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Additions to the Vascular Flora of the Red Slough Wildlife Management Area, McCurtain County, Oklahoma

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ABSTRACT The Red Slough Wildlife Management Area (7,800 ha) is located on the West Gulf Coastal Plain in southeastern Oklahoma. The inventory was motivated by land acquisitions and is intended to augment a 1999 inventory. We report an additional 202 taxa of vascular plants, with 186 species, 16 infraspecific taxa, 158 genera, and 68 families. This is a 62% increase in the number of taxa previously listed for the site. The largest families were the Poaceae (with 35 taxa), Asteraceae (20 taxa), and Fabaceae (18 taxa). Thirty-one nonnative taxa and 19 taxa tracked by the Oklahoma Natural Heritage Inventory were encountered.

Key words: Flora, inventory, Oklahoma, rare taxa, Upper Gulf Coastal Plain.

INTRODUCTION In 1996, the United States Forest Service, in cooperation with the Natural Resources Conservation Service and the Oklahoma Department of Wildlife Conservation, acquired 2,158 ha of fallow rice fields and secondary bottomland forests in McCurtain County, Oklahoma, and initiated an ambitious wetland restoration project (United States Forest Service 2015). The site was named the Red Slough Wildlife Management Area (RSWMA), and Hoagland and Johnson were contracted in March 1999 to inventory the vascular flora, an effort that reported 343 taxa in 90 families (Hoagland and Johnson 2004, Table 1). In the decade since the primary acquisition, 5,624 hectares have been added to the RSWMA (Beagles 2015), and a successful wetland management program has created a mosaic of forested and herbaceous wetlands that hosts over 300 species of resident and migratory birds, many unique to the state (United States Forest Service 2015). Given the increased size of RSWMA, the active management, and that a decade had elapsed since the initial inventory,

this project was undertaken to document previously unreported taxa of vascular plants.

STUDY AREA The RSWMA (94.616°W to 94.703°W, 33.725°N to 33.755°N; Figure 1) is located on the Dissected Coastal Plain province of Oklahoma (Curtis et al. 2008) in the Upper West Gulf Coastal Plain (Hunt 1974). The topography is nearly level and elevation ranges from 100.3 m to 104.2 m above sea level. The surface geology is predominantly Quaternary alluvial deposits consisting of silt, sand, clay, and gravels on floodplains and terraces of the Red River (Johnson 2008). Two soil associations occur at the RSWMA. The Kinta-Wrightsville association occurs on uplands and terraces along the Red River and consists of deep, nearly level, poorly drained loamy soils. The Pledger-Roebuck-Redlake Association is composed of deep, nearly level, moderately to poorly drained clayey floodplain soils (Reasoner 1974).

The RSWMA is located in the Subtropical Humid (Cf) climate zone (Trewartha 1968). Summers are warm (mean July temperature 26.9°C) and humid, and winters are relatively short and mild (mean January temperature 4.0°C). Mean annual precipitation is 136 cm

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Table 1. Summary of collections from the Red Slough Wildlife Management Area, McCurtain County, Oklahoma. Presented are totals from 1999 (Hoagland and Johnson 2004), the present study, and a list generated by combining the two studies. Format follows Palmer and Richardson (2012). Tracked taxa are rare species monitored by the Oklahoma Natural Heritage Inventory. Exotic taxa are those non-native to North America, excluding cultivated and ornamental plants.

Classification	Number of Taxa		
	Combined	1999	2010
Families	115	90	68
Genera	324	227	158
Species	526	340	186
Intraspecific taxa	19	3	16
Tracked taxa	34	15	19
Exotic taxa	53	24	31
Perennials	385	256	133
Annuals	153	79	67
Biennials	5	8	2

(Oklahoma Climatological Survey 2015). Potential natural vegetation is bottomland forest (Duck and Fletcher 1943), in which *Quercus lyrata* Walter, *Quercus nigra* L., and *Quercus phellos* L. are the predominant canopy species (Hoagland 2000). These forests were cleared in the mid-19th century for agricultural production, including rice cultivation (Beagles 2015). Secondary growth forest, old fields, man-made lakes, and wetlands now predominate throughout the study area.

METHODS Vouchers of vascular plants were made throughout the growing season (March to October) of 2010. Vouchers were made only for taxa not collected during the 1999 survey. Vouchers for exotic taxa were made from naturalized populations only, thus excluding cultivated and ornamental plants. Specimens were processed and deposited at the Robert Bebb Herbarium (OKL) at the University of Oklahoma following standard procedures. Manuals used for specimen identification included Smith (1994) and Tyrl et al. (2010).

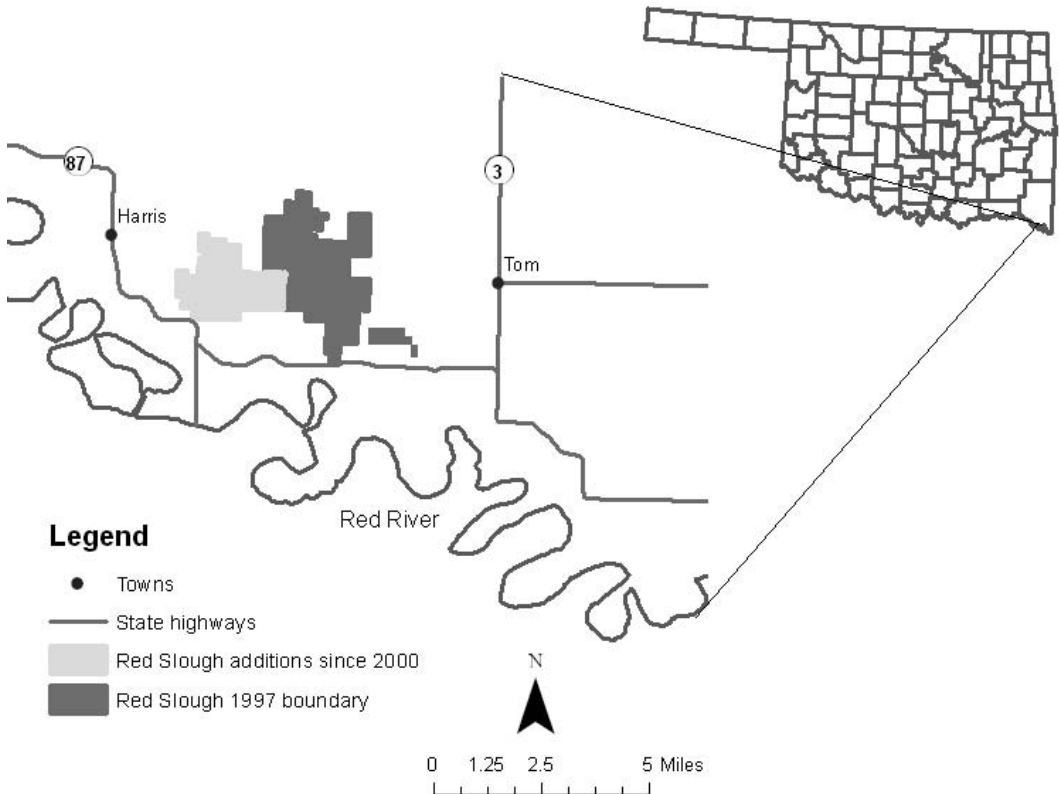


Figure 1. Location of the Red Slough Wildlife Management Area, McCurtain County, Oklahoma.

Table 2. Taxa tracked by the Oklahoma Natural Heritage Inventory that occur at the Red Slough Wildlife Management Area. Taxa are ranked according to level of imperilment at the subnational (S) and global (G) levels on a scale of 1 to 5: 1 represents a taxon that is imperiled, and 5 represents a taxon that is secure. Q = questionable or unresolved taxonomy, T = indicates infraspecific taxa (Groves et al. 1995).

Taxon	Family	G Rank	S Rank
<i>Acmella repens</i>	Asteraceae	G5	S1
<i>Aeschynomene indica</i>	Fabaceae	G5	S1
<i>Axonopus furcatus</i>	Poaceae	G5	S1
<i>Carya myristiciformis</i>	Juglandaceae	G4	S1
<i>Euploca procumbens</i>	Heliotropiaceae	G5	S1
<i>Euthamia leptocepala</i>	Asteraceae	G5	S1
<i>Heteranthera multiflora</i>	Pontederiaceae	G4	S1
<i>Hypericum lobocarpum</i>	Hypericaceae	G4Q	S1
<i>Leptochloa panicoides</i>	Poaceae	G5	S1
<i>Limnobium spongia</i>	Hydrocharitaceae	G4	S1
<i>Morella cerifera</i>	Myricaceae	G5	S1
<i>Persicaria glabra</i>	Polygonaceae	G5	S1
<i>Physostegia intermedia</i>	Lamiaceae	G5	S1
<i>Saccharum giganteum</i>	Poaceae	G5	S1
<i>Spiranthes odorata</i>	Orchidaceae	G5	S1
<i>Spiranthes praecox</i>	Orchidaceae	G5	S1
<i>Symphotrichum dumosum</i> var. <i>dumosum</i>	Asteraceae	G5T3T5	S3
<i>Thalia dealbata</i>	Marantaceae	G4	S3
<i>Tipularia discolor</i>	Orchidaceae	G4G5	S2

Identifications were verified by comparison with collections from the Robert Bebb Herbarium. Origin, either native or introduced to North America, was determined using the PLANTS Database (USDA-NRSC 2015) and Taylor and Taylor (1991). Nomenclature follows the Integrated Taxonomic Information System (ITIS 2015) and Angiosperm Phylogeny Group III (Stevens 2001 and onward), and author names follow the International Plant Names Index (IPNI 2015). The resulting list was compared to Sorrie and Weakley (2001) to identify coastal plain endemics.

RESULTS AND DISCUSSION We collected 202 taxa of vascular plants in 158 genera and 68 families previously unreported from RSWMA (Table 1, Appendix 1), representing a 62.3% increase

from Hoagland and Johnson (2004). Families contributing the greatest number of new taxa were Poaceae (35 taxa), Asteraceae (20 taxa), and Fabaceae (18 taxa). Thirty-one new nonnative taxa were collected in this study, surpassing the 24 reported in 1999. The Poaceae and the Fabaceae had the most nonnative species (nine and eight, respectively). Perennial taxa (66%) predominated the flora, followed by annuals (33%) and biennials (1%). Nineteen taxa were encountered that are currently tracked by the Oklahoma Natural Heritage Inventory (Oklahoma Natural Heritage Inventory 2014; Table 2), compared to 15 in 1999 (Table 1).

Nine species occurred in four of the coastal plain endemic categories of Sorrie and Weakley (2001); six species were “widespread, including the Mississippi embayment” (pg. 62) (*Brunnichia ovata* (Walter) Shinners, *Crataegus marshallii* Ettl., *Hydrolea ovata* Nutt., *Planera aquatica* G.F. Gmel., *Thalia dealbata* Fraser ex Roscoe, and *Trepocarpus aethusae* Nutt. ex DC.), one “widespread, disjunct to central Tennessee and/or Kentucky” (pg. 63) (*Chasmanthium laxum* (L.) H.O. Yates), one “West Gulf Coastal Plain” (pg. 66) (*Sagittaria papillosa* Buchenau), and one “widespread, disjunct to western Cuba” (pg. 66) (*Axonopus furcatus* (Flüggé) Hitchc.).

Four habitats were identified at RSWMA (Hoagland 2000):

1. *Quercus nigra* L.–*Quercus phellos* L./*Carpinus caroliniana* Walter forest association (QNQP)

The QNQP is the most extensive forest type at RSWMA, all occurrences of which were second-growth. These forest stands consist of small patches in a matrix of old fields and moist soil management units. Associated taxa include *Crataegus marshallii* Ettl., *Ilex decidua* Walter, *Sabal minor* (Jacq.) Pers., and *Ulmus rubra* Muhl.

2. *Quercus alba* L.–*Carya tomentosa* (Lam.) Nutt. forest association (QACA)

The QACA forest association is also found in small patches on the RSWMA. Associated taxa include *Acer rubrum* L., *Cornus florida* L., *Crataegus spathulata* Michx., *Lindera benzoin* (L.) Blume, *Carpinus caroliniana* Walter, and *Quercus falcata* Michx.

3. Herbaceous wetland vegetation (WETL)

Several WETL associations were present at RSWMA. However, since they are so heavily

intergraded, all were subsumed into one category. Examples of the *Typha latifolia* L. herbaceous association and the *Ludwigia peploides* (Kunth) P.H. Raven–*Persicaria hydropiperoides* (Michx.) Small herbaceous associations predominate. Common wetland taxa include *Cephalanthus occidentalis* L., *Hibiscus laevis* All., *Juncus effusus* L., *Nelumbo lutea* Willd., *Persicaria amphibia* (L.) Delarbre, *Sagittaria graminea* Michx., and *Salix nigra* Marshall.

4. Disturbed areas and old field vegetation (DAOF)

The DAOF consist of parking areas, mowed lawns, roadsides, and other sites exhibiting signs of physical disruption. Common plants in disturbed areas include *Ambrosia artemisiifolia* L., *A. trifida* L., *Andropogon virginicus* L., *Conyza Canadensis* (L.) Cronq., *Daucus pusillus* Michx., *Digitaria ciliaris* (Retz.) Koeler, *Lespedeza cuneata* (Dum. Cours.) G. Don, *Melilotus officinalis* (L.) Lam., *Mollugo verticillata* L., *Rhus glabra* L., *Sorghum halepense* (L.) Pers., and *Trifolium dubium* Sibth.

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- APPENDIX 1** Annotated list of vascular plant taxa collected during a 2010 resurvey of the Red Slough Wildlife Management Area, McCurtain County, Oklahoma. Each entry includes life history (A = annual, B = biennial, P = perennial), growth form (F = forb, G = graminoid, S = shrub, T = tree), habitat(s) of occurrence (QNQP = *Quercus nigra*–*Quercus phellos*/*Carpinus caroliniana* forest association, QACA = *Quercus alba*–*Carya alba* forest association, WETL = herbaceous wetland vegetation, DAOF = disturbed area/old field), collection number, and unit from which the voucher was collected. Introduced taxa are denoted with an asterisk (*) and taxa tracked by the Oklahoma Natural Heritage Inventory are denoted with a dagger (†).
- ALISMATACEAE
- Sagittaria graminea* Michx. ssp. *graminea* – P; F; WETL; RS-072; Unit 9
- Sagittaria montevidensis* Cham & Schlecht. ssp. *calycina* (Engelm.) Bogin – P; F; WETL; RS-224; Unit 30E
- Sagittaria papillosa* Buchenau – P; F; WETL; RS-278; Unit 26
- AMARYLLIDACEAE
- Hymenocallis lirtosme* (Raf.) Shinnars – P; F; QNQP; RS-044; Unit 15
- ANACARDIACEAE
- Toxicodendron pubescens* Mill. – P; S; DAOF, QACA; RS-279; Unit 20
- APIACEAE
- **Daucus carota* L. – B; F; DAOF; RS-036; Unit 11
- Eryngium yuccifolium* Michx. – P; F; DAOF; RS-114; Unit 34
- Ptilimnium nuttallii* (DC.) Britton – A; F; DAOF; RS-129; Unit 19
- Sanicula canadensis* L. – B; F; QACA; RS-061; Unit 9
- **Torilis arvensis* (Huds.) Link – A; F; DAOF; RS-060; Unit 31
- Tropocarpus aethusae* Nutt. ex DC. – A; F; DAOF; RS-106; Unit 9
- APOCYNACEAE
- Cynanchum leave* (Michx.) Pers. – P; F; DAOF; RS-178; Unit 4
- Apocynum cannabinum* L. – P; F; DAOF; RS-118; Unit 16W
- Asclepias tuberosa* L. – P; F; DAOF; RS-281; Unit 20
- ARACEAE
- Arisaema dracontium* (L.) Schott – P; F; QACA; one individual, no voucher collected; Unit 19
- ASPARAGACEAE
- Manfreda virginica* (L.) Salisb. ex Rose – P; S; QNAP; Unit 9
- Yucca arkansana* Trel. – P; S; DAOF; Unit 36
- Yucca louisianensis* Trel. – P; S; DAOF; RS-290; Unit 20
- ASPLENIACEAE
- Asplenium platyneuron* (L.) Britton, Sterns & Poggenb. – P; F; QACA; RS-081; Unit 9
- ASTERACEAE
- Achillea millefolium* L. – P; F; DAOF; Unit 9
- †*Acmella repens* (Walter) Rich. – P; F; WETL; RS-232; Unit 27A
- ACANTHACEAE
- Ruellia humilis* Nutt. – P; F; DAOF; RS-108; Unit 9
- ADOXACEAE
- Viburnum rufidulum* Raf. – P; S; QACA RS-082; Unit 9

- Ambrosia bidentata* Michx. – A; F; DAOF; RS-180; Unit 9
Baccharis halimifolia L. – P; S; DAOF; RS-264; Unit 20
Bidens polylepis S.F. Blake – A; F; WETL; RS-152; Unit 9
Bidens laevis (L.) Britton, Sterns & Poggenb. – A; F; WETL; RS-251; Unit 21
Boltonia asteroides (L.) L'Hér. – P; F; WETL; RS-259; Unit 29
Erechtites hieraciifolius (L.) Raf. ex DC. var. *hieraciifolius* – A; F; QACA; RS-253; Unit 19
Erigeron strigosus Muhl. ex Willd. var. *septentrionalis* (Fernald & Wiegand) Fernald – A; F; DAOF; RS-043; Unit 6
Eupatorium perfoliatum L. – P; F; DAOF; RS-187; Unit 20
Eupatorium serotinum Michx. – P; F; DAOF; RS-197; Unit 6
†*Euthamia leptcephala* (Torr. & A. Gray) Greene ex Porter & Britton – P; F; DAOF; RS-257; Unit 40N
Helianthus angustifolius L. – P; F; DAOF; RS-265; Unit 20
Heterotheca subaxillaris (Lam.) Britton & Rusby ssp. *latifolia* (Buckley) Semple – A; F; DAOF; RS-177; Unit 20
Lactuca canadensis L. – A; F; DAOF; RS-149; Unit 10
Silphium integrifolium Michx. – P; F; DAOF; RS-137; Unit 27B
†*Symphotrichum dumosum* (L.) G.L. Nesom var. *dumosum* – P; F; WETL; RS-262; Unit 20
Symphotrichum lanceolatum (Willd.) G.L. Nesom ssp. *lanceolatum* – P; F; DAOF; RS-247; Unit 19
Symphotrichum praealtum (Poir.) G.L. Nesom – P; F; DAOF; RS-256; Unit 33
Verbesina helianthoides Michx. – P; F; DAOF; RS-256; Unit 19

BETULACEAE

- Betula nigra* L. – P; T; QNQP; RS-027; Unit 35

BLECHNACEAE

- Woodwardia areolata* (L.) T. Moore – P; F; QNQP; Unit 9

BRASSICACEAE

- Lepidium densiflorum* Schrad. – A; F; DAOF; RS-145; Bittern Lake
Lepidium virginicum L. ssp. *virginicum* – A; F; DAOF; RS-090; Unit 16W
Rorippa palustris (L.) Besser ssp. *fernaldiana* (Butters & Abbe) Jonsell – A; F; WETL; RS-010; Unit 7

CACTACEAE

- Opuntia macrorhiza* Engelm. – P; S; DAOF; RS-255; Unit 4

CAMPANULACEAE

- Lobelia cardinalis* L. – P; F; WETL; Unit 9
Lobelia puberula Michx. – P; F; DAOF; RS-206; Unit 20

CARYOPHYLLACEAE

- **Cerastium glomeratum* Thuill. – A; F; DAOF; RS-014; Unit 6
Sagina decumbens (Elliott) Torr. & A. Gray – A; F; DAOF; RS-031; Unit 39

CERATOPHYLLACEAE

- Ceratophyllum demersum* L. – P; F; WETL; RS-168; Unit 15

COMMELINACEAE

- Commelina virginica* L. – P; F; DAOF; RS-215; Unit 9
Tradescantia occidentalis (Britton) Smyth var. *occidentalis* – P; F; DAOF; RS-035; Unit 6
Tradescantia ohiensis Raf. – P; F; DAOF; RS-088; Unit 9

CONVOLVULACEAE

- Dichondra carolinensis* Michx. – P; F; DAOF; RS-217; Unit 9
**Ipomoea hederacea* Jacq. – A; F; DAOF; RS-225; Unit 30W
Ipomoea lacunosa L. – A; F; DAOF; RS-212; Unit 10
Ipomoea pandurata (L.) G. Mey. – P; F; DAOF; RS-123; Unit 14

CYPERACEAE

- Cyperus odoratus* L. – A; G; DAOF; RS-243; Unit 38
Eleocharis lanceolata Fernald – A; G; WETL; RS-076; Unit 9
Eleocharis quadrangulata (Michx.) Roem. & Schult. – P; G; WETL; RS-186; Unit 40N
Fimbristylis vahlii (Lam.) Link – A; G; WETL; RS-175; Unit 31
Rhynchospora glomerata (L.) Vahl – P; G; WETL; RS-136; Unit 19
Scirpus cyperinus (L.) Kunth – P; G; WETL; RS-125; Unit 5

EQUISETACEAE

- Equisetum laevigatum* A. Br. – P; F; WETL; RS-237; Unit 58

ERICACEAE

- Monotropa uniflora* L. – P; F; QACA; RS-287; Unit 9

EUPHORBIACEAE

- Acalypha gracilens* A. Gray – A; F; DAOF; RS-134; Unit 19
Croton glandulosus L. – A; F; DAOF; RS-102; Unit 9

Croton monanthogynus Michx. – A; F; DAOF; RS-160;
Unit 9

FABACEAE

†*Aeschynomene indica* L. – P; F; DAOF; RS-204; Unit
40N

Centrosema virginianum (L.) Benth. – P; F; DAOF;
RS-284; Unit 20

Desmodium paniculatum (L.) DC. var. *paniculatum* –
P; F; QACA; RS-209; Unit 8

**Kummerowia striata* (Thunb.) Schindl. – A; F;
DAOF; RS-205; Unit 20

**Lespedeza cuneata* (Dum. Cours.) G. Don – P; F;
DAOF; RS-120; Unit 34

Lespedeza repens (L.) W.P.C. Barton – P; F; QACA; RS-
234; Unit 27A

Lespedeza virginica (L.) Britton – P; F; DAOF; RS-214;
Unit 9

**Medicago polymorpha* L. – P; F; DAOF; RS-021; Unit
16W

**Securigera varia* (L.) Lassen – P; F; DAOF; RS-277;
Bittern Lake

Senna marilandica (L.) Link – P; F; WETL; RS-190;
Unit 44

Strophostyles helvola (L.) Elliott – A; F; DAOF; RS-192;
Unit 9

Strophostyles leiosperma (Torr. & A. Gray) Piper – A;
F; DAOF; RS-181; Unit 9

**Trifolium campestre* Schreb. – A; F; DAOF; RS-037;
Unit 8

**Trifolium incarnatum* L. – A; F; DAOF; RS-065; Unit
9

Trifolium reflexum L. – A; F; DAOF; RS-077; Unit 9

Vicia minutiflora D. Dietr. – A; F; DAOF; RS-094; Unit
35

**Vicia sativa* L. – A; F; DAOF; RS-005; Unit 4

**Wisteria floribunda* (Willd.) DC. – P; V; DAOF; RS-
009; Unit 9

FAGACEAE

Quercus marilandica Münchh. – P; T; QACA; RS-068;
Unit 9

Quercus palustris Münchh. – P; T; QNQP; RS-041; Unit
11

Quercus stellata Wangenh. – P; T; QACA; RS-074; Unit
9

GERANIACEAE

**Geranium dissectum* L. – A; F; DAOF; RS-023; Bittern
Lake

HALORAGACEAE

Myriophyllum heterophyllum Michx. – P; F; WETL;
RS-272; Unit 27a

HELIOTROPIACEAE

†*Euploca procumbens* (Mill.) Diane & Hilger – P; F;
DAOF; Unit 44

**Heliotropium indicum* L. – A; F; WETL; RS-127; Unit
30E

HYDROCHARITACEAE

†*Limnobium spongia* (Bosc) Rich. ex Steud. – P; F;
WETL; RS-239; Unit 27A

HYDROLEACEAE

Hydrolea uniflora Raf. – P; F; WETL; RS-113; Bittern
Lake

HYPERICACEAE

Hypericum gymnanthum Englem. & A. Gray – P; F;
DAOF; RS-157; Unit 9

†*Hypericum lobocarpum* Gatt. ex J.M. Coult. – P; S;
DAOF; RS-283; Unit 20

JUGLANDACEAE

†*Carya myristiciformis* (F. Michx.) Elliott – P; T;
QACA; RS-241; Unit 8

Juglans nigra L. – P; T; QACA; Unit 9

JUNCACEAE

Juncus acuminatus Michx. – P; G; WETL; RS-040;
Unit 8

Juncus bufonius L. – A; G; WETL; RS-029; Unit 39

LAMIACEAE

Hedeoma hispida Pursh – A; F; DAOF; RS-067; Unit 9

**Lamium amplexicaule* L. – A; F; DAOF; RS-034; Unit
11

Lycopus rubellus Moench – P; F; WETL; RS-233; Unit
27A

Monarda russeliana Nutt. ex Sims – P; F; DAOF; RS-
059; Teal Lake

†*Physostegia intermedia* (Nutt.) Engelm. & A. Gray –
P; F; WETL; RS-046; Unit 4

Teucrium canadense L. – P; F; DAOF; RS-111; Unit 11

LENTIBULARIACEAE

Utricularia gibba L. – P; F; WETL; RS-054; Otter Lake

LILIACEAE

Erythronium rostratum W. Wolf – P; F; QACA; RS-
092; Unit 35

LYTHRACEAE

**Lagerstroemia indica* L. – P; S; DAOF; RS-288; Unit 9

MALVACEAE

Hibiscus laevis All. – P; F; WETL; RS-126; Unit 7

Sida spinosa L. – A; F; DAOF; RS-191; Unit 5

Tilia americana L. – P; T; QACA; RS-093; Unit 35

MARANTACEAE

†*Thalia dealbata* Fraser ex Roscoe – P; F; WETL; RS-057; Unit 30E

MOLLUGINACEAE

Mollugo verticillata L. – A; F; DAOF; RS-116; Unit 19

MORACEAE

Maclura pomifera (Raf.) C.K. Schneid. – P; T; DAOF; RS-112; Unit 11

MYRICACEAE

†*Morella cerifera* (L.) Small – P; S; DAOF; RS-229; Unit 25

NELUMBONACEAE

Nelumbo lutea Willd. – P; F; WETL; RS-115; Bittern Lake

NYMPHAEACEAE

Nymphaea odorata Aiton ssp. *odorata* – P; F; WETL; RS-053; Otter Lake

OLEACEAE

**Ligustrum sinense* Lour. – P; S; DAOF; RS-042; Unit 9

ONAGRACEAE

Ludwigia glandulosa Walter – P; F; WETL; RS-133; Unit 19

Ludwigia leptocarpa (Nutt.) H. Hara – P; F; WETL; RS-144; Unit 27A

Ludwigia palustris (L.) Elliott – P; F; WETL; RS-193; Unit 9

Ludwigia peploides (Kunth) P.H. Raven – P; F; WETL; RS-122; Unit 7

Oenothera curtiflora W.L. Wagner & Hoch – A; F; DAOF; RS-166; Unit 8

Oenothera filiformis (Small) W.L. Wagner & Hoch – A; F; DAOF; RS-208; Unit 8

Oenothera linifolia Nutt. – A; F; DAOF; RS-064; Unit 9

Oenothera villosa Thunb. – P; F; DAOF; RS-207; Unit 20

ORCHIDACEAE

Spiranthes cernua (L.) Rich. – P; F; DAOF; RS-267; Unit 20

†*Spiranthes odorata* (Nutt.) Lindl. – P; F; QNQP; observed, no voucher collected; Unit 35

†*Spiranthes praecox* (Walter) S. Watson – P; F; QNQP; observed, no voucher collected; Unit 9

Spiranthes tuberosa Raf. – P; F; DAOF; RS-289; Unit 9

†*Tipularia discolor* (Pursh) Nutt. – P; F; QACA; Unit 9

OROBANCHACEAE

Agalinis gattingeri (Small) Small – A; F; DAOF; RS-230; Unit 20

Agalinis heterophylla (Nutt.) Small – A; F; DAOF; RS-226; Unit 8

Buchnera americana L.; P; F; Arbour s.n.; Unit 20

Castilleja indivisa Engelm. – A; F; DAOF; RS-003; Unit 9

OSMUNDACEAE

Osmunda regalis L. – P; F; WETL; Unit 9

PLANTAGINACEAE

Mecardonia acuminata (Walter) Small – P; F; DAOF; RS-213; Unit 9

Penstemon digitalis Nutt. ex Sims – P; F; DAOF; RS-066; Unit 9

Plantago pusilla Nutt. – A; F; DAOF; RS-030; Unit 39

**Veronica arvensis* L. – DAOF; RS-033; A; F; Unit 11

POACEAE

Agrostis hyemalis (Walter) Britton, Sterns & Poggenb. – P; G; WETL; RS-271; Unit 9

**Aira elegantissima* Schur – A; G; DAOF; RS-062; Unit 9

Andropogon glomeratus (Walter) Britton, Sterns & Poggenb. – P; G; WETL; RS-261; Unit 20

Andropogon ternarius Michx. – P; G; DAOF; RS-263; Unit 20

Aristida ramosissima Engelm. ex A. Gray – A; G; DAOF; RS-223; Unit 30E

†*Axonopus furcatus* (Flueggé) Hitchc. – P; G; WETL; RS-167; Unit 13

**Bromus arvensis* L. – A; G; DAOF; RS-047; Unit 6

**Bromus secalinus* L. – A; G; DAOF; RS-071; Unit 9

Coleataenia longifolia (Torr.) Soreng ssp. *rigidula* (Bosc ex Nees) Soreng; P; G; Unit 9 – P; G; DAOF; RS-183; Unit 9

**Dactylis glomerata* L. – P; G; DAOF; RS-022; Unit 27A

Danthonia spicata (L.) P. Beauv. ex Roem. & Schult. – P; G; QACA; RS-079; Unit 9

Dichantherium aciculare (Desv. ex Poir.) Gould & C.A. Clark – P; G; DAOF; RS-195; Unit 9

Dichantherium villosissimum (Nash) Freckmann – P; G; DAOF; RS-196; Unit 9

Digitaria ciliaris (Retz.) Koeler – A; G; DAOF; RS-194; Unit 9

Digitaria cognata (Schult.) Pilg. – P; G; DAOF; RS-131; Unit 38

Echinochloa muricata (P. Beauv.) Fernald – A; G; WETL; RS-140; Unit 13

**Eleusine indica* (L.) Gaertn. – A; G; DAOF; RS-109; Unit 11

Eragrostis hirsuta (Michx.) Nees – P; G; DAOF; RS-131; Unit 38

Eragrostis spectabilis (Pursh) Steud. – P; G; DAOF; RS-199; Unit 9

Eriochloa contracta Hitchc. – A; G; DAOF; RS-141;
Unit 13

Glyceria septentrionalis Hitchc. – P; G; WETL; RS-073; Unit 9

†*Leptochloa panicoides* (J. Presl) Hitchc. – A; G; WETL; RS-189; Unit 30E

Panicum dichotomiflorum Michx. – A; G; DAOF; RS-221; Unit 30E

Panicum virgatum L. – P; G; DAOF; RS-100; Unit 10

**Paspalum urvillei* Steud. – P; G; DAOF; RS-270; Otter Lake

Poa autumnalis Muhl. ex Elliott – P; G; DAOF; RS-095; Unit 35

†*Saccharum giganteum* (Walter) Pers. – P; G; WETL; RS-260; Unit 26

**Schedonorus arundinaceus* (Schreb.) Dumort – P; G; DAOF; RS-026; Unit 30E

Sorghastrum nutans (L.) Nash – P; G; DAOF; RS-173; Unit 20

Sphenopholis obtusata (Michx.) Scribn. – P; G; WETL; RS-039; Unit 8

Steinchisma hians (Elliott) Nash – P; G; WETL; RS-184; Unit 5

Tridens strictus (Nutt.) Nash – P; G; DAOF; RS-156; Unit 9

Tripsacum dactyloides (L.) L. – P; G; DAOF; RS-171; Unit 16W

**Triticum aestivum* L. – A; G; DAOF; RS-069; Unit 9

**Vulpia myuros* (L.) C.C. Gmel. – A; G; DAOF; RS-058; Teal Lake

POLYGALACEAE

Polygala sanguinea L. – A; F; DAOF; RS-121; Unit 34

POLYGONACEAE

Brunnichia ovata (Walter) Shinnars – P; V; WETL; RS-098; Unit 10

Persicaria amphibia (L.) Delarbre – P; F; WETL; RS-222; Unit 38

†*Persicaria glabra* (Willd.) M. Gómez – A; F; WETL; RS-228; Unit 38

PONTERIACEAE

†*Heteranthera multiflora* (Griseb.) C.N. Horn – A; F; WETL; RS-238; Unit 27A

PORTULACACEAE

**Portulaca oleracea* L. – A; F; DAOF; RS-202; Unit 31

POTAMOGETONACEAE

Potamogeton diversifolius Raf. – P; F; WETL; RS-055; Unit 44

Potamogeton nodosus Poir. – P; F; WETL; RS-056; Unit 27A

Potamogeton pusillus L. ssp. *pusillus* – P; F; WETL; RS-275; Bittern Lake

RANUNCULACEAE

**Ranunculus sardous* Crantz – A; F; DAOF; RS-038; Unit 8

Ranunculus longirostris Godr. – P; F; WETL; RS-287; Unit 10

Thalictrum thalictroides (L.) Eames & B. Boivin – P; F; QACA; RS-091; Unit 35

ROSACEAE

Crataegus spathulata Michx. – P; T; QACA; RS-258; Unit 4

Potentilla simplex Michx. – P; F; DAOF; RS-028; Unit 39

RUBIACEAE

**Sherardia arvensis* L. – A; F; DAOF; RS-017; Unit 6

RUTACEAE

Zanthoxylum clava-herculis L. – P; T; DAOF; RS-164; Unit 9

SALICACEAE

Populus deltoides W. Bartram ex Marshall ssp. *deltoides* – P; T; QNQP; RS-020; Unit 15

SAPOTACEAE

Sideroxylon lanuginosum Michx. ssp. *lanuginosum* – P; T; QACA; RS-235; Unit 58

SOLANACEAE

Physalis pubescens L. – A; F; DAOF; RS-138; Unit 19

SPHENOCLEACEAE

**Sphenoclea zeylanica* Gaertn. – A; F; WETL; RS-273; Unit 31

TYPHACEAE

Typha angustifolia L. – P; F; WETL; RS-285; Unit 26

ULMACEAE

Ulmus alata Michx. – P; T; QACA; RS-154; Unit 9

VERBENACEAE

Verbena brasiliensis Vell. – A; F; DAOF; RS-210; Unit 8