WRITTEN FINDINGS OF THE
WASHINGTON STATE NOXIOUS WEED CONTROL BOARD
(February 2000)

Scientific Name: *Leucanthemum vulgare* Lam.
Synonym: *Chrysanthemum leucanthemum* L.

Common Name: Oxeye daisy

Family: Compositae (Asteraceae)

Legal Status: Class B: (a) Regions 7, 10
(b) Region 9 except those areas lying within Klickitat and Yakima counties west of Range 13 E.
(c) Region 6, except those areas lying within Yakima and Kittitas counties west of Range 13 E.

Description and Variation: Oxeye daisy is a perennial herb, 1 to 3 feet tall, with shallow, branched rhizomes and adventitious roots. The stems, which arise from upturned rhizomes or buds on the root crown, range from hairless to slightly hairy. The prostrate, basal stems can root, while the other stems are erect and simple to slightly branched. Cotyledons open aboveground and wither soon after the first leaves form. The toothed, spatula-shaped to round basal leaves occur on long stalks. The stem leaves are alternate and lack stalks; they are lance-shaped to ligulate, with coarse teeth and often have a few lobes at the base. Flowers are showy and daisy-like, with 20 to 30 white ray flowers and numerous, bright yellow disk flowers. Flower heads are usually solitary and grow on long, terminal stems; heads average 1 to 2.2 inches in diameter. Involucral bracts are narrow with a dark brown, scarious margin. The fruit is a dry, indehiscent achene that is circular in outline and lacks a pappus. The entire plant has a disagreeable odor when crushed (Holm et al. 1997; Howarth and Williams 1968; Olson and Wallander 1999).

Economic Importance: *Beneficial:* Flowers are showy, making the plant a popular ornamental species. Leaves are sometimes used in salads (Howarth and Williams 1968). Tea made from the whole plant has diuretic and antispasmodic properties and is used to treat asthma and whooping cough (Holm et al. 1997).

Detrimental: Oxeye daisy is a weed of 13 crops in 40 countries, causing particular problems in pastures. The plant becomes a greater problem as grazing intensity increases. In Canada, it is a serious weed of barley, flax, oats, oilseed rape, sunflowers, and wheat. It competes with cereals and has been shown to reduce oat yield in Canada by up to 16 percent. Oxeye daisy can also host aster yellow and several nematode species (Holm et al. 1997).

Although oxeye daisy is not poisonous, it can give milk an off-flavor if animals consume it. Horses, sheep, and goats will eat oxeye daisy, but cows and pigs avoid it (Howarth and Williams 1968). Plants are low in protein (8.4%) and high in fiber (29%) (Holm et al. 1997). Plants resist cutting, trampling, and grazing (Howarth and Williams 1968). Since cattle avoid oxeye daisy,

the carrying capacity of infested pastures is reduced when cattle are the main grazers (Olson and Wallander 1999).

Many of the exact economic and environmental impacts of oxeye daisy have not been precisely documented. It aggressively invades fields, where it forms dense populations, thus decreasing plant species diversity. In areas of heavy infestation, bare soil is more common, which increases the potential for soil erosion (Olson and Wallander 1999).

Geographical Distribution: Oxeye daisy is a European native that has spread to become a weed in 40 countries, from Africa to Australia and North and South America. The plant is particularly abundant in Europe and North America (Holm et al. 1997). In the U.S., it is found in every state, although it is less common in the south (Olson and Wallander 1999). In Washington, it occurs in both the eastern and western sides of the Cascades; it is particularly abundant in southwestern and northeastern Washington (Washington State Noxious Weed Control Board, unpublished data).

Habitat: Oxeye daisy can survive over a wide range of environmental conditions. It is common in native grasslands, overgrazed pastures, waste areas, meadows, railroad rights-of-way, and roadsides. The plant can grow on a wide range of soils, especially those low in pH and nutrients (Holm et al. 1997; Howarth and Williams 1968; Olson and Wallander 1999). In Europe, the plant is found up to 70° north and 3300 feet in elevation. The plant is unaffected by frost and survives drought well (Howarth and Williams 1968).

History: Oxeye daisy has moved around the world in a variety of ways. Seeds moved into Sweden with timber and into Ireland as a contaminant of ryegrass and timothy (Holm et al. 1997). It was introduced to the Pacific Northwest in the late 1800's and spread primarily as a contaminant of forage grass and legume seed. By 1937, it had spread to cover half the counties in the region (Forcella 1985 cited in Holm et al. 1997). The plant continues to move around the region as an ornamental. Although sale/distribution of the plant is prohibited in Washington, seed packets continue to appear for sale in nurseries.

Growth and Development: Oxeye daisy seeds have no dormancy requirements (Howarth and Williams 1968). Although the plant germinates throughout growing season, most seedlings establish in autumn. Growth is slow during the first winter and spring. Extensive rhizome and crown development occurs during the summer, and the crown will send up new shoots in the fall. The plant flowers during its second year. However, flowering may be delayed if plants are growing under competitive conditions (Holm et al. 1997). Flowering occurs June to August, with seeds dispersing August to September. Seeds will germinate as soon as they are dispersed (Howarth and Williams 1968).

Oxeye daisy rarely appears as a single plant, except when it is newly established from seed. It usually grows in small to large patches (Howarth and Williams 1968).

Reproduction: Oxeye daisy can spread both vegetatively and by seed. Sexual reproduction is more important in more open habitats (Howarth and Williams 1968).

The plant is adapted to insure outbreeding. Disk flowers produce pollen during a male stage that precedes the female stage. Primarily insect pollinated, visitors include the insects from the orders Coleoptera, Diptera, Hymenoptera, Lepidoptera, and Thyanoptera (Howarth and Williams 1968). Plants normally produce 1300 to 4000 fruits, but a vigorous plant may yield up to 26,000 (Dolph-Petersen 1925 cited in Howarth and Williams 1968). Champness and Morris (1948) found one million seeds per hectare in arable fileds and up to 4.2 million seeds per hectare in grasslands.

Fruits are dispersed by wind, as well as in dung and with crop seeds. Less than 40 percent of seeds passing through cattle are viable. Seeds can remain viable for long periods, but they normally germinate the year they are shed or the following spring. Studies indicate 90 to 95% germination at 20° C. Light and chilling appear to have no effect on germination rates (Howarth and Williams 1968).

Response to Mechanical Control Methods: Because of its shallow root system, oxeye daisy is easily killed by intensive cultivation. In pastures, mowing as soon as the first flowers open can eliminate seed production. However, mowing may stimulate shoot production and subsequent flowering in areas with adequate growing seasons (Olson and Wallander 1999).

Response to Cultural Control Methods: Seeds germinate readily on bare soil, so minimizing bare soil exposed by farming or haying practices, or livestock grazing is valuable (Olson and Wallander 1999).

Under high stocking densities in an intensive grazing system, cattle may eat oxeye daisy (Olson and Wallander 1999).

Response to Herbicides: Picloram and 2,4-D are effective at reducing canopy cover of oxeye daisy. However, based on a study in an eastern Washington mountain meadow, application of nitrogen fertilizer was almost as effective as the herbicides at reducing canopy cover of oxeye daisy (Roche unpublished study). After seven years, 80 pounds of N was the most cost effective control; grass yields increased 500 percent with this treatment.

Biocontrol Potentials: Effective biocontrol insects or pathogens have not been found for oxeye daisy (Olson et al. 1997). Oxeye daisy contains polyacetylenes and thiophenes that are generally highly toxic to insect herbivores (Guillet et al. 1995).

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