

2022 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 21 lakes surveyed, none had communities that consisted entirely of native species.
- Overall, 129 species were observed during the survey effort; of which, 9 were non-native and 13 were not previously observed.
- The most widespread species were *Alternanthera philoxeroides* (21 waterbodies), *Cephalanthus occidentalis* (21 waterbodies), *Saururus cernuus* (20 waterbodies), *Zizaniopsis miliacea* (20 waterbodies), and *Juncus effusus* (19 waterbodies).
- The most widespread non-native species were *A. philoxeroides*, *Myriophyllum spicatum* (9 waterbodies), and *Panicum repens* (7 waterbodies).
- Of non-native species observed, *P. repens* is a Mississippi state noxious weed and *Hydrilla verticillata* (5 waterbodies) is a federal noxious weed.

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.
- 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. 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. Objective of this effort was to conduct surveys of aquatic vegetation targeted at rivers and small to medium size lakes throughout the state of Mississippi during the 2022 growing season.

Methodology

Survey methods

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 21 lakes from four river basins were surveyed during June 2023 (Table 1; Loshbaugh et al. 2013). Surveyed waterbodies were located throughout the state (Fig 1). Of the 21 waterbodies surveyed in 2023, 3 had not been visited

during previous survey efforts (App. 1; Turnage and Shoemaker 2018, Turnage et al. 2019, 2020).

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 or stream bank 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. Plant identification and naming convention followed Godfrey and Wooten (1979, 1981). Most observations were identified to species, but in instances of cryptic species with inadequate diagnostic characteristics observations were reported at the genus level.

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. 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):

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

Species Proportion² (p_i):

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

Shannon-Weiner Index² (H'):

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

Shannon Evenness² (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 = $F_i \cdot 100$

²formula retrieved from Gurevitch et al. (2002).

Results and Discussion

Statewide:

In total, 129 species were observed across all waterbodies in 2022. Of the 129 species, 13 of them were not observed in previous iteration of this survey. (App. 2; Turnage and Shoemaker 2018, Turnage et al. 2019, 2020). The most commonly present species were *Alternanthera philoxeroides* (21 waterbodies), *Cephalanthus occidentalis* (21 waterbodies), *Saururus cernuus* (20 waterbodies), *Zizaniopsis miliacea* (20 waterbodies), and *Juncus effusus* (19 waterbodies). Archusa Creek Lake was the most species diverse and even waterbody surveyed in 2022. Bluff Lake was the least diverse and even lake surveyed in 2022. Of the 129 species surveyed in 2022, 9 were non-native. The most common non-native species were *Alternanthera philoxeroides* (21 waterbodies), *Myriophyllum spicatum* (9 waterbodies), and *Panicum repens* (7 waterbodies). Notably, in addition to the state noxious weed *P. repens*, *Hydrilla verticillata*, the federal noxious weed, was observed in 5 waterbodies. Bluff Lake had the greatest number of non-native species (6) while Big Creek and Trace State Park Lake were both tied for least non-native species (1).

Archusa Creek Reservoir (PHWD):

Archusa Creek Reservoir (32.03742N, -88.70548 W) was surveyed on 20 July 2022. This waterbody is in Clarke County in the southeastern region of Mississippi. Littoral zone depth was measured at 10.5' (3.2 m) (Table 1). Out of the 35 points surveyed 35, or 100% were vegetated. The top three (3) most common species by presence were 1) *Paspalum distichum* (present in 74% of points) 2) *Cephalanthus occidentalis*, *Hydrocotyle spp.*, *Myriophyllum aquaticum*, *Zizaniopsis miliacea* (present in 54% of points) and 3) *Myrica cerifera* and *Saururus cernuus* (present in 43% of points). Non-native species (3 species) accounted for 10% of the 30 species

observed. Of the species observed, three non-native species were found in Archusa Creek Reservoir: *Alternanthera philoxeroides*, *Colocasia esculenta*, and *Myriophyllum aquaticum*. Of the 21 waterbodies surveyed, Archusa Creek Reservoir ranked 1st in diversity and evenness.

Bay Springs Reservoir (USACE):

Bay Springs Reservoir (34.54221N, -88.31353W) was surveyed on 7 July 2022. This waterbody stretches through the counties of Tishomingo and Prentiss in the northeastern region of Mississippi. Littoral zone depth was measured at 22.5' (6.86 m) (Table 2). Out of the 43 points surveyed 43, or 100% were vegetated. The top three (3) most common species by presence were 1) *Carex spp.* (present in 79% of points) 2) *Zizaniopsis miliacea* (present in 74% of points) and 3) *Juncus effuses* (present in 63% of points). Non-native species (2 species) accounted for 7.4% of the 27 species observed. *Hydrilla verticillata* (federal noxious weed) and *Alternanthera philoxeroides*, were observed in Bay Springs Reservoir. Of the 21 waterbodies surveyed, Bay Spring Reservoir ranked 5th in diversity and evenness.

Big Creek (PHW):

Big Creek (33.847075N, -89.412573W) was surveyed on 20 July 2022. This waterbody is in Calhoun County in the northeastern region of Mississippi. Littoral zone depth was measured at 12.2' (3.72 m) (Table 3). Out of the 20 points surveyed 20, or 100% were vegetated. The top three (3) most common species by presence were 1) *Alternanthera philoxeroides* (present in 95% of points) 2) *Hydrolea quadrivalvis* (present in 55% of points) and 3) *Cephalanthus occidentalis* (present in 50% of points). Non-native species (1 species) accounted for 7.1% of the 14 species observed. *Alternanthera philoxeroides*, a non-native species, was observed in Big Creek. Of the 21 waterbodies surveyed, Big Creek ranked 20th in diversity and evenness.

Bluff Lake (USFWS):

Bluff Lake (33.28021N, -88.78820W) was surveyed on 22 June 2022. This waterbody stretches in the counties of Winston, Noxubee, and Oktibbeha in the northeastern region of Mississippi. Littoral zone depth was measured at 7' (2.13 m) (Table 4). Out of the 61 points surveyed 61, or 100% were vegetated. The top three (3) most common species by presence were 1) *Taxodium distichum* (present in 95% of points) 2) *Zizaniopsis miliacea* (present in 89% of points) and 3) *Althernanthera philoxeroides* (present in 79% of points). Non-native species (6 species) accounted for 22.2% of the 27 species observed. Of the species observed, five non-native species were found in Bluff Lake: *Althernanthera philoxeroides*, *Hydrilla verticillata* (federal noxious weed), *Myriophyllum aquaticum*, *Myriophyllum spicatum*, and *Oxycaryum cubense*. Of the 21 waterbodies surveyed, Bluff Lake ranked 21st in diversity and evenness.

Choctaw Lake (USFS):

Choctaw Lake (33.2751247N, -89.1458983W) was surveyed on 10 June 2022. This waterbody is in Choctaw County in the northeastern region of Mississippi. Littoral zone depth was measured at 6.0' (1.83 m) (Table 5). Out of the 30 points surveyed 30, or 100% were vegetated. The top three (3) most common species by presence were 1) *Alternanthera philoxeroides* and *Juncus effuses* (present in 83% of points) 2) *Carex spp.* (present in 77% of points) and 3) *Ludwigia*

peploides (present in 63% of points). Non-native species (2 species) accounted for 10.0% of the 20 species observed. *Alternanthera philoxeroides* and *Panicum repens* (state noxious weed), non-native species, were observed in Choctaw Lake. Of the 21 waterbodies surveyed, Choctaw Lake ranked 18th in diversity and evenness.

Doyle Arm (USFWS):

Doyle Arm (33.2706163N, -88.7904W) was surveyed on 24 June 2022. This waterbody is in Noxubee County in the northeastern region of Mississippi. Littoral zone depth was measured at 5.2' (1.56 m) (Table 6). Out of the 25 points surveyed 25, or 100% were vegetated. The top three (3) most common species by presence were 1) *Taxodium distichum* (present in 96% of points) 2) *Limnobium spongia* (present in 88% of points) and 3) *Nymphaea odorata* (present in 80% of points). Non-native species (4 species) accounted for 14.3% of the 28 species observed. *Alternanthera philoxeroides*, *Hydrilla verticillata* (federal noxious weed), *Myriophyllum spicatum*, and *Oxycaryum cubense*, non-native species, were observed in Doyle Arm. Of the 21 waterbodies surveyed, Doyle Arm ranked 3rd in diversity and evenness.

Kemper County Lake (MDWFP):

Kemper County Lake (32.81326N, -88.71906W) was surveyed on 27 June 2022 through 29 June 2022. This waterbody is in Kemper County in the northeastern region of Mississippi. Littoral zone depth was measured at 16.5' (5.03 m) (Table 7). Out of the 89 points surveyed 89, or 100% were vegetated. The most common species by presence were 1) *Juncus effuses* (present in 75% of points) 2) *Peltandra virginica* (present in 74% of points) 3) *Myrica cerifera* (present in 69% of points). Non-native species (4 species) accounted for 14.3% of the 28 species observed. *Alternanthera philoxeroides*, *Hydrilla verticillata* (federal noxious weed), and *Myriophyllum spicatum*, non-native, were observed in Kemper County Lake. Of the 21 waterbodies surveyed, Kemper County Lake ranked 4th in diversity and evenness.

Lake Bill Waller (MDWFP):

Lake Bill Waller (31.19973N, -89.71431W) was surveyed on 11 July 2022. This waterbody is in Marion County in the southeastern region of Mississippi. Littoral zone depth was measured at 20.2' (6.16 m) (Table 8). Out of the 35 points surveyed 34, or 97.1% were vegetated. The top three (3) most common species by presence were 1) *Myriophyllum spicatum*, *Nymphaea odorata*, and *Panicum repens* (present in 100% of points) 2) *Brasenia schreberi* (present in 97% of points) and 3) *Cephalanthus occidentalis* (present in 85% of points). Non-native species (4 species) accounted for 17.4% of the 23 species observed. *Alternanthera philoxeroides*, *Myriophyllum spicatum*, and *Panicum repens* (state noxious weed), non-native species, were observed in Lake Bill Waller. Of the 21 waterbodies surveyed, Lake Bill Waller ranked 14th in diversity and evenness.

Lake Columbia (MDWFP):

Lake Columbia (31.18202N, -89.73340W) was surveyed on 12 July 2022. This waterbody is in Marion County in the southeastern region of Mississippi. Littoral zone depth was measured at 23.5' (7.16 m) (Table 9). Out of the 27 points surveyed 26, or 96.3% were vegetated. The top

three (3) most common species by presence were 1) *Brasenia schreberi* (present in 100% of points) 2) *Myriophyllum spicatum* (present in 96% of points) and 3) *Typha spp.* (present in 92% of points). Non-native species (3 species) accounted for 12.5% of the 24 species observed. *Alternanthera philoxeroides*, *Colocasia esculenta*, and *Myriophyllum spicatum*, non-native species, were observed in Lake Columbia. Of the 21 waterbodies surveyed, Lake Columbia ranked 7th in diversity and evenness.

Loakfoma Lake (USFWS):

Loakfoma Lake (33.26631N, -88.78221W) was surveyed on 24 June 2022. This waterbody is in COUNTY in the REGION of Mississippi. Littoral zone depth was measured at 6.5' (1.98 m), (Table 10). Out of the 56 points surveyed 56, or 100% were vegetated. The top three (3) most common species by presence were 1) *Zizaniopsis miliacea* (present in 100% of points) 2) *Limnobium spongia* (present in 88% of points) and 3) *Cephalanthus occidentalis* and *Nymphaea odorata* (present in 82% of points). Non-native species (2 species) accounted for 8.0% of the 25 species observed. *Alternanthera philoxeroides* and *Hydrilla verticillata* (federal noxious weed), non-native species, were observed in Loakfoma Lake. Of the 21 waterbodies surveyed, Loakfoma Lake ranked 13th in diversity and evenness.

Lake Lowndes (MDWFP):

Lake Lowndes (33.42333N, -88.29988W) was surveyed on 9 June 2022. This waterbody is in Lowndes County in the northeastern region of Mississippi. Littoral zone depth was measured at 5.2' (1.59 m) (Table 11). Out of the 40 points surveyed 40, or 100% were vegetated. The top three (3) most common species by presence were 1) *Juncus effuses*, *Ludwigia hexapetala*, and *Lysimachia nummularia* (present in 70% of points) 2) *Hydrocotyle spp.* (present in 65% of points) and 3) *Cephalanthus occidentalis* (present in 50% of points). Non-native species (3 species) accounted for 12.5% of the 24 species observed. *Alternanthera philoxeroides*, *Ludwigia hexapetala*, and *Myriophyllum aquaticum*, non-native species, were observed in Lake Lowndes. Of the 21 waterbodies surveyed, Lake Lowndes ranked 17th in diversity and evenness.

Lake Mary Crawford (MDWFP):

Lake Mary Crawford (31.57689N, -90.15321W) was surveyed on 11 July 2022. This waterbody is in Lawrence County in the southwestern region of Mississippi. Littoral zone depth was measured at 9.3' (2.83 m), (Table 12). Out of the 24 points surveyed 24, or 100% were vegetated. The top three (3) most common species by presence were 1) *Cephalanthus occidentalis* (present in 83% of points) 2) *Alternanthera philoxeroides* (present in 67% of points) and 3) *Juncus effuses* and *Panicum repens* (present in 54% of points). Non-native species (2 species) accounted for 8.3% of the 24 species observed. *Alternanthera philoxeroides* and *Panicum repens* (state noxious weeds), non-native species, were observed in Lake Mary Crawford. Of the 21 waterbodies surveyed, Lake Mary Crawford ranked 6th in diversity and evenness.

Lake Perry (MDWFP):

Lake Perry (31.13402N, -88.89932W) was surveyed on 19 July 2022. This waterbody is in Perry County in the southeastern region of Mississippi. Littoral zone depth was measured at 20.5' (6.25 m) (Table 13). Out of the 20 points surveyed 20, or 100% were vegetated. The top three (3) most common species by presence were 1) *Myrica cerifera* (present in 75% of points) 2) *Brasenia schreberi* (present in 50% of points) and 3) *Cephalanthus occidentalis* and *Hydrocotyle spp.* (present in 40 % of points). Non-native species (2 species) accounted for 9.5% of the 21 total species observed. *Alternanthera philoxeroides* and *Panicum repens* (state noxious weed), non-native species, were observed in Lake Perry. Of the 21 waterbodies surveyed, Lake Perry ranked 9th in diversity and evenness.

Maynor Creek Lake (PHWD):

Maynor Creek Lake (31.64981N, -88.71278W) was surveyed on 13 July 2022. This waterbody is in Wayne County in the southeastern region of Mississippi. Littoral zone depth was measured at 15.2' (4.63 m), (Table 14). Out of the 54 points surveyed 54, or 100% were vegetated. The top three (3) most common species by presence were 1) *Panicum repens* (present in 81% of points) 2) *Nymphaea odorata* (present in 76% of points) and 3) *Brasenia schreberi* (present in 70% of points). Non-native species (4 species) accounted for 15.4% of the 26 species observed. *Alternanthera philoxeroides*, *Myriophyllum spicatum*, and *Panicum repens* (state noxious weed), non-native species, were observed in Maynor Creek. Of the 21 waterbodies surveyed, Maynor Creek ranked 12th in diversity and evenness.

Okatibbee Lake (MDWFP):

Okatibbee Lake (32.50151N, -88.79643W) was surveyed on 14 July 2022. This waterbody is in Lauderdale County in the southeastern region of Mississippi. Littoral zone depth was measured at 7.0' (2.13 m) (Table 15). Out of the 70 points surveyed 69, or 98.6% were vegetated. The top three (3) most common species by presence were 1) *Zizaniopsis miliacea* (present in 83% of points) 2) *Cephalanthus occidentalis* (present in 65% of points) and 3) *Taxodium distichum* (present in 52% of points). Non-native species (3 species) accounted for 11.1% of the 27 species observed. *Alternanthera philoxeroides*, *Myriophyllum spicatum*, and *Oxycaryum cubense*, non-native species, were observed in Okatibbee Lake. Of the 21 waterbodies surveyed, Okatibbee Lake ranked 16th in diversity and evenness.

Prentiss Walker Lake (MDWFP):

Prentiss Walker Lake (31.82924N, -89.59992W) was surveyed on 21 July 2022. This waterbody is in Smith County in the southeastern region of Mississippi. Littoral zone depth was measured at 16' (4.88 m) (Table 16). Out of the 21 points surveyed 21, or 100% were vegetated. The top three (3) most common species by presence were 1) *Alternanthera philoxeroides* (present in 67% of points) 2) *Polygonum hydropiperoides* (present in 52% of points) and 3) *Hydrolea quadrivalvis* (present in 48% of points). Non-native species (2 species) accounted for 9.1% of the 22 species observed. *Alternanthera philoxeroides* and *Panicum repens* (state noxious weed), non-native species, were observed in Prentiss Walker Lake. Of the 21 waterbodies surveyed, Prentiss Walker Lake ranked 8th in diversity and evenness.

Ross Branch Reservoir (USFWS):

Ross Branch Reservoir (33.26512N, -88.86373W) was surveyed on 27 June 2022. This waterbody is in Winston County in the northeast region of Mississippi. Littoral zone depth was measured at 11.1' (3.38 m) (Table 17). Out of the 25 points surveyed 24, or 96% were vegetated. The top three (3) most common species by presence were 1) *Brasenia schreberi* (present in 96% of points) 2) *Nymphaea odorata* (present in 92% of points) and 3) *Cephalanthus occidentalis* (present in 88% of points). Non-native species (2 species) accounted for 9.5% of the 21 species observed. *Alternanthera philoxeroides*, a non-native species, was observed in Ross Branch Reservoir. Of the 21 waterbodies surveyed, Ross Branch Reservoir ranked 11th in diversity and evenness.

Spring Lake -Wall Doxey (MDWFP):

Spring Lake -Wall Doxey (34.66354N, -89.46733) was surveyed on 6 July 2022. This waterbody is in Marshall County in the northeastern region of Mississippi. Littoral zone depth was measured at 6.6' (2.01 m) (Table 18). Out of the 20 points surveyed 20, or 100% were vegetated. The top three (3) most common species by presence were 1) *Cephalanthus occidentalis* (present in 100% of points) 2) *Myriophyllum spicatum* and *Taxodium distichum* (present in 95% of points) and 3) *Lemna minor* (present in 45% of points). Non-native species (2 species) accounted for 10.0% of the 21 species observed. *Alternanthera philoxeroides* and *Myriophyllum spicatum*, non-native species, were observed in Spring Lake-Wall Doxey. Of the 21 waterbodies surveyed, Spring Lake - Wall Doxey ranked 19th diversity and evenness.

Trace State Park Lake (MDWFP):

Trace State Park Lake (34.24618N, -88.89714W) was surveyed on 6 July 2022. This waterbody is in Lee County in the northeastern region of Mississippi. Littoral zone depth was measured at 25.0' (7.62 m) (Table 19). Out of the 52 points surveyed 50, or 96.2% were vegetated. The top three (3) most common species by presence were 1) *Juncus effuses* (present in 92% of points) 2) *Potamogeton nodosus* (present in 84% of points) and 3) Filamentous algae (present in 82% of points). Non-native species (1 species) accounted for 3.4% of the 29 species observed. *Alternanthera philoxeroides*, a non-native species, was observed in Trace State Park Lake. Of the 21 waterbodies surveyed, Trace State Park Lake ranked 10th in diversity and evenness.

Turkey Creek Reservoir (PHW):

Turkey Creek Reservoir (32.40794N, -89.16074W) was surveyed on 18 July 2022. This waterbody is in Newton County in the northeastern region of Mississippi. Littoral zone depth was measured at 8.2' (2.50 m) (Table 20). Out of the 30 points surveyed 30, or 100% were vegetated. The top three (3) most common species by presence were 1) *Nymphaea odorata* (present in 100% of points) 2) *Brasenia schreberi* (present in 93% of points) and 3) *Myrica cerifera* and *Saururus cernuus* (present in 73% of points). Non-native species (2 species) accounted for 4.3% of the 23 species observed. *Alternanthera philoxeroides* and *Myriophyllum aquaticum*, non-native species, were observed in Turkey Creek Reservoir. Of the 21 waterbodies surveyed, Turkey Creek Reservoir ranked 15th in diversity and evenness.

Turkey Fork Reservoir (PHW):

Turkey Fork (31.33844N, -88.69743W) was surveyed on 20 July 2022. This waterbody is in Greene County in the southeastern region of Mississippi. Littoral zone depth was measured at 24.3' (7.41 m) (Table 21). Out of the 31 points surveyed 41, or 100% were vegetated. The top three (3) most common species by presence were 1) *Panicum repens* (present in 90% of points) 2) *Carex spp.*, *Hydrocotyle spp.*, and *Rhynchospora chalarocephala* (present in 59% of points) and 3) *Eleocharis compressa* (present in 49% of points). Non-native species (3 species) accounted for 9.7% of the 31 species observed. *Alternanthera philoxeroides*, *Myriophyllum spicatum*, and *Panicum repens* (state noxious weed), non-native species, were observed in Turkey Fork Reservoir. Of the 21 waterbodies surveyed, Turkey Fork Reservoir ranked 2nd in diversity and evenness.

Acknowledgements

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Tables and Figures

Table 1. Macrophyte community of Archusa Creek Reservoir. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Archusa Creek Reservoir			
Littoral Depth	10.5'	Date Surveyed	20-Jul-22
Species Richness	30	Total Pts. Sur	35
Native Species Richness	27	Total Pts. Veg	35
		%-Littoral Veg	100
Scientific Name	Common Name	#-Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	6	17%
<i>Brasenia schreberi</i>	Watershield	14	40%
<i>Carex spp.</i>	Sedge	7	20%
<i>Cephalanthus occidentalis</i>	Common buttonbush	19	54%
<i>Chara spp.</i>	Muskgrass	10	29%
<i>Colocasia esculenta</i>	Wild taro	5	14%
<i>Diodia virginiana</i>	Virginia buttonweed	1	3%
<i>Eleocharis compressa</i>	Flatstem spikerush	2	6%
<i>Filamentous algae</i>	Algae	7	20%
<i>Hydrocotyle spp.</i>	Pennywort	19	54%
<i>Juncus effusus</i>	Common rush	7	20%
<i>Ludwigia leptocarpa</i>	Anglestem primrose-willow	1	3%
<i>Ludwigia peploides</i>	Floating primrose-willow	4	11%
<i>Lysimachia nummularia</i>	Creeping Jenny	1	3%
<i>Myrica cerifera</i>	Southern wax myrtle	15	43%
<i>Myriophyllum aquaticum</i>	Parrotfeather	2	6%
<i>Nymphaea odorata</i>	American white waterlily	19	54%
<i>Paspalum distichum</i>	Knotgrass	26	74%
<i>Peltandra virginica</i>	Green arrow arum	16	46%
<i>Persicaria spp.</i>	Knotweed	3	9%
<i>Potamogeton diversifolius</i>	waterthread pondweed	5	14%
<i>Potamogeton nodosus</i>	American pondweed	4	11%
<i>Rhynchospora chalarocephala</i>	Loosehead beaksedge	3	9%
<i>Sagittaria lancifolia</i>	Bulltongue arrowhead	2	6%
<i>Sagittaria platyphylla</i>	Delta arrowhead	5	14%
<i>Saururus cernuus</i>	Lizard's tail	15	43%
<i>Scirpus cyperinus</i>	Woolgrass	5	14%
<i>Taxodium distichum</i>	Bald cypress	8	23%
<i>Typha spp.</i>	Cattail	2	6%
<i>Zizaniopsis miliacea</i>	Giant cutgrass	19	54%

Table 2. Macrophyte community of Bay Springs Reservoir. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Bay Springs Reservoir			
Littoral Depth	22.5'	Date Surveyed	7-Jul-22
Species Richness	27	Total Pts. Sur	43
Native Species Richness	25	Total Pts. Veg	43
		%-Littoral Veg	100
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	16	37%
<i>Brasenia schreberi</i>	Watershield	1	2%
<i>Carex spp.</i>	Sedge	34	79%
<i>Cephalanthus occidentalis</i>	Common buttonbush	24	56%
<i>Chara spp.</i>	Muskgrass	21	49%
<i>Dulichium arundinaceum</i>	Three-way sedge	2	5%
<i>Eleocharis quadrangulata</i>	Squarestem spikerush	4	9%
<i>Filamentous algae</i>	Algae	9	21%
<i>Hibiscus lasiocarpus</i>	Woolly Rose-mallow	5	12%
<i>Hydrilla verticillata</i>	Hydrilla	21	49%
<i>Hydrocotyle spp.</i>	Pennywort	5	12%
<i>Juncus effusus</i>	Common rush	27	63%
<i>Juncus pelocarpus</i>	Brown-fruited rush	14	33%
<i>Justicia americana</i>	American water-willow	18	42%
<i>Leersia oryzoides</i>	Rice cutgrass	20	47%
<i>Myriophyllum aquaticum</i>	Parrotfeather	1	2%
<i>Peltandra virginica</i>	Green arrow arum	1	2%
<i>Persicaria hydropiperoides</i>	Swamp smartweed	2	5%
<i>Potamogeton nodosus</i>	American pondweed	21	49%
<i>Rhynchospora corniculata</i>	Shortbristle horned beaksedge	3	7%
<i>Sagittaria latifolia</i>	Broadleaf arrowhead	4	9%
<i>Sagittaria platyphylla</i>	Delta arrowhead	13	30%
<i>Salix nigra</i>	Black willow	3	7%
<i>Saururus cernuus</i>	Lizard's tail	16	37%
<i>Taxodium distichum</i>	Bald cypress	11	26%
<i>Typha spp.</i>	Cattail	2	5%
<i>Zizaniopsis miliacea</i>	Giant Cutgrass	32	74%

Table 3. Macrophyte community of Big Creek. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Big Creek			
Littoral Depth	12.2'	Date Surveyed	20-Jul-22
Species Richness	14	Total Pts. Sur	20
Native Species Richness	13	Total Pts. Veg	20
		%-Littoral Veg	100
Scientific Name	Common Name	#-Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	19	95%
<i>Carex spp.</i>	Sedge	1	5%
<i>Cephalanthus occidentalis</i>	Common buttonbush	10	50%
<i>Chara spp.</i>	Muskgrass	4	20%
<i>Filamentous algae</i>	Algae	2	10%
<i>Hydrocotyle spp.</i>	Pennywort	7	35%
<i>Hydrolea quadrivalvis</i>	Waterpod	11	55%
<i>Leersia oryzoides</i>	Rice cutgrass	3	15%
<i>Ludwigia leptocarpa</i>	Anglestem primrose-willow	9	45%
<i>Persicaria hydropiperoides</i>	Swamp smartweed	2	10%
<i>Sagittaria lancifolia</i>	Bulltongue arrowhead	1	5%
<i>Salix nigra</i>	Black willow	4	20%
<i>Saururus cernuus</i>	Lizard's tail	2	10%
<i>Taxodium distichum</i>	Bald cypress	8	40%

Table 4. Macrophyte community of Bluff Lake. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Bluff Lake			
Littoral Depth	7.0'	Date Surveyed	22-Jun-22
Species Richness	27	Total Pts. Sur	61
Native Species Richness	21	Total Pts. Veg	61
		%-Littoral Veg	100
Scientific Name	Common Name	#-Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	48	79%
<i>Brasenia schreberi</i>	Watershield	1	2%
<i>Carex spp.</i>	Sedge	1	2%
<i>Cephalanthus occidentalis</i>	Common buttonbush	28	46%
<i>Ceratophyllum demersum</i>	Coontail	36	59%
<i>Chara spp.</i>	Muskgrass	8	13%
<i>Filamentous algae</i>	Algae	27	44%
<i>Hydrilla verticillata</i>	Hydrilla	29	48%
<i>Lemna minor</i>	Common duckweed	28	46%
<i>Limnobium spongia</i>	American frogbit	45	74%
<i>Ludwigia hexapetala</i>	Six-flower primrose-willow	6	10%
<i>Ludwigia leptocarpa</i>	Anglestem primrose-willow	5	8%
<i>Ludwigia peploides</i>	Floating primrose-willow	14	23%
<i>Myriophyllum aquaticum</i>	Parrotfeather	22	36%
<i>Myriophyllum spicatum</i>	Eurasian milfoil	1	2%
<i>Nelumbo lutea</i>	American lotus	45	74%
<i>Nymphaea odorata</i>	American white waterlily	15	25%
<i>Oxycaryum cubense</i>	Cuban bulrush	20	33%
<i>Persicaria hydropiperoides</i>	Swamp Smartweed	17	28%
<i>Potamogeton pulcher</i>	Spotted pondweed	1	2%
<i>Sagittaria lancifolia</i>	Bulltongue arrowhead	2	3%
<i>Sagittaria latifolia</i>	Broadleaf arrowhead	1	2%
<i>Salix nigra</i>	Black willow	4	7%
<i>Saururus cernuus</i>	Lizard's tail	6	10%
<i>Taxodium distichum</i>	Bald Cypress	58	95%
<i>Typha spp.</i>	Cattail	2	3%
<i>Zizaniopsis miliacea</i>	Giant cutgrass	54	89%

Table 5. Macrophyte community of Choctaw Lake. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Choctaw Lake			
Littoral Depth	6.0'	Date Surveyed	10-Jun-22
Species Richness	20	Total Pts. Sur	30
Native Species Richness	18	Total Pts. Veg	30
		%-Littoral Veg	100
Scientific Name	Common Name	# Pts. Present	%- Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	25	83%
<i>Carex spp.</i>	Sedge	23	77%
<i>Cephalanthus occidentalis</i>	Common buttonbush	11	37%
<i>Ceratophyllum demersum</i>	Coontail	1	3%
<i>Eleocharis obtusa</i>	Blunt spikerush	1	3%
<i>Eleocharis quadrangulata</i>	Squarestem spikerush	11	37%
<i>Hydrocotyle umbellata</i>	Manyflower marshpennywort	2	7%
<i>Juncus effusus</i>	Common rush	25	83%
<i>Justicia americana</i>	American water-willow	1	3%
<i>Ludwigia peploides</i>	Floating primrose-willow	19	63%
<i>Lysimachia nummularia</i>	Creeping Jenny	2	7%
<i>Panicum repens</i>	Torpedo grass	10	33%
<i>Paspalum notatum</i>	Bahiagrass	12	40%
<i>Potamogeton diversifolius</i>	waterthread pondweed	3	10%
<i>Rhynchospora corniculata</i>	Shortbristle horned beaksedge	4	13%
<i>Sagittaria lancifolia</i>	Bulltongue arrowhead	3	10%
<i>Saururus cernuus</i>	Lizard's tail	9	30%
<i>Taxodium distichum</i>	Bald cypress	2	7%
<i>Typha spp.</i>	Cattail	4	13%
<i>Zizaniopsis miliacea</i>	Giant cutgrass	2	7%

Table 6. Macrophyte community of Doyle Arm. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Doyle Arm			
Littoral Depth	5.2'	Date Surveyed	24-Jun-22
Species Richness	28	Total Pts. Sur	25
Native Speces Richness	24	Total Pts. Veg	25
		%- Littoral Veg	100
Scientific Name	Common Name	# Pts. Present	%- Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	8	32%
<i>Bacopa caroliniana</i>	Blue waterhyssop	1	4%
<i>Brasenia schreberi</i>	Watershield	12	48%
<i>Carex spp.</i>	Sedge	2	8%
<i>Cephalanthus occidentalis</i>	Common Buttonbush	14	56%
<i>Ceratophyllum demersum</i>	Coontail	17	68%
<i>Chara spp.</i>	Muskgrass	19	76%
<i>Eleocharis quadrangulata</i>	Squarestem spikerush	11	44%
<i>Eleocharis vivipara</i>	Viviparous spikerush	2	8%
<i>Filamentous algae</i>	Algae	13	52%
<i>Hydrilla verticillata</i>	Hydrilla	5	20%
<i>Juncus effusus</i>	Common rush	5	20%
<i>Limnobium spongia</i>	American frogbit	22	88%
<i>Myriophyllum spicatum</i>	Eurasian milfoil	1	4%
<i>Nelumbo lutea</i>	American lotus	18	72%
<i>Nymphaea odorata</i>	American white waterlily	20	80%
<i>Oxycaryum cubense</i>	Cuban bulrush	13	52%
<i>Persicaria hydropiperoides</i>	Swamp Smartweed	11	44%
<i>Persicaria spp.</i>	Knotweed	2	8%
<i>Potamogeton pulcher</i>	Spotted pondweed	1	4%
<i>Ricciocarpos natans</i>	Liverwort	1	4%
<i>Sagittaria latifolia</i>	Broadleaf arrowhead	4	16%
<i>Sagittaria platyphylla</i>	Delta arrowhead	8	32%
<i>Salix nigra</i>	Black Willow	6	24%
<i>Saururus cernuus</i>	Lizard's tail	7	28%
<i>Taxodium distichum</i>	Bald Cypress	24	96%
<i>Typha spp.</i>	Cattail	1	4%
<i>Zizaniopsis miliacea</i>	Giant cutgrass	16	64%

Table 7. Macrophyte community of Kemper County Lake. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Kemper County Lake			
Littoral Depth	16.5'	Date Surveyed	6/27/22-6/29/22
Species Richness	28	Total Pts. Sur	89
Native Species Richness	24	Total Pts. Veg	89
		%-Littoral Veg	100
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	37	42%
<i>Betula nigra</i>	River birch	1	1%
<i>Brasenia schreberi</i>	Watershield	21	24%
<i>Carex</i> spp.	Sedge	52	58%
<i>Cephalanthus occidentalis</i>	Common buttonbush	52	58%
<i>Ceratophyllum demersum</i>	Coontail	5	6%
<i>Dulichium arundinaceum</i>	Three-way sedge	34	38%
<i>Eleocharis quadrangulata</i>	Squarestem spikerush	15	17%
<i>Hydrilla verticillata</i>	Hydrilla	2	2%
<i>Hydrocotyle</i> spp.	Pennywort	18	20%
<i>Juncus effusus</i>	Common rush	67	75%
<i>Leersia oryzoides</i>	Rice cutgrass	6	7%
<i>Ludwigia hexapetala</i>	Six-flower primrose-willow	6	7%
<i>Ludwigia leptocarpa</i>	Anglestem primrose-willow	33	37%
<i>Ludwigia peploides</i>	Floating primrose-willow	15	17%
<i>Lysimachia nummularia</i>	Creeping jenny	2	2%
<i>Myrica cerifera</i>	Southern wax myrtle	61	69%
<i>Myriophyllum spicatum</i>	Eurasian Milfoil	3	3%
<i>Nymphaea odorata</i>	American white waterlily	20	22%
<i>Peltandra virginica</i>	Green arrow arum	66	74%
<i>Persicaria hydropiperoides</i>	Swamp smartweed	24	27%
<i>Potamogeton nodosus</i>	American pondweed	17	19%
<i>Potamogeton pulcher</i>	Spotted pondweed	16	18%
<i>Sagittaria lancifolia</i>	Bulltongue arrowhead	11	12%
<i>Sagittaria platyphylla</i>	Delta arrowhead	17	19%
<i>Saururus cernuus</i>	Lizard's tail	22	25%
<i>Typha</i> spp.	Cattail	7	8%
<i>Zizaniopsis miliacea</i>	Giant cutgrass	27	30%

Table 8. Macrophyte community of Lake Bill Waller. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Lake Bill Waller			
Littoral Depth	20.2'	Date Surveyed	11-Jul-22
Species Richness	23	Total Pts. Sur	35
Native Species Richness	19	Total Pts. Veg	34
		%-Littoral Veg	97.1
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	2	6%
<i>Brasenia schreberi</i>	Watershield	33	97%
<i>Carex spp.</i>	Sedge	18	53%
<i>Cephalanthus occidentalis</i>	Common buttonbush	29	85%
<i>Eleocharis compressa</i>	Flatstem spikerush	20	59%
<i>Hydrocotyle spp.</i>	Pennywort	17	50%
<i>Juncus effusus</i>	Common rush	4	12%
<i>Leersia oryzoides</i>	Rice cutgrass	4	12%
<i>Lysimachia nummularia</i>	Creeping Jenny	1	3%
<i>Myrica cerifera</i>	Southern wax myrtle	26	76%
<i>Myriophyllum spicatum</i>	Eurasian Milfoil	34	100%
<i>Nelumbo lutea</i>	American lotus	1	3%
<i>Nymphaea odorata</i>	American white waterlily	34	100%
<i>Panicum repens</i>	Torpedo grass	34	100%
<i>Phalaris arundinacea</i>	Reed canary grass	1	3%
<i>Persicaria spp.</i>	Knotweed	2	6%
<i>Potamogeton diversifolius</i>	waterthread pondweed	1	3%
<i>Sagittaria latifolia</i>	Broadleaf arrowhead	1	3%
<i>Sagittaria platyphylla</i>	Delta arrowhead	2	6%
<i>Saururus cernuus</i>	Lizard's tail	18	53%
<i>Scirpus cyperinus</i>	Woolgrass	9	26%
<i>Typha spp.</i>	Cattail	24	71%
<i>Zizaniopsis miliacea</i>	Giant cutgrass	22	65%

Table 9. Macrophyte community of Lake Columbia. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Lake Columbia			
Littoral Depth	23.5'	Date Surveyed	12-Jul-22
Species Richness	24	Total Pts. Sur	27
Native Species Richness	21	Total Pts. Veg	26
		%-Littoral Veg	96.3
Scientific Name	Common Name	#-Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	7	27%
<i>Brasenia schreberi</i>	Watershield	26	100%
<i>Carex spp.</i>	Sedge	6	23%
<i>Cephalanthus occidentalis</i>	Common buttonbush	13	50%
<i>Colocasia esculenta</i>	Wild taro	1	4%
<i>Eleocharis compressa</i>	Flatstem spikerush	5	19%
<i>Filamentous algae</i>	Algae	8	31%
<i>Juncus effusus</i>	Common rush	1	4%
<i>Ludwigia leptocarpa</i>	Anglestem primrose-willow	3	12%
<i>Ludwigia peploides</i>	Floating primrose-willow	2	8%
<i>Ludwigia repens</i>	Creeping primrose-willow	4	15%
<i>Myrica cerifera</i>	Southern wax myrtle	10	38%
<i>Myriophyllum spicatum</i>	Eurasian milfoil	25	96%
<i>Nelumbo lutea</i>	American lotus	6	23%
<i>Nymphaea odorata</i>	American white waterlily	23	88%
<i>Persicaria hydropiperoides</i>	Swamp smartweed	8	31%
<i>Persicaria spp.</i>	Knotweed	1	4%
<i>Rhynchospora corniculata</i>	Shortbristle Horned Beaksedge	23	88%
<i>Sagittaria lancifolia</i>	Bulltongue Arrowhead	1	4%
<i>Salix nigra</i>	Black Willow	4	15%
<i>Saururus cernuus</i>	Lizard's tail	13	50%
<i>Scirpus cyperinus</i>	Woolgrass	7	27%
<i>Typha spp.</i>	Cattail	24	92%
<i>Zizaniopsis miliacea</i>	Giant cutgrass	5	19%

Table 10. Macrophyte community of Loakfoma Lake. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Loakfoma Lake			
Littoral Depth	6.5'	Date Surveyed	24-Jun-22
Species Richness	25	Total Pts. Sur	56
Native Species Richness	23	Total Pts. Veg	56
		%-Littoral Veg	100
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	22	39%
<i>Brasenia schreberi</i>	Watershield	34	61%
<i>Carex spp.</i>	Sedge	1	2%
<i>Cephalanthus occidentalis</i>	Common buttonbush	46	82%
<i>Eleocharis tricostata</i>	Three-angled spikesedge	4	7%
<i>Filamentous algae</i>	Algae	19	34%
<i>Hydrilla verticillata</i>	Hydrilla	4	7%
<i>Juncus effusus</i>	Common rush	7	13%
<i>Lemna minor</i>	Common duckweed	2	4%
<i>Limnobium spongia</i>	American frogbit	49	88%
<i>Ludwigia leptocarpa</i>	Anglestem primrose-willow	1	2%
<i>Ludwigia peploides</i>	Floating primrose-willow	2	4%
<i>Nelumbo lutea</i>	American lotus	27	48%
<i>Nymphaea odorata</i>	American white water-lily	46	82%
<i>Persicaria hydropiperoides</i>	Swamp Smartweed	9	16%
<i>Persicaria spp.</i>	Knotweed	4	7%
<i>Potamogeton foliosus</i>	Leafy pondweed	2	4%
<i>Ricciocarpos natans</i>	Liverwort	1	2%
<i>Sagittaria lancifolia</i>	Bulltongue arrowhead	6	11%
<i>Sagittaria platyphylla</i>	Delta arrowhead	11	20%
<i>Salix nigra</i>	Black willow	36	64%
<i>Saururus cernuus</i>	Lizard's tail	5	9%
<i>Taxodium distichum</i>	Bald cypress	39	70%
<i>Typha spp.</i>	Cattail	10	18%
<i>Zizaniopsis miliacea</i>	Giant cutgrass	56	100%

Table 11. Macrophyte community of Lake Lowndes. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Lake Lowndes			
Littoral Depth	5.2'	Date Surveyed	9-Jun-22
Species Richness	24	Total Pts. Sur	40
Native Species Richness	21	Total Pts. Veg	40
		%-Littoral Veg	100
Scientific Name	Common Name	#-Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	12	30%
<i>Carex spp.</i>	Sedge	15	38%
<i>Cephalanthus occidentalis</i>	Common buttonbush	20	50%
<i>Chara spp.</i>	Muskgrass	1	3%
<i>Cladium mariscus</i>	Saw-grass	2	5%
<i>Eleocharis elongata</i>	Slim spikerush	2	5%
<i>Eleocharis quadrangulata</i>	Squarestem spikerush	1	3%
<i>Filamentous algae</i>	Algae	15	38%
<i>Hydrocotyle spp.</i>	Pennywort	26	65%
<i>Iris spp.</i>	Iris	1	3%
<i>Juncus effusus</i>	Common Rush	28	70%
<i>Ludwigia hexapetala</i>	Six-flower primrose-willow	28	70%
<i>Ludwigia peploides</i>	Floating primrose-willow	9	23%
<i>Lysimachia nummularia</i>	Creeping jenny	28	70%
<i>Mimulus rigens</i>	Allegheny monkeyflower	2	5%
<i>Myriophyllum aquaticum</i>	Parrotfeather	7	18%
<i>Persicaria hydropiperoides</i>	Swamp smartweed	6	15%
<i>Persicaria pennsylvanicum</i>	Pennsylvania smartweed	2	5%
<i>Potamogeton diversifolius</i>	waterthread pondweed	4	10%
<i>Sagittaria lancifolia</i>	Bulltongue arrowhead	1	3%
<i>Sagittaria platyphylla</i>	Delta arrowhead	1	3%
<i>Salix nigra</i>	Black willow	3	8%
<i>Saururus cernuus</i>	Lizard's tail	4	10%
<i>Zizaniopsis miliacea</i>	Giant cutgrass	1	3%

Table 12. Macrophyte community of Lake Mary Crawford. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Lake Mary Crawford			
Littoral Depth	9.3'	Date Surveyed	11-Jul-22
Species Richness	24	Total Pts. Sur	24
Native Species Richness	22	Total Pts. Veg	24
		%-Littoral Veg	100
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	16	67%
<i>Carex spp.</i>	Sedge	7	29%
<i>Cephalanthus occidentalis</i>	Common buttonbush	20	83%
<i>Chara spp.</i>	Muskgrass	2	8%
<i>Diodia virginiana</i>	Virginia Buttonweed	2	8%
<i>Eichhornia crassipes</i>	Water hyacinth	4	17%
<i>Eleocharis compressa</i>	Flatstem Spikerush	2	8%
<i>Filamentous algae</i>	Algae	1	4%
<i>Hydrocotyle spp.</i>	Pennywort	1	4%
<i>Juncus effusus</i>	Common rush	13	54%
<i>Lemna minor</i>	Common duckweed	1	4%
<i>Ludwigia peploides</i>	Floating primrose-willow	7	29%
<i>Myrica cerifera</i>	Southern Wax myrtle	5	21%
<i>Nelumbo lutea</i>	American lotus	12	50%
<i>Nymphaea odorata</i>	American white waterlily	5	21%
<i>Panicum repens</i>	Torpedo grass	13	54%
<i>Persicaria pennsylvanicum</i>	Pennsylvania smartweed	11	46%
<i>Potamogeton pulcher</i>	spotted pondweed	1	4%
<i>Sagittaria lancifolia</i>	Bulltongue arrowhead	5	21%
<i>Sagittaria platyphylla</i>	Delta arrowhead	2	8%
<i>Salix nigra</i>	Black willow	9	38%
<i>Saururus cernuus</i>	Lizard's tail	9	38%
<i>Typha spp.</i>	Cattail	7	29%
<i>Zizaniopsis miliacea</i>	Giant cutgrass	5	21%

Table 13. Macrophyte community of Lake Perry. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Lake Perry			
Littoral Depth	20.5'	Date Surveyed	19-Jul-22
Species Richness	21	Total Pts. Sur	20
Native Species Richness	19	Total Pts. Veg	20
		%-Littoral Veg	100
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	7	35%
<i>Brasenia schreberi</i>	Watershield	10	50%
<i>Carex spp.</i>	Sedge	6	30%
<i>Cephalanthus occidentalis</i>	Common buttonbush	8	40%
<i>Eleocharis compressa</i>	Flatstem spikerush	2	10%
<i>Eleocharis tricostata</i>	Three-angled spikesedge	1	5%
<i>Filamentous algae</i>	Algae	2	10%
<i>Hydrocotyle spp.</i>	Pennywort	8	40%
<i>Juncus effusus</i>	Common rush	1	5%
<i>Ludwigia leptocarpa</i>	Anglestem primrose-willow	6	30%
<i>Ludwigia peploides</i>	Floating primrose-willow	5	25%
<i>Myrica cerifera</i>	Southern wax myrtle	15	75%
<i>Nymphaea odorata</i>	American white waterlily	5	25%
<i>Panicum repens</i>	Torpedo grass	6	30%
<i>Peltandra virginica</i>	Green arrow arum	4	20%
<i>Persicaria hydropiperoides</i>	Swamp smartweed	2	10%
<i>Persicaria spp.</i>	Knotweed	1	5%
<i>Potamogeton nodosus</i>	American pondweed	2	10%
<i>Sagittaria lancifolia</i>	Bulltongue arrowhead	2	10%
<i>Saururus cernuus</i>	Lizard's tail	1	5%
<i>Zizaniopsis miliacea</i>	Giant cutgrass	3	15%

Table 14. Macrophyte community of Maynor Creek Lake. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Maynor Creek Lake			
Littoral Depth	15.2'	Date Surveyed	13-Jul-22
Species Richness	26	Total Pts. Sur	54
Native Species Richness	22	Total Pts. Veg	54
		%-Littoral Veg	100
Scientific Name	Common Name	#-Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	2	4%
<i>Bacopa caroliniana</i>	Blue waterhyssop	17	31%
<i>Brasenia schreberi</i>	Watershield	38	70%
<i>Carex spp.</i>	Sedge	18	33%
<i>Cephalanthus occidentalis</i>	Common buttonbush	25	46%
<i>Dulichium arundinaceum</i>	Three-way sedge	2	4%
<i>Eleocharis compressa</i>	Flatstem spikerush	6	11%
<i>Eleocharis quadrangulata</i>	Squarestem spikerush	1	2%
<i>Juncus effusus</i>	Common rush	1	2%
<i>Ludwigia hexapetala</i>	Six-flower primrose-willow	18	33%
<i>Ludwigia leptocarpa</i>	Anglestem primrose-willow	8	15%
<i>Ludwigia peploides</i>	Floating primrose-willow	23	43%
<i>Lysimachia nummularia</i>	Creeping Jenny	1	2%
<i>Myrica cerifera</i>	Southern wax myrtle	23	43%
<i>Myriophyllum spicatum</i>	Eurasian milfoil	11	20%
<i>Nelumbo lutea</i>	American lotus	2	4%
<i>Nymphaea odorata</i>	American white waterlily	41	76%
<i>Panicum repens</i>	Torpedo grass	44	81%
<i>Persicaria hydropiperoides</i>	Swamp Smartweed	6	11%
<i>Potamogeton nodosus</i>	American pondweed	1	2%
<i>Sagittaria platyphylla</i>	Delta arrowhead	1	2%
<i>Salix nigra</i>	Black willow	1	2%
<i>Saururus cernuus</i>	Lizard's tail	8	15%
<i>Scirpus Cyperinus</i>	Woolgrass	10	19%
<i>Taxodium distichum</i>	Bald cypress	1	2%
<i>Zizaniopsis miliacea</i>	Giant cutgrass	19	35%

Table 15. Macrophyte community of Okatibbee Lake. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Okatibbee Lake			
Littoral Depth	7.0'	Date Surveyed	14-Jul-22
Species Richness	27	Total Pts. Sur	70
Native Species Richness	24	Total Pts. Veg	69
		%-Littoral Veg	98.6
Scientific Name	Common Name	#-Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	29	42%
<i>Betula nigra</i>	River Birch	2	3%
<i>Brasenia schreberi</i>	Watershield	5	7%
<i>Carex spp.</i>	Sedge	9	13%
<i>Cephalanthus occidentalis</i>	Common buttonbush	45	65%
<i>Chara spp.</i>	Muskgrass	7	10%
<i>Filamentous algae</i>	Algae	4	6%
<i>Hibiscus lasiocarpus</i>	Woolly rose-mallow	1	1%
<i>Hydrocotyle spp.</i>	Pennywort	10	14%
<i>Juncus effusus</i>	Common rush	4	6%
<i>Juncus pelocarpus</i>	Brown-fruited rush	2	3%
<i>Justicia americana</i>	American water-willow	1	1%
<i>Myrica cerifera</i>	Southern wax myrtle	4	6%
<i>Myriophyllum spicatum</i>	Eurasian milfoil	7	10%
<i>Nelumbo lutea</i>	American lotus	6	9%
<i>Nymphaea odorata</i>	American white waterlily	25	36%
<i>Oxycaryum cubense</i>	Cuban bulrush	1	1%
<i>Persicaria hydropiperoides</i>	Swamp smartweed	4	6%
<i>Persicaria spp.</i>	Knotweed	1	1%
<i>Potamogeton nodosus</i>	American pondweed	5	7%
<i>Sagittaria platyphylla</i>	Delta arrowhead	3	4%
<i>Salix nigra</i>	Black willow	22	32%
<i>Saururus cernuus</i>	Lizard's tail	4	6%
<i>Scirpus cyperinus</i>	Woolgrass	11	16%
<i>Taxodium distichum</i>	Bald cypress	36	52%
<i>Typha spp.</i>	Cattail	1	1%
<i>Zizaniopsis miliacea</i>	Giant cutgrass	57	83%

Table 16. Macrophyte community of Prentiss Walker Lake. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Prentiss Walker Lake			
Littoral Depth	16'	Date Surveyed	21-Jul-22
Species Richness	22	Total Pts. Sur	21
Native Species Richness	20	Total Pts. Veg	21
		%-Littoral Veg	100
Scientific Name	Common Name	#-Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	14	67%
<i>Carex spp.</i>	Sedge	6	29%
<i>Cephalanthus occidentalis</i>	Common buttonbush	9	43%
<i>Diodia virginiana</i>	Virginia buttonweed	1	5%
<i>Eleocharis compressa</i>	Flatstem spikerush	1	5%
<i>Filamentous algae</i>	Algae	4	19%
<i>Hydrocotyle spp.</i>	Pennywort	6	29%
<i>Hydrolea quadrivalvis</i>	Waterpod	10	48%
<i>Juncus effusus</i>	Common rush	4	19%
<i>Leersia oryzoides</i>	Rice cutgrass	3	14%
<i>Ludwigia peploides</i>	Floating primrose-willow	2	10%
<i>Myrica cerifera</i>	Southern wax myrtle	2	10%
<i>Panicum repens</i>	Torpedo grass	1	5%
<i>Persicaria hydropiperoides</i>	Swamp smartweed	11	52%
<i>Rhynchospora chalarocephala</i>	Loosehead beaksedge	2	10%
<i>Sagittaria lancifolia</i>	Bulltongue arrowhead	1	5%
<i>Sagittaria platyphylla</i>	Delta arrowhead	2	10%
<i>Salix nigra</i>	Black willow	1	5%
<i>Saururus cernuus</i>	Lizard's tail	8	38%
<i>Scirpus cyperinus</i>	Woolgrass	2	10%
<i>Sparganium americanum</i>	American bur-reed	6	29%
<i>Zizaniopsis miliacea</i>	Giant cutgrass	5	24%

Table 17. Macrophyte community of Ross Branch Reservoir. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Ross Branch Reservoir			
Littoral Depth	11.1'	Date Surveyed	27-Jun-22
Species Richness	21	Total Pts. Sur.	25
Native Species Richness	19	Total Pts. Veg	24
		%-Littoral Veg	96
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	19	79%
<i>Brasenia schreberi</i>	Watershield	23	96%
<i>Carex spp.</i>	Sedge	16	67%
<i>Cephalanthus occidentalis</i>	Common buttonbush	21	88%
<i>Chara spp.</i>	Muskgrass	17	71%
<i>Eleocharis quadrangulata</i>	Squarestem spikerush	2	8%
<i>Filamentous algae</i>	Algae	3	13%
<i>Juncus effusus</i>	Common rush	9	38%
<i>Leersia oryzoides</i>	Rice cutgrass	9	38%
<i>Ludwigia hexapetala</i>	Six-flower primrose-willow	4	17%
<i>Ludwigia leptocarpa</i>	Anglestem primrose-willow	8	33%
<i>Ludwigia peploides</i>	Floating primrose-willow	5	21%
<i>Nelumbo lutea</i>	American lotus	3	13%
<i>Nymphaea odorata</i>	American white waterlily	22	92%
<i>Persicaria hydropiperoides</i>	Swamp smartweed	4	17%
<i>Potamogeton diversifolius</i>	waterthread pondweed	1	4%
<i>Potamogeton nodosus</i>	American pondweed	4	17%
<i>Sagittaria lancifolia</i>	Bulltongue arrowhead	1	4%
<i>Sagittaria platyphylla</i>	Delta arrowhead	20	83%
<i>Salix nigra</i>	Black willow	6	25%
<i>Zizaniopsis miliacea</i>	Giant cutgrass	13	54%

Table 18. Macrophyte community of Spring Lake – Wall Doxey. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Spring Lake - Wall Doxey			
Littoral Depth	6.6'	Date Surveyed	6-Jul-22
Species Richness	20	Total Pts. Sur	20
Native Species Richness	18	Total Pts. Veg	20
		%-Littoral Veg	100
Scientific Name	Common Name	# Pts. Present	%- Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	4	20%
<i>Azolla caroliniana</i>	Carolina mosquitofern	2	10%
<i>Carex spp.</i>	Sedge	5	25%
<i>Cephalanthus occidentalis</i>	Common buttonbush	20	100%
<i>Dulichium arundinaceum</i>	Three-way sedge	2	10%
<i>Eleocharis quadrangulata</i>	Squarestem spikerush	2	10%
<i>Filamentous algae</i>	Algae	8	40%
<i>Hydrocotyle spp.</i>	Pennywort	2	10%
<i>Iris spp.</i>	Iris	1	5%
<i>Juncus effusus</i>	Common rush	4	20%
<i>Leersia oryzoides</i>	Rice cutgrass	4	20%
<i>Lemna minor</i>	Common duckweed	9	45%
<i>Myriophyllum spicatum</i>	Eurasian watermilfoil	19	95%
<i>Persicaria pennsylvanicum</i>	Pennsylvania smartweed	1	5%
<i>Ricciocarpos natans</i>	Liverwort	1	5%
<i>Sagittaria platyphylla</i>	Delta arrowhead	2	10%
<i>Saururus cernuus</i>	Lizard's tail	1	5%
<i>Taxodium distichum</i>	Bald cypress	19	95%
<i>Typha spp.</i>	Cattail	2	10%
<i>Zizaniopsis miliacea</i>	Giant cutgrass	1	5%

Table 19. Macrophyte community of Trace State Park Lake. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Trace State Park Lake			
Littoral Depth	25.0'	Date Surveyed	6-Jul-22
Species Richness	29	Total Pts. Sur	52
Native Species Richness	28	Total Pts. Veg	50
		%-Littoral Veg	96.2
Scientific Name	Common Name	# Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	7	14%
<i>Brasenia schreberi</i>	Watershield	1	2%
<i>Carex spp.</i>	Sedge	13	26%
<i>Cephalanthus occidentalis</i>	Common buttonbush	24	48%
<i>Ceratophyllum demersum</i>	Coontail	35	70%
<i>Chara spp.</i>	Muskgrass	9	18%
<i>Diodia virginiana</i>	Virginia buttonweed	1	2%
<i>Dulichium arundinaceum</i>	Three-way sedge	1	2%
<i>Eleocharis obtusa</i>	Blunt Spikerush	3	6%
<i>Eleocharis quadrangulata</i>	Squarestem spikerush	11	22%
<i>Filamentous algae</i>	Algae	41	82%
<i>Juncus effusus</i>	Common rush	46	92%
<i>Juncus pelocarpus</i>	Brown-fruited rush	4	8%
<i>Leersia oryzoides</i>	Rice cutgrass	27	54%
<i>Ludwigia leptocarpa</i>	Anglestem primrose-willow	1	2%
<i>Ludwigia peploides</i>	Floating primrose-willow	1	2%
<i>Myrica cerifera</i>	Southern wax myrtle	1	2%
<i>Najas guadalupensis</i>	Southern naiad	39	78%
<i>Nelumbo lutea</i>	American lotus	2	4%
<i>Persicaria pennsylvanicum</i>	Pennsylvania smartweed	6	12%
<i>Potamogeton diversifolius</i>	waterthread pondweed	1	2%
<i>Potamogeton nodosus</i>	American pondweed	42	84%
<i>Rhynchospora corniculata</i>	Shortbristle horned beaksedge	7	14%
<i>Sagittaria lancifolia</i>	Bulltongue arrowhead	1	2%
<i>Sagittaria platyphylla</i>	Delta arrowhead	2	4%
<i>Salix nigra</i>	Black willow	8	16%
<i>Saururus cernuus</i>	Lizard's tail	9	18%
<i>Taxodium distichum</i>	Bald cypress	3	6%
<i>Zizaniopsis miliacea</i>	Giant cutgrass	37	74%

Table 20. Macrophyte community of Turkey Creek Reservoir. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Turkey Creek Reservoir			
Littoral Depth	8.2'	Date Surveyed	18-Jul-22
Species Richness	23	Total Pts. Sur	30
Native Species Richness	22	Total Pts. Veg	30
		%-Littoral Veg	100
Scientific Name	Common Name	#-Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	11	37%
<i>Brasenia schreberi</i>	Watershield	28	93%
<i>Carex spp.</i>	Sedge	12	40%
<i>Cephalanthus occidentalis</i>	Common buttonbush	13	43%
<i>Chara spp.</i>	Muskgrass	5	17%
<i>Diodia virginiana</i>	Virginia buttonweed	1	3%
<i>Filamentous algae</i>	Algae	20	67%
<i>Hydrocotyle spp.</i>	Pennywort	1	3%
<i>Juncus effusus</i>	Common rush	21	70%
<i>Leersia oryzoides</i>	Rice cutgrass	8	27%
<i>Ludwigia leptocarpa</i>	Anglestem primrose-willow	2	7%
<i>Ludwigia peploides</i>	Floating primrose-willow	1	3%
<i>Myrica cerifera</i>	Southern wax myrtle	22	73%
<i>Myriophyllum aquaticum</i>	Parrotfeather	2	7%
<i>Nelumbo lutea</i>	American lotus	1	3%
<i>Nymphaea odorata</i>	American white waterlily	30	100%
<i>Persicaria hydropiperoides</i>	Swamp smartweed	3	10%
<i>Potamogeton nodosus</i>	American pondweed	13	43%
<i>Sagittaria lancifolia</i>	Bulltongue arrowhead	1	3%
<i>Sagittaria platyphylla</i>	Delta arrowhead	1	3%
<i>Salix nigra</i>	Black willow	1	3%
<i>Saururus cernuus</i>	Lizard's tail	22	73%
<i>Zizaniopsis miliacea</i>	Gaint cutgrass	11	37%

Table 21. Macrophyte community of Turkey Fork Reservoir. Species in red are non-native and species in bold font are listed as federal and/or Mississippi state noxious weeds.

Turkey Fork Reservoir			
Littoral Depth	24.3'	Date Surveyed	20-Jul-22
Species Richness	31	Total Pts. Sur	41
Native Species Richness	28	Total Pts. Veg	41
		%-Littoral Veg	100
Scientific Name	Common Name	#-Pts. Present	%-Frequency
<i>Alternanthera philoxeroides</i>	Alligatorweed	7	17%
<i>Brasenia schreberi</i>	Watershield	5	12%
<i>Carex spp.</i>	Sedge	24	59%
<i>Cephalanthus occidentalis</i>	Common buttonbush	8	20%
<i>Diodia virginiana</i>	Virginia buttonweed	2	5%
<i>Eichhornia crassipes</i>	Water hyacinth	5	12%
<i>Eleocharis compressa</i>	Flatstem spikerush	20	49%
<i>Eleocharis palustris</i>	Common spikerush	6	15%
<i>Filamentous algae</i>	Algae	15	37%
<i>Hydrocotyle spp.</i>	Pennywort	24	59%
<i>Juncus acuminatus</i>	Tapertip rush	2	5%
<i>Juncus dudleyi</i>	Dudley's rush	6	15%
<i>Juncus effusus</i>	Common rush	2	5%
<i>Juncus marginatus</i>	Grassleaf rush	13	32%
<i>Leersia oryzoides</i>	Rice cutgrass	18	44%
<i>Lysimachia nummularia</i>	Creeping Jenny	1	2%
<i>Myrica cerifera</i>	Southern wax myrtle	9	22%
<i>Myriophyllum spicatum</i>	Eurasian milfoil	2	5%
<i>Nymphaea odorata</i>	American white waterlily	11	27%
<i>Panicum repens</i>	Torpedo grass	37	90%
<i>Paspalum distichum</i>	Knotgrass	4	10%
<i>Peltandra virginica</i>	Green arrow arum	2	5%
<i>Persicaria spp.</i>	Knotweed	14	34%
<i>Potamogeton diversifolius</i>	waterthread pondweed	4	10%
<i>Rhynchospora chalarocephala</i>	Loosehead beaksedge	24	59%
<i>Sagittaria lancifolia</i>	Bulltongue arrowhead	2	5%
<i>Salix nigra</i>	Black willow	2	5%
<i>Saururus cernuus</i>	Lizard's tail	3	7%
<i>Scirpus cyperinus</i>	Woolgrass	11	27%
<i>Taxodium distichum</i>	Bald cypress	5	12%
<i>Zizaniopsis miliacea</i>	Giant cutgrass	11	27%

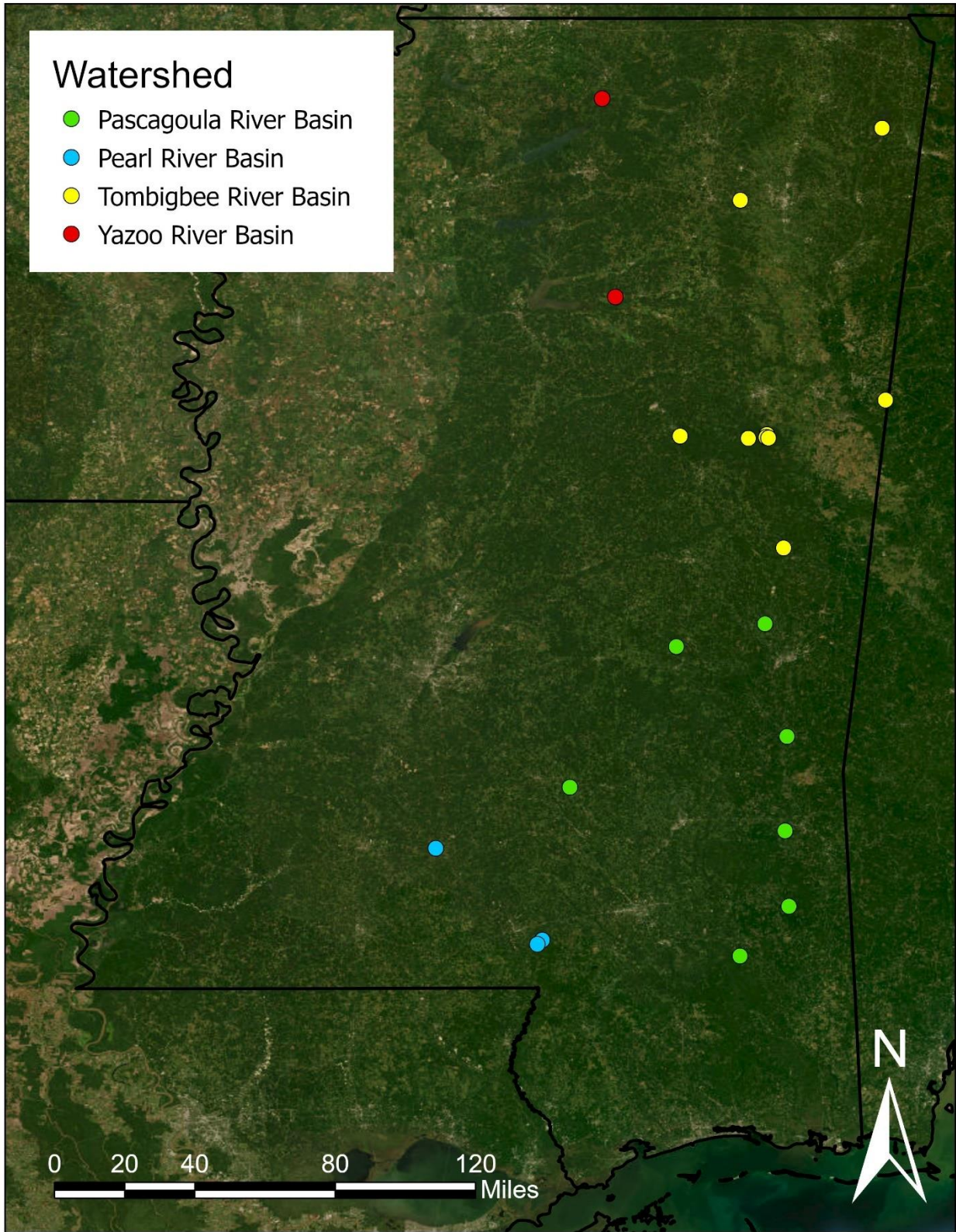


Fig 1. Locations of Mississippi waterbodies surveyed during 2022. Sites belonging to different river/stream basins indicated by different color codes.

Appendices

App. 1. Lakes surveyed in 2017, 2019, 2020, and 2022. 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	Management Entity*
Aberdeen (TTW)		X			USACE
Amory (TTW)		X			USACE
Anchor	X				Private
Archusa Creek	X			X	PHW
Bay Springs (TTW)	X			X	USACE
Bee	X				Private
Big Creek				X	PHW
Bill Waller	X			X	MDWFP
Bogue Homa	X				MDWFP
Bluff	X			X	USFWS
Calling Panther	X				MDWFP
Caroline	X				Private
Choctaw				X	USFS
Clarkco Lake	X				MDWFP
Claude Bennett	X				MDWFP
Columbia	X			X	MDWFP
Columbus (TTW)	X		X		USACE
Dalewood Shore			X		Private
Doyle Arm			X	X	USFWS
Dry Creek	X				PHW
Elvis Presley	X	X			MDWFP
English	X				MDWFP
Flint Creek	X				PHW
Fulton (TTW)		X			USACE
Geiger	X				MDWFP
George			X		Private
Hideaway	X				Private
Horseshoe			X		Private
Kemper	X			X	MDWFP
Lamar Bruce	X	X			MDWFP
Lincoln	X				MDWFP
Little Eagle			X		Private
Loakfoma	X			X	USFWS
Lower			X		USACE

Lowndes	X			X	MDWFP
Mary	X				Private
Mary Crawford	X			X	MDWFP
Maynor Creek	X			X	PHW
Mike Connor	X				MDWFP
Moon	X	X			Private
Natchez	X				MDWFP
Okatibbee			X	X	MDWFP
Okhissa	X				USFS
Perry	X			X	MDWFP
Pickwick (TTW/TVA)		X			USACE/TVA
Pool D (TTW)		X			USACE
Pool E (TTW)		X			USACE
Prentiss Walker	X			X	MDWFP
Roebuck			X		Private
Roosevelt	X				MDWFP
Ross Branch				X	USFWS
Simpson-Legion	X				MDWFP
Smithville (TTW)		X			USACE
Spring		X		X	MDWFP
Tangipahoa	X				MDWFP
Tippah	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	PHW
Walthall	X				MDWFP
Washington	X	X			Private
Wasp			X		Private

*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, and 2023. 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 Native	Status	2017	2019	2020	2022
<i>Acer negundo</i>	box elder	Nat	-	-	10	-
<i>Acer rubrum</i>	red maple	Nat	1	3	9	-
<i>Acer saccharinum</i>	silver maple	Nat	-	-	5	-
<i>Albizia julibrissin</i>	mimosa	Non-nat	-	8	4	-
<i>Algae sp.</i>	algae	-	7	-	-	17
<i>Alnus serrulata</i>	smooth alder	Nat	-	-	1	-
<i>Alnus sp.</i>	alder	Nat	-	9	1	-
<i>Alternanthera philoxeroides</i>	alligator weed	Non-nat	30	7	14	21
<i>Amaranthus tubercualtus</i>	roughfruit waterhemp	Nat	-	-	2	-
<i>Apocynum cannabinum</i>	hemp dogbane		-	-	2	-
<i>Arundinaria gigantea</i>	giant cane	Nat	2	3	-	-
<i>Azolla caroliniana</i>	Carolina mosquitofern	Nat	1	-	2	1
<i>Baccharis halimifolia</i>	eastern baccharis	Nat	5	5	7	-
<i>Bacopa caroliniana</i>	blue waterhyssop	Nat	4	1	1	2
<i>Bacopa monnieri</i>	herb-of-grace	Nat	-	-	1	-
<i>Bacopa sp.</i>	waterhyssop	-	2	-	-	-
<i>Bambusa vulgaris</i>	common bamboo	Nat	-	-	1	-
<i>Betula nigra</i>	river birch	Nat	-	-	13	2
<i>Boehmeria cylindrica</i>	smallspike false nettle	Nat	2	1	21	-
<i>Brasenia schreberi</i>	watershield	Nat	16	3	2	-
<i>Brunnichia ovata</i>	redvine	Nat	-	-	2	-
<i>Cabomba caroliniana</i>	fanwort	Nat	-	-	2	-
<i>Callicarpa americana</i>	American beautyberry	Nat	1	-	-	-
<i>Carex sp.</i>	sedge	-	1	2	9	21
<i>Carya aquatica</i>	water hickory	Nat	2	-	6	-
<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
<i>Ceratophyllum demersum</i>	coontail	Nat	10	8	7	5
<i>Cercis canadensis</i>	eastern redbud	Nat	-	-	1	-
<i>Chara sp.</i>	muskgrass	Nat	11	5	7	11
<i>Chasmanthium sessiflroum</i>	longleaf woodoats	Nat	-	-	1	-
<i>Cinnamomun camphora</i>	camphortree	Non-nat	-	-	1	-
<i>Cladium mariscus</i>	sawgrass	Nat	-	-	4	1
<i>Clethra alnifolia</i>	coastal pepperbush	Nat	-	-	1	-
<i>Colocasia esculenta</i>	wild taro	Non-nat	8	5	2	2

<i>Commelina virginica</i>	Virginia dayflower	Nat	-	-	11	-
<i>Crataegus sp.</i>	hawthorn	Nat	1	-	-	-
<i>Crinum americanum</i>	southern swamp crinum	Nat	-	-	3	-
<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	-	-	-
<i>Cyperus virens</i>	green flatsedge	Nat	-	-	2	-
<i>Cyrilla racemiflora</i>	swamp titi	Nat	-	-	1	-
<i>Dicanthelium latifolia</i>	broadleaf panicgrass	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	-
<i>Drepanocladus sp.</i>	watermoss	-	1	-	-	-
<i>Dulichium arundinaceum</i>	three-way sedge	Nat	1	-	-	5
<i>Echinochloa crus-galli</i>	barnyard grass	Non-nat	-	-	1	-
<i>Echinodorus cordifolius</i>	creeping burhead	Nat	5	-	1	-
<i>Eichhornia crassipes</i>	water hyacinth	Non-nat	8	5	7	2
<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
<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
<i>Eleocharis sp.</i>	spikerush	-	1	-	1	-
<i>Eleocharis vivipara</i>	viviparous spikerush	Nat	14	2	1	1
<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	-
<i>Fraxinus caroliniana</i>	swamp ash	Nat	-	-	1	-
<i>Fraxinus pennsylvanica</i>	green ash	Nat	3	-	2	-
<i>Gleditsia aquatica</i>	water locust	Nat	-	-	5	-
<i>Hibiscus laevis</i>	halberdleaf rosemallow	Nat	2	-	-	-
<i>Hibiscus lasiocarpus</i>	wooly rosemallow	Nat	-	-	1	2
<i>Hibiscus moscheutos</i>	crimson-eyed rosemallow	Nat	1	-	4	-
<i>Hydrilla verticillata</i>	hydrilla	Non-nat	5	9	1	5
<i>Hydrocotyle ranunculoides</i>	floating marshpennywort	Nat	2	5	2	-
<i>Hydrocotyle sp.</i>	pennywort	-	4	-	-	13

<i>Hydrocotyle umbellata</i>	manyflower marshpennywort	Nat	12	7	7	1
<i>Hydrolea quadrivalvis</i>	waterpod	Nat	6	2	-	2
<i>Hypericum walteri</i>	greater marsh st. johnswort	Nat	2	-	4	-
<i>Ilex aquifolium</i>	English holly	Non-nat	-	-	1	-
<i>Ilex decidua</i>	possumhaw	Nat	-	-	4	-
<i>Iris sp.</i>	iris	-	-	-	-	2
<i>Juncus acuminatus</i>	tapertip rush	Nat	-	-	6	1
<i>Juncus dudleyi</i>	Dudley's rush	Nat	-	-	-	1
<i>Juncus effusus</i>	common rush	Nat	15	12	7	19
<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	-	-	-
<i>Juncus roemerianus</i>	black needlerush	Nat	-	-	5	-
<i>Juncus sp.</i>	rush	-	3	-	-	-
<i>Justicia americana</i>	American water-willow	Nat	6	11	22	3
<i>Landoltia punctata</i>	spotted duckweed	Nat	-	4	9	-
<i>Leersia oryzoides</i>	rice cutgrass	Nat	2	-	12	10
<i>Lemna minor</i>	common duckweed	Nat	3	4	11	4
<i>Lemna sp.</i>	duckweed	-	3	-	-	-
<i>Leptochloa panicoides</i>	Amazon sprangletop	Nat	-	-	1	-
<i>Ligustrum sinense</i>	Chinese privet	Non-nat	-	-	1	-
<i>Limnobium spongia</i>	American frogbit	Nat	3	4	2	3
<i>Lindera benzoin</i>	northern spicebush	Nat	4	-	-	-
<i>Liquidambar styraciflua</i>	sweetgum	Nat	4	-	4	-
<i>Ludwigia arcuata</i>	Piedmont primrose-willow	Nat	2	-	-	-
<i>Ludwigia hexapetala</i>	six-petal primrose-willow	Nat	-	-	-	5
<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
<i>Ludwigia sp.</i>	primrose	Nat	2	-	-	-
<i>Lythrum lineare</i>	saltmarsh loosestrife	Nat	-	-	5	-
<i>Magnolia grandiflora</i>	souther magnolia	Nat	-	-	1	-
<i>Magnolia virginiana</i>	sweetbay	Nat	-	-	1	-
<i>Mayaca fluviatilis</i>	stream bogmoss	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
<i>Myriophyllum heterophyllum</i>	variableleaf watermilfoil	Nat	1	-	-	-
<i>Myriophyllum spicatum</i>	Eurasian watermilfoil	Non-nat	3	4	2	9
<i>Najas guadalupensis</i>	southern naiad	Nat	10	-	1	1

<i>Najas minor</i>	brittle naiad	Non-nat	12	2	3	-
<i>Nekemias arborea</i>	peppervine	Nat	-	-	6	-
<i>Nelumbo lutea</i>	American lotus	Nat	11	6	4	11
<i>Nitella sp.</i>	stonewort	-	7	-	-	-
<i>Nuphar advena</i>	spatterdock	Nat	4	-	3	-
<i>Nymphaea odorata</i>	American white waterlily	Nat	20	3	2	14
<i>Nyssa aquatica</i>	water tupelo	Nat	4	-	3	-
<i>Oxycaryum cubense</i>	cuban bulrush	Non-nat	7	3	4	3
<i>Panicum hemitomom</i>	maidencane	Nat	1	-	-	-
<i>Panicum repens</i>	torpedo grass	Non-nat	15	4	3	7
<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
<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
<i>Phalaris arundinacea</i>	reed canary grass	Non-nat	-	-	-	1
<i>Phragmites australis</i>	common reed	Non-nat	1	-	5	-
<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	-
<i>Pluchea camphorata</i>	camphorweed	Nat	2	-	-	-
<i>Pontederia cordata</i>	pickerelweed	Nat	-	-	14	-
<i>Populus deltoides</i>	eastern cottonwood	Nat	-	-	4	-
<i>Potamogeton crispus</i>	curlyleaf pondweed	Non-nat	1	-	-	-
<i>Potamogeton diversifolius</i>	waterthread pondweed	Nat	8	-	-	7
<i>Potamogeton foliosus</i>	leafy pondweed	Nat	10	-	-	1
<i>Potamogeton illinoensis</i>	Illinois pondweed	Nat	2	-	-	-
<i>Potamogeton nodosus</i>	longleaf pondweed	Nat	6	9	3	9
<i>Potamogeton pulcher</i>	spotted pondweed	Nat	-	-	-	4
<i>Ptilium capillaceum</i>	eastern bishopweed	Nat	-	-	1	-
<i>Quercus alba</i>	white oak	Nat	-	-	2	-
<i>Quercus lyrata</i>	overcup oak	Nat	-	-	2	-

<i>Quercus nigra</i>	water oak	Nat	1	2	6	-
<i>Quercus phellos</i>	willow oak	Nat	-	-	3	-
<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	-
<i>Rhynchospora chalarocephala</i>	loosehead_beaksedge	Nat	-	-	-	3
<i>Rhynchospora corniculata</i>	shortbristle horned beaksedge	Nat	5	-	-	4
<i>Ricciocarpos natans</i>	liverwort	Nat	-	-	1	3
<i>Rubus sp.</i>	blackberry	Nat	-	-	3	-
<i>Sabal minor</i>	dwarf palmetto	Nat	-	-	7	-
<i>Sabatia calycina</i>	coastal rose gentian	Nat	-	-	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
<i>Sagittaria latifolia</i>	broadleaf arrowhead	Nat	9	10	4	4
<i>Sagittaria montevidensis</i>	giant arrowhead	Non-nat	2	-	-	-
<i>Sagittaria platyphylla</i>	delta arrowhead	Nat	-	-	-	15
<i>Salix nigra</i>	black willow	Nat	12	3	28	15
<i>Salvinia minima</i>	common salvinia	Non-nat	3	2	3	-
<i>Salvinia molesta</i>	giant salvinia	Non-nat	-	2	2	-
<i>Saururus cernuus</i>	lizard's tail	Nat	17	9	5	20
<i>Schoenoplectus americanus</i>	three-square bulrush	Nat	-	-	3	-
<i>Schoenoplectus tabernaemontani</i>	softstem bulrush	Nat	-	-	6	-
<i>Scirpus cyperinus</i>	woolgrass	Nat	9	7	-	7
<i>Senna sp.</i>	senna	-	-	-	1	-
<i>Sesbania herbacea</i>	bigpod sesbania	Nat	1	7	5	-
<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
<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>Stuckenia pectinata</i>	sago pondweed	Nat	4	-	1	-
<i>Symphotrichum divaricatum</i>	southern annual saltmarsh aster	Nat	-	-	2	-
<i>Symphotrichum lanceolatum</i>	lance-leafed aster	Nat	-	-	1	-

<i>Symphytotrichum subulatum</i>	eastern annual saltmarsh aster	Nat	-	-	6	-
<i>Taxodium distichum</i>	bald cypress	Nat	19	12	17	12
<i>Tillandsia usneoides</i>	Spanish moss	Nat	1	-	1	-
<i>Triadica sebifera</i>	Chinese tallow	Non-nat	1	3	11	-
<i>Toxicodendron radicans</i>	poison ivy	Nat	-	-	1	-
<i>Typha latifolia</i>	broadleaf cattail	Nat	-	8	5	-
<i>Typha sp.</i>	cattail	-	23	-	-	12
<i>Ulmus alata</i>	winged elm	Nat	-	-	2	-
<i>Ulmus americana</i>	American elm	Nat	-	-	1	-
<i>Ulmus sp.</i>	elm	Nat	-	-	14	-
<i>Utricularia macrorhiza</i>	common bladderwort	Nat	-	2	8	-
<i>Utricularia sp.</i>	bladderwort	-	16	-	4	-
<i>Vallisneria americana</i>	American eelgrass	Nat	-	2	6	-
<i>Vitis sp.</i>	grape	-	-	-	3	-
<i>Vitis vulpina</i>	frost grape	Nat	-	-	3	-
<i>Woodwardia areolata</i>	netted chainfern	Nat	-	-	3	-
<i>Zizaniopsis miliacea</i>	giant cutgrass	Nat	7	8	8	20