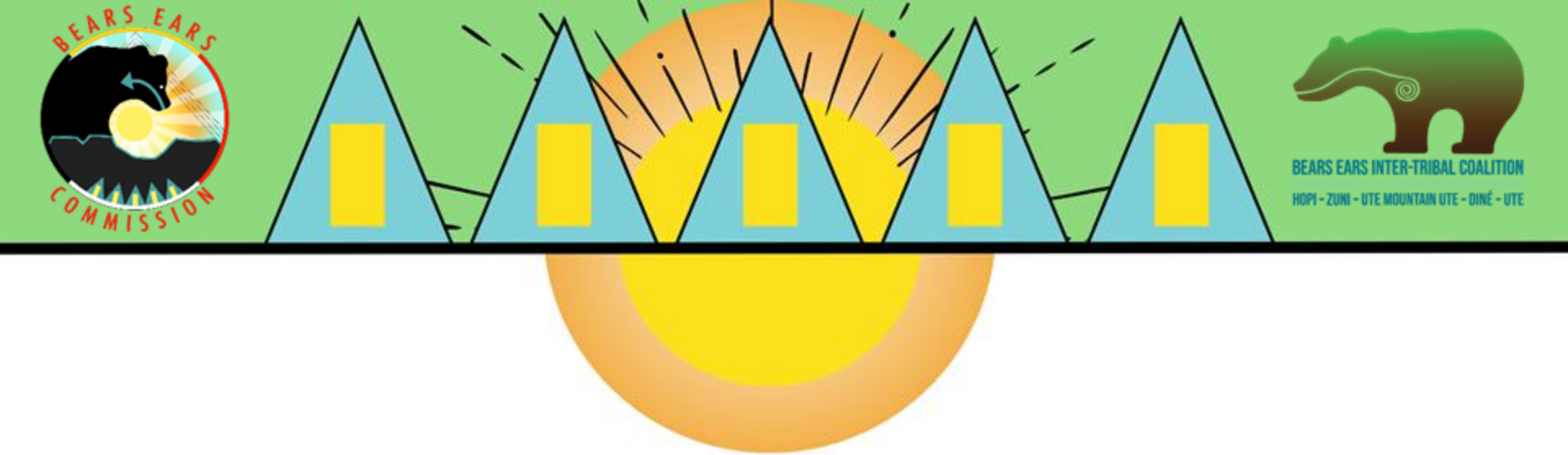

Livestock Grazing Practices

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Presentation Outline

- Global Indigenous-Led Grazing Systems
- Grazing Practices in Bears Ears
- Livestock Utilization Rate and Grazing Intensity
- Plant Indicator Species Project

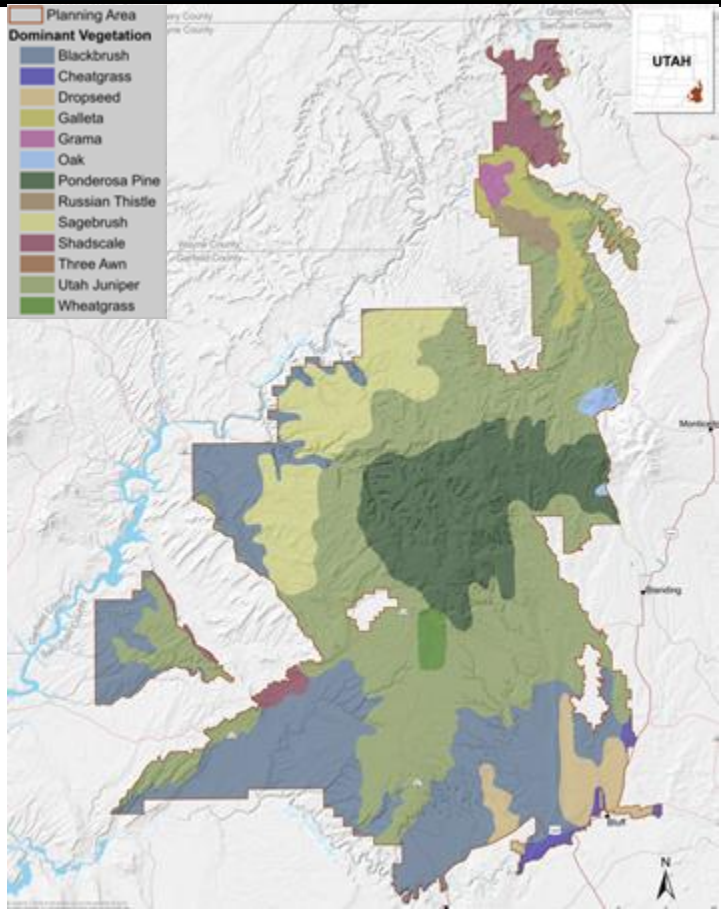
Global Indigenous-Led Grazing Systems

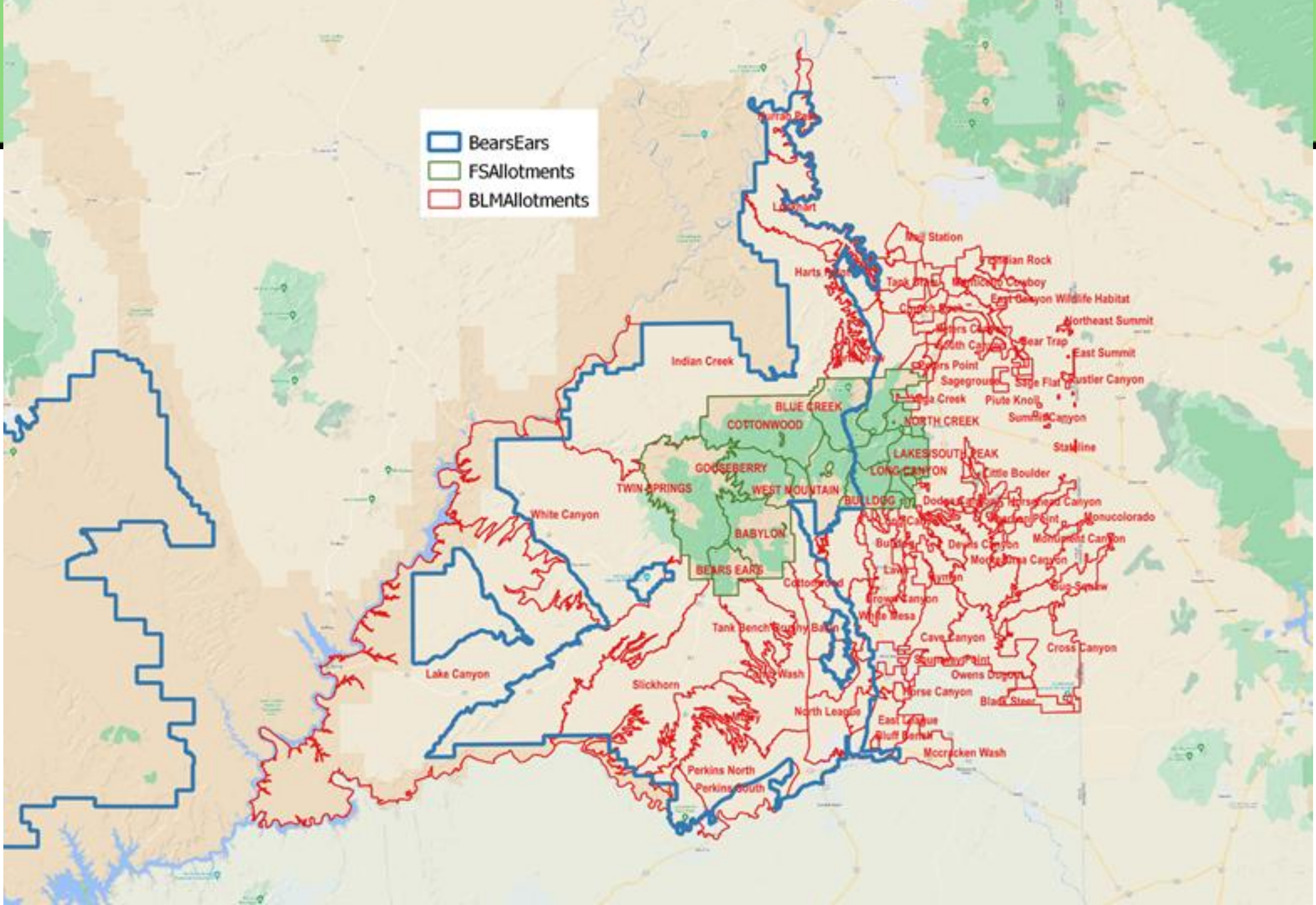
Many Indigenous-led grazing practices worldwide incorporate local traditional ecological knowledge and communal grazing management to promote sustainable grazing practices, overcoming challenges including land privatization, invasive species, and ecological degradation.

- Lipan Apache
  - Texas Buffalo Project began cultivating more “sustainable” native brome grass species for ecosystem remediation
- Sapmi
  - Seasonal migration of reindeer herds, with Sapmi Parliament-appointed management of regional herds
  - Herding area divided into 6 regions, compromising ~40% of Norway's surface area
- Maasai
  - Alalili system: TEK incorporating human, livestock, and wildlife in an integrated co-adapted system where certain portions of rangeland are conserved during the wet season to promote natural regeneration
    - “conserve certain portions of rangeland resources such as pastures and water for subsequent grazing during dry seasons”
- South Africa
  - Traditional rotational grazing - mimicking the natural migration patterns of wild grazing animals based on TEK

Background of Grazing Practices in Bears Ears

- 92% of the monument is open to grazing
- Bears Ears landscape
  - Of the 20 allotments under BLM overlapping the monument, 19 are under the “improve” category
  - Study within the current Bears Ears area estimated sites disturbed from grazing and plowing produced 2.9x more sediment than undisturbed sites (2009)
- In the Final Resource Management Plan
  - “Utilization levels of key forage species would be identified on an allotment-specific basis”
    - “Would take forage needs of wildlife into consideration”




BearsEars
FSAllotments
BLMAllotments
Lockhart
Indian Rock
East Canyon Wildlife Habitat
Northeast Summit
Bear Trap
East Summit
Indian Creek
Sagegrouse
Sage Flat
Rustler Canyon
Piute Knoll
BLUE CREEK
COTTONWOOD
NORTH CREEK
LAKES/SOUTH PEAK
LONG CANYON
Stateline
Little Boulder
GOOSEBERRY
TWIN SPRINGS
WEST MOUNTAIN
BULLDOG
Horsehead Canyon
Monucolorado
White Canyon
BABYLON
Monument Canyon
BEARS EARS
Cottonwood
Brown Canyon
White Mesa
Cave Canyon
Cross Canyon
Lake Canyon
Slickhorn
Horse Canyon
Black Steer
North League
East League
Bluff Bench
Mccracken Wash
Perkins North
Perkins South

Livestock Utilization Rates

- Defined as the percentage of yearly biomass removed or damaged by animals during the grazing period
  - Also referred to as Grazing Utilization, or simply Utilization rate
- Key factors to note:
  - Most studies calculate biomass using peak standing crop at the end of the growing season, often leading to inherent bias
  - Definition of a “growing year” varies widely and differs by environment, therefore Utilization rates should be considered with specific ecosystems in mind
  - Tolerable Utilization rate to maintain plant health varies and is dependent on season and weather patterns

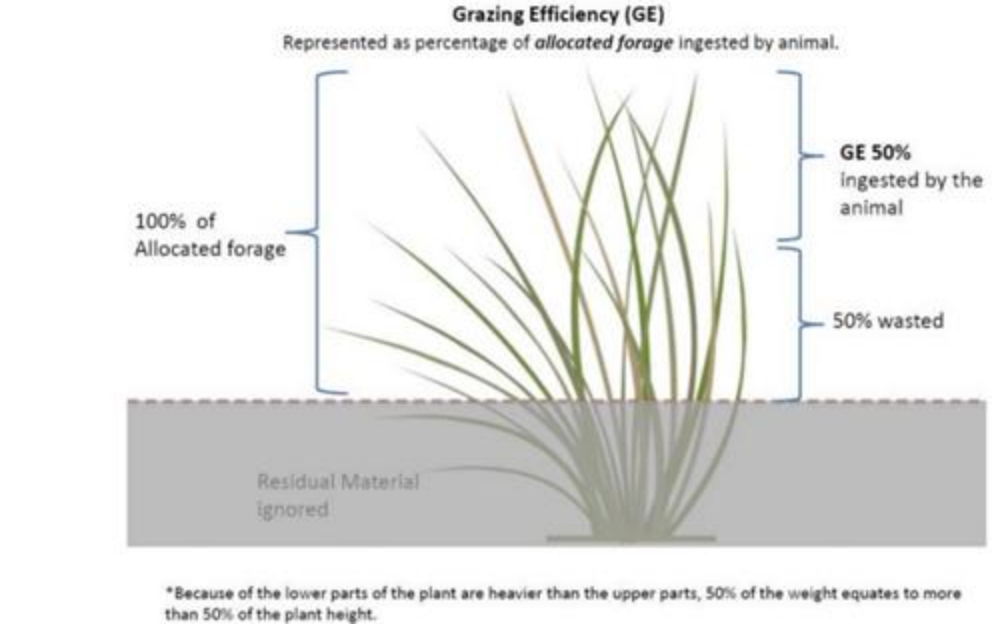
Livestock Utilization Rate Data

- Historic 50/50 rule of thumb
  - Oversimplification that ignores local ecological diversity, particularly the ecology of desert
- Recommendations between 35-40% for many Southwestern ecosystems
  - Changes by growing conditions, ecosystem health, dormant vs growing seasons
  - Utilization Rate guidelines for ecosystems in range of Poor-Excellent conditions (BLM, 2004):
    - Pinyon-Juniper Woodland; Sagebrush Grassland; Mountain Shrubland: 30-40%
  - Another recommendation in mixed-grass shrub ranges of AZ, NM to use a 35% utilization rate (1962)
  - Santa Rita Experimental Range (University of Arizona) averages a 26.2% Utilization rate
    - Ranges from 3.3-53.8%

Livestock Utilization Rate Data

Equation for grazing efficiency:

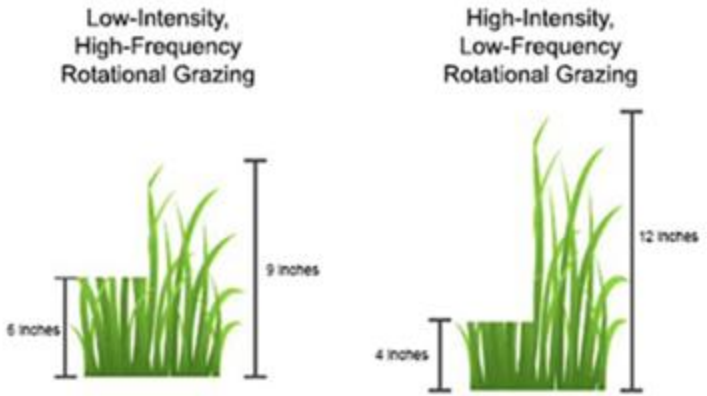
*Intake/ Total Forage Production - Residual) * 100 = Grazing Efficiency. (Figure 2 Green and Brazee 2012)*



- Percent of allocated forage equates to Utilization rate in this figure
- At a 50% Utilization rate, only a fraction of the allocated biomass is actually consumed by livestock, known as Grazing Efficiency

Grazing Intensity

- Grazing intensity (GI) is defined as the level of livestock density and duration of grazing, which significantly influences soil organic carbon (SOC) accumulation or decline in grazed ecosystems. Significant factor in Utilization Rates.
    - Varies in effect based on management practices, including the timing and frequency of livestock grazing
- Rotational grazing can implement high-intensity, low-frequency (HILF) systems, or low-intensity, high-frequency systems (LIHF)
- Continuous grazing systems typically have a much higher GI



Graphic by Kyle Verhoff

Plant Indicator Species

- Current grazing monitoring does not include or focus on culturally important species
- Using Vegetation Tribal Objects and Values list verified by Subcommittee
- Gathering information on impact of livestock grazing on plants on this list
- Eventual goal: identify potential culturally important indicator species for grazing monitoring and management

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Common Name**	**Scientific Name**	**Plant Type**	**Threat Status**	**Cattle Grazed (Y/N)**	**Forage Value**	**Regrowth Rate**	**Vul to Climate Change**	**Vul to Drought**	**Cultural Significance**		Notes
2	Alder	Alnus spp.	Tree	Least Concern	N	Poor-Low	60-90 cm/yr	Low	Tolerant			
3	Alderleaf Mountain Mahogany	Cercocarpus montanus	Tree	Least Concern	Y	Good-Excellent	30 cm/yr	Med-High	Tolerant			
4	Aspen	Populus tremuloides	Tree	Least Concern	Y	Good	60-120 cm/yr	Med	Not tolerant			
5	Birch	Betula spp.	Tree	Least Concern	N	Poor-Excellent	45-90 cm/yr	Med-High	Moderate tolerance			
6	Boxelder Maple	Acer negundo	Tree	Least Concern	N	Poor-Fair	60 cm/yr	Low	Tolerant			
7	Douglas Fir	Pseudotsuga menziesii	Tree	Least Concern	N	N/A	30-60 cm/yr	Med-High	Moderate tolerance			No information on forage value, not good vegetation for cattle
8	Flowering Dogwood	Cornus florida	Tree	Least Concern	Y	Good-Excellent	30-60 cm/yr	Med	Not tolerant			
9	Engelmann Spruce	Picea engelmannii	Tree	Least Concern	N	Poor	15-60 cm/yr	High	Moderate tolerance*			Moderate drought tolerance when established
10	Fremont Cottonwood	Populus fremontii	Tree	Least Concern	Y*	Poor-Good	300-600 cm/yr	Med-High	Moderate tolerance			Can be eaten by cattle, not preferred or often, low cattle forage value
11	Gambel's Oak	Quercus gambelii	Tree	Least Concern	N	Poor-Good	20-45 cm/yr	?	Tolerant*			Drought tolerance when established
12	Hackberry	Celtis occidentalis	Tree	Least Concern	Y	Poor-Good	2.5-40 cm/yr	Low	Tolerant			
13	Littleleaf Mountain Mahogany	Cercocarpus intricatus	Tree	Least Concern	Y	Good	Slow*	Med-High	Tolerant			Grows up to 2.5m, no information on annual growth rate
14	Mountain Mahogany	Cercocarpus montanus	Tree	Least Concern	Y	Good-Excellent	Slow*	Med-High	Tolerant			Grows up to 6m, no information on annual growth rate
15	Netleaf Hackberry	Celtis laevigata reticulata	Tree	Least Concern	Y	Poor-Excellent	Slow*	Med	Tolerant*			Poor forage value for cattle, grows up to 6-16m , drought tolerant once established
16	Pinyon Pine	Pinus edulis	Tree	Least Concern	N	Poor-Excellent	5-15 cm/yr	High	Tolerant*			Drought tolerance when established
17	Ponderosa Pine	Pinus ponderosa	Tree	Least Concern	N*	Low	30-45 cm/yr	High	Tolerant			Can potentially induce abortions in cows??
18	Red Birch/ River Birch	Betula nigra	Tree	Least Concern	N/A	Poor-Good	45-90 cm/yr	Med	Not tolerant			Listed as "no entry" for cattle browsing by USDA

Sources

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