Tree Metric Names and Descriptions

Key information for reading Table 2:

- Unless otherwise indicated, vegetation metrics are summarized to site level. Metrics are calculated based on data from five 100-m^2 plots in the Assessment Area (AA) for the site (or if fewer than 5 plots were sampled, then the total number plots sampled). In the metric descriptions or formulas provided in this appendix, the phrase 'five 100-m^2 plots' can be assumed to mean the 5 plots in the AA or the total number of plots sampled if less than 5. Rarely were fewer than 5 vegetation plots sampled at the AA.
- The term '*Species*' as typically used in this appendix refers to taxonomic species or lowest identifiable taxonomic unit (e.g., variety, genus, family, growth habit).
- **GRAY BANNER,** heading each major group of metrics, lists the NWCA Field Data Form from which the validated field data that is used in metrics originated.
- **COLORED BANNERS**, under each major metric group, provide section and subsection headings for sets of metrics that describe related ecological components.
- **METRIC NAME column** corresponds to the metric name in the NWCA vegetation metrics data set.
- **DESCRIPTION column** provides narrative description of each metric.
- **CALCULATION/TRAIT INFORMATION column** provides:
  - ***In white metric rows:***
    - A general formula for calculation of the metric, if not evident in text in the DESCRIPTION column, is provided. PARAMETER NAMES representing raw data that are included in calculations are highlighted in BLUE and are defined in Table 1.
    - Some calculated metrics listed in the METRIC NAME column are, in turn, used as components of other calculated metrics.
  - ***In colored banner rows defining metric sets*** – General categories of species trait information used in calculating a particular series of metrics are listed, if applicable.
- **METRIC TYPE column** indicates whether the candidate metric describes ecological condition or stress.

Table 1. Parameter names from NWCA 2011 Form V-4 (from Appendix B in NWCA 2011 Technical Report)

PARAMETER NAME	DESCRIPTION	RESULT	VALID RANGE/ LEGAL VALUES
Form V-4: NWCA Snag and Tree Counts and Tree Cover **Tree species (cover and counts) and Snag (counts) data for each of 5 100-m^2 (10x10m) Veg Plots**			
Snag Data			
XXTHIN_SNAG	Dead trees/snags 5 to 10 cm DBH (diameter breast height)	Counts	Investigate if > 200
XTHIN_SNAG	Counts of dead trees/snags 11 to 25cm DBH	Counts	Investigate if > 200
THIN_SNAG	Counts of dead trees/snags 26 to 50cm DBH	Counts	Investigate if > 200
JR_SNAG	Counts of dead trees/snags 51 to 75cm DBH	Counts	Investigate if > 200
THICK_SNAG	Counts of dead trees/snags 76 to 100cm DBH	Counts	Investigate if > 200
XTHICK_SNAG	Counts of dead trees/snags 101 to 200 cm DBH	Counts	Investigate if > 200
Tree Data			
Tree Species Name			
TREE_SPECIES	Scientific Name for each tree species (taxon) encountered in the Veg Plot. All scientific names reconciled to USDA_PLANTS nomenclature. Unknowns are named using growth form codes.	Typically the genus and species name. In some cases: lower taxonomic levels (e.g., subspecies, varieties) or higher taxonomic levels (e.g., genus, family, growth form group)	Taxon name
Tree Species Cover by Height Class			
VSMALL_TREE	For each tree species, cover of trees < 0.5m tall	0-100 % Cover	0-100%
SMALL_TREE	For each tree species, cover of trees 0.5m to 2m tall	0-100 % Cover	0-100%
LMED_TREE	For each tree species, cover of trees > 2 to 5m tall	0-100 % Cover	0-100%
HMED_TREE	For each tree species, cover of trees > 5m to 15m tall	0-100 % Cover	0-100%
TALL_TREE	For each tree species, cover of trees > 15m to 30m tall	0-100 % Cover	0-100%
VTALL_TREE	For each tree species, cover of trees > 30m tall	0-100 % Cover	0-100%
XXTHIN_TREE	For each tree species, counts of trees 5 to 10 cm DBH (diameter breast height)	Counts	Investigate if > 200
XTHIN_TREE	For each tree species, counts of trees 11 to 25cm DBH	Counts	Investigate if > 100
THIN_TREE	For each tree species, counts of trees 26 to 50cm DBH	Counts	Investigate if > 50

PARAMETER NAME	DESCRIPTION	RESULT	VALID RANGE/ LEGAL VALUES
JR_TREE	For each tree species, counts of trees 51 to 75cm DBH	Counts	Investigate if > 20
THICK_TREE	For each tree species, counts of trees 76 to 100cm DBH	Counts	Investigate if > 10
XTHICK_TREE	For each tree species, counts of trees 101 to 200 cm DBH	Counts	Investigate if > 5
XXTHICK_TREE	For each tree species, counts of trees > 200 cm DBH	Counts	Investigate if > 5

Table 2. Metric names and descriptions (from Appendix D in NWCA 2011 Technical Report)

METRIC NAME	METRIC DESCRIPTION	**CALCULATION** (listed in White Metric Row), **SPECIES TRAIT TYPE** (if applicable, indicated in Colored Banners)	**METRIC TYPE** (C = condition, S = stress)
SECTIONS 9 - 11	**METRICS BASED ON RAW DATA FROM FORM V-4: NWCA SNAG AND TREE COUNTS AND TREE COVER** Snag and tree metrics are calculated as means/100-m^2 plots to represent AA, unless specified as totals across AA (from all 5 100m^2). Snag and tree metrics were not placed on a per hectare basis because the AA and sampled plots do not necessarily represent homogenous patches and many wetlands are not forested, but may have occasional trees. Basal area was not calculated because diameters were estimated in classes.		
SECTION 9	**DEAD/SNAG COUNT METRICS - Based on data from FORM V-4 (Snag/standing dead tree section)**		
TOTN_XXTHIN_ SNAG	Total Number Dead tree or snags 5 to 10 cm DBH (diameter breast height)	∑ number of XXTHIN_SNAGS across of all 100-m^2 plots	C
TOTN_XTHIN_ SNAG	Total number of dead trees or snags 11 to 25cm DBH	∑ number of XTHIN_SNAGS across of all 100-m^2 plots	C
TOTN_THIN_ SNAG	Total number of dead trees or snags 26 to 50cm DBH	∑ number of THIN_SNAGS across of all 100-m^2 plots	C
TOTN_JR_ SNAG	Total number of dead trees or snags 51 to 75cm DBH	∑ number of JR_SNAGS across of all 100-m^2 plots	C
TOTN_THICK_ SNAG	Total number of dead trees or snags 76 to 100cm DBH	∑ number of THICK_SNAGS across of all 100-m^2 plots	C
TOTN_XTHICK_ SNAG	Total number of dead trees or snags 101 to 200 cm DBH	∑ number of XTHICK_SNAGS across of all 100-m^2 plots	C
TOTN_SNAGS	Total number of dead trees and snags	∑ number of all dead trees and snags across all DBH classes	C
XN_XXTHIN_ SNAG	Mean Number Dead tree or snags 5 to 10 cm DBH (diameter breast height)	∑ number of XXTHIN_SNAG/5 plots	C
XN_XTHIN_SNAG	Mean number of dead trees or snags 11 to 25cm DBH	∑ number of XTHIN_SNAG/5 plots	C
XN_THIN_SNAG	Mean number of dead trees or snags 26 to 50cm DBH	∑ number of THIN_SNAG/5 plots	C
XN_JR_SNAG	Mean number of dead trees or snags 51 to 75cm DBH	∑ number of JR_SNAG/5 plots	C
XN_THICK_SNAG	Mean number of dead trees or snags 76 to 100cm DBH	∑ number of THICK_SNAG/5 plots	C
XN_XTHICK_ SNAG	Mean number of dead trees or snags 101 to 200 cm DBH	∑ number of XTHICK_SNAG/5 plots	C
XN_SNAGS	Mean number of dead trees and snags	∑ number of dead trees and snags across all DBH classes/5 plots	C
			C
SECTION 10	**TREES - COUNTS AND COVER**		
SECTION 10.1	***TREE COVER METRICS***		

METRIC NAME	METRIC DESCRIPTION	**CALCULATION** (listed in White Metric Row), **SPECIES TRAIT TYPE** (if applicable, indicated in Colored Banners)	**METRIC TYPE** (C = condition, S = stress)
N_TREESPP	Richness tree species	Count unique tree species (taxa) across all 5 plots	C
N_VSMALL_TREE	Richness tree species, trees < 0.5m tall	Count unique tree species (taxa) in VSMALL_TREE height class across all 5 plots	C
N_SMALL_TREE	Richness tree species, trees 0.5m to 2m tall	Count unique tree species (taxa) in SMALL_TREE height class across all 5 plots	C
N_LMED_TREE	Richness tree species, trees > 2 to 5m tall	Count unique tree species (taxa) in LMED_TREE height class across all 5 plots	C
N_HMED_TREE	Richness tree species, trees > 5m to 15m tall	Count unique tree species (taxa) in HMED_TREE height class across all 5 plots	C
N_TALL_TREE	Richness tree species, trees > 15m to 30m tall	Count unique tree species (taxa) in TALL_TREE height class across all 5 plots	C
N_VTALL_TREE	Richness tree species, trees > 30m tall	Count unique tree species (taxa) in VT_TREE height class across all 5 plots	C
N_TREE_ GROUND	Richness tree species in ground layer (e.g., seedlings, saplings), trees < 2m	Count unique tree species (taxa) in GROUND LAYER (VSMALL_TREE and SMALL_TREE height classes) across all 5 plots	C
N_TREE_MID	Richness tree species in subcanopy layer, trees 2m to 15m tall	Count unique tree species (taxa) in MID LAYER (LMED_TREE and HMED_TREE height classes) across all 5 plots	C
N_TREE_UPPER	Richness tree species in subcanopy layer, trees > 15m	Count unique tree species (taxa) in UPPER LAYER (TALL_TREE and VTALL_TREE height classes) across all 5 plots	C
PCTN_TREE_ GROUND	Percent richness of tree species found in ground layer (e.g., seedlings, saplings), trees < 2m	(N_TREE_GROUND/N_TREESPP) x 100	C
PCTN_TREE_MID	Percent richness of tree species found in subcanopy layer, trees 2m to 15m tall	(N_TREE_MID/N_TREESPP) x 100	C
PCTN_TREE_ UPPER	Percent richness of tree species found in subcanopy layer, trees > 15m	(N_TREE_UPPER/N_TREESPP) x 100	C
FREQ_VSMALL_ TREE	Frequency (proportion of plots) of VSMALL trees, trees < 0.5m tall	(Number of 100-m^2 plots in which any species of VSMALL trees occurs/5 plots) x 100	C
FREQ_SMALL_ TREE	Frequency (proportion of plots) of SMALL trees, trees 0.5m to 2m tall	(Number of 100-m^2 plots in which any species of SMALL trees occurs/5 plots) x 100	C

METRIC NAME	METRIC DESCRIPTION	**CALCULATION** (listed in White Metric Row), **SPECIES TRAIT TYPE** (if applicable, indicated in Colored Banners)	**METRIC TYPE** (C = condition, S = stress)
FREQ_LMED_ TREE	Frequency (proportion of plots) of LMED trees, trees > 2 to 5m tall	(Number of 100-m^2 plots in which any species of LMED trees occurs/5 plots) x 100	C
FREQ_HMED_ TREE	Frequency (proportion of plots) of HMED, trees > 5m to 15m tall	(Number of 100-m^2 plots in which any species of HMED trees occurs/5 plots) x 100	C
FREQ_TALL_TREE	Frequency (proportion of plots) of TALL trees, trees > 15m to 30m tall	(Number of 100-m^2 plots in which any species of TALL trees occurs/5 plots) x 100	C
FREQ_VTALL_ TREE	Frequency (proportion of plots) of Frequency of individual, trees > 30m tall	(Number of 100-m^2 plots in which any species of VTALL trees occurs/5 plots) x 100	C
FREQ_TREE_ GROUND	Frequency (proportion of plots) of ground layer trees < 2m	(Number of 100-m^2 plots in which any species of GROUND LAYER (VSMALL or SMALL) trees occurs/5 plots) x 100	C
FREQ_TREE_MID	Frequency (proportion of plots) of subcanopy, trees 2m to 15m tall	(Number of 100-m^2 plots in which any species of MID LAYER (LMED or HMED) trees occurs/5 plots) x 100	C
FREQ_TREE_ UPPER	Frequency (proportion of plots) of CANOPY trees, trees >15m	(Number of 100-m^2 plots in which any species of UPPER LAYER (LMED or HMED)trees occurs/5 plots) x 100	C
XCOV_VSMALL_ TREE	Mean absolute cover VSMALL trees, trees < 0.5m tall	∑ of cover for all tree species in VSMALL height class across all plots/5 plots	C
XCOV_SMALL_ TREE	Mean absolute cover SMALL trees, trees 0.5m to 2m tall	∑ of cover for all tree species in SMALL height class across all plots/5 plots	C
XCOV_LMED_ TREE	Mean absolute cover LMED trees, trees > 2 to 5m tall	∑ of cover for all tree species in LMED height class across all plots/5 plots	C
XCOV_HMED_ TREE_	Mean absolute cover HMED trees, trees > 5m to 15m tall	∑ of cover for all tree species in HMED height class across all plots/5 plots	C
XCOV_TALL_TREE	Mean absolute cover TALL trees, trees > 15m to 30m tall	∑ of cover for all tree species in TALL height class across all plots/5 plots	C
XCOV_VTALL_ TREE_	Mean absolute cover VTALL trees, trees > 30m tall	∑ of cover for all tree species in VTALL height class across all plots/5 plots	C
XCOV_TREE_ GROUND	Mean absolute cover trees in ground layer (e.g., seedlings, saplings), trees < 2m	∑ of cover for all tree species in GROUND LAYER (VSMALL_TREE and SMALL_TREE height classes) across all plots/5 plots	C

METRIC NAME	METRIC DESCRIPTION	**CALCULATION** (listed in White Metric Row), **SPECIES TRAIT TYPE** (if applicable, indicated in Colored Banners)	**METRIC TYPE** (C = condition, S = stress)
XCOV_TREE_MID	Mean absolute cover trees in MID layer, trees 2m to 15m tall	∑ of cover for all tree species in MID LAYER (LMED_TREE and HMED_TREE height classes) across all plots/5 plots	C
XCOV_TREE_ UPPER	Mean absolute cover trees in UPPER layer, trees >15m	∑ of cover for all tree species in UPPER LAYER (TALL_TREE and VTALL_TREE height classes) across all plots/5 plots	C
IMP_VSMALL_ TREE	Importance of VSMALL trees, trees < 0.5m tall	(FREQ_VSMALL_TREE + XCOV_VSMALL_TREE)/2	C
IMP_SMALL_TREE	Importance of SMALL trees, trees 0.5m to 2m tall	(FREQ_SMALL_TREE + XCOV_SMALL_TREE)/2	C
IMP_LMED_TREE	Importance of LMED trees ,trees > 2 to 5m tall	(FREQ_LMED_TREE + XCOV_LMED_TREE)/2	C
IMP_HMED_TREE	Importance of HMED trees, trees > 5m to 15m tall	(FREQ_HMED_TREE + XCOV_HMED_TREE)/2	C
IMP_TALL_TREE	Importance of TALL trees, trees > 15m to 30m tall	(FREQ_TALL_TREE + XCOV_TALL_TREE)/2	C
IMP_VTALL_TREE	Importance of VTALL trees, trees > 30m tall	(FREQ_VTALL_TREE + XCOV_VTALL_TREE)/2	C
IMP_TREE_GROU ND	Importance of trees in GROUND layer (e.g., seedlings, saplings), trees < 2m	(FREQ_TREE_GOUND + XCOV_TREE_GROUND)/2	C
IMP_TREE_MID	Importance of trees in MID layer, trees 2m-15m tall	(FREQ_TREE_MID + XCOV_TREE_MID)/2	C
IMP_TREE_UPPER	Importance of trees in UPPER layer, trees > 15m	(FREQ_TREE_UPPER + XCOV_TREE_UPPER)/2	C
SECTION 10.2	***TREE COUNT METRICS***		
TOTN_XXTHIN_ TREE	Total number of tree stems in XXTHIN class, trees 5 to 10 cm DBH (diameter breast height)	∑ number of tree stems in XXTHIN_TREE class across all species and across all 100-m^2 plots	C
TOTN_XTHIN_ TREE	Total number of tree stems in XTHIN class, trees 11 to 25cm DBH	∑ number of tree stems in XTHIN_TREE class across all species and across 100-m^2 plots	C
TOTN_THIN_ TREE	Total number of tree stems in THIN class, trees 26 to 50cm DBH	∑ number of tree stems in THIN_TREE class across all species and across all 100-m^2 plots	C
TOTN_JR_TREE	Total number of tree stems in JR class, of trees 51 to 75cm DBH	∑ number of tree stems in JR_TREE class across all species and across all 100-m^2 plots	C
TOTN_THICK_ TREE	Total number of tree stems in THICK class, trees 76 to 100cm DBH	∑ number of tree stems in THICK_TREE class across all species and across all 100-m^2 plots	C
TOTN_XTHICK_ TREE	Total number of tree stems in XTHICK class, trees 101 to 200 cm DBH	∑ number of tree stems in XTHICK_TREE class across all species and across all 100-m^2 plots	C

METRIC NAME	METRIC DESCRIPTION	**CALCULATION** (listed in White Metric Row), **SPECIES TRAIT TYPE** (if applicable, indicated in Colored Banners)	**METRIC TYPE** (C = condition, S = stress)
TOTN_XXTHICK_TREE	Total number of tree stems in XXTHICK class, of trees > 200 cm DBH	∑ number of tree stems in XXTHICK_TREE lass across all species and across all 100-m^2 plots	C
TOTN_TREES	Total number of tree stems across all classes DBH	∑ number of tree stems across all size classes, across all species, and across all 100-m^2 plots	C
XN_XXTHIN_TREE	Mean number of tree stems in XXTHIN class, trees 5 to 10 cm DBH (diameter breast height)	TOTN_XXTHIN_TREES/5 plots	C
XN_XTHIN_TREE	Mean number of tree stems in XTHIN class, trees 11 to 25cm DBH	TOTN_XTHIN_TREES/5 plots	C
XN_THIN_TREE	Mean number of tree stems in THIN class, trees 26 to 50cm DBH	TOTN_THIN_TREES/5 plots	C
XN_JR_TREE	Mean number of tree stems in JR class, of trees 51 to 75cm DBH	TOTN_JR_TREES/5 plots	C
XN_THICK_TREE	Mean number of tree stems in THICK class, trees 76 to 100cm DBH	TOTN_THICK_TREES/5 plots	C
XN_XTHICK_TREE	Mean number of tree stems in XTHICK class, trees 101 to 200 cm DBH	TOTN_XTHICK_TREES/5 plots	C
XN_XXTHICK_TREE	Mean number of tree stems in XXTHICK class, of trees > 200 cm DBH	TOTN_XXTHICK_TREES/5 plots	C
XN_TREES	Mean number of tree stems across all classes DBH	TOTN_TREES/5 plots	C