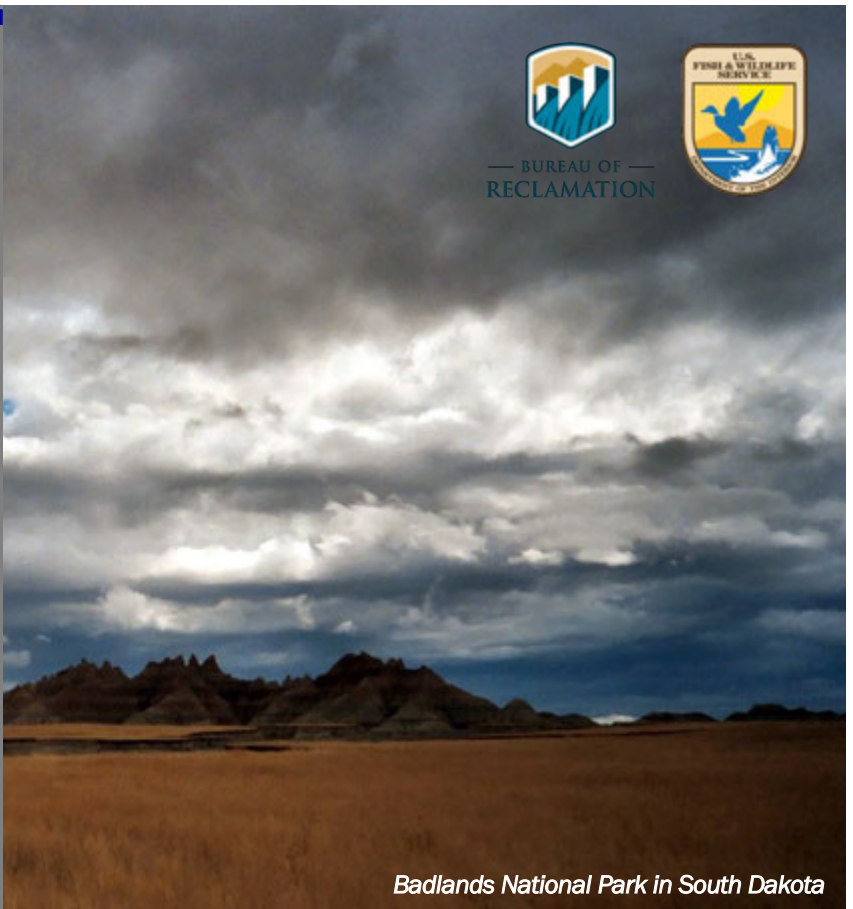


## ACTIONABLE SCIENCE

# Relationships Among Invasive Plants, Native Plants, and Pollinators in Badlands National Park

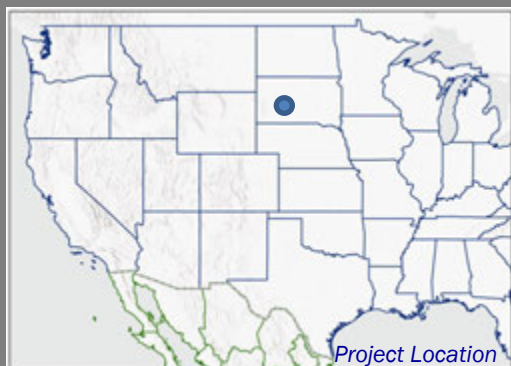


BUREAU OF  
RECLAMATION



Badlands National Park in South Dakota

As land managers address threats to pollinators and endemic plants, such as habitat loss and degradation, it is important to consider how the removal of invasive plants may also be related to conservation. To better understand how pollinators and the plants that depend on them respond to the presence or removal of invasive plant species, the U.S. Geological Survey (USGS) Northern Prairie Wildlife Research Center conducted several research projects throughout Badlands National Park that identified the roles of and relationships among invasive plants, various pollinators, and endemic plants.



Project Location

## KEY ISSUES ADDRESSED

Invasive plant species such as Russian Thistle (*Salsola tragus*) or Yellow Sweetclover (*Melilotus officinalis*) may prevent the successful reproduction of Visher's Buckwheat (VB: *Eriogonum visherii*) by clogging VB flowers with their pollen or detracting pollinators from VB preventing successful pollination. Without a better understanding of the relationships among these species, it is difficult to determine whether or not invasive plant removal is necessary for the conservation of this rare, endemic plant.

To understand how removing invasive plants influences pollinators, land managers must also consider the contributions of non-bee pollinators such as beetles, wasps, and flies. Additionally, understanding the relationships among these non-bee pollinators and invasive plants is important to determining whether the removal of an invasive plant is harmful to pollinators.

## PROJECT GOALS

- Identify relationships among Visher's Buckwheat and invasive plant species
- Determine which pollinator species contribute to rare and endemic plant pollination
- Utilize pollen transport data to determine if invasive plant removal is harmful to pollinators

## CALLING ALL TAXONOMISTS

Gathering plant and pollinator data requires special attention to species identification. Without a skilled taxonomist on the team, data collection can be exceedingly difficult.



Visher's Buckwheat with a Flower Stalk

## PROJECT HIGHLIGHTS

**Innocuous Invasives:** Pollen from the invasive plants Russian Thistle and Yellow Sweetclover did not affect Visher's Buckwheat reproduction.

**A Bee or Not a Bee—They All Carry Mixed Pollen:** Several bee and non-bee pollinators visited Visher's Buckwheat while carrying pollen from many plant species. Visher's Buckwheat depends on many pollinator taxa and are not harmed by the pollen they carry from other plants.

**Pollinator Diversity Improves Resilience:** Bees, flies, beetles, and wasps were all important contributors to pollen transfer, but each with varying contributions and at different times during the season. This diversity may enhance the prairie plant community's resilience to environmental disturbances.

**Timing is Everything:** The native perennial, Few-flowered Buckwheat (*Eriogonum pauciflorum*), may be a more reliable alternative source of pollen and nectar for pollinators than the invasive Russian Thistle, which is an annual. Therefore, Few-flowered Buckwheat can sustain pollinators during times that Visher's Buckwheat is not abundant. Additionally, while pollinators were attracted to the invasive Canada Thistle (*Cirsium arvense*), if it was removed and there were native plant species present, pollinators would switch to native plants.

## Collaborators

- U.S. Geological Survey (USGS)
- National Park Service

CCAST Author: Madison E. Elliot, Virtual Student Federal Service, May 2022.  
Photos courtesy of Dianne Larson/USGS  
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## LESSONS LEARNED

Year-to-year variation in pollinator data is common. For example, the relationship among Visher's Buckwheat and Russian Thistle changed from one season to another. Therefore, management actions based on pollinator data should be based on observations made over several years.

There were significant relationships among non-bee pollinators and native and invasive plant species. Therefore, understanding of the impact of invasive plants on pollinator conservation and on community resilience requires attention to a wide range of insect taxa beyond bees, including flies, beetles, and wasps. Since many invasive plants provide abundant pollen and nectar, they may attract new pollinators to the area, which could be beneficial for nearby native plants. However, it is also possible for invasive plants to outcompete native plants for existing pollinators. These contrasting effects cause uncertainty as to whether the benefits of invasive plants outweigh their threats. Ultimately, although invasive plants provide an alternative source of pollen and nectar for new and existing pollinators, higher floral abundance from native plant species would serve as a better resource for pollinators than invasive species.

## NEXT STEPS

- Publish analysis of pollen data collected in 2009-2010 during a season long study.
- Share current and future research results with land managers to inform best practices.
- Seek out additional taxonomists for in-lab insect species identification

For more information on this project, contact Dianne Larson:

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A Wasp Gathering Nectar From a Canada Thistle