other species such as the northern bobwhite (*Colinus virginianus*) and eastern kingbird (*Tyrannus tyrannus*) were closely tied to adjoining agricultural lands.

The most numerous (3.2 birds per 0.8 river km) and most frequently occurring (98 percent) bird along the river was the indigo bunting (*Passerina cyanea*). The indigo bunting is characteristic of ecotones where medium to large-sized trees are available for calling and shrubby bushes are present for nesting. Both of these conditions are abundant along the riverine zone of the Duck River. Next in frequency of occurrence were the Carolina chickadee, *Parus carolinensis*, (85 percent); northern bobwhite (80 percent); common yellowthroat, *Geothlypis trichas*, (80 percent); northern cardinal, *Cardinalis cardinalis*, (80 percent); and acadian flycatcher, *Empidonax virescens*, (78 percent). Birds with the highest densities (birds per 0.8 river km) were the common grackle, *Quiscalus quiscula*, (2.33); acadian flycatcher (2.00); Carolina chickadee (1.88); blue jay, *Cyanocitta cristata* (1.68); and northern bobwhite (1.35).

The structurally complex habitat along the riverine corridor provided some or all of the life requisites for many different speices of birds. Although the tree canopy averaged 76 percent closure on the riverine study segment, there was good sunlight penetration from both sides of the narrow riverine corridor to the forest floor. This resulted in a dense ground cover (83 percent) and a midstory with trees predominantly in the 8 to 15 cm DBH range, which provided nesting and escape cover for a variety of birds. Large numbers of cavity trees along the river provided nesting sites for the eastern screech-owl *(Otus asio),* wood duck, prothonotary warbler *(Protonotaria citrea),* great crested flycatcher *(Myiarchus crinitus),* Carolina chickadees, tufted titmouse *(Parus bicolor),* and five species of woodpeckers recorded during our census. Feeding barn *(Hirundo rustica)* and northern rough-winged swallows *(Stelgidopteryx serripennis)* were attracted to the frequent insect hatches along the river. American crows *(Corvus brachyrhynchos),* black *(Coragyps atratus)* and turkey vultures *(Cathartes aura)* scavenged on the dead fish that were found on the river banks. Northern bobwhites, mourning doves *(Zenaida macroura),* and other birds were observed drinking or bathing at the water's edge during the census.

The diverse avifauna recorded during the census can also be attributed to the variety of habitat types traversed by the narrow, wooded riverine corridor, which created a continuous edge effect. Cover type maps prepared from aerial photographs (Tennessee Valley Authority, 1966) revealed that lands abutting the riverine study corridor consisted of 43 percent pasture and abandoned agricultural lands, 21 percent cropland, 18 percent upland hardwood forest, 17 percent mixed cedar-hardwood forest, and 1 percent cedar forest. Thus, 64 percent of the lands immediately adjacent to the riparian zone were in some type of agricultural use with limited tree and shrub cover. Most of the forested land that abutts the corridor was located in very steep terrain or contained frequent outcroppings of limestone rock, thereby making this land unsuitable for agricultural purposes.

When considered alone, the avifauna of abutting lands was much less diverse than that of the riverine corridor. For example, breeding bird censuses conducted on abandoned agricultural land, upland hardwood forest (Fowler and Fowler, 1983) and cedar forest sites (Fowler and Fowler, 1984) in the Duck River Project area revealed an average of 12 species on upland hardwood forest and abandoned agricultural land sites and 18 species on cedar forest sites. Pasture and cropland, which abutt much of the riverine corridor, were not censused but undoubtedly support an even less diverse avifauna. In summary the narrow riparian zone which lines the Duck River provides foraging, nesting, escape, and roosting cover for many birds which would otherwise not be there.

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A VEGETATION-HABITAT STUDY ALONG A PORTION OF THE NORTH FORK-FORKED DEER RIVER IN WEST TENNESSEE

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Abstract

A series of 24 vegetation-habitat study quadrats was established along and near the northern side of the North Fork-Forked Deer River approximately 5-6 miles east of Dyersburg, Tennessee. There are three distinct physical and structural habitats: bottomland forest habitat, savanna habitat and marsh habitat depending on the drainage pattern of the areas into the river. Species presence, species

importance values, Simpson's Species Diversity Index and the Shannon-Wiener Species Diversity Index were used to compare the degree of complexity of the habitat types. The savanna type habitat exhibited the greatest species diversity while the marsh areas had a relatively low species diversity index.

INTRODUCTION

The North Fork-Forked Deer River is one of seven major tributaries of the Obion-Forked Deer River System. The study area is approximately 5-6 miles east of Dyersburg, Tennessee. The North Fork-Forked Deer River was channelized like many other streams in the system. Photographs of the area show that until the 1950's the system had ample drainage, but now much of the bottomland timber is dead or dying due to a major breakdown in the drainage pattern (U.S. Dept. of Agriculture).

Prior to channelization, the study area was vegetated by bottomland forest typified by some present areas of the Hatchie River System in West Tennessee with a slow moving, meandering stream and scattered low pockets of cypress *(Taxodium distichum)* and water tupelo *(Nyssa aquatica)* intergrading with southern bottomland forests of green ash *(Fraxinus pennsylvanicus)*, soft maples *(Acer rubrum, A. negundo)* and oaks *(Quercus lyrata, Q. michauxii, Q. nigra, Q. phellos, Q. palustris)* to name but a few. The areas flooded during heavy winter and spring rains but drained during late spring and early summer.

After channelization and the installment of culverts along the levee system to allow more rapid drainage of the area, some general drying out of the lower pockets occurred which led to a shift to a more uniform moist bottomland forest condition.

Since channelization, the culvert system has fallen into a state of disuse due to siltation and sedimentation and to the rapid increase in the local beaver population. Floodwaters backed up behind the levee system creating marsh conditions. Due to siltation and constant flooding, a majority of the trees have died. Large areas of standing dead timber and stumps may be seen in the study area illustrating these detremental factors (U.S. Corps of Engineers).

Recently, drainage was reestablished along some portions of the study area allowing the soil to dry out, and there is evidence from natural revegetation that these areas may eventually return to forest conditions.

METHODS

Twenty-four vegetation-habitat study quadrats 100m^2 in size were established and evaluated along and near the northern shore of the North Fork-Forked Deer River. The sites were selected by traveling down the river and locating areas where there was a functional culvert system, a marginally functional culvert system or no apparent drainage system. Three quadrats 50 meters apart perpendicular to the river were established at each of eight sites along a two mile stretch of the river. Permanent plots were established and sampled throughout the growing season. Metal posts were placed at each corner of a study quadrat, and a diameter breast height (dbh) of 3″ was used as a minimum for tree classification. Diameters were converted to basal area. Species Importance Values were determined for every plant species through summation of relative frequency, relative density and relative dominance (Curtis and Cottam, 1962). Species diversity was determined using Simpson's Species Diversity Index (Simpson, 1949) and Shannon-Wiener Species Diversity Index (Shannon-Wiener, 1963). Species diversity implies both the number of species and the number of individuals of these species in a habitat or community. The two approaches to species diversity widely used in the world today were used in this study:

1) Simpson's Species Diversity Index:

$$D = \frac{N\ (N-1)}{\Sigma\ n_i (n_i - 1)}$$

Where N = the total number of individuals of all species, and

n_i = the total number of individuals of the $_{i}$th species.

2) Shannon-Wiener Species Diversity Index:

$$D = \Sigma P_i \ln p\ _i$$

Where P_i = the relative density of the $_{i}$th species.

Both of these indices are intended to show the variety of species and thus, in a mathematical manner, show the complex structure of a community or habitat. The greater the numerical value of the diversity index (D) the greater is the species diversity. In other words, a plant community with a high diversity index will be structurally more complex, which might imply greater stability, and will provide for a greater range of wildlife habitats (in terms of food, shelter, and spatial distribution) than one with a lower index (Martin, Zim and Nelson, 1951).

RESULTS

The three distinct physical-structural habitats are as follows: *Bottomland Forest Habitat* (Tables 1-2, 9) 8 quadrats.

For many years the bottomland forest area had maintained a suitable drainage. However, sedimentation and the rapid increase in the beaver population has adversely affected bottomland forest. The bottomland forest habitat incurs only occasional flooding and is covered by a full forest canopy. This is evident by the lack of a shrub layer and a minimal herb layer. Few seedlings are evident in the more mature portions of this habitat. Where trees have fallen and along the edges of the habitat species diversity tends to increase. Bottomland Forest Habitat Indices:

	Simpson's	*Shannon-Wiener*
Tree Layer	7.321	2.075
Shrub Layer	—	—
Herb Layer	2.705	1.488

Note: The smallest possible index (one species pure stand), Simpson = 1.000;
The smallest possible index (one species pure stand), Shannon-Wiener = 0.00

Savanna Habitat (Tables 3-5,9) 9 Quadrats

The savanna area is in a state of regeneration of vegetation diversity and an area of high wildlife food diversity (Martin, Zim and Nelson, 1951). It is easy to see by the still remaining dead and fallen trees that the area had been a bottomland hardwood forest that has been killed. Since a new system of drainage was reestablished, the area has activated a high degree of vegetation diversity.

Of the three habitats studied in this project the savanna exhibited the greatest species diversity. The seasonal flooding adds to the diversity by annually bringing in new seed sources and nutrients, and this seed influx may prevent single species dominance. As long as these areas drain each growing season, the community will tend to remain relatively stable and diverse, although occasional timber cutting on a selection basis could be beneficial to wildlife by assuring vertical vegetation stratification.

Savanna Habitat Indices:

	Simpson's	*Shannon-Wiener*
Tree Layer	9.252	2.203
Shrub Layer	2.358	1.066
Herb Layer	9.070	2.490

Marsh Habitat (Tables 6-9) 7 Quadrats

The marsh area was once bottomland hardwoods whose remains can still be seen by slowly decaying trees. A lack of adequate drainage, due to deterioration of drainage patterns and the encroachment of beaver, has accelerated the development of these perennially flooded conditions. This habitat has a very low species diversity index value. It is a community of shallow standing water in which the benthic zone is covered by slowly decaying fallen timber.

TABLE 1. *Bottomland Forest Habitat - Tree Layer**

SPECIES	TREE/ ACRE	RELATIVE FREQUENCY	RELATIVE DENSITY	RELATIVE DOMINANCE	IMPORTANCE VALUE
Fraxinus pennsylvanica var. subintegerrima	80.0	11.54	17.91	29.19	58.64
Acer rubrum	93.3	19.23	20.90	18.33	58.46
Carpinus caroliniana	93.3	19.23	20.90	11.63	51.76
Ulmus rubra	53.3	11.54	11.94	27.25	50.73
Acer negundo	40.0	11.54	8.96	3.20	23.70
Acer saccharinum	26.7	7.69	5.97	8.49	22.15
Quercus lyrata	20.0	3.85	4.48	0.35	8.68
Vitis aestivalis	13.3	3.85	2.99	0.73	7.75
Ostrya virginiana	13.3	3.85	2.99	0.47	7.31
Morus rubra	6.7	3.85	1.49	0.33	5.67
Ilex decidua	6.7	3.85	1.49	0.04	5.38
TOTAL	446.6	100.02	100.02	100.01	300.05

*3″ minimum dbh

TABLE 2. *Bottomland Forest Habitat - Herb Layer*

SPECIES	STEMS/ ACRE	% AVERAGE COVER	RELATIVE FREQUENCY	RELATIVE DENSITY	RELATIVE DOMINANCE	IMPORTANCE VALUE
Aster simplex	1946.7	11.33	16.67	58.63	53.68	128.98
Commelina virginiana	331.3	2.44	12.50	9.37	11.58	33.45
Pilea pumila	248.9	1.78	16.67	7.50	8.42	32.59
Viola missouriensis	244.4	1.44	16.67	7.36	6.84	30.87
Glyceria striata	133.3	1.33	12.50	4.02	6.32	22.84
Saururus cernuus	177.8	0.78	8.33	5.35	3.68	17.36
Onoclea sensibilis	133.3	0.89	4.17	4.02	4.21	12.40
Campsis radicans	88.9	0.78	4.17	2.68	3.68	10.53
Boehmeria cylindrica	26.7	0.22	4.17	0.80	1.05	6.02
Viola papilionacea	8.9	0.11	4.17	0.27	0.53	4.97
TOTAL	3320.2	21.10	100.02	100.00	99.99	300.01

TABLE 3. *Savanna Habitat - Tree Layer**

SPECIES	TREES/ ACRE	RELATIVE FREQUENCY	RELATIVE DENSITY	RELATIVE DOMINANCE	IMPORTANCE VALUE
Quercus lyrata	44.4	10.53	22.22	49.59	82.34
Salix nigra	26.7	15.79	13.33	17.51	46.63
Fraxinus pennsylvanica var. subintegerrima	26.7	15.79	13.33	1.05	30.17
Acer saccharinum	22.2	10.53	11.11	5.84	27.48
Ulmus rubra	26.7	5.26	13.33	4.44	23.03
Acer rubrum	20.0	5.26	6.67	10.31	22.24
Taxodium distichum	8.9	10.53	4.44	1.95	16.92
Populus deltoides	8.9	5.26	4.44	7.21	16.91
Acer negundo	8.9	10.53	4.44	0.68	15.65
Carpinus caroliniana	8.9	5.26	4.44	0.11	9.81
Platanus occidentalis	4.4	5.26	2.22	1.32	8.80
TOTAL	206.7	100.00	99.97	100.01	299.98

*3″ minimum dbh

TABLE 4. *Savanna Habitat - Shrub Layer**

SPECIES	STEMS/ ACRE	% AVERAGE COVER	RELATIVE FREQUENCY	RELATIVE DENSITY	RELATIVE DOMINANCE	IMPORTANCE VALUE
Cephalanthus occidentalis	2408.9	27.44	35.00	52.88	65.26	153.14
Quercus lyrata seedlings	1720.0	11.33	15.00	37.76	26.95	79.71
Hibiscus militaris	173.3	1.56	10.00	3.80	3.70	17.50
Fraxinus pennsylvanica var. subintegerrima seedlings	57.8	0.50	15.00	1.27	1.19	17.46
Hypericum walteri	124.4	0.67	5.00	2.73	1.59	9.32
Acer saccharinum seedlings	35.6	0.33	5.00	0.78	0.79	6.57
Liquidambar styraciflua seedlings	22.2	0.11	5.00	0.49	0.26	5.75
Acer rubrum seedlings	8.9	0.06	5.00	0.20	0.13	5.33
Ulmus rubra seedlings	4.4	0.06	5.00	0.10	0.13	5.23
TOTAL	4555.5	42.06	100.00	100.01	100.00	300.01

*2.9″ maximum dbh

TABLE 5. *Savanna Habitat - Herb Layer**

SPECIES	STEMS/ ACRE	% AVERAGE COVER	RELATIVE FREQUENCY	RELATIVE DENSITY	RELATIVE DOMINANCE	IMPORTANCE VALUE
Panicum agrostoides	4711.1	5.72	9.68	21.86	17.98	49.52
Echinochloa occidentalis	2253.3	2.94	4.84	10.46	9.25	24.55
Aster simplex	2244.4	3.44	3.23	10.42	10.82	24.47
Ludwigia peploides	2222.2	3.89	1.61	10.31	12.22	24.14
Commelina virginiana	2222.2	3.33	1.61	10.31	10.47	22.39
Onoclea sensibilis	2222.2	3.33	1.61	10.31	10.47	22.39
Polygonum desiflorum	1435.6	1.44	4.84	6.66	4.54	16.04
Mikania scandens	520.0	0.61	9.68	2.41	1.92	14.01
Leersia lenticularis	933.3	1.00	4.84	4.33	3.14	12.31
Pilea pumila	511.1	1.22	4.84	2.37	3.84	11.05
Lippia lanceolata	546.7	0.39	4.84	2.54	1.22	8.60
Polygonum pennsylvanicum	88.9	0.39	6.45	0.41	1.22	8.08
Bidens frondosa	26.7	0.22	4.84	0.12	0.70	5.66
Bidens discoidea	275.6	0.28	3.23	1.28	0.87	5.38
Ammania coccinea	444.4	0.44	1.61	2.06	1.40	5.07
Ludwigia leptocarpa	133.3	0.78	1.661	0.62	2.44	4.67
Saururus cernuus	97.8	0.22	3.23	0.45	0.70	4.38
Sagittaria latifolia	22.2	0.17	3.23	0.10	0.52	3.85
Ipomoea lacunosa	22.2	0.17	3.23	0.10	0.52	3.85
Cyperus erythrorhizos	88.9	0.33	1.621	0.41	1.05	3.07
Eclipta alba	222.2	0.11	1.61	1.03	0.35	2.99
Polygonum lapathifolium	44.4	0.33	1.61	0.21	1.05	2.87
Ipomoea hederacea	44.4	0.22	1.61	0.21	0.70	2.52
Nuphar luteum	22.2	0.22	1.61	0.10	0.70	2.41
Glyceria striata	88.9	0.06	1.61	0.41	0.17	2.19
Carex sp.	44.4	0.11	1.61	0.21	0.35	2.17
Eupatorium serotinum	13.3	0.11	1.61	0.06	0.35	2.02
Rhynchospora corniculata	13.3	0.11	1.61	0.06	0.35	2.02
Polygonum hydropiperoides	13.3	0.06	1.61	0.06	0.17	1.84
Rumex altissimus	8.9	0.06	1.61	0.04	0.17	1.82
Cyperus strigosus	4.4	0.06	1.61	0.02	0.17	1.80
Polygonum scandens	4.4	0.06	1.61	0.02	0.17	1.80
TOTAL	21546.2	31.82	99.98	99.96	99.99	299.93

TABLE 6. *Marsh Habitat - Tree Layer**

SPECIES	TREE/ ACRE	RELATIVE FREQUENCY	RELATIVE DENSITY	RELATIVE DOMINANCE	IMPORTANCE VALUE
Taxodium distichum	31.1	42.86	28.00	86.21	157.07
Carpinus caroliniana	58.8	14.29	52.00	2.75	69.04
Salix nigra	17.8	28.57	16.00	0.27	44.84
Nyssa aquatica	4.4	14.29	4.00	10.76	29.05
TOTAL	111.1	100.01	100.00	99.99	300.00

*3″ minimum dbh

TABLE 7. *Marsh Habitat - Shrub Layer**

SPECIES	STEMS/ ACRE	% AVERAGE COVER	RELATIVE FREQUENCY	RELATIVE DENSITY	RELATIVE DOMINANCE	IMPORTANCE VALUE
Cephalanthus occidentalis	2008.9	40.22	85.71	99.56	99.45	284.72
Hibiscus militaris	8.9	0.22	14.29	0.44	0.55	15.28
TOTAL	2017.8	40.44	100.00	100.00	100.00	300.00

*2.9″ maximum dbh

TABLE 8. *Marsh Habitat - Herb Layer*

SPECIES	STEMS/ ACRE	% AVERAGE COVER	RELATIVE FREQUENCY	RELATIVE DENSITY	RELATIVE DOMINANCE	IMPORTANCE VALUE
Ludwigia peploides	13,333.3	27.78	23.53	21.26	84.46	129.25
Lemna valdiviana	4,444.4	0.22	5.88	70.88	0.68	77.44
Nuphar luteum	204.4	3.39	29.41	0.33	10.30	40.04
Hypericum mutilum	191.1	0.89	11.76	0.30	2.70	14.76
Azolla caroliniana	4,444.4	0.22	5.88	7.09	0.68	13.65
Cyperus erythrorhizos	44.4	0.11	5.88	0.07	0.34	6.29
Mikania scandens	22.2	0.11	5.88	0.04	0.34	6.26
Sagittaria latifolia	13.3	0.11	5.88	0.02	0.34	6.24
Ludwigia leptocarpa	4.4	0.06	5.88	0.01	0.17	6.06
TOTAL	22,701.9	32.89	99.98	100.00	100.01	299.99

TABLE 9. *Master List of vascular taxa in the three habitats not inlcuded in tables 1-8.*

Bottomland Forest = BF Savanna = S Marsh = M

NO.	SCIENTIFIC NAME	BF	S	M
1.	Acalypha rhomboidea	X	X	
2.	Acalypha virginica	X	X	
3.	Agrostic hyemalis	X		
4.	Albizia julibrissin	X		
5.	Ambrosia artemisiifolia	X	X	
6.	Ambrosia trifida	X	X	
7.	Amorpha fruticosa		X	
8.	Ampelopsis cordata	X		
9.	Andropogon virginicus	X		
10.	Aster dumosus	X		
11.	Aster pilosus	X		
12.	Aster praealtus	X		
13.	Aster vimineus	X		
14.	Betula nigra	X	X	
15.	Boltonia asteroides	X		
16.	Brunnichia cirrhosa	X		
17.	Carya aquatica		X	
18.	Cassia fasciculata	X	X	
19.	Cirsium discolor	X		
20.	Commelina diffusa	X	X	
21.	Cyperus iria	X	X	
22.	Digitaria sanguinalis	X	X	
23.	Dioscarea villosa	X		
24.	Diospyros virginiana	X		
25.	Echinochloa muricata	X	X	
26.	Eleocharis obtusa		X	X
27.	Eleusine indica	X	X	
28.	Elymus virginicus	X	X	
29.	Erechtites hieracifolia	X		
30.	Erianthus alopecuroides	X		
31.	Erigeron canadensis	X	X	
32.	Eupatorium rogosum	X	X	
33.	Euphorbia preslii	X		
34.	Gleditsia aquatica		X	X
35.	Iva annua	X	X	
36.	Lactuca floridana	X		
37.	Leersia oryzoides	X	X	
38.	Lepidium virginicum	X		
39.	Leptochloa panicoides	X	X	
40.	Lespedeza cuneata	X		
41.	Lonicera japonica	X	X	
42.	Ludwigia alternifolia	X	X	X
43.	Maclura pomifera	X		
44.	Menispermum canadensis	X	X	
45.	Oenothera biennis	X		
46.	Oxalis stricta	X		
47.	Panicum lanuginosum	X		
48.	Parthenocissus quinquefolia	X	X	
49.	Paulownia tomentosa	X		
50.	Phaseolus bracteata	X		
51.	Phytolacca americana	X		
52.	Plantago lanceolata	X	X	
53.	Plantago rugelii	X	X	
54.	Plantago virginica	X	X	
55.	Pluchea camphorata	X	X	
56.	Polygonum hydropiperoides var. opelousanum	X	X	
57.	Polygonum longistylum	X	X	
58.	Pyrrhopappus carolinianus	X		
59.	Quercus falcata var. pagodaefolia		X	
60.	Quercus michauxii	X	X	
61.	Quercus nigra	X	X	
62.	Quercus palustris	X	X	
63.	Quercus phellos	X	X	
64.	Rhus glabra	X		
65.	Rhus radicans	X	X	
66.	Rubus argutus	X		
67.	Sambucus canadenis	X		
68.	Sanicula canadenis	X		
69.	Scutellaria sp	X		
70.	Setaria Geniculata	X	X	
71.	Sida spinosa	X	X	
72.	Solidago canadensis	X		
73.	Sorghum halepense	X	X	
74.	Spirodela polyrhiza			X
75.	Stachys tenuifolia	X		
76.	Teucrium canadense	X		
77.	Tridens flavus	X	X	
78.	Ulmus alata	X	X	
79.	Verbascum thaspus	X		
80.	Viola cucullata	X	X	
81.	Vitis cinerea	X	X	
82.	Vitis rotundifolia	X	X	
83.	Xanthium strumarium	X		

The water stands year around, ranging from depths of a few cm to several m in tree trunk soil cavities. Continued flooding will eventually result in the death of the few existing trees. Any new tree germination is restricted to the surface of a few dead stumps occasionally occupied by buttonbush *(Cephalanthus occidentalis).* Yellow floating primose *(Ludwigia peploides)* may eventually fill the remaining open water. Controlled flooding and drainage of this area would probably increase diversity and wildlife utilization.

Marsh Habitat Indices:	*Simpson's*	*Shannon-Wiener's*
Tree Layer	2.857	1.118
Shrub Layer	1.009	0.028
Herb Layer	1.809	0.808

DISCUSSION

The master list (Table 9) includes all vascular plants sighted in the areas but not in the quadrats (Gleason and Cronquist, 1963). 124 species were sighted in the Bottomland Forest Habitat, 92 species in the Savanna Habitat, and only 14 species in the Marsh Habitat. There cannot be drawn a finite line that will completely separate two or more communities. There is a transition zone (ecotone) in which species more or less specific for one habitat will be found within the edge of adjoining communities. This is what wildlife scientists refer to as "edge species" or in this case "forest edge species" (Dasmann, 1964). Many game species are "edge species" and increasing the edge factor is a powerful tool in wildlife management because, generally, more game species can exist in areas of high diversity and the mixture of bottomland forest and wetland forest offers an excellent opportunity to increase diversity.

Year around shallow water zones limit species diversity and inhibits net ecosystem production with the resultant adverse effect on wildlife populations other than beaver, muskrat, and waterfowl. The hot summer conditions experienced in this area and eutrophication, via decomposition of biomass, may reduce the dissolved oxygen content of the standing water and even inhibit fish biomass production in the summer months (Goldman and Thorne, 1983). The transition between the perennially flooded areas and the other habitats is restricted both in width and species diversity. If these areas were drained each spring, a number of species from adjacent areas could invade the area increasing the diversity of the community and probably also its productivity. Flooding during the late fall and winter months would not greatly impede the advancement of tree species and open water could be maintained for waterfowl during the winter months. If these areas are not drained regularly, sedimentation and organic matter will eventually eliminate much of the open standing water.

All three of these habitat types need to be evaluated on a regular basis and managed by human intervention (flooding, draining, group and selection timber cutting, etc.) if a wildlife program is desired.

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TAS OUTSTANDING TEACHERS FOR 1985 TO BE ANNOUNCED

LOOK FOR THE OUTSTANDING SECONDARY SCIENCE TEACHER IN EACH OF THE THREE GRAND DIVISIONS OF TENNESSEE TO BE ANNOUNCED IN THE NEXT ISSUE (JULY). SELECTIONS ARE MADE JOINTLY BY COMMITTEES FROM THE DEPARTMENT OF EDUCATION AND THE TENNESSEE ACADEMY OF SCIENCE. EVALUATION OF NOMINEES FOR 1985 IS CURRENTLY IN PROGRESS.