Poke Test Site Example and Method

Protected Area
(animals find it difficult to graze)

Cattle trail

Representative Grazed Area
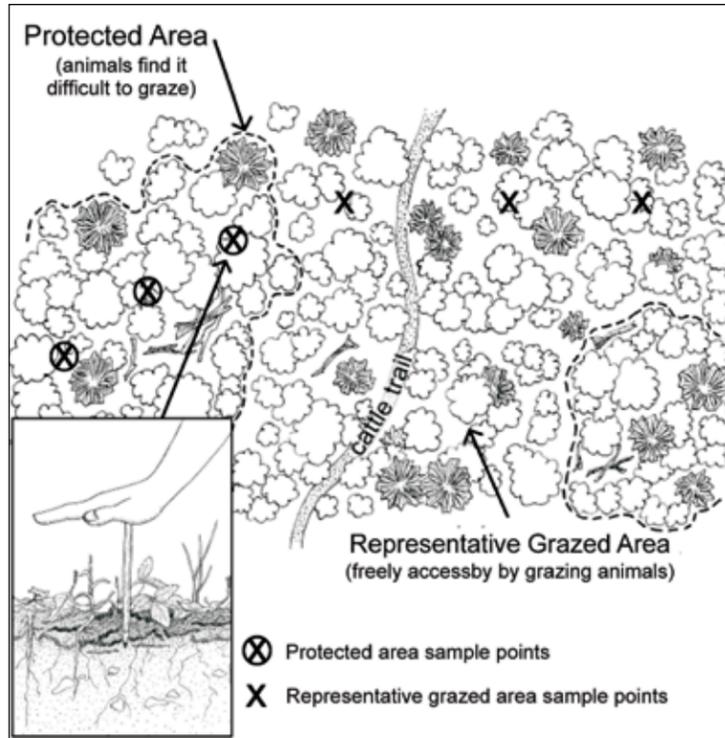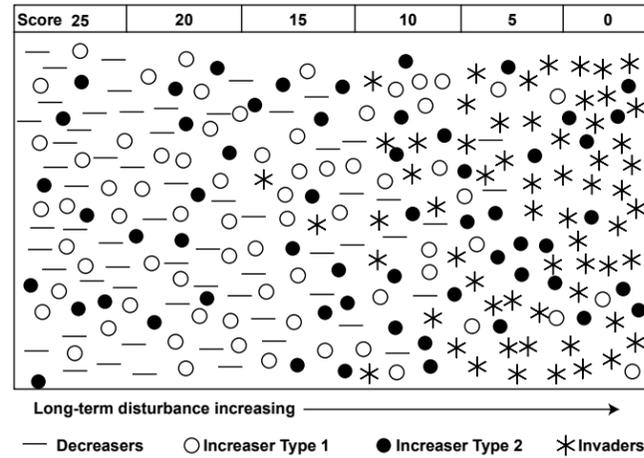(freely accessby by grazing animals)

⊗ Protected area sample points

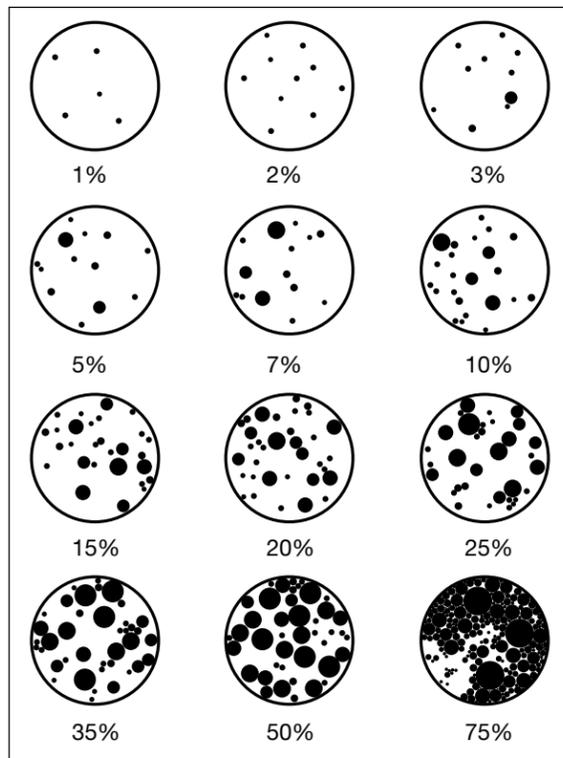✕ Representative grazed area sample points

The "Poke (Pencil) Test Method" can be used to assess LFH thickness and mineral soil compaction or LFH compressibility. To do this, place the eraser end of a sharp pencil (or similar object) in the middle of your palm and then, with a straight arm, push the pencil into the LFH. Thickness of the LFH can be estimated by the distance the pencil penetrates before it hits mineral soil. For compressibility, gauge the resistance you feel as the pencil moves through the LFH. Compare the average from the protected areas to the average of the unprotected areas. Generally, a thinner LFH or more penetration resistance is found where disturbance has affected the site.

Common Response to Disturbance and Possible Ecological Status Scores

Score	25	20	15	10	5	0

Long-term disturbance increasing →

— Decreasers   ○ Increaser Type 1   ● Increaser Type 2   ✳ Invaders

Percent Cover Examples

1%   2%   3%
5%   7%   10%
15%   20%   25%
35%   50%   75%

Density Distribution

Class	Description of abundance in polygon	Distribution	Weeds Score
0	None		5
1	Rare		3
2	A few sporadically occurring individual plants		3
3	A single patch		
4	A single patch plus a few sporadically occurring plants		1
5	Several sporadically occurring plants		1
6	A single patch plus several sporadically occurring plants		
7	A few patches		
8	A few patches plus several sporadically occurring plants		0
9	Several well spaced patches		
10	Continuous uniform occurrences of well spaced plants		
11	Continuous occurrence of plants with a few gaps in the distribution		
12	Continuous dense occurrence of plants		
13	Continuous occurrence of plants with a distinct linear edge in the polygon		

Field Workbook

Range Health Assessment

Field Worksheet for Forests

Alberta Government

What is rangeland health?

Range health refers to the ability of rangelands to perform key ecological (i.e., natural) functions like:

- ❑ produce plant biomass including forage for livestock and wildlife,
- ❑ maintain site potential by protecting soil from erosion and degradation,
- ❑ capture and beneficially release water,
- ❑ cycle nutrients and energy, and
- ❑ maintain biological diversity.

Healthy rangelands optimally perform key functions and provide a broad range of values and benefits for society (e.g., carbon storage, clean water, wildlife habitat, recreation), whereas unhealthy rangelands cannot. Healthy rangelands provide stable grazing opportunities along with watershed and soil protection.

Why should I consider range health?

Health assessments provide an indication of sustainability and resiliency. They are a snapshot in time of management impacts on a particular site. Monitoring range health can highlight the impacts of disturbance, indicate management issues, guide management changes and evaluate outcomes. Assessments provide a means of tracking and communicating successes or arising issues.

What can this tool assess? How do I assess my forested rangelands?

This is an abridged version of the forested rangeland health assessment from the Rangeland Health Assessment for Grassland, Forest and Tame Pasture (Adams et al., 2016). The assessment focuses on evaluating the level of impact that disturbances are having on range health. Although the wording of the tool has an emphasis on grazing disturbances, any disturbance such as wildlife use and human activities (e.g., off road vehicle use, camping, etc.) could be evaluated.

The forested range health assessment can be used for deciduous and coniferous forests at any successional stage including cutblocks and burns throughout the province. If a more detailed assessment of a cutblock area is required, see the Alberta Cutblock Assessment Tool (Level 1 Status Assessment, 2008). Occasionally, areas cleared for tame pasture can have substantial tree regeneration. In these cases, if the area is currently managed as tame pasture the Tame Pasture Health Assessment should be used.

A health assessment involves comparing indicators of key ecological functions and processes for the assessment site to a standard (i.e., Reference Plant Community) representing the potential plant community type for that ecological site and forest successional stage. The Reference Plant Community (RPC) is an expression of plant composition on similar growing conditions with little or no disturbances (e.g., ungrazed or lightly grazed). The Alberta Rangeland section has developed range plant community guides that provide further information about RPCs and the sites you may be evaluating (available on the Government of Alberta website).

An assessment is completed within, and represents one, ecological site. A pasture unit may contain a variety of sites with different plant communities as a result of successional stages or site potential. If required, map the pasture unit subdividing areas of differing site potential or successional stages and assess each separately.

Health categories

The range health score is a cumulative measure of 5 indicators of key characteristics and ecosystem functions and is classified in one of the following health categories:

Healthy:
- A score of 75% or greater
- All of the key functions are being performed
- Grazing (disturbance) is balanced with site capabilities

Healthy with Problems:
- A score of 50 to 74%
- Performance of one or two of the key functions may be impaired
- This score is an early warning that adjustments to management are needed
- Recovery to a healthy category can normally occur within a few years

Unhealthy:
- A score of less than 50%
- Few of the functions of healthy range are being performed
- Significant management changes are required to address unsustainable grazing pressure or other types of disturbance
- Recovery to a healthy category may take many years

For more detailed information:

For more discussion on this tool, range health concepts and evaluation techniques, please refer to Adams et al., 2016 "Rangeland Health Assessment for Grassland, Forest and Tame Pasture" available at a Government of Alberta Rangelands office or website.

Rangeland Health Assessment for Grassland, Forest & Tame Pasture

Field Workbook

Question #1 — How do the plants on the site compare to the reference plant community (RPC)?

Evaluate the impact that disturbance is having on the observed plant community composition compared to the appropriate reference plant community (RPC). Refer to the natural subregion plant community guides developed by the Alberta Rangeland section. As disturbance (e.g., grazing pressure) increases from light or moderate, to heavy or very heavy, there is a change in the understory species composition from desirable decreaser species (e.g., low bush cranberry, red osier dogwood, tall lungwort, showy aster) to less desirable increaser (e.g., snowberry) and invader species (e.g., Kentucky bluegrass, clover or timothy).

Score: (see the response to disturbance, percent cover and density distribution (DD) graphics on back page)

- **25 =** composition resembles the RPC; no reduction in decreasers; no invaders present (DD class 0); disturbance is light to undisturbed
- **20 =** composition resembles the RPC; a reduction in decreasers only occurs in unprotected areas; there is a greater proportion of increasers; invaders are rare (DD class 0-2); disturbance is light to moderate
- **15 =** composition has a greater proportion of increasers; decreasers are reduced throughout; small patches of invaders may be present but not dominant (DD class 1-7); disturbance is moderate
- **10 =** composition has significant proportion of invaders (DD class 8-10); decreasers are limited to small protected areas or absent; disturbance is heavy with some moderately disturbed patches
- **5 =** invaders are dominant (DD class 11-12); palatable increasers and invaders are common; disturbance is heavy throughout
- **0 =** invaders are dominant throughout (DD class 11-12); palatable increasers and invaders are uncommon; disturbance is very heavy

Question #2 — Are there any changes in forest plant community structure?

Evaluate forest structure, plant utilization, growth form and vigour compared to the RPC. In forested communities, life forms layers may include: 1) trees (overstory trees > 5m), 2) understory trees and tall shrubs (> 2m), 3) medium shrubs (0.5m -2m), 4) tall forbs and grasses, and 5) ground cover (low growing grasses, forbs, shrubs, mosses and lichens). Each RPC will have a characteristic number and expression of these layers forming the structure of the forest. For example, some RPCs will naturally have fewer than five layers. Structural layers contribute to maximizing plant production and habitat qualities. Utilization or mechanical damage by livestock and wildlife, along with other disturbances, can affect the appearance or growth form of plants. Repeated heavy use of shrubs may cause a hedged or umbrella shaped appearance, whereas many forbs and grasses may develop a "ground hugging" growth form. Under a continued heavy grazing regime, structural layers will be first reduced, and then eliminated. Plant vigour (i.e., size, reproductive capability, number of shoots or tillers and amount of new growth) is an expression of overall plant health or robustness.

Score:
- **35 =** all life form layers are present; growth form and vigour resembles the RPC; utilization of woody species is light
- **27 =** all layers are present; preferred plants are moderately utilized, showing slightly reduced vigour and change in growth form; utilization of non-preferred plants is light
- **18 =** one layer is significantly reduced or absent; preferred plants are heavily utilized causing alteration of growth form and reduced vigour; non-preferred plants have light to moderate utilization, showing slightly reduced vigour and alterations in growth form
- **9 =** two layers are significantly reduced or absent; preferred plants have poor vigour and severely altered growth form; non-preferred plants have significantly reduced vigour and altered growth form; preferred shrubs are very heavily utilized or eliminated whereas non-preferred shrubs are heavily utilized
- **0 =** three layers are significantly reduced or absent; preferred plants if present, have severely altered growth form and very poor vigour; non-preferred plants are very heavily utilized, causing poor vigour and severely altered growth form


| 35 all layers present, light use | 27 all layers present, moderate use | 18 1 layer reduced or absent | 9 2 layers reduced or absent | 0 3 layers reduced or absent |

Question #3 — Are there changes to the surface organic layer (LFH)?

Evaluate by comparing the distribution, compaction and thickness of LFH between representative disturbed (unprotected) and protected areas (see poke test method illustration on the back page). The organic matter layer found just above mineral soil in a forest is called LFH. It consists of varying thicknesses of undecomposed (L), partly decomposed (F) and fully decomposed vegetation (H). LFH protects soil from erosion, retains moisture and stores and cycles nutrients and minerals. In cutblocks, recent burns and some coniferous forests that have a reduced or absent LFH layer, assessment of compaction should be performed on mineral soil.

Score:
- **20 =** no significant difference in LFH distribution and thickness (<10%); no significant difference in mineral soil compaction/LFH compressibility (<20% more effort required) between unprotected and protected areas
- **14 =** LFH is variably thick and therefore somewhat patchy; LFH thickness is slightly reduced (10-25%); unprotected areas are slightly more compacted, difficult to compress, and are more resistant to penetration (<50% more effort required)
- **8 =** LFH thickness significantly reduced (26-50%); LFH is clearly patchy; unprotected areas are significantly compacted and resistant to penetration (50-200% more effort required); protected areas are small and isolated
- **0 =** LFH thickness severely reduced (>50%); compaction and resistance to penetration is very high (>200% more effort required); protected areas tend to be very small or absent
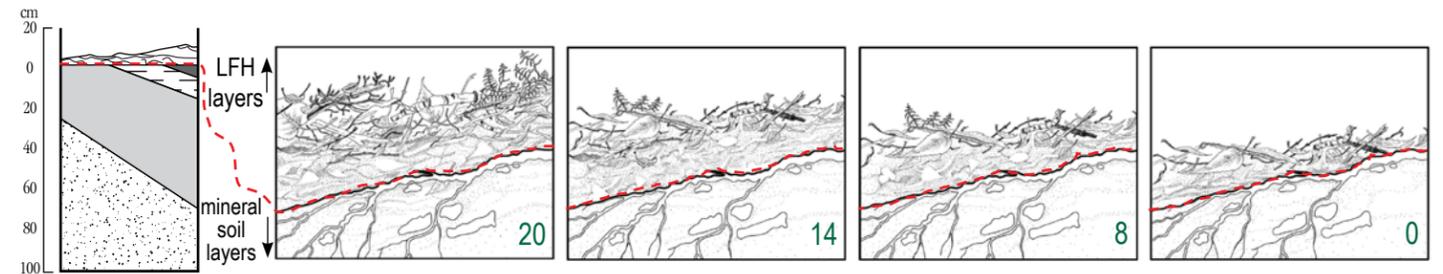
Question #4 — Is the site stable?

Site stability is evaluated in two parts (4.1 and 4.2) by comparing erosion and bare soil to expected (natural) levels for the RPC. Eroding or exposed soils are clear indicators of loss of key ecological functions. Most healthy forests are naturally stable with no erosion and <1% bare soil. Human-caused effects are those over and above what is normal for the RPC and can result directly from grazing, industrial use, off highway vehicles, recreation, or wildlife use or indirectly from rodent burrowing.

Score: (Answer both 4.1 and 4.2. See the percent cover examples on back page.)

4.1 Erosion
- **5 =** no erosion beyond the natural extent for the site
- **3 =** some micro erosion signs (e.g., plant pedestaling and hoof shearing)
- **1 =** both macro (e.g., trails, gully or rill channels) and micro evidence present; no off-site movement of soil
- **0 =** extreme amounts of soil moving off-site

4.2 Human-caused Bare Soil

| 5 = < 1% | 3 = 1 to 5% | 1 = 6 to 15% | 0 = > 15% |

Question #5 — Are noxious weeds present?

The degree of noxious weed infestation is evaluated in two parts (5.1 percent cover and 5.2 density and distribution). Management strives to maintain native plant vigour and dominant cover. The risk of weed invasion is minimized when this is achieved. Low tolerance and early detection of noxious weeds can help limit their spread and reduce control costs. Include weeds listed as prohibited noxious and noxious in the Alberta *Weed Control Act*, or any problem weeds elevated by the local government (e.g., Municipal District).

Score: (Answer both 5.1 and 5.2 using the percent cover and density distribution (DD) classes on the back page.)

5.1 Cover (cumulative cover of all noxious weeds)

| 5 = no noxious weeds | 3 = < 1% cover | 1 = 1 to 15% cover | 0 = > 15% cover |

5.2 Density Distribution (DD) (cumulative DD of all noxious weeds)

| 5 = no noxious weeds | 3 = low level infestation (DD class 1-3) | 1 = moderate infestation (DD class 4-7) | 0 = heavy infestation (DD class 8-13) |