

FIELD REPORT FOR  
SALISBURY SW and NW  
DECEMBER 10-14, 1979

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Two 1:100,000 areas were covered in this field trip, Salisbury SW and Salisbury NW. They are located on the Delmarva Peninsula and include portions of Maryland and Delaware. Bailey (1978)\* includes these areas in the southeastern Mixed Forest Province. These areas are in the flat coastal plain where slopes are gentle and relief is less than 30 m. Streams are sluggish and wetlands are numerous. The climate is generally one of mild winter and hot humid summers where precipitation averages 1000 to 1500 mm annually (Bailey 1978).

All photos were reviewed prior to the trip. Salisbury SW had been previously interpreted, except for 3 photos, and so the initial interpretation was reviewed carefully and questionable areas were marked on the photos and USGS topo sheets for field checking. Salisbury NW had not been interpreted at this time so a quick review of all photos was made and field check sites were selected and marked on the photos and topo sheets. One problem with the Salisbury NW area was incomplete photo coverage of Strip #7. Strip #8 was covered by 1:130,000 color infrared (CIR) photography. The rest of Salisbury NW and all of Salisbury SW was covered by 1:80,000 black and white panchromatic photography. Photo dates and photo quality varied. Photo coverage for Salisbury SW was evenly distributed over the following dates: 4/5/72, 4/3/76, 5/12/76, 3/3/77, 3/25/77, 3/23/78 and 4/29/78. In general, the 1972 photos were sometimes washed out or indistinct, the 1978 photos were dark, and the others were acceptable. Most photos for Salisbury NW were taken on 3/3/77 except for a few on 3/25/77 and the CIR coverage taken on 4/12/77.

The review of Salisbury SW revealed few problems with interpretation of wetland classes except for the estuarine-palustrine transition zone. Water regimes, however, can be difficult to interpret on photos. Certain vegetation such as evergreens on bald cypress can be hard to distinguish on poor quality photos. Occasionally, there were peculiar photo signatures which needed to be checked to determine the vegetation. Salisbury NW, though not interpreted, was reviewed with these same problems in mind. The primary objectives of this field trip were to:

- 1) determine the division between Estuarine and Palustrine, and Estuarine and Riverine Systems,
- 2) determine the head of tidal influence on the major streams,
- 3) check our accuracy and consistency in assigning water regimes, and
- 4) check specific vegetation on the ground which could change the initial interpretation (i.e., interpreting a cypress swamp as mixed hardwood).

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\*Bailey, Robert F. 1978. Descriptions of the Ecoregions of the United States. Forest Service, U.S.D.A., Ogden, Utah. 77 pp.

Over 4½ days, we visited 70 sites for detailed notes and made notes on the topo sheets at many other sites. One one day, we were accompanied by Bruce Nichols from the Salisbury, MD, SCS office and Jill Brenhenan and Dave Smith, field biologists with the USFWS in Annapolis, MD. On a second day, we were accompanied by George Ruddy, field biologist with the USFWS in Annapolis, MD; Earl Bradley, MD Coastal Zone Management; and Wayne Klockner, MD DNR.

### In-Field and Photo Observation for Salisbury SW

#### Salisbury Quadrangle

Site 1--PF01A--Originally typed as PF01C, the whole polygon had a similar dark signature but Ilex opaca was abundant in the understory. The temporarily flooded area was nearest to the road and the stream itself had been channelized some years ago which prevents excessive flooding away from the stream.

Site 2--PF01A--This area was also typed as PF01C which was due to Ilex opaca understory and scattered Pinus taeda in the oak canopy. Some wetter spots were present, but we would not be able to interpret them.

#### Delmar Quadrangle

Site 3--PF01C--This quad was not delineated prior to field trip.

Site 4--PF01C } The photo signature was "wet" but we could not determine the correct water regime from the photo.

Site--PF01/ABF--This photo signature was good. It indicated wet conditions but we wanted to check whether trees or shrubs were dominant. Fraxinus sp. were dominant, but stunted and were growing on hummucks.

#### Hebron Quadrangle

Site 6--PF01A--Originally typed as a liner PF01A, we found the wetland to be wide enough to be made into a polygon. Liriodendron tulipifera was dominant.

Site 7A--PEM5R--We originally typed this as E2SS1P because the photo signature was not characteristic of an emergent wetland. Zizania aquatica and Decodon verticillata were dominant.

Site 7B--PF01R--This area was omitted, but upon photo review, the signature shows a uniformly dark, wet signature.

#### Mardela Springs Quadrangle

Site 8--PF0½R--This area was adjacent to an E2EMP area and should have been included, but was omitted in the original interpretation.

Site 9--E2EM5P--Another case where the photo tone indicates scrub-shrub more than emergent wetland, which accounted for our original PSS1P type. The site has well mixed emergents plus Myrica cerifera and Bacharris halimifolia.

Site 10--E2EM5P--This was correctly interpreted and the photo signature was light gray. Spartina cynosuroides was dominant.

Chicamacomico Quadrangle

Site 11--PF01R--This area was correctly typed. The signature for PF01R was a very dark and uniform texture due to the nearly even-aged hardwood stand. Tonal changes between tidal forested wetlands and uplands are very distinct on this photo.

Site 12--E2EM5P--We originally typed this area as palustrine but in the field we had to alter our break line between E and P systems at this site.

Site 67--E2SS4/EM5P--The photo revealed a complex signature here--one of light and dark patches and presence of scattered pines. This was one of many areas we saw where salt marsh is invading loblolly pine (Pinus taeda) sites due to the rise in sea level. Panicum virgatum and Spartina patens were the dominant emergents.

Site 69--E2F04P--This area was not typed as wet. The photo signature was dark and coarse and indicated evergreens. This area is being invaded by Myrica cerifera, Panicum virgatum, and Spartina patens. It would be hard to detect the emergents beneath the pine canopy, unless the pines are dying or dead.

Site 70--E2EM5P--This area was correctly typed. The signature was white and dark probably revealing wetter areas within the marsh. Juncus sp. was the dominant plant.

✓ Wango Quadrangle

✓ Site 13--PF04E--This area was omitted. The photo signature was a dark, uniform texture but it did not reveal the presence of Chamaecyparis thyoides and Pinus taeda. The signature for this spot is similar to pine forests throughout the quad but this site was on othello soils and was definitely wet.

✓ Site 14A--PF01E--Originally this area was typed as PF0 $\frac{1}{2}$ C, but this error could be explained by the presence of scattered Taxodium distichum, Ilex opaca in the understory, and very wet soils.

✓ Site 14B--PF01E--Same situation as Site 14A.

✓ Site 15--PF02/EM5F--This area near Adkins Pond was omitted. The Taxodium distichum did not have a distinct signature and probably would have been typed as PF01 or PF04. However, in the pond itself there are cypress trees. Adam controls the level in the pond.

Ninepin Quadrangle

Site 16--PF01E--This area was correctly typed. The area was located behind the embankment resulting from stream channelization. Though, behind the embankment, the area is still seasonally flooded and saturated since it is adjacent to the original stream bed which still provides a source of flood waters.

Site 17--PF01/4A--Originally this site was typed a PF04/1A. The photo signature here was similar to a loblolly pine plantation and explains the original type. There was some Ilex opaca in the understory.

Site 18--PF01A--This site, as in Site 17, was located on Othello soils. The photo signature was lighter here than at Site 17. We found that there are degrees of wetness on the same soil series. Quercus spp. were dominant but there were scattered Pinus taeda.

Site 21--PF01E--This area had been logged since the date of photography and logging disturbance created wetter soil conditions. On the 1976 photo, the area would probably be typed as PF0 $\frac{1}{2}$ A.

Site 22--PF01A--This site was located behind an embankment created from stream channelization. Unlike previous sites in this kind of location, this was only temporarily flooded. Bruce Nichols told us that water rarely stands on surface. There was no old stream channel nearby either. Photo signature was not good for determining proper water regime, however.

Site 23--PF01A--Although the topo sheet showed wetland symbols at this site, we found it to be only temporarily flooded.

#### Whaleysville Quadrangle

Site 24--PF01A--This site was another case where an embankment from channelization has reduced the flooding of adjacent forests. In drier areas such as this, Lonicera japonica was often abundant as a ground cover.

Site 25--PSS1/EM5E--This area was originally typed as PSS1E. Acer rubrum saplings were the dominant shrub but we found an abundance of Typha angustifolia.

Site 26--PF04/1E--Apparently the Pinus taeda at this site was difficult to distinguish from hardwoods since the original typing was PF01E.

#### Berlin Quadrangle

✓ Site 19--PF01C--We found that our original linear PF01A was more extensive and was seasonally flooded.

○ Site 20--PEM5C--This wetland was not delineated originally. It was a very small area, which could explain its omission.

○ Site 27--PF01R--Originally typed as PF01C, this was another case of not being accurate in determining water regime, but this is very difficult sometimes.

○ Site 28--PF01/SS1E--This site was correctly interpreted but we found that the polygon could be reduced.

#### ✓ Girdletree Quadrangle

✓ Site 29--PF01E--Correctly interpreted, photo had a dark, characteristically wet signature.

#### Eden Quadrangle

✓ Site 30--PEM2N--We included scrub-shrub in the original typing, but the photo signature appears to be characteristic of emergent vegetation. Zizania aquatica was the dominant plant. On the west side of the road was a greater percentage of shrubs and would be PSS1/EM2N.

Site 31--PSS1/EM2P--This area was omitted, but photo signature looks wet. Acorus calamus and Polygonum sp. were co-dominant here.

Site 32--PF01R--Both the photo tone and proximity to the river led to the correct interpretation of this site. Acer rubra was dominant.

Site 33--PEM5P--This site was well mixed with Hibiscus palustris, Polygonum sagittatum, Leersia oryzoides, and Zizania aquatica. There were shrubs along the edge. The photo tone was mottled which could explain why we included scrub-shrub in the original type.

#### PRINCESS ANNE QUADRANGLE

Site 34--PF01A--This was correctly interpreted.

Site 35--PEM5P--The photo was not very clear, which could explain why scrub-shrub was included in the original type.

Site 36--E2EM5P--This was correctly interpreted.

#### Dividing Creek Quadrangle

Site 37--PF01C--Correctly interpreted, photo was dark but tree crowns were distinct.

Site 38--PF01E--Correctly interpreted, but photo tone does not lend itself well for distinguishing different water regimes.

Site 39--PF01R--The photo tone here is identical with PF01E (our original type) but on the ground we saw tidal evidence. Betula nigra and Acer rubra were dominant.

#### Pocomoke City Quadrangle

Site 40--PF01/2R--The photo has a very dark signature and roughness due to tree crowns. This was first typed as PF01E, but the Taxodium distichum crowns probably stick out higher than other trees giving the rough texture on the photo.

Site 41--PF01R--This site had a very dark signature, similar to one PF01R next to it, but was originally typed as PF01C.

#### Kingston Quadrangle

Site 42--E2EM5P--Though the photo clarity was poor, this area was correctly typed.

Site 43--E2EM5P--This area should have been interpreted. It had a very dark, wet tone on the photo. Juncus roemerianus and Scirpus olneyi were co-dominant here.

Site 44A--E2SS3/EM5P--The photo clarity was poor. Originally typed as PSS1R. This is another case of salt marsh invading former tidally-influenced Palustrine wetlands.

Site 44B--E2F04/SS3P--Same situation as Site 44A.

Site 45--E2SS4/EM5P--This was another case of salt marsh invasion, but we had not even interpreted the area as Palustrine as in Site 44.

Site 46--PF01A--This was correctly typed. It was clearly a wet hardwood forest signature on the photo. It was contained within an old Carolina Bay.

#### Wetipquin Quadrangle

Site 62--E2EM5N } Both of these sites were typed correctly except we had the "P"  
Site 63--E2EM5P } water regime for Site 62. These areas indicated the typical emergent signature on the photo. Spartina alterniflora was dominant at both sites.

Site 64--U (Upland)--The signature looked wet and the species present were common on nearly every palustrine forested site we saw. However, we were unsure about calling this PF01A because it looked high enough above the adjacent estuarine marsh to be free of flooding.

Site 65A--PF04S--This area was originally omitted. The presence of evergreens made it hard to determine the wetness and probably explains its omission.

Site 65B--E2EM5P--Typical emergent signature, correctly typed.

#### Nanticoke Quadrangle

Site 68--E2EM5P--Correctly interpreted. This site had been burned over to promote more desirable food and cover species for wildlife. Distichlis spicata was dominant with a fringe of Phragmites communis and Spartina cynosuroides near the road.

#### In-Field and Photo Observations for Salisbury NW

##### Trap Pond Quadrangle

Site 47--PF01E--Liquidambar styraciflua and Acer rubrum were dominant. The photo tone was dark and characteristic of wet forest.

##### Seaford East Quadrangle

Site 48--PEM2P--We checked this because it was hard to determine the wetland class on the photo. We were unable to identify the plants because we could not gain access and the plants were non-persistent.

##### Seaford West Quadrangle

Site 49--PF01A--The photo signature was less important than proximity to stream in deciding that it was wetland. Liriodendron tulipifera was dominant.

Site 50--PF01C--Nothing distinctive about this site on photo. The dominant trees were Liriodendron tulipifera, Quercus bicolor, Liquidambar styraciflua, and Acer rubrum.

Preston Quadrangle

Site 51--E2EM5P--This site was covered by color infrared (CIR) photography. The signature was a blue-gray tone and a texture similar to that for emergent wetlands on B & W photography. We found wetlands to be more extensive than shown on topo sheet. Most new emergent wetlands were dominated by Panicum virgatum.

Fowling Creek Quadrangle

Site 52A--E2EM5P  
Site 52B--E2EM5P Same as Site 51.

Site 53--PEM5P--This area had a typical emergent wetland signature. Typha angustifolia and Hibiscus palustris were co-dominant here.

Hickinan Quadrangle

Site 54--PF01A--Typical wet forest signature. Betula nigra and Acer rubrum were co-dominant.

Milford Quadrangle

Site 55--PF01R--Typical wet forest signature.  
Site 56--PEM5P  
Site 57--PEM5P Typical emergent wetland signatures.

Most road/stream crossings we encountered on this and the Hickinan quad had wetlands--usually PF01C.

Mispyllion River Quadrangle

Site 58--PF01A--Typical wet forest signature.  
Site 59--E2EM5P--Typical emergent wetland signature. We noticed many wet spots (PF01C or PF01E) along roads which were not mapped by USGS on topo sheet.

Milton Quadrangle

Site 60--PF01R--Typical wet forest signature.

Site 61--E2SS3/EM5P--The photo signature is darker where shrubs occur and white where the emergent vegetation is found.

SUMMARY AND CONCLUSIONS

This was a very productive field trip. We had good weather, took extensive notes, and had valuable assistance from the people who accompanied us on two days.

In the Salisbury SW area, a majority of the sites we checked were interpreted correctly. Our biggest problem seemed to be omission of wetlands followed by incorrect water regime modifiers. Hopefully, we will be able to team the signatures for omitted wetlands from study of our field sites and make additions during quality control. We will also consult the county soil surveys closely for identifying wetlands which were omitted. One particular problem we encountered was that of the variable wetness of Othello soils. Ac-

According to Bruce Nichols of the SCS, most Othello soils would support wetlands, but it depends on the land management. Logging on Othello soil can impede lateral runoff and create wet spots. Therefore, we will use the soil survey to identify wet soils, such as Othello, and then check the photo for clues as to relative wetness, to make a decision. We may want to use the "W" water regime modifier for questionable areas on Othello soils.

We observed that the presence and abundance of Japanese honeysuckle (Lonicera japonica) and American holly (Ilex opaca) are related to water regime. Most PFO1A wetlands contained a lot of holly or ground cover of honeysuckle, while a PFO1E wetland would have a low percentage of these two species.

Stream channelization is common in this area. Areas away from the embankments are probably at least temporarily flooded, but some can be seasonally flooded/saturated depending on topography, soils, and whether the original stream channel is still present as a source of flood waters.

For determining the location of the estuarine/riverine system breaks, we compared the vegetation along the river at various points. When shrubs and trees extended all the way to the river we would call the area below this point estuarine and riverine above the point. In a similar fashion, we placed the R1 (tidal)/R2 (non-tidal) breaks by looking for tidal evidence on bridges or tree trunks as guidelines.

We discovered numerous examples of salt marsh invasion, especially near the Nantocoke River. Most of these areas were interpreted incorrectly because the loblolly pine overstory masks the salt marsh below. This is occurring due to the rise in sea level. Some areas should be easier to interpret because the pines are sickly, thinning out, or dead.

Salisbury NW will not be interpreted right away because there is a possibility of using photos which will be flown in 1980. Also, we will be able to refer to an Atlas of Tidal Marshes for areas in Delaware to aid our interpretation.

Field Check Sites for Salisbury SW and NW with Partial Community Lists

- Site 1--PF01A--*Liriodendron tulipifera* (dom.), *Magnolia virginiana*, *Quercus* sp., *Ilex opaca*, *Rosa* sp., Unid mosses, *Polystichum acrostichoides*, *Lonicera japonica*, *Boehmeria cylindrica*.
- Site 2--PF01A--*Quercus bicolor* (dom.), *Ilex opaca* (dom. understory), *Quercus nigra*, *Acer rubrum*, *Juniperus virginiana*, *Magnolia virginiana*, mosses, *Mitchella repens*, *Vaccinium* sp., *Smilax* sp., *Carex* sp., *Gaultheria procumbens*, *Lonicera japonica*, *Pinus taeda*, grasses.
- Site 3--PF01C--*Acer rubra* (dom.), *Platanus occidentalis*, *Alnus rugosa*, *Cornus amomum*, *Smilax* sp., *Lonicera japonica*, *Cinna arundinaceae*, *Pinus taeda*, *Ilex opaca*, *Boehmeria cylindrica*, *Onoclea sensibilis*, *Salix* sp.
- Site 4--PF01C--*Magnolia virginiana*, *Fraxinus* sp., *Acer rubrum* (co-dom.), *Liquidambar styraciflua*, *Quercus bicolor*, mosses, *Viola* sp., *Ilex verticillata*, *Viburnum* sp., *Ilex opaca*, *Rhus radicans*, *Boehmeria cylindrica*, *Smilax* sp., *Vaccinium* sp.
- Site 5--PF01/ABF--*Fraxinus* sp. (dom.), *Lemna* sp., *Carex* sp., *Alnus rugosa*, *Lyonia lucida*, *Leucothol racernosa*, *Ilex verticillata*, *Sphagnum* and other mosses, *Magnolia virginiana*, *Decodon verticillatus*, *Symplocarpus foetidas*, *Rhododendron vicosum*, *Carex stricta*, *Myrica cerifera*, *Sparganium* sp., *Lyonia lignstrina*,
- Site 6--PF01A--*Liriodendron tulipifera* (dom), *Lonicera japonica* (dom. ground cover), *Ilex opaca*, *Smilax* sp., *Aster* sp., *Eupatorium* spp., mosses, *Carpinus caroliniana*, *Magnolia virginiana*, *Liquidambar styraciflua*, *Osmunda regalis*, *Viburnum dentatum*, *Woodwardia virginica*, *Solidago* sp., *Prunus* sp., *Carex* sp.
- Site 7A--PEMB--*Zizania aquatica* (dom.), *Decodon verticillatus*, *Carex* sp., grasses, *Nuphar* sp., *Clethra alnifolia*, *Polygonum arifolium*, *Cornus amomum*.
- Site 7B--PF01R--*Fraxinus* sp. (dom.), *Lonicera japonica*, *Carex* sp., *Smilax* sp., *Cornus amomum*, *Acer rubrum*, *Ilex opaca*, *Magnolia virginiana*, *Pinus taeda*, *Viburnum dentatum*, *Epilobium* sp.
- Site 8--PF01/2R--*Taxodium distichum* and *Liquidambar styraciflua* (co-dom.), *Magnolia virginiana*, *Ilex opaca*, *Lonicera japonica*, *Pinus taeda*, *Viburnum dentatum*, *Prunus serotina*, *Platanus occidentalis*.
- Site 9--E2EM5P--(well mixed) *Typha angustifolia*, *Hibiscus palustris*, *Rumex* sp., *Panicum virgatum*, *Leersia oryzoides*, *Spartina cynosuroides*, *Rubus* sp., *Scirpus olneyi*, *Decodon verticillatus*, *Mikania scandens*, *Myrica cerifera*, *Bacharris halimifolia*.
- Site 10--E2EM5P--*Spartina cynosuroides* (dom.), *Scirpus* sp., *Hibiscus palustris*, *Osmunda regalis*, *Lycopus* sp., *Typha angustifolia*, *Scirpus olneyi*, *Mikania scandens*, *Acer rubra* and *Myrica cerifera* (on edge).
- Site 11--PF01R--*Acer rubrum* (dom.), *Cornus amomum*, *Cephalanthus occidentalis*, *Ilex verticillatus*, *Smilax* sp., *Carex stricta*, *Carex* sp., *Lonicera japonica*.

- Site 12--E2EM5P--*Panicum virgatum* (dom.), *Scirpus olneyi*, *Hibiscus palustris*, *Phragmites communis*, *Typha angustifolia*, *Scirpus americanus*, *Aster* spp., *Solidago* sp., *Spartina cynosuroides*.
- Site 13--PF04E--*Chamaecyparis thyoides* and *Pinus taeda* (co-dom.), *Ilex opaca*, *Smilax* sp., sphagnum and other mosses, *Acer rubra*, *Liquidambar styraciflua*, *Nyssa sylvatica*, one *Taxodium distichum*.
- Site 14--PF01E--*Acer rubrum* (dom.), *Smilax* sp., *Ilex opaca*, some *taxodium distichum*, *Fraxinus* sp., grasses, *Viola* sp., *Sambucus canadensis*, mosses.
- Site 15--PF02/EM5F--*Taxodium distichum* (dom. tree), *Typha latifolia*, *Carex* sp., *Leersia oryzoides*, *Scutellaria lateriflora*, *Galium* sp.
- Site 16--PF01E--*Acer rubrum*, *Betula nigra*, *Taxodium distichum*, *Fraxinus* sp., *Populus deltoides*, *Magnolia virginiana*, *Liquidambar styraciflua*, *Nyssa sylvatica*, *Boehmeria cylindrica*, *Cinna arundinaceae*, *Smilax* sp., *Lonicera japonica*, *Dulichium arundinaceum*, *Hibiscus palustris*, *Bignonia radicans*.
- Site 17--PF01/4A--*Quercus falcata*, *Quercus bicolor*, *Ilex opaca*, *Pinus taeda*, *Magnolia virginiana*, *Liquidambar styraciflua*, *Kalima latifolia*, *Vaccinium* sp., *Polystrichum* sp., mosses.
- Site 18--PF01A--*Quercus falcata*, *Pinus taeda*, *Myrica cerifera*, *Smilax* sp., *Vaccinium* sp., *Acer rubrum*, *Quercus phellos*, *Liquidambar styraciflua*, *Quercus nigra*, *Carex* sp., grasses.
- Site 19--PF01C--*Acer rubrum*, *Fraxinus* sp., *Liquidambar styraciflua*, *Cinna arundinaceae*, *Allium* sp., *Lonicera japonica*, *Boehmeria cylindrica*, grasses, *Rosa palustris*, *Ilex opaca*, *Smilax* sp., *Populus deltoides* and *Carpinus caroliniana* (on edge).
- Site 20--PEM5C--*Juncus roemerianus* (?), *Typha latifolia*, *Solidago* sp (on edge), *Ludwigia* sp., *Panicum virgatum*, *Juncus balticus*, *Scirpus cyperinus*, *Aster* sp.
- Site 21--PF01E--*Liquidambar styraciflua* (dom.), *Scirpus* sp., *Vaccinium* sp., *Viburnum dentatum*, *Juncus roemerianus*, *Xanthosylem clava-herculis*, *Carex* spp., *Solidago* sp., *Ludwigia* sp., *Prunus serotina*, *Eupatorium dubium*, *Lonicera japonica*, *Rubus* sp., *Smilax* sp., *Carex stricta*, *Panicum* spp., grasses.
- Site 22--PF01A--*Acer rubrum*, *Taxodium distichum* (some), *Cornus florida*, *Fraxinus* sp., *Liquidambar styraciflua*, *Bignonia radicans*, *Lonicera japonica*, *Carex* sp., *Quercus bicolor*, *Clethra* sp., *Sambucus canadensis*, *Rubus* sp., *Phytolacca americana*, *Vitus* sp., *Viburnum dentatum*.
- Site 23--PF01A--*Acer rubrum* and *Liquidambar styraciflua* (co-dom.), *Ilex opaca*, *Pinus taeda* (some), *Carex* sp., *Solidago* sp., *Juncus effusus*, *Ludwigia* sp., *Vaccinium* sp., *Scirpus* sp., *Myrica cerifera*, *Lonicera japonica*, *Fagus grandifolia* (a few), *Hypericum virginicum*, *Mimulus* sp.
- Site 24--PF01A--(well mixed) *Nyssa sylvatica*, *Taxodium distichum*, *Liquidambar styraciflua*, *Acer rubra*, *Lonicera japonica*, *Carex* sp., *Bignonia radicans*.

- Site 25--PSS1/EM5E--*Acer rubrum*<sup>m</sup> (dom. ss), *Pinus taeda* (some), *Vaccinium* sp., *Scirpus* sp., mosses, *Viburnum* sp., *Clethra alnifolia*, *Typha angustifolia*, *Ilex verticillata*, *Smilax* sp., *Woodwardia virginica*
- Site 26--PF04/1E--*Pinus taeda*, *Acer rubrum*<sup>m</sup>, *Liquidambar styraciflua*, *Magnolia virginiana*, *Ilex verticillata*, *Vaccinium* sp., *Sphagnum* moss, *Woodwardia virginica*, *Ilex opaca*, *Myrica cerifera* on edge.
- Site 27--PF01R--*Acer rubrum*<sup>m</sup> (dom.), *Liquidambar styraciflua*, *Populus deltoides*, *Asclepias incarnata*, *Aster* sp., *Carex* sp., grasses, *Leersia oryzoides*, *Galium* sp., *Helianthus giganteus*, *Viburnum* sp., *Eupatorium dubium*, *Cephalanthus occidentalis*, *Geum* sp., *Alnus* sp., *Rumex* sp., *Sambucus canadensis*, *Boehmeria cylindrica*.
- Site 28--PF01/SS1E--*Acer rubrum*<sup>m</sup> (dom), *Lonicera japonica*, *Rosa palustris*, Grasses, *Cirna arundinaceae*, *Scutellaria lateriflora*,
- Site 29--PF01E--*Acer rubrum*<sup>m</sup> (dom.), *Ilex opaca*, *Liquidambar styraciflua*, *Magnolia virginiana*, *Smilax* sp., *Carex* sp., *Sambucus canadensis*, *Vitus* sp., *Rubus* sp., *Bignonia radicans*, *Osmunda regalis*, *Woodwardia areolata*.
- Site 30--PEM2N--*Zizania aquatica* (dom.), a few *Cephalanthus occidentalis*, *Fraxinus* sp., and *Alnus rugosa* along edge.
- Site 31--PSS1/EM2R--*Alnus* sp. (dom.), *Salix* sp., *Acorus calamus* and *Polygonum sagittatum* (co-dom.), *Cuscuta* sp., *Mikania scandens*, *Iris* sp., *Eupatorium perfoliatum*, *Hibiscus palustris*, *Sparganium* sp., *Eleocharis quadrangulata*, *Pontederia cordata* ? or *Peltandra virginica*?
- Site 32--PF01R--*Acer rubrum*<sup>m</sup>, *Liquidambar styraciflua*, *Alnus* sp., *Myrica cerifera*, *Ilex verticillata*, *Lonicera japonica*, *Smilax* sp., *Vitus* sp., *Polygonum* sp., *Rosa multiflora*, *Rubus* sp., *Solidago* sp., *Cornus amomum*, *Iris* sp., *Rosa palustris* a few *Pinus taeda*.
- Site 33--PEM5R--*Hibiscus palustris*, *Polygonum sagittatum*, *Leersia oryzoides*, *Nuphar* sp., (bog rice?), *Polygonum* sp., *Zizania aquatica* (well mixed).
- Site 34--PF01A--*Pinus taeda*, *Ilex opaca*, *Quercus phellos* and *Quercus nigra* (dom.), *Acer rubrum*<sup>m</sup>, *Magnolia virginiana*, *Vitus* sp., *Smilax* sp., *Liquidambar styraciflua*, *Mitchella repens*, *Clethra* sp., grasses, *Vaccinium* sp.
- Site 35--PEM5R--*Spartina cynosuroides*, *Typha angustifolia* and *Acorus calamus* (co-dom.), *Sparganium* sp., *Hibiscus palustris*, *Polygonum arifolium*, *Rorippa* sp., *Peltandra virginica*, *Bideus* sp., *Carex* sp., *Aster* sp., *Sium* sp.? or *Cicuta* sp.?, *Decodon verticillatus*, *Pontederia cordata*, *Iris* sp., *Scirpus validus*, *Cuscuta* sp., *Rosa multiflora*.
- Site 36--E2EM5P--*Scirpus robustus*, *Spartina cynosuroides* (dom.), *Bacharris halimifolia*, *Spartina alterniflora* (on edge), *Cypernis* sp., *Aster* sp., *Solidago*, *Polygonum* sp., *Spartina patens*, *Typha angustifolia*, *Hibiscus palustris*, *Kosteletzkya virginica*, *Limonium nashii*, *Scirpus olneyi*, *Sclepius incarnata*.

- Site 37--PF01C--*Quercus phellos*, *Quercus falcata*, *Liquidambar*, *Styraciflua*, *Ilex opaca*, a few *Pinus taeda*, *Magnolia virginiana*, mosses, *Polystrichum* sp., *Sphagnum* spp., *Vaccinium* sp., *Myrica cerifera*, *Cinna arundinaceae*, *Smilax* sp., grasses, *Unid. orchid*.
- Site 38--PF01E--*Carpinus caroliniana*, *Liquidambar styraciflua* and *Acer rubra* (co-dom.), *Viburnum nudum*, *Fraxinus* sp., *Ilex opaca*, *Smilax* sp., *Bignonia radicans*, *Carex* sp., *Vitis* sp., *Polygonium* sp., *Viburnum dentatum*, *Lyonia ligustrina*, grasses, mosses.
- Site 39--PF01R--*Betula nigra*, *Acer rubra* (Dom.), *Woodwardia areolata*, *Smilax* sp., *Fraxinus* sp., *Nyssa sylvatica* (?), *Carpinus caroliniana*, *Ilex opaca*, *Myrica cerifera*, *Vaccinium* sp., a few *Pinus taeda*, *Sparganium* sp., *Nuphar* sp.
- Site 40--PF01/2R--*Taxodium distichum*, *Fraxinus* sp., *Betula nigra*, *Acer rubra*, *Lonicera japonica* (on edge), *Liquidambar styraciflua*, *Smilax* sp., *Lencothoe* sp. or *Lyonia* sp.
- Site 41--PF01R--*Chamaecypanis thyoides*, *Magnolia virginiana*, *Acer rubra*, *Liquidambar styraciflua*, some *Pinus taeda*, *Smilax* sp., *Woodwardia areolata*, *Ilex verticillata*, *Ilex opaca* (on edge), *Ilex glabra*, *Smilax laurifolia*, *Clethra* sp., *Quercus bicolor*, *Leucothoe* sp., or *Lyonia* sp., *Bignonia capreolata*.
- Site 42--E2EM5P--*Hibiscus* sp., *Distichlis spicata* (dom.), *Limonium nashii*, *Kosteletzkya virginica*, *Panicum virgatum*, *Asclepias incarnata*, *Scirpus robustus*, *Bacharris halimifolia*, *Myrica cerifera*, one *Pinus taeda*, *Polygonium* sp., *Typha* sp., *Phragmites communis* (on edge).
- Site 43--E2EM5P--*Juncus roemerianus* and *Scirpus olneyi* (co-dom.), *Hibiscus* sp., *Distichlis spicata*, *Spartina patens*, (*Pinus taeda*, *Myrica cerifera*, *Bacharris halimifolia*, and *Juniperus virginiana* on small islands)
- Site 44A--E2SS2/EM5P--*Rosa palustris*, *Myrica cerifera*, *Distichlis spicata*, *Pinus taeda*, *Spartina patens*, *Scirpus robustis*, *Bacharris halimifolia*.
- Site 44B--E2F04/SS3P--*Pinus taeda* (dom.), *Myrica cerifera*, *Panicum* sp., *Rosa palustris*, *Typha angustifolia*, *Bacharris halimifolia*, *Distichlis spicata*.
- Site 45--E2SS4/EM5P--*Pinus taeda* and *Juniperus virginiana* (co-dom.), *Myrica cerifera*, *Distichlis spicata* (dom. EM), *Spartina patens*, *Scirpus robustus*, *Solidago* sp., *Typha angustifolia*, *Spartina cynosuroides*, *Ilex glabra*, *Lonicera japonica*, *Smilax* sp., *Iva frutescens*, *Rhus radicans*.
- Site 46--PF01A--Well mixed: *Quercus michauxii*, *Quercus phellos*, *Quercus falcata*, *Acer rubra*, *Liquidambar styraciflua*, *Magnolia virginiana*, *Smilax* sp., *Vaccinium* sp., *Clethra* sp. (?), *Woodwardia areolata*, *Ilex opaca*.
- Site 47--PF01E--*Liquidambar styraciflua* and *Acer rubra* (co-dom.), one *Taxodium distichum*, *Cephalanthus occidentalis*, *Mykania scandens*, *Sparganium* sp., *Asclepias incarnata*, *Glyceria obtusa*, *Alnus* sp., some *Platanus occidentalis*, *Fraxinus* sp., *Typha* sp.
- Site 48--PEM2R--Emergent vegetation not identifiable.

- Site 49--PF01A--*Liriodendron tulipifera* (dom.), *Quercus michauxii*, *Quercus bicolor*, *Liquidambar styraciflua*, *Magnolia virginiana*, *Ilex opaca*, *Smilax* sp., *Solidago* sp., *Aster* sp., *Woodwardia areolata*, *Lonicera japonica*, grasses, *Cinna arundinaceae*, *Vaccinium* sp., some *Chamaecyparis thyoides* and *Pinus taeda*.
- Site 50--PF01C--*Liriodendron tulipifera*, *Quercus bicolor*, *Liquidambar styraciflua*, *Acer rubra*, some *Ilex opaca*, *Lonicera japonica*, *Fraxinus pennsylvanica*, *Quercus phellos*, *Sambucus canadensis*, *Smilax* sp., *Lyonia ligustrina*, *Osmonda regalis*, *Magnolia virginiana*, *Cinna arundinaceae*, *Woodwardia areolata*, *Typha latifolia* (on edge), *Salix* sp.
- Site 51--E2EM5P--*Spartina patens*, *Distichlis spicata*, *Polygonum* sp., *Spartina alterniflora*, *Hibiscus* sp., *Spartina cynosuroides* and *Panicum virgatum* (co-dom.), *Scirpus olneyi*, *Phragmites communis* (on edge), *Kosteletzkya virginica*.
- Site 52A--E2EM5P--*Typha angustifolia*, *Spartina cynosuroides*, *Panicum virgatum*, *Rumex* sp., *Polygonum* sp.
- Site 52B--E2EM5P--*Panicum virgatum* and *Hibiscus* sp. (co-dom.), *Polygonum* sp., *Rumex* sp.
- Site 53--PEM5R--*Typha angustifolia* and *Hibiscus* sp. (co-dom), *Polygonum arifolium*, *Asclepias incarnata*, *Scirpus fluviatilis*, one *Salix* sp., *Carex* spp., *Leersia oryzoides*, *Polygonum* sp.
- Site 54--PF01A--*Betula nigra*, *Pinus palustris*, *Acer rubra*, *Lonicera japonica*, *Liquidambar styraciflua*.
- Site 55--PF01R--*Fraxinus pennsylvanica*, *Acer rubra*, *Vaccinium* sp., *Alnus rugosa*, *Smilax* sp., *Carex* spp., *Cinna arundinaceae*, *Rhus radicans*, mosses.
- Site 56--PEM5R--*Acorus calamus* and *Typha angustifolia* (co-dom.), *Phragmites communis*, *Polygonum arifolium*, *Hibiscus* sp., *Sium* sp. (?)
- Site 57--PEM5R--*Spartina cynosuroides* and *Typha angustifolia* (co-dom.), *Rosa palustris*, *Acer rubra* and *Phragmites communis* (by road), *Rhus radicans*.
- Site 58--PF01A--*Quercus bicolor* (dom.), *Ilex opaca*, *Magnolia virginiana*, *Vaccinium* sp., *Smilax* sp., *Clethra* sp., *Liquidambar styraciflua*, *Lyonia ligustrina*, mosses.
- Site 59--E2EM5P--*Spartina patens* and *Hibiscus palustris* co-dom.), *Phragmites communis*, *Baccharis halimifolia*, *Panicum virgatum* (on edge).
- Site 60--PF01R--*Fraxinus pennsylvanica* and *Acer rubra* (co-dom.), *Liriodendron tulipifera* (on edge), *Smilax* sp. (on edge), *Carex* spp., *Lindera benzoin*, *Liquidambar styraciflua*, *Lonicera japonica*, *Vitis* sp., *Bignonia radicans*.
- Site 61--E2SS3/EM5P--*Panicum virgatum* (dom. EM), *Myrica cerifera* (dom. SS), some *Fraxinus* sp., *Acer rubra*, and *Baccharis halimifolia*.

- Site 62--E2EM5N--*Spartina alterniflora*, (dom), *Zizania aquatica*, *Kosteletzkya virginica*, *Typha angustifolia*, *Scirpus americanus*, *Cyperus* sp., *Panicum virgatum*, *Mikania scandens*, *Hibiscus* sp., *Rhus radican* and *Myrica cerifera* (on edge).
- Site 63--E2EM5P--*Spartina alterniflora* (dom.), *Bidens* sp., *Spartina cynosuroides* (on edge), *Juncus* sp., some *Scirpus validus* and *Typha angustifolia* (on edge).
- Site 64--U (Upland)--*Liquidambar styraciflua*, *Acer rubra*, *Pinus taeda*, *Myrica cerifera*, *Smilax* sp., *Magnolia virginiana*, *Quercus falcata*, *Ilex opaca*, *Lonicera japonica*.
- Site 65A--PF04S--*Pinus taeda* (dom.), *Myrica cerifera*, *Lonicera japonica*, *Rubus* sp.
- Site 65B--E2EM5P--(well mixed) *Distichlis spicata*, *Spartina cynosuroides*, *Juncus roemerianus*, *Iva frutescens*, *Solidago* sp., *Scirpus olneyi*, *Aster* sp., *Bacharris halimifolia* and *Myrica cerifera* (on edge), *Juniperus virginiana* (on edge), *Spartina patens*, *Fimbristylis* sp.
- Site 66--PF01R--*Fraxinus pennsylvania* (dom.), some *Juniperus virginiana*, *Rhus radicans*, *Smilax* sp., *Clethra* sp., *Lyonia ligustrina*, *Myrica cerifera*, (*Typha angustifolia*, *Carex stricta*, *Zizania aquatica*, *Polygonum* sp., *Hibiscus* sp., and *Rosa* sp. (in open areas)), *Magnolia virginiana*, *Alnus* sp., *Lonicera japonica*, *Bidens* sp., *Iris* sp., *Liquidambar styraciflua*.
- Site 67--E2SS4/EM5P--*Panicum virgatum* & *Spartina patens* (dom. EM), *Pinus taeda* (dom. SS), *Juncus* sp., *Phragmites communis*, *Ludwigia* sp., *Solidago* sp., *Myrica cerifera*.
- Site 68--E2EM5P--*Spartina patens* (dom.) *Distichlis spicata*, *Phragmites communis*, *Spartina cynosuroides*, *Solidago* sp., *Scirpus robustus*, *Spartina alterniflora*.
- Site 69--E2F04P--*Pinus taeda* (dom.), *Myrica cerifera* (dom. SS), *Spartina patens*, *Hibiscus* sp., *Panicum virgatum*, *Typha angustifolia*.
- Site 70--E2EM5P--*Juncus* sp. (Dom.), *Scirpus americanus*, *Typha* spp., *Spartina patens*, *Phragmites communis*, a few *Pinus taeda*.