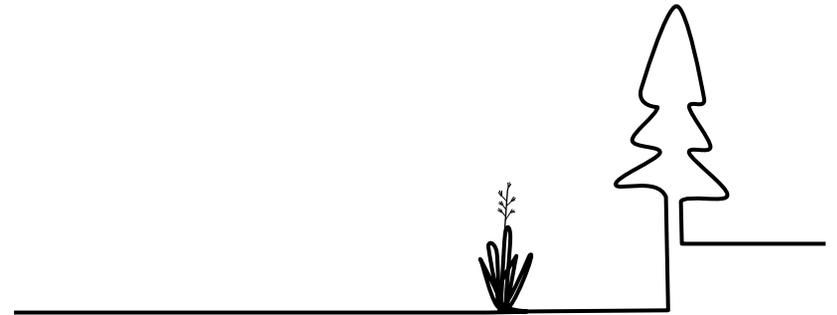


**Interior West
Forest Inventory and Analysis**

Region 4



**All Condition Inventory
Supplemental Field Guide**

4.16.2012



U

Understory Vegetation Description.....	53
Agricultural land / residential yards	54
Circumstances Prohibiting Complete Subplot Sampling ...	55
PDR Entry (Part I Species).....	54
Sample Revisions	53

W

WATER ON PLOT	27
Witness Landmarks Lack of suitable landmark	52

Table of Contents

INTRODUCTION.....	1
ACI Study Locations (2012 Field Season)	1
TYPES OF ACI LOCATIONS.....	3
<i>Partial Plots</i>.....	3
<i>Nonforest Plots</i>.....	3
SECTION 0: GENERAL DESCRIPTION.....	7
ACI PLOT LAYOUT.....	7
PARTIAL PLOT SAMPLE ITEMS	8
NONFOREST PLOT SAMPLE ITEMS.....	10
ESTABLISHING THE PLOT AND SELECTING A REFERENCE POINT.....	11
Old nails/ tags/stakes (previous-plot sampling)	11
0.0.ACI General Description (ACI Monumentation).....	12
0.3.1RM.ACI Circumstances Precluding Plot/Subplot Establishment	13
Plot-level Circumstances	15
Subplot-level Circumstances.....	18
0.3.2RM.ACI Plots with Accessible Forest Land	20
0.3.3RM.ACI Plots with No Accessible Forest Land Present.....	23
SECTION 1: PLOT-LEVEL DATA.....	26
ACI SAMPLE PROCEDURES	26
<i>partial plots</i>	26
<i>nonforest plots</i>.....	26
ACI ITEM REVISIONS	26
1.4.ACI PLOT STATUS.....	27
1.7.ACI SAMPLE KIND	28
1.7.1RM.ACI REGIONAL SAMPLE KIND.....	28
1.13.ACI WATER ON PLOT	28

SECTION 2: CONDITION CLASS	30
ACI SAMPLE PROCEDURES:	30
ACI CONDITION CLASS PROCEDURES	30
<i>partial plots</i>	31
<i>nonforest plots</i>	31
Nonforest Land (subcategories).....	31
CONDITION CLASS NUMBER Examples	32
Exception to CONDITION CLASS STATUS and CONDITION CLASS	
NUMBER assignment for partial plots	33
CONDITION CLASS items	35
2.4.1 CONDITION CLASS NUMBER	35
2.4.2.AC1 CONDITION CLASS STATUS	35
2.4.3 CONDITION NONSAMPLED REASON	35
2.5.11 to 2.5.16 DISTURBANCE / YEAR.....	35
2.5.17 to 2.5.22 TREATMENT / YEAR	35
2.5.23 PHYSIOGRAPHIC CLASS	35
Additional condition-level items (based on PC status).....	36
2.5.1 RESERVED STATUS	36
2.5.2 OWNER GROUP	36
2.5.7 OWNER CLASS.....	36
ACI ITEM REVISIONS	37
2.4.2.AC1 CONDITION CLASS STATUS	37
 SECTION 3: SUBPLOT INFORMATION	 38
ACI SAMPLE PROCEDURES:	38
<i>partial plots</i>	38
<i>nonforest plots</i>	38
ACI ITEM REVISIONS	38
3.2.AC1 SUBPLOT/MACROPLOT STATUS	39
3.5.AC1 MICROPLOT CENTER CONDITION	40
3.9.AC1 SUBPLOT/MACROPLOT CONDITION LIST	40
 SECTION 4: BOUNDARY REFERENCES	 42

F	Field Location Reference Items	51	P	Partial Plots (definition)	3
G	Ground Surface Cover Transects		PHYSIOGRAPHIC CLASS	34	
	Categories	74	PLOT STATUS.....	26	
	Category exception for water ..	76	Plot-level Data	25	
	Procedures	71	Potential Vegetation Classification.....	64	
GROUND SURFACE COVER			R	Reference Point	
TRANSECTS	71		Lack of suitable landmark	52	
Ground Surface Cover Transects			REGIONAL SAMPLE KIND	27	
Form.....	93		RESERVED STATUS (Condition)	35	
H	Habitat Type		S	SAMPLE KIND	27
	Acceptable Manuals for		SUBPLOT HABITAT TYPE.....	64	
	Region 1	69	Acceptable Habitat Type Manuals		
	Manual Key		for Region 1	69	
	Idaho	68	Habitat Type Manual Key		
	Montana	67	Idaho.....	68	
	Manual Selection Procedure for		Montana.....	67	
	Region 1	66	Habitat Type Manual Selection		
	Reference Bibliography	69	Procedure for Region 1	66	
M	MICROPLOT CENTER CONDITION..	39	Subplot Information (FIA items)	37	
	Monumentation	11	SUBPLOT MULTIPLE CONDITION		
	Microplot.....	11	LAND USE FLAG	77	
	Subplot	11	SUBPLOT NONFOREST/Water		
N	Nonforest Land (subcategories).....	30	LAND USE	61	
	Nonforest Plots (definition).....	3	SUBPLOT OWNER CLASS	80	
O	Offset stake	11	SUBPLOT RANGE TYPE	64	
	Old nails/ tags/stakes	10	SUBPLOT RESERVED STATUS	79	
	OWNER CLASS (Condition)	35	SUBPLOT/MACROPLOT		
	OWNER GROUP (Condition)	35	CONDITION LIST	39	
			SUBPLOT/MACROPLOT STATUS	38	
			Subplot-level Data (ACI items).....	61	
			T	TREATMENT / YEAR	34
				Tree, Sapling, and Seedling Data	43
				Circumstances Prohibiting	
				Complete Subplot Sampling....	46

Index

A

- ACI Data Items 84
- ACI Item Revisions
 - Condition Class Procedures 29
 - Condition-level Data 36
 - CONDITION CLASS STATUS 36
 - Plot-level Data 25
 - PLOT STATUS 26
 - REGIONAL SAMPLE KIND 27
 - SAMPLE KIND 27
 - WATER ON PLOT 27
 - Subplot Information 37
 - MICROPLOT CENTER CONDITION 39
 - SUBPLOT/MACROPLOT CONDITION LIST 39
 - SUBPLOT/MACROPLOT STATUS 38
 - Understory Vegetation
 - Description 53
- ACI
 - General Overview 4
 - Plot Layout 7
- ACI Study Locations (2012 Field Season) 1
- ACI Subplot-level Data 61
 - GROUND SURFACE COVER TRANSECTS 71
 - SUBPLOT HABITAT TYPE 64
 - SUBPLOT MULTIPLE CONDITION LAND USE FLAG 77
 - SUBPLOT NONFOREST/Water LAND USE 61
 - SUBPLOT OWNER CLASS 80
 - SUBPLOT RANGE TYPE 64
 - SUBPLOT RESERVED STATUS 79

C

- Circumstances Precluding Plot/Subplot Establishment 12
 - Ownership not National Forest Lands 12
 - Plot-level Circumstances 14
 - Subplot-level Circumstances .. 17
- Circumstances Prohibiting Complete Subplot Sampling
 - Tree, Sapling, and Seedling Data 46
 - Understory Vegetation Description 55
- Condition Boundary Map 33
- CONDITION CLASS
 - Categories 29
 - Condition-level items to record 34
 - Condition-level items to record (based on PC status) 35
 - Exception to Status/Number assignment 30, 32
- CONDITION CLASS NUMBER 34
- CONDITION CLASS NUMBER Examples 31
- CONDITION CLASS STATUS 34, 36
- CONDITION NONSAMPLED REASON 34

D

- DISTURBANCE / YEAR 34
- Down-Woody Materials Plot 59

E

- Existing Vegetation Classification 64

SECTION 5: TREE, SAPLING, AND SEEDLING DATA 44

- ACI SAMPLE PROCEDURES: 44
 - partial plots* **Error! Bookmark not defined.**
 - nonforest plots* 46
 - Circumstances Prohibiting Complete Subplot Sampling* 47

SECTION 6: SEEDLING DATA 48

SECTION 7: SITE TREE INFORMATION 50

SECTION 12: FIELD LOCATION REFERENCE FORM 52

- ACI SAMPLE PROCEDURES 52
 - partial plots* 52
 - nonforest plots* 52
 - Lack of suitable Reference Point (RP) 53
 - Lack of suitable Witness Landmarks 53

SECTION 8: PHASE 2 (2) VEGETATION PROFILE 54

- ACI SAMPLE PROCEDURES 54
- UNDERSTORY VEGETATION DESCRIPTION SAMPLING REVISIONS 54
 - PDR Data Entry (Part I Species) 56
 - Agricultural land / residential yards on subplot 56
 - Circumstances Prohibiting Complete Subplot Sampling* 57

SECTION 10: ACCOUNTING PROCEDURES 59

SECTION 11: DOWN-WOODY MATERIALS PLOT 61

- ACI SAMPLE PROCEDURES 61

SECTION 12: ACI SUBPLOT-LEVEL DATA	62
ACI SAMPLE PROCEDURES	62
12.1.AC1 SUBPLOT NONFOREST/Water LAND USE	62
12.2.AC1 SUBPLOT RANGE TYPE.....	65
12.3.AC1 SUBPLOT HABITAT TYPE (Potential Vegetation Classification).....	65
12.4.AC1 GROUND SURFACE COVER TRANSECTS.....	75
12.5.AC1 SUBPLOT MULTIPLE CONDITION LAND USE FLAG	81
12.6.AC1 SUBPLOT RESERVED STATUS.....	83
12.7.AC1 SUBPLOT OWNER CLASS	84
 APPENDICES	 86
APPENDIX A: ACI DATA ITEMS.....	87
APPENDIX B: GROUND SURFACE COVER TRANSECTS FORM	88
 INDEX.....	 90

Appendix B: Ground Surface Cover Transects Form

GROUND SURFACE COVER TRANSECTS																				
Crew Name(s): _____		STATE _____				COUNTY _____				PLOT # _____										
Categories:	Subplot 1					Subplot 2					Subplot 3					Subplot 4				
	0°	90°	180°	270°	Total	0°	90°	180°	270°	Total	30°	120°	210°	300°	Total	60°	150°	240°	330°	Total
ASH																				
BARE																				
ROCK																				
WATE																				
TRIS																				
PEIS																				
WOOD																				
LIT																				
VEG																				
CRYP																				
LICH																				
MOSS																				
DEVP																				
ROAD																				
OTHER																				
NONSM																				

Procedure: On each subplot area, lay out four 25-foot transects that extend outward from the subplot center at the azimuth directions listed above. Lay a cloth tape along the slope of the ground; do not correct the slope distance to obtain horizontal distance. Start "hits" at the 1-foot mark (for a total of 25 hits per transect direction, and 100 hits per subplot). From subplot center and facing the subplot perimeter, measure hits to the right side of the transect tape. Record total for category by subplot; enter category totals by subplot on the PDR. Note: If a subplot is not sampled, draw a large X over subplot columns.

ASH - Remaining residue after all combustible material has been burned off
 BARE - Bare ground; exposed soil and fragments < 3/4-inch diameter
 ROCK - Rocks; > 3/4-inch diameter
 WATE - Water; remaining above ground surface during the growing season (code all hits within "permanent water" as a water hit; for transient water, or temporary flooding, base hits on ground cover category below water surface as if water was not there)
 TRIS - Transient ice and snow
 PEIS - Permanent ice and snow
 WOOD - Woody material; litter not included
 LIT - Organic debris, freshly fallen or slightly decomposed; includes dead vegetation, animal feces, etc.
 VEG - Basal vegetation; the area outline of a plant near the ground surface; for grass - shoot system; for tree/shrub - stem area
 CRYP - Cryptogamic crust, thin biotically dominated ground or surface crust; for dry rangeland, algae, lichen, mosses or cyanobacteria
 LICH - Lichens; for dry rangeland see cryptogamic crust
 MOSS - Mosses; for dry rangeland see cryptogamic crust
 DEVP - Developed land or man-made structures; maintained residential yards; agricultural crops
 ROAD - Improved roads, paved roads, gravel roads, improved dirt roads and off-road vehicle trails regularly maintained
 OTHER - Other covers not defined elsewhere; includes trash (describe in notes section)
 NONSM - Nonsampled (describe reason in notes section)

Notes: _____

ACP Study February 2007

Introduction

This manual supplement outlines the resource inventory procedures to be used by Forest Inventory and Analysis (FIA) field crews for the All Condition Inventory (ACI) study. These plots expand the Interior West Forest Inventory and Analysis (FIA) Phase 2 (P2) field inventory to include: (1) sampling on nonforest/water grid locations, and (2) data collection on nonforest/water conditions located at forest land grid locations.

This supplement is only to be used for plot locations that are part of the ACI study (see comment box below), and that have a **nonforest and/or water condition** at one or more of the **subplot centers**. If all of the subplot centers at a plot location are located within an accessible forest land condition, then do not use the procedures in this document (use only the FIA manual for all sampling protocol).

ACI – 2008 Field Season

ACI Study Locations (National Forest Lands):

For the 2012 Field Season, limit ACI sampling to subplots with a center located in a National Forest Land ownership (*this is in addition to limiting ACI sampling to subplots with a center located in a nonforest/water condition*).

If a subplot center, or an entire plot, is located in an ownership other than National Forest Lands, follow the procedures outlined in this document under "Circumstances Precluding Plot/Subplot Establishment" (ACI item 0.3.1RM.ACI).

This document is to be used in conjunction with the Interior West Forest Inventory and Analysis Field Procedures field manual (2011, Version 5.0), referred to in this document as the “**FIA manual.**” Unless indicated differently in this document, follow all protocols outlined in the FIA manual.

The primary purpose of this document is to outline protocols that differ from those specified in the FIA manual, and to list additional sample variables/coding that are necessary for implementation of ACI plots. FIA manual instructions that do not differ are not duplicated in this documentation.

To assist the reader, this manual supplement is indexed by sections/item numbers that correspond to the sections/item numbers in the FIA manual. When a reference is made to a section or data item, and the intent is to refer back to the FIA manual for further instruction, the section number or item number will be preceded by “FIA.” For example, refer to “FIA section 8” implies to refer to section 8 in the FIA manual, the Understory Vegetation Description section, for further instruction. On the other hand, when the intent is to refer to a section/item in this document, the section/item number will be preceded by “ACI.”

Section 12 of this document contains additional subplot-level data items that have been added specifically for ACI plots. These items are not described in the FIA manual.

Most data measurements and classifications are to be entered on Portable Data Recorders (PDRs). Refer to appendix 6 of the FIA manual (Glossary) for FIA terminology.

Note: Instructions for any Phase 3 (P3) sampling that may occur on ACI plot locations will not be discussed in this document.

Appendix A: ACI Data Items

Data items with procedures that differ from the FIA manual, or data items that have been added for the ACI study, are listed below with the “.ACI” extension. For these data items, refer to this document for item descriptions. For all other data items, refer to the FIA manual for item descriptions.

Note: This list does not include FIA data items that are not applicable to ACI. See above instructions or version 5.0 of FIA manual for variable references.

<i>ACI Data Items</i> <i>Section 12: ACI Subplot-level Data</i>	
Item No.	Variable Name:
12.1.ACI	SUBPLOT NONFOREST/Water LAND USE
12.2.ACI	SUBPLOT RANGE TYPE <i>(not classified at this time)</i>
12.3.ACI	SUBPLOT HABITAT TYPE
12.4.ACI	GROUND SURFACE COVER TRANSECTS
12.5.ACI	SUBPLOT MULTIPLE CONDITION LAND USE FLAG

Appendices

ACI Field Guide – Appendices	
A	ACI Data Items
B	Ground Surface Cover Transects Form

ACI	
Types of ACI locations:	
Partial Plots	<p>Plots that have an accessible forest land condition(s) present on one or more subplots, but also a nonforest/water condition at one or more of the subplot centers, will simply be referred to as “partial plots” in this document</p> <p>For partial plots, the subplot-level sample procedures in this document will pertain only to subplots with a nonforest/water condition at subplot center. Do not sample any subplots with an “accessible forest land” condition at subplot center using ACI procedures (even if a portion of the subplot has a nonforest/water condition). As an exception, down-woody materials (DWM), which is collected along transects that extend between subplots, can cross subplots with an accessible forest land condition. For plot-level and condition-level data items, follow procedures in this document.</p> <p><i>Note: For partial plots, first sample an entire subplot using standard FIA protocol as outlined in the FIA manual. Then, if the subplot center is located in a nonforest/water condition, complete the additional procedures outlined in this document.</i></p>
Nonforest Plots	<p>Plots that do not have any “accessible forest land condition(s)” present on any of the four subplots will simply be referred to as “nonforest plots” in this document.</p> <p>For nonforest plots, sample procedures in this document pertain to the entire plot.</p>

As a general overview, the ACI study will include the following aspects:

- **Data collection for nonforest/water conditions** – Many of the FIA data items that are currently only collected on subplots with an accessible forest land condition will be collected on subplots with a nonforest/water condition at subplot center. In general, disregard references in the FIA manual that specify only to sample subplots, or portions of subplots, that occur within the “accessible forest land” condition classes.
- **Individual data item protocol revisions (.ACI extension)** – For some of the current FIA manual data items, it has been necessary to modify procedures beyond the simple instruction to “disregard references only to sample on accessible forest land conditions.” Such data items have required further protocol changes, or revised instruction. These FIA data items have been listed in this document using the same item number as used in the FIA manual, but with an “.ACI” extension added to the end of the item number (e.g., item 0.3.2**RM.ACI**). For FIA data items with the “.ACI” extension, use the revised protocols listed in this document.
- **Sampling revisions** – Some of the standard FIA data collection procedures have been revised:
 - **Condition-level data items** – Data items coded at the condition level will be minimal. It will be necessary to determine the “number” of condition classes present on a plot, and what CONDITION CLASS STATUS (FIA item 2.1.1) is present at each subplot center, but it will not be necessary to “map” detailed condition boundaries as outlined in the FIA manual. For each CONDITION CLASS identified, a subset of the standard FIA condition-level data items will be collected (refer to ACI section 2 for further instruction).

12.7.ACI SUBPLOT OWNER CLASS

Record the code that best corresponds to the ownership (or the managing Agency for public lands) of the land located at subplot center.

- ❖ **When collected:** Subplots with a nonforest/water condition at subplot center.
- ❖ **Field width:** 2 digits
- ❖ **Tolerance:** No Errors
- ❖ **MQO:** At least 99% of the time

Values:

SUBPLOT OWNER CLASSES within Forest Service Lands (Owner Group 10):

- 11 National Forest
- 12 National Grassland
- 13 Other Forest Service

<i>ACI – 2012 Field Season</i>
Valid SUBPLOT OWNER CLASS codes for 2012:
<p>For the 2012 Field Season, ACI sampling has been limited to subplots with a center located in a National Forest Land ownership.</p> <p>Given this stipulation, SUBPLOT OWNER CLASS codes 11, 12, or 13, are the only valid owner class codes for the 2012 field season.</p>

- **Tree data** – For nonforest plots, all trees meeting FIA “qualifying tree” specifications will be sampled. For partial plots, additional trees on the nonforest portions of subplots with a nonforest/water condition at subplot center, and meeting FIA “qualifying tree” specifications, will be sampled (refer to ACI section 5 for further instruction).
- **Understory Vegetation Description** – For subplots with a nonforest/water condition at subplot center, this sample will not be limited to the condition class located at subplot center. In addition, the Species Composition protocol can include up to the top four crown canopy cover species per growth habit, per subplot, per condition with a subplot crown canopy cover of 3 percent or greater. If a condition boundary exists on the subplot, the total crown canopy cover on the subplot must be at least 3 percent, but the apportioned cover per condition can be less than 3 percent. **There are also many changes to the Vegetation Structure protocol in version 5.0 of the FIA manual (refer to FIA and ACI section 8 for further instruction).**
- **Down-woody Materials Plot** – This “traverse” transects sample has been revised to allow sampling on all accessible forest land and nonforest/water conditions (refer to ACI section 11 for further instruction). Note: As an exception, portions of transect that cannot be accurately sampled due to water/snow, or portions of transect that cross nonforest linear features (e.g., improved roads, maintained rights-of-way) are not sampled.
- **ACI subplot-level data items** – Some additional subplot-level variables have been added specifically for the ACI study. These data items are to be coded on all subplots with a nonforest/water condition at subplot center (refer to ACI section 12 for further instruction).

12.6.ACI SUBPLOT RESERVED STATUS

Record the code that identifies the area at the subplot center by the reserved designation. Reserved land is withdrawn from wood products utilization through statute or administrative designation (refer to the FIA manual glossary). Examples include Wilderness areas and National Parks and Monuments.

- ❖ **When collected:** Subplots with a nonforest/water condition at subplot center.
- ❖ **Field width:** 1 digit
- ❖ **Tolerance:** No Errors
- ❖ **MQO:** At least 99% of the time

Values:

- | | |
|---|--------------|
| 0 | Not Reserved |
| 1 | Reserved |

4 Multiple NONFOREST LAND USE/water present
(e.g., rangeland and rock outcrop, water and maintained rights-of-way, rangeland and Noncensus water).

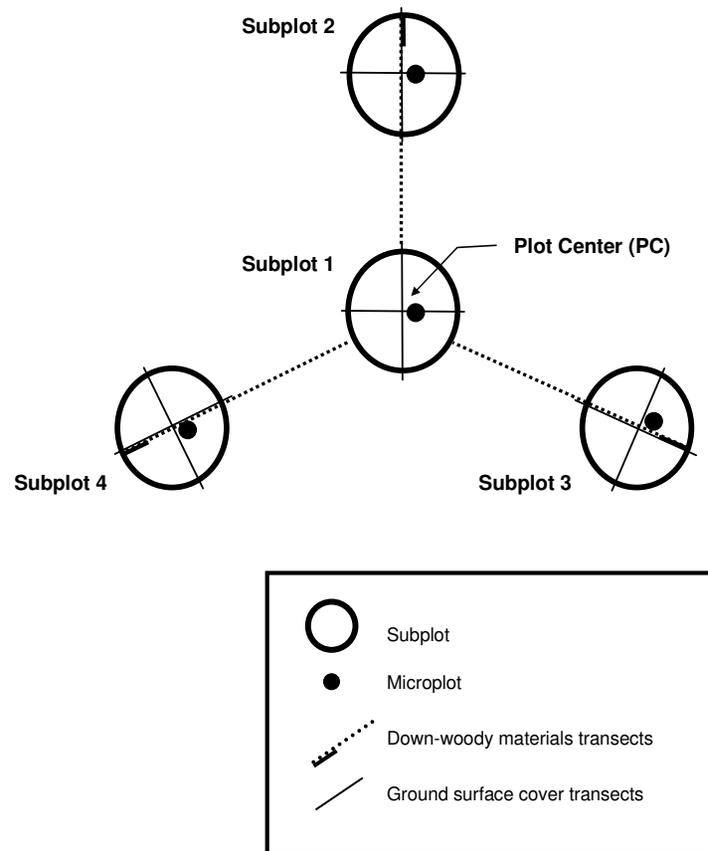
5 Other – explain with note in the PLOT-LEVEL NOTES (FIA item 1.18).

Section 0

General Description

As described in the FIA manual, each plot location (*sometimes referred to as the field location*) consists of a 4-subplot design. The radius of each subplot is 24.0 feet (horizontal distance). The center of subplot 1 is referred to as the plot center, or PC.

ACI Plot Layout:



For **partial plots**, sample the following items for ACI plots:

ACI -- Partial Plots		
Sample Area	Plot Radius (horizontal distance)	Sample Items:
Plot	Area encompassing subplots	<ul style="list-style-type: none"> • Field Location Reference Items • Condition-Level Data <i>Minimal items required**</i> • Plot-Level Data
Subplot	24.0 feet	<ul style="list-style-type: none"> • FIA subplot-level items • Tally Trees ≥ 5.0 inches DBH/DRC <i>Sample additional qualifying trees on nonforest/water conditions</i> • Understory Vegetation Description <i>Revised procedures</i> • ACI subplot-level items
Microplot	6.8 feet	<ul style="list-style-type: none"> • Saplings: 1.0- to 4.9-inches DBH/DRC <i>Sample additional qualifying saplings on nonforest/water conditions</i> • Seedling counts <i>Sample additional qualifying seedlings on nonforest/water conditions</i>
Transect Samples		Design:
Down-Woody Materials <i>Revised procedures</i>		<ul style="list-style-type: none"> • Coarse-Woody Debris (CWD): three 120-ft transects, horizontal distance • Fine-Woody Debris (FWD): 6- to 10-feet, at end of transects, slope distance
*Ground Surface Cover <i>Added for the ACI study</i>		<ul style="list-style-type: none"> • Four 25-ft transects per subplot, slope distance

* **Only sample subplots with nonforest/water condition at subplot center.**

** *Some data items may be coded differently than the standard FIA inventory (refer to the appropriate ACI sections for further detail).*

12.5.AC1 SUBPLOT MULTIPLE CONDITION LAND USE FLAG

Use this classification to identify the subplot area as having either:

- (1) Only one condition/LAND USE type within the subplot boundary, or
- (2) Multiple conditions/LAND USES located within the subplot boundary.

- ❖ **When collected:** Subplots with a nonforest/water condition at subplot center.
- ❖ **Field width:** 1 digit
- ❖ **Tolerance:** No Errors

Values:

- 1 Subplots with single forest condition or **single NONFOREST LAND USE/water present**.
For the ACI study, none of the sample subplots will have a single forest condition. Do not record this code if there are multiple nonforest land subcategories present on the subplot, such as rangeland and rock outcrop.

Subplots with multiple conditions/NONFOREST LAND USES present on the subplot area:

- 2 Multiple forest conditions present (e.g., Aspen vs. Mixed-Conifer; Large diameter vs. small diameter).
This code is not valid for the ACI study.
- 3 **Both a forest condition and NONFOREST LAND USE/water present** (e.g., forest and rangeland, forest and maintained rights-of-way, forest and recreation area, forest and Noncensus water).

CATEGORY EXCEPTION for areas with water:

<i>ACI – Ground Surface Cover Transects</i>	
Water Category EXCEPTION:	
Areas with permanent water	For transect segments that extend through permanent water, classify points as “water” hits. Use the water-level boundary present at the time of the inventory (not necessarily the high-water mark).
Areas with transient water	For transect segments that extend through water that will not remain throughout the growing season, such as temporary flooding or a puddle, go below the water surface and classify (or estimate) the point using the category that would apply if the water was not there.

For **nonforest plots**, sample the following items for the ACI:

ACI -- Nonforest Plots		
Sample Area	Plot Radius (horizontal distance)	Sample Items:
Plot	Area encompassing subplots	<ul style="list-style-type: none"> • Field Location Reference Items • Condition-Level Data <i>Minimal items required</i> • Plot-Level Data
Subplot	24.0 feet	<ul style="list-style-type: none"> • FIA subplot-level items • Tally Trees ≥ 5.0 inches DBH/DRC <i>Sample all qualifying trees</i> • Understory Vegetation Description <i>Revised procedures</i> • ACI subplot-level items
Microplot	6.8 feet	<ul style="list-style-type: none"> • Saplings: 1.0- to 4.9-inches DBH/DRC <i>Sample all qualifying saplings</i> • Seedling count <i>Sample all qualifying seedlings</i>
Transect Samples		
		Design:
Down-Woody Materials <i>Revised procedures</i>		<ul style="list-style-type: none"> • Coarse-Woody Debris (CWD): three 120-ft transects, horizontal distance • Fine-Woody Debris (FWD): 6- to 10-feet, at end of transects, slope distance
Ground Surface Cover <i>Added for the ACI study</i>		<ul style="list-style-type: none"> • Four 25-ft transects per subplot, slope distance

ACI -- Ground Surface Cover Transect categories		
Code (Item #)	Description	Definition
CRYP (12.4.10.ACI)	Cryptogamic crust	Thin, biotically dominated ground or surface crusts on soil in dry rangeland conditions, e.g. cryptogamic crust (algae, lichen, mosses or cyanobacteria).
LICH (12.4.11.ACI)	Lichen	Lichens: an organism generally recognized as a single plant that consists of a fungus and an alga or cyanobacterium living in a symbiotic association. For lichen growing on bare soil in dry rangeland conditions, see cryptogamic crusts.
MOSS (12.4.12.ACI)	Moss	Nonvascular, terrestrial green plants including mosses, hornworts and liverworts - always herbaceous. This code does not apply to moss growing on bare soils in dry rangeland conditions. For rangeland conditions, see cryptogamic crusts.
DEVP (12.4.13.ACI)	Developed land / Residential / Agricultural	Surface area occupied or covered by: (1) any man-made structure other than a road, such as a building, dam, parking lot, electronic site/structure; (2) maintained residential yards; or (3) agricultural crops (not rangeland).
ROAD (12.4.14.ACI)	Road	Improved roads, paved roads, gravel roads, improved dirt roads and off-road vehicle trails regularly maintained or in long-term continuing use. Generally constructed using machinery. Includes cutbanks and fills.
OTHER (12.4.15.ACI)	Other	Other covers not defined elsewhere – includes trash (describe in notes section).
NONSM (12.4.16.ACI)	Nonsampled	Use this code if any points along a transect cannot be sampled (describe reason in notes section).

Ground Surface Cover Transect categories:

ACI – Ground Surface Cover Transect categories		
Code (Item #)	Description	Definition
Ash (12.4.1.ACI)	Ash (organic from fire)	Remaining residue after all combustible material has been burned off.
BARE (12.4.2.ACI)	Bare ground	Exposed soil and rock fragments smaller than ¾-inch diameter. Do not include larger rocks protruding through the soil.
ROCK (12.4.3.ACI)	Rock	Rocks greater than ¾-inch diameter.
WATE (12.4.4.ACI)	Water (See Category EXCEPTION box below)	Water remaining above the ground surface during the growing season, such as streams, bogs, swamps, marshes and ponds.
TRIS (12.4.5.ACI)	Transient ice and snow	Surface area covered by ice and snow at the time of plot measurement, considered transient. For use when permanent ice and snow are not differentiated.
PEIS (12.4.6.ACI)	Permanent ice and snow	Surface area covered with ice and snow at the time of plot measurement, considered permanent. For use when permanent ice and snow are not differentiated.
WOOD (12.4.7.ACI)	Wood	Woody material, slash and debris; any woody material, small and large woody debris, regardless of depth. Litter and non-continuous litter are not included.
LIT (12.3.8.ACI)	Litter	Organic debris, freshly fallen or slightly decomposed; includes dead vegetation, animal feces, etc.
VEG (12.4.9.ACI)	Basal Vegetation	The area outline of a plant near the ground surface; in grass this comprises the shoot system at ground level, while in trees and shrubs it comprises the stem area.

Establishing the Plot and Selecting a Reference Point:

Follow procedures in section 0 of the FIA manual for finding/establishing the PC, and for selecting a suitable reference point (RP). If no suitable RP or witness landmarks are within the vicinity of the plot location, refer to ACI section 12 Field Location Reference form.

For ACI monumentation procedures, refer to ACI item 0.0.ACI.

For circumstances that may preclude plot/subplot establishment, and that are applicable to the ACI study, refer to ACI item 0.3.1RM.ACI.

Previous-plot sampling
Old nails/ tags/stakes:
Whenever possible co-locate plots that have been previously established. See sections 0.1.5 RM and 0.1.5.1RM for “Finding the Plot Center-Remeasurement Locations” and “RP Not Found”.
Most ACI locations were visited by field crews on a previous occasion. Some of these locations were sampled using plot designs that are no longer used. If found, remove any old subplot stakes, old RP/witness tree tags, or old tally-tree nails, if they are no longer used or part of the current FIA sample design (<i>and if they can be located</i>).

Data items with procedures that differ from the FIA manual are listed below with the “.ACI” extension: For all other “general description” data items, refer to the FIA manual.

ACI Item

0.0.ACI General Description (ACI Monumentation)

ACI monumentation procedures for subplots and microplots are described below (*see comment box*).

If a nonforest plot is located in a reserved/wilderness area, follow monumentation and specimen collection guidelines in the FIA manual.

ACI
Subplot/microplot monumentation
<p>For ACI plots , place a wire metal stake at the center of all subplots. Place a second stake at the center of microplots.</p> <p>If a subplot center metal stake cannot be placed in the ground because of bedrock, etc., build a small rock cairn (rock pile) around the stake. Attach a tag to the stake with the subplot number labeled. If a subplot center cannot be monumented at all (e.g., in a river, on a paved road), place a stake where possible (e.g., off the road), and attach a tag to the stake with the subplot number labeled. In the PLOT-LEVEL NOTES, reference the azimuth and distance from the offset stake to the correct subplot center. Take all measurements from the correct subplot/microplot center location, not the offset stake.</p>

each 1-foot mark (against the right side of the tape with your back to plot center). Record each point, referred to as a “hit,” on the Ground Surface Cover Transects Form (*supplemental form – refer to appendix B*) by the appropriate ground surface cover type category (categories listed below). If more than one category occurs at a point (e.g., litter on top of a rock), always record the ground cover category that is on top (i.e., the category that the pointed staff touches first). Note: Foliar canopy cover above the soil surface plane is not considered to be ground surface cover. See water exception below.

Repeat procedures for each transect direction. Each of the four transect directions will contain 25 hits (for a total of 100 hits for the entire subplot).

After all four transects on an individual subplot have been sampled, record the total number of hits by category on the supplemental data form and the PDR (each subplot should have a grand total of 100 hits combining all categories).

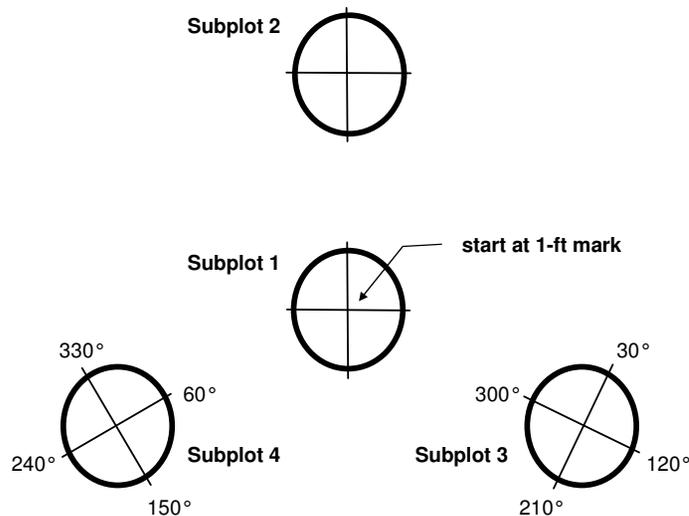
Note: This item is recorded by individual subplot; do not combine totals from different subplots.

azimuth directions listed below. Lay a cloth tape along the slope of the ground; do not correct the slope distance to obtain horizontal distance.

Transect azimuth direction:

ACI – Ground Surface Cover Transects				
Subplots	Degrees (extending outward from subplot center)			
	1 and 2	0 (360)	90	180
3	30	120	210	300
4	60	150	240	330

Ground Surface Cover Transects configuration:



Beginning at the 1-foot mark, place a tip of a plot stake or sharply pointed staff on the ground along the transect line at

0.3.1RM.ACI Circumstances Precluding Plot/Subplot Establishment

ACI – 2012 Field Season	
Ownership not National Forest Lands:	
<p>For the 2012 Field Season, if a subplot center, or an entire plot, is located in an ownership other than National Forest Lands, follow the procedures below. All contractor plots have been previously screened as National Forest Lands. If suspected to be outside NFS lands contact the project COR for instructions.</p> <p>Note: For “plot-level” and “subplot-level” circumstances that may preclude establishment on National Forest Lands, refer to the tables below.</p>	
Circumstance	Procedure
<p>Subplot center located in ownership other than National Forest Lands</p>	<p>If a subplot center is located in an ownership that is not National Forest Lands, then code “Nonsampled” for SUBPLOT/MACROPLOT STATUS and state the reason under SUBPLOT NONSAMPLED REASON. Leave all other subplot-level data items (FIA subplot variables, tree/sapling/seedling data, understory vegetation sample, down-woody materials sample, ACI subplot-level variables) blank for that particular subplot.</p>

Ownership not National Forest Lands:

Entire plot located in ownership other than National Forest Lands

If an **entire nonforest plot** is located in an ownership that is not National Forest Lands, complete the following:

1) Plot-level Data Items:

- STATE (FIA item 1.1)
- COUNTY (FIA item 1.2)
- PLOT NUMBER (FIA item 1.3)
- PLOT STATUS (FIA item 1.4) – record code=3, Nonsampled
- PLOT NONSAMPLED REASON (FIA item 1.5)
- SAMPLE KIND (FIA item 1.7)
- YEAR (FIA item 1.10.1)
- MONTH (FIA item 1.10.2)
- DAY (FIA item 1.10.3)
- CREW NUMBER(S) (FIA item 1.10.4**RM**)
- QA STATUS (FIA item 1.14)
- CREW TYPE (FIA item 1.15)
- INVENTORY PHASE (FIA item 8.1.1**RM**)

- 2) Record “Nonsampled – PLOT STATUS code=3” on the outside of the plot location packet, and briefly note the reason why the location is nonsampled.

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12.4.ACI GROUND SURFACE COVER TRANSECTS

Complete sample as specified below. If there are multiple conditions on the subplot area, transects may cross condition lines (i.e., ignore condition boundaries).

- ❖ **When collected:** Subplots with a nonforest/water condition at subplot center.
- ❖ **Field width:** 3 digits
- ❖ **Tolerance:**
 - Transect Azimuth: ± 2 degrees
 - Number of Hits per category: ± 10 percent

Procedures:

On each subplot area, lay out four transects that extend outward from subplot center at a distance of 25.0 feet, at the

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Plot-level circumstances precluding establishment:

<i>ACI -- Plot-level circumstances precluding establishment</i>	
Circumstance	Procedure
<p>Entire plot inaccessible or with hazardous situation</p> <p><i>(not due to Census or Noncensus water)</i></p>	<p>If an entire nonforest plot is denied access, inaccessible, or entirely too hazardous to visit, complete the following:</p> <p>3) Plot-level Data Items:</p> <ul style="list-style-type: none"> • STATE (FIA item 1.1) • COUNTY (FIA item 1.2) • PLOT NUMBER (FIA item 1.3) • PLOT STATUS (FIA item 1.4) – record code=3, Nonsampled • PLOT NONSAMPLED REASON (FIA item 1.5) • SAMPLE KIND (FIA item 1.7) • YEAR (FIA item 1.10.1) • MONTH (FIA item 1.10.2) • DAY (FIA item 1.10.3) • CREW NUMBER(S) (FIA item 1.10.4RM) • QA STATUS (FIA item 1.14) • CREW TYPE (FIA item 1.15) • INVENTORY PHASE (FIA item 8.1.1RM) <p>2) Record “Nonsampled – PLOT STATUS code=3” on the outside of the plot location packet, and briefly note the reason why the location is nonsampled (e.g., hazardous due to cliffs).</p>

ACI -- Plot-level circumstances precluding establishment	
Circumstance	Procedure
<p>Entire plot located in Census or Noncensus Water</p> <p><i>(see note below)</i></p>	<p>If an entire nonforest plot falls within Census/Noncensus water (<i>even if subplot centers cannot be physically visited</i>), then do not code the plot as “Nonsampled.” Enter codes to indicate the Census/Noncensus water status for the entire plot.</p> <p>For PDR entry, it will be necessary to complete the following menus as specified:</p> <p><u>Menu</u></p> <p>1 – Plot identification data (<i>enter required items</i>)</p> <p>2 – Point data (<i>enter required items; this menu contains FIA and ACI subplot-level variables; for SUBPLOT HABITAT TYPE, record code=9999999; for GROUND SURFACE COVER TRANSECTS classify all hits as “water”</i>)</p> <p>5 – Subplot tree data (<i>enter menu done/no data</i>)</p> <p>7 – Sapling data (<i>enter menu done/no data</i>)</p> <p>8 – Seedling data (<i>enter menu done/no data</i>)</p> <p>9 – Veg. profile data (<i>enter menu done/no data</i>)</p> <p>10 – Veg. Lifeform data (<i>enter all zeros</i>)</p> <p>11 -- Condition class data (<i>enter required items</i>)</p> <p>15 – Plot notes</p>

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Hironaka, M., M.A. Fosberg, and A.H. Winward. 1983. Sagebrush-Grass Habitat Types of Southern Idaho. Bulletin Number 35, University of Idaho. Forest, Wildlife and Range Experiment Station. Moscow, ID. 44p.

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<i>ACI – Plot-level circumstances precluding establishment</i>	
Circumstance	Procedure
Locations with Census or Noncensus Water	<p>Note:</p> <p>Do not classify an entire nonforest plot as Census/Noncensus water unless it is obvious that all subplot perimeters are within the water boundary. Before classifying an entire nonforest plot as Census/Noncensus water, verify that the perimeters of all four subplots fall within the water boundary.</p> <p>If all subplot centers are in Census/Noncensus water, but part of a subplot(s) is on nonforest land, code the subplot centers and subplot samples accordingly. Assign the Census/Noncensus water CONDITION CLASS to the subplot centers, but also determine the appropriate information to record for other data items (e.g., tree, understory vegetation, ground surface cover transects). If it would be too difficult to determine and measure subplot-level data items for a particular subplot, then classify the individual subplot as nonsampled.</p> <p>If only some of the subplot centers are within Census/Noncensus water, and others are located on nonforest land, it will be necessary to assign CONDITION CLASS NUMBERS to each condition class and code subplots/samples accordingly.</p>

Subplot-level circumstances precluding establishment:

**Habitat Type Reference Bibliography (detailed reference citation):
Literature Cited**

ACI -- Subplot-level circumstances precluding establishment	
Circumstance	Procedure
<p>Entire subplot located in Census or Noncensus Water</p> <p><i>(see note above)</i></p>	<p>If an entire subplot perimeter falls within Census/Noncensus water, then do not code the subplot as "Nonsampled." Enter codes to indicate the Census/Noncensus water status for the entire subplot.</p> <p>For PDR entry, it will be necessary to complete the following menus as specified (note: some menus are for the plot area):</p> <p><u>Menu</u></p> <p>1 – Plot identification data (<i>enter required items</i>)</p> <p>2 – Point data (<i>enter required items; this menu contains FIA and ACI subplot-level variables; for SUBPLOT HABITAT TYPE, record code=9999999; for GROUND SURFACE COVER TRANSECTS classify all hits as "water"</i>)</p> <p>5 – Subplot tree data (<i>enter menu done/no data</i>)</p> <p>7 – Sapling data (<i>enter menu done/no data</i>)</p> <p>8 – Seedling data (<i>enter menu done/no data</i>)</p> <p>9 – Veg. profile data (<i>enter menu done/no data</i>)</p> <p>10 – Veg. Lifeform data (<i>enter all zeros</i>)</p> <p>11 – Condition class data (<i>enter required items</i>)</p> <p>15 – Plot notes</p>

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Vegetation Formation	Geographic Area	References
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	Southern Utah	Padgett et al. 1989 Arches NP - Coles et al. 2009a Bryce Canyon NP - Tendick et al. 2011a Capitol Reef NP - Clark et al. 2009 Cedar Breaks NM - Tendick et al. 2011b Hovenweep NM - Von Loh et al. 2008 Natural Bridges NM - Coles et al. 2008b Zion NP - Cogan et al. 2004
	Nevada	Manning and Padgett 1995
	Northeastern California	Smith 1998 Weixelman et al. 1999
Alpine	Western Wyoming	Thilenius and Smith 1985 Potkin 1991
	Utah	Cedar Breaks NM - Tendick et al. 2011b Uinta Mountains - Brown 2006
	West-Central Idaho	Johnson 2004
	Eastern Idaho	Caicco 1983 Cooper et al. 1997 Urbanczyk 1993 Urbanczyk & Henderson 1994 Richardson & Henderson 1999

<i>ACI – Subplot-level circumstances precluding establishment</i>	
Circumstance	Procedure
<p>Entire subplot with hazardous situation</p> <p><i>(not due to Census or Noncensus water)</i></p>	<p>If an entire subplot cannot be accessed, due to a hazardous situation, such as cliffs, then code “Nonsampled” for SUBPLOT/MACROPLOT STATUS (FIA item 3.2) and state the reason under SUBPLOT NONSAMPLED REASON (FIA item 3.3). Leave all other subplot-level data items (FIA subplot variables, tree/sapling/seedling data, understory vegetation sample, down-woody materials sample, ACI subplot-level variables) blank for that particular subplot.</p>
<p>Subplot center inaccessible</p>	<p>If a subplot center cannot be safely accessed due to water or other hazardous situation, and it would be too difficult to determine and measure subplot-level data items located within the perimeter of the subplot (e.g., trees, understory vegetation, ground surface cover items), then code “Nonsampled” for SUBPLOT/MACROPLOT STATUS (FIA item 3.2) and state the reason under SUBPLOT NONSAMPLED REASON (FIA item 3.3). Leave all other subplot-level data items (FIA subplot variables, tree/sapling/seedling data, understory vegetation sample, down-woody materials sample, ACI subplot-level variables) blank for that particular subplot.</p>

0.3.2RM.ACI Plots with Accessible Forest Land

For **partial plots**, complete the following inventory sections (listed below) using procedures outlined in this document.

For ground surface cover transect data, only sample subplots with a nonforest/water condition at subplot center. Do not sample any subplots with an “accessible forest land” condition at subplot center (including those with a portion of the subplot classified with a nonforest/water condition) for ground surface transect data. As an exception, the down-woody materials (DWM) data, which is collected along transects that extend between subplots, can cross subplots with an accessible forest land condition.

1. The Field Location Description (Plot-Level) Data (ACI section 1) – Most variables will have the same code as used for the standard FIA inventory. Data items with different procedures and/or coding instructions include:

- PLOT STATUS (ACI item 1.4.ACI)
- SAMPLE KIND (ACI item 1.7.ACI)
- REGIONAL SAMPLE KIND (ACI item 1.7.1RM.ACI)
- WATER ON PLOT (ACI item 1.13.ACI)

Vegetation Formation	Geographic Area	References
	Southern Utah	Arches NP - Coles et al. 2009a Bryce Canyon NP - Tendick et al. 2011a Capitol Reef NP - Clark et al. 2009 Cedar Breaks NM - Tendick et al. 2011b Hovenweep NM - Von Loh et al. 2008 Natural Bridges NM – Coles et al. 2008b Zion NP - Cogan et al. 2004
Warm Desert Shrublands Creosote, blackbrush, etc.	Southern Nevada	Mojave Desert - Thomas et al. 2004
	Northern Utah	Ouray Refuge - Von Loh et al. 2002
	Southern Utah	Arches NP - Coles et al. 2009a Capitol Reef NP - Clark et al. 2009 Zion NP - Cogan et al. 2004
Grasslands and Forblands	Western Wyoming Eastern Idaho	Mueggler & Stewart 1980 Gregory 1983 Fossil Butte NM – Friesen et al. 2010
	Western Idaho	Tisdale 1986
	Southern Idaho	Hagerman Fossil Beds NM – Erixson & Cogan 2009
	Northern Utah	Dinosaur NM - Coles et al. 2008a Golden Spike NHS - Coles et al. 2011 Ouray Refuge - Von Loh et al. 2002
Grasslands and Forblands	Southern Utah	Arches NP - Coles et al. 2009a Bryce Canyon NP - Tendick et al. 2011a Capitol Reef NP - Clark et al. 2009 Cedar Breaks NM - Tendick et al. 2011b Hovenweep NM - Von Loh et al. 2008 Natural Bridges NM – Coles et al. 2008b Zion NP - Cogan et al. 2004
	Southern Nevada	Mojave Desert - Thomas et al. 2004
Riparian	Southwestern Idaho	Idaho CDC 2011 Janovsky-Jones et al. 2001 Hagerman Fossil Beds NM – Erixson & Cogan 2009
	Southeastern Idaho	Hansen and Hall 2002 Padgett et al. 1989
	Western Wyoming Eastern Idaho	Youngblood et al. 1985 Fossil Butte NM – Friesen et al. 2010
	Northern Utah	Padgett et al. 1989 Dinosaur NM - Coles et al. 2008a Golden Spike NHS - Coles et al. 2011 Ouray Refuge - Von Loh et al. 2002

Vegetation Formation	Geographic Area	References
Cold Desert Shrublands Sagebrush, Salt Desert, Mountain Brush	Southern Idaho	Hironaka et al. 1983 (using Tart's 2011 key) Craters of the Moon NM - Bell et al. 2009 Hagerman Fossil Beds NM – Erixson & Cogan 2009
	Wyoming – Teton & Lincoln Counties	Hironaka et al. 1983 (using Tart's 2011 key) Grand Teton NP - Cogan et al 2005

1. Based on West et al. (1998) and Nachlinger & Reese (1996).

Cold Desert Shrublands Sagebrush, Salt Desert, Mountain Brush	Northern Utah	Hironaka et al. 1983 (using Tart's 2011 key) Dinosaur NM - Coles et al. 2008a Golden Spike NHS - Coles et al. 2011 Ouray Refuge - Von Loh et al. 2002 Timpanogas Cave NM - Coles et al. 2009b
	West-Central Idaho	Johnson 2004
	Northeastern Idaho	Mueggler & Stewart 1980 Cooper et al. 1999
	Nevada – Douglas, Lyon, & Ormsby Counties	Blackburn et al. 1969d
	Nevada – Elko County	Blackburn et al. 1969c Blackburn et al. 1971 Jensen et al. 1988a,b
	Nevada – Eureka County	Blackburn et al. 1969a
	Nevada – Humboldt County	Blackburn et al. 1968b
	Nevada – Lander County	Blackburn et al. 1968c
	Nevada – Lincoln County	Blackburn et al. 1969e
	Nevada – Pershing County	Blackburn et al. 1969b
	Nevada – White Pine County	Blackburn et al. 1968a
	Northern Nevada	Jensen et al. 1988a,b Zamora and Tueller 1973
	Western Wyoming	Upper Green River Basin and Wind River Mtns - Tart 1996 Fossil Butte NM – Friesen et al. 2010

2. The **Condition Class Description Data** (ACI section 2) – Identify the **CONDITION CLASS NUMBER** (FIA item 2.4.1) associated with each nonforest/water **subplot center**, based on condition numbers assigned during the standard FIA inventory. Items collected at the condition level will be minimal. Follow procedures as outlined in ACI section 2. Data items with different procedures and/or coding instructions include:

- **CONDITION CLASS STATUS**
(ACI item 2.4.2.ACI)

3. The **Subplot Description Data** (ACI section 3) – Re-enter codes using ACI protocol. Most variables will have the same code as used for the standard FIA inventory. Data items with different procedures and/or coding instructions include:

- **SUBPLOT/MACROPLOT STATUS**
(ACI item 3.2.ACI)
- **MICROPLOT CENTER CONDITION**
(ACI item 3.5.ACI)
- **SUBPLOT CONDITION LIST**
(ACI item 3.9.ACI)

4. The **Tree/Sapling/Seedling Data** (ACI sections 5 and 6) – For subplots with a nonforest/water condition at subplot center, sample trees as specified:

- **Entire Tree Data Sample (no forest land condition)** – For subplots with no “accessible forest land condition(s)” within the subplot perimeter, sample all tally trees present (≥ 5.0 inches DBH/DRC). On the microplot, tally saplings and count seedlings by species.

- **Partial Tree Data Sample (forest land condition already sampled)** – For subplots with an “accessible forest land” condition present within the subplot perimeter (but not at subplot center), sample any additional tally trees ≥ 5.0-inches DBH/DRC that fall within the nonforest and/or water portion of the subplot. On the microplot, tally additional saplings and count seedlings by species. **Do not re-tally or re-count any sample trees on the “accessible forest land” portion of the subplot.**

5. The **Understory Vegetation Description Data** (ACI section 8) – For subplots with a nonforest/water condition at subplot center, complete the Understory Vegetation Description sample as outlined in this document. Some of the ACI protocols differ from the FIA manual.

6. **Down-woody Materials (DWM)** (ACI section 11) – For DWM, sample all accessible forest land and nonforest/water conditions (refer to ACI section 11 for further instruction). Note: As an exception, do not sample portions of transect that cannot be accurately sampled due to water/snow, or portions of transect that cross nonforest linear features (e.g., improved roads, maintained rights-of-way).

7. **ACI Subplot-Level Data** (ACI section 12). – For subplots with a nonforest/water condition at subplot center, collect data for all ACI subplot-level variables.

Intermountain Region References for Identifying Habitat Types

Vegetation Formation	Geographic Area	References
Aspen Forests	Intermountain Region	Mueggler 1988
Conifer Forests	Western & Central Idaho	Steele et al. 1981
	Wyoming & Eastern Idaho	Steele et al. 1983
	Northern Utah	Mauk & Henderson 1984
	Southern Utah	Youngblood & Mauk 1985
	Western Nevada	Fites 1993 Smith 1994 Potter 1998 Tart 2004 ¹
	North-Central Nevada	Steele et al. 1981 Tart 2004 ¹
	Northeastern Nevada	Mauk & Henderson 1984 (Tart 2004 ¹)
	Southeastern Nevada	Youngblood & Mauk 1985 (Tart 2004 ¹)
	Evergreen Woodlands Pinyon, juniper, Joshua tree, mtn. mahogany	Northern & Central Nevada
	Southern Nevada	Mojave Desert - Thomas et al. 2004
	Southern Idaho	Rust 1999
	Western Wyoming	Fossil Butte NM – Friesen et al. 2010
	Northern Utah	Dinosaur NM - Coles et al. 2008a Golden Spike NHS - Coles et al. 2011
	Southern Utah	Arches NP - Coles et al. 2009a Bryce Canyon NP - Tendick et al. 2011a Capitol Reef NP - Clark et al. 2009 Cedar Breaks NM - Tendick et al. 2011b Hovenweep NM - Von Loh et al. 2008 Natural Bridges NM – Coles et a. 2008b Zion NP - Cogan et al. 2004
Deciduous Woodlands Bigtooth maple, Gamble oak	Northern Utah	Timpanogas Cave NM - Coles et al. 2009b
	Southern Utah	Arches NP - Coles et al. 2009a Bryce Canyon NP - Tendick et al. 2011a Capitol Reef NP - Clark et al. 2009 Natural Bridges NM – Coles et a. 2008b Zion NP - Cogan et al. 2004

- **Subplot center located in nonforest land (*not permanent water*)** -- Examine the area surrounding the subplot, but within the nonforest condition occurring at subplot center. If several habitat types occur within the nonforest condition, record the type that occurs at subplot center. Note: A **forested habitat type** can occur in a nonforest condition.

For areas at subplot center that do not have a defined type listed in the Habitat Type manual(s), such as scree, record code=9999999, and describe in the PLOT-LEVEL NOTES (FIA item 1.18).

Note: For Region 4, refer to the Habitat Type keys and References based on the general Vegetation Formation and Geographic Areas listed below.

0.3.3RM.ACI

Plots with No Accessible Forest Land Present

For **nonforest plots**, complete the following inventory sections using procedures outlined in this document:

1. The **Field Location Reference Data** (ACI section 8). Collect data for all FIA items.
2. The **Field Location Description (Plot-Level) Data** (ACI section 1). Collect data for all FIA items.
3. The **Condition Class Description Data** (ACI section 2) – Items collected at the condition level will be minimal. Follow procedures as outlined in ACI section 2.
4. The **Subplot Description Data** (ACI section 3). Collect data for all FIA items.
5. The **Tree/Sapling/Seedling Data** (ACI sections 5 and 6) – On each subplot area, sample all tally trees present (≥ 5.0 inches DBH/DRC). On each microplot area, tally saplings and count seedlings by species.
6. The **Phase 2 Vegetation Profile** (ACI section 8) – For each subplot, complete the P2 Vegetation sample as outlined in the P2 FIA manual. Some of the ACI protocols differ (see revisions in Section 8).

7. **Down-woody Materials (DWM)** (ACI section 11) – For the DWM plot, sample all conditions (refer to ACI section 11 for further instruction). Note: As an exception, do not sample portions of transect that cannot be accurately sampled due to water/snow, or portions of transect that cross nonforest linear features (e.g., improved roads, maintained rights-of-way).
8. **ACI Subplot-Level Data** (ACI section 12). – Collect data for all ACI subplot-level variables.

12.2.**ACI** SUBPLOT RANGE TYPE
(Existing Vegetation Classification)

For all subplots, record code=999 (undefined). *This variable will not be classified at this time.*

12.3.**ACI** SUBPLOT HABITAT TYPE
(Potential Vegetation Classification)

Base this classification on the type occurring at **subplot center**. Follow procedures described below. Refer to local supplemental Habitat Type manuals. *Complete Habitat Type supplemental worksheets if required.*

- ❖ **When collected:** Subplots with a nonforest/water condition at subplot center.
- ❖ **Field width:** 7 digits
- ❖ **Tolerance:**
 - Series – No errors
 - Type – No errors

Procedures:

- **Subplot center located in permanent water** – If a subplot center is located in Census Water, Noncensus Water, or other permanent water, record code=9999999. For “other” permanent water, such as small streams/ponds not qualifying for Census/Noncensus water, describe in the PLOT-LEVEL NOTES (FIA item 1.18).

WATER categories:

- 91 **Census Water** - Lakes, reservoirs, ponds, and similar bodies of water 4.5 acres in size and larger; and rivers, streams, canals, etc., more than 200 feet wide – high-water mark. Portions of braided streams meeting this criteria and more than 50 percent water at normal high-water level are also considered Census water.

- 92 **Noncensus Water** - Lakes, reservoirs, ponds, and similar bodies of water 1.0 acre to 4.5 acres in size; and rivers, streams, canals, etc., 30.0 feet to 200 feet wide – high-water mark. Portions of rivers and streams not meeting the criteria for Census water, but at least 30-feet wide and 1 acre in size are considered Noncensus water. Portions of braided streams not meeting the criteria for Census water, but at least 30-feet wide and 1 acre in size and more than 50 percent water at normal high-water level are also considered Noncensus water.

Plot-level Data

ACI Sample Procedures:

For **partial plots**, although plot-level data (FIA section 1) will have been collected for the standard FIA inventory, codes will have to be re-entered using ACI protocol. Data items with procedures and/or coding instructions that differ are listed below (*in most instances data items will have the same code as that used for the FIA inventory; however, there is the possibility of different coding based on the procedure listed*).

For **nonforest plots**, collect all FIA plot-level data items listed in section 1 of the FIA manual. Data items with different procedures and/or coding instructions are listed below.

ACI Item Revisions:

Data items with procedures and/or coding instructions that differ from the FIA manual are listed below with the “.ACI” extension.

For all other FIA plot-level data items, refer to the FIA manual for item descriptions (*for partial plots, if an item is not listed below, re-enter the code used for the FIA inventory*). Disregard any references in the FIA manual to collect data only at locations with at least one accessible forest land condition.

Values:

NONFOREST LAND USE categories:

- 10 **Agricultural land** - Land managed for crops, pasture, or other agricultural use. Use code “10” only for areas not better described by one of the following:
- 11 Cropland
 - 12 Pasture (improved through cultural practices)
 - 13 Idle farmland
 - 14 Orchard
 - 15 Christmas tree plantation
- 20 **Rangeland** - Land primarily composed of grasses, forbs, or shrubs. This includes lands vegetated naturally or artificially to provide a plant cover managed like native vegetation and does not meet the definition of pasture.
- 30 **Developed** - Land used primarily by humans for purposes other than forestry or agriculture. Use code “30” only for land not better described by one of the following:
- 31 Cultural (business, residential, and other places of intense human activity)
 - 32 Rights-of-way (improved roads, railway, power lines, maintained canal)
 - 33 Recreation (parks, skiing, golf courses, developed campgrounds)
- 40 **Other** - Land parcels that do not fall into one of the uses described above. Examples include undeveloped beaches, barren land (rock outcrops, sand), marshes, bogs, ice, and snow.

ACI Subplot-level Data

ACI Sample Procedures:

This section lists additional variables/samples that have been added specifically for the ACI study. These variables are not discussed in the FIA manual.

For **partial plots**, collect the following ACI subplot-level data items on subplots with a nonforest/water condition at subplot center. For **nonforest plots**, collect the ACI data items on all subplots.

ACI Item**12.1.AC1** SUBPLOT NONFOREST/Water LAND USE

Use the categories below to classify the LAND USE located at **subplot center**.

The following NONFOREST LAND USE categories are finer subdivisions of nonforest land. At the condition-level (refer to FIA manual section 2), “Nonforest Land” must be at least 120-foot wide and 1 acre in size (exceptions apply to improved roads, rights-of-ways, developed areas). However, for the ACI study, the following nonforest LAND USE subcategories are based on the category occurring at subplot center and can be <120-foot wide and/or <1 acre in size. Therefore, **given that this classification is coded only at the subplot level, it is not intended for condition-level analysis.**

- ❖ **When collected:** Subplots with a nonforest/water condition at subplot center.
- ❖ **Field width:** 2 digits
- ❖ **Tolerance:** No errors
- ❖ **MQO:** At least 99% of the time

ACI Item**1.4.AC1****PLOT STATUS**

Values:

- 1 Sampled – at least one accessible forest land condition present.** Use this code for all **partial plots**, *even if there is a nonforest/water subplot that is nonsampled.*
- 2 Sampled – no accessible forest land condition present.** Use this code for nonforest plots if one or more subplots are **physically sampled** using the ACI procedures, **or if the entire nonforest plot is located in Census or Noncensus water.**
- 3 Nonsampled –** use this code for nonforest plots if the entire plot cannot be accessed; *do not use this code for entire plots located in Census or Noncensus water.*

Note: For some nonforest plots, it is possible that the PLOT STATUS code for the standard FIA inventory will differ from the PLOT STATUS code used for the ACI study. Using standard FIA protocol, it is acceptable to code a nonforest plot as “Sampled” (code 2) if a plot obviously contains no forest land, even though the location was not “physically” sampled.

However, using ACI protocol, a nonforest plot can only be coded “Sampled” (code 2) if one or more of the subplots is physically sampled (*because ACI samples can only be completed during an actual field visit*), or if the entire plot is located in Census or Noncensus water.

1.7.ACI
1.7.1RM.ACI

SAMPLE KIND
REGIONAL SAMPLE KIND

For **partial plots**, re-enter the code used for the standard inventory. For **nonforest plots**, record code=1.

1.13.ACI

WATER ON PLOT

For the ACI study, this variable is not an indicator of Census or Noncensus water on the plot location area. Record any water source that may be within the plot location area, other than Census or Noncensus water. If more than one option applies, record the option that has the greatest impact on the plot location area. Disregard the reference to record the source that has the greatest impact on the “accessible forest land portion” of the plot. Refer to the FIA manual for categories and codes.

Section 11

Down-Woody Materials

ACI Sample Procedures:

For the ACI, DWM has been revised to allow for sampling in accessible forest land and nonforest/water conditions. For this sample, data are collected along transects that extend between subplots. For partial plots, transects can cross subplots with an accessible forest land condition.

For **partial plots** and **nonforest plots**, follow procedures outlined in section 11 of the FIA manual. However, disregard all statements that the three main components of down-woody material (coarse-woody debris, fine-woody debris, and duff/litter) are sampled only on accessible forest land conditions. All three components may be sampled in both forest and nonforest/water conditions.

Instructions for transect line segmenting, and the 8 hierarchical rules used for choosing a maximum of two conditions per 120-foot transect, apply to forest and nonforest/water conditions.

As outlined in the DWM sampling guidelines, do not sample transect segments, or portions of segments, if they cannot be accurately sampled for coarse-woody debris (CWD) due to snow/water. Also, do not sample nonforest linear features (e.g., improved roads, maintained rights-of-way).

Section 2
Condition Class

ACI Sample Procedures:

For ACI plots, it will be necessary to determine the “number” of condition classes present, and what CONDITION CLASS STATUS (FIA item 2.1.1) is present at each **subplot center**, but it will not be necessary to “map” detailed condition boundaries as outlined in the FIA manual.

For **partial plots** and **nonforest plots**, follow the procedures listed below. Data items coded at the condition level will be minimal. For partial plots, re-enter codes for all condition-level data items listed below using ACI protocol.

ACI Condition Class Procedures:

1. Assign CONDITION CLASS NUMBERS to the plot area, based on conditions located at subplot centers.

After the PC has been established, identify all the condition(s) present on the plot area (encompassing the four subplots) using the following CONDITION CLASS categories; refer to the FIA manual for CONDITION CLASS definitions.

- **Accessible forest land** – *this class can be present on a partial plot, but not on a nonforest plot.*
- **Nonforest land** – *at the condition-level, combine all nonforest land subcategories; see comment box below.*
- **Noncensus water**
- **Census water**
- **Nonsampled**

Note: Ephemeral and intermittent streams are classified as land.

Section 10
Accounting Procedures

This section does not apply to the ACI.

For **partial plots**, identify the CONDITION CLASS NUMBER (FIA 2.4.1) associated with each nonforest/water **subplot center**, based on condition numbers assigned during the standard FIA inventory. *Note: For an exception to this procedure, refer to the “Exception to CONDITION CLASS STATUS and CONDITION CLASS NUMBER assignment for partial plots” comment box below.*

For **nonforest plots**, assign a condition number to each subplot, based on the CONDITION CLASS located at the subplot center. The condition class at the PC is designated as CONDITION CLASS NUMBER “1.” If different condition classes are located at other subplot centers, assign condition class numbers sequentially.

<i>ACI – condition-level data</i>
Nonforest Land (subcategories)
<p>At the condition-level, lump “nonforest land” subcategories (e.g., rangeland, developed land, agricultural land, rock outcrops) into the overall “Nonforest Land” CONDITION CLASS. Do not assign different CONDITION CLASS NUMBERS for distinct nonforest land subcategories.</p> <p>Note: For the ACI study, a separate subplot-level variable, NONFOREST LAND USE, has been added to code the nonforest subcategory present at each subplot center (refer to ACI item 12.1.ACI). However, at the condition-level, combine all nonforest land subcategories into the “Nonforest Land” CONDITION CLASS category.</p>

<i>ACI- condition-level data</i>
CONDITION CLASS NUMBER Examples:
<ul style="list-style-type: none"> • If the centers of subplots 1 and 2 are located in rangeland, and the centers of subplots 3 and 4 are located in a rock outcrop, only one “condition class” is present at all subplot centers (Nonforest Land). Assign CONDITION CLASS NUMBER “1” to all subplot centers. • If the centers of subplots 1 and 2 are located in rangeland, the center of subplot 3 is located in a rock outcrop, and the center of subplot 4 is located in Census water, two “condition classes” are present at the subplot centers (Nonforest Land and Census water). Assign CONDITION CLASS NUMBER “1” to subplot centers 1, 2, and 3, and assign CONDITION CLASS NUMBER “2” to subplot center 4. • If the centers of subplots 1, 2, and 3 are located in rangeland, and the center of subplot 4 is inaccessible (due to a cliff), two “condition classes” are present at the subplot centers (Nonforest Land and Nonsampled). Assign CONDITION CLASS NUMBER “1” to subplot centers 1, 2, and 3, and assign CONDITION CLASS NUMBER “2” to subplot center 4.

Circumstances Prohibiting Complete Subplot Sampling:

<i>ACI -- Understory Vegetation Description</i>
Unable to complete subplot sample
Permanent water on subplot:
<p>Due to safety hazards, do not include vegetative species on portions of subplot areas currently located within the boundaries of permanent water. Include species below a high-water mark if the water level at the time of the field visit is below this mark. Record a note on the Understory Vegetation Description form indicating the approximate subplot area not sampled due to water. If applicable, also include a note indicating the approximate area that was sampled below a high-water mark. Base all sample cover/layer estimates on the actual area sampled. Do not “double-count” or estimate higher cover/layer percentages to compensate for portions of the subplot not sampled due to water.</p>
Other situations on subplot:
<p>If a portion of a subplot has any other situation that prohibits sampling (e.g., cliffs, access denied) <i>not due to permanent water</i>, only include species within the accessible portion of the subplot. Record a note on the Understory Vegetation Description form describing the situation, and indicate the approximate area not sampled. Base all sample cover/layer estimates on the actual area sampled. Do not “double-count” or estimate higher cover/layer percentages to compensate for portions of the subplot not sampled.</p>

- **FIA crews only - Collect “unknown specimens” for all plants that cannot be identified to the species level** – For Part I of the Understory Vegetation Description sample, if a plant cannot be identified to the species level, record the plant as an “unknown.” Follow FIA protocol for the recording and collection of unknown specimens (refer to FIA item 9.4RM for detailed instructions). Record “UNKN1” in the species column for the first unknown, “UNKN2” for the second unknown, and so forth. Collect a sample to be sent to the office.

ACI – Understory Vegetation Description
Part I Species Entry on PDR

ACI – Understory Vegetation Description
Agricultural land / residential yards on subplot

ACI – condition-level data
Exception to CONDITION CLASS STATUS and CONDITION CLASS NUMBER assignment for partial plots
<p>For partial plots, always use the CONDITION CLASS NUMBERS assigned at the time of the standard FIA inventory, unless the following scenario applies.</p> <p>SCENARIO:</p> <p>Using standard FIA protocol, a nonforest condition can be classified as “Nonforest Land” (if it obviously contains no accessible forest land conditions), even if it is not physically sampled by the field crew. However, for ACI, a nonforest condition can only be classified as “Nonforest Land” if it is physically sampled (<i>because ACI samples can only be completed during an actual field visit</i>).</p> <p>If a nonforest condition cannot be sampled (e.g., due to a hazardous condition, access denied), and it was classified as “Nonforest Land” using FIA protocol, re-classify the CONDITION CLASS STATUS (FIA item 2.4.1) as “Nonsampled” for ACI. Also, assign a different CONDITION CLASS NUMBER (FIA item 2.4.1) – <i>use the next available number</i>. Use this newly assigned number for all subplot centers located within the ACI “Nonsampled” nonforest condition.</p>

2. Draw a simple condition boundary map.

Draw a simple sketch of all condition class boundaries located on the plot area on the Condition Boundary Map (on side 2 of the Field Location Reference Form). If multiple condition classes and/or nonforest land subcategories are present on the plot area, sketch the approximate boundary line(s). If any boundary line(s) intersects a subplot perimeter, sketch the approximate boundary line across the subplot area. Label condition classes by category, and write the assigned CONDITION CLASS NUMBER next to the label (e.g., rangeland - #1, rock out crop - #1, Noncensus water - #2).

Note: For **partial plots**, the map completed for the standard FIA inventory may be used. However, if any nonforest land subcategories are present on the location, sketch approximate boundary lines on the map.

Phase 2 (P2) Vegetation Profile

ACI Sample Procedures:

The FIA Understory Vegetation Description sample has been revised for the ACI study (revisions listed below). For **partial plots**, sample subplots with a nonforest/water condition at subplot center. For **nonforest plots**, sample all subplots. Other than the revisions listed below, follow sample procedures and Lifeform definitions as outlined in section 8 of the FIA manual.

Understory Vegetation Sampling Revisions:

Contractors and FIA crews need to be able identify all plants to species level that are provided on the “Region 4 Indicator and Dominance Type Species Lists”. If plants cannot be identified to the species level in the field, unknown plant samples need to be collected for identification. Follow FIA protocol for the recording and collection of unknown specimens.

Unknown plants collected by Contractor Crews should be identified prior to submission of plot packets for inspection.

Plant Identification training sessions will be provided by Region 4 NFS personnel to assist FIA crews and Inspectors in building the plant identification knowledge base that is needed to adequately conduct a regionwide All Condition Inventory (ACI).

In addition, a list of Region 4 Forest Personnel with local plant identification expertise will be identified by Forest or area for aiding FIA crews in indicator and dominance species plant identification.

- For each **CONDITION CLASS** designated on the plot area, record the following data items. Refer to the FIA manual for item descriptions.

Record the following items for each **CONDITION CLASS**:

<i>ACI – condition-level data</i>	
FIA Item No.	Item
2.4.1	CONDITION CLASS NUMBER
2.4.2.ACI	CONDITION CLASS STATUS Note: For the ACI study, a nonforest condition can only be classified as “Nonforest Land” if it is physically sampled. If a nonforest land condition is inaccessible, or access denied, classify the condition as “Nonsampled.”
2.4.3	CONDITION NONSAMPLED REASON Record this item only in an entire condition cannot be sampled (if CONDITION CLASS STATUS code=5, Nonsampled)
2.5.11 to 2.5.16	DISTURBANCE / YEAR Record up to three disturbances for each condition class (disturbances must have occurred within the last 5 years; if none of the disturbances listed apply, record “00”)
2.5.17 to 2.5.22	TREATMENT / YEAR Record up to three treatments for each condition class (treatments must be actual applications applied to the condition area within the last 5 years; if none of the treatments listed apply, record “00”)
2.5.23	PHYSIOGRAPHIC CLASS

4. Record additional condition-level data items (based on PC status).

The following items are needed to facilitate PDR functioning.

Record the following condition-level data items for each CONDITION CLASS based on the status of the item at the PC (*i.e., if more than one CONDITION CLASS is present on the plot area, determine the status for each item at the PC, and then re-enter the codes for all condition classes*). Refer to the FIA manual for item descriptions.

ACI – additional condition-level data (based on PC status)	
FIA Item No.	Item
2.5.1	RESERVED STATUS
2.5.2	OWNER GROUP
2.5.7	OWNER CLASS

Note: These entries will not be used to determine the actual status for each subplot center. For the ACI study, **subplot-level** variables (SUBPLOT RESERVED STATUS and SUBPLOT OWNER CLASS) have been added to indicate the actual status at each subplot center; refer to section 12 of this document (ACI items 12.6.ACI and 12.7.ACI).

ACI
Lack of suitable Reference Point (RP):
If no suitable RP landmarks (e.g., tree, large boulder, fence corner, sharp bend in road), are in the vicinity of the plot location, build a small rock cairn (rock pile). Insert a metal stake into the center of the rock cairn and attach an RP tag to the stake. If possible, use a large shrub (e.g., large sagebrush) as the alternative RP landmark, nail an RP tag to the base of the shrub, or place the small rock cairn (with the inserted stake and RP tag) at the base of the shrub. Describe the RP used in the “RP Description” notes section on the Field Location Reference Form.

ACI
Lack of suitable Witness Landmarks:
If no live trees are within the vicinity of the PC, select alternative witness landmarks that are likely to be present in 10 years (e.g., a sound snag, large stump, prominent rock). If no suitable landmarks can be found, build small rock cairns approximately 30-40 feet from the PC and at right angles to each other. Insert a metal stake into the center of the rock cairn and attach a witness tag to the stake (scribe “X” or “Y” on the tag). If possible, use a large shrub (e.g., large sagebrush) as the alternative witness landmark, nail a witness tag to the base of the shrub, or place the small rock cairn (with the inserted stake and tag) at the base of the shrub. Describe the alternative landmarks selected in the “Witness Trees” notes section on the Field Location Reference Form.

Field Location Reference Form

ACI Sample Procedures:

For **partial plots**, all FIA Field Location Reference items are collected by the standard FIA inventory.

For **nonforest plots**, collect all FIA Field Location Reference items listed in section 12 of the FIA manual. Disregard any references in the FIA manual to collect data only if there is at least one accessible forested condition on the location. For the noxious weed survey, examine all subplot areas; disregard the FIA manual reference to “not collect information for the plot if the location is completely nonforest.”

ACI Item Revisions:

Data items with procedures and/or coding instructions that differ from the FIA manual are listed below with the “.ACI” extension.

For all other FIA condition-level data items, refer to the FIA manual for item descriptions.

ACI Item

2.4.2.AC1

CONDITION CLASS STATUS

Values:

- 1 Accessible forest land
- 2 Nonforest land**
- 3 Noncensus water
- 4 Census water
- 5 Nonsampled

For the ACI study, a nonforest condition can only be classified as “Nonforest Land” if it is **physically** sampled (*because ACI samples can only be completed during an actual field visit*). If a nonforest land condition is inaccessible, or access denied, classify the condition as “Nonsampled.”

Subplot Information

ACI Sample Procedures:

This section pertains to FIA subplot-level data items (FIA section 3). Refer to ACI section 12 for other subplot-level data items that have been added for the ACI.

For **partial plots**, although subplot-level data (FIA section 3) will have been collected for the standard FIA inventory, codes will have to be re-entered using ACI protocol. Data items with procedures and/or coding instructions that differ are listed below (*in most instances data items will have the same code as that used for the FIA inventory; however, there is the possibility of different coding based on the procedure listed*).

For **nonforest plots**, collect all FIA subplot-level data items listed in section 3 of the FIA manual (refer to the ACI appendix A for a variable list). Data items with different procedures and/or coding instructions are listed below.

ACI Item Revisions:

Data items with procedures and/or coding instructions that differ from the FIA manual are listed below with the “.ACI” extension.

For all other FIA plot-level data items, refer to the FIA manual for item descriptions (*for partial plots, if a data item is not listed below, re-enter the code used for the FIA inventory*). Disregard any references in the FIA manual to collect data only on subplots with at least one accessible forest land condition.

Site Tree Information

This section does not apply to the ACI.

ACI Item**3.2.ACI****SUBPLOT/MACROPLOT STATUS**

Values:

- 1 Sampled – subplot center located in an accessible forest land condition.** This code is needed to facilitate PDR functioning. For partial plots, use this code for all subplots with a center located in an accessible forest land condition. These subplots were sampled using standard FIA protocol and are not part of the ACI study.
- 2 Sampled – subplot center located in a nonforest/water condition (forest land condition may be present on the subplot).** Use this code for subplots that are physically sampled using ACI procedures, or if an entire subplot is located in Census or Noncensus water.
- 3 Nonsampled –** use this code if an **entire subplot** cannot be accessed, regardless of the condition located at subplot center; *as an exception, do not use this code if an entire subplot is located in Census or Noncensus water.* Also, use this code if a **subplot center** cannot be accessed (e.g., due to cliffs or water), and it would be too difficult to determine and measure subplot-level data items.

3.5.ACI MICROPLOT CENTER CONDITION

Record the CONDITION CLASS NUMBER assigned to the **subplot center** (*even if another condition is located at the microplot center*).

Note: If there is another condition at the microplot center, the code recorded for the standard FIA inventory will differ.

3.9.ACI SUBPLOT/MACROPLOT CONDITION LIST

List all the CONDITION CLASS NUMBERS located on the subplot area (refer to ACI section 2). If more than one number is listed, detailed boundary data are not required. Complete the remainder of this field with zeros.

Section 6
Seedling Data

Refer to ACI section 5 for seedling count procedures.

Boundary References

This section does not apply to the ACI study.

Circumstances Prohibiting Complete Subplot Sampling:

ACI – Tree, Sapling, and Seedling Data

Unable to complete subplot/microplot sample

If a portion of a subplot/microplot has a situation that prohibits complete sampling (e.g., hazardous situation, access denied), include a note in the PLOT-LEVEL NOTES (FIA item 1.18) describing the situation, and indicate if any trees were not sampled.

For **partial plots and nonforest plots**, collect tree data on all subplots/microplots. On each subplot area, sample all tally trees present (\geq 5.0 inches DBH/DRC). On each microplot, tally saplings and count seedlings by species. Disregard FIA manual instructions to count seedlings by “condition and species.”

Note: For “qualifying tree” specifications, refer to FIA manual items 0.4.3**RM** (Subplot Tree Tally), 0.4.4**RM** (Microplot Sapling Tally), and 0.4.5**RM** (Seedling Counts).

Tree, Sapling, and Seedling Data

ACI Sample Procedures:

This section describes data collection procedures for tally trees/saplings (FIA section 5) and seedling counts (FIA section 6). For ACI, the “tally tree” definition is not limited to trees on accessible forest land conditions.

Refer to FIA item 0.4.3**RM** for subplot tally tree procedures and qualifying tree specifications. Refer to FIA item 0.4.4**RM** for microplot sapling tally procedures and qualifying tree specifications. Refer to FIA item 0.4.5**RM** for seedling count procedures.

Use the item descriptions listed in FIA sections 5 and 6. Disregard FIA manual references that pertain to:

- Remeasure(d) or remeasurement – tally tree, plots, etc.
- Resampled trees, “old” tally trees, trees on the formerly centered microplot
- “Account(ing)” for trees, Accounting plots
- Site trees or nontallied site trees (site trees will not be collected for nonforest/water conditions)
- P3 (or Phase 3) plots
- Previous inventory/survey

If necessary, follow procedures outlined for tallying trees on “reserved locations” (e.g., wilderness areas).

Use the “**RM** When collected” specifications to determine when to collect the data item for a particular tree. If the “**RM** When collected” option is not listed for a variable, then use the general “When collected.” References that state to collect the data item for a “new” live/dead tree apply to all trees sampled for the ACI.

Note: For “qualifying tree” specifications, refer to FIA manual items 0.4.3**RM** (Subplot Tree Tally), 0.4.4**RM** (Microplot Sapling Tally), and 0.4.5**RM** (Seedling Counts).