Local and landscape influences on plant community dynamics in a changing world

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Loss of biodiversity

Current global extinction risk in different species groups

- Bony fishes***
- Gastropods***
- Birds*
- Dragonflies**
- Ferns and relatives**
- Monocots**
- Reptiles**
- Mammals*
- Crustaceans***
- Sharks and rays*
- Corals (reef-forming)*
- Conifers*
- Dicots***
- Amphibians*
- Cycads*

IUCN Red List categories

- Data Deficient
- Non-threatened
- Least Concern
- Near Threatened
- Threatened
- Vulnerable
- Endangered
- Critically Endangered
- Extinct in the Wild

Estimate of percentage threatened

Total number of extant assessed species

PERCENTAGE OF SPECIES IN EACH CATEGORY

IPBES report, 2019
Decreased fire
Talk outline

1. Approach and study systems
2. How does landscape connectivity affect long-term community dynamics?
3. How do landscape and local factors affect long-term change?
The Damschen Lab and Collaborators
Talk outline

1. Approach and study systems
2. How does landscape connectivity affect long-term community dynamics?
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Approach

Large-scale

Long-term

Functional

Images: E. Damschen, L. Ladwig
Study systems

- **Oak savanna**
  - Sites: 20, Species: 180

- **Tallgrass prairie**
  - Sites: 79, Species: 394

- **Klamath Mtns., Serpentine grasslands**
  - Sites: 279, Species: 739

- **Longleaf pine savanna**
  - Sites: 544, Species: 821

- **Dolomite glade grassland**
  - Sites: 56, Species: 208
Study systems

- Grassland
- Serpentine
- Prairie
- Glade
- Longleaf pine savanna
- Oak savanna

Photos: E. Damschen, J. Miller, J. Meissen, USFS
Talk outline

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Habitat loss and fragmentation

Factors Contributing to Species Endangerment
(Wilcove et al. 1998)

- Habitat destruction and degradation
- Non-native species
- Pollution
- Overexploitation
- Disease

Photo: http://www.personal.psu.edu/users/k/j/kjs288/fragmentation.html
Fragmented landscapes:

1. Decreased habitat area

2. Increased prevalence of edges

3. Increased isolation
Landscape corridors
- Reduced between-patch isolation -

Hypothesized to increase:

- Movement
- Population sizes
- Genetic diversity
- Species diversity