



Invasive Plant Information for FSP Preparers & Reviewers within the Coast Area

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1. Forest Practices and Invasive Plants:

- a. Forest practices are a possible cause of the introduction or spread of invasive plants.
- b. Road, landing, skid/hoe trail construction, maintenance, use and deactivation are forest practices that represent the greatest potential risk for introducing or spreading invasive plants. The movement of vehicles and equipment involved in these activities also represents a high potential risk. Timber harvesting, silviculture treatments, botanical forest product collecting and fire use, control and suppression are generally lower risk forest practices.

2. Identifying and Prioritizing Invasive Plant Threats and Risk:

- a. The extent to which measures prevent the introduction or spread of invasive plants is a function of both site risk and species priority.

b. Site Risk

- i. High risk sites are those most vulnerable/susceptible to invasion and where the ecological, economic and/or social impacts would be the greatest.
- ii. At the landscape-level, susceptibility to invasive plant invasions varies by BEC zone/subzones across coastal BC. The driest, most light-dominated BEC zone/subzones rank highest. These BEC zones also have the highest human populations which contribute to spread through increased soil disturbance i.e. proximity to cities and towns, trails and linear corridors elevates risk of invasion into susceptible habitats.

Highest Risk	IDFww, CDFmm, CWHxm
Moderate Risk	CWH – ds, dm, ms, mm, ws
Lowest Risk	CWH – wm, vm, wh, vh, MH – mm, wh

- iii. At the local-level, direct proximity to the following areas makes a given site important. These sites apply to any of the above BEC zones.

High Risk	Parks & protected areas
	Ecological reserves
	Endangered ecosystems e.g. Garry Oak Ecosystem in the CDF
	Wildlife Habitat Areas (WHAs)
	Ungulate Winter Ranges
	First Nations spiritual use areas
	First Nations native plant collection areas (for food, medicine, clothing etc.)
	Along banks of wetlands (including marshes, swamps, fens or bogs), lakes, ponds, rivers, streams, or ditch lines
	Gravel pits
Uncultivated agricultural land – pastures, rangelands etc.	

- iv. Forest Development Units that contain or lie within close proximity to high risk sites warrant careful consideration and appropriate measures to prevent a forest practice from introducing or spreading an invasive plant species.

c. Species Priority

- i. The following criteria are used to determine what level of priority a given species has within a particular management area:
- the length of time an invasive plant species has been in a given area i.e. how established it is;
 - how geographically dispersed the species is;
 - whether a plant species is under biological control (i.e. insects, parasites and pathogens that have been introduced to reduce a target plant population below a desired level) and;
 - the potential ecological, economic and/or social impacts of the species.
- ii. **Appendix A** provides a specific list of high priority invasive plants for MFR/BCTS Operating Areas by former Forest District within the Coast Area.

3. Engaging the Challenge Through Collaboration

- a. An effective response to the introduction or spread of invasive plants is often beyond the scope and ability of a single plan holder. Therefore, a coordinated approach through participation with the local/regional invasive plant committee is advisable. Such collaboration can help to discern locally important/priority species, as well as effective, ecologically-suited treatment options.

The following table lists applicable regional weed committees for each of the eight former Ministry of Forest & Range district offices.

Table 1.

Natural Resource Districts	Regional Weed Committee
Chilliwack	Fraser Valley Invasive Plant Committee http://www.fraservalleyweeds.com/invasive_plants.htm
Squamish	Sea-to-Sky Invasive Species Council http://www.ssisc.info/home representing Electoral Areas C & D of the Squamish Lillooet Regional District (including Lions Bay, Britannia Beach, Brackendale, Squamish, Whistler, Pemberton, Mount Currie, Devine and D’Arcy)
South Island	Coastal Invasive Plant Committee* www.coastalinvasiveplants.com
Campbell River	Coastal Invasive Plant Committee* www.coastalinvasiveplants.com
Sunshine Coast	Coastal Invasive Plant Committee* www.coastalinvasiveplants.com
North Island - Central Coast	Coastal Invasive Plant Committee* www.coastalinvasiveplants.com
Haida Gwaii	Northwest Invasive Plant Committee* http://www.nwipc.org/
North Coast	Northwest Invasive Plant Committee* http://www.nwipc.org/

* Currently operates under a collaborative strategic plan

- b. Effective invasive plant management is complex and requires knowledgeable staff who know where infestations exist and whether or not they are spreading. Ongoing vigilance and reporting is necessary as each species’ biology is unique. Generally, it is easiest to identify an invasive plant by its flower. Flowering times vary by species, latitude and elevation. Contractors are available to assist in preparation of the invasive plant management section of Forest Stewardship Plans, if expertise is not available in-house.

4. Invasive Alien Plant Program Tools

- a. The MFR's Invasive Alien Plant Program (IAPP) Application is the most comprehensive database available for use in British Columbia today.

See: <http://www.for.gov.bc.ca/hra/Plants/application.htm>

The database was developed so that stakeholders would not need to set up their own invasive plant tracking systems, and operate in isolation. Rather, it is designed for a multitude of users and provides an interactive, no-cost means of participation. However, only through widespread participation and ongoing use will it be effective. Those licensees who commit to only update the system on only an annual basis overlook the benefit of the real-time capabilities afforded by this database. Prompt input of information can make the difference in successfully abating the introduction or spread of a high priority species in an area where impacts may be significant.

Each spring, full-day IAPP Application training sessions are offered. Contact your local/regional weed committee coordinator for more information and/or to pre-register.

- b. IAPP's Map Display (see: http://webmaps.gov.bc.ca/imf5/imf.jsp?site=mofr_iapp) can be utilized by anyone wishing to learn where invasive plants exist in BC. The locations of high priority invasive plants can be superimposed onto Forest Development Unit maps, especially those that lie within close proximity to high risk sites (see Section 2 b.) in order to formulate strategies to mitigate the introduction or spread of such species.
- c. IAPP's Report-A-Weed function is an easy-to-use (3 steps) wizard that allows for reporting a suspected new sighting of an invasive alien plant species in British Columbia.

See: http://webmaps.gov.bc.ca/imf5/imf.jsp?site=mofr_iapp&startup=raw

5. Practices to Prevent the Introduction or Spread of Invasive Plants

- a. Employment of the following, non-exhaustive list of preventive measures helps to ensure that high priority invasive plants that have established, will not be spread:
 - i. inspection and treatment of gravel pits, recreation sites, employee parking areas and equipment yards (i.e. areas of high traffic and/or soil disturbance);
 - ii. procurement of gravel pit material that contains no high priority plants (seeds or plant parts);
 - iii. inspection of clothing, and vehicle / equipment undercarriages, followed by cleaning if working in an area known to contain high priority invasive plants;
 - iv. treatment of high priority invasive plants on road building and timber harvesting projects *before* activities commence, including along skid trails, landings, and helicopter drop zones;
 - v. strategic placement of signs warning of unlawful dumping of garden or household waste and its consequences;
 - vi. education of roadside mowing and brushing equipment operators to recognize high priority invasive plants so that they are not spread e.g. Japanese knotweed reproduces primarily by cuttings, and mowing and ditch cleaning operations can exacerbate spread as broken root parts and nodes along stems can form new plants;
 - vii. While there is no obligation in *FRPA* to treat currently infested sites, it follows that eradication of such sites would greatly assist in preventing the introduction or spread of such plants, the very intent of the *FRPA*'s Section 47.

- b. In addition to the aforementioned preventative practices, prompt re-vegetation using ecologically-suited grass seed and fertilizer is a vitally important measure to undertake after soil has been disturbed given coastal BC's warm, wet climate, extended growing season and the widespread distribution of numerous invasive plants. Prompt establishment of dense, competitive vegetation cover is critical for preventing the rapid colonization by high priority invasive plants.
- i. "Prompt re-vegetation" could mean concurrent grass seeding and fertilizing after soil disturbance along or in areas not scheduled for reforestation (e.g. ditch lines, cut slopes, fill slopes, deactivated roads, disturbed roadsides or landings) within 2 growing season months after soil disturbance, recognizing that spring and fall are optimum times to seed. Grass seeding is generally preceded by site scarification (if soil compaction has occurred as a result of a forest practice) and followed by fertilization.
 - ii. See **Appendix B** for specific technical information relating to grass seeding and associated measures to prevent invasive plant spread and provide erosion control.
 - iii. A grass seed mixture that limits the potential introduction of weed seed is imperative. To ensure this, either use native seed or an agronomic grass seed that is a grade of **Common No. 1 Forage Mixture** or better.
 - iv. An agronomic grass seed with a grade of Common No. 1 Forage Mixture or better is advisable for most roadside and post-road construction/harvest forest operation scenarios or in areas where there is no immediate adjacency to a high risk site.

A commitment to use Common No. 1 grass seed alone is insufficient. Common No. 1 Forage Mixture (or better) is needed to reduce the potential of invasive plant or noxious weed seed introduction.

Avoid ground cover mixtures and lawn mixtures.

Agronomic Grass Seed – Common No. 1 Forage Mixture or better

- Select for local climate/environment e.g. BEC zone/altitude/aspect/biome
- Select an agronomic grass seed mixture that is predominantly *sodgrasses* for re-vegetating areas that are within close proximity to already established invasive plant populations, as they form a continuous mat to better resist invasive plant spread. They are especially useful around culverts and other erosion prone areas.
- Select an agronomic grass seed mixture that is predominantly *bunchgrasses* for re-vegetating areas more distant from established invasive plant populations, allowing native plants to fill in amongst the clumps.

- v. Native grass seed is best reserved for use in high value ecological areas, where retention of local biodiversity is vital. It is much more expensive than agronomic seed but generally has higher long term survival because of its adaptation to the local climate.

Native Grass Seed

- Select for local climate/environment e.g. BEC zone/altitude/aspect/biome noting specific native mixtures do exist for Garry Oak Ecosystems, high elevation sites and for riparian or wetland sites.

- vi. See **Appendix C** for ecologically-suited, species-specific information for both agronomic and native grass seed mixture options.
- vii. Avoid use of wildflower mixtures (or native wildflower mixtures). Even "native wildflower" seed mixes have been known to contain nothing but introduced and potentially invasive species.

6. Treatment / Disposal Considerations

- a. Contact MFR's Coast Zone Invasive Plant Specialist for species-specific control/treatment or disposal advice.
- b. Appropriate disposal of high priority invasive plants is critical to prevent their spread and could be recognized as a FSP measure if control measures are undertaken. High priority invasive plants can spread quickly because they possess special mechanisms to ensure their survival and proliferation such as very hard, viable, hooked, winged or floating seeds, and/or ability to reproduce vegetatively.
- c. Prevention of spread may be achieved through either localizing infestation treatments (i.e. the treatment and disposal of the invasive plant in situ) or moving associated biomass and/or contaminated soil to a common invasive plant disposal area. If biomass and/or contaminated soil are brought to a regional landfill, ensure that high priority invasive plants are land filled as opposed to composted. Composting generally does not produce sufficient heat required to kill the seeds or plant parts and therefore it represents a new vector of spread once the compost is redeployed for garden use.

7. Other Considerations

- a. If bales are used as sediment control devices, then select certified weed-free forage or clean straw as opposed to hay bales. Hay is simply live grasses cut and baled that contain grains or seeds (including potential weed seed), whereas straw is the dried stalks of standing plants that remain after the initial crop harvest but do *not* generally have seeds or grains attached.
- b. Noxious weeds are a specific category of invasive plants, regulated by the Ministry of Agriculture and Lands. They are plants designated under BC's *Weed Control Act (WCA)*. Such species are primarily a threat to agriculture, but some also pose a risk to native ecosystems. While *FRPA* confines invasive plant management to provincial Crown forest and rangeland occupiers, the *WCA* requires control of species across all land ownership classes, including private land. The Weed Control Regulation of the *WCA* is currently being updated. Once amended into law (likely in 2011), all land occupiers will have a duty to control listed species. A notable inclusion will be Giant hogweed *Heracleum mantegazzianum*. Giant hogweed poses serious threat to both human health and to the integrity of coastal BC's riparian areas. Furthermore, it is not currently widespread. Therefore, inclusion of Giant hogweed in FSP submissions is advisable where developments are planned within proximity to urban centres.
- c. FSP invasive plant measures should not be time-limited to the expiry of a Cutting Permit or Road Permit but rather consistent with the duration of the overarching tenure itself (e.g. a TFL or Forest Licence) in order that measures to prevent the introduction or spread are consistently applied across the land base over time, on a uniform basis. Further, licensee commitments that are required for in-block roads and openings need to also apply to road disturbances accessing new cut blocks (e.g. Road Permit roads built in advance of harvesting).
- d. The inclusion of the wording "...where practicable" used in association with an invasive plant measure means that measures specified in an FSP should be reasonable in the given circumstances. It is inherent that, if tested, reasonableness will be determined on the basis of both efficacy and what is practicable (e.g., while it is possible to grass seed disturbed roadsides as each new section of road is being built, it is operationally impractical to do so).
- e. Licensees may apply to the Forest Investment Account – Land Based Investment Program to seek financial assistance for conducting innovative projects and operational trials aimed at mitigating invasive species. See: <http://www.for.gov.bc.ca/hcp/fia/landbase/index.htm>. The proponent must meet application criteria that improve sustainable resource management over a short period (e.g. 3 years or less).
- e. **Appendix D** contains URLs of pertinent websites to assist with coastal invasive plant identification, biology and management.