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Wetland Evaluation and Mapping at the Susquehanna Steam Electric Station

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WETLAND EVALUATION AND MAPPING AT THE SUSQUEHANNA STEAM ELECTRIC STATION

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Executive Summary

Evaluation for the presence of wetlands at the Susquehanna Steam Electric Station (Susquehanna SES) site was conducted between 16 August and 22 October 1990. Wetlands occur in four areas at the Susquehanna SES site: (1) along a stream draining the hillside above T419, (2) below the Waste Accumulation Area and around the C-1 Pond, (3) along a stream and around the S-2 Pond, and (4) south of the 500-Kv Switchyard and east of T438. The boundaries of these wetland areas are approximate since a formal delineation was not made. A wetlands delineation should be made before any project is planned near the designated wetland areas. This will determine if permits are required from the U. S. Army Corp of Engineers and Pennsylvania Department of Environmental Resources.

WETLAND EVALUATION AND MAPPING AT THE SUSQUEHANNA STEAM ELECTRIC STATION

Evaluation for the presence of wetlands at the Susquehanna Steam Electric Station (Susquehanna SES) site was conducted between 16 August and 22 October 1990. The Susquehanna SES is owned principally by the Pennsylvania Power and Light Company (PP&L) and is located near Beach Haven, Salem Township, Luzerne County, Pennsylvania. The PP&L property west of U. S. Highway 11, south of Township Road T419, and east of Township Road T438 was evaluated for the presence of wetlands (Map 1). Wetlands occur east of U. S. Highway 11 (Susquehanna Riverlands) and west of T438 (south of the Emergency Operations Facility); however, these areas were not evaluated or mapped for this report.

Wetlands on the Susquehanna SES site were classified according to Cowardin, et al. (1979). The following types of wetland occur on the site:

(1) Palustrine forested wetlands are nontidal wetlands dominated by woody vegetation that is 6 m tall or taller.

(2) Palustrine scrub-shrub wetlands are nontidal wetlands dominated by woody vegetation less than 6 m tall, including young trees, true shrubs, and trees or shrubs stunted because of environmental conditions.

(3) Emergent palustrine wetlands are nontidal wetlands less than 8 ha (20 acres) in area dominated by erect rooted herbaceous aquatic plants. Emergent wetlands may also occur in the riverine (wetlands contained within a channel created by moving water) or lacustrine (wetlands situation in a natural or dammed depression greater than 8 ha in total area) systems.

Wetlands occur in four areas of the Susquehanna SES site (Map 1):

(1) Palustrine forested and emergent wetlands occur along a stream draining the hillside above T419 and entering Lake Took-a-while.

(2) Palustrine forested wetland occurs below (east of) the Waste Accumulation Area and along a stream and around a small pond (C-1 Pond).

(3) Emergent, scrub-shrub, and forested palustrine wetlands occur along a stream and pond (S-2 Pond), south of the parking area and main access road, entering Lake Took-a-while.

(4) Emergent, scrub-shrub, and forested palustrine wetlands occur south of the 500-Kv Switchyard and east of T438.

Part of areas 3 and 4 were mapped as palustrine forested and open water wetland by the National Wetland Inventory, Berwick Quadrangle. Other surface drainage (Map 1) consists of artificial ditches along T438 and T419 and south of the Firing Range. These ditches carry run-off after heavy rain, but include little, if any, wetland.

The boundaries of the four wetland areas are approximate since a formal delineation was not made. Delineation, in accordance with the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (Federal Interagency Committee for Wetland Delineation 1989), includes marking and surveying the wetland boundaries. Areas not designated as wetland are upland.

Plant species listed by Reed (1988) as obligate wetland species or facultative wetland species that have been recorded from the Susquehanna SES site are listed in Table 1. Obligate wetland species nearly always occur in wetlands (>99%). Facultative

wetland species usually occur in wetlands (66-99%), but are found occasionally in nonwetlands. Facultative species are equally likely to occur in wetlands or nonwetlands (Reed 1988). These species are not listed in Table 1 since they are not wetland indicators, but some are included in the community descriptions that follow. The obligate and facultative wetland species were used to identify the wetlands on the Susquehanna SES site.

The forested wetland east of T438 is dominated by pin oak[1], swamp white oak, and red maple (FAC). Dominant shrubs are silky dogwood, gray dogwood (FAC), and northern spicebush; dominant herbs are New York fern (FAC), false nettle, spotted touch-me-not, spinulose wood-fern (FAC), and arrow-leaf tearthumb. Additional obligate wetland species include purple-stemmed aster, nodding beggar-ticks, fringed sedge, shallow sedge, Allegheny monkey flower, royal fern, and skunk cabbage.

The forested wetlands below T419, east of the Waste Accumulation Area and south of the main access road (Map 1), are similar in vegetation composition. Dominant trees are red maple (FAC), white ash (FAC), tulip tree (FACU), northern red oak (FACU), and American elm; shrubs are northern spicebush and arrow-wood (FAC); herbs are white snakeroot (FACU), spotted touch-me-not, sensitive fern, cinnamon fern, Canada clearweed, marsh fern, and Virginia knotweed (FAC). Additional obligate wetland species are shallow sedge and skunk cabbage.

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[1]Species are obligate or facultative wetland and listed in Table 1, unless indicated as FAC (Facultative species) or FACU (Facultative upland species).

Scrub-shrub wetlands are dominated by shrubs, with a few scattered trees. This community occurs along the ditches south of the 500-Kv Switchyard, south of the S-2 Pond, and south of the Sewage Treatment Plant. Dominant shrubs are black willow, crack willow (FAC), silky willow and American elder, with sensitive fern, Canada clearweed, arrow-leaved tearthumb, Canada goldenrod (FACU), flat-top goldenrod (FAC), rough goldenrod (FAC), and riverbank grape. Additional obligate wetland species in this community are purple-stemmed aster, purple-leaf willow-herb, fowl manna grass, rice cutgrass, and Allegheny monkeyflower.

Emergent wetlands occupy small areas at the north and east edges of the forested wetland south of T419, along the ditch extending from this wetland to Lake Took-a-while, along the ditch south of the South Parking Area , and around the north, east, and west sides of the S-2 Pond. The ditches contain relatively few species compared to the more extensive wetlands along T438 and the S-2 Pond. Dominants include yellow-fruited, fringed, and shallow sedges, wool-grass, soft rush, sensitive fern, reed canary grass, arrow-leaved tearthumb, Canada goldenrod (FACU), giant goldenrod, rough goldenrod (FAC), skunk cabbage, blue vervain, and New York ironweed. Additional obligate wetland species are purple-stemmed aster, nodding beggar-tick, fringed sedge, blunt spikerush, Virginia bugleweed, Allegheny monkeyflower, rice cutgrass, Halberd-leaf tearthumb, dotted smartweed, silky willow, Olney's bulbrush, green bulrush, and skunk cabbage.

Soils in the mapped wetland areas are Atherton silt loam, Braceville gravelly loam, Chenango gravelly loam, Oquagga channery silt or gravelly loam, Rexford loam,

and Wyoming gravelly loam (U. S. Department of Agriculture 1982). Atherton and Rexford soils were listed as hydric soils by the U. S. Department of Agriculture (1987); the other soil types are not listed as hydric soils. A hydric soil is soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper soil horizons (U. S. Department of Agriculture 1987). No other hydric soils occur in the part of the Susquehanna SES site surveyed for this report.

Permits from the U. S. Army Corps of Engineers and the Pennsylvania Department of Environmental Resources are required to fill, cross, or encroach on wetlands (Section 404 of the Clean Water Act). Such permits may be granted only if no other alternative exists for a project. Before any project is planned near areas designated as wetlands in this report, a formal wetlands delineation should be made to determine if a permit is required.

References

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Reed, P. B. 1988. National list of plant species that occur in wetlands: Pennsylvania. National Wetlands Inventory, U. S. Fish and Wildlife Service, St. Petersburg, FL.

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Table 1. Obligate (OBL) and facultative (FACW) wetland plants recorded at the Susquehanna SES. Classification from Reed (1988).

Species	Common Name	Classif.
Acer saccharinum	Silver maple	FACW
Acorus calamus	Sweetflag	OBL
Agrostis stolonifera	Spreading bentgrass	FACW
Alisma subcordatum	Water-plantain	OBL
Alnus rugosa	Speckled alder	FACW
Anemone canadensis	Canada thimble-weed	FACW
Apios americana	Groundnut	FACW
Arisaema dracontium	Green dragon	FACW
Arisaema triphyllum	Jack-in-the-pulpit	FACW
Asclepias incarnata	Swamp milkweed	OBL
Aster lateriflorus	Calico aster	FACW
Aster novae-angliae	New England aster	FACW
Aster puniceus	Purple-stemmed aster	OBL
Aster simplex	Panicled aster	FACW
Aster umbellatus	Flat-topped white aster	FACW
Betula nigra	River birch	FACW
Bidens cernua	Nodding beggar-ticks	OBL
Bidens frondosa	Devil's beggar-ticks	FACW
Bidens tripartita	Three-lobe beggar-ticks	OBL
Boehmeria cylindrica	False nettle	FACW
Botrychium lanceolatum	Lanceolate grape fern	FACW
Bromus latiglumis	Earleaf brome	FACW
Calamagrostis cinnoides	Reedgrass	OBL
Callitriche heterophylla	Water-starwort	OBL
Campanula aparinoides	Marsh bellflower	OBL
Cardamine bulbosa	Bulbous bitter-cress	OBL
Cardamine pensylvanica	Pennsylvania bitter-cress	OBL
Cardamine pratensis	Cuckoo-flower	OBL
Carex annectens	Yellow-fruit sedge	FACW
Carex bromoides	Brome-like sedge	FACW
Carex comosa	Bearded sedge	OBL
Carex crinita	Fringed sedge	OBL
Carex intumescens	Bladder sedge	FACW
Carex lacustris	Lakebank sedge	OBL
Carex laevivaginata	Smooth-sheath sedge	OBL
Carex lurida	Shallow sedge	OBL
Carex scoparia	Pointed broom sedge	FACW
Carex stricta	Uptight sedge	OBL
Carex tribuloides	Blunt broom sedge	FACW
Carex vulpinoidea	Fox sedge	OBL
Ceratophyllum demersum	Common hornwort	OBL
Chelone glabra	White turtle-head	OBL
Chrysosplenium americanum	Golden saxifrage	OBL

Table 1, continued.

Species	Common Name	Classif.
Cicuta bulbifera	Bulblet water-hemlock	OBL
Cicuta maculata	Spotted water-hemlock	OBL
Cinna arundinacea	Stout wood-reed	FACW
Conium maculatum	Poison-hemlock	FACW
Coptis trifolia	Goldthread	FACW
Cornus amomum	Silky dogwood	FACW
Cyperus esculentus	Yellow nut-grass	FACW
Cyperus odoratus	Rusty flatsedge	FACW
Cyperus strigosus	Straw-color flatsedge	FACW
Dryopteris cristata	Crested wood fern	FACW
Dryopteris x boottii	Boott's wood fern	FACW
Dulichium arundinaceum	Three-way sedge	OBL
Echinochloa muricata	Rough barnyard grass	FACW
Eleocharis acicularis	Least spikerush	OBL
Eleocharis intermedia	Matted spikerush	FACW
Eleocharis obtusa	Blunt spikerush	OBL
Eleocharis tenuis	Slender spikerush	FACW
Elymus riparius	Riverbank wild-rye	FACW
Elymus virginicus	Virginia wild-rye	FACW
Epilobium coloratum	Purple-leaf willow-herb	OBL
Equisetum sylvaticum	Woodland horsetail	FACW
Eragrostis frankii	Frank's lovegrass	FACW
Eragrostis hypnoides	Teal lovegrass	OBL
Eupatorium fistulosum	Hollow joe-pye-weed	FACW
Eupatorium maculatum	Spotted joe-pye-weed	FACW
Eupatorium perfoliatum	Common boneset	FACW
Fraxinus pennsylvanica	Green ash	FACW
Galium asprellum	Rough bedstraw	OBL
Galium palustre	Marsh bedstraw	OBL
Galium trifidum	Small bedstraw	FACW
Gentiana andrewsii	Bottle gentian	FACW
Gentiana crinita	Fringed gentian	OBL
Glyceria canadensis	Canada manna grass	OBL
Glyceria striata	Fowl manna grass	OBL
Helenium autumnale	Common sneezeweed	FACW
Hypericum mutilum	Slender St. John's wort	FACW
Ilex verticellata	Common winterberry	FACW
Impatiens capensis	Spotted touch-me-not	FACW
Impatiens pallida	Pale touch-me-not	FACW
Iris versicolor	Blueflag	OBL
Isoetes engelmanni	Engelmann's quillwort	OBL
Juncus acuminatus	Taper-tip rush	OBL
Juncus effusus	Soft rush	FACW

Table 1, continued.

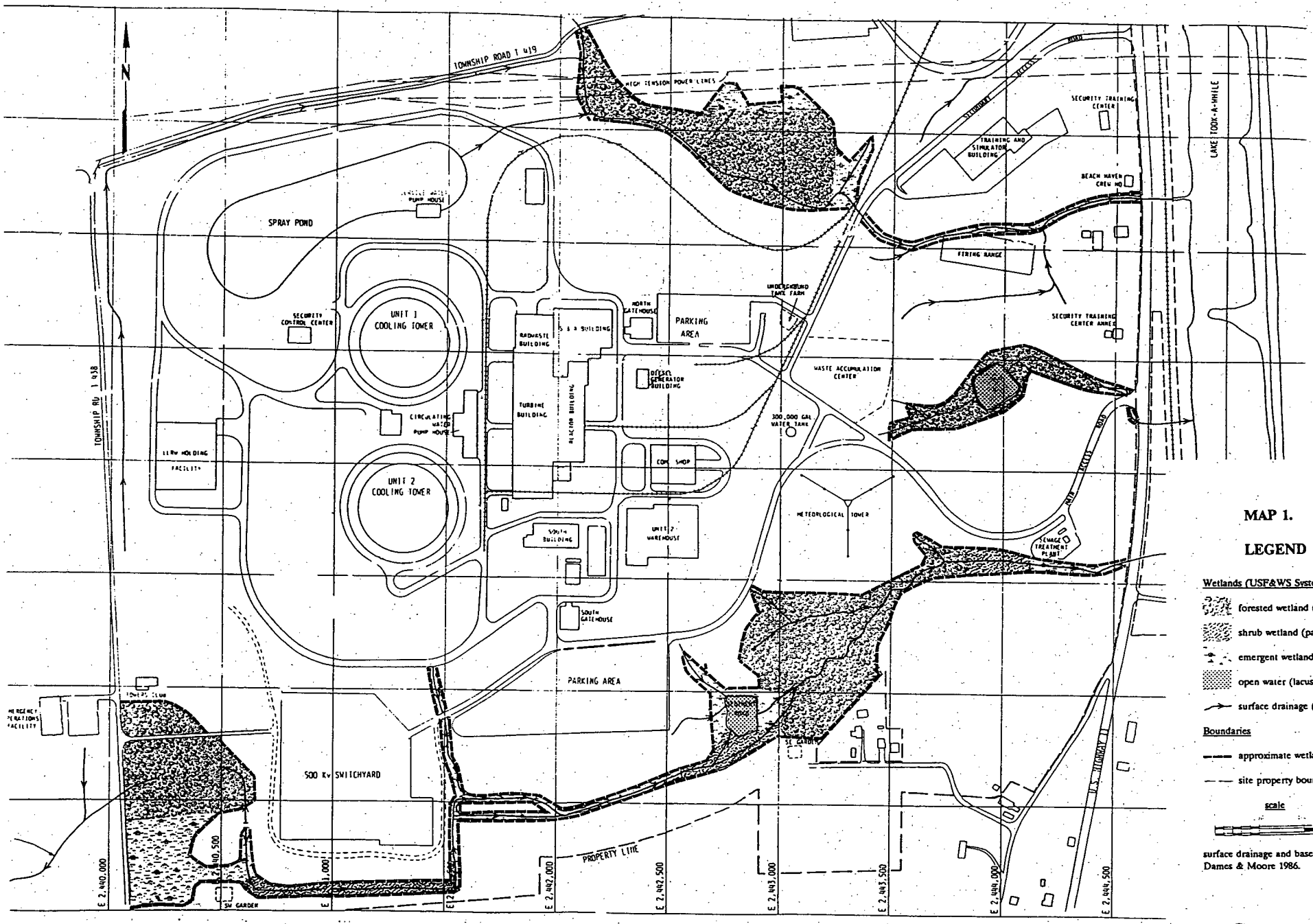
Species	Common Name	Classif.
Justica americana	Common water willow	OBL
Leersia oryzoides	Rice cutgrass	OBL
Leersia virginica	Whitegrass	FACW
Lemna minor	Lesser duckweed	OBL
Lilium superbum	Turk's-cap lily	FACW
Lindera benzoin	Northern spicebush	FACW
Lindernia dubia	Yellow-seed false-pimpernel	OBL
Lobelia cardinalis	Cardinal flower	FACW
Lobelia siphilitica	Great blue lobelia	FACW
Ludwigia alternifolia	Bushy seedbox	FACW
Ludwigia palustris	Marsh seedbox	OBL
Lycopodium inundatum	Northern bog clubmoss	OBL
Lycopodium lucidulum	Shining clubmoss	FACW
Lycopus americanus	American bugleweed	OBL
Lycopus virginicus	Virginia bugleweed	OBL
Lyonia ligustrina	Maleberry	FACW
Lysimachia ciliata	Fringed loosestrife	FACW
Lysimachia terrestris	Swamp loosestrife	OBL
Lythrum salicaria	Purple loosestrife	FACW
Matteuccia struthiopteris	Ostrich fern	FACW
Mertensia virginica	Virginia bluebells	FACW
Mimulus ringens	Allegheny monkey-flower	OBL
Myosotis laxa	Bay forget-me-not	OBL
Myosotis scorpioides	True forget-me-not	OBL
Myosoton aquaticum	Giant chickweed	FACW
Nasturtium officinale	Water-cress	OBL
Nyssa sylvatica	Black gum	FACW
Onoclea sensibilis	Sensitive fern	FACW
Osmunda cinnamomea	Cinnamon fern	FACW
Osmunda regalis	Royal fern	OBL
Panicum dichotomiflorum	Fall panic-grass	FACW
Penthorum sedoides	Ditch stonecrop	OBL
Phalaris arundinacea	Reed canary grass	FACW
Pilea pumila	Canada clearweed	FACW
Platanthera clavellata	Green woodland orchid	FACW
Platanthera lacera	Green fringed orchid	FACW
Platanus occidentalis	American sycamore	FACW
Poa palustris	Fowl bluegrass	FACW
Poa trivialis	Rough bluegrass	FACW
Polygonum arifolium	Halberd-leaf tearthumb	OBL
Polygonum hydropiperoides	Swamp smartweed	OBL
Polygonum natans	Water smartweed	OBL
Polygonum pensylvanicum	Pennsylvania smartweed	FACW

Table 1, continued.

Species	Common Name	Classif.
Polygonum persicaria	Lady's thumb	FACW
Polygonum punctatum	Dotted smartweed	OBL
Polygonum sagittatum	Arrow-leaf tearthumb	OBL
Potamogeton crispus	Curly pondweed	OBL
Potamogeton foliosus	Leafy pondweed	OBL
Potamogeton nodosus	Long-leaf pondweed	OBL
Potamogeton spirillus	Spiral pondweed	OBL
Quercus bicolor	Swamp white oak	FACW
Quercus palustris	Pin oak	FACW
Ranunculus abortivus	Kidneyleaf buttercup	FACW
Ranunculus pensylvanicus	Pennsylvania buttercup	OBL
Ribes americanum	Wild black currant	FACW
Rorippa palustris	Bog yellow-cress	OBL
Rorippa sylvestris	Creeping yellow cress	FACW
Rosa palustris	Swamp rose	OBL
Rubus hispidus	Bristly dewberry	FACW
Rudbeckia laciniata	Cutleaf coneflower	FACW
Sagittaria latifolia	Broadleaf arrow-head	OBL
Salix nigra	Black willow	FACW
Salix sericea	Silky willow	OBL
Sambucus canadensis	American elder	FACW
Scirpus americanus	Olney's Bulrush	OBL
Scirpus atrovirens	Green bulrush	OBL
Scirpus cyperinus	Wool-grass	FACW
Scirpus validus	Soft-stem bulrush	OBL
Scutellaria galericulata	Hooded skullcap	OBL
Scutellaria lateriflora	Blue skullcap	FACW
Selaginella apoda	Meadow spike-moss	FACW
Senecio aureus	Golden ragwort	FACW
Sisyrinchium angustifolium	Blue-eyed grass	FACW
Solidago gigantea	Giant goldenrod	FACW
Sparganium eurycarpum	Giant burreed	OBL
Spiraea tomentosa	Steeple-bush	FACW
Spiranthes cernua	Nodding ladies'-tresses	FACW
Stachys hispida	Rough hedge-nettle	OBL
Stellaria longifolia	Long-leaf starwort	FACW
Symplocarpus foetidus	Skunk cabbage	OBL
Teucrium canadense	American germander	FACW
Thalictrum polygamum	Tall meadow rue	FACW
Thelypteris palustris	Marsh fern	FACW
Triadenum virginicum	Marsh St. John's wort	OBL
Trillium cernuum	Nodding trillium	FACW
Typha angustifolia	Narrow-leaf cattail	OBL

Table 1, continued.

Species	Common Name	Classif.
Typha latifolia	Broadleaf cattail	OBL
Ulmus americana	American elm	FACW
Vaccinium corymbosum	Highbush blueberry	FACW
Vallisneria americana	Wild celery	OBL
Veratrum viride	American false-hellebore	FACW
Verbena hastata	Blue vervain	FACW
Vernonia noveboracensis	New York ironweed	FACW
Veronica americana	American speedwell	OBL
Viola blanda	Sweet white violet	FACW
Viola conspersa	American dog-violet	FACW
Viola cucullata	Mlue marsh violet	FACW
Viola sagittata	Arrow-leaf violet	FACW
Viola striata	Striped cream violet	FACW
Vitis riparia	Riverbank grape	FACW
Wolffia punctata	Dotted water-meal	OBL



MAP 1.

LEGEND

Wetlands (USF&WS System)

- forested wetland (palustrine)
- shrub wetland (palustrine)
- emergent wetland (palustrine)
- open water (lacustrine)
- surface drainage (riverine)

Boundaries

- approximate wetland boundary
- site property boundary

scale

surface drainage and base map from Dames & Moore 1986.