Sagebrush-Associated Wildlife Species

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Sagebrush Region (155.5 mill. acres)

- Sagebrush Steppe
- Sagebrush Semi-Desert (Great Basin Sagebrush)

HISTORICAL PERSPECTIVE

Paige and Ritter (1999):

Before European settlement, "spotty and occasional wildfire probably created a patchwork of young and old sagebrush stands across the landscape, interspersed with grassland openings, wet meadows, and other shrub communities."

Miller and Eddleman (2001):

"The Wyoming big sagebrush and low sagebrush cover types, with less frequent disturbance events but slower recovery rates, and the mountain big sagebrush cover type, with more frequent disturbance but faster recovery rates, created a mosaic of multiple vegetation successional stages across the landscape."

Miller and Eddleman (continued):

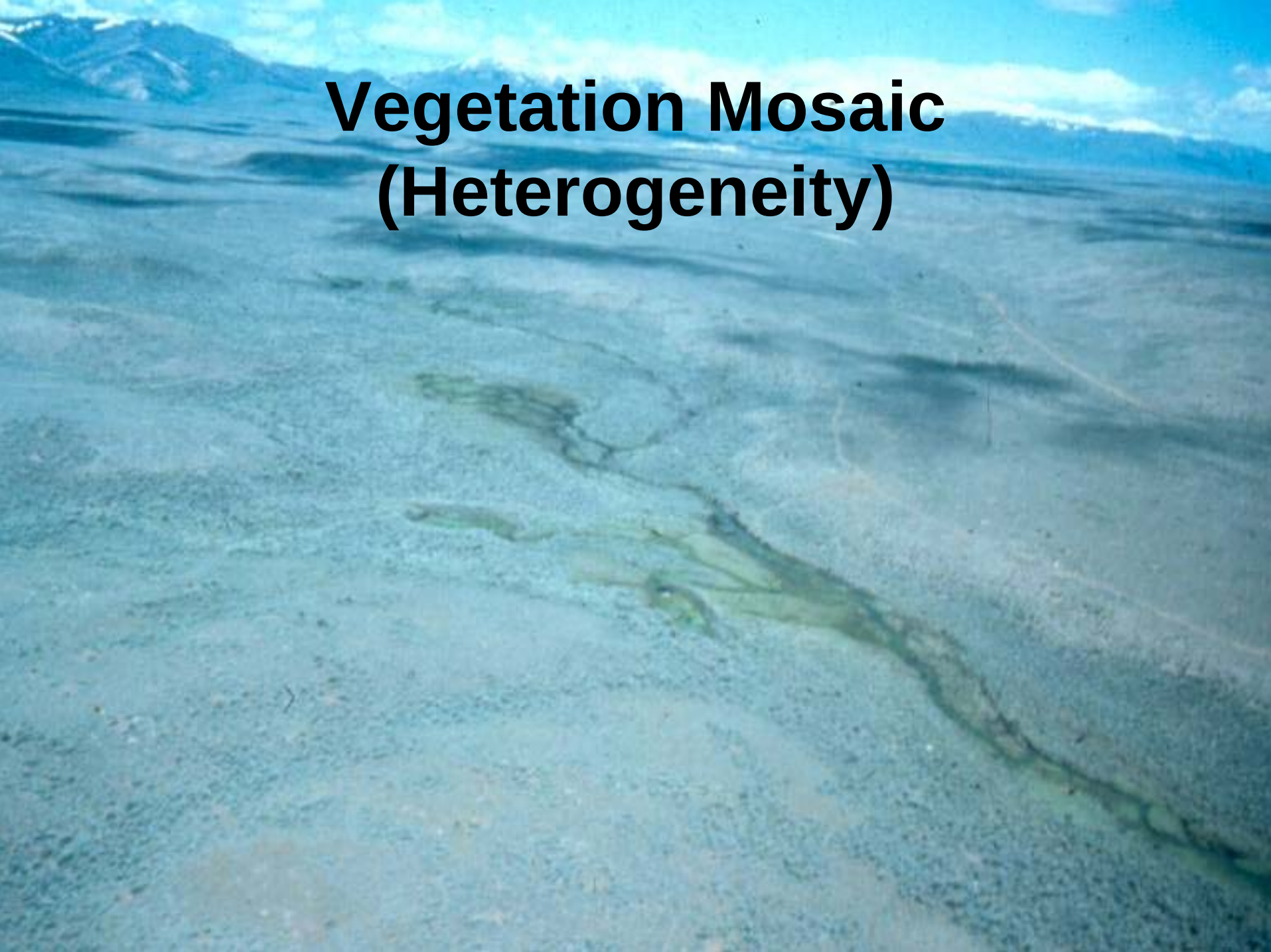
“In addition, fire patterns were patchy, leaving unburned islands, particularly in Wyoming big sagebrush cover types, because of limited and discontinuous fuels. Plant composition ranged from dominant stands of sagebrush to grasslands.”

Wildlife in Sagebrush Communities

- 91 bird species
  - * 33 possibly near-obligates
- 88 mammal species
  - * 19 possibly near-obligates
- 45 reptile species

Sagebrush Habitat Obligates

- Sage Grouse
- Sage Sparrow
- Brewer's Sparrow
- Sage Thrasher
- Pygmy Rabbit
- Sagebrush Vole
- Pronghorn
- Least Chipmunk?
- Sagebrush Lizard?


Vegetation Mosaic
(Heterogeneity)

Sage Grouse

- Require sagebrush for food and/or cover
- Thrive best in sagebrush mosaics
- Optimal habitat has varying sagebrush heights/species and diverse understory

Shrub-Nesting Sagebrush Obligates

- Sage Sparrow – large continuous sagebrush stands
- Brewer's Sparrow – scattered shrubs/short grass
- Sage Thrasher – tall dense sagebrush/bare ground

Brewer’s Sparrow

Sage Sparrow

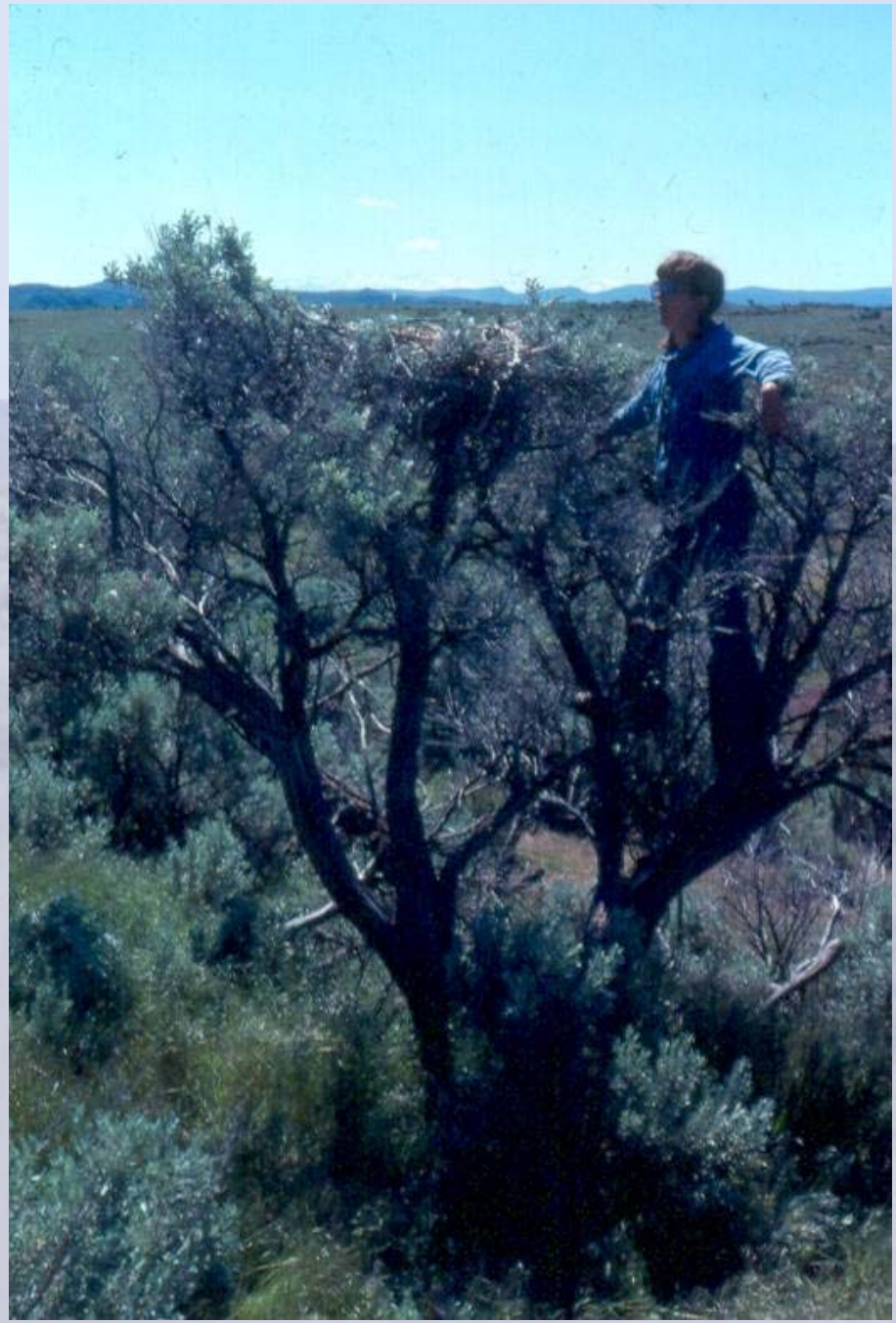
Seedings With 10% Shrub Cover
48% Shrub Nesting Birds
52% Grass Nesting Birds
(McAdoo et al. 1989, JWM)

Sagebrush Obligate Mammals

- Pygmy Rabbit – tall sagebrush clumps/friable soils
- Sagebrush Vole – grass cover (+ sage?)
- Pronghorn – eat forbs mostly, but sagebrush in winter; need openness for visibility

Sagebrush Habitat Associated Bird Species

- Loggerhead Shrike – shrub nester
- Horned Lark – ground nester
- Vesper Sparrow – grass nester
- Western Meadowlark – grass nester
- Lark Sparrow – diverse sagebrush/bunchgrass
- Burrowing Owl – open/disturbed areas
- Many others, including raptors



Sagebrush Habitat Associated Ungulates

- Mule Deer – prefer shrub-forb mix
- Elk – eat dominantly grass, but shrubs in winter
- Bighorn Sheep – sagebrush/grass as winter range

Regional Obligate??

Sagebrush Habitat Associated Lagomorphs

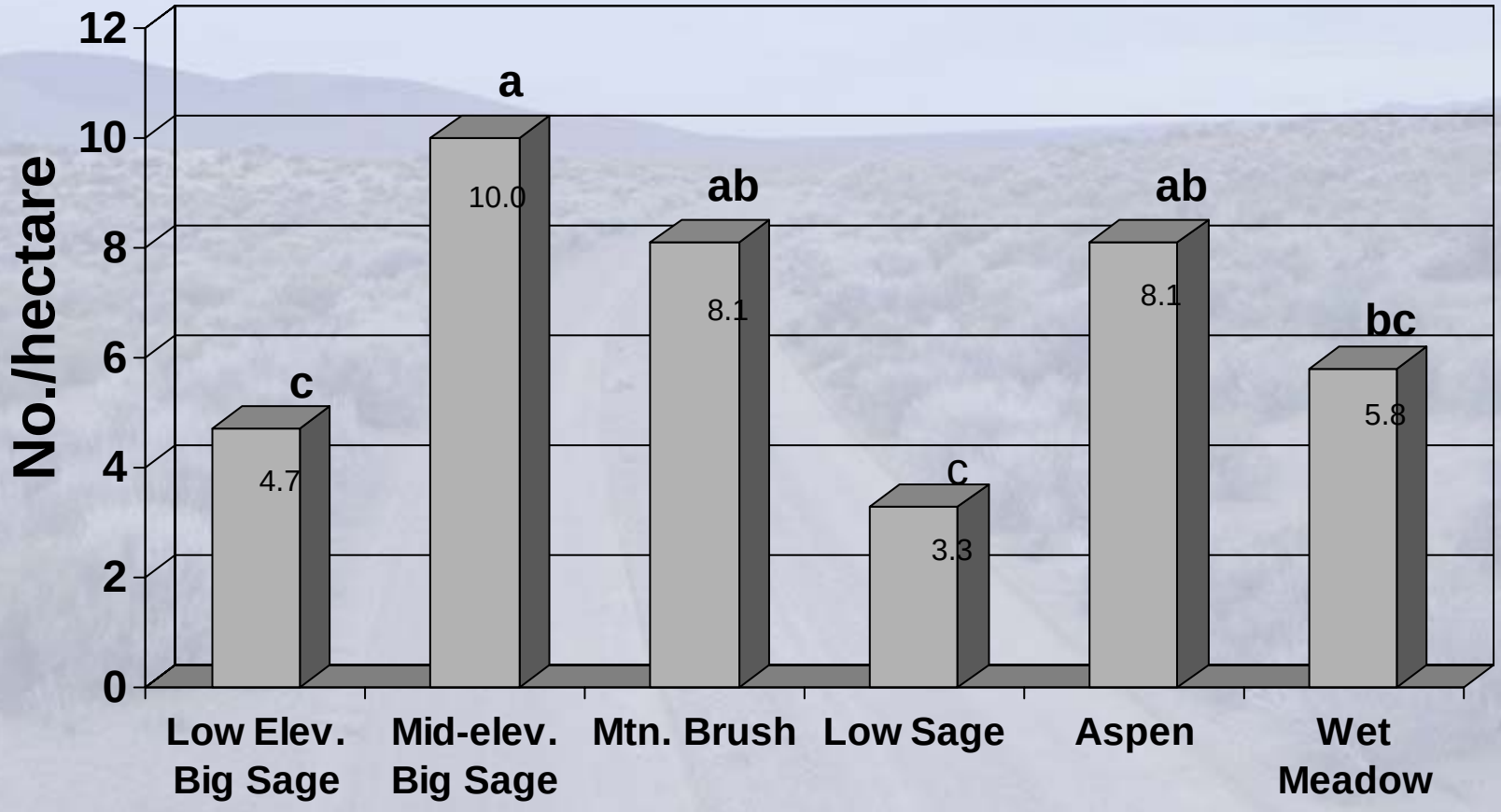
- Black-tailed Jackrabbit – more shrub-associated
- White-tailed Jackrabbit – more grass-associated
- Mountain Cottontail
- Desert Cottontail

Sagebrush Habitat Associated Rodents [acc. literature]

- 28 species
- Great Basin Pocket Mouse – near obligate
- Least Chipmunk – near obligate; require shrubs
- Deer Mouse – most abundant

Deer Mice Densities

(McAdoo et al. 2006)



[Means with differing letters are significantly different ($p<0.05$)]

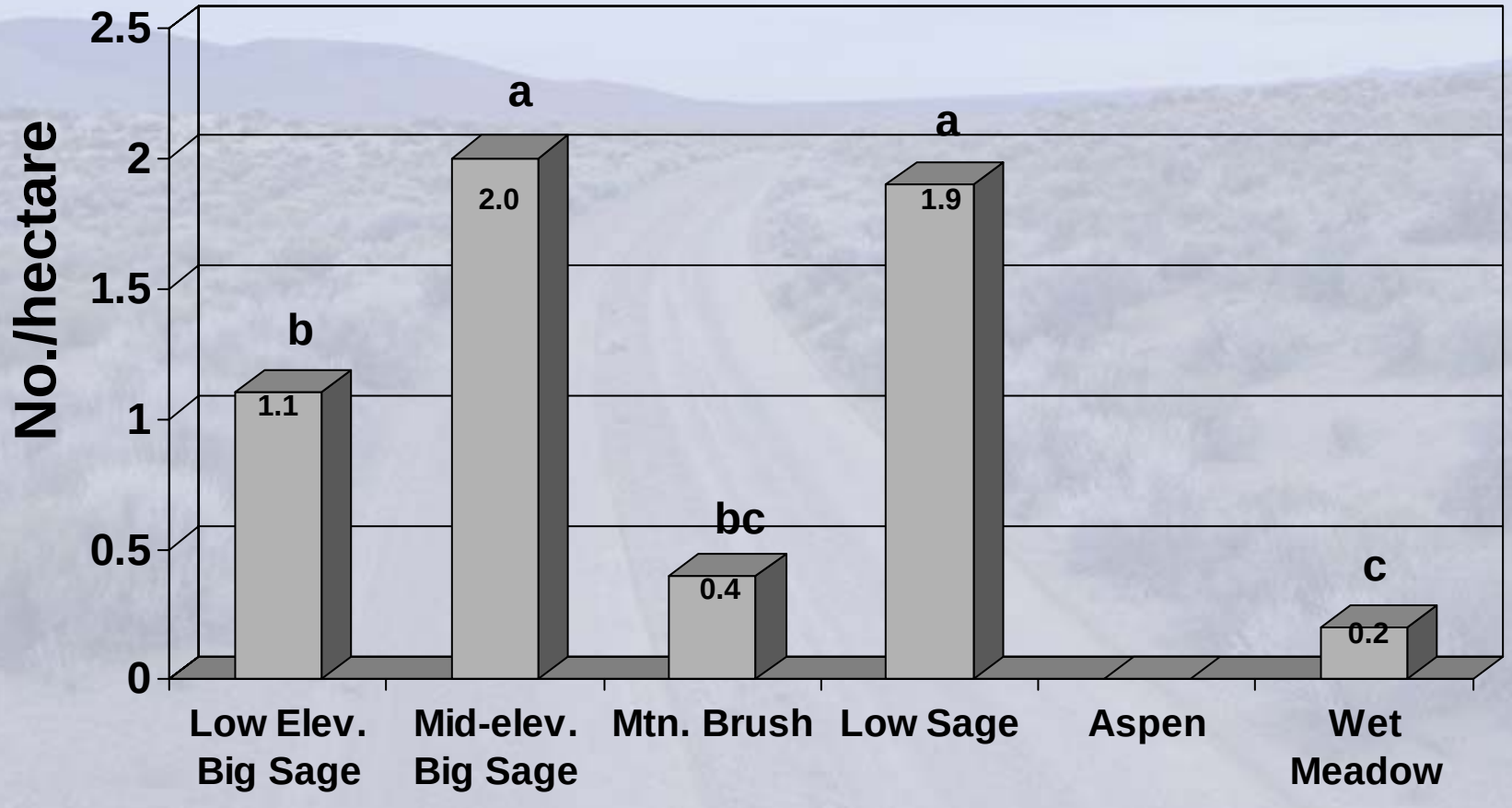
“SAGEBRUSH NEAR-OBLIGATES”?

(McAdoo et al. 2006)

- **Sagebrush voles – prefer grass cover (even crested wheatgrass)**
- **G.B. pocket mice – big sagebrush, low sagebrush, crested wheatgrass**
- **Least chipmunks – most abundant in big sagebrush; require shrub cover**

Great Basin Pocket Mice Densities

(McAdoo et al. 2006)



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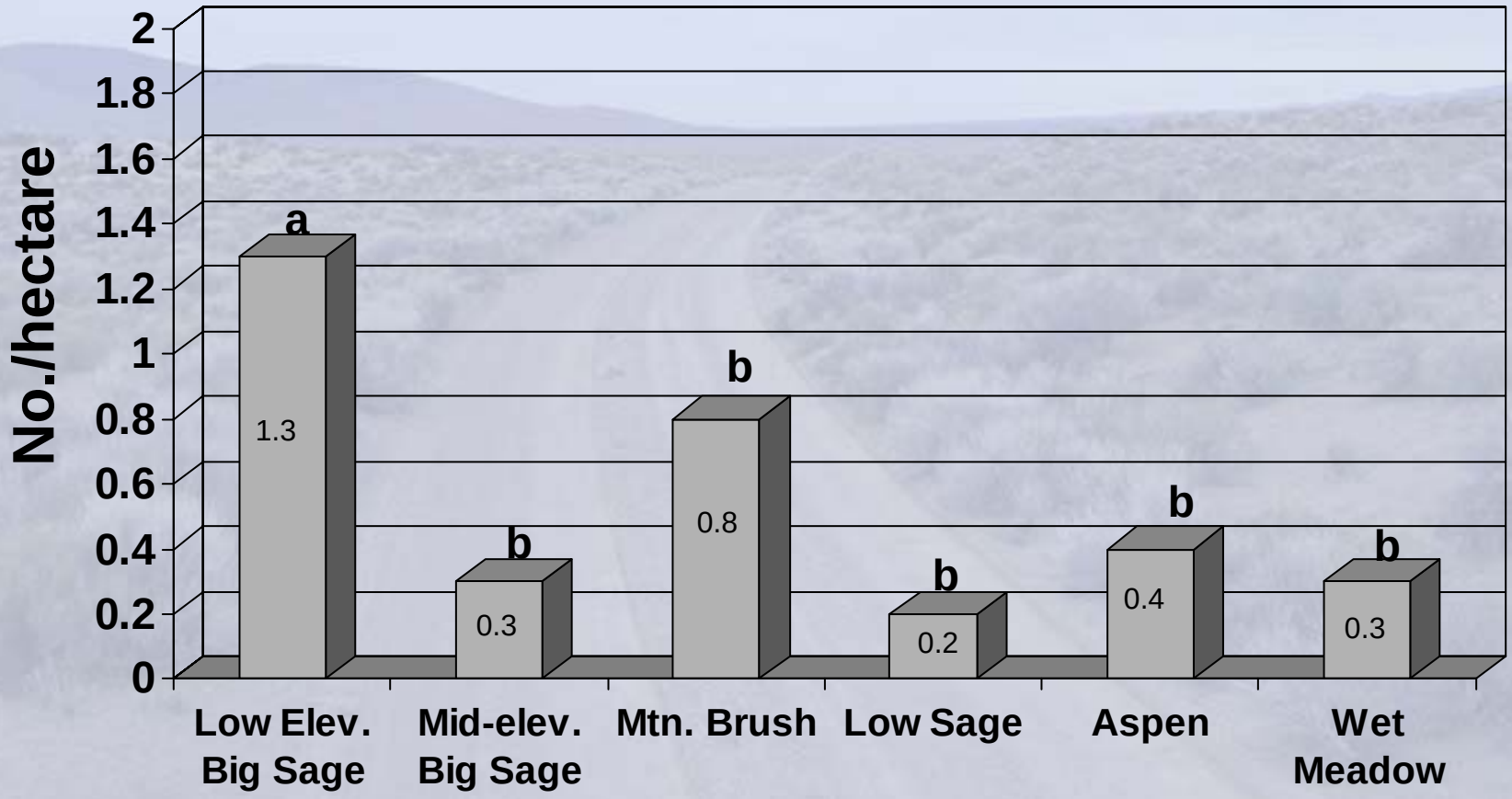
Least Chipmunk Densities

McAdoo et al. 2006



[Means with differing letters are significantly different ($p<0.05$)]

Least Chipmunk Population Indices as Function of Sagebrush Cover

(McAdoo, unpubl. data)

Treatment	Chipmunk Index
• Before sage removal (18% cc)	15*
• After sage removal (4% cc)	1

*p<0.05

Least Chipmunk Population Indices as Function of Sagebrush Cover

(McAdoo, unpubl. data)

Treatment	Chipmunk Index
Untreated (sagebrush cc = 20%)	20
Old Seeding (sagebrush cc = 14%)	14
New Seeding (sagebrush cc = 4%)	1

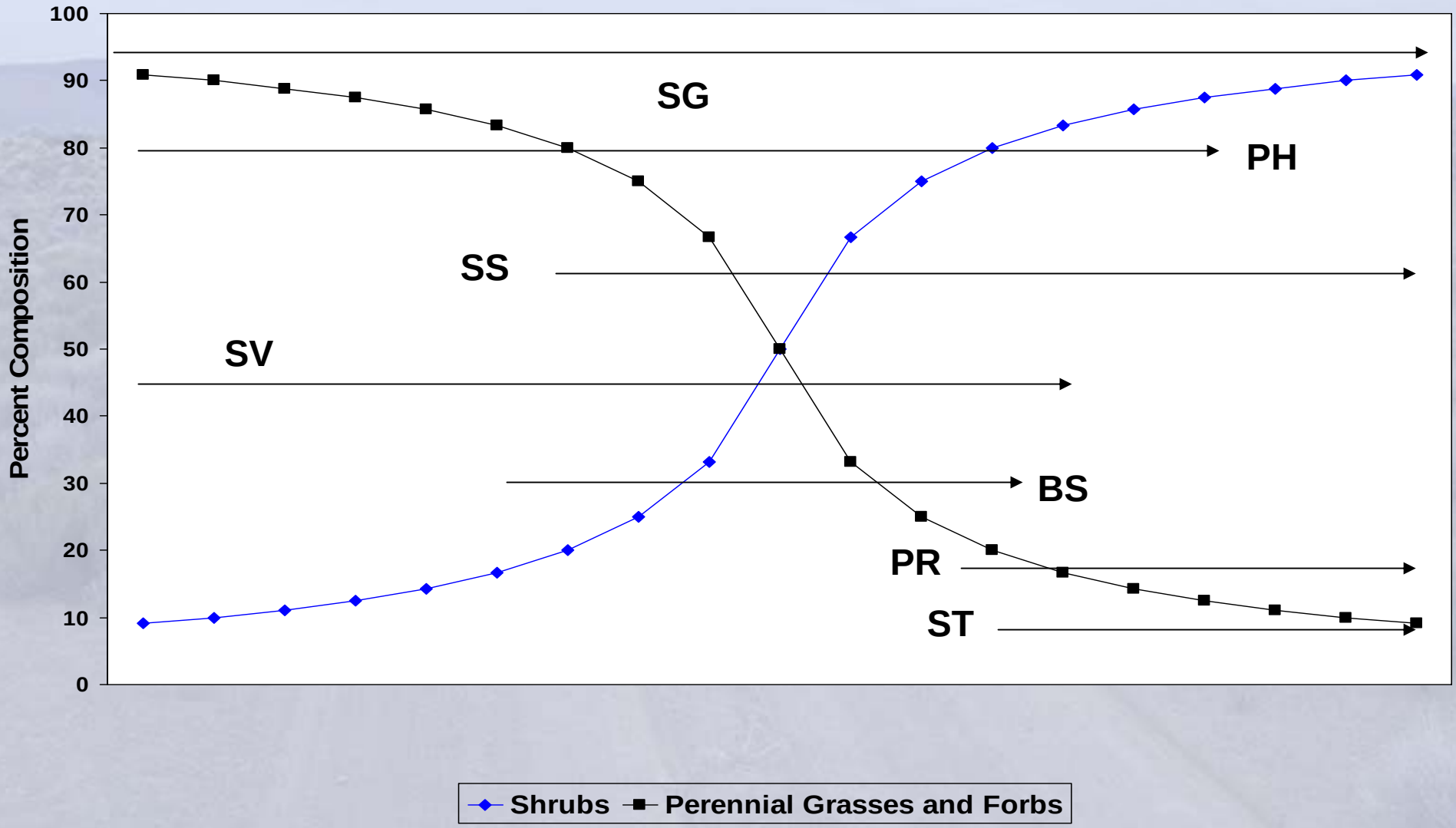
Sagebrush Habitat Associated Mammalian Predators

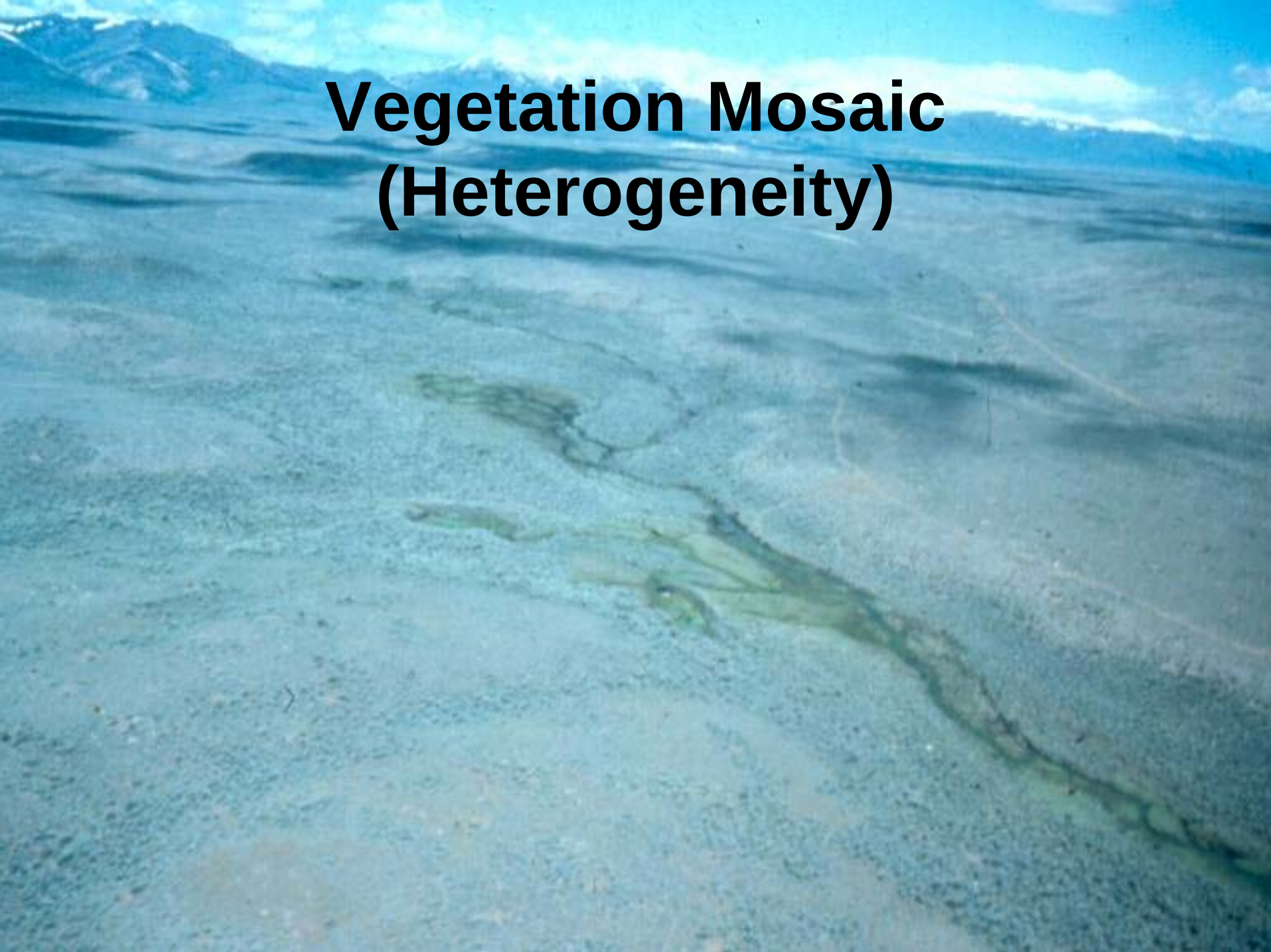
- Coyote
- Bobcat
- Mountain Lion
- Gray Fox
- Red Fox
- Kit Fox
- Short-tailed weasel
- Long-tailed weasel
- Badger
- Striped Skunk
- Others

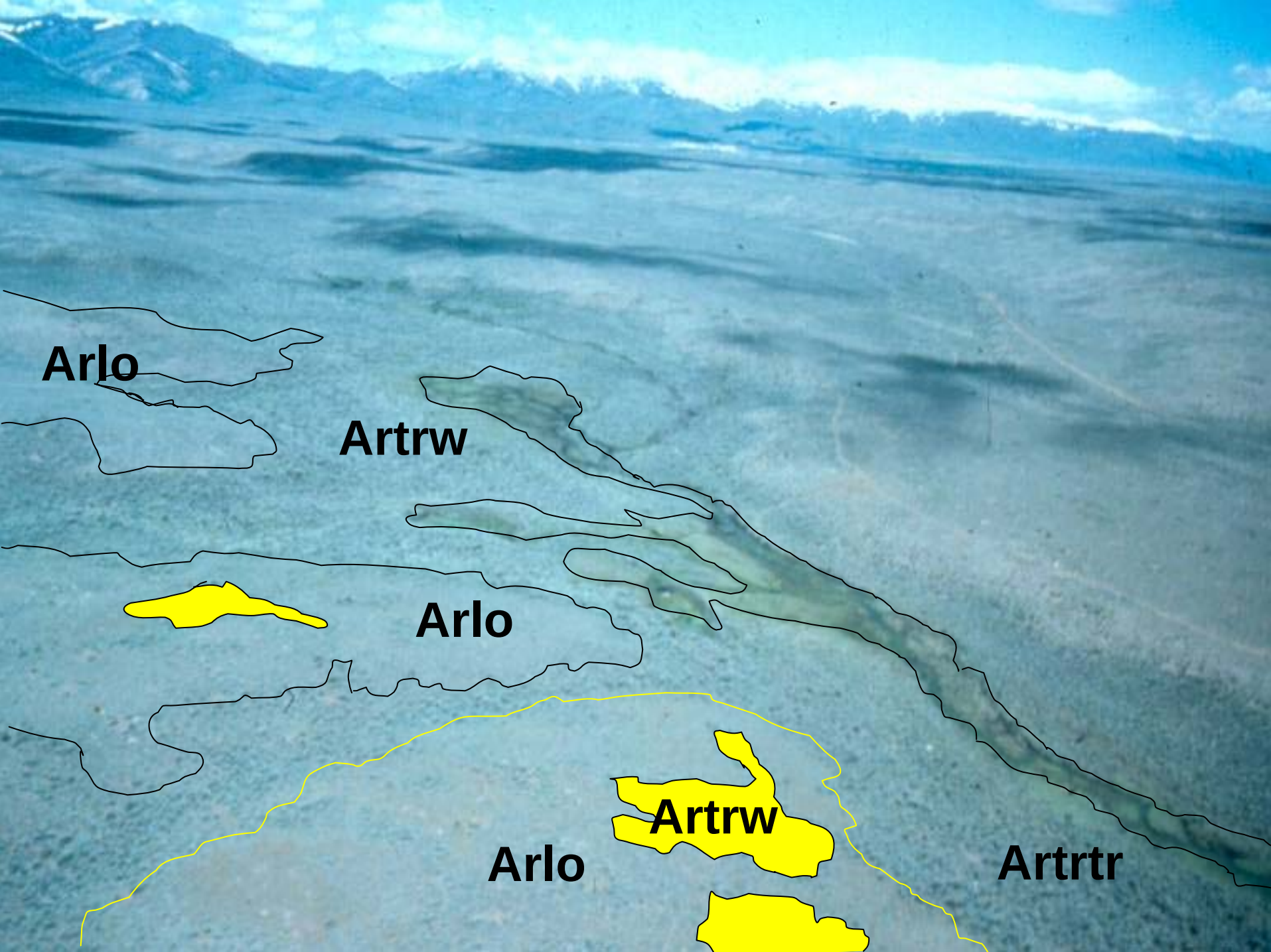
Summary and Inferences

- Habitat requirements of wildlife species are widely diverse
- Pre-settlement vegetation consisted of young and old sagebrush stands and grassy areas (due to periodic wildfire, aroga moth, drought, etc.)
- Sagebrush-grass communities are spatially diverse and temporally dynamic, influencing wildlife abundance, distribution, and diversity
- Historically, some wildlife species were locally abundant but regionally rare (habitat response)

Habitat Requirements for Sagebrush Obligate Species




Vegetation Mosaic
(Heterogeneity)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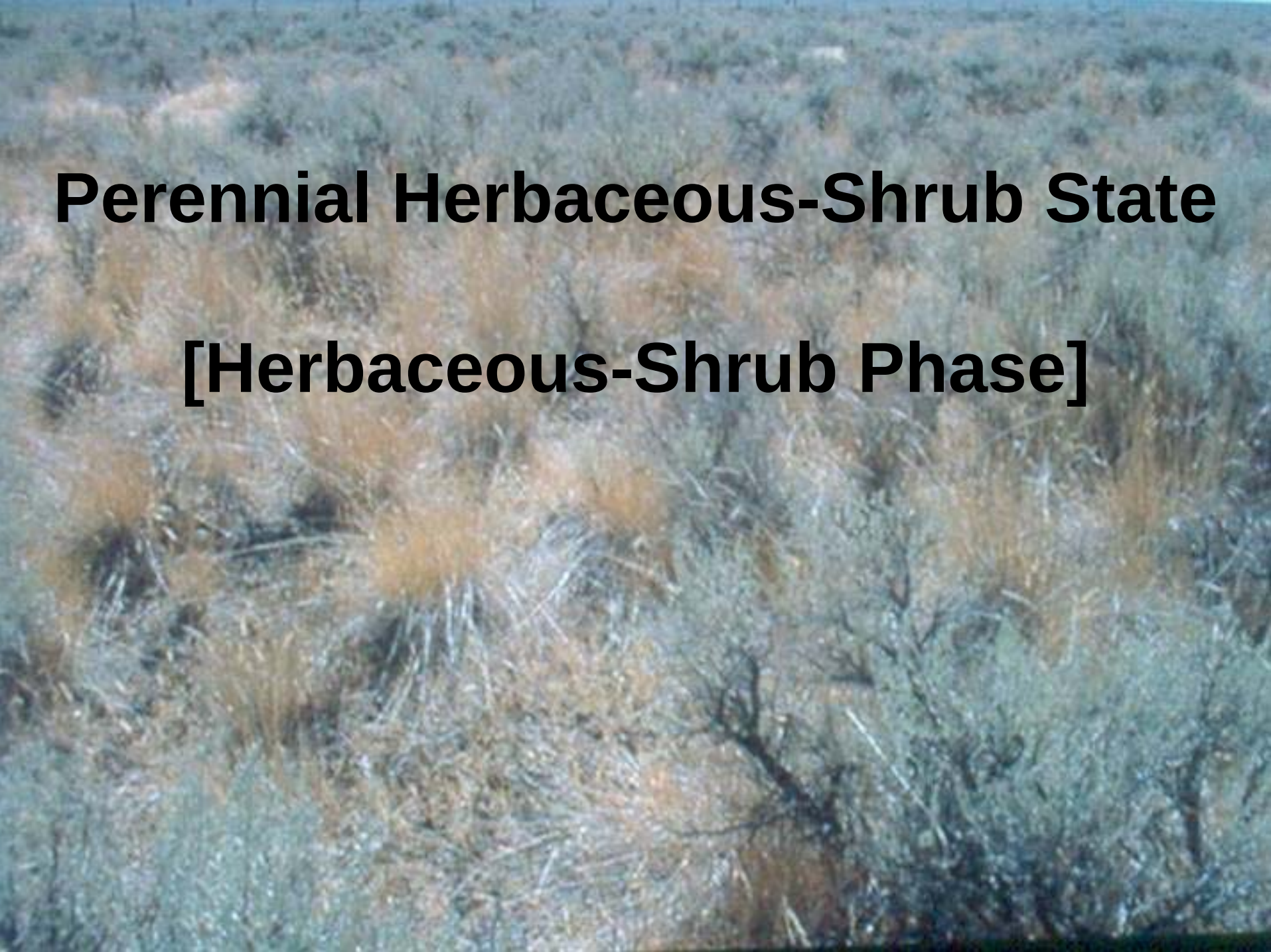
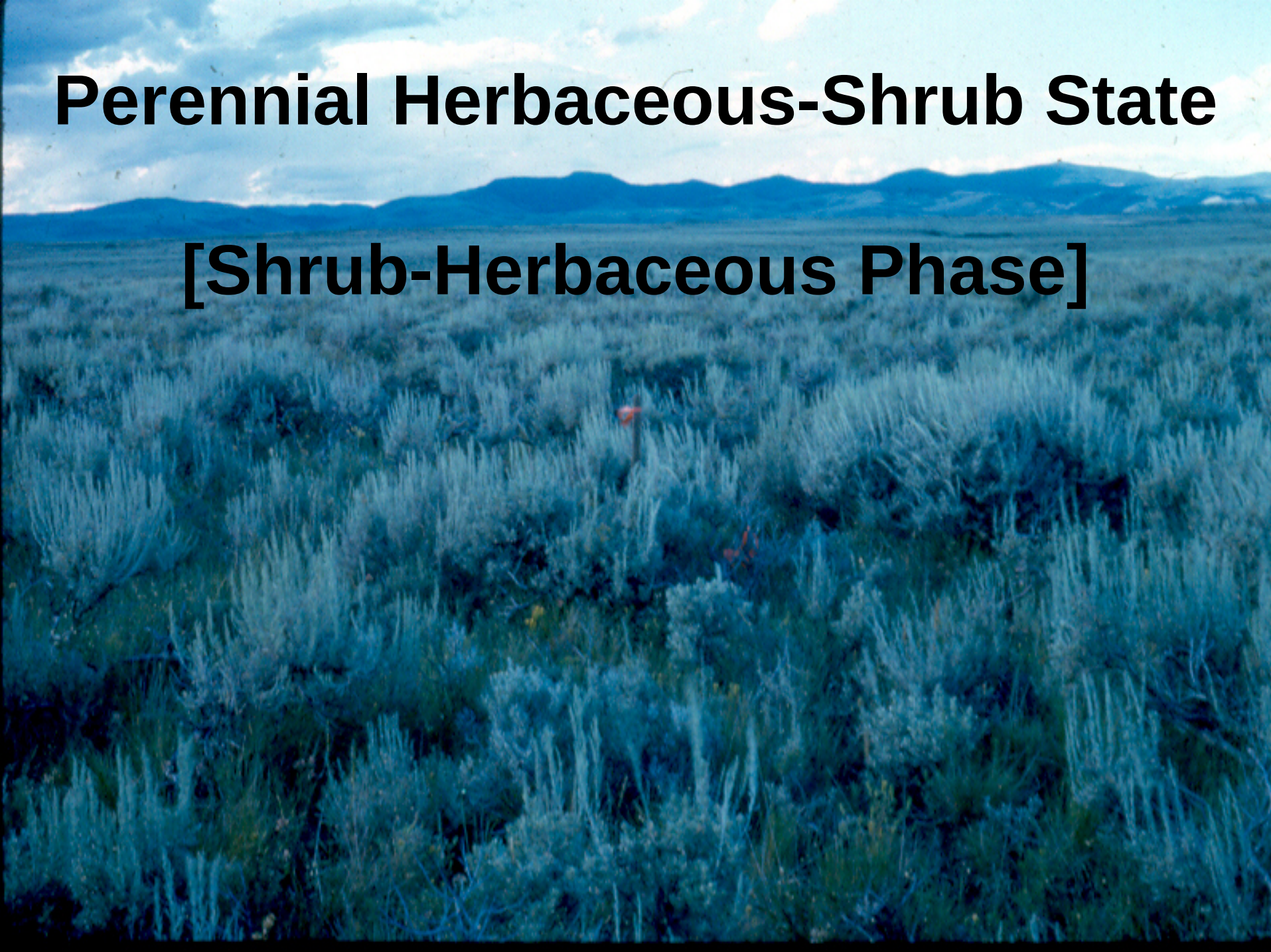
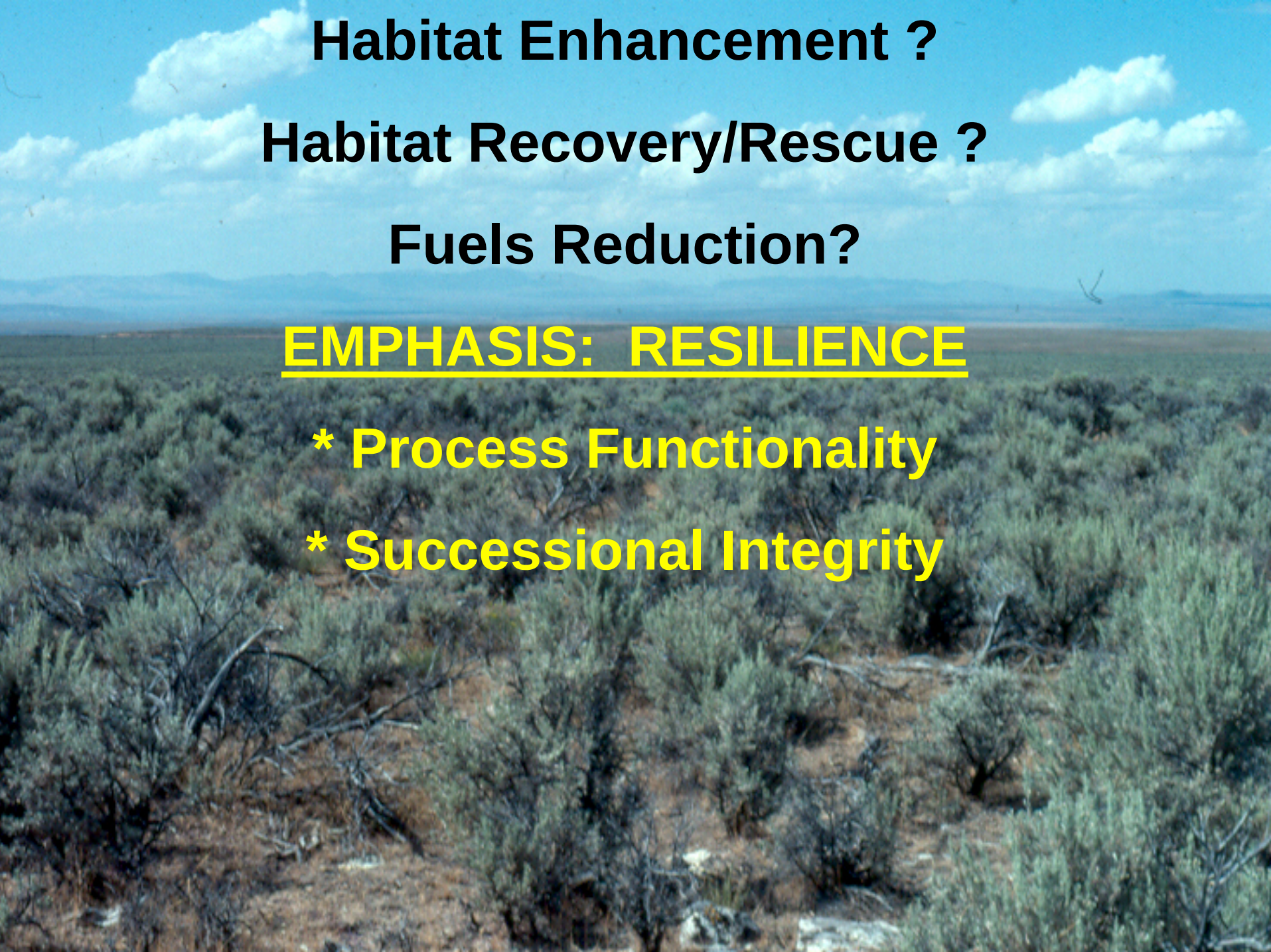
Perennial Herbaceous-Shrub State

[Herbaceous Phase]


Perennial Herbaceous-Shrub State
[Herbaceous-Shrub Phase]


Perennial Herbaceous-Shrub State
[Shrub-Herbaceous Phase]

Threshold Crossed!
Shrub State
(Near-Monotypic Sagebrush)
Expect Cheatgrass monoculture
after Fire!


Habitat Enhancement ?
Habitat Recovery/Rescue ?
Fuels Reduction?
EMPHASIS: RESILIENCE
* Process Functionality
* Successional Integrity

Active vegetation management will be required to restore resilience in sagebrush communities

Resilience, Wildfire, & Sustainability

Success in establishing mosaics of resilient native plant communities will reduce risk of large crown fires and complement rangeland management for wildlife diversity and sustained multiple resource uses