OKEFENOKEE NATIONAL WILDLIFE REFUGE

BIOLOGICAL REPORT

JULY - DECEMBER
1966

I. WILDLIFE

Regular bi-weekly counts of waterfowl and wading birds were made on the prescribed inventory routes from Camp Cornelia boat dock to Buzzard Roost and Gannet Lakes, and from the Jones Island boat dock to Big Water Lake. These counts were made from early October through December. These inventory routes cover an estimated five percent of the waterfowl and wading bird population.

Water levels in the swamp were above normal during the summer but receded to normal during the period September to December. Normal and below normal water conditions provide optimum food conditions for wading birds and make some foods more available to waterfowl.

A. Wading Birds.

Common Egrets. High water during the summer months was probably responsible for a slightly lower common egret breeding population. The fall population was only slightly lower than last year.

Snowy Egrets. These birds left the refuge during August. The population was normal with only occasional individuals seen in the interior of the swamp. Most snowy egrets are seen along roadside ditches and in ponds and borrow pits.

Cattle Egrets. Arrival and departure dates for these birds correspond very closely to those of snowy egrets. Cattle egrets used the rookery in Chesser Prairie again this year. They feed mostly near the edge of the swamp or on pasture lands adjacent to the refuge.

Great Blue Herons. These birds are seen regularly but remain well dispersed throughout the swamp and very few are seen in any one area.

Little Blue Herons. The population of little blue herons was slightly lower this fall as compared to the previous year. The rookery in Chesser Prairie was used by little blue herons again this year.

Green Herons. These birds were common during the summer and nested in the Chesser Prairie rookery, along the Suwannee Canal, and the Sapling Prairie boat run. Through the late fall and early winter they were seen only occasionally.

Louisiana Herons. These birds were seen only infrequently in the swamp. Two were seen several times during the summer along the

Suwannee Canal. One was seen in early December and on January 2 in the same area.

White Ibises. These birds were numerous again this year. The peak population occurred in late November when an estimated 6,000 of these birds were on the refuge. An estimated 900 were still here in late December.

Wood Ibises. The wood ibis were late in arriving at the refuge this year. This was probably due to the high water conditions during the summer months. By early September they were numerous in the vicinity of Big Water Lake. The peak population occurred in late November with an estimated 820 birds using the refuge at that time.

Sandhill Cranes. The peak population of these birds was estimated at 300 individuals during early December. The summer breeding population has remained stable at approximately 200 birds. Cranes are well dispersed over the refuge. They have been seen or heard in all of the areas of the swamp visited. They are present on the recently purchased addition to the refuge which includes Sapp Prairie.

The following tabulation shows the number of cranes seen on regular trips across Chesser and Grand Prairies during the September-December period for the past nine years:

	1958	1959	1960	1961	1962	1963	1964	1965	1966
Early September	2	-	-	5	-	-	3	8	-
Late September	0	7	-	4	2	9	6	-	-
Early October	8	-	2	9	10	9	-	8	7
Late October	19	-	1	-	-	-	7	27	12
Early November	0	2	19	16	6	-	4	14	12
Late November	-	31	18	-	16	-	11	12	12
Early December	8	23	22	12	11	15	8	22	15
Late December	191	23	8	10	54	6	8	19	12

The Sandhill crane is considered a rare species and they receive complete protection with most of their breeding area in Georgia located within the boundary of this refuge. The breeding population during the summer months remains stable at approximately 200 birds and the wintering population varies considerably from year to year. Winter high and low populations have fluctuated from approximately 300 birds to 2,000 birds respectively.

Miscellaneous Birds. Anhingas are common along the swamp water trails and lakes. They can be seen at Big Water, Gannet and Buzzard Roost Lakes almost any day. Black-crowned night herons are seen frequently but very few at a time.

Ospreys and swallow-tailed kites left the refuge during August. American and least bitterns were seen infrequently during this period.

One American bittern was found with its leg entangled in brush along the Suwannee Canal and it was released unharmed. Blackbirds established a roost in the swamp just south of the Camp Cornelia boat dock and they could be seen in large numbers as they left the roost early mornings. Tree swallows were numerous again this fall. Large flocks used the open prairies as feeding areas.

No eagles were seen during the reporting period, however, one mature bald eagle was observed in Chesser Prairie on January 10, 1967. This was the first eagle seen on the refuge since December 1965. The Okefenokee Bird Club reported visiting an active bald eagle nest near Yulee, Florida in January.

B. Waterfowl.

1. Populations.

The fall population of ducks was still low at the end of December. The peak fall population was only 5,950 birds in early December and 5,000 of these were wood ducks. Wintering populations have declined significantly since 1964. Peak populations occurring during January for 1964, 1965 and 1966 were 29,320, 19,998 and 10,040, respectively.

2. Food conditions.

An expected increase in the wintering population had not materialized by late December despite greater production in northern nesting areas this year. This is probably the result of insufficient food being available to hold the migratory birds at this refuge. High water during the summer months results in less natural food production in the swamp. Water levels were above normal during most of the spring and all of the summer.

During most of the September- December period the water level was near normal and this should have made naturally produced foods available to waterfowl. However, due to the high water conditions during the past growing season a very limited quantity of food was available. This same condition existed during the 1965 growing season.

Some emergent species that did produce a seed crop were wampee Peltandra virginica, pickerelweed Pontederia cordata and hardhead Kyrio fimbriata. One small area in Sapling Prairie produced a good crop of arrowhead Sagittaria sp. that was being used extensively by mallards, black ducks and wood ducks during late November. Wood ducks were observed feeding in cypress timber more frequently this past fall and it is believed that they were feeding on cypress seed.

Paintcup Gyrotheca tinctoria was abundant again this year but very little, if any, was utilized by waterfowl. This plant usually grows on batteries in close association with a variety of other plants and their entwined roots make a heavy mat of vegetation.

The paintroot is hardly available to waterfowl unless these mats are disturbed and the roots exposed in some manner. Reports from local residents of waterfowl feeding extensively on the roots of this plant involved areas on lands adjacent to the refuge where hogs had rooted up vast meadows and exposed the roots.

Bamboo vine Smilax laurifolia, several species of holly Ilex sp. and swamp blackgum Nyssa aquatica produced a fair crop of fruit. Most of the blackgum is located in the north and northwest areas of the refuge. Oak mast was insignificant both in the number of trees and the amount of mast produced.

3. Wood Duck Nesting Boxes.

Cypress logs cut during construction of the Suwannee River Sill were snaked out of the swamp and sawed into one inch boards. This lumber was used to construct 101 new cypress nesting boxes during this period. These boxes were built according to recommended specifications and should last for many years.

A quantity of surplus sheet aluminum was acquired from St. Marks Refuge and used to build 93 metal nesting boxes. These boxes are cylindrical in form, ten inches in diameter and have metal cone shaped tops.

Approximately 200 pine posts were obtained by thinning a pine plantation on Cowhouse Island. These posts are 12 feet long and have been pressure treated with a wood preservative. They will be used to erect the 194 new boxes constructed this year. The posts were cut 12 feet long because they will be erected in the deep peat beds of the prairies on the east side of the refuge. It is planned to erect these boxes during January 1967. They will be located in open prairies or pond like openings, in colonies, and wood and metal boxes will be interspersed. They will be placed so that entrance holes will face open water or open prairie. Each box will be numbered and its individual history will be recorded as part of a permanent record.

Each box will have approximately three inches of sawdust and wood shavings in the bottom for nesting material. Each box will have the inside of the lid painted with a mixture containing one ounce of chlordane and a quart of motor oil as a deterrent to wasps. This mixture has been used for the past two years and not a single wasp nest has been found in the nesting boxes.

4. Waterfowl Trapping and Banding

Seventy-two wood ducks have been banded at Okefenokee Refuge during past years. Fifty-nine were banded in 1961, 12 in 1962 and one in 1963.

Trapping of wood ducks was attempted again this year with a total

of 47 being caught and banded. Bait sites were selected and baiting initiated in early September. Several batteries in Chesser Prairie were baited with shelled whole corn. Baiting was generally unsuccessful with only a few wood ducks being attracted to the bait site. Ohio type wire traps were used in an attempt to catch the few ducks that were taking bait. The net results were the capture of one mallard hen and seven coots. This trapping effort was terminated in late November.

Two bait sites on the west side of the refuge were successful in attracting wood ducks. One site was located in the end of the Savannah River Sill Borrow Pit at Pine Island. The borrow pit near the emergency spillway is shallow and has a clean sand bottom. The other bait site is in Sapp Prairie beside a timber access road. The bottom is peat and approximately two feet deep.

The number of ducks visiting the bait sites varied from day to day but at least 75 have been counted at each place. Two standard Ohio type traps were put at each bait site and left open to allow the ducks to become used to them. The ducks were extremely shy of the traps and would not take bait out of them for a long time. When the traps were closed or set we had exactly the same results at each bait site. One immature female was caught at each bait site on the first day the traps were closed. After that the ducks would take the bait string up to the trap and stop. They would not attempt to take corn from the open throat much less go in the trap after it.

Nylon netting that had been ordered arrived in late November and two drop door type traps were constructed on the bait sites. An 18x30x6 foot trap was constructed in Sapp Prairie and a 12x24x6 foot trap was constructed at the Savannah River Sill Borrow Pit. Both traps operate successfully and the door was dropped three times on each trap between December 18 and 28. In six attempts 45 wood ducks were trapped and banded.

Banding goals established for calendar year 1966 were 200 wood ducks and ring-necked ducks as can. Two wood ducks were caught before the hunting season opened. Since we had wood ducks coming into the bait sites and continued baiting would not influence hunting on adjacent lands, we requested and received permission to trap during the open season. The new drop door traps were completed and ready for operation by mid-December. During the next 11 days 45 wood ducks were caught. No further attempts were made after December 28.

Species, sex and age of all ducks banded during 1966 are presented below:

	Male			Female			
	Imm.	Ad.	Unk.	Imm.	Ad.	Unk.	Total
Mallard	-	-	-	-	1	-	1
Wood Duck	14	11	1	16	4	1	47

Our records contain only three recoveries for wood ducks banded at Okefenokee Refuge. One adult male banded on November 10, 1961 was shot at Lake Butler, Florida during the 1962 hunting season. One immature male banded on November 9, 1961 was shot at Orillia, Ontario on September 28, 1962. The third wood duck banded on November 11, 1961 was shot at Crockett, Texas on December 31, 1964.

One recovery of a banded wood duck on lands adjacent to the refuge boundary was of an adult female on November 14, 1966. This duck was banded at Capon Bridge, West Virginia on July 23, 1964.

Banding costs for the four month period from September through December is presented below:

	Labor	Transportation	Bait	Traps	Total
September	$385.00	$85.50	$18.00	$2.00	$490.50
October	332.50	118.20	3.00	2.00	455.70
November	262.50	88.92	12.00	2.00	365.42
December	227.50	110.80	6.00	10.00	362.30
Totals	$1207.50	$411.42	$39.00	$16.00	$1673.92

Average cost per bird banded is excessive, however, 45 of the wood ducks were caught in an 11 day period when two new traps were in operation and full attention could be given to trapping. It is believed that wood ducks can be trapped at a reasonable cost per duck banded in the future.

Seventy-two percent of the cost above is labor and most of this was expended on trapping with the Ohio type traps which were non-productive. Twenty-five percent of the cost is transportation.

Construction of the two new traps of the type used by Refuge Manager Martin at Santee should be enough traps to catch our quota in any given year. This would require two rolls of plastic covered weld wire at an approximate cost of $60.00 nd angle iron which probably could be picked up from military surplus.

One small wood duck roost was found in Sapp Prairie during October. The ducks were scattered with some in a cypress head and heavy brush and some in an adjacent prairie. Driving the roost was not attempted as the location and number of ducks involved precluded a successful and economical venture.

C. Turkeys

Only three turkeys were seen on refuge lands during this period. One was seen on Cowhouse Island on October 14 and two were seen on the Camp Cornelia road on December 15. Apparently the turkey population has been declining over the past two years.

C. Bears

The bear population has apparently remained stable this year.

Bear and bear sign have been seen with about the usual frequency. Bear sign has been observed on Cowhouse Island, at Camp Cornelia boat dock, on Timber Compartment 13, and in Sapling Prairie. A bear cub was accidently killed on the Pocket Road by an employee of Stephen Foster State Park on November 20.

Conflicts between bears and apiarists continue on lands adjacent to the refuge. The number of bear killed each year in the vicinity of the refuge can only be estimated using unofficial reports as a basis. It is estimated that the annual kill would equal or exceed the annual production during years when the water level in the swamp is above normal. During years when the water level in the swamp is normal or below the bear would be more liable to remain within the refuge boundary and production or annual increase should exceed the annual kill. The number of bear and amount of bear sign seen during the past two years indicate that the population is rather stable despite the illegal kill.

E. Deer.

Deer are frequently seen and deer sign is common on most of the upland area of the swamp. Two deer were seen at the edge of Big Water Lake in November and one at Gap-o-Grand Prairie in December. These deer were several miles from any dry land. Two were seen swimming the Suwannee River Sill Borrow Pit going into the backwater area upstream from the sill in December. One buck running through the heavy brush flushed 55 wood ducks away from a trap site late one afternoon near Pine Island. Deer can be seen along the Pocket Road and on the Suwannee River Sill almost any night.

A legume that has been identified by the U. S. Plant Introductory Station as Tephrosia virginianae was found growing in a small but heavy stand along the Suwannee River Sill. At least 95 percent of the available lateral and terminal stems of this plant were browsed by deer. This plant was probably introduced in Bermuda grass seed used to reseed some eroded places in the sill during the summer.

Jacklighting of deer along the Pocket Road going into Stephen Foster State Park has remained a problem. Several empty 12-gauge shotgun shells and one empty and one unfired .303 British cartridge have been found along the road. It would require patrolling nearly 100 percent of the time to prevent this type depredation.

F. Raccoons

Raccoons are common almost everywhere in the swamp and on perimeter lands and islands. Raccoons can be seen in numbers along refuge roads at night and are occasionally seen in the wetlands of the swamp.

G. Otters

Additional otter have been requested by Wheeler Refuge but none

were caught during the past fall. Trapping efforts will continue during the colder months of 1967.

H. Fishing

High water during the summer months receded to normal during September and fishing was fair to good during the remainder of this period. A 10-pound largemouth bass was caught above the Suwannee River Sill in October. The spillways at the Sill remain popular as fishing areas even during the fall months.

Application of lime and fertilizer was continued at the six borrow pits along the Pocket Road until November. This will be continued again about early March of 1967. Failure to obtain optimum water conditions during the past spring was determined to be a result of insufficient lime to neutralize the acid waters. Lime will be applied at increased rates as specified by Fishery Management Biologist Alex Montgomery.

I. Alligators

Alligators are numerous and can be seen in considerable numbers on warm days. This seems to be particularly true on exceptionally warm days during the colder months of the year.

While using an airboat to transport and erect wood duck nesting boxes in Chesser and Grand Prairies (January 1967) alligators were observed on numerous occasions. These were lying out on batteries near their caves. On one occasion five young alligators estimated to be 14-16 inches long were seen on a battery with an adult.

Poachers apparently ceased their efforts to make a fast buck during this period. There were no known losses during the July-December period.

J. Miscellaneous

A new species has been reported for the refuge. An armadillo was seen in the Pocket by Biological Technician William C. Cone on May 25. Several have been seen along the highways during the past two years but this is the first report for the refuge.

II. WEED CONTROL

The refuge program for control of noxious vegetation was executed during the spring and early summer and reported in the January-June Biological Report for 1966.

III. ECOLOGICAL SUCCESSION FOLLOWING FLOODING BY THE SUWANNEE RIVER SILL

The stop logs were placed in the spillways of the Suwannee River Sill in the spring and early summer of 1962. The extra flooding

resulting from the sill has now extended through five growing seasons.

The original "marked tree transect" along the Suwannee River Sill Borrow Pit contained 250 trees. Only 198 were found in 1964, 105 in 1965 and 92 in 1966. Only live trees were counted in 1965 and 1966. All of the Quercus laurifolia, Pinus elliottii, and Cliftonia monophylla are dead. The remaining species included in the transect and the percentage of the original number marked that are still living are Nyssa ogeche 71%; Nyssa sylvatica 47%; Taxodium distichum 89%; Acer rubrum 33%; Cyrilla racemiflora 24%; and Ilex myrtifolia 42%.

Table 1 shows the status of each species.

The Hack's Island transect was checked this year and data for 33 chains of the 62 chain transect was recorded. Only the slash pine Pinus elliottii has died and the other species have reproduced prolifically and also gained in diameter growth. The number of stems per chain of transect have increased in some instances several hundred percent. Work on the transect was discontinued after it was obvious that the loss of trees along the transect consisted of the one species. This transect will be rerun at the termination of this study.

IV. PLANT SUCCESSION ON PRAIRIE BATTERIES

The Chesser Prairie and Sapling Prairie Batteries are to be checked on alternate years. The next check will be during the late summer of 1967.

V. ECOLOGICAL SUCCESSION FOLLOWING THE 1954-1955 FIRES

A resurvey of the Billy's Lake Burn Plot was made during early September of 1966. This plot was checked in 1957 and in 1962. New invading species found in 1966 were Decodon verticillatus Hypericum sp., Ilex glabra, Pieris phyllreifolia, Iris caroliniana, Nymphoides odorata, Gyrotheca tinctoria and Scirpus cyperinus. Two species recorded in previous checks that were not found this year were Typha latifolia and Solidago fistulosa. Changes in the vegetative cover were slight with a general increase in both woody and herbaceous species and a corresponding decrease in the amount of open water area. Complete data on the transect for the years 1957, 1962 and 1966 can be found in Table 2.

VI. SPECIAL ASSIGNMENT

Wildlife Biologist Leonard O. Walker was assigned to the Regional Office for three weeks during August to work on the National Waterfowl Model. The assignment was to assimilate and record data needed for this model.

VII. PUBLIC RELATIONS

Dr. Robert Fleming, missionary and ornithologist from Nepal, was given a tour of the east side prairies on August 29.

Mr. Robert McClung, a writer from Amherst, Massachusetts, and Mr. Tully Pennington, Professor of Zoology, Statesboro, Georgia, were given a tour of the refuge on August 31 and September 1. Mr. McClung was collecting data preparatory to writing a children's book on alligators.

On October 8 a group of 14 students and a professor from Augusta State College was given a tour of the east side of the prairies.

On November 12 a tour of the east side prairies and a chance to observe sandhill cranes was given to the members of the Augusta Bird Club.

The 1966 Christmas Bird Count was conducted on January 2, 1967 in cooperation with the Okefenokee Bird Club. Eighty-two species and approximately 22,800 individuals were reported.

Leonard O. Walker

February 14, 1967 — Leonard O. Walker, Wildlife Biologist

Table I. Survival of Marked Trees along Suwannee River Sill Borrow Pit - 1966

DBH (inches)		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	22	23	24	Total Trees	Percent Living
Quercus	A																				0	0%
laurifolia	B	2	3	12	3	3	1	5	2	1	1					1				1	35	
Nyssa	A		3	6	8	1	1	1	1	1			1								23	71%
ogeche	B		9	8	8	1	1	2	1	1			1								32	
Nyssa	A		2	2				1	1		1				1						8	47%
sylvatica	B	6	3	2		1		1	3		1	1			1						19	
Taxodium	A	1	2		1	1		8	5		4	1	4	3			1			1	32	89%
distichum	B	3	2		1	1		8	5		4	1	4	5			1			1	36	
Acer	A		7	3	1																11	33%
rubrum	B	12	11	3	2	3		1										1			33	
Pinus	A																				0	0%
elliottii	B	1	3	15	14	4	1							1	1						40	
Cyrilla	A		4	1																	5	24%
racemiflora	B	4	12	3	2																21	
Cliftonia	A																				0	0%
monophylla	B		1	2																	3	
Ilex	A		8	4	1																13	42%
myrtifolia	B	4	11	9	3		2	1		1											31	
Total	A	1	26	16	11	2	1	10	7	1	5	1	5	3	1	0	1	0	0	1	92	37%
Total	B	32	55	54	33	13	5	18	9	3	6	2	5	6	2	1	1	1	0	2	250	

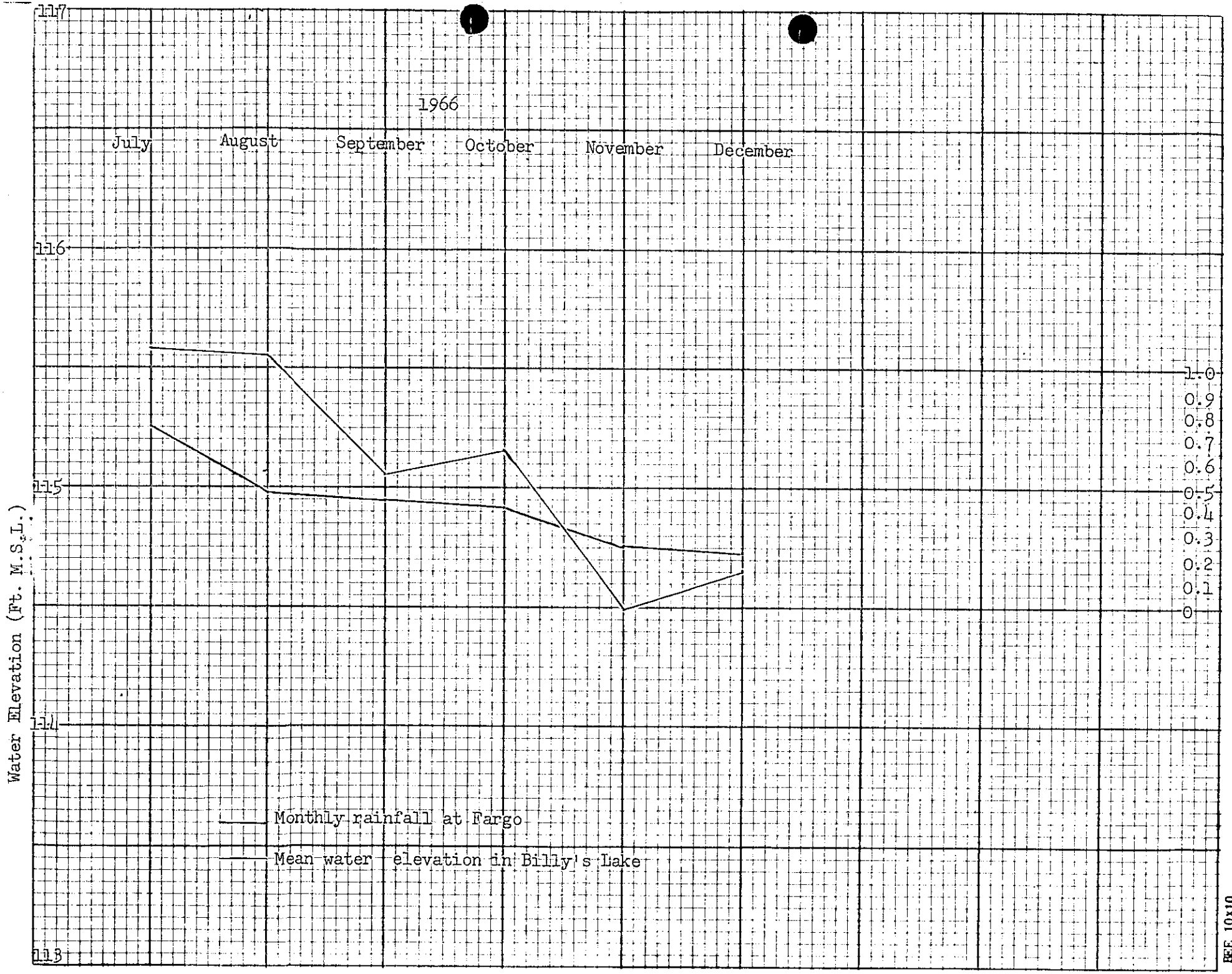
A - Trees still alive on September 2, 1966
B - Number of trees marked and included in original transect.

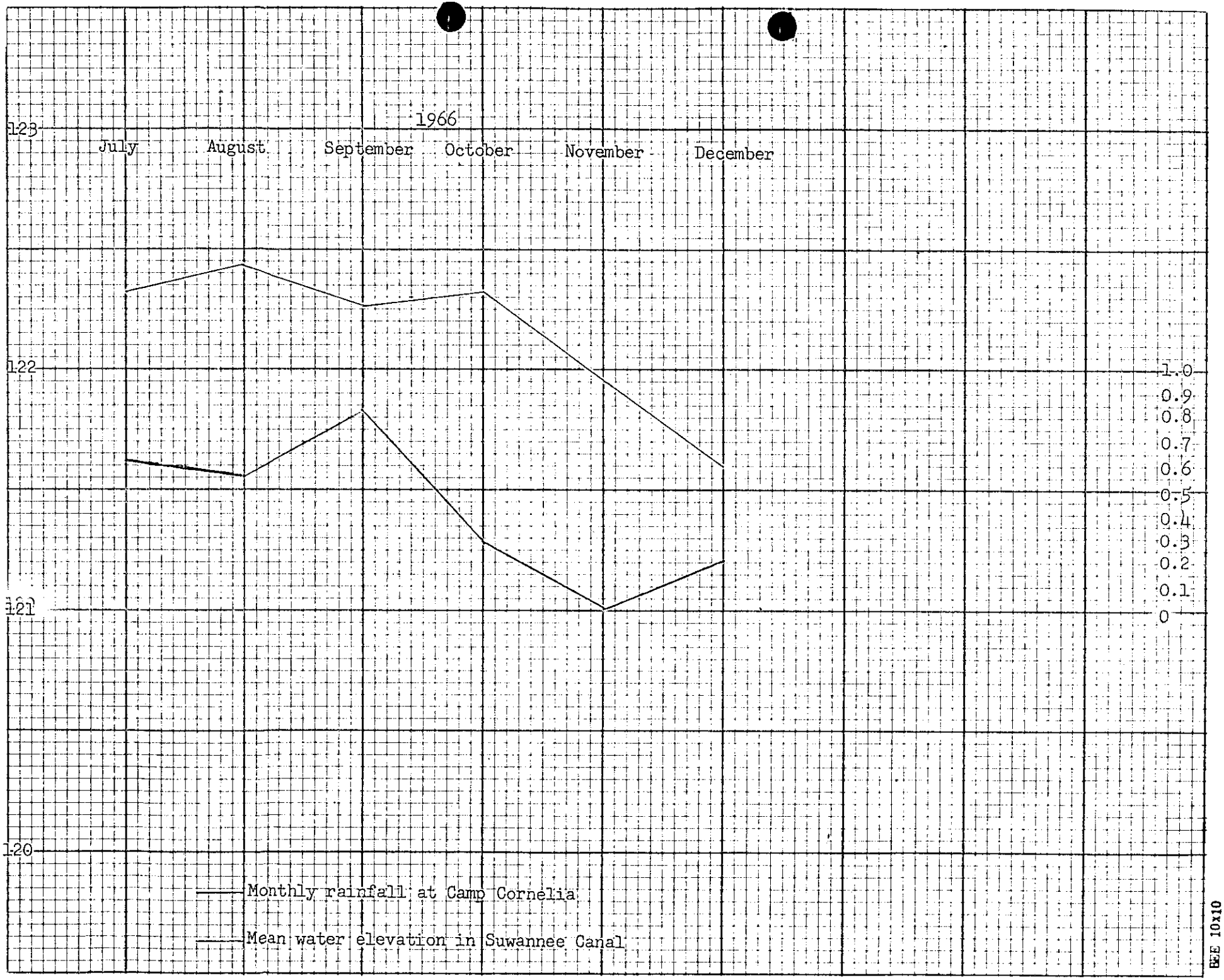
Table 2. Ground Cover by Species and Percentage on the Billy's Lake Burn Plot

	1957	1962	1966	
Water and Sphagnum sp.	57.34	48.32	49.836	1/
Cyrilla racemiflora	7.12	7.07	6.757	
Nyssa sylvatica	1.97	3.92	5.370	
Itea virginiana	1.07	1.33	4.442	
Magnolia virginiana	2.55	3.14	4.245	
Lyonis lucida	0.14	1.27	2.737	
Smilax laurifolia	0.07	0.04	0.845	
Ilex cassine	0.69	0.58	0.804	
Clethra alnifolia	0.04	0.10	0.315	
Pieris phyllyreifolia	--	--	0.290	2/
Acer rubrum	0.07	0.10	0.250	
Decodon verticillatus	--	--	0.175	2/
Gordonia lasianthus	4.33	0.41	0.170	
Persea borbonia	0.71	0.29	0.165	
Myrica cerifera	--	0.01	0.136	
Taxodium distichum	0.04	0.05	0.110	
Hypericum sp.	--	--	0.100	2/
Ilex glabra	--	--	0.065	2/
Cephalanthus occidentalis	--	0.05	0.064	
Smilax walteri	--	0.02	0.0	
Leucothoe racemosa	--	0.18	0.0	
Woodwardia virginiana	23.12	29.46	17.007	
Xyris fimbriata	0.01	0.01	2.736	
Iris caroliniana	--	--	1.850	2/
Scirpus eriophorum	0.02	--	0.400	
Carex hyalinolepis	0.65	0.95	0.360	
Nymphoides odorata	--	--	0.250	2/
Andropogon virginicus	0.04	--	0.226	
Gyrotheca tinctoria	--	--	0.180	2/
Panicum hemitomon	--	--	0.100	2/
Scirpus cyperinus	--	--	0.015	2/
Typha latifolia	--	2.70	0.0	
Solidago fistulosa	0.02	--	0.0	
Totals	100.00	100.00	100.00	

1/ Open water areas were filled with Sphagnum sp.

2/ New invading species


1966
July
August
September
October
November
December
117
116
115
114
113
Water Elevation (Ft. M.S.L.)
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Rainfall (feet)
Monthly rainfall at Fargo
Mean water elevation in Billy's Lake
KEE 10x10


1966
July
August
September
October
November
December
123
122
121
120
Water Elevation (Ft. M.S.L.)
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Rainfall (feet)
Monthly rainfall at Camp Cornelia
Mean water elevation in Suwannee Canal
EUE 10x10