# ECS Site Classification Worksheet

**Version 2.0, Feb 2014**

mm        dd        yyyy

**Surveyor Names:** _____     **Date:** _____ / _____ / _____

**Site Code[2]:** _____        **Stand:** _____        **Acres:** _____        T___ R___S___

**GPS Coordinates: Easting:** _____        **Northing:** _____
                          **Lat:** _____        **Long:** _____
**Reason[1]: stand exam / map / other**        **Review Worksheet** ☐        **Map Correction Needed** ☐
**Comments:** _____
_____
_____
_____

**1**. Map(ping) includes plots to create & verify mapping    **2**. your own reference code for the plot

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# Native Plant Community & Soil Summary

**Main NPC[1]:** _____ (8 char code)        **Soil Map Unit[3]:**_____
**NPC Inclusions:**_____        **Land Type Associaton[4]:** _____ (7 char)
**Potential Crop Trees[2] Present:** _____        **Surface texture[5]:** _____
_____        **Drainage class:** _____
**Growth stage[1]:** _____        **Operability rating[6]:** _____

**1**. See NPC Field Guide.   **2. S**ee ECS tree suitability tables.   **3**. See SSURGO GIS cover; map unit symbol & name.   **4**. See LTA GIS cover.
**5**. e.g. sandy loam not medium       **6. See** ECS season of operability table

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# Soil Worksheet

**Instructions:** Dig/auger a soil pit 60" deep and draw soil profile in the sample box below. Indicate changes in soil texture and the depths at which they occur. **Top of the box (0) is the mineral soil surface for MH, FD & FF NPCs and the peat surface for WF, FP, & AP NPCs.** All depths measured in inches.
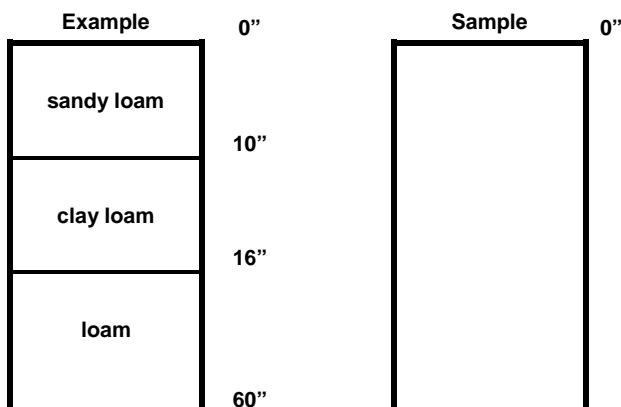
**Landscape position: top/crest – side slope – toe – level – depression** (circle one)

**Slope**(%) _____        **Aspect** _____        **Length of slope above in chains:**___

**Tot. Sample Depth:**___ **Depth to: gray mottles** ____     **gray matrix** ____     **standing water:** ____

**Semipermeable layer Depth:** _____        **Type: hardpan, clayey texture, both** (circle one)

**Humus type: mor – moder – mull – muck – moss peat** (circle one)  **Humus Thickness** (MH,FD,FF) ____

| Example | | Sample | | Comments & Notes: <u>pH</u>_____ |

**Example**        0"        **Sample**        0"        **Comments & Notes: pH**_____

| sandy loam |
| 10" |
| clay loam |
| 16" |
| loam |
| 60" |

# Native Plant Community Worksheet

**Instructions:** Locate a homogeneous portion of the stand. ***Along a 4-chain transect, record all of the plants that you can identify without moving more than a few steps off of the transect***. Record the species of overstory trees, understory trees & shrubs, and other plants in their appropriate life-form columns. ***At the end of the transect, stop to summarize for the whole community/stand*** the ***collective cover[1]*** of all plants in the life-form categories and the ***Abundance/Cover (A/C[2]) codes*** for the individual species of overstory trees, understory trees, and shrubs. Use this list to key out the site in the Field Guide.

| Overstory trees (> 33 feet) collective cover[1]: _____ | A[2]/C[1] * | Forbs, Ferns, & Fern Allies collective cover[1]: _____ | Grasses, sedges & rushes collective cover[1]: _____ |
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| **Understory trees & Shrubs** collective cover[1]: _____ | **A[2]/C[1]** * |  | **Mosses & Lichens** collective cover[1]: _____ |
| ***e.g.*** Red maple | *C/2* |  |  |
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**1. Cover (C) Codes:** **1** = <5% cover, plants occurring as scattered individuals; **2** = 5-25% cover, plants in small patches or spreading individuals; **3** = 25-50% cover, plants in large patches/colonies or co-dominant trees; **4** = 50-75% cover, plants in extensive colonies/mats/interrupted canopy or co-dominant trees; **5** = >75% cover, plants forming continuous canopy/carpet or occurring as dominant trees.

**2. Abundance (A) Codes:** **R** = rare, nearly absent; **F** = few, scattered individuals, **C** = common; **A** = abundant, co-dominant; **D** = dominant.

**\*** Estimate the abundance and cover of individual species using the combination of the abundance and cover codes above: ***e.g. enter "C/2" for a plant that is common in small patches that cover about 5-25% of the ground.***

# Instructions for ECS Site Classification Worksheets

The *ECS Site Classification Worksheets* were designed to help foresters and other field staff use the *Native Plant Community Field Guides* for Minnesota. The worksheets are designed: 1.) to remind the user of the vegetation and soil features to observe, 2.) to help select appropriate crop trees and season of operation, and 3.) to serve as datasheets for building a GIS cover of known locations of Native Plant Communities.

## Getting started – Field forms, what to sample, and where

- Copy pages one and two of this document front-to-back, for field use.
- Use an air photo and relevant maps; pre-delineate your site into polygons that are likely to be different plant communities. For example, a forest stand or group of stands might have several combinations of cover-types, slope positions, tree heights, etc. that could indicate different communities. In theory, a worksheet could be completed for each of these combinations. In practice, some of these polygons will obviously be the same plant community when seen on the ground and some will prove to be minor inclusions. Focus on the main community or two that will be affected by management or focus on the communities that you want to document.
- When you get to the site, determine a path that will take you through all likely community types. For a typical 20 to 40 acre stand, one can usually walk this course to the far end of a stand to get a feeling for the variety of communities that occur in the stand. At that time, decide which communities to sample and where you want to sample them as you re-trace your steps.
- A worksheet should be filled out for each sample location. If more than one NPC occurs in a stand, do a worksheet for each one. A sample should consist of a four-chain transect or an area of about 400 square meters. "Flagging out" a transect by putting flags at one-chain intervals before starting can help you to concentrate on searching for indicator plants rather than pacing.

## ECS Site Classification Worksheet – General Information Block

- **Surveyor Name:** record your full name.
- **Date:** record the date in mm/dd/yyyy format. e.g. 07/16/2004
- **Site Code:** use to record a code for the sample that will help *you* remember which sample it is such as: traverse & plot information, permit numbers, abbreviated site names, owner names, project codes.  The UTM location is used as a unique sample identifier upon entering the information into a database.
- **Stand:** record the MNDNR stand number if it exists.
- **Acres:** record the acres that the plot can be extrapolated to; 100 acres maximum.
- **GPS coordinates:** Record coordinates from the center point (soil pit location) of the four-chain transect. MNDNR extended zone 15 UTM coordinates are preferred and assumed. Alternatively record latitude and longitude, using decimal degrees.
- **T/R/S:** record the PLS township, range, and section. This is checked against the GPS coordinates and stand number.
- **Comments:** Comments are very useful to people who might want to use the data from the worksheet. Observations about pH (FP & AP NPCs), surface water, exposed bedrock, context of the sample, tree mortality, and why the sample was collected are all good things to record.

## Native Plant Community & Soil Summary – fill out last, see below

## Soil Worksheet

- Soils observations should be collected at the center point along the four-chain transect.
- **Landscape position:** circle the appropriate landscape position of the sample. Use of Lidar imagery and topographic information can assist on making this decision.
- **Slope:** record the percent slope.

- **Aspect:** record general aspect (N, NE, E, SE, S, SW, W, NW) of the sample site
- **Length of slope:** record the length of slope above the sample in <u>chains</u>.
- **Total Sample Depth:** record the maximum depth in inches attained for the soil sample
- **Depth to gray soil colors:** record the depth in inches to gray mottles, gray matrix, and standing water. If none are observed write a dash (-) or "none". Do not record a leached surface horizon (E layer) with bright colors below, we are interested in gray colors due to water saturation that should remain gray to the bottom of the hole.
- **Depth to semipermeable layer:** record the upper depth to the semipermeable layer, when present. Indicate the absence of such horizons by recording a dash (-) or "none."
- **Semipermeable Type:** A semipermeable layer is a soil horizon that is a hardpan, has a clayey texture, and/or has a firm consistence. Textures include: clay, silty clay, sandy clay, clay loam, silty clay loam, and sandy clay loam (consult your *Guide to Texture by Feel*). The field test for a hardpan or firm consistence is to take a natural chunk of soil (ped) a half to one inch in diameter and squeeze it between your thumb and a finger. Peds from a hardpan will disintegrate with considerable pressure or you cannot make it crumble. Firm peds will deform with considerable pressure.
- **Humus type:** circle the appropriate humus type according to the following definitions:
  - o Mor: A thick mat of undecomposed to partially decomposed conifer litter that is not significantly incorporated into the mineral soil (FD system).
  - o Moder: Partially decomposed remains of broad-leaved deciduous forest-litter that are shallowly incorporated into the mineral soil (MH system).
  - o Mull: All organic matter, except leaves from the previous fall, is incorporated into the mineral soil. The dark topsoil (A layer) is unusually thick - 3 to 5 inches. Mull humus is typical for prairies (UP System) but is used in MH System forests with high populations of earthworms.
  - o Muck: A dark-colored, soil surface layer composed of highly decomposed plant material in which the original plant parts are not recognizable (WF system).
  - o Moss peat: Little-decomposed, brown peat composed of the remains of Sphagnum moss (FP and AP Systems).
- **Humus Thickness:** record humus layer thickness in inches for MH, FD, and FF communities only and omit it from the sketch. Draw the humus (peat) layer(s) in the sketch for WF, FP, and AP communities.
- **Soil Profile Sketch:** sketch soil layer boundaries based on changes in texture or color. Record the depth for each boundary. The top of the sketch (0 inches) is the mineral soil surface not the top of the humus with FD, MH, and FF communities. With WF, FP, and AP communities, the top (0 inches) is the peat or muck surface.
- **Comments & Notes:** use this space to record any observations not covered above OR use this space to record assumptions that you have made about the soils if field conditions do not allow you to make the above observations. E.g., soil frozen, colors.

## Native Plant Community Worksheet

- **See additional instructions in box and footnotes.**
- **Flag out a 4-chain transect representative of the whole stand or extent of the community within the stand, by placing flags/ribbon at 1-chain intervals.** Actually flagging a transect forces you to slow down and notice plants that you wouldn't see just cruising and it allows you to concentrate on finding plants rather than pacing. At the end of each chain, it is useful to stop and review the plants in each category, as it is easy to miss recording trees/shrubs if you are intent on the ground layer.
- **Working <u>slowly</u> along the transect, record all plants that you know in their appropriate life-form categories.** The purpose of this is to develop a species list typical of the community/stand that you are trying to summarize. A complete list is more useful than just indicator plants that appear in the *Field Guide* keys.
- **Collect or photograph any plants that you feel are important for later identification.** Pressed specimens and photos can be submitted along with the worksheet to the Ecological Land Classification Program for identification. Remember to label the specimens or photos with the **Site Code**.
- **At the end of the transect, estimate the total <u>collective cover</u> of all plants in the same growth-forms category as you remember them being represented in the whole stand/community. Record your estimate using the Cover Codes described at the bottom of the form and below.**

The purpose of this is to get an overall estimate of canopy closure, density of the shrub layer, and cover of herbaceous plants. Only the separation of trees into canopy (>33 feet tall) and understory (<33 feet tall) is important in the keys. The community Class fact sheets in the Field Guide summarize the vegetation by these categories.

- **At the end of the transect, estimate the <u>abundance and cover of each individual</u> woody plant (canopy trees >33 feet tall and understory trees and shrubs <33 feet tall) as you remember them being represented in the whole stand/community. Record your estimate using the Abundance Codes and Cover Codes described at the bottom of the form.** The purpose of this is to allow for some review of prescriptions with regard to availability of seed trees, advance regeneration, and likely sources of competition with desired crop trees of the future stand.

## Native Plant Community & Soil Summary

- **Main NPC:** Using the information on the plant and soil worksheets, use the *Field Guide* to key out the Native Plant Community to the Class level or lower and enter the code into this space. e.g. MHn35.
- **NPC Inclusions:** Write in this space the NPC Class codes for communities for which you didn't fill out a worksheet because of their small size. Most often, these will be small wetland communities like WFn55 ash swales, narrow transition zones between uplands and wetlands, etc.
- **Potential Crop Trees Present:** List the potential crop trees present on the site that are ranked excellent or good on the *ECS Tree Suitability Table* OR from your observations of good advance regeneration.
- **Growth-stage:** Consult the Natural History section in the Field Guide or Silviculture strategies website for the NPC Class. Record here the **estimated age of the stand** AND if it seems to be a **young** stand composed of early successional trees, **transitional to mature** stand where initial trees are being replaced by mid- or late successional ones, a **mature stand** composed of mid-successional and late-successional trees, **transitional to old-growth** stand composed only of late-successional species, or an **old-growth** stand composed only of late-successional trees in many layers. There will be instances where the age and composition do not match the idealized Natural History and stand dynamics presented in the Field Guides.
- **Soil Map Unit:** if a soil survey exists, record the map unit and the series name. For complexes, use the likely series e.g. 870C, Goodland for map unit 870 with 2-12% slopes, Itasca/Goodland Complex. The digital soil survey layer is available in ArcGIS quick layers at: Geology and Soils/SSURGO/SSURGO Soils-All.
- **Land Type Association:** Record in this space the 7-character code & name of the Land Type Association. See Geology and Soils/ ECS Land Type Assoc of MN in ArcGIS quicklayers or Landview overlay layers.
- **Surface texture:** Record the main texture of the upper 12 inches of mineral soil OR record the texture as "muck" or "peat" if the surface organic layer is greater than 12 inches thick.
- **Drainage class:** Using the information from the soil worksheet, use the ECS Soil Drainage Key to determine the drainage class. Write out the class or use codes as follows: VP=very poor, PD=poor, SP=somewhat poor, MW=moderately well, WD=well, SX=somewhat excessive, EX=excessive. On floodplains or beaver meadows with evidence that they are active use AF=annually flooded. For small vernal pools or closed depressions that pond water, use AP=annually ponded.
- **Operability rating:** Using the information from the soil worksheet, use the *ECS Acceptable Operating Season to Minimize Compaction and Rutting* table to list the acceptable seasons to minimize Compaction.

## Pictures

- **General site condition:** Take at least one photograph of the site that bests reflects the general stand condition at the time of the survey.
- **Other photos:** Capture any other images that you believe would be useful for classification or training purposes (soil profile, unknown plants, etc.)

Attach photos to the point location when entering data into the online NPC point database.

# Send Your Completed Form to the ECS Program

- Scan, create a pdf file and send to the Region ECS staff below. Make sure the pdf is legible. The file name should follow this protocol: UTME UTMN, e.g "353023E 5178862N". OR

- The pdf file can also be attached to a database using an online data entry application. It takes less than 5 minutes to enter a worksheet. If you want to try it, but do not know how, contact your Area ECS lead or ECS program staff below. OR

- Photocopy your completed form and file it with the other information/photos for that stand and mail the original to one of the ECS staff listed below.


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**Thank you. Your data will be added to the ECS Program's database and will be available through ArcGIS quick layers.** We will also provide those data upon request.