

**Oregon Department of Agriculture
Pest Risk Assessment for
Turkish thistle, *Carduus cinereus* M.Bieb.
February 2020**

**Species: Turkish thistle, (*Carduus cinereus*) M.Beib.
Family: Asteraceae**

Findings of this review and assessment:

Turkish thistle 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 of similar plants and an analysis using two ODA evaluation forms. Using the Noxious Qualitative Weed Risk Assessment v. 3.8, Turkish thistle scored 62 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: Turkish thistle (at right) is native of the Irano-Turanian Region which extends from Turkey east to the Himalayas (see Map 1). It has only recently been documented in North America (2007) with its known distribution is limited to the Snake River Canyons of NE Oregon and East Central Idaho (Map 2). The plant is closely related to Italian thistle (*Carduus pycnocephalus*) and was misidentified as such until 2014. Careful botanical scrutiny and genetic profiling since have led to its identification as a unique species of the genus *carduus* (Gaskin et al, 2019).



To date all known infestations are located within the back country of Hells Canyon National Recreation Area in some of the most rugged and remote locations of NE Oregon. US Forest Service noxious weed managers have conducted surveys for the plant, released biocontrol agents and are treating outlying sites. Rugged back country terrain, low budgets and a lack of appropriate NEPA and Endangered Species Consultation have prevented herbicide treatment of the large main sites.

It is likely that as the awareness of Turkish thistle as a new and unique species is shared with regional noxious weed managers, that some other populations of Italian thistle will turn out to be Turkish thistle.

It is not clear how the plant was introduced in Oregon. Wallowa County added Turkish thistle to its A-weed list in 2014.

Biology and reproduction: Little is known about this plant because it is such a new find in the United States. Even in its home range species descriptions are cryptic with some botanists treating this plant as a subspecies and more recently, others treating it as a separate species.

Turkish thistle is an annual that can flower at 3" tall (Photo 1 in appendices) but can also grow up to 4 feet tall depending on site conditions. This plasticity may allow the plant to take advantage of multiple environmental conditions; assuring seed production in dry years and then maximizing seed production when conditions are favorable. Seed viability is unknown but Musk thistle seeds can remain viable in the soil for up to 18 years (James et al., 1998). It is presumed not to reproduce vegetatively.

There are six introduced carduus thistles in the United States. A full botanical description is available in Gaskin et al (2019). Turkish thistle is one of three annual thistles in the *Carduus* genus that has non-spheric flower buds. Musk (*C. nutans*), walted (*C. crispus*) and plumeless (*C. acanthoides*) are biennial thistles that all have round shaped flower buds. Turkish (*C. cinereus*), Italian (*C. pycnocephalus*) and slenderflower (*C. tenuiflorus*) are annuals all have more compressed flower bud shapes narrowing towards the flower. Turkish thistle has loose arrangement of flowers with each flower usually have its own stem. Italian and slenderflower thistles have tight groups of flowers that often attach directly to the main stem (Figure 1). Uniquely, Turkish thistle has hair on the edges of the bracts on the flower buds, whereas the bract edges are not hairy in the other species in the US.

Environmental factors affecting reproductive success and dispersal: The newness of this plant to the United States and the lack of documentation of its native habitats make it hard to predict its ecological amplitude. Because the plant is an annual, yearly growing season moisture and temperatures are likely limiting factors.

Due to the back-country and rugged nature of its current known distribution (Photo 2), the primary vectors for spread are currently natural forces of wind, water and transport by animals.

In addition, fire regimes in the canyon have become more frequent and more intense. Seeds are dispersed and competition is removed creating conditions favorable for expansion of weeds.

Biological factors affecting reproductive success and dispersal:

As an escaped species from the East of the Mediterranean, Turkish thistle in North America is not subjected to the full array of insect, fungal, pathogenic species that likely limit its population and reproduction in its native environment. Without its natural enemies Turkish thistle may be freer to express its full biological potential in Oregon. That said, there are two generalist seed head weevils in the area already that attack carduus and native thistles. *Rhinocyllus conicus* is commonly known as the thistle seed head weevil and is broadly established in the west. *Larinus carlinae* is an accidentally introduced seed head weevil that is not thought to be an effective biocontrol agent on any carduus species (Winston et al, 2015). While both seed head weevils have been documented on Turkish thistle (Figure 2), their presence seems to be rare and no seed head damage has been found during multiple visits by entomologists and weed control managers. One unique aspect of the plant is that the seed head often falls off before the seeds are mature. It is uncertain if this plays a role in seed head weevil impact on this plant or not (Joel Price, personal communication).

The musk thistle crown weevil (*Trichosirocalus horridus*) has been documented to have moderate impact on Italian and slenderflower thistles in Oregon. The crown weevil was released intentionally on two different Turkish thistle sites over the last decade but there has been no evidence found that either release established.

Hybridization does occur within the genus. Welled thistle (*Carduus crispus*) is known to hybridize with Musk thistle in Europe. Plumeless thistle is known to hybridize with Musk thistle in the United States. This raises concern that hybrids of Turkish thistle with other carduus thistles are possible in our area. Hybrids may express different characteristics and be able to utilize habitats differently than their parents can.

Human factors affecting dispersal:

Most of the Turkish thistle sites are in the rugged back-country of Hells Canyon. The primary anthropogenic vector would be recreational uses that did not recognize the weed and carried propagules from one place to another.

The time and effort that it takes to treat the back-country sites is a significant challenge to the budgets and time of area weed managers. If enough resources aren't allocated for the effort, the plant will likely spread within the wilderness to a critical mass enough for it begin to colonizing higher used recreation sites or neighboring agricultural lands and move out from there. This can already be seen at the Pittsburg landing developed recreation site on the Idaho side of the Snake River where the plant was found within 100 feet of the main road. The Tulley Creek site is mixed public and private land, has an active grazing of cattle in the area and is in immediate proximity to a cattle driveway. Cattle movement is a likely source of spread to other areas.

Native range of Turkish thistle:

Turkish thistle is native of the Irano-Turanian Region which extends from Turkey east to the Himalayas (see Map 1). The species has a wide range of climatic conditions in its native range that are similar to many of our own climate conditions (Maps 3 and 4) Maps are from the Köppen-Geiger climate classification that divides climates into five main climate groups, with each group being divided based on seasonal precipitation and temperature patterns. While the plants distribution in its native range is not known, it may have the potential to disperse into similar habitats across the west.

Introduced range:

Turkish thistle is only known in Wallowa County, Oregon. To date, three large sites are known: Tulley Creek (~440 gross acres), Deep Creek (~50 gross acres) and Tryon Creek (~12 gross acres), with multiple small (< 5 gross acres) satellite populations (Map 2).

The infested area is a rugged canyon grassland with scattered shrubby and forested areas in a temperate continental climate. Local variation in topography and aspect result in a variety of plant community types over small areas. Largely basaltic soils are mixed with ash and Loess deposits and provide a wide variety of substrates that impact plant community distribution. Turkish thistle often occurs in plant communities dominated by native bunchgrasses, including blue bunch wheatgrass (*Pseudoroegneria spicata*) and Idaho fescue (*Festuca idahoensis*) (Johnson and Simon, 1987). Within these areas, Turkish thistle has been found in sites ranging from dry rocky talus on southern aspects to deeper soils in more mesic sites.

Potential economic impacts:

Turkish thistle appears to spread readily and to be very competitive in native rangelands. It does not appear to be grazed by livestock or wildlife and will likely act as a deterrent to grazing. Infested grasslands may see a reduction in productivity when thistle densities reach higher levels.

If the plant were to escape the wilderness, it could have higher impacts than Italian and slenderflower thistle and more similar impacts to the more common musk thistle and the A-listed plumeless thistle. Prior to the release of *Rhinocyllus conicus*, Italian (and/or slender flower as they are often lumped together) were the target of very active management to control their spread and large impacts (Glenn Miller, personal communication). Even with the agent present, these thistles have a significant impact on pastures, rangeland, vernal pools and oak woodland understory in south western Oregon (Carrie Pirosko, personal communication).

As noted previously, even though *Rhinocyllus conicus* is present in NE Oregon and interacts with the plant, no documentation of actual impact has been found.

Manual or chemical treatments would likely be necessary to control the spread of Turkish thistle, which can be expensive. Pasture and hay crops could become contaminated by Turkish thistle making the crop of lower value.

Carduus thistles are known to be weedy; there are five previously known introduced carduus thistles in the US and all are listed as noxious weeds in some states of the lower 48. As a genus, Carduus was one of five genera (out of the 760 weedy genera compared) that has a disproportionate number of both weed species and noxious species in the continental US and Canada (Schmidt and Drake, 2011). According to Alfonso Suzanna (an international expert on thistles - personal communication) commenting on the status of carduus in general, "species of *Carduus* are usually opportunistic colonizers even in its native range: waste or disturbed places (the more nitrified by cattle, the better), ditches, field margins are usually their habitat. The genus has an unknown origin and what we see now is the result of thousands of years of association to anthropic activity."

Environmental impacts: In their native range the genus is 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). This butterfly has been documented to impact plumeless thistle in Wallowa County, but is not expected to act as a control for the plant. The butterfly may use Turkish thistle as a food plant as well. Turkish thistle may be used by native pollinators early to mid-summer pollen and nectar supply.

Turkish thistle spreads easily on its own in Oregon and competes with native vegetation (Photo 3), potentially outcompeting native plant species which could thereby impact food supplies for grazers and browsers and/or change habitat structure and function.

Potential impact on human health: None indicated

Probability of detection in landscape: Turkish thistle is not an easy plant to locate as it is not large or showy in stature. The growing season is short and the plant can mature at very small stature. Many of the seed heads fall off the plant as the plant begins to senesce. The plant stems are short lived and decay quickly making detection challenging any time the plant is not actively growing. For the public it blends into the wide array of native and non-native thistles already present in NE Oregon and would not be noticed unless it formed a large and/or dense monoculture.

For managers, Turkish thistle can be mistaken for Italian thistle and potentially slenderflower thistle, particularly if it isn't in full flower. In much of the wilder rangelands of Eastern Oregon the plant could go undetected for many years. Partners need to be trained to distinguish between these thistles.

Efficacy of control measures:

It is expected that control measures for Turkish thistle will have a similarly high efficacy to those of other weedy thistles in the *carduus* genus.

The book *Weed Control in Natural Areas in the Western United States* (Ditomaso et al. (2013), describe a variety of effective treatments for four out of the five *carduus* species as a group. The fifth *carduus* species, Welled thistle (*C. crispus*) was not addressed in the book because it was not known to be present in the west at the time of publication. It was discovered in Wallowa County Oregon in 2014 (see ODA Risk assessment for *C. crispus*, 2017) and follows the same pattern of response to treatment as the other *cardui*.

As a group the *carduus* genus is very susceptible to a wide variety of growth regulator herbicides, glyphosate and the branch chain amino acid inhibitors (i.e. sulfonyl ureas and imazapic...) providing managers with a wide variety of herbicide options for different situations. In NE Oregon Welled and Turkish thistle have also shown to be susceptible to picloram and aminopyralid. Timely and effective control of seed production is challenging with any plant in a remote location. Compounding that with the short growing season of Turkish thistle and the fact that it can reproduce when it is very small and it is even harder.

Similarly, cultural practices like tillage and mowing can be effective with other members of the genus if they are timed properly and repeated often enough to reduce or stop seed production. Also, grazing with goats and or sheep can help accomplish control when timed and repeated properly. However, considering the back-country nature of current sites tillage and mowing are not feasible. Grazing with goats and sheep is unlikely to be considered on public lands due to the risk of exposing indigenous and tenuous populations of big horned sheep (*Ovis canadensis*) to diseases that cause pneumonia.

Noxious Weed Qualitative Risk Assessment 3.8
Oregon Department of Agriculture

Common Name: Turkish thistle
Scientific Name: *Carduus cinereus*
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: 62 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: Not known in North America to date. Congeners are weedy and opportunistic and invasive

- 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. Western US climates are similar to this plants home range. Multiple environments are invaded in current known distribution.

- 3) 0 **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 know infestation in the US are in NE Oregon.

- 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 a few populations have been detected in NE 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 wide range of habitats they invade.

- 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 most thistle seeds rarely last in the soil for more than several years, musk thistle seeds can last up to 18 years.

7) 4 **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 seems negligible.

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 or animals. Seed heads appear to fall of plant before maturity of seeds.

9) 4

Potential of Species to be Spread by Humans. What 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:

Unknown for this plant at this time but would likely follow the patterns of other *Carduus* thistles.

IMPACT INFORMATION

10) 7

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 would be suggest Turkish thistle to cause moderate economic impact

primarily to range, pasture and crops. However, lack of biocontrol impact may indicate a higher level of impact.

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, fire and other natural events. It can be expected to exhibit competition for resources with native plants.

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) 8

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, plant skeleton losses seed heads and lays down quickly and looks like many other thistles to the public.

14) 3

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

Comments:

control are not achievable. Political or legal issues may prevent effective control.

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

Category Scores:

21 Geographic score (Add scores 1-4)

18 Biological Score (Add lines 5-9)

12 Impact Score (Add lines 10-12)

11 Control Score (Add Lines 13-14)

62 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: Turkish thistle

Scientific Name: *Carduus cinereus*

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, February 2020

Appendices:

Map 1: The Irano-Turanian Region - shown in orange below - extends from Turkey and the east coast of the Mediterranean Sea east to the Himalayas.



Map 2: Pink dots mark all known locations of Turkish thistle in Wallowa County Oregon. Green shading denotes The Oregon portions of the Hells' Canyon National Recreation Area. The Snake River divides Oregon and Idaho and there are several sites know on the Idaho side as well.

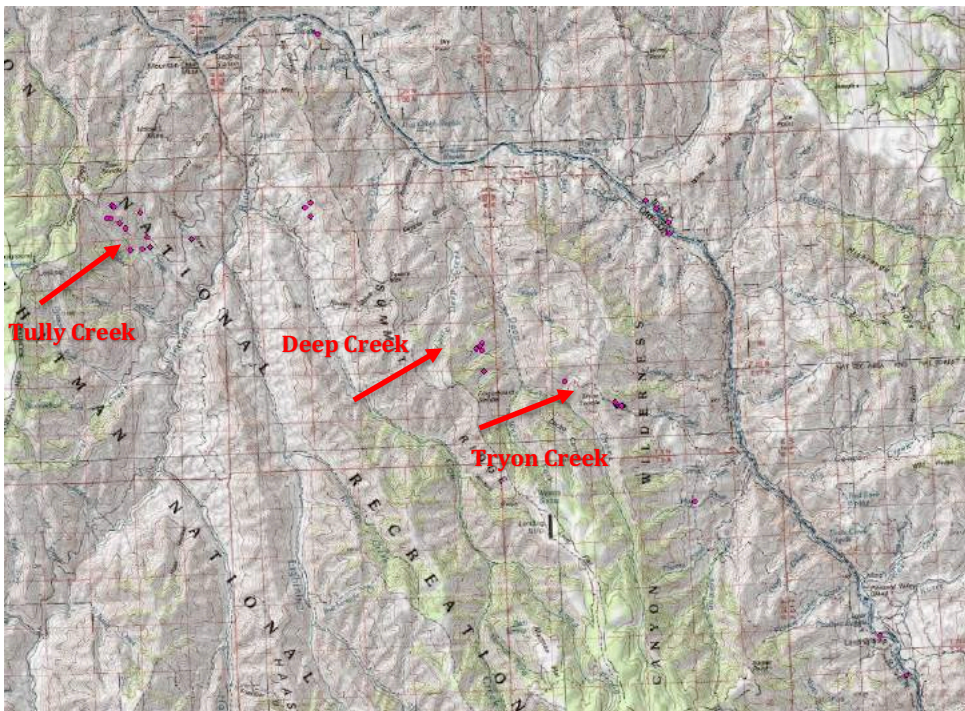


Photo 1: Turkish thistle with a fully developed flower at ~3" tall



Figure 1: Photo on the left illustrates the typical tight or clumped arrangement of Italian thistle flowers versus the typical looser arrangement of flowers in Turkish thistle.



Photo 2: Photo illustrates the rugged nature of the Hells Canyon where the plant is found. This is taken at the Tulley Creek site that is only accessible by foot or horseback. There is a road at the bottom of the Canyon along the Imnaha River and one within several miles of the site from the top of the canyon.



Figure 2: Photo on the left shows a *Rhinocyllus conicus* weevil and egg masses near the flower buds on Turkish thistle at the Tryon Creek site. Photo on the right shows two *Larinus carlinae* on the plant.

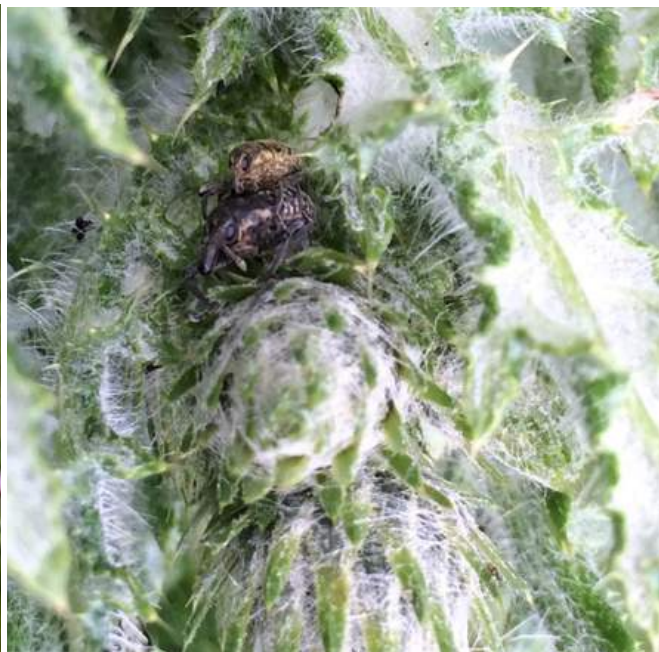
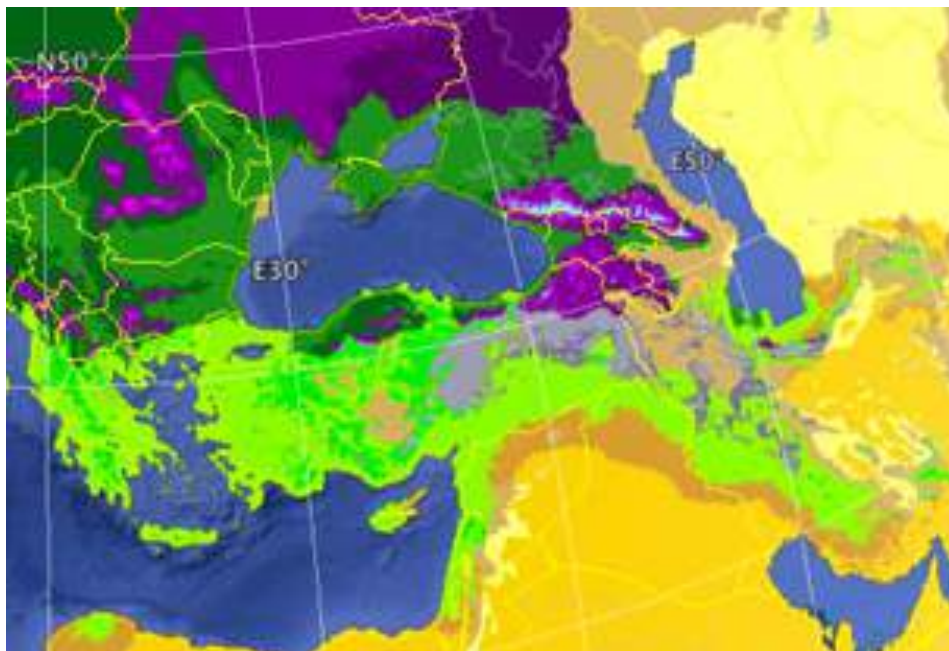
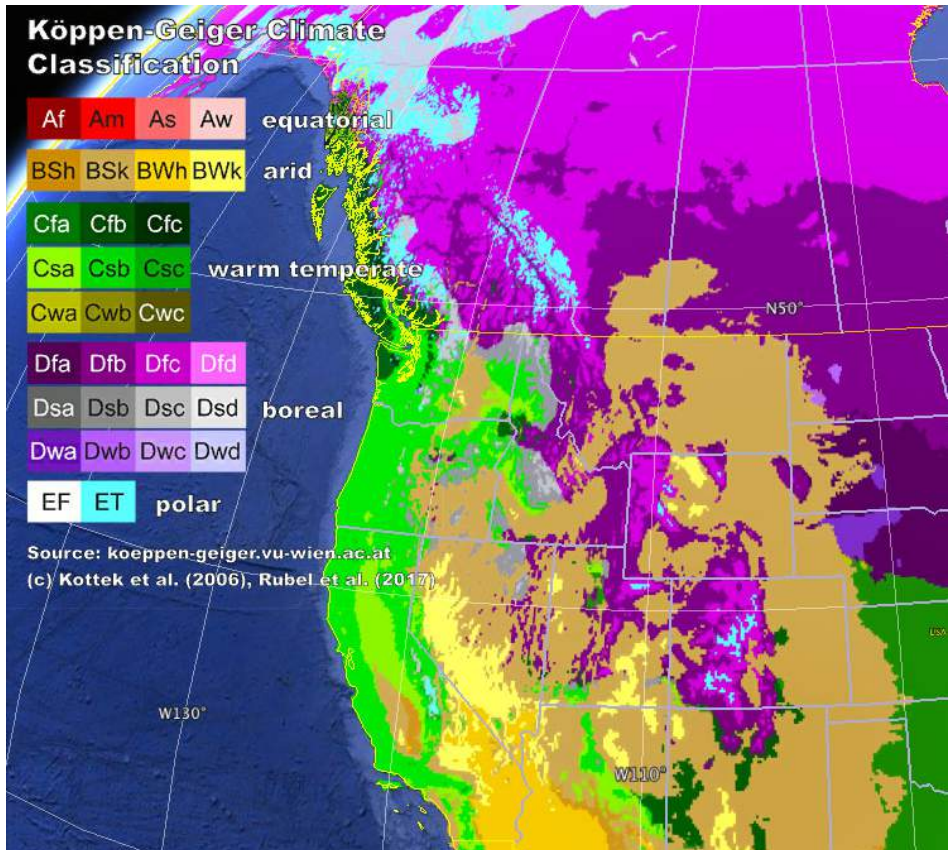


Figure 3: Photo shows thick patches of thistle in the Tryon Creek area (left) and Tulley Creek (right) areas.



Map 3 and 4: Current global climate conditions maps of the Western US (top map) and the Irano-Turanian region with a key by color. Images clipped from US Dept of State Geographer copyright 2016 Google.



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