

**Oregon Department of Agriculture
Pest Risk Assessment for
Welted thistle, *Carduus crispus* L.
February 2017**

Species: Welted thistle, Curly plumeless thistle, (*Carduus crispus*) L.
Family: Asteraceae

Findings of this review and assessment:

Welted thistle (*Carduus crispus*) was evaluated and determined to be a category “A” rated noxious weed, as defined by the Oregon Department of Agriculture (ODA) Noxious Weed Policy and Classification System. This determination was based on a literature review and analysis using two ODA evaluation forms. Using the Noxious Qualitative Weed Risk Assessment v. 3.8, welted thistle scored 61 indicating a Risk Category of A; and a score of 16 with the Noxious Weed Rating System v. 3.1, indicating an “A” rating.

Introduction: Welted thistle, native to Europe and Asia, has become a weed of waste ground, pastures, and roadsides, in some areas of the United States. The first record of welted thistle occurred in the Eastern U.S. in 1974. For decades, only one site (British Columbia) had been documented west of the Rockies. In 2016, a new western infestation was detected in Wallowa County, Oregon. Welted thistle was found invading irrigated field margins, ditch banks and tended alfalfa crops. Several satellite infestations were found within a mile radius of the core infestation (see Appendix, Map 1). It is not clear how the plant was introduced into Oregon, but contaminated crop seed is suspected. *Carduus crispus* closely resembles the more common *C. acanthoides* (plumeless thistle) that is also present in very low numbers in Wallowa County. Wallowa County listed welted thistle as an A-rated weed and quickly expanded survey boundaries and began implementing early eradication measures.



Welted thistle in Wallowa County, Oregon

Biology and reproduction: Welted thistle grows as an annual or biennial, 30–150 cm tall depending on growing conditions. Stems are openly branching, hairy with curled hairs to nearly smooth. Stems have spiny wings to 1.5 cm wide, and sport wing spines 3 mm long. The leaves have winged petioles at their base. Leaf blades are 10–20 cm long with spiny-toothed margins. Flower heads are borne singly or in groups of 2–5, 15–18 mm wide. Flower peduncles are spiny-winged to near apex or throughout, to 4 cm wide. Flower corollas can be either purple or ±

white. Flower parts are both male and female. Flowering occurs July through September. Insect pollination is required. Reproduction is entirely by seed.

Carduus crispus closely resembles the much more common *C. acanthoides*. Some published records of *C. crispus* are probably *C. acanthoides*. Although the degree of spininess and tough versus brittle stems were used as key characters to differentiate the two taxa, both characters are subjective (<http://www.efloras.org>). Welled thistle spines become much less pronounced as they approach the base of the flower, sometimes to the point of having a smooth stem near the bud. The spiny, winged stems of plumeless thistle persist all the way up the stem to the flower (Appendix, Photos 1 and 2). The top and bottom of welled thistle leaves contrast each other (due to a fine pubescence made up of two types of hairs under the leaf) more distinctly than the different surfaces of plumeless thistle, which are only haired along green veins underneath and become glabrous on top. Other differentiating tendencies are: a purple (occasionally white) flowering welled thistle compared to the pinkish flower of plumeless thistle, webbed bracts on welled thistle with very little webbing on plumeless thistle, a rounder seed head with shorter and less pointed involucre on welled thistle versus longer pointed involucre and a more cylindrical seed head on plumeless thistle (personal observation and <https://gobotany.newenglandwild.org/dkey/carduus/#c2>).

	<i>Welled thistle</i>	<i>Plumeless thistle</i>
<i>Spines along stems up to flower</i>	less pronounced as near base of flower, sometimes smooth	Spiny, winged all way up stem to base of flower
<i>Leaf surfaces</i>	Smooth top, quite hairy underneath	Smooth top, only hairy along veins underneath
<i>Flower color</i>	Purple (less often white)	pink
<i>Bracts</i>	webbed	Very little webbing
<i>Seed heads</i>	Rounded	More cylindrical
<i>Involucre</i>	Shorter, less pointed	Longer, pointed

Environmental factors affecting reproductive success and dispersal: Precipitation levels and elevation may be the biggest factors determining success of establishment. Welled thistle is adapted to a wide range of environmental conditions in its native range, so it has the potential to disperse well beyond its current distribution in North America. Much of the Cascades, Central and Eastern Oregon are prime environments for invasion should welled thistle be left unchecked at its current location.

Biological factors affecting reproductive success and dispersal: As an escaped species from Eurasia, welled thistle in North America is not exposed to the array of insect and fungal species that limit its population and reproduction in its native environment. Without its natural enemies welled thistle may be free to express its full biological potential in Oregon. That said, there are biocontrol agents in the area that attack other thistles. It is not yet clear if welled thistle is attacked by the introduced seed-feeding weevil, *Rhinocyllus conicus*. Insect larvae have been found mining the seed heads, but which species is unclear at this point. *Larinus planus*, an accidentally introduced seed head weevil (not approved as a biological control agent) that attacks many native and non-native *carduus* species has been documented to attack welled

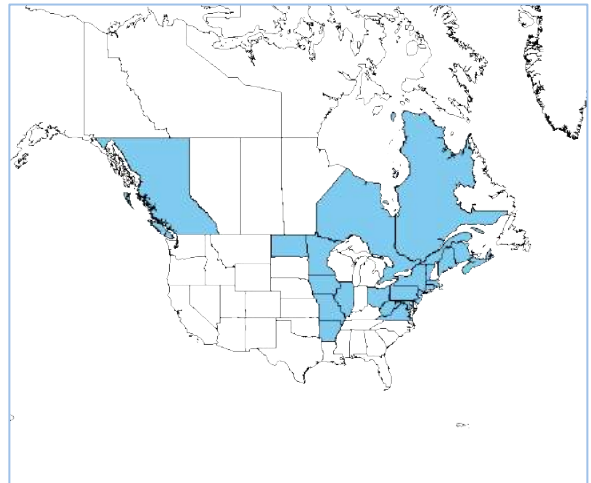
thistle in Wallowa County (Appendix Photo 3). *Larinus planus* is not a particularly effective bio-agent because it does not build up high enough numbers to have a substantial impact on non-native thistles (Eric Coombs, personal communication).

Because plumeless thistle is known to hybridize with musk thistle in the United State and welted thistle is known to hybridize with musk thistle (*Carduus nutans*) in Europe, the concern about welted thistle hybridizing with musk and/or plumeless thistles exists. Hybrid offspring may express different characteristics and be able to utilize habitats differently than the parental generation. Examples include meadow knapweed and *Onopordum × spinosissimum* which has caused problems for weed managers in Australia (Dan Sharrat, Personal communication).

Human factors affecting dispersal: The transport of agricultural commodities (e.g. seed, hay, livestock) can be expected to be the dominant means of seed dispersal for welted thistle. Some right-of-way maintenance practices can also contribute to localize seed dispersal when there are thistle populations on road shoulders or agricultural waterways.

Native range of welted thistle: Welted thistle is found from Southwestern Europe, through Scandinavia and Siberia, to Eastern Asia. It is also found in the disputed region of Kashmir (wikipedia.org). Utilizing plant hardiness maps as an indication of the potential of welted thistle to invade different areas of Oregon, a large portion of the state is at risk. In its native range, welted thistle apparently inhabits Plant Hardiness Zones 4-9 (Map 2). Many of our noxious weeds in Oregon have a Mediterranean origin, whereas welted thistle apparently meets the southern end of its range at that latitude, but then extends much further north, as well as into colder climates. In Oregon, that translates to the entire state being at risk with the exception potentially of our hottest and driest areas.

Introduced range: *Carduus crispus* has been reported also from Arkansas, Connecticut, Iowa, Illinois, Maine, Maryland, Massachusetts, Missouri, New York, North Dakota, Ohio, Rhode Island, Vermont, Virginia, West Virginia, and several Canadian provinces (Map at right, Plants database). *Welted thistle is now located in Wallowa County, Oregon.*



Potential economic impacts: Welted thistle could be a contaminant in grass and alfalfa hay, reducing its quality and marketability. Welted thistle seeds may also be a contaminant in alfalfa, grain, or grass seed. Infested grasslands and pastures may see a reduction in productivity when thistle densities reach high levels. This spiny thistle would act as a deterrent to most grazing. Welted thistle has been listed as a noxious weed in West Virginia, Iowa, and Arkansas. In West Virginia welted thistle is listed as a class 3 weed and in Iowa and Arkansas all species in the Carduus genus are listed as noxious weeds.

Environmental impacts: In its native range, *Carduus* species are a favorite food plant of caterpillars of the Painted Lady butterfly (*Vanessa cardui*), which derives its species name, *cardui*, from their preference for *Carduus* thistles (wikipedia.org). In its native range, walted thistle is used by bees as a late summer pollen and nectar supply and would likely serve this function in Oregon as well. However, this potential benefit is negated when you consider that walted thistle has the potential to reach densities that would outcompete valued crops and native plants across a large geographical range. Further, plumeless and musk thistles are closely related species with similar ecology and both have shown themselves to be aggressive and weedy in the western states.

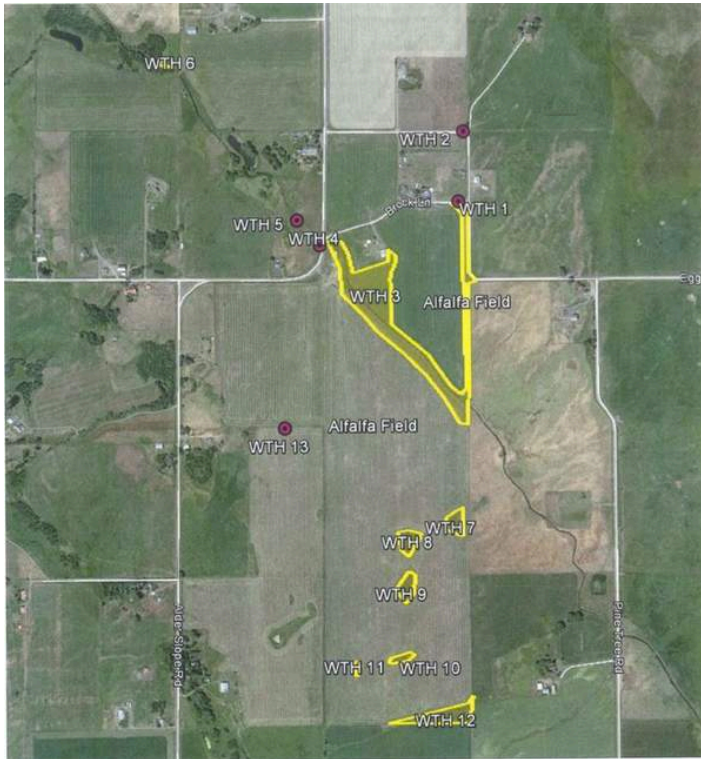
Potential impact on human health: None indicated

Probability of detection in landscape: Walted thistle can be difficult to detect as it blends into the wide array of native and non-native thistles already present in Northeastern Oregon. In the more remote rangelands of Eastern Oregon, walted thistle could go undetected for many years. However, for weed specialists, walted thistle can easily be detected as one of two invasive thistles, walted or plumeless thistle, particularly when bolted and in full flower. Partners would need to be trained to distinguish between the two thistles.

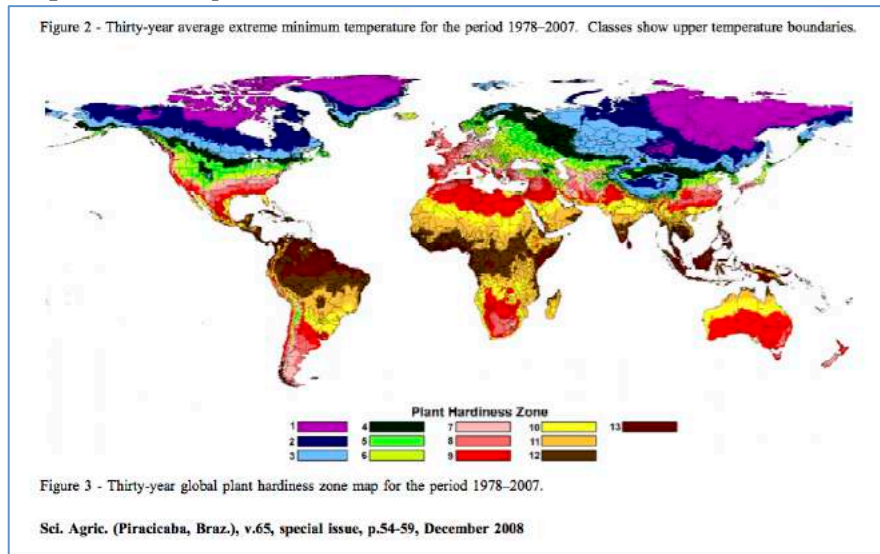
Efficacy of control measures: It is expected that control measures for walted thistle will have a similarly high efficacy to those of other weedy thistles in the *carduus* genus. They are very susceptible to a wide variety of growth regulator herbicides, glyphosate, and the branch-chained amino acid inhibitors (e.g. sulfonyl ureas and imazapic) providing managers with a wide variety of herbicide options for different situations. However, timely and effective control before seed set has been the most challenging factor even with effective herbicides. Cultural practices like tillage and mowing can be effective if they are timed properly and repeated often enough to reduce or stop seed production. Similarly, grazing with goats and or sheep can accomplish control when well timed and repeated. In general, thistles compete poorly with healthy perennial grasses and other vegetation. Establishment of select, aggressive grasses is an important part of an effective control of weedy thistles no matter what methods are being used.

Appendices:

Map 1: Know distribution of welvet thistle on Alder Slope approximately two miles NE of Enterprise OR. Map created by Ryan Oberhelman, Wallowa County Vegetation Department, December, 2016.



Map 2: Global plant hardiness zones.



Photos 1 and 2: Wilted (on left) and plumeless thistle upper stems and buds for comparison.



Photo 3: Photo below shows two buds that have been attacked by the accidental biocontrol agent *Larinus planus* (Eric Coombs, personal communication) as evidenced by dark deformed bud scales.



References:

1. *Carduus crispus* in Flora of North America Vol 19, 20, 21. Pp. 19-21
found at: <http://www.efloras.org>
2. <https://plants.usda.gov/core/profile?symbol=CACR2>
3. Weltded thistle; *Carduus crispus* found at wikipedia.org
4. Plumeless, musk, Italian, and slenderflower thistle, DiTomaso, J.M., G.B. Kyser et al. 2013. *Weed Control in Natural Areas in the Western United States*. Weed Research and Information Center, University of California. 544 pp.
5. Explanatory notes on the origin of the hybrid of *Carduus crispus* L. and *Carduus nutans* L. on the West Frisian island of Schiermonnikoog, the Netherlands, *Vijko P.A. Lukkien & Pipasi Jeurissen (Universiteit Utrecht, Faculteit Biologie, Postbus 80084, 3508 TB Utrecht; e-mail: v.p.a.lukkien@bio.uu.nl), Gorteria 31 (2005)*
6. The Study of Biological Active Substances of Thistle Curled (*Carduus crispus* L.) , Omirbaeva A.E., Datkhaev U.M., Asfendiarovs' National Medicinal University, Almaty, Republic of Kazakhstan, Grudko V.A., Bezv N.Yu., Gladukh Eu. V., Iudina Iu. V. , *International Journal of Pharmacognosy and Phytochemical Research*, 2016; 8(2); 297-299
7. Personal communications regarding these topics with Dan Sharrat (NE Oregon Integrated Weed Management Specialist) and Eric Coombs (Noxious Weed Entomologist) retired ODA weed control staff, February 2017.
8. Global Plant Hardiness Zones for Phytosanitary Risk Analysis, Roger D. Magarey, Daniel M. Borchert, and Jay W. Schlegel *Sci. Agric. (Piracicaba, Braz.)*, v.65, special issue, p.54-59, December 2008

Noxious Weed Qualitative Risk Assessment 3.8
Oregon Department of Agriculture

Common Name: Wелted thistle
Scientific Name: *Carduus crispus*
Family: Asteraceae

For use with plant species that occur or may occur in Oregon to determine their potential to become serious noxious weeds. For each of the following categories, select the number that best applies. Numerical values are weighted to increase priority categories over less important ones. Choose the best number that applies, intermediate scores can be used.

Total Score: 61 **Risk Category:** A

GEOGRAPHICAL INFORMATION

- 1) 5 Invasive in Other Areas**
0 Low- not known to be invasive elsewhere.
2 Known to be invasive in climates dissimilar to Oregon's current climates.
6 Known to be invasive in geographically similar areas.
Comments: Infestations in the eastern half of North America are found in temperate climates of the Midwest and the Northeast. (Species is restricted to temperate zone regions, it is not known from warmer Mediterranean climates) Closest relatives (*Carduus pycnocephalus* and *nutans*) are known to be invasive in this climate. Wелted thistle is at least mildly invasive in its known range in the eastern US.
- 2) 6 Habitat Availability:** Are there susceptible habitats for this species and how common or widespread are they in Oregon?
1 *Low* – Habitat is very limited, usually restricted to a small watershed or part of a watershed (e.g., tree fern in southern Curry County).
3 *Medium* – Habitat encompasses 1/4 or less of Oregon (e.g., oak woodlands, coastal dunes, eastern Oregon wetlands, Columbia Gorge).
6 *High* – Habitat covers large regions or multiple counties, or is limited to a few locations of high economic or ecological value (e.g., threatened and endangered species habitat).
Comments: Disturbed grasslands and pastures and waste areas are common throughout Oregon. Millions of acres are susceptible to invasion in the Central and Northeastern parts of the state.
- 3) 3 Proximity to Oregon:** What is the current distribution of species?
0 *Present* – Occurs within Oregon.

- 1 *Distant* – Occurs only in distant US regions or foreign countries.
- 3 *Regional* – Occurs in Western regions of US but not adjacent to Oregon border.
- 6 *Adjacent* – Weedy populations occur adjacent (<50 miles) to Oregon border.

Comments: Only one other known site west of the Rockies is in BC.

4) 10 **Current Distribution:** What is the current distribution of escaped populations in Oregon?

- 0 *Not present* – Not known to occur in Oregon.
- 1 *Widespread* – Throughout much of Oregon (e.g., cheatgrass).
- 5 *Regional* – Abundant (i.e., occurs in eastern, western, central, coastal, areas of Oregon) (e.g., gorse, tansy ragwort).
- 10 *Limited* – Limited to one or a few infestations in state (e.g., kudzu).

Comments: Only one small population has been detected in Oregon.

BIOLOGICAL INFORMATION

5) 3 **Environmental Factors:** Do abiotic (non-living) factors in the environment effect establishment and spread of the species? (e.g., precipitation, drought, temperature, nutrient availability, soil type, slope, aspect, soil moisture, standing or moving water).

- 1 *Low* – Severely confined by abiotic factors.
- 2 *Medium* – Moderately confined by environmental factors
- 4 *High* – Highly adapted to a variety of environmental conditions (e.g., tansy ragwort, Scotch broom).

Comments: This is largely unknown for this plant but likely similar to its closest relatives which have a moderate range of habitats they invade. (Probably limited by growing season moisture, high summer temperatures or altitude).

6) 4 **Reproductive Traits:** How does this species reproduce? Traits that may allow rapid population increase both on and off site.

- 0 *Negligible* – Not self-fertile, or is dioecious and opposite sex not present.
- 1 *Low* – Reproduction is only by seed, produces few seeds, or seed viability and longevity are low.
- 3 *Medium* – Reproduction is vegetative (e.g., by root fragments, rhizomes, bulbs, stolons).
- 3 *Medium* – Produces many seeds, and/or seeds of short longevity (< 5 years).
- 5 *High* – Produces many seeds and/or seeds of moderate longevity (5-10 years) (e.g., tansy ragwort).
- 6 *Very high* – Has two or more reproductive traits (e.g., seeds are long-lived >10 years and spreads by rhizomes).

Comments: No data on seed viability exists for this species but literature suggests that though thistle seeds of this genus rarely last in the soil for more than several years, musk thistle seeds can last up to 10 years.

- 7) 3 **Biological Factors:** Do biotic (living) factors restrict or aid establishment and spread of the species? (What is the interaction of plant competition, natural enemies, native herbivores, pollinators, and pathogens with species?)
- 0 *Negligible* – Host plant not present for parasitic species.
 - 1 *Low* – Biotic factors highly suppress reproduction or heavily damage plant for an extended period (e.g., biocontrol agent on tansy ragwort).
 - 2 *Medium* – Biotic factors partially restrict or moderately impact growth and reproduction, impacts sporadic or short-lived.
 - 4 *High* – Few biotic interactions restrict growth and reproduction. Species expresses full growth and reproductive potential.

Comments: Plant competition limits the ability of *Carduus* thistles to invade and dominate areas, potential biocontrols are present in the area but impact may be limited.

- 8) 3 **Reproductive Potential and Spread After Establishment**
Non-human Factors: How well can the species spread by natural means?
- 0 *Negligible* – No potential for natural spread in Oregon (e.g., ornamental plants outside of climate zone).
 - 1 *Low* – Low potential for local spread within a year, has moderate reproductive potential or some mobility of propagules (e.g., propagules transported locally by animals, water movement in lakes or ponds, not wind blown).
 - 3 *Medium* - Moderate potential for natural spread with either high reproductive potential or highly mobile propagules (e.g., propagules spread by moving water, or dispersed over longer distances by animals) (e.g., perennial pepperweed).
 - 5 *High* – Potential for rapid natural spread throughout the susceptible range, high reproductive capacity and highly mobile propagules. Seeds are wind dispersed over large areas (e.g., rush skeletonweed).

Comments: Moderate potential for spread by water, wind or animals.

- 9) 4 **Potential of Species to be Spread by Humans.** 3What human activities contribute to spread of species? Examples include: interstate or international commerce; contaminated commodities; packing materials or products; vehicles, boats, or equipment movement; logging or farming; road maintenance; intentional introductions of ornamental and horticultural species, or biofuel production.
- 1 *Low* – Potential for introduction or movement minimal (e.g., species not traded or sold, or species not found in agricultural commodities, gravel or other commercial products).

3 *Medium* – Potential for introduction or off-site movement moderate (e.g., not widely propagated, not highly popular, with limited market potential; may be a localized contaminant of gravel, landscape products, or other commercial products) (e.g., lesser celandine, Canada thistle).

5 *High* – Potential to be introduced or moved within state high (e.g., species widely propagated and sold; propagules common contaminant of agricultural commodities or commercial products; high potential for movement by contaminated vehicles and equipment, or by recreational activities) (e.g., butterfly bush, spotted knapweed, Eurasian watermilfoil).

Comments: Possible contaminant of seed, crop and agriculture equipment and with continued spread by vehicles and animals would become more common.

IMPACT INFORMATION

10) 6 **Economic Impact:** What impact does/can the species have on Oregon's agriculture and economy?

0 *Negligible* – Causes few, if any, economic impacts.

1 Low - Potential to, or causes low economic impact to agriculture; may impact urban areas (e.g., puncture vine, pokeweed).

5 *Medium* – Potential to, or causes moderate impacts to urban areas, right-of-way maintenance, property values, recreational activities, reduces rangeland productivity (e.g., English ivy, Himalayan blackberry, cheatgrass).

10 *High* – Potential to, or causes high impacts in agricultural, livestock, fisheries, or timber production by reducing yield, commodity value, or increasing production costs (e.g., gorse, rush skeleton weed, leafy spurge).

Comments: Referencing similar *Carduus* species this species would be expected to cause moderate economic impact primarily to range, pasture and crops.

11) 5 **Environmental Impact:** What risks or harm to the environment does this species pose? Plant may cause negative impacts on ecosystem function, structure, and biodiversity of plant or fish and wildlife habitat; may put desired species at risk.

0 *Negligible* – None of the above impacts probable.

1 Low – Can or does cause few or minor environmental impacts, or impacts occur in degraded or highly disturbed habitats.

4 *Medium* – Species can or does cause moderate impacts in less critical habitats (e.g., urban areas, sagebrush/ juniper stands).

6 *High* – Species can or does cause significant impacts in several of the above categories. Plant causes severe impacts to limited or priority

habitats (e.g., aquatic, riparian zones, salt marsh; or T&E species sites).

Comments: This species would be expected to invade native rangelands following disturbance factors such as grazing, timber harvest and natural events. It can be expected to exhibit competition for resources with native plants but likewise it may provide a pollen and nectar source for pollinators later in the growing season.

12) 0

Impact on Health: What is the impact of this species on human, animal, and livestock health? (e.g., poisonous if ingested, contact dermatitis, acute and chronic toxicity to livestock, toxic sap, injurious spines or prickles, causes allergy symptoms).

0 *Negligible* – Has no impact on human or animal health.

2 *Low* – May cause minor health problems of short duration, minor allergy symptoms (e.g., leafy spurge).

4 *Medium* – May cause severe allergy problems, death or severe health problems through chronic toxicity, spines or toxic sap may cause significant injury. (e.g., giant hogweed, tansy ragwort).

6 *High* – Causes death from ingestion of small amounts, acute toxicity (e.g. poison hemlock).

Comments: Discomfort and inconvenience would be direct impacts

CONTROL INFORMATION

13) 7

Probability of Detection at Point of Introduction: How likely is detection of species after introduction and naturalization in Oregon?

1 *Low* – Grows where probability of early detection is high, showy and easily recognized by public; access to habitat not restricted (e.g., giant hogweed).

5 *Medium* – Easily identified by weed professionals, ranchers, botanists; some survey and detection infrastructure in place. General public may not recognize or report species (e.g., leafy spurge).

10 *High* – Probability of initial detection by weed professionals low. Plant shape and form obscure, not showy for much of growing season, introduction probable at remote locations with limited access (e.g., weedy grasses, hawkweeds, skeletonweed).

Comments: Not very showy and looks like many other thistles to the public.

14) 2

Control Efficacy: What level of control of this species can be expected with proper timing, herbicides, equipment, and biological control agents?

- 1 *Negligible* – Easily controlled by common non-chemical control measures (e.g., mowing, tillage, pulling, and cutting; biocontrol is very effective at reducing seed production and plant density) (e.g., tansy ragwort).
- 2 *Low* – Somewhat difficult to control, generally requires herbicide treatment (e.g., mechanical control measures effective at preventing flowering and but not reducing plant density; herbicide applications provide a high rate of control in a single application; biocontrol provides partial control).
- 4 *Medium* – Treatment options marginally effective or costly. Tillage and mowing increase plant density (e.g., causes tillering, rapid regrowth, spread from root fragments). Chemical control is marginally effective. Crop damage occurs or significant non-target impacts result from maximum control rates. Biocontrol agents ineffective.
- 6 *High* – No effective treatments known or control costs very expensive. Species may occur in large water bodies or river systems where containment and complete control are not achievable. Political or legal issues may prevent effective control.

Comments:

Carduus species can be chemically controlled by a variety of broadleaf herbicides. It is also controlled in the rosette stage by tillage. Diligence and commitment is necessary for eradication of individual sites.

Category Scores:

24 Geographic score (Add scores 1-4) **17** Biological Score (Add lines 5-9)

11 Impact Score (Add lines 10-12) **9** Control Score (Add Lines 13-14)

61 Total Score (Add scores 1-14 and list on front of form)

Risk Category: 55-90 = A 24-54 = B < 24 = unlisted.

This Risk Assessment was modified by ODA from the USDA-APHIS Risk Assessment for the introduction of new plant species. V3.8 2/19/2016

Oregon Department of Agriculture Noxious Weed Rating System

Common Name: Welled thistle

Scientific Name: *Carduus crispus*

Point Total: **16**

Rating: **A**

1) Detrimental Effects: **Bold all that apply, enter number of circles**

- 3**
1. Health: causes poisoning or injury to humans or animals
 2. **Competition: strongly competitive with crops, forage, or native flora**
 3. Host: host of pathogens and/or pests of crops or forage
 4. **Contamination: causes economic loss as a contaminate in seeds and/or feeds**
 5. **Interference: interferes with recreation, transportation, harvest, value, or wildlife and livestock movement**

2) Reproduction & Capacity for Spread: **Bold** the number that best describes, enter that number

- 3**
1. Few seeds, not wind blown, spreads slowly
 2. Many seeds, slow spread
 3. **Many seeds, spreads quickly by vehicles or animals**
 4. Windblown seed, or spreading rhizomes, or water borne
 5. Many wind-blown seeds, high seed longevity, spreading rhizomes, perennials

3) Difficulty to Control: **Bold** the number that best describes, enter that number

- 3**
1. Easily controlled with tillage or by competitive plants
 2. Requires moderate control, tillage, competition or herbicides
 3. **Herbicides generally required, or intensive management practices**
 4. Intensive management generally gives marginal control
 5. No management works well, spreading out of control

4) Distribution: **Bold** the number that best describes, enter that number

- 5**
1. Widely distributed throughout the state in susceptible habitat
 2. Regionally abundant, 5 or more counties, more than 1/2 of a county
 3. Abundant throughout 1- 4 counties, or 1/4 of a county, or several watersheds
 4. Contained in only 1 watershed, or less than 5 square miles gross infestation
 5. **Isolated infestation less than 640 acres, more than 10 acres**

5) Ecological Impact: **Bold** the number that best describes, enter that number

- 2**
1. Occurs in most disturbed habitats with little competition
 2. **Occurs in disturbed habitats with competition**
 3. Invades undisturbed habitats and crowds out native species

Note: Noxious weeds are non-native plants with scores of 11 points or higher. Any plants in 4.1, 4.2, and 4.3 should not be classified as "A" rated weeds.

Ratings: 16 + = A, 15 - 11 = B

ODA Weed Rating System 8/30/2012 v3.2

Assessment completed by Mark Porter, Glenn Miller and Carri Piroso, February 2017.