

# TECHNICAL NOTE

USDA NATURAL RESOURCES CONSERVATION SERVICE PACIFIC ISLANDS AREA

## Range and Pasture Technical Note - No. 6

### Grazing Land Plant Inventory

**Step 1:** Make a plant inventory map(s) of the planning area(s) (recommend 1:24,000 or less).

Maps should show:

- The best aerial imagery available
- Ranch infrastructure (fences, roads, troughs, etc)
- Ungrazable areas should be grayed out (steep gulch sides, ponds, quarries, lava flows etc)
- Identify any distinct areas dominated by brush or tree cover (brush cover type(s)) with hollow polygons (ie brushy stands, tree plots or forest stands, etc). Number or name brush cover types as appropriate. (may do this step in the field)
- Hollow soils layer with labels (or use separate soils map)

**Step 2:** Evaluate tree/brush by cover type(s) using the data sheet on page 4 of this tech note. If trees/brush occur randomly across the entire planning area, then evaluate the entire area. If brush occurs in clumpy stands and are all very similar, describe them collectively as a unit. If there are distinctively different brush cover types describe them separately. See directions on data sheet.

**Step 3:** Evaluate herbaceous plant community using page 5 of this tech note. Conduct a line-point intercept transect (See Att. A Quick Start LPI Refresher). Transects can be done on a tape or as a step transect (drop a pin approx. 6 inches in front of mark on toe). The number of transects needed will depend on the complexity and scale of the site. Mark the approximate path of the transect(s) on the plant inventory map(s). Transect data must adequately reflect site conditions. Transect locations should be located to include all common variations in landscape position, slope and vegetation. Summarize data on Line Point Intercept Summary Page.

**Step 4:** Establish at least 4 photo points with representative photos of the planning area's benchmark condition. Try to capture representative as well as any range within the plant community. Be sure to mark locations of photo points on veg inventory map and capture a permanent landmark in the picture to line up and match in future photos (see CPTN 5). Recommend including in the photos (on a photo board) the following information: Client name, photo point number, date, location (lat/long), direction, and brief description of photo.

#### Field Gear needed:

- ✓ Maps
- ✓ Plant ID book
- ✓ Monitoring Manual Vol I
- ✓ Pin (Wire flag)
- ✓ Field tape, 300 ft (opt)
- ✓ Compass
- ✓ Data sheets
- ✓ Clip board
- ✓ Photo board or sheets
- ✓ Camera
- ✓ Pens (incl dry erase)

Dakine Ranch PP# 1  
2017-08-15  
20° 03'33.29" N 155° 33'37.99" W  
Direction: 135° MN  
Ohia/Euc with brush in understory

**Step 5:** Attach map(s), LPI data sheets and photos to Grazing Land Plant Inventory Data Sheets and file. Use this data to help complete Grazing Land Condition Scoresheet (GLCS).

# Example plant inventory map

Customer(s): DAKINE RANCH  
District: HAWAII SOIL & WATER CONSERVATION DISTRICT  
Legal Description: TM K: xxxxxxxxx  
Date: 03/07/2016

Field Office: HAWAII SERVICE CENTER  
Agency: USDA - NRCS  
Assisted By: IMA PLANNER  
State and County: HI, Hawaii County, Hawaii









## Grazing Veg Inventory Map

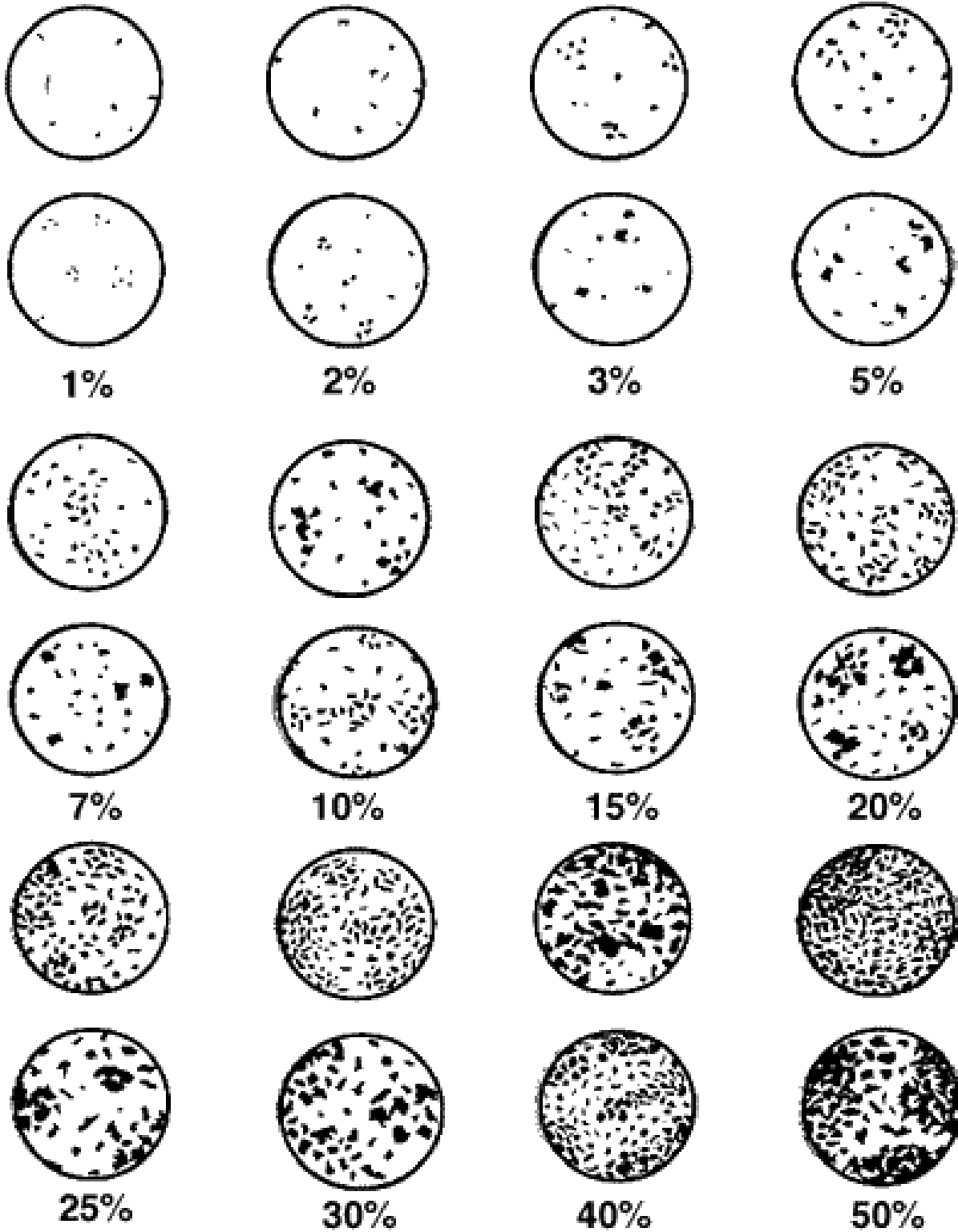
1 inch = 417 feet



**Brush Density Scores (BDS)** (Adapted from Texas A&M Agrilife Extension Publication B-6222)

	
<p><i>BDS 1: Very light brush, only a few scattered plants, not limiting forage growth</i></p>	<p><i>BDS 2: Light brush common, but not widespread, not significantly limiting mobility or production</i></p>
	
<p><i>BDS 3: Brush thick enough to limit mobility but livestock can maneuver through it.</i></p>	<p><i>BDS 3: Early stage invasion, brush small and widespread (frequent across an identified area)</i></p>
	
<p><i>BDS 4: Brush thick, mobility only possible in pathways or trails. Forage is thin in understory</i></p>	<p><i>BDS 5: Very thick brush, mobility through it nearly impossible. Little to no forage in understory.</i></p>

# Comparison Charts for Visual Estimation of Tree/Brush Canopy Cover



(modified from Terry & Chilianger, 1955)

## Grazing Land Plant Inventory Data Sheet

Client Name:				Island:	
Dominant Soil Type (s):		Slope:		Elevation:	
Planner(s):				Date:	

### I. Woody/Brush Inventory: Describe the plant community in the planning/grazing areas.

Assign a name or number to the different brush cover type(s) (if applicable) and identify on the map. Estimate the percent canopy cover of the brush cover type using the Comparison Charts for Visual Estimation of Tree/Brush Cover (pg 3). Also estimate the Brush Density Score (BDS) (using the table on pg 2) and assign an overall value of the cover type: desirable (+) or undesirable (-) or intermediate (0). Next describe the plants that make up the brush cover types. Enter the dominant plant names, height class (short: <3 ft, medium: 3-6 ft, tall: >6 ft) and approximate percent composition of each species in the cover type. Complete a separate table for each distinctly different brush cover type.

<b>Woody Cover Type Name/Number:</b>				<b>% Canopy:</b>			
<b>BDS:</b>		<b>+/-/0:</b>		<b>Understory (check all that apply):</b>			
<b>Tree/Brush Species:</b>			<b>Dom. Height class</b>	Grass		Dense	
				Forbs		Sparse	
				+ / - / 0		Litter	
						Bare soil	

<b>Woody Cover Type Name/Number:</b>				<b>% Canopy:</b>			
<b>BDS:</b>		<b>+/-/0:</b>		<b>Understory (check all that apply):</b>			
<b>Tree/Brush Species:</b>			<b>Dom. Height class</b>	Grass		Dense	
				Forbs		Sparse	
				+ / - / 0		Litter	
						Bare soil	

<b>Woody Cover Type Name/Number:</b>				<b>% Canopy:</b>			
<b>BDS:</b>		<b>+/-/0:</b>		<b>Understory (check all that apply):</b>			
<b>Tree/Brush Species:</b>			<b>Dom. Height class</b>	Grass		Dense	
				Forbs		Sparse	
				+ / - / 0		Litter	
						Bare soil	

## II. Line Point Intercept Summary

Complete a Line-Point Intercept Transect. Summarize transect data in tables below per transect. Either enter totals for “Desirable”, “Intermediate” and “Undesirable” plant groups or enter by species. Estimate the percent composition of each group/species in the sward by weight. Enter the average height or height range of each group/species and % top canopy cover.

A **desirable** species is readily consumed, persistent, and provides high tonnage and quality for a significant part of the growing season. **Undesirable** species, such as woody invaders, noxious weeds, and toxic plants, are those that typically are not eaten (rejected) by most livestock or cause undesirable side effects when eaten, and that crowd out more desirable species. **Intermediate** species are those which, while eaten, provide low tonnage or lose quality fast, and often have a short-lived grazing use period.

Transect No: _____ Plant Cover:	Avg height	% by wt	% Top Canopy (LPI)
	Total	100	
% Bare Ground			
% Litter			
% Basal Cover			

Transect No: _____ Plant Cover:	Avg height	% by wt	% Top Canopy (LPI)
	Total	100	
% Bare Ground			
% Litter			
% Basal Cover			

# Line-point Intercept Data Form

Client: \_\_\_\_\_

Shaded cells for calculations

Transect No: \_\_\_\_\_ Observer: \_\_\_\_\_ Recorder: \_\_\_\_\_

Direction: \_\_\_\_\_ Date: \_\_\_\_\_ Intercept (Point) Spacing Interval = \_\_\_\_\_ cm ( \_\_\_\_\_ in)

Pt.	Top layer	Lower layers			Soil surface	Pt.	Top layer	Lower layers			Soil surface
		Code 1	Code 2	Code 3				Code 1	Code 2	Code 3	
1						26					
2						27					
3						28					
4						29					
5						30					
6						31					
7						32					
8						33					
9						34					
10						35					
11						36					
12						37					
13						38					
14						39					
15						40					
16						41					
17						42					
18						43					
19						44					
20						45					
21						46					
22						47					
23						48					
24						49					
25						50					

% foliar cover = \_\_\_\_\_ top layer pts (1st col) x 2 = \_\_\_\_\_ %

% bare ground\* = \_\_\_\_\_ pts (w/NONE over S) x 2 = \_\_\_\_\_ %

% basal cover = \_\_\_\_\_ plant base pts (last col) x 2 = \_\_\_\_\_ %

**Top layer codes:** Species code, common name, or NONE (no cover).

**Lower layers codes:** Species code, common name, L (herbaceous litter), WL (woody litter, >5 mm (~1/4 in) diameter).

5mm = approx. width of pencil eraser.

Duff: Partially decomposed (unrecognizable) plant material (organic matter)

## Unknown

### Species Codes:

AF# = annual forb  
 PF# = perennial forb  
 AG# = annual graminoid  
 PG# = perennial graminoid  
 SH# = shrub  
 TR# = tree

## Soil Surface (do not use litter):

Species Code (for basal intercept)  
 R = rock fragment (>5 mm (~1/4 in) diameter)  
 BR = bedrock, M = moss  
 LC = visible biotic crust on soil  
 S = soil without any other soil surface code  
 EL = embedded litter  
 D = duff K = manure

\*Bare ground occurs ONLY when Top layer = NONE, Lower layers are empty (no L), and Soil surface = S.

% cover by spp = top layer pts by spp x 2 = \_\_\_\_\_ %

% litter = \_\_\_\_\_ lower layer pts L or WL x 2 = \_\_\_\_\_ %

Original data sheet from: Univ. of AZ Monitoring Manual. See Attachment A: Quick Start LPI Refresher for more detailed instructions.

## Common Plants List

Common	Scientific	Code	Woody or Herbaceous	Desirable (+) / Undesirable (-) / Intermediate (0)
African couchgrass	<i>Digitaria abyssinica</i>	DIAB	H	0
Ageratum	<i>Ageratum conyzoides</i>	AGCO	H	-
Apple of sodom	<i>Solanum linnaeanum</i>	SOLI3	H	-
Aramina	<i>Urena lobata</i>	URLO	H	-
Balloon Plant	<i>Asclepias physocarpa</i>	ASPH2	H	-
Baron's grass	<i>Ischaemum polystachyum</i>	ISPO3	H	+
Broom sedge	<i>Andropogon virginicus</i>	ANVI2	H	-
Buffel grass	<i>Pennisetum ciliare</i>	PECI	H	+
Bullthistle	<i>Cirsium vulgare</i>	CIVU	H	-
Bushy beardgrass	<i>Schizachyrium condensatum</i>	SCCO10	H	-
California grass	<i>Urochloa mutica</i>	URMU	H	+
Carpet Grass	<i>Axonopus fissifolius</i>	AXFI	H	0
Comb hyptis	<i>Hyptis pectinata</i>	HYPE3	H	-
Common Buttercup	<i>Ranunculus spp</i>	RANUN	H	0
Common Geranium	<i>Geranium spp</i>	GERAN	H	0
Common vetch	<i>Vicia spp</i>	VICIA	H	+
Cowpea	<i>Vicia spp</i>	VICIA	H	+
Creeping indigo	<i>Indigofera spicata</i>	INSP2	H	-
Cuba jute	<i>Sida rhombifolia</i>	SIRH	H	-
Dallis grass	<i>Paspalum dilatatum</i>	PADI3	H	+
Elephant's foot	<i>Elphantopus mollis</i>	ELMO5	H	-
False mallow	<i>Malvastrum coromandelianum</i>	MACO6	H	-
Fireweed	<i>Senecio madagascariensis</i>	SEMA15	H	-
Florida prickly blackberry	<i>Rubus argutus</i>	RUAR2	H	-
Fountain grass	<i>Pennisetum setaceum</i>	PESE3	H	-
Glenwood grass	<i>Sacciolepis indica</i>	SAIN	H	0
Guinea grass	<i>Urochloa maxima</i>	URMA3	H	+
Hilo grass	<i>Paspalum conjugatum</i>	PACO14	H	0
Himalayan raspberry	<i>Rubus ellipticus</i>	RUEL3	H	-
Honohono grass	<i>Commelina diffusa</i>	CODI5	H	0
Japanese mat rush	<i>Juncus effusus</i>	JUEF	H	-
Joee, seashore vervain	<i>Verbena litoralis</i>	VELI	H	-
Kaimi clover	<i>Desmodium incanum</i>	DEIN3	H	+
Kikania, cocklebur	<i>Xanthium strumarum</i>	XAST	H	-
Kikuyu grass	<i>Pennisetum clandestinum</i>	PECL2	H	+
Mysore raspberry	<i>Rubus niveus</i>	RUNI4	H	-
Natal red top	<i>Rhynchelytrum repens</i>	RHRE2	H	0
Nutsedge	<i>Cyperus spp</i>	CYPER	H	-
Orchard Grass	<i>Dactylis glomerata</i>	DAGL	H	+
Pangola grass	<i>Digitaria eriantha</i>	DIER	H	+
Pearlflower	<i>Heterocentron subtriplinervium</i>	HESU4	H	-
Pitted Beard Grass	<i>Bothriochloa pertusa</i>	BOPE2	H	0
Rattail/Smut grass	<i>Sporobolus indicus</i>	SPIN4	H	0/-
Sacramento Bur	<i>Triumfetta semitriloba</i>	TRSE4	H	-
Sand Mallow	<i>Sidastrum micranthum</i>	SIDAS	H	-
Sedge	<i>Cyperus spp</i>	CYPER	H	-



Sleeping grass	<i>Mimosa pudica</i>	MIPU8	H	-
Small desmodium	<i>Desmodium heterophyllum</i>	DEHE9	H	+
Sour Grass	<i>Digitaria insularis</i>	DIIN2	H	-
Spanish needle	<i>Bidens pilosa</i>	BIPI	H	-
Spiny amaranth	<i>Amaranthus spinosus</i>	AMSP	H	-
Star grass	<i>Cynodon nlemfuensis</i>	CYNL80	H	+
Sweet Vernal	<i>Anthoxanthum odoratum</i>	ANOD	H	0
Thimbleberry	<i>Rubus rosifolius</i>	RURO	H	-
Tibouchina	<i>Tibouchina herbacea</i>	TIHE2	H	-
Tineroo glycine	<i>Neonotonia wightii</i>	NEWI2	H	+
Tumbleweed, Russian thistle	<i>Salsola kali</i>	SAKA	H	-
Turkeyberry	<i>Solanum torvum</i>	SOTO4	H	-
Uhaloa	<i>Waltheria indica</i>	WAIN	H	0
Uluhe	<i>Dicranopteris linearis</i>	DILI	H	-
Vasey grass	<i>Paspalum urvillei</i>	PAUR2	H	0
Velvet Grass	<i>Holcus lanatus</i>	HOLA	H	+/0
Wainaku grass	<i>Panicum repens</i>	PARE3	H	0/-
Wedelia	<i>Sphagneticola trilobata</i>	SPTR6	H	-
White Clover	<i>Trifolium repens</i>	TRRE3	H	+
African Tulip	<i>Spathodea campanulata</i>	SPCA2	W	0/-
Albizia	<i>Albizia spp</i>	ALBIZ	W	0/-
Black wattle	<i>Acacia meansii</i>	ACME80	W	-
Cat's Claw	<i>Caesalpinia decapetala</i>	CADE15	W	-
Christmas Berry	<i>Schinus terebinthifolius</i>	SCTE	W	0/-
Common Guava	<i>Psidium guajava</i>	PSGU	W	-
Formosa Koa	<i>Acacia confusa</i>	ACCO	W	-
Haole koa	<i>Leucaena leucocephala</i>	LELE10	W	+
Ironwood	<i>Casurina spp</i>	CASUA	W	0/-
Jacaranda	<i>Jacaranda mimosifolia</i>	JAMI	W	0/-
Kiawe	<i>Prosopis pallida</i>	PRPA4	W	0
Klu	<i>Acacia farnesiana</i>	ACFA	W	-
Koa	<i>Acacia koa</i>	ACKO	W	0
Kosters curse	<i>Clidemia hirta</i>	CLHI3	W	-
Lantana	<i>Lantana camara</i>	LACA2	W	-
Melochia	<i>Melochia umbellata</i>	MEUM3	W	0/-
Octopus Tree	<i>Schefflera actinophylla</i>	SCAC2	W	0/-
Ohia	<i>Metrosideros polymorpha</i>	MEPO5	W	0
Opiuma	<i>Pithecellobium dulce</i>	PIDU	W	-
Pluchea/ Sourbush	<i>Pluchea spp</i>	PLUCH	W	-
Silver Oak	<i>Grevillea robusta</i>	GRRO	W	0/-
Strawberry guava	<i>Psidium cattleianum</i>	PSCA	W	-