Additional Resources:

Oregon State University Extension, *Pacific Northwest's Least Wanted List: Invasive Weed Identification and Management* (EC 1563)

USDA NRCS Plant Materials website: https://plants.usda.gov

Ecologically Based Invasive Plant Management: website, manuals, and information at http://www.ebipm.org/

Medusahead Management Guide for the Western States. University of California, Weed Research and Information Center, Davis. www.wric.ucdavis.edu

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RECOGNIZING AND IDENTIFYING

Three Invasive Annual Grasses in the Great Basin Desert

Downy Brome (Cheatgrass), Medusahead, and Ventenata

Fara Ann Brummer, Pete Schreder, Grace Haskins, and Jason Jaeger

Invasive annual grasses are a threat to the Great Basin desert ecosystem. They compromise habitat diversity for important wildlife species such as the greater sage-grouse. They shorten the grazing season for livestock, and do not provide as much consistent forage biomass and quality as perennial native bunchgrasses. They tend to be much smaller, have less overall leaf area, and capitalize on early season moisture. One annual grass, medusahead, can reduce livestock carrying capacity by 50 to 80 percent. Invasive

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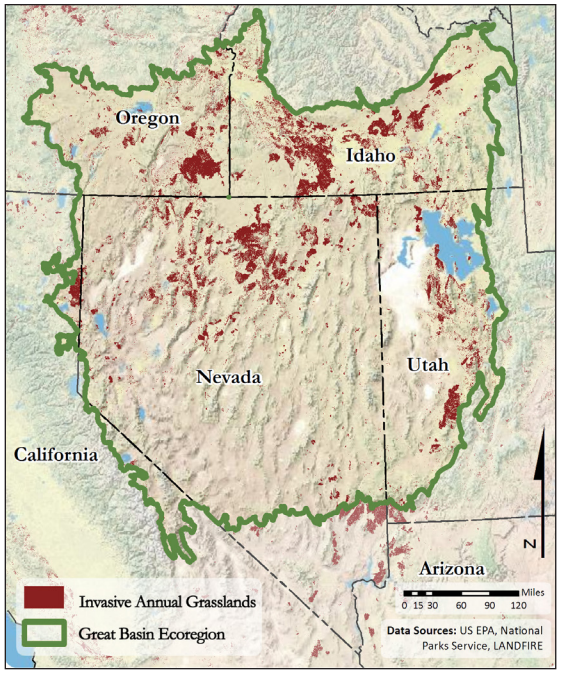

Map: Great Basin Landscape Conservation Cooperative

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Ventenata (North Africa Wire Grass) (*Ventenata dubia*)

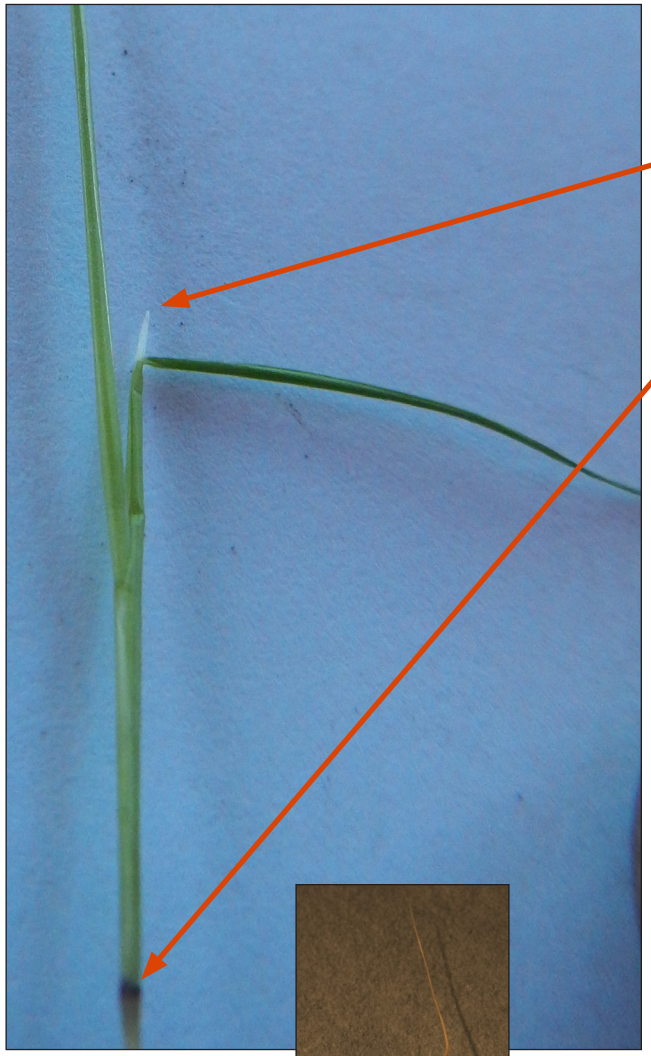

Photo: Fara Brummer, © Oregon State University

During it's vegetative stage, ventenata has a long ligule and dark node.

Photo: Fara Brummer, © Oregon State University

Ventenata has an open panicle and appears very rigid when dried. The heads do not nod like cheatgrass.

Photo: Fara Brummer, © Oregon State University

A ventenata invaded meadow. Ventenata frequently has a lime green color during it's early growth.

Photo: Fara Brummer, © Oregon State University

A dominated site can accumulate litter, which has been found to self-perpetuate ventenata.

Photo: Carol W. Witham

Ventenata can be confused with annual hairgrass (*Deschampsia danthonioides*) that has a similar appearance when it develops seedheads. However, annual hairgrass is a native, and noncompetitive with other grasses. It has two florets per spikelet, compared with ventenata that can have three. Also, it lacks the dark red to black nodes found on ventenata stems.

Photo: Tim Prather, © University of Idaho

The seedhead on ventenata has a distinctively bent awn.

Downy Brome (Cheatgrass) (*Bromus tectorum*)

Photo: Fara Brummer, © Oregon State University

Leaves are wide and soft to the touch, with small hairs on both sides.

Photo: Matt Lavin, © Montana State University

The sharp awn on the mature seedhead is straight and long.

Photo: Matt Lavin, © Montana State University

Japanese brome (*Bromus japonicus*) is a look-alike to cheatgrass. However, once seedheads develop, the awns are shorter and can have a bend in them. Once they dry, they often bend out at right angles. Japanese brome can also become weedy, like cheatgrass.

Photo: Matt Lavin, © Montana State University

Flowering heads droop down as they mature with seeds.

Photo: Matt Lavin, © Montana State University

A cheatgrass-infested lower elevation sagebrush steppe site.

Medusahead (*Taeniatherum caput-medusae*)

Photo: Fara Brummer, © Oregon State University

Leaves are very narrow with fine short hairs on the surface and leaf margins. Roots are very shallow. The plant can often have a characteristic yellow-green color.

Photo: Grace Haskins, BLM

Medusahead with developing seedheads. Note the coarse, prominent awns.

Photo: Matt Lavin, © Montana State University

Squirreltail (*Elymus elomoides*), at first glance, may look like medusahead when its seeds are developed, but the awns are not as sharp, and the heads may droop. Also, squirreltail is a perennial bunchgrass, not an annual. Leaves are much wider than medusahead .

Photo: Grace Haskins, BLM

An invaded site on the sagebrush steppe. Dry medusahead plants have a dull buff color. Litter accumulation from previous years' growth is common and breaks down slowly.

Photo: Matt Lavin, © Montana State University

Foxtail (*Hordeum jubatum*) may also appear similar, but the leaves are quite large compared with medusahead. It also matures much earlier in spring, and it inhabits different sites such as waste places, old corrals, and holding areas.

annual grasses typically have a shallow root system. Shallow root systems limit forage availability to early season use, particularly during drought years. Once these grasses gain a foothold, they can progressively dominate a system, as they germinate in the fall and generally "green up" earlier than our native grasses. Invasive annual grasses increase wildfire threat by providing dry "fine fuels" earlier in the season than native bunchgrasses.

The first step in managing these species is awareness of the annual grass and surrounding range conditions that are most at risk to invasion. Once an invasive annual grass has been identified in an area, strategies to limit its impact should be long-term and consistent to ensure the health of rangelands and pastures. The three major invasive annuals included in this publication are downy brome (cheatgrass), medusahead wildrye, and ventenata.

Name	Time of Germination/Emergence/ Seed Dispersal	Habitat Types	Grazing Suitability	Nonchemical Control	Commonly Used Herbicide Control	Herbicide Time of Application
Downy Brome (Cheatgrass) *(Bromus tectorum)*	**Germination** Fall, following moisture accumulation **Emergence** Early fall if moisture is available, or in spring **Establishment** by seed, which is prolific. Seed can be soil banked over time. Seeds can persist up to 5 years in the field.	Disturbed sites over a variety of soil types	Early spring. (Protein levels can be 20% or more). Seedhead awns can irritate eyes or create abcesses in late summer. Can be grazed in winter for targeted control with the use of protein supplementation.	■ Perennial grass establishment and cover ■ Early season grazing with adequate stocking rate ■ Hoeing of young plants before seedset ■ Mowing can reduce seed accumulation, but remaining plants may regrow ■ Seed burial by tilling	■ Bromacil+ ■ Glyphosate+ ■ Imazapic+* ■ Tebuthiuron+	Depending on product, pre-emergent applications in fall through post-emergent applications in spring are most effective. Check product label and consult your county or BLM weed specialist.
Medusahead wildrye (*Taeniatherum caput-medusae*)	**Germination** Mostly fall, although some can germinate in winter through spring **Emergence** Early fall through spring, depending on moisture conditions and thatch layer **Establishment** By seeds, less than 6 feet away from parent plant. Mature seeds are dispersed from July–October. Seeds can persist 2 years in the field.	■ Soils that are warmer, such as on south-facing slopes and burned areas ■ Clay-dominated soils	■ Mid-spring ■ Livestock will graze before it flowers ■ May be grazed in winter with protein supplementation ■ High silica (6.4% AIA)* may lead to lower intake rates. ■ Seedhead awns can irritate eyes or create abcesses in late summer.	■ Perennial grass establishment and cover ■ Removing thatch layer by raking, prescribed burning, or tillage where possible, followed by reseeding	■ Aminopyralid+ ■ Glyphosate++ ■ Imazapic+ ■ Rimsulfuron+ ■ Sulfometuron*	Depending on product, pre-emergent applications in fall through post-emergent applications in spring are most effective. Check product label and consult your county or BLM weed specialist.
Ventenata (*Ventenata dubia*)	**Germination:** Fall (soil temperature between 48°F – 84°F) **Emergence:** Fall through spring, depending on site and old ventenata litter level on site **Establishment:** Seed, which is produced from May to August. Seed can persist up to 2 years in the field.	■ Areas that are wet in spring, and dry out ■ Clay-dominated soils ■ Shallow and gravelly soils ■ May take over cheatgrass and medushaead sites	■ Mid spring, approximately 2 weeks to a month later than cheatgrass, and typically later than medusahead ■ Silica (2.7% AIA) may contribute to coarse nature of plant. Plant generally appears unpalatable to livestock.		■ Imazapic+ ■ Rimsulfuron+ * ■ Sulfometuron ■ Sulfosulfuron	Late fall. Check product label and consult your county or BLM weed specialist.

+ Herbicide is approved on BLM-managed ground on western U.S. rangelands.
++ Herbicide is approved on BLM-managed ground on western U.S. rangelands, but may NOT be aerially applied.
* Certain formulations of this chemical may not be aerially applied on BLM managed ground on western U.S. rangelands.
+* Resistance has occurred in Group 1 and 2 herbicides in the Pacific Northwest.
Check with your local BLM office on specific formulations and local restrictions.
For more detailed information, contact your local Extension agent, weed management specialist, or county weed master.