

Floristics Survey of Battle Creek Cypress Swamp Sanctuary,  
Clavert County, Maryland

Brent W. Steury

Battle Creek Cypress Swamp Sanctuary located at 38° 30' north latitude, 76° 35' west longitude in Calvert County, Maryland, protects 119 acres (48 hectares) of one of the northernmost remaining bald cypress (*Taxodium distichum*) swamps in the United States. The sanctuary lies within the backswamp valley flat floodplain of Battle Creek and is contained to the east and west by the natural levee borders of the channel. The swamp was originally surveyed by Curran (1907) who reported it to be 93% pure with second growth bald cypress.

During this survey the swamp was observed to be dominated by a canopy of mature bald cypress, red maple (*Acer rubrum*), and green ash (*Fraxinus pennsylvanica*) which shaded a sparse shrub layer of arrow-wood viburnum (*Viburnum dentatum*), virginia willow (*Itea virginica*), winterberry (*Ilex verticillata*), pawpaw (*Asimina triloba*), and spice-bush (*Lindera benzoin*). The dense herbaceous layer is dominated by lizard's tail (*Saururus cernuus*), orange touch-me-not (*Impatiens capensis*), common woodreed (*Cinna arundinacea*), bur-reed (*Sparganium americanum*), false nettle (*Boehmeria cylindrica*), netted chain-fern (*Woodwardia areolata*), few-bracted beggar-ticks (*Bidens discoidea*), halberd leaved and arrow leaved tearthumb (*Polygonum arifolium* and *P. sagittatum*), and sedges (*Carex crinita*, *C. frankii*, *C. laevivaginata*, *C. lupulina*, *C. lurida*, *C. radiata*, and *C. tribuloides*). A cardinal flower (*Lobelia cardinalis*) with an albinistic inflorescence was observed on 23 August, 1997.

The sparsely vegetated mud flats along the banks of Battle Creek support colonies of common water-purslane (*Ludwigia palustris*), water-starwort (*Callitriche heterophylla*), water-mat (*Chrysosplenium americanum*), buttercup-pennywort (*Hydrocotyle ramunculoides*), false pimpinell (*Lindernia dubia*), hedge-hyssop (*Gratiola virginiana*), mud-plantain (*Heteranthera reniformis*), and golden club (*Orontium aquaticum*). Common vines included posion-ivy (*Toxicodendron radicans*) and greenbrier (*Smilax rotundifolia*). The non-native japanese honeysuckle vine (*Lonicera japonica*) was invasive throughout the sanctuary on wet and dry soils. The uplands surrounding the valley flat are predominately composed of american beech (*Fagus grandifolia*) and oaks (*Quercus alba*, *Q. falcata*, *Q. marilandica*, *Q. prinus*, and *Q. rubra*), however some upland areas within the sanctuary are maintained as managed meadows.

From May through October, 1997, 18 days of field reconnaissance were conducted in or near Battle Creek Cypress Swamp Sanctuary to document occurrences of state rare vascular plants. Historically, three state rare vascular plants were known to exist in the sanctuary. Two of these, the purple turtlehead (*Chelone obliqua*) and the leafy pondweed (*Potamogeton foliosus*) were confirmed as extant, while the third species, climbing fern (*Lygodium palmatum*) was not observed (this climbing fern population had dwindled to two plants by 1982 when it was last reported in the sanctuary). As a result of this survey a total of 21 state listed vascular plants have been documented in or near Battle Creek Cypress Swamp Sanctuary. These are listed below alphabetically by family.

Nomenclature of all taxa follows that of Gleason and Cronquist (1991). Other source books consulted for specimen identification were Brown and Brown (1972, 1984), Fernald (1950), and Radford et al. (1968). State rankings follow the Maryland Natural

Heritage Program (1994). Voucher specimens were deposited at the Smithsonian Institution United States National Herbarium (US), the University of Michigan Herbarium (MICH), the University of Alabama Herbarium (UNA), or the Battle Creek Cypress Swamp Sanctuary Herbarium (BCSH). All taxa occurred within Battle Creek Cypress Swamp Sanctuary unless noted otherwise.

#### ALISMATACEAE

*Sagittaria australis* (J. G. Smith) Small—Appalachian arrow-head. Status Uncertain. *Steury 970708.4* (UNA) confirmed by Robert Haynes (UNA), 8 July 1997, an estimated 200 plants, most in flower and immature fruit, collectively occurred in at least 18 sites on muddy peat in *Taxodium distichum* swamp. This was the only species of *Sagittaria* observed in Battle Creek Cypress Swamp Sanctuary. It is known from only four other sites in two Maryland Counties; Calvert and Harford (Lynn Davidson, database manager, Maryland Heritage and Biodiversity Conservation Program, pers. comm. 1997). Associates at Battle Creek included *Juncus acuminatus*, *Sparganium americanum*, *Boehmeria cylindrica*, *Leersia oryzoides*, *Saururus cernuus*, *Lobelia cardinalis*, *Alisma subcordatum*, and *Taxodium distichum*.

#### APIACEAE

*Hydrocotyle ranunculoides* L. f.—Buttercup-pennywort. Watch List. *Steury 970708.2* (BCSH), 8 July 1997, an estimated 8,000 plants, some in flower and immature

fruit, collectively occurred in at least six colonies on mud flats along Battle Creek in *Taxodium distichum* swamp. Associates included *Chrysosplenium americanum*, *Impatiens capensis*, *Woodwardia areolata*, *Cardamine pensylvanica*, *Viburnum dentatum*, *Ranunculus recurvatus*, *Viola cucullata*, and *Boehmeria cylindrica*.

***Hydrocotyle verticillata*** Thunb.—Whorled pennywort. Watch List. Steury 970705.1 (BCSH), 5 July 1997, an estimated 200 plants in flower and fruit occurred on saturated organic detritus and muddy peat along a marsh/woodland ecotone just south of Battle Creek Cypress Swamp Sanctuary. Associates were *Samolus floribundus*, *Scirpus americanus*, *Myrica cerifera*, *Cicuta maculata*, *Ptilimnium capillaceum*, *Apios americana*, *Lonicera japonica*, and *Smilax rotundifolia*.

#### ARISTOLOCHIACEAE

***Aristolochia serpentaria*** L.—Virginia-snakeroot. Watch List. Steury 970705.2 (US), 5 July 1997, eight plants in bud occurred on sandy loam covered with leaf litter in shady mixed deciduous woodland just southwest of Battle Creek Cypress Swamp Sanctuary. Associates included *Nyssa sylvatica*, *Polystichum acrostichoides*, *Asplenium platyneuron*, *Polygonum virginianum*, *Arisaema triphyllum*, and *Asimina triloba*.

#### ASCLEPIADACEAE

*Matelea carolinensis* (Jacq.) Woodson—Spiny angle-pod. Highly State Rare. *Steury 970823.1* (US), 23 August 1997, 12 vines, two with immature fruit, occurred along a sandy roadside with deep leaf litter near the entrance to the Battle Creek Cypress Swamp Sanctuary. Associates included *Smilax rotundifolia*, *Campsis radicans*, *Vitis vulpina*, and *Acer rubrum*.

#### ASTERACEAE

*Antennaria solitaria* Rydb.—Southern single-head pussytoes. Highly State Rare. *Steury 970510.4* (US), 10 May 1997, one colony with 32 stoloniferous plants in mature fruit occurred on dry sandy/pebbly loam of an open southwestern slope in shady *Fagus grandifolia/Quercus* woodland east of Battle Creek Cypress Swamp Sanctuary. Associates included *Kalmia latifolia*, *Hieracium venosum*, and *Fagus grandifolia*.

*Bidens discoidea* (T & G.) Britton—Few-bracted beggar-ticks. State Rare - Watch List. *Steury 971004.2* (US), 4 October 1997, an estimated 5,000 plants in flower and mature fruit occurred on muddy peat in *Taxodium distichum* swamp north of Sixes Road in Battle Creek Cypress Swamp Sanctuary. This was the most common *Bidens* observed in the sanctuary. Associates included *Saururus cernuus*, *Impatiens capensis*, *Boehmeria cylindrica*, *Bidens connata*, *Acer rubrum*, and *Taxodium distichum*.

#### BORAGINACEAE

*Myosotis macrosperma* Engelm.—Big-seed scorpion-grass. Highly State Rare. *Steury 970510.1* (US), 10 May 1997, 37 plants in flower and immature fruit occurred on mesic peat hummocks in *Taxodium distichum* swamp and at least 100 plants occurred on mesic sandy loam in the lower areas of a mixed deciduous woodland just east of Battle Creek Cypress Swamp Sanctuary. Associates in *Taxodium distichum* swamp included *Acer rubrum*, *Lindera benzoin*, *Arisaema triphyllum*, *Carex radiata*, *Parthenocissus quinquefolia*, *Lonicera japonica*, *Impatiens capensis*, *Claytonia virginica*, and *Ranunculus abortivus*.

#### CUSCUTACEAE

*Cuscuta pentagona* Engelm.—Field dodder. Watch List. *Steury 970708.5* (US), 8 July 1997, one colony, in flower and immature fruit, measured 2.3 x 1.5 m in a managed meadow at Battle Creek Cypress Swamp Sanctuary. Parasitic on *Solanum carolinense* and *Ipomoea hederacea*. Other associates included *Rubus pensilvanicus*, *Lonicera japonica*, *Ambrosia artemisiifolia*, *Commelina communis*, and *Campsis radicans*.

#### CYPERACEAE

*Carex cephalophora* Muhl. var. *mesochorea* (Mackenzie) Gleason—Midland sedge. Highly State Rare. *Steury 970802.3* (MICH) annotated as *Carex mesochorea* Mackenzie by Anton Reznicek (MICH) following Kartesz and Kartesz (1980) and state

listed as *Carex mesochorea*, 2 August 1997, eight plants in mature fruit occurred on mesic sandy loam in a meadow east of Battle Creek Cypress Swamp Sanctuary. A total of four other extant populations are known in Maryland from Caroline, Cecil, Charles, and Montgomery Counties (Lynn Davidson, database manager, Maryland Heritage and Biodiversity Conservation Program, pers. comm. 1997). Associates included *Verbesina alternifolia*, *Tridens flavus*, *Geum canadense*, *Lonicera japonica*, *Rubus pensilvanicus*, and seedlings of *Liquidambar styraciflua* and *Asimina triloba*.

*Carex radiata* (Wahlenb.) Small—Stellate or radiate sedge. Highly State Rare. *Steury* 970607.3 (MICH) confirmed by Anton Reznicek, 7 June 1997, approximately 500 fruiting tufts occurred on peat hummocks in *Taxodium distichum* swamp south of Sixes Road in Battle Creek Cypress Swamp Sanctuary. Although historically regarded as rare, recent inventories have found this sedge to be extant statewide (Chris Frye, Maryland Heritage and Biodiversity Conservation Programs, pers. comm. 1997). Associates included *Taxodium distichum*, *Toxicodendron radicans*, *Lindera benzoin*, *Cinna arundinacea*, *Carex laevivaginata*, and *Myosotis macrosperma*.

*Carex seorsa* Howe—Weak stellate or separated sedge. Watch List. *Steury* 970607 (US), 7 June 1997, two tufts with fruiting stems occurred on a peat hummock in *Taxodium distichum* swamp. Associates included *Acer rubrum*, *Toxicodendron radicans*, *Itea virginica*, and *Ilex verticillata*.

## FAGACEAE

*Castanea dentata* (Marshall) Borkh.—Chestnut. State Rare - Watch List. *Steury* 970920.1 (US), 20 September 1997, one 4 m tall tree infected with chestnut blight (*Endothia parasitica*) occurred on sandy loam at the crest of a slope approximately 14 m high along the eastern edge of Battle Creek Cypress Swamp Sanctuary. Two 8 m tall chestnut trees 5 m distant from the live specimen were still standing but dead due to infestation by the chestnut blight. In 1907 Curran reported that chestnut comprised 26.5 % of the hardwood flora in Calvert County woodlands with an average of 32 trees per acre. Associates at this site included *Fagus grandifolia*, *Quercus rubra*, *Kalmia latifolia*, *Asimina triloba*, and *Hamamelis virginiana*.

*Castanea pumila* (L.) Miller—Chinquapin. Watch List. *Steury* 970802.2 (US), 2 August 1997, four trees, one in immature fruit, occurred at the crest of a sandy loam slope along Battle Creek. Associates included *Vaccinium corymbosum*, *Quercus alba*, *Liquidambar styraciflua*, *Pinus virginiana*, *Liriodendron tulipifera*, *Carpinus caroliniana* and *Sassafras albidum*.

## GENTIANACEAE

*Bartonia paniculata* (Michx.) Muhl.—Screw-stem. Watch List. *Steury* 971004.1 (US), 4 October 1997, nine plants in flower occurred on a mat of sphagnum moss on a sandy loam 1 m high bank slope along a 2 m wide creek in shady deciduous forest and 5



plants occurred in similar habitat 50 m upstream near the northern edge of Battle Creek Cypress Swamp Sanctuary. Associates included *Viola cucullata*, *Athyrium filix-femina*, *Kalmia latifolia*, and seedlings of *Acer rubrum*.

#### LILIACEAE

*Melanthium virginicum*—Virginia bunch-flower. Watch List. *Steury 970816.1* (BCSH), 16 August 1997, 18 plants with dehiscent fruit occurred on a moist peat hummock in *Taxodium disticum* swamp. Associates included *Pilea pumila*, *Laportea canadensis*, *Impatiens capensis*, *Cryptotaenia canadensis*, *Cinna arundinacea*, and *Asimina triloba*.

#### JUNCACEAE

*Juncus coriaceus* Mackenzie—Leathery or awl-leaved rush. Watch List. *Steury 970823.3* (US), 23 August 1997, seven tufts with approximately 100 fruiting stems occurred along an edge of *Typha angustifolia* marsh just south of Battle Creek Cypress Swamp Sanctuary. Associates included *Myrica cerifera*, *Hydrocotyle verticillata*, *Cinna arundinacea*, *Sambucus canadensis*, and *Mikania scandens*.

#### PASSIFLORACEAE

*Passiflora lutea* L.—Yellow passionflower. Watch List. *Steury 970705.3* (BCSH), 5 July 1997, two vines with mature fruit occurred on 4 October 1997 climbing shrubs along a fallow cut path along the eastern edge of Battle Creek Cypress Swamp Sanctuary and 11 vines collectively occurred in two sites in mixed deciduous woodland west of the sanctuary. Associates at the western most site included *Arisaema triphyllum*, *Asimina triloba*, *Nyssa sylvatica*, and *Campsis radicans*.

#### POTAMOGETONACEAE

*Potamogeton foliosus* Raf.—Leafy pondweed. Highly State Rare. *Steury 970802.1* (BCSH), 2 August 1997, one colony measuring 0.6 x 0.4 m occurred in Battle Creek under water 0.15 m deep and was associated with *Sparganium americanum*.

#### RANUNCULACEAE

*Ranunculus pusillus* Poiret—Low spearwort. Watch List. *Steury 970510.2* (US), 10 May 1997, eight plants in flower and immature fruit occurred in a open shrub swamp just east of Battle Creek Cypress Swamp Sanctuary. Associates included *Alnus serrulata*, *Saururus cernuus*, *Viola cucullata*, *Sambucus canadensis*, *Cardamine pensylvanica*, and *Juncus effusus*.

#### SCROPHULARIACEAE

*Chelone obliqua* L.—Purple Turtlehead. Highly State Rare. *Steury 970823* (MICH), 23 August 1997, an estimated 600 plants occurred on muddy peat in *Taxodium distichum* swamp along the Battle Creek Cypress Swamp Sanctuary boardwalk and smaller populations were observed scattered throughout the northern half of the sanctuary. The species was observed in flower on 23 August and 4 October 1997 in association with *Taxodium distichum*, *Toxicodendron radicans*, *Itea virginica*, *Viburnum dentatum*, and *Cinna arundinacea*.

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Alice Ferguson Foundation/National Park Service

2001 Bryan Point Road, Accokeek, Maryland, 20607