

**WRITTEN FINDINGS OF THE  
WASHINGTON STATE NOXIOUS WEED CONTROL BOARD  
DRAFT August 29, 2011**

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| Scientific name: | <i>Clematis orientalis</i> L.  |
| Synonyms:        | <i>Viticella orientalis</i> (Linnaeus) W.A. Weber, <i>Clematis daurica</i> Pers., <i>Clematis glauca</i> Willd., <i>Clematis glauca</i> Willd. var. <i>angustifolia</i> Ledeb., <i>Clematis globosa</i> Royle, <i>Clematis aurea</i> A. Nelson & J.F. Macbr. |
| Common name:     | Oriental clematis, Chinese clematis, oriental virginsbower, orange peel clematis   |
| Family:          | Ranunculaceae  |
| Legal Status:    | Proposed for 2012 as a Class A noxious weed  |

**Description and Variation:**

*Clematis orientalis* is a highly variable plant species that can be challenging to identify, as its name has been frequently misapplied both botanically and in the horticultural and gardening trade (Grey-Wilson 1989). The following description is based primarily on the Flora of North American treatment (Pringle 1997) as well as C. Grey-Wilson's 1989 treatment that describes the species and seven varieties. The varieties are differentiated by leaf and inflorescence characteristics (Grey-Wilson 2000) and partly correlated with their distribution in Asia (Pringle 1997). The seven varieties described by Grey-Wilson (1989) are *C. orientalis* var. *orientalis*, *C. orientalis* var. *hindukushensis*, *C. orientalis* var. *robusta*, *C. orientalis* var. *baluchistanica*, *C. orientalis* var. *tenuifolia*, *C. orientalis* var. *latifolia* and *C. orientalis* var. *daurica*. It is noted in the Flora of North America that the *Clematis orientalis* invading in the Rocky Mountains seem best referred to that of *C. orientalis* var. *robusta*, native to Afghanistan (Pringle 2003). The following description describes the *C. orientalis* at the species level. The listing of *Clematis orientalis* as a noxious weed includes all of the species subspecies as well as any named cultivars.

**Overall Habit:** *C. orientalis* is a moderately vigorous, deciduous climber or a scrambling shrub that typically forms a mass of stems and grows 2 to 8 meters long (Grey-Wilson 1989, Pringle 1997). Vines climb by means of their tendril-like leaf petioles and rachises (Pringle 1997).

**Roots/Rhizomes:** Roots of the plant are weak and flexible and have orange-tan colored fine roots (Francis 200?).

**Stem:** Its slender, ridged stems are grayish or whitish green, sometimes tinged purple-red (Grey-Wilson 1989). They may be glabrous or sparsely hairy but soon become glabrous (Grey-Wilson 1989). Older stems may grow up to 7 cm in diameter (Francis 200?).

**Leaves:** Leaves are opposite, pinnately compound and glaucous, with five to seven leaflets (Pringle 1997, Toomey and Leeds 2001). Leaflets have variable size, shape and margins. Their shape ranges from lanceolate to elliptic or ovate and the leaflets are unlobed to trilobed, but often unevenly bilobed (Pringle 1997, Grey-Wilson 2000). Leaflets are 1-5.5 cm long by 0.5-3.5 cm wide and may or may not have a few small even teeth along the lower margin (Pringle 1997). They are pubescent on both sides or more rarely completely glabrous above (Grey-Wilson 1989).

**Flowers:** Inflorescences are axillary on stems and also sometimes terminal (Pringle 1997). Flowers are solitary or in 3-many flowered cymes and occur on the current season's growth (Pringle 1997, Francis

200?). Flowers bloom on pedicels that are (0.5-) 1-1.1 cm in length (Pringle 1997). Flowers have 4 sepals that range in color from yellow to greenish yellow and may sometimes be tinged with reddish or brownish purple on the outside (Grey-Wilson 1989, Pringle 1997) (Figure 1.). Sepals are ovate-lanceolate to elliptic and are 0.8-2.1 cm long and about 2.5 longer than the width (Pringle 1997). Sepal margins are densely pubescent on the exterior while overall being pubescent on both sides or rarely glabrous on the exterior (Grey-Wilson 1989, Pringle 1997). When the flowers first open, the sepals spread outwards widely and become recurved at maturity (Grey-Wilson 1989).

Flowers are bisexual and do not have petals. There have 20-40 stamens and 75-150 pistils per flower (Pringle 1997). Stamen filaments are hairy toward the base (Pringle 1997).



**Figure 1. *Clematis orientalis* in flower and fruit (left) Yakima County Noxious Weed Control Board 2010, Illustration of *C. orientalis* from the Flora of North America, 1997.**

**Fruits and Seeds:** Prominent seedheads are produced after flowering (Toomey and Leeds 2001). Flowers form achenes that have hairy styles attached and are 2-5 cm long (Grey-Wilson 2003). Seeds remain aggregated together in a somewhat spherical shape and can remain attached to the plant for a length of time.

#### **Distinguishing Clematis species:**

The easiest time to identify *Clematis* species are when they are in flower. *Clematis orientalis* can easily be distinguished from our native clematis species by its flower color. Native clematis species in the Pacific Northwest have flower colors ranging from white to cream, bluish to reddish or brownish-purple (Hitchcock and Cronquist 1973). A native clematis species, *Clematis ligusticifolia*, is found growing in similar habitats, even right along with, the *Clematis orientalis* found in Yakima County. The two can easily be distinguished by flower color: *C. ligusticifolia* has white to cream colored flowers and *C. orientalis* has yellow to greenish yellow flowers.

*Clematis tangutica* is another cultivated yellow flower clematis species. Characteristics to tell *C. tangutica* and *C. orientalis* apart are flower form and color as well as leaflet serration. *C. tangutica* flowers have bright yellow sepals, are nodding and bell-shaped to having more open sepals, but sepals not becoming recurved as they are in *C. orientalis* (Grey-Wilson 2000). *C. tangutica* leaflet margins are serrate (Grey-Wilson 2000). *Clematis tangutica* is naturalized in Canada (USDA Plants) and is classified as a noxious weed in the Alberta Province (Province of Alberta 2010). Kozloff (2005) also notes *C. tangutica* is known to escape from cultivation.

#### **Habitat:**

In its native habitat, *Clematis orientalis* is documented as growing in rocky places along valley bottoms, river and streambanks, in hedgerows and other field boundaries (Grey-Wilson 1989, Grey-Wilson 2000). In its introduced range, it grows along roadsides, open woods, steep hillsides and riverbanks (Pringle 2003, Yakima County NWCB 2011, George Beck pers. comm. 2011). It is also found growing in gullies, sand depressions, desert and semidesert areas (Francis 200?). In Utah, it is found on river and creek banks, along intermittent streams at the mouth of canyons (Francis 200?). Pringle (1997) notes it can grow at elevations 0-2600 meters.

*Clematis orientalis* needs well-drained soils but otherwise it is not particular about other soil properties such as texture or pH, as it is able to tolerate both acidic and alkaline conditions (Francis 200?). It also grows well on chalky soils (Francis 200?). Plants like sun or partial shade conditions (Toomey and Leeds 2001).

#### Geographic Distribution:

Native Distribution: Native to Eurasia (Pringle 2003), it is specifically found in Afghanistan, Iran, Syria, Turkey, Armenia, Azerbaijan, Georgia, Russian Federation (Ciscaucasia, Dagestan and European part), Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, China (Gansu, Xinjiang), India (Himachal Pradesh, Jammu and Kashmir), Pakistan and Greece (Aegean Islands) (USDA, ARS 2011).

Distribution in North America: Naturalized *C. orientalis* is documented in Oregon, Colorado, Idaho, New Mexico, Nevada, and Utah (USDA NRCS 2011, EDDMapS 2011). It is listed in Colorado as a Class B Noxious Weed (Colorado Dept. of Agriculture, n.d.). *C. orientalis* has also been recorded in Ontario Canada (USDA 2011).

History and Distribution in Washington: As of 2011, *C. orientalis* populations have only been found in Yakima County. The first population, discovered and controlled in 2006, did require one follow up control visit to eradicate the population (D. Jacobson, pers. comm.). It was subsequently added to the Washington State Noxious Weed Control Board Monitor List. In 2010, many more infestations were found along and near the Yakima River. These populations were controlled using herbicide in the fall of 2010 (D. Jacobson pers. comm.). In the late summer of 2011, additional populations were found in Yakima County, some adjacent to the previously treated populations. All of these new populations were controlled using herbicide in the fall of 2011 (D. Jacobson pers. comm.).

#### **Biology:**

Growth and Development: *Clematis orientalis* grows rapidly, producing at least 1 meter of growth per year from sprouts or existing stems (Francis 200?). Plants grow up into trees or over bushes and often grow sprawling over the ground or over rocks (Grey-Wilson 2000) (Figure 2.). Its growth is very dense and appears to shade out other species when growing on the ground. *C. orientalis* flowers from summer to fall (Pringle 1997) and is pollinated by bees and flies (Plants For A Future 2011). It is common to observe both flowers and fruits on the plant at the same time (Francis, 200?).



**Figure 2. *Clematis orientalis* growth habit in Yakima County, Yakima County Noxious Weed Control Board 2010.**

**Reproduction:**

*Clematis orientalis* reproduces by seed and vegetatively by layering and sprouting from root crowns (Francis 200?). Seeds are dispersed by the wind (Francis 200?), animals and people.

**Control:**

*Clematis orientalis* is noted to be difficult to control once it is established (Summit County 2009). *C. orientalis* can establish in hard to access areas such as steep slopes with loose rocks, making control of some infestations difficult and expensive (Steve Ryder pers. comm.).

**Response to Herbicide:**

Yakima County Noxious Weed Board controlled populations with a 1% mixture of imazapyr (Habitat) and a surfactant (Dynamic, mixed at half ounce per gallon of water). The initial population, found in 2006, required one follow up treatment. The subsequent populations found and treated in fall 2010 did not require follow up treatment (D. Jacobson, personal communication 2011) (Figure 3). The most recent populations found in 2011 will be monitored to see if they need any additional herbicide treatments.



**Figure 3. *Clematis orientalis* after herbicide treatment by Yakima County Noxious Weed Control Board, Yakima County Noxious Weed Control Board 2010.**

Ted Brown, Weed Supervisor of Clear Creek County Colorado (pers. comm.), recommends using a mix of Milestone at 7 ounces per acre and WeeDestroy (2, 4-D Amine) at 50 ounces per acre to treat *C. orientalis*. Also, using Milestone alone at 3, 5 or 7 ounces per acre or 2, 4-D Amine at 64 ounces per acre along with a surfactant (Induce) at 32 ounces per 100 gallons of water, will kill the plant.

Additional recommendations from Colorado (Clear Creek County n.d.), where it is actively being controlled, include a number of other herbicide treatments listed, as follows, in the order of efficacy. First treatment recommended is Escort (metsulfuron) at 1 ounce product per acre plus 0.25% surfactant, which is equivalent to 1 quart over 100 gallon of total spray solution. Apply this treatment during the flowering growth stage. Second recommended treatment is Plateau (imazapic) at 12 fluid ounces of product per acre plus 1 quart per acre methylated seed oil. This treatment should also be applied at the flowering growth stage. Third treatment recommended is 2,4-D amine that is 3.8 pound ae per gallon of product at 2 quarts product per acre. Apply this treatment at flowering to early post flowering growth stages. This treatment will damage neighboring brush species if any are present. The fourth treatment recommended is Tordon (picloram) at 1 quart per acre. Apply this treatment at the flowering growth stage. This treatment will also damage neighboring brush species if any are present. This herbicide has restricted use and cannot be applied near trees or water.

K.George Beck, Professor of Weed Science at Colorado State University, is conducting control studies on *C. orientalis* and will have results available in the near future.

Please refer to the PNW Weed Management Handbook, available online at <http://weeds.ippc.orst.edu/pnw/weeds> for specific herbicide instructions, as herbicide recommendations may have changed since the time of this writing.

Response to Cultural Methods: No cultural methods have been described for *C. orientalis*.

Response to Mechanical Methods: Colorado (Clear Creek County n.d.) recommends hand pulling or digging the plant when the soil is moist, making sure to pull all the roots and carefully bag plant material so as to not scatter seeds.

Biological Control Potential: There are no known biological controls for *Clematis orientalis*.

### **Economic Importance:**

Detrimental: Clear Creek County Colorado notes that *C. orientalis* causes death to young trees and brush and outcompetes native shrubby and herbaceous species and the juice of freshly crushed leaves and stems have blister causing agents (Clear Creek County n.d.). Plants For A Future (2011) database indicates that while there have not been reports of toxicity for this particular species, some if not all the members of the *Clematis* genus are mildly poisonous. Pringle (1997) notes that *C. orientalis* is a threat to young trees and native shrubby and herbaceous species.

Beneficial: *Clematis orientalis* has been used ornamentally in the landscape as a flowering groundcover (Francis 200?). It is among the most drought-tolerant of any clematis and grows well on walls or fences (Grey-Wilson 2000). It has also been noted to have some medicinal uses. In an area of Pakistan in its native range, *C. orientalis* has traditionally been used as an emollient and febrifuge (Hazat et al., 2010). It is also listed as being used as an antiseptic, a refrigerant, used as a gargle for ulcerated throats and as a treatment for dog bites (Plants For A Future 2011).

### **Rationale for Listing:**

*Clematis orientalis* is capable of forming dense infestations, which are noted to outcompete native shrubs and groundcovers and to kill small trees. It is listed as a noxious weed in Colorado, where it is reportedly difficult to control if it is allowed to spread. *C. orientalis* has the potential to establish in a variety of habitats in Washington State; however, current distribution is extremely limited at this time, with known populations in Yakima County. This species meets the criteria of a noxious weed, in that it can be highly destructive in natural areas, competitive, and difficult to control. As a new invader with limited distribution, a Class A listing will allow for the feasible goals of preventing further introductions through early detection/rapid response (ED/RR) and the eradication of existing populations.

## **References:**

Clear Creek County, n.d., Chinese Clematis (*Clematis orientalis*), Clear Creek County Noxious Weeds, Colorado. <http://www.co.clear-creek.co.us/Depts/Weeds/Weeds/ChineseClematis.pdf>. Accessed 7/11/2011.

Colorado Department of Agriculture, n.d. Colorado Noxious Weed List. <http://www.colorado.gov/cs/Satellite/Agriculture-Main/CDAG/1174084048733>. Accessed 7/11/2011.  
EDDMapS. 2011. Early Detection & Distribution Mapping System. The University of Georgia - Center for Invasive Species and Ecosystem Health. Available online at <http://www.eddmaps.org/>; last accessed August 1, 2011.

Francis, J.K. 200?. In: Francis, John K., ed. Wildland Shrubs of the United States and its Territories: Thamnisc Descriptions General Technical Report IITF-WB-1 U.S. Department of Agriculture, Forest Service International Institute of Tropical Forestry and Shrub Sciences Laboratory. Accessed 7/11/2011. [http://www.fs.fed.us/global/iitf/wildland\\_shrubs.htm](http://www.fs.fed.us/global/iitf/wildland_shrubs.htm)

Grey-Wilson, C. 1989. *Clematis orientalis* (Ranunculaceae) and Its Allies. Kew Bulletin 44(1): 33-60.

Hazrat, A., J. Shah, S. Ahmad, M. Nisar, A. K. Jan and Sikandar. 2010. Medicina Plants of Ushera Valley, DIR, NWFP, Pakistan. Pakistan Journal of Botany 42(1): 31-34.

Kozloff, E. N. 2005. Plants of Western Oregon, Washington and British Columbia. Portland Oregon. Timber Press. 512 p.

Plants For A Future, 2011. Accessed online 8.2.2011  
<http://www.pfaf.org/user/Plant.aspx?LatinName=Clematis+orientalis>

Pringle, J. S. 1997. *Clematis orientalis*. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico. 16+ vols. New York and Oxford. Vol. 3  
[http://www.efloras.org/florataxon.aspx?flora\\_id=1&taxon\\_id=200007697](http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=200007697) accessed 7/11/2011.

Province of Alberta 2010, Weed Control Act, Weed Control Regulation; Alberta Regulation 19/2010, © Alberta Queen's Printer, 2010. [http://www.qp.alberta.ca/documents/Regs/2010\\_019.pdf](http://www.qp.alberta.ca/documents/Regs/2010_019.pdf). Accessed online 8.1.2011.

Summit County, 2009 Summit County Weed Management Plan 2009, Colorado.  
<http://www.co.summit.co.us/weeds/documents/2009%20Weed%20Management%20final%20plan.pdf>.  
Accessed on 8.1.2011

Toomey M. and E. Leeds. 2001. An Illustrated Encyclopedia of Clematis. Timber Press, Portland Oregon. pg. 304

USDA, ARS, 2011. National Genetic Resources Program. *Germplasm Resources Information Network - (GRIN)* [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: <http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?98> (1 August 2011)

USDA, NRCS. 2011. The PLANTS Database (<http://plants.usda.gov>, 1 August 2011). National Plant Data Team, Greensboro, NC 27401-4901 USA.