

<b>NAME OF SPECIES:</b> <i>Taeniatherum caput-medusae</i> (L.) Nevski	
<b>Synonyms:</b> <i>Taeniatherum asperum</i> auct. non (Simonkai) Nevski; <i>Taeniatherum crinitum</i> (Schreb.) Nevski var. <i>caput-medusae</i> (L.) Wipff; <i>Elymus caput-medusae</i> L. (11)	
<b>Common Name:</b> Medusahead, Medusahead rye	<b>Cultivars?</b> YES <input type="checkbox"/> NO <input type="checkbox"/>
<b>A. CURRENT STATUS AND DISTRIBUTION</b>	
I. In Wisconsin?	1. YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
	2. <u>Abundance:</u>
	3. <u>Geographic Range:</u> Not reported in WI
	4. <u>Habitat Invaded:</u> Disturbed Areas <input type="checkbox"/> Undisturbed Areas <input type="checkbox"/>
	5. <u>Historical Status and Rate of Spread in Wisconsin:</u> Not known
	6. <u>Proportion of potential range occupied:</u>
II. Invasive in Similar Climate Zones	1. YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> <u>Where (include trends):</u> Reported as invasive in California, Oregon, and Washington and in British Columbia (1). This species is known in a number of other western states NV, UT and ID, and also a few in the east NY and PA. In the west it is in California, Oregon, Washington, Utah, Nevada and Idaho (4).
III. Invasive in Which Habitat Types	1. Upland <input type="checkbox"/> Wetland <input type="checkbox"/> Dune <input type="checkbox"/> Prairie <input checked="" type="checkbox"/> Aquatic <input type="checkbox"/> Forest <input checked="" type="checkbox"/> Grassland <input checked="" type="checkbox"/> Bog <input type="checkbox"/> Fen <input type="checkbox"/> Swamp <input type="checkbox"/> Marsh <input type="checkbox"/> Lake <input type="checkbox"/> Stream <input type="checkbox"/> Other: "Medusahead maintain its dominance on sites where native vegetation has been eliminated or severely reduced by overgrazing, cultivation, or frequent fires [102]....It has invaded fields, dry roadsides, and disturbed sagebrush slopes in British Columbia, Washington, Idaho, Oregon, and California [26, 58, 60]"(5)
IV. Habitat Affected	1. <u>Soil types favored or tolerated:</u> Soils with high clay content, well-developed profiles, and those receiving run-off from infested areas are most susceptible to invasion (2).
	2. <u>Conservation significance of threatened habitats:</u> A new study makes it clear that cheatgrass and native grasses may all eventually be replaced by medusahead, which eliminates more than 80 percent of the grazing value of land (3). 62.1 million acres are at risk of invasion if disturbance occurs. Medusahead invasion has shifted the balance from a shrub/perennial grass ecosystem to an annual grass-dominated ecosystem (5).
V. Native Range and Habitat	1. <u>List countries and native habitat types:</u> <i>T. caput-medusae</i> is native to the Mediterranean region of Eurasia (2, 5). Specifically, it is native to Spain, Portugal, southern France, Morocco and Algeria (4).
VI. Legal Classification	1. <u>Listed by government entities?</u> Listed as invasive in 3 states (1). CA-C list (noxious weed); CO-A List (noxious weed); NV-noxious weed; OR-B list (noxious weed); UT-noxious weed (5, 11)
	2. <u>Illegal to sell?</u> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> Notes:
<b>B. ESTABLISHMENT POTENTIAL AND LIFE HISTORY TRAITS</b>	
I. Life History	1. <u>Type of plant:</u> Annual <input checked="" type="checkbox"/> Biennial <input type="checkbox"/> Monocarpic Perennial <input type="checkbox"/> Herbaceous Perennial <input type="checkbox"/> Vine <input type="checkbox"/> Shrub <input type="checkbox"/> Tree <input type="checkbox"/> <b>Grass</b>

	<p>2. <u>Time to Maturity</u>: <i>T. caput-medusae</i> has root development and anatomy suitable for later reproductive phenology and matures later than other annual species. One study found that medusahead reaches maturity two to three weeks later than cheat grass (4).</p> <p>3. <u>Length of Seed Viability</u>: <i>T. caput-medusae</i> is an extremely capable seeder because of its large annual production of viable seed, and because its seed maintains viability in litter and soil for at least 1 year (5). Other sources state that the seed longevity for medusahead is at least 2 years (8).</p> <p>4. Methods of Reproduction: Asexual <input type="checkbox"/> Sexual <input checked="" type="checkbox"/>  <u>Notes</u>:</p> <p>5. <u>Hybridization potential</u>:</p>
II. Climate	<p>1. <u>Climate restrictions</u>: Medusahead grows where extended periods of great cold are lacking (2). Germination may be delayed with cold temperatures and dryness (4). Medusahead grows in areas that have relatively mild to cold temperatures in winter but are hot in summer. It is generally found in areas that receive fall, winter, and spring moisture followed by dry summers. It occurs in areas with annual precipitation of 10 to 40 inches, with an upper limit of precipitation approximately 50 inches (5).</p> <p>2. <u>Effects of potential climate change</u>: Germination rates increased with increases in temperature and water potential (2).</p>
III. Dispersal Potential	<p>1. <u>Pathways</u> - Please check all that apply:</p> <p><u>Unintentional</u>: Bird <input type="checkbox"/> Animal <input checked="" type="checkbox"/> Vehicles/Human <input checked="" type="checkbox"/>  Wind <input checked="" type="checkbox"/> Water <input checked="" type="checkbox"/> Other:</p> <p><u>Intentional</u>: Ornamental <input type="checkbox"/> Forage/Erosion control <input type="checkbox"/>  Medicine/Food: Other:</p> <p>2. <u>Distinguishing characteristics that aid in its survival and/or inhibit its control</u>: A study found that medusahead has a faster growth rate, a longer period of growth and produced more total biomass even than cheatgrass, another invading species (3). <i>T. caput-medusae</i> reproduces by seeds with up to 6,000 seeds produced per square foot, and has a high germination rate (4, 5). <i>T. caput-medusae</i> can outcompete other species by extracting the majority of moisture well before perennial grasses have begun to grow (7). A recent study found evidence that seeds from invasive plants in the United States may have evolved a greater ability to uptake Manganese from soil than seeds from plants in France, where it is native (10).</p>
IV. Ability to go Undetected	1. HIGH <input type="checkbox"/> MEDIUM <input type="checkbox"/> LOW <input checked="" type="checkbox"/>
<b>C. DAMAGE POTENTIAL</b>	
I. Competitive Ability	1. <u>Presence of Natural Enemies</u> :

	<p>2. <u>Competition with native species</u>: A study found that medusahead effectively removed available soil water at depths where <i>A. spicatum</i> roots were growing. These characteristics confer an advantage in fall establishment and allow medusahead to compete successfully for soil moisture with <i>B. tectorum</i> and, especially, with <i>A. spicatum</i>, which is late germinating and slow growing (2). Dry, dead vegetation decomposes slowly and forms a persistent dense litter on the soil surface that can suppress desirable vegetation. (5)</p>
	<p>2. Rate of Spread:          -changes in relative dominance over time:          -change in acreage over time:          HIGH(1-3 yrs) <input checked="" type="checkbox"/> MEDIUM (4-6 yrs) <input type="checkbox"/> LOW (7-10 yrs) <input type="checkbox"/>          Notes: Medusahead is now spreading at about 12 percent a year over 17 western states (3).</p>
<p>II. Environmental Effects</p>	<p>1. <u>Alteration of ecosystem/community composition?</u>          YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>          Notes: <i>T. caput-medusae</i> has been documented to outcompete native species and is known to form dense stands or even monocultures. Studies report that this species can reach densities of 1,000 to 2,000 plants per square meter (4, 5).</p> <p>2. <u>Alteration of ecosystem/community structure?</u>          YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>          Notes: Medusahead is an annual grass and therefore, only occupies one vegetative layer. This species, however, has changed the proportion of shrub/perennial grass ecosystem to more annual grass-dominated ecosystems in the west (FEIS), in effect, changing the community structure across the landscape (4).</p> <p>3. <u>Alteration of ecosystem/community functions and processes?</u>          YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>          Notes: <i>T. caput-medusae</i> changes many ecological processes and system wide parameters where it occurs. This species has invaded vernal pools and swales occurring in pastures. It is documented to absorb soil moisture earlier than other native species, and change both the hydrologic and competition [between native species] regimes. This species also changes fire regimes in the western part of its range, by substantially increasing its frequency. Also, <i>T. caput-medusae</i> ties up soil nutrients (4).</p> <p>4. <u>Allelopathic properties?</u> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>          Notes: A study conducted at UC-Davis found evidence supporting the hypothesis that medusahead does have allelopathic properties. These effects were most clearly demonstrated on wild oats (6).</p>
<p><b>D. SOCIO-ECONOMIC EFFECTS</b></p>	
<p>I. Positive aspects of the species to the economy/society:</p>	<p>Notes:</p>
<p>II. Potential Socio-Economic Effects of Requiring Controls:</p>	<p>Positive:          Negative:</p>
<p>III. Direct and indirect Socio-Economic Effects of Plant :</p>	<p>Notes: Medusahead is of little to no value for grazing. Medusahead-dominated areas have very little species diversity and as a result very low value for wildlife cover (5).</p>

IV. Increased Costs to Sectors Caused by the Plant::	Notes:
V. Effects on human health:	Notes:
VI. Potential socio-economic effects of restricting use:	Positive: Medusahead reduces the grazing value of lands (3). Negative:
<b>E. CONTROL AND PREVENTION</b>	
I. Costs of Prevention (please be as specific as possible):	Notes:
II. Responsiveness to prevention efforts:	Notes: Maintaining good stands of perennial vegetation helps to prevent medusahead invasion (2). Researchers have found evidence that wheatgrass may serve as a barrier to medusahead invasion. In an Oregon test area, the U.S. Department of Agriculture has planted bands of desert wheatgrass at the edge of a medusahead infestation, and so far the barriers have practically stopped the noxious weed in its tracks (9).
III. Effective Control tactics:	Mechanical <input checked="" type="checkbox"/> Biological <input type="checkbox"/> Chemical <input checked="" type="checkbox"/> Times and uses: Atrazine can help to control medusahead, but this herbicide also eradicates some native grasses. Controlled burning in early June eliminated this weed for several years. Heavy spring grazing by sheep during the green stage of medusahead has been reported to assist in its control (2). Two types of smut disease that eliminate seed production are being researched for potential biological control (7). Spring plowing after medusahead has germinated has given some control with optimal results reaching 95% reduction (5).
IV. Costs of Control:	Notes: This species takes at least one year to control (4).
V. Cost of prevention or control vs. Cost of allowing invasion to occur:	Notes:
VI. Non-Target Effects of Control:	Notes: Some methods of chemical control may also affect native grasses (2).
VII. Efficacy of monitoring:	Notes: Nested plot frequency or percent cover could be used to monitor changes in medusa head as well as changes in the community in which it occurs. Population studies for detailed analysis of the effects of management activities can be done by mapping individuals (4). The site must be monitored for at least four years after the last flowering adult plants have been eliminated and treatments repeated when necessary (8).
VIII. Legal and landowner issues:	Notes:
<b>F. HYBRIDS AND CULTIVARS</b>	
I. Known hybrids?  YES <input type="checkbox"/> NO <input type="checkbox"/>	Name of hybrid:  Names of hybrid cultivars:
II. Species cultivars	Names of cultivars:

	<p>Notes: Subordinate taxa:</p> <p><i>T. caput-medusae</i> subsp. <i>asperum</i>, syn: <i>Cuviera caput-medusae</i> var. <i>aspera</i> Simonk.; <i>Taeniatherum asperum</i> (Simonk.) Nevski</p> <p><i>T. caput-medusae</i> subsp. <i>caput-medusae</i>, syn: <i>Elymus caput-medusae</i> L.;</p> <p><i>T. caput-medusae</i> subsp. <i>crinitum</i>, syn: <i>Elymus crinitus</i> Schreb.; <i>Hordeum crinitum</i> (Schreb.) Desf.; <i>Taeniatherum crinitum</i> (Schreb.) Nevski (12)</p>
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**G. REFERENCES USED:**

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- WI DNR
- TNC
- Native Plant Conservation Alliance
- IPANE
- USDA Plants

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