SPECIES ACCOUNT FOR MARSH PLUME THISTLE (CIRSIUM PALUSTRE)

1.0 BACKGROUND
Marsh plume thistle (Cirsium palustre (L.) Scop.) was introduced into North America from Europe. It has become a plant of concern in the Prince George Timber Supply Area (PGTSA), as populations are spreading west from the Robson Valley. North American research is scarce, but there are a large number of European sources that shed light on this species’ ecology. Many of these resources were compiled by Nancy Fraser, of the Ministry of Forests, Forest Practices Branch in Kamloops, BC, in 2000.

The species was first located in Prince Rupert as early as 1954, near Valemount during the 1980s, and has since developed a population in the Robson Valley. This population has begun to threaten the PGTSA with its rapid spread west from the east end of the Robson Valley to Purden Lake Provincial Park.

1.1 Taxonomic Overview

**Scientific Name**

*Cirsium palustre* (L.)

**Family**

Compositae

**Common Names**

Marsh Thistle
Marsh Plume Thistle
European Swamp Thistle

2.0 DESCRIPTION

The following description is modified from Fraser (2000), Douglas et al. (1998), and the Ministry of Agriculture, Foods, and Fisheries (MAFF 2002).

Marsh plume thistle is identified by tight clusters of light purple flowerheads at the terminal apex of long (0.3 – 2.0 m) straight, unbranched, stems. Bracts at the base of the flowerheads are armed with a long spine. Leaves are spiny and deeply segmented, have winged bases, and can be hairy on the underside. Marsh plume thistle has long fibrous roots as well.

The seeds of marsh plume thistle are 2.5-3.5 mm long, straw coloured, and possess a 9-10 mm long “tawny pappus” (Douglas et al. 1998).
3.0 DISTRIBUTION

Marsh plume thistle has been in North America since at least 1902, where it was discovered in New Hampshire (Fraser 2000). It is currently located in New Zealand, Canada, the United States, and Eurasia.

3.1 North America

Currently, in Canada, marsh plume thistle has been reported from British Columbia to Nova Scotia including reports in Ontario, Quebec, Newfoundland and the French Islands. In the US, marsh plume thistle has been reported in Massachusetts, Michigan, New Hampshire, New York, and Wisconsin (Fraser 2000). In Canada the thistle was first documented in Prince Rupert, BC, and has since developed independent infestations in the province.

3.2 British Columbia

Although there are infestations of marsh plume thistle in several distinct locations across British Columbia, marsh plume thistle is infrequent in BC south of 55°N (Douglas et al 1998). Marsh plume thistle is located in Prince Rupert, on the Queen Charlotte Islands, and on Vancouver Island. In the 1980s it was identified in the Robson Valley, and has steadily spread west from this site (Fraser 2000). It is currently as far west as the Purden Lake Provincial Park, and a containment line has been established to help limit any further spread.

Population numbers or total land area affected are not available for BC, but there are dense clumps throughout the Robson Valley, and they continue along Highway 16 east into the Purden Lake Provincial Park. There are scattered reports of individuals in southern portions of the province. As of 2002 there were approximately 130 hectares of land covered by marsh plume thistle in the McBride area (Mahoney and McGuire 2004).

3.3 Regional

According to current IAPP inventory records (MOFR 2007) within the PGTSA, there are 780 sites recorded. Field surveys suggest that these sites are three quarters (75 percent) accurate. Marsh plume thistle is located primarily east of Prince George, from Purden Lake into the Robson Valley. There are numerous relatively isolated sites on the north side of the Fraser River, along cutblocks and roads in the North Fraser Road area from Averil Lake to the McGregor River. There has been a containment line established encompassing this area and its western boundary corresponds to Purden Lake Provincial Park. Sites have been found off of the Blackwater Road, over 90 kilometers “as-the-crow-flies” from the edge of the containment area.

4.0 PLANT CHARACTERISTICS

4.1 Habitat

Marsh plume thistle is well adapted to moist-to-wet openings, including pastures, bog and fen communities, cut-blocks, and roadsides. However, it can grow in a range of soil types, from humic soils to gravel. Although it is generally shade-intolerant, preferring full sun, it can germinate and establish under the forest canopy (MAFF 2002).
In the PGTSA, marsh plume thistle is located primarily in the SBSwk1 subzone, and was also observed in the ICH, and low lying areas with little or no slope.

### 4.2 Life Cycle

Marsh plume thistle is a facultative biennial of European origin that reproduces by seed. As a biennial, the plant forms a rosette for the first year, forms a flowering stalk in their second year, and dies after seed set (MAFF 2002). It is defined as a facultative biennial because under differing environmental conditions it may remain vegetative as a rosette for 4-5 years before producing seed (Fraser 2000; Falinska 1997). Populations are maintained by numerous wind-dispersed seeds, a persistent seed bank, the ability to germinate throughout the growing season, and possible allelopathic properties (Fraser 2000). Moisture appears to be the most limiting factor to the distribution of marsh plume thistle. It is an early successional species and is inhibited by intra-specific competition (Fraser 2000).

Often marsh plume thistle is an early successional invader, taking advantage of recently exposed sites. It can be outcompeted by later successional stage vegetation that shade out marsh plume thistle (i.e. willow) (Fraser 2000). Marsh plume thistle is able to germinate from April to October. However, the majority of seedlings emerge in the spring or fall (Fraser 2000). Germination can be inhibited by shade and low temperature. Specific temperature requirements for germination are not currently available for the region.

Marsh plume thistle has a persistent seed bank. Because not all seeds germinate immediately after dispersal the seed bank changes little in size, once established, even with a decrease in surrounding seed production (Fraser 2000). Light will cause the seeds to germinate (Fraser 2000). It is unknown how long the seeds remain viable in the seed bank.

### 4.3 Impacts

Marsh plume thistle does not generally invade cultivated areas but it can spread in moist pastures. This plant is unpalatable to cattle and it therefore reduces available desirable forage plants, thereby reducing carrying capacity. It can colonize undisturbed riparian habitats, moist fields, and meadows, where it may replace native vegetation, reducing wildlife and livestock forage values. It colonizes cut-blocks after harvesting and forms dense stands that compete with tree seedlings. Tall, persistent stems can cause snow press and other forms of mechanical injury to tree seedlings (MAFF 2002).

Although no allelopathic properties have been confirmed in marsh plume thistle, Ballegaard and Warncke (1985b) learned that ethanol extracts from *Cirsium palustre* leave negatively impacted seedling growth in a dramatic way. The relevance to other species, however, was not assessed, nor was the impact of microbial, absorptive, or other physical processes, under natural conditions on the foliage.
6.0 REFERENCES


Pons, T.J. 1977. Ecophysiological study in field layer of ash coppice: experiments with *geum-urbanum* and *Cirsium palustre* in different light intensities. Acta Botanica Neerlandica **26**: 29-42