Standard Operating Procedures

SOP X. A General Approach for Associating Standardized Vegetation Classes with Survey Locations

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Introduction

Linking natural resources surveys to a standardized set of vegetation classes increases the long-term value of the survey data and supports data analysis at broad spatial scales (landscapes or ecoregions). The vegetation class associated with each survey location is an important attribute (covariate) that may be needed for future, currently unanticipated, applications of the data set. *At a minimum, most natural resource surveys should document the standardized vegetation class associated with each survey location.* For some surveys, this will suffice for documenting vegetation conditions. For other surveys, additional environmental attributes (plant species cover estimates, stem counts, water temperature, etc.) will be needed and separate SOP's for collecting this information will be needed.

This SOP provides guidance for associating standardized and mapped vegetation classes (hereafter referred to as 'vegetation classes') with natural resources data collected at points or polygons. The SOP can be used in any terrestrial or wetland survey when a minimum documentation of vegetation is needed. (Marine systems are not included at this time.) Survey coordinators can link sample locations with vegetation classes in advance of the field season and print them on the field data sheets and project maps. One advantage of this approach is that field staff with minimal botanical training can verify that the associated vegetation class is found at the survey location or, if the assignment is incorrect, can assign another vegetation class from a short list of those found in the study area.

How Are Vegetation Classes Standardized and Mapped?

Ecological systems are recurring groups of biological communities that are found in similar physical environments and are influenced by similar dynamic ecological processes, such as fire or flooding. These ecological systems are represented by standardized and mapped vegetation classes that are readily identifiable by conservation and resource managers in the field (Comer et al. 2003). Several federal and NGO agencies employ these standards and have developed useful tools; we employ the USGS National Gap Analysis Program (GAP) Land Cover Map. The GAP map uses vegetation classes from NatureServe's Ecological System Classification (Comer et al. 2003) and the National Vegetation Classification (NVC) System; these are the same vegetation classes used by the LANDFIRE program to model fire behavior and predict disturbance potential. The GAP map covers the entire U.S. including Alaska, Hawaii and Puerto Rico.

The standardized vegetation classifications (defined as Class, Formation, Macrogroup, and Ecological System) for a state, county, or Landscape Conservation Cooperative (LCC) can be perused with the GAP Land Cover Data Viewer. If you click on a location on the map, a

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description of the class and a range map pop up. This tool can be used to generate a master list of the land cover classes in the vicinity of the study area. Full descriptions of the classes are available from NatureServe Explorer for states, provinces, Forest Service Ecoregions, and MRLC 2000 Map Zones. For example, a search for 'oak', with Wisconsin selected as a state, turns up a list of classifications, one of which is 'North-Central Interior Dry Oak Forest and Woodland'. A detailed description is provided.

Linking Vegetation Classes to Sample Locations

The survey coordinator will oversee the assignment of vegetation classes to sample locations. GIS technical skills are required to conduct the overlay analysis. With the sample location coordinates (and datum) in hand, the GIS technician will overlay the survey location coordinates on the GAP land cover map (available for download by regions, LCCs, states or for the whole country: here) and create a site-specific map showing the vegetation classes that the sample locations fall within and the list of sites with their expected vegetation class. Additionally, a master list of all the vegetation classes found in the study area is needed for reference, in the event that the assigned vegetation class is in error. Descriptions of the vegetation classes can be downloaded from NatureServe for states, ecoregions, or map zones: here.

The survey coordinator will prepare data sheets for each survey location and print the associated vegetation class on the data sheet. The fields shown in Table 1 should be added to the data sheets and databases that are used for the survey. The database should provide a pick-list of all potential vegetation classes likely to be documented during the survey.

Table 1. Fields to be added to wildlife survey data sheets or databases.

- Sample Site ID # _____
  (Geographic coordinates should have been recorded with survey data)
- Survey Date _____
- Vegetation Class NVC Subclass: [Full name from the GAP database – to be filled in by the survey coordinator]
- Vegetation Class Ecological System: [Full name from the GAP database – to be filled in by the survey coordinator]
- Is site within the designated Ecological System? Y or N
- If not, what Ecological System is it in? (refer to local list)
- _____
- Is the site within 100m of an edge or ecotone? Y or N
- If yes, what is the secondary Ecological System? (refer to local list)
  _____
- Disturbances (from list, multiple disturbances can be recorded):
  _____
- Notes about the site:
  _____

  _____

Recording Disturbances

Disturbances, both natural and human-induced, can affect the condition of the vegetation and be observed at the survey location. In addition to verifying the associated vegetation class, the field observer should document disturbances (Table 2). This includes any recent management or natural disturbances that have changed the structure or composition of the vegetation. The disturbance should be detectable by the field observer at the time of the survey; most observable

disturbances will have occurred within the last two years. Some disturbances, such as tree blow-downs, may be visible much longer than two years and should be documented. If a recent disturbance occurred (e.g. mowed), but there is no observable change to the expected structure or composition of the vegetation (vegetation has regrown), then do not record as a disturbance.

Categories of disturbance can be presented as a pull-down menu in the database and multiple sources of disturbance ($\leq$ 5) can be selected (Table 2). 'No disturbance' is the default value.

Table 2. Disturbances that may affect the structure and composition of the vegetation.

Disturbances	
Animal damage	Invaded by exotic species
Chained	Mowed
Construction: building	Plowed/Disked
Construction: road	Prescribed burn
Construction: trail	Treated with fertilizer
Destructive use (non-harvest)	Treated with herbicide
Drought damage	Treated with insecticide
Flooded	Wetland: drained
Forest: clear-cut	Wetland: fall drawdown
Forest: selective harvest	Wetland: spring drawdown
Grazed	Wildfire
Hurricane damage	Wind event/blow down
Ice damage	Other (write in)
Insect damage	No disturbance

Workflow and Detailed Instructions for Documenting Vegetation Classes and Disturbances

- Download a GAP map for your region.
- Overlay your survey locations on the vegetation classification map and derive the NVC Subclass and the Ecological System associated with each location.
- Print the Subclass and Ecological System name on each datasheet along with the Site ID (Location name/number). Print a list of all Ecological Systems likely to be encountered at survey locations on the back of the data sheet as a reference.
- Enter the NVC Subclass and Ecological System name into the database when the locations are set up. Ensure that pick lists for the vegetation classes and disturbances are correctly set up in the database for data entry.
- Print the pick-list of potential disturbances (Table 2) on the data sheet.
- Train observers to recognize, on the ground, the Ecological Systems associated with survey locations in the study area and any other potential Ecological Systems they may need to record.

- Field observers will verify, in the field, that the primary Ecological System assignment to each survey location is accurate or note on the data sheet what the correct classification should be (referring to the list on the back of the data sheet).
- Secondary Ecological System designations will be made on location (in the field) by the observer or recorder. *The secondary Ecological System is identified only if a different Ecological System is located within 100 m of the sample site.* Stated another way, locations that have secondary Ecological Systems have an edge or ecotone within 100 m. The error associated with many digital maps requires that this designation be made in the field. The secondary Ecological System name field in the database will be 'NA' as a default and will be updated as needed by the survey coordinator after field verification.
- Field observers will document up to 5 types of disturbances that they observe at the survey location on the data sheet; record 'none' if no disturbances are observed.
- Enter the vegetation classification information into the database, along with other field observations.
- Archive the GIS maps used to select the sample locations and the GAP maps used to assign the classes, along with other survey materials, in ServCat. This will allow for post-hoc analysis of attributes such as point count distances to edges, level of fragmentation, size of patches, etc., that may prove useful in the future.
- If the survey coordinator needs assistance with GIS maps and overlays, contact the AKN Node administrator, or the Refuge System Inventory and Monitoring Program for assistance.

References

Comer, P., D. Faber-Langendoen, R. Evans, S. Gawler, C. Josse, G. Kittel, S. Menard, M. Pyne, M. Reid, K. Schulz, K. Snow, and J. Teague. 2003. Ecological systems of the United States: a working classification of U.S. terrestrial systems. NatureServe, Arlington, Virginia. http://www.natureserve.org/library/usEcologicalsystems.pdf