

A SUMMARY OF THE VERDE VALLEY

BREEDING BIRD SURVEY, 1970

BibKey
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Introduction:

During the first year of the Verde Valley (Yavapai County, Arizona) Breeding Bird Study (Carothers & Johnson, 1969), we found a definite relation between the number of trees present on a study area and the population structure of the breeding birds found within that area. The 1969 Survey was primarily initiated to observe the effects riparian manipulation, or phreatophyte control, had on the wildlife in the Verde Valley using a breeding bird study as an indicator. It was found that in almost pure cottonwood (Populus fremontii) stands of a particular age class that there existed a direct linear relationship between the number of trees on an area and the number of birds found there. In the 1969 study, we had three study areas, one unmanipulated control plot and two areas that had been subjected to phreatophyte control; one severely thinned and the other moderately thinned. In the 1970 study, we used the three previously studied cottonwood areas plus three additional ones. Two of the additional three were unmanipulated cottonwood stands and the remaining was of a mixed deciduous type containing in addition to cottonwood, sycamore (Platanus wrightii), willow (Salix gooddingii), ash (Fraxinus velutina), hackberry (Celtis reticulata), mesquite (Prosopis juliflora), and box elder (Acer negundo).

Not only are we concerned with the quantitative and qualitative effects of phreatophyte control on the avifauna, but also in determining which birds are exclusively dependent upon native riparian vegetation and thus would be affected by future thinning in existing riparian stands by the water salvage and flood control agencies.

It is through a study of this nature that we ultimately hope to amass sufficient data so that agencies involved in phreatophyte control may determine to what extent, if any, they can manipulate the riparian habitat in the Verde Valley without seriously altering the breeding bird populations and their species diversity.

Methods and Materials:

All study areas were surveyed with a steel-tape and Brunton compass following the natural contours of the topography. A grid pattern was established on the area and colored surveyor's tape and metal tags or wooden stakes were

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placed at 100 foot intervals along this grid. Each tag contained a number and a letter, which was also recorded on a map made of the area. Thus, any point within the study area could be quickly located on the map by its diagnostic number and letter.

To determine the populations of breeding birds, the spot-map method (Kendeigh, 1944) was employed. On each bird census, the locations of singing males, songposts, nest sites and other pertinent information were recorded on a map of the study area. A new map was used for each census. Because of territorial behavior by most birds during the breeding season, a composite map for each species will show aggregations of observations, thus, indicating territories. Non-territorial species were censused on the average number seen per visit.

The study areas may be categorized into two main types, relatively pure cottonwood and mixed deciduous. The cottonwood areas consisted of two unmanipulated control areas, and two areas which had undergone varying stages of phreatophyte control. These four areas were of approximately the same age class. The fourth cottonwood area was of a much younger age class and with a much higher density of trees.

All of the cottonwood areas are within a radius of five air miles from Camp Verde and were picked for similarities in elevation (approximately 3150 feet for all study areas), basic ecology, including biological and physical characteristics (e.g. flora, soil type and terrain). The mixed deciduous area is approximately located 10 miles NNE of Camp Verde. This area has not been treated for phreatophyte control, but it was our intent to gather information on the existing avifauna in this area so that if the area were ever manipulated, the existing data would serve as an excellent set of control data.

Table I lists the number of times each area was censused and the number of man hours involved in gathering the field data on each area.

Several parameters of vegetational composition were analyzed in an attempt to find what factor(s) other than tree density the birds were selecting for (Table II).

The ocular tube method (Winkworth and Goodall, 1962) was used to ascertain percent of ground and canopy cover. Basal area (number of square feet per acre occupied by trees) was measured by the Bitterlick variable radius technique (Grosenbach, 1952). Tree heights were determined by a clinometer.

Results and Discussion:

Table III illustrates the difference found in the breeding bird populations on the six study areas. For a detailed breakdown of the densities of the individual species on each area see Appendix I.

Odum (1950), working in an eastern hardwood forest, found that small plots, less than 25 acres in size, may be used to determine the densities of the more common species, but that the densities of the more rare and less common species are either exaggerated or completely missed. He found that the total density calculations for all nesting species on a 10-acre tract were consistently 10 percent higher as measured in nesting pairs per 100 acres than a similar study done on a 25 acre tract of the same habitat. Odum (op. cit.) concluded that results from the small plots could be used for comparison with results from larger areas if the 10 percent reduction were made. In our 1969 report, we reduced our total density calculations by 10 percent, thinking that perhaps a more accurate picture of the population structure of the avifauna in the less than 10 acre in size riparian study areas would be presented. Since we cannot find homogeneous cottonwood stands approaching 25 acres or more in size in the Verde Valley, we feel that there is really no justification in lowering the density figures by a constant. As long as all of our study areas are approximately 10 acres in size, they may be compared to one another without any exaggerated degree of error.

Table IV compares the breeding bird densities of the areas that were censused in both 1969 and 1970. In every case, the population densities found in 1970 were significantly lower than they were in 1969. Control #1 showed a reduction of 23.8% of the total number of nesting species, the Reddell Plot was reduced by 5.75% and the John Edge Plot by 9.70%. It is not possible to determine whether or not this overall drop in population densities of birds in the riparian habitat in the Verde Valley can be attributed to phreatophyte control.

Figures 1, 2 and 3 compare the number of breeding pairs per 100 acres with number of trees per acre, basal area and canopy cover, respectively. On the three original areas, the John Edge Plot, the Reddell Plot and the Control #1, there is a definite relationship between these three parameters and bird density. The Cottonwood Thicket and Control #2, however, do not plot within the "expected" limits, suggesting that the birds are probably selecting for a combination of all these factors but that these factors may exist in varying proportions. At any rate, the severely manipulated John Edge Plot had the lowest number of trees per acre, the lowest basal area and less percent canopy cover than any of the other areas. It also had the smallest breeding bird population.

The Control #1 area, however, with the greatest number of birds per 100 acres of all areas censused did not have the extreme measurements of any of the vegetational parameters investigated, again indicating that there is selection for a combination of vegetational factors. It is possible then, that the Control #1 falls within an optimum range of habitat requirements for the birds. It is interesting to note that the less severely manipulated Reddell Plot had a higher bird population density although fewer trees per acre and a lower basal area than Control #2.

The Reddell Plot did, however, have a greater percent canopy cover than the Control #2, but the significance of this is difficult to interpret. The lower boundaries of the Cottonwood Thicket and Control #2 areas are within less than 100 feet from the interstate highway, I-17. A study is presently in progress to determine the effects of highway pollution (chemical and psychological) on the native bird populations.

There was no major change in the species diversity on Control #1 and the Reddell Plot from 1969 to 1970 (Table V). There was a loss of three species and a gain of one on the Control #1 and a gain of four and a loss of two on the Reddell Plot. Of the birds not present during the 1970 survey, two of them, the Phainopepla and the Ash-throated Flycatcher were missing from all three areas that had been surveyed during the 1969 study. Also, of the birds gained, the House Sparrow was new to all three original areas and was also found on Control #2. It is possible that this type of fluctuation in a species population is not due to changes in the environment, but a function of cyclic changes in nesting grounds and/or population size. As in the case of the House Sparrow, the appearance of the species on all three areas within one year may indicate a very rapid rate of population growth partially or totally effected by increased human occupation near the river.

The John Edge Plot had an overall increase of seven species over the preceeding year. This was not accompanied by an increase in total density of the population, as it was down by 9.70% from 1969. After phreatophyte control, there may be a rapid rate of canopy growth in the remaining trees. This expansion of the canopy would be in response to an increase in sunlight available to the trees and available space in which to expand. The increase in foliage volume may then essentially be an open "niche" and be exploited as such by the birds. On areas where habitat requirements are less abundant, i. e., areas which have undergone heavy phreatophyte control manipulation, intraspecific competition for limiting factors may be working in such a way that the species diversity may tend to increase until all "niches" are filled, while the population density of all species decreases or remains stable.

The other two cottonwood study areas did not differ markedly from the afore mentioned areas. The Cottonwood Thicket Plot did, however, show a decrease and in some cases a complete absence of species which depend upon a relatively open canopy. Some of these are the Western and Cassin's Kingbirds, the Vermilion Flycatcher and the Sparrow Hawk.

The data obtained from the mixed deciduous riparian community of the Dry Beaver Creek Plot may be incomplete. Because of a problem in finding a suitable stand of this vegetation type in the Verde Valley, the area was not surveyed and mapped until mid-June. In the Verde Valley, most breeding activity is near termination by mid- and late-June but three acceptable censuses were made in June and from this we feel that a reasonably accurate estimation of the population structure in that community may be presented.

The Dry Beaver Creek study area is 10.3 acres in size with 24.0 trees per acre. Some vegetational measurements that were made on this area are as follows: basal area, 23.5 square feet per acre; ground cover, 18%; canopy cover, 30%; and average height of trees, 29.5 feet. Of the 21 species found nesting on this area, eleven, or 52.8%, are exclusively dependent upon the riparian vegetation for breeding (see Appendix II). In addition to the other ten species found on the area but not exclusively limited to the riparian habitat there are seven more species indigenous to the desert habitat on either side of the Dry Beaver Creek study area. This desert habitat was traversed on a number of occasions and a preliminary estimation of the population density in this habitat type was determined to be less than 50 pairs per 100 acres. The desert habitat also has a correspondingly low species diversity. The nesting birds found on transects running approximately 300 feet on either side of the Dry Beaver Creek area are as follows: Gambel's Quail, Scrub Jay, Loggerhead Shrike, Rock Wren, Horned Lark, Gray Vireo and Desert Sparrow. In traverses off the Dry Beaver Creek area, but in the riparian habitat, several other species that are exclusively dependent upon this habitat type were seen. These were as follows: Lazuli Bunting, Indigo Bunting, Yellow Warbler, Song Sparrow, Yellow-throat and White-winged Dove. It is readily apparent then, that over 50% of the birds resting along the Dry Beaver Creek drainage are exclusively dependent upon the riparian vegetation.

The relatively low population density (281.3 pairs per 100 acres) given for this riparian community may be due to either the lack of running water throughout the summer months, or the fact that censusing did not begin until mid-June or both.

Conclusions:

The unmanipulated Control #1 area had the largest breeding bird population of all areas studied (1006.2 pairs per 100 acres). The most severely manipulated John Edge Plot had the lowest breeding bird population (524.2 pairs per 100 acres).

In the summary of the 1969 Verde Valley Breeding Bird Survey, we concluded that on the basis of bird population densities on three cottonwood tree areas the number of trees (of an even age class) was a limiting factor in determining population size. Data gathered again in 1970 from these three areas tend to support that conclusion. Additional information gathered on various vegetational factors indicates that the Reddell Plot has more similarities with the Control #1 area than the John Edge Plot. The bird population densities confirm this.

From the data at hand, it would appear as if moderate thinning as in the case of the Reddell Plot, was not seriously detrimental to the population structure of the avifauna, but that severe manipulation as was done on the John Edge Plot is obviously detrimental.

The Cottonwood Thicket and Control #2 areas do not seem to be very closely related to either the Control #1 or the Reddell Plot when both bird population densities and vegetational composition are considered. A factor other than vegetational structure of these two areas which may explain relatively low population densities when compared to the Control #1 and the Reddell Plot is their proximity to a busy interstate highway.

It has been determined that 56.4% of the birds nesting in the cottonwood areas of the Verde Valley are exclusively dependent upon the riparian habitat.

In the mixed deciduous habitat of Dry Beaver Creek, 52.8% of the nesting birds on the study area were exclusively dependent upon that vegetation type. This figure is probably higher as several species known to nest in this habitat type were not found on the study area.

Based on the three areas censused both in 1969 and 1970, the entire population of breeding birds in the cottonwood riparian habitat of the Verde Valley was down by an average of 8.4%. It is not known whether or not this is within the expected fluctuations of bird populations based on density dependent factors or rather a trend caused by density independent factors due primarily to man's activities.

Literature Cited

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Table I

<u>Area</u>	<u>Number of Censuses</u>	<u>Number of Man Hours</u>
Control #1	7	39.5
Control #2	8	52.5
Cottonwood Thicket	11	51.0
Reddell Plot	8	45.0
John Edge Plot	10	75.5
Dry Beaver Creek Plot	3	19.0

Table II

Vegetational Analysis of Cottonwood Tree Study Areas

<u>Area</u>	<u>Size of Area (Acres)</u>	<u>Tree Density (per acre)</u>	<u>Basal Area (sq. ft. per acre)</u>	<u>Ground Cover (%)</u>	<u>Canopy Cover (%)</u>	<u>Average Height (%)</u>
Control #1	7.55	46.6	60	75	58	57
Control #2	12.20	35.0	64	86	32	55
Cottonwood Thicket	5.50	95.0	66	22	80	20
Reddell Plot	9.14	26.0	54	52	54	--
John Edge Plot	10.30	10.3	30	75	38	50

Table III
A Summary of the Number of Pairs of Breeding Birds
Found on the Five Riparian Study Areas

Area	Total Number of Nesting Pairs	Total Number of Pairs Per 100 Acres	Total Number of Nests Found
(Cottonwood)			
Control #1	76	1006.2	26
Control #2	99	811.4	48
Cottonwood Thicket	47	856.6	15
Reddell Plot	80	885.7	38
John Edge Plot	54	524.2	14
(Mixed Deciduous)			
Dry Beaver Creek Plot	29	281.3	2

Table IV
A Comparison of the Breeding Bird Densities of the
Three Areas Censused in 1969 and 1970

Area	Total Number of Nesting Pairs		Total Number of Pairs Per 100 Acres		Total Number of Nests Found		Percent Difference in Total Number of Nesting Pairs from 1969 to 1970
	1969	1970	1969	1970	1969	1970	
Control #1	100	76	1322.9	1006.2	47	26	-23.80%
Reddell Plot	88	80	939.5	885.7	37	38	- 5.75%
John Edge Plot	60	54	580.5	524.2	23	14	- 9.70%

Table V
A Comparison of the Species Composition of Birds on the Six
Study Areas

<u>Species</u>	<u>Areas*</u>					
	1	2	3	4	5	6
	**					
Yellow Warbler	XX	X	X	XX	XX	
Bullock's Oriole	XX	X	X	XX	XX	
Bewick's Wren	XX	X	X	XX	X	X
Starling	XX	X	X	XX	XX	X
Cassin's Kingbird	XX	X		XX	X	
Black-chinned Hummingbird	XX	X	X	XX	X	X
Western Kingbird	XX	X		XX	XX	
Mourning Dove	XX	X	X	XX	XX	X
Vermilion Flycatcher	XX	X		XX	XX	
Robin	XX	X	X	XX		
Summer Tanager	XX	X	X	XX	XX	X
House Finch	XX	X		XX	X	X
Red-winged Blackbird	XX		X	XX	XX	
Crested Flycatcher	XX	X	X	XX	XX	X
Western Wood Pewee	XX			XX		
Yellow-billed Cuckoo	XX	X	X	XX	XX	
Gila Woodpecker	XX	X	X	XX	X	X
Lucy's Warbler	XX	X	X	XX		X
Ladder-backed Woodpecker	XX	X	X	XX	XX	X
Abert's Towhee	XX		X	XX	XX	
Black Phoebe	XX			XX		X
Hooded Oriole	XX	X	X	XX	X	X
Bridled Titmouse	XX	X	X	X	X	X
Sparrow Hawk	XX	X		XX	XX	
Mockingbird	XX	X		X	X	
House Sparrow	X	X		X	X	
Red-shafted Flicker	XX	X	X	XX	XX	
Phainopepla	X			X	X	
Brown-headed Cowbird	XX	X	X	XX	XX	X
Horned Owl	X	X				
Blue Grosbeak		X	X	XX		X
White-winged Dove		X				
White-breasted Nuthatch		X				
Killdeer				XX	XX	
Spotted Sandpiper				XX		X

Table V (Continued)

<u>Species</u>	<u>Areas*</u>					
	1	2	3	4	5	6
Yellow-throat				X		X
Long-tailed Chat			X			X
Bell's Vireo						X
Ash-throated Flycatcher	X			X	X	X
Cooper's Hawk						X
Cardinal						X
Verdin						X
Total	30 28	28	21	30 32	19 24	21

*Areas: 1, Control #1; 2, Control #2, 3, Cottonwood Thicket; 4, Reddell Plot; 5, John Edge Plot; 6, Dry Beaver Plot.

**The data in the first column on areas 1, 4 and 5 refer to that which was found in the 1969 Survey.

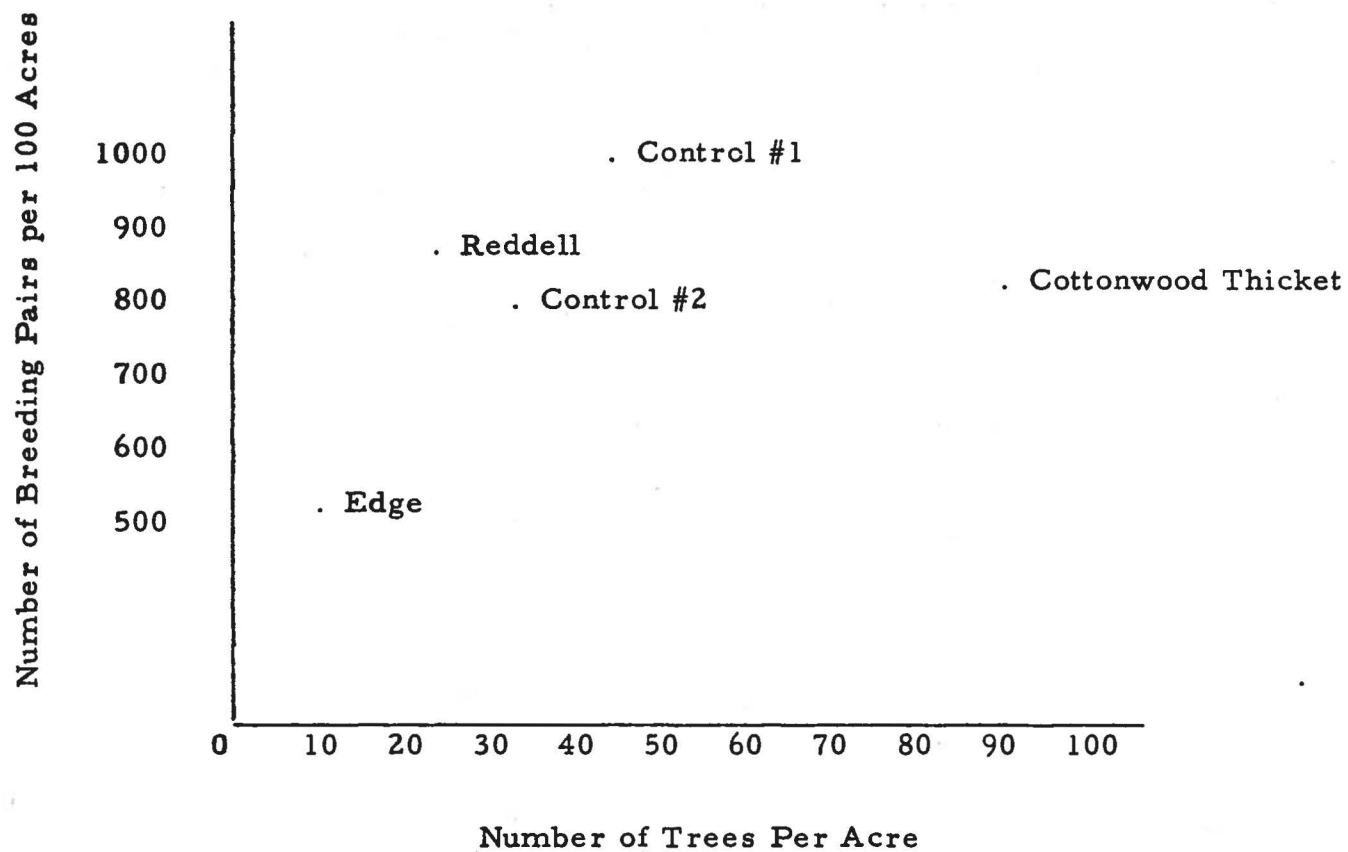


Figure 1. A comparison of the number of breeding pairs of birds per 100 acres of habitat with the number of trees per acre.

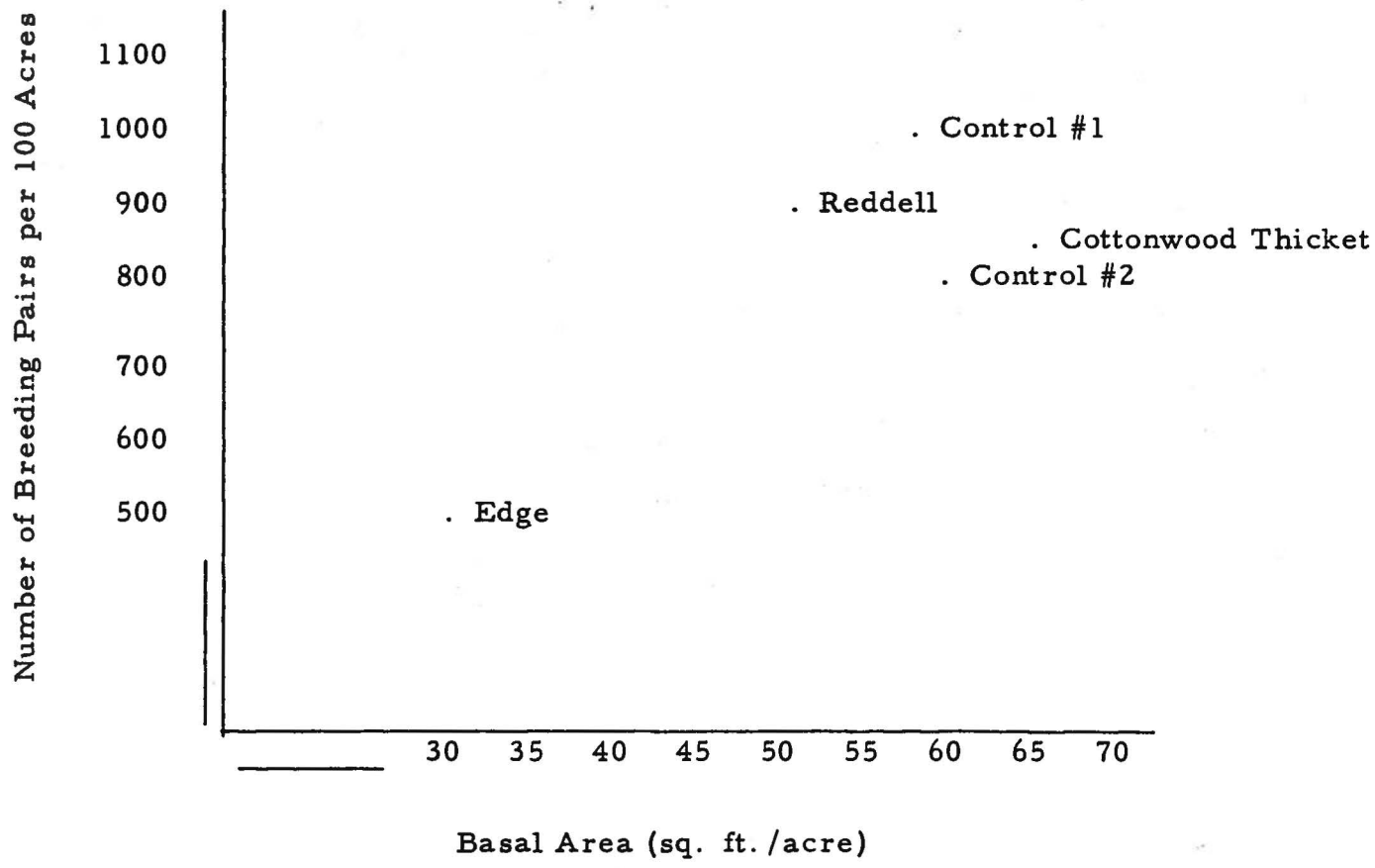


Figure 2. A comparison of the number of breeding pairs of birds per 100 acres of habitat with the basal area of trees.

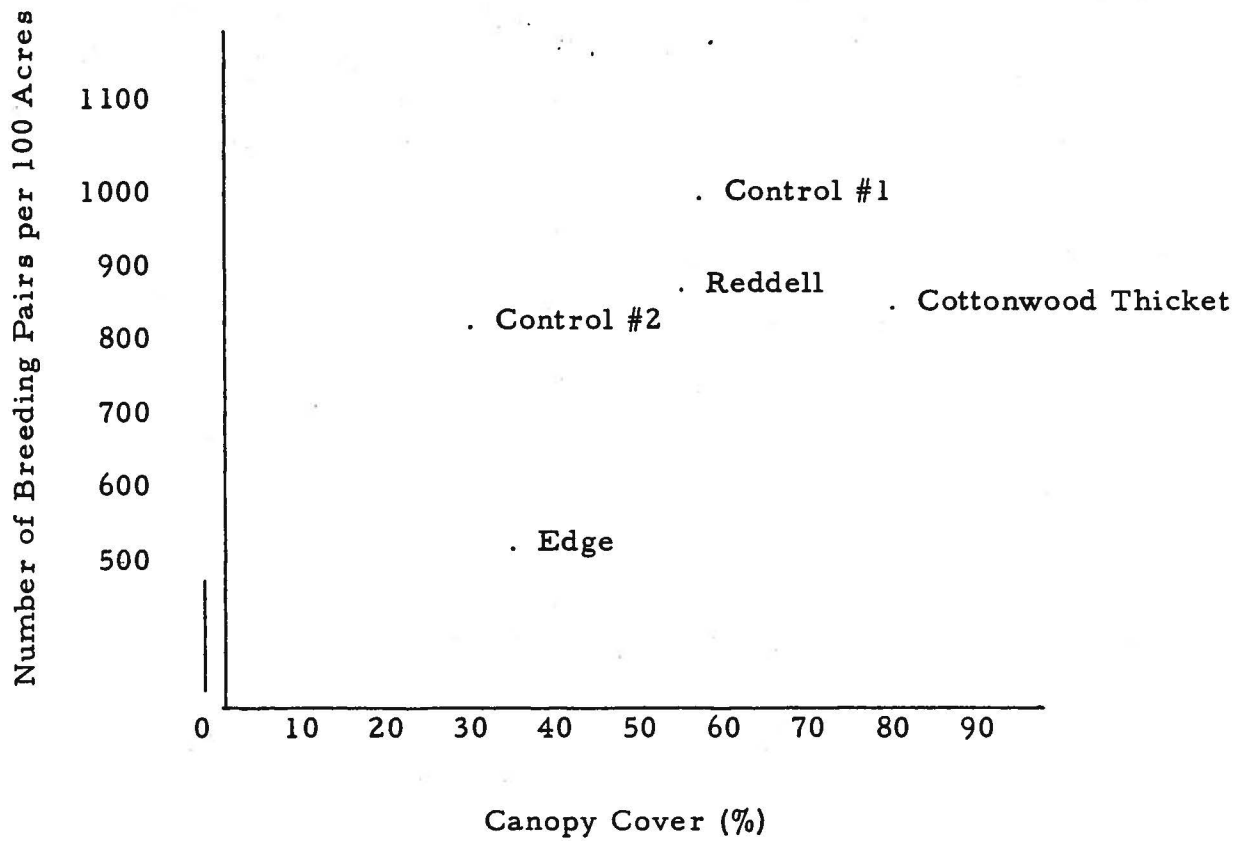


Figure 3. A comparison of the number of breeding pairs of birds per 100 acres of habitat with percent canopy cover.

APPENDIX I

Number of Pairs of Breeding Birds on the Study Areas

Species	Control #1		Control #2		Cottonwood Thicket		Reddell Plot		John Edge Plot		Dry Beaver Creek Plot	
	*A	*B	*A	*B	*A	*B	*A	*B	*A	*B	*A	*B
Yellow Warbler												
<u>Dendroica petechia</u>	9	119.0	6	49.1	5	90.0	7	76.6	9	87.4	0	0.0
Bullock's Oriole												
<u>Iceterus bullockii</u>	8	106.0	6	49.1	3	54.6	6	65.6	6	58.3	0	0.0
Bewick's Wren												
<u>Thryomanes bewickii</u>	8	106.0	6	49.1	4	72.8	4	43.8	2	19.4	3	29.1
Starling												
<u>Sturnus vulgaris</u>	8	106.0	18	147.5	2	36.4	6	65.6	3	29.1	0	0.0
Cassin's Kingbird												
<u>Tyrannus vociferans</u>	4	53.0	4	32.8	0	0.0	6	65.6	5	48.6	0	0.0
Black-chinned Hummingbird												
<u>Archilochus alexandri</u>	4	53.0	2	16.4	4	72.8	1	10.9	1	9.7	2	19.4
Western Kingbird												
<u>Tyrannus verticalis</u>	3	39.7	8	65.6	0	0.0	10	109.5	6	58.3	0	0.0
Mourning Dove												
<u>Zenaidura macroura</u>	3	39.7	5	41.0	5	90.9	7	76.6	2	19.4	1	9.7
Vermilion Flycatcher												
<u>Pyrocephalus rubinus</u>	2	26.5	1	8.2	0	0.0	2	21.9	2	19.4	0	0.0
Robin												
<u>Turdus migratorius</u>	2	26.5	4	32.8	2	36.4	3	32.8	0	0.0	0	0.0
Summer Tanager												
<u>Piranga rubra</u>	2	26.5	4	32.8	3	54.6	3	32.8	3	29.1	3	29.1
House Finch												
<u>Carpodacus mexicanus</u>	2	26.5	2	16.4	0	0.0	2	21.9	1	9.7	1	9.7
Red-wing Blackbird												
<u>Agelaius phoeniceus</u>	2	26.5	0	0.0	1	18.4	2	21.9	2	19.4	0	0.0
Crested Flycatcher												
<u>Myiarchus tyrannulus</u>	2	26.5	4	32.8	3	54.6	1	10.9	2	19.4	2	19.4
Western Wood Pewee												
<u>Contopus sordidulus</u>	2	26.5	0	0.0	0	0.0	2	21.9	0	0.0	0	0.0

	Control #1		Control #2		Cottonwood Thicket		Reddell Plot		John Edge Plot		Dry Beaver Creek Plot	
	*A	*B	*A	*B	*A	*B	*A	*B	*A	*B	*A	*B
Yellow-billed Cuckoo												
<u>Coccyzus americanus</u>	2	26.5	2	16.4	2	36.4	1	10.9	1	9.7	0	0.0
Lucy's Warbler												
<u>Vermivora luciae</u>	2	26.5	2	16.4	3	54.6	1	10.9	0	0.0	1	9.7
Gila Woodpecker												
<u>Centurus uropygialis</u>	2	26.5	4	32.8	1	18.4	2	21.9	1	9.7	1	9.7
Ladder-backed Woodpecker												
<u>Dendrocopos scalaris</u>	1	13.2	3	24.6	1	18.4	1	10.9	1	9.7	1	9.7
Abert's Towhee												
<u>Pipilo aberti</u>	1	13.2	0	0.0	2	36.4	1	10.9	1	9.7	0	0.0
Black Phoebe												
<u>Sayornis nigricans</u>	1	13.2	0	0.0	0	0.0	1	10.9	0	0.0	1	9.7
Hooded Oriole												
<u>Icterus cucullatus</u>	1	13.2	1	8.2	1	18.4	1	10.9	1	9.7	1	9.7
Bridled Titmouse												
<u>Parus wollweberi</u>	1	13.2	2	16.4	1	18.4	1	10.9	0	0.0	1	9.7
Sparrow Hawk												
<u>Falco sparverius</u>	1	13.2	2	16.4	0	0.0	1	10.9	1	9.7	0	0.0
Mockingbird												
<u>Mimus polyglottos</u>	1	13.2	2	16.4	0	0.0	2	21.7	1	9.7	0	0.0
House Sparrow												
<u>Passer domesticus</u>	1	13.2	2	16.4	0	0.0	1	10.9	1	9.7	0	0.0
Red-shafted Flicker												
<u>Colaptes cafer</u>	1	13.2	3	24.6	1	18.4	2	21.9	1	9.7	0	0.0
Horned Owl												
<u>Bubo virginianus</u>	0	0.0	1	8.2	0	0.0	0	0.0	0	0.0	0	0.0
Blue Grobeak												
<u>Guiraca caerulea</u>	0	0.0	2	16.4	1	18.4	1	10.9	0	0.0	1	9.7
White-winged Dove												
<u>Zenaida asiatica</u>	0	0.0	2	16.4	0	0.0	0	0.0	0	0.0	0	0.0
White-breasted Nuthatch												
<u>Sitta carolinensis</u>	0	0.0	1	8.2	0	0.0	0	0.0	0	0.0	0	0.0
Killdeer												
<u>Charadrius vociferus</u>	0	0.0	0	0.0	0	0.0	1	10.9	1	9.7	0	0.0
Spotted Sandpiper												
<u>Actitis macularia</u>	0	0.0	0	0.0	0	0.0	1	10.9	0	0.0	0	0.0

	Control #1		Control #2		Cottonwood Thicket		Reddell Plot		John Edge Plot		Dry Beaver Creek Plot	
	*A	*B	*A	*B	*A	*B	*A	*B	*A	*B	*A	*B
Yellow Throat												
<u>Geothlypis trichas</u>	0	0.0	0	0.0	0	0.0	1	10.9	0	0.0	0	0.0
Long-tailed Chat												
<u>Icteria virens</u>	0	0.0	0	0.0	2	36.4	0	0.0	0	0.0	1	9.7
Bells vireo												
<u>Vireo bellii</u>	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	19.4
Ash-throated Flycatcher												
<u>Myiarchus cinerascens</u>	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	29.1
Cooper's Hawk												
<u>Accipiter cooperii</u>	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	9.7
Cardinal												
<u>Richmondia cardinalis</u>	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	19.4
Verdin												
<u>Auriparus flaviceps</u>	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	9.7
Total number of Nesting Pairs Equals	76		99		47		80		54		29	61.
Total number of Pairs/ 100 Acres Equals	1006.2		811.4		856.6		885.7		524.2		281.3	

*A equals actual pairs found on study areas.

*B equals projected number of pairs per 100 acres of habitat.

APPENDIX II

BREEDING BIRDS OF THE RIPARIAN VEGETATION IN THE VERDE VALLEY, 1969 - 1970

Dependence on Riparian Vegetation

- A) Birds chiefly riparian in Verde Valley, but will nest away from large trees. (Percent of total nesting birds equals 14.5)

Great Horned Owl
Black-chinned Hummingbird
Cassin's Kingbird¹
Black Phoebe
Vermilion Flycatcher
Bewick's Wren
Blue Grosbeak
Abert's Towhee

- B) Birds' natural habitat limited to riparian vegetation in the Verde Valley. (Percent of total nesting birds equals 56.4)

Great Blue Heron
Green Heron
Cooper's Hawk
Zone-tailed Hawk²
Black Hawk³
Bald Eagle³
Sparrow Hawk
White-winged Dove
Yellow-billed Cuckoo
Screech Owl
Belted Kingfisher
Red-shafted Flicker
Gila Woodpecker
Ladderback Woodpecker⁴
Western Kingbird⁴
Wied's Crested Flycatcher
Western Wood Pewee
Bridled Titmouse
Verdin

FW16-10

White-breasted Nuthatch
Robin
Starling
Lucy's Warbler⁵
Yellow Warbler
Yellow-throat
Long-tailed Chat
Red-winged Blackbird
Hooded Oriole
Bullock's Oriole
Summer Tanager
Lesser Goldfinch

- C) Birds not dependent on riparian habitat, but will utilize it when available. (Percent of total nesting birds equals 29.1)

Turkey Vulture
Gambel's Quail
Pheasant
Killdeer⁶
Spotted Sandpiper⁷
Mourning Dove
Lesser Nighthawk
Ash-throated Flycatcher⁸
Cliff Swallow
Mockingbird
Phainopepla
Bell's Vireo
House Sparrow
Scott's Oriole
Brown-headed Cowbird
Cardinal

Footnotes:

¹ Cassin's Kingbird needs semi-open land with scattered large trees.

² The Black Hawk is very rare in the United States. Its northern most range extension is probably the Verde Valley in Arizona.

³ The Bald Eagle is on the rare and endangered list of the Bureau of Sport Fisheries and Wildlife.

⁴ The Western Kingbird needs scattered trees with open land to nest.

⁵ Lucy's Warbler utilized mesquite, but only in association with large trees. It nests under the bark of cottonwoods and willows.

⁶The Killdeer needs large open gravel or sandy areas along streams, ponds, or lakes to nest.

⁷The Spotted Sandpiper is rare in the Verde Valley and needs open gravel or sandy areas along streams, ponds or lakes to nest.

⁸The Cliff Swallow uses the riparian vegetation for feeding only.