NECSS Field Tour – Ecological Site Highlights

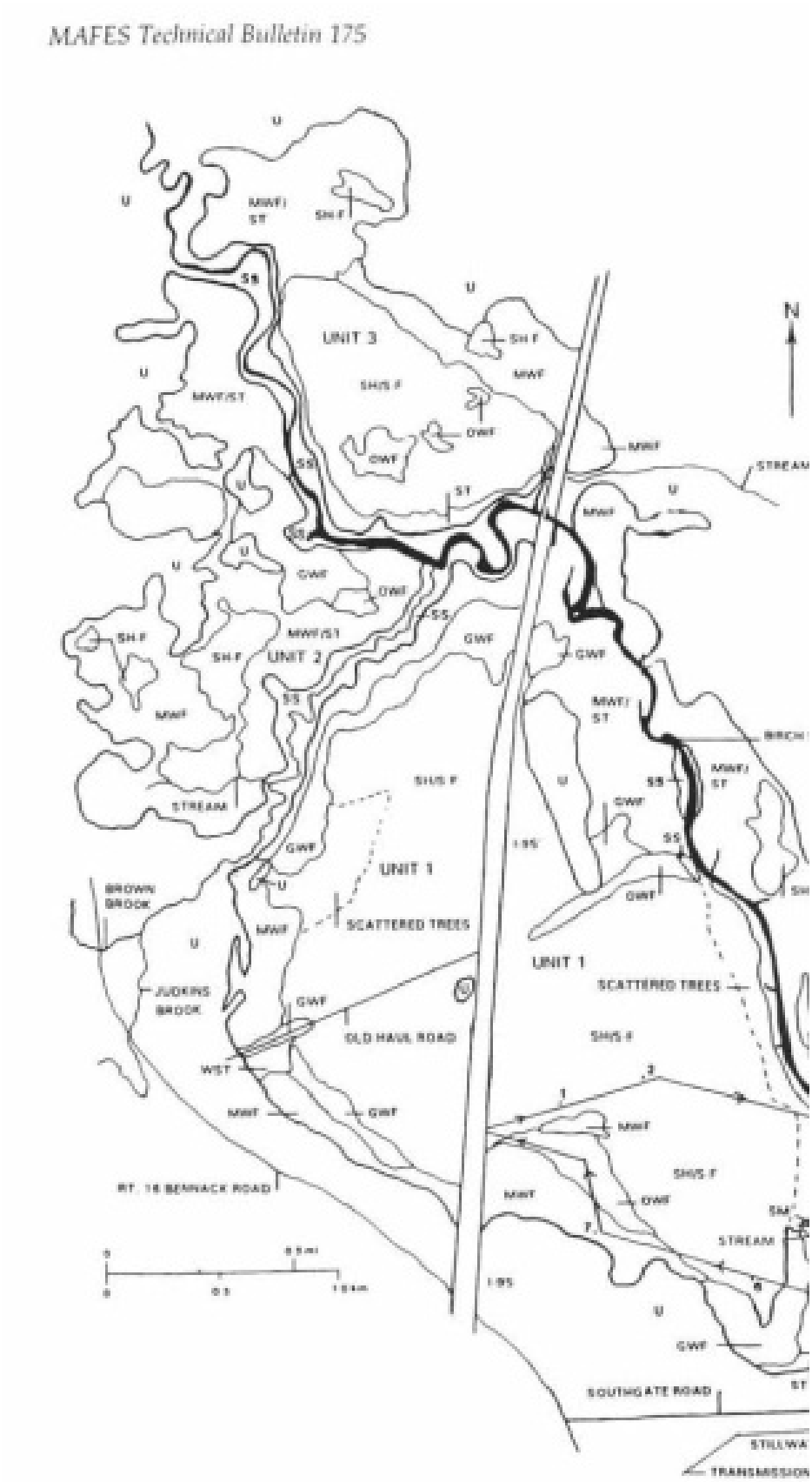
TOUR SITE 1. OPEN, NUTRIENT-POOR [ACIDIC] PEATLAND WITH GREATER THAN 40 cm OF UNDECOMPOSED OR PARTIALLY DECOMPOSED ORGANIC FIBERS FORMED MAINLY FROM SPHAGNUM MOSSES (UNPATTERNED FEN) - **ALTON BOG** – North of Orono on either side of Interstate 95 – SEE BOG MAP AND LEGEND ON NEXT PAGE

ECOLOGICAL SITE DESCRIPTION: Alton "Bog" is a very large (-1030 ha), unpatterned, very acidic to acidic fen occupying a flat open basin in the Penobscot River lowland. A representative portion of the southern part of Unit (complex) 1 (see map) was sampled for vegetation, chemistry, and peat stratigraphy. The peat is shallow (generally - 1 m deep; maximum often probings: 2 m); boulders emerge through it in some places. The peat began accumulating about 5500 14C yr B.P. (H. Almquist-Jacobson, Univ. Maine, pers. comm.) as open and wooded fen atop soils derived from glaciomarine silt-clay. *Sphagnum* remains are absent below 0.5 m depth; oligotrophication/ acidification had not progressed enough for an abundance of *Sphagnum* until recent time. The peatland is bordered on the southwest by an esker. Birch Stream flows generally south-southeastward through the peatland. The much smaller Brown Brook passes northeastward through the fen and into an eastward flowing bend of Birch Stream. Along much of their courses through the peatland, these streams are narrowly bordered by swamp forest on largely-mineral soil. The southern roughly two-thirds of the peatland (Unit 1), south of Brown Brook and mostly west of Birch Stream, contains the largest expanse of shrub heath and sedge fen vegetation characteristic of very acidic conditions. This complex is bisected, and its drainage and vegetation disturbed by the south to north alignment of U.S. Interstate Highway 95 (195). Further disturbance on the western side of 195 was caused by a haul road that was used for construction of 195. This disturbance is still evident in the vegetation. Mixed wooded fen vegetation is present on the east side of the stream. The northern third (approx.) of the peatland is split into roughly equal western (Unit 2) and eastern (Unit 3) parts by Birch Stream. Unit 2 vegetation consists of a patchwork of wooded fen and shrub-thicket. Unit 3 contains the peatland's second largest area of open shrub heath and sedge (very acidic fen type). The pore-water in near-surface peat in Unit 1 ranges from pH 4.0 to 4.5, with dissolved calcium from 0.4 to 5.7 mg L^{1}

(Description, map and legend excerpted from: DAVIS, R.B. and D.S. ANDERSON. 1999. Numeric method and supporting database for evaluation of Maine peatlands as candidate natural areas. Maine Agricultural and Forest Experiment Station Technical Bulletin 175. p 70; and additional information is available in ANDERSON D. S. and R. B. DAVIS. 1998. The Flora and Plant Communities of Maine Peatlands. Maine Agricultural and Forest Experiment Station Technical Bulletin 170.)

MAP LEGEND

AWF = angiosperm wooded fen
Ch = *Chamaedaphne*
D = drainage
DD = drainage ditch
F = fen
F* = ribbed fen
FB = forested bog
Gr = graminoid
GWF = gymnosperm wooded fen
LG = lagg
LST = low shrub thicket
MB = mud bottom
MC = *Chamaedaphne-moss* lawn
ML = moss lawn
MWF = mixed wooded fen
OAWF = open angiosperm wooded fen
OGWF = open gymnosperm wooded fen
OWF = open wooded fen
P = pattern
S = sedge
Sch = *Scheuchzeria*
SH = shrub heath
ShF = shrub (mostly non-ericaceous) fen
SM = streamside meadow
SS = streamside swamp (mineral soil wetland)
ST = shrub thicket
U = upland
WSH = wooded shrub heath
WST = wooded shrub thicket
WT = water track



2. MODERATELY WELL DRAINED COARSE-LOAMY SOIL FORMED IN LODGEMENT TILL ON LOWER SLOPES AND RAVINE FLATS - **HEMLOCK FOREST** (CHESUNCOOK)

ECOLOGICAL SITE DESCRIPTION - Located on well drained loamy shallow (< 50 cm), acidic (pH 4.8-5.6), soils on lower slopes and ravine flats, may grade into somewhat poorly drained, sea level to 1200 ft elevation, and dominated (> 50% cover) by a closed canopy of hemlock or often co-dominant with red spruce, red oak, yellow birch, red maple, or sugar maple. White Pine, such as in this location, is co-dominant because it is in a transitional site where the white pine will give way to hemlock in time. The understory is sparse with conifer regeneration and some moss on rocks and dead-down material [NVC-Appalachian (Hemlock)-Northern Hardwood Forest or Laurentian-Acadian Pine-Hemlock-Hardwood Forest; SAF 23 Eastern Hemlock-acidic, well to somewhat poorly drained lithic regosols, lithic and gleyed podzols, or orthic gleysols, on slopes, hill tops, on thin rocky till or on colluvial or shale deposits, and sandy, marine or fluvial banks at elevations between sea level and 2500 ft.]

3A. WELL DRAINED COARSE-LOAMY OVER SANDY OR SANDY-SKELETAL FORMED OVER GLACIAL TILL ON LOWER TO MIDDLE HILL SLOPES - **NORTHERN HARDWOOD (BEECH-BIRCH-MAPLE) FOREST** (MONADNOCK)

ECOLOGICAL SITE DESCRIPTION - Located on well drained silt loams, sandy loams, or loamy sands over glacial till on lower to middle portions of hill slopes (10-50%) up to 2000 ft elevation, and dominated by closed canopy of beech, yellow birch, and sugar maple with a variable understory dominated by tree regeneration. Striped maple is a common sub-canopy tree and paper birch, red maple and conifers can each have greater than 25% cover. This plant community is actually an Alternative State called ASPEN-BIRCH WOODLAND/FOREST COMPLEX of the Reference State NORTHERN HARDWOOD FOREST. This site is in a later stage of transition than Site 4 (near big rock) which was more recently harvested than this site. [NVC - Appalachian (Hemlock)-Northern Hardwood Forest or Laurentian-Acadian Northern Hardwood Forest; SAF 25 Sugar Maple-Beech-Yellow Birch – occurs at elevations from near sea level to ~2500 ft., on moist, well-drained, fertile loamy soils.]

3B. OPEN, NUTRIENT-POOR [ACIDIC] PEATLAND WITH GREATER THAN 40 cm OF UNDECOMPOSED OR PARTIALLY DECOMPOSED ORGANIC FIBERS – **SHEEP LAUREL-DWARF SHRUB BOG** –

ECOLOGICAL SITE DESCRIPTION - Located in saturated, highly acidic (pH 3.9 to 4.6), peatland, and water is not visible. Plant community is dominated by dwarf heath shrubs such as Sheep Laurel, Rhodora, and/or Labrador Tea, with some Leatherleaf, on fibric organic matter that is permanently saturated with water. Stunted and scattered black spruce and larch trees from less than 25% cover. Heath shrubs carpet the hummocks with sedges contributing 20 to 25% cover, including tufted cotton-grass. Pitcher plant and sundew are usually present. Virtually all nutrients come from precipitation.

4A. SOMEWHAT EXCESSIVELY DRAINED SANDY SOILS FORMED IN GLACIOFLUVIAL MATERIAL - **ASPEN-BIRCH WOODLAND/FOREST COMPLEX** (gravel pit and big rock) (ADAMS)

ECOLOGICAL SITE DESCRIPTION - Alternative State is a transition to Northern Hardwood Forest. This plant community is located on well to excessively drained, soils, and dominated by an open canopy of post fire or harvest aspen, birch, and red maple with a dense understory of shrubs and herbs (especially in more open patches). [NVC – Acadian Low-Elevation Spruce-Fir-Hardwood Forest or Laurentian-Acadian Pine-Hemlock-Hardwood Forest or Laurentian-Acadian Northern Hardwood Forest; SAF 16, transition subtype Aspen-Paper Birch - early-successional stage of Northern Hardwood or Spruce-Northern Hardwood Forest, occurs on most soils except very driest sands and wettest swamps]

4B. MODERATELY WELL DRAINED COARSE-SILTY SOILS FORMED IN GLACIOLACUSTRINE MATERIALS - **RED PINE-WHITE PINE FOREST** (NICHOLVILLE)

ECOLOGICAL SITE DESCRIPTION - Located on dry-mesic to xeric, very shallow to shallow (10-50 cm to bedrock) sandy loams to sands on upland flats, slopes of < 25% or low ridges at < 1000 ft, and dominated by a partial (> 70%) canopy of red pine and white pine or red spruce may be co-dominant. Paper birch, red maple and big-toothed aspen are also present. Understory is sparse, less than 25% cover and contain few species, such as low-bush blueberry, bracken fern and wintergreen. The ground has patches of mosses and very few lichen. [NVC- Laurentian-Acadian Northern Pine-(Oak) Forest]

4C. VERY POORLY DRAINED SOIL LOCATED ON MINERAL OR TERRIC ORGANIC FLATS ALONG DRAINAGES, STREAM FLOWAGES, FLOODPLAINS, OR LOW FLATS - **CATTAIL MARSH**

ECOLOGICAL SITE DESCRIPTION - - Located on semi-permanently flooded muck over mineral soil, adjacent to open water and dominated by tall marsh species such as Cattail species with some few shrubs such as winterberry and meadowsweet. Other grasses and sedges as well as herbs and mosses are usually sparse and occur on hummocks.[NVC – Laurentian-Acadian Freshwater Marsh]

4D. SOMEWHAT POORLY TO POORLY DRAINED COARSE-SILTY SOILS FORMED FROM GLACIOLACUSTRINE MATERIALS – **SPRUCE-FIR WET FLAT TRANSITIONING BETWEEN NORTHERN HARDWOOD FOREST AND RED PINE-WHITE PINE WOODLAND** (ROUNDABOUT)

ECOLOGICAL SITE DESCRIPTION – Located on less than 30 cm of moist (only seasonally flooded in spring) organic material over mineral soil on level to gently sloping low flats or along drainages and dominated by spruce species with balsam fir and occasionally northern white cedar, white pine, larch and red maple. The understory is greater than 75% mosses with sparse shrubs, such as low-bush blueberry, and herbs such as bunchberry and goldthread. [NVC - Northern Appalachian (Laurentian?)-Acadian Conifer-Hardwood Acidic Swamp; Cowardin - Palustrine Needle-leaved Evergreen and Deciduous Forested Wetland (PFO4/2); SAF - Red Spruce - Balsam Fir: 33]

5A. SOMEWHAT EXCESSIVELY DRAINED SANDY SOILS FORMED IN GLACIOFLUVIAL MATERIAL **JACK PINE WOODLAND** (ADAMS)

ECOLOGICAL SITE DESCRIPTION - Located on very well drained, very shallow (< 20 cm) layer of sandy soil or poorly decomposed organic duff over bedrock, some occurrences grow on deeper sands on gentle slopes of flats or low ridges, usually at < 900 ft elevation, and dominated by an open canopy (< 60% closure) of jack pine. Red spruce, black spruce or white pine are common associates. The understory has abundant layer of heath shrubs such as low-bush blueberry, sheep laurel, and herbs such as bunchberry. Reindeer lichen can be abundant as at this location. [NVC – Northern Appalachian-Acadian Rocky Heath Outcrop]

5B. POORLY DRAINED SANDY SOILS FORMED IN GLACIOFLUVIAL MATERIAL ON NONPERENNIAL RIVERINE OR MINERAL FLAT - **SPRUCE-FIR-WET FLAT** (KINSMAN)

ECOLOGICAL SITE DESCRIPTION - Located on less than 30 cm of moist (only seasonally flooded in spring) organic material over mineral soil on level to gently sloping low flats or along drainages and dominated by red, black and red-black hybrid spruce with balsam fir and occasionally northern white cedar, white pine, larch and red maple. The understory is greater than 75% mosses with sparse shrubs, such as mountain holly, low-bush blueberry, and herbs such as bunchberry, trillium, and goldthread. [NVC - Northern Appalachian (Laurentian?)-Acadian Conifer-Hardwood Acidic Swamp; Cowardin - Palustrine Needle-leaved Evergreen and Deciduous Forested Wetland (PFO4/2); SAF - Red Spruce - Balsam Fir: 33]

6. SOMEWHAT EXCESSIVELY DRAINED SANDY SOILS FORMED IN GLACIOFLUVIAL MATERIAL - **NORTHERN HARDWOOD (BEECH-BIRCH-MAPLE) FOREST** (ADAMS)

ECOLOGICAL SITE DESCRIPTION - Located on well drained silt loams, sandy loams, or loamy sands over glacial till on lower to middle portions of hill slopes (10-50%) up to 2000 ft elevation, and dominated by closed canopy of beech, yellow birch, and sugar maple with a variable understory dominated by tree regeneration. Striped maple is a common sub-canopy tree and paper birch, red maple and conifers can each have greater than 25% cover. This plant community is actually an Alternative State called ASPEN-BIRCH WOODLAND/FOREST COMPLEX of the Reference State NORTHERN HARDWOOD FOREST. This site is in a later stage of transition than Site 4 (near big rock) which was more recently harvested than this site. [NVC - Appalachian (Hemlock)-Northern Hardwood Forest or Laurentian-Acadian Northern Hardwood Forest; SAF 25 Sugar Maple-Beech-Yellow Birch – occurs at elevations from near sea level to ~2500 ft., on moist, well-drained, fertile loamy soils.]

(Some of the Ecological Site/Plant Community Description (except for Tour Site 1) information taken from GAWLER S. AND A. CUTKO. 2010. Natural Landscapes of Maine: A Guide to Natural Communities and Ecosystems. Maine Natural Areas Program, Maine Department of Conservation, Augusta, Maine.)