

Field Report for Newark NW, Newark SW

August 22-26, 1983

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INTRODUCTION

The Newark NW and SW 1:100,000 work areas are located in southeastern Pennsylvania along the eastern border, and include a small area of western New Jersey which extends into the NW work area. Major drainages include the Delaware, Schuylkill and Lehigh Rivers.

Both work areas are located within the Appalachian Oak Forest association of the Eastern Deciduous Forest Province (2214), according to Bailey's Ecoregion classification (1978)*.

The aerial photographs covering the two work areas are 1:58,000 color infra-red (CIR) positives taken on four dates: 4-21-81, 5-4-81, 5-8-81 and 4-19-82. Because of the several dates of photography there is some inconsistency in photographic signature due to changes in growing season and photo quality. This should not cause a serious problem, however, during interpretation if field and topographic data is carefully correlated. Generally, the April 1981 photography is of excellent contrast and resolution (Roll 9). The dark green emulsion of the April 1982 photography reduces contrast, but resolution is very good (Roll 319). The May 4, 1981 photography (Roll 13) is extremely dark red with poor resolution and contrast. This should be the only roll that may cause exceptional problems during interpretation. The May 8, 1981 photography (Roll 39) has a slightly "washed out" appearance which reduces resolution, but contrast is still satisfactory.

The December 1981 mapping conventions were followed with the exception of the persistent emergent subclass. PEM1 and E2EM1 are used exclusively to indicate the Phragmites australis dominance type, in order to maintain consistency with previously completed maps within the region. The old subclass "5" is used for all other narrow-leaved persistent emergents. However, no P. australis was observed during this trip.

The objectives of this trip were as follows: to correlate photographic signatures with field observations of plant communities and water regimes in new work areas; to compare signatures of similar wetland types, particularly PF01's from each of the four dates of photography; to check areas with the red understory signature associated with floodplain PF01's to determine species and water regime; to check the red signature associated with Melvin soils on agricultural lands for presence of wetland conditions; to check a variety of recurring PEM5 signatures to determine water regimes and other reasons for differences in color and tone.

* Bailey, R. G. 1978. Description of the Ecoregions of the United States. USDA Forest Service. Ogden, Utah. 77pp.

During this field trip we were accompanied on various days by two biologists from the Pennsylvania Department of Natural Resources, and three representatives of the Pennsylvania Game Commission. These agencies are presently utilizing NWI maps and are interested in training their employees in the use of the National Wetlands Classification. They aided us by providing information on the location and ownership of local wetlands, typical flooding patterns, recent rainfall conditions, and plant identification.

IN-FIELD AND PHOTO OBSERVATIONS

Downingtown

- SITE 1--PF01A. Juglans cinerea is dominant in the overstory. Impatiens capensis forms the dominant ground cover, growing up to 5 feet tall, accompanied by a large variety of less common shrubs and herbaceous plants. Site appears to be extremely flooded for short periods. Seasonally flooded channels are present, as well as Arisaema, an ~~obligate~~ wetland species.
FAC-WET
- SITE 2--POWKh. This classification was chosen to describe the open water areas of large impounding basins associated with gravel excavations and strip mines, in which water regimes are maintained artificially.
- PUBKs. This describes the bare mud and gravel flats that form within impounding basins as a result of spoil deposition. This one is mostly mud with patches of Carex and Cyperus.
- SITE 3--POW/EM2F. A carpet of unidentified nonpersistent emergents covering a thick layer of mud comprised the nonflooded portion of this small depression at the time of check. The signature appears as open water on the aerial photo and probably would have been delineated as such. A small PEM5E, dominated by Leersia oryzoides, appearing as a small white dot, is too small to map.
- SITE 4--PF01A. Liriodendron tulipifera dominates, with Acer rubrum, Lindera benzoin, and Viburnum spp. common. Linear delineation is appropriate here. The stream is 10 feet wide and perennial, with a rocky bed.
- SITE 5--PF01/EM5A. Salix nigra, Juglans nigra and Platanus occidentalis are codominant tree species with Urtica dioica the dominant emergent. This is a strong example of the red understory signature commonly associated with PF01A's along streams. In the Baltimore work areas this signature indicated a Lonicera understory, but it seems that a dense low shrub or herbaceous life form in general is responsible, rather than any particular species.

Pottstown

- SITE 6--PF01C. Quercus palustris and Acer rubrum codominate with several common understory species, including Lindera benzoin, Cornus amomum and Viburnum dentatum.

--PSS1/EM5E. The shrub layer includes a mixture of Acer rubrum saplings, Viburnum dentatum, Alnus rugosa and Cornus amomum. Leersia oryzoides is the dominant emergent. There are Carex stricta hummocks and an exceptionally large variety of subordinate species including Juncus effusus and Scirpus cyperinus.

SITE 7--PFO1/EM5C. Ulmus sp. and Calamagrostis canadensis dominate. C. canadensis appears in patches as a bright white signature between the trees. A single bush of Cephalanthus occidentalis was sighted.

SITE 8--PFO1A. Platanus occidentalis, Ulmus sp. and Fraxinus sp. codominate the overstory. Lindera benzoin is dominant in the understory. This site, like many PFO's in this quad contains a mixture of upland and wetland species, an indication that water regimes may fluctuate frequently.

SITE 9--PEM5E. Juncus effusus and Scirpus cyperinus dominate in these three small depressions in the south end of the PEM5A below.

--PEM5A. The mixed emergents at this site include Eupatorium maculatum, Verbena hastata, Solidago sp., Polygonum sp. and various unidentified grasses. Limited access prevented positive verification of the dark central portion on the photo as either a burn or flooding. Burn seemed most likely in view of correlated species and topo information, resulting in choice of temporarily flooded water regime.

Elverson

SITE 10--PEM5E. Polygonum arifolium and P. sagitatum dominate this site. Common are Typha latifolia, Scirpus cyperinus, and small patches of shrubs containing Alnus rugosa, Cornus sp. and Acer rubrum.

Downingtown

SITE 11--PEM5A. This site contains a mixture of Solidago sp., Carex spp., unidentified grasses, Veronia noveboracensis and Cornus sp. seedlings. Signature and plant species suggest "A" to "C" water regime, but soil tested here was very dry and rocky. The decision was to be conservative with temporarily flooded water regime.

--PEM5E. A purple-stemmed Epilobium sp. is dominant in this depression. Polygonum arifolium, Juncus effusus, Impatiens capensis and Salix sp. seedlings are common.

SITE 12--PEM5C. This site contains a mixture of Verbena hastata, Solidago sp. and Eupatorium maculatum as most common among other species. Signature and location strongly influenced choice of water regime due to limited access.

--PEM5E. Carex stricta in well developed hummocks and Onoclea sensibilis form the main dominance zone. Polygonum sp., Impatiens capensis and Typha latifolia are also very common locally. Yellowish color of this signature is consistent with other sites that have Carex stricta hummocks with seasonal/saturated water regime.

SITE 13--PEM5C. This is a nearly monospecific stand of Phalaris arundinacea.

SITE 14--PAB3Zh. Lemna, Nymphaea odorata, and Nuphar variegatum codominate. There are patches of open water present.

--PSS1E. This site is a mixture of Acer rubrum saplings, Rosa sp., Cornus sp. and Viburnum dentatum.

SITE 15--PF01A. Carya sp., Ulmus sp. and Fraxinus sp. are codominant with a mixed shrub understory. This site displays a representative PF01A signature.

Boyertown

SITE 16--PF01A. This site has a mixed overstory of Fagus grandifolia, Ulmus sp., Acer rubrum, Fraxinus sp., Acer saccharum and Quercus rubra. The understory is fairly open. This site appeared dry at time of check, but debris was noted at bases of trees.

Fleetwood

SITE 17--PEM5C. A "typical" mixed emergent site of Impatiens capensis, Eupatorium maculatum, Solidago sp., Rubus sp., and Polygonum arifolium. There is a large variety of additional subordinate species.

SITE 18--PEM5E. Carex stricta is dominant, growing in large hummocks accompanied by a variety of subordinate emergents. The yellowish green signature is consistent with other sites of this type.

SITE 19--PEM5C. This is a monospecific stand of Phalaris arundinacea.

Manatawny

SITE 20--PF01A. This site has a mixed overstory which includes Fagus grandifolia, Liriodendron tulipifera, Acer rubrum, Platanus occidentalis and Fraxinus americana. There is also a variety of less common herbaceous species. Shallow channels run throughout which were dry at time of check, but there was an abundance of deposited sand and gravel as well as debris piled up against trees. A good typical PF01A signature for May photography.

Hazelton

SITE 21--PF04A. Tsuga canadensis is dominant with a Rhododendron maximum understory. The forest floor was dry at time of check, but abundance of debris indicated heavy flooding, probably for brief periods. Many stream channels, 2 to 3 feet deep, run through this site. These were saturated when field checked.

Weatherly

SITE 22--PSS1E. Vaccinium corymbosum is dominant, growing on well developed mounds of soil. The maze of channels between the mounds are saturated and very mucky. Sphagnum and Kalmia angustifolia are common, along with other species normally found in bogs and nutrient deficient situations.

SITE 23--PF01/SS1E. A diverse mixture of shrubs, this site is dominated by Acer rubrum saplings, Vaccinium corymbosum and Viburnum dentatum. Directly across the street from site #22, this site seems to have further successional development.

Nesquehoning

SITE 24--PF01A. Acer rubrum, Fraxinus americana and Quercus sp. forms the overstory. The understory is mixed shrubs, while the herbaceous layer is sparse. This site was checked about 100 feet in from the road along the streambank, which was cut down 2 to 3 feet.

Allentown East

SITE 25--PF01C. Fraxinus americana dominates the overstory, and Ulmus americana dominates the understory. There is almost no shrub or herbaceous layer. The bare soil is dried and cracked into plates. "A" looks more appropriate for the PF01 immediately surrounding this site. The "cracked-mud" area might just have been very small and right next to the road where we checked. It has been delineated as such.

SITE 26--PEM5E. Leersia oryzoides is dominant east of the road bridge.

--PEM2F. West of the bridge is more flooded with two species of Polygonum dominating. Penthorum sedoides is very common. Grading away from the bridge the site becomes "E" again, and L. oryzoides and Scirpus cyperinus become more common. This PEM2F appears as open water on the aerial photo.

Quakertown

SITE 27--PEM5E. Polygonum sp. and Acorus calamus dominate this vegetated stream. A good example of a linear emergent wetland.

SITE 28--PEM5C. Acorus calamus and Scirpus cyperinus dominate. Juncus effusus and Carex stricta are common on this site which is within an upland field.

SITE 29--R2AB3H. This vegetated river channel contains a mixture of Nymphaea odorata, Nuphar variegatum, Sparganium sp. and Lemna. Phalaris anundinacea and Salix nigra vegetate a small island in the channel.

SITE 30--PSS1E. This shrub mixture contains Cephalanthus occidentalis, Rosa sp., Spiraea latifolia, Cornus sp., and Acer rubrum saplings. The presence of C. occidentalis indicates a high degree of flooding. This site is part of a large shrub swamp that is impounded by roads and the railroad and is maintained by the Game Commission for wildlife management purposes.

SITE 31--PEM5E. This is a monospecific stand of Typha latifolia.

--PSS1E. Various mixed shrubs, the same as for site #30, dominate this site, but in a slightly shorter form, growing about 4 to 6 feet tall.

Doylestown

SITE 32--PF01A. Fraxinus americana, Acer rubrum and Ulmus rubra are codominant in the overstory. This site was checked in the red signature. The streambank is cut down 5 to 6 feet.

SUMMARY

This summer appears to have been unusually dry, resulting in lower than normal water tables in many of the wetlands we encountered. This caused some difficulty in determining typical water regimes. Wetland plant species present and other evidence, such as debris surrounding tree bases, were relied upon heavily in determining degree of flooding in many cases. ~~Obligate~~ wetland species such as Arisaema were often found growing in very dry soils. FAC.W

The reddish understory signature common to floodplain PF01's seems to be consistently associated with a dense understory of low shrubs and/or herbaceous vegetation in general, rather than as a result of any particular species. In the Baltimore work area the signature was found to be associated with a Lonicera japonica understory. In Newark SW and NW Urtica dioica and Rubus occidentalis as well as L. japonica produced this effect. This signature also indicates a temporarily flooded (A) water regime.

Agricultural lands with a solid red signature, usually on floodplains and associated with Melvin or Bowmansville soils, were always upland situations. They usually had very short herbaceous vegetation resulting from mowing or grazing.

Plant species had the greatest influence in the PEM5 type in causing variability in photographic signature. Bright white resulted from dense stands of seasonally flooded or seasonal/saturated Phalaris arundinacea or Calamagrostis canadensis. Yellowish green was caused by seasonal/saturated stands of Carex stricta hummocks. Shaded green signatures were most often seasonally flooded mixtures of Solidago sp., Eupatorium sp., Juncus effusus, Impatiens capensis, Polygonum sp. and/or Carex sp.

Many Riverine sites that were spot checked appeared to have characteristics of both the lower perennial (R2) and upper perennial (R3) subsystems. It was decided to continue using the convention of R50WH that was used in the Baltimore

work area to describe a R2/R3 mixed type, unless the stream/river obviously fits into either category (ie. a wide, meandering R2 on a wide floodplain as opposed to an R3 on a steep slope or with visible rapids on the aerial photo).

Two conventions were established to describe the large impounding basins associated with the gravel excavations and strip mines. PUBKs describes the exposed unvegetated spoil deposits within the basins, and POWKh describes the open water areas. The "K", or artificial, modifier is to be used alone, as the sole indicator of water regime.

In a surprising number of wetlands, in seasonally as well as temporarily flooded sites, there was a mixture of obligate wetland species with other species that are typically found in uplands. This may be an indication of water regimes that fluctuate frequently, perhaps on a yearly, rather than just a seasonal basis.

In general, the objective to examine a representative cross section of sites from all dates of photography was accomplished, with the exception of the May 4, 1981 photography. This affects only Strip 8 of both work areas.

APPENDIX

Partial Plant Community list for Newark NW and SW check sites.

SITE 1--PF01A. Juglans cinerea, Carya ovata, Fraxinus americana, Cornus sp.,
Impatiens capensis.

SITE 2--POWKh.

--PUBKs. Carex sp., Cyperus sp.

SITE 3--POW/EM2F. Unidentified nonpersistent emergents.

SITE 4--PF01A. Liriodendron tulipifera, Acer rubrum, Fagus grandifolia,
Lindera benzoin, Viburnum (dentatum or recognitum), Viburnum acerifolium.

SITE 5--PF01/EM5A. Salix nigra, Juglans nigra, Platanus occidentalis, Acer
rubrum, Urtica dioica, Rubus occidentalis, Impatiens capensis, Lilium sp.

SITE 6--PF01C. Quercus palustris, Acer rubrum, Lindera benzoin, Cornus amomum,
Viburnum dentatum, Alnus rugosa.

--PSS1/EM5E. Acer rubrum, Viburnum dentatum, Alnus rugosa, Cornus
amomum, Leersia oryzoides, Carex stricta, Juncus effusus, Scirpus
cyperinus, Polygonum spp.

SITE 7--PF01/EM5C. Ulmus sp., Vitis sp., Cornus sp., Rubus allegheniensis,
Calamagrostis canadensis.

SITE 8--PF01A. Platanus occidentalis, Ulmus sp., Fraxinus sp., Juglans cinerea,
Lindera benzoin, Vitis sp., Rosa sp., Impatiens capensis.

SITE 9--PEM5E. Juncus effusus, Scirpus cyperinus.

--PEM5A. Eupatorium maculatum, Verbena hastata, Solidago sp., Polygonum
sp., unidentified grasses and sedges.

SITE 10--PEM5E. Polygonum arifolium, P. sagittatum, Typha latifolia, Scirpus
cyperinus, Eupatorium maculatum, Verbena hastata.

SITE 11--PEM5A. Solidago sp., Carex spp., unidentified grasses, Veronia
noveboracensis, Cornus sp., Panicum clandestinum, Juncus effusus.

--PEM5E. Epilobium sp., Salix sp., Juncus effusus, Impatiens capensis,
Typha latifolia, Polygonum arifolium.

SITE 12--PEM5C. Verbena hastata, Solidago sp., Eupatorium maculatum, Acer
rubrum, Polygonum sp., Impatiens capensis, Rubus allegheniensis.

--PEM5E. Carex stricta, Onoclea sensibilis, Typha latifolia, Polygonum
sp., Impatiens capensis, Thelypteris palustris, Osmunda cinnamomea.

- SITE 13--PEM5C. Phalaris arundinacea, Salix sp., Veronia noveboracensis.
- SITE 14--PAB3Zh. Lemna, Nymphaea odorata, Nuphar variegatum, Scirpus validus.
--PSS1E. Acer rubrum, Rosa sp., Cornus sp., Viburnum dentatum, Carex stricta, Polygonum arifolium.
- SITE 15--PF01A. Carya sp., Ulmus sp., Fraxinus sp., Carpinus caroliniana, Lindera benzoin, Acer rubrum, Lonicera japonica, Geum sp.
- SITE 16--PF01A. Fagus grandifolia, Ulmus sp., Acer rubrum, Fraxinus sp., Lindera benzoin, Geum sp., Symplocarpus foetidus.
- SITE 17--PEM5C. Impatiens capensis, Eupatorium maculatum, Solidago sp., Salix sp., Rubus sp., Polygonum arifolium, Sagittaria sp.
- SITE 18--PEM5E. Carex stricta, Leersia oryzoides, Juncus effusus, Impatiens capensis, Onoclea sensibilis, Scirpus cyperinus.
- SITE 19--PEM5C. Phalaris arundinacea.
- SITE 20--PF01A. Fagus grandifolia, Liriodendron tulipifera, Acer rubrum, Platanus occidentalis, Fraxinus americana, Lindera benzoin, Cornus amomum.
- SITE 21--PF04A. Tsuga canadensis, Rhododendron maximum, Acer rubrum, Quercus rubra, Lindera benzoin.
- SITE 22--PSS1E. Vaccinium corymbosum, Kalmia angustifolia, Sphagnum sp., Pinus rigida, Acer rubrum, Osmunda cinnamomea.
- SITE 23--PF01/SS1E. Acer rubrum, Vaccinium corymbosum, Viburnum dentatum, Nyssa sylvatica, Leersia oryzoides, Osmunda cinnamomea.
- SITE 24--PF01A. Acer rubrum, Fraxinus americana, Quercus sp., Ilex verticillata, Viburnum dentatum.
- SITE 25--PF01C. Fraxinus americana, Ulmus americana, Cornus racemosa, Geum sp.
- SITE 26--PEM5E. Leersia oryzoides, Typha latifolia, Alisma triviale, Polygonum sp.
--PEM2F. Polygonum spp., Penthorum sedoides, Scirpus cyperinus, Alisma triviale, Ludwigia palustris.
- SITE 27--PEM5E. Polygonum sp., Acorus calamus, Sagittaria sp., Nuphar variegatum.
- SITE 28--PEM5C. Acorus calamus, Scirpus cyperinus, Juncus effusus, Carex stricta, Veronia noveboracensis.
- SITE 29--R2AB3H. Nymphaea odorata, Nuphar variegatum, Sparganium sp., Lemna sp., Sagittaria sp.

SITE 30--PSS1E. Cephalanthus occidentalis, Rosa sp., Spiraea latifolia,
Cornus sp., Acer rubrum.

SITE 31--PEM5E. Typha latifolia, Thelypteris palustris, Boehmeria cylindrica,
Cephalanthus occidentalis.

--PSS1E. Cephalanthus occidentalis, Rosa sp., Spiraea latifolia,
Cornus sp., Acer rubrum.

SITE 32--PF01A. Fraxinus americana, Acer rubrum, Ulmus rubra, Acer negundo,
Lindera benzoin.