

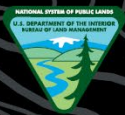


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Interpreting Indicators of Rangeland Health

A line of evidence to support Land Health Decisions



Why Land Health? ▲

- 43 CFR Part 4100
Subpart 4180
- The Public Lands Rule expands the Fundamentals of Land Health
- Interpreting Indicators of Rangeland Health (IIRH) is a monitoring protocol developed by BLM, USGS, USFS, and USDA ARS & NRCS





Preparing to Interpret the Indicators





Monitoring Methods



- Soil Pit
- Line Point Intercept
- Species Composition
- Annual Production
- Soil Stability
- Photos



Soil Profile

- R034BY404CO
- Semidesert Stony Loam (Shadscale)

Plot Characterization

- Top: Sandy Loam
- Lower: Sandy Clay Loam
- Alluvial Fan
- Shadscale is dominant shrub

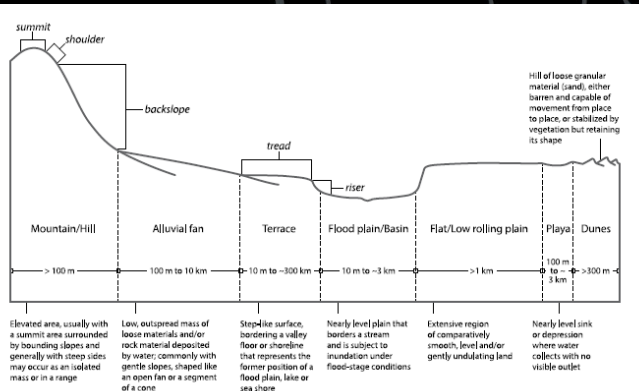


Figure A4.1. Generic landscape units (mountain/hill, alluvial fan, terrace, floodplain/basin, flat/low rolling plain, playa, dunes) to describe topographic position (Herrick et al. 2017).

Mesa County Area, Colorado

47—Utaline, sodic-Uffens complex, 3 to 12 percent slopes, very stony

Map Unit Setting

National map unit symbol: k09j
Elevation: 5,200 to 6,000 feet
Mean annual precipitation: 6 to 9 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Utaline, very stony, sodic, and similar soils: 45 percent
Uffens, very stony, and similar soils: 40 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Utaline, Very Stony, Sodic

Setting

Landform: Strath terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Colluvium and/or slope alluvium derived from igneous and sedimentary rock over cretaceous source residuum weathered from clayey shale

Typical profile

A - 0 to 3 inches: very cobbly sandy loam
Bkn1 - 3 to 10 inches: cobbly sandy clay loam
Bkn2 - 10 to 22 inches: very stony silty clay loam
Bk - 22 to 46 inches: very stony clay loam
2Bk - 46 to 60 inches: cobbly clay loam

Properties and qualities

Slope: 3 to 12 percent
Surface area covered with cobbles, stones or boulders: 1.5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.07 to 0.21 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 80 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 25.0
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

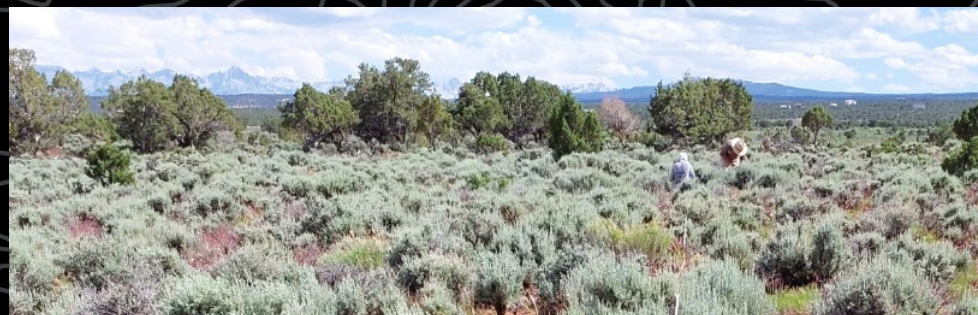
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R034BY404CO - Semidesert Stony Loam (Shadscale)
Hydric soil rating: No



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Attributes of Rangeland Health	Associated Indicator(s) of Rangeland Health ¹	Quantitative Indicators	Selected Measurements and References
Soil/Site Stability	Water flow patterns	Bare ground	Line point intercept (2)
	Bare ground	Proportion of soil surface covered by gaps longer than a defined minimum	Canopy gap intercept (2) Basal gap intercept (2)
	Wind-scoured and/or depositional areas		
	Litter movement		
Hydrologic Function	Soil surface resistance to erosion	Soil aggregate stability in water	Soil stability test (2)
	Soil surface loss and degradation		
	Effects of plant community composition and distribution on infiltration		
	Litter cover and depth		
Biotic Integrity	Water flow patterns	Bare ground	Line point intercept (2)
	Bare ground	Litter cover	
	Soil surface resistance to erosion	Foliar cover composition	
	Soil surface loss and degradation	Proportion of soil surface covered by gaps longer than a defined minimum	Canopy gap intercept (2) Basal gap intercept (2)
Biotic Integrity	Effects of plant community composition and distribution on infiltration	Soil aggregate stability in water	Soil stability test (2)
	Litter cover and depth		
	Soil surface resistance to erosion	Soil aggregate stability in water	Soil stability test (2)
	Soil surface loss and degradation		
Biotic Integrity	Functional/structural groups		
	Dead or dying plants or plant parts	Foliar cover and composition, including live vs. dead vegetation	Line point intercept (2)
	Litter cover and depth	Litter cover	
	Annual production	Invasive plant cover	
Biotic Integrity	Invasive plants		
	Vigor with an emphasis on reproductive capability of perennial plants	Annual production	Total harvest (1) (Appendix 8) Weight units (1) (Appendix 8)



Rangeland Health Indicator	Measurement Method ¹	Quantitative Indicator Value
Bare ground (indicator 4)	Line point intercept	Bare ground percent
	Gap intercept	Size of intercanopy or basal gaps
Soil surface resistance to erosion (indicator 8)	Soil stability test	Soil surface stability values
Effects of plant community composition and distribution on infiltration (indicator 10)	Production by species ²	Functional/structural group composition by weight
	Line point intercept	Functional/structural group composition by cover
Functional/structural groups (indicator 12)	Production by species ²	Functional/structural group composition by weight
	Line point intercept	Functional/structural group composition by cover
Dead or dying plants or plant parts (indicator 13)	Line point intercept	Proportion of dead plants or plant parts intercepted
	Belt transect	Proportion or density of dead or dying plants
Litter cover and depth (indicator 14)	Line point intercept	Litter cover
Annual production (indicator 15)	Total harvest ²	Total annual production
	Weight units ²	
Invasive plants (indicator 16)	Production by species ²	Invasive plant composition by weight
	Line point intercept	Cover of invasive species
	Belt transect	Density of invasive plants





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Degrees of Departure



The diagram illustrates the vertical distribution of plant roots in a soil profile. The vertical axis is labeled 'feet' and ranges from 0 to 5. The horizontal axis shows various plant types: Deep-rooted perennial shrub, Annual forb, Mid-rooted perennial bunchgrass, Shallow-rooted perennial bunchgrass, Perennial forb (Nitrogen-fixing), Perennial forb, Deep-rooted perennial bunchgrass, Rhizomatous perennial grass, and Annual grass. A legend indicates 'Biological soil crust (lichens, mosses, bacteria)'.

Soil and Site Stability “S” (10 indicators)					Hydrologic Function “H” (10 indicators)					Biotic Integrity “B” (9 indicators)							
Attribute Rating: N-S					Rationale:	Attribute Rating: N-S					Rationale:	Attribute Rating: S-M					Rationale:
				11	Excellent ground cover.											Based off of production, observed species composition was slightly different than what was expected for the site. Kentucky Bluegrass accounted for large portion of grass production.	
				9													
				7						11							
				6						9							
				5						5							
				4						4				16	17		
				3						3				14	13		
				2					14	2				12	11		
			8	1					8	1				15	8		9
E-T	M-E	M	S-M	N-S			E-T	M-E	M	S-M	N-S		E-T	M-E	M		S-M



Transition to Watershed

Grand Junction Field Office

- 239 allotments
- ~1.3 Million Acres

Allotment Focus

- Time: Extensive
 - Intensive data collection
 - Coordination
- Annual snapshot
- Various approved monitoring methods

Watershed Analysis

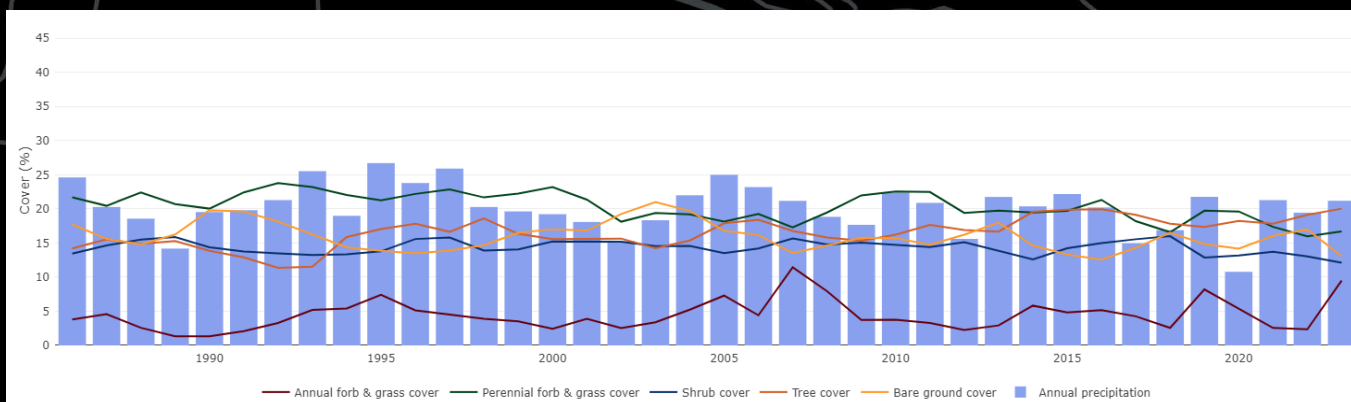
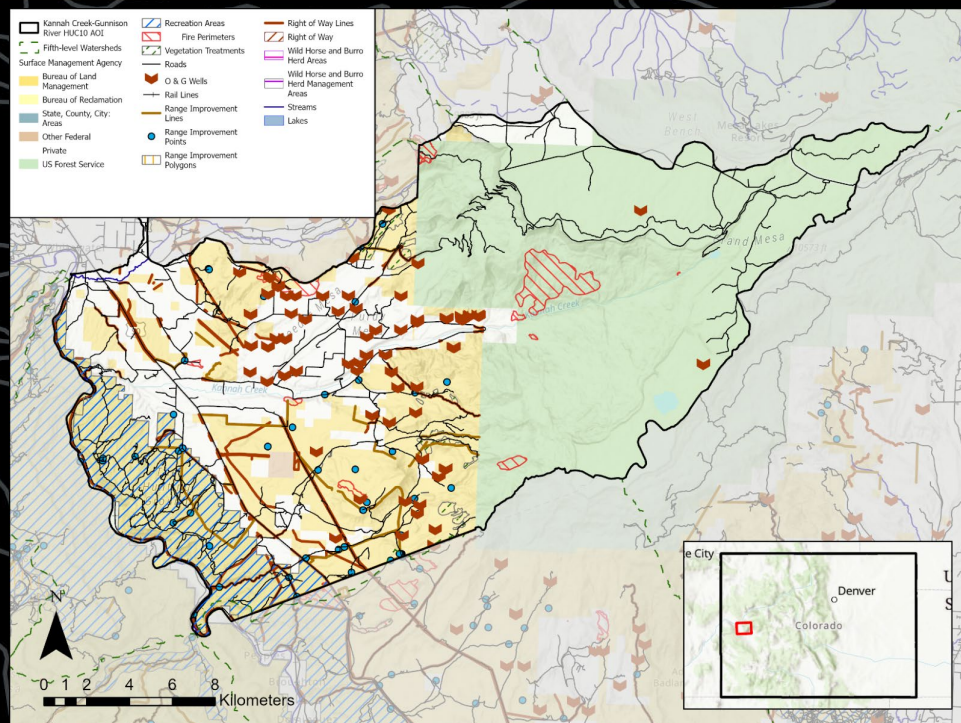
- Time: Reduced
 - Ground Truth
 - Focus on areas of concern
- Multi- year comparison
- Streamlined across BLM



Lines of Evidence

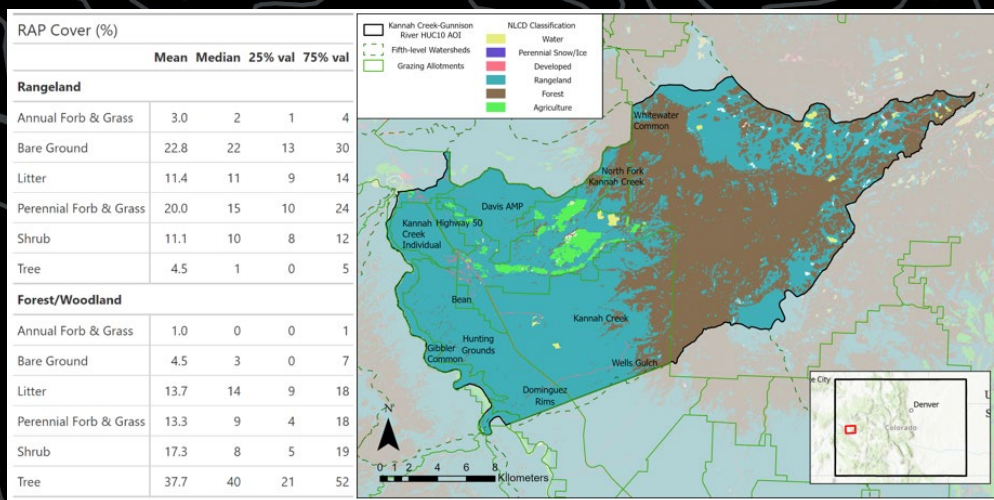
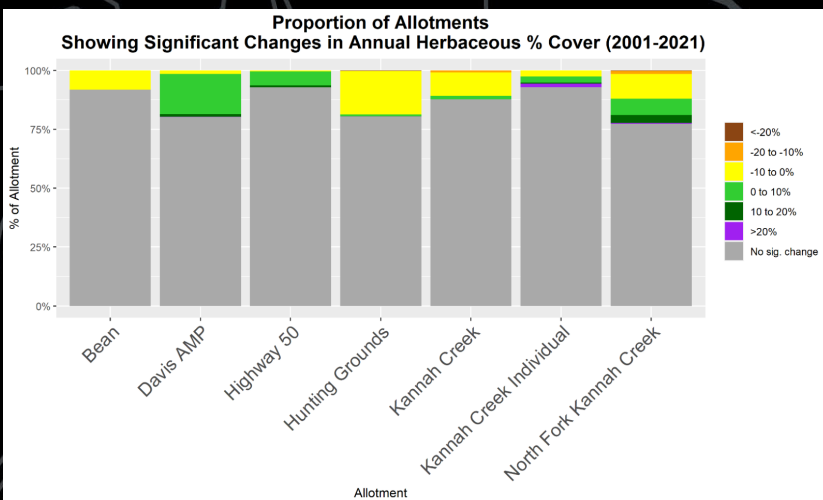
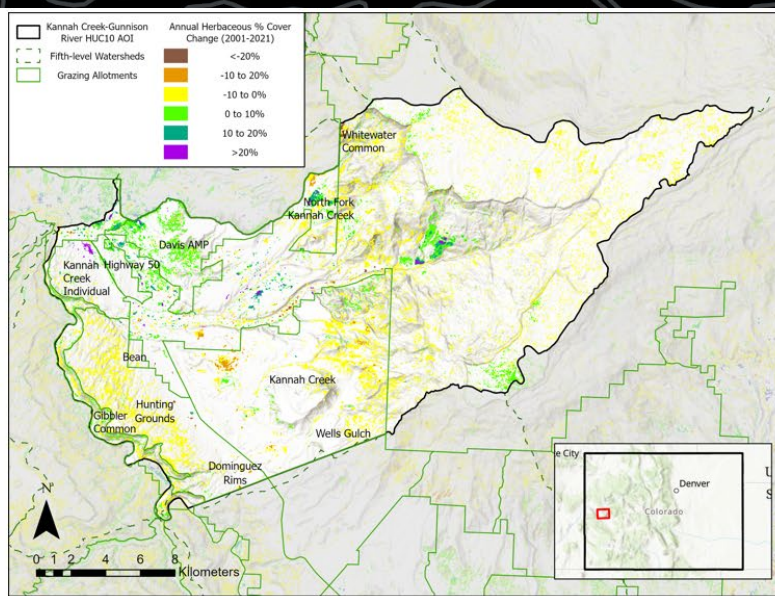
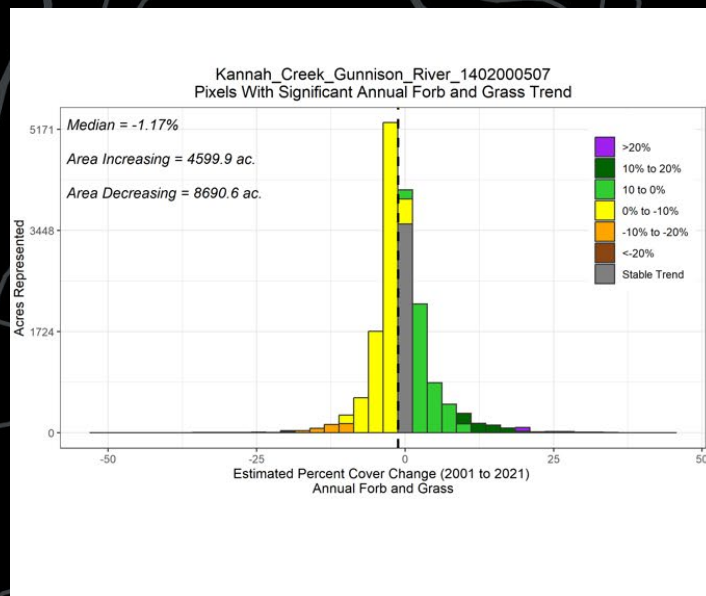


- AIM
- PFC
- RAP
- Supplemental Methods/ Data
- Watershed Report





Watershed Report





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Questions



See you at: 38.857160, -108.333778