Some thoughts on UMR floodplain forests
Nathan De Jager USGS-UMESC

- Developing quantitative measures useful in project planning/design:
  - Hydrogeomorphic patterns and floodplain vegetation management
- Establishing management objectives by measuring impacts and magnitudes of ‘stressors’
  - Reed canarygrass invasion
- Future Research Directions

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Hydrogeomorphology and Bottomland Forest Ecology

Hodges 1997. Forest Ecology and Management

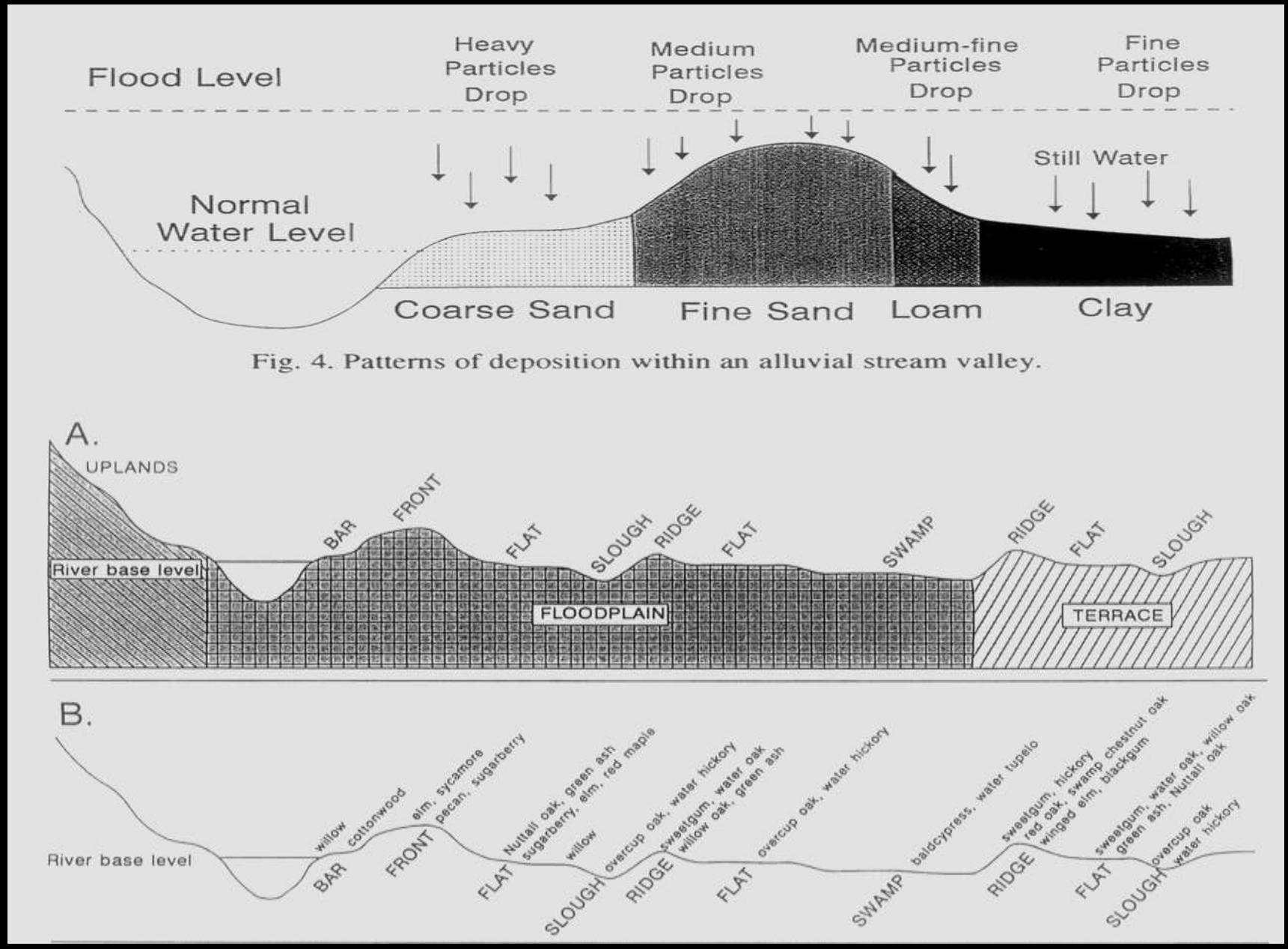

Fig. 4. Patterns of deposition within an alluvial stream valley.

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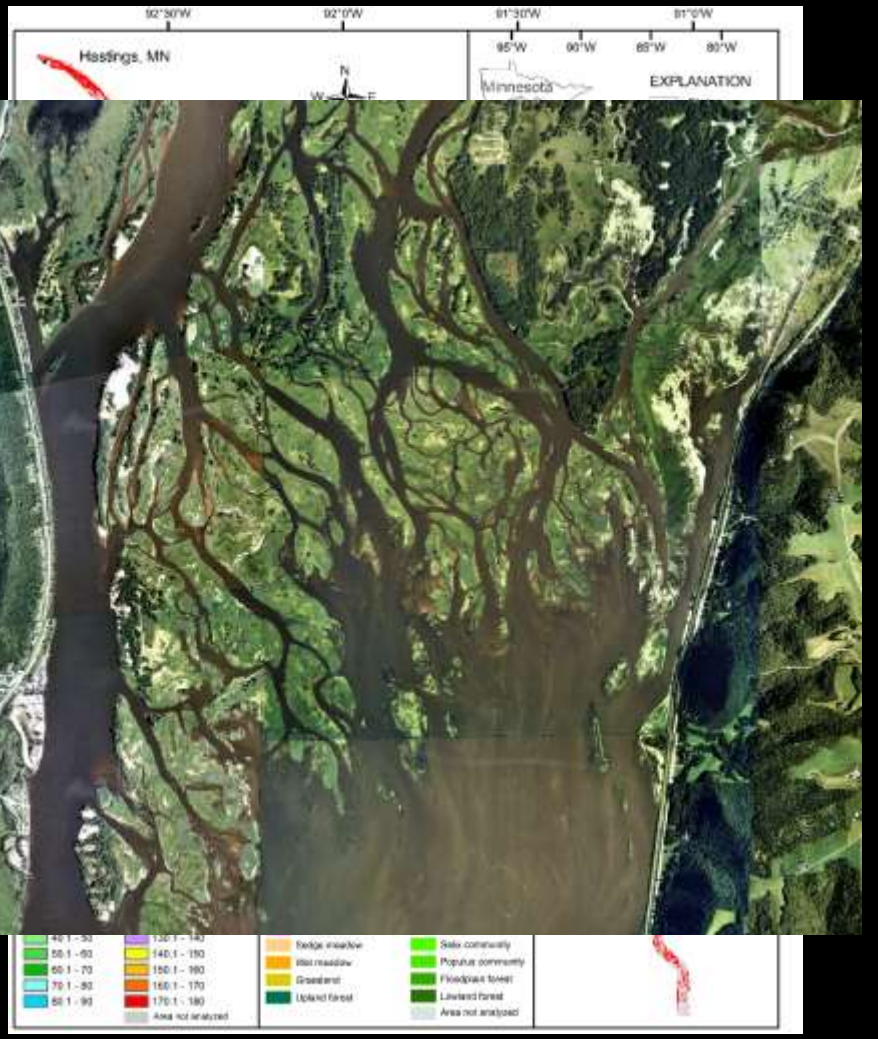
Forest Species Composition and Soils in COE Permanent Plots

De Jager et al. (2012) Forest Ecology and Management
De Jager (2012) American Journal of Botany

Plant Community Type in LTRM Land Cover Data

De Jager et al. (2015) Applied Vegetation Science



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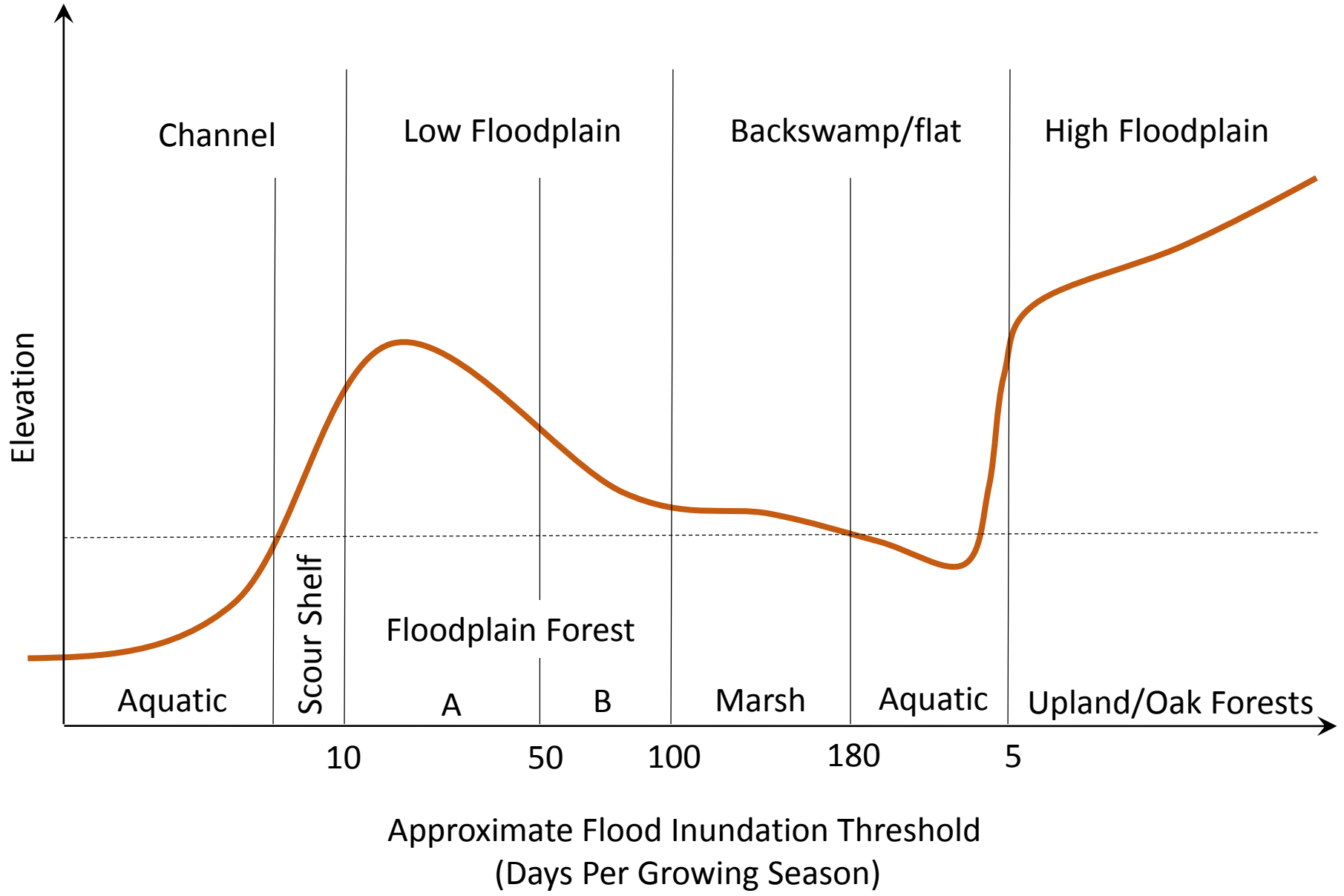

Floodplain Forest A:
Mix of oak, maple, elm, ash, and hackberry with active understory recruitment growing on a range of soil types, but more sand.

Floodplain Forest B:
Silver Maple dominated forests with poor understory recruitment growing on silt/clay soils

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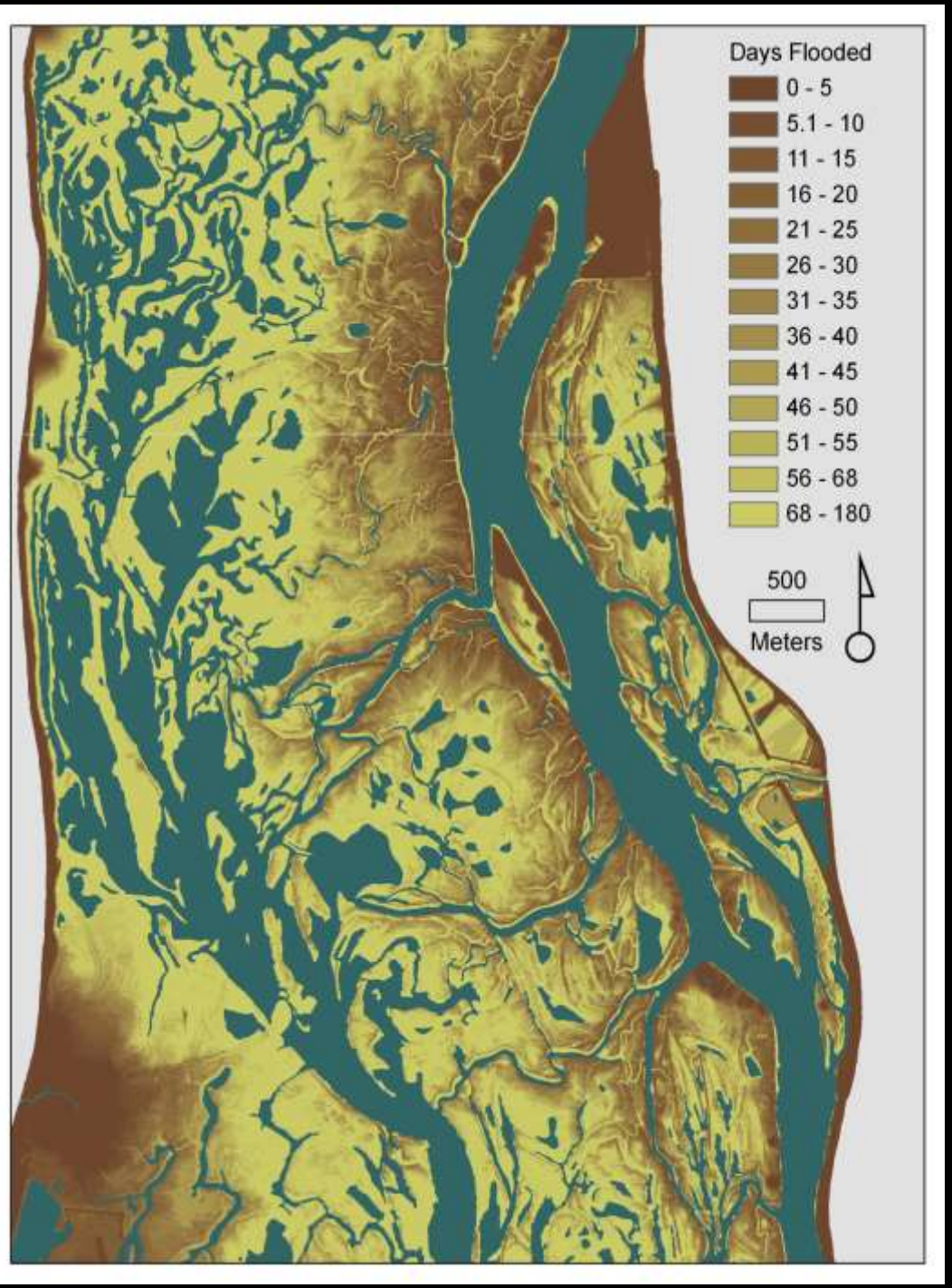
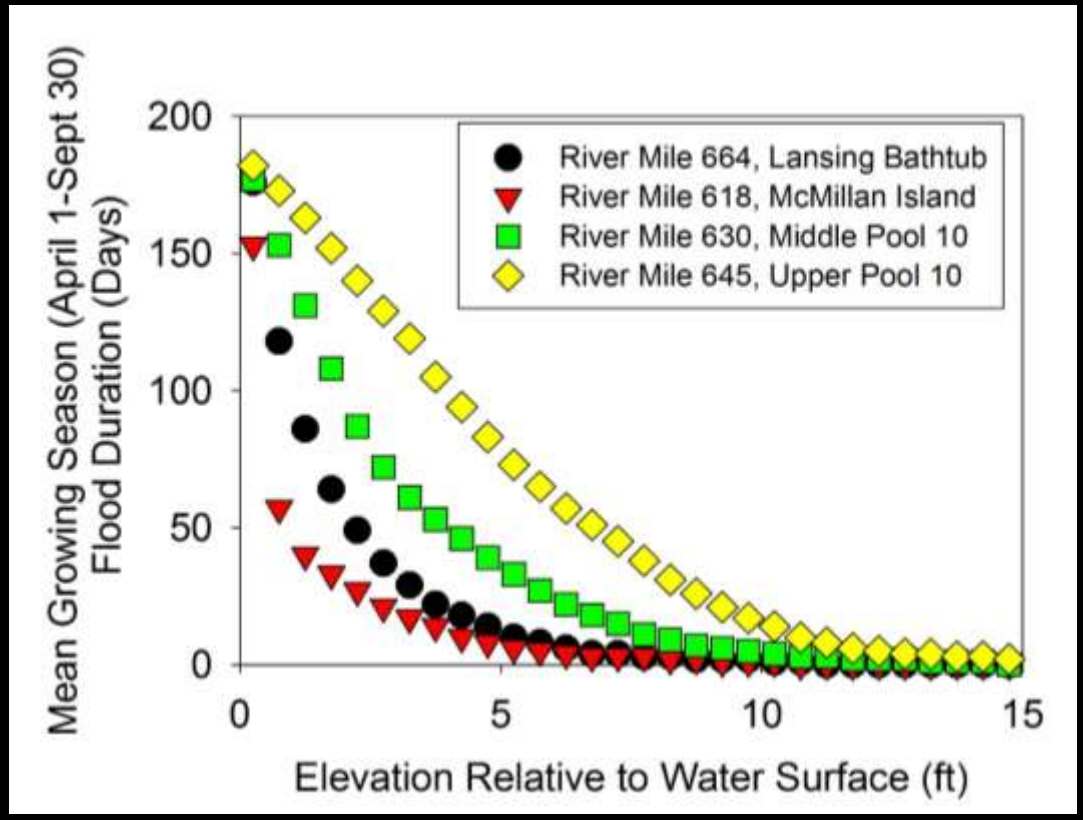
Applications





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Phalaris arundinacea (Reed Canarygrass) invasion

- Factors contributing to successful invasion/suppression
  - Canopy gaps / herbicides
    - *Thomsen et al. 2012. Wetlands*
  - Deer browsing / flooding
    - *De Jager et al. 2013. Forest Ecology and Management*
    - *Cogget et al. 2014. Nat. Areas J.*
  - Willow Stakes
    - Miller-Adamany et al. (In Prep)
- Effects on Nitrogen Cycling
  - *De Jager et al. (2015). Wetlands Ecology and Management*
  - *Kreiling et al. (2015) Wetlands*
  - *De Jager et al. (In Review). Wetlands*
  - *Swanson et al. (In Review) Ecosystems*

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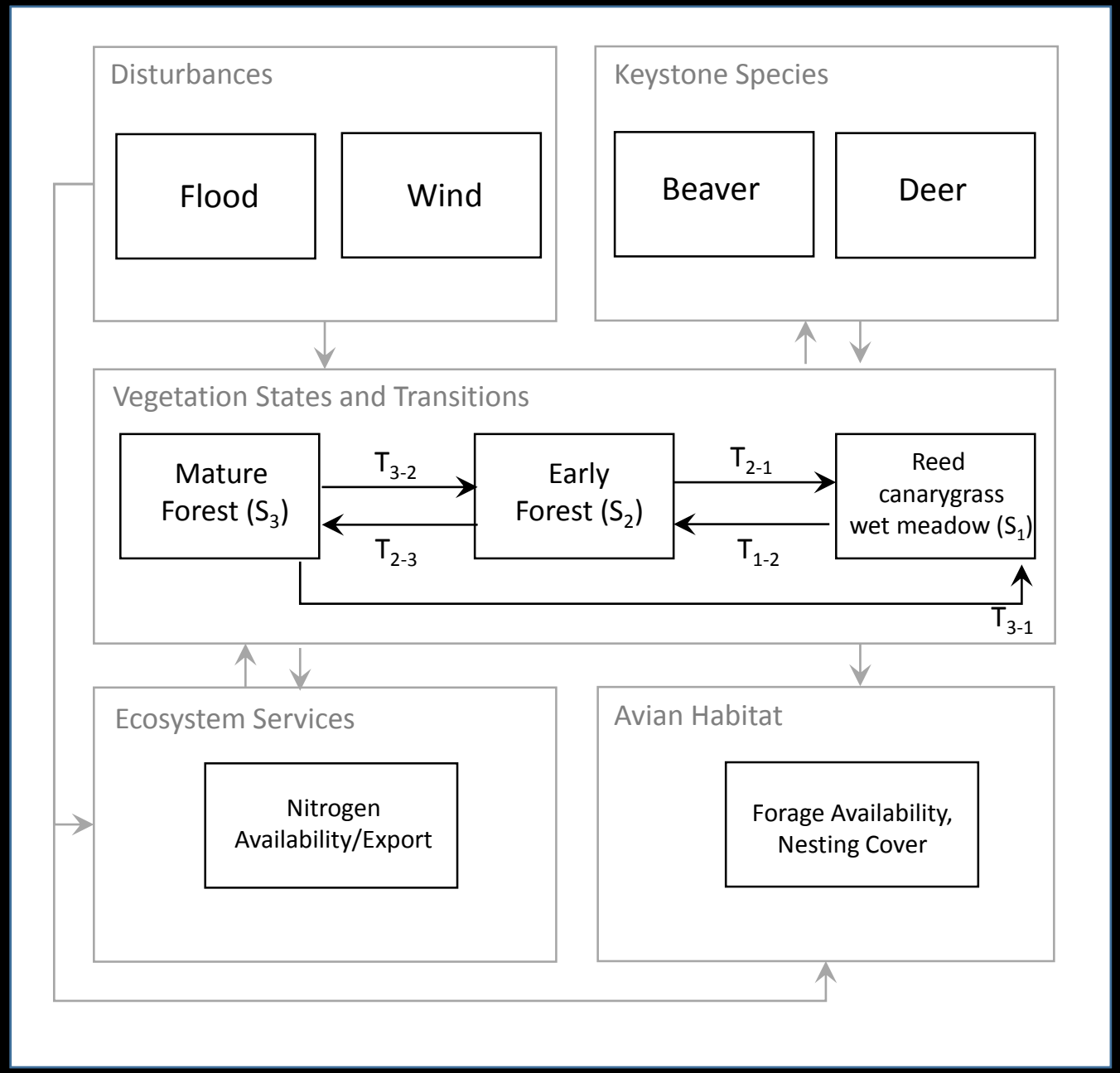
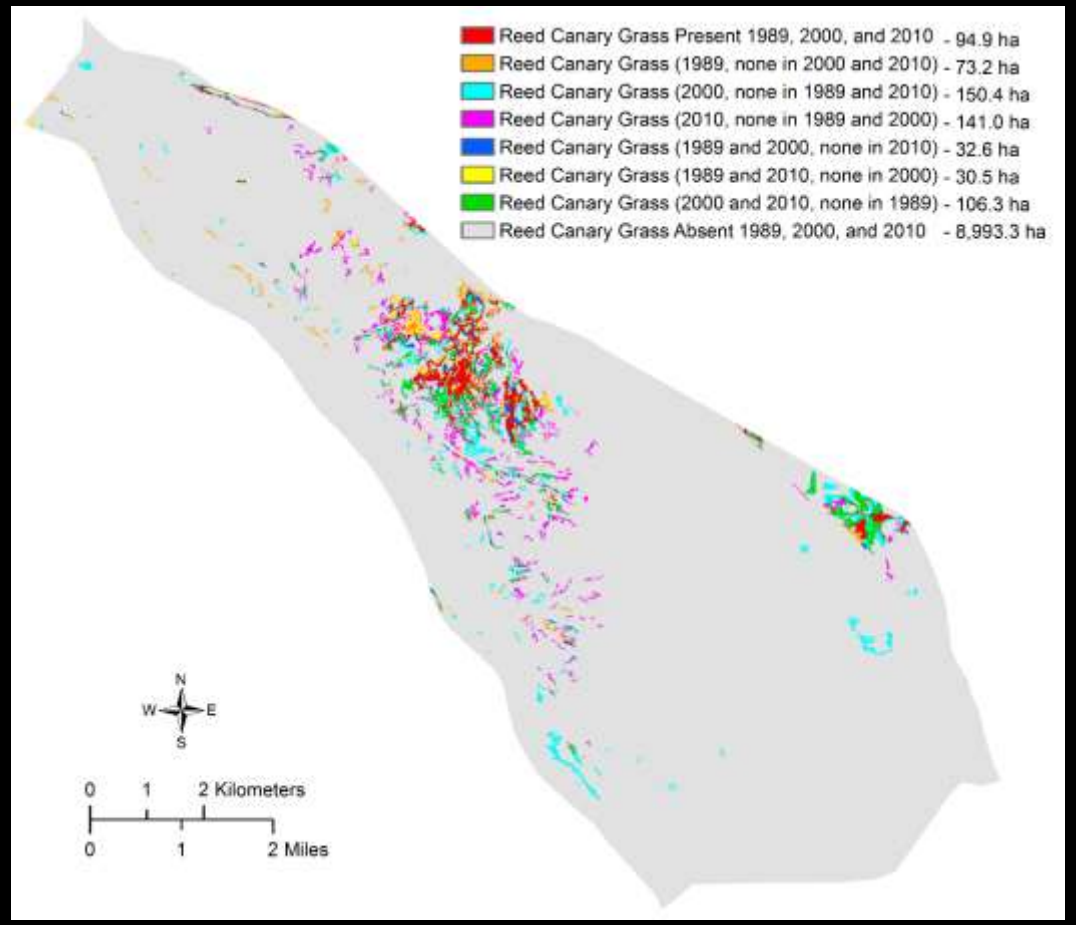
1) Wind, beaver, other disturbances open canopy
2) RCG invades and suppresses seedling establishment
3) Management actions suppress RCG but browsing by deer maintains saplings within flood height and increases mortality
4) Invasion alters habitat
5) Invasion alters N cycling through litter that has low C:N (relative to native forests), rapid decomposition and release of N into the environment.



Regional RCG Assessment
Miller-Adamany et al. (In Prep)



- How big of a deal is this, really?
- Trends in RCG abundance and distribution (1989-2010)
- Landscape-scale factors associated with invasion
- Present day distribution maps
- Projected future risk of invasion maps

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Future Research Directions:

- Examine factors influencing floodplain forests for the entire UMRS (Van Appledorn FY 2017)
  - Hydrogeomorphology
  - Land Use History
  - Forest Patch Size
  - Etc…
- Make projections of future floodplain forests under alternative environmental/management scenarios
  - How resilient are these forests in the face of multiple disturbances?

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Thanks to:

- Jim Rogala, Brian Ickes: gage data
- Yao Yin and Jason Rohweder: Flood Inundation Modelling and Mapping
- LaCrescent COE: Permanent Plot Data
- UMESC Resource Mapping Group: Erin Hoy (Veg data)
- Meredith Thomsen, Eric Strauss, Ben Cogger, Whitney Swanson, Amber Miller-Adamany (UW-L)

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