

Dwarf Mistletoe – Biology & Distribution

- [Biology & Behaviour](#)
- [Hosts & Symptoms](#)
- [Geographic Distribution](#)

Biology and Behaviour

Parasitic and pathogenic effects of dwarf mistletoes include reduced growth rates and decreased strength and quality of infected wood. Individual small trees can be killed, and, in time, growth of infected, living trees can become completely stagnated.

Statistically, growth losses caused by dwarf mistletoes become clearly evident (i.e., differences in growth rates are significantly different than those expected by chance variation alone) after 50% or more of tree branches become infected with mistletoe plants, generally when trees are 15 to 20 years of age or older.

Very large stem swellings caused by hemlock dwarf mistletoe drastically affect wood quality. Severely infected trees are also more susceptible to other damaging agents.

Several features of dwarf mistletoe influence stand dynamics, and should be kept in mind when assessing pest risks or developing silvicultural or stand management prescriptions:

- Dwarf mistletoes are obligate parasites that survive only on live branches or stems of living trees. They die as soon as a branch or stem dies.
- In forests disturbed by logging or fire, dwarf mistletoes survive on residual overstorey trees, and eventually spread to nearby young regeneration. Birds or squirrels occasionally carry dwarf mistletoe seeds, but they are not considered important sources of spread.
- Dwarf mistletoe seeds are explosively ejected from plants to horizontal distances of up to 15 m, and land on tree branches or stems with needles to cause a new infection.
- Depending on the species and other conditions, three to five years (or more) elapse before new infections produce seeds, two to three years for visible swelling in the host bark, and one to two years for shoots and flowers. Seeds mature one year later, and are dispersed in late summer or autumn.
- Initial spread of dwarf mistletoe from infected residual trees to susceptible regenerating trees depends on several factors, including:
 - age and size of young target trees
 - amount of dwarf mistletoe seed spreading to the target trees
 - stand density and distribution of both residual and target trees



Larch dwarf mistletoe,
Arceuthobium laricis

- Trees can be infected at any age but generally must be 2 to 3 m in height (10 years or older) before appreciable new infections are visible. Lodgepole pine regeneration as small as 30 cm tall can be visibly infected.
- In lodgepole pine stands, spread of dwarf mistletoe into young trees is more extensive from single, isolated residual trees than from relatively uniform, dense, even-aged stands of residual trees. Spread appears to be accelerated when dense infected residual stands are partially disturbed by cutting or wildfire.
- Within even-aged stands, dwarf mistletoes spread slowly (approximately 1 m to 1.5 m per year), with faster spread in less dense stands

Hosts and Symptoms

Trees of all ages can be parasitized and affected by dwarf mistletoes. In B.C., four dwarf mistletoe species are of concern (see table below).

For detailed information on their field identification, refer to the *Field Guide to Pests of Managed Forests in British Columbia* or another suitable field identification reference.

Dwarf Mistletoe	Major Host(s)	Secondary Host(s)
Lodgepole pine dwarf mistletoe	lodgepole pine	ponderosa pine
Western hemlock dwarf mistletoe	western hemlock	anabilis fir, grand fir, sitka spruce
Western larch dwarf mistletoe	western larch	lodgepole pine (commonly infected), western white pine, grand fir
Douglas-fir dwarf mistletoe	Douglas-fir	grand fir

Other dwarf mistletoes in B.C. include a subspecies found on shore pine in coastal areas, and a subspecies on mountain hemlock in a few south-coastal, subalpine localities. Procedures outlined in this guide will also apply to these limited situations.

Secondary host tree species are often infected by dwarf mistletoe when growing near infected, major host tree species. Where such trees are infected, they should be treated the same as major tree species. Any

species not listed in the table above as susceptible to dwarf mistletoe are potentially useful for regenerating infected stands or for retention as future crop trees, and for leave trees for wildlife or biodiversity purposes.

Dwarf mistletoes are readily identified in ground surveys during the data collection phase of forest development plans or any prescriptions. Symptoms of infection such as brooming and stem or branch swellings should be verified by identifying the dwarf mistletoe shoots on affected bark. Low-level aerial observations, although useful to indicate general areas of severe occurrence, must be verified by ground-level detection.

Geographic distribution of dwarf mistletoes in British Columbia

Figure 1. Lodgepole pine dwarf mistletoe (*Arceuthobium americanum*).

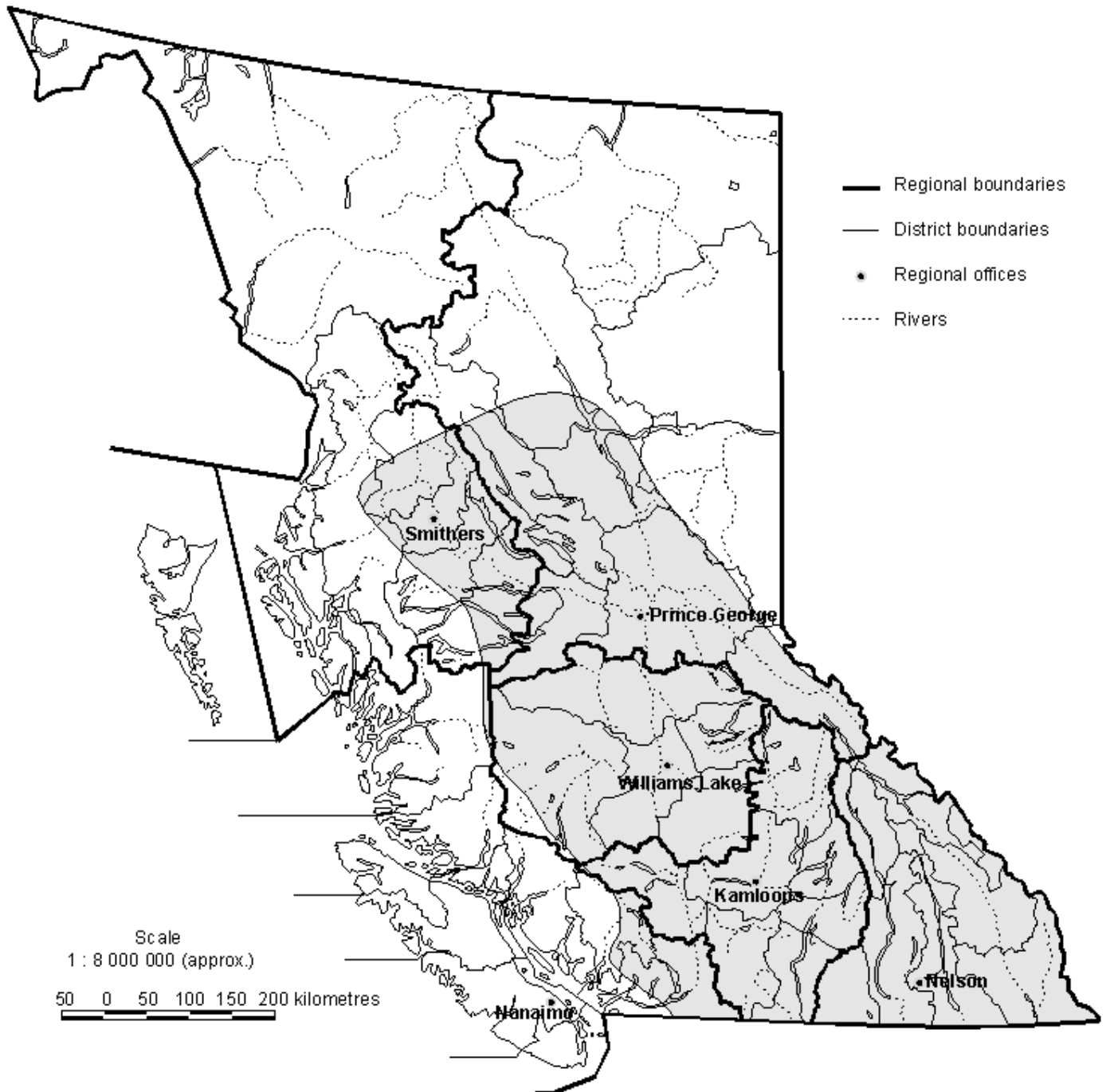
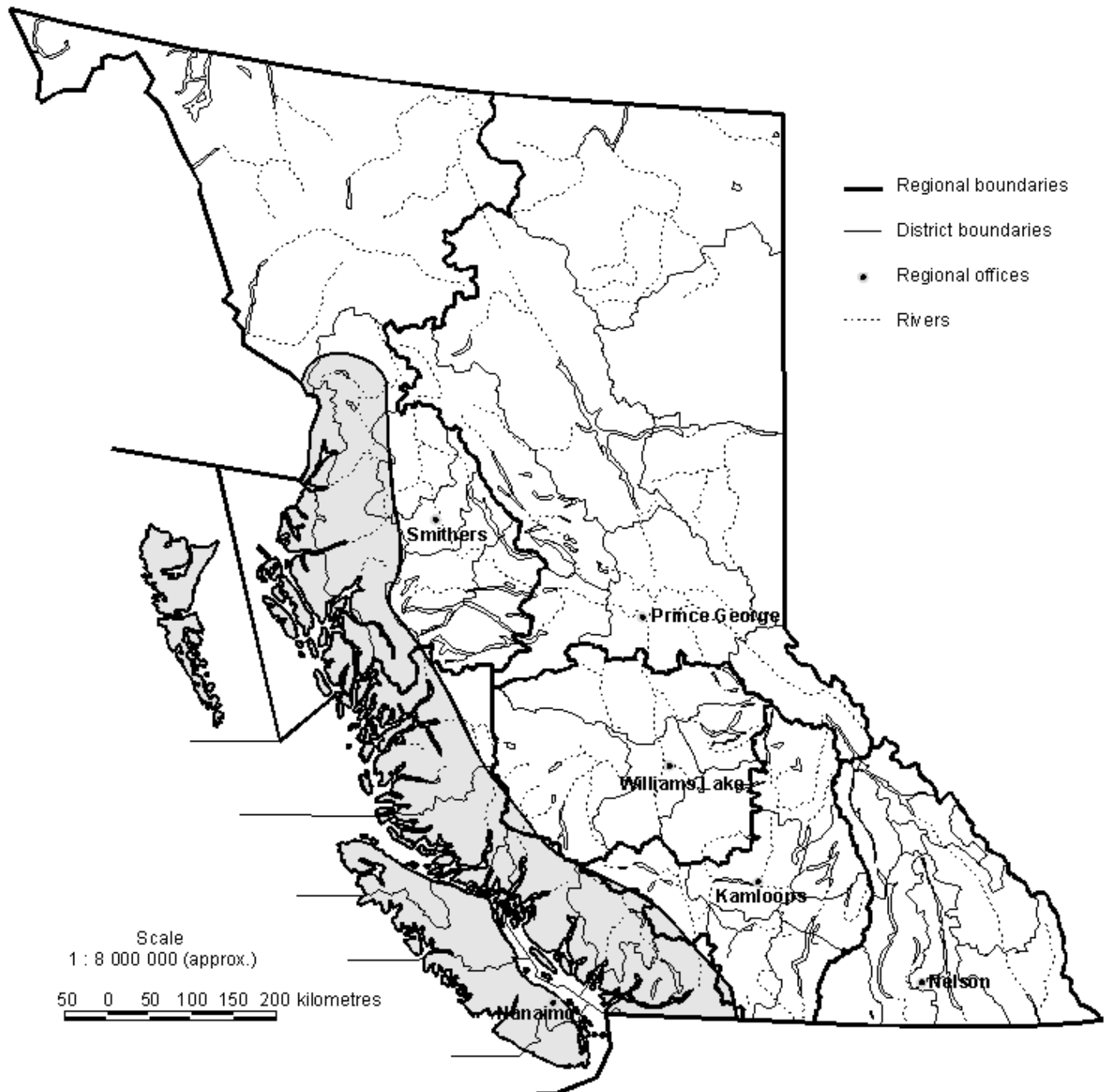


Figure 2. Western hemlock dwarf mistletoe (*Arceuthobium tsugense*).



Note: With the exception of a few areas in the Prince Rupert Forest Region, western hemlock dwarf mistletoe occurs only in coastal, not interior, hemlock stands.

Figure 3. Western larch dwarf mistletoe (*Arceuthobium laricis*).



Figure 4. Douglas-fir dwarf mistletoe (*Arceuthobium douglasii*).

