

2024 Survey of Aquatic Plant Species in Mississippi Waterbodies



A report submitted to the Mississippi Aquatic Invasive Species Council

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Executive Summary

Conclusions

- Of the 16 lakes surveyed, only Chotard Lake and Lake Lee had macrophyte communities that consisted entirely of native species.
- Generally, macrophyte communities in the Tennessee River and Tombigbee River basins were more rich and diverse than those in the Yazoo River basin.
- Overall, 99 species were observed during the survey effort; of which, 12 were non-native and 14 were not previously observed.
- The three most widespread species were *Cephalanthus occidentalis* at 14 lakes (87.5%), *Taxodium distichum* at 14 lakes (87.5%), and *Alternanthera philoxeroides* at 13 lakes (81.3%).
- *Hydrilla verticillata* was the only federal noxious weed observed in the surveys and was present at 4 lakes (25.0%). Mississippi state noxious weeds included *H. verticillata*, *Panicum repens* at 1 lake (6.3%), and *Triadica sebifera* at 2 lakes (12.5%).
- *Utricularia macrorhiza* was observed at Mosquito Run despite authorities considering this species absent in Mississippi.
- *Panicum repens* (at Pickwick Lake) and *Vallisneria denseserrulata* × *spiralis* (at TTW Pool E), both non-native, were observed for the first time in their respective systems during these surveys.

Recommendations

- Continue monitoring waterbodies within Mississippi for the presence of non-native aquatic plant species.
- Implement early detection, rapid response (EDRR) management options on populations of those non-native aquatic plant species known to be in Mississippi; specifically small, isolated populations before they colonize other sites (*i.e.* *P. repens* in Pickwick Lake and *V. denseserrulata* × *spiralis* in TTW Pool E).
- Determine suitable goals for management of large populations of non-native aquatic plant species.
- Implement management strategies on those populations of native species that have grown to nuisance levels in Mississippi waterbodies.

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Introduction

The state of Mississippi (MS) has significant water resources that, many times, are impaired by invasive aquatic and wetland plant species. Impaired waterbodies can then act as source populations to introduce non-native vegetation to other waterbodies in the region. The likelihood of being a source population increases if the waterbody in question has a high frequency of boat traffic. Many times, small waterbodies that have significant amounts of boat traffic are overlooked due to the size of the waterbody. The world's surface waters are dominated by small waterbodies (<250 acres; Downing et al. 2006). In the state of Mississippi, 192,050 acres are covered by small waterbodies (<100 acres; Neal and Willis 2012) which is greater than the five largest reservoirs (117,840 acres; Ross Barnett, Sardis, Grenada, Enid, and Arkabutla reservoirs) in the state combined (USACE 2023). The state has more small waterbodies (> 160,000) and a greater density (1 per 0.51 mi²) of small waterbodies than any other state in the MidSouth (MS, AL, AR, TN, LA, and GA) region of the United States (Neal and Willis 2012).

Many waterbodies in the state that receive the highest amount of traffic are those owned and managed by the state of MS. The Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP) and the Pat Harrison Waterway District are two state agencies that are responsible for managing state owned waterbodies in Mississippi. Other lakes that receive a significant amount of traffic are federal lakes operated by the US Fish and Wildlife Service (USFWS), the US Forest Service (USFS), or the US Army Corps of Engineers (USACE). Aside from state and federally operated waterbodies, there are also waterbodies operated by homeowners' associations within the state. Many of these waterbodies are known to have problematic vegetation while others have never been surveyed.

Two federally listed noxious weeds have been found within the state: *Hydrilla verticillata* (Hydrilla or Waterthyme) and *Salvinia molesta* (giant salvinia). Additionally, torpedo grass (*Panicum repens*) and tallowtree (*Triadica sebifera*) are invasive species listed on the MS noxious weed but not the federal list; both species are known to cause localized problems in the waterbodies they infest.

This annual survey effort is the only to have been conducted on small to medium sized (100-7,500 acres) in Mississippi. Ongoing surveys will allow management bodies to annually track the spread of invasive species and provide information to resource managers for decision making purposes. The objective of this effort was to conduct surveys of aquatic vegetation targeted at small to medium size lakes in the Mississippi Delta and reservoirs in the northern section of the Tennessee-Tombigbee Waterway as well as the Mississippi section of Pickwick Lake.

Methodology

Water bodies were selected based on a combination of size, frequency of boat traffic, location within the state, and previous survey status. All waterbodies surveyed were within the geographic boundaries of the state of Mississippi. A total of 16 lakes from three river basins were

surveyed during June 2024 (Table 1; Loshbaugh et al. 2013). Surveyed lakes were located in the Mississippi Delta and along the northern section of the Tennessee-Tombigbee Waterway (Fig 1). Of the 16 waterbodies surveyed in 2024, 11 had not been visited during previous survey efforts (App. 1; Turnage and Shoemaker 2018, Turnage et al. 2019, 2020, Lee et al. 2023, Schmid and Turnage 2023).

Lakes were surveyed using point surveys of the littoral zone. Points were placed on a path that followed the shoreline. Survey points were taken by boat at intervals ranging from 100-1,000 m, depending on overall lake shoreline length. In general, increased length of shoreline resulted in increased distances between sampling points. Survey points were taken in the littoral zone of each waterbody, which was determined through Secchi readings (3 times the average secchi depth). At each survey point the GPS location and water depth were recorded. Macrophytes at each point were documented via species presence for all aquatic plants (angiosperms, ferns, lycophytes, marchantiophytes, and mosses) and charophytes (Wetzel 2001). All visible macrophytes within 3.05 m (10 ft) of any part of the boat were recorded. At each survey point, a plant rake was deployed to determine the presence and identity of submersed macrophytes. Macrophytes that were observed on a waterbody but not within a sampling point were noted. Macrophytes were primarily identified *in situ*, but when *in situ* identification was difficult, specimens were collected for later identification with a taxonomic key. Taxonomic treatments for Tracheophytes (vascular plants), Marchantiophytes, and Charophytes followed *Flora of the Southeastern United States, A Synopsis of the Liverwort Flora of North America North of Mexico, and Freshwater Algae of North America* (Wehr et al. 2015, Stotler and Crandall-Stotler 2017, Weakley and Southeastern Flora Team 2024). Most observations were identified to species, but in instances of cryptic species with inadequate diagnostic characteristics observations were reported at the genus level. In total, 68 specimens plus several duplicates were collected, pressed, dried, and deposited in the Mississippi State University Herbarium (MISSA) as voucher specimens.

Macrophyte community statistics

Species lists for each waterbody were compiled, including total points surveyed, percent of littoral zone vegetated, points present, and the native/non-native status of each species. Species frequency and proportion were calculated for each species at each site and mean species richness, Shannon-Weiner Index, and Shannon Evenness were calculated for each waterbody as descriptive statistics of macrophyte communities. Species frequency and proportion both represent the prevalence of individual species in each community. Species frequencies were reported in species lists whereas species proportions were used to calculate Shannon-Weiner Indices. Mean species richness represents a measure of central tendency for the number of different species at sample points in the same waterbody. Shannon-Weiner Index and Shannon Evenness correspond to species diversity and species evenness respectively. Said metrics were calculated using the following formulae:

Species Frequency¹ (F_i):

$$F_i = \frac{n_i}{t}$$

Mean Species Richness² (\bar{x}_s):

$$\bar{x}_s = \frac{N}{t}$$

Species Proportion³ (p_i):

$$p_i = \frac{n_i}{N}$$

Shannon-Weiner Index³ (H'):

$$H' = -\sum_{i=1}^s p_i \ln p_i$$

Shannon Evenness³ (J):

$$J = \frac{H'}{\ln s}$$

Definition of symbols:

n_i = number of occurrences for species i

N = number of occurrences for all species

t = number of survey points

s = number of species in plant community (richness)

Notes:

¹percent frequency = $F_i \cdot 100$

² \bar{x}_s refers to mean species richness of entire community whereas \bar{x}_{ns} and \bar{x}_{nns} refer to mean richness of native and non-native species respectively.

³formula retrieved from Gurevitch et al. (2002).

Results and Discussion

Statewide

In total, 99 species were observed across all waterbodies in 2024. Of the 99 species, 14 of them were not observed in previous iterations of this survey (App. 2; Turnage and Shoemaker 2018, Turnage et al. 2019, 2020, Lee et al. 2023, Schmid and Turnage 2023). Of lakes surveyed in 2024, Bay Springs Lake ($s=39$, $\bar{x}_s=8.39$, $H'=3.31$, $J=0.90$; Table 2) and Pickwick Lake ($s=41$, $\bar{x}_s=3.94$, $H'=3.34$, $J=0.90$; Table 2) had among the most robust littoral zones. Chotard Lake ($s=13$, $\bar{x}_s=3.00$, $H'=1.66$, $J=0.65$; Table 2) and Six Mile Lake ($s=13$, $\bar{x}_s=2.37$, $H'=1.97$, $J=0.77$; Table 2) were among the most depauperate. Of the 99 species observed in 2024, 11 were non-

native. Of lakes surveyed in 2024, Chotard Lake and Lake Lee were the only lakes where non-native species were not observed during the survey. The tree most common species observed during the surveys were *Cephalanthus occidentalis* at 14 lakes (87.5%), *Taxodium distichum* at 14 lakes (87.5%), and *Alternanthera philoxeroides* at 13 lakes (81.3%). Pool D and Pickwick Lake were both tied for the total number of non-native species in their surveys ($s_{nn}=6$; Table 2). Lake Jackson had the greatest mean richness of non-native species ($\bar{x}_{nns}=2.86$; Table 2). *Hydrilla verticillata* is a federally and state listed noxious weed and was observed at 4 lakes (25.0%) during the 2024 surveys. *Panicum repens* and *Triadica sebifera* are both state listed noxious weeds and were observed in 1 (6.3%) and 2 (12.5%) lakes respectively. *Utricularia macrorhiza* was observed as the most common species in Mosquito Run. Prior to this 2024 survey, *U. macrorhiza* was not previously considered present in Mississippi (despite being reported in previous iterations of this survey; App. 2). Despite very few prior records of *U. macrorhiza* in Mississippi, this species is likely native and should be treated as such. Additionally, *Vallisneria denseserrulata* × *spiralis* was observed in Pool E (at 34.4758, -88.3346 on June 24, 2024) of the Tennessee-Tombigbee Waterway and this is the first record of this species in Mississippi. This hybrid was identified *in situ* using morphological characteristics, but *Vallisneria spp.* can be cryptic. Samples were sent to Dr. Ryan Thum at Montana State University for genetic confirmation. *Vallisneria denseserrulata* × *spiralis* is an invasive species that is problematic in the reservoirs of the Tennessee River. The population of *V. denseserrulata* × *spiralis* within Pool E was very limited and this early detection should be capitalized on for rapid response. Finally, *Panicum repens* was recorded for the first time in the Mississippi section of Pickwick Lake (at 34.9506, -88.2181 on June 25, 2024). The population of *P. repens* in the Goat Island arm of Pickwick Lake was very limited and this early detection should be capitalized on for rapid response.

Yazoo River Basin

Chotard Lake

Chotard Lake (32.5869, -91.0469) was surveyed June 11, 2024. Chotard Lake ranked 15th in species richness ($s=13$) and 14th in mean species richness ($\bar{x}_s=3.00$) (Table 2). It ranked 16th in species diversity ($H'=1.66$) and 16th in species evenness ($J=0.65$) (Table 2). The most frequent species were *Lemna minor* (98.2%), *Spirodela polyrhiza* (98.2%), and *Salix nigra* (57.9%) (Table 3). There were no federal noxious weeds present in Chotard Lake. There were no non-native species present in Chotard Lake (Table 3).

Dump Lake

Dump Lake (32.6431, -91.6145) was surveyed June 10, 2024. Dump Lake ranked 10th in species richness ($s=18$) and 15th in mean species richness ($\bar{x}_s=2.52$) (Table 2). It ranked 11th in species diversity ($H'=2.39$) and 10th in species evenness ($J=0.83$) (Table 2). The most frequent species were *Nelumbo lutea* (65.2%), *Cephalanthus occidentalis* (47.8%), and *Taxodium distichum* (30.4%) (Table 4). The only non-native species in Dump Lake was *Alternanthera philoxeroides* (13.0%) (Table 4).

Lake Jackson

Lake Jackson (33.0531, -91.0958) was surveyed June 13, 2024. Lake Jackson ranked 8th in species richness ($s=21$) and 3rd in mean species richness ($\bar{x}_s=8.22$) (Table 2). It ranked 8th in species diversity ($H'=2.57$) and 8th in species evenness ($J=0.85$) (Table 2). The most frequent species were *Alternanthera philoxeroides* (100.0%), *Landoltia punctata* (94.4%), and *Pontederia crassipes* (94.4%) (Table 5). The only Mississippi state noxious weed was *Triadica sebifera* (2.8%) (Table 5). Other non-native species included *Alternanthera philoxeroides* (100.0%), *Pontederia crassipes* (94.4%), and *Cyperus blepharoleptos* (88.9%) (Table 5).

Lake Lee

Lake Lee (33.2672, -91.0592) was surveyed June 13, 2024. Lake Lee ranked 12th in species richness ($s=16$) and 12th in mean species richness ($\bar{x}_s=3.71$) (Table 2). It ranked 13th in species diversity ($H'=2.22$) and 13th in species evenness ($J=0.80$) (Table 2). The most frequent species were *Landoltia punctata* (78.9%), *Lemna minor* (78.9%) and *Wolffia sp.* (55.3%) (Table 6). There were no non-native species present in Lake Lee (Table 6).

Little Eagle Lake

Little Eagle Lake (33.1434, -90.3569) was surveyed June 12, 2024. Little Eagle Lake ranked 16th in species richness ($s=12$) and 8th in mean species richness ($\bar{x}_s=5.59$) (Table 2). It ranked 14th in species diversity ($H'=2.01$) and 12th in species evenness ($J=0.81$) (Table 2). The most frequent species were *Alternanthera philoxeroides* (100.0%), *Landoltia punctata* (100.0%), *Hydrocotyle ranunculoides* (88.9%) and *Pontederia crassipes* (88.9%) (Table 7). Non-native species included *Albizia julibrissin* (3.7%), *Alternanthera philoxeroides* (100.0%), and *Pontederia crassipes* (94.4%) (Table 7).

Long Branch

Long Branch (33.7609, -90.1478) was surveyed June 18, 2024. Long Branch ranked 7th in species richness ($s=26$) and 6th in mean species richness ($\bar{x}_s=6.88$) (Table 2). It ranked 7th in species diversity ($H'=2.72$) and 11th in species evenness ($J=0.82$) (Table 2). The most frequent species were *Alternanthera philoxeroides* (100.0%), *Pontederia crassipes* (92.0%), and *Taxodium distichum* (84.0%) (Table 8). Non-native species included *Alternanthera philoxeroides* (100.0%), and *Pontederia crassipes* (92.0%) (Table 8).

McIntyre Scatters

McIntyre Scatters (33.6797, -90.1669) was surveyed June 20, 2024. McIntyre Scatters ranked 11th in species richness ($s=17$) and 7th in mean species richness ($\bar{x}_s=6.13$) (Table 2). It ranked 9th in species diversity ($H'=2.54$) and 4th in species evenness ($J=0.90$) (Table 2). The most frequent species were *Heteranthera reniformis* (100.0%), *Najas minor* (93.3%), and *Taxodium distichum* (73.3%) (Table 9). The only non-native species present was *Najas minor* (93.3%) (Table 9). Survey effort of McIntyre Scatters was lesser due to shallow water with limited navigability.

Mosquito Run

Mosquito Run (33.3679, -90.2596) was surveyed June 19, 2024. Mosquito Run ranked 6th in species richness ($s=26$) and 1st in mean species richness ($\bar{x}_s=10.96$) (Table 2). It ranked 5th in species diversity ($H'=2.85$) and 7th in species evenness ($J=0.87$) (Table 2). The most frequent species were *Lemna minor* (100.0%), *Utricularia macrorhiza* (100.0%), *Alternanthera philoxeroides* (96.4%), *Cyperus blepharoleptos* (96.4%), and *Limnobium spongia* (96.4%) (Table 10). Non-native species included *Alternanthera philoxeroides* (96.4%), *Cyperus blepharoleptos* (96.4%), and *Pontederia crassipes* (94.6%) (Table 10).

Old Yazoo Cutoff

Old Yazoo Cutoff (33.1301, -90.5109) was surveyed June 12, 2024. Old Yazoo Cutoff ranked 5th in species richness ($s=27$) and 11th in mean species richness ($\bar{x}_s=3.92$) (Table 2). It ranked 6th in species diversity ($H'=2.77$) and 9th in species evenness ($J=0.84$) (Table 2). The most frequent species were *Alternanthera philoxeroides* (70.3%), *Pontederia crassipes* (51.4%), and *Hibiscus laevis* (40.5%) (Table 11). The only Mississippi state noxious weed was *Triadica sebifera* (5.4%) (Table 11). Other non-native species included *Albizia julibrissin* (10.8%), *Alternanthera philoxeroides* (70.3%), and *Pontederia crassipes* (51.4%) (Table 11).

Round Lake

Round Lake (33.4416, -90.1996) was surveyed June 19, 2024. Round Lake ranked 9th in species richness ($s=15$) and 5th in mean species richness ($\bar{x}_s=6.95$) (Table 2). It ranked 10th in species diversity ($H'=2.44$) and 2nd in species evenness ($J=0.90$) (Table 2). The most frequent species were *Alternanthera philoxeroides* (95.5%), *Lemna minor* (95.5%), and *Pontederia crassipes* (90.9%) (Table 12). Non-native species included *Alternanthera philoxeroides* (95.5%), and *Pontederia crassipes* (90.9%) (Table 12).

Six Mile Lake

Six Mile Lake (33.6907, -90.2042) was surveyed June 17, 2024. Six Mile Lake ranked 14th in species richness ($s=13$) and 16th in mean species richness ($\bar{x}_s=2.37$) (Table 2). It ranked 15th in species diversity ($H'=1.97$) and 14th in species evenness ($J=0.77$) (Table 2). The most frequent species were *Taxodium distichum* (89.5%), *Cephalanthus occidentalis* (47.4%), and *Ulmus sp.* (31.6%) (Table 13). The only non-native species was *Alternanthera philoxeroides* (5.3%) (Table 13). The survey of Six Mile Lake ended prematurely due to mechanical issues.

Wolf Lake

Wolf Lake (32.9278, -90.4944) was surveyed June 14, 2024. Wolf Lake ranked 9th in species richness ($s=21$) and 13th in mean species richness ($\bar{x}_s=3.26$) (Table 2). It ranked 12th in species diversity ($H'=2.30$) and 15th in species evenness ($J=0.76$) (Table 2). The most frequent species were *Taxodium distichum* (83.9%), *Cephalanthus occidentalis* (46.8%), and *Ulmus sp.* (41.9%) (Table 14). The only non-native species was *Alternanthera philoxeroides* (3.2%) (Table 14).

Tennessee River/ Tombigbee River Basins

Bay Springs Lake

Bay Springs Lake (34.5491, -88.3357) was surveyed June 26, 2024. Bay Springs Lake ranked 3rd in species richness ($s=39$) and 2nd in mean species richness ($\bar{x}_s=8.39$) (Table 2). It ranked 2nd in species diversity ($H'=3.31$) and 1st in species evenness ($J=0.90$) (Table 2). The most frequent species were *Hydrilla verticillata* (72.2%), *Triadenum walteri* (66.7%), and *Potamogeton nodosus* (61.1%) (Table 15). The only Federal/Mississippi state noxious weed was *Hydrilla verticillata* (72.2%) (Table 15). Other non-native species included *Alternanthera philoxeroides* (5.6%) and *Najas minor* (11.1%) (Table 15). The survey of Bay Springs Lake ended prematurely due to unsafe weather.

TTW Pool D

TTW Pool D (34.4001, -88.4023) was surveyed June 27, 2024. TTW Pool D ranked 2nd in species richness ($s=41$) and 4th in mean species richness ($\bar{x}_s=7.00$) (Table 2). It ranked 3rd in species diversity ($H'=3.26$) and 5th in species evenness ($J=0.88$) (Table 2). The most frequent species were *Justicia americana* (87.5%), *Alnus serrulata* (70.8%), and *Potamogeton nodosus* (70.8%) (Table 16). The only Federal/Mississippi state noxious weed was *Hydrilla verticillata* (12.5%) (Table 16). Other non-native species included *Alternanthera philoxeroides* (8.3%), *Colocasia esculenta* (41.7%), *Myriophyllum aquaticum* (12.5%), *Myriophyllum spicatum* (8.3%) and *Najas minor* (4.2%) (Table 16). The survey of TTW Pool D ended prematurely due to unsafe weather.

TTW Pool E

TTW Pool E (34.4784, -88.3411) was surveyed June 24, 2024. TTW Pool E ranked 4th in species richness ($s=35$) and 9th in mean species richness ($\bar{x}_s=4.88$) (Table 2). It ranked 4th in species diversity ($H'=3.12$) and 6th in species evenness ($J=0.88$) (Table 2). The most frequent species were *Alnus serrulata* (65.4%), *Chara sp.* (65.4%), and *Zizaniopsis mileacea* (38.5%) (Table 17). The only Federal/Mississippi state noxious weed was *Hydrilla verticillata* (3.8%) (Table 17). Other non-native species included *Albizia julibrissin* (11.5%), *Alternanthera philoxeroides* (3.8%), *Myriophyllum aquaticum* (3.8%), and *Vallisneria denseserrulata* × *spiralis* (3.8%) (Table 17).

Pickwick Lake - Goat Island Arm

The Goat Island arm of Pickwick Lake (34.9659, -88.2299) was surveyed June 25, 2024. Pickwick Lake ranked 1st in species richness ($s=41$) and 10th in mean species richness ($\bar{x}_s=3.94$) (Table 2). It ranked 1st in species diversity ($H'=3.34$) and 3rd in species evenness ($J=0.90$) (Table 2). The most frequent species were *Cephalanthus occidentalis* (36.1%), *Justicia americana* (33.3%), and *Liquidambar styraciflua* (30.6%) (Table 18). Noxious weeds included *Hydrilla verticillata* (federal/Mississippi state noxious weed; 27.8%) and *Panicum repens* (Mississippi state noxious weed; 2.8%) (Table 18). Other non-native species included *Albizia julibrissin* (13.9%), *Alternanthera philoxeroides* (25.0%), *Myriophyllum aquaticum* (2.8%), and *Najas minor* (13.9%) (Table 18).

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Tables and Figures

Table 1. Geographic characteristics of lakes surveyed during June 2024.

Site name	Date surveyed	Latitude	Longitude	Area (ac)	Sample Points (<i>t</i>)	River/Streams Basin
Chotard Lake	June 11, 2024	32.5869	-91.0469	1123	57	Yazoo River
Dump Lake	June 10, 2024	32.6431	-90.6145	439	23	Yazoo River
Lake Jackson	June 13, 2024	33.0531	-91.0958	164	36	Yazoo River
Lake Lee	June 13, 2024	33.2672	-91.0592	1110	38	Yazoo River
Little Eagle Lake	June 12, 2024	33.1434	-90.3569	700	27	Yazoo River
Long Branch	June 18, 2024	33.7609	-90.1478	73	25	Yazoo River
McIntyre Skatters	June 20, 2024	33.6797	-90.1669	551	15	Yazoo River
Mosquito Run	June 19, 2024	33.3679	-90.2596	1005	28	Yazoo River
Old Yazoo Cutoff	June 12, 2024	33.1301	-90.5109	87	37	Yazoo River
Round Lake	June 19, 2024	33.4416	-90.1996	34	27	Yazoo River
Six Mile Lake	June 17, 2024	33.6907	-90.2042	531	19	Yazoo River
Wolf Lake	June 14, 2024	32.9278	-90.4944	18000	63	Yazoo River
Bay Springs Lake	June 26, 2024	34.5491	-88.3357	6401	19	Tombigbee River
Pool D	June 27, 2024	34.4001	-88.4023	1797	25	Tombigbee River
Pool E	June 24, 2024	34.4784	-88.3411	751	26	Tombigbee River
Pickwick Lake	June 25, 2024	34.9659	-88.2299	3363	39	Tennessee River

Table 2. Macrophyte community metrics of lakes surveyed during June 2024

Site Name	Richness			Mean Richness			Diversity	Evenness
	Total (s)	Non- Native (s_{nn})	Native (s_n)	Total (\bar{x}_s)	Non- Native (\bar{x}_{nns})	Native (\bar{x}_{ns})	Shannon- Weiner Index (H')	Shannon Evenness (J)
Chotard Lake	13	0	13	3.00	0.00	3.00	1.66	0.65
Dump Lake	18	1	17	2.52	0.13	2.39	2.39	0.83
Lake Jackson	21	4	17	8.22	2.86	5.36	2.57	0.85
Lake Lee	16	0	16	3.71	0.00	3.71	2.22	0.80
Little Eagle Lake	12	3	9	5.59	1.93	3.67	2.01	0.81
Long Branch	26	2	24	6.88	1.92	4.96	2.72	0.82
McIntyre Skatters	17	1	16	6.13	0.93	5.20	2.54	0.90
Mosquito Run	26	3	23	10.96	2.79	8.18	2.85	0.87
Old Yazoo Cutoff	27	4	23	3.92	1.38	2.54	2.77	0.84
Round Lake	15	2	13	6.95	1.86	5.09	2.44	0.90
Six Mile Lake	13	1	12	2.37	0.05	2.32	1.97	0.77
Wolf Lake	21	1	20	3.26	0.03	3.23	2.30	0.76
Bay Springs Lake	39	3	36	8.39	0.89	7.50	3.31	0.90
Pool D	41	6	35	7.00	0.88	6.13	3.26	0.88
Pool E	35	5	30	4.88	0.27	4.62	3.12	0.88
Pickwick Lake	41	6	35	3.94	0.86	3.08	3.34	0.90

Table 3. Macrophyte community of Chotard Lake. Species with '0' for points present indicates it was present at site but was not observed at any survey points.

Chotard Lake			
Littoral Depth	7.2'	Date Surveyed	June 11, 2024
Species Richness	13	Total Pts. Sur	57
Native Species Richness	13	Total Pts. Veg	57
		%-Littoral Veg	100.0
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Alnus serrulata</i>	smooth alder	3	5.3
<i>Carya aquatica</i>	water hickory	5	8.8
<i>Cephalanthus occidentalis</i>	buttonbush	1	1.8
<i>Diospyros virginiana</i>	American persimmon	1	1.8
<i>Fraxinus pennsylvanica</i>	green ash	2	3.5
<i>Lemna minor</i>	common duckweed	56	98.2
<i>Ludwigia sp.</i>	waterprimrose	4	7.0
<i>Platanus occidentalis</i>	sycamore	5	8.8
<i>Populus deltoides</i>	cottonwood	2	3.5
<i>Quercus nigra</i>	water oak	1	1.8
<i>Salix nigra</i>	black willow	33	57.9
<i>Spirodela polyrhiza</i>	greater duckweed	56	98.2
<i>Vitis sp.</i>	grape	2	3.5

Table 4. Macrophyte community of Dump Lake. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds. Species with '0' for points present indicates it was present at site but was not observed at any survey points.

Dump Lake			
Littoral Depth	3.3'	Date Surveyed	June 10, 2024
Species Richness	18	Total Pts. Sur	23
Native Species Richness	17	Total Pts. Veg	23
		%-Littoral Veg	100.0
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Acmella repens</i>	Creeping spotflower	1	4.3
<i>Alternanthera philoxeroides</i>	alligatorweed	3	13.0
<i>Carex vulpinoidea</i>	fox sedge	1	4.3
<i>Cephalanthus occidentalis</i>	buttonbush	11	47.8
<i>Commelina virginica</i>	Virginia dayflower	1	4.3
<i>Cyperus sp.</i>	nutsedge	1	4.3
<i>Juncus effusus</i>	common rush	1	4.3
<i>Nelumbo lutea</i>	American lotus	15	65.2
<i>Persicaria sp.</i>	knotweed	3	13.0
<i>Platanus occidentalis</i>	sycamore	1	4.3
<i>Quercus nigra</i>	water oak	1	4.3
<i>Quercus phellos</i>	willow oak	1	4.3
<i>Sagittaria platyphylla</i>	delta arrowhead	2	8.7
<i>Salix nigra</i>	black willow	4	17.4
<i>Saururus cernuus</i>	giant salvinia	2	8.7
<i>Sesbania herbacea</i>	bigpod sesbania	2	8.7
<i>Taxodium distichum</i>	baldcypress	7	30.4
<i>Zizaniopsis miliacea</i>	giant cutgrass	1	4.3

Table 5. Macrophyte community of Lake Jackson. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds. Species with '0' for points present indicates it was present at site but was not observed at any survey points.

Lake Jackson			
Littoral Depth	3.6'	Date Surveyed	June 13, 2024
Species Richness	21	Total Pts. Sur	36
Native Species Richness	17	Total Pts. Veg	36
		%-Littoral Veg	100.0
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	alligatorweed	36	100.0
<i>Azolla caroliniana</i>	Carolina mosquitofern	5	13.9
<i>Cephalanthus occidentalis</i>	buttonbush	3	8.3
<i>Cyperus blepharoleptos</i>	Cuban bulrush	32	88.9
<i>Hydrocotyle ranunculoides</i>	floating marshpennywort	26	72.2
<i>Landoltia punctata</i>	spotted duckweed	34	94.4
<i>Lemna minor</i>	common duckweed	35	97.2
<i>Ludwigia peploides</i>	floating waterprimrose	2	5.6
<i>Ludwigia sp.</i>	waterprimrose	7	19.4
<i>Panicum hemitomon</i>	maidencane	1	2.8
<i>Persicaria sp.</i>	knotweed	5	13.9
<i>Pontederia crassipes</i>	waterhyacinth	34	94.4
<i>Riccia fluitans</i>	floating crystalwort	12	33.3
<i>Ricciocarpos natans</i>	fringed heartwort	1	2.8
<i>Sagittaria latifolia</i>	broadleaf arowhead	7	19.4
<i>Taxodium distichum</i>	baldcypress	32	88.9
<i>Triadenum walteri</i>	greater marsh St. Johnswort	3	8.3
<i>Triadica sebifera</i>	tallowtree	1	2.8
<i>Typha latifolia</i>	broadleaf cattail	2	5.6
<i>Utricularia gibba</i>	southern bladderwort	11	30.6
<i>Zizaniopsis miliacea</i>	giant cutgrass	7	19.4

Table 6. Macrophyte community of Lake Lee. Species with '0' for points present indicates it was present at site but was not observed at any survey points.

Lake Lee			
Littoral Depth	8.1'	Date Surveyed	June 13, 2024
Species Richness	16	Total Pts. Sur	38
Native Species Richness	16	Total Pts. Veg	38
		%-Littoral Veg	100.0
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Alnus serrulata</i>	smooth alder	1	2.6
<i>Amorpha fruticosa</i>	indigobush	3	7.9
<i>Azolla caroliniana</i>	Carolina mosquitofern	3	7.9
<i>Carya aquatica</i>	water hickory	2	5.3
<i>Diospyros virginiana</i>	American persimmon	4	10.5
<i>Forestiera acuminata</i>	swamp privet	15	39.5
<i>Gleditsia aquatica</i>	swamp locust	3	7.9
<i>Landoltia punctata</i>	spotted duckweed	30	78.9
<i>Lemna minor</i>	common duckweed	30	78.9
<i>Platanus occidentalis</i>	sycamore	3	7.9
<i>Quercus bicolor</i>	swamp white oak	1	2.6
<i>Salix nigra</i>	black willow	17	44.7
<i>Taxodium distichum</i>	baldcypress	2	5.3
<i>Ulmus sp.</i>	elm	4	10.5
<i>Vitis sp.</i>	grape	2	5.3
<i>Wolffia sp.</i>	watermeal	21	55.3

Table 7. Macrophyte community of Little Eagle Lake. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds. Species with '0' for points present indicates it was present at site but was not observed at any survey points.

Little Eagle Lake			
Littoral Depth	4.5'	Date Surveyed	June 12, 2024
Species Richness	12	Total Pts. Sur	27
Native Species Richness	9	Total Pts. Veg	27
		%-Littoral Veg	100.0
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Albizia julibrissin</i>	mimosa tree	1	3.7
<i>Alternanthera philoxeroides</i>	alligatorweed	27	100.0
<i>Azolla caroliniana</i>	Carolina mosquitofern	2	7.4
<i>Cephalanthus occidentalis</i>	buttonbush	2	7.4
<i>Hydrocotyle ranunculoides</i>	floating marshpennywort	24	88.9
<i>Landoltia punctata</i>	spotted duckweed	27	100.0
<i>Nyssa aquatica</i>	water tupelo	20	74.1
<i>Pontederia crassipes</i>	waterhyacinth	24	88.9
<i>Sagittaria latifolia</i>	broadleaf arowhead	1	3.7
<i>Taxodium distichum</i>	baldcypress	20	74.1
<i>Triadenum walteri</i>	greater marsh St. Johnswort	2	7.4
<i>Zizaniopsis miliacea</i>	giant cutgrass	1	3.7

Table 8. Macrophyte community of Long Branch. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds. Species with '0' for points present indicates it was present at site but was not observed at any survey points.

Long Branch			
Littoral Depth	1.8'	Date Surveyed	June 18, 2024
Species Richness	26	Total Pts. Sur	25
Native Species Richness	24	Total Pts. Veg	25
		%-Littoral Veg	100.0
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Alnus serrulata</i>	smooth alder	1	4.0
<i>Alternanthera philoxeroides</i>	alligatorweed	25	100.0
<i>Azolla caroliniana</i>	Carolina mosquitofern	4	16.0
<i>Carya aquatica</i>	water hickory	5	20.0
<i>Cephalanthus occidentalis</i>	buttonbush	14	56.0
<i>Commelina virginica</i>	Virginia dayflower	1	4.0
<i>Cyperus sp.</i>	nutsedge	1	4.0
<i>Echinodorus cordifolia</i>	creeping burhead	4	16.0
<i>Gleditsia aquatica</i>	swamp locust	1	4.0
<i>Hibiscus laevis</i>	halberdleaf rosemallow	11	44.0
<i>Hibiscus lasiocarpus</i>	wooly rosemallow	8	32.0
<i>Ilex decidua</i>	possumhaw	4	16.0
<i>Justicia ovata</i>	looseflower waterwillow	2	8.0
<i>Lemna minor</i>	common duckweed	1	4.0
<i>Limnobium spongia</i>	American frogsbit	5	20.0
<i>Ludwigia peploides</i>	floating waterprimrose	1	4.0
<i>Nelumbo lutea</i>	American lotus	1	4.0
<i>Nyssa aquatica</i>	water tupelo	3	12.0
<i>Persicaria sp.</i>	knotweed	1	4.0
<i>Pontederia crassipes</i>	waterhyacinth	23	92.0
<i>Quercus phellos</i>	willow oak	7	28.0
<i>Salix nigra</i>	black willow	1	4.0
<i>Sesbania herbacea</i>	bigpod sesbania	1	4.0
<i>Spirodela polyrhiza</i>	greater duckweed	19	76.0
<i>Taxodium distichum</i>	baldcypress	21	84.0
<i>Utricularia gibba</i>	southern bladderwort	7	28.0

Table 9. Macrophyte community of McIntyre Scatters. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds. Species with '0' for points present indicates it was present at site but was not observed at any survey points.

McIntyre Scatters			
Littoral Depth	4.5'	Date Surveyed	June 20, 2024
Species Richness	17	Total Pts. Sur	15
Native Species Richness	16	Total Pts. Veg	15
		%-Littoral Veg	100.0
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Cephalanthus occidentalis</i>	buttonbush	4	26.7
<i>Ceratophyllum demersum</i>	coontail	1	6.7
<i>Echinodorus cordifolia</i>	creeping burhead	6	40.0
<i>Heteranthera limosa</i>	blue mudplantain	2	13.3
<i>Heteranthera reniformis</i>	kidneyleaf mudplantain	15	100.0
<i>Hibiscus laevis</i>	halberdleaf rosemallow	2	13.3
<i>Lemna minor</i>	common duckweed	3	20.0
<i>Ludwigia peploides</i>	floating waterprimrose	5	33.3
<i>Najas guadalupensis</i>	southern naiad	4	26.7
<i>Najas minor</i>	brittle naiad	14	93.3
<i>Nelumbo lutea</i>	American lotus	10	66.7
<i>Persicaria sp.</i>	knotweed	2	13.3
<i>Sagittaria latifolia</i>	broadleaf arrowhead	4	26.7
<i>Salix nigra</i>	black willow	2	13.3
<i>Sesbania herbacea</i>	bigpod sesbania	1	6.7
<i>Spirodela polyrhiza</i>	greater duckweed	6	40.0
<i>Taxodium distichum</i>	baldcypress	11	73.3

Table 10. Macrophyte community of Mosquito Run. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds. Species with '0' for points present indicates it was present at site but was not observed at any survey points.

Mosquito Run			
Littoral depth	3.9'	Date Surveyed	June 19, 2024
Species Richness	26	Total Pts. Sur	28
Native Species Richness	23	Total Pts. Veg	28
		%-Littoral Veg	100
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	alligatorweed	27	96.4
<i>Azolla caroliniana</i>	Carolina mosquitofern	17	60.7
<i>Cabomba caroliniana</i>	fanwort	7	25.0
<i>Cephalanthus occidentalis</i>	buttonbush	2	7.1
<i>Ceratophyllum demersum</i>	coontail	17	60.7
<i>Cyperus blepharoleptos</i>	Cuban bulrush	27	96.4
<i>Hydrocotyle ranunculoides</i>	floating marshpennywort	17	60.7
<i>Hydrocotyle umbellata</i>	manyflowered marshpennywort	1	3.6
<i>Lemna minor</i>	lesser duckweed	28	100.0
<i>Limnobium spongia</i>	American frogsbit	27	96.4
<i>Ludwigia sp.</i>	waterprimrose	7	25.0
<i>Nelumbo lutea</i>	American lotus	15	53.6
<i>Nymphaea odorata</i>	white waterlily	3	10.7
<i>Nyssa aquatica</i>	water tupelo	11	39.3
<i>Persicaria sp.</i>	knotweed	2	7.1
<i>Pontederia crassipes</i>	waterhyacinth	24	85.7
<i>Ricciocarpos natans</i>	fringed heartwort	1	3.6
<i>Sagittaria latifolia</i>	broadleaf arrowhead	1	3.6
<i>Salix nigra</i>	black willow	2	7.1
<i>Sesbania herbacea</i>	bigpod sesbania	2	7.1
<i>Spirodela polyrhiza</i>	greater duckweed	4	14.3
<i>Taxodium distichum</i>	baldcypress	9	32.1
<i>Triadenum walteri</i>	marsh St. Johnswort	2	7.1
<i>Utricularia gibba</i>	southern bladderwort	25	89.3
<i>Utricularia macrorhiza</i>	common bladderwort	28	100.0
<i>Zizaniopsis miliacea</i>	giant cutgrass	1	3.6

Table 11. Macrophyte community of Old Yazoo Cutoff. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds. Species with '0' for points present indicates it was present at site but was not observed at any survey points.

Old Yazoo Cutoff			
Littoral Depth	7.2'	Date Surveyed	June 12, 2024
Species Richness	27	Total Pts. Sur	37
Native Species Richness	23	Total Pts. Veg	37
		%-Littoral Veg	100.0
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Albizia julibrissin</i>	mimosa tree	4	10.8
<i>Alnus serrulata</i>	smooth alder	2	5.4
<i>Alternanthera philoxeroides</i>	alligatorweed	26	70.3
<i>Carex vulpinoidea</i>	fox sedge	1	2.7
<i>Carya aquatica</i>	water hickory	1	2.7
<i>Cephalanthus occidentalis</i>	buttonbush	14	37.8
<i>Cyperus sp.</i>	nutsedge	1	2.7
<i>Diospyros virginiana</i>	American persimmon	2	5.4
<i>Hibiscus laevis</i>	halberdleaf rosemallow	15	40.5
<i>Juncus effusus</i>	common rush	6	16.2
<i>Lemna minor</i>	common duckweed	12	32.4
<i>Ludwigia peploides</i>	floating waterprimrose	8	21.6
<i>Panicum hemitomon</i>	maidencane	1	2.7
<i>Persicaria sp.</i>	knotweed	2	5.4
<i>Platanus occidentalis</i>	sycamore	1	2.7
<i>Pontederia crassipes</i>	waterhyacinth	19	51.4
<i>Quercus nigra</i>	water oak	3	8.1
<i>Quercus phellos</i>	willow oak	3	8.1
<i>Quercus virginiana</i>	southern live oak	1	2.7
<i>Ricciocarpos natans</i>	fringed heartwort	3	8.1
<i>Salix nigra</i>	black willow	1	2.7
<i>Taxodium distichum</i>	baldcypress	3	8.1
<i>Triadica sebifera</i>	tallowtree	2	5.4
<i>Ulmus sp.</i>	elm	3	8.1
<i>Utricularia gibba</i>	southern bladderwort	1	2.7
<i>Vitis sp.</i>	grape	3	8.1
<i>Zizaniopsis miliacea</i>	giant cutgrass	7	18.9

Table 12. Macrophyte community of Round Lake. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds. Species with '0' for points present indicates it was present at site but was not observed at any survey points.

Round Lake			
Littoral Depth	3.3'	Date Surveyed	June 19, 2024
Species Richness	15	Total Pts. Sur	22
Native Species Richness	13	Total Pts. Veg	22
		%-Littoral Veg	100.0
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	alligatorweed	21	95.5
<i>Bidens sp.</i>	beggartick	4	18.2
<i>Cephalanthus occidentalis</i>	buttonbush	8	36.4
<i>Ceratophyllum demersum</i>	coontail	7	31.8
<i>Echinodorus cordifolia</i>	creeping burhead	2	9.1
<i>Hibiscus lasiocarpus</i>	wooly rosemallow	2	9.1
<i>Hydrocotyle ranunculoides</i>	floating marshpennywort	14	63.6
<i>Lemna minor</i>	common duckweed	21	95.5
<i>Limnobium spongia</i>	American frogsbit	3	13.6
<i>Ludwigia peploides</i>	floating waterprimrose	8	36.4
<i>Nyssa aquatica</i>	water tupelo	15	68.2
<i>Pontederia crassipes</i>	waterhyacinth	20	90.9
<i>Quercus nigra</i>	water oak	1	4.5
<i>Spirodela polyrhiza</i>	greater duckweed	19	86.4
<i>Taxodium distichum</i>	baldcypress	8	36.4

Table 13. Macrophyte community of Six Mile Lake. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds. Species with '0' for points present indicates it was present at site but was not observed at any survey points.

Six Mile Lake			
Littoral Depth	1.5'	Date Surveyed	June 17, 2024
Species Richness	13	Total Pts. Sur	19
Native Species Richness	12	Total Pts. Veg	19
		%-Littoral Veg	100.0
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	alligatorweed	1	5.3
<i>Amorpha fruticosa</i>	indigobush	1	5.3
<i>Carya aquatica</i>	water hickory	1	5.3
<i>Cephalanthus occidentalis</i>	buttonbush	9	47.4
<i>Echinodorus cordifolia</i>	creeping burhead	1	5.3
<i>Forestiera acuminata</i>	swamp privet	2	10.5
<i>Hibiscus laevis</i>	halberdleaf rosemallow	2	10.5
<i>Nyssa aquatica</i>	water tupelo	2	10.5
<i>Quercus bicolor</i>	swamp white oak	1	5.3
<i>Sesbania herbacea</i>	bigpod sesbania	1	5.3
<i>Taxodium distichum</i>	baldcypress	17	89.5
<i>Ulmus sp.</i>	elm	6	31.6
<i>Vitis sp.</i>	grape	1	5.3

Table 14. Macrophyte community of Wolf Lake. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds. Species with '0' for points present indicates it was present at site but was not observed at any survey points.

Wolf Lake			
Littoral Depth	3.9'	Date Surveyed	June 14, 2024
Species Richness	21	Total Pts. Sur	63
Native Species Richness	20	Total Pts. Veg	62
		%-Littoral Veg	98.4
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Alnus serrulata</i>	smooth alder	3	4.8
<i>Alternanthera philoxeroides</i>	alligatorweed	2	3.2
<i>Amorpha fruticosa</i>	indigobush	1	1.6
<i>Arundinaria gigantea</i>	river cane	1	1.6
<i>Carex vulpinoidea</i>	fox sedge	1	1.6
<i>Carya aquatica</i>	water hickory	22	35.5
<i>Cephalanthus occidentalis</i>	buttonbush	29	46.8
<i>Commelina virginica</i>	Virginia dayflower	1	1.6
<i>Diospyros virginiana</i>	American persimmon	7	11.3
<i>Forestiera acuminata</i>	swamp privet	22	35.5
<i>Gleditsia aquatica</i>	swamp locust	5	8.1
<i>Hibiscus laevis</i>	halberdleaf rosemallow	15	24.2
<i>Hibiscus lasiocarpus</i>	wooly rosemallow	1	1.6
<i>Ilex decidua</i>	possumhaw	1	1.6
<i>Quercus bicolor</i>	swamp white oak	7	11.3
<i>Quercus nigra</i>	water oak	1	1.6
<i>Quercus virginiana</i>	southern live oak	1	1.6
<i>Salix nigra</i>	black willow	3	4.8
<i>Sesbania herbacea</i>	bigpod sesbania	1	1.6
<i>Taxodium distichum</i>	baldcypress	52	83.9
<i>Ulmus sp.</i>	elm	26	41.9

Table 15. Macrophyte community of Bay Springs Lake. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds. Species with ‘0’ for points present indicates it was present at site but was not observed at any survey points.

Bay Springs Lake			
Littoral Depth	37.2'	Date Surveyed	June 26, 2024
Species Richness	39	Total Pts. Sur	19
Native Species Richness	36	Total Pts. Veg	18
		%-Littoral Veg	94.7
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Acer negundo</i>	boxedler	10	55.6
<i>Alnus serrulata</i>	smooth alder	5	27.8
<i>Alternanthera philoxeroides</i>	alligatorweed	1	5.6
<i>Carex sp.</i>	sedge	2	11.1
<i>Carya aquatica</i>	water hickory	1	5.6
<i>Cephalanthus occidentalis</i>	buttonbush	9	50.0
<i>Chara sp.</i>	muskgrass	4	22.2
<i>Cyperus sp.</i>	nutsedge	1	5.6
<i>Diospyros virginiana</i>	American persimmon	4	22.2
<i>Dulichium arundinaceum</i>	threeway sedge	6	33.3
<i>Echinodorus cordifolia</i>	creeping burhead	7	38.9
<i>Eleocharis vivipara</i>	viviparous spikerush	3	16.7
<i>Hibiscus lasiocarpus</i>	wooly rosemallow	4	22.2
<i>Hydrilla verticillata</i>	hydrilla	13	72.2
<i>Hydrocotyle umbellata</i>	manyflower marshpennywort	3	16.7
<i>Juncus acuminatus</i>	tapertip rush	5	27.8
<i>Juncus effusus</i>	common rush	7	38.9
<i>Juncus repens</i>	lesser creeping rush	2	11.1
<i>Justicia americana</i>	America waterwillow	2	11.1
<i>Liquidambar styraciflua</i>	sweetgum	8	44.4
<i>Najas guadalupensis</i>	southern naiad	1	5.6
<i>Najas minor</i>	brittle naiad	2	11.1
<i>Nyssa biflora</i>	swamp tupelo	1	5.6
<i>Persicaria sp.</i>	knotweed	1	5.6
<i>Potamogeton nodosus</i>	American pondweed	11	61.1
<i>Quercus bicolor</i>	swamp white oak	1	5.6
<i>Quercus nigra</i>	water oak	3	16.7
<i>Quercus phellos</i>	willow oak	1	5.6
<i>Rhexia mariana</i>	pale meadowbeauty	1	5.6

<i>Sagittaria latifolia</i>	broadleaf arrowhead	1	5.6
<i>Salix nigra</i>	black willow	1	5.6
<i>Saururus cernuus</i>	giant salvinia	5	27.8
<i>Scirpus cyperinus</i>	woolgrass	2	11.1
<i>Scirpus pendulus</i>	rufous bulrush	1	5.6
<i>Taxodium distichum</i>	baldcypress	1	5.6
<i>Triadenum walteri</i>	greater marsh St. Johnswort	12	66.7
<i>Typha latifolia</i>	broadleaf cattail	1	5.6
<i>Utricularia gibba</i>	southern bladderwort	1	5.6
<i>Zizaniopsis miliacea</i>	giant cutgrass	7	38.9

Table 16. Macrophyte community of TTW Pool D. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds. Species with '0' for points present indicates it was present at site but was not observed at any survey points.

TTW Pool D			
Littoral Depth	-	Date Surveyed	June 27, 2024
Species Richness	41	Total Pts. Sur	25
Native Species Richness	35	Total Pts. Veg	24
		%-Littoral Veg	96.0
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Alnus serrulata</i>	smooth alder	17	70.8
<i>Alternanthera philoxeroides</i>	alligatorweed	2	8.3
<i>Brasenia schreberi</i>	watershield	2	8.3
<i>Carex sp.</i>	sedge	1	4.2
<i>Cephalanthus occidentalis</i>	buttonbush	1	4.2
<i>Ceratophyllum demersum</i>	coontail	4	16.7
<i>Chara sp.</i>	muskgrass	12	50.0
<i>Colocasia esculenta</i>	wild taro	10	41.7
<i>Commelina virginica</i>	Virginia dayflower	1	4.2
<i>Didiplis diandra</i>	water purslane	2	8.3
<i>Diospyros virginiana</i>	American persimmon	5	20.8
<i>Eleocharis vivipara</i>	viviparous spikerush	8	33.3
<i>Hibiscus lasiocarpus</i>	wooly rosemallow	2	8.3
<i>Hydrilla verticillata</i>	hydrilla	3	12.5
<i>Hydrocotyle umbellata</i>	manyflower marshpennywort	2	8.3
<i>Itea virginica</i>	Virginia sweetspire	1	4.2
<i>Juncus effusus</i>	common rush	2	8.3
<i>Justicia americana</i>	America waterwillow	21	87.5
<i>Liquidambar styraciflua</i>	sweetgum	3	12.5
<i>Ludwigia peploides</i>	floating waterprimrose	7	29.2
<i>Myriophyllum aquaticum</i>	parrotfeather	3	12.5
<i>Myriophyllum heterophyllum</i>	variableleaf watermilfoil	2	8.3
<i>Myriophyllum spicatum</i>	Eurasian watermilfoil	2	8.3
<i>Najas minor</i>	brittle naiad	1	4.2
<i>Nelumbo lutea</i>	American lotus	3	12.5
<i>Nuphar advena</i>	spatterdock	1	4.2
<i>Oxydendron arboreum</i>	sourwood	1	4.2
<i>Peltandra virginica</i>	green arrowarum	1	4.2
<i>Potamogeton foliosus</i>	leafy pondweed	1	4.2

<i>Potamogeton nodosus</i>	American pondweed	17	70.8
<i>Quercus nigra</i>	water oak	1	4.2
<i>Rhynchospora sp.</i>	beaksedge	2	8.3
<i>Sagittaria latifolia</i>	broadleaf arrowhead	4	16.7
<i>Sagittaria platyphylla</i>	delta arrowhead	4	16.7
<i>Sesbania herbacea</i>	bigpod sesbania	3	12.5
<i>Sparganium americanum</i>	American burreed	3	12.5
<i>Taxodium distichum</i>	baldcypress	2	8.3
<i>Triadenum walteri</i>	greater marsh St. Johnswort	3	12.5
<i>Typha latifolia</i>	broadleaf cattail	2	8.3
<i>Utricularia gibba</i>	southern bladderwort	3	12.5
<i>Zizaniopsis miliacea</i>	giant cutgrass	3	12.5

Table 17. Macrophyte community of TTW Pool E. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds. Species with '0' for points present indicates it was present at site but was not observed at any survey points.

TTW Pool E			
Littoral Depth	0.3'	Date Surveyed	June 24, 2024
Species Richness	35	Total Pts. Sur	26
Native Species Richness	30	Total Pts. Veg	26
		%-Littoral Veg	100.0
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Acer negundo</i>	boxedler	3	11.5
<i>Albizia julibrissin</i>	mimosa tree	3	11.5
<i>Alnus serrulata</i>	smooth alder	17	65.4
<i>Alternanthera philoxeroides</i>	alligatorweed	1	3.8
<i>Carya aquatica</i>	water hickory	1	3.8
<i>Chara sp.</i>	muskgrass	17	65.4
<i>Diospyros virginiana</i>	American persimmon	4	15.4
<i>Eleocharis quadrangulata</i>	squarestem spikerush	5	19.2
<i>Heteranthera limosa</i>	blue mudplantain	1	3.8
<i>Heteranthera reniformis</i>	kidneyleaf mudplantain	1	3.8
<i>Hydrilla verticillata</i>	hydrilla	1	3.8
<i>Hydrocotyle umbellata</i>	manyflower marshpennywort	1	3.8
<i>Juncus effusus</i>	common rush	3	11.5
<i>Justicia americana</i>	America waterwillow	8	30.8
<i>Liquidambar styraciflua</i>	sweetgum	4	15.4
<i>Liriodendron tulipifera</i>	tulip poplar	6	23.1
<i>Ludwigia peploides</i>	floating waterprimrose	2	7.7
<i>Myriophyllum aquaticum</i>	parrotfeather	1	3.8
<i>Myriophyllum heterophyllum</i>	variableleaf watermilfoil	2	7.7
<i>Nitella sp.</i>	stonewort	1	3.8
<i>Nuphar advena</i>	spatterdock	3	11.5
<i>Peltandra virginica</i>	green arrowarum	1	3.8
<i>Platanus occidentalis</i>	sycamore	1	3.8
<i>Potamogeton nodosus</i>	American pondweed	8	30.8
<i>Quercus bicolor</i>	swamp white oak	1	3.8
<i>Quercus nigra</i>	water oak	1	3.8
<i>Sagittaria latifolia</i>	broadleaf arrowhead	3	11.5
<i>Sagittaria platyphylla</i>	delta arrowhead	1	3.8

<i>Schoenoplectus americanus</i>	threesquare bulrush	1	3.8
<i>Schoenoplectus tabernaemontani</i>	softstem bulrush	3	11.5
<i>Sesbania herbacea</i>	bigpod sesbania	4	15.4
<i>Triadenum walteri</i>	greater marsh St. Johnswort	3	11.5
<i>Typha latifolia</i>	broadleaf cattail	4	15.4
<i>Vallisneria denseserrulata × spiralis</i>	hybrid eelgrass	1	3.8
<i>Zizaniopsis miliacea</i>	giant cutgrass	10	38.5

Table 18. Macrophyte community of the Goat Island Arm of Pickwick Lake. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds. Species with '0' for points present indicates it was present at site but was not observed at any survey points.

Pickwick Lake - Goat Island Arm			
Littoral Depth	13.5'	Date Surveyed	June 25, 2024
Species Richness	41	Total Pts. Sur	39
Native Species Richness	35	Total Pts. Veg	36
		%-Littoral Veg	92.3
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Acer negundo</i>	boxedler	4	11.1
<i>Albizia julibrissin</i>	mimosa tree	5	13.9
<i>Alnus serrulata</i>	smooth alder	5	13.9
<i>Alternanthera philoxeroides</i>	alligatorweed	9	25.0
<i>Amorpha fruticosa</i>	indigobush	5	13.9
<i>Carex sp.</i>	sedge	1	2.8
<i>Carex vulpinoidea</i>	fox sedge	1	2.8
<i>Carya aquatica</i>	water hickory	3	8.3
<i>Cephalanthus occidentalis</i>	buttonbush	13	36.1
<i>Ceratophyllum demersum</i>	coontail	3	8.3
<i>Chara sp.</i>	muskgrass	1	2.8
<i>Diospyros virginiana</i>	American persimmon	3	8.3
<i>Echinodorus cordifolia</i>	creeping burhead	2	5.6
<i>Eleocharis vivipara</i>	viviparous spikerush	1	2.8
<i>Hibiscus laevis</i>	halberdleaf rosemallow	1	2.8
<i>Hibiscus lasiocarpus</i>	wooly rosemallow	1	2.8
<i>Hydrilla verticillata</i>	hydrilla	10	27.8
<i>Itea virginica</i>	Virginia sweetspire	1	2.8
<i>Juncus effusus</i>	common rush	4	11.1
<i>Justicia americana</i>	America waterwillow	12	33.3
<i>Liquidambar styraciflua</i>	sweetgum	11	30.6
<i>Myriophyllum aquaticum</i>	parrotfeather	1	2.8
<i>Najas guadalupensis</i>	southern naiad	4	11.1
<i>Najas minor</i>	brittle naiad	5	13.9
<i>Nyssa aquatica</i>	water tupelo	3	8.3
<i>Nyssa biflora</i>	swamp tupelo	2	5.6
<i>Oxydendron arboreum</i>	sourwood	1	2.8
<i>Panicum repens</i>	torpedograss	1	2.8
<i>Persicaria sp.</i>	knotweed	1	2.8

<i>Platanus occidentalis</i>	sycamore	9	25.0
<i>Potamogeton nodosus</i>	American pondweed	1	2.8
<i>Quercus nigra</i>	water oak	3	8.3
<i>Sagittaria platyphylla</i>	delta arrowhead	1	2.8
<i>Salix nigra</i>	black willow	1	2.8
<i>Salvinia minima</i>	lesser salvinia	1	2.8
<i>Saururus cernuus</i>	giant salvinia	3	8.3
<i>Taxodium distichum</i>	baldcypress	2	5.6
<i>Triadenum walteri</i>	greater marsh St. Johnswort	1	2.8
<i>Typha latifolia</i>	broadleaf cattail	1	2.8
<i>Ulmus sp.</i>	elm	3	8.3
<i>Vallisneria americana</i>	American eelgrass	2	5.6

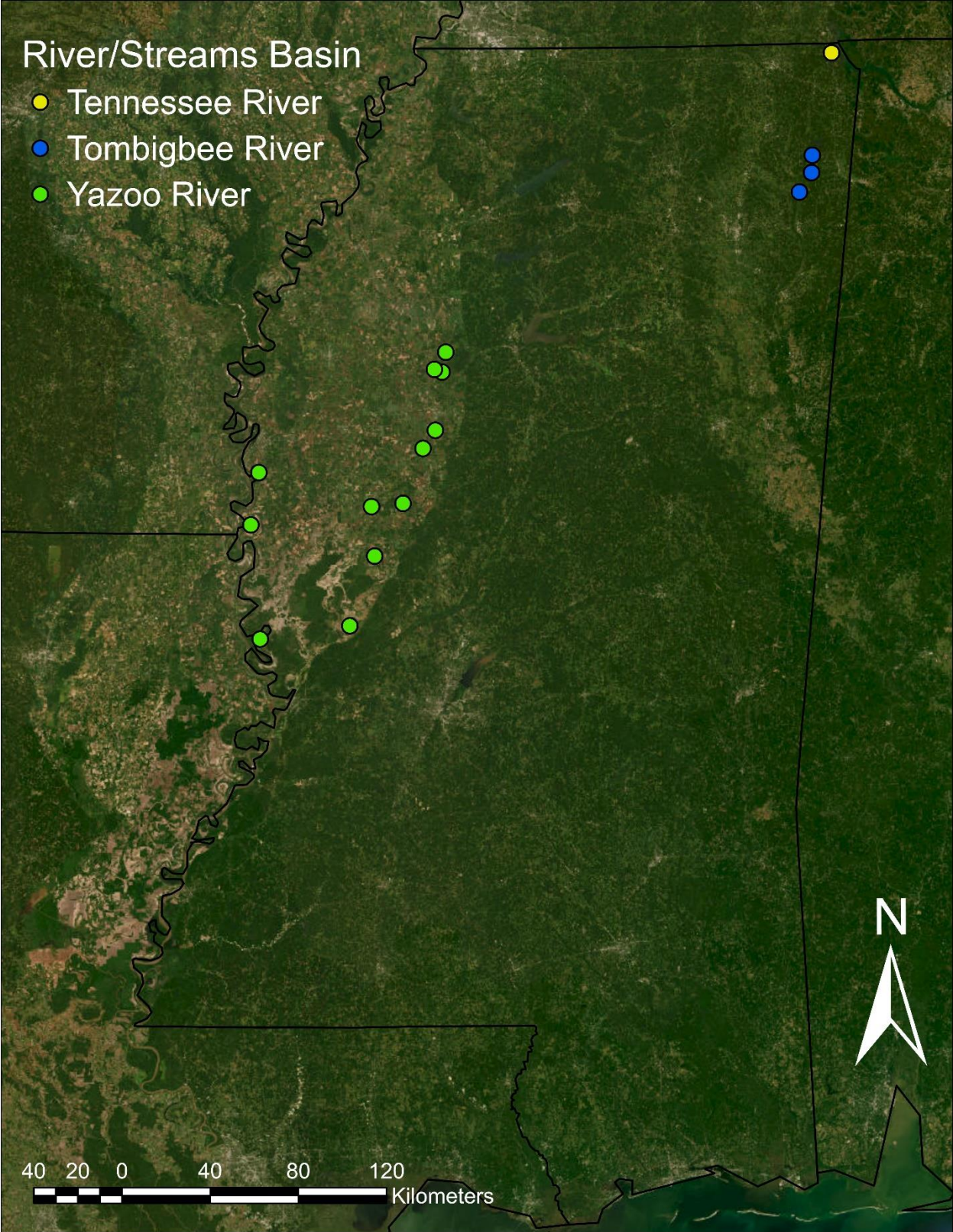


Fig 1. Locations of Mississippi lakes surveyed during June 2024. Sites belonging to different river basins indicated by different colors.

Appendices

App. 1. Lakes surveyed in 2017, 2019, 2020, 2022, 2023, and 2024. An ‘X’ indicates year(s) lake was surveyed. Lakes where non-native species were observed for at least one survey are in **red font**. Lakes where federal and/or state noxious weed(s) was observed are in **bold**.

Lakes	2017	2019	2020	2022	2023	2024	Management Entity*
Aberdeen (TTW)		X					USACE
Amory (TTW)		X					USACE
Anchor	X						Private
Archusa Creek	X			X	X		PHW
Bay Springs (TTW)	X			X		X	USACE
Bee	X						Private
Big Creek				X			PHW
Bill Waller	X			X	X		MDWFP
Bogue Homa	X						MDWFP
Bluff	X			X			USFWS
Calling Panther	X				X		MDWFP
Caroline	X						Private
Chochtow				X			USFS
Chotard						X	MDWFP
Clarkco Lake	X						MDWFP
Claude Bennett	X				X		MDWFP
Columbia	X			X	X		MDWFP
Columbus (TTW)	X		X				USACE
Dalewood Shore			X				Private
Doyle Arm			X	X			USFWS
Dry Creek	X				X		PHW
Dump						X	Private
Eddins					X		Private
Elvis Presley	X	X					MDWFP
English	X						MDWFP
Flint Creek	X				X		PHW
Fulton (TTW)		X					USACE
Geiger	X				X		MDWFP
George			X				Private
Hideaway	X						Private
Horseshoe			X				Private
Ivy					X		MDWFP
Jackson						X	Private
Kemper	X			X			MDWFP

Lamar Bruce	X	X					MDWFP
Lee						X	MDWFP
Lincoln	X				X		MDWFP
Little Eagle			X			X	Private
Loakfoma	X			X			USFWS
Long Branch						X	USFWS
Lower			X				USACE
Lowndes	X			X			MDWFP
Mary	X						Private
Mary Crawford	X			X	X		MDWFP
Maynor Creek	X			X	X		PHW
McIntyre Scatters						X	MDWFP
Mike Connor	X				X		MDWFP
Moon	X	X					Private
Mosquito Run						X	USFWS
Natchez	X				X		MDWFP
Okatibbee			X	X			MDWFP
Okhissa	X				X		USFS
Old Yazoo Cutoff						X	MDWFP
Perry	X			X	X		MDWFP
Pickwick (TTW/TVA)		X				X	USACE/TVA
Pool D (TTW)		X				X	USACE
Pool E (TTW)		X				X	USACE
Prentiss Walker	X			X	X		MDWFP
Roebuck			X				Private
Roosevelt	X						MDWFP
Ross Branch				X			USFWS
Round						X	MDWFP
Simpson-Legion	X				X		MDWFP
Six Mile						X	MDWFP
Smithville (TTW)		X					USACE
Spring		X		X			MDWFP
Tangipahoa	X				X		MDWFP
Tippah	X						MDWFP
Tom Bailey					X		MDWFP
Tombigbee	X						MDWFP
Trace State Park			X	X			MDWFP
TTW AL-Col		X					USACE
TTW Canal		X					USACE
Turkey Creek	X			X			PHW
Turkey Fork	X			X	X		PHW

Walthall	X				X		MDWFP
Washington	X	X					Private
Wasp			X				Private
Wolf						X	MDWFP

*In the Management Entity column: USACE is U.S. Army Corps of Engineers; PHW is Pat Harrison Waterway District; MDWFP is MS Department of Wildlife, Fisheries, and Parks; USFWS is U.S. Fish and Wildlife Service; USFS is the U.S. Forest Service; and TVA is the Tennessee Valley Authority.

App. 2. List of all species observed in surveys conducted in 2017, 2019, 2020, 2022, 2023, and 2024. Numbers in year columns indicate number of waterbodies the respective species was observed in. Status column indicates whether the species is native (Nat), non-native (Non-nat), or unknown (-).

Scientific Name	Common Name	Status	2017	2019	2020	2022	2023	2024
<i>Acer negundo</i>	box elder	Nat	-	-	10	-	-	3
<i>Acer rubrum</i>	red maple	Nat	1	3	9	-	-	-
<i>Acer saccharinum</i>	silver maple	Nat	-	-	5	-	-	-
<i>Acmella repens</i>	Creeping spotflower	Nat	-	-	-	-	-	1
<i>Albizia julibrissin</i>	mimosa	Non-nat	-	8	4	-	-	4
<i>Algae sp.</i>	algae	-	7	-	-	17	-	-
<i>Alnus serrulata</i>	smooth alder	Nat	-	-	1	-	6	9
<i>Alnus sp.</i>	alder	Nat	-	9	1	-	-	-
<i>Alternanthera philoxeroides</i>	alligatorweed	Non-nat	30	7	14	21	26	13
<i>Amaranthus tuberculatus</i>	roughfruit waterhemp	Nat	-	-	2	-	-	-
<i>Amorpha fruticosa</i>	indigobush	Nat	-	-	-	-	-	4
<i>Apocynum cannabinum</i>	hemp dogbane	Nat	-	-	2	-	-	-
<i>Arundinaria gigantea</i>	giant cane	Nat	2	3	-	-	14	1
<i>Azolla caroliniana</i>	Carolina mosquitofern	Nat	1	-	2	1	1	5
<i>Baccharis halimifolia</i>	eastern baccharis	Nat	5	5	7	-	6	-
<i>Bacopa caroliniana</i>	blue waterhyssop	Nat	4	1	1	2	3	-
<i>Bacopa monnieri</i>	herb-of-grace	Nat	-	-	1	-	2	-
<i>Bacopa sp.</i>	waterhyssop	-	2	-	-	-	1	-
<i>Bambusa vulgaris</i>	common bamboo	Nat	-	-	1	-	-	-
<i>Betula nigra</i>	river birch	Nat	-	-	13	2	-	-
<i>Bidens sp.</i>	beggarticks	-	-	-	-	-	-	1
<i>Boehmeria cylindrica</i>	smallspike false nettle	Nat	2	1	21	-	-	-
<i>Bolboschoenus robustus</i>	sturdy bulrush	Nat	-	-	-	-	4	-
<i>Brasenia schreberi</i>	watershield	Nat	16	3	2	-	13	1
<i>Brunnichia ovata</i>	redvine	Nat	-	-	2	-	-	-
<i>Cabomba caroliniana</i>	fanwort	Nat	-	-	2	-	5	1
<i>Callicarpa americana</i>	American beautyberry	Nat	1	-	-	-	-	-
<i>Carex sp.</i>	sedge	-	1	2	9	21	7	3
<i>Carex vulpinoidea</i>	foxtail sedge	Nat	-	-	-	-	4	4
<i>Carya aquatica</i>	water hickory	Nat	2	-	6	-	-	9
<i>Carya glabra</i>	pignut hickory	Nat	-	-	1	-	-	-
<i>Castanea dentata</i>	American chesnut	Nat	-	-	1	-	-	-
<i>Cephalanthus occidentalis</i>	common buttonbush	Nat	21	8	17	21	18	14
<i>Ceratophyllum demersum</i>	coontail	Nat	10	8	7	5	7	5
<i>Cercis canadensis</i>	eastern redbud	Nat	-	-	1	-	-	-
<i>Chara sp.</i>	muskgrass	Nat	11	5	7	11	9	4

<i>Chasmanthium sessiflroum</i>	longleaf woodoats	Nat	-	-	1	-	-	-
<i>Cicuta maculata</i>	water hemlock	Nat	-	-	-	-	7	-
<i>Cinnamomun camphora</i>	camphortree	Non-nat	-	-	1	-	-	-
<i>Cladium mariscus</i>	sawgrass	Nat	-	-	4	1	6	-
<i>Clethra alnifolia</i>	coastal pepperbush	Nat	-	-	1	-	-	-
<i>Colocasia esculenta</i>	wild taro	Non-nat	8	5	2	2	4	-
<i>Commelina virginica</i>	Virginia dayflower	Nat	-	-	11	-	1	4
<i>Crataegus sp.</i>	hawthorn	Nat	1	-	-	-	-	-
<i>Crinum americanum</i>	southern swamp crinum	Nat	-	-	3	-	4	-
<i>Crotalaria sp.</i>	rattlebox	-	-	1	-	-	-	-
<i>Cynodon dactylon</i>	Bermuda grass	Non-nat	-	-	1	-	-	-
<i>Cyperus esculentus</i>	yellow nutsedge	Non-nat	4	-	21	-	-	-
<i>Cyperus iria</i>	rice flatsedge	Non-nat	-	-	1	-	-	-
<i>Cyperus odoratus</i>	fragrant flatsedge	Nat	4	-	-	-	-	-
<i>Cyperus sp.</i>	flatsedge	-	1	-	-	-	11	4
<i>Cyperus virens</i>	green flatsedge	Nat	-	-	2	-	-	-
<i>Cyrilla racemiflora</i>	swamp titi	Nat	-	-	1	-	7	-
<i>Dicanthelium latifolia</i>	broadleaf panicgrass	Nat	-	-	1	-	-	-
<i>Didiplis diandra</i>	water purslane	Nat	-	-	-	-	-	1
<i>Digitaria sp.</i>	crabgrass	-	2	-	-	-	-	-
<i>Diodia virginiana</i>	Virginia buttonweed	Nat	-	-	1	6	-	-
<i>Diospyros virginiana</i>	common persimmon	Nat	-	-	9	-	-	8
<i>Drepanocladus sp.</i>	watermoss	-	1	-	-	-	-	-
<i>Dulichium arundinaceum</i>	three-way sedge	Nat	1	-	-	5	4	1
<i>Echinochloa crus-galli</i>	barnyard grass	Non-nat	-	-	1	-	-	-
<i>Echinodorus cordifolius</i>	creeping burhead	Nat	5	-	1	-	6	6
<i>Eleocharis compressa</i>	flatstem spikerush	Nat	-	-	-	8	-	-
<i>Eleocharis elongata</i>	slim spikerush	Nat	-	-	-	1	-	-
<i>Eleocharis obtusa</i>	blunt spikerush	Nat	4	2	3	2	1	-
<i>Eleocharis palustris</i>	common spikerush	Nat	-	-	1	1	-	-
<i>Eleocharis parvula</i>	dwarf spikerush	Nat	-	-	1	-	-	-
<i>Eleocharis quadrangulata</i>	squarestem spikerush	Nat	2	6	3	9	7	1
<i>Eleocharis sp.</i>	spikerush	-	1	-	1	-	3	-
<i>Eleocharis vivipara</i>	viviparous spikerush	Nat	14	2	1	1	16	3
<i>Elymus virginicus</i>	Virginia wildrye	Nat	-	-	1	-	-	-
<i>Equisetum sp.</i>	horsetail	-	2	5	1	-	-	-
<i>Eupatorium serotinum</i>	lateflowering thoroughwort	Nat	3	-	2	-	-	-
<i>Foresteria acuminata</i>	eastern swamp privet	Nat	-	-	6	-	-	3
<i>Fraxinus caroliniana</i>	swamp ash	Nat	-	-	1	-	-	-
<i>Fraxinus pennsylvanica</i>	green ash	Nat	3	-	2	-	-	1
<i>Gleditsia aquatica</i>	water locust	Nat	-	-	5	-	-	3

<i>Heteranthera limosa</i>	blue mudplantain	Nat	-	-	-	-	-	2
<i>Heteranthera reniformis</i>	kidneyleaf mudplantain	Nat	-	-	-	-	-	2
<i>Hibiscus laevis</i>	halberdleaf rosemallow	Nat	2	-	-	-	-	6
<i>Hibiscus lasiocarpus</i>	wooly rosemallow	Nat	-	-	1	2	-	6
<i>Hibiscus moscheutos</i>	crimsoneyed rosemallow	Nat	1	-	4	-	-	-
<i>Hydrilla verticillata</i>	hydrilla	Non-nat	5	9	1	5	1	4
<i>Hydrocotyle ranunculoides</i>	floating marshpennywort	Nat	2	5	2	-	7	4
<i>Hydrocotyle sp.</i>	pennywort	-	4	-	-	13	-	-
<i>Hydrocotyle umbellata</i>	manyflower marshpennywort	Nat	12	7	7	1	18	4
<i>Hydrolea quadrivalvis</i>	waterpod	Nat	6	2	-	2	-	-
<i>Hydrolea uniflora</i>	oneflower false fiddleleaf	Nat	-	-	-	-	4	-
<i>Hypericum lobocarpum</i>	five-lobed St. Johnswort	Nat	-	-	-	-	1	-
<i>Hypericum mutillum</i>	dwarf St. Johnswort	Nat	-	-	-	-	1	-
<i>Hypericum sp.</i>	St. Johnswort	Nat	-	-	-	-	5	-
<i>Ilex aquifolium</i>	English holly	Non-nat	-	-	1	-	-	-
<i>Ilex decidua</i>	possumhaw	Nat	-	-	4	-	-	2
<i>Iris sp.</i>	iris	-	-	-	-	2	2	-
<i>Itea virginica</i>	Virginia sweetspire	Nat	-	-	-	-	-	2
<i>Juncus acuminatus</i>	tapertip rush	Nat	-	-	6	1	-	1
<i>Juncus canadensis</i>	Canada rush	Nat	-	-	-	-	2	-
<i>Juncus dudleyi</i>	Dudley's rush	Nat	-	-	-	1	-	-
<i>Juncus effusus</i>	common rush	Nat	15	12	7	19	15	6
<i>Juncus marginatus</i>	grassleaf rush	Nat	-	-	-	1	-	-
<i>Juncus pelocarpus</i>	brownfruit rush	Nat	-	-	-	3	-	-
<i>Juncus repens</i>	lesser creeping rush	Nat	3	-	-	-	8	1
<i>Juncus roemerianus</i>	black needlerush	Nat	-	-	5	-	6	-
<i>Juncus sp.</i>	rush	-	3	-	-	-	6	-
<i>Justicia americana</i>	American water-willow	Nat	6	11	22	3	1	4
<i>Justicia ovata</i>	looseflower water-willow	Nat	-	-	-	-	3	1
<i>Landoltia punctata</i>	spotted duckweed	Nat	-	4	9	-	-	3
<i>Leersia oryzoides</i>	rice cutgrass	Nat	2	-	12	10	-	-
<i>Lemna minor</i>	common duckweed	Nat	3	4	11	4	4	8
<i>Lemna sp.</i>	duckweed	-	3	-	-	-	-	-
<i>Leptochloa panicoides</i>	Amazon sprangletop	Nat	-	-	1	-	-	-
<i>Ligustrum sinense</i>	Chinese privet	Non-nat	-	-	1	-	-	-
<i>Lilaeopsis carolinensis</i>	Carolina grasswort	Nat	-	-	-	-	1	-
<i>Limnobium spongia</i>	American frogbit	Nat	3	4	2	3	4	3
<i>Lindera benzoin</i>	northern spicebush	Nat	4	-	-	-	-	-
<i>Liquidambar styraciflua</i>	sweetgum	Nat	4	-	4	-	13	4

<i>Liriodendron tulipifera</i>	tulip poplar	Nat	-	-	-	-	-	1
<i>Ludwigia arcuata</i>	Piedmont primrose-willow	Nat	2	-	-	-	-	-
<i>Ludwigia hexapetala</i>	six-petal primrose-willow	Nat	-	-	-	5	3	-
<i>Ludwigia leptocarpa</i>	anglestem primrose-willow	Nat	-	6	10	11	-	-
<i>Ludwigia palustris</i>	marsh seedbox	Nat	3	-	-	-	-	-
<i>Ludwigia peploides</i>	floating primrose-willow	Nat	18	8	7	14	17	7
<i>Ludwigia sp.</i>	primrose	Nat	2	-	-	-	8	3
<i>Lychnothamnus barbatus</i>		Nat	-	-	-	-	1	-
<i>Lythrum lineare</i>	saltmarsh loosestrife	Nat	-	-	5	-	5	-
<i>Magnolia grandiflora</i>	souther magnolia	Nat	-	-	1	-	-	-
<i>Magnolia virginiana</i>	sweetbay	Nat	-	-	1	-	-	-
<i>Mayaca fluviatilis</i>	stream bogmoss	Nat	1	-	-	-	3	-
<i>Mentha aquatica</i>	watermint	Non-nat	-	-	-	-	1	-
<i>Mikania scandens</i>	climbing hempvine	Nat	-	-	2	-	-	-
<i>Mimulus rigens</i>	Allegheny monkeyflower	Nat	-	-	-	1	-	-
<i>Myrica cerifera</i>	southern wax myrtle	Nat	-	-	6	12	-	-
<i>Myriophyllum aquaticum</i>	parrotfeather	Non-nat	6	6	2	5	6	3
<i>Myriophyllum heterophyllum</i>	variableleaf watermilfoil	Nat	1	-	-	-	6	2
<i>Myriophyllum spicatum</i>	Eurasian watermilfoil	Non-nat	3	4	2	9	5	1
<i>Najas guadalupensis</i>	southern naiad	Nat	10	-	1	1	7	3
<i>Najas minor</i>	brittle naiad	Non-nat	12	2	3	-	1	4
<i>Nekemias arborea</i>	peppervine	Nat	-	-	6	-	-	-
<i>Nelumbo lutea</i>	American lotus	Nat	11	6	4	11	5	5
<i>Nitella sp.</i>	stonewort	-	7	-	-	-	6	-
<i>Nuphar advena</i>	spatterdock	Nat	4	-	3	-	6	2
<i>Nymphaea odorata</i>	American white waterlily	Nat	20	3	2	14	14	1
<i>Nyssa aquatica</i>	water tupelo	Nat	4	-	3	-	-	6
<i>Nyssa biflora</i>	swamp tupelo	Nat	-	-	-	-	10	2
<i>Orontium aquaticum</i>	goldenclub	Nat	-	-	-	-	2	-
<i>Oxycaryum cubense</i>	cuban bulrush	Non-nat	7	3	4	3	4	2
<i>Panicum hemitomom</i>	maidencane	Nat	1	-	-	-	11	2
<i>Panicum repens</i>	torpedo grass	Non-nat	15	4	3	7	26	1
<i>Panicum rigidulum</i>	redtop panicgrass	Nat	1	-	-	-	-	-
<i>Panicum sp.</i>	panicgrass	-	4	-	-	-	-	-
<i>Parthenocissus quinquefolia</i>	Virginia creeper	Nat	-	-	1	-	-	-
<i>Paspalum distichum</i>	knotgrass	Nat	-	-	4	2	-	-
<i>Paspalum floridanum</i>	Florida paspalum	Nat	-	-	2	-	-	-
<i>Paspalum notatum</i>	bahiagrass	-	-	-	-	1	-	-

<i>Paspalum sp.</i>	paspalum	-	-	-	25	-	-	-
<i>Paspalum urvillei</i>	Vasey's grass	Non-nat	-	-	1	-	-	-
<i>Peltandra virginica</i>	green arrow arum	Nat	2	8	2	5	9	2
<i>Persea palustris</i>	swamp bay	Nat	-	-	2	-	-	-
<i>Persicaria amphibium</i>	water knotweed	Nat	3	-	-	-	-	-
<i>Persicaria hydropiperoides</i>	swamp smartweed	Nat	7	-	6	14	-	-
<i>Persicaria pennsylvanicum</i>	Pennsylvania smartweed	Nat	1	1	7	4	-	-
<i>Persicaria sp.</i>	knotweed	-	10	-	14	8	16	8
<i>Phalaris arundinacea</i>	reed canary grass	Non-nat	-	-	-	1	-	-
<i>Phragmites australis</i>	common reed	Non-nat	1	-	5	-	6	-
<i>Pinus elliotii</i>	slash pine	Nat	-	-	4	-	-	-
<i>Pinus sp.</i>	pine	Nat	-	-	2	-	-	-
<i>Platanus occidentalis</i>	American sycamore	Nat	7	3	14	-	-	6
<i>Pluchea camphorata</i>	camphorweed	Nat	2	-	-	-	-	-
<i>Pontederia cordata</i>	pickerelweed	Nat	-	-	14	-	7	-
<i>Pontederia crassipes</i>	water hyacinth	Non-nat	8	5	7	2	7	6
<i>Populus deltoides</i>	eastern cottonwood	Nat	-	-	4	-	-	1
<i>Potamogeton crispus</i>	curlyleaf pondweed	Non-Nat	1	-	-	-	-	-
<i>Potamogeton diversifolius</i>	waterthread pondweed	Nat	8	-	-	7	14	-
<i>Potamogeton foliosus</i>	leafy pondweed	Nat	10	-	-	1	-	1
<i>Potamogeton illinoensis</i>	Illinois pondweed	Nat	2	-	-	-	1	-
<i>Potamogeton nodosus</i>	longleaf pondweed	Nat	6	9	3	9	2	4
<i>Potamogeton pulcher</i>	spotted pondweed	Nat	-	-	-	4	1	-
<i>Potamogeton pusillus</i>	small pondweed	Nat	-	-	-	-	2	-
<i>Proserpinaca pectinata</i>	combleaf mermaidweed	Nat	-	-	-	-	1	-
<i>Ptilium capillaceum</i>	eastern bishopweed	Nat	-	-	1	-	-	-
<i>Quercus alba</i>	white oak	Nat	-	-	2	-	-	-
<i>Quercus bicolor</i>	swamp white oak	Nat	-	-	-	-	-	5
<i>Quercus laurifolia</i>	laurel oak	Nat	-	-	-	-	-	-
<i>Quercus lyrata</i>	overcup oak	Nat	-	-	2	-	-	-
<i>Quercus nigra</i>	water oak	Nat	1	2	6	-	-	9
<i>Quercus phellos</i>	willow oak	Nat	-	-	3	-	-	4
<i>Quercus rubra</i>	red oak	Nat	-	-	1	-	-	-
<i>Quercus stellata</i>	post oak	Nat	-	-	1	-	-	-
<i>Quercus virginiana</i>	southern live oak	Nat	-	-	2	-	-	2
<i>Rhexia mariana</i>	pale meadowbeauty	Nat	-	-	-	-	-	1
<i>Rhychospora sp.</i>	beaksedge	Nat	-	-	-	-	5	1
<i>Rhynchospora chalarocephala</i>	loosehead_beaksedge	Nat	-	-	-	3	-	-
<i>Rhynchospora corniculata</i>	shortbristle horned beaksedge	Nat	5	-	-	4	7	-

<i>Rhynchospora glomerata</i>	clustered beaksedge	Nat	-	-	-	-	1	-
<i>Riccia fluitans</i>	floating crystalwort	Nat	-	-	-	-	-	1
<i>Ricciocarpos natans</i>	liverwort	Nat	-	-	1	3	-	3
<i>Rotala sp.</i>	rotalla	Nat	-	-	-	-	4	-
<i>Rubus sp.</i>	blackberry	Nat	-	-	3	-	-	-
<i>Sabal minor</i>	dwarf palmetto	Nat	-	-	7	-	6	-
<i>Sabatia calycina</i>	coastal rose gentian	Nat	-	-	1	-	1	-
<i>Saccharum giganteum</i>	sugarcane plumegrass	Nat	6	-	-	-	-	-
<i>Sacciolepis striata</i>	American cupscale	Nat	5	1	2	-	-	-
<i>Sagittaria graminea</i>	grassy arrowhead	Nat	3	3	-	-	-	-
<i>Sagittaria lancifolia</i>	bulltongue arrowhead	Nat	11	5	6	15	6	-
<i>Sagittaria latifolia</i>	broadleaf arrowhead	Nat	9	10	4	4	11	7
<i>Sagittaria montevidensis</i>	giant arrowhead	Non-nat	2	-	-	-	-	-
<i>Sagittaria papillosa</i>	nipplebract arrowhead	Nat	-	-	-	-	1	-
<i>Sagittaria platyphylla</i>	delta arrowhead	Nat	-	-	-	15	10	4
<i>Salix nigra</i>	black willow	Nat	12	3	28	15	3	10
<i>Salvinia minima</i>	common salvinia	Non-nat	3	2	3	-	6	1
<i>Salvinia molesta</i>	giant salvinia	Non-nat	-	2	2	-	5	-
<i>Samolus parviflorus</i>	water pimpernel	Nat	-	-	-	-	1	-
<i>Saururus cernuus</i>	lizard's tail	Nat	17	9	5	20	18	3
<i>Schoenoplectus americanus</i>	three-square bulrush	Nat	-	-	3	-	-	1
<i>Schoenoplectus tabernaemontani</i>	softstem bulrush	Nat	-	-	6	-	6	1
<i>Scirpus cyperinus</i>	woolgrass	Nat	9	7	-	7	8	1
<i>Scirpus pendulus</i>	rufous bulrush	Nat	-	-	-	-	-	1
<i>Senna sp.</i>	senna	-	-	-	1	-	-	-
<i>Sesbania herbacea</i>	bigpod sesbania	Nat	1	7	5	-	-	8
<i>Sesbania punicia</i>	scarlet sesbania	Non-nat	-	-	2	-	-	-
<i>Setaria pumila</i>	yellow foxtail	Non-nat	-	-	1	-	-	-
<i>Sideroxylon lanuginosum</i>	gum bumelia	Nat	-	-	2	-	-	-
<i>Sium suave</i>	waterp parsnip	Nat	-	-	3	-	-	-
<i>Smilax sp.</i>	breenbriar	Nat	-	-	3	-	-	-
<i>Solidago canadensis</i>	canada goldenrod	Nat	-	-	5	-	-	-
<i>Sorghum halepense</i>	Johnson's grass	Non-nat	-	-	1	-	-	-
<i>Sparganium americanum</i>	American bur-reed	Nat	7	1	6	1	6	-
<i>Spartina alterniflora</i>	smooth cordgrass	Nat	-	-	5	-	-	-
<i>Spartina cyosuroides</i>	big cordgrass	Nat	-	-	6	-	-	-
<i>Spartina patens</i>	saltmeadow cordgrass	Nat	-	-	2	-	-	-
<i>Spirodela polyrhiza</i>	greater duckweed	Nat	-	-	-	-	1	5
<i>Sporobolus sp.</i>	dropseed	-	-	-	-	-	5	-
<i>Stuckenia pectinata</i>	sago pondweed	Nat	4	-	1	-	1	-

<i>Symphytotrichum divaricatum</i>	southern annual saltmarsh aster	Nat	-	-	2	-	-	-
<i>Symphytotrichum lanceolatum</i>	lance-leafed aster	Nat	-	-	1	-	-	-
<i>Symphytotrichum subulatum</i>	eastern annual saltmarsh aster	Nat	-	-	6	-	-	-
<i>Taxodium ascendens</i>	pond cypress	Nat	-	-	-	-	1	-
<i>Taxodium distichum</i>	bald cypress	Nat	19	12	17	12	17	-
<i>Tillandsia usneoides</i>	Spanish moss	Nat	1	-	1	-	-	-
<i>Toxicodendron radicans</i>	poison ivy	Nat	-	-	1	-	-	-
<i>Triadenum walteri</i>	greater marsh st. johnswort	Nat	2	-	4	-	20	7
<i>Triadica sebifera</i>	Chinese tallow	Non-nat	1	3	11	-	20	2
<i>Tripsacum dactyloides</i>	eastern gamagrass	Nat	-	-	-	-	1	-
<i>Typha angustifolia</i>	narrowleaf cattail	Nat	-	-	-	-	1	-
<i>Typha domingensis</i>	southern cattail	Nat	-	-	-	-	3	-
<i>Typha latifolia</i>	broadleaf cattail	Nat	-	8	5	-	16	5
<i>Typha sp.</i>	cattail	-	23	-	-	12	2	-
<i>Ulmus alata</i>	winged elm	Nat	-	-	2	-	-	-
<i>Ulmus americana</i>	American elm	Nat	-	-	1	-	-	-
<i>Ulmus sp.</i>	elm	Nat	-	-	14	-	-	5
<i>Utricularia biflora</i>	longspur bladderwort	Nat	-	-	-	-	2	-
<i>Utricularia gibba</i>	humped bladderwort	Nat	-	-	-	-	7	6
<i>Utricularia macrorhiza</i>	common bladderwort	Nat	-	2	8	-	-	1
<i>Utricularia radiata</i>	floating bladderwort	Nat	-	-	-	-	1	-
<i>Utricularia sp.</i>	bladderwort	-	16	-	4	-	4	-
<i>Vallisneria americana</i>	American eelgrass	Nat	-	2	6	-	7	1
<i>Vallisneria denseserrulata</i> × <i>spiralis</i>	hybrid eelgrass	Non-nat	-	-	-	-	-	1
<i>Vitis sp.</i>	grape	-	-	-	3	-	-	4
<i>Vitis vulpina</i>	frost grape	Nat	-	-	3	-	-	1
<i>Wolffia sp.</i>	watermeal	-	-	-	-	-	1	-
<i>Woodwardia areolata</i>	netted chainfern	Nat	-	-	3	-	-	-
<i>Xyris difformis</i>	bog yelloweyed grass	Nat	-	-	-	-	4	-
<i>Zannichellia palustris</i>	horned pondweed	Nat	-	-	-	-	3	-
<i>Zizania aquatica</i>	southern wild rice	Nat	-	-	-	-	6	-
<i>Zizaniopsis miliacea</i>	giant cutgrass	Nat	7	8	8	20	20	8