

**WRITTEN FINDINGS OF THE  
WASHINGTON STATE NOXIOUS WEED CONTROL BOARD  
November 1998; updated 2017  
Proposal to reclassify from a Class A noxious weed**

Scientific Name: *Thymelaea passerina* (L.) Coss. & Germ.

Synonyms: *Passarine annuelle*, *Stellera passerina*

Common Name: spurge flax, annual thymelaea

Family: Thymelaeaceae

Legal Status: Class A noxious weed in 1999; WSDA Prohibited Plants List, WAC 16-752



Images: left, *Thymelaea passerina* held above where it was growing; center, flowering stems, image by Larry Hudson OCNWCB; right, *T. passerina* main stem with leaves, left and right image by WSNWCB.

**Description and Variation:**

**General and Stems:** *Thymelaea passerina* is an herbaceous, erect annual with a fibrous taproot (Holmes et al. 2000, Nevling Jr. and Barringer 2016). The overall plant size ranges from 4 inches to 2 feet tall (10 to 60 cm) (Vincent and Thieret 1987). Slender, wiry and erect, spurge flax grows as one main stem, or more commonly, branches from the upper plant. The coloring of the plant ranges from green to yellow-green, turning red in the fall (Nevling Jr. and Barringer 2016).

**Leaves:** Leaves are alternately arranged and are sessile or subsessile with petioles to 1 mm, jointed at a yellow cartilaginous base. Leaf blades are small and narrow (5 to 20 mm long by 1 to 2.5 mm wide), linear to linear-lanceolate shaped (Vincent and Thieret 1987, Nevling Jr. and Barringer 2016). Leaves are glabrous, or less commonly undersides weakly puberulent, leathery, tapering to an acute tip with entire (smooth) margins (Holmes et al. 2000, Nevling Jr. and Barringer 2016).



Images: left, upper branching stems of *T. passerina*; right, *T. passerina* taproot, images by WSNWCB.

**Flowers:** The flowers are in leaf axils, single or 2 to 7 in cymose clusters with two bracts at the base, 2 to 3 mm long that arise from a tuft of white hairs (Holmes et al. 2000, Nevling Jr. and Barringer 2016). The flowers are greenish and tubular, with appressed hairs, 2 to 3 mm long, perfect and incomplete: 4 sepals, no petals and 8 stamens, the stamens are in two whorls of four and inserted. Below each flower, two very small bracts arise from a tuft of tiny white hairs (Nevling Jr. and Barringer 2016).

**Fruit:** The fruit is a dry, 1-seeded capsule that is enclosed by the persistent floral tube (hypanthium) (Holmes et al. 2000). The seed in the capsule is brown to black in color, 2 to 3 mm long and ovoid (Vincent and Thieret 1987).

This species is difficult to find growing out in the field as it easily blends in with surrounding plants. *Thymelaea passerina* may resemble *Polygonum* species; however, there is no ocrea (papery sheath at the nodes).

*Thymelaea passerina* is the only species in this genus, and it is the only herbaceous annual found in the Thymelaeaceae family. It is still absent in a number of taxonomic keys, since only shrubby species were known in North America, but is now included in the Flora of North America (Harriman 1979, Vincent and Thieret 1987, Nevling Jr. and Barringer 2016).



Images: left, dense flowering stems of *Thymelaea passerina*; center, flower of *T. passerina*; right, developing flower buds, left and center image by OCNWCB, right image by WSNWCB.

#### Habitat:

Considered a common weed of dry soils, *Thymelaea passerina* is found growing in grain fields, pastures, bluffs, railroad embankments, and flood plains (Pohl 1955, Wofford and DeSelm 1988). In Okanogan County, plants are found growing on arid shrub steppe to sub irrigated meadows (OCNWCB 2017). The original infestation is reported in steep, horse range land, growing near an alkaline lake in strong lime soil. *Thymelaea passerina* is growing and thriving in areas with other invasive plants such as Russian knapweed (*Acroptilon repens*) and diffuse knapweed (*Centaurea diffusa*), and appears to be outcompeting surrounding vegetation (OCNWCB 2017).

#### Geographic Distribution:

According to the USDA GRIN database, (USDA ARS 2017), *Thymelaea passerina* is native to parts of northern Africa, Asia and Europe. Specifically the database lists:

- Northern Africa: Algeria, Morocco, Tunisia
- Asia: Kuwait, Armenia, Azerbaijan, Georgia, Russian Federation, China, Turkmenistan, Uzbekistan, Siberia, Afghanistan, Iran, Israel, Jordan, Syria, Turkey, India, Pakistan
- Europe: Moldova, Ukraine, Austria, Belgium, Czech Republic, Germany, Hungary, Poland, Slovakia, Switzerland, Albania, Bulgaria, Croatia, Greece, Italy, Macedonia, Romania, Serbia, Slovenia, France, Portugal, Spain

USDA GRIN database (USDA ARS 2017) lists *Thymelaea passerina* naturalized or adventive in Australia and the United States. It has also been documented in Ontario and Quebec, Canada, (Marie-Victorin Herbarium 2006, Newmaster and Ragupathy 2012).

*Thymelaea passerina* seeds are thought to have been introduced to North America as a feed seed contaminant (Vincent and Thieret 1987). Wofford and DeSelm (1988) report that *T. passerina* was known from 7 states (Illinois, Iowa, Kansas, Mississippi, Nebraska, Ohio, and Wisconsin) and a total of 15 counties. There is a herbarium specimen from Alabama collected in 1922 that is not referred to by Wofford and DeSelm (1988).

As of 2017, twelve states are documented to have *Thymelaea passerina*, specifically:

- North Dakota: observed in 2016, 8 square feet (0.00018259 acre infested)
- South Dakota: 1989 herbarium record (RM 549040), though the 2008 discovery of *T. passerina* is noted as being when it was first found at Conata Basin, National Grasslands (Haar, 2012, Kostel, 2008 in Kohl and Koop 2017). Surveys in 2009 found 36 infested acres at Conata Basin (Haar 2011). In 2010, there were about 40 infested acres found at Badlands National Park; in 2011 there was about 40 to 80 infested acres at the Badlands National Park and 200 acres infested at Conata Basin Grasslands; in 2012 very few plants as a dry spring weather inhibited germination (Haar et al. 2013).
- Kansas (McGregor et al. 1976 in USDA NRCS 2017)
- Nebraska: 1950, almost completely taking over a pasture (IND 99588)
- Texas: 1999, two herbarium records, both in wheat growing areas, roadside and margins of wheat fields (Holmes et al. 2000)
- Iowa: 1956: Eroded field road on hillside of loess soil. Introduced weed (WTU: 200525)

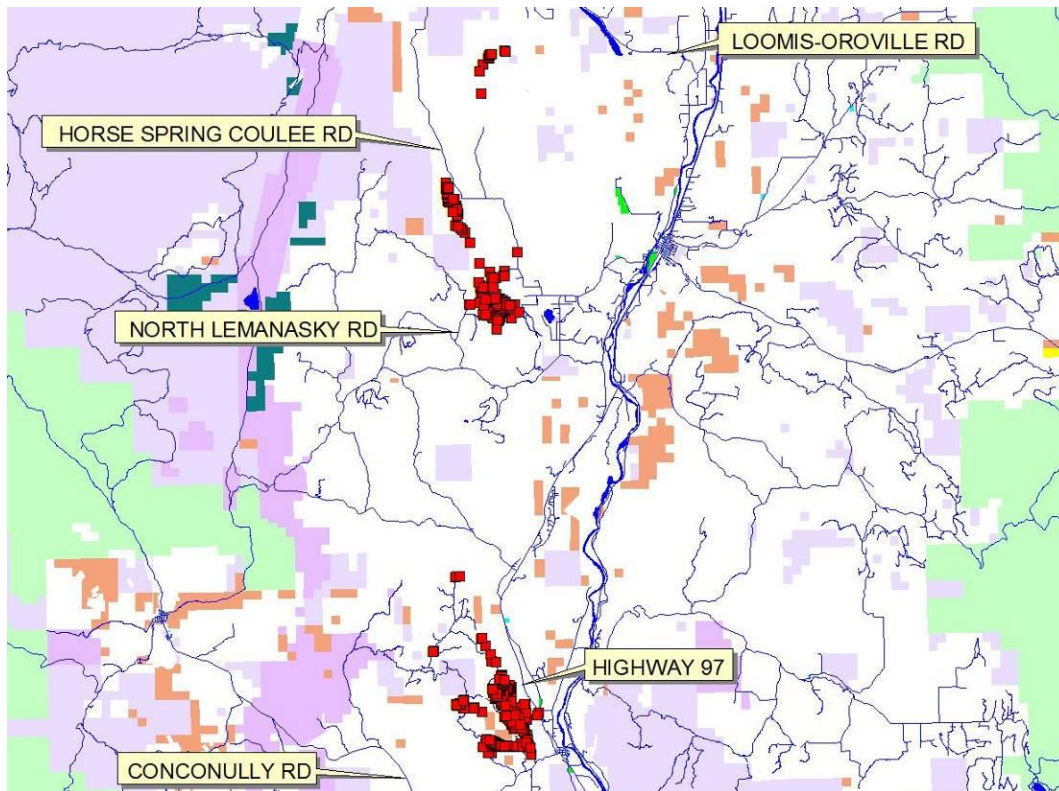
- Wisconsin: 1977 herbarium record, abundant, in open field of bulldozed clay, and along railroad tracks
- Illinois: 1973 herbarium specimen in Lake County, side of right of way on till from which topsoil graded off (F1744805)
- Ohio: 1985 herbarium record (KE 0005302); several hundred plants, plants were found growing on a reserve that was once farmland, on a gravelly hillside of eroded Milton silt loam soil (Vincent and Thieret 1987)
- Mississippi: 1991, remnant prairie (MWI 00053022)
- Alabama: 1922 herbarium specimen (TENN-V-0154470), Colbert County.
- Washington: identified in Washington in 1996, listed as a Class A noxious weed in 1999 (Consortium of Midwest Herbaria 2017, EDDMapS 2017, and USDA NRCS 2017 unless otherwise cited)

#### Washington

The Okanogan County Noxious Weed Control Board responded to a landowner request for identification in the fall of 1996 when he noticed this species growing in native horse range. The estimated infestation site covered about 600 acres, with a condensed infestation size estimate of 6 acres. An aggressive control program was initiated, and with plants treated each year, infestations still increased in size. A brief timeline from the Okanogan County Noxious Weed Control Board of *Thymelaea passerina* in Okanogan County is:

- 1996: first discovered in Okanogan County
- 2004: 130 acres documented as infested
- 2010 and 2011: two new populations found, 1,635 acres found infested
- 2013 and 2015: wildfires occurred in infested areas
- 2016: 10,560 acres infested, with a condensed infestation size of 88 acres, several new sites found in the fall that had already completed their annual lifecycle.





Map: Red squares mark the current known sites of *Thymelaea passerina* in 2016, map by Okanogan County Noxious Weed Control Board.

#### Growth and Development:

*Thymelaea passerina* is an annual that germinates from seed in the spring. Okanogan County plants in 2017 were at about 0.5 inches tall in May (Larry Hudson pers. comm. 2017). Flowers may bloom as early as April, but more commonly from June to September (Holmes et al. 2000). In Okanogan County, plants typically reach maturity mid-July (Larry Hudson pers. comm. 2017). Plants turn red in the fall.

#### Reproduction:

*Thymelaea passerina* reproduces by seed. Kohl and Koop (2017) report from Tan (1980b) that plants can self-pollinate and that seeds can remain dormant for two years (Tan 1980a). Plants have high seed set, but flower pollinators are unknown (Tan 1980 in Vincent and Thierat 1987).

The original infestation in Okanogan County is thought to be the result of contaminated hay (OCNWCB 2017). *Thymelaea passerina* is spreading to new areas within Okanogan County by all-terrain vehicles/off-road vehicles use in infested areas, high concentrations of deer and other wildlife movement in infested areas, hunters moving through infestations, and fire suppression activities (OCNWCB 2017). Populations in Texas are suspected to have been introduced by contaminated farm equipment from further north (Holmes et al. 2000).



Image: left, off road activity through a site of *Thymelaea passerina* during fall of 2016; in the foreground are plants that display the red fall coloring of *T. passerina*, images by OCNWCB.

#### Economic Importance:

**Detrimental:** *Thymelaea passerina* is mentioned as a common weed in central Europe and western Asia where it shows up in grain crops (Pohl 1955). In the early Iowa collections, it was observed that *T. passerina* was growing in a pasture as an aggressive weed (Pohl 1955). In Texas, one of the herbarium specimens is noted as growing on the edge of wheat fields, but it is unknown if it is causing any negative impacts to the wheat crops. Animals will not graze this plant. While it is unknown if *T. passerina* is decreasing the carrying capacity of pastureland (Kohl and Koop 2017), some rangelands have areas of dense growth in Okanogan County.

The Washington State Department of Agriculture includes *Thymelaea passerina* on its prohibited plants list (quarantine list), WAC 16-752. It is “prohibited to transport, buy, sell, offer for sale, or distribute plants or plant parts of the regulated species on this list into or within the state of Washington or to sell, offer for sale, or distribute seed packets of seed, flower seed blends, or wildflower mixes of these regulated species into or within the state of Washington” (WSDA 2016). The contamination of harvested seed or hay by *T. passerina* would stop the sale of these products if this scenario were to ever occur.

In Okanogan County, *Thymelaea passerina* occurs in 10,560 acres of infested native rangeland. (OCNWCB 2017). Surveying for populations is time consuming and difficult due to rugged terrain, climate and fire hazards, and working in rattlesnake habitat (OCNWCB 2017). Herbicide application costs are high due to treatments being time and labor intensive (OCNWCB 2017). Research is needed on the negative impacts *T. passerina*.

**Beneficial:** None known

#### Control Methods:

*Thymelaea passerina* can be difficult to find to control due to its slender growth habit and ability to blend in with surrounding vegetation (OCNWCB 2017). Staff at the Badlands National Park in South Dakota recommends identifying infestations in the fall as it is the easiest time to find plants with their red coloring (Haar et al. 2013).

When possible, carry out control methods when pollinators are not active on plants. Also, make sure to clean shoes, clothing, and equipment when leaving infestations to prevent spreading seeds to new locations.

Response to Herbicide: *Thymelaea passerina* is difficult to control due to the small, leathery leaves lack of surface area. Okanogan County Noxious Weed Control Board reports that to eradicate *Thymelaea passerina*, infested areas should be treated 3 times through the growing season--early June, late July and early September.

Okanogan County herbicide treatments in 2017 used Tordon 22K at 2 pts/acre + Escort at 1 ounce/acre + MSO in the spring and for fall applications, 2-4D at 3 Pts/acre + Escort at 1 ounce/acre + MSO (Larry Hudson pers. comm. 2017). As of the end of August, control results for both treatments have had mixed success--in some areas they have had very good control 85-90%, while other areas, treatment efforts appear to be having limited effect (Larry Hudson pers. comm. 2017).

Cultural Methods:

Seed areas where control has taken place with non-invasive plant species, including grasses and desirable forage species, to provide competition.

Mechanical and Manual Methods: None known.

Biological Control: None known.

References:

Consortium of Midwest Herbaria. 2017. *Thymelaea passerina*. <http://midwestherbaria.org/portal/> accessed August 2017.

EDDMapS. 2017. Early Detection and Distribution Mapping System. The University of Georgia-Center for Invasive Species and Ecosystem Health. Available online at <http://www.eddmaps.org/> accessed August 2017.

George, V. and A. K. Rishi. 1982. Constituents of *Thymelaea passerina*. Fitoterapia. 1982. Vol. 53 (5/6). Pp. 191-2.

Gleason, H. A. and A. Cronquist. 1991. Manual of Vascular Plants of Northeastern United States and Adjacent Canada. The New York Botanical Garden. Bronx, NY. P. 312.

Haar, M. 2011. Spurge flax (*Thymelaea passerina*) at Badlands National Park: Discovery and preliminary herbicide control trials. Black Hills Area Botanist & Ecologist Workshop (BHABEW VIII) [https://science.nature.nps.gov/im/units/ngpn/partner/BlackHills/docs/2011/BH\\_Ecologist\\_Agenda\\_2011.pdf](https://science.nature.nps.gov/im/units/ngpn/partner/BlackHills/docs/2011/BH_Ecologist_Agenda_2011.pdf)

Haar, M. J., J. A. Delger, and P. J. Roghair. 2013. New native and exotic species for Badlands National Park. National Park Service. U.S. Department of the Interior. Presentation. Accessed online at: [https://science.nature.nps.gov/im/units/ngpn/partner/BlackHills/docs/2013/05\\_Haar\\_New\\_Natives\\_Exotics\\_BADL.pdf](https://science.nature.nps.gov/im/units/ngpn/partner/BlackHills/docs/2013/05_Haar_New_Natives_Exotics_BADL.pdf)

Harriman, N. A. 1979. Four Additions to the Wisconsin Flora. The Michigan Botanist. Vol. 18 (4). Pp. 143-145.

Holmes, W. C., J. F. Pruski, and J. R. Singhurst. 2000. *Thymelaea passerina* (Thymelaeaceae) New to Texas. SIDA, Contributions to Botany. 19 (2) 403-406.

Kohl, L. and A. Koop. 2017. Weed risk assessment for *Thymelaea passerina* (L.) Coss & Germ (Thymelaeaceae) – Spurge flax. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (PPQ), Raleigh, NC. 20 pp.

Marie-Victorin Herbarium. 2006. #MT0002229 *Thymelaea passerina*. University of Montreal Biodiversity Center MT. <http://portal.neherbaria.org/portal/collections/individual/index.php?occid=475199&clid=0> accessed August, 2017.

McGregor, R. L. and T. M. Barkley, R. E. Brooks, E. K. Schofield. 1986. Flora of the Great Plains. University Press of Kansas. P. 498.

Nevling Jr., L. I. and K. Barringer. 2016. *Thymelaea*. Flora of North America. Volume 6. [http://www.efloras.org/florataxon.aspx?flora\\_id=1&taxon\\_id=132930](http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=132930) accessed August, 2017.

Newmaster, S. G. and S. Ragupathy, 2012. Flora Ontario – Integrated Botanical Information System (FOIBIS), Phase II. University of Guelph, Canada. Available at: <http://www.uoguelph.ca/foibis/>

Okanogan County Noxious Weed Control Board (OCNWCB). 2017. Reclassification proposal: spurge flax (*Thymelaea passerina*) and supplemental information.

Pohl, R. W. 1955. *Thymelaea passerina*, a new weed in the United States. Iowa Academy of Sciences, Vol. 62. Dec. 15, 1955.

Tan, K. 1980. Studies in the Thymelaeaceae II: A revision of the genus *Thymelaea*. Notes Royal Bot. Gard. Edinburgh 38: 189-246.

USDA ARS, 2017. National Genetic Resources Program. Germplasm Resources Information Network (GRIN) Online Database. National Germplasm Resources Laboratory, Beltsville, Maryland. <https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?id=416510> accessed August 2017.

USDA NRCS. 2017. The PLANTS Database (<http://plants.usda.gov>, August 2017). National Plant Data Team, Greensboro, NC 27401-4901 USA.

Vincent, M. A. and J. W. Thieret. 1987. *Thymelaea passerina* (Thymelaeaceae) in Ohio. SIDA: Contributions to Botany. Vol. 12 (1). Pp. 75-78.

Wofford, B. E. and H. R. De Selm. 1988. Distribution of and first report of *Thymelaea passerina* from the southeastern United States. Castanea. Dec 1988. Vol. 53 (4). Pp. 305-6.



Washington State Department of Agriculture (WSDA). 2016. Plants and seeds whose sales are prohibited in Washington State. Accessed online at:  
<https://agr.wa.gov/FP/Pubs/docs/PlantServices/BrochureProhibitedPlants.pdf>

Original Rationale for Listing:

*Thymelaea passerina*, or spurge flax, is aggressive, it is very difficult to control, livestock will not graze this plant, and at this time the distribution is limited to Okanogan County. This weedy Eurasian species was not previously known to Washington state, nor any other Pacific Northwest site, prior to the fall of 1996. Spurge flax has an estimated infestation size of about 600 acres of native range land, with a condensed infestation size estimate of 6 acres. An aggressive control program makes control, and possibly eradication, feasible at this time. The Okanogan County Noxious Weed Control Board requested that spurge flax be listed as a noxious weed.