

October 24, 2016

Marni Fedoruk
Environmental Project Coordinator
Ministry of Transportation and Infrastructure
P.O. Box 9850
Stn Provincial Government
Victoria, BC V8W 9T5

Dear Mr. Marni Fedoruk;

Re: Invasive Plant Species Assessment of the Andesite Creek Aggregate Tenure

The Ministry of Transportation and Infrastructure (the Ministry) is planning the construction of a grade separation to replace an existing level rail crossing on Highway 16, 45 km west of Terrace, BC. During planning, the Ministry is investigating suitable sites for staging of construction equipment and stockpiling of excavated rock, as well as potential sources for aggregate materials. The Ministry's Andesite Creek Aggregate Tenure, situated approximately 1.5 km east of the level crossing and immediately adjacent to the proposed work site, has been identified as a potentially suitable location. McElhanney Consulting Services Ltd. (McElhanney) was retained by the Ministry to assess invasive plant species presence and spread within the Andesite Creek Aggregate Tenure, particularly within the cleared and developed pit area. This report presents observations of assessed areas within the existing aggregate pit, as well as control measures recommended in regards to these findings in accordance with the Ministry's standards and regulatory requirements.

Legislation

The Invasive Species Council of British Columbia defines invasive plants as 'non- native plant species that have been introduced, either intentionally or accidentally, into the environment from other areas' and as agents that 'threaten natural ecosystem functions, species diversity, food security, human health and safety, and economic development.' Plant species can be considered as noxious, invasive, or as exotic. Species considered exotic, have no negative environmental, economic, or social impacts. Species that fall under the definition of invasive and noxious are of concern. Noxious weeds are regulated under the BC Weed Control Act (the Act) and are defined as: "Typically non-native plants that have been introduced to British Columbia without the insect predators and plant pathogens that help keep them in check in their native habitats." For this reason and because of their aggressive growth, these plants can be highly destructive, competitive and difficult to control. There is a provincial and regional list that has designated noxious weeds that require this control and management.

The Ministry's own Standard Specifications for Highway Construction (MoTI's Standards) along with Best Practices for Managing Invasive Plants on Roadsides (MoTI's Best Practices) both

include control measures that are to be applied during the development of the tenure and have been referenced in this document.

Study Area

The Andesite Creek Aggregate Tenure Area is situated immediately north of Highway 16 and the CN railway, approximately 40 km west of Terrace, BC, near Andesite Creek (Figure 2). The entire tenure area covers 31.9 ha. The tenure's southeast boundary starts 30 m northwest of the railway at Andesite Creek, and runs parallel to the rail southwest for 1 km. Along the northeast, the boundary borders Andesite Creek, while the northwest and southwest boundaries extend well upslope above the existing developed pit. The field assessment focused on the already developed pit areas and its boundaries within the aggregate tenure seeing as most invasive plants would have originated there.

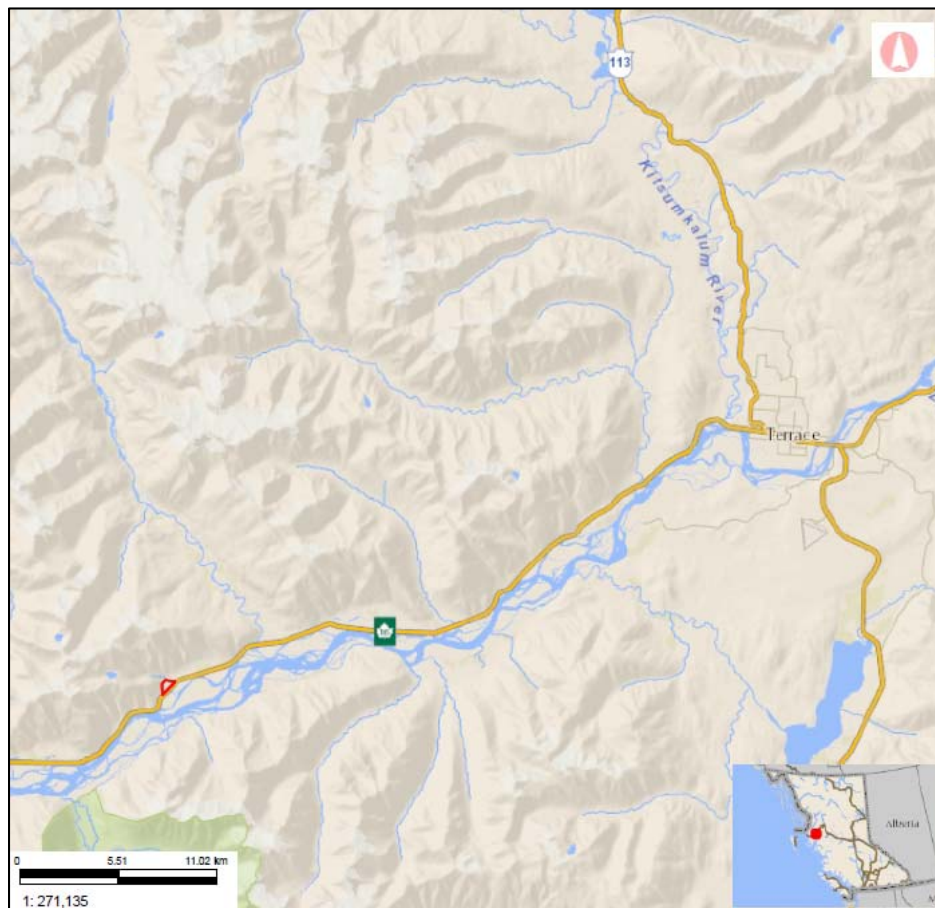


Figure 1. Area map indicating Andesite Creek Aggregate Tenure area (red), 40 km west of Terrace, BC.

The aggregate tenure is situated within the Coast and Mountain Ecoprovince of northern BC, and is contained within the Nass Mountains Ecosection of the Coastal Gap Ecoregion. It lies within the Coastal Western Hemlock (CWH) biogeoclimatic zone, at a transition zone between two subzones: the very wet maritime (CWHvm) and submontane wet submaritime (CWHws1).

Anthropogenic disturbances have included the development of the adjacent highway and railroad, as well as forest harvesting operations, the aggregate pit development, and the pit access road. These disturbances would have been the sources for invasive plant dispersal and eventual establishment and propagation.

Methods

The assessment of the Andesite Creek Aggregate Tenure Area was intended to identify any invasive plant species that were already present on the site. A desktop assessment of the study area utilized the province's public mapping software and the Northwest Invasive Plant Council website to determine any already marked invasive species within the development zone. Field investigations involved a crew of two walking and working around the pit as demarcated in Figure 2 and along the access road on September 2, 2016. Photographs were taken while invasive plant species were keyed and their reaches within the footprint were noted.



Figure 2: Map of the study area at the Andesite Creek Aggregate Tenure (red outline) with assessed area within the orange polygon. *Map not to scale. McElhanney Vertisee, 2016.

Results

The BC Invasive Alien Plant Program did show one invasive alien plant site on the access road, however no species data was available. There were no reports of particular invasive plant observations within the tenure according to the BC and Northwest Invasive Plant Council websites. The field assessment observed several exotic and invasive plants evenly distributed through the current pit and access road, except for the Canada thistle (*Cirsium arvense*) that was

only observed along the northern edge of the current pit (Figure 3). Table 1 lists the exotic, invasive, and noxious plants found onsite, along with their location and if action is necessary under provincial legislation or under MoTI's Best Practices.



Figure 3. Photo of young Canada thistle found along the northern edge of the currently developed pit.

Table 1. Exotic, invasive and noxious plants at Andesite Creek Aggregate Tenure, their location and required actions.

Plant	Location	Action Required?
Common Tansy (<i>Tanacetum vulgare</i>)	Pit* and Road	Yes- regionally noxious under the Act
Eastern Eyebright (<i>Euphrasia nemorosa</i>)	Pit* and Road	No- considered exotic
St John's Wort (<i>Hypericum perforatum</i>)	Road	No- invasive and of concern but not regulated
Yellow King Devil (<i>Hieracium caespitosum</i>)	Pit* and Road	Yes- invasive and requires control under MOTI's Best Practices
Wall Lettuce (<i>Lactuca muralis</i>)	South eastern edge of Pit and Road	No- considered exotic
Canada Thistle	Northern edge of Pit	Yes- provincially noxious under the Act
Oxeye Daisy (<i>Leucanthemum vulgare</i>)	Pit*	Yes- regionally noxious under the Act

*Pit: Species is spread out unanimously throughout the current pit area.

Other native species observed were sweet scented bedstraw (*Galium triflorum*), Siberian miner's lettuce (*Claytonia sibirica*), yarrow (*Achillea millefolium*), Mexican hedge nettle (*Stachys mexicana*), common horsetail (*Equisetum arvense*) and pearly everlasting (*Anaphalis margaritacea*). Bedstraw has been considered a noxious weed in the northeastern states, while yarrow has been considered a weed in garden landscapes, however none of these native species are of concern in British Columbia.

Orange hawkweed (*Hieracium aurantiacum*) is currently the only hawkweed considered regionally noxious under the Act. The hawkweed species found on site was the yellow king devil and is not regulated under the Act however under MOTI's Best Practices for Managing Invasive Plants on Roadsides Pocket Guide, hawkweed species in general should be managed.

Conclusions and Recommendations

As per the Act and its regulation, noxious weeds are to be controlled, and any machinery or vehicle with noxious weeds shall not be moved along a highway. Control measures are best described in MOTI's Best Practices and Standards. These best practices will be referenced in the environmental management plan for works associated with the adjacent Highway 16 level crossing project. These would be addressed by the contractor that is awarded the works. A qualified environmental professional should visit the site with the contractor's environmental representative in order to identify and manage particular areas, avoiding the further spread of noxious weeds to other project sites and the highway.

Please note that this assessment encompasses species observed during the post flowering stage which can present a challenge to speciate all invasive plants found onsite.

Please feel free to contact the undersigned if you have any questions or concerns about this document.

Sincerely,

Prepared by,



Kasia Kistowska, BSc, BIT
Project Biologist
McElhanney Consulting Services Ltd.

Reviewed by,



Brad Pollard, MSc, RPBio, RPF
Senior Scientist
McElhanney Consulting Services Ltd.

Literature Cited

- Banner, A, W MacKenzie, S Haeussler, S Thomson, J Pojar, and R Trowbridge. 1993. A Field Guide to Site Identification and Interpretation for the Prince Rupert Forest Region. Land Management Handbook Number 26. Research Branch of Ministry of Forests, Victoria, BC. 281 pp.
- BC Weed Control Act. Government of British Columbia. 1996. [http://www.bclaws.ca/Recon/document/ID/freeside/00_96487_01] Accessed September 15, 2016.
- BC Weed Control Regulation. Government of British Columbia. 2011. [http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/10_66_85] Accessed September 15, 2016
- Invasive Alien Plant Program. Government of British Columbia. 2016. [<http://maps.gov.bc.ca/ess/hm/iapp/>] Accessed September 1, 2016
- iMapBC. Government of British Columbia. 2016. [<http://maps.gov.bc.ca/ess/sv/imapbc/>] Accessed September 1, 2016
- Invasive Species Council of British Columbia. 2016. [<http://bcinvasives.ca/>] Accessed September 1, 2016
- Ministry of Transportation and Infrastructure. 2010. Best Practices for Managing Invasive Plants on Roadsides- A Pocket Guide for British Columbia's Maintenance Contractors. Invasive Plant Council of British Columbia. Williams Lake, British Columbia.
- Ministry of Transportation and Infrastructure. 2016. Standards and Specifications for Highway Construction. Volume 1. Victoria, British Columbia.
- Northwest Invasive Plant Council. 2016. [<http://nwipc.org/>] Accessed September 1, 2016