Seeding Methods for Revegetation in Western Montana

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Seeding Factors Limiting Revegetation in Western Montana

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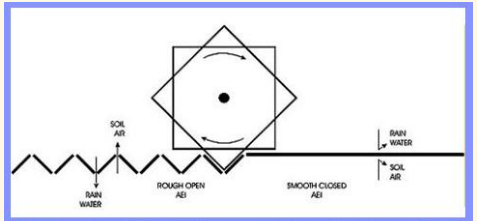
Seeding Methods and Revegetation

- Restoration sometimes causes for environments to “get worse before the get better” in some ways
- Revegetation is a crucial part of restoration
  - Erosion
  - Biodiversity
  - Nutrient Cycling
  - Habitat creation

Seeding Techniques and Challenges



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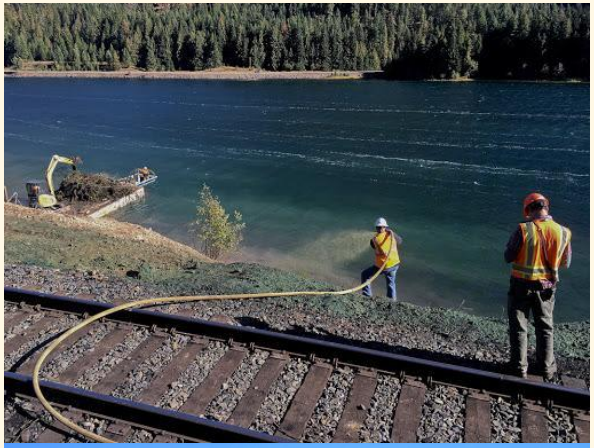
Imprinting



Hydroseeding

Drill seeding

Hand Seeding Factors

- Benefits:
  - Cheaper
  - Less equipment intensive
  - Done by volunteers
- Limitations:
  - Less controlled
  - Not as effective

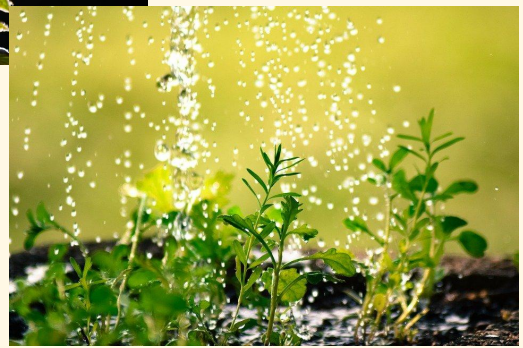
- Efficacy could be improved by altering controllable limiting factors


Seed spreading by hand.

Variables Limiting Revegetation from Seeds

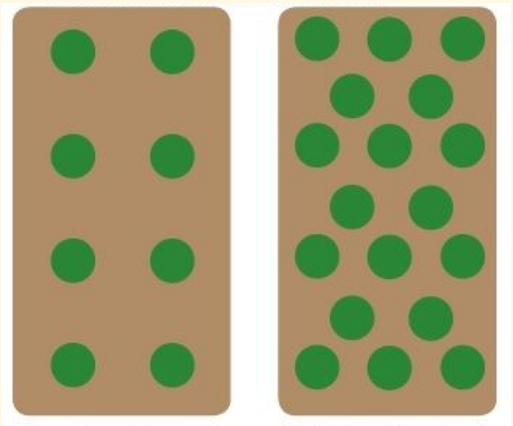
Sunlight and Water

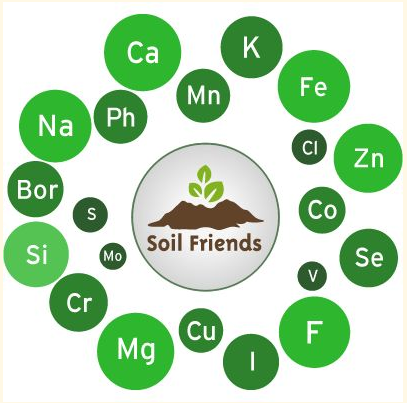
- Unrealistic to control these factors



Seeding Density and Fertilization

- Realistic to control these factors

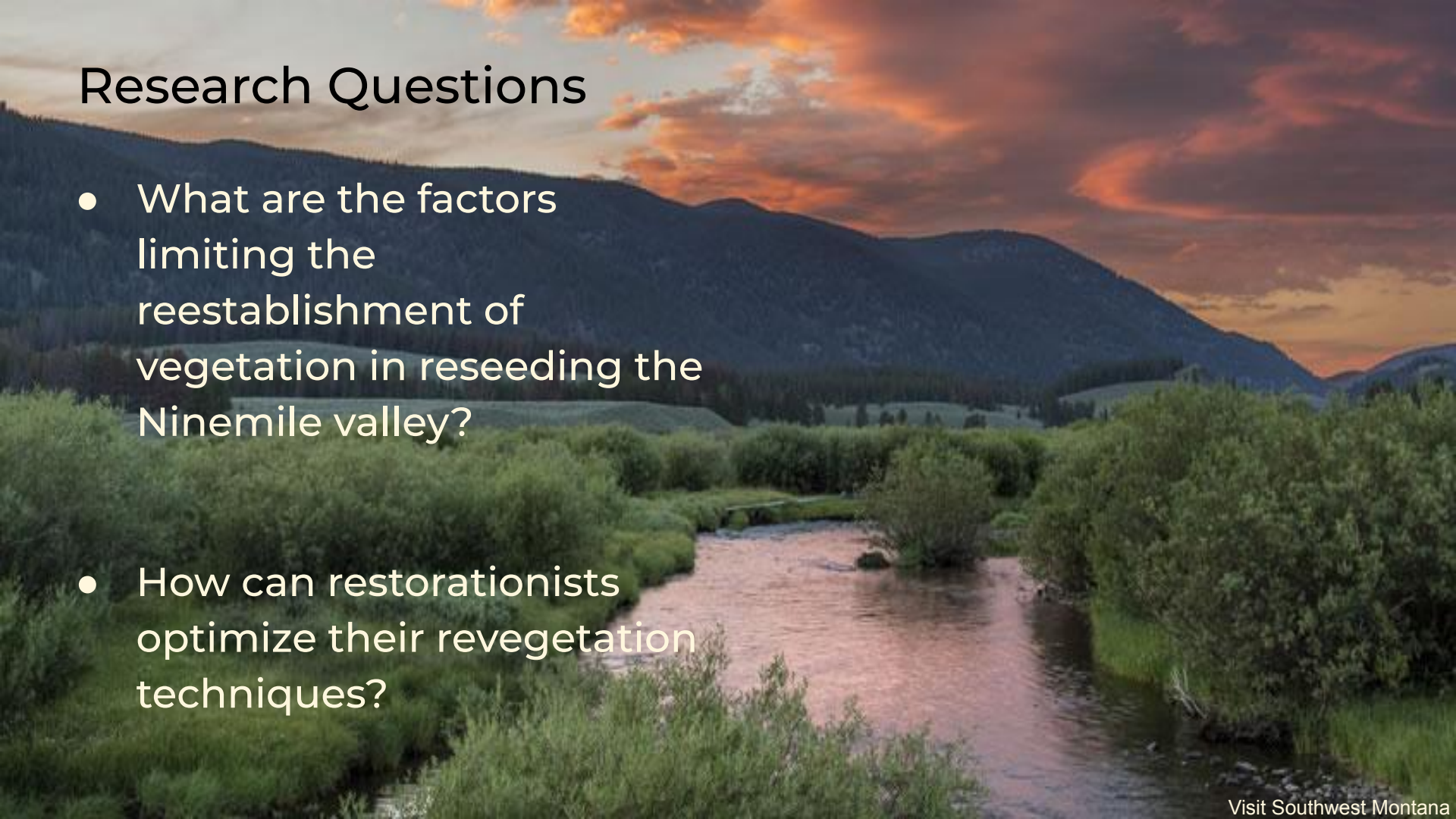




Research Questions

- What are the factors limiting the reestablishment of vegetation in reseeding the Ninemile valley?

- How can restorationists optimize their revegetation techniques?



Study Site: Ninemile Valley

Seed Mix Composition

6 NATIVE SPECIES:

- Slender wheatgrass (*Elymus trachycaulus*)
- Mountain brome (*Bromus carinatus*)
- Blue wildrye (*Elymus glaucus*)
- American mannagrass (*Glyceria grandis*)
- Western yarrow (*Achillea millefolium*)
- Large-leaf avens (*Geum macrophyllum*)

Mountain brome

bbbseed.com/wp-content/uploads/2014/03/MountainBrome150-1.jpg

Western yarrow

everwilde.com/media/1000/Achillea-millefolium-occidentalis-01.gif

Large-leaf avens

minnesotawildflowers.info/udata/r9ndp23q/yellow/largeleaf-avens_0704_111235.jpg

Experimental Treatment Plots

VARIABLE 1

Fertilization:

Phosphorus (P), Nitrogen (N), Potassium (K)

VARIABLE 2

Seeding Density

Fertilizer	Low Seed Density	High Seed Density	No Seed
Control	X	X	X
N	X		
P	X		
K	X		
NP	X		
PK	X		
NK	X		
NPK	X	X	X

Experimental Treatment Plots

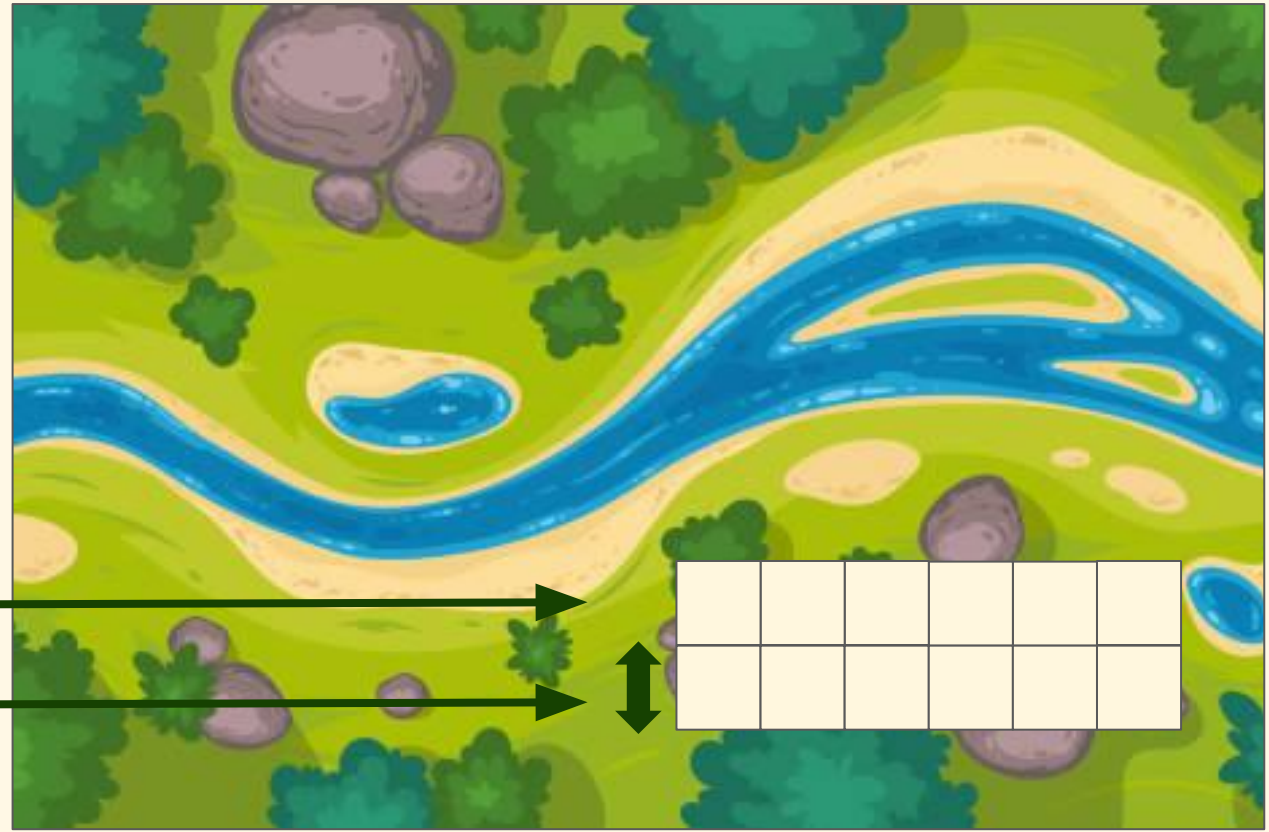
VARIABLE 1

Fertilization:

Phosphorus (P), Nitrogen (N), Potassium (K)

VARIABLE 2

Seeding Density



Monitoring Growth of Treatment Plots

COVER

BIOMASS

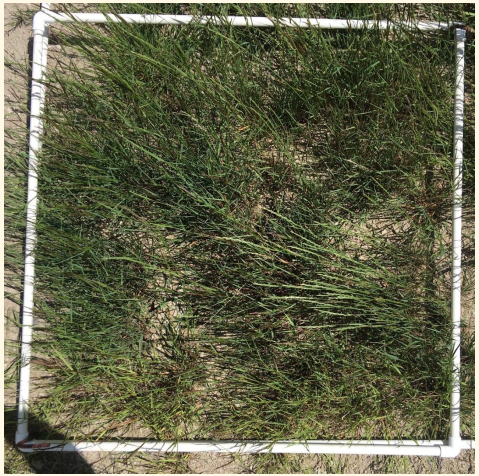
STRUCTURE

Monitoring Growth of Treatment Plots

COVER: percentage of ground covered by vegetation.

BIOMASS: aboveground net primary productivity for each species.

STRUCTURE: height of plant growth.



High percent cover

Low percent cover

Measuring biomass by clipping samples

Expected Outcomes: Gain Insight on....

Limiting **nutrients**

➔ How to best promote seed mix plant growth based on limiting nutrients

Optimal **seeding density**

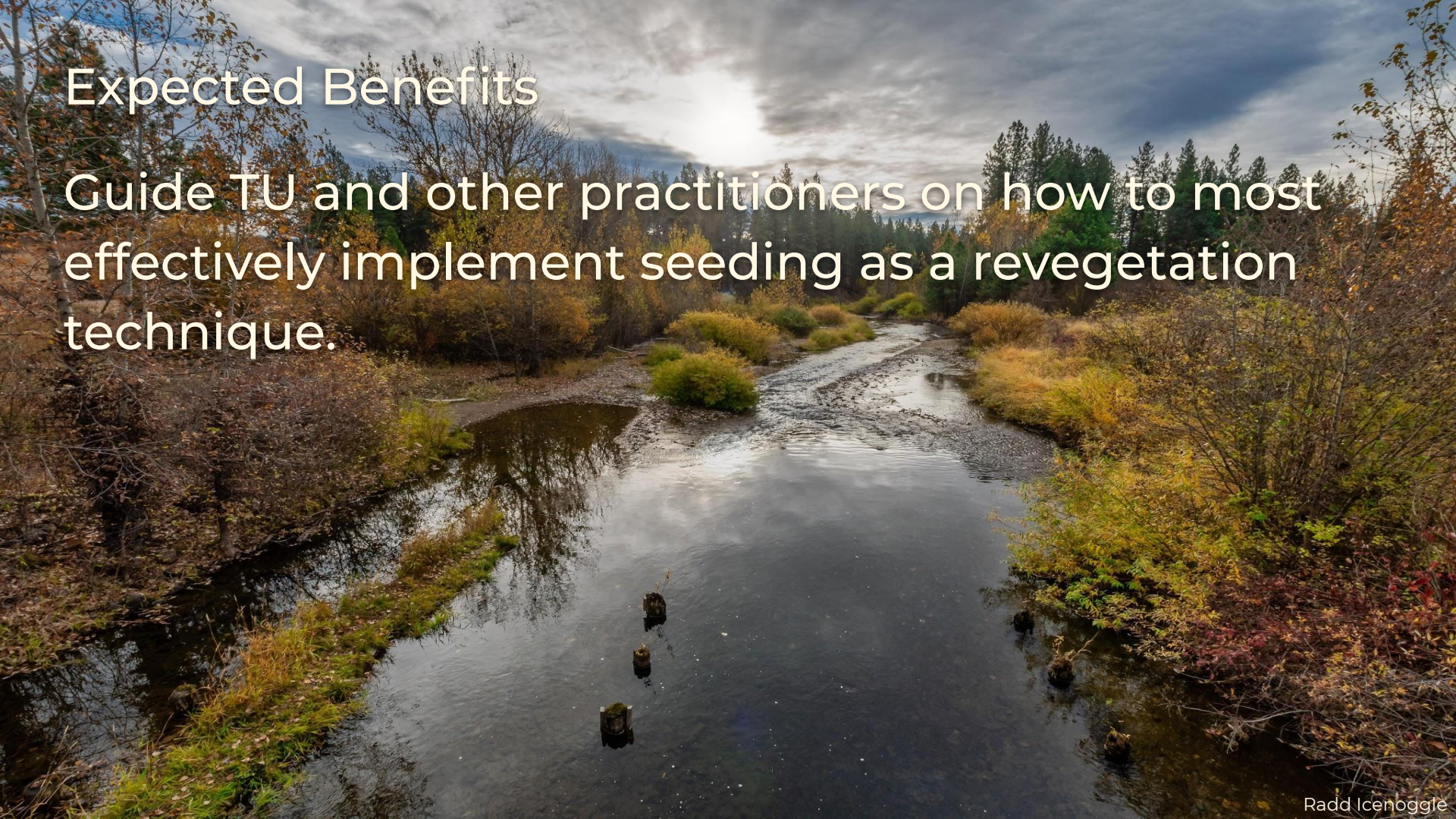
➔ Determine the most cost-effective method without compromising productivity

Independent **recruitment**

➔ Assess any independent plant growth on control plots

Expected Benefits

Guide TU and other practitioners on how to most effectively implement seeding as a revegetation technique.



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