

Management of Invasive Plants in Protected Areas

Project Numbers: UKE-F17-W-1447 & COL-F17-W-1427

Prepared for: Fish and Wildlife Compensation Program
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Invasive Species Council



EAST KOOTENAY
INVASIVE SPECIES
COUNCIL

Prepared with financial support of the Fish and Wildlife Compensation Program on behalf of its program partners BC Hydro, the Province of BC, Fisheries and Oceans Canada, First Nations and public stakeholders.

Additional partners include Nature Conservancy of Canada, The Nature Trust of BC, Ministry of Forests, Lands, & Natural Resource Operations, and BC Parks.



Ministry of Forests,
Lands & Natural
Resource Operations



Date: February, 2017

EXECUTIVE SUMMARY

The invasion of noxious weeds has numerous negative impacts on natural ecosystems. Invasive plants threaten the health of Canada's limited native grasslands, may displace or extirpate endangered plant and animal species, negatively impact wildlife habitats, reduce productivity in forestry, agriculture and fisheries, and overall contribute negatively to functioning ecosystems. The Fish and Wildlife Compensation Program provided financial support to the East Kootenay Invasive Species Council to retain functional and sustainable ecosystems by mitigating the impacts of invasive species in protected areas of the East Kootenay and their adjacent lands. In 2016, invasive plant inventories and treatments were conducted at partnering conservation properties: Nature Conservancy of Canada (NCC), the Nature Trust of BC (TNT), the Ministry of Forests, Lands, & Natural Resource Operations (MFLNRO), BC Parks and other high-value adjacent lands. This successful collaboration resulted in an efficient partnership to decrease the existing invasive plant populations, as well as to prevent any further negative impact on the ecosystem.

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INTRODUCTION

The East Kootenay Invasive Species Council (EKISC) engaged in a partnership with several agencies in the 2016 field season. The partners involved included the Fish and Wildlife Compensation Program (FWCP), the Nature Conservancy of Canada (NCC), the Nature Trust of BC (TNT), and the Ministry of Forests, Lands, & Natural Resource Operations (MFLNRO). A new partner for the 2016 season was BC Parks, who saw the value of landscape-level land management and increased invasive plant control funding. In accordance with stakeholder's contribution agreements, services included invasive plant management control activities at high priority sites within the East Kootenay region. Several planning sessions were conducted to determine which properties were threatened by the encroachment of invasive plants, and how to pool funds from the various stakeholders for this joint effort.

This program aimed to retain functional and sustainable ecosystems in protected areas by mitigating the impacts of invasive species in adjacent lands. The benefits include the reduction of propagule pressure from neighbouring invasive populations, wildlife habitat conservation, long-term cost savings from potential future invasive species management action, restoration of chemically treated areas with native plant species, and training of various land managers. This report summarizes the activities that were completed.

This project aligns with FWCP action plans for Upland/Dryland and Riparian/Wetland Areas. These actions include invasive species monitoring, rapid response, and control. Invasive plant sites are monitored for treatment efficacy and to assess changes in distribution and abundance. Treated sites were restored using a site-appropriate seed mix. This project utilizes an Ecosystem-based Approach to restore and enhance priority habitats for grazing ungulates and other open forest habitat species.

MANAGEMENT AREA

EKISC's jurisdiction lies within the Regional District of East Kootenay (RDEK), and has been divided into Invasive Plant Management Areas (IPMAs) as shown in Figure 1. Administrative duties and operational activities were conducted throughout EKISC's territory, with a focus on priority sites on conservation properties associated with essential wildlife habitat corridors and grassland conservation.

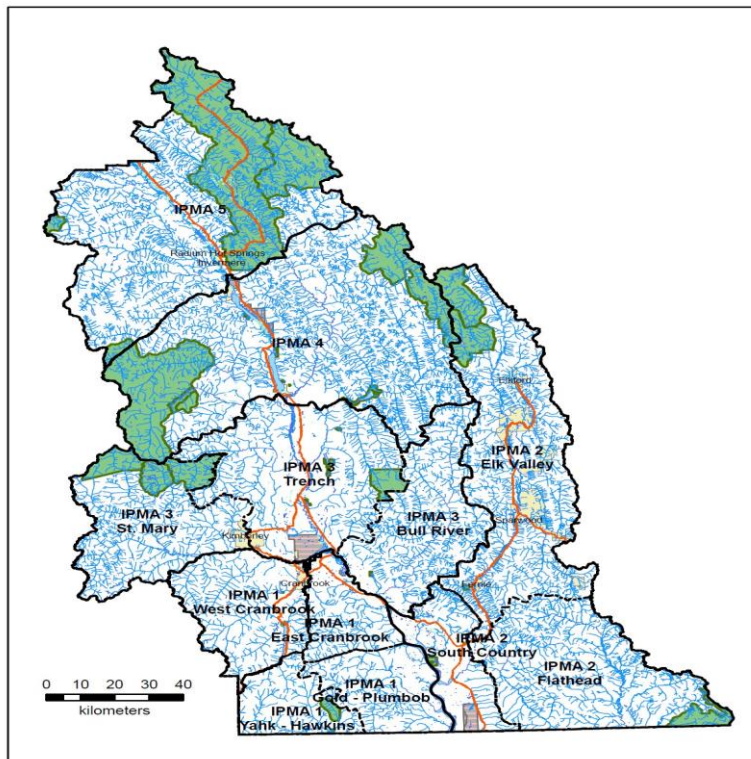


Figure 1. Invasive Plant Management Area (IPMA) Boundaries within the Regional District of East Kootenay

PARTNER CONTRIBUTIONS

Following a spring planning session, partner organization representatives and EKISC staff agreed on a work plan which detailed the amount of pooled funding to be allocated to various high-value properties in the East Kootenay region. Table 1 lists the various partners and their contributions to this collaborative project.

Table 1. List of partners and their contributions for invasive plant management on conservation properties in the East Kootenay region in 2016.

Partner/Funder	Total Contribution \$	Treatments/ Monitoring \$	Admin \$
FWCP	43,000	39,290	3,710
TNT	3,500	3,110	420
MFLNRO	10,000	8,800	1,200
NCC	20,000	17,600	2,400
BC Parks	10,000	8,800	1,200
EKISC (In-Kind)	3,710		
TOTAL	\$90,210	\$77,600	\$8,930

TREATMENT SUMMARY

Treatment for conservation properties started June 8th, 2016, and continued sporadically throughout the field season, ending on October 16th, 2016. A total of 195 sites were treated, using 20.28 liters and 4.23 kilograms of undiluted herbicide, covering an area of 67.08 hectares. The conservation properties that were chosen for invasive plant management in 2016 are shown in Table 2, along with treatment costs and area treated per property. The dollars per hectare amount can vary significantly due to what type of treatment is required and how dense the invasive plant populations are. If the treatment requires mechanical control due to a pump house or riparian area, the dollars per hectare will be significantly higher than if the property has a large, dense infestation that is easily treated with broadcast spraying. If the dollars per hectare is high on a property, it is necessary to discuss invasive plant management for that property before the 2017 season. EKISC has an in-house crew that is able to complete manual control to lower costs, or if there are very few invasive plant sites on the property and limited treatment is needed, consider treating lower priority species or to re-allocate the funding to properties that have greater invasive plant populations.

Table 2. Conservation properties and associated land managers that were prioritized for invasive plant management in 2016.

Property	Land Manager	Area Treated (ha)	Treatment Cost (\$)	\$/ha	Manual/ Biocontrol/ Inventory \$
Armstrong	TNT	0.175	599.77	3,427.26	
Big Ranch	TNT	5.288	1,735.56	328.21	
Bummer's Flats	TNT/MFLNRO	2.615	4,002.77	1,530.70	1710.00
Cherry Creek	TNT	0.450	1514.69	3,365.98	In-Kind
Columbia Lake East	MFLNRO	2.125	938.17	441.49	
Columbia Lake East Provincial Park	BC Parks	0.225	1,083.25	4,814.44	
Columbia Lake Westside	TNT	1.015	2,183.19	2,150.93	
Dry Gulch Provincial Park	BC Parks	0.875	759.78	868.32	
Earl Ranch	MFLNRO	0.175	1,035.98	5,919.89	
Elk Valley	NCC	0.337	998.20	2,962.02	
Hoodoos	NCC/TNT	0.900	1,497.50	1,663.89	
Kikomun Provincial Park	BC Parks	7.512	3,275.00	435.97	
Kootenay River Ranch	NCC	4.115	3,499.78	850.49	
Lot 48	NCC	0.150	1,331.89	8,879.27	
Lower Norbury Creek	TNT	3.650	1,099.58	301.25	
Luxor Linkage	NCC	1.095	747.86	682.98	500.00
Marion Creek	NCC	0.566	3,166.71	5,594.89	750.00
Mt. Broadwood/ Wigwam	NCC	18.176	5,050.58	277.87	
Norbury Provincial Park	BC Parks	0.062	0	0	250.00
Pine Butte	NCC	6.925	3,525.78	509.14	
Red Barn	MFLNRO	0.600	1,020.26	1,700.43	
Sheep Mountain (Cutts)	TNT/MFLNRO	4.000	1,569.86	392.47	
Starr	MFLNRO	1.150	1,569.86	1,365.10	
Sun Lakes	MFLNRO	0.150	1,299.98	8,666.53	
Thunderhill	NCC	0.850	1,654.39	1,946.34	
Wasa Provincial Park	BC Parks	0.152	2,301.75	15,143.09	
Wasa Slough	TNT	0.020	0	0	500.00
Wycliffe	MFLNRO	3.730	4,146.55	1,111.68	
TOTAL		67.083ha	\$51,608.69	\$769.33/ha	\$3,710.00



Figure 2. The EKISC crew collaborates with Ducks Unlimited, TNT, and Rocky Mt Naturalists for the annual purple loosestrife weed pull at Bummer's Flats.

The tables and maps to follow summarize the treatments that occurred at each conservation property. The red pin marks depict treatments that occurred with conservation property funding, the blue pin marks show where mechanical control occurred, the pink pin marks are biocontrol releases and the yellow pin marks show treatments from other funding partners.

At several conservation properties, mechanical treatments were the most effective management option. Some sites were close to water which precluded the use of herbicides along the riparian zone. Visual surveys at all sites will provide a more accurate inventory of weed populations for future planning and management. In addition, biological control (biocontrol) insects were surveyed, collected, and distributed at appropriate locations. This long-term management tool is useful for areas that will not be visited regularly or where herbicide treatment is not possible.

Grass seed was spread at all hand-pull sites by EKISC crew when feasible and if there was a good chance of seed establishment. If this seed successfully germinates at the site, it will provide competition for the undesirable invasive weeds, as well as increase biodiversity and forage value.

FINANCIAL SUMMARY

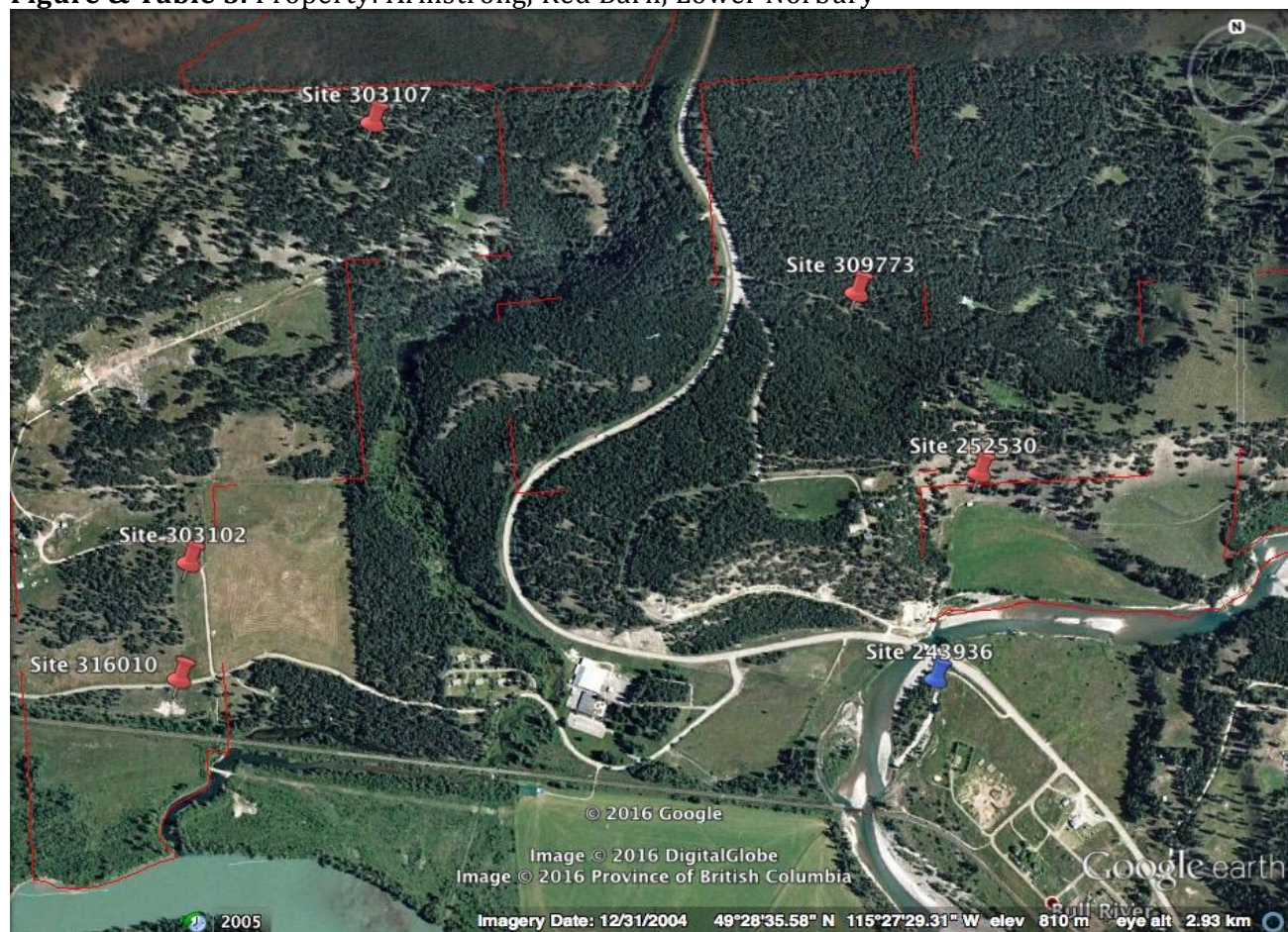
See separate document which summarizes the expenses from this project.

RECOMMENDATIONS

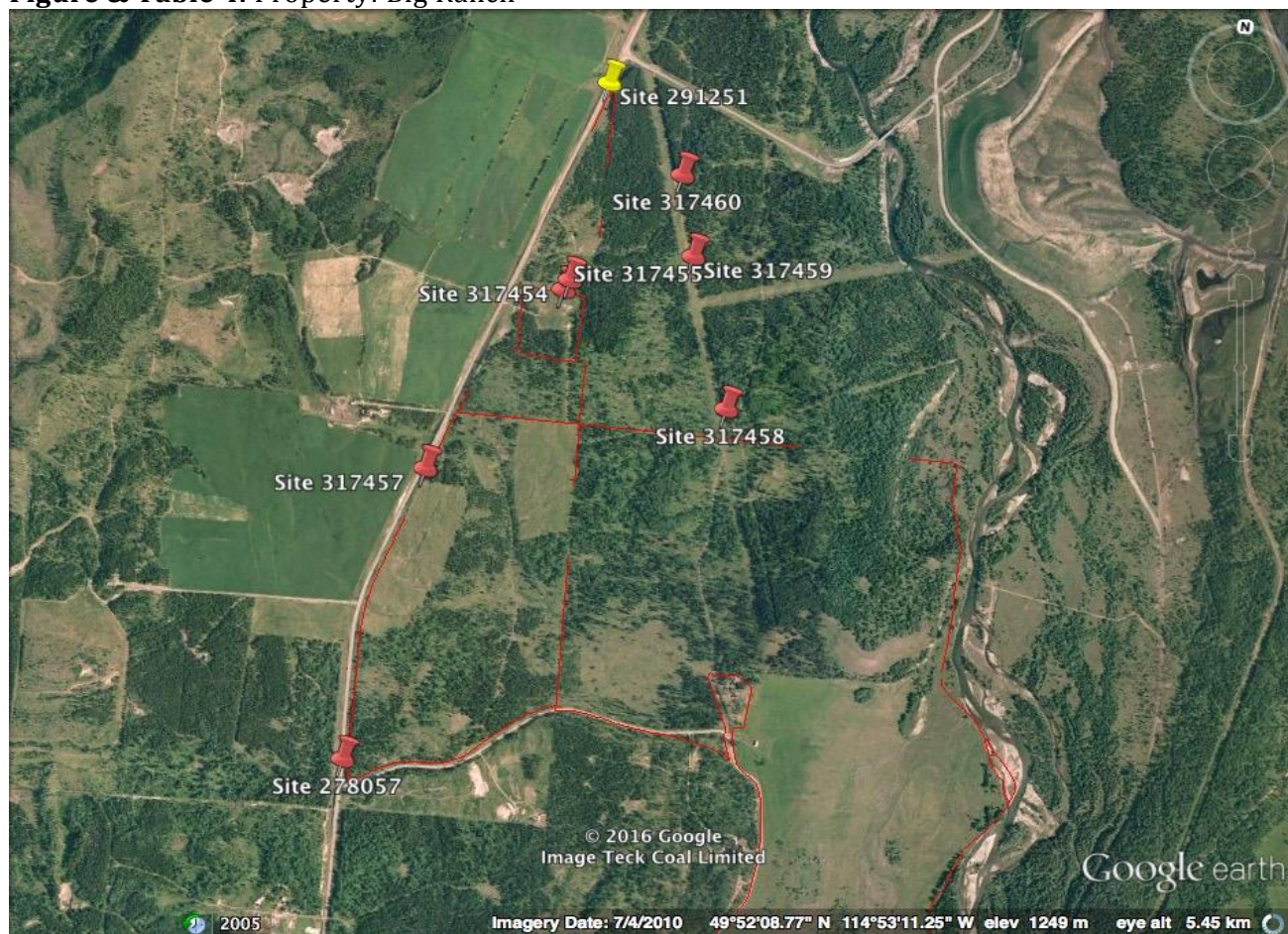
The collaboration between EKISC and partnering land managers based within the East Kootenay allowed for efficient and timely delivery of an invasive plant management plan on conservation properties. A few recommendations to ensure a more effective long-term management strategy include:

- Increased budget for invasive plant inventory, treatments and monitoring
- Conduct invasive plant inventories on the areas where the status of invasive plant is unknown
- Provide employees with invasive plant identification training to assist with inventory of invasive plants in remote areas
- Better communication between with EKISC staff throughout the year of known or new invasive plant sites that need to be inventoried and/or treated
- To participate in an invasive plant treatment planning meeting with EKISC in the spring of 2017 to create a more strategic plan for invasive plants on priority conservation properties
- Collaborate with other land managers including Ecosystem Restoration experts for a wider scope of invasive plant management in the East Kootenay region
- Use proper invasive plant management practices when working on conservation properties:
 - Cleaning boots and pants free of seeds and burrs on site
 - Spraying trucks or ATVs to prevent the transport of seeds
 - Seeding immediately after any land disturbance on ROWs
 - Staying on dirt roads or skid trails as much as possible

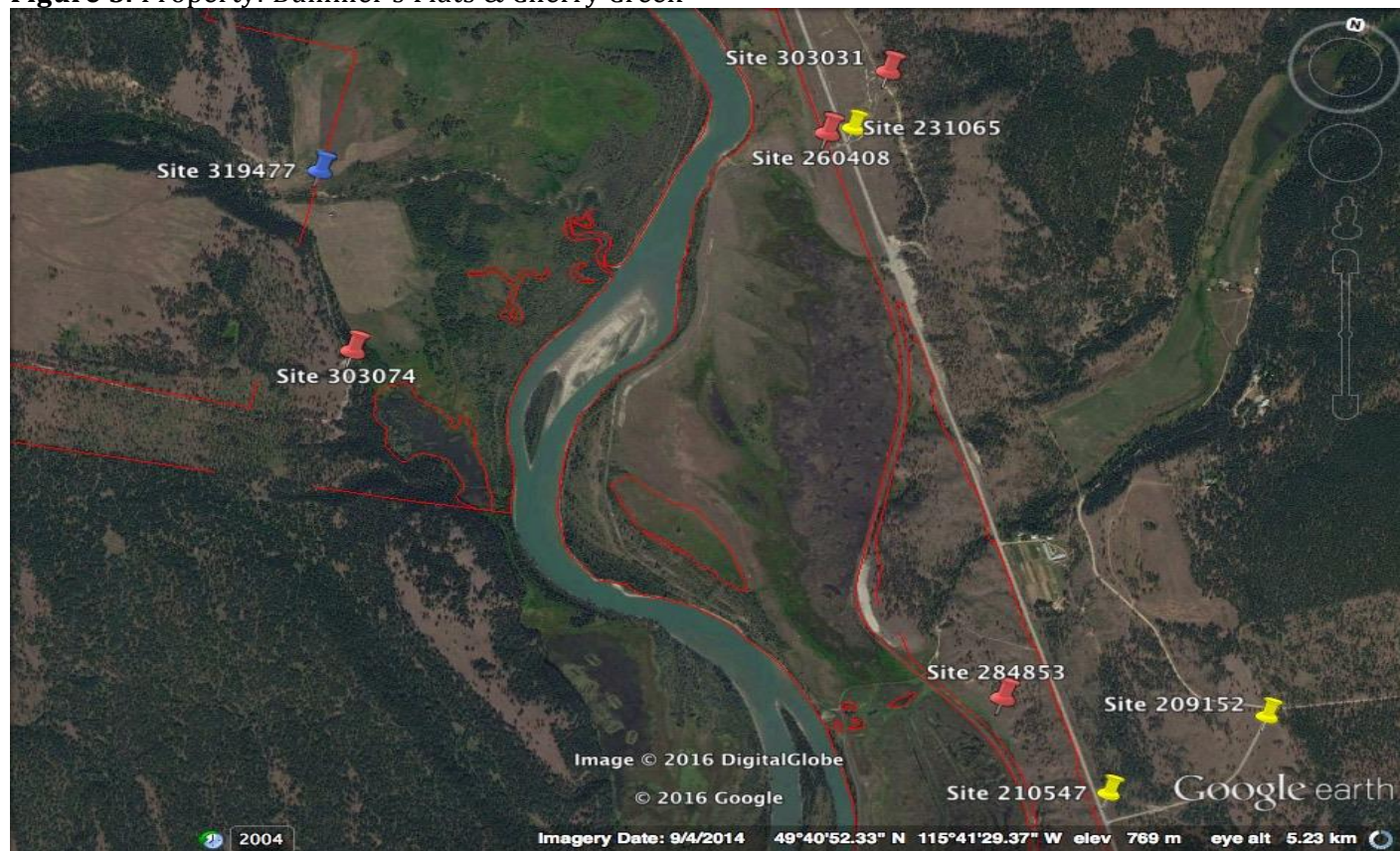
On behalf of the East Kootenay Invasive Species Council, we sincerely appreciate this significant financial contribution for invasive plant management in the East Kootenay.

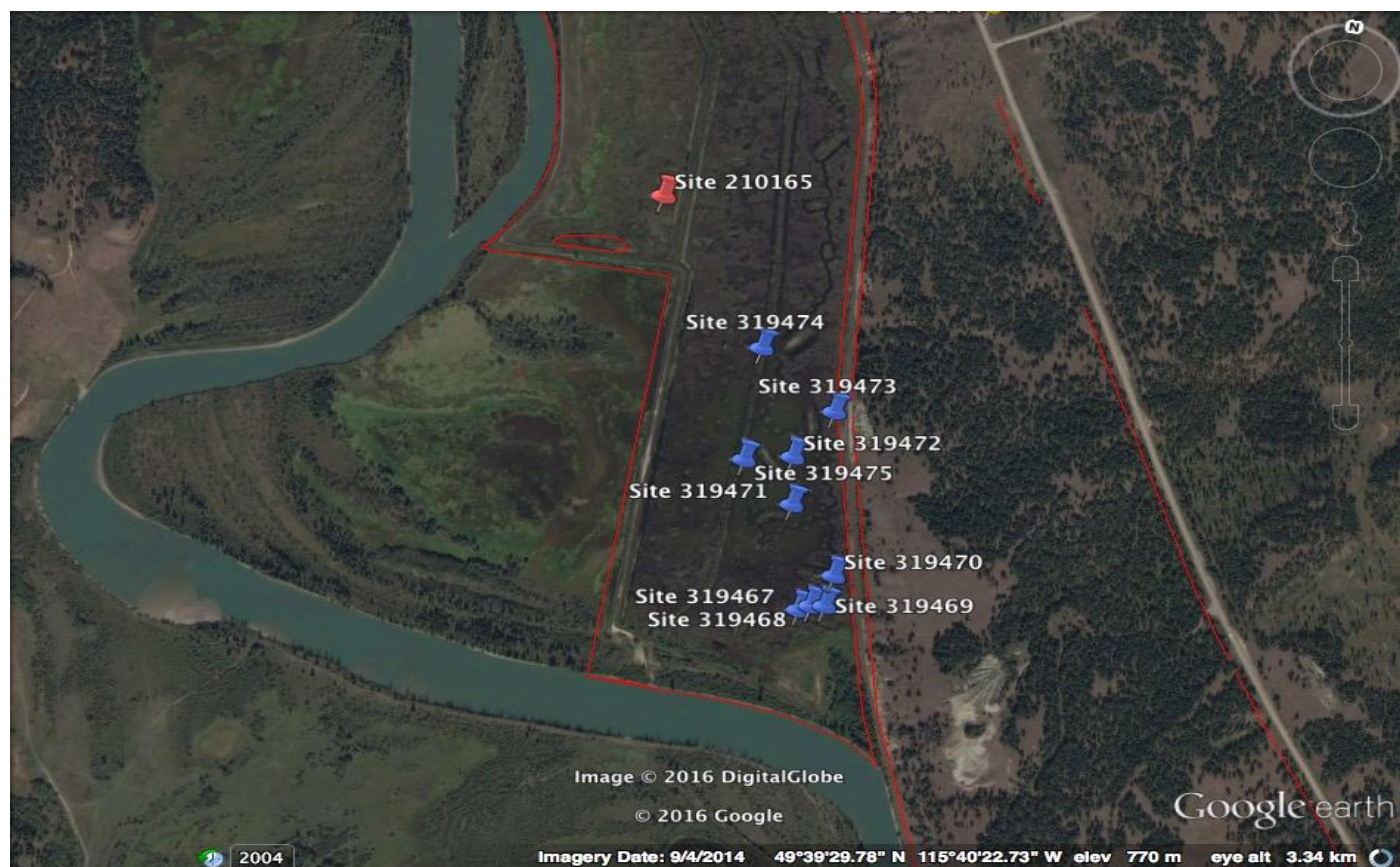
APPENDIX**INVASIVE PLANT TREATMENTS****Figure & Table 3.** Property: Armstrong, Red Barn, Lower Norbury

Property	Site Number	Invasive Plants Found	Herbicide	Amount of Mix Used (L)	Undiluted Herbicide Used (L or Kg)	Area Treated per Site (ha)	Total Area Treated
Armstrong, Lower Norbury Creek, Red Barn	309773	Blueweed, Burdock, Spotted knapweed	Clearview	35	0.035	0.175	4.425
	303102	Blueweed, Spotted knapweed	Clearview	440	0.506	2.20	
	303107	Blueweed, Spotted knapweed	Clearview	200	0.230	1.00	
	316010	Blueweed	Clearview	90	0.104	0.45	
	252530	Burdock, Spotted knapweed	Clearview	120	0.12	0.600	

Figure & Table 4. Property: Big Ranch

Property	Site Number	Invasive Plants Found	Herbicide	Amount of Mix Used (L)	Undiluted Herbicide Used (L or Kg)	Area Treated per Site (ha)	Total Area Treated
Big Ranch	317454	Spotted knapweed, Yellow/common roadflax	Tordon 22K	160	1.500	0.667	5.290
	317455	Canada thistle, Spotted knapweed	Milestone	450	0.712	1.875	
	278057	Spotted knapweed	Milestone	3.0	0.005	0.013	
	317457	Canada thistle, Scentless Chamomile	Milestone	350	0.554	1.460	
	317458	Canada thistle	Milestone	300	0.475	1.25	
	317459	Canada thistle, Spotted knapweed	Milestone	3.0	0.005	0.013	
	317460	Spotted knapweed	Milestone	3.0	0.005	0.013	

Figure 5. Property: Bummer's Flats & Cherry Creek

**Table 5.** Property: Bummer's Flats & Cherry Creek

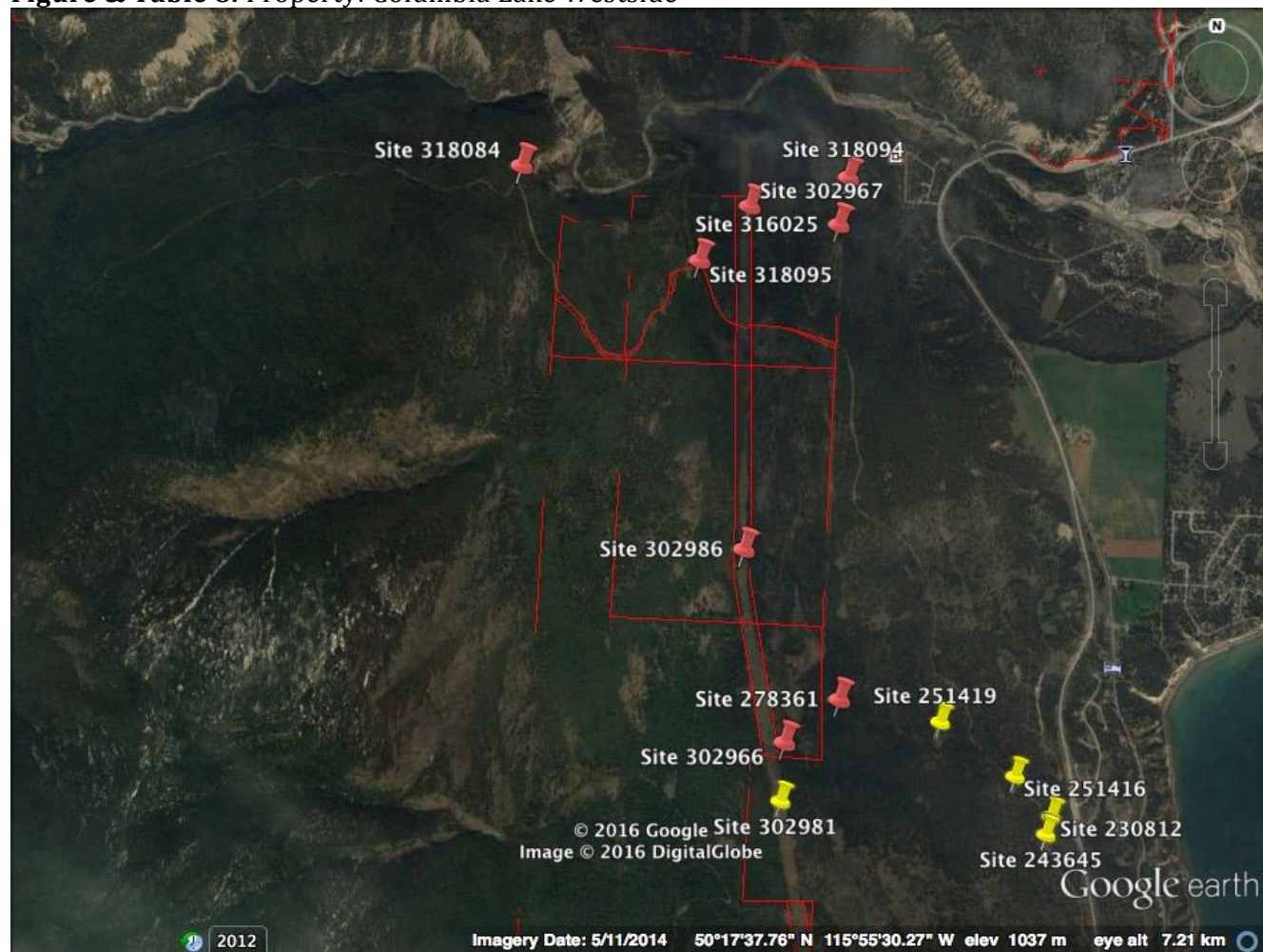
Property	Site Number	Invasive Plants Found	Herbicide	Amount of Mix Used (L)	Undiluted Herbicide Used (L or Kg)	Area Treated per Site (ha)	Total Area Treated
Bummer's Flats	210165	Spotted Knapweed	Milestone	55	0.110	0.275	3.065
	260408	Spotted Knapweed	Milestone	290	0.580	1.450	
	284853	Spotted Knapweed	Clearview	135	0.135	0.675	
	303031	Spotted Knapweed	Clearview	25	0.029	0.125	
	303074	Spotted Knapweed, Burdock	Clearview	90	0.090	0.450	
	319467	Purple Loosestrife	Hand pull	-	-	0.010	
	319468	Purple Loosestrife	Hand pull	-	-	0.010	
	319469	Purple Loosestrife	Hand pull	-	-	0.010	
	319470	Purple Loosestrife	Hand pull	-	-	0.010	
	319471	Purple Loosestrife	Hand pull	-	-	0.010	
	319472	Purple Loosestrife	Hand pull	-	-	0.010	
	319473	Purple Loosestrife	Hand pull	-	-	0.010	
	319474	Purple Loosestrife	Hand pull	-	-	0.010	
	319475	Purple Loosestrife	Hand pull	-	-	0.010	

Figure & Table 6. Property: Columbia Lake East

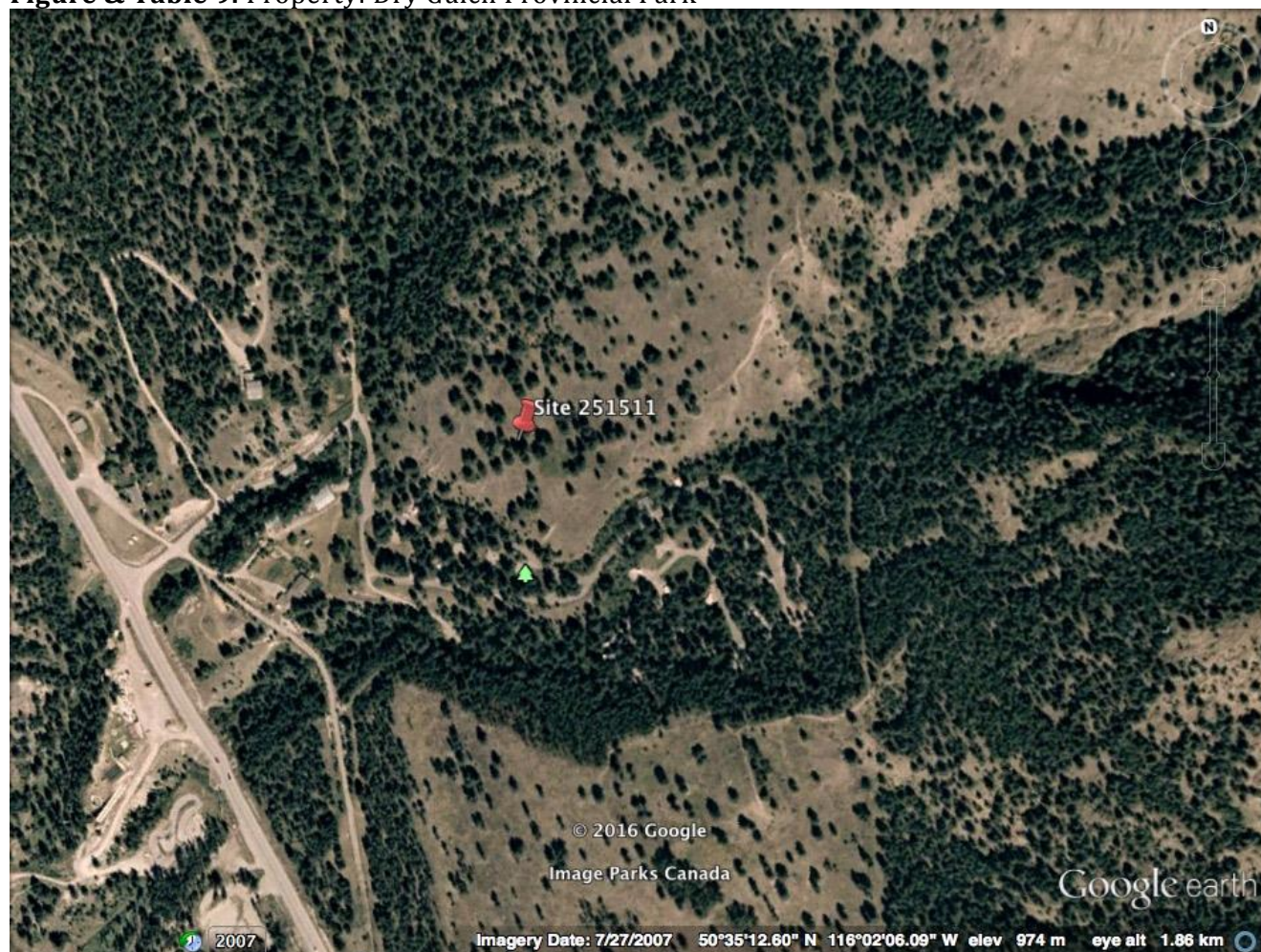
Property	Site Number	Invasive Plants Found	Herbicide	Amount of Mix Used (L)	Undiluted Herbicide Used (L or Kg)	Area Treated per Site (ha)	Total Area Treated
Columbia Lake East	45829	Spotted Knapweed	Lontrel	340	1.020	1.700	2.125
	128133	Spotted Knapweed	Lontrel	40	0.120	0.200	
	318081	Spotted Knapweed	Milestone	45	0.090	0.225	

Figure & Table 7. Property: Columbia Lake East Provincial Park

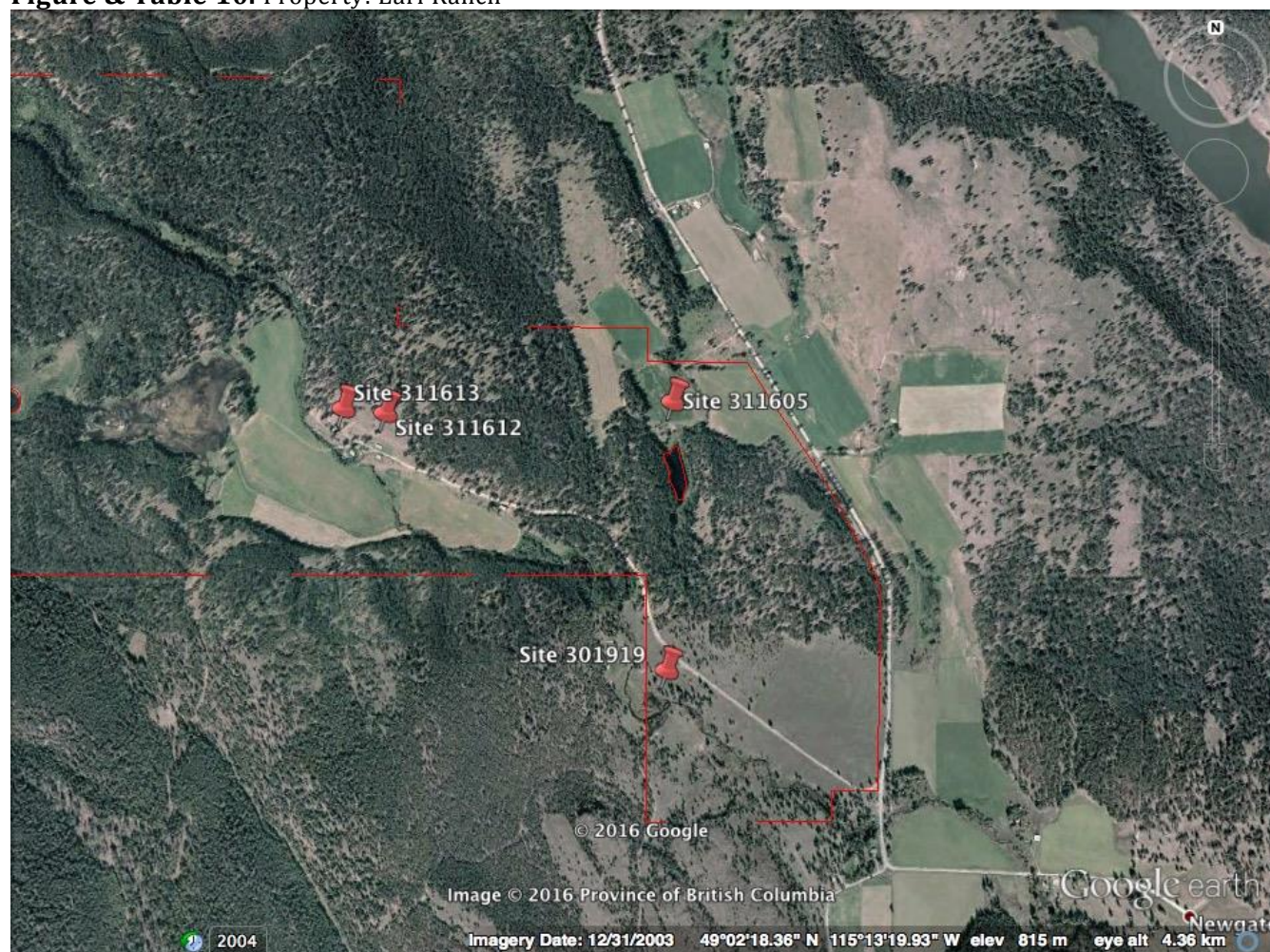
Property	Site Number	Invasive Plants Found	Herbicide	Amount of Mix Used (L)	Undiluted Herbicide Used (L or Kg)	Area Treated per Site (ha)	Total Area Treated
Columbia Lake East Provincial Park	251406	Diffuse knapweed, Spotted knapweed	Milestone	45	0.090	0.225	0.225

Figure & Table 8. Property: Columbia Lake Westside

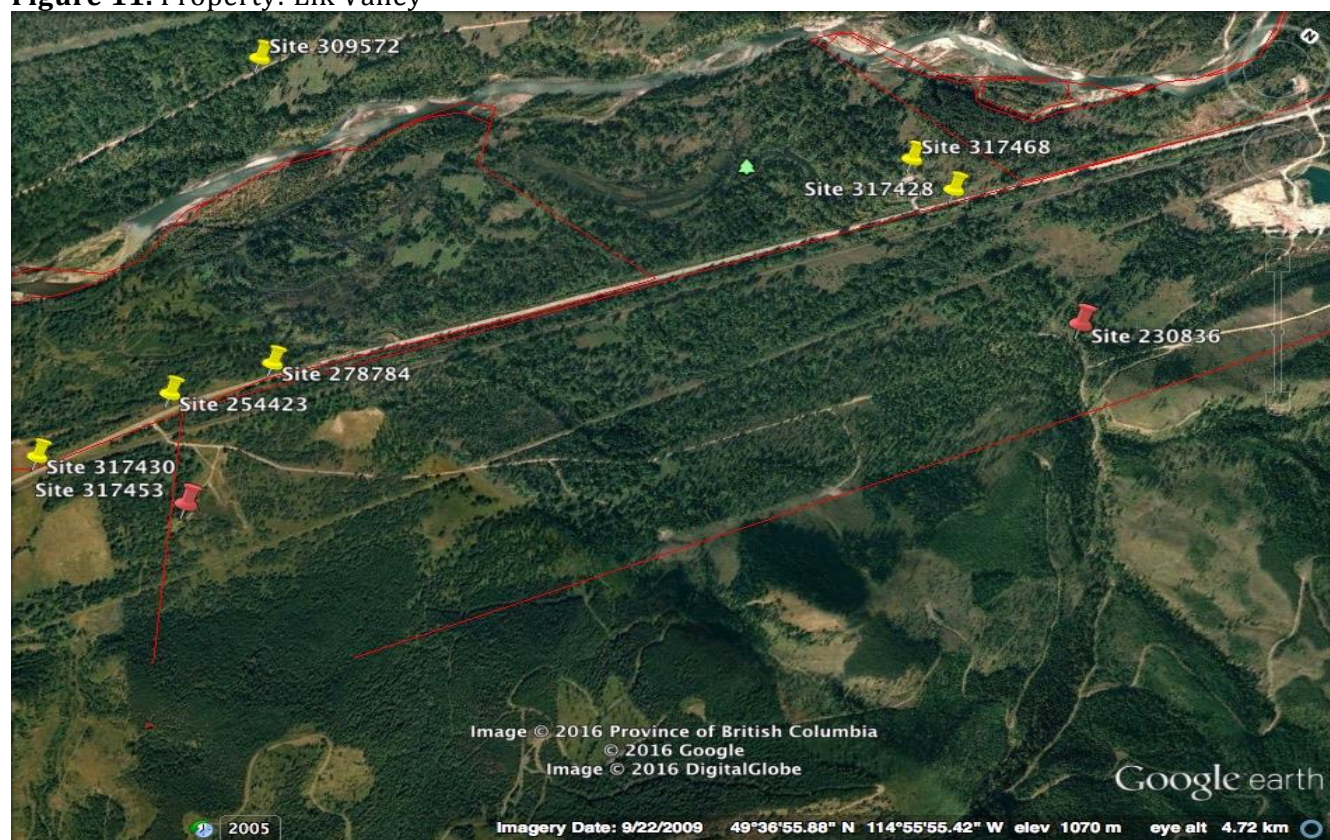
Property	Site Number	Invasive Plants Found	Herbicide	Amount of Mix Used (L)	Undiluted Herbicide Used (L or kg)	Area Treated per Site (ha)	Total Area Treated
Columbia Lake Westside	278361	Common Tansy	Milestone	3	0.006	0.015	1.015
	302966	Common Tansy	Milestone	10	0.020	0.050	
	302967	Spotted Knapweed	Milestone	5	0.010	0.025	
	302986	Spotted Knapweed	Milestone	15	0.030	0.075	
	316025	Spotted Knapweed	Milestone	30	0.060	0.150	
	318084	Spotted Knapweed	Milestone	45	0.090	0.225	
	318094	Spotted Knapweed	Milestone	70	0.140	0.350	
	318095	Spotted Knapweed	Milestone	25	0.050	0.125	

Figure & Table 9. Property: Dry Gulch Provincial Park

Property	Site Number	Invasive Plants Found	Herbicide	Amount of Mix Used (L)	Undiluted Herbicide Used (L or Kg)	Area Treated per Site (ha)	Total Area Treated
Dry Gulch Provincial Park	251511	Spotted Knapweed	Lontrel	175	0.613	0.875	0.875

Figure & Table 10. Property: Earl Ranch

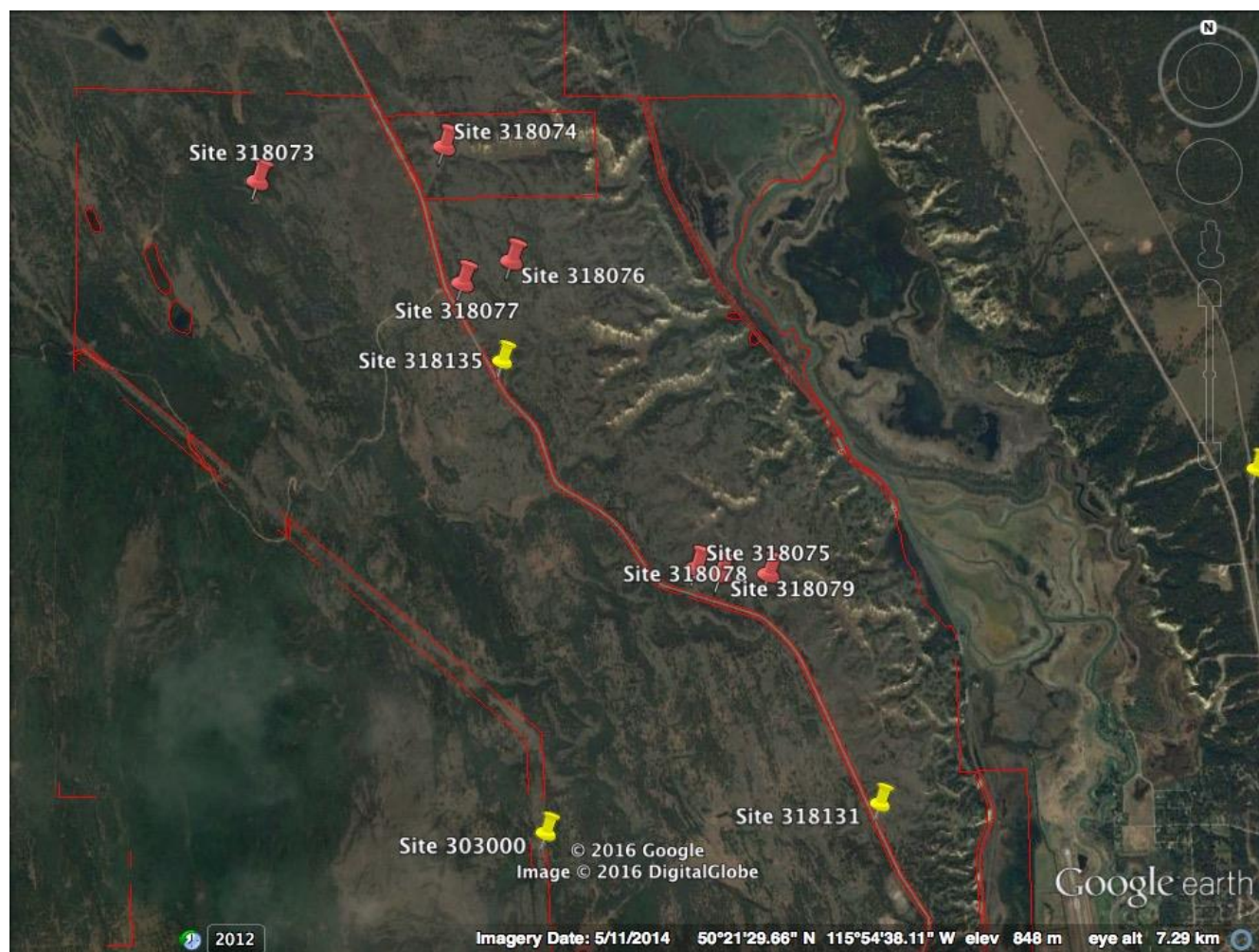
Property	Site Number	Invasive Plants Found	Herbicide	Amount of Mix Used (L)	Undiluted Herbicide Used (L or kg)	Area Treated per Site (ha)	Total Area Treated
Earl Ranch	301919	Yellow/common Roadflax	Clearview	15	0.015	0.075	0.175
	311605	Wormwood	Clearview	5	0.005	0.025	
	311612	Baby's Breath	Clearview	10	0.010	0.050	
	311613	St. John's Wort	Clearview	5	0.005	0.025	

Figure 11. Property: Elk Valley

**Table 11.** Property: Elk Valley

Property	Site Number	Invasive Plants Found	Herbicide	Amount of Mix Used (L)	Undiluted Herbicide Used (L or Kg)	Area Treated per Site (ha)	Total Area Treated
Elk Valley	230836	Common Tansy, Wormwood	Tordon 22K	5	0.027	0.012	0.337
	270709	Spotted Knapweed	Milestone	20	0.042	0.083	
	270710	Spotted Knapweed	Tordon 22K	4	0.021	0.010	
	270716	Burdock, Canada Thistle, Spotted Knapweed	Milestone	28	0.058	0.117	
	276031	Spotted Knapweed, Yellow/common Roadflax	Milestone & Tordon 22K	20	0.091	0.057	
	295816	Spotted Knapweed	Milestone	5	0.010	0.021	
	295853	Spotted Knapweed, St. John's wort, Sulphur Cinquefoil	Tordon 22K	3	0.016	0.007	
	295855	Hound's tongue, Spotted Knapweed, St. John's wort	Tordon 22K	3	0.016	0.007	
	317453	Spotted Knapweed, St. John's wort, Sulphur Cinquefoil	Tordon 22K	10	0.054	0.024	

Figure & Table 12. Property: Hoodoos



Property	Site Number	Invasive Plants Found	Herbicide	Amount of Mix Used (L)	Undiluted Herbicide Used (L or kg)	Area Treated per Site (ha)	Total Area Treated
Hoodoos	318073	Spotted Knapweed	Milestone	80	0.160	0.400	0.900
	318074	Spotted Knapweed	Milestone	35	0.070	0.175	
	318075	Spotted Knapweed	Milestone	30	0.060	0.150	
	318076	Spotted Knapweed	Milestone	15	0.030	0.075	
	318077	Spotted Knapweed	Milestone	10	0.020	0.050	
	318078	Spotted Knapweed	Milestone	5	0.010	0.025	
	318079	Diffuse Knapweed	Milestone	5	0.010	0.025	

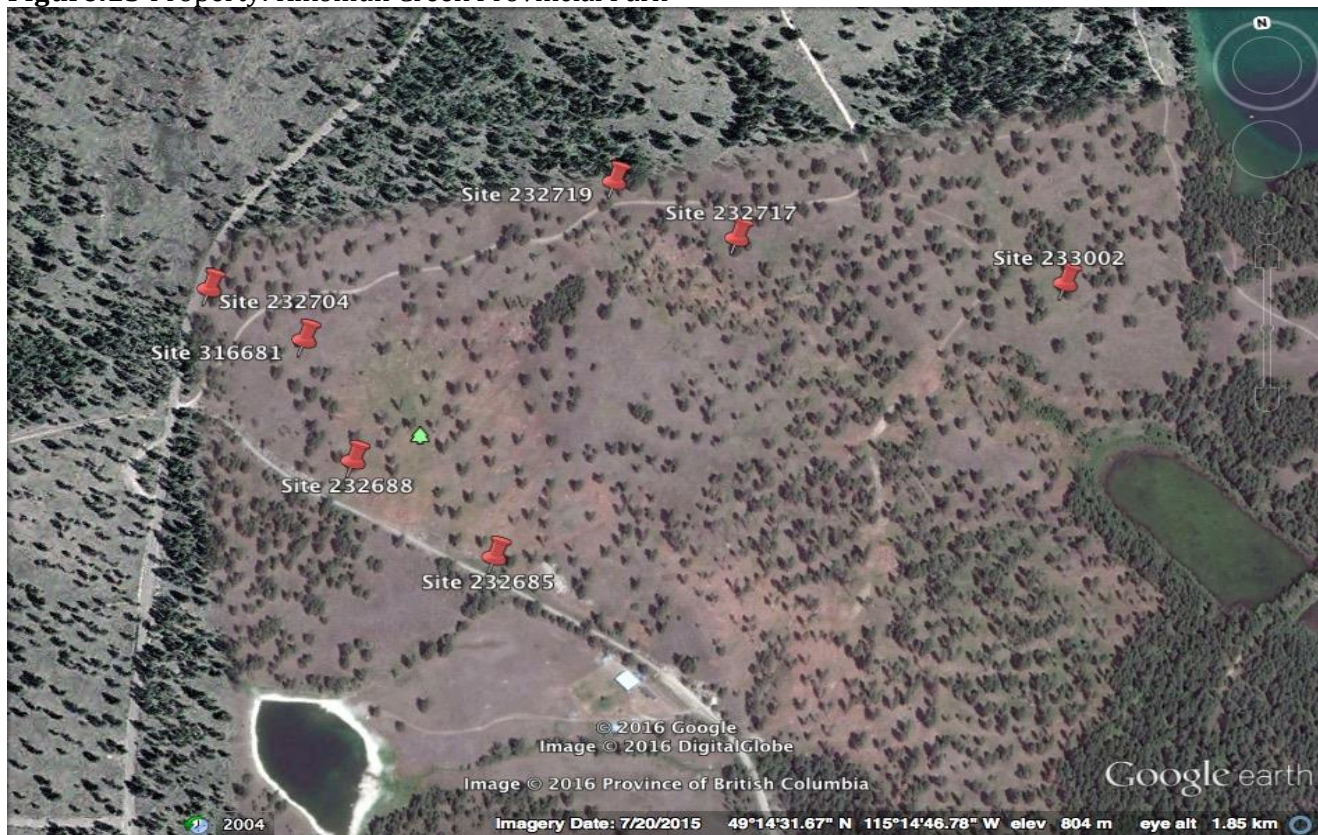
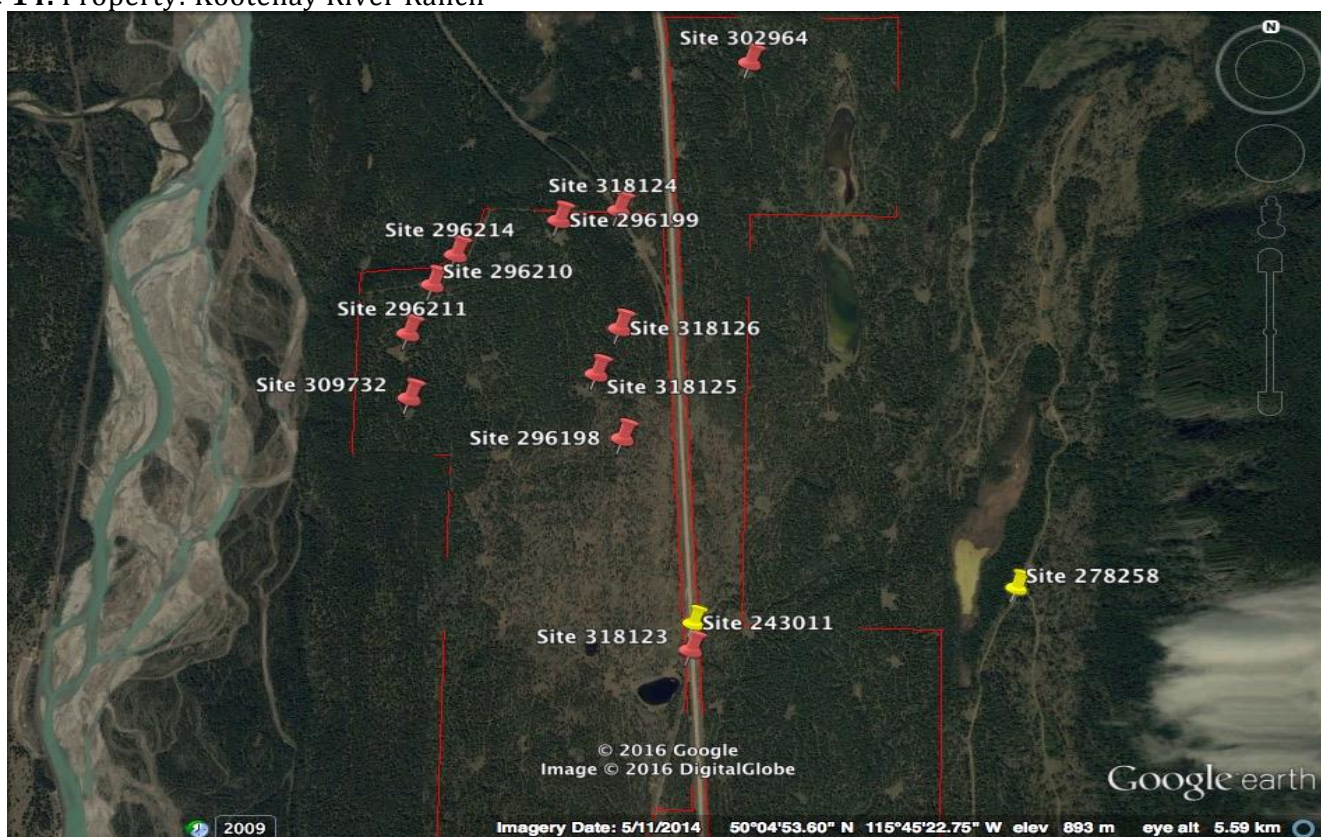
Figure.13 Property: Kikomun Creek Provincial Park



Table 13 Property: Kikomun Creek Provincial Park

Conservation Properties 2016
East Kootenay Invasive Species Council

Property	Site Number	Invasive Plants Found	Herbicide	Amount of Mix Used (L)	Undiluted Herbicide Used (L or Kg)	Area Treated per Site (ha)	Total Area Treated
Kikomun Provincial Park	228508	Hound's-tongue	Tordon 22K	1	0.013	0.003	7.512
	230972	Spotted Knapweed	Milestone	5	0.009	0.023	
	232668	Spotted Knapweed, St. John's wort	Milestone	200	0.353	0.930	
	232685	Spotted Knapweed, St. John's wort	Milestone	130	0.230	0.605	
	232688	Canada Thistle, Spotted Knapweed, St. John's wort	Milestone	50	0.088	0.233	
	232704	St. John's wort, Sulphur cinquefoil	Milestone	40	0.071	0.186	
	232717	Spotted Knapweed, St. John's wort	Milestone	105	0.186	0.488	
	232719	Spotted Knapweed, St. John's wort	Milestone	5	0.009	0.023	
	233002	Spotted Knapweed, Sulphur cinquefoil	Milestone	20	0.035	0.093	
	233016	Spotted Knapweed	Milestone	10	0.018	0.047	
	233269	Bull Thistle, Mullein	Milestone	20	0.035	0.093	
	233272	Spotted Knapweed, St. John's wort	Milestone	140	0.247	0.651	
	233273	Hound's-tongue, Spotted Knapweed, St. John's wort	Tordon 22K	21	0.107	0.089	
	233274	Spotted Knapweed	Milestone	20	0.035	0.093	
	233687	Bull Thistle, Mullein	Milestone	5	0.009	0.023	
	241221	Spotted Knapweed, St. John's wort, Sulphur cinquefoil	Milestone	695	1.228	3.233	
	270384	Bull Thistle, Hound's-tongue, Spotted Knapweed	Tordon 22K	3	0.009	0.040	
	270418	Hound's-tongue	Tordon 22K	2	0.042	0.009	
	303116	Hound's-tongue, Spotted Knapweed	Tordon 22K	19	0.080	0.082	
	316681	Spotted Knapweed, St. John's wort	Milestone	21	0.037	0.098	
	316682	Hound's-tongue	Tordon 22K	2	0.027	0.006	
	316683	Spotted Knapweed, St. John's wort	Milestone	50	0.088	0.233	
	316684	Bull Thistle	Milestone	50	0.088	0.233	

Figure 14. Property: Kootenay River Ranch

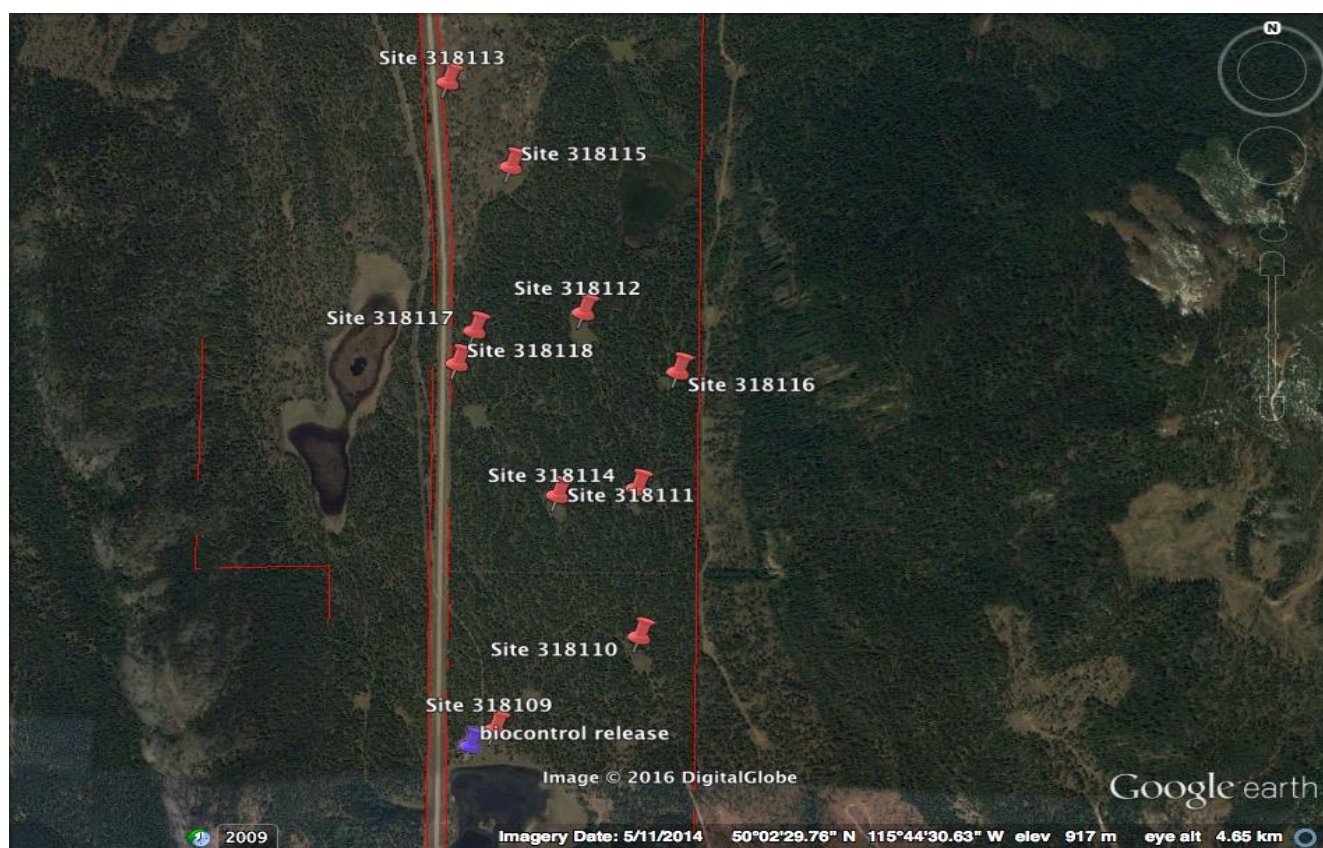
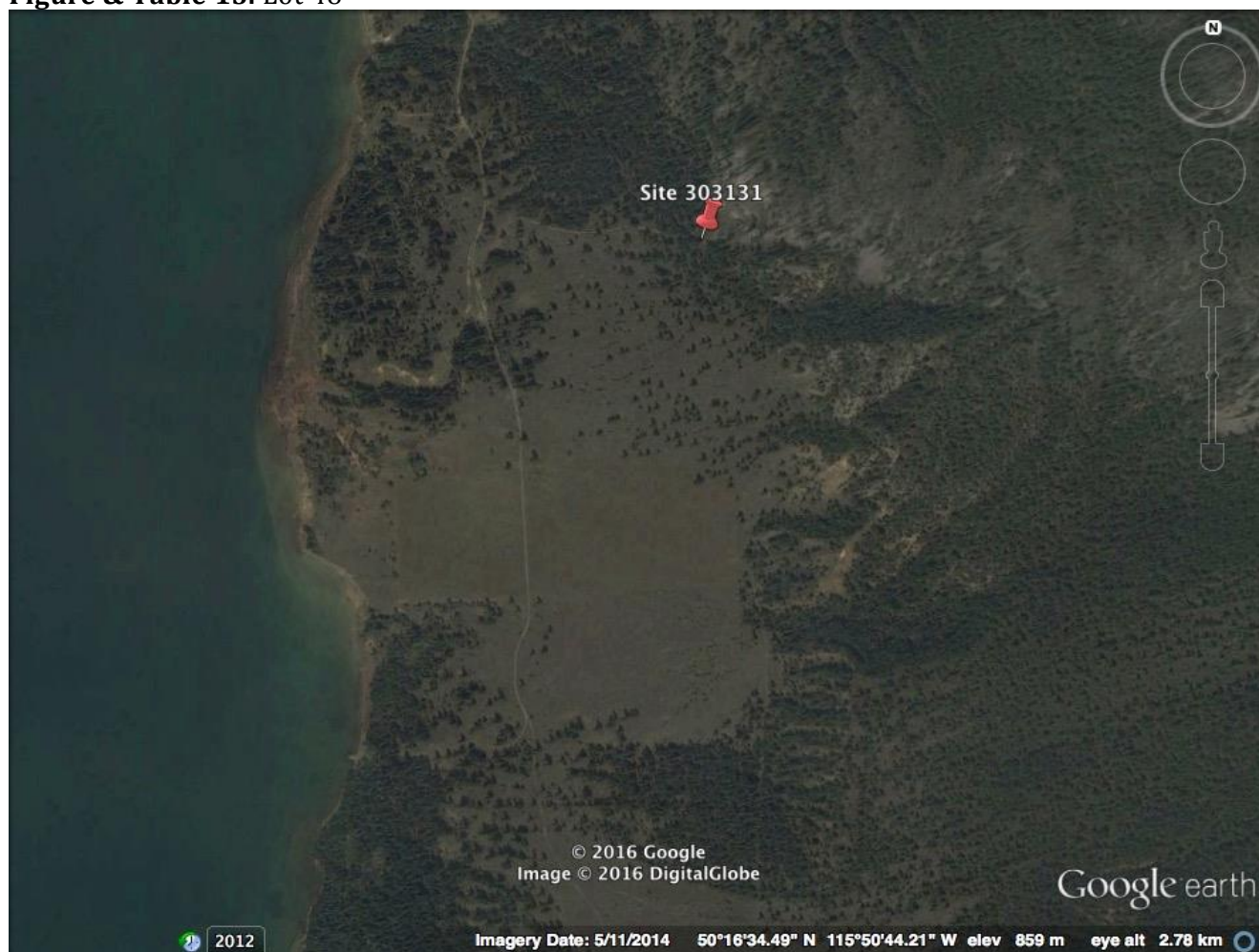


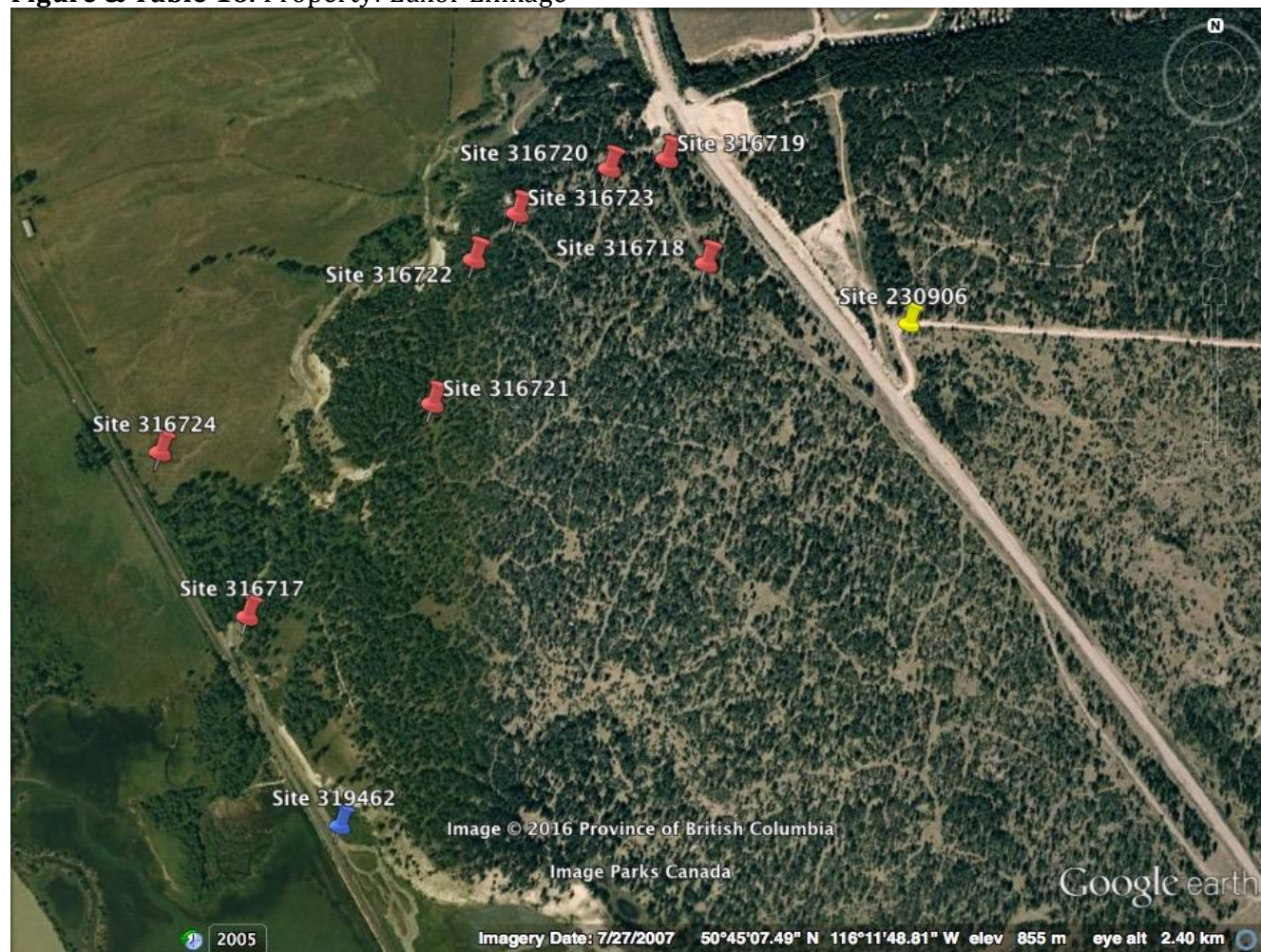
Table 14. Property: Kootenay River Ranch

Conservation Properties 2016
East Kootenay Invasive Species Council

Property	Site Number	Invasive Plants Found	Herbicide	Amount of Mix Used (L)	Undiluted Herbicide Used (L or Kg)	Area Treated per Site (ha)	Total Area Treated
Kootenay River Ranch	296198	Spotted knapweed	Clearview	10	0.010	0.050	4.115
	296199	Spotted knapweed	Clearview	25	0.025	0.125	
	296210	Spotted knapweed	Clearview	15	0.015	0.075	
	296211	Spotted knapweed	Clearview	2	0.002	0.010	
	296214	Spotted knapweed	Clearview	11	0.011	0.055	
	302964	Diffuse knapweed, Spotted knapweed	Clearview	240	0.240	1.200	
	309732	Spotted knapweed	Clearview	10	0.010	0.050	
	318109	Diffuse knapweed	Clearview	115	0.115	0.575	
	318110	Spotted knapweed	Clearview	70	0.070	0.350	
	318111	Spotted knapweed	Clearview	60	0.060	0.300	
	318112	Spotted knapweed	Clearview	45	0.045	0.225	
	318113	Spotted knapweed	Clearview	40	0.040	0.200	
	318114	Spotted knapweed	Clearview	35	0.035	0.175	
	318115	Spotted knapweed	Clearview	30	0.030	0.150	
	318116	Spotted knapweed	Clearview	10	0.010	0.050	
	318117	Spotted knapweed	Clearview	10	0.010	0.050	
	318118	Spotted knapweed	Clearview	10	0.010	0.050	
	318123	Spotted knapweed	Clearview	40	0.040	0.200	
	318124	Spotted knapweed	Clearview	25	0.025	0.125	
	318125	Spotted knapweed	Clearview	15	0.015	0.075	
	318126	Spotted knapweed	Clearview	5	0.005	0.025	

Figure & Table 15. Lot 48

Property	Site Number	Invasive Plants Found	Herbicide	Amount of Mix Used (L)	Undiluted Herbicide Used (L or kg)	Area Treated per Site (ha)	Total Area Treated
Lot 48	303131	Diffuse knapweed, Spotted knapweed	Milestone	30	0.060	0.150	0.150

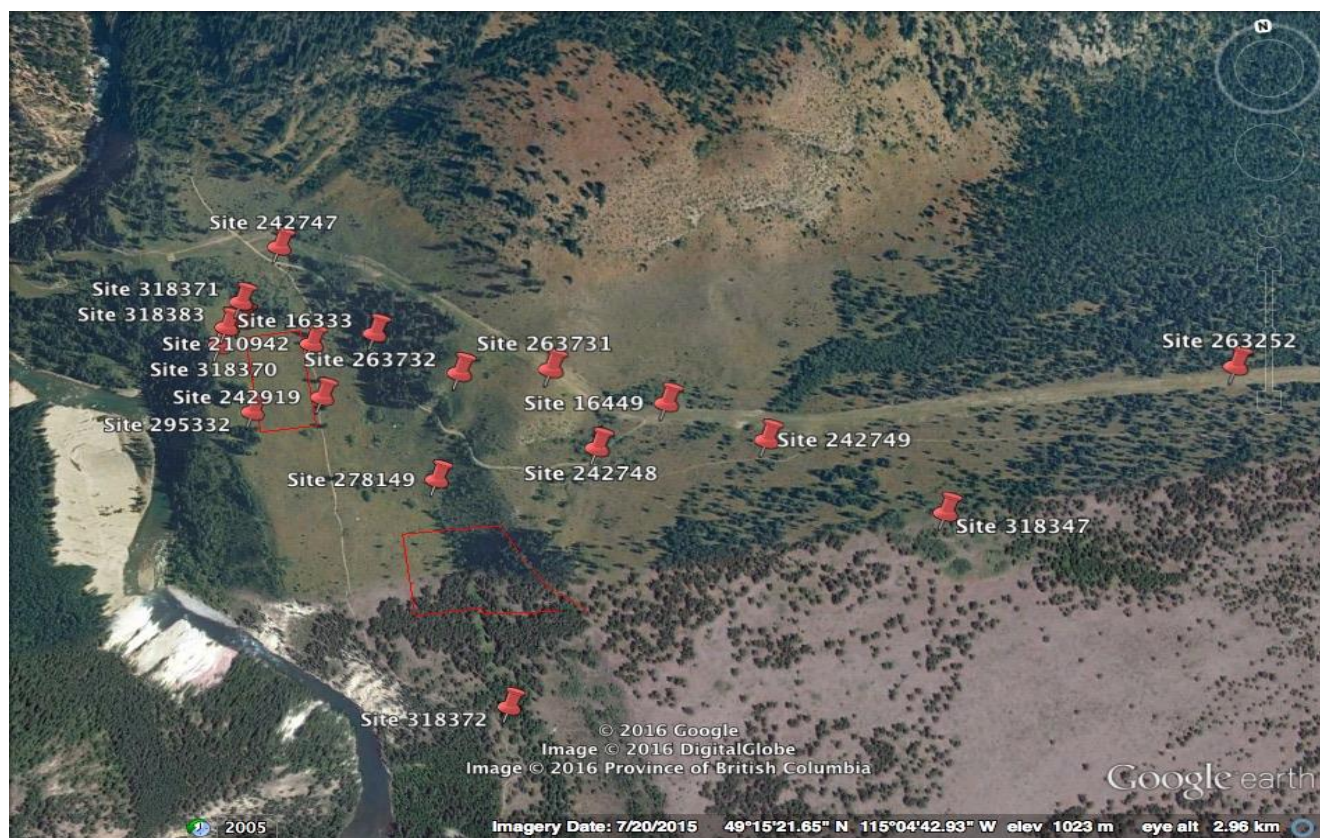
Figure & Table 16. Property: Luxor Linkage

Property	Site Number	Invasive Plants Found	Herbicide	Amount of Mix Used (L)	Undiluted Herbicide Used (L or Kg)	Area Treated per Site (ha)	Total Area Treated
Luxor Linkage	316717	Dalmatian Roadflax, Spotted knapweed	Lontrel	8	0.0280	0.040	1.095
	316718	Spotted knapweed	Lontrel	100	0.3500	0.500	
	316719	Spotted knapweed	Lontrel	38	0.1330	0.190	
	316720	Spotted knapweed	Lontrel	40	0.1400	0.200	
	316721	Spotted knapweed	Lontrel	8	0.0280	0.040	
	316722	Spotted knapweed	Lontrel	10	0.0350	0.050	
	316723	Spotted knapweed	Lontrel	5	0.0175	0.025	
	316724	Spotted knapweed	Lontrel	10	0.0350	0.050	

Figure & Table 17. Property: Marion Creek

Property	Site Number	Invasive Plants Found	Herbicide/ Mech. Treatment	Amount of Mix Used (L)	Undiluted Herbicide Used (L or Kg)	Area Treated per Site (ha)	Total Area Treated
Marion Creek	302968	Spotted knapweed	Milestone	35.00000	0.0700	0.1750	0.566
	302970	Spotted knapweed	Milestone	15.00000	0.0300	0.0750	
	318121	Spotted knapweed	Milestone	45.00000	0.0900	0.2250	
	318121	Canada Thistle, Spotted knapweed	Hand Pull	-	-	0.0910	

Figure 18. Property: Mt. Broadwood & Wigwam



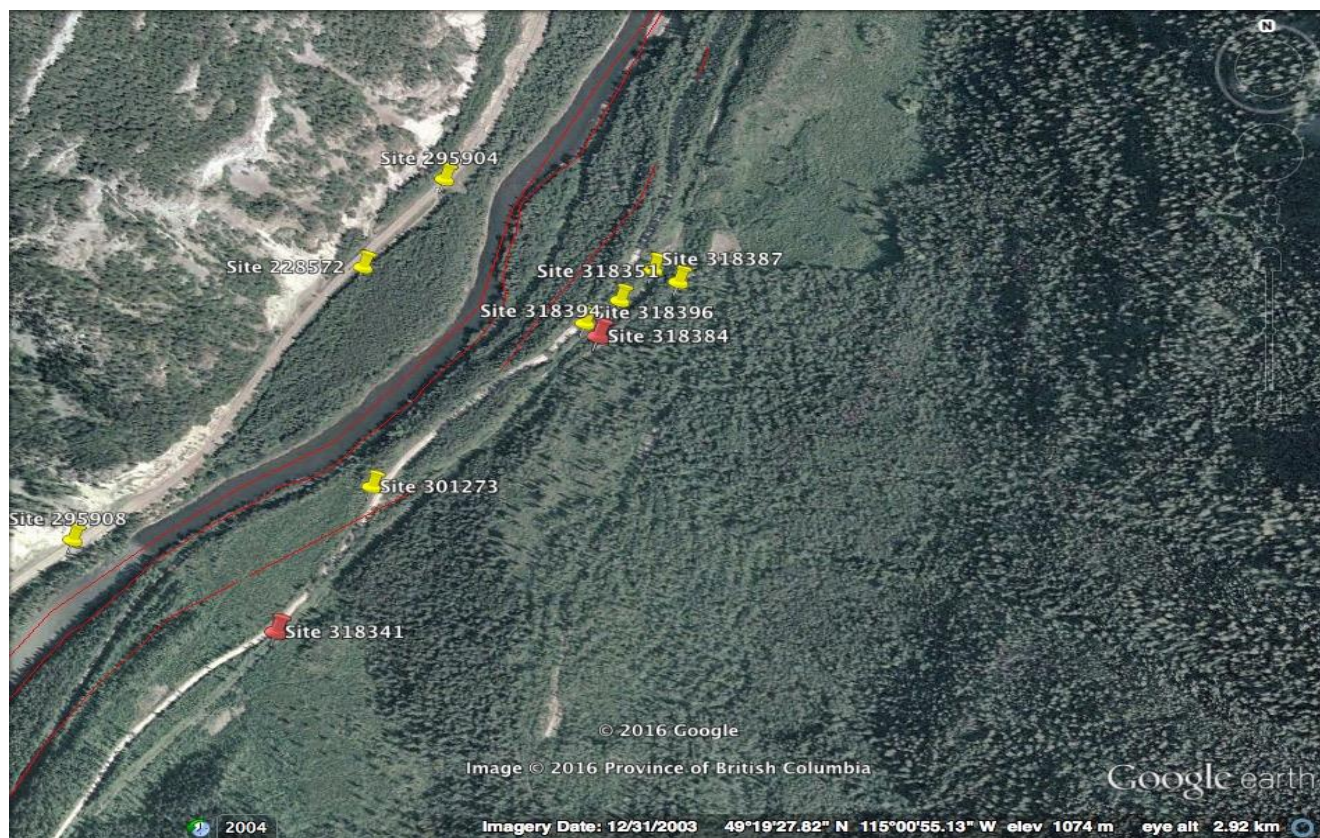


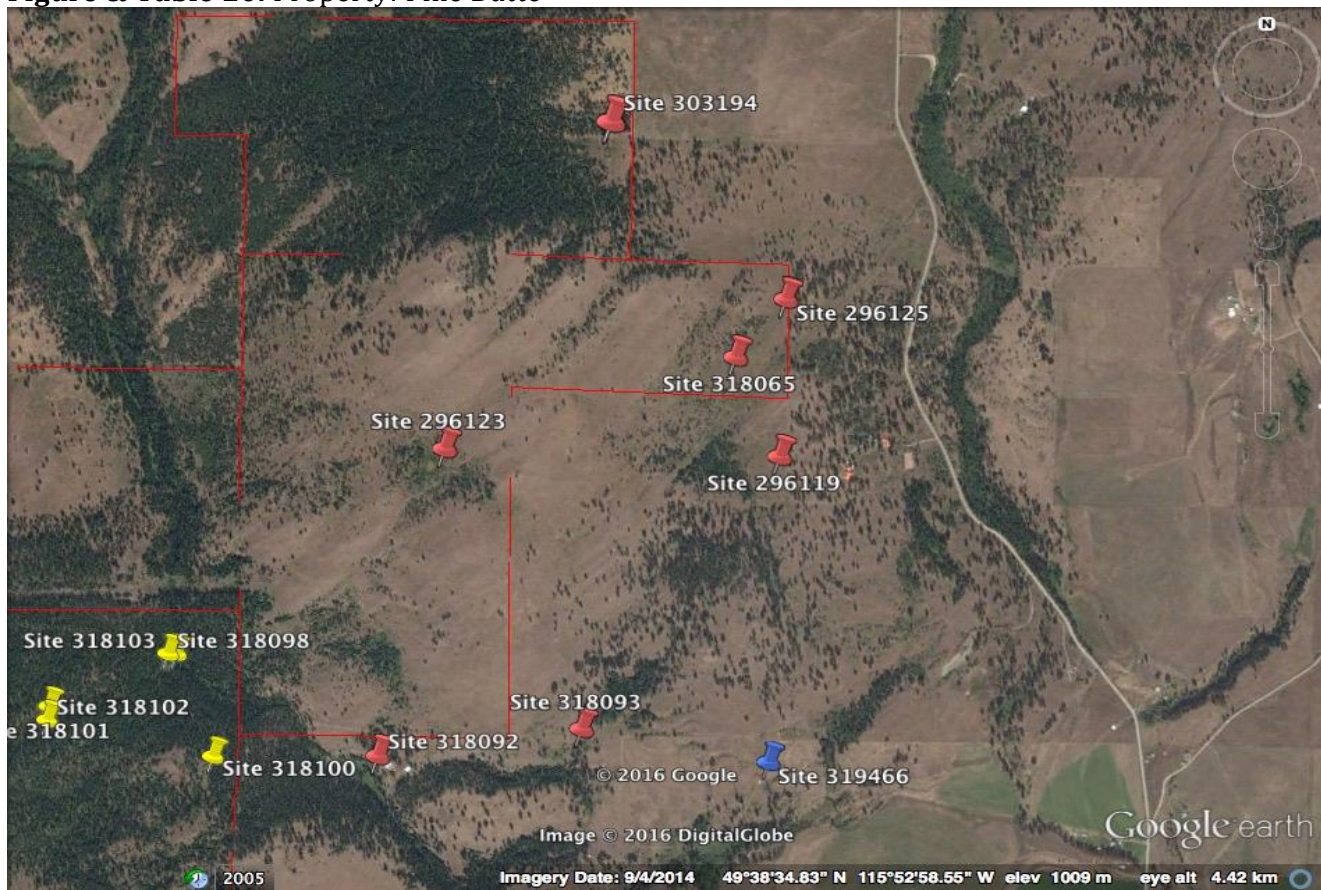


Table 18. Property: Mt. Broadwood & Wigwam

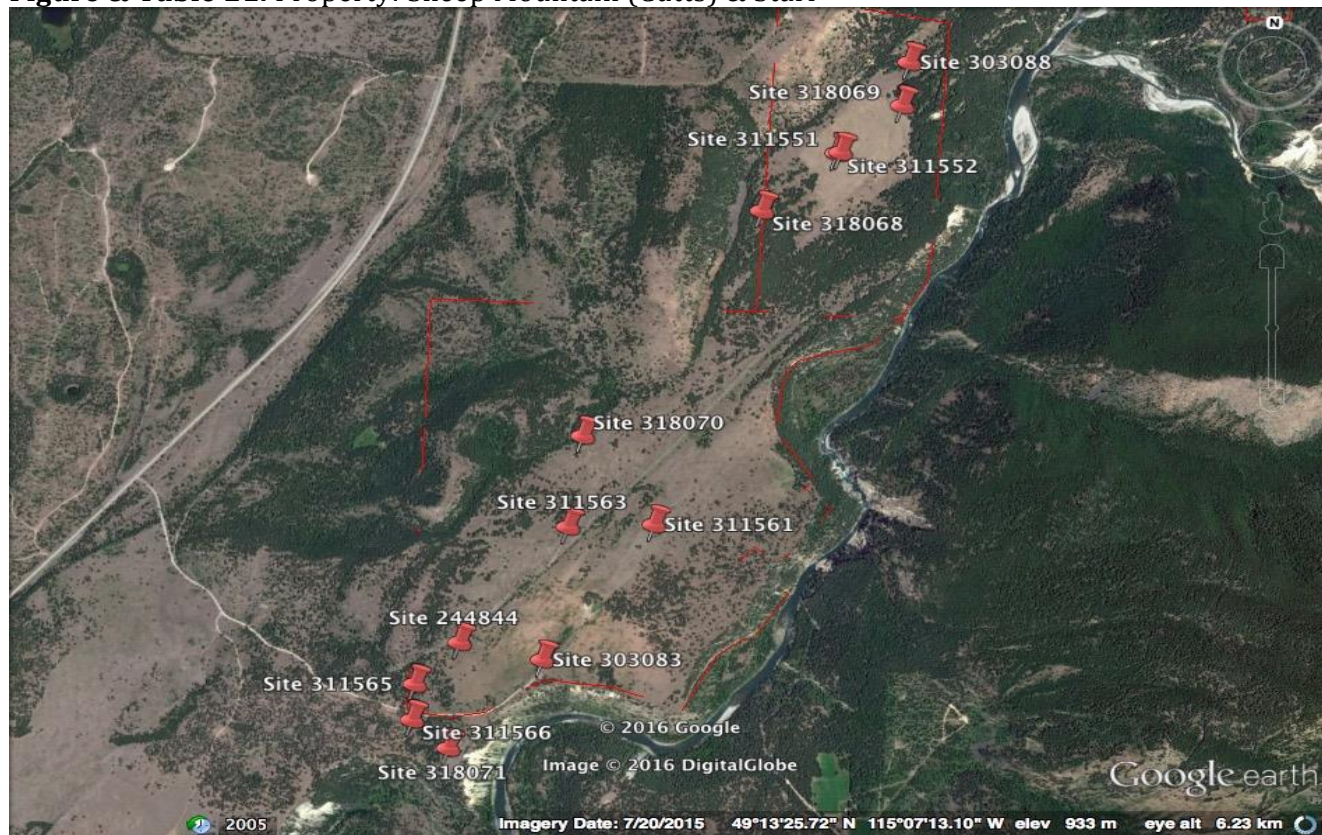
Property	Site Number	Invasive Plants Found	Herbicide/ Mech. Treatment	Amount of Mix Used (L)	Undiluted Herbicide Used (L or Kg)	Area Treated (per Site) (ha)	Total Area Treated
Mt. Broadwood & Wigwam	16333	Spotted Knapweed	Milestone	270	0.662	1.742	18.176
	16449	Spotted Knapweed	Milestone	10	0.025	0.065	
	210942	Spotted Knapweed, St. John's wort, Sulphur Cinquefoil	Milestone	80	0.196	0.516	
	242747	Spotted Knapweed	Milestone	52	0.128	0.336	
	242748	Spotted Knapweed, St. John's wort	Milestone	25	0.061	0.161	
	242749	Spotted Knapweed	Milestone	2	0.005	0.013	
	242753	Spotted Knapweed	Milestone	5	0.012	0.032	
	242754	Spotted Knapweed	Milestone	50	0.123	0.323	
	242761	Spotted Knapweed	Clearview	400	0.361	2.581	
	242767	Spotted Knapweed	Clearview	430	0.301	2.150	
	242786	Spotted Knapweed	Clearview	55	0.050	0.355	
	242806	Spotted Knapweed	Milestone	75	0.184	0.484	
	242812	Spotted Knapweed	Milestone	170	0.417	1.097	
	242914	Spotted Knapweed	Milestone	175	0.429	1.129	
	242919	Spotted Knapweed, St. John's wort, Sulphur Cinquefoil	Milestone	156	0.383	1.007	
	263252	Spotted Knapweed	Milestone	5	0.012	0.032	
	263254	Spotted Knapweed	Milestone	25	0.061	0.161	
	263731	Spotted Knapweed	Milestone	30	0.074	0.194	
	263732	Spotted Knapweed	Milestone	5	0.012	0.032	
	276384	Spotted Knapweed	Milestone	80	0.150	0.516	
	278149	Spotted Knapweed	Clearview	35	0.045	0.226	
			Milestone	320	0.785	2.065	
	295332	Spotted Knapweed, Hawkweed species	Milestone	65	0.159	0.419	
	309801	Spotted Knapweed, Yellow/common Roadflax	Clearview	130	0.117	0.839	
	318328	Burdock, Spotted Knapweed	Clearview	110	0.099	0.710	
	318331	Spotted Knapweed	Clearview	75	0.068	0.484	
	318340	Burdock	Milestone	15	0.028	0.097	
	318341	Spotted Knapweed	Clearview	15	0.014	0.097	
	318347	Spotted Knapweed	Milestone	10	0.025	0.065	
	318348	Spotted Knapweed	Milestone	10	0.025	0.065	
	318369	Spotted Knapweed	Milestone	5	0.012	0.032	
	318370	Spotted Knapweed	Milestone	5	0.012	0.032	
	318371	Spotted Knapweed	Milestone	5	0.012	0.032	
	318372	Spotted Knapweed	Milestone	5	0.012	0.032	
	318373	Spotted Knapweed	Clearview	5	0.006	0.032	
	318383	Spotted Knapweed	Milestone	2	0.005	0.013	
	318384	Spotted Knapweed	Clearview	2	0.002	0.013	

Figure & Table 19. Property: Norbury Provincial Park

Property	Site Number	Invasive Plants Found	Mech. Treatment	Area Treated per Site (ha)	Total Area Treated
Norbury Provincial Park	304372	Burdock, Canada Thistle, Diffuse Knopweed	Hand Pull	0.062	0.062

Figure & Table 20. Property: Pine Butte

Property	Site Number	Invasive Plants Found	Herbicide	Amount of Mix Used (L)	Undiluted Herbicide Used (L or kg)	Area Treated per Site (ha)	Total Area Treated
Pine Butte	296119	Spotted knapweed, Sulphur cinquefoil	Milestone	300	0.600	1.600	6.925
	296123	Spotted knapweed, Sulphur cinquefoil	Milestone	290	0.580	1.450	
	296125	Sulphur cinquefoil	Milestone	130	0.260	0.650	
	303194	Sulphur cinquefoil	Milestone	295	0.590	1.475	
	318065	Sulphur cinquefoil	Milestone	300	0.600	1.500	
	318092	Chicory, Spotted knapweed	Milestone	30	0.060	0.150	
	318093	Spotted knapweed	Milestone	20	0.040	0.100	

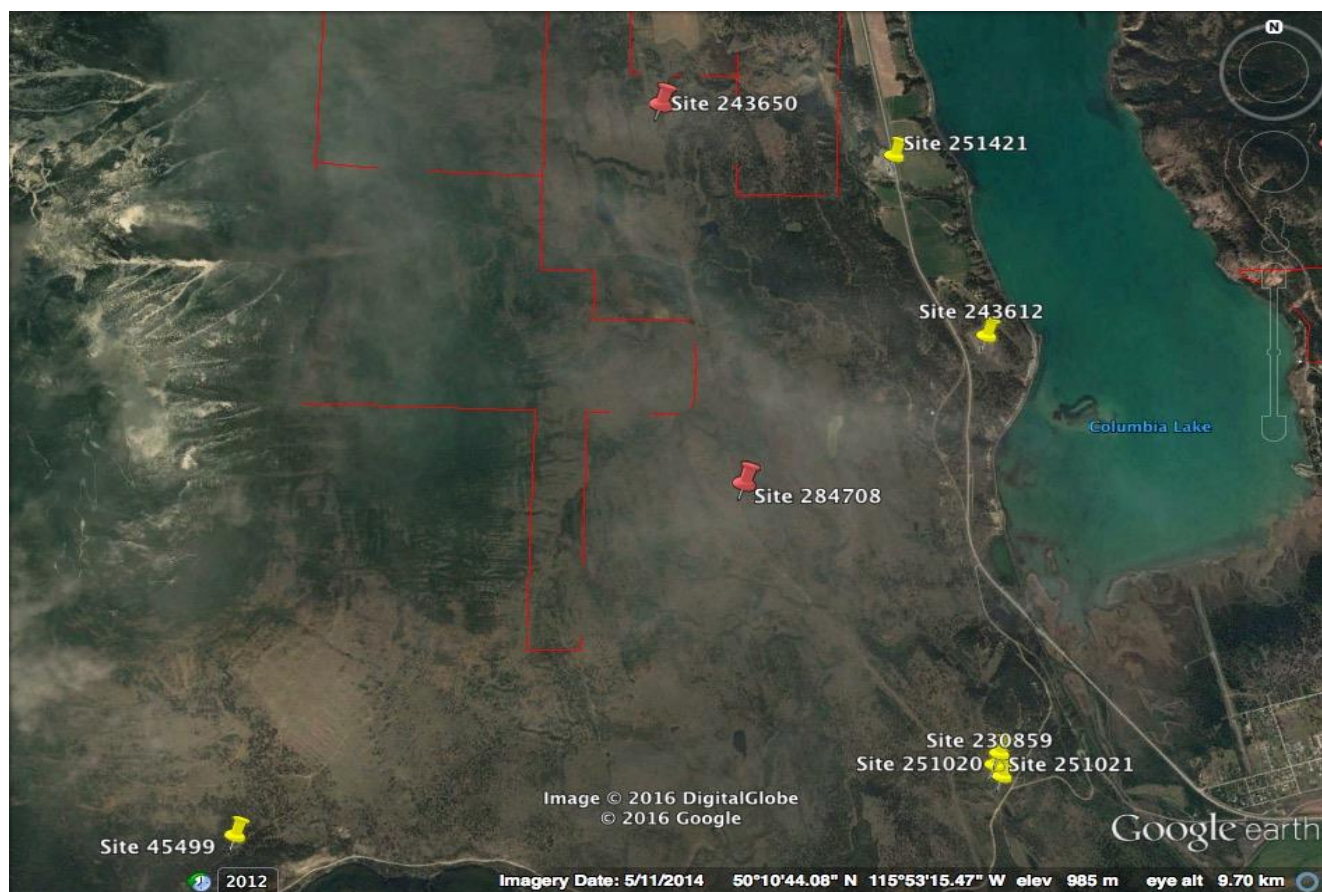
Figure & Table 21. Property: Sheep Mountain (Cutts) & Starr

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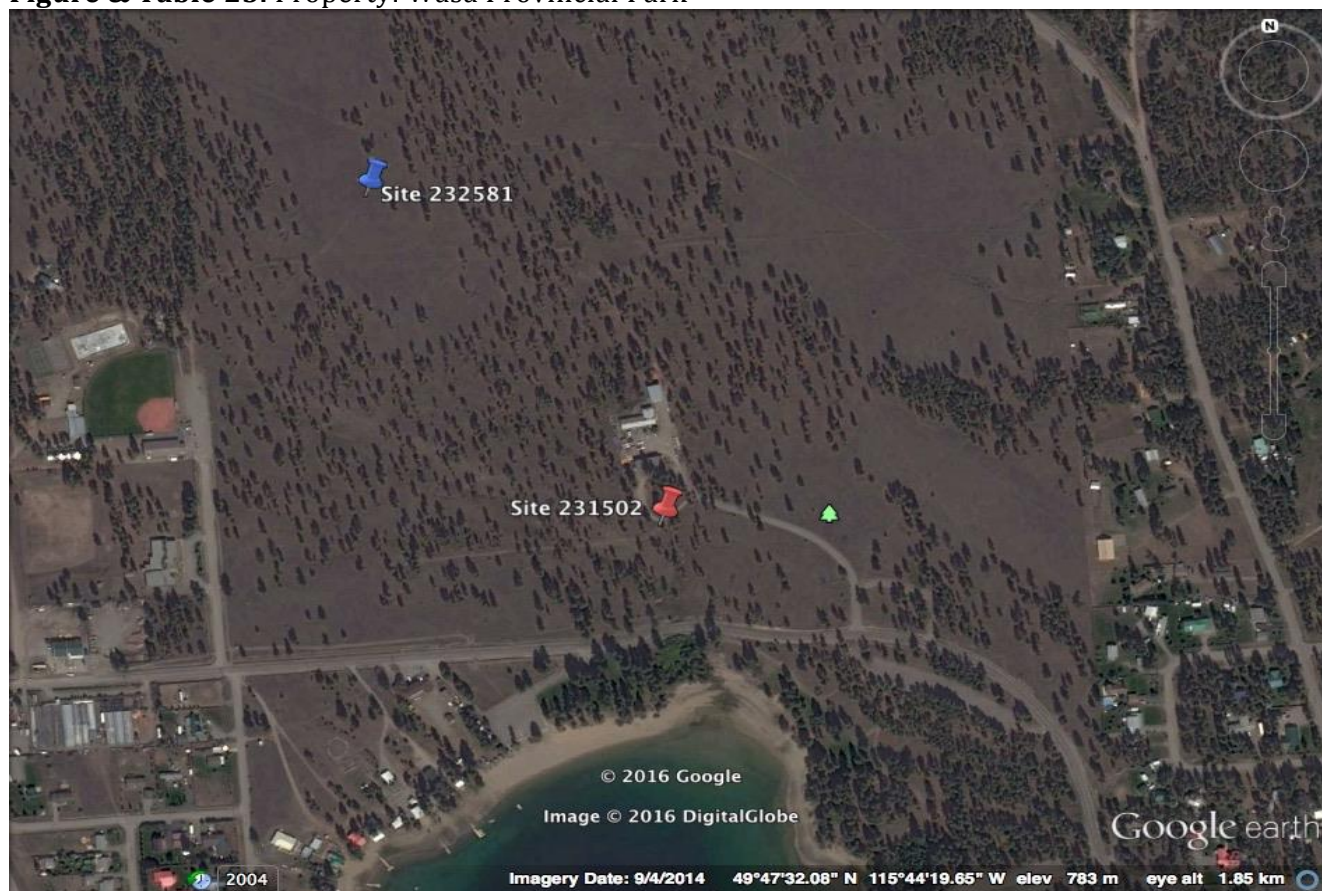
Property	Site Number	Invasive Plants Found	Herbicide	Amount of Mix Used (L)	Undiluted Herbicide Used (L or Kg)	Area Treated per Site (ha)	Total Area Treated
Sheep Mountain (Cutts)	244844	St. John's Wort, Sulphur Cinquefoil	Clearview	70	0.070	0.350	4.000
	303083	St. John's Wort, Sulphur Cinquefoil	Clearview	290	0.290	1.450	
	311561	St. John's Wort, Sulphur Cinquefoil	Clearview	140	0.140	0.700	
	311563	St. John's Wort, Sulphur Cinquefoil	Clearview	60	0.060	0.300	
	311565	St. John's Wort, Sulphur Cinquefoil	Clearview	50	0.050	0.250	
	311566	St. John's Wort, Sulphur Cinquefoil	Clearview	40	0.040	0.200	
	318070	St. John's Wort, Sulphur Cinquefoil	Clearview	90	0.090	0.450	
	318071	St. John's Wort, Sulphur Cinquefoil	Clearview	60	0.060	0.300	
Starr	303088	Blueweed, St. John's Wort, Sulphur Cinquefoil	Clearview	55	0.055	0.275	1.15
	311551	Spotted Knapweed, Sulphur cinquefoil	Clearview	10	0.01	0.050	
	311552	Hawkweed Species	Clearview	27	0.0270	0.135	
	318068	St. John's Wort, Sulphur cinquefoil	Clearview	135	0.135	0.675	
	318069	Hawkweed Species	Clearview	3	0.003	0.015	

Figure & Table 22. Property: Thunderhill & Sun Lakes

Conservation Properties 2016
East Kootenay Invasive Species Council



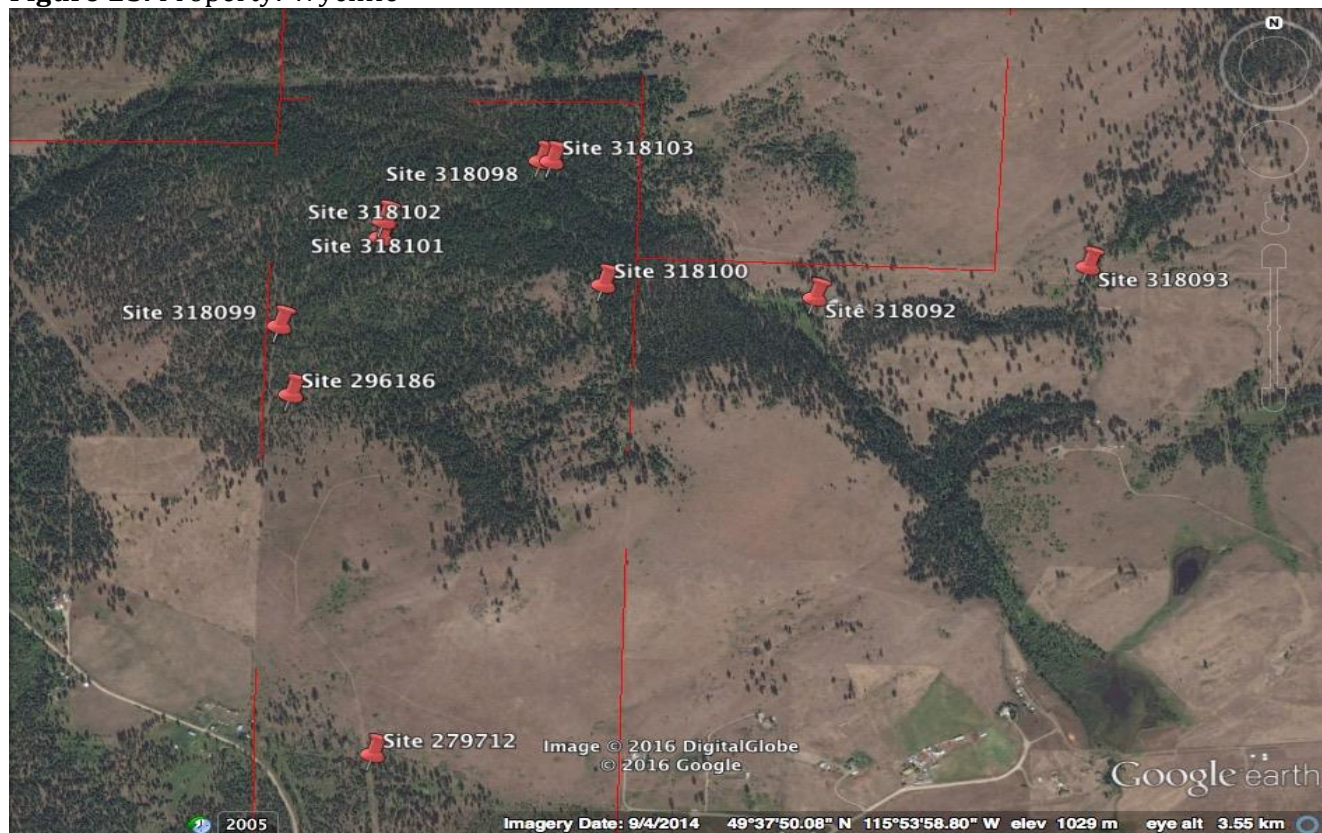
Property	Site Number	Invasive Plants Found	Herbicide	Amount of Mix Used (L)	Undiluted Herbicide Used (L or Kg)	Area Treated per Site (ha)	Total Area Treated
Thunderhill	284708	Diffuse knapweed, Spotted knapweed	Milestone	170	0.340	0.850	1.00
Sun Lakes	243650	Burdock, Diffuse knapweed, Spotted knapweed	Milestone	30	0.060	0.150	

Figure & Table 23. Property: Wasa Provincial Park

Property	Site Number	Invasive Plants Found	Herbicide/ Mech. Treatment	Amount of Mix Used (L)	Undiluted Herbicide Used (L or Kg)	Area Treated per Site (ha)	Total Area Treated
Wasa Provincial Park	231502	Spotted Knapweed	Lontrel	30	0.084	0.15	0.152
	232581	Spotted Knapweed	Hand Pull	-	-	0.002	

Figure & Table 24. Property: Wasa Slough

Property	Site Number	Invasive Plants Found	Mech. Treatment/ Biocontrol	Area Treated per Site (ha)	Total Area Treated
Wasa Slough	116090	Spotted Knapweed	Hand Pull	0.0100	0.0200
	113319	Spotted Knapweed	Hand Pull	0.0100	
	319491	Spotted Knapweed	Cyphocleonus	-	

Figure 25. Property: Wycliffe

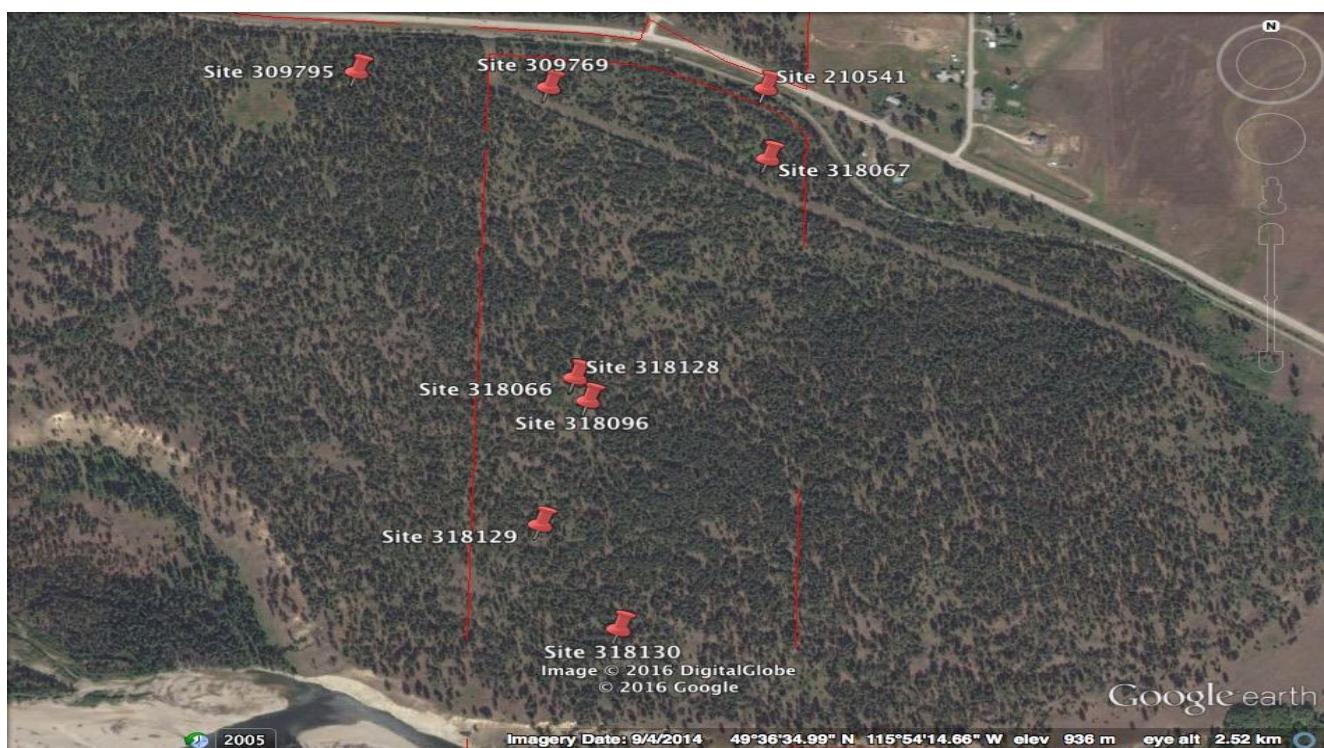


Table 25. Property: Wycliffe

Conservation Properties 2016
East Kootenay Invasive Species Council

Property	Site Number	Invasive Plants Found	Herbicide	Amount of Mix Used (L)	Undiluted Herbicide Used (L or Kg)	Area Treated per Site (ha)	Total Area Treated
Wycliffe	210541	Spotted Knapweed	Milestone	10	0.020	0.050	3.370
	279712	Spotted Knapweed, Yellow devil hawkweed	Clearview	30	0.030	0.150	
	296186	Yellow devil hawkweed	Lontrel	200	0.700	1.000	
	309769	Yellow devil hawkweed	Lontrel	15	0.053	0.075	
	309795	Russian Knapweed, Yellow devil hawkweed	Lontrel	75	0.263	0.375	
	318066	Hawkweed species, Spotted knapweed, Sulphur cinquefoil	Milestone	120	0.240	0.600	
	318067	Hawkweed species, Spotted knapweed, Sulphur cinquefoil	Milestone	55	0.110	0.275	
	318096	Yellow devil hawkweed	Milestone	25	0.050	0.125	
	318098	Hawkweed species	Lontrel	75	0.210	0.375	
	318099	Hawkweed species	Lontrel	50	0.140	0.250	
	318100	Hawkweed species	Lontrel	30	0.084	0.150	
	318101	Hawkweed species	Lontrel	20	0.056	0.100	
	318102	Hawkweed species	Lontrel	15	0.042	0.075	
	318103	Hawkweed species	Lontrel	10	0.028	0.050	
	318128	Yellow devil hawkweed	Lontrel	10	0.035	0.050	
	318129	Yellow devil hawkweed	Lontrel	5	0.018	0.025	
	318130	Yellow devil hawkweed	Lontrel	1	0.004	0.005	

INVENTORIES

Luke Creek - NCC

Figure 26. Property: Luke Creek, July 12, 2016

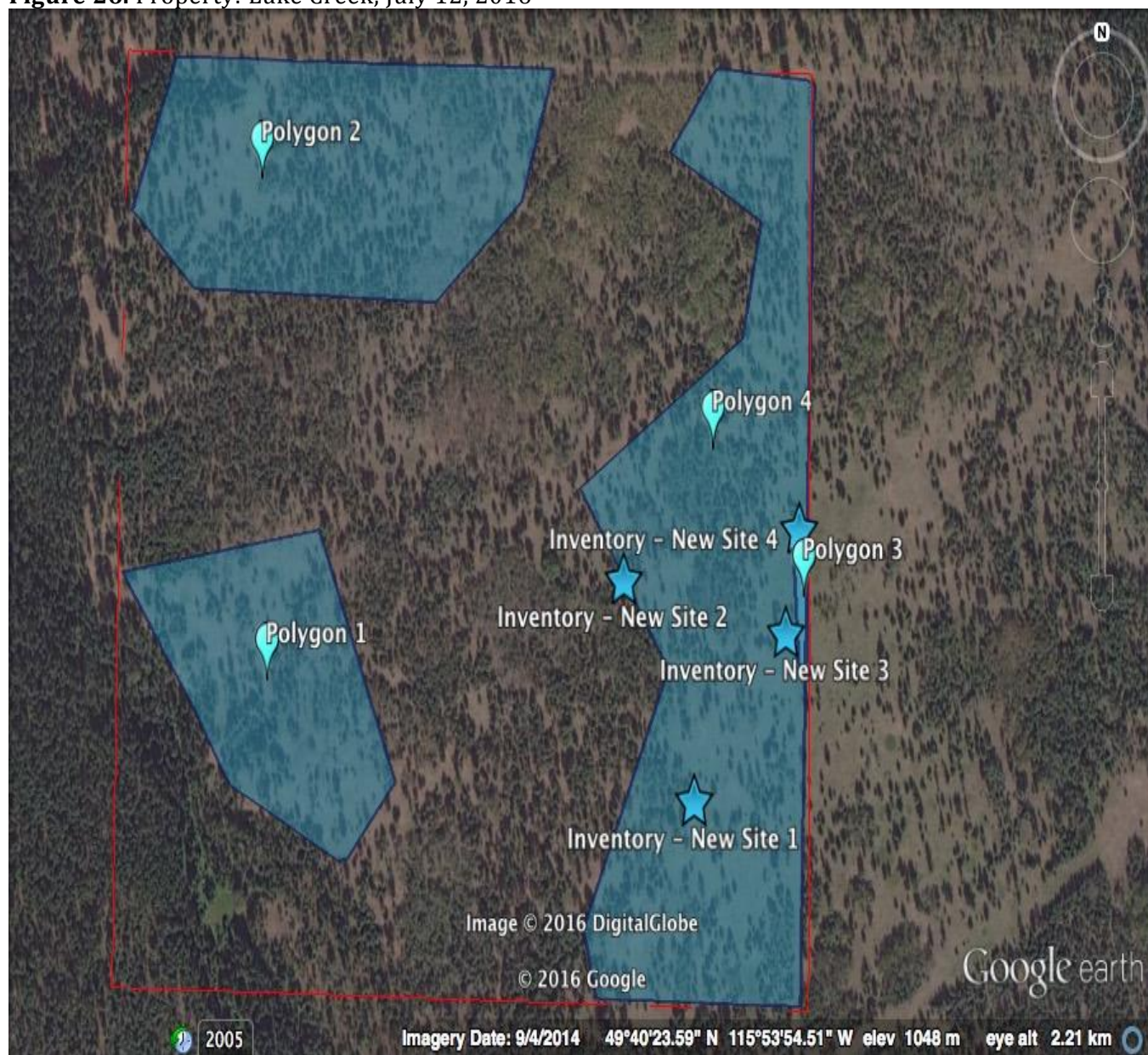









Table 26. Property: Luke Creek, July 12, 2016



Poly #	Comments	Photos	
1	Lupin and lemon weed. (Lithospermum). Some mullein but not much.		
2	Same vegetation as polygon 1. Mostly lupin, lemon weed, small patches of mullein, patches of snowberry and rose. Grasses present		
3	Strip of sulphur cinquefoil and silver cinquefoil along fence line. Patchy, and sparse.		

4

In some openings
the mullein is
denser than this.



Inv. Point #	Species	Dist.	Dens.	Approx. Area	Comments	Photo
1	Hound's tongue	1	1	1m2	At cattle trough, only one plant.	
2	Cheat Grass	-	-	10m2	Cheat grass infestation, due to disturbance. Major badger diggings? At least 7 spots.	

3	Canada Thistle, Hound's Tongue	3	2	60m2	Located on a slash pile close to the fence line. Blue Bur is also present.	
4	Canada Thistle	5	4	50m2	Appears to be coming across the fence line. Attached photo looks through gate onto adjacent property	

Mt. Broadwood and Wigwam Treatments and Inventory

The Mt. Broadwood and Wigwam treatments included inventory polygons, sites, photos and treatment points. The attached file "Mt Broadwood-Wigwam Inventory and Treatment.kmz" provides in-depth treatment and inventory information in and around the Mt. Broadwood and Wigwam area.