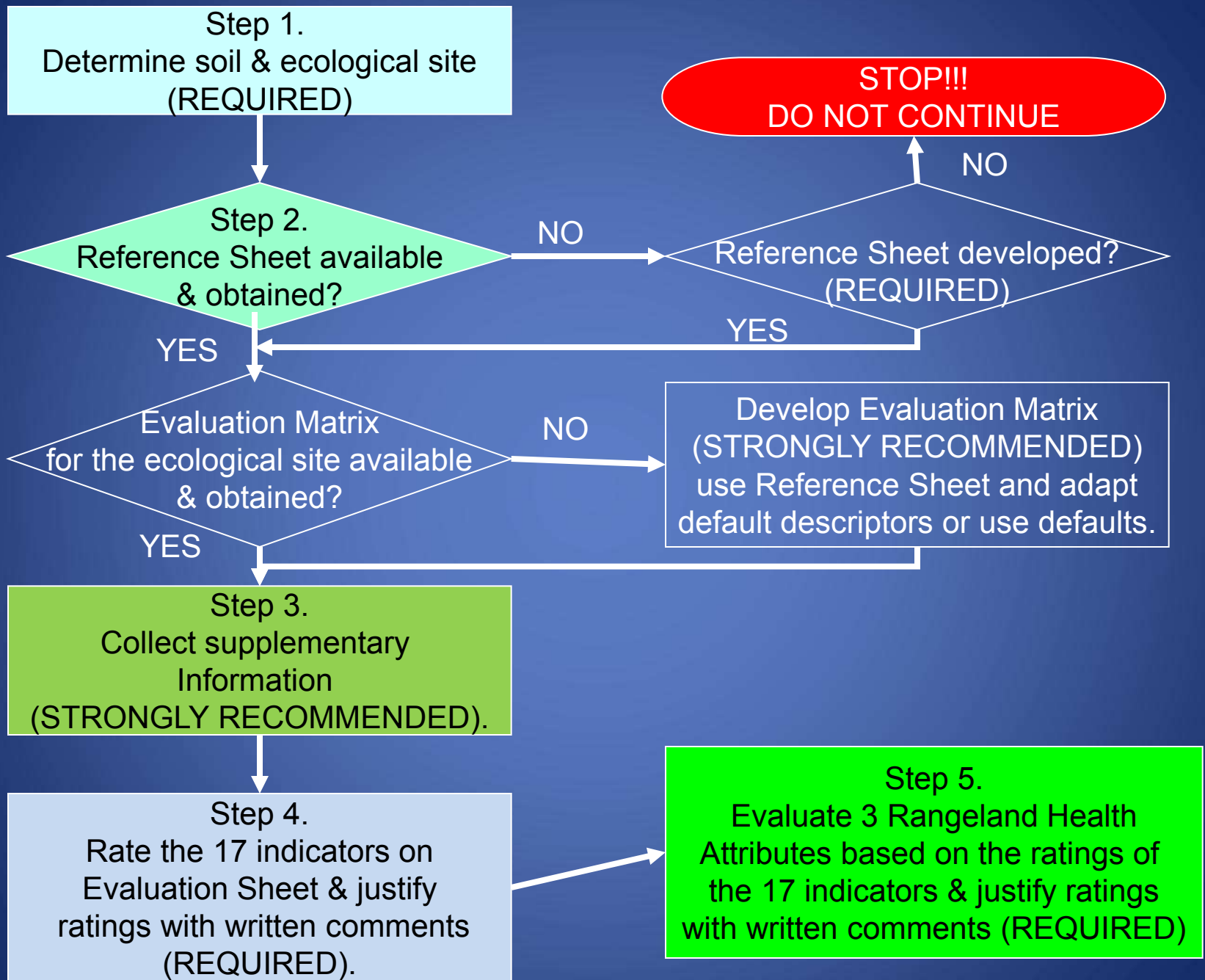# Applying the Technique:
A five-step process

Applying the Technique
Five Steps

1. Determine Soil and Ecological Site at the evaluation area
2. Obtain or develop Reference Sheet
3. Collect Supplementary Information
4. Rate 17 indicators
5. Evaluate the 3 Rangeland Health Attributes

Step 1.
Determine soil & ecological site
(REQUIRED)

Step 2.
Reference Sheet available & obtained?

NO →

Reference Sheet developed?
(REQUIRED)

NO → **STOP!!! DO NOT CONTINUE**

YES

YES

Evaluation Matrix for the ecological site available & obtained?

NO →

Develop Evaluation Matrix
(STRONGLY RECOMMENDED)
use Reference Sheet and adapt
default descriptors or use defaults.

YES

Step 3.
Collect supplementary
Information
(STRONGLY RECOMMENDED).

Step 4.
Rate the 17 indicators on
Evaluation Sheet & justify
ratings with written comments
(REQUIRED).

→ **Step 5.**
Evaluate 3 Rangeland Health
Attributes based on the ratings of
the 17 indicators & justify ratings
with written comments (REQUIRED)

Rangeland Health Evaluation Sheet

Aerial Photo:_____.

Management Unit _*Randy Rancher*_   State _*NM*_   Office _*Las Cruces*_   Range/Ecol. Site Code: *042XB999NM*_
   (Allotment or pasture)

1

Ecological Site Name*:*   *Limy*   Soil Map Unit/Component Name: *Nickel gravelly fine sandy loam*

Observers: ____*Joe Smith, Jose Garcia and _____eus Jones*_____ Date: _*June 10, 2002*

Location (description):___*Limy site two miles north of windmill in S.E. pasture*_____

T. _*11 S* R. _*23* W   or _____N. Lat.   Or   UTM E_____m   Position by GPS? Y / N *No*
       UTM Zone____, Datum_____
Sec. _*12*__, _*NE*__ 1/4   _____W. Long.   N_____m   Photos taken? Y / N *Yes*

Size of evaluation area   *Evaluation area is approximately 3 ac. and represents entire ecological site in this pasture*

Soil / site verification:
Range/Ecol. Site Descr., Soil Surv., and/or Ecol. Ref. Are   Evaluation Area:

2

Surface texture _*grfsl, grlfs, gl*   Surface texture _*gfsl*_____
Depth: very shallow __, shallow __, moderate __, deep _*X*_   Depth: very shallow __, shallow __, moderate __, deep _*X*_
Type and depth of diagnostic horizons: Type and depth of diagnostic horizons:
1. _*Calcic horizon w/in 20"*   3. _____ 1. *Calcic Horizon at 15"*   3. _____
2. _____   4. _____ 2. _____ 4. _____
Surf. Efferv.: none__, v. slight__, slight__, strong _X_, violent__   Surf. Efferv.: none__, v. slight__, slight__, strong _X_, violent__

Parent material _*Alluvium*   Slope _*0-5*_% Elevation _*4100*_ft.   Topographic position _*toeslope*_____ Aspect _*south*_

Recent weather

Wildlife use, liv   *use was extremely heavy yearlong during*

Off-site influen

Criteria used to

*Area is locate   *n this area. This ecological site dominates this*

Step 1 – Determine Soil and Ecological Site at Evaluation Area

Other remarks (_____

Reference: (1) Ecological Reference Worksheet:_*Limy SD – 42B*__, Author: _*J.Christensen*_____, Creation Date: _*05/25/2002*

or (2) Other (e.g. name and date of ecological site description, locations of ecological reference area(s))____*Limy Ecological Site 042XB999NM June 2001*_____.

Author(s)/participant(s): J. Christensen, R. Gell, R. Bartel, B. Bladen, D. Trujillo, L. Heney, D. Graham, P. Smith, & J. Herrick

Contact for lead author: __jchristense_____: No

Date: 03/23/2002   MLRA: __42__ E_____imate (see Ecological Site

Description). Current plant community *cannot* be used to identify the ecological site.

Reference Sheet

Page 73

Indicators. For each indicator, describe the potential for the site. Where possible, (1)_____2) include expected range of values for above- and below-average years for <u>each</u> community within the reference state, when appropriate & (3) cite data. Continue descriptions on separate sheet.

1. Number and extent of rills: *None*

2. Presence of water flow patterns: *None, except following extremely high intensity storms, when short (less than 1 m) flow patterns may appear; minimal evidence of past or current soil deposition or erosion.*

3. Number ___

Step 2(a). Obtain (part of ESD, from NRCS) or Develop Reference sheet for evaluation area(s)

4. Bare grou___   moss, plant canopy are *not* bare grou___   *occasional 12 inch patches associ___*   *disturbances*

5. Number ___

6. Extent of ___

7. Amount of litter movement (describe size and distance expected to travel): *Minimal and short, associated with water flow patterns following extremely high intensity storms. Litter also may be moved during intense wind storms*

8. Soil surface (top few mm) resistance to erosion (stability values are averages – most sites will show a range of values):*Stability class (Herrick et al. 2001) anticipated to be 5-6 at surface and subsurface under vegetation and 4-5 at surface and subsurface in the interspaces. These values need verification at reference sites.*

Evaluation Matrix – Pages 81- 87

Fill in specific narratives for remaining four classes

Add text from Reference Sheet to None-to-Slight

Step 2(b). Obtain (part of ESD, from NRCS) or Develop Evaluation Matrix for evaluation area(s)

Step 3.
Collect Supplementary Data

Appendix 3- page 77

- **Ecological Reference Areas**

- **Quantitative Data**

- **Functional/Structural Groups**

Functional/Structural Groups Worksheet

State _ID_ Office _Big Butte_ Ecological Site _Loamy 10-14" PZ_ Site ID _
Observer(s) _____ Long, Wide, High _____ Date _____ 8/5/00

| Functional/Structural Groups | | | Species List for Functional/Structural |
Name	Potential[1]	Actual[2]	Plant Names
Annual grasses	T	S	Cheatgrass, six weeks fescue
Short Pern. bunchgrasses	M	M	Sandberg bluegrass
Mid pern. bunchgrasses	D	M	Thurbers needlegrass, bottlebrush
Tall Pern. bunchgrass	M	T	Basin wildrye
N fixing forb	M	T	Astragalus spp., Lupine
Biological Crust[3]	S	M	Lichen & Mosses

Indicate whether each "structural/functional group" is a **Dominant (D)** (roughly 41-100% composition), a **Subdominant (S)** (roughly 11-40% composition), a **Minor Component (M)** (roughly 3-10% composition), or a **Trace Component (T)** (<3 % composition) based on weight or cover composition in the area of interest (e.g., "Actual[2]" column) relative to the "Potential[1]" column derived from information found in the ecological site description and/or at the ecological reference area.

Biological Crust[3] dominance is evaluated solely on **cover** not composition by weight.

Step 4 – Rate the 17 indicators Appendix 1- page 69

- Complete reconnaissance
- Use Evaluation Matrix
- Teams preferred
- Rate deviation:
  - None-to-Slight
  - Slight-to-Moderate
  - Moderate
  - Moderate-to-Extreme
  - Extreme-to-Total
- Record comments!!

Departure from Expected	Code	Instructions:
None to Slight	N-S	(1) Assign 17 indicator ratings. If indicator not present, rate None to Slight.
Slight to Moderate	S-M	(2) In the three grids below, write the indicator number in the appropriate column for each indicator that is applicable to the attribute.
Moderate	M	(3) Assign overall rating for each attribute based on preponderance of evidence.
Moderate to Extreme	M-E	(4) Justify each attribute rating in writing.
Extreme	E	

Indicator	Rating	Comments
1. Rills	S H / N-S	
2. Water-flow Patterns	S H / S-M	
3. Pedestals and/or terracettes	S H / S-M	Occasionally in flow patterns
4. Bare Ground _15____%	S H / M	Normal is 3-5%. This area has 3-fold higher than expected
5. Gullies	S H / N-S	
6. Wind-scoured, blowouts, and/or deposition areas	S / N-S	
7. Litter movement	H / S-M	
8. Soil surface resistance to erosion	S H B / M	Expected should be 5-6, but we had a mean of 18 cells with 3.8
9. Soil Surface loss or degradation	S H B / S-M	
10. Plant community composition and distribution relative to infiltration and runoff	H / N-S	
11. Compaction layer	S H B / S-M	Some platy structure with roots passing horizontally for short distances < 1 inch
12. Functional/structural groups	B / M	We should expect several species in each F/S group but only have one species/group here Also, red brome, an invasive exotic, is a subdominate
13. Plant mortality/decadence	B / N	
14. Litter amount	H B / N-S	
15. Annual production	B / M	Expected 1000 #/ac; have 400-600 #/ac here
16. Invasive/noxious plants	B / N-E	Red brome is subdominate and common at this site
17. Reproductive capability of perennial plants	B / N-	

Departure from Expected | Code
None to Slight...................... | N-S
Slight to Moderate.................. | S-M
Moderate........................... | M
Moderate to Extreme................ | M-E
Extreme............................ | E

Instructions:
(1) Assign 17 indicator ratings. If indicator not present, rate None to Slight.
(2) In the three grids below, write the indicator number in the appropriate column for each indicator that is applicable to the attribute.
(3) Assign overall rating for each attribute based on preponderance of evidence.
(4) Justify each attribute rating in writing.

Indicator	Rating	Comments
1. Rills	S H / N-S	
2. Water-flow Patterns	S H / S-M	
3. Pedestals and/or terracettes	S H / S-M	

1. **Rills rate N-S (none to slight)**
2. **Water flow patterns rate S-M (Slight to Moderate)**
3. **Pedestals/Terracettes rate S-M (Slight to Moderate)**

6. Wind-scoured, blowouts, and/or deposition areas	S	
	N-S	
7. Litter movement	S	
	M	
8. Soil surface resistance to erosion	S H B	
	M-E	
9. Soil surface loss or degradation	S H B	
	M	
10. Plant community composition and distribution relative to infiltration	H	has increased run-o
	M-E	

S = Soil and Site Stability

H = Hydrologic Function

B = Biologic Integrity

Only applies to S (Soil Site Stability)

6.	Wind-scoured, blowouts, and/or deposition areas	S				
		N-S				
7.	Litter movement	S				Small litter shows sign of moderate move
		M				
8.	Soil surface resistance to erosion	S	H	B		Stability values average from 3-4 on surf
		M-E				
9.	Soil surface loss or degradation	S	H	B		Severe past erosion has left much of the
		M				
10.	Plant community composition and distribution relative to infiltration		H			Change from grass dominated to shrub has increased run-off
			M-E			
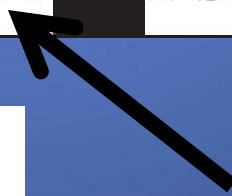
Applies to S (Soil Site Stability); H (Hydrologic Function); and B (Biotic Integrity)

Only applies to H (Hydrologic Function)

Provide comments

6. Wind-scoured, blowouts, and/or deposition areas	S / N-S		
7. Litter movement	S / M		Small litter shows sign of moderate move
8. Soil surface resistance to erosion	S H B / M-E		Stability values average from 3-4 on surf
9. Soil surface loss or degradation	S H B / M		Severe past erosion has left much of the
10. Plant community composition and distribution relative to infiltration	H / M-E		Change from grass dominated to shrub has increased run-off

Comments will help the next person better understand what you saw and why you rated it the way you did.

Step 5 – Rate Attributes

Indicators of Soil/Site Stability

1. Rills
2. Water Flow Patterns
3. Pedestals/Terracettes
4. Bare Ground
5. Gullies
6. Wind Scour Areas
7. Litter Movement
8. Resistance to Erosion

9. Loss of soil surface
10. Plant/infiltration effects
11. Compaction layer
12. Functional/structural groups
13. Plant mortality/decadence
14. Litter Amount
15. Annual Production
16. Invasive Plants
17. Reproductive Capability

Step 5 – Rate Attributes

Indicators of Hydrologic Function

1. **Rills**
2. **Water Flow Patterns**
3. **Pedestals/Terracettes**
4. **Bare Ground**
5. **Gullies**
6. Wind Scour Areas
7. Litter Movement
8. **Resistance to Erosion**

9. **Loss of soil surface**
10. **Plant/infiltration effects**
11. **Compaction layer**
12. Functional/structural groups
13. Plant mortality/decadence
14. **Litter Amount**
15. Annual Production
16. Invasive Plants
17. Reproductive Capability

Step 5 – Rate Attributes

Indicators of Biotic Integrity

1. Rills
2. Water Flow Patterns
3. Pedestals/Terracettes
4. Bare Ground
5. Gullies
6. Wind Scour Areas
7. Litter Movement
8. **Resistance to Erosion**
9. **Loss of soil surface**

10. Plant/infiltration effects
11. **Compaction layer**
12. **Functional/structural groups**
13. **Plant mortality/decadence**
14. **Litter Amount**
15. **Annual Production**
16. **Invasive Plants**
17. **Reproductive Capability**

1. Rills	S	H	
	N-S		
2. Water-flow Patterns	S	H	
	S-M		
3. Pedestals and/or terracettes	S	H	
	S-M		
4. Bare Ground _15____%	S	H	
	M		
5. Gullies	S	H	
	N-S		
6. Wind-scoured, blowouts, and/or deposition areas	S		
	N-S		
7. Litter movement		H	
		S-N	
8. Soil surface resistance to erosion	S	H	B
		M	
9. Soil Surface loss or degradation	S	H	B
		S-M	

10. Plant community composition and distribution relative to infiltration and runoff		H	
		N-S	
11. Compaction layer	S	H	B
		S-M	
12. Functional/structural groups			B
			M
13. Plant mortality/decadence			B
			N
14. Litter amount		H	B
		N-S	
15. Annual production			B
			M
16. Invasive/noxious plants			B
			M-E
17. Reproductive capability of perennial plants			B
			N-

Step 5 – Rate Attributes
Appendix 1- page 69

- Record the indicator number in appropriate category for each attribute to which it applies
- Rate attribute based on preponderance of evidence
  - Not merely mean, mode or median
  - Document your justification

Step 5 – Rate Attributes
Appendix 1- page 69

- Record the indicator number in appropriate category for each attribute to which it applies
- Rate attribute based on preponderance of evidence
  - Not merely mean, mode or median
  - Document your justification

1. Record the indicators

2. **Rate the attribute --**
   N-S
   S-M
   M
   M-E
   E-T

E	M-E	M	S-M	N-S
			15	17
		12	11	14
	16	8	9	13

B (9 indicators):
Biotic Integrity
Rating: **??????**

Attribute Rating Justification
Biotic Integrity: Red brome is strongly impacting the vegetation and the production of this site.

1. Record the indicators

2. **Rate the attribute --**
   N-S
   S-M
   M
   M-E
   E-T

Attribute Rating Justification

Biotic Integrity: Red brome is strongly impacting the vegetation and the production of this site.

E	M-E	M	S-M	N-S
		15		17
		12	11	14
16		8	9	13

B (9 indicators):
Biotic Integrity
Rating:

Why moderate?

Moderate

Attribute Rating Justification

Biotic Integrity: Red brome is strongly impacting the vegetation and the production of this site.

12 = FUNCTIONAL/STRUCTURAL GROUPS

15 = ANNUAL PRODUCTION

16 = INVASIVE PLANTS