METHODS TO CHARACTERIZE HABITAT

The following are some methods that can be employed to characterize habitat:

ECOLOGICAL COMMUNITIES ANALYSIS

Every detailed natural resources evaluation should incorporate an ecological community analysis. This consists of identifying, describing, and mapping the community types present within the project area. The characterization of ecological communities is primarily based on vegetative types, but it may also consider abiotic factors and wildlife usage. Descriptions of ecological communities should generally follow *Ecological Communities of New York State*. In some cases, the dominant plant species listed in the community descriptions contained in this document may differ from the matching urban communities found in New York City. Descriptions of the various plant communities can vary widely with respect to the species composition in New York City. It is important to note that all species listed under a particular plant community composition are not required to be present at each location to classify that particular plant community. Rather, each location must be viewed in context with the potential altered elements of the system, such as, past site disturbances, filling and depletion of soils and hydrologic alterations to the site and adjacent areas that influence the vegetation composition. Therefore, relation to the these changes and additional collection of field data with respect to dominant and co-dominant vegetation, understory species composition, soils, and hydrology provides additional information as to the appropriate ecological community classification. Careful attention to dominant and co-dominant vegetation, understory species composition, soils, and hydrology provides guidance as to the correct "plant community" classification. Once the ecological communities have been identified and described, they should be mapped using GIS, and the areal coverage of each should be determined. Another source of information on habitat types in New York City is the U.S. Fish and Wildlife publication "Significant Habitats and Habitat Complexes of the New York Bight Watershed." It includes maps that indicate where each habitat type is located within the New York Bight, descriptions of the physical setting and lists of species that are commonly found within the habitat.

WETLAND DELINEATION

If a federal or state-regulated wetland is present on or adjacent to a site and project-related activities would take place in this wetland or its adjacent area, an official delineation of the wetland boundaries should be performed, unless the wetland boundary is obvious without an official delineation, such as a functional riprap shoreline. Delineation and mapping of state and federal wetland boundaries provides information on habitats present, plant species, and the uniqueness of a site. Delineation methods are based on three parameters: soils, vegetation, and hydrology. Issues related to wetlands delineation and the methods that should be used are discussed in Subsection 352 of this chapter.

TREE SURVEY

Trees provide valuable habitat to many species of birds and some mammals. A tree survey is used to assess the number, location, and diversity of trees on a parcel. A GIS tree survey map should be conducted when trees are present on-site and would be cleared or otherwise impacted (*e.g.*, by soil compaction, which can adversely affect the root system) due to project-related activities. Trees located on adjacent properties that may be subject to the "edge effect," (*e.g.*, trees that were once part of protected interior of the forest are now located on the perimeter due to clearing) should also be surveyed. The minimum diameter of trees to be surveyed and the methodology to conduct the survey should be determined in consultation with the appropriate Borough Division of the New York City Forester of Parks and Recreation, New York City Environmental Protection, and any other applicable resource agencies. In general, each tree to be surveyed should be marked with a unique identifier and identified to the lowest possible taxonomic level (preferably species). The tree's diameter is then typically measured at breast height (4.5 ft above ground level) and recorded. If a tree has multiple trunks at breast height, the diameter of each trunk should be measured and recorded separately. The iden-

tifier (*e.g.*, identification number), diameter(s), and species (or genus) should be recorded for each tree, and each tree should be mapped. The location of each tree can be identified using a GPS or a land surveying team. In some instances, such specificity may not be necessary if the approximate location of each tree is sufficient to identify whether it would be impacted by the project. The results of a tree survey are used to determine what trees would be impacted by project-related activities and, if appropriate, to develop compensatory mitigation for these impacts (see Section 550). These surveys should be performed early on in the design process to accommodate potential design changes to project if significant tree species are affected. Tree survey approach needs to be reviewed prior to actual use of specific surveying technique.

QUADRANT APPROACH

This technique is used to identify a plant species' presence and dominance in a predetermined area, typically one square meter in size. Typically multiple quadrants are located in a grid-type fashion over a parcel and the plant species within the quadrant are identified, vegetative strata represented, and percent dominance for each species determined. Additional quadrants can be added to the grid to ensure that all habitat types are represented. The study results can then be subjected to statistical analyses to assess habitat variability and diversity.

TRANSECT APPROACH

This method is most applicable to linear projects (roadways, transportation corridors, and greenways) and involves the establishment of a baseline and perpendicular transects. Dependent upon the size of the parcel and the diversity of the habitats, transects can be closely (every fifty feet) or widely (every quarter-mile) spaced. Transects are walked and changes in plant species and dominance are noted.

HABITAT HETEROGENEITY

When additional information is necessary regarding the value of a habitat type, an evaluation of habitat heterogeneity may be appropriate. Since a diverse plant community that produces a diverse crop of seeds, berries, nuts, and green growth can typically support a diverse wildlife community, the number of species (and co-dominance among several species) is often indicative of the habitat's value to wildlife. Heterogeneous habitat may also provide a seasonal or year-round important food supply for wildlife, such as acorn production in an oak-dominated forest or muskrat habitat in a cattail monoculture. The determination of habitat heterogeneity involves identifying the plant species in each vegetative stratum (groundcover, shrub layer, vines, understory, and canopy) and documenting the number of species in each stratum.

INCREMENT BORINGS

Increment borings are small diameter cores taken from a living tree that are used to determine the age of the tree by counting growth rings. The age and height of the tree can give a qualitative measure of the rate of growth. In addition, the age can be used to determine the minimum amount of time vegetative succession has been occurring in a particular community. Increment borings would rarely be necessary for a CEQR evaluation, but this method may be applicable at the discretion of the resource agencies.

WATER QUALITY ANALYSIS

Available harbor survey data in the vicinity of a potential impact should be compared to New York State DEC's water quality standards to assess existing water quality. Additional information on water quality analysis and modeling is given in Section 350 of this chapter.

A detailed discussion of some of the above methods may be located in the 2008 ASTM guidelines for sampling vegetation.