Table of Contents

Introduction

This document provides guidance on populating all tables and fields in the NASIS Vegetation Plot object. It assists Soil and Plant Sciences Division Ecologists with populating Ecological Site Inventory (ESI) point data directly into NASIS.

This document assumes the user already understands basic NASIS functionality. For additional guidance in how to use NASIS, please refer to Chapters 1 through 12 on the NASIS Training Materials website. Chapters 1, 2, 3, 4, 6, and 9 will be the most relevant for those entering Vegetation Plot data exclusively.

Each field has a definition and population standard. Units of measure are specified for each field. Where pertinent, customized population guidance is provided for each field.

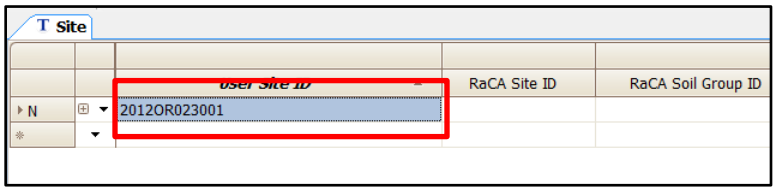
Getting Started – Creating a New Site Record and Vegetation Plot Record

The NASIS Site object stores the location information of the Vegetation Plot record. Every Vegetation Plot record is required to be linked to a Site record. This means the user must either link to an existing Site record or create a brand-new one that can be linked to the Vegetation Plot record. After the Site record is created or the existing record is identified, the new Vegetation Plot record can be created and linked to the Site.

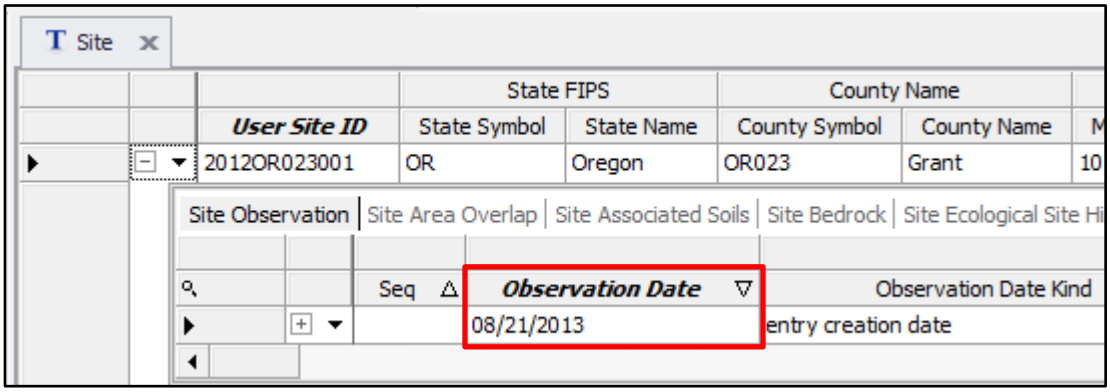
The Site and Site Observation tables must be populated before entering Vegetation Plot records. The Vegetation Plot records are established after the Site has been created. They are linked to the appropriate Site and Site Observation table records. These are the minimum steps required for entering a new vegetation plot into NASIS, but more data must be populated in the Vegetation Plot and Site tables.

Step-By-Step Instructions - Getting Started

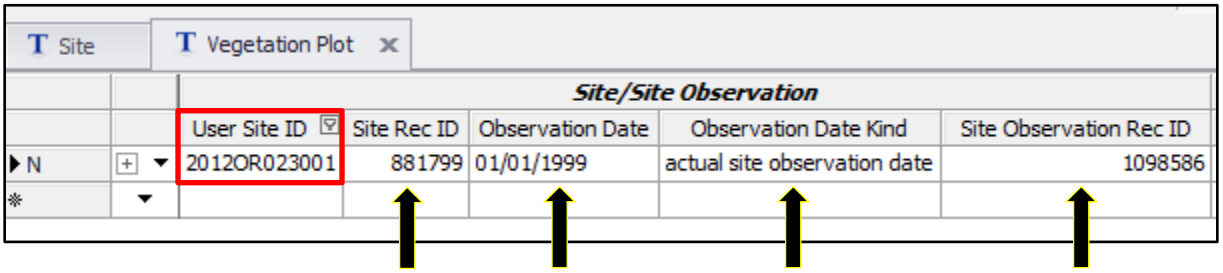
1. Open the Site table > Enter a User Site ID.
    a. The National standard for creating a User Site ID is provided in the NASIS Training Material Chapter 23, in the **User Site ID** section.



2. Open the Site Observation child table > Populate the Observation Date.

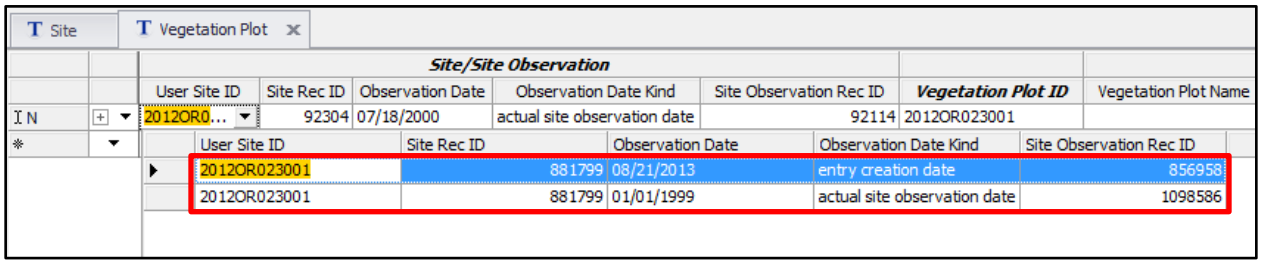


3. Open the Vegetation Plot table > Enter the User Site ID created in step 1.



Notice how the Site Rec ID, Observation Date, Observation Date Kind, and Site Observation Record ID fields are auto-populated when the User Site ID is entered. This occurs because these data elements also are in the Site table and are linked to the User Site ID.

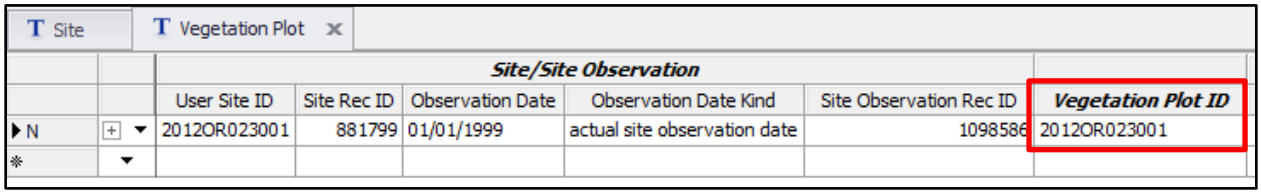
Notice also that a choice list appears as the User Site ID is typed into the field. The User Site ID can be selected from the choice list. All site records in the local database are available in this choice list. The list is filtered as the User Site ID is typed into the field. ***If the USER SITE ID is not in the LOCAL DATABASE, it will not be available as a choice.***



If more than one date is populated in the Site Observation table for a given site, be sure to choose the one that should be linked to the Vegetation Plot record. For example, in the screenshot of the "**Site/Site Observation**," *notice that the User Site ID and Site Rec ID are the same, but the*

Observation Dates and Site Observation Rec IDs are different. Two records are in the Site Observation table for this site, and either one can be linked to the Vegetation Plot.

4. Enter a Vegetation Plot ID.
    a. The Vegetation Plot ID should be the same as the User Site ID. Veg Transect ID, entered in the Vegetation Transect child table, can be unique to capture the specific transect established within the Vegetation Plot.



T Site | T Vegetation Plot

		Site/Site Observation					
		User Site ID	Site Rec ID	Observation Date	Observation Date Kind	Site Observation Rec ID	Vegetation Plot ID
▶ N	⊞ ▾	2012OR023001	881799	01/01/1999	actual site observation date	1098586	2012OR023001
*	▾						

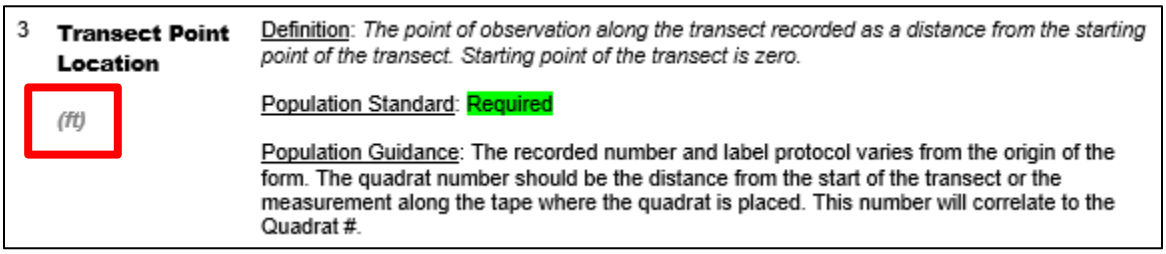
Color Coded System for Data Population

Some NASIS fields must be populated, some are optional, and some are not populated. A simple color-coded system was created to assist with data population requirements.

- **REQUIRED** - These fields are highlighted in green.
    - When the population standard for a field is highlighted in green, that field must be populated.
    - Always populate the Low, RV, and High values for a required data element unless specifically instructed otherwise.
- **DO NOT POPULATE** - These fields highlighted in red.
- **OPTIONAL** - Not highlighted.

Units of Measure

If a NASIS field requires a unit of measure, it is indicated in gray and italics under the field name.



3 **Transect Point Location**

(ft)

Definition: *The point of observation along the transect recorded as a distance from the starting point of the transect. Starting point of the transect is zero.*

Population Standard: Required

Population Guidance: The recorded number and label protocol varies from the origin of the form. The quadrat number should be the distance from the start of the transect or the measurement along the tape where the quadrat is placed. This number will correlate to the Quadrat #.

While all other units of measure in NASIS are in metric, the Vegetation Plot object contains a mixture of U.S. customary and metric measurements.

Sampling Protocols

Sampling protocols indicate the methods used to collect ESI point data. Each sampling protocol is designed to collect different kinds of vegetation information, using different methods. They range from simple ocular estimates of the kinds and amounts of plants to using statistical sampling designs such as Nested Frequency.

There are two types of sampling protocols:

Plot Sampling Protocols – These are the protocols that apply to all the ESI data collected at a specific site. They define how the entire Vegetation Plot was sampled. A Site may have multiple Plots established. In the context of vegetation classification, a *Plot* is an area of defined size and shape that is intended for characterizing a homogenous occurrence of vegetation, and which is large enough in area to contain a large proportion of the species that typically occurs in the plant community.

Transect Sampling Protocols – These are a subdivision of the Plot Sampling Protocols. They apply to any transects that were used to collect ESI data at a given site. A Plot may have multiple Transects established. A *transect* is a straight line or narrow section through an area (Plot) along which observations are made or measurements taken.

The sampling protocol used will dictate which tables and fields are required. This section provides a list of the Plot Sampling Protocols and Transect Sampling Protocols and the tables that are required to be populated for each Sampling Protocol.

Plot Sampling Protocols

Sampling Protocol	Tables to Populate
Basal area	• Vegetation Plot ✓ *Total Basal Area* ✓ *Basal Area Assess. Method* ✓ *Plot Basal Area Factor* ○ Plot Species Basal Area (species-specific) ▪ Basal Area Trees Counted ○ Site Woody Basal Area (not species-specific) ▪ Site Trees Counted ○ Plot Sampling Protocol Used
Crop tree inventory	• Vegetation Plot ✓ *Forest Stand Type** ✓ *# of Trees Counted* ✓ *Stand Quality** ○ Crop Tree Summary ▪ Crop Tree Subplot Details ▪ Crop Tree Totals ▪ Crop Tree Details ○ Plot Disturbance ○ Plot Sampling Protocol Used

Pasture condition score	• Vegetation Plot ✓ *Pasture Condition Index (PCI) fields* ✓ *Undesirable Invading Species ** ✓ *Major Invading Species ** ✓ *Pasture Forage Type** ○ Plot Sampling Protocol Used <u>PCI fields:</u> Desirable Plants, Plant Cover, Plant Diversity, Ground Cover Residue, Standing Dead Forage, Plant Vigor, Legume %, Use Uniformity, Livestock Conc. Areas, Soil Compaction, Sheet & Rill Erosion, Wind Erosion, Stream/Shoreline Erosion, Gully Erosion, Plant Residue Comp. Score, Erosion Comp. Score, Pasture Condition Score
Pasture or grazing stick	• Vegetation Plot ✓ *Desirable Plant Vigor* ✓ *Desirable Seedling Abundance* ✓ *Decadent Plant Abundance* ✓ *Plant Residue Adequacy* ✓ *Undesirable Invading Species ** ✓ *Major Invading Species ** ✓ *Pasture Forage Type* ✓ *Average Pasture Stand Density** ✓ *Average Pasture Production* ✓ *Average Pasture Plant Ht.* ○ Plot Grazing Use Table ○ Plot Sampling Protocol Used
Rangeland health * Data gathered from published ecological site descriptions (ESDs) or other references.	• Vegetation Plot ✓ *Rangeland Health Indicator (RHI) fields* ✓ *Ref. Plant Community** ✓ *Representative Annual Production** ✓ *Total Estimated Annual Production*** ✓ *Total Allowable Prod.** ✓ *Total Palatable Prod.** ✓ *Similarity Index* ✓ *Undesirable Invading Species *** ✓ *Major Invading Species *** ✓ *Invading Species Can. Cov. % *** ○ Plot Grazing Use Table ○ Plot Sampling Protocol Used <u>RHI fields:</u> Annual Production, Bare Ground, Compaction Layer, Func/Struct Groups, Erosion Resistance, Gullies, Rills, Pedestals/Terracettes, Infiltration & Runoff, Litter Amount, Litter Movement, Plant Mortality, Productive Capability, Invasive Plants, Soil Surface Degradation, Water Flow Patterns, Wind Scour Areas, Soil/Site Stability Summ., Biotic Integrity Summ., Hydro. Function Summ.

Range trend	• Vegetation Plot ✓ *Desirable Plant Vigor* ✓ *Desirable Seedling Abundance* ✓ *Decadent Plant Abundance* ✓ *Plant Residue Adequacy* ✓ *Undesirable Invading Species* ✓ *Major Invading Species* ✓ *Invading Species Can. Cov. %* ✓ *Soil Surface Erosion* ✓ *Soil Crusting* ✓ *Soil Compaction* ✓ *Bare Ground %* ✓ *Gully & Rill Presence* ✓ *Soil Degradation* ✓ *Current Range Trend* ✓ *Planned Range Trend* ○ Plot Grazing Use Table ○ Plot Sampling Protocol Used
Relevé method	• Vegetation Plot ✓ *Plot Size* ✓ *A Horizon Depth* ✓ *Total Basal Area* ✓ *Basal Area Assess. Method* ✓ *Forest Stand Type** ✓ *# of Trees Counted* ✓ *Strata Inventoried* ✓ *Stand Regeneration* ✓ *Stand Quality** ○ Plot Plant Inventory ▪ Subplot Plant Details* ○ Plot Plant Type Canopy Cover ○ Site Woody Basal Area Table ▪ Site Trees Counted ○ Plot Disturbance ○ Plot Sampling Protocol Used
Site index * Data potentially collected with this method.	• Vegetation Plot ✓ *Forest Stand Type* ✓ *Strata Inventoried* ✓ *Stand Regeneration** ✓ *Stand Quality** ✓ *# of Trees Counted* ○ Plot Tree Site Index Summary ▪ Plot Tree Site Index Details ○ Plot Disturbance ○ Plot Sampling Protocol Used
Forest stand inventory	• Vegetation Plot

*Data potentially collected with this method**.**	✓ *Soil Profile ?* ✓ *Understory Description ?* ✓ *Mensuration Data ?* ✓ *Understory Reprod. Abundance* ✓ *Woody Understory Abundance* ✓ *Herb. Understory Abundance* ✓ *Lichens Understory Abundance* ✓ *Crown Canopy Closure %** ✓ *Crown Can. Closure Assess. Meth.** ✓ *LPP Crown Competition Factor** *(Lodge Pole Pine (LPP))* ✓ *LPP Crown Comp. Ave DBH** *(Diameter at Breast Height (DBH))* ✓ *Basal Cover % - Ave.* ✓ *Total Basal Area* ✓ *Basal Area Assess. Method* ○ Plot Tree Summary ○ Plot Tree Inventory ▪ Trees Counted ○ Site Woody Basal Area ▪ Site Trees Counted ○ Plot Disturbance ○ Plot Sampling Protocol Used
Weight estimate and ocular reconnaissance	• Vegetation Plot ✓ *Plot Size* Forest Data: ✓ *Total Basal Area* ✓ *Basal Area Assess. Method* ✓ *Forest Stand Type** ✓ *# of Trees Counted* ✓ *Strata Inventoried* ✓ *Stand Regeneration* ✓ *Stand Quality** Range Data: ✓ *Total Canopy Cover %* ✓ *Total Canopy Cover Class* ✓ *Total Est. Annual Prod.* ✓ *Total Palatable Prod.* ✓ *Similarity Index** ✓ *Harvest Efficiency %* ✓ *Take ½, Leave ½* ✓ *Acres/AUM* ✓ *AUM/acre* ✓ *AUD/acre* ✓ *Bare Ground %* Data overlapping both: ○ Plot Plant Inventory ▪ Subplot Plant Details* ○ Plot Plant Type Canopy Cover ○ Plot Grazing Use Table* ○ Plot Disturbance

	○ Plot Sampling Protocol Used
Windbreak	• Vegetation Plot ✓ *Windbreak Row 1 Direction* ✓ *Windbreak Trapped Soil Depth* ✓ *Windbreak Trapped Soil Texture* ✓ *Understory Description ?* ✓ *Mensuration Data ?* ○ Windbreak Row Data ○ Plot Sampling Protocol Used
Zig Zag transect *(Strip, Fixed, and Variable Plot Sampling may be used to collect the same set of data.)*	• Vegetation Plot ✓ *Basal Cover % - Ave.* ✓ *Total Basal Area* ✓ *Basal Area Assess. Meth.* ✓ *Current Tree Density* ✓ *Current Tree Spacing* ✓ *Current D+x Spacing* ✓ *Current Plot Ave DBH* ✓ *Plot Basal Area Factor* ✓ *Current Basal Area* ✓ *Forest Stand Type* ✓ *Strata Inventoried* ✓ *Stand Regeneration* ✓ *Stand Quality* ✓ *Desired Tree Density* ✓ *Desired D+x Spacing* ✓ *Desired Basal Area* ✓ *Excess Basal Area* ✓ *Excess Tree Density* ✓ *% Stocking Change* ✓ *% Good Condition* ✓ *% Fair Condition* ✓ *% Poor Condition* ✓ *Hard Tree Snag Density** ✓ *Soft Tree Snag Density** ○ Main Forest Stand Details ○ Plot Sampling Protocol Used

Transect Sampling Protocols

Sampling Protocol	Tables to Populate
Belt Transect ** Modified protocol methods may use Density Quadrat Details*	• Vegetation Plot ○ Vegetation Transect ✓ *Transect Length* ✓ *Belt Width* ✓ *Total # Plants – Belt* ✓ *Total # Species – Belt* ✓ *Total Density - Belt* ▪ Vegetation Transect Plant Summary ✓ *Density Quadrat Size** ✓ *Density Quadrat Shape** ✓ *Total # of Mature Plants** ✓ *Average Mature Density** ✓ *Average Mature Density Class** ✓ *Total # of Seedling Plants** ✓ *Average Seedling Density** ✓ *Average Seedling Density Class** ▪ Belt Data ▪ Density Quadrat Details* ▪ Belt Transect Summary ▪ Transect Sampling Protocol Used
Canopy cover class* ** Typically Forested Sites; see also: Daubenmire method.*	• Vegetation Plot ○ Vegetation Transect ✓ *Transect Total Canopy Cover %* ✓ *Transect Total Canopy Cover Class* ✓ *Canopy Cover Assess. Method* ✓ *Crown Canopy Closure %* ✓ *Crown Can. Closure Assess. Meth.* ✓ *LPP Crown Competition Factor* ✓ *LPP Crown Comp. Ave. DBH* ✓ *Overstory Canopy Cover %* ✓ *Overstory Canopy Cover Class* ▪ Transect Overstory Canopy Cover ▪ Transect Sampling Protocol Used
Comparative yield **Can be used in conjunction with the Dry Weight Rank method. Data is collected and recorded as outlined for both methods.*	• Vegetation Plot • *Comparative Yield Ave. Prod.* ○ Vegetation Transect ○ *Comparative Yield Annual Production* ○ *Total Comparative Yield Rank* ○ *Average Comparative Yield Rank* ○ *Comparative Ref. Clipped Wt. Ave.* ▪ Comparative Yield Reference Quadrats ▪ Comparative Yield Data ▪ Transect Sampling Protocol Used

Daubenmire method
** NASIS protocol is the Canopy Cover Class.*
	• Vegetation Plot
	  ○ Vegetation Transect
	  ✓ *# of Daubenmire Quadrats Sampled*
	  ▪ Vegetation Transect Plant Summary
	  ✓ *Daubenmire Composition %*
	  ✓ *# of Quadrats In*
	  ✓ *Species Frequency – Daubenmire*
	  ✓ *Canopy Cover %*
	  ✓ *Canopy Cover % Ave. – Daubenmire*
	  ✓ *Canopy Cover Ave. Class*
	  ▪ Daubenmire Canopy Cover Class Summary
	  - Daubenmire Canopy Cover Quad Details
	  ▪ Transect Sampling Protocol Used

Density method	• Vegetation Plot
	  ○ Vegetation Transect
	  ▪ Vegetation Transect Plant Summary
	  ✓ *Density Quadrat Size*
	  ✓ *Density Quadrat Shape*
	  ✓ *Total # of Mature Plants*
	  ✓ *Average Mature Density*
	  ✓ *Average Mature Density Class*
	  ✓ *Total # of Seedling Plants*
	  ✓ *Average Seedling Density*
	  ✓ *Average Seedling Density Class*
	  ▪ Density Quadrat Details
	  ▪ Transect Sampling Protocol Used

Double weight sampling
** Wt. Units are used for extended shrub plots with this method or for the Weight Unit Estimate method (see following).*
	• Vegetation Plot
	  ○ Vegetation Transect
	  ✓ *# of Dbl. Samp. Quadrats Sampled*
	  ✓ *# of Dbl. Samp. Quadrats Clipped*
	  ✓ *Dbl. Sampling Annual Production*
	  ✓ *Dbl. Sampling Composition %**
	  ▪ Vegetation Transect Plant Summary
	  ✓ *Plant Prod Quadrat Size*
	  ✓ *Plant Prod Quadrat Shape*
	  ✓ *Total Clipped Wt. - Estimated*
	  ✓ *Total Clipped Wt. - Fresh*
	  ✓ *Total Clipped Wt. – Air-dry*
	  ✓ *Species Total Wt.*
	  ✓ *Dbl. Sampling Ave. Yield*
	  ✓ *Double Sampling Composition %*
	  ✓ *Trace Amount ?*
	  ✓ *Wt. Conversion Factor*
	  ✓ *Dbl. Sampling Correction Factor*
	  ✓ *Air-dry Wt. Adjustment*
	  ✓ *Utilization Adjustment*

	✓ *Growth Adjustment* ✓ *Weather Adjustment* ✓ *Wt. Unit Weight** ✓ *Total # of Wt. Units** ✓ *Wt. Unit Ave. Yield** ✓ *Total Wt. Unit Weight Clipped** ▪ Plant Production Quadrat Details ▪ Transect Sampling Protocol Used
Dry weight rank (DWR) **Can be used in conjunction with the Comparative Yield method. Data is collected and recorded as outlined for both methods.*	• Vegetation Plot o Vegetation Transect ✓ *DWR Annual Prod* ✓ *# DWR Quadrats Sampled* ▪ Vegetation Transect Plant Summary ✓ *DWR Quadrat Size* ✓ *DWR Quadrat Shape* ✓ *DWR 1 Tally* ✓ *DWR 2 Tally* ✓ *DWR 3 Tally* ✓ *DWR Weighted Tally* ✓ *DWR Composition %* ✓ *DWR Ave. Yield* ✓ *Wt. Conversion Factor* ▪ DWR Quadrat Details ▪ Transect Sampling Protocol Used
Frequency ** Cover data can be recorded and input using the Step Point form and information on the following pages.* **Nested Frequency method also is discussed.*	• Vegetation Plot o Vegetation Transect ✓ *# of Frequency Quadrats Sampled* ▪ Vegetation Transect Plant Summary ✓ *Freq. Quadrat Size* ✓ *Freq. Quadrat Shape* ✓ *# Quadrats In* ✓ *Total # of Mature Plants* ✓ *Total # of Seedling Plants* ▪ Frequency Quadrat Details ▪ Transect Sampling Protocol Used
Gap intercept	• Vegetation Plot o Vegetation Transect ✓ *Transect Length* ✓ *Minimum Basal Gap Size* ✓ *Minimum Canopy Gap Size* ✓ *Gaps Measured Between* ✓ *Total Canopy Gap Length* ✓ *Total Canopy Gap %* ✓ *Total Basal Gap Length* ✓ *Total Basal Gap %* ▪ Transect Gap Details

	▪ Transect Sampling Protocol Used
Harvest method	• Vegetation Plot ○ Vegetation Transect ✓ *Total Harvest Annual Production* ✓ *Dbl. Sampling Composition %** ▪ Vegetation Transect Plant Summary ✓ *Plant Prod Quadrat Size* ✓ *Plant Prod Quadrat Shape* ✓ *Total Clipped Wt. - Fresh* ✓ *Total Clipped Wt. – Air-dry* ✓ *Dry Weight %* ✓ *Trace Amount ?* ▪ Plant Production Quadrat Details ▪ Total Quadrat Harvest* ▪ Transect Sampling Protocol Used
Line intercept **Currently only the summary data can be entered, not transect readings.*	• Vegetation Plot ○ Vegetation Transect ✓ Transect Length ▪ Vegetation Transect Plant Summary ✓ *Line Intercept Composition %** ✓ *# of Foliar Cover Hits* ✓ *Foliar Cover % - Line Int.* ✓ *Total Foliar Cover – Line Int.* ✓ *# Basal Cover Hits* ✓ *Basal Cover % - Line Int.* ✓ *Total Basal Cover – Line Int.* ▪ Transect Sampling Protocol Used
Line-point intercept	• Vegetation Plot ○ Vegetation Transect ✓ *Transect Length* ✓ *# Gr. Cover Points Sampled* *(Ground (Gr))* ✓ *# Gr. Surf Cover Points Sampled* ✓ *Transect Basal Cover %* ✓ *Total Basal Cover %* ✓ *Transect Canopy Cover %* ✓ *LPI (Line-Point Interval) Observation Interval* ✓ *Total # of Points Sampled* ▪ Vegetation Transect Plant Summary ✓ *Ave. Live Canopy Ht. Bottom** ✓ *Ave. Live Canopy Ht. Top** ✓ *# of Canopy Cover Hits* ✓ *Canopy Cover %* ✓ *Line Intercept Composition %** ✓ *# of Foliar Cover Hits* ✓ *# Basal Cover Hits* ✓ *% of Total Canopy Cover* ▪ Point Plant Cover Details

	▪ Transect Sampling Protocol Used
Nested frequency	• Vegetation Plot ○ Vegetation Transect ✓ *# of Nested Freq. Quadrats Sampled* ▪ Vegetation Transect Plant Summary ✓ *Nested Freq. Quadrat Size* ✓ *Nested Freq. Quadrat Shape* ✓ *# Quadrats In* ✓ *Total # of Mature Plants* ✓ *Total # of Seedling Plants* ▪ Nested Frequency Quadrat Details ▪ Nested Frequency Summary ▪ Transect Sampling Protocol Used
Ocular estimate ** Plot level is made up of Weight Estimate and Ocular Reconnaissance.*	• Vegetation Plot ○ Vegetation Transect ✓ *Total Harvest Annual Production* ✓ *% of Total Canopy Cover** ✓ *Dbl. Sampling Composition %** ▪ Vegetation Transect Plant Summary ✓ *Plant Prod Quadrat Size* ✓ *Plant Prod Quadrat Shape* ✓ *Total Wt. – Estimated* ✓ *Dry Weight %* ✓ *Wt. Conversion Factor* ✓ *Trace Amount ?* ▪ Plant Production Quadrat Details ▪ Transect Sampling Protocol Used
Plant Species Richness * ** Referred to as Sociability Class.*	• Vegetation Plot ✓ *Undesirable Invading Species ** ✓ *Major Invading Species ** ○ Plot Plant Inventory ▪ Subplot Plant Details* ○ Plot Sampling Protocol Used Or ○ Vegetation Transect ✓ *Total # Species – Belt** ▪ Vegetation Transect Plant Summary ▪ Transect Sampling Protocol Used
Standing biomass	• Vegetation Plot ✓ *Total Above Ground Biomass – Ave.* ○ Vegetation Transect ✓ *Total Above Ground Biomass* ✓ *Standing Herbaceous Biomass* ▪ Transect Standing Biomass Details

	▪ Transect Sampling Protocol Used
Step gap	• Vegetation Plot ○ Vegetation Transect ✓ *Transect Length* ✓ *Minimum Basal Gap Size* ✓ *Minimum Canopy Gap Size* ✓ *Gaps Measured Between* ✓ *Total Canopy Gap %* ✓ *Total Basal Gap %* ▪ Transect Gap Details ▪ Transect Sampling Protocol Used
Step point	• Vegetation Plot ○ Vegetation Transect ✓ *Transect Length* ✓ *# Gr. Cover Points Sampled* ✓ *# Gr. Surf Cover Points Sampled* ✓ *Total # of Points Sampled* AND recording ground-level without canopy/foliar hits ▪ Transect Ground Cover ▪ Ground Cover Details OR recording ground-level with canopy/foliar hits ▪ Transect Ground Surface Cover ▪ Ground Surface Cover Details And recording basal hits or canopy/foliar cover by species ▪ Vegetation Transect Plant Summary ✓ *# of Foliar Cover Hits* ✓ *# Basal Cover Hits* ✓ *% of Total Canopy Cover* ▪ Point Plant Cover Details ▪ Transect Sampling Protocol Used
Weight unit estimate	• Vegetation Plot ○ Vegetation Transect ✓ *# of Dbl. Samp. Quadrats Sampled** ○ *Weight Unit Annual Prod* ▪ Vegetation Transect Plant Summary ✓ *Plant Prod. Quadrat Size* ✓ *Plant Prod. Quadrat Shape* ✓ *Wt. Conversion Factor* ✓ *Wt. Unit Weight* ✓ *Total # of Wt. Units* ✓ *Wt. Unit Ave. Yield*

	✓ *Total Wt. Unit Weight Clipped* ▪ Plant Production Quadrat Details ▪ Transect Sampling Protocol Used

Vegetation Plot

This table contains information about each vegetation plot and summary data collected from the plot. Plot data refers to data collected on a specified area, not typically collected on a transect. Summary data includes summaries of all transects captured within the "plot."

Plot Sampling Protocols: All

Transect Sampling Protocols: All

1 **User Site ID**

Definition: *A short label to help a user identify a particular site.*

Population Standard: Required

Population Guidance: Use this field to link the site record to the pedon. Begin typing the User Site ID into the field and a choice list will appear (see screenshot). **A pedon MUST be linked to the Site and Site Observation entries**. The site must be in the local database for it to be available as a choice.

2 **Site Record ID**

Definition: *An internal ID (integer) that is part (or all) of a key that uniquely identifies a record. Also known as part (or all) of the "primary key." This value is managed by NASIS and cannot be edited.*

Population Standard: Required

Population Guidance: Automatically populated by NASIS.

3 **Observation Date**

Definition: *The date on which this particular soil was described or sampled, expressed as month, day, year -- MM/DD/YYYY.*

Population Standard: Required

Population Guidance: Be sure the correct date is selected if more than one record is populated in the Site Observation table.

4 **Observation Date Kind**

Definition: *Indicates whether the date associated with a site observation is the actual date of observation, or something else.*

Population Standard: Required

Population Guidance: Be sure the correct date is selected if more than one record is populated in the Site Observation table.

5 **Site Observation Record ID**

Definition: *An internal ID (integer) that is part (or all) of a key that uniquely identifies the Site Observation Record. This value is managed by NASIS and cannot be edited.*

Population Standard: Required

Population Guidance: Automatically populated by NASIS.

6	**Vegetation Plot ID**	Definition: *An alpha-numeric code that uniquely identifies a single occurrence of a particular vegetation plot.* Population Standard: Required Population Guidance: Should match User Site ID. This field is used to identify each vegetation plot. The Vegetation Plot ID should follow the National standard method of population established for a site. This field allows the user to place a label on the Site to assist with locating the particular site record(s) in the National database. All vegetation plot(s) recorded in NASIS should follow this standard, which is referenced in the KSSL Laboratory Information Manual. The National standard for the User Site ID is the "YYYYXXZZZ123" convention: • "YYYY" is the 4-digit year when the data or samples were collected. • "XX" is the 2-character State FIPS code, such as "NE" for Nebraska (for non-USA samples, the code is the abbreviation for the country). • "ZZZ" is the 3-digit county FIPS code (e.g., 079). • "123" is the 3-digit consecutive pedon number for that county in that year. The letter S precedes the User Site ID for soil characterization samples. An example of the User Site ID for a sample location is S2005NE079001. If multiple transects are collected at a "site," there is one Vegetation Plot ID and each transect will have a specific Vegetation Transect ID recorded in the Vegetation Transect child table.
7	**Vegetation Plot Name**	Definition: *A descriptive name that, in conjunction with the vegetation plot ID, helps to identify the vegetation plot.* Population Standard: Optional Population Guidance: A standardized naming convention will assist in allowing plot data to be filtered. Potential naming conventions may include series such as tier levels (e.g., *tier 1, tier 2, tier 3*); type of data collection (e.g., site correlation, preliminary, ESD data collection), or other naming conventions. Protocol should be established by region or by MLRA office.
8	**Primary Data Collector**	Definition: *The name of the primary person responsible for collecting the data on a vegetation plot.* Population Standard: Optional Population Guidance: Populate Last Name, First Name
9	**Data Collection Purpose**	Definition: *A short text narrative that can be used to describe a particular purpose for the collection of data from a particular vegetation plot. This field is expected to be used infrequently.* Population Standard: Optional Population Guidance: Answer should be succinct and consistent. Establish a known set of purposes for the specific area or region. Examples: soil correlation, ESD development, general observation.
10	**Data Origin**	Definition: *The origin of the vegetation data, whether entered or imported directly into this database, or transcribed/converted from another vegetation database.* Population Standard: Optional Population Guidance: Select the most appropriate answer from the drop-down menu.
11	**Plot Size** *(m^2)*	Definition: *The area of a vegetation inventory plot expressed in square meters.* Population Standard: Optional Population Guidance: A general plot size is 1 acre (4047 sq. m.); however, different methods may focus on a range of plot sizes. Plot size is not to be confused with the quadrat size (hoop size or frame size along a transect).
12	**Soil Profile ?**	Definition: *A yes/no indicator as to whether a detailed soil profile description was collected from this plot.* Population Standard: Optional

Population Guidance: If a soil profile description is collected on a vegetation plot, select this checkbox to capture it, and then populate the associated User Pedon ID.

13 **Assoc. User Pedon ID**

Definition: *The value recorded in the User Pedon ID column of the Pedon table for the pedon description collected from a vegetation plot.*

Population Standard: Required

Population Guidance: Record the User Pedon ID of the associated soil profile description(s) collected on this vegetation plot.

14 **Legacy Soil 232 ID**

Definition: *The identification number assigned to the Soil-232 form used to record soil profile data for the plot as recorded in legacy vegetation inventory data.*

Population Standard: Obsolete

Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.

15 **A Horizon Depth**

(cm)

Definition: *The depth to the bottom of the A horizon of the soil identified within the plot.*

Population Standard: Optional

Population Guidance: The depth of the A horizon can be found on the Soil-232 or in quick notes in the horizon depth column. The depth of the A horizon (or all A horizons collectively) are entered here in centimeters.

16 **Alkaline/Saline Indicator**

Definition: *An indicator as to whether the soil is alkaline, saline, or neither, within the upper 18 inches of the soil profile.*

Population Standard: Optional

Population Guidance: Check the box to indicate if the soil has the characteristics of an *alkaline* or *saline* soil. Indicators include EC, CCE, pH, visible salts, structure, or other supporting documentation.

17 **Alkaline Affected?**

Definition: *A yes/no indicator as to whether alkalinity has affected the windbreak species.*

Population Standard: Optional

Population Guidance: If there has been an effect to species within a windbreak, then check the box.

18 **Salinity Class**

Definition: *A class indicating the degree of salinity within the upper 18 inches of the soil profile.*

Population Standard: Optional

Population Guidance: Salinity classes are defined in Chapter 3 of the Soil Survey Manual and are established based on the electrical conductivity (EC) of the soil. Based on the EC of the soil for the plot, populate this cell using the classes defined in Chapter 3.

19 **Legacy Restrictive Layer Depth**

(cm)

Definition: *The depth in centimeters to the top of a root-restrictive layer as recorded in legacy data.*

Population Standard: Obsolete

Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.

20 **Legacy Soil Name**

Definition: *The name of the correlated soil component as recorded in legacy data.*

Population Standard: Obsolete

Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.

21 **Legacy Soil Phase**

Definition: *The soil phase name that the plot occurs on as recorded in legacy data.*

Population Standard: Obsolete

Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.

22 **Legacy Local Soil Phase**

Definition: *The phase of the correlated soil component as recorded in legacy data.*

Population Standard: Obsolete

Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.

23 **Legacy Surface Texture**

Definition: *The texture classification of the soil surface layer as recorded in legacy data.*

Population Standard: Obsolete

Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.

24 **Legacy Texture Modifier**

Definition: *The modifier classification of the soil surface texture as recorded in legacy data.*

Population Standard: Obsolete

Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.

25 **Legacy Term In Lieu of Texture**

Definition: *Substitute terms applied to materials that do not fit into a textural class because of organic matter content, size, rupture resistance, solubility, or another reason as recorded in legacy data.*

Population Standard: Obsolete

Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.

26 **Legacy Erosion Class**

Definition: *A class indicating the degree of past erosion as recorded in legacy vegetation inventory data.*

Population Standard: Obsolete

Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.

27 **Legacy Landform Group**

Definition: *The name of the landform(s) that the plot occurs on as was recorded in legacy vegetation inventory data.*

Population Standard: Obsolete

Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.

28 **Legacy Cryptogam Cover Class**

Definition: *The extent of the ground surface covered by cryptogams as reported in legacy data, expressed as a class.*

Population Standard: Obsolete

Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.

29 **Rangeland Use History**

Definition: *An indication of the degree of rangeland use of the area where a plot exists.*

Population Standard: Optional

Population Guidance: Select the range of historic utilization for the established plot. If the history is not known, is unclear, or has shifted, consider selecting *Unknown*. If not grazed or is grazed after aftermath is harvested for hay, the select *Harvested for Hay*. *Overgrazed* is land that has experienced loss of plant cover and accelerated erosion because of heavy grazing or browsing pressure. *Proper grazed* refers to grazing being done at an intensity that will maintain enough cover to protect the soil and maintain or improve the quantity and quality of desirable vegetation. *None* or *Slightly Grazed* refers to either the absence of grazing use on current year's forage production or little evidence of use.

30 **Canopy Cover % - Ave.**

(%)

Definition: *The average percentage of canopy cover of all vegetation transects collected from a given vegetation plot.*

Population Standard: Optional

Population Guidance: Calculated average of the Total Canopy Cover for all transects across the plot, as recorded in the Vegetation Transect child tables. This may be also a measurement or estimation of the Total Overstory Canopy Cover for the plot.

31 **Total Canopy Cover %**

(%)

Definition: *The estimated percentage of the ground that is shaded by vegetation canopy at midday.*

Population Standard: Optional

Population Guidance: This cell is to capture the total canopy cover as a percentage as estimated for the plot. This is completed by multiple protocols across multiple land types *(rangeland, forestland, pastureland*).

32 **Total Canopy Cover Class**

Definition: *The estimated percentage of the ground that is shaded by vegetation canopy at midday, expressed as a class.*

Population Standard: Optional

Population Guidance: Based on the calculation in the previous cell (Total Canopy Cover %) select the class that fits the calculated percentage. The classes are as follows: 1 = Trace, 2 = 0.1-1%, 3 = 1-2%, 4 = 2-5%, 5 = 5-10%, 6 = 10-25%, 7 = 25-50%, 8 = 50-75%, 9 = 75-95%, and 10 = >95%. This Domain class varies between protocols: select the range that best fits the percentage calculated in the previous cell.

33 **Total Overstory Canopy Cover %**

(%)

Definition: *The canopy cover percentage of all species in the overstory stratum.*

Population Standard: Optional

Population Guidance: Calculated average of the Total Overstory Canopy Cover for all Transects across the plot, as recorded in the Vegetation Transect child tables. This cell may also capture the Total Overstory Canopy Cover as a percentage estimated for the plot. This is completed by multiple protocols across multiple land types (rangeland, forestland, pastureland).

34 **Total Overstory Canopy Cover Class**

Definition: *The canopy cover percentage of all species in the overstory stratum, expressed as a class.*

Population Standard: Optional

Population Guidance: Based on the calculation in the previous cell (Total Overstory Canopy Cover %) select the class that fits the calculated percentage. The classes are as follows: 1 = Trace, 2 = 0.1-1%, 3 = 1-2%, 4 = 2-5%, 5 = 5-10%, 6 = 10-25%, 7 = 25-50%, 8 = 50-75%, 9 = 75-95%, and 10 = >95%. This Domain class varies between protocols: select the range that best fits the percentage calculated in the previous cell.

35 **Dbl. Sampling Ave. Annual Prod.**

Definition: *The average total annual production of all vegetation transects collected from a given vegetation plot as measured by the Double Sampling protocol.*

	(lbs/acre)	Population Standard: Optional Population Guidance: Calculation of production based on the Double Sampling Protocol, averaged across all transects. Data is located in the Vegetation Transect child table. Further guidance can be found in the Monitoring Manual as well as in the National Range and Pasture Handbook.
36	**Comparative Yield Ave. Prod.** *(lbs/acre)*	Definition: *The average total annual production of all vegetation transects collected from a given vegetation plot as measured by the Comparative Yield protocol.* Population Standard: Optional Population Guidance: Calculation of production based on the Comparative Yield Protocol, averaged across all transects. Data is located in the Vegetation Transect child table. Further guidance can be found in the Monitoring Manual as well as in the National Range and Pasture Handbook.
37	**Total Above Ground Biomass - Ave.** *(lbs/acre)*	Definition: *The average total above-ground biomass of all vegetation transects within a given vegetation plot.* Population Standard: Optional Population Guidance: Calculated average of above-ground biomass production of plant species as recorded in Vegetation Transect and Transect Standing Biomass Details child tables.
38	**Understory Reprod. Abundance**	Definition: *A class indicating the abundance of plant reproduction in the understory.* Population Standard: Optional Population Guidance: Select the most appropriate answer from the drop-down menu for the site (comparison across all plots or all transects). The abundance of plant reproduction in the understory is rated as *Very abundant* (5), *Abundant* (4), *Moderately abundant* (3), *Sparsely abundant* (2), or *None* (1). The number corresponds the rating code on the ESI Forest Plot Inventory Worksheet, found in the exhibits of the National Forestry Handbook, Section 637.
39	**Woody Understory Abundance**	Definition: *A class indicating the abundance of woody plants in the understory.* Population Standard: Optional Population Guidance: Select the most appropriate answer from the drop-down menu. The density of woody species in the understory is rated as *Very abundant* (5), *Abundant* (4), *Moderately abundant* (3), *Sparsely abundant* (2), or *None* (1). The number corresponds the rating code on the ESI Forest Plot Inventory Worksheet, found in the exhibits of the National Forestry Handbook, Section 637.
40	**Herb. Understory Abundance**	Definition: *A class indicating the abundance of herbaceous plants in the understory.* Population Standard: Optional Population Guidance: Select the most appropriate answer from the drop-down menu for the site (comparison across all plots or all transects). The density of herbaceous species in the understory is rated as *Very abundant* (5), *Abundant* (4), *Moderately abundant* (3), *Sparsely abundant* (2), or *None* (1). The number corresponds the rating code on the ESI Forest Plot Inventory Worksheet, found in the exhibits of the National Forestry Handbook, Section 637.
41	**Lichens Understory Abundance**	Definition: *A class indicating the abundance of lichens or mosses in the understory.* Population Standard: Optional Population Guidance: Select the most appropriate answer from the drop-down menu for the site (comparison across all plots or all transects). The density of lichens in the understory is rated as *Very abundant* (5), *Abundant* (4), *Moderately abundant* (3), *Sparsely abundant* (2), or *None* (1). The number corresponds the rating code on the ESI Forest Plot Inventory Worksheet, found in the exhibits of the National Forestry Handbook, Section 637.
42	**Crown Canopy Closure %**	Definition: *The percentage of crown closure of the overstory species.* Population Standard: Optional

	(%)	Population Guidance: Calculated across all plots or for all transects for the site using canopy cover measurements of the overstory of woody species or may be estimated. Measurement protocol can be found in the National Forestry Handbook Section 636.
43	**Crown Can. Closure Assess. Meth.**	Definition: *The method used to obtain the crown canopy closure percentage.* Population Standard: Optional Population Guidance: Select the most appropriate answer from the drop-down menu: *estimated* values or *measured* values.
44	**LPP Crown Competition Factor**	Definition: *An index number indicating the crown competition factor for lodgepole pine.* Population Standard: Optional Population Guidance: Calculated lodgepole pine based on average diameter and average basal area for all plots or all transects as recorded in the Plot Tree Site Index Summary child table or Vegetation Transect child table. Data is found on the ESI-Forest Plot Field Worksheet, protocol and guidance is found in the National Forestry Handbook Exhibit 63-57.
45	**LPP Crown Comp. Ave DBH** *(in)*	Definition: *The average diameter at breast height (DBH), typically 4.5 feet above ground level, of the lodgepole pine stand being evaluated. This value is used in computing the crown competition factor.* Population Standard: Optional Population Guidance: Calculated average diameter of all lodgepole pine for all plots or all transects as recorded in the Plot Tree Site Index Summary child table or Vegetation Transect child table. Data is found on the ESI-Forest Plot Field Worksheet, protocol and guidance is found in the National Forestry Handbook Exhibit 63-57.
46	**Basal Cover % - Ave.** *(%)*	Definition: *The average percentage of basal cover of all vegetation transects collected from a given vegetation plot.* Population Standard: Obsolete Population Guidance: Calculated across all transects as captured in the Vegetation Transect child table. This cell is more accurately expressed as average square feet per acre. Do not populate this cell. Under consideration for corrections during data model updates.
47	**Total Basal Area** *(ft^2/acre)*	Definition: *Total basal area for the plot.* Population Standard: Optional Population Guidance: The total basal area of a plot as captured on the ESI Forest Plot Field Worksheet and the ESI Windbreak Plot Field Worksheet. Basal area is expressed as square feet per acre. Calculated from the Site Woody Basal Area child table, by multiplying the basal area factor (BAF) by the number of trees in for each factor captured.
48	**Basal Area Assess. Method**	Definition: *The method used to determine basal area.* Population Standard: Optional Population Guidance: Select the most appropriate answer from the drop-down menu: *estimated* values or *measured* values.
49	**Cons Tree Shrub Group.**	Definition: *The identifier for a particular Conservation Tree Shrub Group (CTSG) which that is associated with a soil map unit component or vegetation inventory plot. A CTSG is a physiographic unit or area having similar climatic and edaphic characteristics that control the selection and height of growth of trees and shrubs (National Forestry Manual).* Population Standard: Optional Population Guidance: Select the designated group identification from the drop-down list based on the soil component found for the site.

50 **Windbreak Row 1 Direction**

Definition: *The direction that row 1 of the windbreak faces. Row 1 is defined as the row on the west or north side of the windbreak, depending upon windbreak orientation.*

Population Standard: Optional

Population Guidance: Select the most appropriate cardinal direction from the drop-down list for the azimuth of the first row of the windbreak.

51 **Windbreak Trapped Soil Depth**

(cm)

Definition: *The depth of soil material trapped by the windbreak.*

Population Standard: Optional

Population Guidance: Measure the depth across the length of the windbreak, entering the average depth in centimeters.

52 **Windbreak Trapped Soil Texture**

Definition: *The texture class of soil material trapped by the windbreak.*

Population Standard: Optional

Population Guidance: Select the most appropriate textural class from the drop-down list based on a collected sample of the trapped soil and the results of a ribbon test or textural triangle.

53 **Understory Description ?**

Definition: *A yes/no indicator of whether a detailed understory vegetation description is available for the plot.*

Population Standard: Optional

Population Guidance: Check the box if there is a description of the understory taken for the plot. If no description is available, leave the box unchecked.

54 **Mensuration Data ?**

Definition: *A yes/no indicator as to whether detailed mensuration data is available for a plot.*

Population Standard: Optional

Population Guidance: Check the box if there is detailed mensuration data available for the plot. If no data is available, leave the box unchecked. Mensuration data is referring to a measurement of the vegetative cover, including ocular estimations that are captured for this plot (height, cover, production, frequency/density).

55 **Legacy Vigor Class**

Definition: *A rating of the relative robustness of the plant community of a vegetation inventory plot. It is reflected primarily by the size and condition the of plants and their parts in relation to their age and the environment in which they are growing.*

Population Standard: Obsolete

Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.

56 **Legacy Site Condition**

(%)

Definition: *The percentage of the existing plant community on a plot that is historic climax plant community as recorded in legacy vegetation inventory data.*

Population Standard: Obsolete

Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.

57 **Legacy Overstory Species**

Definition: *A listing of one or more plant species that make up the overstory plant community for the plot as recorded in legacy vegetation inventory data.*

Population Standard: Obsolete

Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.

58 **Plant Moisture State**

Definition: *The moisture state of plant material at which plant weights were recorded for a plot.*

Population Standard: Optional

Population Guidance: Select the appropriate option for the weights captured by the data: *green weights*, *air-dried*, *oven-dried*, *etc.*

59 **Current Tree Density**

(trees/acre)

Definition: *The number of trees per acre found on the plot at the time of inventory.*

Population Standard: Optional

Population Guidance: Density is calculated using the current tree spacing and is expressed as trees per acre. Field note sheet, formula, and measurement protocols are captured in the National Forestry Handbook Section 636.21.

60 **Current Tree Spacing**

(ft)

Definition: *The average distance between individual trees within the plot at the time of inventory, expressed in feet.*

Population Standard: Optional

Population Guidance: Spacing is calculated as an average of the distance of trees. Data is found on the Transect Field Notes. Field note sheet, formula, and measurement protocols are captured in the National Forestry Handbook Section 636.21.

61 **Current D+x Spacing**

(ft)

Definition: *A variable (e.g. 'D+10') used to determine the current tree density of the site; where "D" is the average tree diameter (DBH in whole inches) of trees on the site, and "x" is the current average tree spacing of trees within the plot. The 'D+x' value is expressed in whole feet.*

Population Standard: Optional

Population Guidance: The D+X "rule of thumb" is a determination for thinning. X will vary based on tree species and location. Consult local forestry specialist to determine the constant for the specific locale. Data is found on the Transect Field Notes. Field note sheet, formula, and measurement protocols are captured in the National Forestry Handbook Section 636.21.

62 **Current Plot Ave DBH**

(in)

Definition: *The average diameter at breast height (DBH) of trees within the plot at the time of inventory, expressed in inches.*

Population Standard: Optional

Population Guidance: DBH is calculated as an average of the diameter of trees inventoried. Data is found on the Transect Field Notes. Field note sheet, formula, and measurement protocols are captured in the National Forestry Handbook Section 636.21.

63 **Plot Basal Area Factor**

Definition: *The conversion factor used to compute total basal area for the plot without regard to individual species. The value chosen is dependent upon the tool used in the field.*

Population Standard: Optional

Population Guidance: Data is found on the ESI Forest Field Plot Worksheet, tool and measurement protocol as well as the BAF are captured in the National Forestry Handbook Section 636.

64 **Current Basal Area**

(ft^2/acre)

Definition: *Total basal area of the plot at the time of inventory.*

Population Standard: Optional

Population Guidance: Data is found on the Transect Field Notes. Field note sheet, formula, and measurement protocols are captured in the National Forestry Handbook Section 636.35

65 **Forest Stand Type**

Definition: *A description of the structure of the forest stand with regard to the main stand, secondary stand, and understory strata.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. *Choice A* represents a main stand that is the dominant size and age class (overstory). *Choice B* represents a main stand that is intermediate in height or age with some secondary trees clearly taller and older, with an understory of younger trees. *Choice C* represents a main stand that is smaller and younger of a two-aged stand, and dominant in number of trees.

66 **Strata Inventoried**

Definition: *The strata of the forest stand that is being inventoried.*

Population Standard: Optional

Population Guidance: The strata inventoried is populated by selecting the appropriate forest stand from the drop-down menu. Forest stands are the *Main Stand*, *Secondary Stand*, and *Understory Strata*. Main stands generally are the larger and older trees. Secondary stands generally are slightly smaller but mature earlier generation tree, and the understory is suppressed trees, advanced reproduction, or other plants. Guidance can be found in the National Forestry Handbook Section 636.21.

67 **Stand Regeneration**

Definition: *The regeneration of the forest stand that is being inventoried.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu: *adequate*, *inadequate*, or *not applicable*.

68 **Stand Quality**

Definition: *A rating of the overall quality of the forest stand being evaluated.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Overall stand quality or stand condition is rated as *good, fair*, or *poor*. Guidance can be found in the National Forestry Handbook Section 636.21.

69 **Desired Tree Density**

(trees/acre)

Definition: *The desired number of trees per acre that is the target for management of the site.*

Population Standard: Optional

Population Guidance: Desired tree density is determined based on goals established within a management plan (general reference to a conservation plan or forest management plan.)

70 **Desired D+x Spacing**

(ft)

Definition: *A variable (e.g. 'D+10') used to determine the desired tree density of the site; where "D" is the average tree diameter (DBH in whole inches) of trees on the site, and "x" is a constant that varies due to region of the country and the species of the site, and ranges from -5 to +15. The 'D+x' value is expressed in whole feet.*

Population Standard: Optional

Population Guidance: Desired D+x is determined based on goals established within a management plan (general reference to a conservation plan or forest management plan.)

71 **Desired Basal Area**

(ft^2/acre)

Definition: *The target or desired total basal area for the plot.*

Population Standard: Optional

Population Guidance: Desired basal area is determined based on goals established within a management plan (general reference to a conservation plan or forest management plan.)

72 **Excess Basal Area**

(ft^2/acre)

Definition: *The amount of change in basal area necessary to reach the 'desired' level. Negative values indicate the 'current' level is below the 'desired' level.*

Population Standard: Optional

Population Guidance: Excess basal area is a calculation of the difference between current basal area and desired basal area.

73	**Excess Tree Density**	Definition: *The difference between the current and desired density of trees on the site. Positive values are the number of trees that should be thinned from the stand. Negative numbers indicate that the 'current' density is less than the 'desired' density and there is room for additional trees to be planted.* Population Standard: Optional Population Guidance: Excess tree density is a calculation of the difference between current tree density and desired tree density.
74	**% Stocking Change** *(%)*	Definition: *The percentage change required in tree density for the plot to reach the 'desired' tree density.* Population Standard: Optional Population Guidance: Percentage of stocking change is a calculation of the difference between excess tree density and desired tree density divided by the current tree density.
75	**% Good Condition** *(%)*	Definition: *The percentage of trees inventoried within a plot that are rated in good condition.* Population Standard: Optional Population Guidance: Populate the percentage of trees within the overall stand that rated as *good*. Data is found on the Transect Field Notes. Guidance can be found in the National Forestry Handbook Section 636.21
76	**% Fair Condition** *(%)*	Definition: *The percentage of trees inventoried within a plot that are rated in fair condition.* Population Standard: Optional Population Guidance: Populate the percentage of trees within the overall stand that rated as *fair*. Data is found on the Transect Field Notes. Guidance can be found in the National Forestry Handbook Section 636.21
77	**% Poor Condition** *(%)*	Definition: *The percentage of trees inventoried within a plot that are rated in poor condition.* Population Standard: Optional Population Guidance: Calculate the percentage of trees within the overall stand that rated as *poor*. Data is found on the Transect Field Notes. Guidance can be found in the National Forestry Handbook Section 636.21
78	**# of Trees Counted**	Definition: *The number of individual trees of all plant species counted within the plot.* Population Standard: Optional Population Guidance: Data is found on the Transect Field Notes. Field note sheet, formula, and measurement protocols are captured in the National Forestry Handbook Section 636.21. The Relevé method also will capture this information.
79	**Hard Tree Snag Density** *(trees/acre)*	Definition: *The number of hard tree snags per acre. Hard tree snags are dead, standing tree trunks that are > 4" in diameter at 4.5 feet above the ground, and > 6 feet in height; have no evidence of decay; and with bark largely intact.* Population Standard: Optional Population Guidance: Data is found on the ESI Forest Plot Field Worksheet. Worksheet and protocols are captured in the National Forestry Handbook Section 637. The Relevé method also will capture this information.
80	**Soft Tree Snag Density**	Definition: *The number of soft tree snags per acre. Soft tree snags are dead, standing tree trunks that are > 4" in diameter at 4.5 feet above the ground, and > 6 feet in height; have no evidence of decay; and with bark that has partially or totally sloughed off.*

	(trees/acre)	Population Standard: Optional Population Guidance: Data is found on the ESI Forest Plot Field Worksheet. Worksheet and protocols are captured in the National Forestry Handbook Section 637. The Relevé method also will capture this information.
81	**RHI - Annual Production**	Definition: *Rangeland health indicator: the degree of departure from the ESD regarding annual production. Reference: NRI Grazing Land On-Site Data Collection Instructions, dated 4/10/2012.* Population Standard: Optional Population Guidance: Rating is documented on the Rangeland Health Evaluation Sheet, indicator #15 – annual production.
82	**RHI - Bare Ground**	Definition: *Rangeland health indicator: the degree of departure from the ESD with regard to amount and pattern of bare ground. Reference: NRI Grazing Land On-Site Data Collection instructions, dated 4/10/2012.* Population Standard: Optional Population Guidance: Rating is documented on the Rangeland Health Evaluation Sheet, indicator #4 – bare ground percent.
83	**RHI - Compaction Layer**	Definition: *Rangeland health indicator: the degree of departure from the ESD with regard to presence of compacted layers below the soil surface. Reference: NRI Grazing Land On-Site Data Collection instructions dated 4/10/2012.* Population Standard: Optional Population Guidance: Rating is documented on the Rangeland Health Evaluation Sheet, indicator #11 – compaction layer.
84	**RHI - Func/Stuct Groups**	Definition: *Rangeland health indicator: the degree of departure from the ESD with regard to presence and diversity of functional or structural groups. Reference: NRI Grazing Land On-Site Data Collection instructions, dated 4/10/2012.* Population Standard: Optional Population Guidance: Rating is documented on the Rangeland Health Evaluation Sheet, indicator #12 – functional/structural groups.
85	**RHI - Erosion Resistance**	Definition: *Rangeland health indicator: the degree of departure from the ESD with regard to the resistance of the soil surface to erosion. Reference: NRI Grazing Land On-Site Data Collection instructions, dated 4/10/2012.* Population Standard: Optional Population Guidance: Rating is documented on the Rangeland Health Evaluation Sheet, indicator #8 – soil surface resistance to erosion.
86	**RHI - Gullies**	Definition: *Rangeland health indicator: the degree of departure from the ESD regarding the presence of gullies. Reference: NRI Grazing Land On-Site Data Collection instructions, dated 4/10/2012.* Population Standard: Optional Population Guidance: Rating is documented on the Rangeland Health Evaluation Sheet, indicator #5 - gullies.
87	**RHI - Rills**	Definition: *Rangeland health indicator: the degree of departure from the ESD regarding the presence of rills. Reference: NRI Grazing Land On-Site Data Collection instructions, dated 4/10/2012.* Population Standard: Optional

		Population Guidance: Rating is documented on the Rangeland Health Evaluation Sheet, indicator #1 - rills.
88	**RHI - Pedestals/ Terracettes**	Definition: *Rangeland health indicator: the degree of departure from the ESD with regard to the presence of pedestalling and terracettes. Reference: NRI Grazing Land On-Site Data Collection instructions, dated 4/10/2012.* Population Standard: Optional Population Guidance: Rating is documented on the Rangeland Health Evaluation Sheet, indicator #3 – pedestals and/or terracettes.
89	**RHI - Infiltration & Runoff**	Definition: *Rangeland health indicator: the degree of departure from the ESD with regard to infiltration and runoff. Reference: NRI Grazing Land On-Site Data Collection instructions, dated 4/10/2012.* Population Standard: Optional Population Guidance: Rating is documented on the Rangeland Health Evaluation Sheet, indicator #10 – plant community composition and distribution relative to infiltration.
90	**RHI - Litter Amount**	Definition: *Rangeland health indicator: the degree of departure from the ESD with regard to the amount of litter present. Reference: NRI Grazing Land On-Site Data Collection instructions, dated 4/10/2012.* Population Standard: Optional Population Guidance: Rating is documented on the Rangeland Health Evaluation Sheet, indicator #14 – litter amount.
91	**RHI - Litter Movement**	Definition: *Rangeland health indicator: the degree of departure from the ESD with regard to litter movement by wind or water. Reference: NRI Grazing Land On-Site Data Collection instructions, dated 4/10/2012.* Population Standard: Optional Population Guidance: Rating is documented on the Rangeland Health Evaluation Sheet, indicator #7 – litter movement.
92	**RHI - Plant Mortality**	Definition: *Rangeland health indicator: the degree of departure from the ESD with regard to plant mortality and/or decadence. Reference: NRI Grazing Land On-Site Data Collection instructions, dated 4/10/2012.* Population Standard: Optional Population Guidance: Rating is documented on the Rangeland Health Evaluation Sheet, indicator #13 – plant mortality/decadence.
93	**RHI - Reproductive Capability**	Definition: *Rangeland health indicator: the degree of departure from the ESD with regard to the site capability to produce perennial plant seeds and/or tillers. Reference: NRI Grazing Land On-Site Data Collection instructions dated 4/10/2012.* Population Standard: Optional Population Guidance: Rating is documented on the Rangeland Health Evaluation Sheet, indicator #17 – reproductive capability of perennial plants.
94	**RHI - Invasive Plants**	Definition: *Rangeland health indicator: the degree of departure from the ESD with regard to the presence of invasive species. Reference: NRI Grazing Land On-Site Data Collection instructions, dated 4/10/2012.* Population Standard: Optional Population Guidance: Rating is documented on the Rangeland Health Evaluation Sheet, indicator #16 – Invasive plants.

95 **RHI - Soil Surface Degradation**

Definition: *Rangeland health indicator: the degree of departure from the ESD with regard to the loss or degradation of the soil surface horizon. Reference: NRI Grazing Land On-Site Data Collection instructions dated 4/10/2012.*

Population Standard: Optional

Population Guidance: Rating is documented on the Rangeland Health Evaluation Sheet, indicator #9 – soil surface loss or degradation.

96 **RHI - Water Flow Patterns**

Definition: *Rangeland health indicator: the degree of departure from the ESD with regard to water flow patterns and erosion. Reference: NRI Grazing Land On-Site Data Collection instructions, dated 4/10/2012.*

Population Standard: Optional

Population Guidance: Rating is documented on the Rangeland Health Evaluation Sheet, indicator #2 - water flow patterns.

97 **RHI - Wind Scour Areas**

Definition: *Rangeland health indicator: the degree of departure from the ESD with regard to the presence of wind-scoured blowouts and/or depositional areas. Reference: NRI Grazing Land On-Site Data Collection instructions dated 4/10/2012.*

Population Standard: Optional

Population Guidance: Rating is documented on the Rangeland Health Evaluation Sheet, indicator #6 – wind-scoured blowouts and/or depositional areas.

98 **RHI - Soil/Site Stability Summ.**

Definition: *Rangeland health indicator summary: A summary rating indicating the degree of departure from the ESD with regard to the capacity of the site to limit redistribution and loss of soil resources (including nutrients and organic matter) by wind and water.*

Population Standard: Optional

Population Guidance: Calculated summary rating based on where most of the indicators for the soil/site stability attributes fall under the five categories.

99 **RHI - Biotic Integrity Summ.**

Definition: *Rangeland health indicator summary: A summary rating indicating the degree of departure from the ESD with regard to the capacity of the site to support characteristic functional and structural communities in the context of normal variability, to resist loss of this function and structure due to a disturbance, and to recover following such disturbance.*

Population Standard: Optional

Population Guidance: Calculated summary rating based on where most of the indicators for the biotic integrity attributes fall under the five categories.

100 **RHI – Hydrologic Function Summ.**

Definition: *Rangeland health indicator summary: A summary rating indicating the degree of departure from the ESD with regard to the capacity of the site capture, store, and safely release water from rainfall, run-on, and snowmelt (where relevant), to resist reduction in this capacity, and to recover this capacity following such disturbance.*

Population Standard: Optional

Population Guidance: Calculated summary rating based on where most of the indicators for the hydrologic function attributes fall under the five categories.

101 **Pasture Forage Type**

Definition: *The name of the pasture forage type as recorded when using the Pasture Stick sampling protocol.*

Population Standard: Optional

Population Guidance: Limited to 30 characters. Generalized identifier is best unless a monoculture stand. Some examples are dryland alfalfa, grass and legume mix, irrigated mixed grass, or irrigated

warm-season grass mix. Standardized lists of forage types for the area is suggested. Consistency will assist with data analysis and filtering of data.

102 **Average Pasture Stand Density**

(%)

Definition: *The average percentage cover of plants in the sample area.*

Population Standard: Optional

Population Guidance: The percentage of cover is measured using the Pasture Stick sampling protocol. An average percentage is calculated across the sampling area and reported in this column. An ocular or measured density may also be calculated as part of the Pasture condition index scorecard.

103 **Average Pasture Plant Ht.**

(in)

Definition: *The average height in inches of plants for the pasture forage type in the sample area.*

Population Standard: Optional

Population Guidance: The calculated average height of plants for the pasture forage type in the sample area as determined by use of the Pasture Stick sampling protocol reported as inches. Measurement also may be gathered as part of the Pasture condition index scorecard.

104 **Average Pasture Production**

(lbs/acre)

Definition: *The average annual estimated dry matter production of the sample area as determined by use of the Pasture Stick sampling protocol reported as pounds per acre.*

Population Standard: Optional

Population Guidance: Report the average annual dry matter production as estimated using the Pasture Stick or other accepted methods. Pounds per acre are recorded in whole integers.

105 **PCI - Desirable Plants**

Definition: *Pasture Condition Indicator: The percentage of plant cover by weight that is desirable forage, expressed as a class.*

Population Standard: Optional

Population Guidance: Rating is documented on the Pasture Condition Score Sheet, percentage of desirable plants indicator.

106 **PCI - Plant Cover**

Definition: *Pasture Condition Indicator: The percentage of live, leafy canopy or basal cover of desirables and intermediates, expressed as a class.*

Population Standard: Optional

Population Guidance: Rating is documented on the Pasture Condition Score Sheet, plant cover indicator. This rating is an average of the individual ratings for the living canopy cover and basal cover of desirable and intermediate species.

107 **PCI - Plant Diversity**

Definition: *Pasture Condition Indicator: The diversity of well represented forage species.*

Population Standard: Optional

Population Guidance: Rating is documented on the Pasture Condition Score Sheet, plant diversity indicator.

108 **PCI - Ground Cover Residue**

Definition: *Pasture Condition Indicator: Ground cover and/or thatch. Ground cover and standing dead forage are rated separately and then the scores are averaged.*

Population Standard: Optional

Population Guidance: Rating is documented on the Pasture Condition Score Sheet; this is one of two factors for the plant residue indicator.

109 **PCI - Standing Dead Forage**

Definition: *Pasture Condition Indicator: standing dead forage. Ground cover and standing dead forage are rated separately and then the scores are averaged.*

Population Standard: Optional

Population Guidance: Rating is documented on the Pasture Condition Score Sheet; this is one of two factors for the plant residue indicator.

110 **PCI - Plant Residue Comp. Score**

Definition: *Pasture Condition Indicator: The overall composite score for plant residue based on individual ratings for ground cover, standing dead forage, or thatch. Ground cover and standing dead forage are rated separately and then the scores are averaged.*

Population Standard: Optional

Population Guidance: Calculated average of the individual rating for ground cover residue and standing dead forage. Rating is documented on the Pasture Condition Score Sheet, plant residue indicator.

111 **PCI - Plant Vigor**

Definition: *Pasture Condition Indicator: Degree of stress of the plant community.*

Population Standard: Optional

Population Guidance: Rating is documented on the Pasture Condition Score Sheet, plant vigor indicator. If this rating is less than 4, then a secondary rating will be made to identify the plant stresses causing reduced vigor. This rating is **NOT** entered in this cell. Populate only the general criteria rating.

112 **PCI – Legume %**

Definition: *Pasture Condition Indicator: The percentage of legumes present as total air-dry weight, expressed as a class.*

Population Standard: Optional

Population Guidance: Rating is documented on the Pasture Condition Score Sheet, percent legume indicator.

113 **PCI - Use Uniformity**

Definition: *Pasture Condition Indicator: The degree of uniformity of grazing.*

Population Standard: Optional

Population Guidance: Rating is documented on the Pasture Condition Score Sheet, uniformity of use indicator.

114 **PCI - Livestock Conc. Areas**

Definition: *Pasture Condition Indicator: The presence of livestock concentration areas and their proximity to surface water.*

Population Standard: Optional

Population Guidance: Rating is documented on the Pasture Condition Score Sheet, livestock concentration areas indicator.

115 **PCI - Soil Compaction**

Definition: *Pasture Condition Indicator: The degree of soil compaction.*

Population Standard: Optional

Population Guidance: Rating is documented on the Pasture Condition Score Sheet, soil compaction indicator.

116 **PCI - Sheet & Rill Erosion**

Definition: *Pasture Condition Indicator: The presence and extent of sheet and rill erosion.*

Population Standard: Optional

Population Guidance: Rating is documented on the Pasture Condition Score Sheet, erosion indicator. Sheet and rill erosion are always recorded on the pasture condition score sheet, however, other indicators may be rated. The individual ratings and the averaged rating are recorded in subsequent cells.

117 **PCI - Wind Erosion**

Definition: *Pasture Condition Indicator: The presence and extent of wind erosion.*

Population Standard: Optional

Population Guidance: Rating is captured on the Pasture Condition Score Sheet only if documented on the plot (pasture unit) and will be noted under the erosion indicator.

118 **PCI - Stream/Shore Erosion**

Definition: *Pasture Condition Indicator: The presence and extent of streambank and/or shoreline erosion.*

Population Standard: Optional

Population Guidance: Rating is captured on the Pasture Condition Score Sheet only if documented on the plot (pasture unit) and will be noted under the erosion indicator.

119 **PCI - Gully Erosion**

Definition: *Pasture Condition Indicator: The presence and extent of gully erosion.*

Population Standard: Optional

Population Guidance: Rating is captured on the Pasture Condition Score Sheet only if documented on the plot (pasture unit) and will be noted under the erosion indicator.

120 **PCI - Erosion Comp. Score**

Definition: *Pasture Condition Indicator: The overall composite rating for the site based on individual scores for sheet and rill erosion, along with gully, streambank, shoreline, or wind erosion where present.*

Population Standard: Optional

Population Guidance: Calculated average of the individual scores for each of the erosion types identified in the scorecard. Only score or include those erosion types that are present within the plot (pasture unit).

121 **PCI - Pasture Condition Score**

Definition: *Pasture Condition Indicator: The overall composite rating for the site based on individual scores for sheet and rill erosion, along with gully, streambank, shoreline, or wind erosion where present.*

Population Standard: Optional

Population Guidance: Calculated average of the individual scores for each of the indicators identified in the scorecard. Score may also be calculated as a total of the ratings. The average is represented by a rating of 1-5, while the total is established in ratings of 45-50, etc. Refer to the score sheet instructions for further guidance.

122 **Ref. Plant Community**

Definition: *The Reference plant community to which the plot is being compared.*

Population Standard: Optional

Population Guidance: The Reference Plant Community is identified by the State and the community phase. For example: if in State 1, community phase 1, enter 1.1; if State 1, community phase 2, then enter 1.2. Documentation for this cell is found on the Worksheet for Determining Similarity Index.

123 **Representative Annual Prod.**

(lbs/acre)

Definition: *The expected or representative annual air-dry production of the reference plant community in a normal year, expressed in pounds per acre.*

Population Standard: Optional

Population Guidance: The annual production for the desired reference plant community as found in the ecological site description. Capture the production for a normal year as a whole number, not as a range. Documentation for this cell is found on the Worksheet for Determining Similarity Index.

124 **Total Est. Annual Prod.**

(lbs/acre)

Definition: *The total estimated air-dry annual production of all species within the sample plot.*

Population Standard: Optional

Population Guidance: The total estimated production of all species found in the plot is calculated or entered here as lbs./acre. Documentation for this cell is found on the Worksheet for Determining Similarity Index. Calculations are a total of individual species captured in the Plot Plant Inventory.

125 **Total Allowable Prod.**

(lbs/acre)

Definition: *The total allowable air-dry annual production of all species within the sample plot.*

Population Standard: Optional

Population Guidance: The total production of all species allowed calculated or entered here as lbs./acre. Documentation for this cell is found on the Worksheet for Determining Similarity Index. Calculations are a total of individual species captured in the Plot Plant Inventory and is the lower value of total estimated and total representative production for each species.

126 **Total Palatable Prod.**

(lbs/acre)

Definition: *The total palatable air-dry annual production of all species within the sample plot.*

Population Standard: Optional

Population Guidance: Calculation of the total palatable production of all species or may be a manual entry here as lbs./acre. Calculations are a total of individual species captured in the Plot Plant Inventory.

127 **Similarity Index**

(%)

Definition: *A comparison of current estimated production to that of the reference plant community, expressed as an index of 0 to 100.*

Population Standard: Optional

Population Guidance: Calculated percentage (index) of the total allowable and the representative annual production. Documentation for this cell is found on the Worksheet for Determining Similarity Index.

128 **Annual Useable Prod.**

(lbs/acre)

Definition: *The estimated annual air-dry production that is deemed to be available for animal consumption.*

Population Standard: Optional

Population Guidance: Calculation based on the Total Palatable Production multiplied by the Harvest Efficiency (percentage/100).

129 **Harvest Efficiency %**

(%)

Definition: *The percentage of the total forage production that will, on average, be harvested by the grazing animals.*

Population Standard: Optional

Population Guidance: Harvest efficiency is a factor of forage lost during mastication, damage due to trampling, and leaf/plant shatter which relates to plant moisture. This is expressed as a percentage in whole integers. The percentage represents all plants for the Site or plot plant community.

130 **Take ½ Leave ½**

(aum/acre)

Definition: *The portion of the estimated annual useable yield using the 'Take Half, Leave Half' method, expressed as animal unit months (AUM) per acre.*

Population Standard: Optional

Population Guidance: Calculation based on the use of half of the annual useable production. Useable annual production multiplied by 0.5, then divided by 912 lbs./animal unit month.

131 **Acres/AUM**

(acres/aum)

Definition: *The estimated annual useable yield expressed as acres per animal unit month (AUM).*

Population Standard: Optional

Population Guidance: Calculation based on 30 lbs./day air-dry intake of an Animal Unit. To calculate the acres per animal unit month, 912 lbs./animal unit month is divided by the Annual Useable Production (lbs./acre).

132 **AUM/acre**

(aum/acre)

Definition: *The estimated annual useable yield expressed as animal unit months (AUM) per acre.*

Population Standard: Optional

Population Guidance: Calculation based on 30 lbs./day air-dry intake of an Animal Unit. To calculate for animal unit month per acre, the Annual Useable Production (lbs./acre) is divided by 912 lbs./animal unit month.

133 **AUD/acre**

(aud/acre)

Definition: *The estimated annual useable yield expressed as animal unit days (AUD) per acre.*

Population Standard: Optional

Population Guidance: Calculation based on 30 lbs./day air-dry intake of an Animal Unit. To calculate for animal unit day per acre, the Annual Useable Production is divided by 30.4 (30.4 is the result of 912 lbs./month divided by 30 lbs./day).

134 **Desirable Plant Vigor**

Definition: *An assessment of the vigor of desirable plant species on the site.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Rating is captured as *Good, Fair*, or *Poor*. The drop-down menu offers *Excellent* and *Moderate* as options, but unless alternative forms are utilized, populate according to protocol. Data is documented on the Trend Determination Worksheet. Guidance and data forms are available in the National Range and Pasture Handbook.

135 **Desirable Seedling Abundance**

Definition: *An assessment of the abundance of desirable plant seedlings on the site.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Rating for the abundance of seedlings and young plants of desired species is captured as *Abundant*, *Some*, or *None*. Data is documented on the Trend Determination Worksheet. Guidance and data forms are available in the National Range and Pasture Handbook.

136 **Decadent Plant Abundance**

Definition: *An assessment of the abundance of decadent plants on the site.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Rating for the abundance of decadent plants is captured as *More* than expected, *Few*, or *Some*. Protocol refers to *Many, Some, None*. The translation is that *Many* is more than expected, *Some* is the same as *Some*, and *Few* is comparable to *None*. Data is documented on the Trend Determination Worksheet. Guidance and data forms are available in the National Range and Pasture Handbook.

137 **Plant Residue Adequacy**

Definition: *An assessment of the adequacy of plant residue and litter on the site.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Rating for the abundance of plant residue and litter is captured as *Abundant*, *Adequate*, or *Inadequate*. Data is documented on the Trend Determination Worksheet. Guidance and data forms are available in the National Range and Pasture Handbook.

138 **Undesirable Invading Species**

Definition: *An assessment of the abundance of undesirable invading species on the site.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Rating for the abundance of invading undesirable plants is captured as *Many*, *Some*, or *None*. Data is documented on the Trend Determination Worksheet. Guidance and data forms are available in the National Range and Pasture Handbook.

139 **Major Invading Species**

Definition: *A listing of invading species on the site.*

Population Standard: Optional

Population Guidance: Provide a list of the major invading species, using the scientific name. If more than one major species is identified, separate with a comma. Character limit for this column is 60.

Data is documented on the Trend Determination Worksheet. Guidance and data forms are available in the National Range and Pasture Handbook.

140 **Invading Species Can. Cov. %**

(%)

Definition: *The percentage of canopy cover attributed to invading species on the site.*

Population Standard: Optional

Population Guidance: The total canopy cover or foliar cover for all invading species is captured as a whole integer. Data is documented on the Trend Determination Worksheet. Guidance and data forms are available in the National Range and Pasture Handbook.

141 **Soil Surface Erosion**

Definition: *An assessment of the degree or extent of soil erosion on the site.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Rating for the extent of soil surface erosion is captured as *Severe*, *Moderate*, or *Slight*. Data is documented on the Trend Determination Worksheet. Guidance and data forms are available in the National Range and Pasture Handbook.

142 **Soil Crusting**

Definition: *An assessment of the degree or extent of soil crust formation on the site.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Rating for the extent of soil crusting is captured as *Severe*, *Moderate*, or *Slight*. Data is documented on the Trend Determination Worksheet. Guidance and data forms are available in the National Range and Pasture Handbook.

143 **Soil Compaction**

Definition: *An assessment of the degree or extent of soil compaction on the site.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Rating for the extent of soil compaction is captured as *Severe*, *Moderate*, or *Slight*. Data is documented on the Trend Determination Worksheet. Guidance and data forms are available in the National Range and Pasture Handbook.

144 **Bare Ground %**

(%)

Definition: *An estimate of the percentage of bare ground found on the site.*

Population Standard: Optional

Population Guidance: This column is set to accept a numerical value to document the percentage of bare ground (as a whole integer). Protocol is established to document the rating of the extent of bare ground as *More* than expected, *Normal*, or *Less* than expected. If the percentage of bare ground is not known, leave this column blank. Rating can be captured under Vegetation Plot Text child table, Kind is data conversion notes, Category is Trend, Subcategory is Percent Bare Ground, Text Entry is the rating value. Data is documented on the Trend Determination Worksheet. Guidance and data forms are available in the National Range and Pasture Handbook.

145 **Gully & Rill Presence**

Definition: *An assessment of the presence of rills and gullies on the site.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Rating for the extent of gullies and rills is captured as *Numerous*, *Few*, or *None*. Data is documented on the Trend Determination Worksheet. Guidance and data forms are available in the National Range and Pasture Handbook.

146 **Soil Degradation**

Definition: *An assessment of the degree of soil degradation that has occurred on the site.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Rating of the overall soil degradation for the site is captured as *Severe*, *Moderate*, or *Slight*. Data is documented

on the Trend Determination Worksheet. Guidance and data forms are available in the National Range and Pasture Handbook.

147 **Current Range Trend**

Definition: *An assessment of the trend of the current plant community on the site toward or away from the historic plant community.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. The current range trend is based on the evaluated factors for the current plot reading compared to a baseline reading. Rating for the current range trend is captured as *Toward*, *Away from*, or *Not apparent*. Data is documented on the Trend Determination Worksheet. Guidance and data forms are available in the National Range and Pasture Handbook.

148 **Planned Range Trend**

Definition: *An assessment of the trend of the current plant community on the site toward or away from the desired or planned plant community based on the producer's objectives for the site.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. The planned range trend is established during the planning process as part of the goals of the operation. Rating for the planned range trend is captured as *Positive*, *Negative*, or *Not apparent*. Data is documented on the Trend Determination Worksheet. Guidance and data forms are available in the National Range and Pasture Handbook.

149 **QC Review Person**

Definition: *The name of the person performing the quality control review of the data.*

Population Standard: Optional

Population Guidance: Enter as first name space last name (e.g., John Doe).

150 **QC Review Date**

Definition: *The date of the quality control review, expressed as MM/DD/YYYY.*

Population Standard: Optional

Population Guidance: Enter the date when the quality control review was completed in numerical format with a two-digit month / two-digit day / four-digit year (e.g., 01/01/2010).

151 **QA Review Person**

Definition: *The name of the person performing the quality assurance review of the data.*

Population Standard: Optional

Population Guidance: Enter as first name space last name (e.g., Jane Doe).

152 **QA Review Date**

Definition: *The date of the quality assurance review, expressed as MM/DD/YYYY.*

Population Standard: Optional

Population Guidance: Enter the date when the quality assurance review was completed in numerical format with a two-digit month / two-digit day / four-digit year (e.g., 02/02/2010).

153 **Legacy SWCD**

Definition: *The name of the Soil & Water Conservation District in which the plot exists as recorded in legacy vegetation inventory data.*

Population Standard: Obsolete

Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.

154 **Legacy Field Office**

Definition: *The NRCS (SCS) field office within a state where the vegetation inventory plot/site exists as was recorded in legacy vegetation inventory data.*

Population Standard: Obsolete

Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.

155 **Legacy SCS/NRCS Area**

Definition: *The NRCS (SCS) administrative area within a state where the vegetation inventory plot/site exists as was recorded in legacy vegetation inventory data.*

Population Standard: Obsolete

Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.

Information in this box pertains to columns 153-161.

Population Standard: Required for Alaska Staff

Population Guidance: Follow State/Region specific guidance

156 **AK Total Lichen Cover**

(%)

Definition: *The total lichen cover expressed as a percentage. It is proposed as a state-specific (AK) attribute. This attribute is to be used to accommodate only the respective attribute included in Alaska's AK SITE databases.*

157 **AK Total Litter1 Cover**

(%)

Definition: *The total herbaceous litter and mulch cover expressed as a percentage. It is proposed as a state-specific (AK) attribute. This attribute is to be used to accommodate only the respective attribute included in Alaska's AK SITE databases.*

158 **AK Total Litter2 Cover**

(%)

Definition: *The total woody litter and debris > 2.5 cm cover expressed as a percentage. It is proposed as a state-specific (AK) attribute. This attribute is to be used to accommodate only the respective attribute included in Alaska's AK SITE databases.*

159 **AK Total Moss Cover**

(%)

Definition: *The total bryophyte cover expressed as a percentage. It is proposed as a state-specific (AK) attribute.*
This attribute is to be used to accommodate only the respective attribute included in Alaska's AK SITE databases.

160 **AK Total Surface Fragment Cover**

(%)

Definition: *The total surface rock fragment cover expressed as a percentage. It is proposed as a state-specific (AK) attribute. This attribute is to be used to accommodate only the respective attribute included in Alaska's AK SITE databases.*

161 **AK Total Bare Soil Cover**

(%)

Definition: *The total bare soil cover expressed as a percentage. It is proposed as a state-specific (AK) attribute.*
This attribute is to be used to accommodate only the respective attribute included in Alaska's AK SITE databases.

162 **AK Total Surface Water Cover**

(%)

Definition: *The total surface water cover expressed as a percentage. It is proposed as a state-specific (AK) attribute. This attribute is to be used to accommodate only the respective attribute included in Alaska's AK SITE databases.*

163 **AK Ecological Site Status**

Definition: *Ecological_Site_Status is used to track which vegetative community each plot belongs to within an ecological site. This places a plot within a community and within a sere of the community. All sites are given an Ecological_Site_Id and an Ecological_Site_Status. This informs the user of which Ecological_Site_Id that point belongs and also which disturbance it underwent and how long ago.*

164 **AK Total Surface Bedrock Cover**

(%)

Definition: *The total surface bedrock cover expressed as a percentage. It is proposed as a state-specific (AK) attribute. This attribute is to be used to accommodate only the respective attribute included in Alaska's AK SITE databases.*

165 **AK fEcosite**

Definition: *AK_Field_Ecological_Site_Id is used to track which Ecological Site Id the site has been assigned during the project. At the end of the project, this value will be combined with other appropriate values to construct a valid Ecological_Site_Id which exists in ESIS. It is a three-digit character field with padded leading zeros, if necessary; for example, 003, or 055, or 234. It is used as a short-cut method of communication among the project members and perhaps other closely related projects.*

Vegetation Transect

This table contains information about each vegetation transect within a vegetation plot and summary vegetation data collected along the transect.

Plot Sampling Protocols: Relevé

Transect Sampling Protocols: All

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange transects in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Veg Transect ID**

Definition: *A unique alphanumeric identifying code for the vegetation transect.*

Population Standard: Required

Population Guidance: Consistency should be established in the method used to populate or identify each transect. Keep the transect ID short and descriptive.

3 **Start Latitude (WGS84)**

Definition: *The latitudinal start point of the transect, expressed in decimal degrees, WGS84 datum.*

Population Standard: Required

Population Guidance: The starting point of the transect must be recorded. If converted from a description, make a note in the transect text table. Latitude can be converted from Universal Transverse Mercator (UTMs) coordinate system either in GIS or via a converter tool from the internet. Extend decimal to the seventh integer following the decimal sign.

4 **Start Longitude (WGS84)**

Definition: *The longitudinal start point of the transect, expressed in decimal degrees, WGS84 datum.*

Population Standard: Required

Population Guidance: The starting point of the transect must be recorded. If converted from a description, make a note in the transect text table. Longitude can be converted from UTMs either in GIS or via a converter tool from the internet. Ensure the negative sign is included if it is appropriate and extend decimal to the seventh integer following the decimal sign.

5 **End Latitude (WGS84)**

Definition: *The latitudinal end point of the transect, expressed in decimal degrees, WGS84 datum.*

Population Standard: Required

Population Guidance: The end of the transect should be marked, but if not, leave this blank. Latitude can be converted from UTMs either in GIS or via a converter tool from the internet. Extend decimal to the seventh integer following the decimal sign.

6 **End Longitude (WGS84)**

Definition: *The longitudinal end point of the transect, expressed in decimal degrees, WGS84 datum.*

Population Standard: Required

Population Guidance: The end of the transect should be marked, but if not, leave this blank Longitude can be converted from UTMs either in GIS or via a converter tool from the internet. Ensure the negative sign is included if it is appropriate and extend decimal to the seventh integer following the decimal sign.

7 **Transect Azimuth**

Definition: *The direction of the transect, from starting point.*

Population Standard: Optional

Population Guidance: Enter as a whole integer to the nearest degree of the direction shooting from the starting point to the end of the transect.

8 **Transect Length** *(ft)*

Definition: *The length of the transect, in feet.*

Population Standard: Required

Population Guidance: Transect length is recorded in feet.

9 **Start Elevation** *(m)*

Definition: *The elevation of the start point of the transect.*

Population Standard: Optional

Population Guidance: Ensure to enter elevation as meters, not feet.

10 **End Elevation** *(m)*

Definition: *The elevation of the end point of the transect.*

Population Standard: Optional

Population Guidance: Ensure to enter elevation as meters, not feet.

11 **# of Dbl. Samp. Quadrats Sampled**

Definition: *The total number of quadrats that were sampled during a vegetation inventory when using the Double Sampling method.*

Population Standard: Optional

Population Guidance: The number of quadrats (hoops or frames) that are estimated including those that are clipped along the transect. Generally, ten quadrats are estimated with two to three of these ten are clipped; therefore, *ten* should be entered in as the number of Double Sampling quadrats sampled. Guidance and protocol are available in the Sampling Vegetation Attributes publication and the NRPH Ch. 4, USDA-NRCS.

12 **# of Dbl. Samp. Quadrats Clipped**

Definition: *The number of quadrats that were clipped during a vegetation inventory when using the Double Sample method.*

Population Standard: Optional

Population Guidance: The number of quadrats (hoops or frames) that are clipped of the total sampled along the transect. If two are clipped of the ten sampled, then two should be entered in as the number of Double Sampling quadrats clipped. Guidance and protocol are available in the Sampling Vegetation Attributes publication and the NRPH Ch. 4, USDA-NRCS.

13	**# of Nested Freq. Quadrats Sampled**	Definition: *The total number of quadrats that were sampled during a vegetation inventory when using the Nested Frequency method.* Guidance and protocol are available in the Sampling Vegetation Attributes publication. Population Standard: Optional Population Guidance: The Nested Frequency field sheet will have the total quadrats or frames sampled along the transect. Guidance and protocol are available in the Sampling Vegetation Attributes publication.
14	**# of Frequency Quadrats Sampled**	Definition: *The total number of quadrats that were sampled during a vegetation inventory when using the Frequency method.* Population Standard: Optional Population Guidance: The Nested Frequency field sheet will have the total quadrats or frames sampled along the transect. Guidance and protocol are available in the Sampling Vegetation Attributes publication.
15	**# of DWR Quadrats Sampled**	Definition: *The total number of quadrats that were sampled during a vegetation inventory when using the Dry Weight Rank method.* Population Standard: Optional Population Guidance: The Dry Weight Rank Worksheet will have the total quadrats or frames sampled along the transect. Guidance and protocol are available in the Sampling Vegetation Attributes publication.
16	**# of Daubenmire Quadrats Sampled**	Definition: *The total number of quadrats that were sampled during a vegetation inventory when using the Daubenmire method.* Population Standard: Optional Population Guidance: The Daubenmire Worksheet will have the total quadrats or frames sampled along the transect. Guidance and protocol are available in the Sampling Vegetation Attributes publication.
17	**Dominant Quadrat Size – Legacy** *(ft^2)*	Definition: *The dominant quadrat size used during data collection on a plot as recorded in legacy data.* Population Standard: Obsolete Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.
18	**Secondary Quadrat Size – Legacy** *(ft^2)*	Definition: *The secondary quadrat size used during data collection on a plot as recorded in legacy data.* Population Standard: Obsolete Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.
19	**Dominant Quadrat Shape - Legacy**	Definition: *A measure of soil exchangeable hydrogen ions that may become active by cation exchange.* Population Standard: Obsolete Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.
20	**Seconday Quadrat Shape - Legacy**	Definition: *The secondary quadrat shape used during data collection on a plot as recorded in legacy data.* Population Standard: Obsolete

Population Guidance: This cell should not be populated; it is specific to historic sites loaded into NASIS and should not be populated with any current data entry.

21 **Belt Width**

(ft)

Definition: *The width of the belt transect.*

Population Standard: Optional

Population Guidance: Belt width is recorded on the Belt transect form. Guidance and protocol are available in the Monitoring Manual Volume 1: Quick Start (USDA-ARS Jornada, 2005).

22 **Dbl. Sampling Annual Prod**

(lbs/acre)

Definition: *The total annual production of all plant species on the transect as measured by the Double Sampling Protocol.*

Population Standard: Optional

Population Guidance: Calculation of total production recorded in whole integers as pounds per acre. Calculations are completed using figures gathered on the Vegetation Transect Plant Summary and Plant Production Quadrat Details tables. Manual entry is acceptable. Data is recorded for calculations on the Plant production form. Protocol, guidance, and forms can be found in the Sampling Vegetation Attributes, Monitoring Manual Volume II, and the NRPH Ch. 4.

23 **Total Harvest Annual Prod**

(lbs/acre)

Definition: *The total annual production of all plant species on the transect as measured by the Double Sampling protocol. (This should be the Total Harvest Protocol)*

Population Standard: Optional

Population Guidance: The NASIS Information shows Double Sampling, but this is specifically related to Total Harvest Protocol. Calculation of total production recorded as in whole integers as pounds per acre. Calculations are completed using figures gathered on the Vegetation Transect Plant Summary and Plant Production Quadrat Details tables. Manual entry is acceptable. Data is recorded for calculations on the Plant Production form. Protocol, guidance, and forms can be found in the Sampling Vegetation Attributes, Monitoring Manual Volume II, and the NRPH Ch. 4.

24 **Weight Unit Annual Prod**

(lbs/acre)

Definition: *The total annual production of all plant species on the transect as measured by the Weight Unit Estimate protocol.*

Population Standard: Optional

Population Guidance: Calculation of total production recorded in whole integers as pounds per acre. Calculations are completed using figures gathered on the Vegetation Transect Plant Summary and Plant Production Quadrat Details tables. Manual entry is acceptable. Data is recorded for calculations on the Plant Production form. Protocol and guidance specific to this method is found in the Rangeland Inventory and Monitoring Supplemental Studies publication, USDI-BLM TR 4400-5, 1992. Reference and forms can be found in the Sampling Vegetation Attributes, Monitoring Manual Volume II, and the NRPH Ch. 4.

25 **DWR Annual Prod**

(lbs/acre)

Definition: *The total annual production of all plant species on the transect as measured by the Dry Weight Rank protocol.*

Population Standard: Optional

Population Guidance: Calculation of total production recorded in whole integers as pounds per acre. Calculations are completed using figures gathered on the Vegetation Transect Plant Summary and Dry Weight Rank Quadrat Details tables. Manual entry is acceptable. Data is recorded for calculations on the Plant Production form. Protocol, guidance, and forms can be found in the Sampling Vegetation Attributes.

26 **Comparative Yield Annual Prod**

(lbs/acre)

Definition: *The total annual production of all plant species on the transect as measured by the Comparative Yield protocol.*

Population Standard: Optional

Population Guidance: Calculation of production recorded in whole integers as pounds per acre. Calculations are completed using figures gathered on the Comparative Yield Data and Comparative

Yield Reference Quadrats tables. Manual entry is acceptable. Data is recorded for calculations on the Plant Production form. Protocol, guidance, and forms can be found in the Sampling Vegetation Attributes.

27 **Total Comparative Yield Rank**

Definition*: The numeric sum of all the individual ranks multiplied by the tally of each rank to calculate the weighted ranking total.*

Population Standard: Optional

Population Guidance: Calculation of the Total Comparative Yield Total Rank is recorded in whole integer. Calculations are completed using figures gathered on the Comparative Yield Data and Comparative Yield Reference Quadrats tables. Manual entry is acceptable. Data is recorded for calculations on the Plant Production form. Protocol, guidance, and forms can be found in the Sampling Vegetation Attributes.

28 **Ave. Comparative Yield Rank**

Definition*: The numeric average of the individual estimated yield rank observations along the transect, computed as "comparative yield rank total" divided by the number of observations.*

Population Standard: Optional

Population Guidance: Calculation of the Average Comparative Yield Rank is recorded in whole integer. Calculations are completed using figures gathered on the Comparative Yield Data and Comparative Yield Reference Quadrats tables. Manual entry is acceptable. Data is recorded for calculations on the Plant Production form. Protocol, guidance, and forms can be found in the Sampling Vegetation Attributes.

29 **Comparative Ref. Clipped Wt. Ave.**

(g)

Definition*: The average fresh (green) weight, in grams, of the five clipped reference quadrats along the transect. (Must calculate average rank index (ARI) and average rank of clipped quadrats with this method.)*

Population Standard: Optional

Population Guidance: Calculation of the Comparative Yield Average Clipped Weight is recorded in whole integer as grams. Calculations are completed using figures gathered on the Comparative Yield Data and Comparative Yield Reference Quadrats tables. Manual entry is acceptable. Data is recorded for calculations on the Plant Production form. Protocol, guidance, and forms can be found in the Sampling Vegetation Attributes.

30 **Total Above Ground Biomass**

(lbs/acre)

Definition*: The air-dry weight, in pounds per acre, of the total above-ground biomass (including loose plant residue, litter, and downed wood) of all plant species for the transect.*

Population Standard: Optional

Population Guidance: Calculation of total above-ground biomass of all species along the transect as recorded on the Transect Plant Inventory child table. Above-Ground Biomass is captured during forest inventory: do not use for rangeland production.

31 **Standing Herbaceous Biomass**

(lbs/acre)

Definition*: The air-dry weight, in pounds per acre, of standing herbaceous biomass (attached to rooted plants) of all plant species for the transect.*

Population Standard: Optional

Population Guidance: Calculation of total above-ground biomass of all species along the transect as recorded on the Transect Plant Inventory child table. Standing herbaceous biomass is captured by the pastureland stick or pasture condition score index card by transect. Do not populate with forest or rangeland production data.

32 **Transect Basal Cover %**

(%)

Definition*: The total percentage of the transect covered by the basal portion of plants.*

Population Standard: Optional

Population Guidance: Calculation of the basal point hits as recorded for all species within the Point Plant Cover child table. Line-Intercept, Line-Point Intercept, and Step Point are the common protocol for capturing this information.

33 **Total Basal Cover %**

(%)

Definition*: The total basal cover of all plant species along a transect.*

Population Standard: Obsolete

Population Guidance: Do not populate. Updates to NASIS data model are under consideration to remove this column due to duplication of entry.

34 **Minimum Basal Gap Size**

(ft)

Definition*: The minimum basal gap size considered for the Gap Intercept protocols on a transect.*

Population Standard: Optional

Population Guidance: Standard protocol for Gap Intercept (found in Volume 1: Quick Start Guide for Monitoring Manual) is designed to allow flexibility between sites. Minimum gap size is recorded on the top of the worksheet, in either centimeters of feet. If recorded in centimeters, convert to tenths of a foot (0.1).

35 **Minimum Canopy Gap Size**

(ft)

Definition*: The minimum canopy gap size considered for the Gap Intercept protocols on a transect.*
Population Standard: Optional

Population Guidance: Standard protocol for Gap Intercept (found in Volume 1: Quick Start Guide for Monitoring Manual) is designed to allow flexibility between sites. Minimum gap size is recorded on the top of the worksheet, in either centimeters of feet. If recorded in centimeters, convert to tenths of a foot (0.1).

36 **Gaps Measured Between**

Definition*: An indication of the type of plant(s) that basal and/or canopy gaps were measured between.*

Population Standard: Optional

Population Guidance: Standard protocol calls for the following options: *only perennial vegetation, annual and perennial vegetation*, or *annual grasses and perennial vegetation*. Canopy may be measured with following additional choices: *woody vegetation only*, or *herbaceous vegetation*. Establish a protocol and record this information consistently.

37 **Total Canopy Gap Length**

(ft)

Definition*: The total length of canopy gaps along a transect.*

Population Standard: Optional

Population Guidance: Calculation of the length of all canopy gaps recorded on the transect, as captured in the Transect Gap Details child table.

38 **Total Canopy Gap %**

(%)

Definition*: The percentage of the transect covered by gaps in the canopy.*

Population Standard: Optional

Population Guidance: Calculation of the percentage of all canopy gaps recorded on the transect, Total canopy gap length divided by the length of the transect multiplied by 100.

39 **Total Basal Gap Length**

(ft)

Definition: *The total length of basal gaps along a transect.*

Population Standard: Optional

Population Guidance: Calculation of the length of all basal gaps recorded on the transect, as captured in the Transect Gap Details child table.

40 **Total Basal Gap %**

(%)

Definition: *The percentage of the transect covered by gaps in plant basal cover.*

Population Standard: Optional

Population Guidance: Calculation of the percentage of all basal gaps recorded on the transect, Total basal gap length divided by the length of the transect multiplied by 100.

41 **Understory Reprod. Abundance**

Definition: *A class indicating the abundance of plant reproduction in the understory.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. The abundance of plant reproduction in the understory is rated as *Very abundant* (5), *Abundant* (4), *Moderately abundant* (3), *Sparsely abundant* (2), or *None* (1). The number corresponds the rating code on the ESI Forest Plot Inventory Worksheet, found in the exhibits of the National Forestry Handbook, Section 637.

42 **Woody Understory Abundance**

Definition: *A class indicating the abundance of woody plants in the understory.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. The density of woody species in the understory is rated as *Very abundant* (5), *Abundant* (4), *Moderately abundant* (3), *Sparsely abundant* (2), or *None* (1). The number corresponds the rating code on the ESI Forest Plot Inventory Worksheet, found in the exhibits of the National Forestry Handbook, Section 637.

43 **Herb. Understory Abundance**

Definition: *A class indicating the abundance of herbaceous plants in the understory.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. The density of herbaceous species in the understory is rated as *Very abundant* (5), *Abundant* (4), *Moderately abundant* (3), *Sparsely abundant* (2), or *None* (1). The number corresponds the rating code on the ESI Forest Plot Inventory Worksheet, found in the exhibits of the National Forestry Handbook, Section 637.

44 **Lichens Understory Abundance**

Definition: *A class indicating the abundance of lichens or mosses in the understory.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. The density of lichens in the understory is rated as *Very abundant* (5), *Abundant* (4), *Moderately abundant* (3), *Sparsely abundant* (2), or *None* (1). The number corresponds the rating code on the ESI Forest Plot Inventory Worksheet, found in the exhibits of the National Forestry Handbook, Section 637.

45 **Transect Total Canopy Cover %**

(%)

Definition: *The cumulative canopy cover percentage of all species along the transect.*

Population Standard: Optional

Population Guidance: Calculation of the sum of the percentage of canopy cover for all species along the transect as recorded in the Transect Plant Summary table.

46 **Transect Total Canopy Cover Class**

Definition: *The cumulative canopy cover percentage of all species along the transect, expressed as a class.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu: select the cover class that correlates to the Total Canopy Cover % calculated in #45. The classes are as follows: 1 = Trace, 2 = 0.1-1%, 3 = 1-2%, 4 = 2-5%, 5 = 5-10%, 6 = 10-25%, 7 = 25-50%, 8 = 50-75%, 9 = 75-95%, and 10 = >95%. This Domain class varies between protocols: select the range that best fits the percentage calculated in the previous cell.

47 **Canopy Cover Assess. Method**

Definition: *The method used to determine canopy cover.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu: *estimated* values or *measured* values.

48 **Crown Canopy Closure %**

(%)

Definition: *The percentage of crown closure of the overstory species.*

Population Standard: Optional

Population Guidance: Calculated using canopy cover measurements of the overstory of woody species or may be estimated. Measurement protocol can be found in the National Forestry Handbook Section 636.

49 **Crown Can. Closure Assess. Meth.**

Definition: *The method used to obtain the crown canopy closure percentage.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu: *estimated* values or *measured* values.

50 **LPP Crown Competition Factor**

Definition: *An index number indicating the crown competition factor for lodgepole pine.*

Population Standard: Optional

Population Guidance: Calculated lodgepole pine based on average diameter and average basal area. Data is based on an individual transect and is found on the ESI-Forest Plot Field Worksheet. Protocol and guidance is found in the National Forestry Handbook Exhibit 63-57.

51 **LPP Crown Comp. Ave DBH**

(in)

Definition: *The average diameter at breast height (DBH), typically 4.5 feet above ground level, of the lodgepole pine stand being evaluated. This value is used in computing the crown competition factor.*

Population Standard: Optional

Population Guidance: Calculated average diameter of all lodgepole pine for the plot as recorded in the Plot Tree Site Index Summary child table. Data is found on the ESI-Forest Plot Field Worksheet. Protocol and guidance is found in the National Forestry Handbook Exhibit 63-57.

52 **Overstory Canopy Cover %**

(%)

Definition: *The canopy cover percentage of all species in the overstory stratum along the transect.*

Population Standard: Optional

Population Guidance: Calculation of the sum of the percentage of overstory canopy cover for all species along the transect as recorded in the Transect Plant Summary table and Transect Overstory Canopy Cover child table.

53 **Overstory Canopy Cover Class**

Definition: *The canopy cover percentage of all species in the overstory stratum along the transect, expressed as a class.*

Population Standard: Optional

Population Guidance: The percentage calculated the Overstory Canopy Cover Percent as it correlates to the Cover Class. The classes are as follows: 1 = Trace, 2 = 0.1-1%, 3 = 1-2%, 4 = 2-5%, 5 = 5-10%, 6 = 10-25%, 7 = 25-50%, 8 = 50-75%, 9 = 75-95%, and 10 = >95%. This Domain class varies between protocols: select the range that best fits the percentage calculated in the previous cell.

54 **Gr. Cover Assess. Method**

Definition: *The method used to assess ground cover.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu: *estimated* values or *measured* values. Ground Cover reflects the first thing intercepting a raindrop recorded as plant canopy (foliar) cover live or standing dead, litter, gravel, cobble, stone, and bedrock. Ground cover plus bare ground equals 100 percent.

55 **# of Gr. Cover Quadrats Sampled**

Definition: *The total number of quadrats on the transect sampled for ground cover.*

Population Standard: Optional

Population Guidance: Quadrats read for other protocols can be used to read cover as well by recording the cover at the points or tines within the quadrat. Record the total number of quadrats read in this cell and then the corresponding number of points read for all quadrats in the # of Ground Cover Points Sampled cell.

56 **# of Gr. Cover Points Sampled**

Definition: *The total number of points on the transect sampled for ground cover.*

Population Standard: Optional

Population Guidance: The number of quadrats sampled multiplied by the number of points sampled at each quadrat will provide the total number of ground cover points sampled. This is not used to record the total number of line-point intercept points read, this figure is captured in the Total Number of Points Sampled cell.

57 **Gr. Surf. Cover Assess. Method**

Definition: *The method used to assess ground surface cover.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu: *estimated* values or *measured* values. Ground surface cover is the percentage of the ground surface actually occupied by bare soil, basal vegetation, litter, downed wood, gravel, rock, or soil biological crust, including mosses and lichens.

58 **# of Gr. Surf. Cover Quadrats Sampled**

Definition: *The total number of quadrats on the transect sampled for ground surface cover.*

Population Standard: Optional

Population Guidance: Quadrats read for other protocols can be used to read cover as well by recording the cover at the points or tines within the quadrat. Record the total number of quadrats read in this cell and then the corresponding number of points read for all quadrats in the # of Ground Surface Cover Points sampled cell.

59 **# of Gr. Surf. Cover Points Sampled**

Definition: *The total number of points on the transect sampled for ground surface cover.*

Population Standard: Optional

Population Guidance: The number of quadrats sampled multiplied by the number of points sampled at each quadrat will provide the total number of ground surface cover points sampled. This is not used to record the total number of line-point intercept points read, this figure is captured in the Total Number of Points Sampled cell.

60 **LPI Observation Interval**

(ft)

Definition: *The distance between observation points along the transect when using Line-Point Intercept protocol.*

Population Standard: Optional

Population Guidance: Based on the method used for completing the Line-Point Intercept protocol, document the interval between points read along the transect in the nearest tenth of a foot.

61 **Total # of Points Sampled**

Definition: *The total number of points sampled along the transect.*

Population Standard: Optional

Population Guidance: Calculated by dividing the length of the transect by the LPI Observation Interval to determine the number of points sampled. Other methods may be documented as well including Step Point and Point Intercept.

62 **Top Canopy Ht. Ave.**

Definition: *The average height of plants in the top canopy layer along the transect.*

Population Standard: Optional

		(ft)	Population Guidance: Calculation of the average height of all plants recorded in the top canopy layer as recorded in the Point Plant Details and Vegetation Transect Plant Summary child tables.
63	**Top Canopy Ht. Std. Dev.**	*(ft)*	Definition: *The standard deviation of the height of plants in the top canopy layer along the transect.* Population Standard: Optional Population Guidance: Calculated based on the height of all plants recorded in the top canopy layer as recorded in the Point Plant Details and Vegetation Transect Plant Summary child tables.
64	**Total # Plants - Belt**		Definition: *The total number of plants found using the Belt Transect protocol.* Population Standard: Optional Population Guidance: Calculation based on the Belt Transect Summary table.
65	**Total # Species - Belt**		Definition: *The total number of species found using the Belt Transect protocol.* Population Standard: Optional Population Guidance: Calculation from the Belt Data child table within the Vegetation Transect Plant Summary table.
66	**Total Density – Belt**	*(plants/acre)*	Definition: *The total plant density of all species found using the Belt Transect protocol.* Population Standard: Optional Population Guidance: Calculation based on the Belt Transect Summary table.

Vegetation Transect Plant Summary

This table contains data about plant species found along a vegetation transect within a vegetation plot.

Plot Sampling Protocols: None specified

Transect Sampling Protocols: Most protocols

1	**Seq**	Definition: *Sequential number of the feature being described.* Population Standard: Optional Population Guidance: To arrange Plants in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

Information in this box pertains to columns 2 through 4

Population Standards: Required

Population Guidance: These three fields pull information from the Plant Object in NASIS. Populating any one of the three fields will result in auto-population of the other two fields.

2	**Plant Symbol**	Definition: *A unique symbol used to identify a plant genus or a plant species. (The PLANTS Database, USDA-NRCS, National Plant Data Center)*

3	**Scientific Name**	Definition: *The full genus and species name as listed in The PLANTS Database, USDA-NRCS, National Plant Data Center.*
4	**National Vernacular Name**	Definition: *The most generally accepted common name of a plant as listed in The PLANTS Database, USDA-NRCS, National Plant Data Center.*
5	**Plant Nativity**	Definition: *The nativity of the plant species.* Population Standard: Optional Population Guidance: Select the most appropriate answer from the drop-down menu: *Native*, *Introduced*, or *Unknown*. The Plants Database has a map designating the nativity by state to assist with populating this data. Deviations from the Plants database may exist.
6	**Plant Type Group**	Definition: *The designation of a plant type group being inventoried by lifeform.* Population Standard: Optional Population Guidance: Select the most appropriate answer from the drop-down menu: *Forb*, *Grass/Grass-like, Microbiotic crust, Moss, Shrub/vine*, or *Tree*.
7	**Height Class Lower Limit** *(ft)*	Definition: *The lower height limit of the plant height class being described.* Population Standard: Optional Population Guidance: Enter data to the tenth of a foot, zero to a maximum of 500 feet. Capture the lowest height measured for the plant species named, or the minimum expected measurement. Data relates to the Belt Transact Height Class.
9	**Height Class Upper Limit** *(ft)*	Definition: *The upper height limit of the plant height class being described.* Population Standard: Optional Population Guidance: Enter data to the tenth of a foot, zero to a maximum of 500 feet. Capture the highest height measured for the plant species named, or the maximum expected measurement. Data relates to the Belt Transact Height Class.
10	**Sociability Class**	Definition: *An indication of how individual plants of a species exist within the sample area in relation to one another.* Population Standard: Optional Population Guidance: Select the most appropriate answer from the drop-down menu: *Growing solitarily* (individual plants exist as scattered single plants), *Small group or clump* (individual plants exist as a small group or clump of plants), *Small patches* (plants exist in small patches), *Large patches* (plants exist in large patches), or *Near pure stand* (plants exist as a nearly pure stand within the sample area).
11	**Ave. Live Canopy Ht. Bottom** *(ft)*	Definition: *The average height to the bottom of the canopy of measured trees of a species.* Population Standard: Optional Population Guidance: Calculated average of the live canopy bottom height for all points recorded for a specific species measured on the transect. Data for calculation recorded in the Point Plant Cover Details child table.
12	**Ave. Live Canopy Ht. Top** *(ft)*	Definition: *The average height to the top of the canopy of measured trees of a species. Synonymous with 'tree height.'* Population Standard: Optional

Population Guidance: Calculated average of the live canopy top height for all points recorded for a specific species measured on the transect. Data for calculation recorded in the Point Plant Cover Details child table.

13 **Overstory DBH Minimum**

(in)

Definition: *The lower end of the range of diameter at breast height (DBH) for trees > 15 feet in height of a particular species in the overstory stratum.*

Population Standard: Optional

Population Guidance: The minimum diameter in inches for a specific species (trees greater than 15 feet in height) as established for the transect recorded.

14 **Overstory DBH Maximum**

(in)

Definition: *The upper end of the range of diameter at breast height (DBH) for trees > 15 feet in height of a particular species in the overstory stratum.*

Population Standard: Optional

Population Guidance: The maximum diameter in inches for a specific species (trees greater than 15 feet in height) as established for the transect recorded.

15 **Overstory Canopy Cover %**

(%)

Definition: *The total percentage of canopy cover of trees of a particular species in the overstory stratum.*

Population Standard: Optional

Population Guidance: Calculation of the percentage of Overstory Canopy Cover for the specific species as measured with densiometer quadrats.

16 **Overstory Canopy Cover Class**

Definition: *The total percentage of canopy cover of trees of a particular species in the overstory stratum, expressed as a class.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu: select the cover class that correlates to the calculated Overstory Canopy Cover %. The classes are as follows: 1 = Trace, 2 = 0.1-1%, 3 = 1-2%, 4 = 2-5%, 5 = 5-10%, 6 = 10-25%, 7 = 25-50%, 8 = 50-75%, 9 = 75-95%, and 10 = >95%. This Domain class varies between protocols, select the range that best fits the percentage calculated in the previous cell.

17 **Plant Prod Quadrat Size**

(ft^2)

Definition: *The total area of the vegetation quadrat used.*

Population Standard: Optional

Population Guidance: The common plot sizes are 9.6, 4.8, 2.4, 1.92, and 0.96 square feet. A plot size of 0.01 acre is common and converts to 435.6 square feet.

18 **Plant Prod Quadrat Shape**

(ft^2)

Definition: *The shape of the quadrat used. Most common shapes are rectangular and circular.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu: the shape options are *circular*, *square*, or *rectangular*.

19 **Nested Freq. Quadrat Size**

(ft^2)

Definition: *The total area of the vegetation quadrat used.*

Population Standard: Optional

Population Guidance: The common plot sizes are 0.06, 0.25, 0.69, 1.0, 1.56, 2.78, or 6.25 square feet.

20 **Nested Freq. Quadrat Shape**

Definition: *The shape of the quadrat used. Most common shapes are rectangular and circular.*

Population Standard: Optional

		Population Guidance: Select the most appropriate answer from the drop-down menu: the shape options are *circular*, *square*, or *rectangular*.
21	**Freq. Quadrat Size** *(ft²)*	Definition: *The total area of the vegetation quadrat used.* Population Standard: Optional Population Guidance: The common plot sizes are 0.06, 0.24, 0.97, 1.72, 2.69, or 1.08 square feet.
22	**Freq. Quadrat Shape**	Definition: *The shape of the quadrat used. Most common shapes are rectangular and circular.* Population Standard: Optional Population Guidance: Select the most appropriate answer from the drop-down menu: the shape options are *circular*, *square*, or *rectangular*.
23	**DWR Quadrat Size** *(ft²)*	Definition: *The total area of the vegetation quadrat used.* Population Standard: Optional Population Guidance: The common plot sizes are 0.06, 0.24, 0.97, 1.72, 2.69, or 1.08 square feet.
24	**DWR Quadrat Shape**	Definition: *The shape of the quadrat used. Most common shapes are rectangular and circular.* Population Standard: Optional Population Guidance: Select the most appropriate answer from the drop-down menu: the shape options are *circular*, *square*, or *rectangular*.
25	**Density Quadrat Size** *(ft²)*	Definition: *The total area of the vegetation quadrat used.* Population Standard: Optional Population Guidance: Density protocol refers to using a variable plot size based on the species being reviewed. 1 meter by 5 meters or 1 meter by 16 meters are suggested sizes (5 meter squared and 16 meter squared). Record the plot size as documented on worksheet converted to feet squared. Multiply the meter squared area value by 10.7639104 to calculate the area value as feet squared.
26	**Density Quadrat Shape**	Definition: *The shape of the quadrat used. Most common shapes are rectangular and circular.* Population Standard: Optional Population Guidance: Select the most appropriate answer from the drop-down menu: the shape options are *circular*, *square*, or *rectangular*. For the density protocol it refers to a rectangular plot shape.
27	**Total Clipped Wt.- Estimated** *(g)*	Definition: *The total estimated fresh (green) weight, in grams, of all clipped quadrats.* Population Standard: Optional Population Guidance: Calculated total of estimated weights for all clipped quadrats as recorded in the Plant Production Quadrat Details child table. Captured for Double Sampling method.
28	**Total Clipped Wt. – Fresh** *(g)*	Definition: *The total actual fresh (green) weight, in grams, of all clipped quadrats.* Population Standard: Optional Population Guidance: Calculated total of clipped fresh or green weights for the species of all clipped quadrats as recorded in the Plant Production Quadrat Details child table. Captured for Double Sampling method.

29 **Total Clipped Wt. - Air-dry**

(g)

Definition: *The total air-dry weight of a species that was clipped from all quadrats.*

Population Standard: Optional

Population Guidance: Calculated total of air-dry weights for the species of all clipped quadrats as recorded in the Plant Production Quadrat Details child table. Captured for Double Sampling method.

30 **Total Wt. - Air-dry**

(g)

Definition: *The total air-dry weight of a species from all quadrats.*

Population Standard: Optional

Population Guidance: Calculated air-dry weights of all quadrats for a species.

31 **Total Wt. – Estimated**

(g)

Definition: *The total estimated fresh (green) weight, in grams, of all estimated quadrats.*

Population Standard: Optional

Population Guidance: Calculated total weight as estimated for all quadrats for a species. Calculation may include the conversion of weight units multiplied by the weight unit weight for Double Sampling and Weight Unit Estimation protocols.

32 **Total Wt. – Existing**

(g)

Definition: *"Species Total Estimated Wt. of All Quadrats" multiplied by "Double-Sampling Correction Factor."*

Population Standard: Optional

Population Guidance: A calculation of the total weight estimated cell multiplied by the Double Sampling correction factor. This correction factor is calculated by dividing the clipped subplots clipped weight by the clipped subplots estimated weight. Captured for Double Sampling method.

33 **Dry Weight %**

(%)

Definition: *The percentage of dry weight used to convert fresh weight to air-dry weight.*

Population Standard: Optional

Population Guidance: The dry weight percentage can be a factor that is found in technical guidance provided by the state, or it can be calculated based on the fresh weight and air-dry weight gathered during the clipping process. The dry weight divided by the wet weight multiplied by 100 provides the percentage of dry weight.

34 **Species Total Wt.**

(g)

Definition: *"Species Total Existing Wt." multiplied by the "Double Sampling Correction Factor" (formerly called Plot Correction Factor).*

Population Standard: Optional

Population Guidance: A calculation of the total weight by multiplying the Total Weight Existing by the percentage of dry weight (converted to decimal format: Dry weight percentage divided by 100). Captured for Double Sampling method as reference by the Sampling Vegetation Attributes publication.**

**The Species Total Wt., as referenced in the Volume II of the Monitoring Manual for the Double Sampling protocol, is calculated using a different formula with the air-dry reconstructed weight; and use the adjustment factors for utilization, growth, and weather. The value is recorded in pounds per acre. The formula is: (total wt. units X wt. unit wt. X 1/(# subplots) X Plot size CF X ADW adj. X Clip/Est CF) / (Util. adj X Grwth. adj X Wthr. adj.) The two Species Total Weights are different and must be captured differently.

35 **Dbl. Sampling Ave. Yield**

(lbs/acre)

Definition: *The computed average production for a particular species across all quadrats using the Double Sampling protocol.*

Population Standard: Optional

Population Guidance: A calculation of the average yield is the species total weight multiplied by the size correction factor or weight conversion factor based on the quadrat size and the number of plots sampled gives the factor to multiply times the grams to convert grams to lbs./acre. If ten quadrats or subplots are collected that are 9.6 square feet, the total area is 96.0 feet square; thus the grams or species total weight should be multiplied by 1.0 to calculate the average yield as referenced in the Sampling Vegetation Attributes publication.

36 **Dbl. Sampling Composition %**

(%)

Definition: *The percentage of the total plant community occupied by a particular plant species as determined by the Double Sampling method.*

Population Standard: Optional

Population Guidance: Calculation of the species Dbl. Sampling Ave. Yield divided by the Total Plot Yield for all species multiplied by 100.

37 **Daubenmire Composition %**

(%)

Definition: *The percentage of the total plant community occupied by a particular plant species as determined by the Daubenmire method.*

Population Standard: Optional

Population Guidance: Calculation is based on the percentage of canopy cover. Divide the total canopy cover of the specific species divided by the total percentage of canopy cover of all plant cover, multiplied by 100.

38 **Line Intercept Composition %**

(%)

Definition: *The percentage of the total plant community occupied by a particular plant species as determined by the Line Intercept method.*

Population Standard: Optional

Population Guidance: Calculation is based on percentage of cover. Divide the total percentage of cover for the specific species divided by the total percentage of cover for all plants, multiplied by 100.

39 **Trace Amount ?**

Definition: *A yes/no indicator that a 'trace' amount of a species exists. A 'trace' is defined as 'less than a measurable amount.'*

Population Standard: Optional

Population Guidance: If the species is recorded but the amount is less than what is measurable (less than 0.2 grams), then it is considered a trace amount and the box should be checked.

40 **Wt. Conversion Factor**

Definition: *A conversion factor used to convert weights obtained from quadrats to standard units of pounds per acre. The value varies based on the size of quadrat used.*

Population Standard: Optional

Population Guidance: The weight conversion factors are based on the size of quadrat used and is referenced in multiple publications for clipping. Conversion factors to convert grams to lbs./acre for common quadrat sizes are: CF of 50 for a 1.92 sq. ft. quadrat; CF of 40 for a 2.4 sq. ft. quadrat; CF of 20 for a 4.8 sq. ft. quadrat; CF of 10 for a 9.6 sq. ft. quadrat; CF of 0.22 for a 0.01 ac. quadrat; CF of 20 for a 4.8 sq. ft. quadrat; or CF of 100 for a 0.01 ac. quadrat measured in pounds.

41 **Dbl. Sampling Correction Factor**

Definition: *The correction factor to convert estimated weights to actual weights for a plant species, computed as "Species Total Wt. of Clipped Quadrats" divided by "Species Total Estimated Wt. of Clipped Quadrats." Formerly called 'plot correction factor.'*

Population Standard: Optional

Population Guidance: Calculation based on the Double Sampling method (independent of the reference used), where the species total clipped weight of clipped quadrats is divided by the species total estimated weight of clipped quadrats.

42 **Air-dry Wt. Adjustment**

Definition: *An adjustment factor that accounts for the amount (percentage) of moisture contained in the vegetation at the time of clipping, expressed as a decimal fraction ranging from 0.01 to 1.0.*

Population Standard: Optional

Population Guidance: The air-dry weight adjustment can be a factor that is found in technical guidance provided by the state or can be calculated based on the fresh weight and air-dry weight gathered during the clipping process. The dry weight divided by the wet weight provides the proportion of air-dry weight in decimal format. If the plant is 40% moisture and 60% air-dry mass, then enter 0.6.

43 **Utilization Adjustment**

Definition: *An adjustment factor that accounts for the amount (percentage) of vegetation removed by herbivory or other loss, expressed as a decimal fraction ranging from 0.01 to 1.0.*

Population Standard: Optional

Population Guidance: Enter the proportion of the plant remaining after utilization. This may vary by subplot so enter the average across the entire site (transect). If 40% of the plant was utilized, then enter 0.6 for the 60% of the plant remaining.

44 **Growth Adjustment**

Definition: *An adjustment factor that accounts for the proportion of annual plant growth that has occurred at the time of clipping, expressed as a decimal fraction ranging from 0.01 to 1.0.*

Population Standard: Optional

Population Guidance: The Growth Adjustment is a reflection of the growth expected during the period for that given year. Growth curves are an estimation and will provide the percentage of growth expected for the period when the site was clipped. If in July 60% of the growth has occurred, then enter 0.6.

45 **Weather Adjustment**

Definition: *An adjustment factor that accounts for the growing condition of the clipping year as compared to long-term annual growth conditions, expressed as a decimal fraction ranging from 0.01 to 2.0.*

Population Standard: Optional

Population Guidance: The weather adjustment factor is based on the precipitation, timing, temperature, and other climatic factors. A factor of 1.0 suggests a normal or expected weather occurrence. A factor of 1.2 suggests that the weather exceeded what was expected to increase production by 20 percent. The reverse of that is a rating of 0.8 in which the weather was below the expected, reducing production by 20 percent.

46 **# of Quadrats In**

Definition: *The number of quadrats along the transect in which a particular species occurs.*

Population Standard: Optional

Population Guidance: Calculation of the number of quadrats in which a species occurs, as recorded for density and frequency protocols.

47 **Species Frequency – Daubenmire**

(%)

Definition: *For a given species, the percentage of quadrats or points along the transect where the species was found using the Daubenmire method.*

Population Standard: Optional

Population Guidance: Calculate the percentage of frequency for each plant species by dividing the number of quadrats the species occurs in by the total number of quadrats sampled along the transect, multiplied by 100.

48 **DWR 1 Tally**

Definition: *For a given species, the number of quadrats in which "Dry Weight Rank 1" of the "DWR Quadrat Details" child table = "Yes."*

Population Standard: Optional

		Population Guidance: Calculated by counting the number of quadrats with Dry Weight Rank of 1, as recorded in the Dry Weight Rank Quadrat Details child table.
49	**DWR 2 Tally**	Definition: *For a given species, the number of quadrats in which "Dry Weight Rank 2" of the "DWR Quadrat Details" child table = "Yes."* Population Standard: Optional Population Guidance: Calculated by counting the number of quadrats with Dry Weight Rank of 2, as recorded in the Dry Weight Rank Quadrat Details child table.
50	**DWR 3 Tally**	Definition: *For a given species, the number of quadrats in which "Dry Weight Rank 3" of the "DWR Quadrat Details" child table = "Yes."* Population Standard: Optional Population Guidance: Calculated by counting the number of quadrats with Dry Weight Rank of 3, as recorded in the Dry Weight Rank Quadrat Details child table.
51	**DWR Weighted Tally**	Definition: *For a given species (DWR 1 Tally x 7) + (DWR 2 Tally x 2) + (DWR 3 Tally x 1).* Population Standard: Optional Population Guidance: Calculated sum of the (DWR 1 Tally multiplied by 7) plus (DWR 2 Tally multiplied by 2) plus (DWR 3 Tally by 1) for the specific species.
52	**DWR Composition %** *(%)*	Definition: *For a given species, "DWR Weighted Tally" multiplied by 10, divided by the number of quadrats sampled.* Population Standard: Optional Population Guidance: Calculated by dividing the specific species weighted tally by the total of the weighted column for all species, multiplied by 100.
53	**DWR Ave. Yield** *(lbs/acre)*	Definition: *The computed average production for the species across all quadrats using the Dry Weight Rank protocol.* Population Standard: Optional Population Guidance: This is calculated based on the Dry Weight Rank with the Comparative Yield method. Average rank for the site for the specific species multiplied by the Average Rank interval and then multiply by the conversion factor to convert grams per quadrat based on quadrat size.
54	**Wt. Unit Weight** *(g)*	Definition: *The clipped and weighed fresh weight of the reference weight unit for a particular species collected near but outside the transect area. It is a repeatable unit for the particular plant species. It can consist of a plant part, an entire plant, or a group of plants. Select a weight unit that is easy to identify, count, and remember.* Population Standard: Optional Population Guidance: Weight in grams as a whole integer for the weight unit for the specific species. Utilized for production by multiple protocols.
55	**Total # of Wt. Units**	Definition: *The total number of weight units estimated for a particular species.* Population Standard: Optional Population Guidance: Calculated by totaling the number of weight units across all quadrats on the transect.
56	**Wt. Unit Ave. Yield**	Definition: *The computed average production for the species across all quadrats using the Weight Unit Weight protocol.*

(lbs/ac)

Population Standard: Optional

Population Guidance: Calculated by multiplying the total number of weight units recorded in the prior column for the specific species, multiplied by the weight unit weight, multiplied by the plot conversion factor to convert grams to pounds per acre.

57 **Total Wt. Unit Weight Clipped**

Definition: *The total clipped and weighed fresh weight of the weight unit quadrats that were clipped for a particular species.*

Population Standard: Optional

Population Guidance: Calculated by summing the clipped weights for all quadrats clipped for a specific species.

58 **# of Canopy Cover Hits**

Definition: *The total number of canopy hits of a species along the transect.*

Population Standard: Optional

Population Guidance: Calculated total of canopy cover hits recorded in the Point Plant Cover Details child table for the specific species.

59 **Canopy Cover %**

(%)

Definition: *The estimated canopy cover percentage of a species.*

Population Standard: Optional

Population Guidance: Calculated by dividing the total number of canopy cover hits by the total number of points sampled multiplied by 100.

60 **Canopy Cover % Ave. – Daubenmire**

(%)

Definition: *The estimated average canopy cover percentage of a species as determined by the Daubenmire method.*

Population Standard: Optional

Population Guidance: Total the products for all cover classes by species. Divide the sum by the total number of quadrats sampled on the transect. This is recorded on the Daubenmire form as illustrated in the Sampling Vegetation Attribute publication.

61 **Canopy Cover Ave. Class**

Definition: *For a given species, the modal value in the "Canopy Cover Class" column from the "Transect Canopy Cover Class Summary" child table for a transect, expressed as a class.*

Population Standard: Obsolete

Population Guidance: Unclear for which protocol this column pertains and is proposed for removal with next data model update.

62 **# of Foliar Cover Hits**

Definition: *The total number of foliar cover hits of a species along the transect.*

Population Standard: Optional

Population Guidance: Calculated total of foliar cover hits recorded in the Point Plant Cover Details child table for the specific species. Manual calculations and entry based on field data sheets is necessary. Data to complete this calculation is currently not available in NASIS. This is proposed for correction with future data model updates.

63 **Foliar Cover % - Line Int.**

(%)

Definition: *For a given species, the percentage of points along a transect on which foliar cover of that species was encountered using the Line-Point Intercept protocol. Computed by the number of points in which "Foliar Cover" = "Yes," divided by the total number of points sampled, multiplied by 100.*

Population Standard: Optional

Population Guidance: Calculated by dividing the total length of foliar cover by the total length of the transect multiplied by 100. Manual calculations and entry based on field data sheets is

necessary. Data to complete this calculation is currently not available in NASIS. This is proposed for correction with future data model updates.

64 **Total Foliar Cover - Line Int.**

(ft)

Definition: *The total length along a transect occupied by foliar cover of a particular species.*

Population Standard: Optional

Population Guidance: Calculated by summing the length of all foliar intercepts of a species along the transect. This total is found on the Line Intercept form, and accounts for forb, shrub, and tree species. Manual calculations and entry based on field data sheets is necessary. Data to complete this calculation is currently not available in NASIS. This is proposed for correction with future data model updates.

65 **# of Basal Cover Hits**

Definition: *The total number of basal cover hits of a species along the transect.*

Population Standard: Optional

Population Guidance: Calculated total of basal cover hits recorded in the Point Plant Cover Details child table for the specific species.

66 **Basal Cover % - Line Int.**

(%)

Definition: *For a given species, the percentage of points along a transect in which basal cover of that species was encountered using the Line-Point Intercept protocol. Computed by the number of points on which "Basal Cover" = "Yes," divided by the total number of points sampled, multiplied by 100.*

Population Standard: Optional

Population Guidance: Calculated by dividing the total length of basal cover by the total length of the transect multiplied by 100. Manual calculations and entry based on field data sheets is necessary. Data to complete this calculation currently is not available in NASIS. This is proposed for correction with future data model updates.

67 **Total Basal Cover - Line Int.**

(ft)

Definition: *The total length along a transect occupied by basal cover of a particular species.*

Population Standard: Optional

Population Guidance: Calculated by summing the length of all basal intercepts of a species along the transect. This total is found on the Line Intercept form, and accounts for grass and grass-like species. Manual calculations and entry based on field data sheets is necessary. Data to complete this calculation currently is not available in NASIS. This is proposed for correction with future data model updates.

68 **Total # of Mature Plants**

Definition: *The total number of mature plants for a given plant species within all quadrats on the transect.*

Population Standard: Optional

Population Guidance: Calculated by totaling the number of mature plants for a specific species across all quadrats on a transect, recorded in the Density Quadrat Details child table.

69 **Average Mature Density**

Definition: *The average number of mature plants per quadrat, for a given plant species over all quadrats on the transect.*

Population Standard: Optional

Population Guidance: Calculated by multiplying the average mature plant density per quadrat by total number of possible quadrats on the transect. Data is recorded in the Density Quadrat Details child table. Protocol is documented in the Sampling Vegetation Attributes publication.

70 **Average Mature Density Class**

Definition: *A class indicating the density of mature plants of a species per quadrat. Dependent upon quadrat size recorded for the species being counted.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu: select the class that covers the average mature density. Classes are *1* (1 to 10 plants per quadrat), *2* (11 to 100 plants per quadrat), *3* (101 to 500 plants per quadrat), *4* (501 to 999 plants per quadrat), and *5* (greater than 999 plants per quadrat).

71 **Total # of Seedling Plants**

Definition: *The total number of seedling plants for a given plant species within all quadrats on the transect.*

Population Standard: Optional

Population Guidance: Calculated by totaling the number of seedling plants for a specific species across all quadrats on a transect, recorded in the Density Quadrat Details child table.

72 **Average Seedling Density**

Definition: *The average number of seedling plants per quadrat, for a given plant species over all quadrats on the transect.*

Population Standard: Optional

Population Guidance: Calculated by multiplying the average seedling density per quadrat by total number of possible quadrats on the transect. Data is recorded in the Density Quadrat Details child table. Protocol is documented in the Sampling Vegetation Attributes publication.

3 **Average Seedling Density Class**

Definition: *A class indicating the density of seedling plants of a species per quadrat. Dependent upon quadrat size recorded for the species being counted.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu: select the class that covers the average seedling density. Classes are *1* (1 to 10 plants per quadrat), *2* (11 to 100 plants per quadrat), *3* (101 to 500 plants per quadrat), *4* (501 to 999 plants per quadrat), and *5* (greater than 999 plants per quadrat).

74 **Ground Cover Abundance Class**

Definition: *A class representing the proportion of the total ground cover of each species along the transect.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu: select the class that includes the Ground Cover abundance for the specific species. Classes are *Trace to 1%* (occasional plant present), *2 to 9%* (sparsely abundant), *10 to 19%* (moderately abundant), *20 to 29%* (abundant), or *30% or more* (very abundant). Frequency and Step Point protocols will provide this calculation as documented in the Sampling Vegetation Attributes publication.

75 **% of Total Canopy Cover**

(%)

Definition: *The percentage of the total canopy along the transect that is attributed to a particular species.*

Population Standard: Obsolete!

Population Guidance: This column may pertain to multiple protocols. Further clarification is being researched to populate this cell. No direct link is found to determine use, so considered obsolete until further information is obtained.

76 **Basal Area**

(ft^2/acre)

Definition: *The total basal area measured of a particular species.*

Population Standard: Optional

Population Guidance: Calculated by adding the number of individuals found in each subplot to generate the average density per square meter or square feet. Apply appropriate conversion factors to convert to hectare and acres. Calculations based on the Density Quadrat Details child table.

77 **Basal Area Assess. Method**

Definition: *The method used to determine basal area.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu: *estimated* values or *measured* values.

Plant Production Quadrat Details

This table contains data collected from individual quadrats along a transect collected using the Double Sampling, Harvest (not Total Harvest), and/or Weight Unit protocols as part of a vegetation inventory.

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange quadrats in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Quadrat #**

Definition: *The number assigned to a particular quadrat within a plot or transect from which measurements were recorded.*

Population Standard: Required

Population Guidance: The recorded number and label protocol varies from the origin of the form. The quadrat number should be *1, 2, 3*, etc. This number will correlate to the transect point location or subplot number.

3 **Transect Point Location**

(ft)

Definition: *The point of observation along the transect recorded as a distance from the starting point of the transect. Starting point of the transect is zero.*

Population Standard: Required

Population Guidance: The recorded number and label protocol varies from the origin of the form. The quadrat number should be the distance from the start of the transect or the measurement along the tape where the quadrat is placed. This number will correlate to the Quadrat #.

4 **Quadrat Clipped ?**

Definition: *An indicator as to whether the plants in a quadrat were clipped and weighed or not.*

Population Standard: Required

Population Guidance: If the quadrat was clipped the box should be checked; if it was estimated only and not clipped, leave the box unchecked.

5 **Species Wt. Air-dry**

(g)

Definition: *The air-dry weight of the particular plant species in a particular quadrat.*

Population Standard: Optional

Population Guidance: Record the air-dry weight of the clipped plot, if clipped. If not clipped or an actual dry weight recorded, this field will be left blank. Weights are captured as grams to the whole integer.

6 **Species Wt. Clipped**

(g)

Definition: *The clipped weight of the particular plant species in a particular quadrat.*

Population Standard: Optional

Population Guidance: Record the fresh or green weight of the clipped plot, if clipped. If not clipped or an actual fresh or green weight recorded, this field will be left blank. Weights are captured as grams to the whole integer.

7 **Species Wt. Estimated**

Definition: *The estimated weight of the particular plant species in a particular quadrat, computed as "# of weight units" multiplied by "weight unit weight."*

Population Standard: Optional

(g)

Population Guidance: In the protocol for using weight unit, this is a calculation of the number of weight units recorded in a following cell multiplied by the weight of the weight units, recorded on the Vegetation Transect Plant Summary child table. Weights are captured as grams to the whole integer.

8 **Trace Amount ?**

Definition: *A yes/no indicator that a 'trace' amount of a species exists. A 'trace' is defined as 'less than a measurable amount.'*

Population Standard: Required

Population Guidance: If the species is recorded but the amount is less than what is measurable (less than 0.2 grams), then it is considered a trace amount and the box should be checked.

9 **# of Weight Units**

Definition: *The number of weight units of a particular species estimated to exist within a quadrat.*

Population Standard: Optional

Population Guidance: The recorded number of weight units for the specific quadrat recorded to the 100^{th} of a unit.

10 **Species Canopy Cover %**

(%)

Definition: *The estimated canopy cover percentage of a species.*

Population Standard: Optional

Population Guidance: Species canopy cover is recorded here if production is a method captured as an understory transect within the Relevé or Forest Stand Inventory. Data is transect-driven, and specific to a quadrat on the transect. If data is for the species across the entire transect, record that data on the Vegetation Transect Plant Summary child table. If it is plot-based, record this information on the Plot Plant Summary tables.

11 **Species Canopy Cover Class**

Definition: *The estimated Canopy Cover Class of a species.*

Population Standard: Optional

Population Guidance: Based on the previous cell (Species Canopy Cover %) select the class that fits the recorded percentage. The classes are as follows: 1 = Trace, 2 = 0.1-1%, 3 = 1-2%, 4 = 2-5%, 5 = 5-10%, 6 = 10-25%, 7 = 25-50%, 8 = 50-75%, 9 = 75-95%, and 10 = >95%. This Domain class varies between protocols, so ensure the class selected by this definition fits the recorded percentage of canopy.

Belt Data

This table records data collected using the Belt Transect protocol along a transect as part of a vegetation inventory.

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange quadrats in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Plant Ht Class Lower Limit**

(ft)

Definition: *The lower height limit of the plant height class being described.*

Population Standard: Required

Population Guidance: The Belt Transect method protocol allows for three class ranges to be set (Classes *A, B*, and *C.*) Flexibility is provided for more or fewer classes, depending upon the species being evaluated. Record the lower limit of the specific class for this reading. Height is recorded in feet to the nearest tenth.

3 **Plant Ht Class Upper Limit**

(ft)

Definition: *The upper height limit of the plant height class being described.*

Population Standard: Required

Population Guidance: The Belt Transect method protocol allows for three class ranges to be set (Classes *A, B,* and *C.*) Flexibility is provided for more or fewer classes, depending upon the species being evaluated. Record the upper limit of the specific class being recorded for this reading. Height is recorded in feet to the nearest tenth.

4 **# of Plants**

Definition: *The number of individual plants, for a given height class of a plant species, that are rooted within the sample area.*

Population Standard: Required

Population Guidance: Record the number of species or plant hits for this plant height class as recorded on the total hits for the specific plant species by size class.

5 **Species Density**

(plants/acre)

Definition: *The number of individual plants of a species per acre for the specified height group. Calculated as the number of individual plants counted within the belt area, multiplied by 43,560, divided by area (sq. feet) covered by the belt (belt width x transect length).*

Population Standard: Optional

Population Guidance: Calculated as the number of plants for the specific species within the specific plant height class, multiplied by (43,560 / the belt area (belt width X transect length). Ensure that the belt area is converted to square feet so that the calculation comes out as plants per acre. Enter as a whole integer.

Daubenmire Canopy Cover Class Summary

This table contains data pertaining to canopy cover of individual species collected using the Daubenmire protocol.

1 **Seq**

Definition: *A measure of soil exchangeable hydrogen ions that may become active by cation exchange.*

Population Standard: Optional

Population Guidance: To arrange tree rows in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Canopy Cover Class**

Definition: *The estimated Canopy Cover Class of a species using the Daubenmire protocol.*

Population Standard: Required

Population Guidance: Select the most appropriate answer from the drop-down menu: select from the defined classes for the Daubenmire protocol. Classes are *1 to 5%*, *6 to 25%*, *26 to 50%*, *51 to 75%*, *76 to 95%*, or *96 to 100%*. In protocol, a ten-cover class system is an option, however, the data will have to be converted to the six-class grouping to be easily recorded in NASIS.

3 **Class Midpoint %**

(%)

Definition: *The midpoint percentage value of the identified Canopy Cover Class range.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu: select from the defined class midpoint for the selected class range in the canopy cover class cell. The Class midpoints for the established classes are *2.5* (1 to 5%), *15* (6 to 25%), *37.5* (26 to 50%), *62.5* (51 to 75%), *85* (76 to 95%), or *97.5* (96 to 100%).

4 **# of Quadrat Hits**

Definition: *The number of quadrats in which a particular species falls into the identified canopy cover class using the Daubenmire protocol.*

Population Standard: Optional

Population Guidance: Calculated based on the number of quadrats that a species is recorded hitting within this particular Canopy Class. Number is found on the Daubenmire summary form, or it is calculated by summing the total quadrats recorded in the Daubenmire Canopy Cover Quad Details child table.

5 **Canopy Cover Product**

Definition: *The product of "Canopy Cover Class Midpoint %" x "cover class count" for a particular species and canopy cover class.*

Population Standard: Optional

Population Guidance: Calculated by multiplying the class midpoint % by the # of quadrat hits for the specific species and canopy cover class.

Daubenmire Canopy Cover Quad Details

This table contains data pertaining to canopy cover of individual plant species collected from individual quadrats using the Daubenmire protocol.

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange quadrats in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Quadrat #**

Definition: *The number assigned to a particular quadrat within a plot or transect from which measurements were recorded.*

Population Standard: Required

Population Guidance: As defined, when a quadrat has a record of a plant species within the cover class, record the quadrat number in this cell. (on the Daubenmire form, if under the AGSP species, for cover class 1, record all the quadrat numbers that have a 1 under the AGSP species record line. If none appear, leave this cell blank.)

Density Quadrat Details

This table contains data collected along a transect regarding plant density.

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange quadrats in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Quadrat #**

Definition: *The number assigned to a particular quadrat within a plot or transect from which measurements were recorded.*

Population Standard: Required

Population Guidance: The quadrat number is a sequential numbering of the quadrats measured. They should be *1, 2, 3*, etc.

3 **Transect Point Location**

(ft)

Definition: *The point of observation along the transect recorded as a distance from the starting point of the transect. Starting point of the transect is zero.*

Population Standard: Required

Population Guidance: The recorded number and label protocol varies from the origin of the form. The transect point location is equivalent to the coordinates of each quadrat. The Standard density form records this as two numbers. The first number is the X axis and the second number is the location of the Y axis. This method is detailed in the Sampling Vegetation Attributes publication. This should be entered as x.y or 0.4 or 16.48. Other protocol for Density, record the measurement from the start of the tape in feet to the nearest tenth.

4 **# of Mature Plants**

Definition: *The number of mature individuals for a given plant species within the quadrat.*

Population Standard: Optional

Population Guidance: Record the number of mature plants counted for the specific species within the quadrat as documented on the density form, as a whole integer.

5 **Mature Density Class**

Definition: *A class indicating the density of mature plants of a species per unit area.*

Population Standard: Obsolete

Population Guidance: Protocol details do not outline the selection of a density class. Advise that this cell should not be populated. Select the most appropriate answer from the drop-down menu to represent the mature density (# plants/quadrat) as a class. The classes provided are *1 to 10*, *11 to 100*, *101 to 500*, *501 to 999* or *greater than 999*.

6 **# of Seedling Plants**

Definition: *The number of seedlings for a given plant species within the quadrat.*

Population Standard: Optional

Population Guidance: Record the number of seedling plants counted for the specific species within the quadrat as documented on the density form, as a whole integer.

7 **Seedling Density Class**

Definition: *A class indicating the density of seedling plants of a species per unit area.*

Population Standard: Obsolete

Population Guidance: Protocol details do not outline the selection of a density class. Advise that this cell should not be populated. Select the most appropriate answer from the drop-down menu to represent the seedling density (# plants/quadrat) as a class. The classes provided are *1 to 10*, *11 to 100*, *101 to 500*, *501 to 999* or *greater than 999*.

Dry Weight Rank Quadrat Details

This table contains data from individual quadrats along a transect collected using the Dry Weight Rank (DWR) protocol as part of a vegetation inventory.

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange quadrats in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Quadrat #**

Definition: *The number assigned to a particular quadrat within a plot or transect from which measurements were recorded.*

Population Standard: Required

Population Guidance: The quadrat number is a sequential numbering of the quadrats measured. They should be *1, 2, 3*, etc. This number correlates to the Transect point location.

3 **Transect Point Location**

(ft)

Definition: *The point of observation along the transect recorded as a distance from the starting point of the transect. Starting point of the transect is zero.*

Population Standard: Required

Population Guidance: The recorded number and label protocol varies from the origin of the form. The quadrat number should be the distance from the start of the transect or the measurement along the tape where the quadrat is placed. This number will correlate to the Quadrat #.

4 **DWR 1 ?**

Definition: *The estimated portion of the total plant community that a particular plant species comprises, assign to Dry Weight Rank 1 (70%). When selected alone, DWR 1 corresponds to 70% composition. When selected with DWR 2, they correspond to 90% composition. When selected with DWR 3, they correspond to 80% composition. When selected with DWR 2 & 3, they correspond to 100% composition.*

Population Standard: Required

Population Guidance: Check the box if the specific species is identified in the quadrat as the rank 1 plant (70% of the plant community). Data is recorded on the Dry Weight Rank form by plot and species. If the species is not ranked as a 1 for this quadrat, leave the box unchecked.

5 **DWR 2 ?**

Definition: *The estimated portion of the total plant community that a particular plant species comprises, assign to Dry Weight Rank 2 (20%). When selected alone, DWR 2 corresponds to 20% composition. When selected with DWR 1, they correspond to 90% composition. When selected with DWR 3, they correspond to 30% composition. When selected with DWR 1 & 3, they correspond to 100% composition.*

Population Standard: Required

Population Guidance: Check the box if the specific species is identified in the quadrat as the rank 2 plant (20% of the plant community). Data is recorded on the Dry Weight Rank form by plot and species. If the species is not ranked as a 2 for this quadrat, leave the box unchecked.

6 **DWR 3 ?**

Definition: *The estimated portion of the total plant community that a particular plant species comprises, assign to Dry Weight Rank 3 (10%). When selected alone, DWR 3 corresponds to 10% composition. When selected with DWR 1, they correspond to 80% composition. When selected with DWR 2, they correspond to 30% composition. When selected with DWR 1 & 2, they correspond to 100% composition.*

Population Standard: Required

Population Guidance: Check the box if the specific species is identified in the quadrat as the rank 3 plant (10% of the plant community). Data is recorded on the Dry Weight Rank form by plot and species. If the species is not ranked as a 3 for this quadrat, leave the box unchecked.

Frequency Quadrat Details

This table contains data from individual quadrats along a transect collected using the Frequency protocol as part of a vegetation inventory. Cover data collected by frequency is not entered here, rather it is entered on the Point Plant Cover Details if canopy, foliar, and basal cover are recorded by species; otherwise record in Transect Ground Surface Cover Tables.

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange quadrats in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Quadrat #**

Definition: *The number assigned to a particular quadrat within a plot or transect from which measurements were recorded.*

Population Standard: Required

Population Guidance: The quadrat number is a sequential numbering of the quadrats measured. They should be *1, 2, 3*, etc. This number correlates to the Transect point location.

3 **Transect Point Location**

(ft)

Definition: *The point of observation along the transect recorded as a distance from the starting point of the transect. Starting point of the transect is zero.*

Population Standard: Required

Population Guidance: The Transect Point Location will be the distance from the start of the base line, and the quadrat number will determine distance down the transect where the quadrat is placed.

4 **Species Present ?**

Definition: *A yes/no indicator as to whether a particular plant species is present within a particular quadrat.*

Population Standard: Required

Population Guidance: Check the box if the specific species is identified in the quadrat. If the plant species is not present, do not enter the quadrat number for this species. The required status of this cell will not allow the record to be saved if the species box is not checked.

Nested Frequency Quadrat Details

This table contains data from individual quadrats along a transect collected using the Nested Frequency protocol as part of a vegetation inventory. Cover data collected by Nested Frequency is not entered here, rather it is entered on the Point Plant Cover Details if canopy, foliar, and basal cover are recorded by species; otherwise record in Transect Ground Surface Cover Tables.

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange quadrats in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Quadrat #**

Definition: *The number assigned to a particular quadrat within a plot or transect from which measurements were recorded.*

Population Standard: Required

Population Guidance: The quadrat number is a sequential numbering of the quadrats measured. They should be *1, 2, 3*, etc. This number correlates to the Transect Point Location.

3 **Transect Point Location**

(ft)

Definition: *The point of observation along the transect recorded as a distance from the starting point of the transect. Starting point of the transect is zero.*

Population Standard: Required

Population Guidance: The Transect Point Location will be the distance from the start of the base line, and the quadrat number will determine distance down the transect where the quadrat is placed.

4 **Smallest Quadrat In ?**

Definition: *The identifying subquadrat number of the smallest subquadrat within a quadrat for Nested Frequency sampling in which the referenced species was found. Higher numbers indicate larger-sized subquadrats.*

Population Standard: Required

Population Guidance: Record the number of the smallest subquadrat in which a species is found. Subquadrat 1 is the smallest increasing numbers reflect larger subquadrats. Data to be entered here is recorded on the Nested Frequency Form under the quadrat number.

Nested Frequency Summary

This table contains summary data collected using the Nested Frequency protocol as part of a vegetation inventory.

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange quadrats in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Subquadrat #**

Definition: *The identifying number of a subquadrat within a quadrat for Nested Frequency sampling. Higher numbers indicate larger-sized subquadrats.*

Population Standard: Required

Population Guidance: This number relates to the size of the quadrat as recorded (*1, 2, 3, 4,* etc.)

3 **Subquadrat Size** *(in)*

Definition: *The size of the subquadrat represented by the length of one side of the subquadrat, in inches.*

Population Standard: Required

Population Guidance: Common subquadrat (or nested quadrats) sizes are 30, 20, 15, 12, 10, 6, and 3 inches. The subquadrats are square (a 3-inch subquadrat is 3 inches by 3 inches).

4 **# of Subquadrat Hits**

Definition: *For a given species, the number of subquadrats of a particular size where the referenced species was found along the transect.*

Population Standard: Optional

Population Guidance: Calculated by totaling the number of hits recorded for the subquadrat for the specific species across the transect.

5 **Species Frequency** *(%)*

Definition: *For a given species, the percentage of subquadrats of a particular size where the species was found along the transect.*

Population Standard: Optional

Population Guidance: Calculated by the number of subquadrat hits for the specific species divided by the number of quadrats sampled, and then multiply by 100 to determine the species frequency.

Point Plant Cover Details

This table contains data pertaining to plant cover collected at points along a vegetation transect. Line-point intercept and cover data for Frequency and Nested Frequency protocols are recorded here.

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange points in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Transect Point Location**

(ft)

Definition: *The point of observation along the transect recorded as a distance from the starting point of the transect. Starting point of the transect is zero.*

Population Standard: Required

Population Guidance: Protocols vary on determining how points are collected. Generally, the Transect Point Location will be the distance from the start of the transect where the quadrat or point is read (is placed). For Frequency and Nested Frequency protocols: if multiple readings are taken at one transect point location, read each hit as a separate record using X.Y for the point number; for example, at the 9 foot mark and on the third corner reading, the Transect Point Location would be 9.3.

3 **Live Canopy Ht. Bottom**

(ft)

Definition: *Height of the bottom of the dominant canopy layer.*

Population Standard: Optional

Population Guidance: Enter the height measured for the bottom of the dominant canopy layer in feet to the nearest tenth.

4 **Live Canopy Ht. Top**

(ft)

Definition: *Height of the top of the dominant canopy layer.*

Population Standard: Optional

Population Guidance: Enter the height measured for the top of the dominant canopy layer in feet to the nearest tenth.

5 **Canopy Cover Present ?**

Definition: *A yes/no indicator as to whether a point along the transect is covered by the vertical projection of the outermost perimeter of the natural spread of foliage of the particular plant species. Small openings within the canopy are included.*

Population Standard: Required

Population Guidance: Check the box if the specific species has canopy cover recorded for this transect point location. If the plant species is not present (no hits recorded for the species), do not enter the quadrat number for this species. The required status of this cell will not allow the record to be saved if one of the three boxes (*canopy*, *foliar*, or *basal cover*) is not checked.

6 **Foliar Cover Present ?**

Definition: *A yes/no indicator as to whether a point along the transect is covered by the vertical projection of the aerial portions of the particular plant species. Small openings in the canopy are excluded.*

Population Standard: Required

Population Guidance: Check the box if the specific species has foliar cover recorded for this transect point location. If the plant species is not present (no hits recorded for the species), do not enter the quadrat number for this species. The required status of this cell will not allow the record to be saved if one of the three boxes (*canopy, foliar*, or *basal cover*) is not checked.

7 **Basal Cover Present ?**

Definition: *A yes/no indicator as to whether a point along the transect is occupied by the basal portion of the particular plant species.*

Population Standard: Required

Population Guidance: Check the box if the specific species has basal cover recorded for this transect point location. If the plant species is not present (no hits recorded for the species), do not enter the quadrat number for this species. The required status of this cell will not allow the record to be saved if one of the three boxes (*canopy, foliar*, or *basal cover*) is not checked.

Belt Transect Summary

This table stored summary plant data for individual height classes from a belt transect.

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange quadrats in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Plant Ht Class Lower Limit**

(ft)

Definition: *The lower height limit of the plant height class being described.*

Population Standard: Required

Population Guidance: The Belt Transect method protocol allows for three class ranges to be set (Classes *A, B*, and *C*.) Flexibility is provided for more or fewer classes, depending upon the species being evaluated. Record the lower limit of the specific class being recorded for this reading. Height is recorded in feet to the nearest tenth.

3 **Plant Ht Class Upper Limit**

(ft)

Definition: *The upper height limit of the plant height class being described.*

Population Standard: Required

Population Guidance: The Belt Transect method protocol allows for three class ranges to be set (Classes *A, B,* and *C*.) Flexibility is provided for more or fewer classes, depending upon the species being evaluated. Record the upper limit of the specific class being recorded for this reading. Height is recorded in feet to the nearest tenth.

4 **Total # of Plants**

Definition: *The number of individual plants, for a given height class of all plant species.*

Population Standard: Optional

Population Guidance: Calculated by adding the number of plants hit across all species within the specific height class. Data for calculation is found in the Vegetation Transect Plant Summary and Belt Data child tables.

5 **Ht. Class Plant Density**

Definition: *The number of individual plants of all species per acre for the specified height class.*

Population Standard: Optional

Population Guidance: Calculated as the total number of plants for all species within the specific plant height class, multiplied by (43,560 / the belt area (belt width X transect length). Ensure that the belt area is converted to square feet so that the calculation comes out as plants per acre. Enter as a whole integer.

Comparative Yield Data

This table contains data collected using the Comparative Yield protocol as part of a vegetation inventory.

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange quadrats in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Quadrat #**

Definition: *The number assigned to a particular quadrat within a plot or transect from which measurements were recorded.*

Population Standard: Required

Population Guidance: This column must be populated for the row to save. Comparative Yield makes no reference to the Quadrat #, so a fix is proposed for the next data model update. Until that time, number plots or records in a sequential order as entered.

3 **Transect Point Location**

Definition: *The point of observation along the transect recorded as a distance from the starting point of the transect. Starting point of the transect is zero.*

Population Standard: Obsolete

Population Guidance: No reference to the Transect Point location is used for the Comparative Yield method

4 **Yield Rank**

Definition: *A numeric value that estimates production of the quadrat being evaluated compared to the five clipped reference quadrats for the transect (located in "Reference Quadrats" table). Values range from zero to five: zero means no yield and five is high-yield.*

Population Standard: Required

Population Guidance: For each Yield Rank and mid rank is a dot count metrics or tally. Then a rank X tall is figured. These will then be used to calculate the average ranking for the site. The ARI is necessary to calculate the production.

Comparative Yield Reference Quadrats

This table contains data about the reference quadrats from the Comparative Yield protocol as part of a vegetation inventory.

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange quadrats in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Ref Yield Rank**

Definition: *The identifier of each Reference Yield rank quadrat associated with a transect that indicates increasing levels of production. Five reference quadrats are subjectively located, clipped, and weighed. Reference 1 is assigned to the lowest-yielding, and Reference 5 assigned to the highest-yielding quadrat.*

Population Standard: Required

Population Guidance: Establish which Yield rank the reference quadrat is capturing and record that here (1-5). There could be situations in which only three references are used, or more reference plots are established. Typically, five references are used.

3 **Quadrat Size**

(ft^2)

Definition: *The total area of the vegetation quadrat used.*

Population Standard: Required

		Population Guidance: The common plot sizes are 96, 9.6, 4.8, 2.4, 1.92, and 0.96 square feet.
4	**Quadrat Shape**	Definition: *The shape of the quadrat used. Most common shapes are rectangular and circular.* Population Standard: Required Population Guidance: Select the most appropriate answer from the drop-down menu: the shape options are *circular*, *square*, or *rectangular*.
5	**Clipped Weight** ***(g)***	Definition: *The fresh (green) clipped weight in grams of the particular reference quadrat.* Population Standard: Required Population Guidance: Record the green (fresh) weight of the clipped reference quadrat in grams to the nearest whole integer.
6	**Conversion Factor**	Definition: *The conversion factor used to get lbs./ac. from grams per the area unit, used in the reference quadrats.* Population Standard: Required Population Guidance: The weight conversion factors are based on the size of quadrat used and is referenced in multiple publications for clipping. Conversion factors to convert grams to lbs./ac for common quadrat sizes are: CF of 50 for a 1.92 sq. ft. quadrat; CF of 40 for a 2.4 sq. ft. quadrat; CF of 20 for a 4.8 sq. ft. quadrat; CF of 10 for a 9.6 sq. ft. quadrat; CF of 0.22 for a 0.01 ac. quadrat; CF of 20 for a 4.8 sq. ft. quadrat; or CF of 100 for a 0.01 ac. quadrat measured in pounds.

Total Quadrat Harvest

This table contains data about each quadrat along a transect in which the whole quadrat is harvested (clipped) without separating individual species.

Plot Sampling Protocols: Total Harvest (This is not the same as the Harvest method, which is recorded in the Plant Production Tables.)

Transect Sampling Protocols: None specified

1	**Seq**	Definition: *Sequential number of the feature being described.* Population Standard: Optional Population Guidance: To arrange quadrats in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.
2	**Quadrat #**	Definition: *The number assigned to a particular quadrat within a plot or transect from which measurements were recorded.* Population Standard: Required Population Guidance:
3	**Transect Point Location**	Definition: *The point of observation along the transect recorded as a distance from the starting point of the transect. Starting point of the transect is zero.*

		(ft)	Population Standard: Optional Population Guidance: Protocols will vary on how to collect quadrats along an established transect. In some instances (Step methods) this may be a rough estimate based on the step number multiplied by the step interval to provide the distance of the quadrat from zero (start of the transect).
4	**Total Clipped Wt – Fresh**	*(g)*	Definition: *The total actual fresh (green) clipped weight, in grams, of all vegetation with an individual quadrat.* Population Standard: Required Population Guidance: The total weight of a quadrat, not separated by species recorded in grams. This is not a calculation based on other protocol: it is for a specific protocol. If quadrats are clipped for total weight (not weight by species), then this is where the data is recorded. Total production can be calculated based on the quadrat size, using conversion factors as recorded on the Vegetation Transect table.

Transect Gap Details

This table contains data collected along a vegetation transect pertaining to basal and canopy gaps.

Plot Sampling Protocols: None specified

Transect Sampling Protocols: Gap Intercept

1	**Seq**	Definition: *Sequential number of the feature being described.* Population Standard: Optional Population Guidance: To arrange measurements in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.
2	**Gap #**	Definition: *A sequential number identifying a particular gap along a transect.* Population Standard: Required Population Guidance: Starting with the first gap measure, sequentially number all gaps listed on the spreadsheet, starting with 1.
3	**Gap Kind**	Definition: *The type of gap being described.* Population Standard: Required Population Guidance: Select the most appropriate answer from the drop-down menu. The gap kind is either *basal* gap or *canopy* gap.
4	**Gap Start Point**	Definition: *The distance from the starting point of the transect (ft.) where a particular gap begins. Zero measurement is the beginning point of the transect. Must be less than the Gap End Point.* Population Standard: Required Population Guidance: Measurement of the start of an interspace between canopy or basal plants Gaps are recorded in tenths of a foot with one decimal place allowed.
5	**Gap End Point**	Definition: *The distance from the starting point of the transect (cm) where a particular gap ends. Zero measurement is the beginning point of the transect. Must be greater than the Gap Start Point.*

Population Standard: Required

Population Guidance: Measurement of the end of an interspace between canopy or basal plants Gaps are recorded in tenths of a foot with one decimal place allowed.

6 **Gap Length**

Definition: *The length of a particular gap along a transect; "gap end point" minus "gap start point."*

Population Standard: Optional

Population Guidance: Calculation of the length of each gap based on the end point minus the start point of each gap measured. Length of a gap to count must be equal to or greater than the minimum gap size set for the transect.

Transect Ground Cover

This table contains data pertaining to the types and amounts of different ground cover materials along a transect.

Plot Sampling Protocols: None specified

Transect Sampling Protocols: Step Point, Point Intercept, Line-Point Intercept, Frequency, Nested Frequency

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange points in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Ground Cover Type**

Definition: *The type of plant or other material that would first intercept a falling raindrop and prevent it from impacting the soil surface (a vertical or bird's-eye view of first intercept). If no such material is present, 'bare ground' is recorded.*

Population Standard: Required

Population Guidance: Select the most appropriate answer from the drop-down menu. The options available are *bare ground, bedrock, biological crust, forb, grass or grass-like, litter, nonvascular plant, shrub or vine or liana, surface fragments large* (equal to or greater than three inches in size), *surface fragments small* (greater than 0.25 and less than three inches in size), *tree, water*, and *embedded litter*. **NOTE:** Ground cover is defined as the percentage of material, other than bare ground, covering the land surface. It may include live and standing dead vegetation, litter, cobble, gravel, stones, and bedrock. Ground cover (including canopy cover) plus bare ground should total 100 percent. The actual soil surface or bare "soil" is captured in ground surface cover. Ground surface is a measure of one-layer description. When the structure or multiple layers are described, the Ground Surface Cover is more appropriate to record this data.

3 **# of Points**

Definition: *The number of points along the transect where a particular cover type occurred.*

Population Standard: Optional

Population Guidance: Calculation of the sum of points for each ground cover type recorded along the transect, as recorded on the Ground Cover Details child table.

4 **Ground Cover % - Points**

(%)

Definition: *The percentage of the soil surface being protected from being hit by a raindrop (vertical or bird's-eye view of first intercept) by a particular cover material type computed from the percentage of individual point observations along a transect covered by that cover material type.*

Population Standard: Optional

Population Guidance: Calculated by dividing the number of points captured for the specific ground cover type divided by the total number of points collected. This is then multiplied by 100 to capture the percentage of ground cover as a whole integer.

5 **Quadrat Size**

(ft^2)

Definition: *The total area of the vegetation quadrat used.*

Population Standard: Obsolete

Population Guidance: Do not populate this column. Proposed for removal when data model updated. Cover is a generally a secondary measurement from another protocol and is not captured based on the specific quadrat. In most instances the quadrat size is not relevant to this measurement and is captured under the specific protocol measured (Nested Frequency, Frequency, etc.)

6 **Quadrat Shape**

Definition: *The shape of the quadrat used. Most common shapes are rectangular and circular.*

Population Standard: Obsolete

Population Guidance: Do not populate this column. Proposed for removal when data model updated. Cover is a generally a secondary measurement from another protocol and is not captured based on the specific quadrat. In most instances the quadrat shape is not relevant to this measurement and is captured under the specific protocol measured (Nested Frequency, Frequency, etc.)

7 **Ground Cover % Ave. – Quadrats**

(%)

Definition: *The average percentage of the soil surface being protected from being hit by a raindrop (vertical or bird's-eye view of first intercept) by a particular cover material type computed from individual quadrats along a transect.*

Population Standard: Optional

Population Guidance: Calculated by dividing the tally of hits recorded for the specific cover type by the total number of hits recorded, then multiply this by 100 to record as a whole integer. In the case that this is figured within a specific quadrat: calculate by taking a sum of all quadrat percentages recorded on the Ground Cover Details child table and dividing it by the number of quadrats in which the cover type is recorded, to gain an average of ground cover along the transect.

Ground Cover Details

This table contains data about ground cover found at individual observation points along a transect.

Plot Sampling Protocols: None specified

Transect Sampling Protocols: Step Point, Line-Point Intercept, Point Intercept

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange points in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Transect Point Location**

Definition: *The point of observation along the transect recorded as a distance from the starting point of the transect. Starting point of the transect is zero.*

Population Standard: Required

Population Guidance: Record the distance down the transect that the point was recorded, generally at a foot marker or the number of steps taken. Different protocols will vary the distance between points taken and the method of collecting points. Record to the nearest tenth.

3 **Quadrat #**

Definition: *The number assigned to a particular quadrat within a plot or transect from which measurements were recorded.*

Population Standard: Optional

Population Guidance: Record the quadrat number captured based on the assigned protocol. Many times in collecting cover in a quadrat or frame method, dot tallies are recorded and not assigned to a specific quadrat. In this instance, record the total of dots in the Transect Ground Cover table as a total rather than individual hits. Protocol and data collection forms will vary.

4 **Quadrat Cover %**

Definition: *The percentage of the soil surface within a quadrat covered by a particular cover material type.*

Population Standard: Optional

Population Guidance: The recorded percentage for the specified quadrat and cover type. If a dot tally is figured for the quadrat specifically, this is calculated by the dot tally for the specific cover type within the specified quadrat divided by the total dot tally for that specified quadrat. If no quadrat is specified, then the percentage of cover is recorded on the Transect Ground Cover table.

Transect Ground Cover Data – Legacy – No New Data should be recorded in this table.

This table contains data pertaining to ground cover collected from individual quadrats, converted from the legacy ESIS-ESI database.

Plot Sampling Protocols: None specified

Transect Sampling Protocols: Legacy data brought over from ESIS. Protocols collecting this data will refer to other child tables.

1 **Seq**

Definition: *Sequential number of the feature being described.*

2 **Quadrat #**

Definition: *The number assigned to a particular quadrat within a plot or transect from which measurements were recorded.*

3 **Bare Ground %**

(%)

Definition: *The percentage of bare soil surface within a quadrat.*

4 **Canopy Cover %**

(%)

Definition: *The percentage of the soil surface within a quadrat covered by plant canopy up to 4.5 feet above the ground.*

5 **Rock Frag Cover %**

(%)

Definition: The percentage of the soil surface within a quadrat that is covered by rock fragments greater than 2mm in size.

6 **Mulch Weight** *(g)*

Definition: *The weight of mulch material collected from an individual quadrat.*

Transect Ground Surface Cover

This table contains data pertaining to the types and amounts of different ground surface cover material along a transect.

Plot Sampling Protocols: None specified

Transect Sampling Protocols: Step Point, Point Intercept, Line-Point Intercept, Frequency, Nested Frequency

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange quadrats in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Ground Surface Cover Type**

Definition: *The type of plant or other material that is in contact with and protecting the actual soil surface.*

Population Standard: Required

Population Guidance: Select the most appropriate answer from the drop-down menu. The options available are *bare ground, bedrock, biological crust, forb, grass or grass-like, litter, nonvascular plant, shrub or vine or liana, surface fragments large* (equal to or greater than three inches in size), *surface fragments small* (greater than 0.25 and less than three inches in size), *tree, water, downed wood fine-small, downed wood coarse-small, downed wood coarse-large, tree snags hard, tree snags soft*, and *embedded litter*. **NOTE:** Ground Surface Cover is the percentage of the ground surface actually occupied by bare soil, basal vegetation, litter, downed wood, gravel, rock or soil biological crust including mosses and lichens. Ground Surface Cover is most appropriate when multiple layers or the structure of a community is recorded. If a single layer is captured, then Ground Cover is more appropriate.

3 **# of Points**

Definition: *The number of points along the transect where a particular cover type occurred.*

Population Standard: Optional

Population Guidance: Calculation of the sum of points for each ground surface cover type recorded along the transect, as recorded on the Ground Cover Details child table.

4 **Ground Cover % - Points** *(%)*

Definition: *The percentage of the soil surface being protected from being hit by a raindrop (vertical or bird's-eye view of first intercept) by a particular cover material type computed from the percentage of individual point observations along a transect covered by that cover material type.*

Population Standard: Optional

Population Guidance: Calculated by dividing the number of points captured for the specific ground surface cover type divided by the total number of points collected. This is then multiplied by 100 to capture the percentage of ground cover as a whole integer.

5 **Quadrat Size** *(ft)*

Definition: *The total area of the vegetation quadrat used.*

Population Standard: Obsolete

Population Guidance: Do not populate this column. Proposed for removal when data model updated. Cover is a generally a secondary measurement from another protocol and is not captured based on the specific quadrat. In most instances the quadrat size is not relevant to this measurement and is captured under the specific protocol measured (Nested Frequency, Frequency, etc.)

6 **Quadrat Shape**

Definition: *The shape of the quadrat used. Most common shapes are rectangular and circular.*

Population Standard: Obsolete

Population Guidance: Do not populate this column. Proposed for removal when data model updated. Cover is a generally a secondary measurement from another protocol and is not captured based on the specific quadrat. In most instances the quadrat shape is not relevant to this measurement and is captured under the specific protocol measured (Nested Frequency, Frequency, etc.)

7 **Ground Cover % Ave. – Quadrats**

(%)

Definition: *The average percentage of the soil surface being protected from being hit by a raindrop (vertical or birds-eye view of first intercept) by a particular cover material type computed from individual quadrats along a transect.*

Population Standard: Optional

Population Guidance: Calculated by dividing the tally of hits recorded for the specific cover type by the total number of hits recorded, then multiply this by 100 to record as a whole integer. In the case that this is figured within a specific quadrat, then this is calculated by taking a sum of all quadrat percentages recorded on the Ground Surface Cover Details child table and dividing it by the number of quadrats the cover type is recorded to gain an average of ground cover along the transect.

Ground Surface Cover Details

This table contains data about ground surface cover found at individual observation points along a transect.

Plot Sampling Protocols: None specified

Transect Sampling Protocols: Forest Stand Inventory, Relevé, others may apply

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange quadrats in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Transect Point Location**

(ft)

Definition: *The point of observation along the transect recorded as a distance from the starting point of the transect. Starting point of the transect is zero.*

Population Standard: Required

Population Guidance: Record the distance down the transect that the point was recorded, generally at a foot marker or the number of steps taken. Different protocols will vary the distance between points taken and the method of collecting points. Record to the nearest tenth.

3 **Quadrat #**

Definition: *The number assigned to a particular quadrat within a plot or transect from which measurements were recorded.*

Population Standard: Optional

Population Guidance: Record the quadrat number captured based on the assigned protocol. Many times, in collecting cover in a quadrat or frame method, dot tallies are recorded and not assigned to a specific quadrat. In this instance, record the total of dots in the Transect Ground Surface Cover table as a total rather than individual hits. Protocol and data collection forms will vary.

4 **Quadrat Cover %**

(%)

Definition: *The percentage of the soil surface within a quadrat covered by a particular cover material type.*

Population Standard: Optional

Population Guidance: The recorded percentage for the specified quadrat and cover type. If a dot tally is figured for the quadrat specifically, this is calculated by the dot tally for the specific cover type within the specified quadrat divided by the total dot tally for that specified quadrat. If no quadrat is specified, then the percentage of cover is recorded on the Transect Ground Surface Cover table.

Transect Overstory Canopy Cover

This table contains data pertaining to canopy cover of overstory species collected at points along a vegetation transect.

Plot Sampling Protocols: Canopy Cover Class, Relevé

Transect Sampling Protocols: Relevé, others are not specified

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange quadrats in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Transect Point Location**

(ft)

Definition: *The point of observation along the transect recorded as a distance from the starting point of the transect. Starting point of the transect is zero.*

Population Standard: Required

Population Guidance: Protocols will vary on how to collect quadrats along an established transect. In some instances (Step methods) this may be a rough estimate based on the step number multiplied by the step interval to provide the distance of the quadrat from zero (start of the transect).

3 **Overstory Canopy Present ?**

Definition: *A yes/no indicator of whether overstory canopy is present at the sample location.*

Population Standard: Required

Population Guidance: Check the box if canopy cover is recorded for this transect point location. If canopy cover is not present, leave this box unchecked to record a non-hit.

4 **# of Densiometer Quadrants Covered**

Definition: *The number of quadrants or points of the densiometer covered by canopy at the sample location.*

Population Standard: Optional

Population Guidance: This is the number of quadrats that have overstory canopy cover at the sample location. In some protocol, multiple measurements are taken at a sample point. In this case, an average of quadrats will be recorded in this cell.

5	**Overstory Canopy Cov %** *(%)*	Definition: *The percentage of canopy cover of the overstory stratum at a point along the transect.* Population Standard: Optional Population Guidance: Calculated based on the method used. For instance, the spherical densiometer method calculates cover percentage by taking the average quadrats covered multiplied by 1.07. The leaf tube takes the number of positive hits (leaf hits) divided by the total number of observations (positive hits plus the negative hits), and then multiply by 100. Refer to the method used to determine the correct calculation.
6	**Overstory Canopy Cov Class**	Definition: *The percentage of canopy cover of the overstory stratum at a point along the transect, expressed as a class.* Population Standard: Optional Population Guidance: Based on the previous cell (Overstory Canopy Cover %) select the class that fits the recorded percentage. The classes are as follows: 1 = Trace, 2 = 0.1-1%, 3 = 1-2%, 4 = 2-5%, 5 = 5-10%, 6 = 10-25%, 7 = 25-50%, 8 = 50-75%, 9 = 75-95%, and 10 = >95%. This Domain class varies between protocols, so ensure the class selected by this definition fits the recorded percentage of canopy.

Transect Sampling Protocol Used

This table lists the sampling protocol(s) used to collected vegetation inventory data along a vegetation transect within a vegetation plot. Protocols used for a vegetation plot as a whole are recorded in the Plot Sampling Protocol Used table.

Plot Sampling Protocols: None specified; However, some protocols listed may occur in both categories, depending upon the method used.

Transect Sampling Protocols: All

1. **Belt transect** – Used to detect changes in species with low cover or density. Reference: Monitoring Manual, Vol I, pp. 30-33.

2. **Canopy cover class** – (Includes the Daubenmire method) Used for cover, frequency, and composition. References: Sampling Vegetation Attributes, Ch VD, pg 55-63; National Vegetation Classification Standard, Version 2, pp. 24-26.

3. **Comparative yield** – Used for production and composition. Reference: Sampling Vegetation Attributes, Ch V-L, pp. 116-122.

4. **Density method** – Used for precise estimates of species richness. References: Monitoring Manual, Vol II, Ch 10, pp. 57-60; Sampling Vegetation Attributes, Ch V-I, pp. 94-101.

5. **Double weight sampling** – Used for composition and production. Used for herbivore carrying capacity estimates and ecosystem energy flow. References: Sampling Vegetation Attributes, Ch V-J, V-K, pp. 102-115.

6. **Dry weight rank** – Used for composition, frequency, and production. Reference: Sampling Vegetation Attributes, Ch V-C, pp. 50-54.

7. **Frequency** – Used for frequency and cover. Reference: Sampling Vegetation Attributes, Ch V-B, pp. 37-49.

8. **Gap intercept** – Used for wind erosion and exotic plant invasion risk, and for soil water erosion risk and water infiltration. References: Monitoring Manual, Vol I, pp. 16-22; NRI Rangeland Training Videos; Sampling Vegetation Attributes, Ch V-E, pp. 64-69.

9. **Harvest method** – Used for composition and production. Used for herbivore carrying capacity estimates and ecosystem energy flow. References: Sampling Vegetation Attributes, Ch V-J, V-K, pp. 102-115. (Not the same as Total Harvest method)

10. **Line intercept** – Used for cover and composition (by cover). Reference: Sampling Vegetation Attributes, Ch V-E, pp. 64-69.

11. **Line-point intercept** – Used for soil erosion risk, water infiltration, and changes in species composition or cover. References: Monitoring Manual, Vol I, pp. 9-15. Monitoring Manual, Vol II, Ch 15, pp. 79-82; NRI Rangeland Training Videos.

12. **Nested frequency** – Used for frequency and cover. Reference: Sampling Vegetation Attributes, Ch V-B, pp. 37-49.

13. **Ocular estimate** – Used only in low intensity inventories.

14. **Sociability class** – (Also referred to as Plant Species Richness) Used to define horizontal structure or dispersion of a species within a plot. Reference: Mueller- Dombois and Ellenberg 1974, Aims and Methods of Vegetation Ecology.

15. **Standing biomass** – Used to determine site index. Reference: National Forestry Manual, Exhibit 537-1. National Resources Inventory Grazing Land On-site Data Collection Handbook of Instructions, Ch. 15.

16. **Step gap** – Used for wind erosion and exotic plant invasion risk, and for soil water erosion risk and water infiltration. Reference: Monitoring Manual, Vol I, pp. 17.

17. **Step point** – Used for cover and composition. Reference: Sampling Vegetation Attributes, Ch V-F, pp. 70-77.

18. **Weight unit estimate** – Used for herbivore carrying capacity estimates and ecosystem energy flow. Reference: National Range and Pasture Handbook, Ch 4, 600-0401[c](1).

19. **Dry weight rank/Comparative yield** – A combination of Dry Weight Rank and Comparative Yield protocols.

1	**Seq**	Definition: *Sequential number of the feature being described.* Population Standard: Optional Population Guidance: To arrange protocol in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Protocol Name**

Definition: *The name of the sampling protocol used in the vegetation inventory on the transect.*

Population Standard: Required

Population Guidance: Select the most appropriate answer from the drop-down menu. The protocols available for selection are *Belt transect, Canopy cover class* (Daubenmire method), *Comparative yield, Density method, Double weight sampling, Dry weight rank, Frequency, Gap intercept, Harvest method, Line intercept, Line-point intercept, Nested frequency, Ocular estimate, Sociability class* (Plant species richness), *Standing biomass, Step gap, Step point, Weight unit estimate*, and *Dry weight rank/Comparative yield*. Descriptions of each transect protocol precede this section.

3 **Data Collector**

Definition: *The name of the person collecting the measurements or observations.*

Population Standard: Optional

Population Guidance: Populate with the first name and then last name of the person reading or completing the observations (e.g., John Doe).

4 **Data Recorder**

Definition: *The name of the person that recorded the data.*

Population Standard: Optional

Population Guidance: Populate with the first name and then last name of the person recording or writing the data if captured on the field worksheet (e.g., Jane Doe). May be the same as the data collector.

5 **Sampling Intensity**

Definition: *The intensity of the sampling done with a particular sampling protocol.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. The rating for sampling intensity is *High*, *Medium*, or *Low*. This relates to Tier 3 (high), Tier 2 (medium) and Tier 1 (low) data as outlined in the National Ecological Site Handbook, USDA-NRCS.

Transect Standing Biomass Details

This table contains data pertaining to standing biomass measurements collected from individual quadrats along a vegetation transect.

Plot Sampling Protocols: Pasture Stick, Pasture Condition Score, and Ocular Estimate; secondary data collected with Plot Protocol may apply

Transect Sampling Protocols: Standing biomass, Relevé

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange quadrats in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Quadrat #**

Definition: *The number assigned to a particular quadrat within a plot or transect from which measurements were recorded.*

Population Standard: Required

Population Guidance: Record the quadrat number captured based on the assigned protocol.

3	**Transect Point Location** *(ft)*	Definition: *The point of observation along the transect recorded as a distance from the starting point of the transect. Starting point of the transect is zero.* Population Standard: Required Population Guidance: Record the distance down the transect that the point was recorded, generally at a foot marker or the number of steps taken. Different protocols will vary the distance between points taken and the method of collecting points. Record to the nearest tenth.
4	**Quadrat Size** *(ft^2)*	Definition: *The total area of the vegetation quadrat used.* Population Standard: Required Population Guidance: The common plot sizes are 9.6, 4.8, 2.4, 1.92, and 0.96 square feet. A plot size of 0.01 acres is common and converts to 435.6 square feet. Protocol sizes may vary, verify on the data worksheet to determine size used.
5	**Quadrat Shape**	Definition: *The shape of the quadrat used. Most common shapes are rectangular and circular.* Population Standard: Required Population Guidance: Select the most appropriate answer from the drop-down menu: the shape options are *circular*, *square*, or *rectangular*.
6	**Herbaceous Biomass Wt. Green** *(g)*	Definition: *The weight, in grams, of standing herbaceous biomass (attached to rooted plants) for the quadrat measured at the moisture content at the time of sampling (green).* Population Standard: Optional Population Guidance: Measure of all standing herbaceous vegetation that is rooted at the time of clipping (fresh or green weight). Measured in grams.
7	**Biomass Wt. Air-dry** *(g)*	Definition: *The weight, in grams, of standing herbaceous biomass (attached to rooted plants) for the quadrat measured after the sample has been air-dried.* Population Standard: Optional Population Guidance: After clipped, air-dry vegetation according to established protocol, ensuring samples do not mold. Weigh once dry and record measurement for quadrat in grams.

Vegetation Transect Text

This table contains text notes pertaining to an individual vegetation transect.

Plot Sampling Protocols: Relevé, others not specified

Transect Sampling Protocols: All

1	**Seq**	Definition: *Sequential number of the feature being described.* Population Standard: Optional Population Guidance: To arrange text notes in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2	**Date**	Definition: *The date associated with a particular record, expressed as month, day, year -- xx/xx/xxxx.* Population Standard: Required Population Guidance: Enter the date when the action or note was completed in numerical format with a two-digit month / two-digit day / four-digit year (e.g., 01/01/2010).
3	**Author**	Definition: *Name of the person who entered, or is responsible for, a particular record.* Population Standard: Optional Population Guidance: Populate with the first name and then last name of the author (e.g., John Doe).
4	**Kind**	Definition: *A text entry is identified by its kind, category, and subcategory. Kind is the highest division of classification. Text kind provides a grouping of text entries according to their subject matter.* Population Standard: Optional Population Guidance: Select the most appropriate answer from the drop-down menu. The menu contains the following options: *Edit notes* (edits made to existing data), *Miscellaneous notes* (notes not related to any other choices), *Data conversion notes* (data conversion issues encountered when converting data from another database), or *Data collection notes* (notes recorded on field sheets during data collection or inventories).
5	**Category**	Definition: *A text entry is identified by its kind, category, and subcategory. Category is a subdivision of kind. "Agr" and "Soi" are two categories for the text kind "Nontechnical Description."* Population Standard: Optional Population Guidance: The category is a user-defined field. Consistency is best to aid in querying and filtering by text kind, category, and subcategory. Work with Regional staff to establish a protocol for placing text into categories and subcategories.
6	**Subcategory**	Definition: *A text entry is identified by its kind, category, and subcategory. Subcategory is a subdivision of category. For text kind, a "Nontechnical" description and for text category "Agr," the subcategory corresponds to the SSSD field "desnum."* Population Standard: Optional Population Guidance: The subcategory is a user-defined field. Consistency is best to aid in querying and filtering by text kind, category, and subcategory. Work with Regional staff to establish a protocol for placing text into categories and subcategories.
7	**Text Entry**	Definition: *The actual narrative text portion of a text entry. The other parts of a text entry are its identifiers: kind, category, and subcategory.* Population Standard: Required Population Guidance: Text entries should be short, concise, and in correct and simple English. A standardized method of writing text within categories and subcategories is helpful when completing queries and filtering.

Crop Tree Summary

This table contains summary data for the crop tree inventory plot.

Plot Sampling Protocols: Crop Tree Inventory

Transect Sampling Protocols: None specified

1	**Seq**	Definition: *Sequential number of the feature being described.* Population Standard: Optional Population Guidance: To arrange plots in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.
2	**Total # of Trees**	Definition: *The number of individual trees of all plant species counted within the plot.* Population Standard: Optional Population Guidance: Calculated by taking the sum of all trees counted across all subplots as recorded on the Crop Tree Totals child table.
3	**Current Tree Density** *(trees/acre)*	Definition: *The number of trees per acre found on the plot at the time of inventory.* Population Standard: Optional Population Guidance: Total number of trees (as previously recorded) divided by the product of the number of plots multiplied by the plot size, to the nearest whole number as trees/acre.
4	**Total Basal Area** *(ft^2/acre)*	Definition: *Total basal area of the plot at the time of inventory.* Population Standard: Optional Population Guidance: Calculated by adding the total basal area of all subplots recorded in the Crop Tree Subplot Details child table.
5	**Average DBH** *(in)*	Definition: *The average diameter at breast height (DBH) of trees within the plot at the time of inventory, expressed in inches.* Population Standard: Optional Population Guidance: The product of the sum of the average DBH as recorded on the Crop Tree Totals divided by the total number of categories recorded. Also calculated by taking the sum of all DBH measured across all species on the Crop Tree Details child table divided by the total number of trees measured.
6	**Cut Tree Basal Area Ave.** *(ft^2/acre)*	Definition: *The average basal area of trees within the plot designated to be removed from the stand.* Population Standard: Optional Population Guidance: Calculated by adding the cut tree basal area of all subplots recorded in the Crop Tree Subplot Details child table and dividing by the number of subplots.
7	**Leave Tree Basal Area Ave.** *(ft^2/acre)*	Definition: *The average basal area of trees within the plot designated to be left after thinning.* Population Standard: Optional Population Guidance: Calculated by adding the leave tree basal area of all subplots recorded in the Crop Tree Subplot Details child table and dividing by the number of subplots.
8	**# of Cut Trees**	Definition: *The number of trees designated to be removed from the plot.* Population Standard: Optional Population Guidance: Calculated by tallying the number of trees marked as a “cut tree” on the Crop Tree Details child table.
9	**Cut Tree Density**	Definition: *The number of trees per acre found on the plot designated to be removed from the stand.* Population Standard: Optional

(trees/acre)

Population Guidance: Calculated by dividing the number of cut trees previously recorded by the plot size.

10 **Cut Tree Ave. DBH**

(in)

Definition: *The average diameter at breast height (DBH) of trees within the plot designated to be removed from the stand, expressed in inches.*

Population Standard: Optional

Population Guidance: Calculated by taking the sum of the DBH for all trees marked as cut trees, recorded on the Crop Tree Details child table, and dividing by the number of cut trees previously calculated.

Crop Tree Details

This table contains the detailed tree inventory data collected using the Crop Tree Inventory protocol.

Plot Sampling Protocols: Crop Tree Inventory

Transect Sampling Protocols: None specified

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange tree species in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Tree ID #**

Definition: *The number assigned to a particular measured tree.*

Population Standard: Optional

Population Guidance: This is recorded as a whole number, starting with 1, proceeding sequentially as move through the trees/hits recorded for a subplot on the Crop Tree Inventory Worksheets.

Information in this box pertains to columns 3 through 5

Population Standards: Required

Population Guidance: These three fields pull information from the Plant Object in NASIS. Populating any one of the three fields will result in auto-population of the other two fields.

3 **Plant Symbol**

Definition: *A unique symbol used to identify a plant genus or a plant species. (The PLANTS Database, USDA-NRCS, National Plant Data Center)*

4 **Scientific Name**

Definition: *The full genus and species name as listed in The PLANTS Database, USDA-NRCS, National Plant Data Center.*

5 **National Vernacular Name**

Definition: *The most generally accepted common name of a plant.*

6 **Tree DBH**

(in)

Definition: *The diameter of measured tree at breast height, typically 4.5 feet above ground level.*

Population Standard: Optional

Population Guidance: Record the diameter of the tree at breast height as recorded on the worksheet to the nearest inch, allows population to the nearest tenth of an inch.

7 **Primary Category**

Definition: *The primary resource function that a particular tree is serving.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. For the selected tree, determine the classification category criteria that fits the producer's objectives. Trees may classify as multiple categories. The primary category is the category for which it makes the greatest contribution to accomplishing the landowner's objective. The categories are *timber* (T), *visual quality* (V), *water quality* (WQ), and *wildlife* (W).

8 **Secondary Category**

Definition: *The secondary resource function that a particular tree is serving.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Based on the producer's objectives, trees potentially may fit other categories besides the primary criteria. The secondary category provides an opportunity to record the next category that provides significant contributions to the landowner's objectives. The categories are *timber* (T), *visual quality* (V), *water quality* (WQ), and *wildlife* (W). If a secondary category is not recorded on the worksheet, leave this cell blank.

9 **Cut Tree ?**

Definition: *An indicator that a particular tree is designated to be removed from a stand.*

Population Standard: Required

Population Guidance: Check the box if the specified tree is to be cut. If no data is available, leave the box unchecked.

Crop Tree Subplot Details

This table contains data pertaining to subplots as part of the Crop Tree Inventory.

Plot Sampling Protocols: Crop Tree Inventory

Transect Sampling Protocols: None specified

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange subplots in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Subplot #**

Definition: *The number assigned to a particular subplot within a vegetation inventory plot from which measurements were recorded.*

Population Standard: Required

Population Guidance: This is recorded as a whole number, starting with 1 as recorded on the Crop Tree Inventory Worksheets.

3 **Leave Tree Basal Area**

(ft^2/acre)

Definition: *The basal area of trees within the plot designated to be left after thinning.*

Population Standard: Optional

Population Guidance: Calculated by taking the total number of leave trees within the subplot multiplied by the BAF (basal area factor) as determined by the method used to measure the

basal area. "Leave" trees are all trees that are not marked to be cut or killed: this includes BOTH crop trees AND trees that are neither crop trees nor cut trees. This can also be calculated by subtracting the cut tree basal area from the total basal area.

4 **Cut Tree Basal Area**

(ft²/acre)

Definition: *The basal area of trees within the plot designated to be removed from the stand.*

Population Standard: Optional

Population Guidance: Calculated by taking the total number of cut trees within the subplot multiplied by the BAF as determined by the method used to measure the basal area.

5 **Total Basal Area**

(ft²/acre)

Definition: *Total basal area for the subplot.*

Population Standard: Optional

Population Guidance: Calculated by taking the total number of cut trees within the subplot multiplied by the BAF as determined by the method used to measure the basal area. Also calculated as the sum of the leave tree and cut tree basal areas.

Crop Tree Totals

This table contains summary data of the individual crop tree categories.

Plot Sampling Protocols: Crop Tree Inventory

Transect Sampling Protocols: None specified

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange data in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Crop Tree Category**

Definition: *The primary resource function that a particular tree is serving.*

Population Standard: Required

Population Guidance: Select the most appropriate answer from the drop-down menu. The categories are *timber* (T), *visual quality* (V), *water quality* (WQ), and *wildlife* (W). This cell reflects the primary categories recorded on the Crop Tree Details child table. Create a record/row for each category represented on this child table.

3 **# of Trees**

Definition: *The number of trees within the plot that have a particular primary crop tree category designated.*

Population Standard: Optional

Population Guidance: Calculated by tallying the total number of trees that are recorded with the specific category as the primary category on the Crop Tree Details Child Table.

4 **Tree Density**

(trees/ac)

Definition: *The number of trees per acre found on the plot at the time of inventory of a particular crop tree category.*

Population Standard: Optional

Population Guidance: Calculated by taking the total number of trees recorded within the subplot, on the Crop Tree Details child table, divided by the size of the plot, apply plot to acre conversion.

5	**Ave. DBH** *(in)*	Definition: *The average diameter at breast height (DBH) of trees within the plot of a particular crop tree category at the time of inventory, expressed in inches.* Population Standard: Optional Population Guidance: Calculated by dividing the total of all DBH across the subplot, as recorded in the Crop Tree Details Table, by the total number of trees. Recorded in inches, with the ability to record to the nearest tenth of an inch.

Main Forest Stand Details

This table contains data collected about the 'main' (primary) forest stand present on a particular vegetation plot.

Plot Sampling Protocols: Forest Stand Inventory, Ocular Estimate, Zig Zag, Fixed Radius, Variable Radius, Relevé

Transect Sampling Protocols: None specified

1	**Seq**	Definition: *Sequential number of the feature being described.* Population Standard: Optional Population Guidance: To arrange points in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.
2	**Transect Point Location** *(ft)*	Definition: *The point of observation along the transect recorded as a distance from the starting point of the transect. Starting point of the transect is zero.* Population Standard: Required Population Guidance: Record as the tree number, proceeding as a sequential order of 1 through the number of trees surveyed. (Zero or the starter tree is not recorded.) Distance is recorded in the next cell (distance from previous point). The unit will be proposed for correction during the next data model update.
3	**Distance From Previous Point** *(ft)*	Definition: *The distance of the tree being measured from the previous tree along the zig-zag transect. For the first tree encountered along the transect, it is the distance from the starting point of the transect.* Population Standard: Required Population Guidance: The distance from the previous point to the current point or tree as measured in feet, to the nearest tenth of a foot.

Information in this box pertains to columns 4 through 6

Population Standards: Required

Population Guidance: These three fields pull information from the Plant Object in NASIS. Populating any one of the three fields will result in auto-population of the other two fields.

4	**Plant Symbol**	Definition: *A unique symbol used to identify a plant genus or a plant species. (The PLANTS Database, USDA-NRCS, National Plant Data Center)*
5	**Scientific Name**	Definition: *The full genus and species name as listed in The PLANTS Database, USDA-NRCS, National Plant Data Center.*

6 **National Vernacular Name**

Definition: *The most generally accepted common name of a plant.*

7 **Tree DBH**

(in)

Definition: *The diameter of measured tree at breast height, typically 4.5 feet above ground level.*

Population Standard: Optional

Population Guidance: Measured in inches to the nearest tenth, the diameter of the tree at breast height is recorded on the Forest Inventory Worksheet or Transect Field Notes Sheet for a Main Stand Inventory.

8 **Tree Condition**

Definition: *The overall condition of the tree.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Rate the tree condition as *good*, *fair*, or *poor*.

9 **Notes**

Definition: *Notes describing decisions, issues, or other history related to the record.*

Population Standard: Optional

Population Guidance: Capture any notes recorded during data collection in this cell. This is a free form text format to enter detailed notes.

Plot Disturbance

This table contains data pertaining to disturbances that have occurred at the plot location.

Plot Sampling Protocols: Data is collected as a resource assessment or may be gathered as general site information for any potential protocol.

Transect Sampling Protocols: None specified

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange disturbances in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Disturbance Type**

Definition: *The kind of disturbance that has occurred on the plot.*

Population Standard: Required

Population Guidance: Select the most appropriate answer from the drop-down menu. Characterize the dominant disturbance on the plot by *nonrodent animals, rodents, biological brush management, chemical brush management, mechanical brush management, construction activities, cryoturbation, cultivation, drainage, water erosion, wind erosion, fertilizer addition, firefighting operations, forest planting, hay removal, heavy machinery, insect damage, insecticide application, land use conversion, livestock grazing, livestock heavy use, livestock tanks/spring development, livestock walkways, mass land movement, mining equipment operations, mowing/clipping, overhead transmission lines, plant disease damage, prescribed fire, recreational foot traffic, recreational vehicles, dirt roads, gravel roads, paved roads, salt spray damage, seedbed preparation, site preparation, snow/ice damage, soil deposition by water, soil deposition by wind, tidal surge/damage, timber harvest* (aerial or suspension, clear-cut, ground-based mechanical,, or selective), *transported fill material*, *underground utilities, water flooding/ponding, canopy wildfire, general wildfire, ground wildfire, wildlife grazing*, and *wind storm damage*. The choice *brush management* (legacy) is no longer a valid selection. Choose the more specific form of brush management.

3	**Frequency**	Definition: *The frequency that a particular disturbance type has occurred on the plot.* Population Standard: Optional Population Guidance: Select the most appropriate answer from the drop-down menu. Categorize the frequency of occurrence as *rarely applied, occasionally applied, systematically applied*, or *unknown*.
4	**Disturbance Impact**	Definition: *The degree of impact caused by a particular disturbance type.* Population Standard: Optional Population Guidance: Select the most appropriate answer from the drop-down menu. Disturbance impact is a general characterization of *low, medium*, or *high*.
5	**When Last Applied ?**	Definition: *An indication of the length of time since a disturbance was last occurred on the plot.* Population Standard: Optional Population Guidance: Select the most appropriate answer from the drop-down menu. Time frames are categorized as *within past year*, *within past 1 to 5 years*, *within past 5 to 10 years*, *more than 10 years ago*, *within past 10 to 25 years*, *within past 25 to 50 years*, *more than 50 years ago*, and *unknown*.
6	**Notes**	Definition: *Notes describing decisions, issues, or other history related to the record.* Population Standard: Optional Population Guidance: Capture any notes recorded during the disturbance assessment in this cell. This is a free form text format to enter detailed notes.

Plot Grazing Use

This table contains data pertaining to the grazing use of the plot area.

Plot Sampling Protocols: Data is collected as a resource assessment or may be gathered as general site information for any potential protocol.

Transect Sampling Protocols: None specified

1	**Seq**	Definition: *Sequential number of the feature being described.* Population Standard: Optional Population Guidance: To arrange data in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.
2	**Animal Kind**	Definition: *The kind of grazing animal(s) that has been using the area where the plot exists.* Population Standard: Required Population Guidance: Select the most appropriate answer from the drop-down menu. Animal kinds are *antelope, bear, bison, blacktail deer, caribou, cattle, dall sheep, deer, elk, goats, horses and mules, lagomorphs (rabbits, hares), moose, mountain goats, muskoxen, reindeer, sheep, other*, and *unknown*.
3	**Frequency of Use**	Definition: *The frequency that the specified kind of animal grazes the area.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Rate the frequency of use by *rarely, if ever, grazed*; *occasionally grazed*; *systematically grazed*; or *unknown*.

4 **Season of Use**

Definition: *The season(s) of the year that the area where the plot exists is grazed by the identified kind of animal.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Select the dominant season of use as *spring, summer, fall, winter, year-round, specialized system* (a specialized system is in place that regularly alternates the season of use), *not grazed*, or *unknown*.

5 **Stocking Rate**

Definition: *The estimated number of animals, expressed as a class, of a particular kind that are using the area per unit area.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Stocking rate is a general characterization of *low*, *medium*, or *high*.

Plot Plant Inventory

This table contains data collected pertaining to individual plant species found on the plot. The inventory data were collected from the plot as a whole, as opposed to collecting plant data along transects within the plot.

Plot Sampling Protocols: Ocular Estimate, Relevé method, Rangeland Health, Pasture Stick, Pasture Condition Score

Transect Sampling Protocols: None specified

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange species in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

Information in this box pertains to columns 3 through 5

Population Standards: Required

Population Guidance: These three fields pull information from the Plant Object in NASIS. Populating any one of the three fields will result in auto-population of the other two fields.

2 **Plant Symbol**

Definition: *A unique symbol used to identify a plant genus or a plant species. (The PLANTS Database, USDA-NRCS, National Plant Data Center)*

3 **Scientific Name**

Definition: *The full genus and species name as listed in The PLANTS Database, USDA-NRCS, National Plant Data Center.*

4 **National Vernacular Name**

Definition: *The most generally accepted common name of a plant.*

5 **Plant Type Group**

Definition: *The designation of a plant type group being inventoried by lifeform.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Plant species (tree species) are identified as *Introduced* (species was introduced from another geographic region), *Native* (species is naturally found in the region or is naturalized), or *Unknown* (not known whether species is considered native or introduced). The Plants Database (USDA-NRCS, National Plant Data Center) is a resource to determine nativity.

6 **AK Stratum Cover Class**

Definition: *General life form and horizontal layer (cover class) added to accommodate the STRATUM class attribute in AK SITE.*

7 **Height Class Lower Limit**

(ft)

Definition: *The lower height limit of the plant height class being described.*

Population Standard: Optional

Population Guidance: Enter data to the tenth of a foot, zero to a maximum of 500 feet. Capture the lowest height measured for the plant species named or the minimum expected measurement.

8 **Height Class Upper Limit**

(ft)

Definition: *The upper height limit of the plant height class being described.*

Population Standard: Optional

Population Guidance: Enter data to the tenth of a foot, zero to a maximum of 500 feet. Capture the highest height measured for the plant species named, or the maximum expected measurement.

9 **Plant Nativity**

Definition: *The nativity of the plant species.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu: *Native*, *Introduced*, or *Unknown*. The Plants Database has a map designating the nativity by state to assist with populating this data. Deviations from the Plants database may exist.

10 **Sociability Class**

Definition: *An indication of how individual plants of a species exist within the sample area in relation to one another.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu: *Growing solitarily* (individual plants exist as scattered single plants), *Small group or clump* (individual plants exist as a small group or clump of plants), *Small patches* (plants exist in small patches), *Large patches* (plants exist in large patches), or *Near pure stand* (plants exist as a nearly pure stand within the sample area).

11 **Live Canopy Ht. Bottom**

(ft)

Definition: *Height of the bottom of the dominant canopy layer.*

Population Standard: Optional

Population Guidance: The live canopy bottom height for the specific species measured in the plot.

12 **Live Canopy Ht. Top**

(ft)

Definition: *Height of the top of the dominant canopy layer.*

Population Standard: Optional

Population Guidance: The live canopy bottom height for the specific species measured in the plot.

13 **Overstory DBH Minimum**

(in)

Definition: *The lower end of the range of diameter at breast height (DBH) for trees > 15 feet in height of a particular species in the overstory stratum.*

Population Standard: Optional

Population Guidance: The minimum diameter in inches for a specific species (trees greater than 15 feet in height) as established for the transect recorded.

14 **Overstory DBH Maximum**

(in)

Definition: *The upper end of the range of diameter at breast height (DBH) for trees > 15 feet in height of a particular species in the overstory stratum.*

Population Standard: Optional

Population Guidance: The maximum diameter in inches for a specific species (trees greater than 15 feet in height) as established for the transect recorded.

15 **Canopy Cover %**

(%)

Definition: *The estimated canopy cover percentage of a species.*

Population Standard: Optional

Population Guidance: The estimated canopy cover of the specific species may be estimated or measured. Canopy cover in this instance may correlate to foliar cover depending upon protocol used to estimate canopy cover (*herbaceous foliar*, *herbaceous canopy cover*, *shrub*, or *short woody* species).

16 **Canopy Cover Class**

Definition: *The estimated Canopy Cover Class of a species.*

Population Standard: Optional

Population Guidance: Based on the previous cell (Canopy Cover %) select the class that fits the recorded percentage. The classes are as follows: 1 = Trace, 2 = 0.1-1%, 3 = 1-2%, 4 = 2-5%, 5 = 5-10%, 6 = 10-25%, 7 = 25-50%, 8 = 50-75%, 9 = 75-95%, and 10 = >95%. This Domain class varies between protocols, so ensure the class selected by this definition fits the recorded percentage of canopy.

17 **Spp Trace Amt Flag**

Definition: *A yes/no indicator that a 'trace' amount of a species exists. A 'trace' is defined as 'less than a measurable amount.'*

Population Standard: Required

Population Guidance: If the species is recorded but the amount is less than what is measurable (less than 0.2 grams), then it is considered a trace amount and the box should be checked.

18 **Basal Area**

(ftt/acre)

Definition: *The total basal area measured of a particular species.*

Population Standard: Optional

Population Guidance: Calculated based on the sub plot size, number of stems and average stem diameter as recorded in the Subplot Plant Details child table. *Density Measurements, Ocular Estimation, Step Point*, and *other protocol* are options to be recorded on this plot basis.

19 **Understory Ground Cover %**

(%)

Definition: *The percentage of the total ground cover of each understory species within the plot.*

Population Standard: Optional

Population Guidance: Estimated cover for the plot may be recorded here, or this may be calculated based on the data entered in the Subplot Plant Details child table. Calculation is completed by dividing the number of stems for the species by the total number of stems for all species. For other protocol it would be recorded as the number of understory ground cover hits (basal hits) by the total number of hits for all categories. These numbers would then be multiplied by 100 to equal percentage of cover.

20 **Understory Ground Cover Class**

Definition: *A class representing the proportion of the total ground cover of each understory species within the plot.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu: select the class that includes the Understory Ground Cover percentage for the specific species. Classes are *Trace to 1%* (occasional plant present), *2 to 9%* (sparsely abundant), *10 to 19%* (moderately

abundant), *20 to 29%* (abundant), or *30% or more* (very abundant). Plot-based readings of Frequency and Step Point protocols will provide this calculation as documented in the Sampling Vegetation Attributes publication. If the data was collected in a quadrat related to a transect, record this in the Vegetation Transect Plant Summary table.

21 **Seedling Density Class**

Definition: *A class indicating the density of seedling plants of a species per unit area.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu: select the class that covers the seedling density for the plot. Classes are *1* (1 to 10 plants per quadrat), *2* (11 to 100 plants per quadrat), *3* (101 to 500 plants per quadrat), *4* (501 to 999 plants per quadrat), and *5* (greater than 999 plants per quadrat).

22 **Mature Density Class**

Definition: *A class indicating the density of mature plants of a species per unit area.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu: select the class that covers the mature plant density for the plot. Classes are *1* (1 to 10 plants per quadrat), *2* (11 to 100 plants per quadrat), *3* (101 to 500 plants per quadrat), *4* (501 to 999 plants per quadrat), and *5* (greater than 999 plants per quadrat).

23 **Vegetation Strata Level**

Definition: *Identifies which strata or level of the vegetation canopy to which the particular referenced plant belongs.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu: select either *overstory* (upper most layer of vegetation, usually trees or tall shrubs) or *understory* (lower most layer of vegetation, usually low shrubs, forbs or grasses) to represent the species strata level.

24 **Order of Dominance**

Definition: *A numeric indicator of the dominance of the particular plant within the total plant community; 1 is most dominant.*

Population Standard: Optional

Population Guidance: The dominance in composition within the plant community, in which "1" is the most dominant species in the plant community.

25 **Observed Outside Plot ?**

Definition: *An indicator that a particular plant was observed on the site, but actually was outside the vegetation inventory plot.*

Population Standard: Required

Population Guidance: The box should be checked if the species is recorded but occurs on the outside of the established plot boundary.

26 **Estimated Annual Prod.**

(lbs/acre)

Definition: *The estimated annual air-dry production of a particular species within the sample plot.*

Population Standard: Optional

Population Guidance: The estimated production of the specific species found in the plot is calculated or entered here as lbs./acre. Documentation for this cell is found on the Worksheet for Determining Similarity Index.

27 **ESD Annual Prod.**

(lbs/acre)

Definition: *The annual air-dry production of a particular species as shown in the respective Ecological Site Description (ESD).*

Population Standard: Optional

Population Guidance: The annual production of the specific species found in the desired reference plant community documented in the ecological site description. Capture the production for a normal year as a whole number, not as a range. Documentation for this cell is found on the Worksheet for Determining Similarity Index.

28 **Allowable Prod.** *(lbs/acre)*

Definition: *The allowable annual air-dry production of a particular species within the sample plot.*

Population Standard: Optional

Population Guidance: The production of the specific species allowed calculated or entered here as lbs./acre. Documentation for this cell is found on the Worksheet for Determining Similarity Index. Calculation is based on the lower value of total estimated and total representative production for the specific species.

29 **Palatable Prod.** *(lbs/acre)*

Definition: *The palatable annual air-dry production of a particular species within the sample plot.*

Population Standard: Optional

Population Guidance: The portion of the species total standing forage that is considered palatable production of the species or may be a manual entry here as lbs./acre. Calculations are a total of individual species captured in the Plot Plant Inventory.

30 **AK Functional Group**

Definition: *General life form and horizontal layer (cover class) added to accommodate the STRATUM cv class attribute in AK SITE.*

Subplot Plant Details

This table contains data pertaining to individual plant species collected from individual subplots of a vegetation inventory plot.

Plot Sampling Protocols: Ocular Estimate, Relevé method, Rangeland Health, Pasture Stick, Pasture Condition Score

Transect Sampling Protocols: None specified

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange subplots in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Subplot #**

Definition: *The number assigned to a particular subplot within a vegetation inventory plot from which measurements were recorded.*

Population Standard: Optional

Population Guidance: The subplot number is referenced in the data forms and is generally a sequential list of numbers, listed as whole integers.

3 **Subplot Size** *(m^2)*

Definition: *The size of the subplot used to inventory a particular species within a vegetation inventory plot.*

Population Standard: Optional

Population Guidance: Protocol will determine the subplot size, and this data should be recorded in site information on data forms for each specific protocol. (Relevé, Ocular, Basal Area, Densiometer, and others).

4 **# of Stems**

Definition: *The number of individual plant stems of a particular species found in the subplot being sampled.*

Population Standard: Optional

Population Guidance: The number of stems counted in the subplot in whole integers.

5 **Average Stem Diameter**

(in)

Definition: *The average diameter of plant stems of a particular species in the subplot being counted, generally measured near the base of each stem at or above ground level.*

Population Standard: Optional

Population Guidance: The average stem diameter is measured in inches to the nearest tenth of an inch and is a figure found on the data form. Protocol used will determine the specifics of how the measurement is taken (taken at ground level, at an established height).

Plot Plant Type Canopy Cover

This table contains data pertaining to canopy cover by various plant type groups within a vegetation plot.

Plot Sampling Protocols: Ocular Estimate, Relevé method, Forest Stand Inventory, Fixed Radius, Variable Radius, Zig Zag

Transect Sampling Protocols: None specified

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange data in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Plant Type Group**

Definition: *The designation of a plant type group being inventoried.*

Population Standard: Required

Population Guidance: Select the most appropriate answer from the drop-down menu: the plant type group options are *forb, grass/grass-like, lichen, microbiotic crust, moss, shrub/vine*, or *tree*. If the subgrouping for the record is not listed, select the grouping that is most fitting and then capture the decision in the Veg Plot text table. Consistency in selections of non-linear alignment is key to data interpretation.

3 **Height Class Lower Limit**

Definition: *The lower height limit of the plant height class being described.*

Population Standard: Required

Population Guidance: The Height class lower limit is, as it says, capturing the lower limit of the class selected for the specific species or canopy captured in this table. In some instances, this could be the lowest range of height measured for the canopy but is better captured as the lower limit for the selected class (predefined terms for each protocol).

4 **Height Class Upper Limit**

Definition: *The upper height limit of the plant height class being described.*

Population Standard: Required

Population Guidance: The Height class upper limit is, as it says, capturing the upper limit of the class selected for the specific species or canopy captured for this record/point. In some instances, this could be the highest range of height measured for the canopy but is better captured as the upper limit for the selected class (predefined terms for each protocol).

5 **Canopy Cover %**

Definition: *The percentage of canopy cover of each plant type group within the plot.*

		Population Standard: Optional Population Guidance: Percentage captured as a whole integer. If the class is captured but not an estimated percentage, capture the class not a percentage. Protocol may have a mid-range or average established to capture the percentage. Each protocol used may vary slightly; follow protocol guidance.
6	**Canopy Cover Class**	Definition: *The percentage of canopy cover of each plant type group within the plot, expressed as a class.* Population Standard: Optional Population Guidance: Based on the record, and the previous cell (Canopy Cover %) select the class that fits the recorded percentage. The classes are as follows: 1 = Trace, 2 = 0.1-1%, 3 = 1-2%, 4 = 2-5%, 5 = 5-10%, 6 = 10-25%, 7 = 25-50%, 8 = 50-75%, 9 = 75-95%, and 10 = >95%. This Domain class varies between protocols, so ensure the class selected by this definition fits the recorded percentage of canopy.
7	**Assessment Method**	Definition: *The method used to determine canopy cover.* Population Standard: Optional Population Guidance: Select the most appropriate answer from the drop-down menu: *estimated* values or *measured* values.

Plot Sampling Protocol Used

This table lists the sampling protocol(s) used to collected vegetation inventory data from the plot as a whole. Protocols used along individual vegetation transects are recorded in the Transect Sampling Protocol Used table.

Plot Sampling Protocols: All

Transect Sampling Protocols: None specified

The following sampling protocols are available in NASIS.

1. **Basal area** – Used to determine tree basal area. Reference: Husch et. al. 2002, Forest Mensuration, 4th ed., Chapter 8, Stand Parameters.

2. **Crop tree inventory** – Used to determine the composition, quality, condition (age, size, health, growth rate, height), and stocking (trees per acre, percentage of stocking, D+ spacing, or basal area) of a stand by inventorying the trees on a quality basis (Leave/Cut/Other). Data elements include species, DBH, quality rating, age.

3. **Windbreak assessment** – Used to determine the composition, quality, condition (age, size, health, growth rate, height), and suppression of windbreak plantings. Data elements include species, DBH, rooting depth, height, damage, age, and degrees of suppression. NFH 637.

4. **Fixed radius** – Used to determine tree diameter, range of diameters, stocking rate (trees per acre, percentage for stocking, D+ spacing, or basal area, stand composition, and stand condition (age, health, growth rate, and height) by measuring all or some of the trees within a fixed area

plot. Data elements include species, distance between trees, age, growth rate, tree quality, and DBH. Reference: NFH 636.3.

5. **Ocular estimate** – Used only in low intensity inventories. Includes the Weight Estimate and Ocular Reconnaissance method as described in the USDI-BLM Technical Report 4400-5, 1992.

6. **Pasture condition score** – Used on pastureland to determine how well a pasture is managed and management impacts on soil, water, and air quality. Reference: Guide to Pasture Condition Scoring; Pasture Condition Score Sheet.

7. **Pasture stick** – The USDA–NRCS grazing stick or pasture stick is a good educational tool for getting started in rotational grazing. The stick is used for making determinations of when livestock should be put on or moved to a different pasture, measuring average pasture growth rates, establishing rotation lengths, and estimating amount of available dry matter.

8. **Rangeland health** – Used to assess whether the integrity of ecological processes are balanced and sustained. Reference: Interpreting Indicators of Rangeland Health, Version 4.

9. **Relevé method** – Used to determine canopy cover, vertical and horizontal structure. References: Barbour et.al, 1987, Terrestrial Plant Ecology, Second Edition, Chapter 9; California Native Plant Society 2007, Relevé protocol; Minnesota Department of Natural Resources 2007, A Handbook for Collecting Vegetation Plot Data in Minnesota: The Relevé Method.

10. **Site index** – Used to determine site index. Reference: National Forestry Manual, Exhibit 537-1.

11. **Variable radius** – Used to determine tree diameter, range of diameters, stocking rate (trees per acre, percentage of stocking, D+ spacing, or basal area), stand composition, and stand condition (age, health, growth rate, and height) by measuring all or some of the trees within a plot of a radius limit determined by tree size. Data elements include species, distance between trees, age, growth rate, tree quality, and DBH. Reference: NFH 636.3

12. **Zig Zag** – Used to determine tree diameter, range of diameters, stocking rate (trees per acre, percentage of stocking, D+ spacing, or basal area), stand composition, and stand condition (age, health, growth rate, and height) by taking individual tree measurements along a designed zig-zag transect. Data elements include species, distance between trees, age, growth rate, tree quality, and DBH. Reference: NFH 636.3

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange protocol in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Protocol Name**

Definition: *The name(s) of the sampling protocol used in the plot-level vegetation inventory.*

Population Standard: Required

Population Guidance: Select the most appropriate answer from the drop-down menu. The protocols available for selection are *Basal area, Crop tree inventory, Windbreak, Fixed radius, Ocular*

Estimate, Pasture condition score, Pasture stick, Rangeland health, Relevé method, Site index, Variable radius, or *Zig zag*. Descriptions of each plot protocol precede this section.

3 **Data Collector**

Definition: *The name of the person collecting the measurements or observations.*

Population Standard: Optional

Population Guidance: Populate with the first name and then last name of the person reading or completing the observations (e.g., John Doe).

4 **Data Recorder**

Definition: *The name of the person that recorded the data.*

Population Standard: Optional

Population Guidance: Populate with the first name and then last name of the person recording or writing the data if captured on the Field Worksheet (e.g., Jane Doe). May be the same as the data collector.

5 **Sampling Intensity**

Definition: *The intensity of the sampling done with a particular sampling protocol.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. The rating for sampling intensity is *High*, *Medium*, or *Low*. This relates to Tier 3 (high), Tier 2 (medium) and Tier 1 (low) data as outlined in the National Ecological Site Handbook, USDA-NRCS.

Plot Species Basal Area

This table contains data pertaining to **basal area of individual species** collected as part of a vegetation inventory within a vegetation plot.

Plot Sampling Protocols: Basal Area (Forested), Relevé, Fixed Plot, Strip Plot, others may apply

Transect Sampling Protocols: None specified

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange plants in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

Information in this box pertains to columns 2 through 4

Population Standards: Required

Population Guidance: These three fields pull information from the Plant Object in NASIS. Populating any one of the three fields will result in auto-population of the other two fields.

2 **Plant Symbol**

Definition: *A unique symbol used to identify a plant genus or a plant species. (The PLANTS Database, USDA-NRCS, National Plant Data Center)*

3 **Scientific Name**

Definition: *The full genus and species name as listed in The PLANTS Database, USDA-NRCS, National Plant Data Center.*

4 **National Vernacular Name**

Definition: *The most generally accepted common name of a plant as listed in The PLANTS Database, USDA-NRCS, National Plant Data Center.*

5 **Basal Area Factor**

Definition: *The conversion factor used to compute total basal area for the site. The value chosen is dependent upon the tool used in the field.*

Population Standard: Required

Population Guidance: Select the most appropriate answer from the drop-down menu. The basal area factor is dependent upon the tool used in the field and methods used. The current choices available are *5, 10, 20, 30*, and *40*. Protocols have a higher possible range; the accurate range will be proposed for the next data model update.

6 **# of Trees In**

Definition: *The number of individual trees of a species in the plot that were counted during basal area measurement for a particular basal area factor.*

Population Standard: Optional

Population Guidance: Calculated by the number of hits, number of records/rows, recorded on the Basal Area Trees Counted child table.

7 **Species Basal Area**

(ft²/acre)

Definition: *The total basal area measured of a particular species.*

Population Standard: Optional

Population Guidance: Calculated by taking the number of trees in, previously calculated, multiplied by the BAF as determined by the method used to measure the basal area.

Basal Area Trees Counted

This table contains data about individual trees of a particular species measured when collecting basal area data as part of a vegetation inventory on a plot.

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange data in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Tree #**

Definition: *The number assigned to a particular measured tree.*

Population Standard: Required

Population Guidance: This is recorded as a whole number, starting with 1, proceeding sequentially as move through the trees/hits recorded for a subplot on the Crop Tree Inventory Worksheets.

3 **Tree Height**

(ft)

Definition: *The height of a particular tree measured.*

Population Standard: Optional

Population Guidance: The tree height of each tree measured as recorded on the inventory form. The method/protocol used will vary how the data will look on each protocol worksheet/form.

3	**Tree DBH** *(in)*	Definition: *The diameter of measured tree at breast height, typically 4.5 feet above ground level.* Population Standard: Optional Population Guidance: The DBH for each tree recorded on the inventory the inventory form. The method/protocol used will vary how the data will look on each protocol worksheet/form.

Plot Tree Inventory

This table contains data about tree species found on a plot.

Plot Sampling Protocols: Variable Plot Sampling, others may apply

Transect Sampling Protocols: None specified

1	**Seq**	Definition: *Sequential number of the feature being described.* Population Standard: Optional Population Guidance: To arrange plants in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

Information in this box pertains to columns 2 through 4

Population Standards: Required

Population Guidance: These three fields pull information from the Plant Object in NASIS. Populating any one of the three fields will result in auto-population of the other two fields.

2	**Plant Symbol**	Definition: *A unique symbol used to identify a plant genus or a plant species. (The PLANTS Database, USDA-NRCS, National Plant Data Center)*
3	**Scientific Name**	Definition: *The full genus and species name as listed in The PLANTS Database, USDA-NRCS, National Plant Data Center.*
4	**National Vernacular Name**	Definition: *The most generally accepted common name of a plant.*
5	**# of Trees**	Definition: *The total number of trees counted of a particular species.* Population Standard: Optional Population Guidance: Calculated by tallying all trees counted within all DBH Class Midpoints for specified species, as recorded on the Plot Trees Counted child table.
6	**Composition %** *(%)*	Definition: *The percentage of a particular species in the plant community within the plot.* Population Standard: Optional Population Guidance: Calculated by dividing the Species Basal Area calculated in this table, by the total basal area for all species within the plot.
7	**DBH Average** *(in)*	Definition: *The average diameter at breast height (DBH) of the identified species.* Population Standard: Optional

Population Guidance: Calculated by adding up the DBH Class Midpoints captured for the specific species and dividing by the number of classes recorded for that species. Data recorded in the Plot Trees Counted child table.

8 **Species Basal Area**

(ft²/acre)

Definition: *The total basal area measured of a particular species.*

Population Standard: Optional

Population Guidance: Calculated by taking the total number of trees, previously recorded, multiplied by the BAF as determined by the method used to measure the basal area.

Plot Trees Counted

This table contains data about the trees of a species counted in various DBH size classes within a plot.

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange data in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **DBH Class Midpoint**

(in)

Definition: *The midpoint value of the DBH size class inventoried, expressed as an even integer in inches.*

Population Standard: Required

Population Guidance: Enter the midpoint value for the selected DBH Classes recorded for the specific species on the Inventory Form. The ESI Forest Plot Field Worksheet captures the average DBH minimum and maximum, and the midpoint is the median/mean of these two measurements.

3 **# of Trees**

Definition: *The total number of trees counted of a particular species within a DBH class within the plot.*

Population Standard: Required

Population Guidance: Enter the number of trees that were recorded within the specified DBH Class Midpoint for the particular species on the Inventory Form.

Plot Tree Site Index Summary

This table contains measurements from individual trees of a species collected for site index purposes.

Plot Sampling Protocols: Site Index, Forest Inventory, others may apply

Transect Sampling Protocols: None specified

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange plants in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

Information in this box pertains to columns 2 through 4

Population Standards: Required

Population Guidance: These three fields pull information from the Plant Object in NASIS. Populating any one of the three fields will result in auto-population of the other two fields.

2	**Plant Symbol**	Definition: *A unique symbol used to identify a plant genus or a plant species. (The PLANTS Database, USDA-NRCS, National Plant Data Center)*
3	**Scientific Name**	Definition: *The full genus and species name as listed in The PLANTS Database, USDA-NRCS, National Plant Data Center* .
4	**National Vernacular Name**	Definition: *The most generally accepted common name of a plant.*
5	**Plant Nativity**	Definition: *The nativity of the plant species.* Population Standard: Optional Population Guidance: Select the most appropriate answer from the drop-down menu. Plant species (tree species) are identified as *Introduced* (species was introduced from another geographic region), *Native* (species is naturally found in the region or is naturalized), or *Unknown* (not known whether species is considered native or introduced). The Plants Database (USDA-NRCS, National Plant Data Center) is a resource to determine nativity.
Ss	**Site Index Base**	Definition: *The number in the National Register of Site Index Curves corresponding to the site index curve used to determine the site index and the annual productivity of forest overstory tree species.* Population Standard: Required Population Guidance: Select the most appropriate answer from the drop-down menu. The selection list is extensive and correlates to the options available within the National Register of Site Index Curves, available in the National Forestry Manual, Exhibit 537-1 in Part 537-4.
7	**# of Trees**	Definition: *The total number of trees counted of a particular species.* Population Standard: Optional Population Guidance: Calculated by tallying the total number of trees recorded in the Plot Tree Site Index Details child table for the specific species.
8	**Average Site Index**	Definition: *Average of all site index measurements for a species within the plot.* Population Standard: Optional Population Guidance: Calculated by using the average canopy top height, or average height of the tree, and the average tree age as factors in the Growth curve associated with the Site Index Base. The point of intersection of height and age among the selected Base curve provides the average site index. The National Register of Site Index Curves is available in the National Forestry Manual, Exhibit 537-1 in Part 537-4.
9	**DBH Average** *(in)*	Definition: *The average diameter at breast height (DBH) of the identified species.* Population Standard: Optional Population Guidance: Calculated by taking the sum of the DBH for all trees recorded of the specific species, in the Plot Tree Site Index Details child table, divided by the number of trees previously recorded.

10 **Average Tree Age**

(yr)

Definition: *The average age of measured trees of a species within the plot, in years.*

Population Standard: Optional

Population Guidance: Calculated by taking the sum of the tree ages recorded for all trees within the specific species, in the Plot Tree Site Index Details child table, divided by the number of trees previously recorded.

11 **Average Canopy Top Ht.**

(ft)

Definition: *The average height to the top of the canopy of measured trees of a species. Synonymous with 'tree height.'*

Population Standard: Optional

Population Guidance: Calculated by taking the sum of the Canopy Top Height recorded for all trees within the specific species, in the Plot Tree Site Index Details child table, divided by the number of trees previously recorded.

Plot Tree Site Index Details

This table contains measurements from individual trees of a species collected for site index purposes.

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange data in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Tree #**

Definition: *The number assigned to a particular measured tree.*

Population Standard: Required

Population Guidance: This is recorded as a whole number, starting with 1, proceeding sequentially as move through the trees/hits recorded on the ESI Forest Plot Field Worksheet.

3 **Crown Class**

Definition: *Indicates whether the measured tree is dominant or codominant in the stand.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Crown class is rated as either *codominant* (tree whose crown helps to form the general level of the main canopy in even-aged stands or, in uneven-aged stands, the main canopy of the tree's immediate neighbors, receiving full light from above and comparatively little from the sides) or *dominant* (tree whose crown extends above the general level of the main canopy of even-aged stands or, in uneven-aged stands, above the crowns of the tree's immediate neighbors and receiving full light from above and partial light from the sides). Data is recorded on the ESI Forest Plot Field Worksheet.

4 **Reproduction Source**

Definition: *How a particular tree was initiated, or method of regeneration.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. The reproductive source choice list is *coppice* (regeneration by sprouting from roots or suckers of a previous tree that was cut or otherwise removed), *direct seeded* (regeneration is the result of seeds placed in the soil by human hands or mechanical means), *planted* (regeneration by planting of seedlings or saplings), and *naturally seeded* (regeneration is the result of seeds produced by nearby plants and seeds falling in place, or moved by wind or animals.).

5 **Tree DBH**

Definition: *The diameter of measured tree at breast height, typically 4.5 feet above ground level.*

		(in)	Population Standard: Optional Population Guidance: The diameter at breast height measured to the nearest tenth of an inch. Data is recorded on the ESI Forest Plot Field Worksheet.
6	**10 Yr. Growth Radius**	*(in)*	Definition: *Radius of the last ten growth rings of a particular tree to the nearest tenth of an inch.* Population Standard: Optional Population Guidance: The measurement of the length or radius of the last ten rings of the ring core. Data is recorded on the ESI Forest Plot Field Worksheet to the nearest tenth of an inch.
7	**Growth Ring Count**		Definition: *Total number of growth rings counted. Growth rings are counted (typically) using an increment borer or stumps.* Population Standard: Optional Population Guidance: The number of growth rings counted using a ring borer or other method. Data is recorded on the ESI Forest Plot Field Worksheet.
8	**Growth Ring Count Height**	*(ft)*	Definition: *Height above the ground where ring count was done. Typically, at DBH (4.5 feet) but can be stumps or other height.* Population Standard: Optional Population Guidance: The height at which the growth rings are collected and counted is recorded on the ESI Forest Plot Field Worksheet. Height is recorded to the nearest tenth of a foot.
9	**Growth Ring Count Age**	*(yr)*	Definition: *Number of years for the measured tree to reach the ring count height.* Population Standard: Optional Population Guidance: This is a correction factor that is found on the National Register for Site Growth Curves in the National Forestry Manual (Exhibit 537-4) based on tree species and site index.
10	**Tree Age**	*(yr)*	Definition: *Total age of a particular tree, in years.* Population Standard: Optional Population Guidance: Calculated by adding the growth ring count age to the growth ring count.
11	**Canopy Ht. Bottom**	*(ft)*	Definition: *The height to the bottom of the canopy of a particular tree being inventoried.* Population Standard: Optional Population Guidance: Canopy bottom height is measured with different tools or estimated. The data is recorded on the ESI Forest Plot Field Worksheet as part of the overstory canopy and entered to the nearest foot.
12	**Canopy Ht. Top**	*(ft)*	Definition: *The height to the top of the canopy of a particular tree being inventoried. Synonymous with 'tree height.'* Population Standard: Optional Population Guidance: Canopy top height is often synonymous with tree height and is measured with different tools or estimated. The data is recorded on the ESI Forest Plot Field Worksheet and entered to the nearest foot.

13	**AK Number of Rings in Last Inch**	Definition: *The number of rings in the last inch of a specific tree's diameter can be used to provide an estimate of the tree's growth rate over the last X years. This is helpful when evaluating a tree's and, by extension, a stand's production potential. This attribute is to be used to accommodate only the respective attribute included in Alaska's AK SITE databases.*

Plot Tree Summary

This table contains summary data about trees in various DBH size classes within a plot.

Plot Sampling Protocols: None specified

Transect Sampling Protocols: None specified

1	**Seq**	Definition: *Sequential number of the feature being described.* Population Standard: Optional Population Guidance: To arrange data in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.
2	**DBH Class Midpoint** *(in)*	Definition: *The midpoint value of the DBH size class inventoried, expressed as an even integer in inches.* Population Standard: Required Population Guidance: Each DBH Class Midpoint captured in the Plot Tree Inventory table and Plot Trees Counted child table, for all species, is recorded as individual rows/records.
3	**# of Trees**	Definition: *The total number of trees counted of all species within a particular DBH class within the plot.* Population Standard: Optional Population Guidance: Calculated as the total number of trees (regardless of species or across all species) for the specific DBH Class Midpoint, as recorded in the Plot Tree Inventory table and Plot Trees Counted child table.
4	**DBH Class Basal Area** *(ft^2/acre)*	Definition: *The total basal area measured for a DBH class within the plot.* Population Standard: Optional Population Guidance: Calculated by using the Plot Basal Area Factor, recorded on the Vegetation Plot table, by the number of trees previously recorded.
5	**DBH Class Tree Density** *(trees/ac)*	Definition: *The computed number of trees per acre within the plot for a particular DBH class size.* Population Standard: Optional Population Guidance: Calculated by taking the total number of trees recorded within the subplot, on the Crop Tree Details child table, divided by the size of the plot, apply plot to acre conversion.

Site Woody Basal Area

This table records the woody basal area observations for a particular site/plot. **This data is specific to trees collected without regard to individual species.**

Plot Sampling Protocols: Basal Area (Forested), Relevé, others may apply

Transect Sampling Protocols: None specified

1	**Seq**	Definition: *Sequential number of the feature being described.* Population Standard: Optional Population Guidance: To arrange data in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.
2	**Basal Area Factor**	Definition: *The conversion factor used to compute total basal area for the site. The value chosen is dependent upon the tool used in the field.* Population Standard: Required Population Guidance: Select the most appropriate answer from the drop-down menu. The basal area factor is dependent upon the tool used in the field and methods used. The current choices available are *5, 10, 20, 30*, and *40*. Protocols have a higher possible range, the accurate range will be proposed for the next data model update.
3	**Number of Trees In**	Definition: *The number of trees counted within the plot for the particular basal area factor.* Population Standard: Required Population Guidance: Calculated by the number of hits, number of records/rows, recorded on the Site Trees Counted child table.

Site Trees Counted

This table records the woody basal area observations for a particular site/plot.

1	**Seq**	Definition: *Sequential number of the feature being described.* Population Standard: Optional Population Guidance: To arrange data in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.
2	**Diameter Breast Height** *(in)*	Definition: *The diameter of measured tree at breast height, typically 4.5 feet above ground level.* Population Standard: Required Population Guidance: The DBH for each tree recorded on the inventory the inventory form. The method/protocol used will vary how the data will look on each protocol worksheet/form.
3	**Tree Height** *(ft)*	Definition: *The height of a particular tree measured.* Population Standard: Required Population Guidance: The tree height of each tree measured as recorded on the inventory form. The method/protocol used will vary how the data will look on each protocol worksheet/form.

Vegetation Plot Text

This table contains text notes that pertain to a vegetation plot as a whole.

Plot Sampling Protocols: All

Transect Sampling Protocols: All

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange notes in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Date**

Definition: *The date associated with a particular record, expressed as month, day, year -- xx/xx/xxxx.*

Population Standard: Required

Population Guidance: Enter the date when the action or note was completed in numerical format with a two-digit month / two-digit day / four-digit year (e.g., 01/01/2010).

3 **Author**

Definition: *Name of the person who entered, or is responsible for, a particular record.*

Population Standard: Optional

Population Guidance: Populate with the first name and then last name of the author (e.g., John Doe).

Kind

Definition: *A text entry is identified by its kind, category, and subcategory. Kind is the highest division of classification. Text kind provides a grouping of text entries according to their subject matter.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. The menu contains the following options: *ESIS-ESI range notes, ESIS-ESI forest notes, Data conversion notes* (these three deal with legacy data converted from ESIS or other databases to NASIS), *Edit notes* (edits made to existing data), *Miscellaneous notes, QC/QA review notes, Forest understory description* (narrative notes recorded on plot data describing the forest understory community), *Saleable forest products* (a description or listing of the saleable and or useable forest products from the plot), *Other forest considerations*, and *Data collection notes* (notes recorded on field sheets during data collection or inventories).

5 **Category**

Definition: *A text entry is identified by its kind, category, and subcategory. Category is a subdivision of kind. "Agr" and "Soi" are two categories for the text kind "Nontechnical Description."*

Population Standard: Optional

Population Guidance: The category is a user-defined field. Consistency is best to aid in querying and filtering by text kind, category, and subcategory. Work with Regional staff to establish a protocol for placing text into categories and subcategories.

6 **Subcategory**

Definition: *A text entry is identified by its kind, category, and subcategory. Subcategory is a subdivision of category. For text kind "Nontechnical" description and text category "Agr," subcategory corresponds to the SSSD field "desnum."*

Population Standard: Optional

Population Guidance: The subcategory is a user-defined field. Consistency is best to aid in querying and filtering by text kind, category, and subcategory. Work with Regional staff to establish a protocol for placing text into categories and subcategories.

7 **Text Entry**

Definition: *The actual narrative text portion of a text entry. The other parts of a text entry are its identifiers: kind, category, and subcategory.*

Population Standard: Required

Population Guidance: Text entries should be short, concise, and use correct and simple English. A standardized method of writing text within categories and subcategories is helpful when completing queries and filtering.

Windbreak Row Data

This table contains data collected from individual rows of a windbreak as part of a vegetation inventory. Data pertaining to windbreaks for DBH may be entered in the Plot Plant Inventory.

Plot Sampling Protocols: Windbreak Assessment

Transect Sampling Protocols: None specified

1 **Seq**

Definition: *Sequential number of the feature being described.*

Population Standard: Optional

Population Guidance: To arrange tree rows in a non-sequential order as defined by the row, an alternative sequence can be established using this column. Rows can then be ordered ascending or descending by sequence.

2 **Row ID**

Definition: *An identifier indicating the position of the row within the windbreak, generally a number beginning with '1' for the row on the west or north side of the windbreak depending upon the orientation of the windbreak. If multiple species are planted in the same row, an uppercase letter beginning with 'A' for the first species, 'B' for the second species, etc., is added to the number to identify a segment of a row where each species is planted.*

Population Standard: Required

Population Guidance: Row information is recorded on the ESI Windbreak Plot Field Worksheet or regional/state supplement. Protocol and further guidance are located in the National Forestry Handbook.

Information in this box pertains to columns 3 through 5

Population Standards: Required

Population Guidance: These three fields pull information from the Plant Object in NASIS. Populating any one of the three fields will result in auto-population of the other three fields.

3 **Plant Symbol**

Definition: *A unique symbol used to identify a plant genus or a plant species. (The PLANTS Database, USDA-NRCS, National Plant Data Center)*

4 **Scientific Name**

Definition: *The full genus and species name as listed in The PLANTS Database, USDA-NRCS, National Plant Data Center.*

5 **National Vernacular Name**

Definition: *The most generally accepted common name of a plant as listed in The PLANTS Database, USDA-NRCS, National Plant Data Center.*

6 **# of Growing Seasons**

Definition: *The number of growing seasons since the tree or shrub was planted in a windbreak row.*

Population Standard: Optional

Population Guidance: Age in years (whole integers) of the tree species as captured on the ESI Windbreak Plot Field Worksheet.

7 **Species Condition**

Definition: *The general condition class of the identified species in a windbreak row.*

Population Standard: Optional

Population Guidance: ESI Windbreak Plot Field Worksheet records the condition as a ranking of *Good, Fair, Poor, Dead*, or *None*. Clarification of each of these rankings is available in the National Forestry Handbook Section 637.

8 **Crown Spread Left**

(ft)

Definition: *The average distance that the crown extends to the left of the evaluation row. Left is toward row #1.*

Population Standard: Optional

Population Guidance: ESI Windbreak Plot Field Worksheet records the crown spread left and right as feet (whole integer). Protocol and guidance are available in the National Forestry Handbook Section 637.

9 **Crown Spread Right**

(ft)

Definition: *The average distance that the crown extends to the right of the evaluation row. Right is away from row #1.*

Population Standard: Optional

Population Guidance: ESI Windbreak Plot Field Worksheet records the crown spread left and right as feet (whole integer). Protocol and guidance are available in the National Forestry Handbook Section 637.

10 **Spacing Between Rows**

(ft)

Definition: *The distance between a row of trees or shrubs within a windbreak, and its adjacent rows.*

Population Standard: Optional

Population Guidance: ESI Windbreak Plot Field Worksheet records the spacing between rows and within rows as feet (whole integer). Protocol and guidance are available in the National Forestry Handbook Section 637.

11 **Spacing Within Row**

(ft)

Definition: *The distance between individual trees or shrubs within a row of a windbreak.*

Population Standard: Optional

Population Guidance: ESI Windbreak Plot Field Worksheet records the spacing between rows and within rows as feet (whole integer). Protocol and guidance are available in the National Forestry Handbook Section 637.

12 **Cultivation Past**

Definition: *An indicator of the extent of cultivation activities in past years.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. ESI Windbreak Plot Field Worksheet records the rating of past cultivation as *Excellent, Good, Fair*, *Poor*, or *None*. Clarification of each of these rankings is available in the National Forestry Handbook Section 637.

13 **Cultivation Present**

Definition: *An indicator of the extent of cultivation activities during the current year.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. ESI Windbreak Plot Field Worksheet records the rating of current cultivation as *Excellent, Good, Fair*, *Poor*, or *None*. Clarification of each of these rankings is available in the National Forestry Handbook Section 637.

14 **DBH Average**

(in)

Definition: *The average diameter at breast height (DBH) of the identified species.*

Population Standard: Optional

Population Guidance: Calculation of the average diameter from data entered on the Plot Plant Inventory table, or as recorded on the ESI Windbreak Plot Field Worksheet. Protocol and guidance are available in the National Forestry Handbook Section 637.

15 **Disease Kind**

Definition: *The dominant type of disease causing the damage.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Data is recorded on the ESI Windbreak Plot Field Worksheet, documenting the damage by disease, insect, and injury, as well as the degree of damage for each species of tree. Diseases to select from are *None, Canker, Cedar apple rust, Fire blight, Fungus, Needle rust, Other, Virus*, or *X disease*. Protocol and guidance are available in the National Forestry Handbook Section 637.

16 **Disease Damage Degree**

Definition: *An indication of the degree of damage to the plants by disease.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Data is recorded on the ESI Windbreak Plot Field Worksheet, documenting the damage by disease, insect, and injury, as well as the degree of damage for each species of tree. The rating for degree of damage is *Severe* (apparent loss of species in row), *Moderate* (apparent loss of foliage, vigor, and top growth or general overall decline of species in the row), *Slight* (no appreciable damage is apparent), or *None* (no damage). Protocol and guidance are available in the National Forestry Handbook Section 637.

17 **Injury Kind**

Definition: *The dominant type or source of injury causing damage to the plants.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Data is recorded on the ESI Windbreak Plot Field Worksheet, documenting the damage by disease, insect, and injury, as well as the degree of damage for each species of tree. Injuries to select from are *None, Animal, Chemical, Deer, Dieback, Fire, Flooding, Frost crack, Grazing, Hail, Ice, Implement, Other, Rabbit, Snow, Sunscald, Wind*, or *Winter kill*. Protocol and guidance are available in the National Forestry Handbook Section 637.

18 **Injury Damage Degree**

Definition: *An indication of the degree of damage to the plants by some injury.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Data is recorded on the ESI Windbreak Plot Field Worksheet, documenting the damage by disease, insect, and injury, as well as the degree of damage for each species of tree. The rating for degree of damage is *Severe* (apparent loss of species in row), *Moderate* (apparent loss of foliage, vigor, and top growth or general overall decline of species in the row), *Slight* (no appreciable damage is apparent), or *None* (no damage). Protocol and guidance are available in the National Forestry Handbook Section 637.

19 **Insect Kind**

Definition: *The dominant type of insect causing damage to the plants.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Data is recorded on the ESI Windbreak Plot Field Worksheet, documenting the damage by disease, insect, and injury, as well as the degree of damage for each species of tree. Insects to select from are *None, Borer, Grasshopper, Other, Oyster scale, Tip moth, Web worm, Spruce mite*, or *Elm leaf beetle*. Protocol and guidance are available in the National Forestry Handbook Section 637.

20 **Insect Damage Degree**

Definition: *An indication of the degree of damage to the plants by insects.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Data is recorded on the ESI Windbreak Plot Field Worksheet, documenting the damage by disease, insect, and injury, as well as the degree of damage for each species of tree. The rating for degree of damage is *Severe* (apparent loss of species in row), *Moderate* (apparent loss of foliage, vigor, and top growth or general overall decline of species in the row), *Slight* (no appreciable damage is apparent), or

None (no damage). Protocol and guidance are available in the National Forestry Handbook Section 637.

21 **Ground Cover Extent**

Definition: *An indication of the extent and type of ground cover within the windbreak row.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Data is recorded on the ESI Windbreak Plot Field Worksheet, documenting the extent of ground cover within each tree row. The ratings are *Dense, Light, Sparse*, or *None*. Protocol and guidance are available in the National Forestry Handbook Section 637.

22 **Ht. to Live Crown Left**

(ft)

Definition: *The average height to live crown on the left side (toward row #1) of the row being evaluated.*

Population Standard: Optional

Population Guidance: Data is found on the ESI Windbreak Plot Field Worksheet with the height to live crown on the left and right as feet (whole integer). Protocol and guidance are available in the National Forestry Handbook Section 637.

23 **Ht. to Live Crown Right**

(ft)

Definition: *The average height to live crown on the right side (away from row #1) of the row being evaluated.*

Population Standard: Optional

Population Guidance: Data is found on the ESI Windbreak Plot Field Worksheet with the height to live crown on the left and right as feet (whole integer). Protocol and guidance are available in the National Forestry Handbook Section 637.

24 **Survival %**

(%)

Definition: *The percentage of plants of the species within a row that are surviving at the time of observation.*

Population Standard: Optional

Population Guidance: Data is found on the ESI Windbreak Plot Field Worksheet with the percentage of present surviving trees (whole integer). Protocol and guidance are available in the National Forestry Handbook Section 637.

25 **Row Ht. Average**

(ft)

Definition: *The average height of all plants of a particular species in the windbreak row.*

Population Standard: Optional

Population Guidance: Data is found on the ESI Windbreak Plot Field Worksheet with the average height of all trees as feet (whole integer). Protocol and guidance are available in the National Forestry Handbook Section 637.

26 **Row Ht. Max. Average**

(ft)

Definition: *The average height of the two tallest plants of a particular species in the windbreak row.*

Population Standard: Optional

Population Guidance: Data is found on the ESI Windbreak Plot Field Worksheet with the average height of the two dominant trees as feet (whole integer). Protocol and guidance are available in the National Forestry Handbook Section 637.

27 **Reproduction Abundance Class**

Definition: *An indication of the abundance of reproduction of a windbreak species.*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Data is recorded on the ESI Windbreak Plot Field Worksheet, documenting the abundance of reproduction as a class rating. The ratings are *Heavy* (sprouts or seedlings 5 feet or less apart), *Medium* (sprouts or seedlings 6 to 20 feet apart), *Light* (an occasional sprout or seedling. More than 20 feet apart.), or *None* (No reproduction occurring). Protocol and guidance are available in the National Forestry Handbook Section 637.

28 **Rooting Depth Few**

(cm)

Definition: *The depth to the lower boundary in the soil profile in which roots of trees or shrubs are described as being 'few' (<1 per unit area) in abundance.*

Population Standard: Optional

Population Guidance: Data is found on the ESI Windbreak Plot Field Worksheet where soil depth to *few*, *common* and *many* roots are found. The field sheet captures data in inches and must be converted to centimeters for NASIS (whole integer). Protocol and guidance are available in the National Forestry Handbook Section 637. Description for describing roots in the soil profile is in the Field guide for describing soils, USDA-NRCS.

29 **Rooting Depth Common**

(cm)

Definition: *The depth to the lower boundary in the soil profile in which roots of trees or shrubs are described as being 'common' (1 to <5 per unit area) in abundance.*

Population Standard: Optional

Population Guidance: Data is found on the ESI Windbreak Plot Field Worksheet where soil depth to *few*, *common* and *many* roots are found. The field sheet captures data in inches and must be converted to centimeters for NASIS (whole integer). Protocol and guidance are available in the National Forestry Handbook Section 637. Description for describing roots in the soil profile is in the Field guide for describing soils, USDA-NRCS.

30 **Root Depth Many**

(cm)

Definition: *The depth to the lower boundary in the soil profile in which roots of trees or shrubs are described as being 'many' (=>5 per unit area) in abundance.*

Population Standard: Optional

Population Guidance: Data is found on the ESI Windbreak Plot Field Worksheet where soil depth to *few*, *common* and *many* roots are found. The field sheet captures data in inches and must be converted to centimeters for NASIS (whole integer). Protocol and guidance are available in the National Forestry Handbook Section 637. Description for describing roots in the soil profile is in the Field guide for describing soils, USDA-NRCS.

31 **Suppression Degree Left**

Definition: *An indicator of the level of suppression of plants in the row being evaluated by plants in a row to its left (toward row #1).*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Data is recorded on the ESI Windbreak Plot Field Worksheet, documenting the degree of suppression by plants to the rows to the left and to the right. The ratings are *Severe* (overtopping has resulted in serious reduction in height growth of more than one-third of total height), *Moderate* (side competition and/or overtopping has caused abnormal top development and some apparent height loss of up to one-third of total height), Slight (competition for light from the side has caused the crown to develop abnormally), or *None* (the crown is completely free to develop). Protocol and guidance are available in the National Forestry Handbook Section 637.

32 **Suppression Row ID Left**

Definition: *The row position identifier of the row to the left that is causing the suppression.*

Population Standard: Optional

Population Guidance: Data is found on the ESI Windbreak Plot Field Worksheet with the tree number identified that is causing the suppression from the left. Protocol and guidance are available in the National Forestry Handbook Section 637.

33 **Suppression Degree Right**

Definition: *An indicator of the level of suppression of plants in the row being evaluated by plants in a row to its right, away from row #1).*

Population Standard: Optional

Population Guidance: Select the most appropriate answer from the drop-down menu. Data is recorded on the ESI Windbreak Plot Field Worksheet, documenting the degree of suppression by plants to the rows to the left and to the right. The ratings are *Severe* (overtopping has resulted in serious reduction in height growth of more than one-third of total height), *Moderate* (side competition

and/or overtopping has caused abnormal top development and some apparent height loss of up to one-third of total height.), *Slight* (competition for light from the side has caused the crown to develop abnormally), or *None* (the crown is completely free to develop). Protocol and guidance are available in the National Forestry Handbook Section 637.

34 **Suppression Row ID Right**

Definition: *The row position identifier of the row to the right that is causing the suppression.*

Population Standard: Optional

Population Guidance: Data is found on the ESI Windbreak Plot Field Worksheet with the tree number identified that is causing the suppression from the right. Protocol and guidance are available in the National Forestry Handbook Section 637.

35 **Vital Notes ?**

Definition: *A yes/no indicator of whether vital notes about a windbreak row are recorded.*

Population Standard: Required

Population Guidance: Check the box if there are vital notes documented on the ESI Windbreak Plot Field Worksheet.

36 **Within Soil Taxon Range ?**

Definition: *A yes/no indicator of whether the soil in a windbreak is within the range of characteristics of the soil series described for the site.*

Population Standard: Required

Population Guidance: Check the box if the soil in the windbreak is within the range of characteristics of the soil series described for the site. Consult Web Soil Survey to determine the soils mapped/described for the site.

37 **Notes**

Definition: *Notes describing decisions, issues, or other history related to the record.*

Population Standard: Optional

Population Guidance: Comments captured for specific tree rows and species within each row are captured in this section. Long narrative text for the plot overall is entered in the Vegetation Plot Text child table.