

Oregon Department of Agriculture  
Plant Pest Risk Assessment for  
Garden loosestrife, *Lysimachia vulgaris*  
2014

Name: Garden loosestrife, garden yellow loosestrife, *Lysimachia vulgaris*  
Family: Primrose (Primulaceae)

**Findings of this Review and Assessment:** Garden loosestrife, *Lysimachia vulgaris* is a wetland plant native to Eurasia and Africa, but it has been spread widely in the U.S. as an ornamental garden plant. In Washington, this plant is aggressively spreading along the shoreline of Lake Sammamish where it appears capable of displacing purple loosestrife, *Lythrum salicaria*, another wetland invasive. Garden loosestrife was evaluated using the ODA Noxious Weed Qualitative Risk Assessment and ODA Noxious Weed Rating System, receiving scores of 62 and 22, respectively. Under both systems, garden yellow loosestrife scored as an “A” rated weed. Reports of escaped populations in Oregon are uncertain, but likely either unknown or limited to Multnomah County. This plant’s repeated escape from cultivation suggests potential to become a serious wetland invasive.

**Introduction:** Garden loosestrife is an erect rhizomatous perennial growing to 1.2 m tall, with terminal panicles of showy yellow flowers. Lanceolate to ovate leaves (7-12 cm long, 1.5-4 cm wide) are opposite to whorled, sessile (or nearly so) and dotted with very small black to orange glands (DiTomaso and Healy 2003). The stems and abaxial leaf surfaces are hairy; stems are sometimes slightly flattened. Flowers have five ovate sepals with maroon margins (figure 2); the corolla is approximately 2.5 cm in diameter with five yellow petals (8-12 mm long) and sometimes with red or orange bases (Figure 1, inset).



**Figure 1. Showy flowers of garden yellow loosestrife at infestation in Marymoor Park and close-up of individual flower (photos from King Co, WA).**

In wet soils, garden loosestrife forms dense monocultures and is reportedly capable of out-competing the aggressive non-native purple loosestrife, *Lythrum salicaria* as well as natives like cattails, *Typha latifolia* and spirea, *Spirea douglasii* (Messick & Kerr 2007). There are over 160 species of annual, biennial or perennial herbaceous species within the genus *Lysimachia*. The name *Lysimachia*, derived from the Greek word ‘lysis’ meaning “dissolve” and *mache* meaning “fighting” or “strife”, alludes to soothing properties. Extracts from *L. vulgaris* have been used as a folk medicine to treat high blood pressure (NWCB 2008) and a variety of other medical conditions (Morozowska and Sulewska 2009). In North America, there are ~22 species known with six considered introduced (*L. barystachys*, *L. clethroides*, *L. japonica*, *L. nummularia*, *L. punctata*, and *L. vulgaris*) (USDA-NRCS 2014). Garden loosestrife plants are promoted as well-suited to bog gardens or other water features and are available through retail nurseries, catalogs and online vendors.

**Habitat:** Garden loosestrife favors wet habitats like shorelines of lakes and rivers, as well as freshwater marshes, fens and wet woodlands (DiTomaso et al. 2003). Plants also known to grow in wet roadside areas (King Co.2010). Plants grow in a variety of soils including organic and mineral soils and are somewhat tolerant of drought (Ebasco Environmental 1993).

**Growth Habits, Reproduction, and Spread:**

Garden loosestrife is an emergent rhizomatous plant that -similar in many ways to purple loosestrife - reproduces by rhizomes, stolons and seed. Plants may remain in a vegetative state, possibly for multiple years, before blooming (Cusack 1986), which may complicate early detection efforts. Plants flower in mid to late summer tall (July to September) and typically grow 1-1.2 m tall (King County 2010). Observations of naturalized populations in Washington suggest garden loosestrife grows and reproduces best in areas with ample soil moisture, but established stands are capable of surviving dry or even drought-conditions (Ebasco Environmental 1993). In wet settings, rhizomes of individual plants can extend 3 to 10 m (Messick and Kerr 2007, Campbell et al. 2010). Introductions of garden loosestrife are often suspected to be escapes from ornamental cultivation. Published data on reproduction of garden loosestrife is limited; however Oh et al.

(2008) reviewed seed morphology within the genus *Lysimachia* and found characteristics of *L. vulgaris* and other wetland species that appear to be adaptations to water dispersal. Seeds can float for over one week and are likely dispersed by water as well as waterfowl (Ebasco Environmental 1993). Native stands in Poland exhibited 49-75% seed viability after three weeks storage; cultivated plants in the same study produced seed that was 63-78% viable (Morozowska and Sulewska 2009). At another site in Poland, seeds remained a notable component of the wet meadow seed bank for 15-20 years (Falińska 1999). In southern Sweden, garden loosestrife was one of several shoreline plants which regrew following mechanical lakeshore restoration treatments where water levels had been lowered for the previous 80 years (Skoglund and Hytteborn 1990). Garden loosestrife is reportedly susceptible to cucumber mosaic virus (widespread in most temperate and tropical climates) and herbivory by a moth (*Chariaspilates formosaria*) and gall mite (*Aceria campestricola*) (Ebasco Environmental 1993), neither of which is known in the Western U.S.

**Hardiness:** Garden loosestrife is hardy to USDA Zone 4a (figure 6). Plants regenerate from rhizomes or sprout from seed and appear well adapted to conditions in the Pacific Northwest.

**Native/Introduced Range:** Garden loosestrife is native to much of Asia, including northwestern China, much of Siberia, the Caucasus, middle Asia, and all of Europe, including the United Kingdom (USDA-GRIN 2014). It is considered introduced in Japan (Mito and Eusugi 2004). In North America, naturalized populations have been found in multiple states in New England and the northern mid-west, Montana, Colorado, Washington, Oregon, and in Canada (British Columbia and most eastern provinces).



**Figure 2. Maroon margins of garden loosestrife calyx. (photo by Ben Legler).**

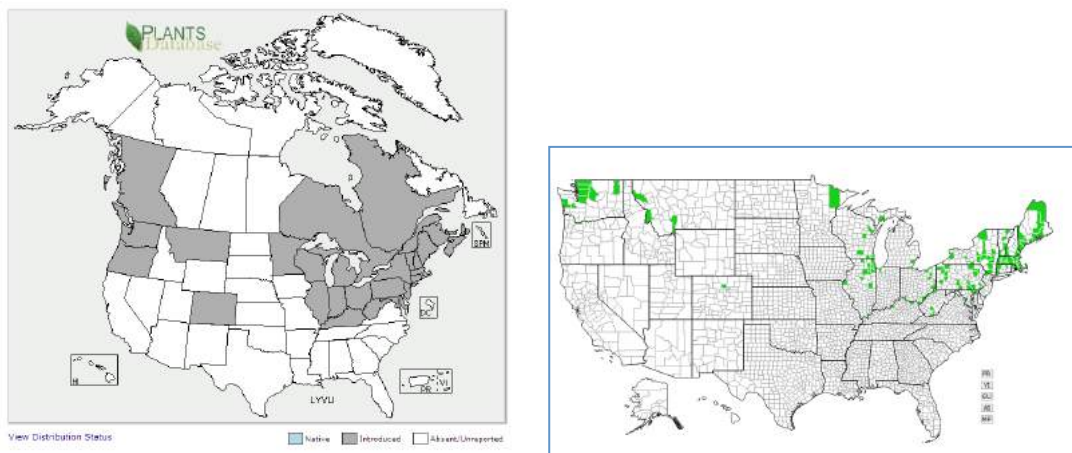


**Figure 3. Rhizomes of garden loosestrife (photo by King Co., WA).**

Cusick (1986) reported populations of garden loosestrife to be increasing in the Ohio River Valley. In Washington, garden loosestrife was first collected in 1978 from Lake Washington; extensive infestations were noted in the early 1990's along the shoreline of Lake Sammamish (NWCB) where approximately one-quarter (20 miles) of the shoreline is infested (Messick and Kerr 2007). Populations have been noted at lakes and riparian areas within Chelan, Grays Harbor, King, Skagit, Snohomish, Stevens, Thurston, and Whatcom counties (EddMaps 2014). In British Columbia, garden loosestrife has been found in ditches and lakeshores near Vancouver, Victoria, Sooke and a number of other sites on Vancouver Island (Klinkenberg 2013).

Garden yellow loosestrife is on Washington's quarantine (WSDA 2011) and Class B list (NWCB 2013). It is also banned in Connecticut (USDA 2014) and targeted for eradication and/or control in British Columbia, though not a noxious weed there (Coastal ISC 2011).

**Oregon Distribution:** Reported near Tigard and Durham (Washington County), but the extent not documented (R. Emanuel, pers. comm.). The INVADERS database reports garden loosestrife in



**Figure 5. Garden loosestrife distributions by state (USDA Plants) and by county (EDDMaps)**

Multnomah County, though the exact site(s) are unclear. Resource managers with Portland BES, Metro and other agencies have not noted escaped populations.

**Probability of Detection:** Garden loosestrife can be distinguished from other loosestrife, *Lysimachia* spp. by its maroon/red calyx margins (Campbell et al. 2010). Infestations may be difficult to detect unless plants are flowering since they may resemble other plants at a distance and may remain in a vegetative state for one or more years before flowering (Cusack 1986). Another non-native, though less-aggressive look-alike is spotted loosestrife, *Lysimachia punctata*, which produces single or small clusters of larger flowers in its leaf axils, rather than in a terminal panicle (King County 2010). The most likely pathway for introduction is the likely escape from home gardens into urban waterways and subsequently downstream. Detection will be most effective during the summer bloom period and with a boat to allow close inspection of shoreline habitats.

**Economic Impact:** Ornamental sales of this plant are not quantified, but it is noted as available through at least two Oregon nurseries (OAN 2014). Extracts from garden loosestrife or varieties thereof are used in various folk medicine, though plants are not grown commercially for this or other medical purposes. Negative economic impacts are associated with cost of controlling garden loosestrife infestations, especially those in inaccessible areas. Clogging of ditches may impair water flow and increase management costs (King County 2010). Radtke and Davis (2000) suggested economic loss attributable to purple loosestrife, *Lythrum salicaria* in Oregon may be as much as \$664 per affected acre (net).



Botanic gardens within its native range have noted garden loosestrife’s localized “aggressive expansion” in cultivated areas and recommend not planting it (Lecher and Kohen 2010).

**Ecological Impacts:** Garden loosestrife’s ability to aggressively invade wetlands and displace native wetland plants may negatively impact wildlife such as waterfowl and fish (King County 2010). Purple loosestrife, similar in many ways to garden loosestrife, is thought to alter wetland ecosystems by out-competing native plants used by wildlife for cover, food or nesting.

**Control:** In certain settings for small populations (single plants or small patches) manual or physical control measures may be appropriate. Digging individual plants is feasible, but should target complete removal of the rhizome and would optimally be done prior to seed set; all plant material (seed heads, stems, and rhizomes) should be bagged and disposed of in a landfill, rather than composted on site or as yard waste. Mechanical cutting (e.g., with a brush cutter or mower) can reduce lateral spread and may impede seed production, but ultimately will not kill garden loosestrife plants. All plant fragments should be removed and properly disposed to prevent regrowth onsite or spread to other areas by water. King County (2010) suggests sheet mulching (cardboard covered with 6 in. of mulch) or covering with landscaping fabric or black plastic to control areas with dense seedlings; this method requires use of a buffer of several feet to prevent rhizomes emerging at the cover’s margins. Applications of triclopyr TEA (Renovate3™) at 1.5% solution have proven effective on populations in Washington’s Snoqualamie River basin. Applications of glyphosate (Rodeo™) have also been tested, but Messick and Kerr (2007) report that because glyphosate is non-selective, its use may contribute to increased germination of unwanted plants including garden loosestrife.

No biocontrol agents known.

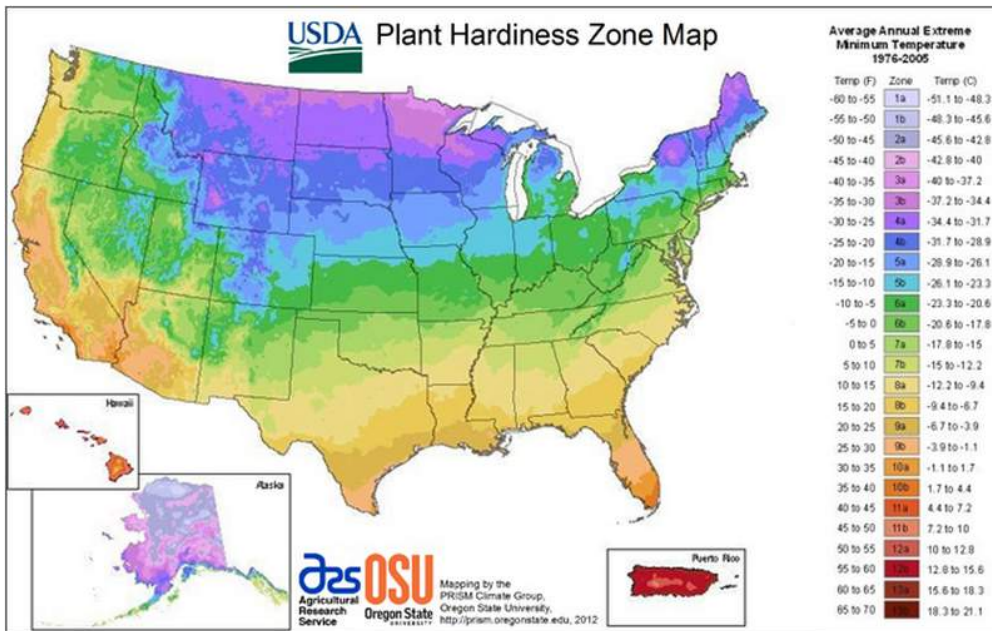


Figure 6. USDA plant hardiness zone map (<http://planthardiness.ars.usda.gov>)

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## Noxious Weed Qualitative Risk Assessment Oregon Department of Agriculture

**Common name:** Garden yellow loosestrife, garden loosestrife

**Family:** Primulaceae

**Scientific name:** *Lysimachia vulgaris*

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 the value of important factors over less important ones. Choose the best number that applies, intermediate scores can be used.

**Total Score:** 72      **Risk Category:** A

### GEOGRAPHICAL INFORMATION

**1.6 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: Multiple infestations known in the Pacific Northwest (Washington, Montana, British Columbia) plus multiple states in the midwestern/northeastern portions of the U.S. and multiple provinces of eastern Canada.

**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: Potential invasive weed of wetland habitats including riparian areas, lake shorelines, wet roadsides, freshwater marshes, and fens; suitable habitat matches that of purple loosestrife.

**3.4 Proximity to Oregon: What is the current distribution of the 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: First detected in King County, Washington in 1978; now known in eight counties.

- 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: Reported near Tigard and Durham (Washington County), but the extent is unclear. INVADERS database reports plants in Multnomah county (c. 1900, attributed to Suksdorf); however Multnomah Co. weed authorities are not aware of any naturalized populations.

#### BIOLOGICAL INFORMATION

- 5.4** **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: Tolerant of many soil types, spreads rapidly in areas with wet/saturated soils, but capable of withstanding drought conditions as well.

- 6.6** **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: Plants produce ample seed that shows high germination rates and viability for 15-20 years; rhizomes may spread up to 10 m (33 ft) in wet soils.

- 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: Pollination likely by bees; there is no evidence of impacts to garden loosestrife in Washington by cucumber mosaic virus or insect herbivory.

**8.4 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: Seed adapted to water dispersal and movement by waterfowl.

**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: Sold as ornamental, often under common names of ‘yellow loosestrife’, and ‘circle loosestrife’; possible movement of seed with boats, trailers, etc..

## 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: Costs associated with control efforts in wetland and riparian habitats of purple loosestrife are estimated at \$664 per affected acre.

- 11.6 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: Dense stands can change community composition, crowding out native riparian species.

- 12.1 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: May cause skin irritation or allergic reactions according to garden forums, but no literature found to support that possible impact.

## 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: Survey during bloom period and at medium range (to distinguish garden loosestrife from goldenrod (*Solidago* spp.)).

- 14.4**      **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.

Comments: Combination of physical and chemical treatments effective, but regrowth from seed and/or persistent rhizomes necessitates on-going monitoring and treatments. Use of herbicides in aquatic settings may prove controversial in natural settings.

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Category Scores:

**16** Geographic score (Add scores 1-4)      **22** Biological Score (Add scores 5-9)

**13** Impact Score (Add scores 10-12)      **11** Control Score (Add scores 13-14)

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

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

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This Risk Assessment was modified by ODA from the USDA-APHIS Risk Assessment for the introduction of new plant species.

2/12/2014    v3.8

Oregon Department of Agriculture  
Noxious Weed Rating System

**Common name:** Garden yellow loosestrife, garden loosestrife

**Family:** Primulaceae

**Scientific name:** *Lysimachia vulgaris*

**Points Total:** 22

**Rating:** A

- 1. 4**      **Detrimental Effects:** Circle all that apply, enter number of circles
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, land value, or wildlife and livestock movement
- 2. 5**      **Reproduction and Capacity for spread** Circle the number that best describes, enter that number.
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. 3**      **Difficulty to Control** Circle the number that best describes, enter that number.
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. 6**      **Distribution** Circle the number that best describes, enter that number.
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
  6. Occurs in less than 10 acres, or not present, but imminent from adjacent state
- 5. 4**      **Ecological Impact** Circle the number that best describes, enter that number.
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
  4. Invades restricted habitats (i.e., riparian) and crowds out native species

## 21 TOTAL POINTS

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Note: Noxious weeds are those non-native plants with total 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 2/12/2014 v3.2