i-Tree Eco Data Collection Variables and Descriptions

Plot variables and descriptions	
Plot ID	Unique identifier
Date & crew	Project management information
GPS coordinates	Used to help locate plot. (Note- GPS functionality is not integrated as part of Eco application)
Photo ID	Used to help identify plot or document plot attributes
Plot address	Used for locating plot
Plot contact	Relevant Information for field crews to gain access, etc.
Measurement units	Units for all measurement in the plot: metric (m/cm) or English (ft/in)
Reference objects	At least (2) objects that will assist in locating plot center for future plot re-measurement
Direction to reference object	Direction (DR) from plot center to each reference object (degrees)
Distance to reference object	Distance (DS) from plot center to each reference object (ft or m)
Tree Measurement Point	If plot center falls on a building or other surface (such as a highway) where plot center cannot be accessed, the plot is not moved; all distances and directions to trees are measured and recorded from a recorded fixed point (e.g., building corner) referred to as the TMP.
Percent measured	Proportion of the plot that is actually measured as portions of plot may be inaccessible or outside project area of interest boundary.
Actual land use	As determined by field crew from a standard list of land uses (not used for stratification)
Percent In	Proportion of the plot in land uses identified by field crew to nearest 1%
Tree cover %	Percent of plot area covered by tree canopies estimated to nearest 5%
Shrub cover %	Percent of plot area covered by shrub canopies estimated to nearest 5%
Plantable space %	Percent of plot that is plantable for trees (i.e., plantable soils space not filled with tree canopies) and tree planting would not be restricted as a result of land use (footpath, baseball field, and so on); to nearest 5%

Ground cover variables and descriptions	
Ground Cover	Used to estimate the amount and distribution of various ground cover types. Total individual covers must equal 100%

Shrub variables and descriptions	
Shrub species code	Species code selected from standard list of tree & shrub species
Average height of shrub mass	Where mass is a group of shrub species or genera of similar height (ft or m)
Percent area	Percent of the total shrub cover on plot occupied by shrub mass
Percent shrub mass missing	Percent of shrub mass volume (height x ground area) that is not occupied by leaves estimated to nearest 5%

Tree variables and descriptions	
Tree ID	Unique tree number
Status	Indicates if a tree was planted (P) or naturally regenerated (I) in the landscape. Remeasurement has additional tree status options as specified in the manual
Distance (DS) in ft/m and direction (DR) in degrees from plot center	Used to identify and locate trees for future measurements
Tree species code	Species code from standard list of trees & shrubs
Land use	Specifies the actual land use, as recorded in general plot data, in which the tree is located
Height of DBH measurement	Recorded if dbh is not measured at default height of 1.37m (4.5ft)
DBH 1 - 6	Diameter at breast height (in/cm) for all recorded trees. DBH 2 -6 are used for recording multi stem trees
Total Height	Height to top of tree (ft/m)
Live top height	Height to live top of canopy. Used in cases where total tree height may be void of canopy due to dieback (ft/m)
Crown base	Height to base of live crown (ft/m)
Crown width	Recorded by (2) measurements N-S (north - south) & E-W (east - west) widths (ft/m)
Percent canopy missing	The percent of the crown volume that is not occupied by leaves; two perpendicular measures of missing leaf mass are made and the average result is recorded to nearest 5%
Dieback	Percent crown dieback to nearest 5%
Percent impervious beneath canopy	Percent of land area beneath entire tree canopy's drip line that is impervious
Percent shrub cover beneath canopy	Percent of land area beneath entire tree canopy's drip line that is occupied by shrubs
Crown light exposure	Number of sides of the tree receiving sunlight from above; used to estimate competition and growth rates
Distance (S1) in ft/m and direction (D1) in degrees to space conditioned residential buildings	Measured for trees at least 6.1 m (20ft) tall and within 18.3 m (60ft) of structures (3) stories or less in height. Optional for energy effects analysis
Tree site	N/S to indicate if a tree is a street tree. Used to estimate proportion of population that is street trees

Adapted from *A Ground-Based Method of Assessing Urban Forest Structure and Ecosystem Services* . Arboriculture and Urban Forestry. Nov 2008
http://www.itreetools.org/eco/resources/08%20UFORE.pdf