

The Invasive Grass *Venttenata* (*Venttenata dubia*): A New Threat for Nevada

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***Ventenata dubia* (Leers) Coss. (VeDu)**
(wiregrass, North Africa grass, ventenata)



The Genus *Ventenata* (Koeler)



Photo by Pamela Pavek

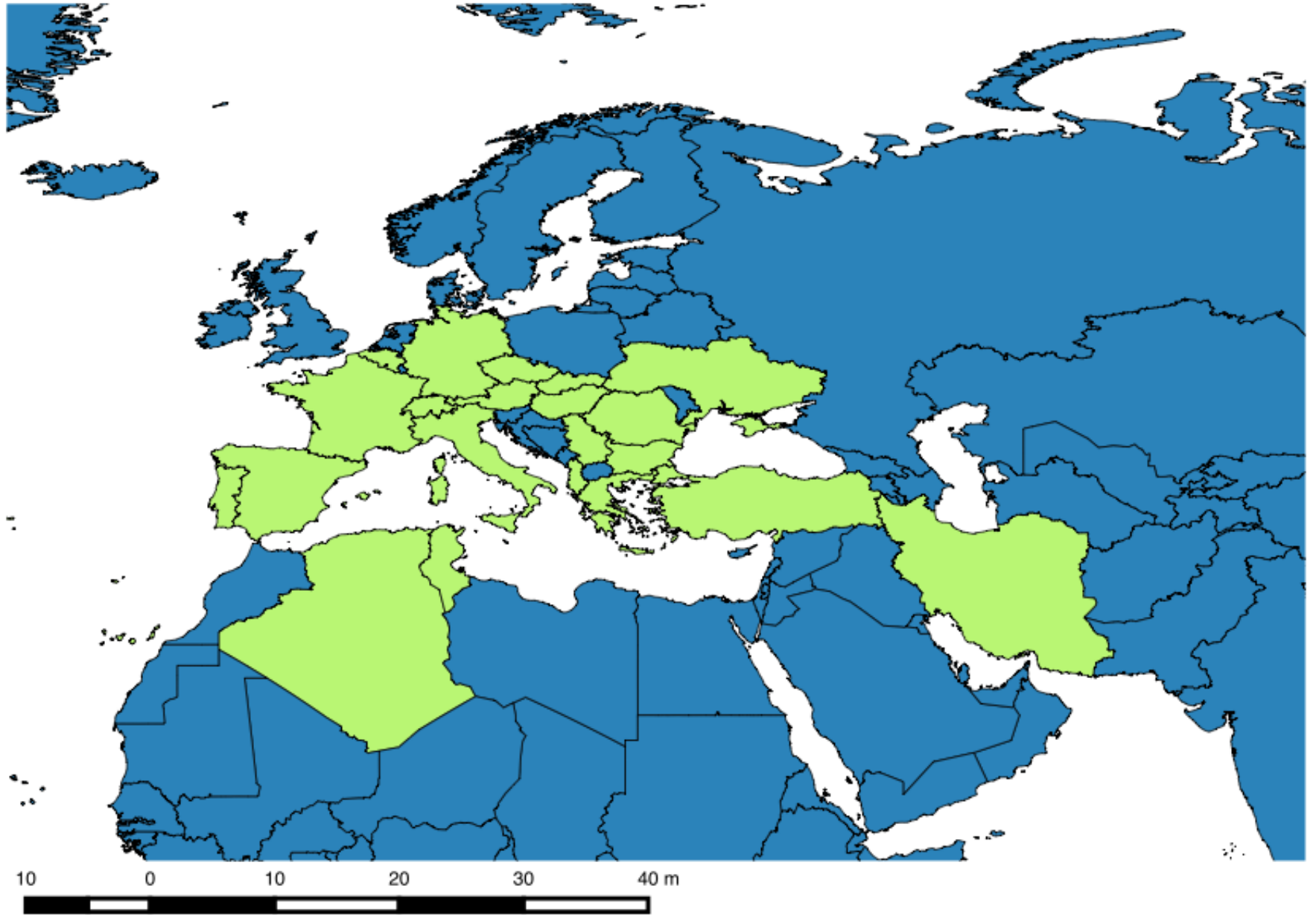
- *Ventenata* is in the Aveneae (“oat tribe”)
- Eight recognized species distributed across Eurasia
- Native to central and southern Europe, north Africa, and eastward to central Asia
- Annual grasses
- Plants grow in dry, open habitats
- Named for Etienne Pierre Ventenat (1757-1808), a French botanist

Distribution of *Ventenata dubia*

- Native to the Mediterranean Region (Europe and North Africa), central and eastern Europe, and eastward to Iran



Native Range of *Ventenata dubia*

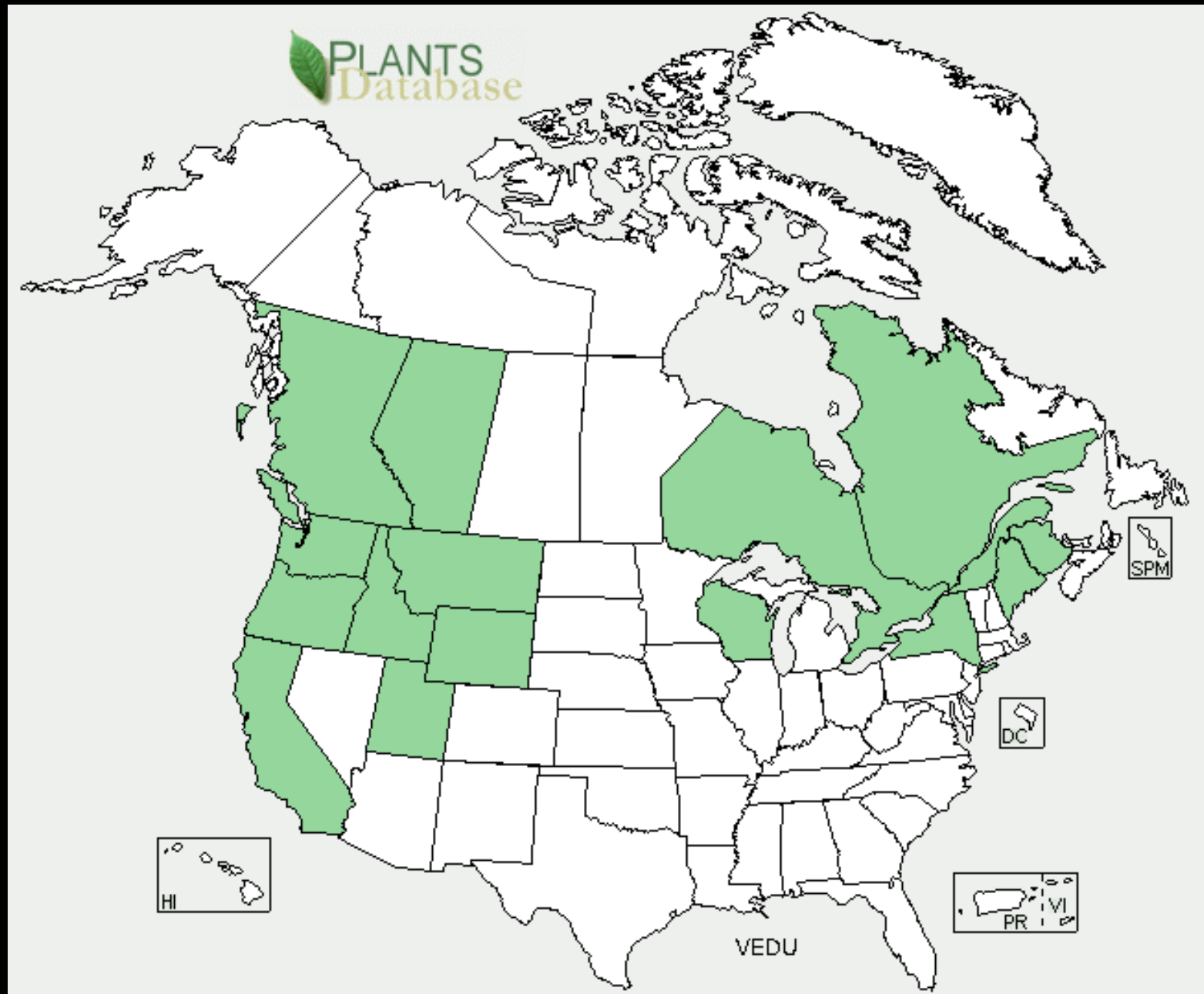


Distribution of *Ventenata dubia*

- Native to the Mediterranean Region (Europe and North Africa), central and eastern Europe, and eastward to Iran
- Reported from the eastern and western USA, and five Canadian Provinces (apparently not in Nevada?)



Introduced Range of *Ventenata dubia*

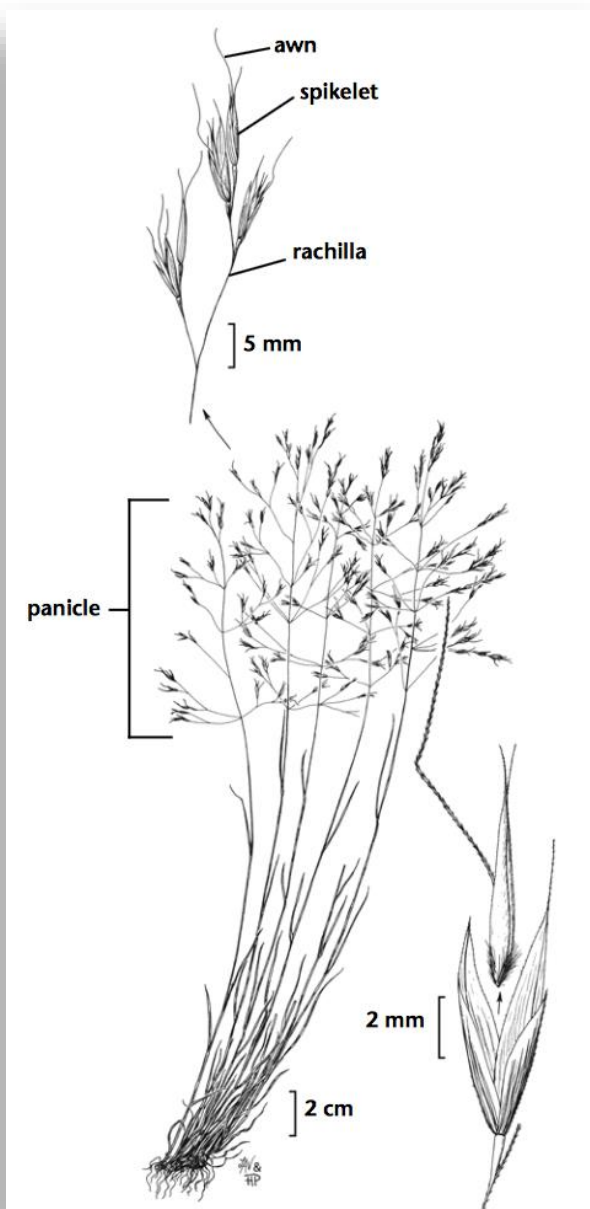


Invasion of *Venttenata dubia*

- Native to the Mediterranean Region (Europe and North Africa), central and eastern Europe, and eastward to Iran
- Reported from the eastern and western USA, and five Canadian Provinces (apparently not in Nevada?)
- Invasive in the interior pacific northwest of the US, Utah, and California; also in British Columbia
- Well known collection history
- First reported in 1952 (Spokane County, Washington)
- Relatively recent invasion?



Ventenata dubia Characteristics



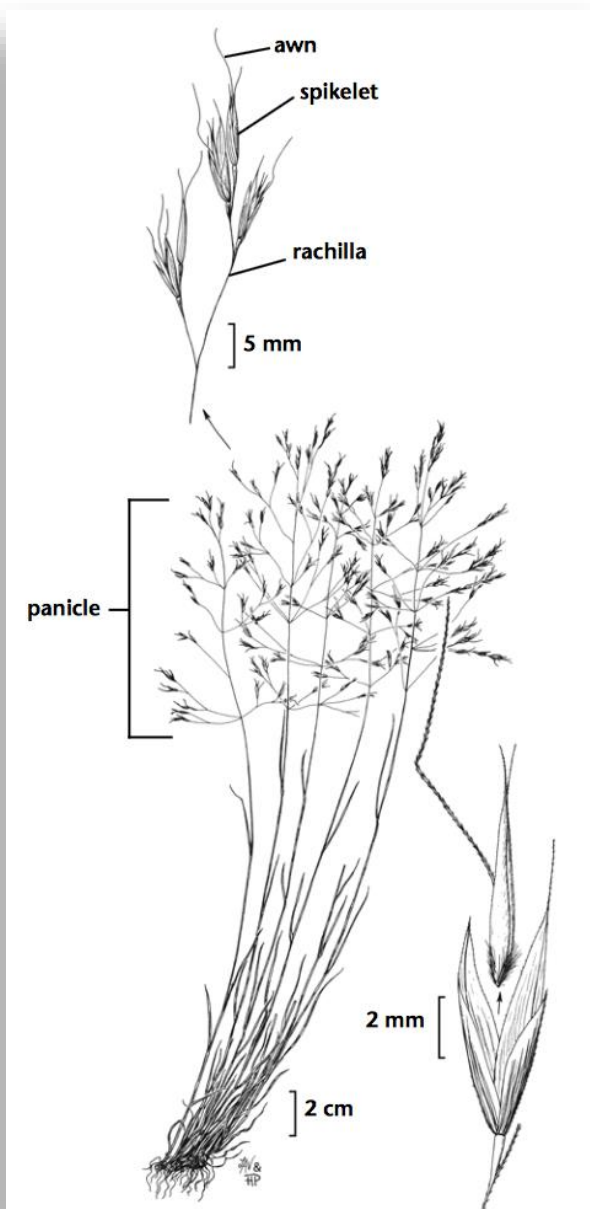
- Winter annual grass
- Plants are slim, erect culms (10-46 cm tall)
- Stems have microscopic hairs that give the plants a shiny green appearance

Pasture in central Oregon Infested with *Venttenata dubia*



Photo by Fara Brummer

Ventenata dubia Characteristics



- Winter annual grass
- Plants are slim, erect culms (10-46 cm tall)
- Stems have microscopic hairs that give the plants a shiny green appearance
- Germinates in the fall when temperatures are moderate to high (18-28 C)
- Flowers, May – June
- Seed set, late June – July
- Occurs in semi-arid habitats (range of precipitation zones, 300 – 1,120 mm/year)

Identifying *Ventenata dubia*



- *Ventenata dubia* can be identified based on the overall architecture of the plant and specific characters
- Inflorescence is an open, spreading panicle
- At the end of each drooping panicle side branch are 1-5 spikelets (seeds)
- In May-June, plants have a reddish-black band at the nodes
- Unusually long ligule (1-8 mm)
- Mature seeds (June-July) have a twisted and bent awns

Deschampsia danthonioides (Annual Hairgrass): Potential for Misidentification



D. danthonioides seeds



V. dubia seeds

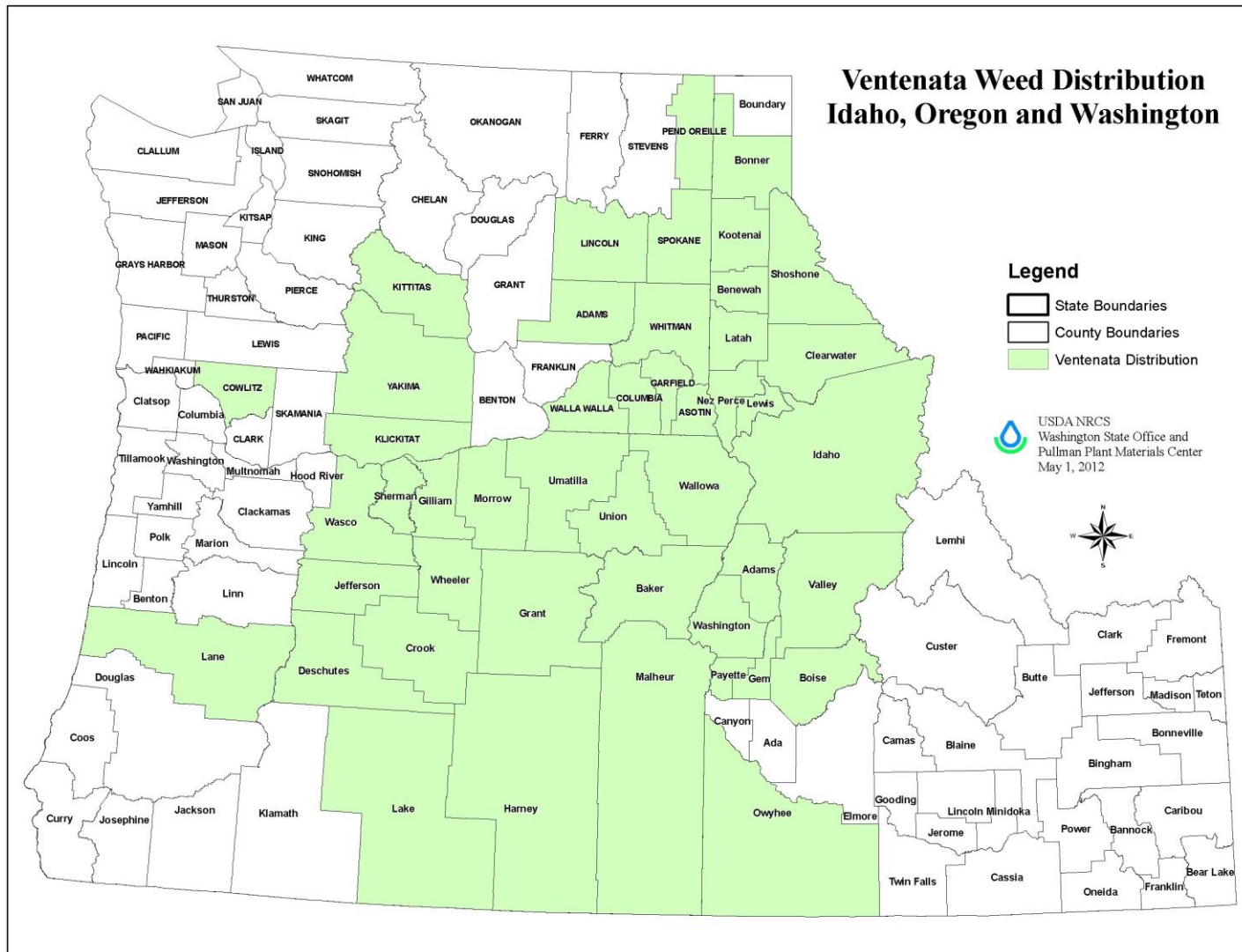


Spread of *Ventenata dubia* in the Northwestern US

- Spread occurs through contaminated grass seed, hay and annual crops; and along roads
- Long awns probably assist dispersal by humans and animals
- Established in 21 Idaho and 13 counties in just 35 years (Northam and Callihan 1992)
- Spreading at a rate of 1.2 million hectares/year (National Invasive Plant Council 2001)
- Area of infestation is expanding, especially into regions with < 350 mm of precipitation per year



Distribution of *Venttenata dubia* in Idaho, Oregon and Washington



Map prepared by Pamela Pavek

Ecological and Economic Impacts of *Ventenata dubia*

- First invaded and spread along roadsides in eastern Washington and northern Idaho
- The grass now dense stands in pastures and rangelands, it dominates south-facing slopes in central Idaho
- It reduces native perennial grass and forb biodiversity, and alters community structure and ecosystem functioning
- *V. dubia* has invaded timothy grass hay fields in eastern Washington, and reduced the value of this product
- It accumulates silica and is unpalatable to livestock and wildlife; it possesses minimal forage value
- The shallow root structure of *V. dubia* may lead to increased soil erosion, compared with native plants

Venttenata dubia



Video by Joseph Rausch, near John Day, OR

Venttenata dubia



Venttenata dubia



Venttenata dubia



Ventenata in Medusahead Infested Sites



Management of *Ventenata dubia*

- Effective management strategies for *V. dubia* requires more information on the biology and ecology of the species
- Management should focus on reducing and/or eliminating seed production
- Mowing *V. dubia* multiple times during the growing season has been effective (not when plants are heading)
- Fire may initially suppress the grass, but it is capable of reestablishing in the year(s) following fire
- Grazing is not effective/recommended because of the low palatability of the grass (silica accumulation)
- *V. dubia* has been shown to be resistant to glyphosate and sethoxydim. Application of imazapic in the fall when perennial grasses are dormant has been effective

Insight from the Combined Analysis of Native and Invasive Populations

- Implemented in management of invasive species, e.g. biological control programs
- Identify geographic origins (source populations)
- Assess introduction dynamics (multiple introductions?) and pattern of range expansion (local or widespread?)
- Determine the genetic consequences of introduction events (reduced genetic diversity?)

Overall Objective of the Current Project

Use a multidisciplinary approach to test the feasibility of using biological control in the management of *Venttenata dubia* in the western United States



Photo by Matt Lavin



Photo by Pamela Pavek



**CONTROL
NOXIOUS
WEEDS**

**IT'S YOUR
RESPONSIBILITY**

CROOK COUNTY
541-447-6228

Specific Goals of the Project

1. Conduct foreign exploration in the native range of *Ventenata dubia*
 - Identify and geo-reference native populations of *V. dubia*
 - Survey for and sample potential biological control agents (e.g., insects, mites)
 - Collect samples of approximately 25 plants per population for subsequent genetic analyses

Conservation Status of *Venttenata dubia* in its Native Range

Country	Status
France	Locally protected
Italy	Rare
Serbia	Extinct
Czech Republic	Endangered
Slovakia	Near threatened
Portugal	Rare
Spain	Status Unknown
Germany	Endangered
Greece	Status Unknown
Ukraine	Rare
Switzerland	Rare



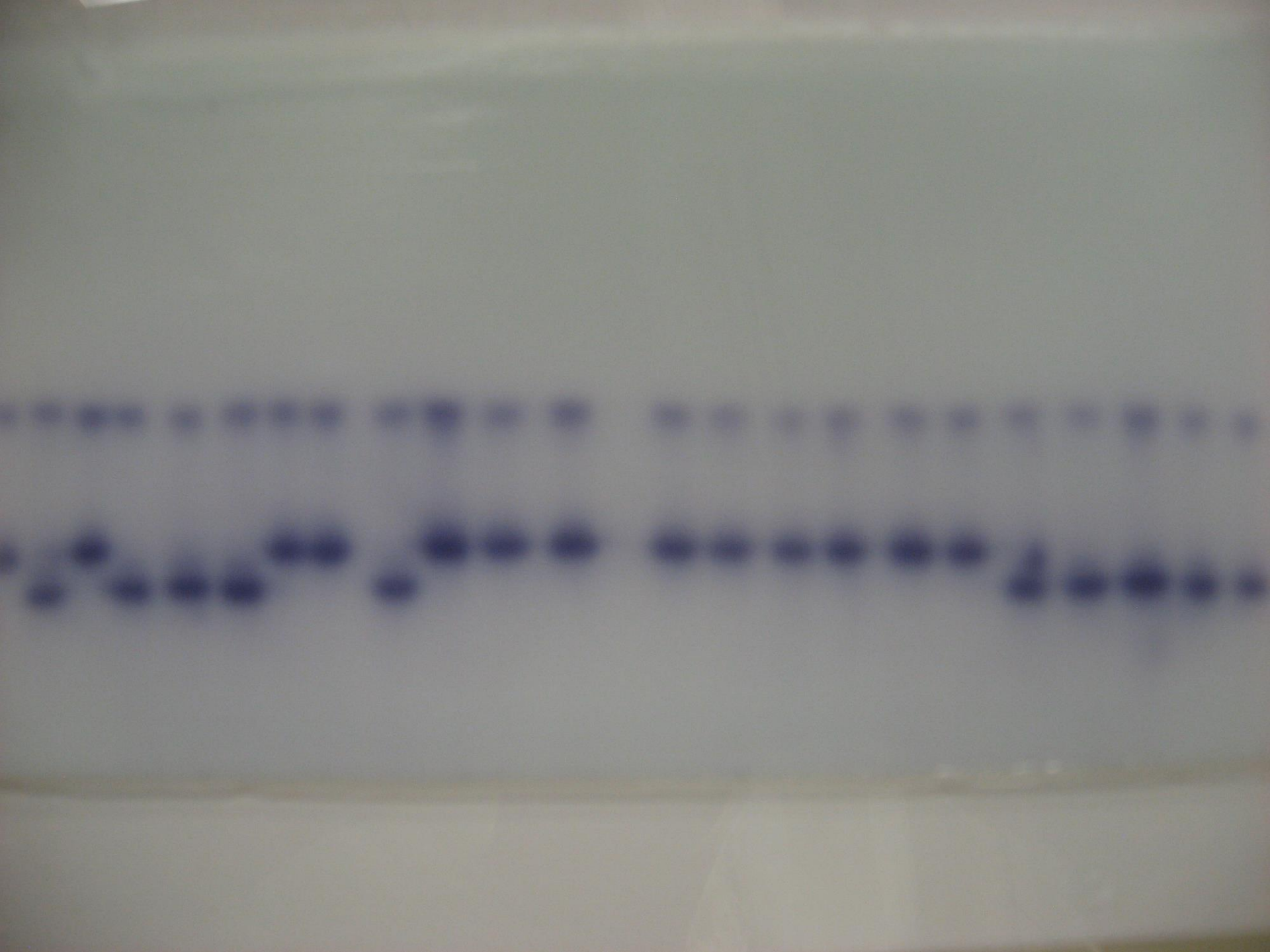
Specific Goals of the Project

2. Assess the introduction dynamics and pattern of range expansion of *Ventenata dubia* in the western United States (North America)
 - Target specific invasive populations for sampling using historical records and data from herbarium specimens
 - Collect samples of approximately 25-35 plants per population for subsequent genetic analyses
 - Geo-reference location of invasive populations
 - Conduct genetic analyses of native and invasive populations of *V. dubia* using allozymes (co-dominant marker) and amplified fragment length polymorphic (AFLP) techniques (dominant marker)

Collection History of *Ventenata dubia*

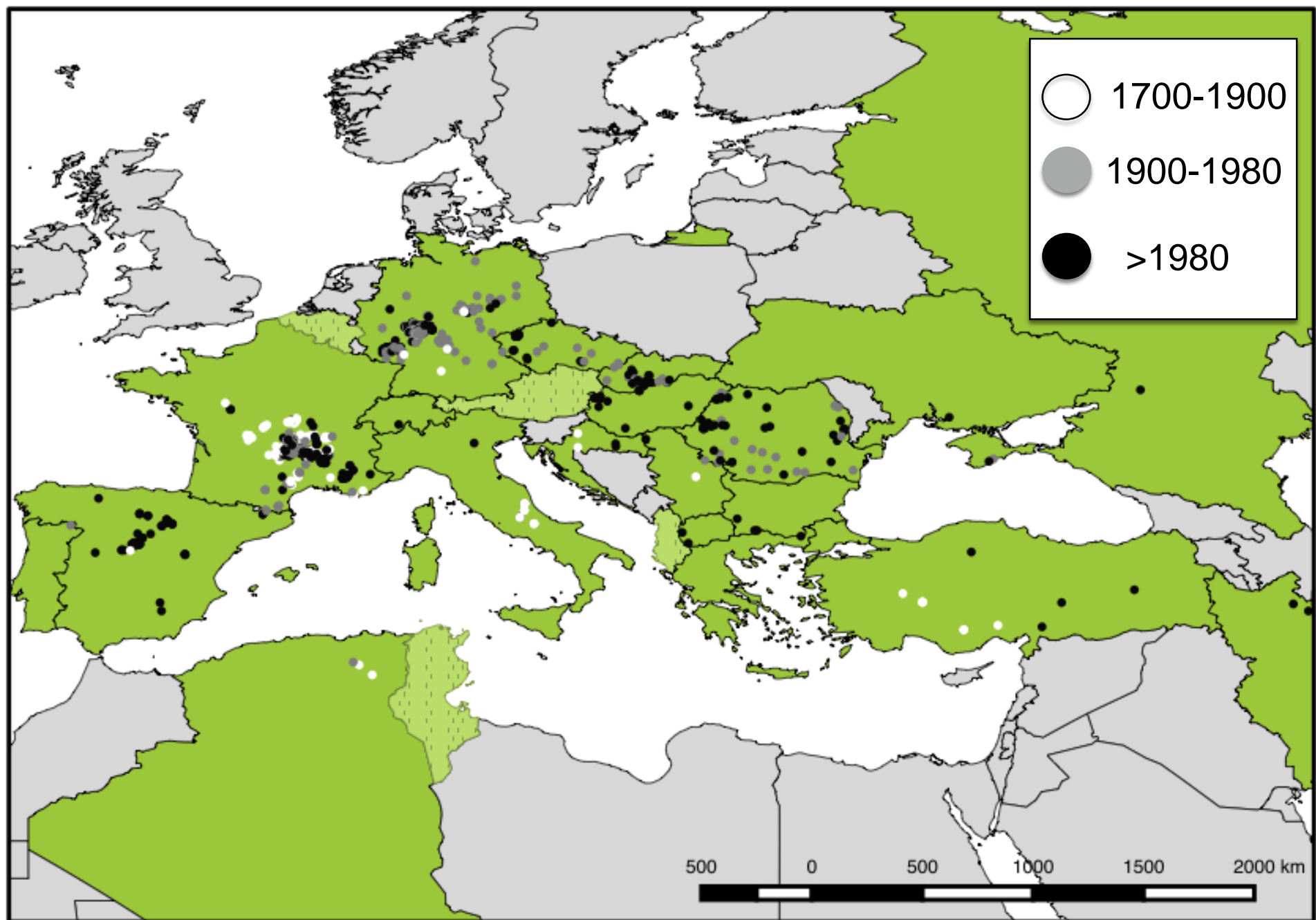
Location	Date
Spokane County, WA	1952
Kootenai, County, ID	1957
Klickitat County, WA	1962
Idaho County, ID	1972
Wasco County, OR	1979
Polk County, OR	1984
Elmore County, ID	1986
British Columbia	1988
Ravalli County, MT	1995
Grant County, OR	1996
Sheridan County, WY	1997





Specific Goals of the Project

3. Use multi-scale ecological mapping techniques to detail the current and predict the future distribution of *Ventenata dubia* in the western United States (North America)
 - Use herbarium specimens, historical information and online resources to reconstruct the introduction and range expansion of VeDu in the western US (NA)
 - Obtain georeferenced occurrence data for native and invasive populations of VeDu
 - Perform climate niche modeling analyses of VeDu to determine the potential distribution of the species based on current climate and predict changes in its distribution under climate change



Specific Goals of the Project

4. Seek the participation of landowners, ranchers and other stakeholders interested in the invasion of *Ventenata dubia* in the western United States
 - Create an interactive and easy-to-use website, and a smart phone app, to assist in the identification of the grass and obtain geo-referenced updates on its distribution
 - Use the website to disseminate information on the invasion of *V. dubia* in the western United States
 - Conduct workshops with interested parties to disseminate information on this invasion and engage in public outreach about this project



ABOUT GRASSMAPPER

This is Photoshop's version of Lorem Ipsum. Proin gravida nibh vel velit auctor aliquet. Aenean sollicitudin, lorem quis bibendum auctor, nisi elit consequat ipsum, nec sagittis sem nibh id elit. Duis sed odio sit amet nibh vulputate cursus a sit amet mauris. Morbi accumsan ipsum velit. Nam nec tellus a odio tincidunt auctor a ornare odio. Sed non mauris vitae erat consequat auctor eu in elit.





Thank you. Questions?