

**WRITTEN FINDINGS OF THE
WASHINGTON STATE NOXIOUS WEED CONTROL BOARD
(November 1999)**

Scientific Name: *Clematis vitalba* L.

Common Name: old man's beard

Family: Ranunculaceae

Legal Status: Class C

Description and Variation: *C. vitalba* is a perennial vine with climbing, woody stems that can grow 20 to 30 meters long. The leaf arrangement is opposite. The leaves are pinnately compound, consisting of usually 5 leaflets. The leaflet margins are usually entire, but the upper leaflet is sometimes 3-lobed. This species is deciduous. The flowers are white to greenish-white, and they are about 2 cm in diameter. The inflorescence of *C. vitalba* is a terminal axillary panicle – the flowers are found in stalked clusters of the upper leaf axils.

Each individual flower is perfect, they contain both male and female flower structures (stamens and pistils). The flowers do not have petals - they are composed of 4 sepals, many stamens and many styles. Some stamens can be non-fertile, and some are petaloid. The styles are plumose (feathery), and they are long, white and persistent. The fruit is an achene. The common name, old man's beard, is from the seed stage of the flower, when a mass of white is produced from the feathery styles that elongate and stay attached to the small hairy seed.

C. vitalba is similar in appearance to our native *C. ligusticifolia*, whose range in Washington is east of the Cascades, in sagebrush to ponderosa pine forest, and usually associated with creek bottoms (Hitchcock et al. 1994).

	<u><i>C. vitalba</i> (exotic)</u>	<u><i>C. ligusticifolia</i> (native)</u>
Flowers:	perfect, each flower contains stamens and pistils	flowers are male (staminate) or female (pistillate)
Leaves:	leaflet margins usually entire, with the upper leaflet sometimes 3-lobed	leaflets are coarsely toothed

Economic Importance:

Detrimental: In areas where *C. vitalba* has naturalized (New Zealand), this species blankets shrubs and native trees over 20 meters tall. Once the tree collapses, *C. vitalba* continues to grow along the ground in layers that are several meters thick, preventing the regeneration of anything below it. Any light necessary for plant growth is blocked out. *C. vitalba* spreads quickly along river margins, but it will establish in any area not intensively managed or grazed (Cronk and Fuller, 1995).

Beneficial: Considered an ornamental.

Habitat:

The ecological behavior of *C. vitalba* changes when it is found outside of its native range (Cronk and Fuller, 1995).

In the native ranges of Wales and southern England, *C. vitalba* is associated with chalk and limestone areas. Low calcium levels impede, or delay the growth. In central Europe this species is found in soils ranging from weakly acidic to weakly basic, and it requires highly fertile soils with good drainage. The climate of the native ranges is temperate and moist. Limiting factors in native ranges include an annual rainfall of less than 800 mm (31.5 inches), and the low summer temperatures of the higher elevations.

Outside of its native range, this species is found in the forest lands, and it is found in the margins, and openings of forested lands. It is also found in riparian areas established with willows, in waste areas, and in coastal and lowland areas (Cronk and Fuller, 1995).

In Washington *C. vitalba* is found west of the Cascade Mountains. A request for distribution information in Washington was sent out in January 2000.

Geographic Distribution:

C. vitalba is native to south, west and central Europe. This native distribution also extends to the Netherlands, south to the Mediterranean and east to the Caucasus Mountains (Cronk and Fuller, 1995).

History:

C. vitalba is known in Washington from west of the Cascade Mountains. San Juan County proposed it for listing to the 2000 Washington State Noxious Weed List. In New Zealand, *C. vitalba* was recorded as naturalized by mid 1930's.

Growth and Development:

C. vitalba is a woody, perennial vine, with annual leaf loss (deciduous). Flowers are visible throughout most of the summer. The whitish, fluffy seed heads are visible in the fall and winter. Seeds fall sporadically over the winter, which may contribute to a seed bank.

C. vitalba requires high light for growth and reproduction, and is tolerant of moderate shade. In seedling germination studies done in forests, *C. vitalba* seedlings did not survive in undisturbed forests with low light levels. It was also found that nitrogen may be the limiting nutrient resource (Bungard et al. 1998).

Invasive characteristics include: rapid growth rate; early reproductive maturity; easy vegetative spread from fragmentation; quick recovery from physical damage and the ability to resprout; and *C. vitalba* is a prolific seed producer, whose seeds are dispersed by wind (Cronk and Fuller, 1995). Stems can produce 5 meters of new growth each season. The trailing stems along the ground can produce roots at each node, giving *C. vitalba* the capability to produce a new plant every 15cm (5.9 inches). Fragments are spread by water, and from garden cuttings.

Reproduction:

Plants mature faster in full sunlight, and seed production is possible after one to three years, depending on the exposure to full sunlight. Asexual reproduction is possible after one year. An estimated 17,000 viable seeds are produced per 0.5m² in areas where *C. vitalba* is a canopy species. Seed dispersal is by wind, water, people and animals. *C. vitalba* is wind pollinated and insect pollinated. The filaments produce nectar, which attract insect pollinators. Several bee species and flies are attracted to the pollen and nectar.

C. vitalba can also spread by fragmentation, when roots are produced from stem fragments and from attached stems. Vegetative spread by fragmentation occurs more often from older plants, since the older stem tissue holds more water and it has higher carbohydrate reserves (Cronk and Fuller, 1995).

Response to Herbicide:

Several herbicides are mentioned as an effective control for *C. vitalba*, with most herbicide control information originating from New Zealand. One method mentioned is to cut the vine at ground level and at waist height, and treat both ends. Round-up® is one herbicide used, with mixed success rates, with better control from younger, less mature plants (Cronk and Fuller, 1995). Before chemical treatment, read label instructions for site specific information.

Response to Cultural Methods:

Response to Mechanical Methods:

Seedlings can be hand pulled. Larger stems need to be cut and removed from the area.

Biocontrol Potentials:

Because of the wide spread distribution and impact of *C. vitalba* in New Zealand, and given the plant biology (vigorous resprouting when cut, and spread by fragmentation), biocontrol agents may be the only feasible and practical answer for control. A list of potential biocontrol insects from England has been gathered, and research into host specificity still needs to be completed before release into New Zealand. Possible biocontrol candidates include: *Horisme vitalbata* – attacks the leaves; *Melanthia procellata* and *Eupithica haworthiata* – damages the flowers; and *Xylocleptes bispinus* – attacks structural and vascular stem tissue (Cronk and Fuller, 1995). A fungus, *Phoma clematidina*, perhaps spread by the leaf miner *Phytomyza vitalbae* is used as a biocontrol agent (information from CABI Bioscience Centre, Switzerland).

References:

- *Bungard, R.A. and D. McNeil and J.D. Morton. 1997. Effects of chilling, light and nitrogen-containing compounds on germination, rate of germination and seed inhibition of *Clematis vitalba* L. Abstract from: Ann-bot. London; New York: Academic Press, June 1997. V. 79 (6) p. 643-650.
- *Bungard R. A. and J.D. Morton, D.L. McNeil and G.T. Daly. 1998. Abstract from: Effects of irradiance and nitrogen on *Clematis vitalba* establishment in a New Zealand lowland podocarp forest remnant.
- *Cronk, Q.C.B. and J. L. Fuller. 1995. Plant Invaders. The threat to natural ecosystems. Chapman and Hall. London, Glasgow, Weinheim, NY, Tokyo, Melbourne, Madras. Pp. 69-72.

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*Popay, A.I. 1986. Aglink, FPP 858. Old Man's Beard *Clematis vitalba*. Information Services, MAP, Private Bag, Wellington, NZ.

****References available from the Washington State Noxious Weed Control Board Office in Kent, WA.***

Rationale for Listing:

Clematis vitalba (old man's beard), is an exotic, perennial vine known from several areas in western Washington. Outside of its native range, the ecological behavior of *C. vitalba* changes, and exhibits invasive characteristics that include: rapid growth rate; early reproductive maturity; easy vegetative spread from fragmentation; quick recovery from physical damage with the ability to resprout; and prolific seed production with wind dispersal.

In areas where *C. vitalba* has naturalized (New Zealand), this species blankets shrubs and native trees over 20 meters tall. Once the tree collapses, *C. vitalba* continues to grow along the ground in layers that are several meters thick, preventing the regeneration of anything below it. Any light necessary for plant growth is blocked out. *C. vitalba* spreads quickly along river margins, but it will establish in any area not intensively managed or grazed.

On Orcas Island, in San Juan County, the impacts of *C. vitalba* are visible and spreading as this species climbs over the forested areas. As a Class C noxious weed, each county or weed district will have the ability to control and prevent this plant from spreading in their areas.