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JASPER NATIONAL PARK ICEFIELDS PATHWAY

Non-Native Plant Survey

Submitted to:

Laura Barz
Environmental Specialist
Environmental Services, ESCSM
Public Works and Government Services Canada
100-167 Lombard Avenue
Winnipeg, Manitoba R3B 0T6

REPORT

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1.0 INTRODUCTION

The Parks Canada Agency (PCA) proposes to construct a hardened surface, multiuse walking and cycling trail (the Project) along the Icefields Parkway (Highway 93N), from the municipality of Jasper to the Columbia Icefield (approximately 107 km). As part of this proposed project PCA is conducting a Detailed Impact Analysis (DIA). To support this DIA, various biological studies along the route were completed in the summer and fall of 2016.

The Terms of Reference document for the DIA details the biological surveys required to support the DIA for the proposed project. The surveys are to provide detailed information on specific species, including vascular and non-vascular plants, and components of the environment in proximity to proposed alignment. The details and results obtained from these surveys will be used in the DIA.

Invasive plant species are especially abundant along roadways and near human disturbances (Tannas 2014). Therefore weeds have the potential to be a concern during construction and operation of the proposed Icefield Parkway Trail. Weeds can quickly become established in disturbed areas and aggressively outcompete native vegetation species. The introduction of invasive plants and their ability to spread can affect local resources, by reducing species diversity, reducing native forage species for wildlife and reducing the overall productive capability of the area (Axys 2015).



2.0 TARGET SPECIES OF INTEREST

Within the Province of Alberta, the Alberta *Weed Control Act* (2010) governs the legislation of prohibited noxious and noxious invasive plant species or weeds (Province of Alberta 2010). Prohibited noxious weeds tend to be limited in distribution and abundance, typically have not yet become established in the province, and are required to be destroyed to prevent establishment.

Noxious weeds are more prevalent and are well-established in the province, and as such, require control measures where found. Under the Alberta Weed Control Act and Regulation (2010) there are 46 prohibited noxious weed species and 29 noxious weed species (Table 1). Municipalities, counties and other jurisdictions may also upgrade the status of certain weeds depending on the areas' specific weed issues. Jasper National Park has previously completed a number of weed surveys (Tannas 2014) and the 2015 Restoration Program Year End Report (PCA 2015) resulted in invasive species rankings of "High", "Moderate", and "Low" priority. There are currently 26 high, 23 moderate and 83 low priority invasive species tracked by Jasper National Park (PCA 2015) (Table 2).

Table 1: Alberta Weed Act and Regulation (2010) Prohibited Noxious and Noxious Weeds

Designation	Common Name	Scientific Name
Prohibited Noxious	autumn olive	<i>Elaeagnus umbellata</i> Thunb.
Prohibited Noxious	balsam, Himalayan	<i>Impatiens glandulifera</i> Royle
Prohibited Noxious	barberry, common	<i>Berberis vulgaris</i> L.
Prohibited Noxious	bartsia, red	<i>Odontites vernus (Bellardi) Dumort</i>
Prohibited Noxious	buckthorn, common	<i>Rhamnus cathartica</i> L.
Prohibited Noxious	cinquefoil, sulphur	<i>Potentilla recta</i> L.
Prohibited Noxious	crupina, common	<i>Crupina vulgaris</i> Pers. ex Cass.
Prohibited Noxious	dyer's woad	<i>Isatis tinctoria</i> L.
Prohibited Noxious	Eurasian water milfoil	<i>Myriophyllum spicatum</i> L.
Prohibited Noxious	flowering rush	<i>Butomus umbellatus</i> L.
Prohibited Noxious	garlic mustard	<i>Alliaria petiolata (M. Bieb.) Cavara & Grande</i>
Prohibited Noxious	goatgrass, jointed	<i>Aegilops cylindrica</i> Host
Prohibited Noxious	hawkweed, meadow	<i>Hieracium caespitosum</i> Dumort.
Prohibited Noxious	hawkweed, mouse-ear	<i>Hieracium pilosella</i> L.
Prohibited Noxious	hawkweed, orange	<i>Hieracium aurantiacum</i> L.
Prohibited Noxious	hoary alyssum	<i>Berteroa incana (L.) DC.</i>
Prohibited Noxious	hogweed, giant	<i>Heracleum mantegazzianum</i> Sommier & Levier
Prohibited Noxious	iris, pale yellow	<i>Iris pseudacorus</i> L.
Prohibited Noxious	knapweed, bighead	<i>Centaurea macrocephala</i> Puschk. ex Willd.
Prohibited Noxious	knapweed, black	<i>Centaurea nigra</i> L.
Prohibited Noxious	knapweed, brown	<i>Centaurea jacea</i> L.
Prohibited Noxious	knapweed, diffuse	<i>Centaurea diffusa</i> Lam.
Prohibited Noxious	knapweed, hybrid	<i>Centaurea x psammogena</i> Gáyer
Prohibited Noxious	knapweed, meadow	<i>Centaurea x moncktonii</i> C. E. Britton
Prohibited Noxious	knapweed, Russian	<i>Rhaponticum repens (L.) Hidalgo</i>
Prohibited Noxious	knapweed, spotted	<i>Centaurea stoebe</i> L. ssp. <i>micranthos (Gugler) Hayek</i>
Prohibited Noxious	knapweed, squarrose	<i>Centaurea virgata</i> Lam. ssp. <i>squarrosa (Willd.) Gugler</i>
Prohibited Noxious	knapweed, Tyrol	<i>Centaurea nigrescens</i> Willd.
Prohibited Noxious	knotweed, giant	<i>Fallopia sachalinensis (F. Schmidt Petrop.) Ronse Decr.</i>
Prohibited Noxious	knotweed, hybrid Japanese	<i>Fallopia x bohémica (Chrtek & Chrtková) J. P. Bailey</i>



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Table 1: Alberta Weed Act and Regulation (2010) Prohibited Noxious and Noxious Weeds

Designation	Common Name	Scientific Name
Prohibited Noxious	knotweed, Japanese	<i>Fallopia japonica</i> (Houtt.) Ronse Decr.
Prohibited Noxious	loosestrife, purple	<i>Lythrum salicaria</i> L.
Prohibited Noxious	medusahead	<i>Taeniatherum caput-medusae</i> (L.) Nevski
Prohibited Noxious	nutsedge, yellow	<i>Cyperus esculentus</i> L.
Prohibited Noxious	puncturevine	<i>Tribulus terrestris</i> L.
Prohibited Noxious	ragwort, tansy	<i>Jacobaea vulgaris</i> Gaertn.
Prohibited Noxious	rush skeletonweed	<i>Chondrilla juncea</i> L.
Prohibited Noxious	saltcedar	<i>Tamarix ramosissima</i> Ledeb.
Prohibited Noxious	saltlover	<i>Halogeton glomeratus</i> (M. Bieb.) C.A. Mey.
Prohibited Noxious	St John's-wort, common	<i>Hypericum perforatum</i> L.
Prohibited Noxious	starthistle, yellow	<i>Centaurea solstitialis</i> L.
Prohibited Noxious	tamarisk, Chinese	<i>Tamarix chinensis</i> Lour.
Prohibited Noxious	tamarisk, smallflower	<i>Tamarix parviflora</i> DC.
Prohibited Noxious	thistle, marsh	<i>Cirsium palustre</i> (L.) Scop.
Prohibited Noxious	thistle, nodding	<i>Carduus nutans</i> L.
Prohibited Noxious	thistle, plumeless	<i>Carduus acanthoides</i> L.
Noxious	baby's-breath, common	<i>Gypsophila paniculata</i> L.
Noxious	bellflower, creeping	<i>Campanula rapunculoides</i> L.
Noxious	bindweed, field	<i>Convolvulus arvensis</i> L.
Noxious	blueweed	<i>Echium vulgare</i> L.
Noxious	brome, downy	<i>Bromus tectorum</i> L.
Noxious	brome, Japanese	<i>Bromus japonicus</i> Thunb.
Noxious	burdock, great	<i>Arctium lappa</i> L.
Noxious	burdock, lesser	<i>Arctium minus</i> (Hill) Bernh.
Noxious	burdock, woolly	<i>Arctium tomentosum</i> Mill.
Noxious	buttercup, tall	<i>Ranunculus acris</i> L.
Noxious	chamomile, scentless	<i>Tripleurospermum inodorum</i> (L.) Sch. Bip.
Noxious	clematis, yellow	<i>Clematis tangutica</i> (Maxim.) Korsh.
Noxious	cockle, white	<i>Silene latifolia</i> Poir. ssp. <i>alba</i> (Miller) Greuter & Burdet
Noxious	daisy, oxeye	<i>Leucanthemum vulgare</i> Lam.
Noxious	dame's rocket	<i>Hesperis matronalis</i> L.
Noxious	henbane, black	<i>Hyoscyamus niger</i> L.
Noxious	hoary cress, globe-podded	<i>Lepidium appelianum</i> Al-Shehbaz
Noxious	hoary cress, heart-podded	<i>Lepidium draba</i> L.
Noxious	hoary cress, lens-podded	<i>Lepidium chalepense</i> L.
Noxious	hound's-tongue	<i>Cynoglossum officinale</i> L.
Noxious	mullein, common	<i>Verbascum thapsus</i> L.
Noxious	pepper-grass, broad-leaved	<i>Lepidium latifolium</i> L.
Noxious	scabious, field	<i>Knautia arvensis</i> (L.) Coult.
Noxious	sow thistle, perennial	<i>Sonchus arvensis</i> L.
Noxious	spurge, leafy	<i>Euphorbia esula</i> L.
Noxious	tansy, common	<i>Tanacetum vulgare</i> L.
Noxious	thistle, Canada	<i>Cirsium arvense</i> (L.) Scop.
Noxious	toadflax, Dalmatian	<i>Linaria dalmatica</i> (L.) Mill.
Noxious	toadflax, yellow	<i>Linaria vulgaris</i> Mill.



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Table 2: Jasper National Park Priority Invasive Species List.

Scientific Name	Common Name	Alberta Weed Designation	JNP Priority ^a	JNP Action ^b
<i>Carduus nutans</i>	nodding thistle	Prohibited Noxious	H	X
<i>Centaurea diffusa</i>	diffuse knapweed	Prohibited Noxious	H	X
<i>Centaurea maculosa</i>	spotted knapweed	Prohibited Noxious	H	X
<i>Cirsium vulgare</i>	bull thistle		H	X
<i>Datura stramonium</i>	jimsonweed		H	X
<i>Echium vulgare</i>	blueweed	Noxious	H	X
<i>Geranium pratense</i>	meadow cranesbill		H	X
<i>Hieracium aurantiacum</i>	orange Hawkweed	Prohibited Noxious	H	X
<i>Hieracium flagellare</i>	whiplash Hawkweed		H	X
<i>Hieracium piloselloides</i>	yall hawkweed		H	X
<i>Hieracium pratense</i>	yellow hawkweed		H	X
<i>Impatiens glandulifera</i>	himalayan balsam	Prohibited Noxious	H	X
<i>Matricaria perforata</i>	scentless chamomile	Noxious	H	X
<i>Silene cucubalis</i>	bladder campion		H	X
<i>Tanacetum vulgare</i>	common tansy	Noxious	H	X
<i>Chrysanthemum leucanthemum</i>	ox-eye daisy	Noxious	H	W
<i>Ranunculus acris</i>	tall buttercup	Noxious	H	W
<i>Vicia cracca</i>	tufted vetch		H	W
<i>Carum carvi</i>	caraway		H	W
<i>Clematis tangutica</i>	yellow clematis	Noxious	H	W
<i>Euphorbia esula</i>	leafy spurge	Noxious	H	X
<i>Linaria dalmatica</i>	Dalmatian toadflax	Noxious	H	W
<i>Linaria vulgaris</i>	common toadflax		H	W
<i>Verbascum thapsus</i>	common mullein		H	W
<i>Cirsium arvense</i>	Canada thistle	Noxious	H	I
<i>Salsola kali</i>	Russian thistle		H	I
<i>Cichorium intybus</i>	chicory		M	X
<i>Silene cserei</i>	biennial campion		M	X
<i>Silene pratensis</i>	white cockle		M	X
<i>Sisymbrium loeselii</i>	tall hedge mustard		M	X
<i>Crepis tectorum</i>	annual hawk's beard		M	W
<i>Descurainia Sophia</i>	flixweed		M	W
<i>Erodium cicutarium</i>	stork's bill		M	W
<i>Erucastrum gallicum</i>	dog mustard		M	W
<i>Galium spurium</i>	cleavers		M	W
<i>Kochia scoparia</i>	kochia		M	W
<i>Onobrychis viciifolia</i>	sainfoin		M	W
<i>Physalis heterophylla</i>	clammy ground cherry		M	W
<i>Potentilla argentea</i>	silvery cinquefoil		M	W
<i>Sisymbrium altissimum</i>	tumbling mustard		M	W
<i>Sonchus arvensis</i>	perennial sowthistle	Noxious	M	W
<i>Sonchus asper</i>	snnual sowthistle		M	W
<i>Sonchus uliginosus</i>	dsmooth perennial sowthistle		M	W
<i>Anthyllis vulneraria</i>	kidney vetch		M	W



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Table 2: Jasper National Park Priority Invasive Species List.

Scientific Name	Common Name	Alberta Weed Designation	JNP Priority ^a	JNP Action ^b
<i>Brassica napus</i>	Argentine Canola		M	W
<i>Campanula rapunculoides</i>	creeping bellflower		M	X
<i>Caragana arborescens</i>	common caragana		M	W
<i>Chenopodium album</i>	lambs quarters		M	W
<i>Papaver nudicaule</i>	Iceland poppy		M	W
<i>Artemisia absinthium</i>	absinthe wormwood		L	X
<i>Gypsophila paniculata</i>	baby's breath		L	X
<i>Phalaris arundinaceae</i>	reed canary grass		L	X
<i>Phalaris canariensis</i>	canary grass		L	X
<i>Rheum raphaniticum</i>	rhubarb		L	X
<i>Agropyron desertorum</i>	Siberian/Desert Wheat Grass		L	W
<i>Agropyron repens</i>	quack grass		L	W
<i>Agropyron trachycaulum</i>	slender wheat grass		L	W
<i>Agrostis stolonifera</i>	redtop		L	W
<i>Alyssum alyssoides</i>	pale alyssum		L	W
<i>Arabis glabra</i>	tower mustard		L	W
<i>Armoracia rusticana</i>	horse radish		L	W
<i>Astragalus cicer</i>	cicer milk vetch		L	W
<i>Atriplex prostrata</i>	prostrate saltbrush		L	W
<i>Avena fatua</i>	wild oat		L	W
<i>Avena sativa</i>	cultivated oat		L	W
<i>Brassica campestris</i>	rape		L	W
<i>Brassica juncea</i>	Indian mustard		L	W
<i>Brassica kaber</i>	wild mustard		L	W
<i>Bromus inermis</i>	smooth/awnless brome		L	W
<i>Bromus japonicus</i>	Japanese chess	Noxious	L	W
<i>Bromus tectorum</i>	downy brome	Noxious	L	W
<i>Capsella bursa-pastoris</i>	shepherd's purse		L	W
<i>Cerastium tomentosum</i>	snow in summer		L	W
<i>Cerastium vulgatum</i>	mouse-ear chickweed		L	W
<i>Chaenorrhinum minus</i>	dwarf snapdragon		L	W
<i>Convolvulus arvensis</i>	field bindweed		L	W
<i>Corispermum hyssopifolium</i>	bugseed		L	W
<i>Dactylis glomerata</i>	orchard grass		L	W
<i>Delphinium spp.</i>	domestic larkspur		L	W
<i>Dianthus deltoides</i>	maiden pink		L	W
<i>Erysimum cheriranthoides</i>	wormseed mustard		L	W
<i>Euphrasia nemorosa</i>	hairy eyebright		L	W
<i>Fagopyrum esculentum</i>	common buckwheat		L	W
<i>Galeopsis tetrahit</i>	hemp nettle		L	W
<i>Galium mollugo</i>	white bedstraw		L	W
<i>Helianthus maximilianii</i>	narrow-leaved sunflower		L	W
<i>Hordeum vulgare</i>	barley		L	W
<i>Lappula squarrosa</i>	bluebur		L	W
<i>Lens culinaris</i>	lentil		L	W



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Table 2: Jasper National Park Priority Invasive Species List.

Scientific Name	Common Name	Alberta Weed Designation	JNP Priority ^a	JNP Action ^b
<i>Lepidium campestre</i>	field peppergrass		L	W
<i>Linum usitatissimum</i>	common flax		L	W
<i>Lolium multiflorum</i>	Italian ryegrass		L	W
<i>Lotus corniculatus</i>	bird's foot trefoil		L	W
<i>Medicago falcata</i>	yellow lucerne		L	W
<i>Medicago lupulina</i>	black medick		L	W
<i>Medicago sativa</i>	alfalfa		L	W
<i>Melilotus alba</i>	white sweet clover		L	W
<i>Melilotus officinalis</i>	yellow sweet clover		L	W
<i>Polugonum monspeliense</i>	knotweed		L	W
<i>Polygonum arenastrum</i>	common knotweed		L	W
<i>Polygonum convolvulus</i>	wild buckwheat		L	W
<i>Raphanus raphanistrum</i>	wild radish		L	W
<i>Rumex acetosella</i>	sheep sorrel		L	W
<i>Secale cereale</i>	rye		L	W
<i>Senecio viridis</i>	green foxtail		L	W
<i>Senecio viscosus</i>	sticky groundsel		L	W
<i>Senecio vulgaris</i>	common groundsel		L	W
<i>Silene noctiflora</i>	night-flowering catchfly		L	W
<i>Solanum dulcamara</i>	climbing nightshade		L	W
<i>Stellaria media</i>	common chickweed		L	W
<i>Thlaspi arvense</i>	stinkweed		L	W
<i>Tragopogon dubius</i>	goat's beard		L	W
<i>Tragopogon pratensis</i>	meadow goat's beard		L	W
<i>Trifolium aureum</i>	yellow/Hop clover		L	W
<i>Trifolium hybridum</i>	alsike clover		L	W
<i>Trifolium pratense</i>	red clover		L	W
<i>Trifolium repense</i>	white clover		L	W
<i>Triticum aestivum</i>	common wheat		L	W
<i>Urtica urens</i>	small nettle		L	W
<i>Agropyron pectiniforme</i>	crested wheat grass		L	N
<i>Chenopodium capitatum</i>	strawberry blite		L	N
<i>Festuca ovina</i>	sheep fescue		L	N
<i>Festuca rubra</i>	red fescue		L	N
<i>Lepidium densiflorum</i>	common peppergrass		L	N
<i>Matricaria matricarioides</i>	pineappleweed		L	N
<i>Phleum pratense</i>	Timothy		L	N
<i>Plantago major</i>	common plantain		L	N
<i>Poa annua</i>	annual bluegrass		L	N
<i>Poa compressa</i>	Canada bluegrass		L	N
<i>Poa pratensis</i>	Kentucky bluegrass		L	N
<i>Potentilla norvegica</i>	Norwegian cinquefoil		L	N
<i>Taraxacum officinale</i>	dandelion		L	I

^a - H – High priority; M – Moderate priority; L – Low priority



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^b **X**= action to control all occurrences found in JNP; **W**= action to control all occurrences found in wilderness settings, otherwise monitor and primarily indirect treatment; **I**= indirect treatment and monitoring; species may be highly invasive but distribution is too extensive for direct control except in high priority sites; **N**= no action at this time, not deemed currently invasive in JNP

Weed surveys for noxious or prohibited noxious weed species (Alberta Weed Control Act 2010) and moderate and high priority invasive species within Jasper National Park were targeted along the proposed trail alignment as part of the field survey. Low priority species were documented as time allowed.



3.0 SURVEY METHODS

Field surveys were undertaken to identify invasive and non-native plant species hotspots. Surveys were focused on areas of previous disturbance not previously surveyed within a 60 m survey zone on both sides of the trail alignment. Non-native and invasive species, including noxious and prohibited noxious weeds as per the *Weed Control Act* and *Weed Control Regulation* (Government of Alberta 2010) were identified and the locations were documented with a GPS location, description and photos.

Two surveys were conducted between July 13 – 22, 2016 and August 17 and 21, 2016. Additionally, non-native plant species data from surveys completed for Parks Canada Agency, in June 2016, on primarily highway improvement projects were included as a number of the survey areas overlapped with the proposed Icefield Parkway trail.



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4.0 RESULTS

During July and August of 2016, 219 non-native plant species occurrence locations were documented for 16 species, including 1 prohibited noxious species, 8 noxious species (Government of Alberta 2011) and 7 non-native species. Information on each non-native plant species is provided in Table 3. Detailed locations of all observed occurrences are provided in Figures 1-18 and Appendix A.

Table 3: Non-native Plant Species Recorded During the 2016 Field Surveys

Scientific name	Common name	Occurrences	Alberta Weed Act	Priority ^a	Action ^b	General Character	Means of Spreading	Seed Viability (years)	Growth Season/
<i>Crepis tectorum</i>	Annual hawk's beard	8	-	M	W	annual	seed	< 5	mid-June to September
<i>Cirsium vulgare</i>	Bull thistle	1	-	H	X	biennial	seed	<3	flowers early June until frost
<i>Cirsium arvense</i>	Canada thistle	13	Noxious	H	I	creeping perennial	rhizomes	< 5	mid-June to September
<i>Caragana arborescens</i>	Common caragana	1	-	M	W	perennial	seed	unknown	flowers mid spring
<i>Tanacetum vulgare</i>	Common tansy	1	Noxious	H	X	perennial	rhizomes and seed	≤ 25	flowers July to September
<i>Linaria vulgaris</i>	Common toadflax	1	Noxious	H	W	creeping perennial	rhizomes and seed	≤10	flowers July to October
<i>Linaria dalmatica</i>	Dalmatian toadflax	14	Noxious	H	W	creeping perennial	rhizomes and seed	< 10	flowers July to October
<i>Erucastrum gallicum</i>	Dog mustard	1	-	M	W	annual	seed	3+	flowers early June to September
<i>Chrysanthemum leucanthemum</i>	Ox-eye daisy	121	Noxious	H	W	perennial	shallow rhizomes and seed	2-3+	flowers June to August
<i>Sonchus arvensis</i>	Perennial sow thistle	18	Noxious	M	W	creeping perennial	rhizomes and seed	unknown	flowers early July until frost
<i>Centaurea maculosa</i>	Spotted knapweed	3	Prohibited Noxious	H	X	biennial	seed	5-10	flowers July to August
<i>Ranunculus acris</i>	Tall buttercup	6	Noxious	H	W	perennial	seed	2-4	flowers late May to September
<i>Sisymbrium loeselii</i>	Tall hedge mustard	6	-	M	X	annual or biennial	seed	unknown	flowers June to August
<i>Vicia cracca</i>	Tufted vetch	4	-	H	W	annual	rhizomes	unknown	flowers June to August
<i>Clematis tangutica</i>	Yellow clematis	6	Noxious	H	W	perennial	vegetative and seed	unknown	flowers June to August
<i>Hieracium pratense</i>	Yellow hawkweed	15	-	H	X	perennial	rhizomes, vegetative and seed	< 7	flowers late May to September

^a - **H** – High priority; **M** – Moderate priority; **L** – Low priority

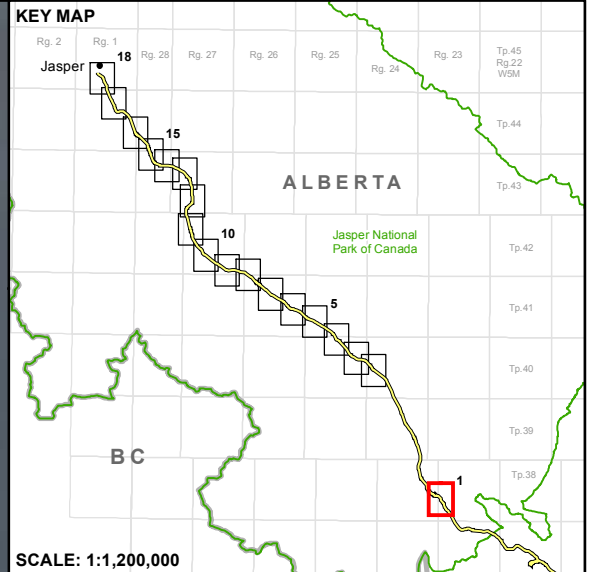
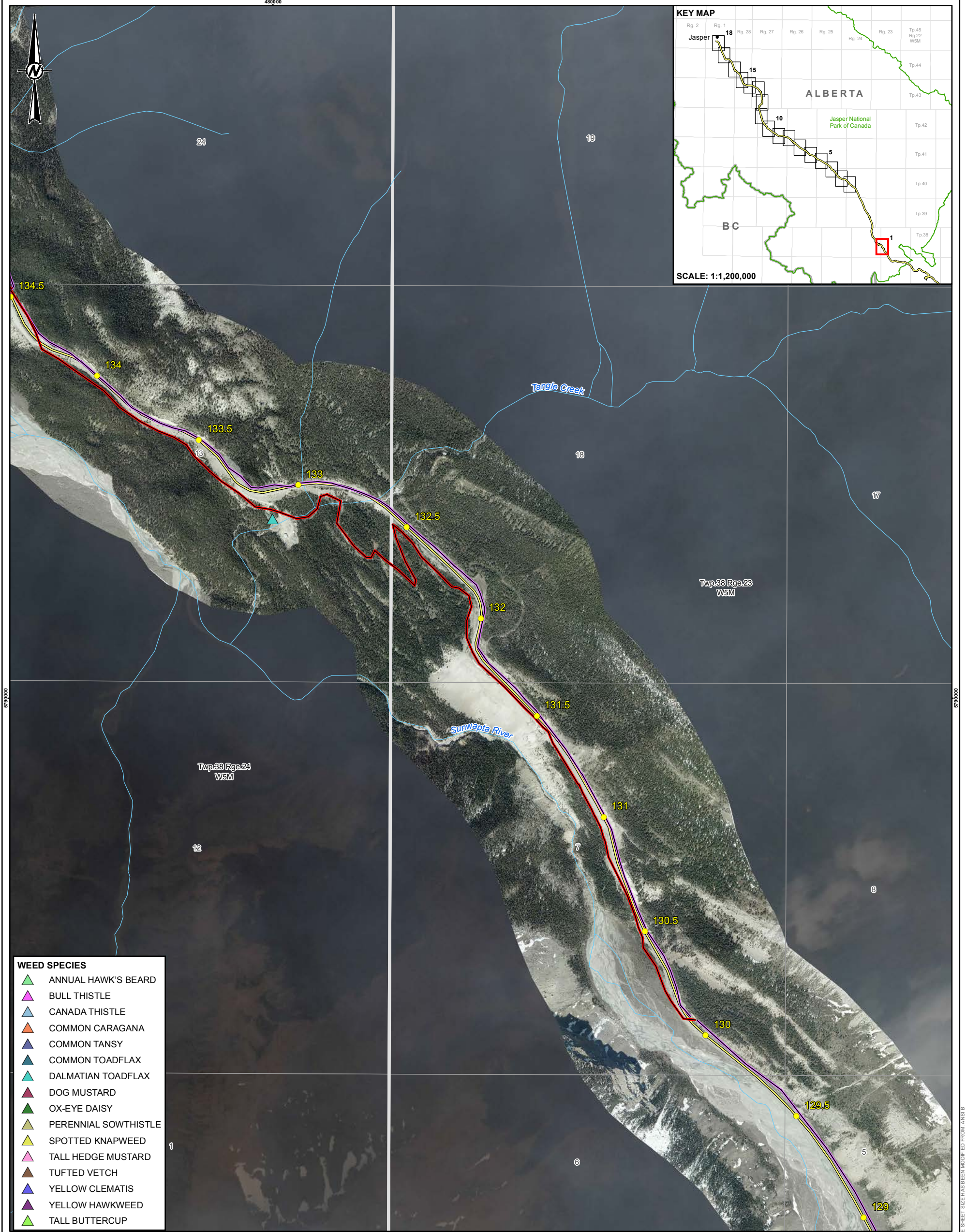
^b - **X**= action to control all occurrences found in JNP; **W**= action to control all occurrences found in wilderness settings, otherwise monitor and primarily indirect treatment; **I**= indirect treatment and monitoring; species may be highly invasive but distribution is too extensive for direct control except in high priority sites; **N**= no action at this time, not deemed currently invasive in JNP



Of these results, four species are rated as high priority with a required action to control all occurrences within JNP:

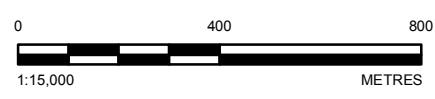
- Bull thistle;
- Common tansy;
- Spotted knapweed; and
- Yellow hawkweed.

One species, tall hedge mustard, is rated as moderate priority with a required action to control all occurrences within JNP. The remaining species observed require action to control all occurrences found in wilderness settings, or require monitoring and indirect treatment outside of wilderness settings or indirect treatment and monitoring. Canada thistle for example is a high priority species that rated as highly invasive, but its distribution is too extensive for direct control except in high priority sites.



- WEED SPECIES**
- ▲ ANNUAL HAWK'S BEARD
 - ▲ BULL THISTLE
 - ▲ CANADA THISTLE
 - ▲ COMMON CARAGANA
 - ▲ COMMON TANSY
 - ▲ COMMON TOADFLAX
 - ▲ DALMATIAN TOADFLAX
 - ▲ DOG MUSTARD
 - ▲ OX-EYE DAISY
 - ▲ PERENNIAL SOWTHISTLE
 - ▲ SPOTTED KNAPWEED
 - ▲ TALL HEDGE MUSTARD
 - ▲ TUFTED VETCH
 - ▲ YELLOW CLEMATIS
 - ▲ YELLOW HAWKWEED
 - ▲ TALL BUTTERCUP

- LEGEND**
- HIGHWAY 93N
 - ALTERNATE TRAIL ROUTE
 - PROPOSED TRAIL ROUTE
 - WATERCOURSE



REFERENCE(S)

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DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
PARKS CANADA

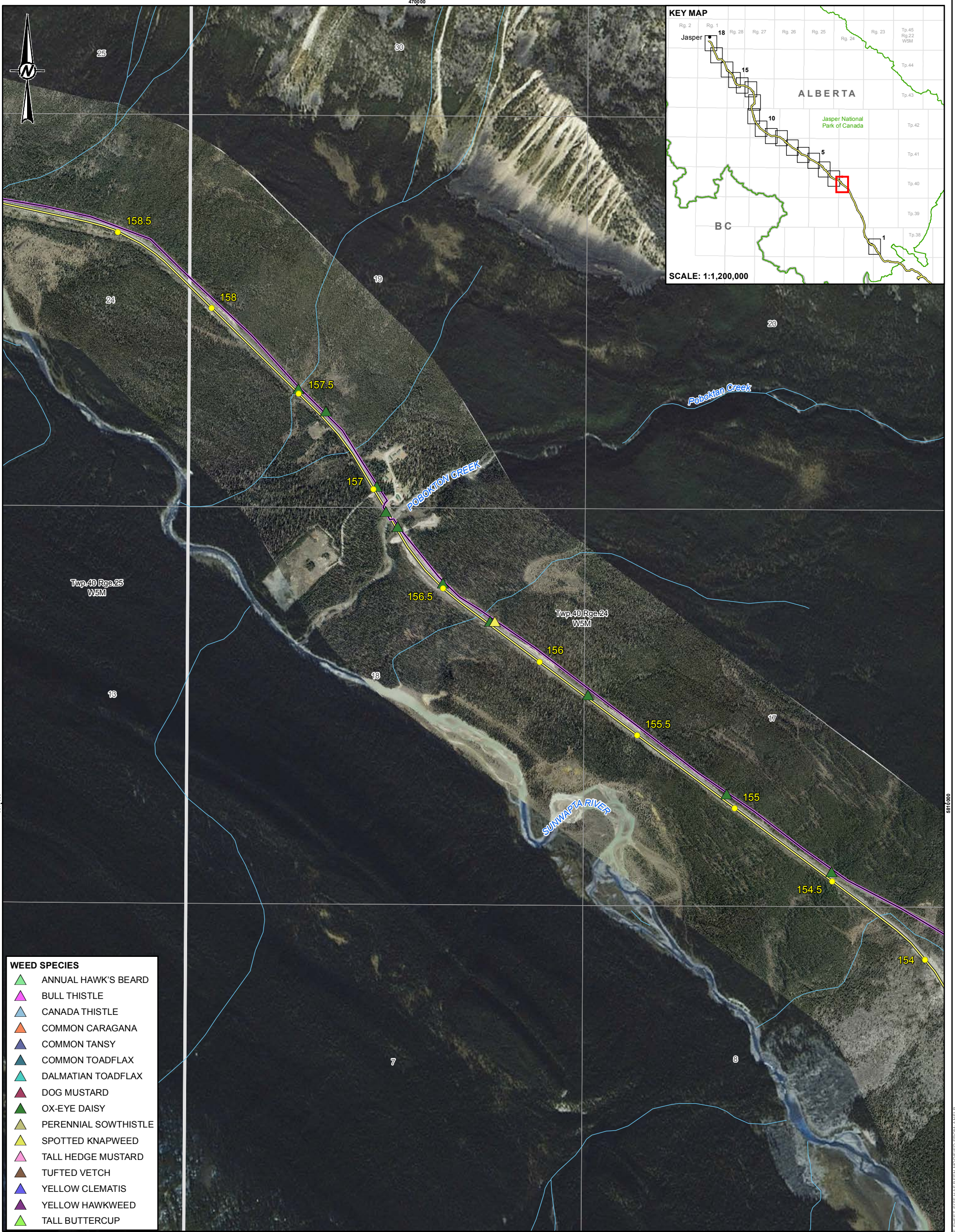
PROJECT
JASPER ICEFIELDS PARKWAY

TITLE
WEED SPECIES LOCATIONS

CONSULTANT	DATE	REVISION
	YYYY-MM-DD	2016-10-27
	DESIGNED	LV
	PREPARED	RC
	REVIEWED	VC
	APPROVED	CD

PROJECT NO. 1659727	CONTROL 2000	REV. 0	FIGURE 1
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/B3



WEED SPECIES

▲	ANNUAL HAWK'S BEARD
▲	BULL THISTLE
▲	CANADA THISTLE
▲	COMMON CARAGANA
▲	COMMON TANSY
▲	COMMON TOADFLAX
▲	DALMATIAN TOADFLAX
▲	DOG MUSTARD
▲	OX-EYE DAISY
▲	PERENNIAL SOWTHISTLE
▲	SPOTTED KNAPWEED
▲	TALL HEDGE MUSTARD
▲	TUFTED VETCH
▲	YELLOW CLEMATIS
▲	YELLOW HAWKWEED
▲	TALL BUTTERCUP

LEGEND

—	HIGHWAY 93N
—	PROPOSED TRAIL ROUTE
—	WATERCOURSE



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- DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
PARKS CANADA

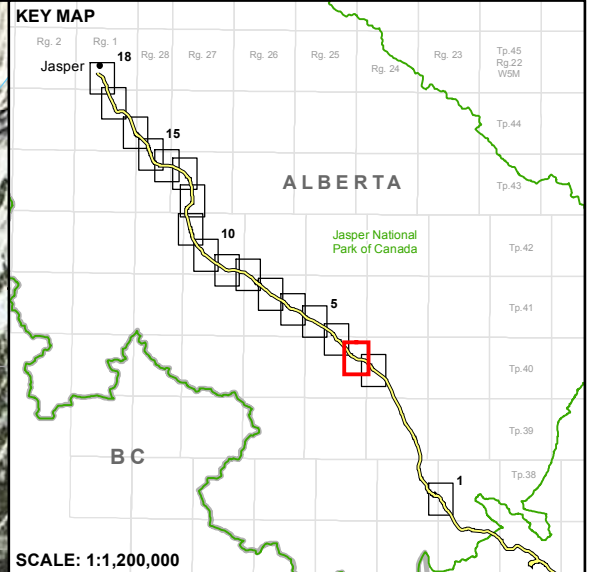
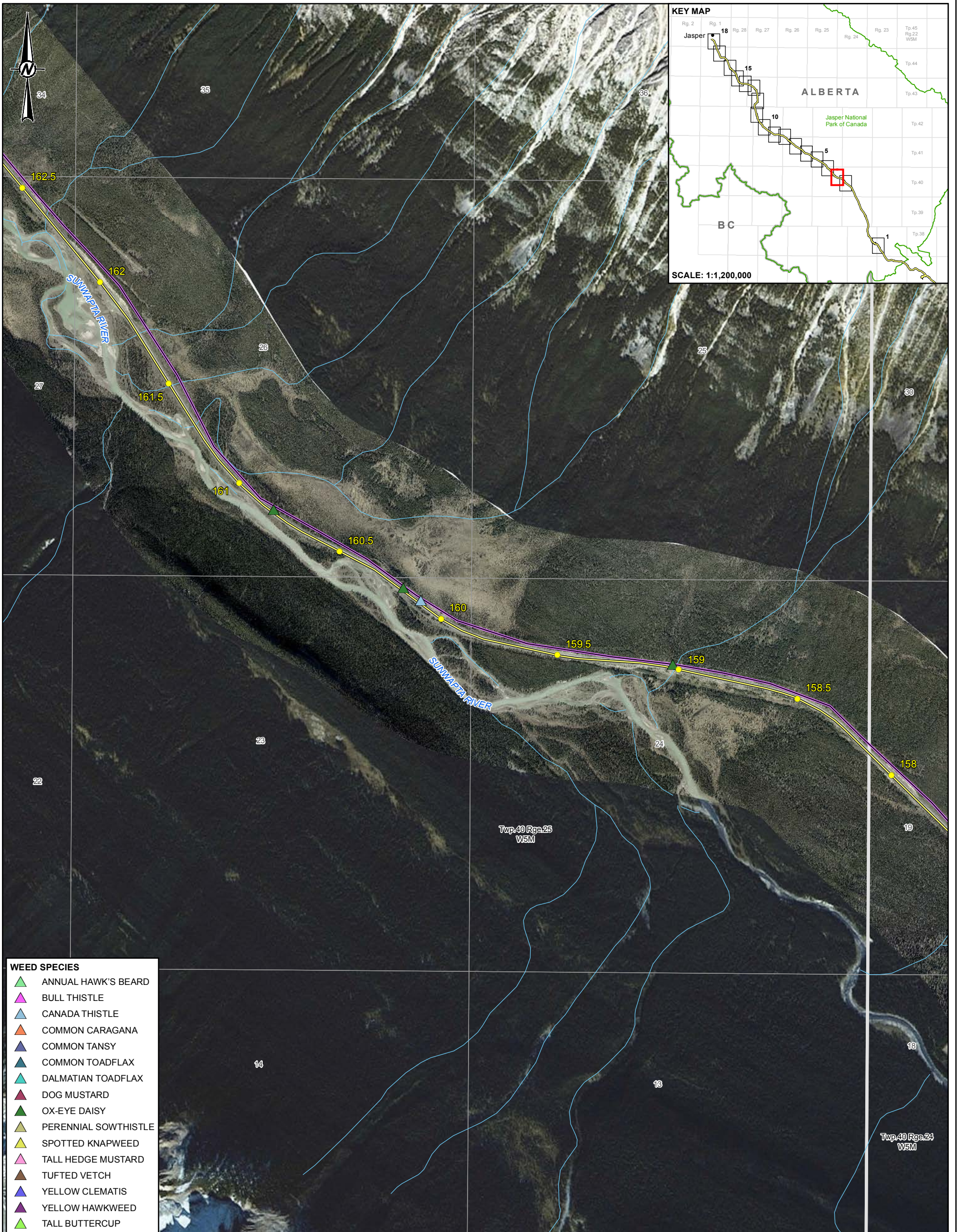
PROJECT
JASPER ICEFIELDS PARKWAY

TITLE
WEED SPECIES LOCATIONS

CONSULTANT	YYYY-MM-DD	2016-10-27
	DESIGNED	LV
	PREPARED	RC
	REVIEWED	VC
	APPROVED	CD

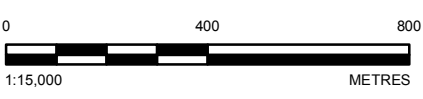
PROJECT NO.	CONTROL	REV.	FIGURE
1659727	2000	0	2





- WEED SPECIES**
- ▲ ANNUAL HAWK'S BEARD
 - ▲ BULL THISTLE
 - ▲ CANADA THISTLE
 - ▲ COMMON CARAGANA
 - ▲ COMMON TANSY
 - ▲ COMMON TOADFLAX
 - ▲ DALMATIAN TOADFLAX
 - ▲ DOG MUSTARD
 - ▲ OX-EYE DAISY
 - ▲ PERENNIAL SOWTHISTLE
 - ▲ SPOTTED KNAPWEED
 - ▲ TALL HEDGE MUSTARD
 - ▲ TUFTED VETCH
 - ▲ YELLOW CLEMATIS
 - ▲ YELLOW HAWKWEED
 - ▲ TALL BUTTERCUP

- LEGEND**
- HIGHWAY 93N
 - PROPOSED TRAIL ROUTE
 - WATERCOURSE



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DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
PARKS CANADA

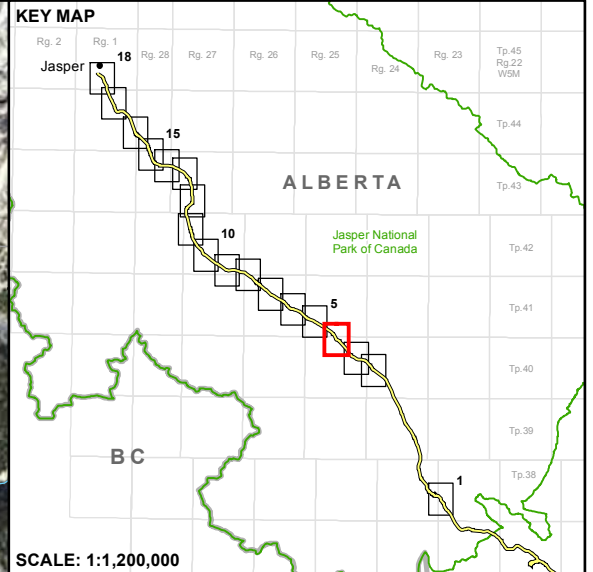
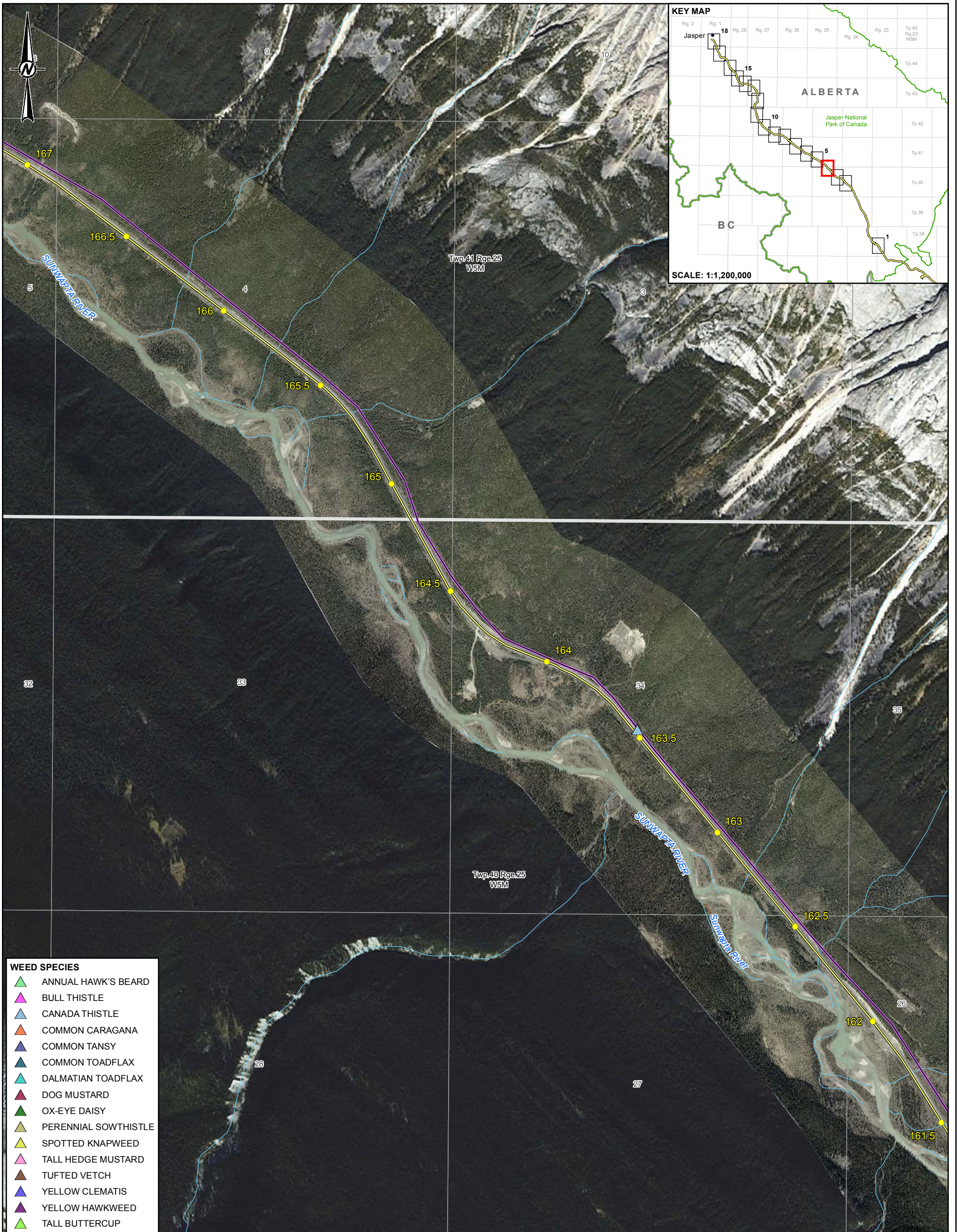
PROJECT
JASPER ICEFIELDS PARKWAY

TITLE
WEED SPECIES LOCATIONS

CONSULTANT	DATE	REVISION
	YYYY-MM-DD	2016-10-27
	DESIGNED	LV
	PREPARED	RC
	REVIEWED	VC
	APPROVED	CD

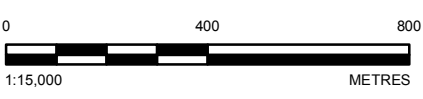
PROJECT NO. 1659727 CONTROL 2000 REV. 0 FIGURE 3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSIB 25mm



- WEED SPECIES**
- ▲ ANNUAL HAWK'S BEARD
 - ▲ BULL THISTLE
 - ▲ CANADA THISTLE
 - ▲ COMMON CARAGANA
 - ▲ COMMON TANSY
 - ▲ COMMON TOADFLAX
 - ▲ DALMATIAN TOADFLAX
 - ▲ DOG MUSTARD
 - ▲ OX-EYE DAISY
 - ▲ PERENNIAL SOWTHISTLE
 - ▲ SPOTTED KNAPWEED
 - ▲ TALL HEDGE MUSTARD
 - ▲ TUFTED VETCH
 - ▲ YELLOW CLEMATIS
 - ▲ YELLOW HAWKWEED
 - ▲ TALL BUTTERCUP

- LEGEND**
- HIGHWAY 93N
 - PROPOSED TRAIL ROUTE
 - WATERCOURSE



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DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
PARKS CANADA

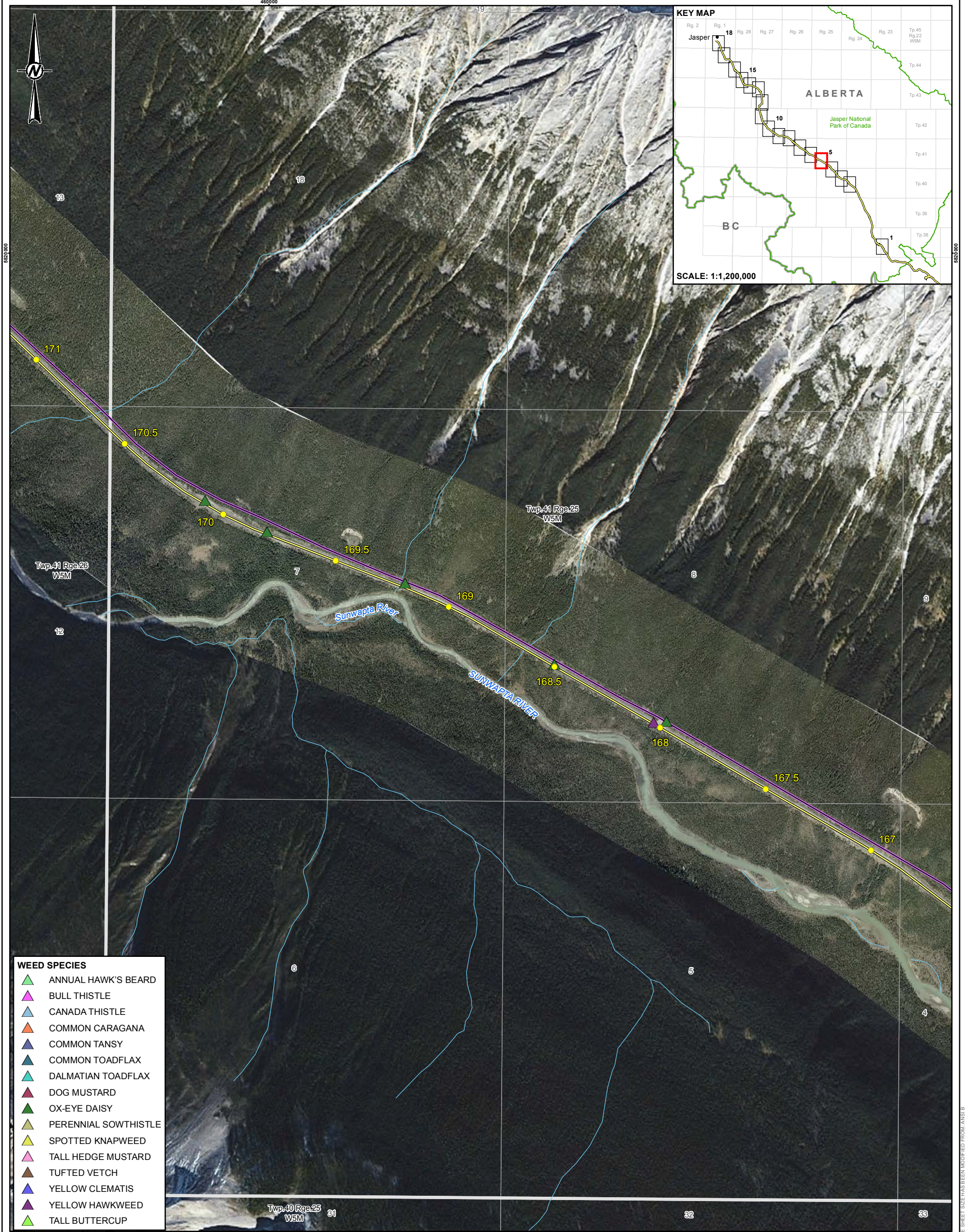
PROJECT
JASPER ICEFIELDS PARKWAY

TITLE
WEED SPECIES LOCATIONS

CONSULTANT	YYYY-MM-DD	2016-10-27
	DESIGNED	LV
	PREPARED	RC
	REVIEWED	VC
	APPROVED	CD

PROJECT NO.	CONTROL	REV.	FIGURE
1659727	2000	0	4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A4 (8) 25mm

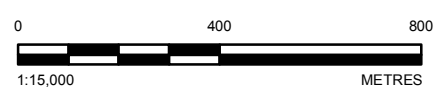


WEED SPECIES

	ANNUAL HAWK'S BEARD
	BULL THISTLE
	CANADA THISTLE
	COMMON CARAGANA
	COMMON TANSY
	COMMON TOADFLAX
	DALMATIAN TOADFLAX
	DOG MUSTARD
	OX-EYE DAISY
	PERENNIAL SOWTHISTLE
	SPOTTED KNAPWEED
	TALL HEDGE MUSTARD
	TUFTED VETCH
	YELLOW CLEMATIS
	YELLOW HAWKWEED
	TALL BUTTERCUP

LEGEND

	HIGHWAY 93N
	PROPOSED TRAIL ROUTE
	WATERCOURSE



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DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
PARKS CANADA

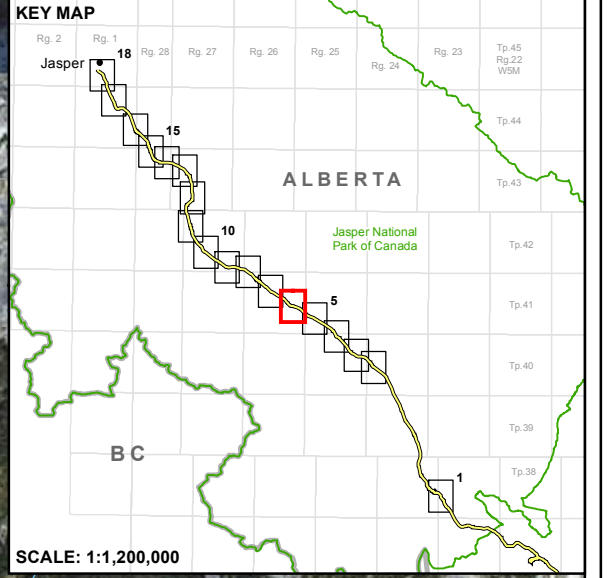
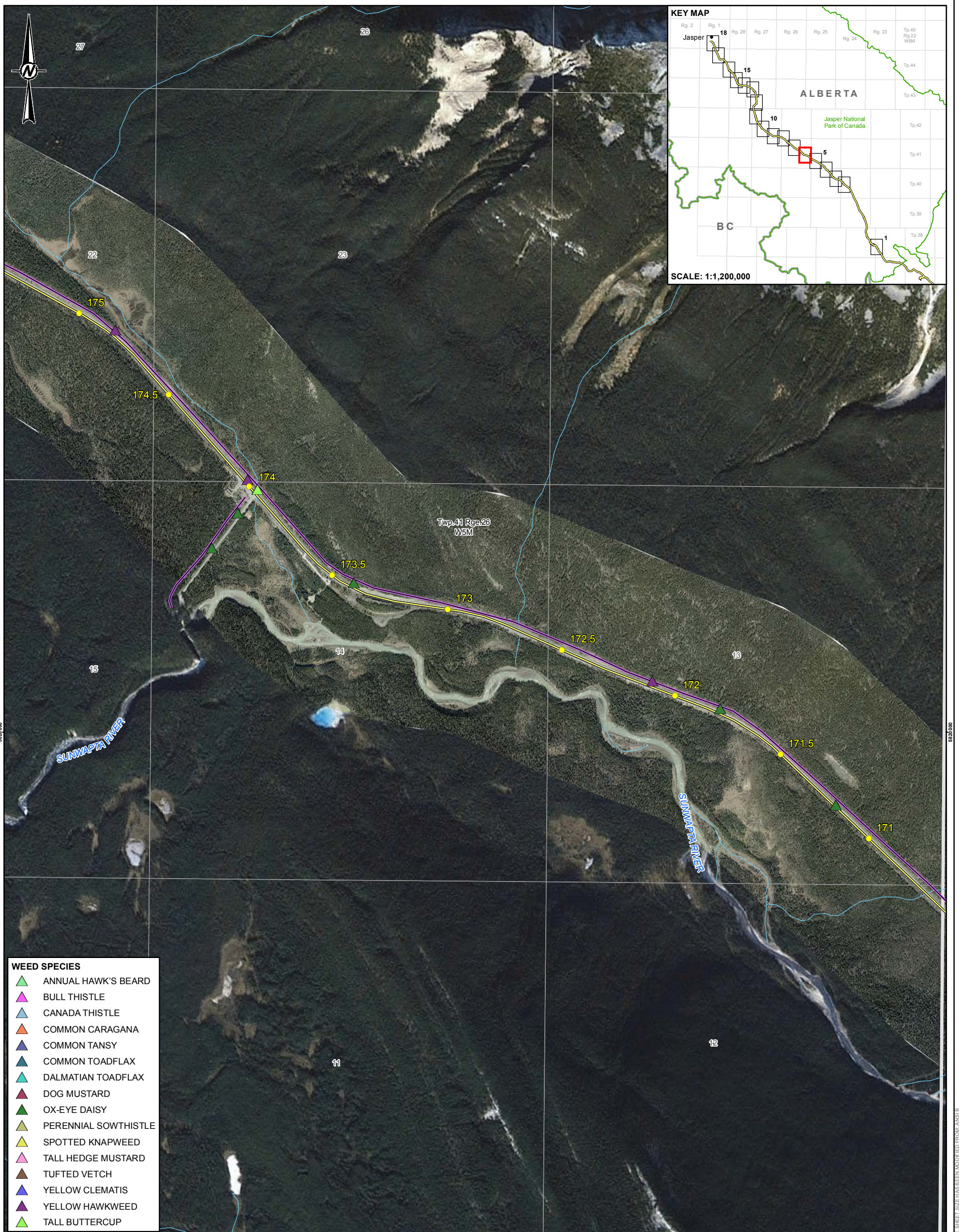
PROJECT
JASPER ICEFIELDS PARKWAY

TITLE
WEED SPECIES LOCATIONS

CONSULTANT	YYYY-MM-DD	2016-10-27
	DESIGNED	LV
	PREPARED	RC
	REVIEWED	VC
	APPROVED	CD

PROJECT NO.	CONTROL	REV.	FIGURE
1659727	2000	0	5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A4 (81x118cm)

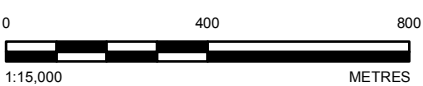


WEED SPECIES

▲	ANNUAL HAWK'S BEARD
▲	BULL THISTLE
▲	CANADA THISTLE
▲	COMMON CARAGANA
▲	COMMON TANSY
▲	COMMON TOADFLAX
▲	DALMATIAN TOADFLAX
▲	DOG MUSTARD
▲	OX-EYE DAISY
▲	PERENNIAL SOWTHISTLE
▲	SPOTTED KNAPWEED
▲	TALL HEDGE MUSTARD
▲	TUFTED VETCH
▲	YELLOW CLEMATIS
▲	YELLOW HAWKWEED
▲	TALL BUTTERCUP

LEGEND

—	HIGHWAY 93N
—	PROPOSED TRAIL ROUTE
—	WATERCOURSE



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- DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
PARKS CANADA

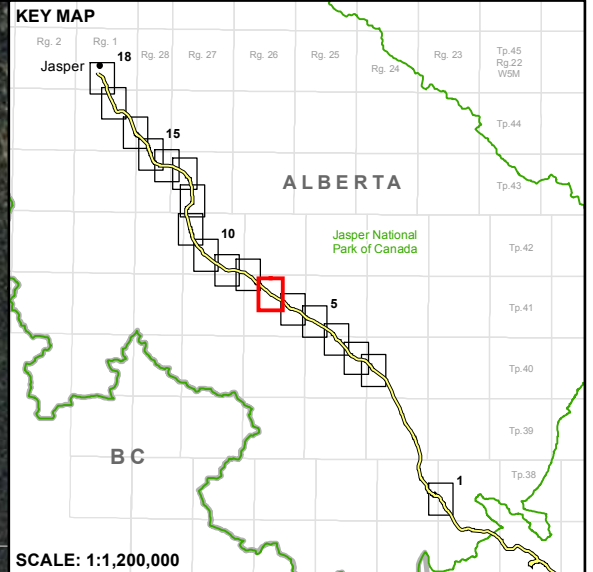
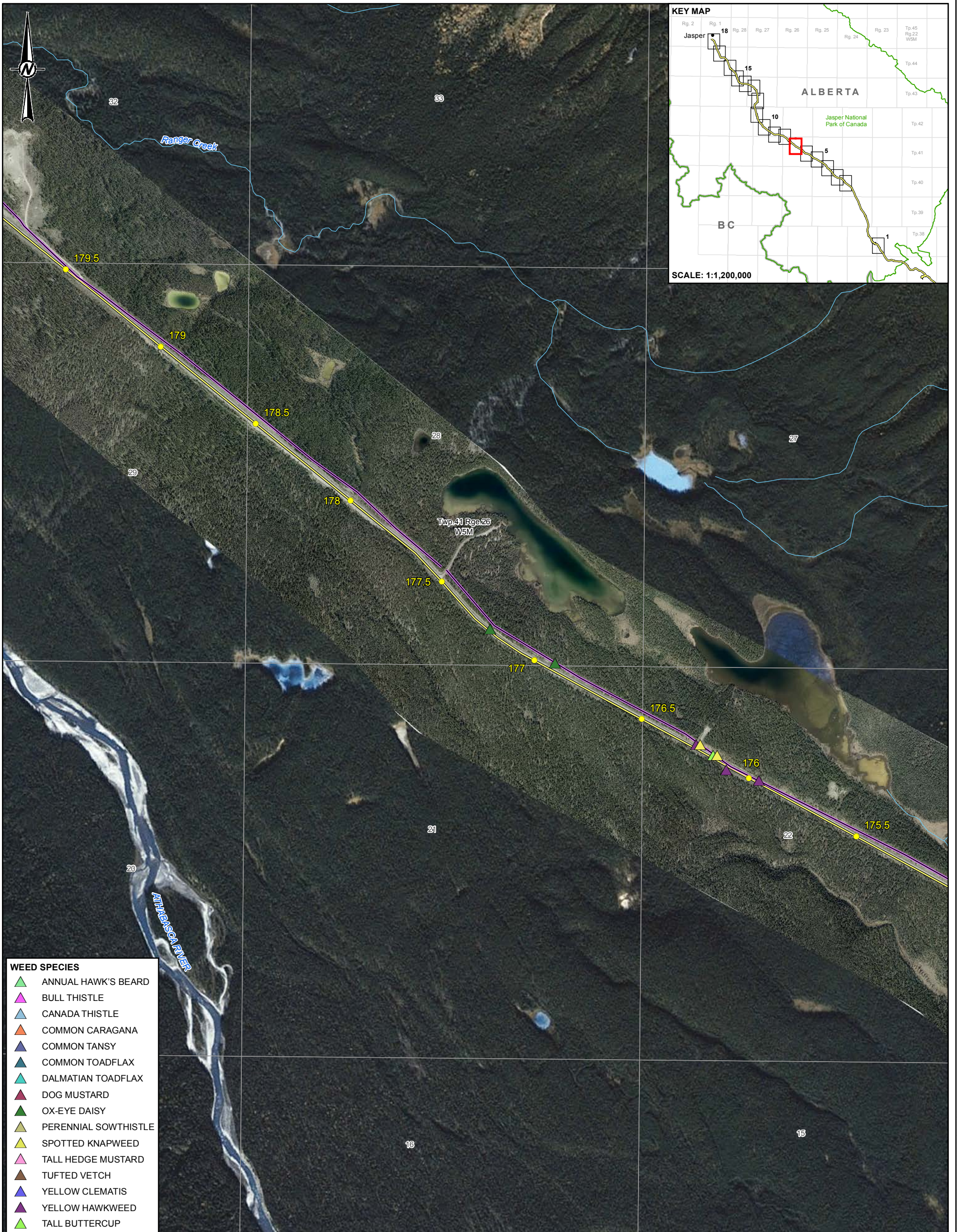
PROJECT
JASPER ICEFIELDS PARKWAY

TITLE
WEED SPECIES LOCATIONS

CONSULTANT	YYYY-MM-DD	2016-10-27
	DESIGNED	LV
	PREPARED	RC
	REVIEWED	VC
	APPROVED	CD

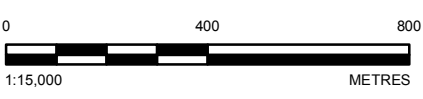


PROJECT NO.	CONTROL	REV.	FIGURE
1659727	2000	0	6



- WEED SPECIES**
- ▲ ANNUAL HAWK'S BEARD
 - ▲ BULL THISTLE
 - ▲ CANADA THISTLE
 - ▲ COMMON CARAGANA
 - ▲ COMMON TANSY
 - ▲ COMMON TOADFLAX
 - ▲ DALMATIAN TOADFLAX
 - ▲ DOG MUSTARD
 - ▲ OX-EYE DAISY
 - ▲ PERENNIAL SOWTHISTLE
 - ▲ SPOTTED KNAPWEED
 - ▲ TALL HEDGE MUSTARD
 - ▲ TUFTED VETCH
 - ▲ YELLOW CLEMATIS
 - ▲ YELLOW HAWKWEED
 - ▲ TALL BUTTERCUP

- LEGEND**
- HIGHWAY 93N
 - PROPOSED TRAIL ROUTE
 - WATERCOURSE



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DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
PARKS CANADA

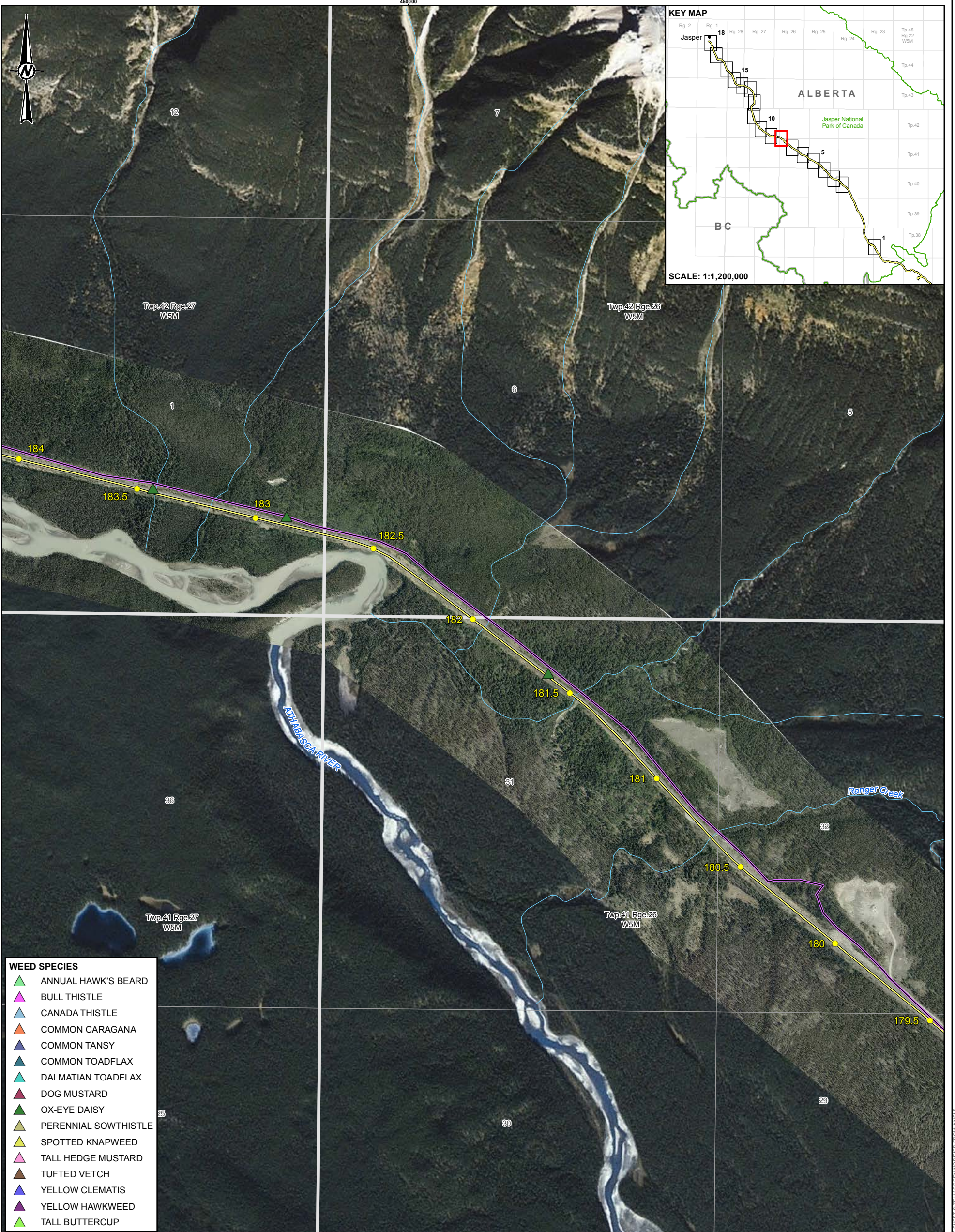
PROJECT
JASPER ICEFIELDS PARKWAY

TITLE
WEED SPECIES LOCATIONS

CONSULTANT	YYYY-MM-DD	2016-10-27
	DESIGNED	LV
	PREPARED	RC
	REVIEWED	VC
	APPROVED	CD

PROJECT NO.	CONTROL	REV.	FIGURE
1659727	2000	0	7

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSIB 25mm



- WEED SPECIES**
- ▲ ANNUAL HAWK'S BEARD
 - ▲ BULL THISTLE
 - ▲ CANADA THISTLE
 - ▲ COMMON CARAGANA
 - ▲ COMMON TANSY
 - ▲ COMMON TOADFLAX
 - ▲ DALMATIAN TOADFLAX
 - ▲ DOG MUSTARD
 - ▲ OX-EYE DAISY
 - ▲ PERENNIAL SOWTHISTLE
 - ▲ SPOTTED KNAPWEED
 - ▲ TALL HEDGE MUSTARD
 - ▲ TUFTED VETCH
 - ▲ YELLOW CLEMATIS
 - ▲ YELLOW HAWKWEED
 - ▲ TALL BUTTERCUP

- LEGEND**
- HIGHWAY 93N
 - PROPOSED TRAIL ROUTE
 - WATERCOURSE



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- DATUM: NAD 83 PROJECTION: UTM ZONE 11

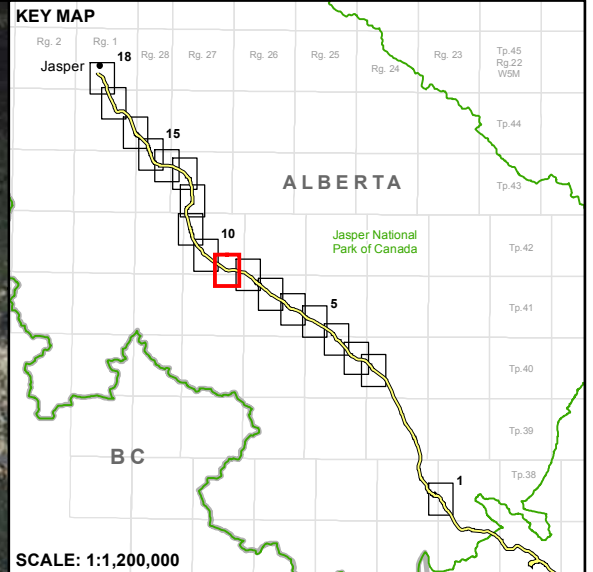
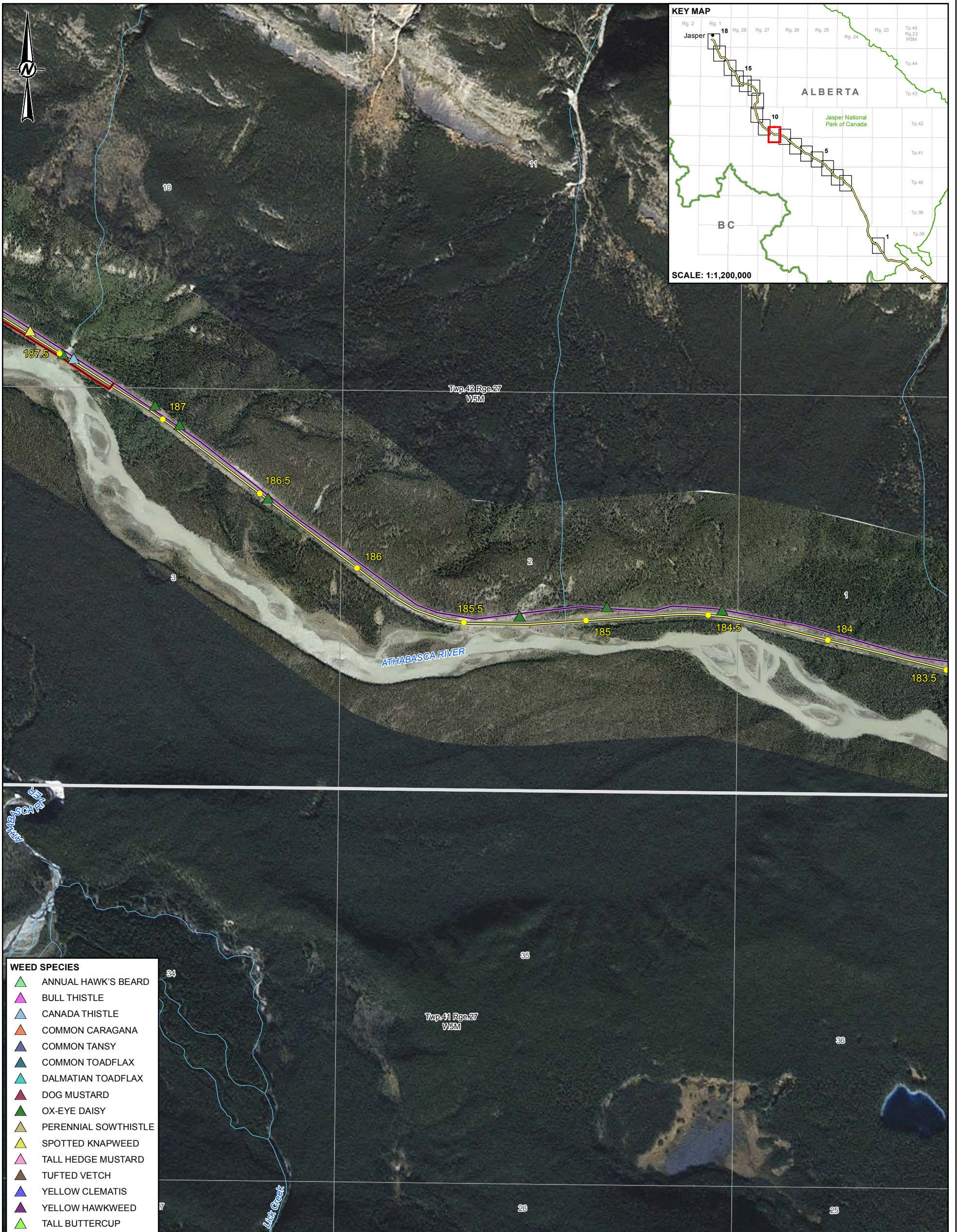
CLIENT
PARKS CANADA

PROJECT
JASPER ICEFIELDS PARKWAY

TITLE
WEED SPECIES LOCATIONS

CONSULTANT	YYYY-MM-DD	2016-10-27
	DESIGNED	LV
	PREPARED	RC
	REVIEWED	VC
	APPROVED	CD

PROJECT NO.	CONTROL	REV.	FIGURE
1659727	2000	0	8

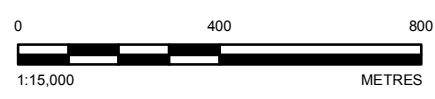


WEED SPECIES

- ▲ ANNUAL HAWK'S BEARD
- ▲ BULL THISTLE
- ▲ CANADA THISTLE
- ▲ COMMON CARAGANA
- ▲ COMMON TANSY
- ▲ COMMON TOADFLAX
- ▲ DALMATIAN TOADFLAX
- ▲ DOG MUSTARD
- ▲ OX-EYE DAISY
- ▲ PERENNIAL SOWTHISTLE
- ▲ SPOTTED KNAPWEED
- ▲ TALL HEDGE MUSTARD
- ▲ TUFTED VETCH
- ▲ YELLOW CLEMATIS
- ▲ YELLOW HAWKWEED
- ▲ TALL BUTTERCUP

LEGEND

- HIGHWAY 93N
- ALTERNATE TRAIL ROUTE
- PROPOSED TRAIL ROUTE
- WATERCOURSE



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DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
PARKS CANADA

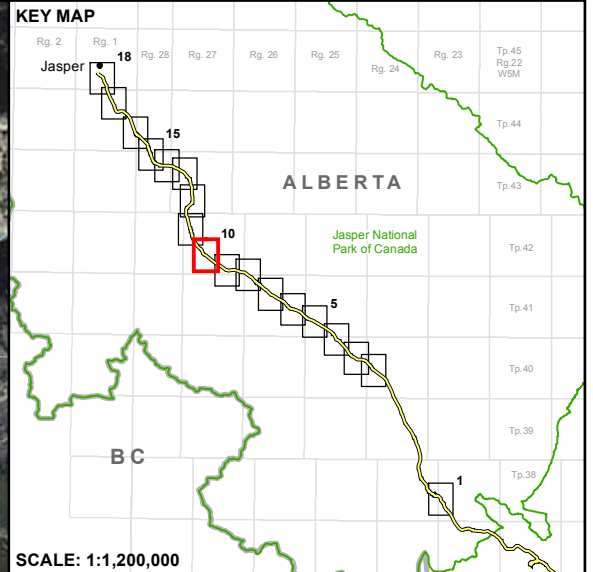
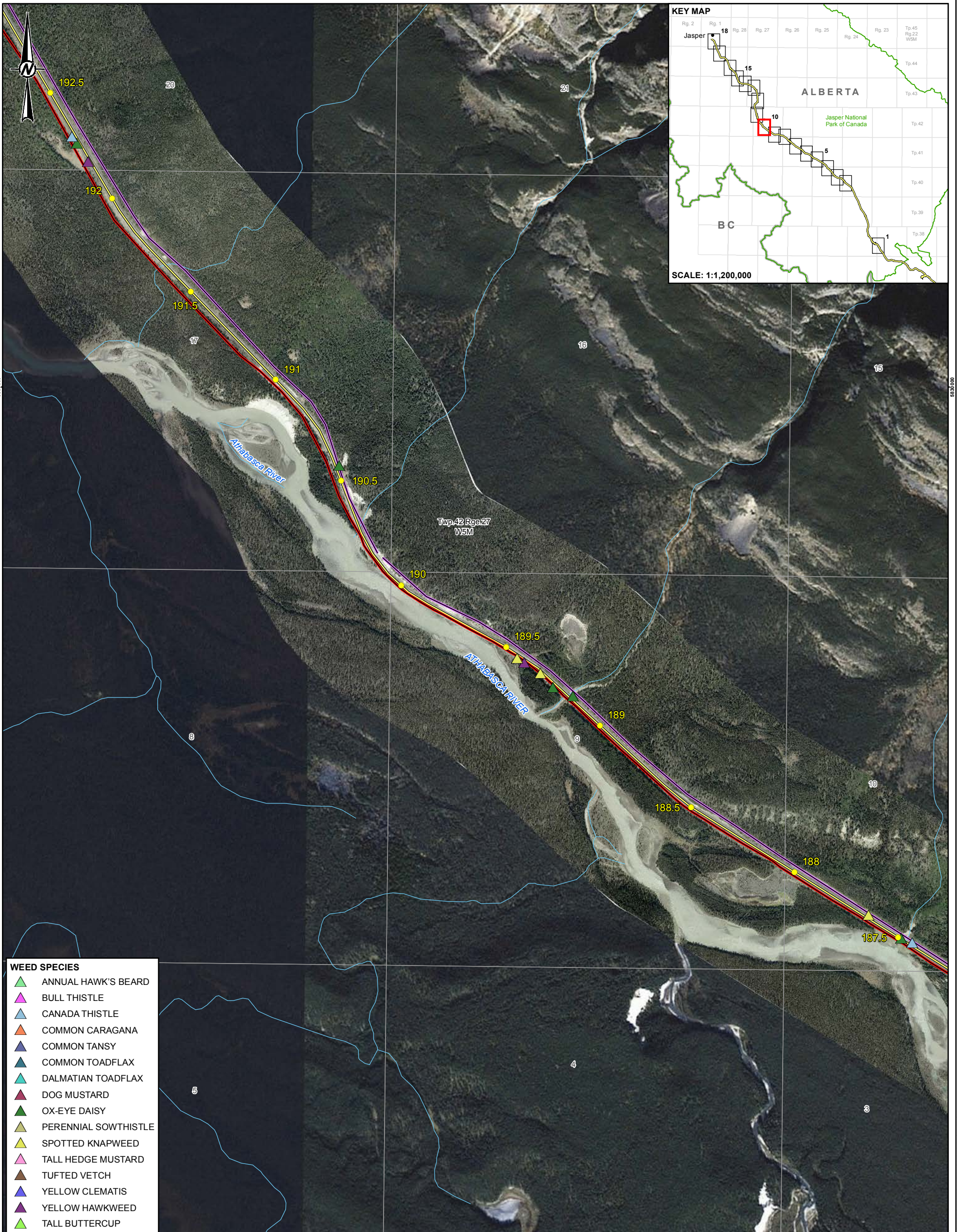
PROJECT
JASPER ICEFIELDS PARKWAY

TITLE
WEED SPECIES LOCATIONS

CONSULTANT	YYYY-MM-DD	2016-10-27
	DESIGNED	LV
	PREPARED	RC
	REVIEWED	VC
	APPROVED	CD

PROJECT NO.	CONTROL	REV.	FIGURE
1659727	2000	0	9

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSIB 25mm

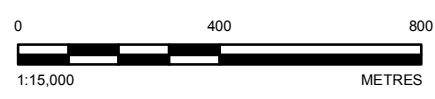


WEED SPECIES

▲	ANNUAL HAWK'S BEARD
▲	BULL THISTLE
▲	CANADA THISTLE
▲	COMMON CARAGANA
▲	COMMON TANSY
▲	COMMON TOADFLAX
▲	DALMATIAN TOADFLAX
▲	DOG MUSTARD
▲	OX-EYE DAISY
▲	PERENNIAL SOWTHISTLE
▲	SPOTTED KNAPWEED
▲	TALL HEDGE MUSTARD
▲	TUFTED VETCH
▲	YELLOW CLEMATIS
▲	YELLOW HAWKWEED
▲	TALL BUTTERCUP

LEGEND

—	HIGHWAY 93N
—	ALTERNATE TRAIL ROUTE
—	PROPOSED TRAIL ROUTE
—	WATERCOURSE



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DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
PARKS CANADA

PROJECT
JASPER ICEFIELDS PARKWAY

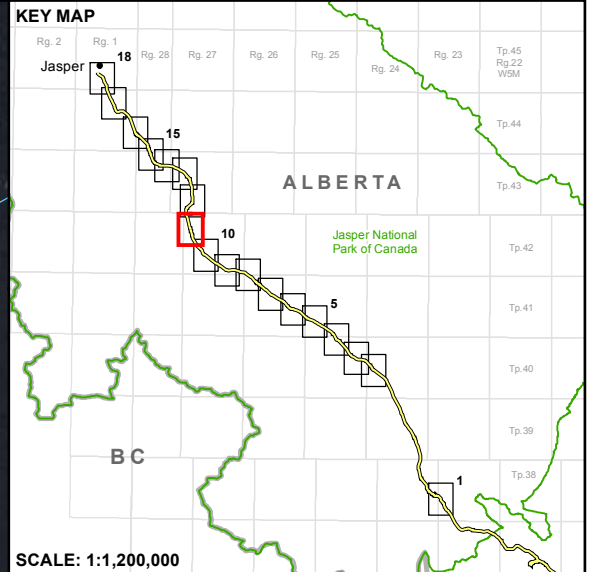
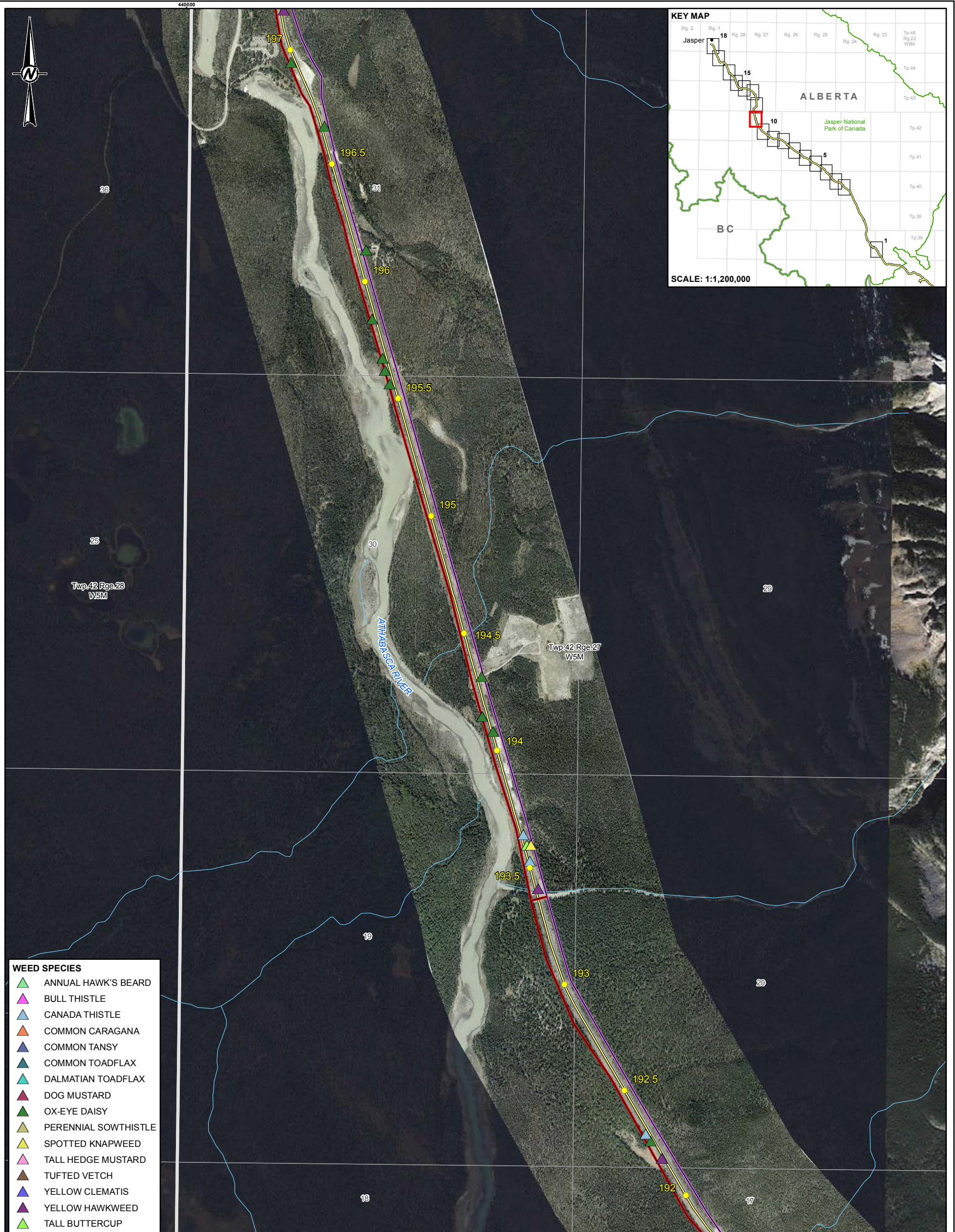
TITLE
WEED SPECIES LOCATIONS

CONSULTANT	YYYY-MM-DD	2016-10-27
	DESIGNED	LV
	PREPARED	RC
	REVIEWED	VC
	APPROVED	CD



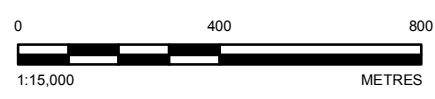
PROJECT NO.	CONTROL	REV.	FIGURE
1659727	2000	0	10

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A4 (8) 25mm



- WEED SPECIES**
- ▲ ANNUAL HAWK'S BEARD
 - ▲ BULL THISTLE
 - ▲ CANADA THISTLE
 - ▲ COMMON CARAGANA
 - ▲ COMMON TANSY
 - ▲ COMMON TOADFLAX
 - ▲ DALMATIAN TOADFLAX
 - ▲ DOG MUSTARD
 - ▲ OX-EYE DAISY
 - ▲ PERENNIAL SOWTHISTLE
 - ▲ SPOTTED KNAPWEED
 - ▲ TALL HEDGE MUSTARD
 - ▲ TUFTED VETCH
 - ▲ YELLOW CLEMATIS
 - ▲ YELLOW HAWKWEED
 - ▲ TALL BUTTERCUP

- LEGEND**
- HIGHWAY 93N
 - ALTERNATE TRAIL ROUTE
 - PROPOSED TRAIL ROUTE
 - WATERCOURSE



REFERENCE(S)

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DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
PARKS CANADA

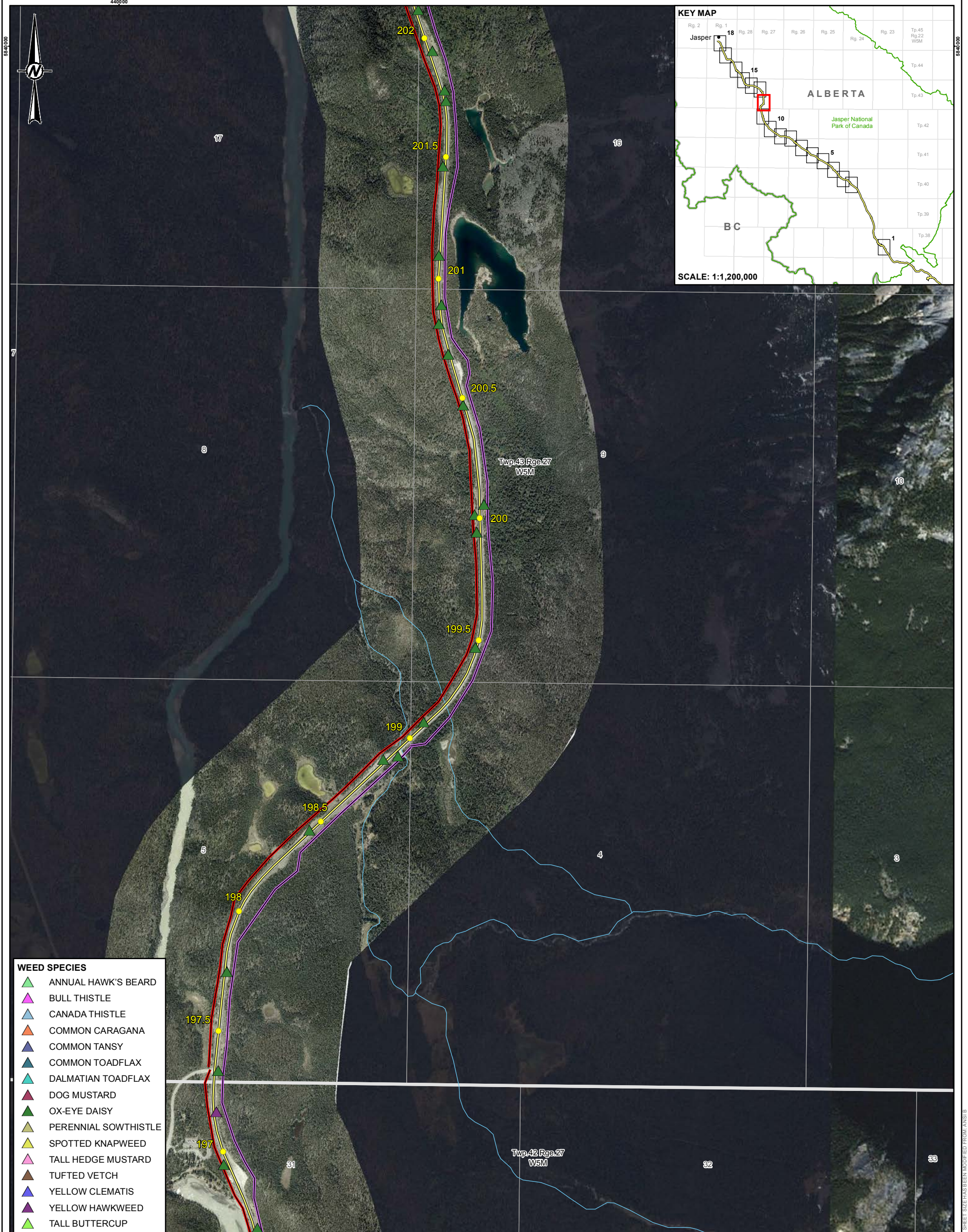
PROJECT
JASPER ICEFIELDS PARKWAY

TITLE
WEED SPECIES LOCATIONS

CONSULTANT	DATE	REVISION
	YYYY-MM-DD	2016-10-27
	DESIGNED	LV
	PREPARED	RC
	REVIEWED	VC
	APPROVED	CD

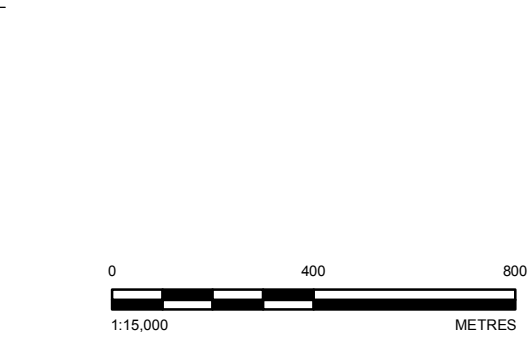
PROJECT NO.	CONTROL	REV.	FIGURE
1659727	2000	0	11

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A4 (8



- WEED SPECIES**
- ANNUAL HAWK'S BEARD
 - BULL THISTLE
 - CANADA THISTLE
 - COMMON CARAGANA
 - COMMON TANSY
 - COMMON TOADFLAX
 - DALMATIAN TOADFLAX
 - DOG MUSTARD
 - OX-EYE DAISY
 - PERENNIAL SOWTHISTLE
 - SPOTTED KNAPWEED
 - TALL HEDGE MUSTARD
 - TUFTED VETCH
 - YELLOW CLEMATIS
 - YELLOW HAWKWEED
 - TALL BUTTERCUP

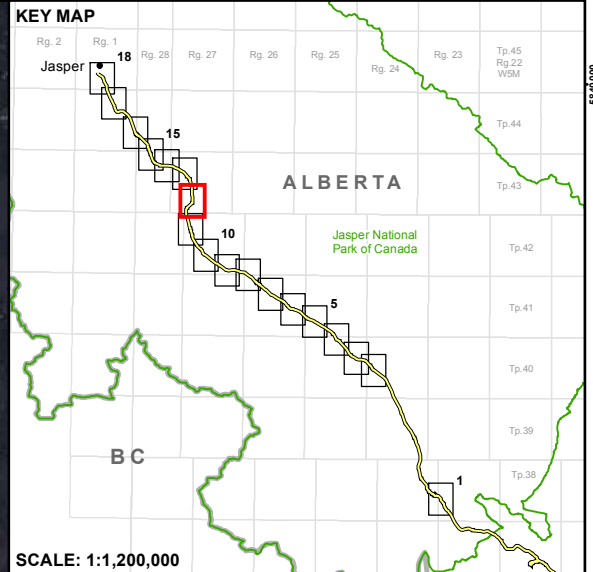
- LEGEND**
- HIGHWAY 93N
 - ALTERNATE TRAIL ROUTE
 - PROPOSED TRAIL ROUTE
 - WATERCOURSE



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DATUM: NAD 83 PROJECTION: UTM ZONE 11



CLIENT
PARKS CANADA

PROJECT
JASPER ICEFIELDS PARKWAY

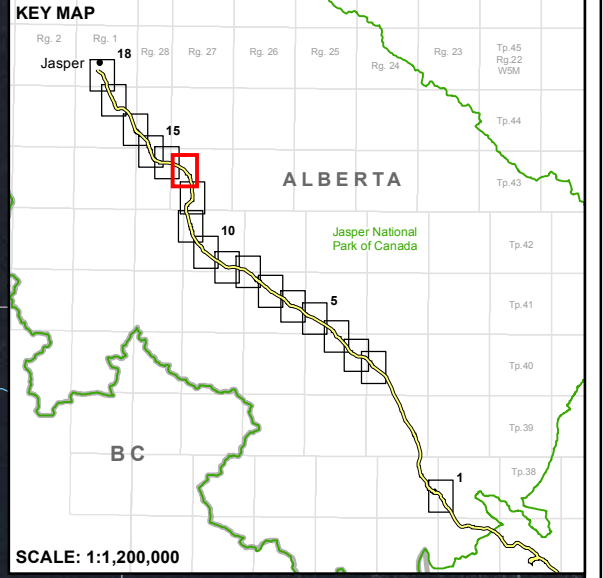
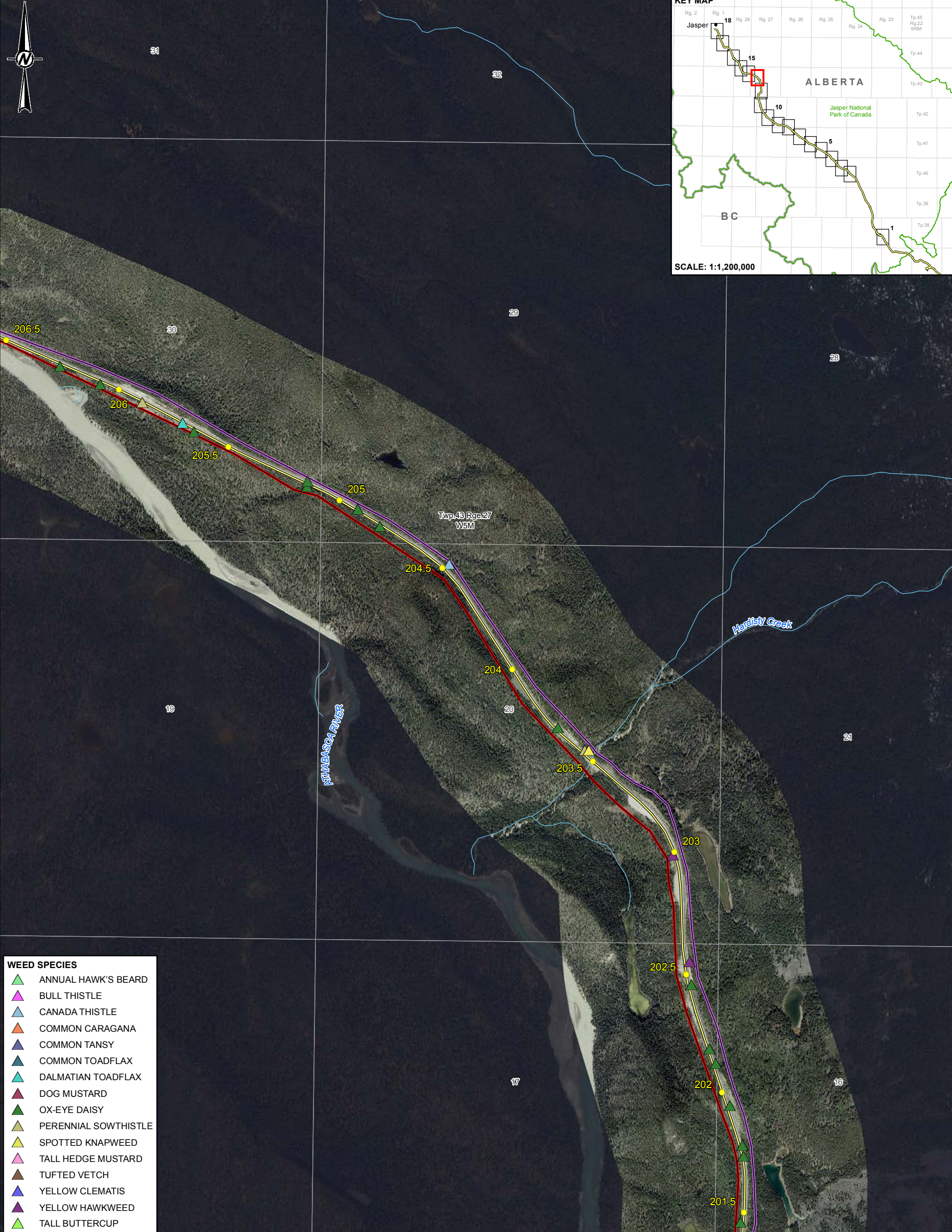
TITLE
WEED SPECIES LOCATIONS

CONSULTANT	YYYY-MM-DD	2016-10-27
	DESIGNED	LV
	PREPARED	RC
	REVIEWED	VC
	APPROVED	CD

PROJECT NO.	CONTROL	REV.	FIGURE
1659727	2000	0	12

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSIB 25mm

440000

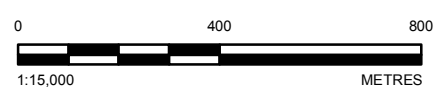


WEED SPECIES

▲	ANNUAL HAWK'S BEARD
▲	BULL THISTLE
▲	CANADA THISTLE
▲	COMMON CARAGANA
▲	COMMON TANSY
▲	COMMON TOADFLAX
▲	DALMATIAN TOADFLAX
▲	DOG MUSTARD
▲	OX-EYE DAISY
▲	PERENNIAL SOWTHISTLE
▲	SPOTTED KNAPWEED
▲	TALL HEDGE MUSTARD
▲	TUFTED VETCH
▲	YELLOW CLEMATIS
▲	YELLOW HAWKWEED
▲	TALL BUTTERCUP

LEGEND

—	HIGHWAY 93N
—	ALTERNATE TRAIL ROUTE
—	PROPOSED TRAIL ROUTE
—	WATERCOURSE



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DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
PARKS CANADA

PROJECT
JASPER ICEFIELDS PARKWAY

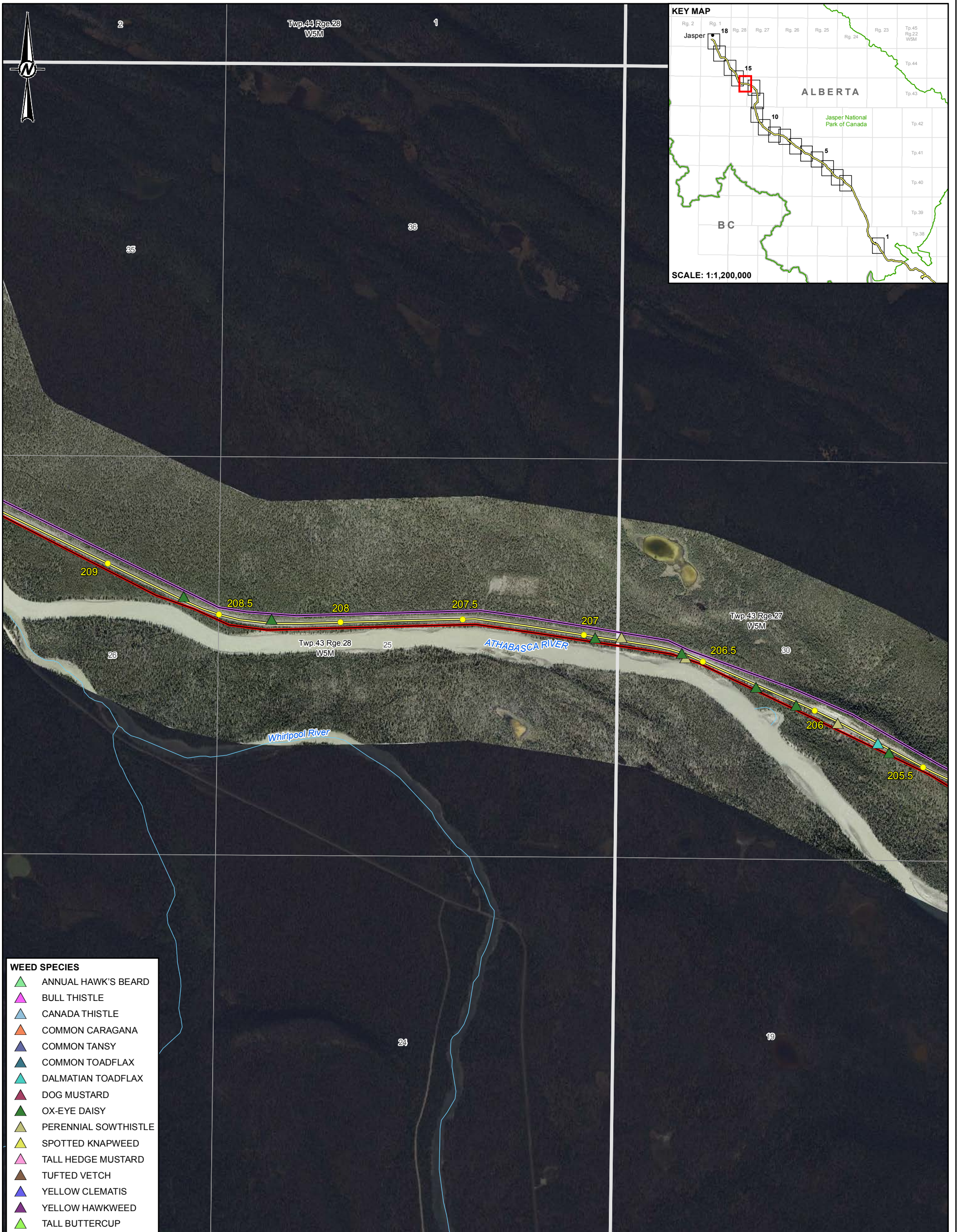
TITLE
WEED SPECIES LOCATIONS

CONSULTANT	YYYY-MM-DD	2016-10-27
	DESIGNED	LV
	PREPARED	RC
	REVIEWED	VC
	APPROVED	CD



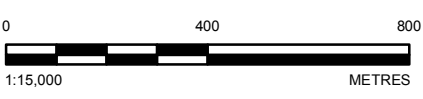
PROJECT NO.	CONTROL	REV.	FIGURE
1659727	2000	0	13

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3 (841x1190mm) TO A4 (297x420mm)



- WEED SPECIES**
- ▲ ANNUAL HAWK'S BEARD
 - ▲ BULL THISTLE
 - ▲ CANADA THISTLE
 - ▲ COMMON CARAGANA
 - ▲ COMMON TANSY
 - ▲ COMMON TOADFLAX
 - ▲ DALMATIAN TOADFLAX
 - ▲ DOG MUSTARD
 - ▲ OX-EYE DAISY
 - ▲ PERENNIAL SOWTHISTLE
 - ▲ SPOTTED KNAPWEED
 - ▲ TALL HEDGE MUSTARD
 - ▲ TUFTED VETCH
 - ▲ YELLOW CLEMATIS
 - ▲ YELLOW HAWKWEED
 - ▲ TALL BUTTERCUP

- LEGEND**
- HIGHWAY 93N
 - ALTERNATE TRAIL ROUTE
 - PROPOSED TRAIL ROUTE
 - WATERCOURSE



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DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
PARKS CANADA

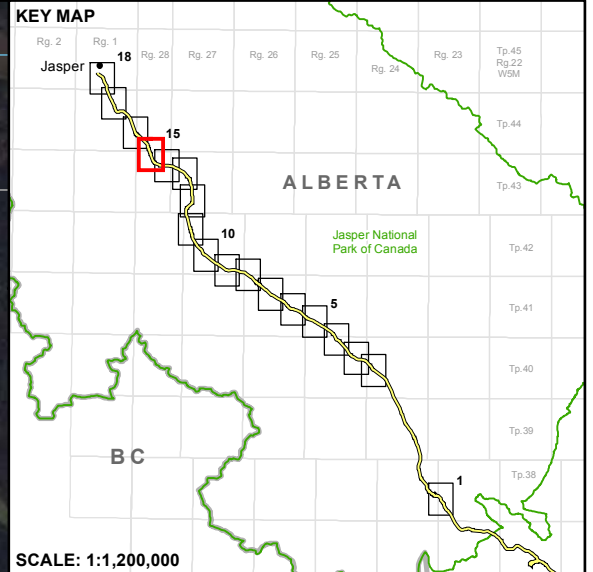
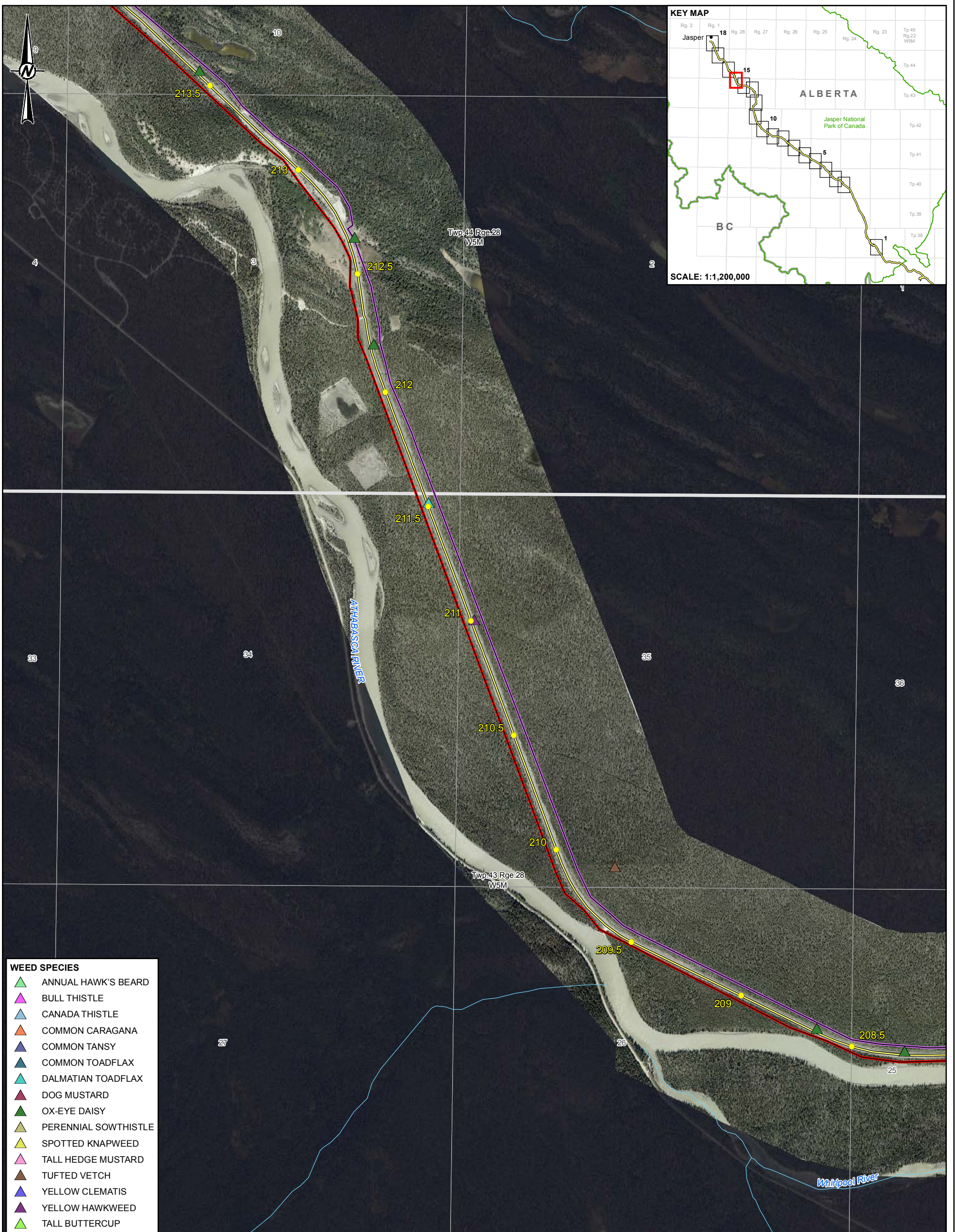
PROJECT
JASPER ICEFIELDS PARKWAY

TITLE
WEED SPECIES LOCATIONS

CONSULTANT	YYYY-MM-DD	2016-10-27
	DESIGNED	LV
	PREPARED	RC
	REVIEWED	VC
	APPROVED	CD

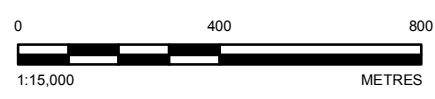
PROJECT NO.	CONTROL	REV.	FIGURE
1659727	2000	0	14

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A4 (81mm x 119mm)



- WEED SPECIES**
- ▲ ANNUAL HAWK'S BEARD
 - ▲ BULL THISTLE
 - ▲ CANADA THISTLE
 - ▲ COMMON CARAGANA
 - ▲ COMMON TANSY
 - ▲ COMMON TOADFLAX
 - ▲ DALMATIAN TOADFLAX
 - ▲ DOG MUSTARD
 - ▲ OX-EYE DAISY
 - ▲ PERENNIAL SOWTHISTLE
 - ▲ SPOTTED KNAPWEED
 - ▲ TALL HEDGE MUSTARD
 - ▲ TUFTED VETCH
 - ▲ YELLOW CLEMATIS
 - ▲ YELLOW HAWKWEED
 - ▲ TALL BUTTERCUP

- LEGEND**
- HIGHWAY 93N
 - ALTERNATE TRAIL ROUTE
 - PROPOSED TRAIL ROUTE
 - WATERCOURSE



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DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
PARKS CANADA

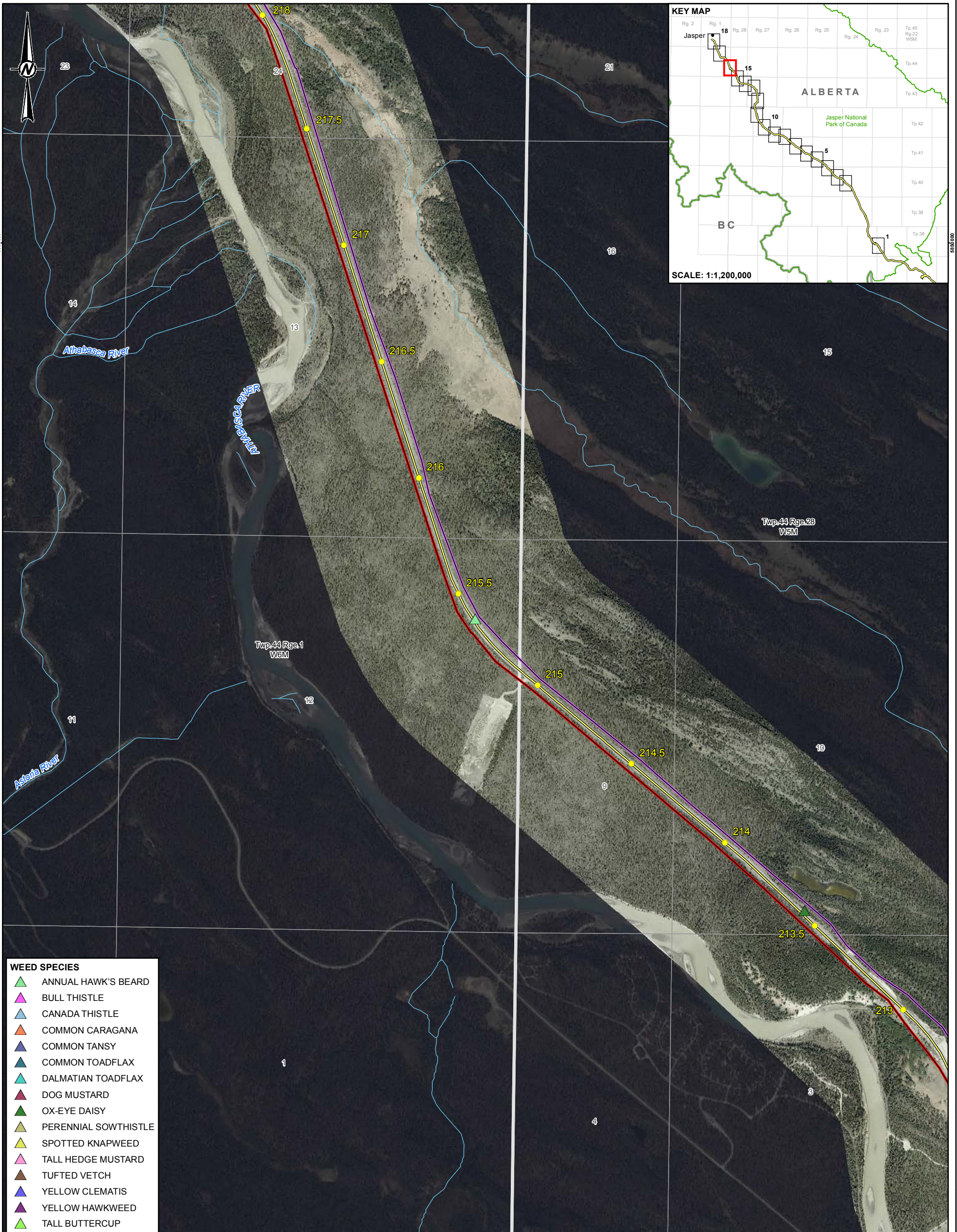
PROJECT
JASPER ICEFIELDS PARKWAY

TITLE
WEED SPECIES LOCATIONS

CONSULTANT	DATE	REVISION
	YYYY-MM-DD	2016-10-27
	DESIGNED	LV
	PREPARED	RC
	REVIEWED	VC
	APPROVED	CD

PROJECT NO. 1659727 CONTROL 2000 REV. 0 FIGURE 15

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/B3

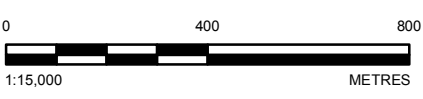


WEED SPECIES

- ▲ ANNUAL HAWK'S BEARD
- ▲ BULL THISTLE
- ▲ CANADA THISTLE
- ▲ COMMON CARAGANA
- ▲ COMMON TANSY
- ▲ COMMON TOADFLAX
- ▲ DALMATIAN TOADFLAX
- ▲ DOG MUSTARD
- ▲ OX-EYE DAISY
- ▲ PERENNIAL SOWTHISTLE
- ▲ SPOTTED KNAPWEED
- ▲ TALL HEDGE MUSTARD
- ▲ TUFTED VETCH
- ▲ YELLOW CLEMATIS
- ▲ YELLOW HAWKWEED
- ▲ TALL BUTTERCUP

LEGEND

- HIGHWAY 93N
- ALTERNATE TRAIL ROUTE
- PROPOSED TRAIL ROUTE
- WATERCOURSE



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DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
PARKS CANADA

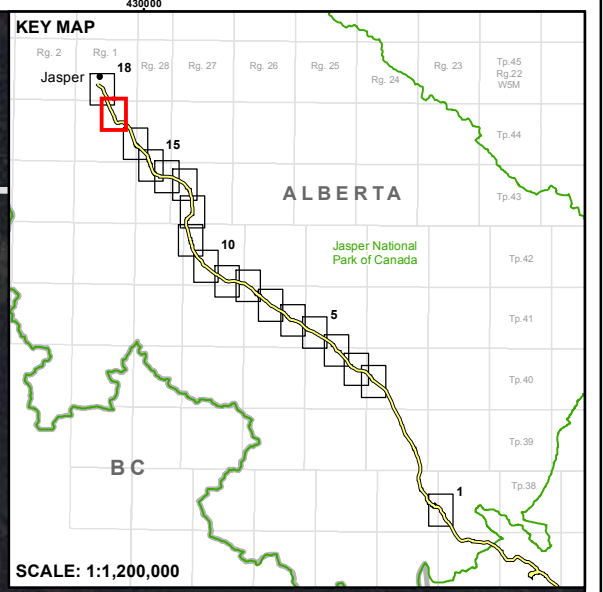
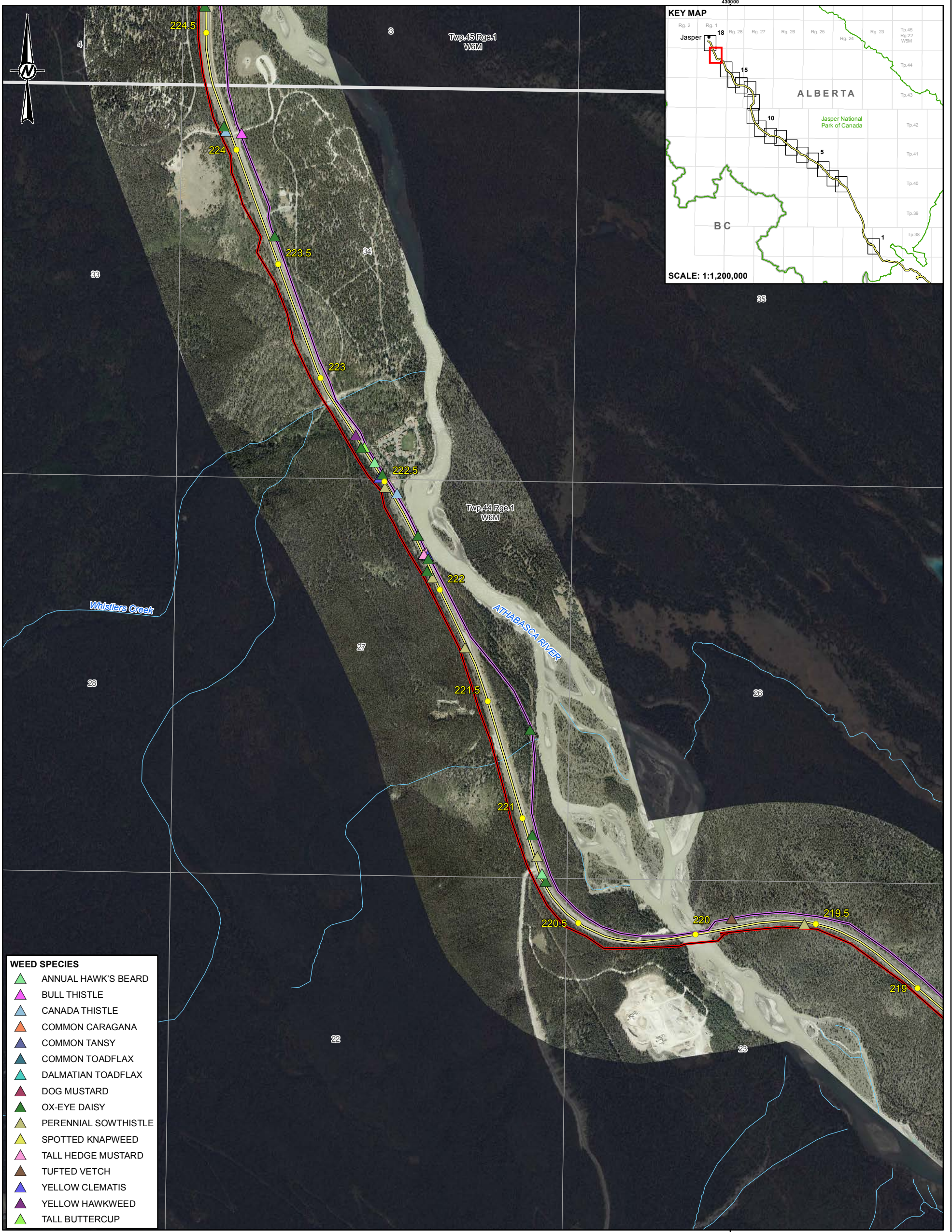
PROJECT
JASPER ICEFIELDS PARKWAY

TITLE
WEED SPECIES LOCATIONS

CONSULTANT	YYYY-MM-DD	2016-10-27
	DESIGNED	LV
	PREPARED	RC
	REVIEWED	VC
	APPROVED	CD

PROJECT NO.	CONTROL	REV.	FIGURE
1659727	2000	0	16

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A4 (81mm)

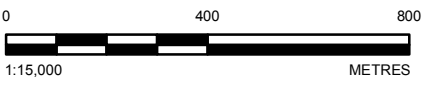


WEED SPECIES

- ▲ ANNUAL HAWK'S BEARD
- ▲ BULL THISTLE
- ▲ CANADA THISTLE
- ▲ COMMON CARAGANA
- ▲ COMMON TANSY
- ▲ COMMON TOADFLAX
- ▲ DALMATIAN TOADFLAX
- ▲ DOG MUSTARD
- ▲ OX-EYE DAISY
- ▲ PERENNIAL SOWTHISTLE
- ▲ SPOTTED KNAPWEED
- ▲ TALL HEDGE MUSTARD
- ▲ TUFTED VETCH
- ▲ YELLOW CLEMATIS
- ▲ YELLOW HAWKWEED
- ▲ TALL BUTTERCUP

LEGEND

- HIGHWAY 93N
- ALTERNATE TRAIL ROUTE
- PROPOSED TRAIL ROUTE
- WATERCOURSE



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DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
PARKS CANADA

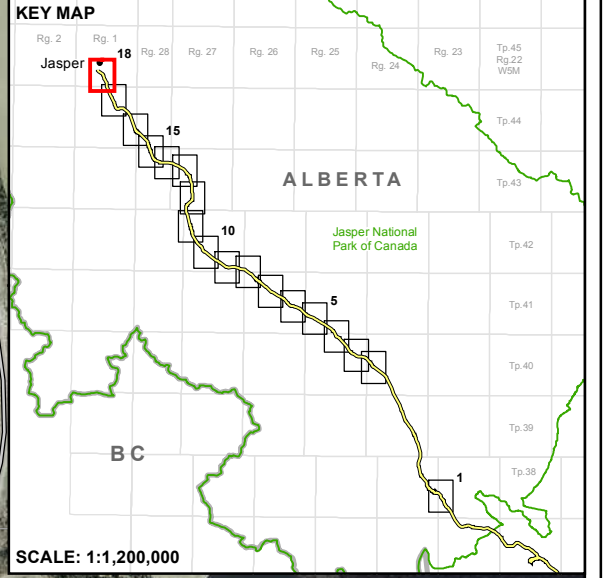
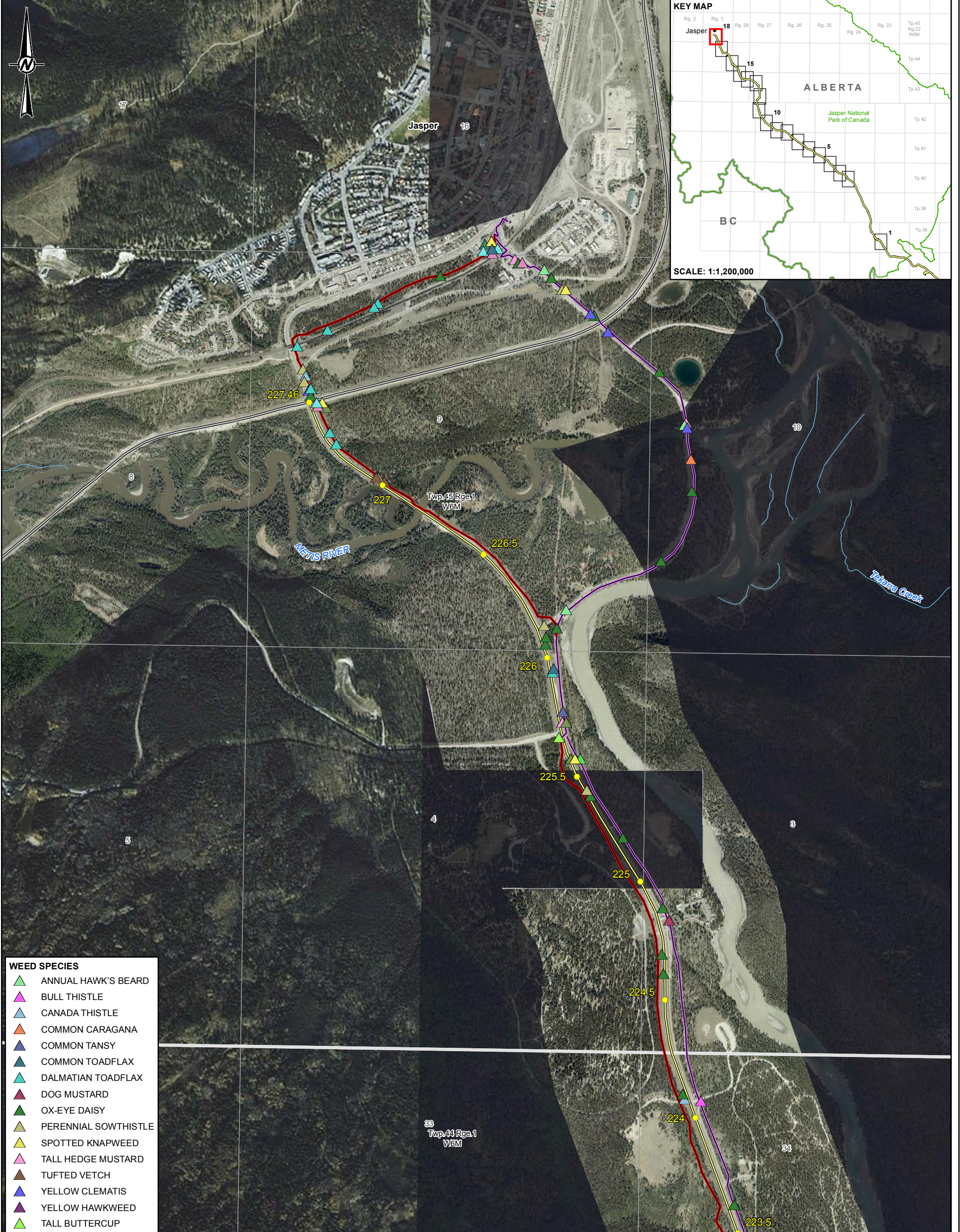
PROJECT
JASPER ICEFIELDS PARKWAY

TITLE
WEED SPECIES LOCATIONS

CONSULTANT	YYYY-MM-DD	2016-10-27
	DESIGNED	LV
	PREPARED	RC
	REVIEWED	VC
	APPROVED	CD

PROJECT NO. 1659727	CONTROL 2000	REV. 0	FIGURE 17
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A4 (811 x 1191 mm) TO A3 (1191 x 841 mm)

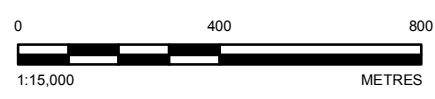


WEED SPECIES

- ▲ ANNUAL HAWK'S BEARD
- ▲ BULL THISTLE
- ▲ CANADA THISTLE
- ▲ COMMON CARAGANA
- ▲ COMMON TANSY
- ▲ COMMON TOADFLAX
- ▲ DALMATIAN TOADFLAX
- ▲ DOG MUSTARD
- ▲ OX-EYE DAISY
- ▲ PERENNIAL SOWTHISTLE
- ▲ SPOTTED KNAPWEED
- ▲ TALL HEDGE MUSTARD
- ▲ TUFTED VETCH
- ▲ YELLOW CLEMATIS
- ▲ YELLOW HAWKWEED
- ▲ TALL BUTTERCUP

LEGEND

- HIGHWAY 16
- HIGHWAY 93N
- ALTERNATE TRAIL ROUTE
- PROPOSED TRAIL ROUTE
- WATERCOURSE



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DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
PARKS CANADA

PROJECT
JASPER ICEFIELDS PARKWAY

TITLE
WEED SPECIES LOCATIONS

CONSULTANT	YYYY-MM-DD	2016-10-27
	DESIGNED	LV
	PREPARED	RC
	REVIEWED	VC
	APPROVED	CD

PROJECT NO.	CONTROL	REV.	FIGURE
1659727	2000	0	18

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSIB 25mm



5.0 CLOSURE

We trust that this information meets your current requirements. If you have any questions or concerns, please contact the undersigned.

GOLDER ASSOCIATES LTD.

Valerie Coenen, B.Sc., EP, ATT
Senior Terrestrial Ecologist

Corey De La Mare, B.Sc., P.Biol
Principal, Senior Biologist

VC/CD/km

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6.0 REFERENCES

- Axys Environmental Consulting Ltd. and David Walker & Associates. 2015. Best Management Practices for Routine Leaseholder Activities. Prepared for Leaseholder Working Group, Jasper National Park. January 1998, Updated November 2015.
- Parks Canada Agency. 2015. Jasper National Park Vegetation Restoration Program 2015 -Year End Report. Prepared by Landon Shepherd, Vegetation Restoration Specialist. January 2015.
- Province of Alberta. 2010. Weed Control Act, Weed Control Regulation. Alberta Regulation 19/2010, Weed Regulation. Alberta Queen's Printer. Edmonton, AB. 14 pp. Available at: [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/acts6156](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/acts6156)
- Tannas. 2014. Rare plant/weed data collected between 2010 and 2014 for Jasper National Park. Provided by Jasper National Park Field Unit, February 5, 2016.

https://capws.golder.com/sites/p1659727/icefields/traillbiophysicalfieldsurveys/6000_reporting/6002_non-nativeplants/final/jnp_non-native_plant_survey_final.docx



APPENDIX A

Weed Survey Location and Data

As a global, employee-owned organisation with over 50 years of experience, Golder Associates is driven by our purpose to engineer earth's development while preserving earth's integrity. We deliver solutions that help our clients achieve their sustainable development goals by providing a wide range of independent consulting, design and construction services in our specialist areas of earth, environment and energy.

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Asia	+ 86 21 6258 5522
Australasia	+ 61 3 8862 3500
Europe	+ 44 1628 851851
North America	+ 1 800 275 3281
South America	+ 56 2 2616 2000

solutions@golder.com
www.golder.com

Golder Associates Ltd.
102, 2535 - 3rd Avenue S.E.
Calgary, Alberta, T2A 7W5
Canada
T: +1 (403) 299 5600

