

**Natural Community
FIELD FORM INSTRUCTIONS**

Modified for **Massachusetts**
by Patricia Swain, NHESP
and Andy Finton, NHESP (Form 2)
and (Form 3) Nancy Putnam, DFW Forest Project Ecologist
John Scanlon, DFW Forest Project Leader

from a 1991 draft by
Lesley Sneddon, Regional Ecologist
The Nature Conservancy, Eastern Heritage Task Force
201 Devonshire Street
Boston, Massachusetts

Massachusetts Natural Heritage & Endangered Species Program

Division of Fisheries and Wildlife

Rt. 135

Westborough, MA 01581

Field forms were designed to standardize data collection. We have divided the community data into categories, and designed separate forms with different purposes:

COMMUNITY FORM 1: TRANSECT, SITE SURVEY SUMMARY: use this form for reconnaissance, for a new site that is essentially unknown from community description perspective. Use this form to try to "make sense" of the landform: where are the communities in relation to changes in topography? What are the communities? What are the boundaries? For sites that are degraded (obvious C and D ranked community occurrences), this may be the only community form completed. It will serve as a record of the visit and provide some community data, but probably will not be mapped or entered into the database of Priority and Exemplary Communities. Information on low quality community occurrences may be entered into a secondary community database to be tracked for a record of the sites. Form 1 is useful for recording general information along transects, with notes taken when communities change.

FORM 2: NATURAL COMMUNITY SUMMARY AND RANKING form: use to record information on the community location and rank, and includes fields for description. The natural community will be a part of a property or site: a bog, a hemlock ravine, an isolated stretch of floodplain forest are all communities. Single Form2s may have several plot or transect forms with them. On the back of Form 2 is guidance for assigning a rank for a community occurrence (element occurrence rank), generally for A or B-ranked occurrences, or best known occurrences (C- or D- ranked common communities for which no pristine examples occur). The basis of ranking needs to be explained: range wide, state wide, or locally. These ranks are meant to apply state wide: if you are only familiar with the community in part of the state, give it a relative rank, but give your area of comparison. If you are giving it a global rank say so clearly. Form 2 contains fields for ownership information – if known - and other miscellaneous information that will assist in initiating protection activity. This form will also contain basic information regarding management needs of the community element: burning, exclosures, etc. This form can also be used as a record of subsequent visits, as an update form. A marked up topographic map must accompany Form 2, showing location and boundaries of the community type.

FORM 3, BASIC VEGETATION AND HABITAT INFORMATION: This form is to report plots, usually done in the best occurrences of community types. There can be several Forms 3 for any given community occurrence and its Form 2. This form contains all the basic information fields needed for minimum documentation of community occurrences. The sampling method is the relevé, which appears to be a reasonable compromise between the community "species list" and the more detailed plot techniques (e.g. macro-plots). Relevés are circular, square, or rectangular plots placed in the most representative portion of the community occurrence (but placement within this area should be random). Plots in most cases are not permanently marked (but semi-permanent markers may be used if a return visit is anticipated). Plots may be measured with a tape, but if you are familiar with your pace length, you may simply pace the distance and flag the corners. Identify what size and shape plot were used, or if it was plotless.

A given community occurrence may have several plots. All the information on Form 3 pertains to the plot. If more than one plot is taken (large community occurrences may require more than one plot), use a new sheet for each plot. Each should be labeled carefully to associate it with other Form 3s and with its Form 2. Make sure each plot can be identified if the pieces of paper get separated. Each set of forms needs a map associated with it to locate the plots and the community.

Filling out Form 3. Follow these instructions as much as possible. There is a lot of information requested, and you may not be able to supply it all. Soil information is helpful, but requires equipment you may not have with you. Do what you can, balancing information acquisition with time available. General descriptions are very useful.

All forms submitted to NHESP will be photocopied. Interns may transcribe them. You need to be neat and clear. Pencil doesn't photocopy well. Your data is valuable – help us make it useful by being legible!

Form 1 Reconnaissance

A. Identifiers:

- 1) **Site Name** - "Official" name. Leave blank if you don't know it.
- 2) **Survey Site Name** - provisional name assigned by field worker; should represent an identifiable feature on topographic map.
- 3) **Town** - appropriate name from topographic map.
- 4) **Directions** – provide these from an easily identified road or other location. Include parking information if useful. These should be precise directions in words; attach a map if appropriate.
- 5) **GPS used, yes or no, and the latitude and longitude, make and model of the GPS unit if used.** Provide the lat and long from a topo map if no GPS was used. If GPS points are taken at each observation location, provide the points below and leave the lat and long blank here.
- 6) **Source Code** -assigned by NHESP.
- 7) **Survey Date** - year, month, day. Date of survey.
- 8) **Main Surveyor:** name of person responsible for the identifications and information.
- 9) **Other Surveyors** - names and addresses, as appropriate, for field assistants.

B. Topography:

- 10) **Transect** - a sequence number for identifying location.
- 11) **A topographic map must accompany the form, with locations indicated. Reconnaissance Diagram** - diagrammatic cross section or toposequence showing changes in elevation and corresponding changes in vegetation and soils. Mark each observation point and releve location on the diagram. (Corresponding brief descriptions for each point are given in part C). Use arrow to show compass direction and indicate approximate elevation changes and distance covered in meters. Indicate scale using ruler or stick figure.

C. Vegetation/Habitat Observations:

- 12) **Observation point number for the transect, GPS point name, and GPS latitude and longitude.** Give the GPS point a unique identifier for correlating with other information.
- 13) **Community name** - state or national vegetation name, if known; provisional name may be assigned if preferred – label as such if used.
- 14) **Additional data** - state whether Form 2 and/or Form 3 were completed for this observation point.
- 15) **General Description** - briefly describe the community or feature with the physiognomy and three dominant species of each stratum. If form 3 was filled out, omit, and write “see form 3,” and make sure they are identified for easy cross reference.

Form 2: Natural Community Summary and Ranking:

Always include a copy of the appropriate USGS topographic map with this form, with the community and any transects shown.

- 1) **Community Name** - name of the community from the draft classification.
- 2) **NatureServe Association Name** – an optional field for those working with the National Classification.
- 3) **Survey Date** - Date the field work was done.
- 4) **Today's Date** - Date the form is filled out.
- 5) **Survey site name** - Provisional name of the site, usually named after a geographic feature.
- 6) **Surveyors name(s)** - give the main surveyors name first, name field assistants present. Add addresses if appropriate.
- 7) **Best Source** – if the form is based on previous work or someone else's survey, provide a citation.
- 8) **Transcriber** – leave blank, NHESP use only.
- 9) **Town** - official town the site is in, not local village
- 10) **Directions to the site** - from an easily identified road or other location. Include parking information if useful. Give precise directions in words; attach map if appropriate. Use clear sentences that will be understandable to someone who is unfamiliar with the area and has only your directions to follow. Give distances as closely as possible and use compass directions. Give additional directions to the plot within the site.
- 11) **GPS point(s)** – yes or no, and supply if taken.
- 12) **Vegetation Description** - description of the site with list of key species and community structure.
- 13) **Physical Description** - Give a word picture of the area, including a general description of the vegetation and the landscape. Describe the setting for the site, including whether there is surrounding conservation land, highways, or development.
- 14) **Is the community on conservation land:** if known, name the property.
- 15) **Evidence of Disturbances/Threats/Management** – as described on the form. Generally, threats and evidences of disturbances are from observations while in the field or from information gained from knowledgeable sources. These may lead to management recommendations as appropriate
- 16) **Protection comments** - to be filled out if the information is known.
- 17) **General Comments** – notes on sampling techniques, other forms filled out, and other information gathered or needed. Note if photographs were taken and are available, what type (digital, slides, prints).
- 18-21) **Owner information** - leave blank if not known

Community Element Occurrence Ranking

These fields are very important, fill out the parts you are comfortable with. Use the comment fields. In the comments field state what the comparisons are to: is this a property, region, state, or range wide assessment? Comment on size, exotics, management possibilities, position in the landscape, ownership or other useful criteria. NHESP does have draft technical criteria for ranks which will be made available on request.

Natural Community Form 3 General Instructions

Generalized from modifications made by Nancy Putnam and John Scanlon for Combined Allowable Harvest & Biological Inventory of DFW Lands

FORM 3, BASIC VEGETATION AND HABITAT INFORMATION: This form is used to report plots that are traditionally located in the best occurrences and in the most representative portions of natural communities. Traditionally, Form 3 plots are subjectively located in order to capture the full biodiversity of plant communities. Complete a Form 3 at the first place where a community looks appropriate. Complete additional Form 3's as needed if there are substantial changes in vegetation composition and/or structure in subsequent parts of the natural community occurrence. Examples of "substantial changes" include a shift in tree species composition from American beech and yellow birch to sugar maple and white ash within a stand of northern hardwoods (NH), or a shift in species composition from black oak and American beech to red oak and sugar maple in a stand of mixed hardwoods (MH). Likewise, a shift in tree size from 8-10" DBH dominant trees to 12-14" might warrant two sample plots. Also, a shift in canopy closure from relatively open (35% canopy) to relatively closed (60% canopy) might warrant two sample plots.

A. Identifiers:

- 1) **Community Type** – State name of observed community type using Swain & Kearsley or NatureServe's US NVC. If you are unsure if one of these community types applies, mark the name as provisional.
- 2) **GPS Point:** Take GPS point at the center of the plot, name the point using a unique identifier, and record the identifier used.
- 3) **Assigned Type** – Leave blank, this is for the official community type name, assigned by NHESP staff.
- 4) **Latitude** - in decimal degrees. **Longitude** - in decimal degrees. **Provide projection if not in Mass State Plane!**
- 5) **Site Name** - "Official" name. Leave blank if you don't know it.
- 6) **Quad name(s)** - USGS quadrangle map name and scale (optional).
- 7) **Ecoregion** – Use updated standard MA ecoregions (can be assigned later).
- 8) **County** – county name from map (optional)
- 9) **Town** – town or city name from map, not local village.
- 10) **Directions** - from an easily identified road or other known location. Include parking information if useful. Give precise directions in words; attach map if appropriate. Use clear sentences that will be understandable to someone who is unfamiliar with the area and has only your directions to follow. Give distances as closely as possible and use compass directions to plot. Edit/enhance directions at the end of each field day.
- 11) **Survey Date** - year, month, and day. Pertains to date of field survey.
- 12) **Previous observations of this type at this site** – If you have observed this community type at this site before, list the dates of your previous observations.
- 13) **Surveyors** - names and addresses, as appropriate. List principle surveyor first.

B. Environmental Description:

- 14) **Plot #** - Your number, may be the same as the GPS point identifier if desired.
- 15) **Image Annotation #** - patch identifier if noted on aerial photograph (optional).
- 16) **Elevation** – (from topo map) elevation of the plot, in feet or meters, label units used.
- 17) **Topographic Position** - topographic position of the plot in the landscape, check off.
- 18) **Topographic Sketch** - draw a topographical sketch and indicate position of plot. Add N arrow to show compass direction and indicate approximate elevation changes (optional).
- 19) **Slope Aspect** - use a compass and be sure to correct for the magnetic declination.
- 20) **Slope Class** - measure slope using a clinometer or check appropriate slope class. Note if clinometer used.
- 21) **Slope Shape** – circle the appropriate type for vertical or horizontal topography observed

- 22) Downed Wood** – record diameter, approximate length in 5 foot increments, and decay class for the single piece of downed wood $\geq 4''$ that has the largest diameter of all downed wood in the plot or near GPS point (e.g., if one piece of downed wood has a 20'' diameter, and all other pieces of downed wood have a smaller diameter, record the approximate length and the decay class for the 20'' piece). Then, estimate the average diameter of all downed wood $\geq 4''$ in diameter in the general vicinity. Then record the % cover (cover classes from item 41) of downed wood. Use the following decay classes:
- Decay Class A** = bark is usually present, at least partially, wood is still firm, but some areas may be soft when pressed with a foot, branches may be intact and log is often elevated, at least partially.
- Decay Class B** = bark is usually absent, wood is very spongy when pressed with fingers, log is usually entirely on the ground, and branches are usually absent.
- 23) Fuel load** – estimate levels of dead and highly flammable fuels that are less than $\frac{1}{4}''$ in diameter.
- 24) Snags:** Record the species, DBH, and approximate height class (estimate or use Kuchler height classes in #41) of standing dead trees $\geq 4''$ DBH.
- 25) Unvegetated Surface** – Check only one option that represents the most dominant feature in the plot. For example, if there is a scattering of both small rocks and large rocks at the site, check large rocks on the pick list. Likewise, if there are ledge (bedrock) outcrops and large rocks in the vicinity of the plot, check bedrock. However, if there is only a slight outcrop of bedrock, but numerous large rocks near the plot, check large rocks on the pick list.
- 26) Litter and duff depth:** Litter includes freshly-fallen leaves, needles, twigs, bark, fruits, and wood fragments. Duff is the fermentation layer and humus layer (organic horizon). Measure depth from top of litter down to the edge of mineral soil and round it to the nearest one-half inch.
- 27) Parent Material/Bedrock** - note the geologic substrate influencing the plant community (bedrock or surficial materials), if known.

Igneous and Metamorphic Rocks

Granitic (Granite, Schyolite, Syenite, Trachyte)

Gabbroic (Gabbro, Basalt, Pyroxenite, Peridotite)

Dioritic (Diorite, Dacite, Andesite)

Gneiss, Schist, Slate and Phyllite, Marble, and Serpentine

Sedimentary Rocks

Conglomerates and Breccias

Limestone and Dolomite

Sandstone, Siltstone, Shale

Marl, Gypsum

Glacial deposits:

undifferentiated glacial deposit, till, moraine, bedrock and till

Glacio-fluvial deposits (outwash plains, ice-contacted GF deposits, eskers, kames, pro-glacial deltas, etc.)

Deltaic deposits (alluvial cones, deltaic complexes)

Lacustrine & fluvial deposits (glacio-fluvial, fluvio-lacustrine, freshwater sandy beaches, stony/gravelly shore)

Marine deposits (bars, spits, sandy beaches, old shorelines, old beach ridges, old marine clays, etc.)

Organic deposits: peat (with clear fibric structure) and muck

Marsh, regularly flooded by lake or river (high mineral content)

Slope and modified deposits: talus and scree slopes, colluvial, solifluction, landslide

Aeolian deposits: dunes, aeolian sand flats, loess deposits, cover sands

- 28) Moisture Regime** - moisture regime is based on the amount of water available to plants. It is evaluated on the basis of soil drainage, soil structure and texture, and climate. Choose one:

VERY DRY: medium and coarse sands: steep eroding sands, rock piles, gravel, and shallow soils, not influenced by ground water.

DRY: deep silty sands and loamy sands, not influenced by ground water.

MOIST: soil surface above the maximum water level; normal soil profile development hampered because of imperfect drainage. Upper 1-2 feet of soil well-aerated during vegetative season. Occurs also on heavy textured soils with perched water table and on dry deep peat.

WET: water level at soil surface for most of vegetative season. Reduced gley layer up to mineral soil surface on mineral soils; mottling usually absent or insignificant. Organic soil, gleysol

SATURATED: water level above soil surface for most part of vegetative season. Minimum water level approximately at soil surface. Organic soil.

PERIODICALLY INUNDATED: (hydric) known to be periodically inundated due to flood/drought cycles or other variable moisture regimes.

PERMANENTLY INUNDATED: (hydric) minimum water level above soil surface, soils permanently inundated.

29) Soil Type – estimate overall texture of upper 1 m of loose deposit.

sand : soil does not remain in a ball when squeezed, soil particles are 0.05-2.0mm in diameter.

clay: generally hard when dry and sticky and plastic when wet, soil particles are <0.002 mm in diameter.

loam: consists of sand, silt, and clay separates ranging from sandy loams to silty clay loams.

muck: dark colored, finely divided, well decomposed organic soil material mixed with mineral soil material. The content of organic matter is more than 20%.

peat: unconsolidated material, largely undecomposed organic matter that has accumulated under excess moisture.

30) Sphagnum Hummocks Overhanging Water: these areas may be important nesting habitat for Four-toed Salamanders. Document these habitats if they are visible from the plot and only if they are greater than 25 m² in overall size. If these habitats are larger than 0.5 acre, a separate plot (Form 3) should be done within that community type. For sphagnum habitats less than 0.5 acre estimate the size of the sphagnum/open water habitat, if pools of water or channels of moving water are present, circle the appropriate category(s). Measure or estimate maximum water depths in three locations within the channels or pools of water present. Record the habitat location with a GPS point.

31) Evidence of Land Use History – Circle or record observations of agricultural, management, or past development activities that are evident within or near the plot. This will help determine the occurrence of primary vs. secondary forest (primary forest may have been cut, but was never converted to agriculture, and may retain soil invertebrates and vegetation root structures that are absent from secondary forest).

32) Evidence of Disturbance – Circle observed evidence of past disturbance within or near the plot.

33) Environmental Comments - Additional observations, note whether vegetation is homogeneous or made up of distinct patches; evidence of erosion or sedimentation; invasive plant species, etc. For invasive plants, list the scientific name of the species and note whether the infestation observed at the plot appears to be New (colonizing), Established, or Expanding. Document all ATV activity that is causing erosion, rutting, or other environmental degradation. Take a digital photo and GPS waypoint at each occurrence, and maintain an office spreadsheet to summarize all occurrences.

C. VEGETATION: Protocol for Community form (Form 3, back).

34) System: check appropriate ecological system for the plot

35) Plot Number: for correlating with site forms and other plots. Should be the same as #14.

36) Plot dimensions: Normally, width and length dimensions for square plots. Say if “plotless.” Plot sizes vary with the type of community. Choose the appropriate plot size based on the table below:

Forest	200 - 500 m ²	
	Seedling and sapling (1-6” dbh dominate); development classes 1 & 2:	10 x 10 m plot
	Large pole (trees 7-12” dbh dominate); development class 3:	15 x 15 m plot
	Sawtimber (trees >12” dbh); development classes 4 & 5:	20 x 20 m plot
Shrubland	50 - 200 m ²	8 x 8 m plot
Grassland & Heath:	25 - 100 m ²	may be multiple smaller plots 5 x 5 m plot

Square plots are preferred. Because there is greater potential for edge effects or patchiness in long rectangular plots, use them only when needed to fit in a narrow zone.

Circle or variable radius plots are possible. Specify what is used.

37) Leaf Phenology - Check the type of leaf structure for the dominant stratum (greater than 25% cover).

38) Physiognomic Type - Select the description that best describes the community structure.

39) Photo Cover Type: Cover type abbreviation used by the photo interpreter, if available.

39a) Field-Observed Cover Type: Record observed cover type for the area around and including the plot.

40) Strata / life forms - Visually divide the community into vegetation layers. Indicate a distinct range of height above ground for each stratum (e.g., 50-80 feet for the tree canopy, T2). Then record the total percent cover for each stratum within the relevé. All vegetation layers may not be present at all plots. Remember that the height ranges for individual vegetation layers cannot overlap. However, the % cover may total to >100% since tree canopy occurs above shrub canopy, and shrub canopy occurs above herbaceous vegetation. Also, if gaps occur between vegetation layers, represent those gaps in the height data (e.g., if there is a 10 foot gap between the bottom of the tree canopy and the top of the tree sub-canopy, you might record their heights as 50-80 feet and 20-40 feet, respectively).

41) Relevé Data - list all species and their abundance/cover classes for each stratum, beginning with the tallest. Separate each stratum with a blank line. On the first line of each stratum, record the stratum code (OR Kuchler code), with its total percent cover. Species outside the plot should be listed in parentheses and not counted in the total number of species used in tabular comparison. For tree strata, include diameters (DBH) of several (or all, say which) of the (largest) trees in the plot. IF YOU USE A DIFFERENT APPROACH, MAKE IT VERY CLEAR WHAT YOU HAVE DONE.

Braun-Blanquet

Cover/abundance values:

- r one or few individuals
- + occasional, < 5% cover
- 1 common, < 5% cover
- 2- 5-12% cover
- 2+ 13-25% cover
- 3 26-50% cover
- 4 51-75% cover
- 5 > 75% cover

Sociability scale:

- 1 growing solitarily, singly
- 2 small groups, small tussocks
- 3 small patches, large tussocks
- 4 large patches, mats
- 5 great crowds, mats covering whole plot

Kuchler Height Classes

Life form Categories

Woody Plants

- B Broadleaf evergreen
- D Broadleaf deciduous
- E Needleleaf evergreen
- N Needleleaf deciduous
- S Semideciduous (B+D)
- M Mixed (D+E)

Structural Categories

Height (stratification)

- 8 >35m
- 7 20 - 35m
- 6 10 -20m
- 5 5 - 10m
- 4 2 - 5m
- 3 0.5 - 2m
- 2 0.1- 0.5m (knee high)
- 1 <0.1m (ankle high)

an alternative to the protocol on the back of form 3

Herbaceous Plants

- G Graminoids
- H Forbs
- L Lichens, mosses

Special Life Forms

- C Climbers (lianas)
- X Epiphytes

Coverage (of the layer)

- c continuous (>75%)
- i interrupted (50 - 75%)
- p parklike, patches (25 - 50%)
- r rare (5 - 25%)
- b barely present, sporadic (1-5%)
- a almost absent, scarce, (<1%)

Protocol for Community forms (form 3, back)

P. Swain

Using relevé procedures.

Plot sizes vary with the community--generally 20 x 20m or 10 x 10m for forest. If necessary subplots can be nested for different layers (5x5m for shrubs, several 1x1m for herbaceous)--label clearly whatever is done.

NOTE: You may prefer using actual estimated coverages instead of cover classes. If doing that be consistent, and clearly explain what you have done.

Kuchler height class

Species name1	Braun-Blanquet's code notes (cover . sociability)
Species name2	Braun-Blanquet's code notes (cover . sociability)

for example: (some people use abbreviations for species in notes, Acsa or Quru)

D6c

Acer saccharum	4.1	dbh to 10"
Quercus rubra	3.1	dbh to 8"
Acer rubrum	2.1	dbh to 6", one dead stem
Fraxinus americana	1.1	dbh to 8", edge of plot, most canopy out

M5r

Pinus strobus	2.1
Acer rubrum	2.2, multiple stems
Sassafras albidum	+1
Betula papyrifera	1.2

D3p

Cornus amomum	1.2
Viburnum acerifolium	+1

H1-2p (There's a choice here--call entire layer H and list small Ds and Gs, or separate each growth form. Purists probably separate. I tend to name the layer by appearance, so if grassy looking its G, even if it has Hs or if it is broadleaved herbaceous looking its H, but includes woody and grassy. Tends to be a long section.)

Aster infirmus	+1 (fl) (There are <u>lots</u> of +.1, s, probably most common.)
Aster paternus	+2
Viola sp 1.2 (it is best to be as precise as possible on species for the computer)	
Eupatorium rugosum	+1
Geum canadense	+1
Osmunda cinnamomea	2.2
Acer rubrum	+1
Vaccinium angustifolium	2.4
(Carex stricta	3.4, area near woods, not in plot)

B1a

Mitchella repens	+2
Gaultheria procumbens	+2

Note: There's flexibility here. Lump overlapping size classes (i.e. D4-5r). This is one reason for using the self defined strata on the top of the back of form 3, as well as the Kuchler classes.

If its a measured plot, say so: if eye balled, say where. And so on.