

Site availability

- I. What is a safe site?
 - a. Definition
 - b. Characteristics that determine quality of a safe site
- II. Disturbance as a central process creating safe sites
 - a. Definition
 - b. Types of disturbance and modifying factors
 - c. Disturbance ecology-predicting response of desired and invasive species
- III. Seedling recruitment
 - a. Seed → germination → emergence → establishment → survival
 - b. Recruitment patterns of native and introduced perennial grasses (see handout)
 - c. Precipitation inputs and recruitment in the Intermountain West
- IV. Colonization of safe sites
 - a. Seed limitation vs. safe site limitation
 - b. Lottery models-colonization a function of dispersal frequency, numbers of seeds dispersed and competitive ability
- V. Managing site availability
 - a. Minimizing sites available to invasive species (see handout)
 - i. Niche occupation and functional group diversity
 - ii. Relationship between bunchgrass cover, bare ground, litter cover and invasive plant establishment
 - b. Increasing sites available to desired species (see handout)
 - i. Relationship between disturbance intensity/severity, site viability and resource availability
 - ii. Case study: measuring effects of disturbance on soil characteristics (see worksheet)
 - iii. Case study: how to select appropriate level of disturbance

iv. Applying disturbance (see worksheet)

Readings

Harper, J. L., J. T. Williams, and G. R. Sagar. 1965. The behavior of seeds in soil I. The heterogeneity of soil surfaces and its role in determining the establishment of plants from seed. *Journal of Ecology* 53:273-286.

Turnbull, L. A., M. J. Crawley, and M. Rees. 2000. Are plant populations seed-limited? A review of seed sowing experiments. *Oikos* 88:225-238.

Measuring effects of disturbance on soil characteristics

	Disturbance type					
Variables	No disturbance	Seed drill	Shallow till	Deep till	Rip	Herbicide
Seeds on surface (# m ⁻²)						
Bare ground (%)						
Litter remaining (g m ⁻²)						
Microtopography (mm)						
Compaction (kg cm ⁻²)						
Surface light (μmol m ⁻²)						
Soil moisture (% water)						
Soil surface temp (C)						
Soil Nitrate (ppm)						

