

**AGRICULTURAL RESEARCH FOUNDATION
INTERIM REPORT
FUNDING CYCLE 2017 – 2019**

TITLE: Prescribed Fire as a Management Opportunity for Control of *Ventenata dubia* in Oregon

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COOPERATORS: The Nature Conservancy, Zumwalt Prairie Preserve

SUMMARY:

Invasive annual grasses, such as cheatgrass (*Bromus tectorum*) and medusahead (*Taeniatherum caput-medusae*) are having a negative impact on millions of acres across the western US. These annual grasses can displace native species, lower forage quantity and quality, lower species diversity and richness, and lower wildlife habitat quality. *Ventenata* (*Ventenata dubia*) is a relatively new invasive annual grass to the ecosystems across the Pacific Northwest. It was first reported in North America in 1952 in Washington and has since spread to 10 western states in the United States as well as British Columbia and Alberta, Canada. It is unknown when *ventenata* arrived in Oregon, however, its spread has been very rapid. For example, in low elevation grasslands of northeastern Oregon, its rate of increase has been greater than cheatgrass. Some monitoring sites reveal that *ventenata* has nearly doubled in just 5 years. The staggering spread and increase of this species means it is now considered to be the primary invasion threat to intact grasslands in the region. Even though *ventenata* is still relatively new, this small and wispy annual grass is already generating a wide range of environmental and economic issues. Although the impact and spread of *ventenata* has been rapid in the last decade, very little is documented about the basic ecology, the conditions that enable its spread, or how it can be controlled through various management interventions.

OBJECTIVES:

Under prior Agricultural Research Funding (ARF8527A), we investigated the response of *ventenata* and its seed bank to prescribed fires on the grasslands known as the Zumwalt Prairie in northeastern Oregon along with The Nature Conservancy (TNC) one year after the prescribed fire of 2016. Therefore, overall objective in this continued study will be to monitor the effects of prescribed fire on *ventenata* over time. Specifically, we will examine three main questions:

- 1) Does the cover and density of *ventenata* increase or decrease over time after a prescribed fire?
- 2) How does the seed bank of *ventenata* respond in subsequent years after a prescribed fire?
- 3) How does this response vary with other contributing factors such as: annual climate, plant community composition prior to prescribed fire, prior fire history (e.g., burned in 2006), and fire intensity?

PROCEDURES:

Within the largest intact remnant of the grassland type in the region is The Nature Conservancy's Zumwalt Prairie Preserve (ZPP), a 32,000 acre conservation area in the northeastern Oregon. At this site, The Nature Conservancy (TNC) has a set of 16 plots (established in 2004 and burned in 2006) that were used to study the interactions of fire and grazing on the prairie with no post-fire seeding. These large plots (~300 x 900 feet) were burned again in Fall 2016 by the TNC. Their

design allows us to look at fire responses with two known fires ten years apart (2006 & 2016). Pre and post-fire vegetation data (in 2016 and 2017 respectively) will be recorded along nine, 100-m (or about 300 foot) transects placed randomly within each plot. Along each transect measures of plant cover and soil cover characteristics (e.g., rock or bare ground) will be recorded. In addition, measures of all invasive grass species will be collected at intervals along each transect. To examine how fire affects the seed bank of ventenata, we tested for changes in density of ventenata seedlings from seed bank samples collected within our plots pre and post-fire. Because fire intensity can be variable across the landscape, the effects of the burn on vegetation and soil will be evaluated along the transects using methods developed by the National Park Service. The response of ventenata before and after fire across all plots will be evaluated with potential contributing factors to examine the influence of different plant communities, grazing, precipitation and temperature, and fire severity.

SIGNIFICANT ACCOMPLISHMENTS TO DATE:

We completed pre-burn vegetation sampling in Summer of 2016 and collected seed bank samples pre- and post-burn in Fall of 2016. The seed bank study was completed in the Fall/Winter of 2016 and we are currently working through data analysis in anticipation of manuscript preparation this Spring 2017. Our next steps will be vegetation data collection for year 2 post-burn (Spring/Summer 2018). Preliminary seed bank data from year one post fire did not indicate a consistent affect of fire on ventenata seed bank. The seed bank collection for year 2 post-burn is scheduled for Fall 2018, will be grown out in greenhouse (Winter 2018), and write-up of all results completed by January 2019.

The results from year one of this study will be combined with year two prior to submission for publication. However, the results from year one of the seed bank study will be presented in a poster format at the Society for Range Management in 2019.

ADDITIONAL FUNDING RECEIVED DURING PROJECT TERM:

A Joint Venture Agreement with the USDA Forest Service, Pacific Northwest Research Station (\$50,000) to help support a graduate student project following up on this research. (Morris)

FUTURE FUNDING POSSIBILITIES:

Lesley Morris is applying for support through the OSU Branch Experiment Station Internship program again for summer 2018. In addition, Dr. Morris will be seeking additional funds from The Nature Conservancy's 2018 Oren Pollak Memorial Student Research Grant for Grassland Science (\$9,600) to provide additional support for the graduate student, Luke Ridder, now conducting this research as a two-year study.