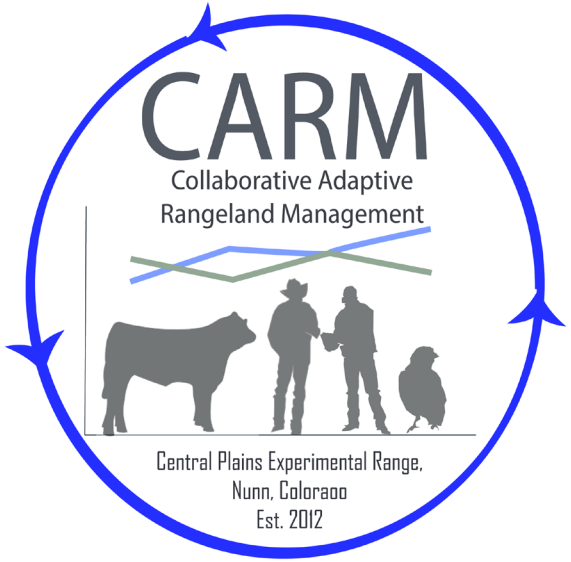
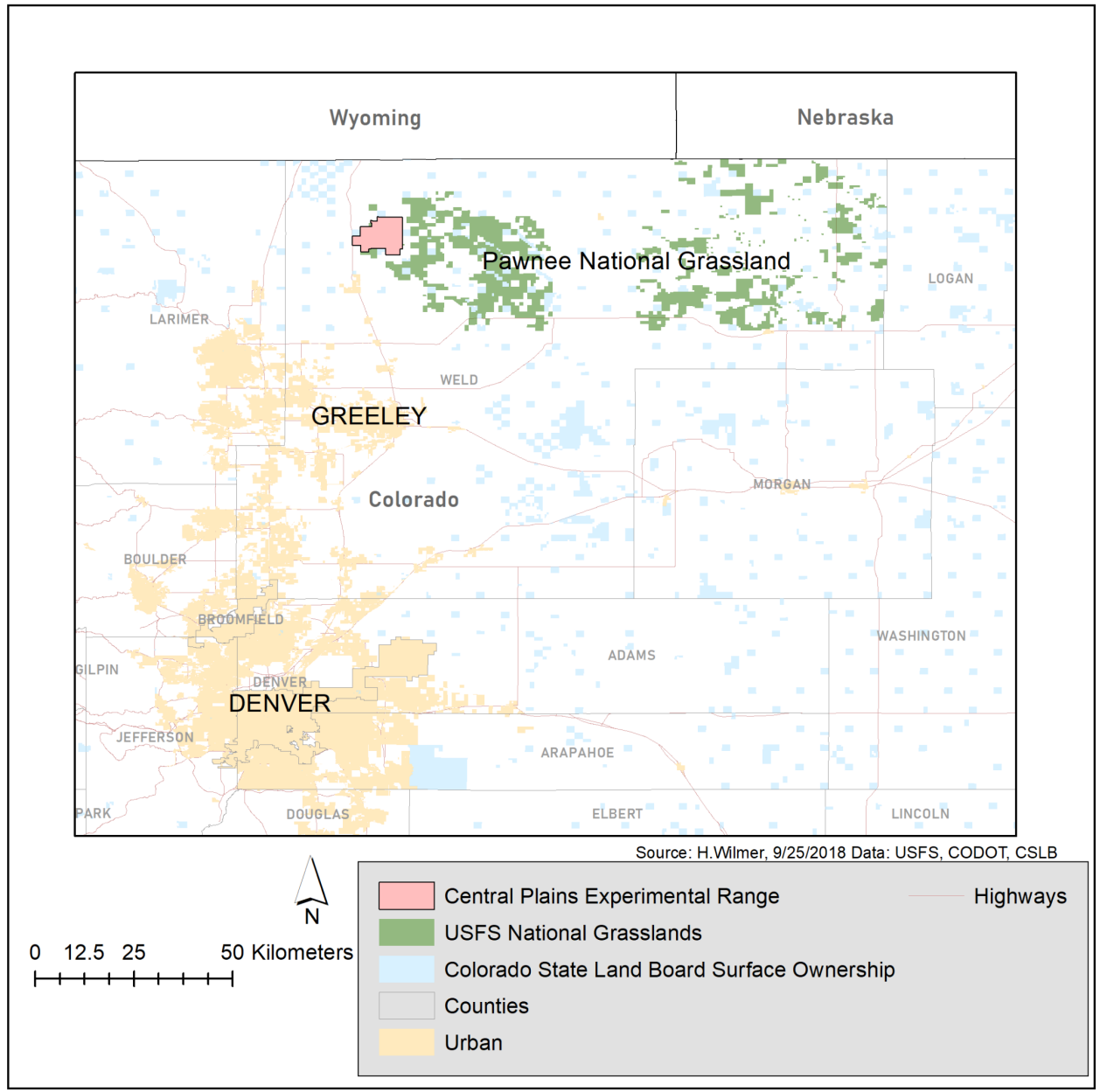
Collaborative management of rangelands to meet goals for beef, birds and people in Northeast Colorado

Terri Schulz, The Nature Conservancy

Collaborative Adaptive Rangeland Management (CARM) Purpose



to examine how science can be conducted in a real-world manner (i.e., at ranch-level scales with manager involvement) to evaluate the effectiveness of adaptive grazing management for both production and conservation goals.


Wyoming
Nebraska
Pawnee National Grassland
LOGAN
LARIMER
WELD
GREELEY
Colorado
MORGAN
BOULDER
BROOMFIELD
WASHINGTON
ADAMS
GILPIN
DENVER
DENVER
JEFFERSON
ARAPAHOE
PARK
DOUGLAS
ELBERT
LINCOLN
Source: H.Wilmer, 9/25/2018 Data: USFS, CODOT, CSLB
N
0 12.5 25 50 Kilometers
Central Plains Experimental Range
USFS National Grasslands
Colorado State Land Board Surface Ownership
Counties
Urban
Highways

1. Collaborative Team

Established 2012

Local grazing association
Conservation organizations
Federal & state agencies
Researchers

2. Ranch-Scale Study

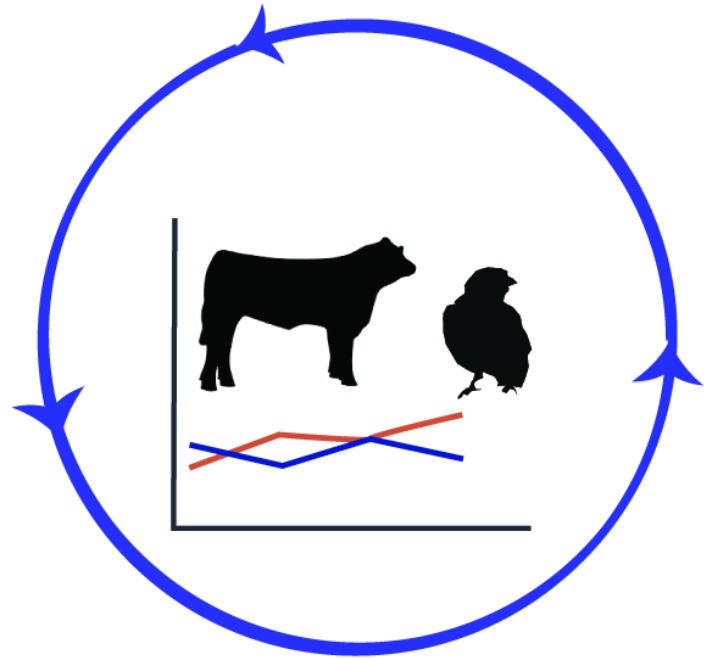
USDA-ARS Central Plains Experimental Range

Grazing Treatments

- Ten pairs of 130 ha pastures with similar soil, topography, and vegetation
- Pairs of pastures grazed with same stocking rate (number of yearling steers per total 1300 ha mid-May to September)

Traditional Rangeland Management (TRM)	**Collaborative Adaptive Rangeland Management (CARM)**
Similar to management on local ranches: Season-long grazing without adaptive decision-making	Stakeholders decide: 1. Goals and objectives 2. Annual stocking rate 3. Stock density 4. Pasture grazing sequence and rest 5. Cattle rotation triggers

3. Collaborative Adaptive Management (10 years)



Monitoring data and dialogue inform decision-making

Research Team

USDA Agricultural Research Service

TEXAS A&M UNIVERSITY

ltar

WARNER COLLEGE OF NATURAL RESOURCES
COLORADO STATE UNIVERSITY

UNIVERSITY OF WYOMING

USDA Northern Plains Climate Hub
U.S. DEPARTMENT OF AGRICULTURE

Decision-maker Group

EDF ENVIRONMENTAL DEFENSE FUND®
Finding the ways that work

Bird Conservancy of the Rockies

COLORADO STATE UNIVERSITY EXTENSION

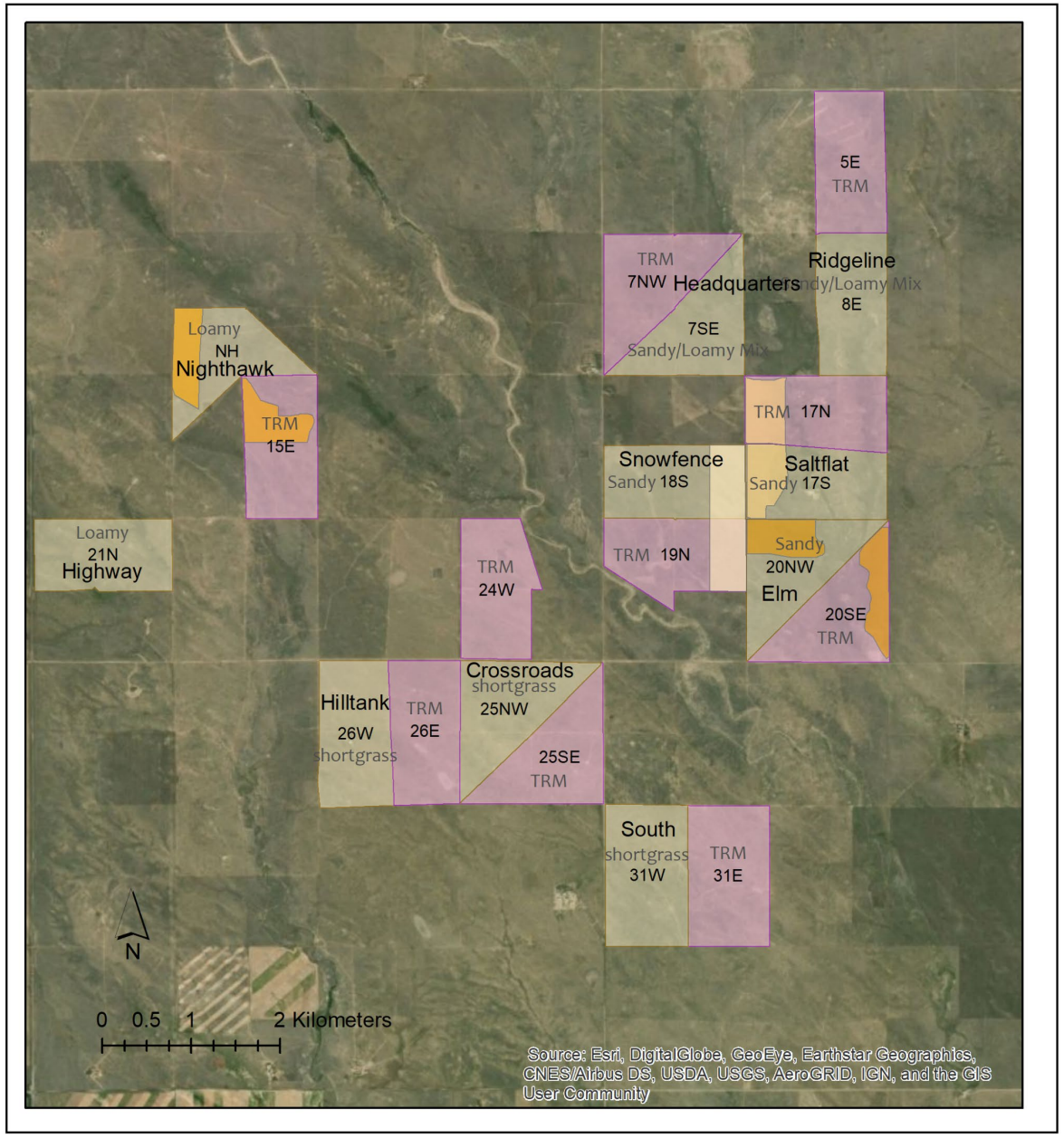
The Nature Conservancy

Crow Valley Livestock Cooperative, Inc.

USDA United States Department of Agriculture
Natural Resources Conservation Service

FOREST SERVICE U.S. DEPARTMENT OF AGRICULTURE

CO DNR COLORADO State Land Board
An innovative land trust funding Colorado schools since 1876.



Legend

AGM_Pastures

- 2014 Burn 1
- 2014 Burn 2
- 2016 Burn
- 2017 Burn

Grazing

- CARM Pasture
- TRM Pasture

Goal: Manage the land in order to pass it on to future generations
-Economically
-Ecologically

Vegetation

Profitable ranching operations

Wildlife

Collaborative Learning

Vegetation

A) Attain and/or maintain abundances of cool-season perennial graminoids within 30% of targets for each plot.

B) Maintain or increase plant compositional diversity both within and across pastures.

C) Increase variation in vegetation structure, composition, and density within and among pastures.

D) In pastures that had stands of four-wing saltbush at the start of experiment, increase or maintain cover relative to baseline.

Profitable ranching operations

A. Maintain or increase livestock weight gain

B. Reduce economic impact of drought

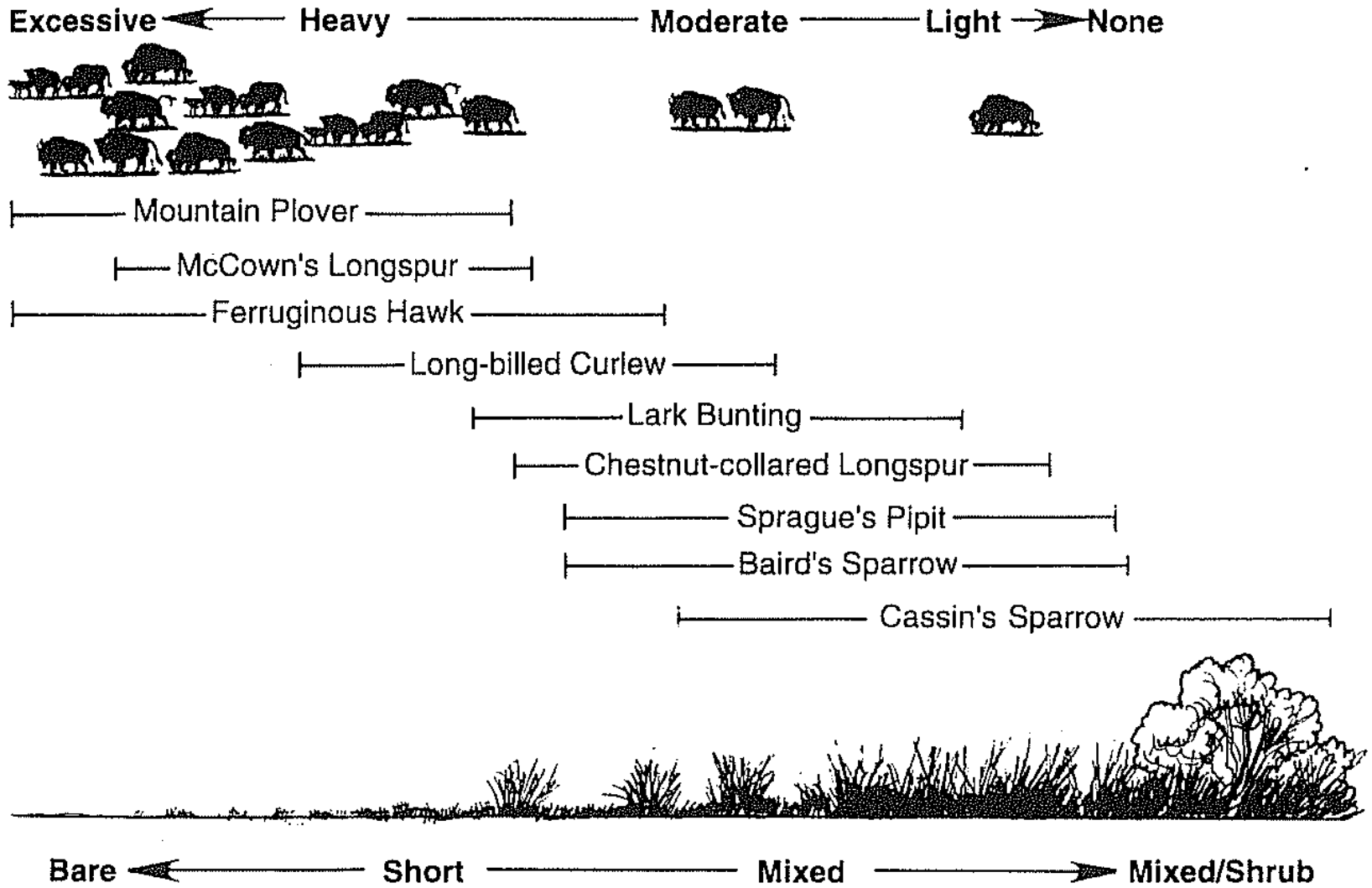
C. Maintain or reduce operating costs

Wildlife

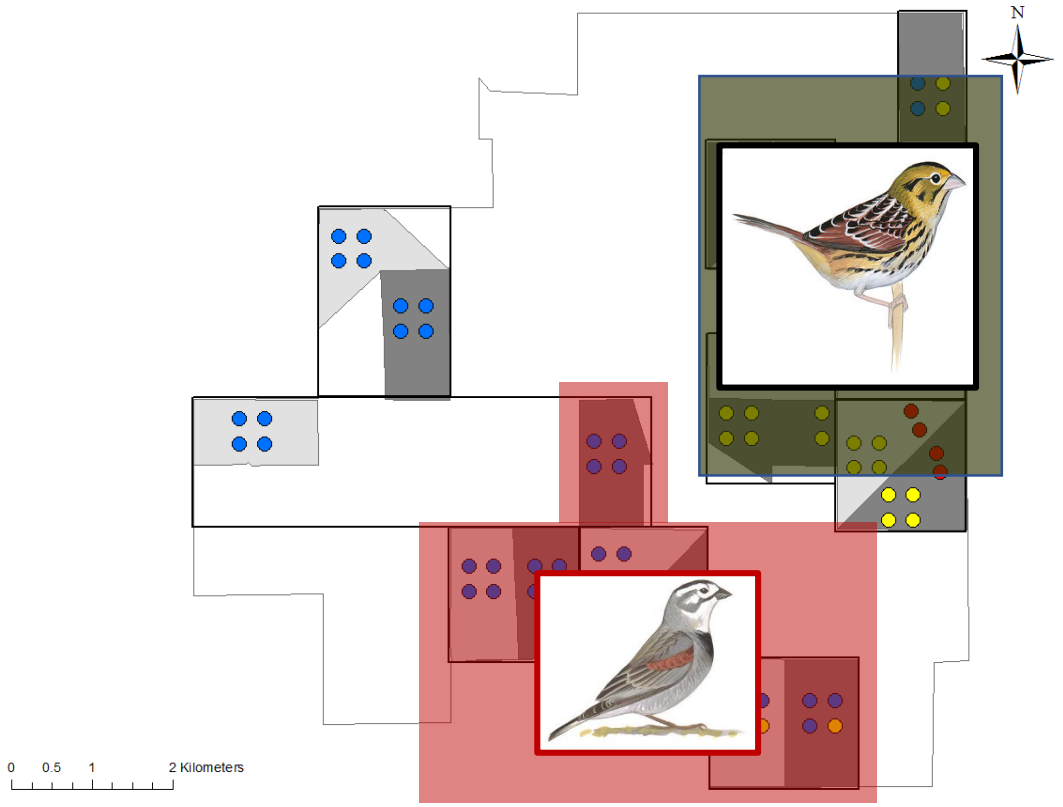
A. Increase populations of mountain plover.
B. Maintain populations of McCown's longspur, Western meadowlark, and horned lark
C. Increase populations of grasshopper sparrow, Cassin's sparrow, Brewers sparrow, and lark bunting
D. Maintain control of prairie dog populations (No prairie dogs.)

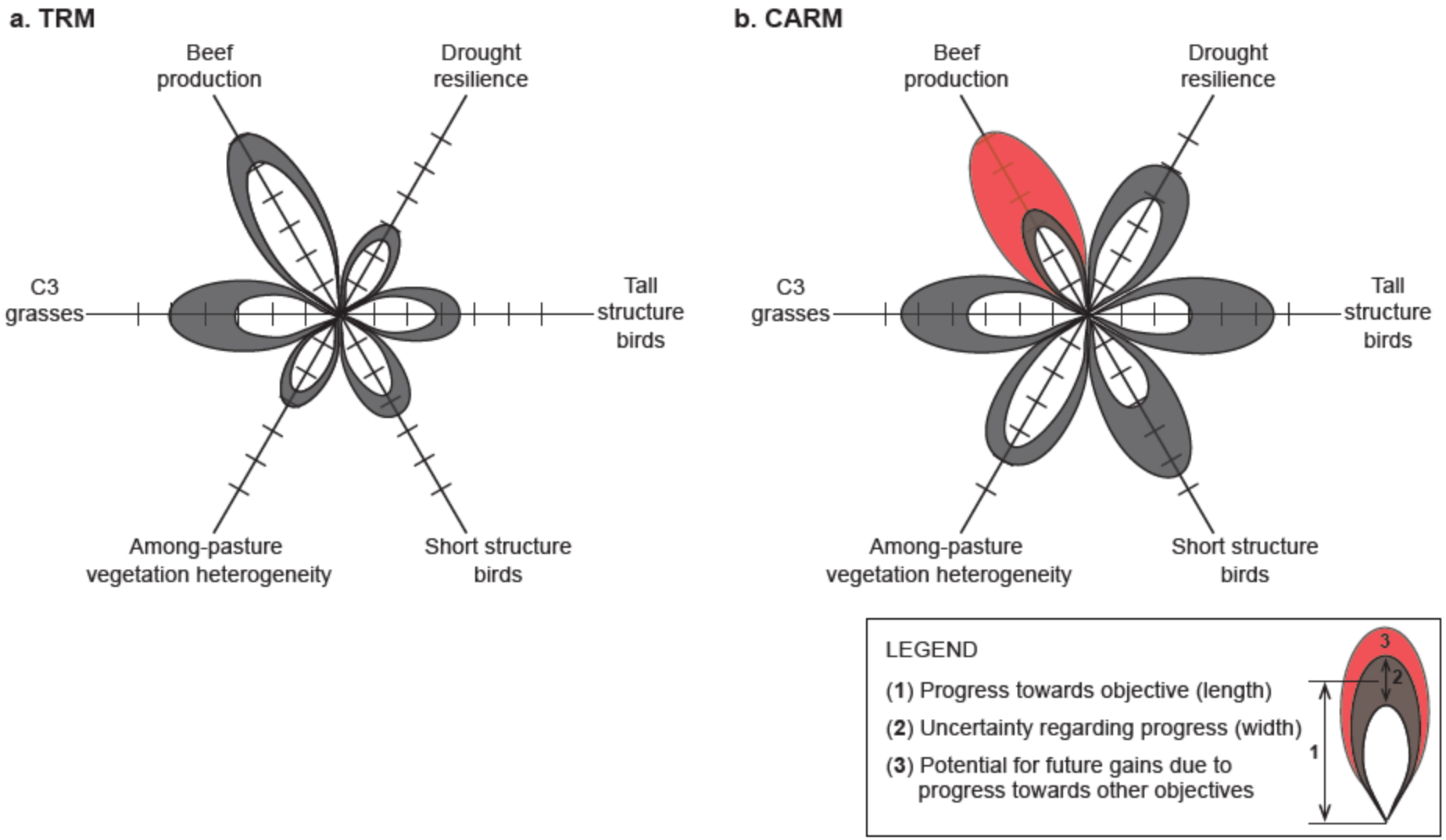
Collaborative Learning

A. Apply new knowledge and CARM in new areas
B. Respect, understanding and trust increases among stakeholders and researchers
C. Stakeholders and researchers co-produce new knowledge


Excessive
Heavy
Moderate
Light
None
Mountain Plover
McCown's Longspur
Ferruginous Hawk
Long-billed Curlew
Lark Bunting
Chestnut-collared Longspur
Sprague's Pipit
Baird's Sparrow
Cassin's Sparrow
Bare
Short
Mixed
Mixed/Shrub

Spatial Prioritization

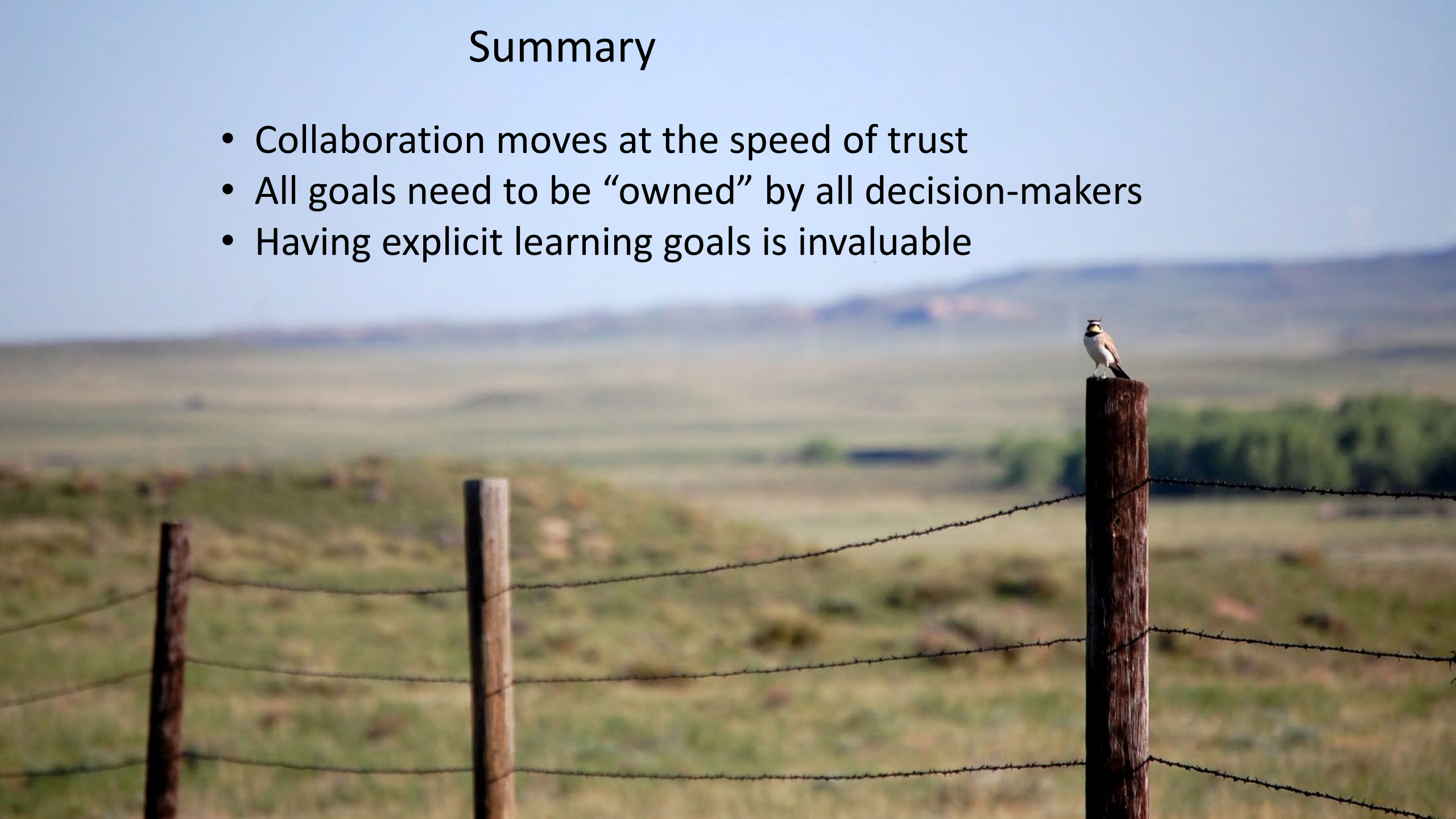



a. TRM
Beef production
Drought resilience
C3 grasses
Tall structure birds
Among-pasture vegetation heterogeneity
Short structure birds
b. CARM
Beef production
Drought resilience
C3 grasses
Tall structure birds
Among-pasture vegetation heterogeneity
Short structure birds
LEGEND
(1) Progress towards objective (length)
(2) Uncertainty regarding progress (width)
(3) Potential for future gains due to progress towards other objectives
1
2
3

Treatment	Pre-Drought Year	Drought Year	Post-Drought Year (Early)
Grass Banking (**managing for heterogeneity**)	**Promote cool-season perennials** **Grasshopper Sparrow** **McCown's Longspur**	**Grass Bank maintains stocking rate**	**Early post-drought forage production enhanced by grassbanking or not impacted**
No Grass Banking (**managing for the middle**)	**Horned Lark**	**Reduce Stocking Rate (-$)**	

Summary

- Collaboration moves at the speed of trust
- All goals need to be “owned” by all decision-makers
- Having explicit learning goals is invaluable



Learn More:

Wilmer, Hailey, Justin D Derner, Maria E. Fernández-Giménez, David D Briske, David J Augustine, Lauren M Porensky, and The CARM Stakeholder Group. 2018. “Collaborative Adaptive Rangeland Management Fosters Management-Science Partnerships.” *Rangeland Ecology & Management* 71 (5): 646–57.

Digital Fact sheet: https://spark.adobe.com/page/cDD9u5v5ZeC88/