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Noxious Weed Monitoring at the Rock Creek Confluence Site

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Introduction

- While disturbance can maintain ecosystem structure, it can also render them susceptible to invasion by non-native plants
- Disturbance opens ecological niches, leading to succession by species with specialized traits
- Succession by non-native plants can degrade ecosystem function
- The Rock Creek Confluence site (RCC) has experienced disturbance from a century of grazing and initial stages for a housing development
- Five Valleys Land Trust (FVLT) now manages the site which is inundated with noxious weeds
- Updated knowledge of noxious weeds will help inform management at RCC

Focal Noxious Weed Species

- Figure 1: Oxeye daisy (*Leucanthemum vulgare*)
 - Perennial herb
 - Rapid reproduction, seeds & rhizome clones
 - Outcompetes natives through population growth
- Figure 2: Toadflax (*Linaria dalmatica*)
 - Perennial herb
 - Lateral roots can continue sprouting clones
 - Persistent, reduces forage quality
- Figure 3: Leafy spurge (*Euphorbia esula*)
 - Perennial herb
 - Up to 8-year seed viability
 - Extensive tap root system, impacts water availability
- Figure 4: Spotted knapweed (*Centaurea maculosa*)
 - Biennial or perennial, herb
 - Possibly allelopathic, uses root toxins against other species
 - Tap roots and increased seed production
- Figure 5: Hoary alyssum (*Berteroa incana*)
 - Annual, biennial, or perennial herb
 - Cold and hot temperatures tolerant
 - Toxic to horses, poor forage quality



Figure 1: Oxeye daisy



Figure 2: Toadflax



Figure 3: Leafy spurge



Figure 5: Hoary alyssum

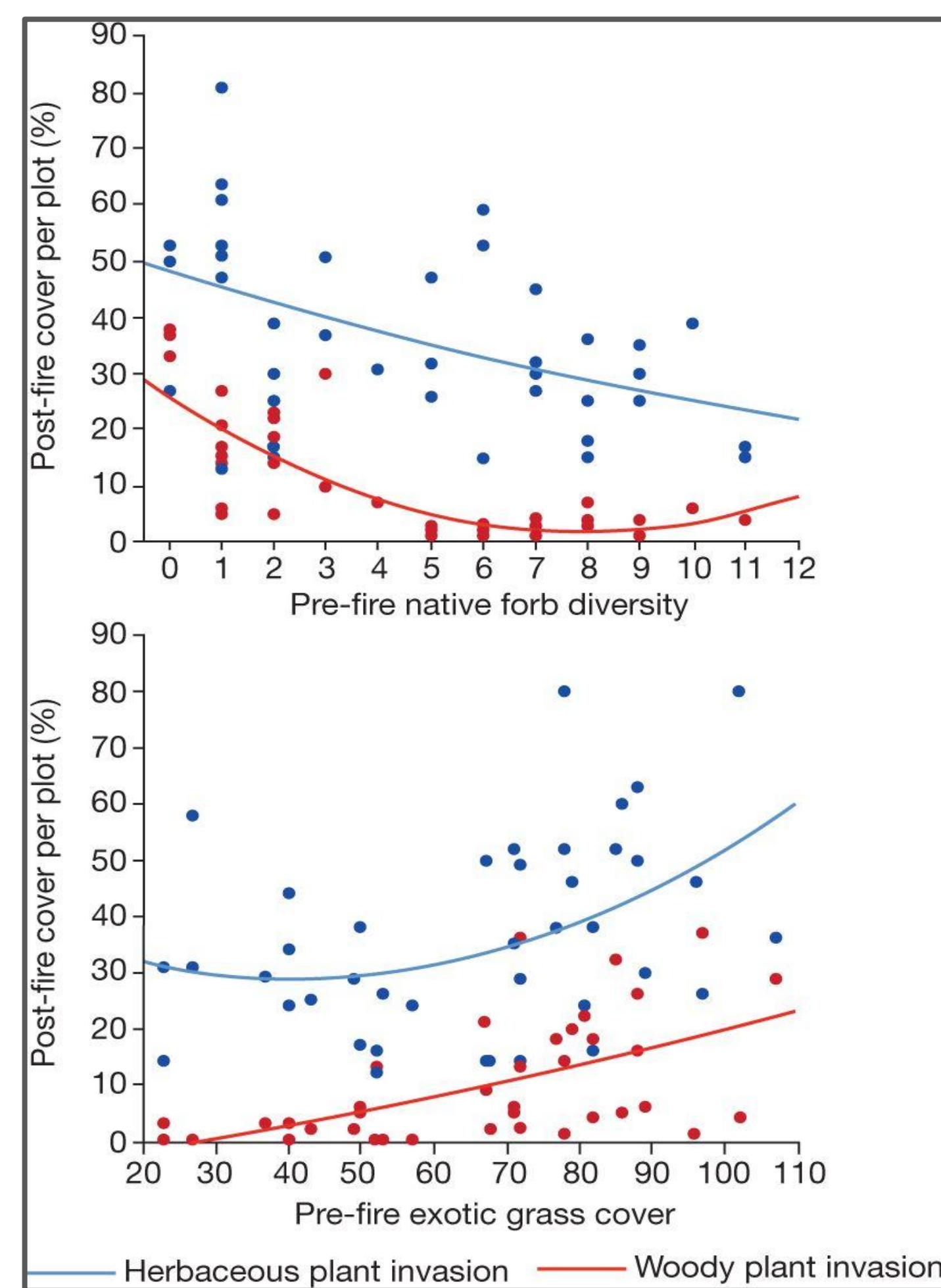


Figure 4: Spotted knapweed

Courtesy of: usda.gov

Background

Disturbance can favor invasives rather than natives



Post disturbance cover of invasive species increases while post disturbance cover of native species decreases (Macdougall et al 2015)

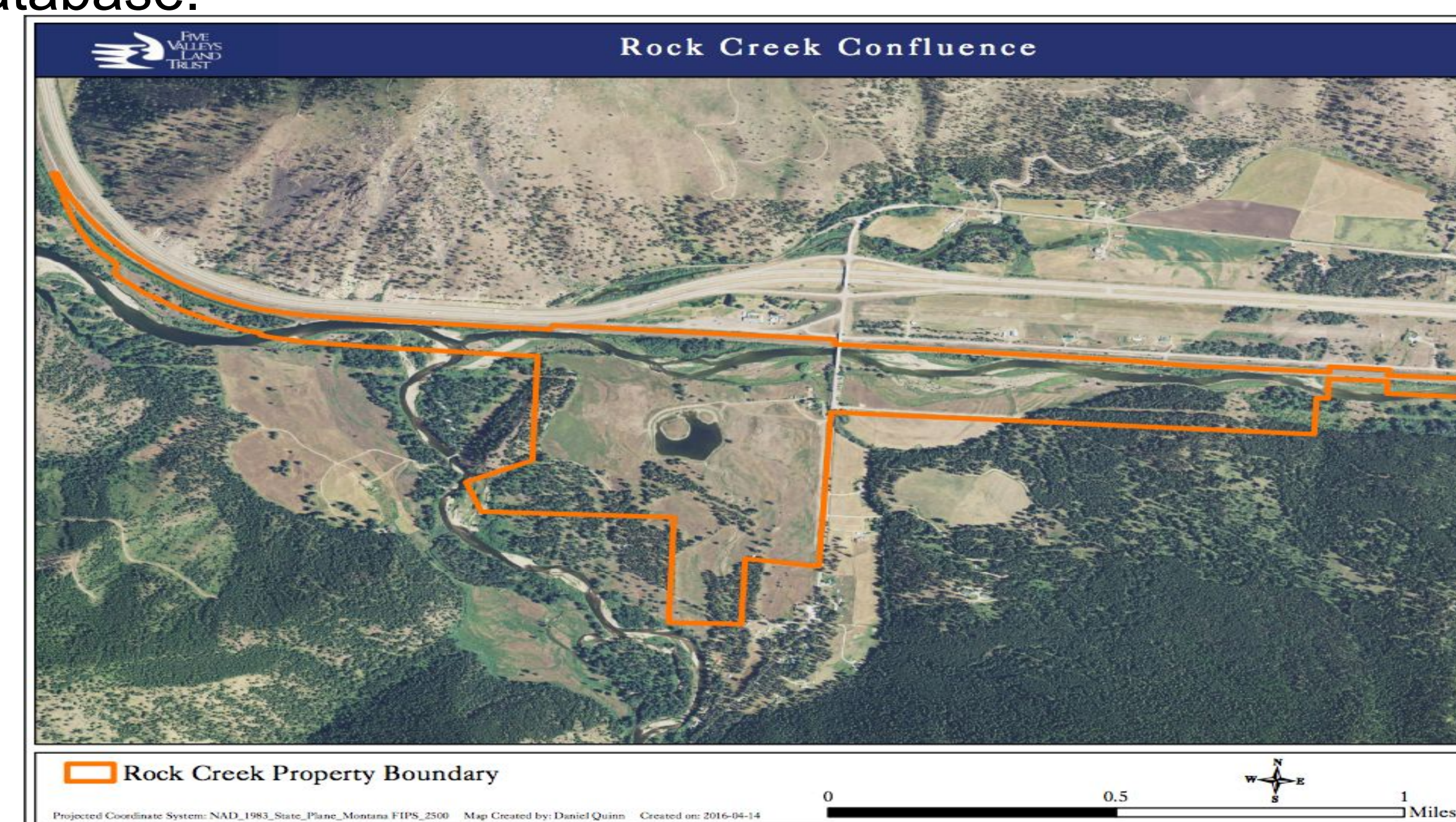
Proposed Subdivision Overlay



Overlay of developer proposed subdivision and approximate initial surface soil removal at the RCC Site boundaries.

Methods

1. Record perimeter GPS coordinates of the sampling area.
2. Conduct systematic sampling of focal species along 50m line transects (North to South), 50m apart (East to West), combining:
 - a. Point-line intercept with species identification every 5m (to establish baseline frequency % for the focal species),
 - b. And modified dry weight (baseline density rate % per quadrat every 5m).
3. Overlay data onto digital RCC map using GPS coordinates.
4. Create independent map layer for each focal species showing density and modified dry weight frequency rates.
5. Create pamphlet design of noxious weeds (with locations, identifications, and removal instructions for RCC visitors) and provide it to FVLT.
6. Consolidate data, overlays, and analyses with existing RCC database.



Expected Outcomes

- A comprehensive noxious weed map with density and frequency on individual overlays
- This could be used by FVLT to develop site plans and guide future restoration efforts
- A simple, accurate, and precise monitoring protocol that could be adopted by future groups
- Create a user friendly interpretation of our data depicted on a pamphlet available at the RCC site to:
 - Educate daily users of the site in the negative role noxious weeds play on native diversity in ecosystems
 - Provide species specific identifiable features, pictures, and species disposal recommendations

Objectives

1. Establish baseline site conditions regarding focal noxious weeds in order to create a map of current weed distribution.
2. Generate an educational pamphlet to inform RCC visitors of up to date site information along with instructions on how to assist in ongoing efforts
3. Contribute to the longevity and sustainability of the efforts at RCC.

Acknowledgments

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