A SURVEY OF THE AQUATIC MACRO INVERTEBRATES AND SUBMERGED AQUATIC VEGETATION IN TWELVE PONDS IN THE GREAT MARSH. LEWES . DELAWARE

ANNUAL REPORT

1989

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Attachment C
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Annual Report

A Survey of the Aquatic Macro-Invertebrates and Submerged Aquatic Vegetation in Twelve Ponds in the Great Marsh, Lewes, DE

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The sampling procedure for submerged aquatic vegetation and aquatic macro-invertebrates was the same in 1988 as in 1987. Sampling for aquatic vegetation started in late March. The quantity of aquatic vegetation was determined by two line transects placed randomly in each pond of the twelve ponds. Two permanent transects were installed to determine random placement of the transects to be sampled. To select the line transect for sampling, a coin is flipped to chose one of the permanent transects and another coin flip decides the direction (left or right) to move from it. A draw determines the number of meters to move around the perimeter of the pond from the permanent transect to locate the transect for sampling. Any species that touches the line or lies under it is considered and quantified by the total linear distance covered along the transect. From this the percent cover of each species is determined. Ponds were sampled every 30 days.

Activity traps were used to sample invertebrates in each of the twelve ponds. Sampling started in early April with traps being placed in the ponds at depths of 15 cm. and 30 cm. in randomly determined locations and left for 3 to 4 hours. The contents of the traps were then collected using a sieve (opening size of 500 mm.) and preserved with 20% ethyl alcohol. Ponds were sampled every 15 days. Samples

are being analyzed, in the lab at the University of Delaware, to identify the genus and species of macro-invertebrates present and their relative abundance in each pond.

Two permanent transects were installed to determine random placement of activity traps, such that each pond is divided into four quadrents. Quadrents are numbered 1 thru 4 in a counter-clockwise direction around the pond with the chosen quadrent specified by a draw. Activity traps are placed at the two depths along a line transect within the chosen quadrent. A draw decides the number of meters to move around the perimeter of the pond from a permanent transect to locate the line transect for sampling. The permanent transect is selected by a flip of the coin.

The sampling of macro-invertebrates was supplemented by making collections using a sweep net. For each pond, five different locations were randomly sampled and a figure 8 motion used to make the collection. The contents of the net was placed in a pan and collected using a sieve. The samples were preserved with 20% ethyl alcohol and brought back to the lab for analysis. Ponds were sampled every 15 days, at the same time the activity traps were placed in the ponds.

The percent cover of aquatic vegetation that was present

in the 1988 sampling period is found in Tables 1 and 2. Ruppia maritima did not appear in any of the ponds until June. Pond 2 contained the greatest amount of cover throughout the sampling period. In September Ruppia was still present in 4 of the ponds. Ruppia was absent in ponds 3,5,9,10,11, and 12. Algae mats were present in ponds 1,2,4,6,8,9, and11 in March. Overall, the quantity of algae increased till September. Algae did not occur in ponds 3 and 10 throughout the sampling period.

In August of 1988, two plastic pans (16 in X 10 3/4 in X 3 3/4 in) were randomly buried in each pond. These pans will be collected in November of 1988 and analysed in the lab to identify macro invertebrates present. Also, in the second sampling period of August, two sweep net collections were made in each pond so to provide vegetations for data analysis.

During the 1987 sampling period Ruppia did not colonize any of the ponds until August when it appeared in ponds 2,6, and 7. Until this time the ponds contained either no vegetation, or a few contained saltmarsh cordgrass (Sparhna alternifolia) and glasswort (Salicomia sp.). Ponds 2,5,6, and8 had been colonized by algae which formed along the perimeter of the pond.

The colonization of the ponds by Ruppia seems to be

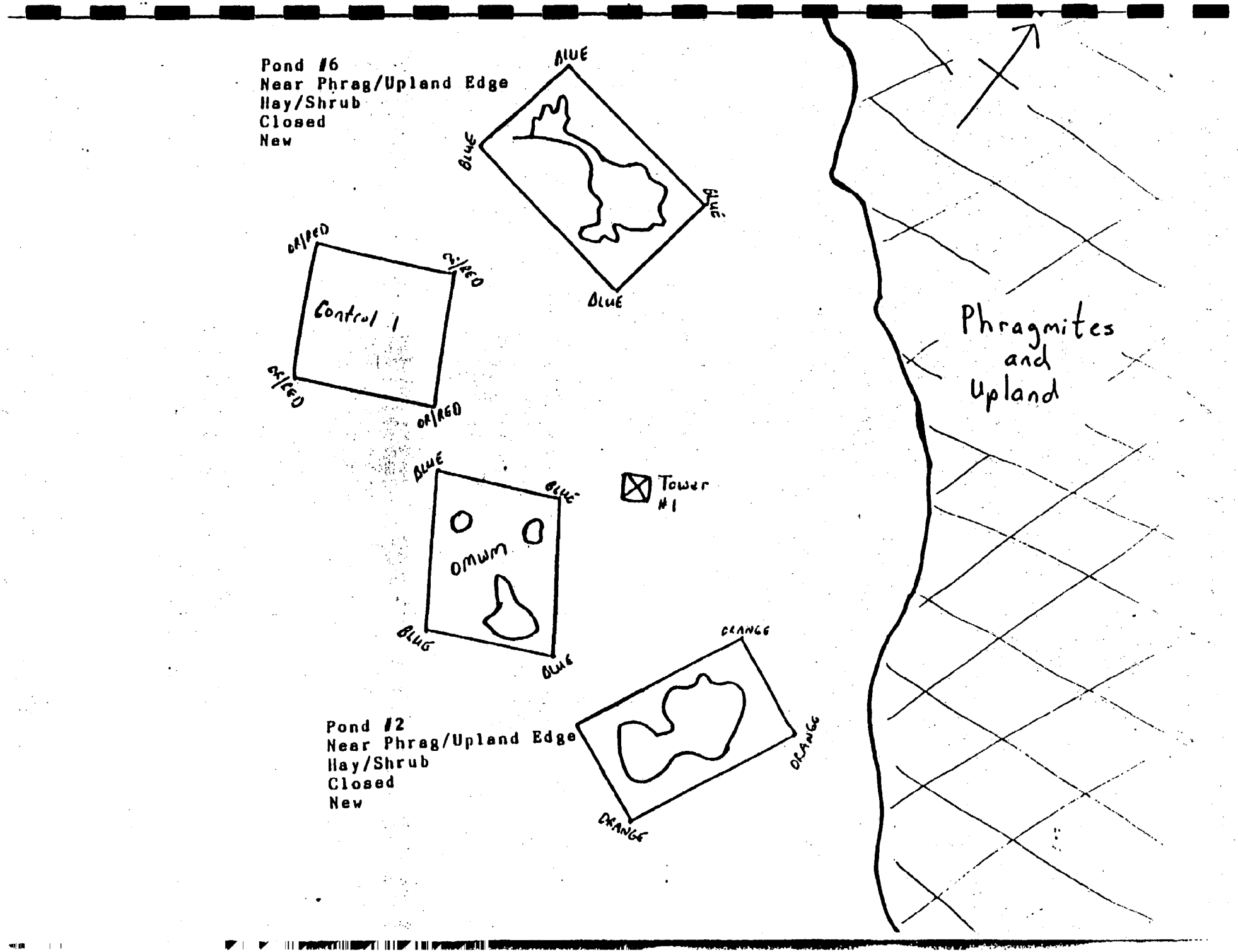
correlated with the type of bottom and depth of the pond. The ponds in which Ruppia were not present had either a soft bottom or a depth greater than .5m. Preliminary data from the sampling of the macro-invertebrates indicates that the rate of colonization of the ponds by Ruppia can be correlated with the diversity of the aquatic macro-invertebrates. Analyzes of the data on bird usuage collected by DNREC should indicate a correlation with the diversity and abundance of the aquatic macro-invertebrates and submerged vegetation.

Table 1. Percent cover of *Ruppia maritima* in ponds in 1988

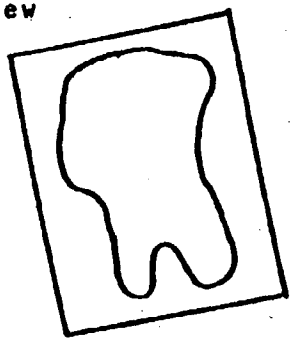
	Ponds											
	1	2	3	4	5	6	7	8	9	10	11	12
March 28	0	0	0	0	0	0	0	0	0	0	0	0
June 10	0	97	0	45	0	.36	.5	1.4	0	0	0	0
July 28	.5	85	0	0	0	.4	77	.1	0	0	0	0
September 6	.3	73	0	0	0	0	16	.3	0	0	0	0

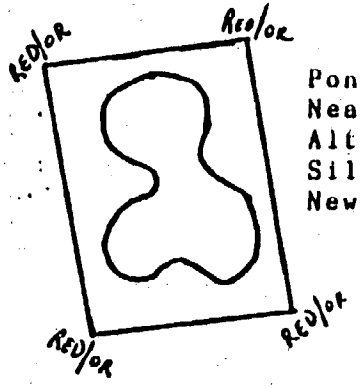
Table 2. Percent cover of algae in ponds for 1982

	Ponds											
	1	2	3	4	5	6	7	8	9	10	11	12
March 28	0	0	0	0	.1	0	0	0	0	0	0	0
June 10	.1	1.3	0	.5	0	.4	2	2	0	0	0	0
July 28	9	63	0	1	1	4	55	15	0	0	0	0
September 6	.0	0	0	0	0	0	79	16	0	0	0	0

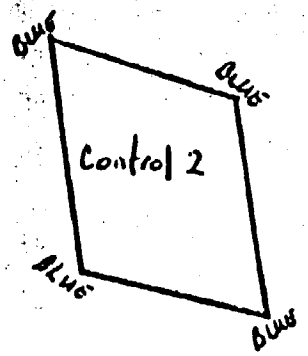

Pond #6
Near Phrag/Upland Edge
Hay/Shrub
Closed
New
BLUE
BLUE
BLUE
BLUE
ORANGE
ORANGE
Control 1
ORANGE
ORANGE
BLUE
BLUE
BLUE
BLUE
OMWM
Tower #1
Phragmites and Upland
Pond #2
Near Phrag/Upland Edge
Hay/Shrub
Closed
New
ORANGE
ORANGE
ORANGE

Pond #11
Open Marsh
Hay/Near Alt
Closed
New





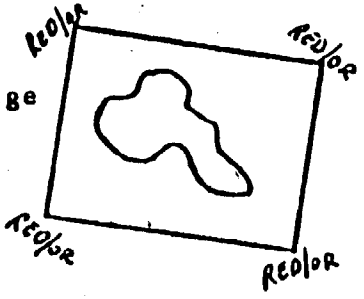
Pond #3
Near Phrag/Upland Edge
Alt/Near Hay
Sill
New

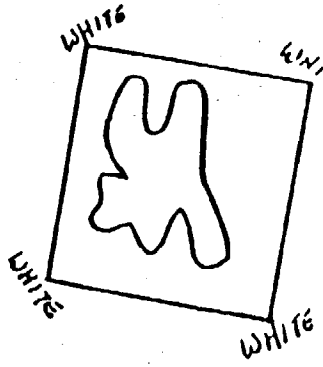


Tower
#2

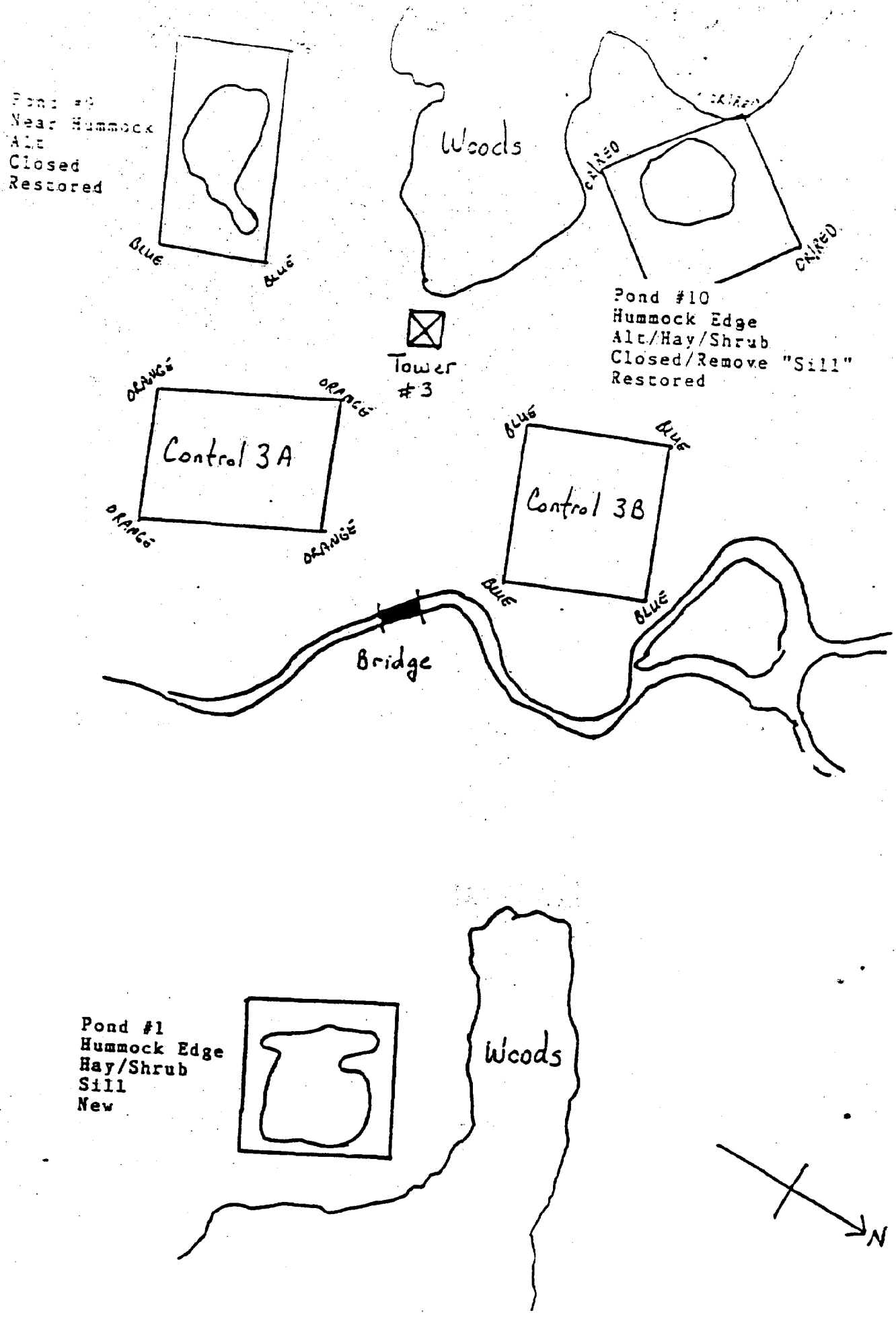
Phragmites
and
Upland

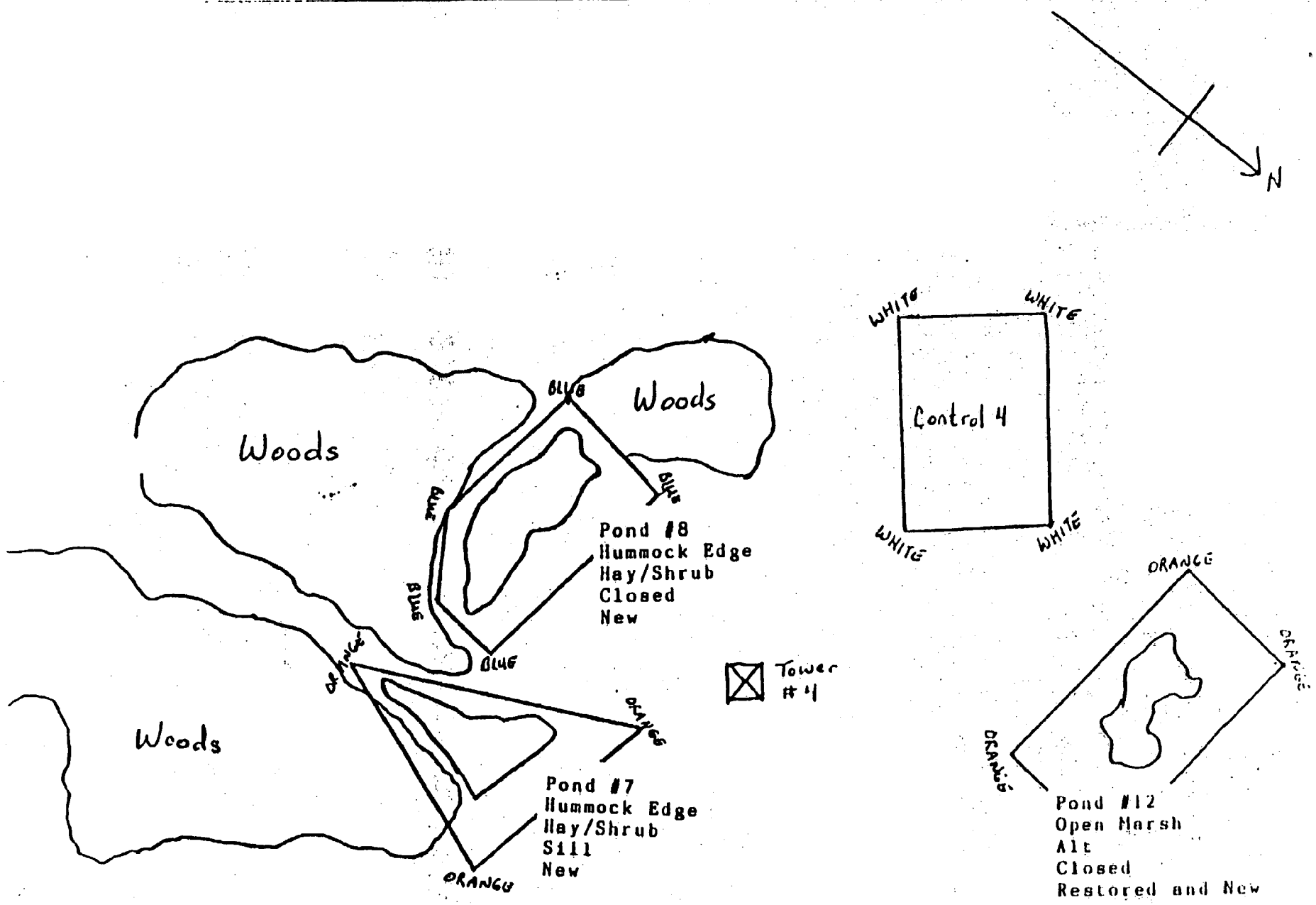
Pond #4
Near Phrag/Upland Edge
Alt/Near Hay
Closed
New





Pond #5
On Phrag/Upland Edge
Hay/Shrub
Sill
New


Pond #9
Near Hummock
Alt
Closed
Restored
BLUE
BLUE
Woods
ORANGE
ORANGE
Pond #10
Hummock Edge
Alt/Hay/Shrub
Closed/Remove "Sill"
Restored
Tower
#3
ORANGE
ORANGE
Control 3A
ORANGE
ORANGE
BLUE
BLUE
Control 3B
BLUE
BLUE
Bridge
Pond #1
Hummock Edge
Hay/Shrub
Sill
New
Woods
N


N
Woods
Woods
Woods
BLUE
BLUE
BLUE
BLUE
Pond #8
Hummock Edge
Hay/Shrub
Closed
New
ORANGE
ORANGE
ORANGE
Tower
#1
Pond #7
Hummock Edge
Hay/Shrub
Sill
New
WHITE
WHITE
Control 4
WHITE
WHITE
ORANGE
ORANGE
ORANGE
Pond #12
Open Marsh
Alt
Closed
Restored and New

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