Seed Issues and Seed Sourcing:

Sage Grouse Habitat Restoration

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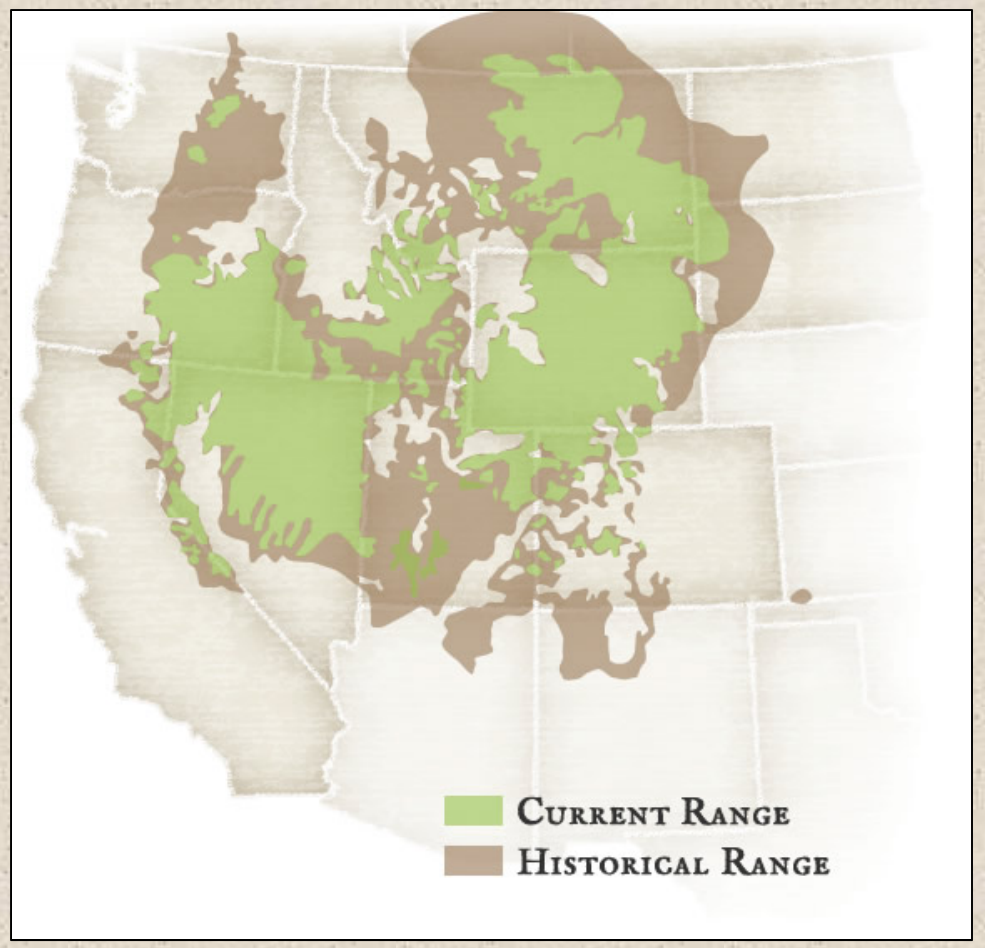
Sage Grouse

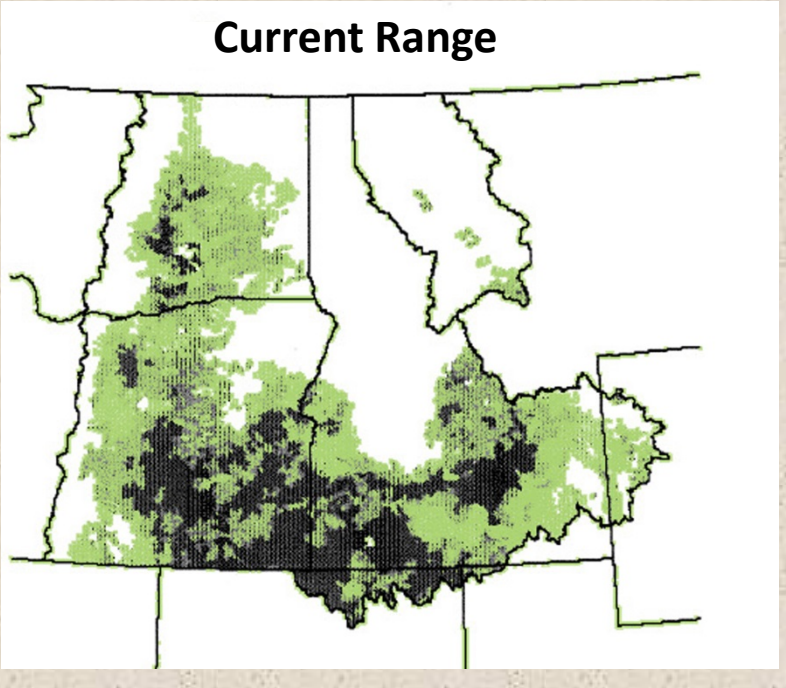
- Now occupy approximately one half of original range
- Decline due to habitat loss and landscape fragmentation
- Habitat restoration
  - Active restoration via reseeding of native plants
  - Slow or halt population decline

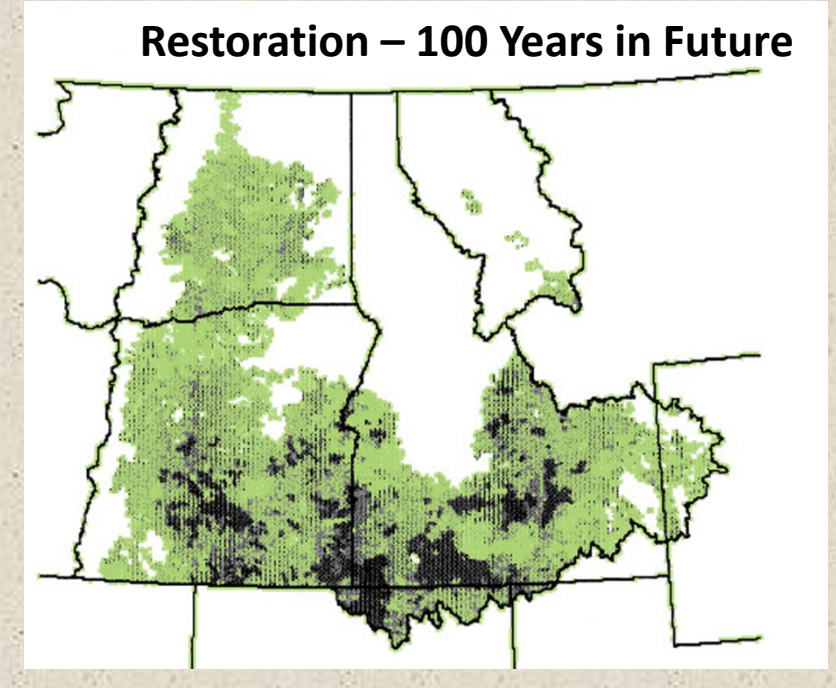


Sage Grouse Initiative

Can it work?

- Models -> a six-fold increase in areas under restoration will reduce risk of local extinction of Sage Grouse





Black areas occupied by Sage Grouse

Wisdom et al. 2002 Conservation Biology 16

Winter

Spring

Sagebrush

70% or greater

Fall

Summer

Diet

Spring and Summer

- Insects
- Forbs

} Chicks

- Sagebrush

Mountain Big Sagebrush

Fall and Winter

- Sagebrush

Wyoming Big Sagebrush

Examples

- *Achillea millefolium* – common yarrow
- *Antennaria spp.* – pussytoes
- *Astragalus spp.* – milkvetch
- *Crepis spp.* – hawksbeard
- *Linum lewisii* – blue flax
- *Lomatium spp.* – desert parsley
- *Machaeranthera spp.* – tansyaster
- *Sphaeralcea coccinea* – scarlet globemallow

Availability?

- *Achillea millefolium* – common yarrow
- *Antennaria spp.* – pussytoes
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Limited

Species and Seed Source

- Species?
  - Shrubs, grasses
  - Forbs? Research and Specialists
  - Location
- Seed Source
  - Suitability for a site
  - Long-term establishment

Does each species occur naturally in your area?

Search
Name Search

Scientific Name Go

- Alternative Crops
- Characteristics
- Classification
- Cover Crops
- Culturally Significant
- Distribution Update
- Documentation
- Fact Sheets & Plant Guides
- Invasive and Noxious Weeds
- Links
- Threatened & Endangered
- Wetland Indicator Status

Image Gallery

- 40,000+ Plant Images
- Submit Your Digital Images

Download

You are here: Home / Advanced Search and Download

Advanced Search and Download

About the Advanced Search and Download

1. Distribution

PLANTS Floristic Area or Not — include:
Any
PLANTS Floristic Area
--North America
--Lower 48 U.S. States
--Alaska
--Canada

Lower 48

Note: PLANTS Floristic Area or Not cannot be used with the next two search boxes.

State and Province — include:
--Vermont
--Virginia
--Washington
--West Virginia
--Wisconsin
--Wyoming

Wyoming

Note: County results are added to State and Province results. See About the Advanced Search and Download for details.

County Distribution (Select a maximum of 256) — include:
Wyoming:Albany
Wyoming:Big Horn
Wyoming:Campbell
Wyoming:Carbon
Wyoming:Converse
Wyoming:Crook

Wyoming: Converse

3. Ecology

Duration — include:
Any
Annual
Biennial

Growth Habit — include:
Any
Forb/herb
Graminoid

Native Status — include:
Any
Native to PLANTS Floristic Area
--North America Native
--L48 Native
--AK Native

--L48 Native

Seed Source?

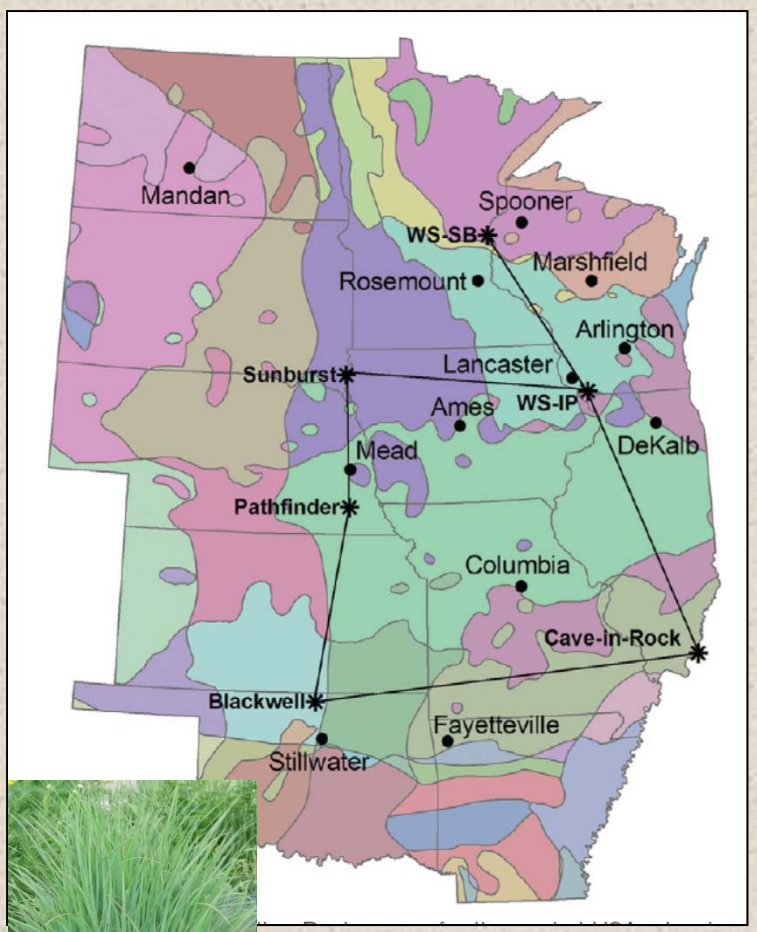

Long-term success in restoring a species to a given site is dependent upon obtaining **plants adapted** to the site.

Local Adaptation

Plant Ecotypes: distinct genotypes (or populations) within a species, resulting from adaptation to local environmental conditions.

G. Turesson 1922 The species and variety as ecological units.

Ecotypic Variation - Latitude



Casler et al. '07 Crop Science

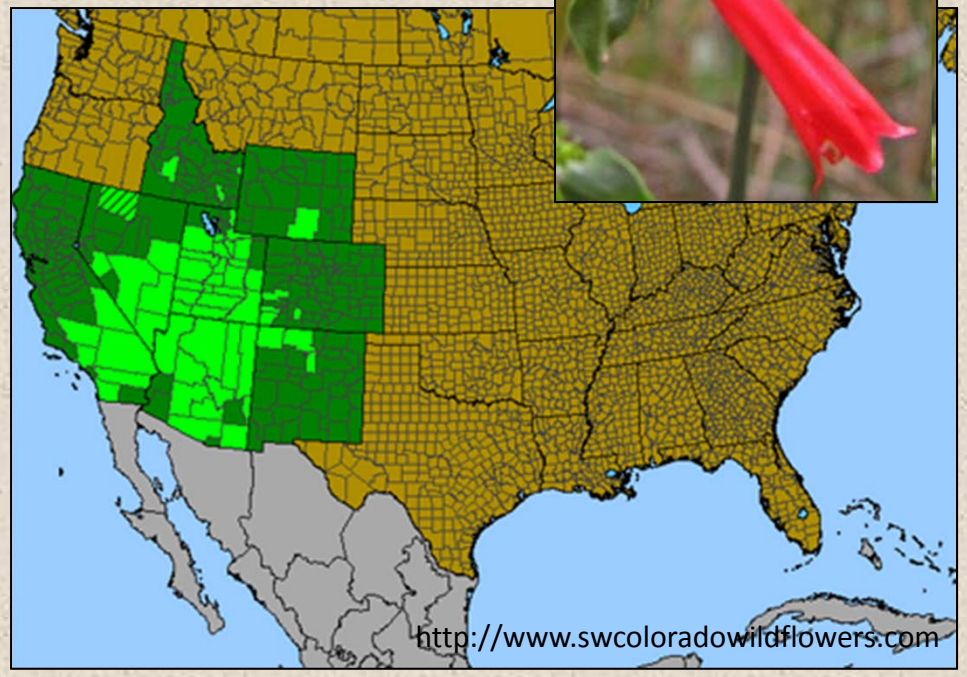
Switchgrass, *Panicum virgatum*

- Relative importance of latitude and longitude for adaptation and agronomic performance (biomass).
- Significant effect of latitude (north-south) but not longitude.
- Latitudinal ecotypes

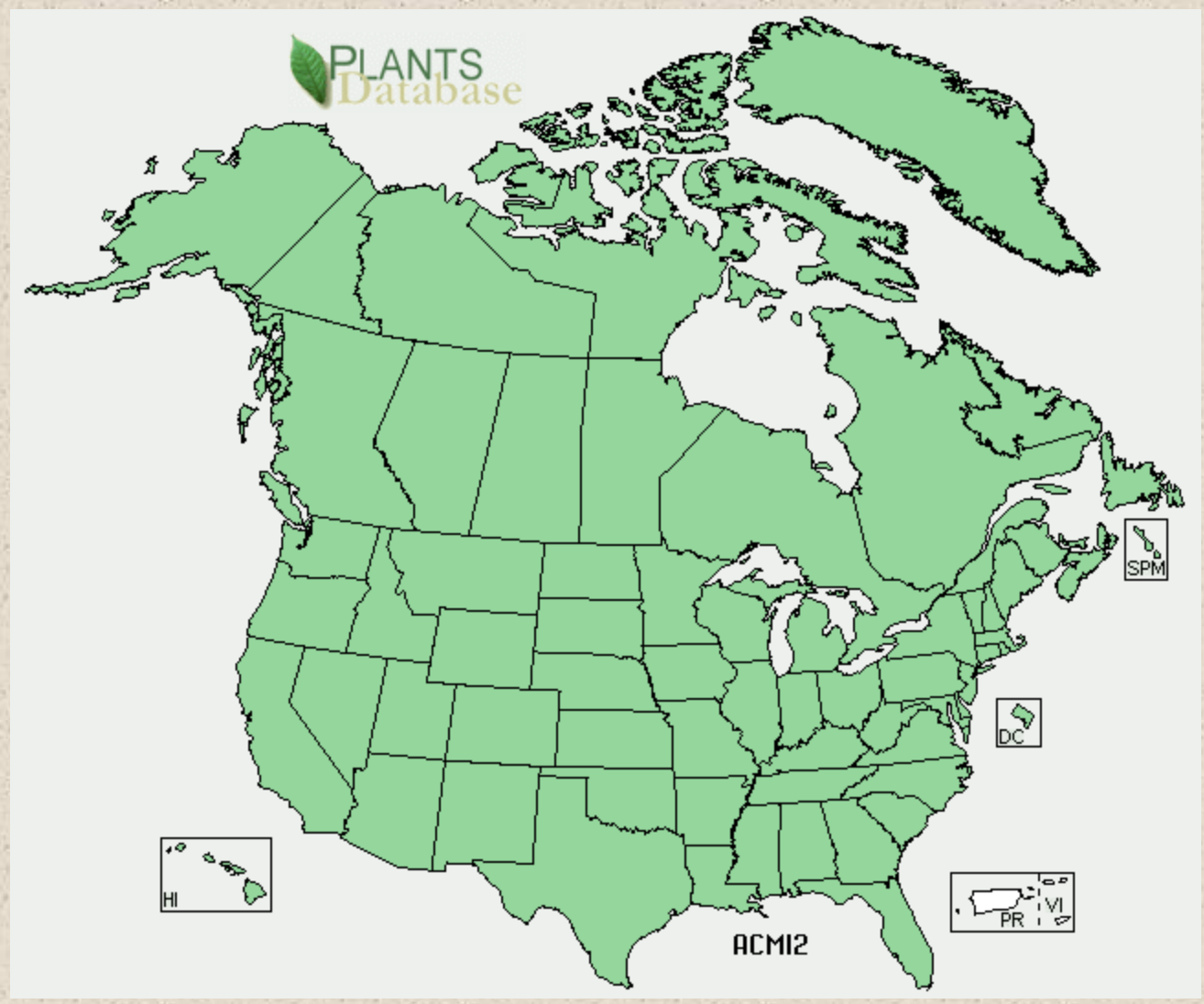
Ecotypic Variation - Elevation

Firecracker Penstemon, *Penstemon eatonii*

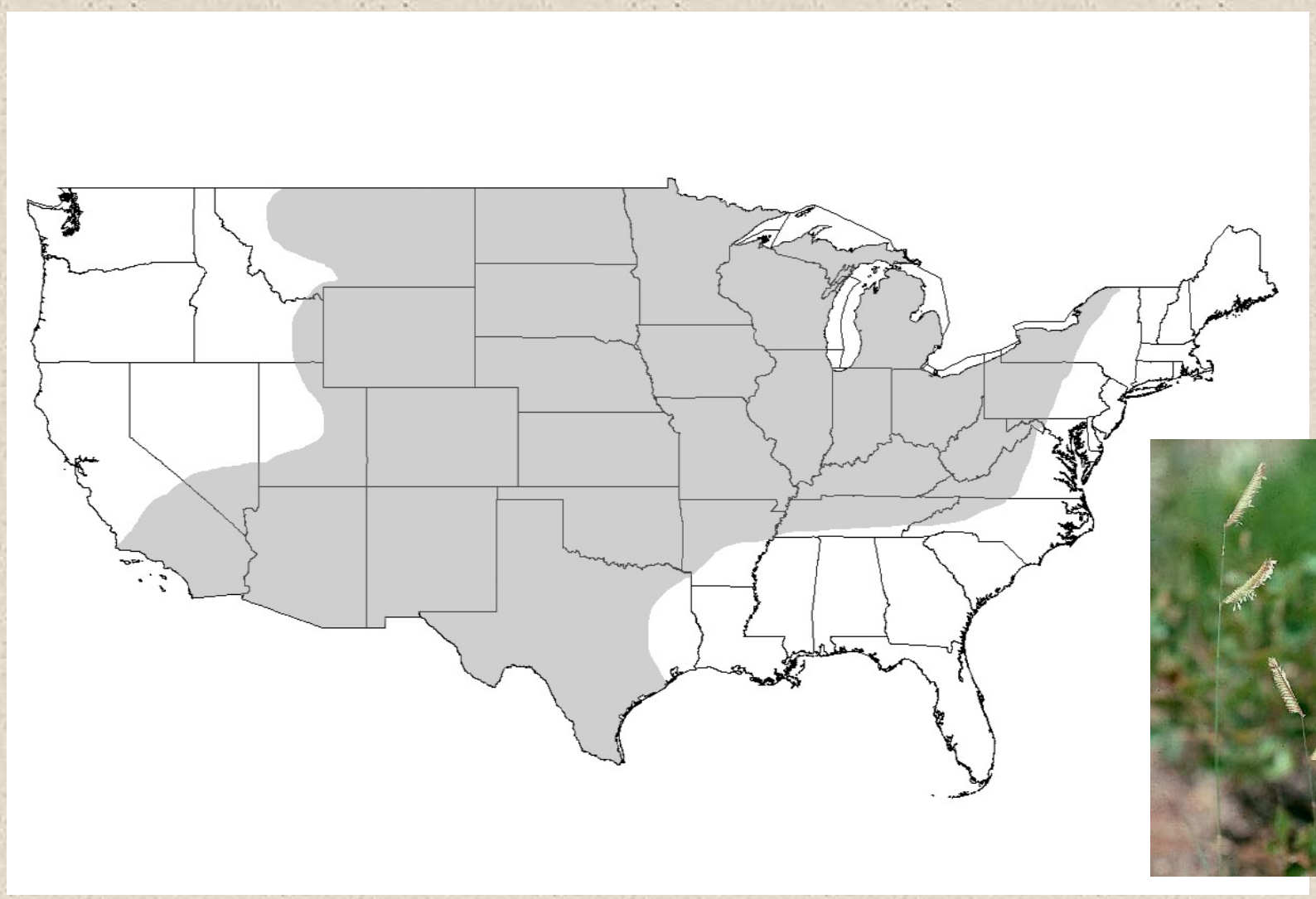
- Habitat correlated variation in seed germination.
- 'Between-population variation in germination response to chill is…correlated with the climate at the site of seed origin."
- Elevation - ecotypes



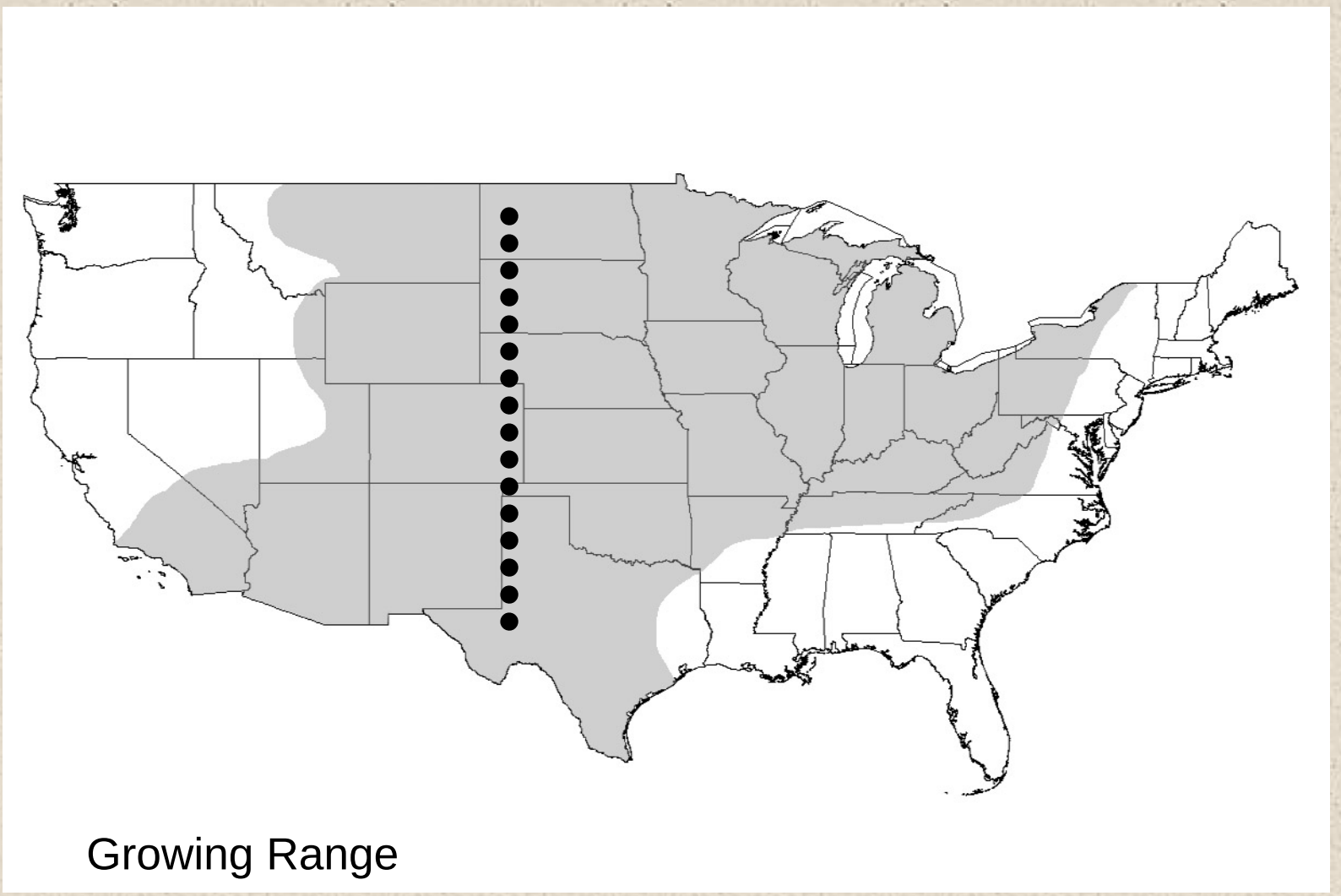
Meyer 92 Bull Tor Bot Club
Meyer et al. 95 Amer J Botany


PLANTS
Database
SPM
DC
HI
PR
VI
ACMI2

Available Resources are Often Cultivars

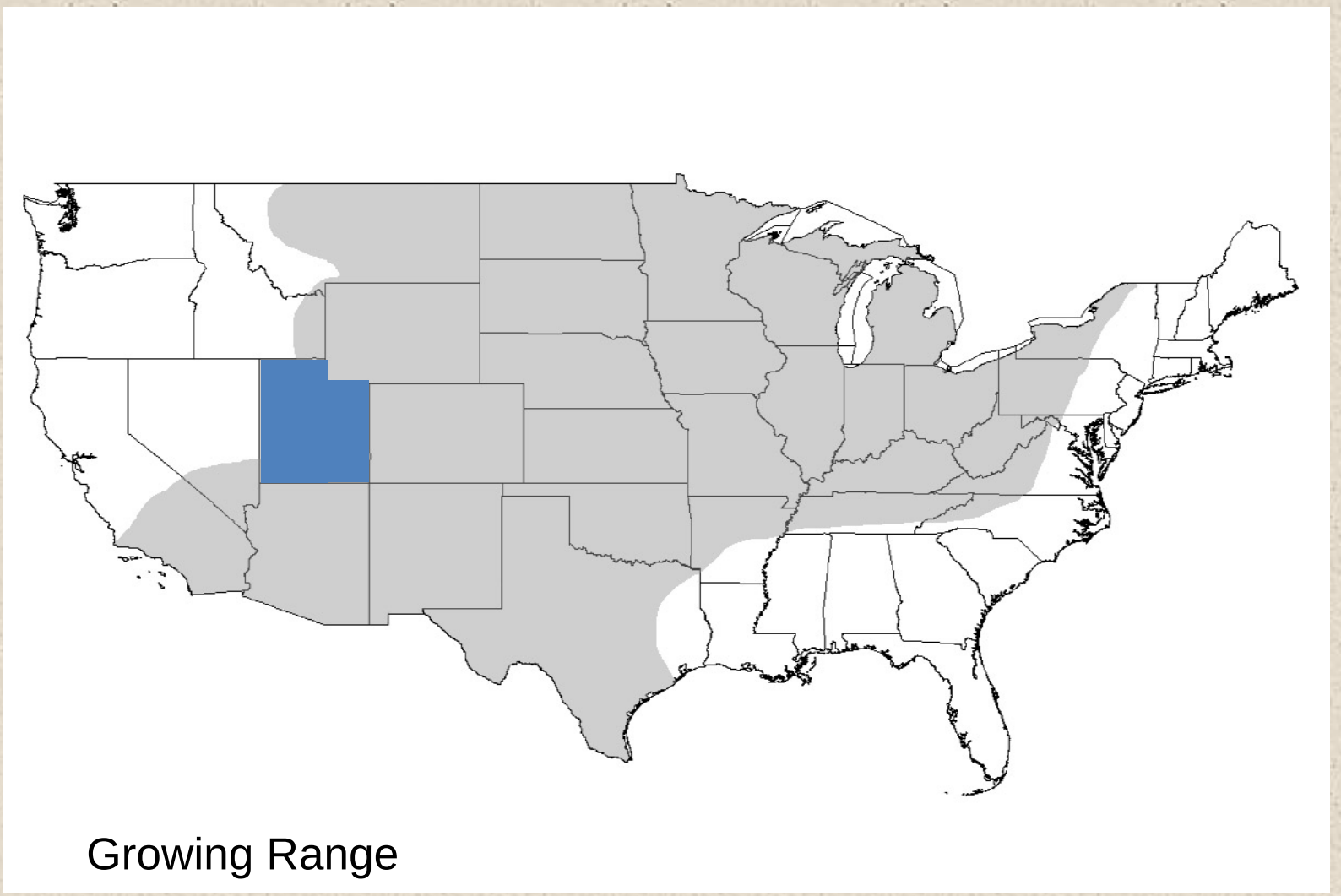


Latitudinal Variation: *Bouteloua gracilis*



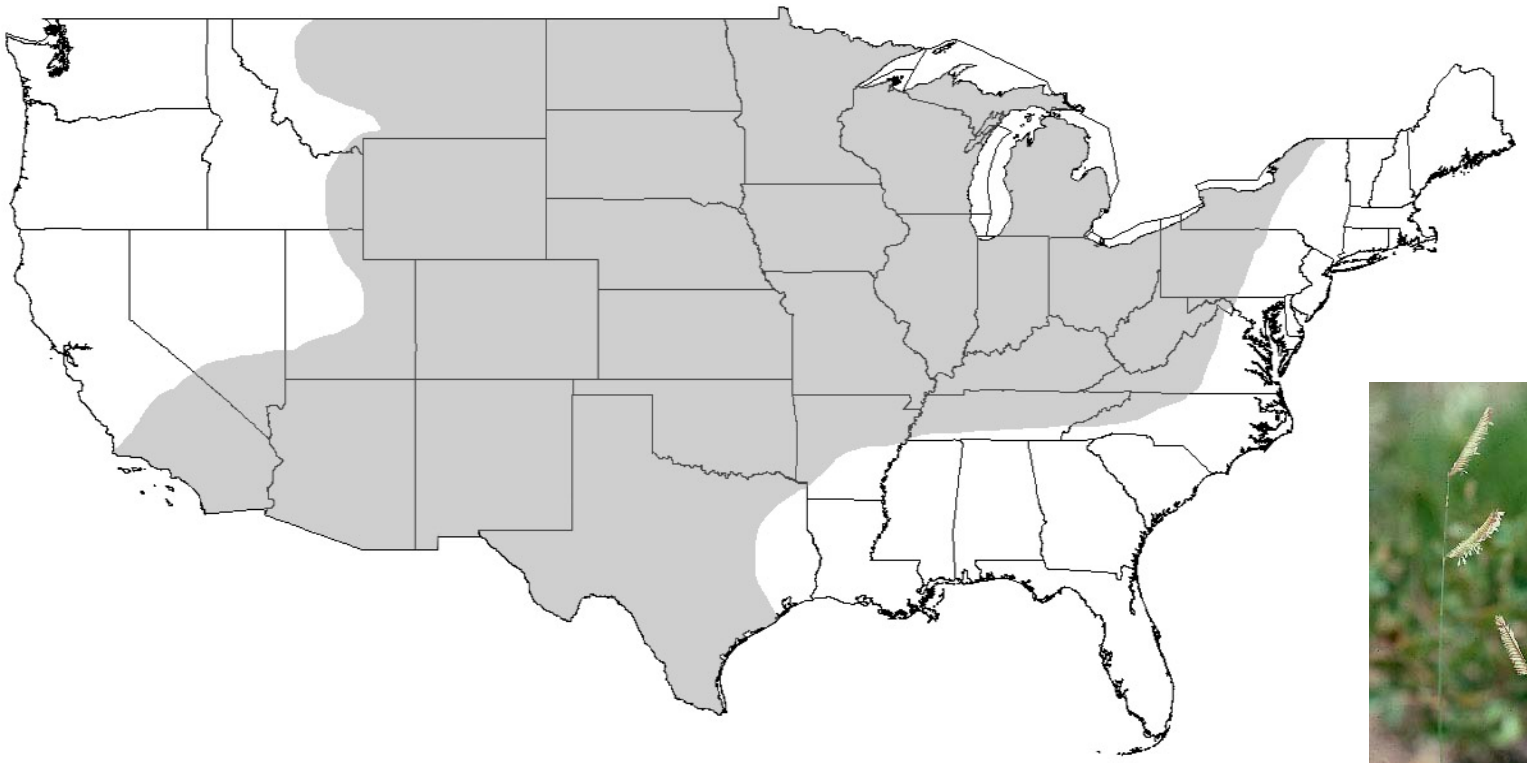
Growing Range

Latitudinal Variation: *Bouteloua gracilis*



Growing Range

Available Resources: Cultivars



New Mexico

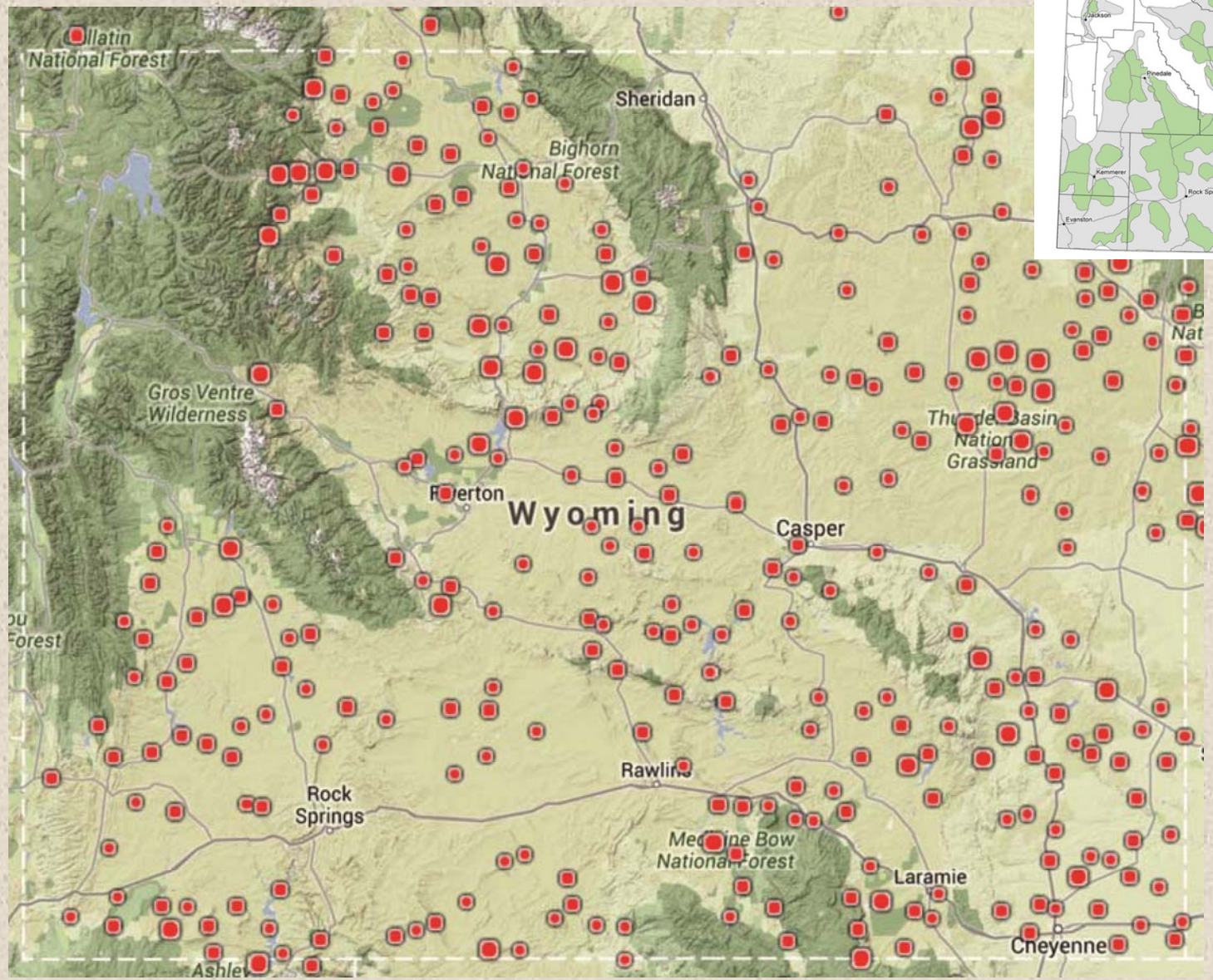
Wyoming

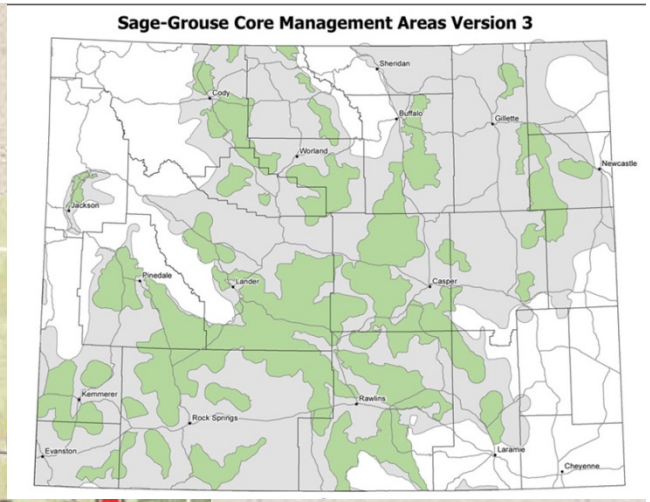
Species and Source Selection

Opportunities!

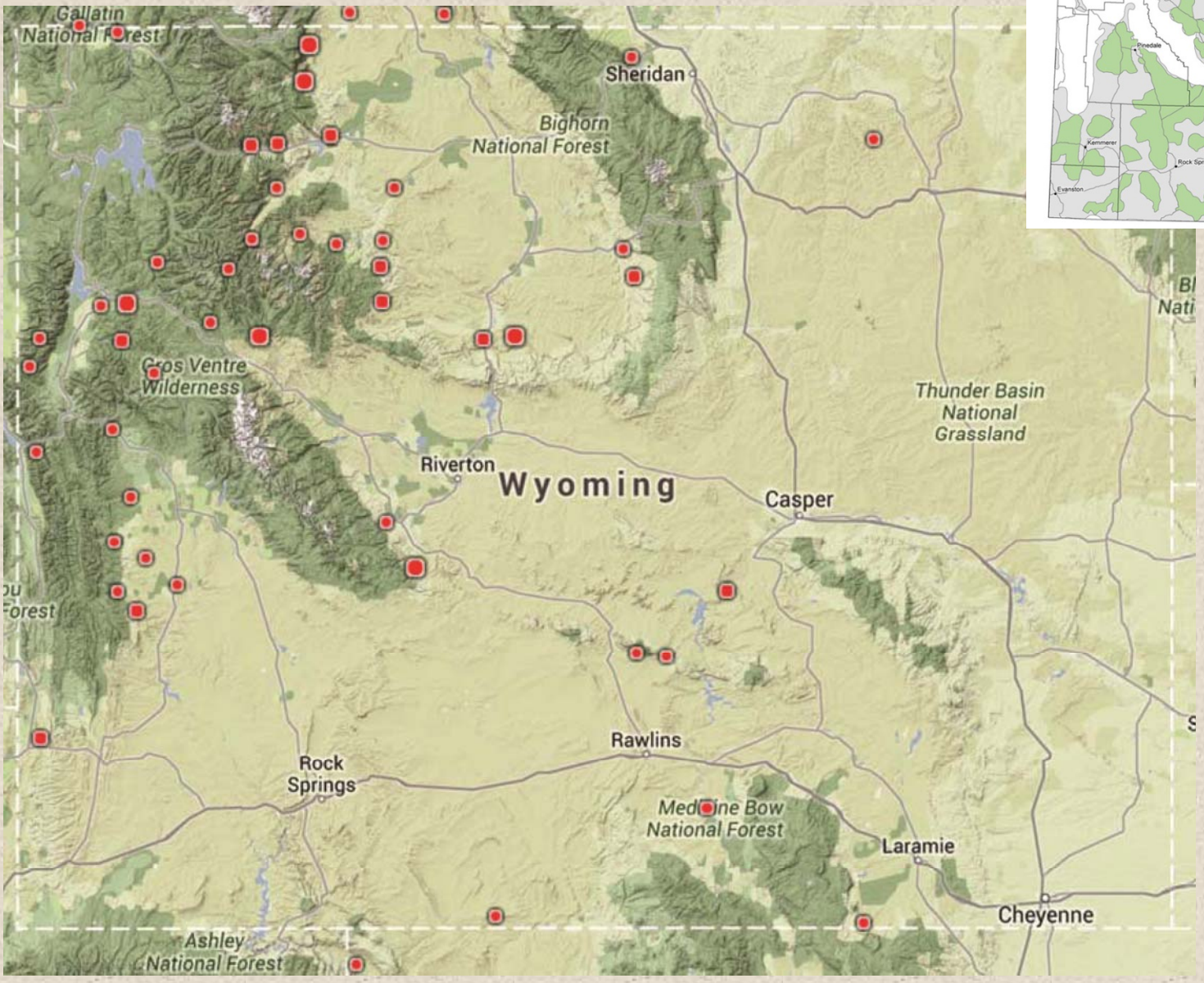
- Species selection
  - Common vs. rare
  - Characteristics for germination and growth
- Source selection for seed increase
  - Maintain natural variation
  - Region specific?

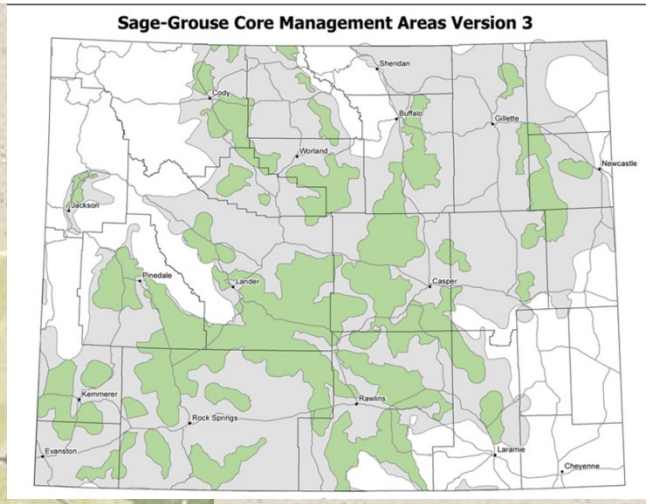
Sphaeralcea coccinea



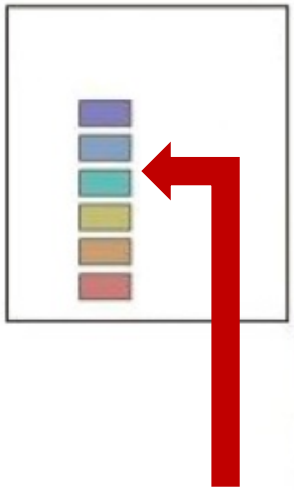


Hedysarum boreale

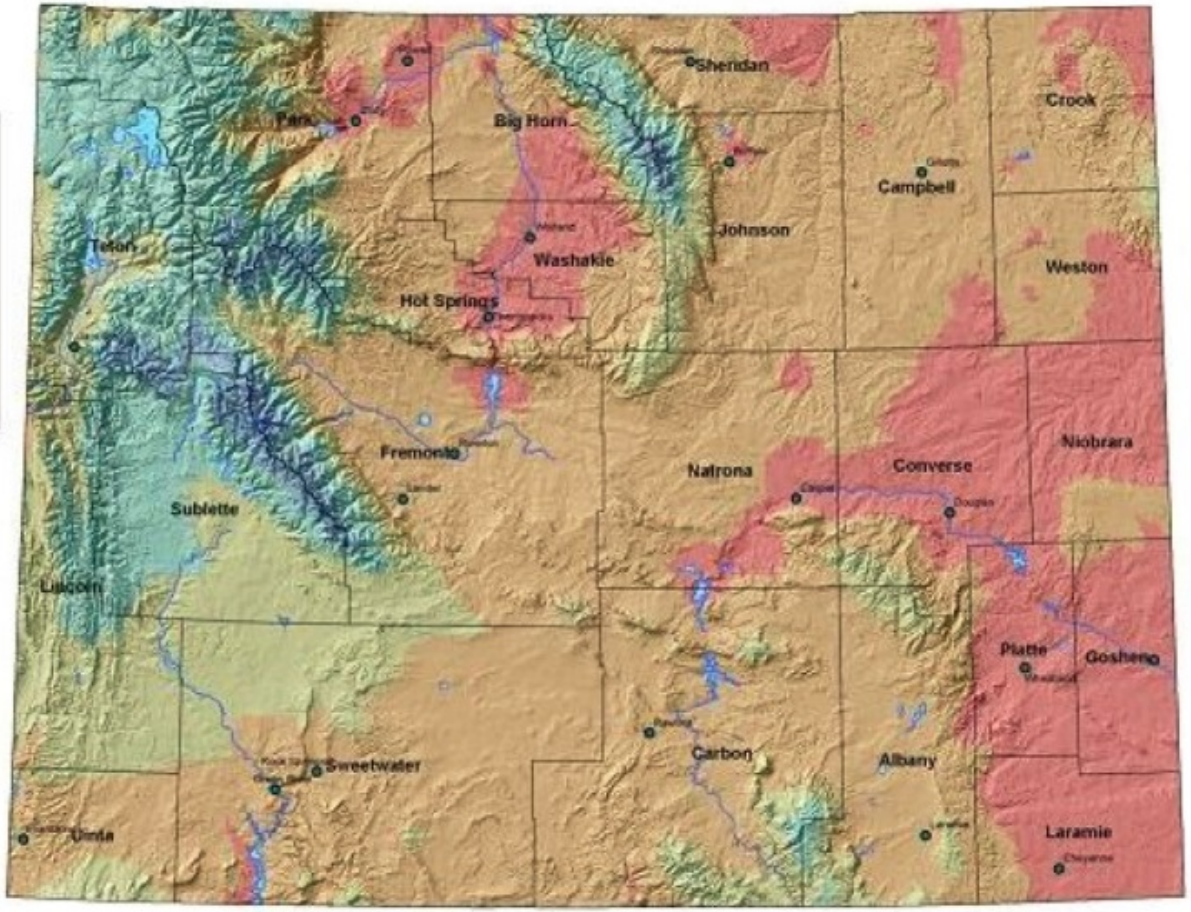




Wyoming Mean Annual Temperature



Difference in 25 ◦F



0 12.5 25 50 75 100

Lambert Conformal Conic Projection
Central Meridian: -107.5
1st Standard Parallel: 33
2nd Standard Parallel: 45
Latitude of Origin: 41

Wyoming State Climate Office
http://www.wrds.uwyo.edu/wrds/wsco/wsc.html

Seed Issues and Seed Sourcing

- Active Restoration…
  - Seeding native species
- Consider forbs as well as shrubs and grasses
  - Opportunities to improve seed mix
  - Match seed source to site conditions
- Meet goals for Sage Grouse habitat

Strategies

- Germination is the most critical stage for survival
- Consider alternative planting methods
- Different seed sources may have different uses depending on the site in question

Native Species and Seed Source

- Resources to determine native species relevant for Sage Grouse
- Importance of seed source for long-term sustainability and adaptation to site conditions

Strategies:

- Common species
- Regional ecotypes
- Planting methods to reduce competition
- Invasives

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Some benefits?

Wyoming Reclamation and Restoration Center

http://uwadmnweb.uwyo.edu/wrrc/Rec_Bulletins.asp

B-1204

B-1204 April 2010

SUCCESSFUL RESTORATION OF SEVERELY DISTURBED LANDS: Seeding essentials for reclaiming disturbed lands

This bulletin provides general information appropriate for all Wyoming ecological sites.

Part of a series by the University of Wyoming Cooperative Extension Service Reclamation Issue Team and the Wyoming Reclamation and Restoration Center that describes strategies for restoring ecological functions to disturbed Wyoming lands.

Reclamation and restoration: For this series, **reclamation** means **restoration** of components that support desired ecological functions, such as livestock grazing, wildlife forage and cover, water supply, water quality protection, and aesthetic values.

Introduction

This bulletin provides information most relevant to revegetating disturbed grassland and shrubland plant communities in Wyoming. The information applies to sites drastically disturbed by mining or construction activities where topsoil has been stripped, stockpiled, and replaced.

Determine reclamation objectives

The goal for any reclamation project is to restore important pre-disturbance ecological functions of a site disturbed by construction or mining operations. Important functions include wildlife habitat, forage for livestock and wildlife, watershed and water quality protection, and others. A thorough pre-disturbance inventory provides the basis for describing important functions and setting reclamation objectives.

Summary of components of successful reclamation seeding. See text for more information.

Activity	Critical components

Design a reclamation seed mix	• Determine reclamation objectives.
	• Assess site-specific pre-disturbance vegetation characteristics (e.g., canopy cover of herbaceous species, shrub density).
	• Utilize site-specific Natural Resources Conservation Service (NRCS) Ecological Site Descriptions (ESDs) for lists of appropriate species.
	• Calculate seeding rates in mixes using the NRCS worksheet available on the Wyoming Reclamation and Restoration Center Web site (http://uwyo.edu/WRRC) under Reclamation Information (see also Table 2).
	  • Double that rate for "critical" (steep or unstable) sites.
	  • Double the drill rate for broadcast seeding (i.e., a steeply sloping, broadcast-seeded site would require 80 seeds per square foot).
	• Sagebrush: plant at ¼ to 1 pound per acre.
	• Native annuals: 1 ounce to 2.5 lbs per acre depending on seed size.
	• Consult local range specialists from the University of Wyoming Cooperative Extension Service (UWCES), NRCS, Bureau of Land Management (BLM), Forest Service, the Wyoming Department of Environmental Quality, Land Quality Division, or other local experts on native vegetation.

<u>Successful revegetation</u>:

- Seed mix
- Seedbed
- Planting methods

Funding: