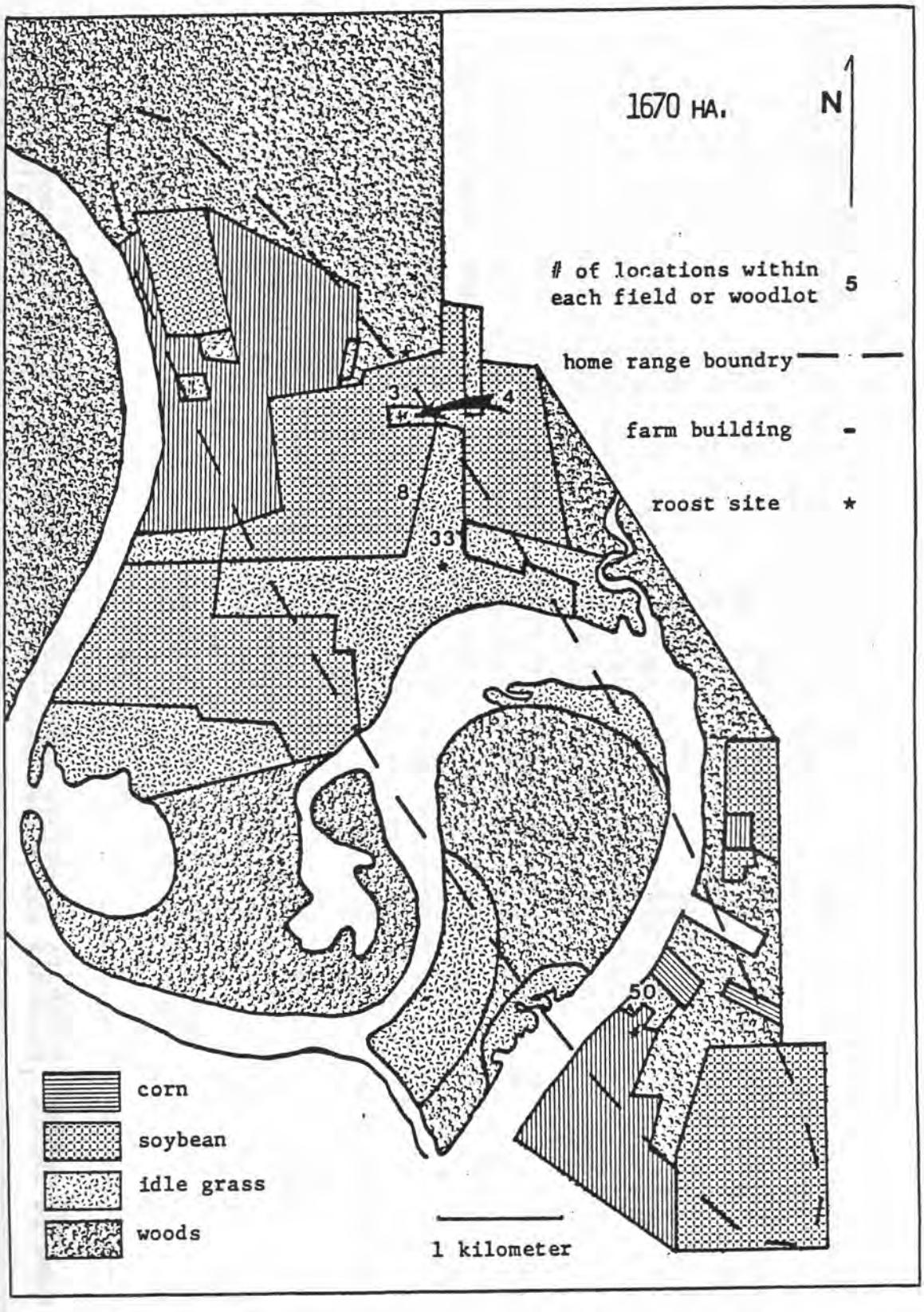

Figure 3. Ninety-five percent confidence ellipse and the distribution of telemetry locations for Curles Neck #224, July - August 1985.

Table 3. Results for G-tests comparing the observed versus the expected[1] number of barn owl locations in agricultural habitats near Richmond, Virginia, 1984 - 1986.

OWL #	TIME PERIOD		HABITAT TYPE: Small grain	Corn	Soy-bean	Wood	Pas-ture	Tame Hay	Idle grass	Resi-dent.	N	G	P
206	1 Jul-31 Aug 1984	OBS	--	8	13	6	--	--	28	2	57	79.7	<.001
		EXP	--	8	20	17	--	--	4	8			
	1 Jul-31 Aug 1985	OBS	--	0	3	43	--	--	20	0	66	148.2	<.001
		EXP	--	12	25	14	--	--	4	11			
	1 Sep-31 Oct 1985	OBS	--	5	1	65	--	--	31	0	102	198.5	<.001
		EXP	--	23	37	26	--	--	6	10			
208	1 Jul-31 Aug 1984	OBS	--	6	15	8	--	--	15	2	46	25.5	<.001
		EXP	--	10	10	15	--	--	5	6			
	1 Jul-31 Aug 1985	OBS	--	1	7	13	--	--	29	2	52	76.9	<.001
		EXP	--	7	8	21	--	--	5	11			
215	1 Jul-31 Aug 1985	OBS	--	3	3	15	--	--	34	--	55	96.2	<.001
		EXP	--	14	6	30	--	--	5	--			
	1 Sep-31 Oct 1985	OBS	--	1	2	6	--	--	43	--	52	111.0	<.001
		EXP	--	19	6	18	--	--	9	--			
217	1 Jul-31 Aug 1985	OBS	--	0	0	2	6	5	44	--	57	95.9	<.001
		EXP	--	5	11	17	6	6	12	--			
	1 Sep-31 Oct 1985	OBS	--	6	2	2	11	8	31	--	60	70.4	<.001
		EXP	--	5	16	17	6	5	11	--			
224	1 Jul-31 Aug 1985	OBS	--	1	7	2	--	--	46	--	56	126.0	<.001
		EXP	--	12	14	21	--	--	9	--			
	1 Sep-31 Oct 1985	OBS	--	0	11	0	--	--	87	--	98	273.3	<.001
		EXP	--	24	18	39	--	--	17	--			
226	1 May-30 Jun 1986	OBS	14	1	2	2	--	--	64	--	83	180.2	<.001
		EXP	4	14	15	33	--	--	17	--			
	TOTAL	OBS	14	32	66	164	17	13	472	6	784	1061.5	<.001
		EXP	4	152	185	265	12	11	104	46			

[1] Calculated by multiplying N x the proportion of the owl's home range occupied by each habitat (from Table 2).

Table 4. Barn owl habitat use near Richmond, Virginia, 1984 - 1986.

OWL #	TIME PERIOD	sm grain	corn	soybean	woods	pasture	tame hay	grass	resident
206	July-Aug.'84	-------	NS[1]	avoided[2]	avoided	-------	-------	preferred[3]	avoided
	July-Aug.'85	-------	avoided	avoided	preferred	-------	-------	preferred	avoided
	Sept-Oct.'85	-------	avoided	avoided	preferred	-------	-------	preferred	avoided
208	July-Aug.'84	-------	NS	NS	avoided	-------	-------	preferred	avoided
	July-Aug.'85	-------	avoided	NS	NS	-------	-------	preferred	avoided
215	July-Aug.'85	-------	avoided	NS	avoided	-------	-------	preferred	-------
	Sept-Oct.'85	-------	avoided	avoided	avoided	-------	-------	preferred	-------
217	July-Aug.'85	-------	avoided	avoided	avoided	NS	NS	preferred	-------
	Sept-Oct.'85	-------	NS	avoided	avoided	NS	NS	preferred	-------
224	July-Aug.'85	-------	avoided	avoided	avoided	-------	-------	preferred	-------
	Sept-Oct.'85	-------	avoided	NS	avoided	-------	-------	preferred	-------
226	May-June'86	preferred	avoided	avoided	avoided	-------	-------	preferred	-------

[1]NS habitats are those which were not significantly (P>0.05) preferred or avoided.
[2]avoided habitats are those in which the owl spent significantly less time than expected.
[3]preferred habitats are those in which the owl spent significantly more time than expected.

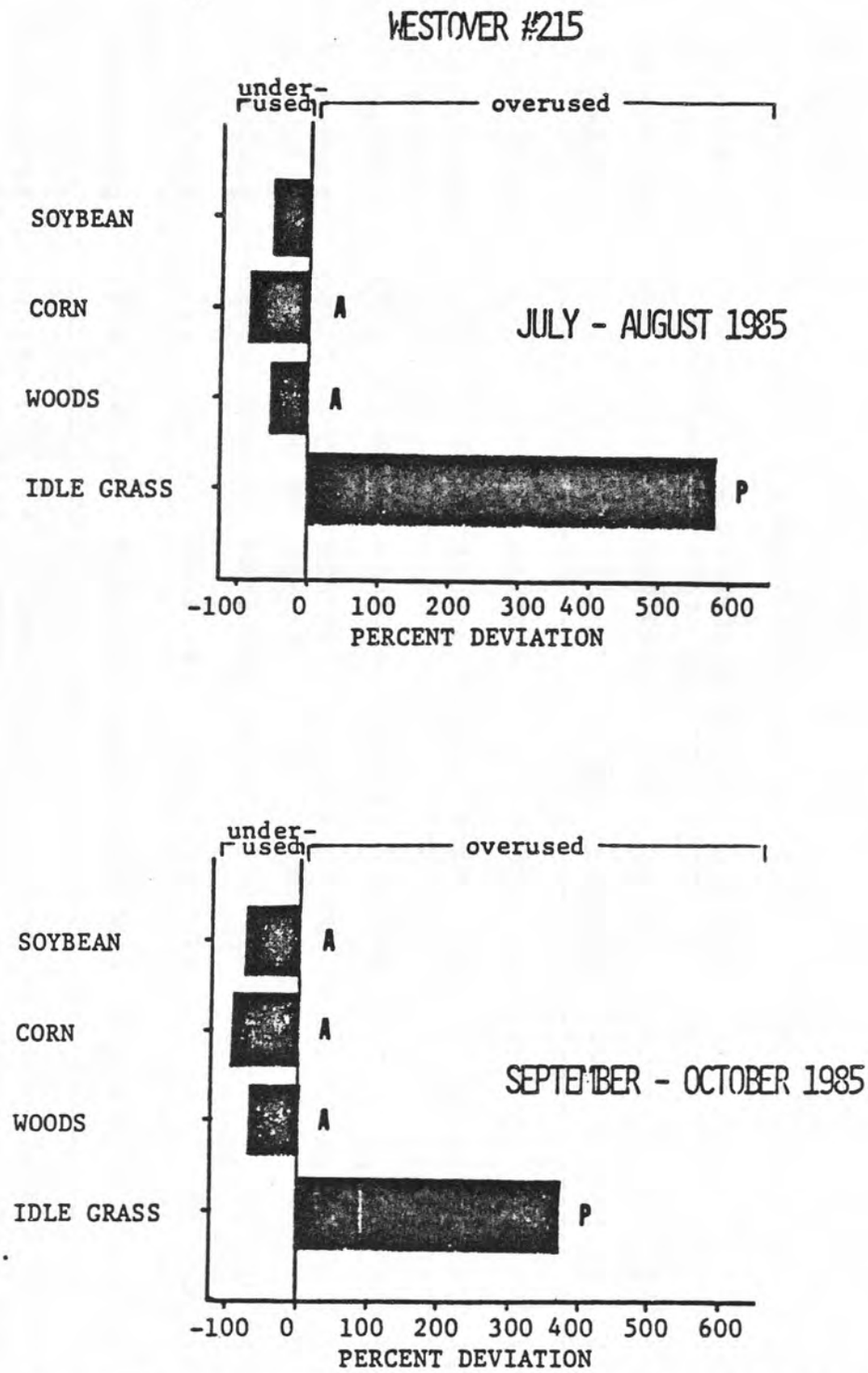

Figure 4. Percent deviation from expected use of habitats by Westover #215. Deviations were calculated by (observed-expected)/ expected. P denotes preferred habitats and A denotes avoided habitats.

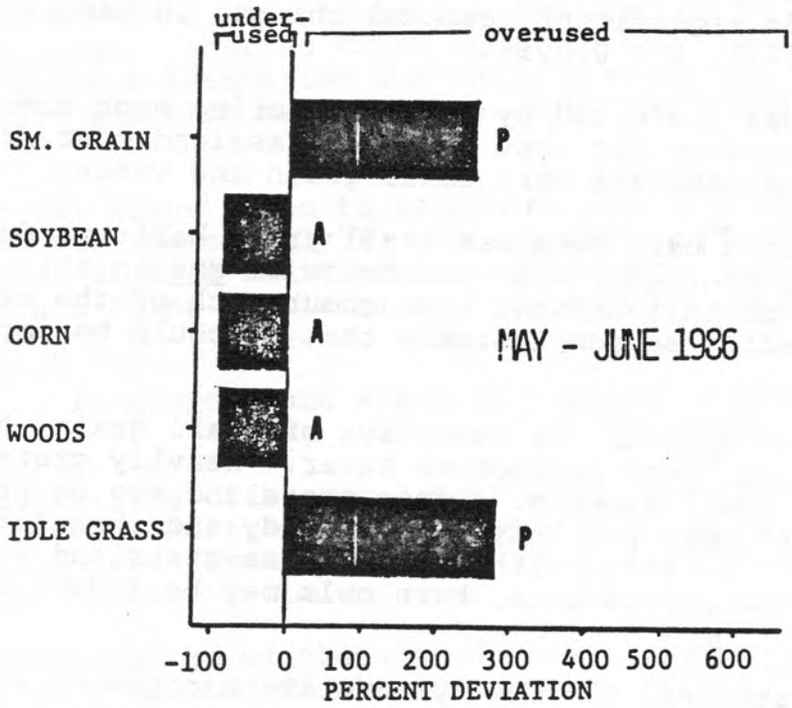

Figure 5. Percent deviation from expected use of habitats by Curles Neck #226. Deviations were calculated by (observed-expected)/ expected. P denotes preferred habitats and A denotes avoided habitats.

Habitat Use

The null hypothesis of habitat use in exact proportion to its availability within an owl's home range was rejected for each owl during each time period; G tests were significant ($P < 0.001$) in all cases (Table 3). Eastern Virginia barn owls did not hunt in a random manner throughout their home range. Therefore, utilization availability analyses were conducted for all owls during each time period to identify habitat preferences and avoidances. The results are summarized in Table 4. Figures 4 and 5 depict the degree of deviation from expected use of each habitat on two areas, Westover Plantation and Curles Neck. Chi-square contingency tests revealed that only one owl made significant seasonal changes in habitat use (Midview #206), $X^2 = 62.8$, $P < 0.001$).

Idle grassland was preferred by each owl during each time period. Grassy fields were the specific type of idle grassland most frequently used. Other preferred habitats were small grain and woods.

The degree to which barn owls use small grain habitats deserves further study. The potentially high abundance of Mus in this habitat and the availability of this habitat throughout much of the barn owl's range during its breeding season indicate that it could be important seasonally.

Cultivated habitats, with the exception of small grain, have low prey populations and/or dense protective cover. Heavily grazed pasture supports few small mammals. Dense grassland may be present in small fields which are very patchily distributed, and therefore less efficiently utilized. In areas with little dense grassland available, or in years of low vole populations, barn owls may be absent or may have low fecundity.

Based on these studies, the most productive management practice for barn owls is the preservation of dense grassland. The bulk of dense grassland is found on private land, thus making preservation measures difficult. State wildlife agencies with tax incentive programs, such as Indiana's Classified Wildlife Habitat Program, could encourage maintenance of dense grassland and edge habitats. Educating landowners about the barn owl's uniqueness, rodent-catching abilities, and reliance upon grassland may help to decrease loss of grassland. Education may also help reduce incidences of barn owl shooting and intentional nest destruction, and educated landowners may use rodenticides more cautiously and accept nest boxes on their property more readily.

Nest box provision has been the chief means of managing for barn owls. It is essential that nest boxes are placed in close proximity to productive habitat, which is best described as dense grassland supporting high Microtus populations. The mean area of dense grassland within eastern Virginia barn owl home ranges was 97 hectares indicating that, in general, nest boxes should be erected only in

areas with a similar availability of grassland. Ninety-seven hectares is an approximate figure, of course since all of the owls studied were nonbreeding, small grain and woods were preferred in some cases, and grassland varies in its capacity to support Microtus.

Completed data on these studies of habitat utilization by barn owls may be found in, Rosenburg, Charles P., 1986. Barn Owl Habitat and Prey Use in Agricultural Eastern Virginia, M.A. Thesis, College of William and Mary, Williamsburg, Va., 114 pages.

JOB X-B - To determine the status of barn owls in Virginia, select suitable locations for nest boxes, construct and erect next boxes in appropriate areas.

The status of barn owls was reported on in the progress report for last year. Nesting sites known to have been occupied in the past ten years were identified and their present activity determined. A comparison was then made between those sites and the sites used in 1986.

Of 111 sites known to have been used for nesting by barn owls in the past ten years, only 43 (39 percent) were still active in 1986. Since that time, 4 additional nesting sites have been located. Efforts are being continued to locate additional active nest sites.

JOB X-C - To monitor and evaluate the use of erected nest boxes.

Three types of barn owl nest boxes have been erected as part of this project. Fifty-five boxes were erected early enough to be used in the 1986 breeding season. Forty-five boxes were erected after the breeding season.

An evaluation of the use of these boxes for the 1986 breeding season was presented in the last annual report. Of 55 boxes available, 13 or 23.6 percent were used the first year.

A continuing evaluation of nest box use is being made.

LITERATURE CITED

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TARGET DATE FOR COMPLETION:

STATUS OF PROGRESS:

SIGNIFICANT DEVIATION IN PROGRESS:

RECOMMENDATIONS:

COST THIS SEGMENT: Federal 4,990.00 : State 1,664.00: Total 6,654.00

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DATE: August 1, 1987