Southern Lakes Roadways Invasive Plant "Patrol and Pull" Project

Year 3 Report – 2017

Prepared for:

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1 Introduction

This report documents work performed during the 2017 Patrol and Pull invasive plant control program on Southern Lakes roadways. The work was performed by Yucan Planning under contract (No. C00039544) for YG HPW and is the third consecutive year of the control program (2015, 2016, 2017). The scope, methods, and goals of the Patrol and Pull program were presented in detail in the 2015 and 2016 reports, so that information will not be repeated in this report. Rather, it provides an updated status report of invasive plant populations in the study area and an evaluation of the program's effectiveness in context of results and observations from the previous two work seasons.

The roadways patrolled included the South Klondike Highway from its intersection with the Alaska Highway to the Alaska-BC border, the Atlin road from km 0 to the BC border, and the entirety of the Tagish Road (Fig. 1 and Table 1). Note that the section of the SKH from Carcross to the Alaska border was added to the control program in 2016 and continued in 2017, but was not patrolled in 2015. As in previous years, all side roads to these three roadways were also patrolled (e.g., Annie Lake Road, 10-Mile Road, etc.).

Table 1: Roadways Surveyed

Road Name		Km Surveyed 2015	Km Surveyed 2016	Km Survey 2017
South Klondike Highway (km 24-158)		44	134	134
	Kookatsoon Lake Road	0.75	0.5	0.5
	Mosquito Road	1.25	1	1
	CCC Road	2.5	2.5	2.5
	Cowley Lake Road	2	2	2
	Ingo's Road	1	1	1
	Percival Road	1	0.5	0.5
	Linville Road	0.5	0.5	0.5
	Narrow Gauge Road	1.5	0.5	1
	Robinson Subdivision Road	5.5	5.5	5.5
	Annie Lake Road (and feeders)	30	30	30
	Meadows Road	0.5	0.5	0.5
	Lewes Lake Road	1.5	1	1
	Carcross lagoon and Carcross Rod and Gun Club access road	0.5	0.5	0.5
	Watson Lake Subdivision Road	2	2.5	2.5
Tagish Road (km 0-54)		54	54	54
	Airport Road	1.5	1.5	1.5
	Chootla Subdivision Road	2.5	2.5	2.5
	Crag Lake Road	1	1	1
	10 Mile Road	2	0.5	0.5
	Taku Subdivision roads	7	8	8
	Tagish Estates Road	3.5	3.5	2
	Tagish River Road	1.5	1.5	1.5
	Pennycook Road	2	2	3
	Secret Valley Road	1	1.5	1

Road Name		Km Surveyed 2015	Km Surveyed 2016	Km Survey 2017
Atlin Road (km 0-41)		41	41	41
	Lubbock River Road	2	1	1
	Snafu Campground Road	1	1	1
	Tarfu Campground Road	2	2	2
	Camp Yukon Road	1	1	1
Total Kilometres Surveyed		**217**	**304**	**304**

2 Update on Patrol and Pull Methodologies

The methods utilized in 2017 were essentially unchanged from the previous two years—i.e., slow speed patrol of roadways by vehicle with stops to identify, record and eradicate invasive plants. However, the following observations and methodological refinements arose from the work in 2017:

Perhaps the main conclusion from this year's work, regarding methodologies, is that it is important to drive infested roadways twice in the season. This started to become apparent last year (2016) and was reinforced this year, as it was noted that sometimes single plants or even small colonies are missed on the first patrol. This is also important because it is becoming clear that the gas brush cutter does not always make a clean and complete cut when used to clear large sweetclover plants or dense patches of sweetclover; as a consequence, young shoots are sometimes missed by the cutter and grow flower heads within a week or two after the taller stalks were cut. This was observed at a number of locations that were patrolled a second time, and was especially apparent in thicker, more well-established colonies. Another short-coming that is emerging regarding use of the gas brush cutter is that the operator must operate it in a manner that protects the blade from hitting stones and consequently it is not always operated close enough to the ground to cut very short sweetclover plants. This tendency also contributes to the problem stated above whereby some plants are not cut completely or cleanly, though it really is only a problem in large colonies where mowing is being done rather than hand-pulling.

Two other observations reinforced in 2017 were: 1) It is important to patrol the roads at less than 40 KPH in order to spot single plants; driving faster greatly increased the likelihood of missing plants, and 2) A crew of two people is much more effective than a single person at spotting and eradicating plants in a colony; we repeatedly observed that a second person spotted plants, especially small plants, that escaped observation by the first person.

Timing of the Control Measures: It was confirmed in 2017 that it is prudent to wait as long as possible in the flowering season to carry out the Patrol and Pull for a number of reasons. First, small, emergent plants are difficult to spot from vehicles, and the larger they get, the less likely it is for them to escape detection. Along the same lines, some species, such as sowthistle and spotted knapweed, are only detectable when they start flowering; otherwise they blend in too well with the native vegetation. Consequently, the period from late July to early August is probably the earliest that Patrol and Pull should be conducted.

3 Report on Individual Roadways

3.1 South Klondike Highway and Side Roads

The Patrol and Pull was conducted along 134 kilometres of the South Klondike Highway (SKH) from the Carcross Corner (km 158) to the Alaska-BC border (km 24), along with approximately 49 kilometres of side roads that connect with this section of the highway. A total of 110 stops were made to remove and document invasive plants.

This year, the section of highway had a similar occurrence (location and species) of invasive plants as in 2015 and 2016. The primary invasive species found along this section was again sweetclover. The overall extent of the sweetclover infestations was similar to 2015 and 2016; the size of individual sweetclover colonies was smaller than in 2015, but about the same as we found in 2016. It is noteworthy however, that the number of single plant locations was down to 8 in 2017, compared to 21 the previous year (10 were found in 2015, but the study area was smaller). All sweetclover plants encountered (52 locations) were cut or pulled.

The largest sweetclover infestations were found at the Carcross Corner (~150 m^2), within the first kilometer of the Robinson Subdivision Road (~300 m^2), and just south of the Nares River Bridge (125 m^2). Generally, the frequency and size of sweetclover colonies decreases with distance down to the South Klondike Highway (i.e., distance from the Carcross Cutoff), until the Carcross area where there are multiple colonies including the large infestation south of the Nares River Bridge.

Most of the side roads off the SKH were free of invasive plants, except for the large patch of sweetclover mentioned along the Robinson Subdivision Road, plus one significant colony and two single plant locations on the Annie Lake Road. The single plants were located around km 1 and the colony of ~20 m^2 is near km 3.

We briefly surveyed the two active gravel pits along the South Klondike Highway at km 129 (Lewes Lake) and km 151 (Mosquito Road). We found two small infestations of sweetclover near the entrance of the km 151 pit. The other pit was free of invasive plants.

The section of highway between Carcross (km 105) and the BC-Alaska border (km 24) was surveyed for the first time in 2016. Similar to the 2016 findings, the area near the border (between km 24 and 56) has a significant population of Altai lyme grass, with 46 colonies varying in size from 1 to 25 m^2 along this stretch of road.

In total, 50 colonies of Altai lyme grass were encountered during the survey (including the 46 mentioned above in the border area between km 24 and 56 SKH). The infestations generally are within the highway right-of-way. However, a very large infestation (>100m^2) occurs in Carcross, between the Nares River Bridge (km 105) and Montana Services gas station (km 106), and extends well beyond the highway right-of-way.

Altai lyme grass grows in tight, large tufts that are very well rooted; hand pulling is extremely difficult and only works in cases of small infestation where tufts are young and small. Consequently, we only removed (and bagged) plants from one location north of Carcross, which was at km 144 (for more discussion on management options for Altai lyme grass, see Section 4). No mowing of pulling was attempted at larger colonies, since the effort would be ineffectual.

In 2017, isolated populations of four other invasive plant species were found in the South Klondike Highway area. These species include:

- *Yellow sweetclover:* A large patch of ~25-30 m^2 was located near km 108.5 (RHS), in the same location as in 2015 and 2016. The size of the area has been reduced from ~100 m^2 in 2015, but it is unchanged from 2016. In addition, one new colony of yellow sweetclover was found near km 103 (3 plants). All plants were pulled or mowed.
- *Perennial sow thistle:* One plant was found at the corner with the Alaska Highway (LHS), in the same location where a small patch was found in 2015 and 2016. The plant was removed and bagged for disposal. We suspect more plants may have been present, but had been removed as a result of roadwork that was occurring at the time of the survey. In addition, one new colony of ~ 10 plants (5 m^2) was found this year near km 105.5. All of those plants were pulled and bagged.
- *Yellow clematis:* As in 2015 and 2016, this species was found growing on both sides of the road along a 100 m section near km 105 (in front of the CTFN building and Montana Services gas station). Although the growth (~50 m^2) is fairly extensive within this section, this species is not strongly invasive. The species is perhaps best classified as a persistent non-native plant, rather than invasive, and probably is not spreading aggressively in this area. It was therefore felt that removal of the plants was not a priority. Further discussion about managing this species is included in Section 4.
- *Oxeye daisy:* Three small oxeye daisy colonies were encountered, including one plant near the Carcross corner (km 156.5), 20 plants near km 79.5 (in BC), and 5 plants near km 46 (in BC). The latter colony was found within 500 m of an old herbicide spraying sign from the Northwest BC Invasive Plant Council, where they sprayed an oxeye daisy colony with Tordan 22 in 2012 (Darrell Hill, NWIPC Field Coordinator, personal communication 2016). The colony near km 79.5 is in the same location that we reported finding a scentless chamomile colony in 2016, but it is possible we misidentified the plants last year (the species can look very similar). At all locations, the plants were pulled and bagged.

Tagish Road and Side Roads

Patrol and Pull on the entire Tagish Road (54 km) between Jake's Corner and the intersection with South Klondike Highway, along with approximately 21 kilometres of side roads. A total of 60 stops were made to document and remove invasive plants. However, only the first few kilometers of the 10 Mile Road and Pennycook Road (Microwave Tower Road) were surveyed because it became apparent that there was no adequate habitat for sweetclover along their roadsides, and no invasive plants were encountered beyond the intersection with these roads. All other side roads were surveyed for their entire length. This year, we also included the HPW Carcross maintenance station in the survey and mowed the sweetclover growing in the compound.

The primary invasive species found in the Tagish Road area was sweetclover; all sweetclover plants encountered were cut or pulled. The largest infestations were found at Jake's Corner (~110 m^2) and between km 16-18.5 of the Tagish Road (~ 400 m^2 cumulative). Small but sweetclover patches were also found in three locations in the Taku Subdivision, as well as along the first 200 m of Ten Mile Road.

Overall, the pattern (number of patches and locations) of sweetclover infestation along the Tagish Road was similar to that encountered in 2015 and 2016, but the extent and density of the very large patches

mentioned in the previous paragraph were smaller in 2017. This year, 54 stops were made to document and remove sweetclover, compared to 44 and 57 in 2015 and 2016, respectively.

Isolated populations of other invasive plant species in the Tagish Road area were found growing in the same location as in 2015 and 2016. These species include:

- Yellow sweetclover:
  - ~10 m^2 at km 21 (east of the Tagish Bridge). All plants were pulled or mowed.
  - ~25 m^2 at km 53 (two patches, one on each side of the road). All plants were pulled or mowed.
- Perennial sow thistle:
  - ~5 m^2 near km 5.5 Tagish Road (LHS). All plants were removed and bagged for disposal.
  - ~50 m^2 near km 19.5 Tagish Road (RHS). An extensive infestation. Plants were just beginning to flower and many were still developing flower shoots. Only the shoots with flowers were removed. Additional control methods will be required to contain this infestation (see Section 4).
  - ~1 m^2 near km 41.5 (RHS). All plants were removed and bagged for disposal.
- Altai lyme grass: 20 plants near km 28 (RHS), the same location as in 2015/2016, but the population was much smaller in 2017. All plants were removed and bagged for disposal.

Atlin Road and Side Roads

Patrol and Pull work was conducted on 41 kilometers of the Atlin Road from the intersection with the Tagish Road to the Yukon-BC border, as well as approximately 5 kilometers of side roads. A total of 47 stops were made to document and remove invasive plants.

Similar to the other two roadways, the primary invasive species encountered along the Atlin Road was sweetclover. All sweetclover plants that were spotted were cut or pulled. In terms of side roads, only the first kilometer of the Lubbock River Road, and the access roads to the Snafu and Tarfu Lake campgrounds were surveyed because no sweetclover habitat existed further down these roads (even the first kilometer of these roads contains essentially no sweetclover habitat). No invasive plants were found on any of the other side roads.

The number of sweetclover colonies encountered along the Atlin Road in 2017 was 40, compared to 31 in 2016 and 40 also in 2015. Of the 40 colonies, 16 were single plants; the remainder varied in size from 0.5 m^2 to 40 m^2. The overall number and size of colonies were about the same as in 2016, but less than in 2015.

Isolated populations of other invasive plant species encountered along the Atlin Road in 2017 include:

- *Spotted knapweed:* Eleven flowering plants and multiple (>20) leaf rosettes near km 12.5 (LHS). All plants with roots were removed and bagged for disposal. This infestation was found in the same location as the 2016 colony. Due to these control measures, it does not appear to be spreading; however this species should be monitored closely because of its potential to expand and become uncontrollable.
- *Oxeye daisy:* two patches of oxeye daisy totalling ~100 m^2 were found growing within 100 m of each other near the entrance to two private properties at km 3, which is the same location where this infestation was first documented in 2016. In addition, one oxeye daisy plant was found at km

20. This species is a perennial and better controlled through pulling and bagging, as mowing does not kill the plants. The single plant at km 20 was pulled and bagged, however, the first two patches were too big to pull and were mowed instead with the hope to at least curtail their spread by seed. Further discussion regarding control of oxeye daisy is included in Section 4.

- *Unscented chamomile:* As in 2015 and 2016, a patch of unscented chamomile was encountered in 2017 near the entrance of a private driveway at km 10.5 (RHS). The plants were growing alongside Shasta daisies, making it likely they were planted by the property owner as ornamentals. Because scented chamomile is only weakly invasive, and Shasta daisy is not rated as invasive, we exercised sensitivity to the landowner and decided not to mow all of the plants and only pulled the unscented chamomile.
- *Bird vetch:* As first reported in 2016, a ~10 m^2 colony of bird vetch was found again at the start of the same driveway at km 10.5. This is a species of high concern as it can spread very quickly into wooded areas and smother other vegetation. We pulled all bird vetch plants growing along the portion of the driveway that bisects the ROW, but not on the private property.
- *Yellow Lucerne:* One plant was found near km 19.5, which is about 500 m distance from a two-plant colony discovered and pulled in 2016. No yellow Lucerne was found at the 2016 location. The one plant at km 19.5 was pulled and bagged for disposal.

4 Update on the Overall Status of Invasive Plant Species on Southern Lakes Roadways

The previous years' reports listed the invasive species encountered on these roadways, discussed the extent of infestation, and evaluated the threat posed by each species. Here, we provide updates to those assessments.

4.1 Sweetclover

Sweetclover remains the primary invasive plant growing along Southern Lakes Roadways. However, it appears that colonies along these roadways are being effectively contained by the Patrol and Pull program, and in some cases their densities are being reduced.

Large Colonies: Five large sweetclover colonies were noted in previous reports. They occur at:

1. The intersection of the South Klondike Highway and Alaska Highway
2. Kilometre 16-18.5 along the Tagish Road
3. The first one kilometer of the Robinson Subdivision Road
4. A 500 m long section south of the Nares River Bridge
5. The intersection of the Tagish Road and the Alaska Highway

The first four appear to be contained by previous years' mowing efforts, and are not spreading. However, the density of plants in those colonies has not changed significantly, which suggests there are very well established seedbanks along these stretches. However, the large colony at the intersection of Tagish Road and the Alaska Highway was noticeably less dense this year. Overall, this has been a good year for sweetclover growth in Yukon, so this observation at the Tagish Road intersection is a sign that perhaps two years of mowing is starting to have an effect on this section.

Small and Isolated Colonies: Small sweetclover colonies of <20 plants, as well as isolated plants, were still encountered on these roadways, at about the same frequency as reported in 2015 and 2016. The small, isolated colonies are not getting larger, and about a quarter appeared to be smaller this year. The persistence of small colonies is best interpreted as the result of well-established, but localized, seed banks, and it is probable that continued mowing and pulling will eventually exhaust these seedbanks and eliminate small colonies.

A review of the GPS location data shows that the isolated plants encountered were new infestation, and not previously encountered ones. While this means there does not appear to be a net reduction in the overall extent of infestation of sweetclover, it can be deemed a success that at least the population is being held in check. What remains unknown, and difficult to test, is whether new plants/colonies are growing from residual seeds in soils along the roads or from new seed being dispersed from other colonies. In 2016, we suggested that distance from source colonies may provide a test of these two hypotheses, but no pattern has emerged from the data to resolve this issue. However, because the new plants are often found in isolation and not it colonies, this tends to favour the conjecture that they are the result of new seed dispersal, not pre-existing seeds.

Evaluation of Hypotheses Regarding Sweetclover Population Dynamics: In the two previous reports, we hypothesized that sweetclover colonies existed in three population states along Southern Lakes Roadways: 1) large colonies supported by well-established ("deep") seedbanks, 2) incipient colonies supported by moderate seedbanks, and 3) isolated plants resulting from recent seed dispersal events. We also postulated that there would be a correlation between the size of the colony/seedbank and the time of the most recent roadwork, whereby roadways that were upgraded more recently would have less resilient seedbanks that were easier to eradicate than roadways that were upgraded ten or more years ago (because the seedbank there has had time to grow). As noted in the first two reports, it will take several years of consistent mowing to test these hypotheses, but our assessment at this point in the Patrol and Pull program is as follows:

First, there certainly seem to be "deep", well-established seedbanks at the five problem areas noted earlier. Only the colony at the Tagish Road-Alaska Highway intersection shows signs of being reduced by mowing so far. Second, the evidence is weak at this point to support a correlation between the size of the colony/seedbank and the time that has elapsed since roadwork has occurred. Specifically, the prediction that mowing should have a greater effect reducing incipient colonies along the Atlin Road (upgrades in the last 2-10 years) versus the Tagish Road (upgrades in the last 10-15 years) has not been supported so far. In fact, it is our impression that the colonies on the Atlin Road seemed to be more robust this year, though this observation was not quantified.

Finally, two of the basic tenants of this multi-year project are that: 1) multiple years of repeated mowing/pulling should eventually eliminate small colonies of sweetclover by exhausting their seedbanks, and 2) the frequency of occurrence of isolated (colonizing) sweetclover plants should decline over the years because sources of dispersing seed will be eliminated by mowing established colonies. At this juncture in the control program, the small colonies still persist and regrow each year, and new single plant colonizers are still showing up. Thus, our conclusion at this point is that two years of mowing is not enough time to affect the desired outcomes. However, it was known going into this program that it would probably take more than a few years of mowing to exhaust the seedbed. But, as noted before, the results so far support the prediction that the Patrol and Pull program at least stops the further spread of sweetclover along roadways in the Southern Lakes. Therefore, continuation of the program will eventually reduce the seedbank so that

the only control measures required will be mowing of the persistent colonies and pulling of single colonizing plants that appear occasionally due to seed dispersal from large colonies growing along the Alaska Highway and via road traffic and maintenance activities.

4.2 Other Invasive Plant Species

Yellow Sweetclover: In 2015, we encountered three small colonies of yellow sweetclover: one near Tagish, one near Carcross, and one on the Atlin Road. In 2016 and 2017, we encountered yellow sweetclover plants in these the same locations on the SKH and Tagish Road, and one additional location just east of Carcross. Yellow and white sweetclover are very similar plants, with similar biological properties, and some taxonomists consider them to be conspecific. All yellow sweetclover encountered on these roadways should be treated identically to white sweetclover. The reason its distribution is worth noting is because the yellow colour provides a secondary means of tracking the spread of sweetclover, as the appearance of a yellow plant may be an indication of newly introduced seed.

Oxeye Daisy: In 2017, four new locations with oxeye daisy were encountered. Previously, only one site had been identified on the Atlin Road at km 3. The new sites include one plant at km 20 of the Atlin Road, three locations on the South Klondike Highway (km 46, 79.5, and 156.5), and one on the Taku Subdivision Road near Tagish. Two of the colonies on the South Klondike Highway (5 and 20 plants each) are located along the BC section of the highway, in and around the same areas where the Northwest BC Invasive Plant Council has sprayed herbicides to control oxeye daisies. The oxeye daisy found on the Taku Subdivision Road was located at a driveway entrance that likely had been seeded with ornamentals by the property owner. The previously known large colony on the Atlin Road was also suspected to be the result of intentional seeding.

It is concerning that more oxeye daisy colonies are being encountered and that people are actively seeding this species. Oxeye daisy has a high potential to become problematic, in particular when it spreads into grass fields. It spreads both by seed and vegetatively through its roots (rhizomes), and can grow into dense, persistent colonies. These colonies outcompete and displace both native and agronomic grass species. The impact is especially damaging to hayfields and pastures because it reduces both crop yield and quality. Oxeye daisy can be pulled (the whole plant, including roots must be pulled), but elsewhere (e.g., British Columbia) it has been found that it is best managed by means of herbicidal spraying. The level of infestation in southern Yukon does not yet warrant spraying, but this may become a prudent action soon if oxeye daisy starts spreading more. Experience in northern British Columbia shows that it is best to stop this species early in the colonization event, as it is essentially impossible to eradicate once it is established.

Spotted knapweed: A small but dense patch of spotted knapweed was encountered and pulled on the Atlin Road (near km 12.5) in 2015. This patch did not return in 2016, indicating effective eradication. However, four flowering plants and ten leaf rosettes were found in 2016, only 20 m distance from the eradicated patch. In 2017, eleven near-flowering plants and many small leave rosettes (immature plants) were removed in this same general location. This indicates that there is a seedbank in the soil, and the area should be monitored closely for the next few years, as it is important to ensure this does not become an established colony and the progenitor of a knapweed infestation in Southern Yukon.

The concern and approach to spotted knapweed are similar to those for oxeye daisy. It has strong invasive tendencies, and if allowed to take hold can form dense stands that reduce the vigour and diversity of native plants, as well as the quantity and quality of forage crops in agricultural fields (i.e., hay and pasture). Spotted knapweed is a biannual or short-lived perennial plant that reproduces and spreads by seeds, which

are produced in abundance and are highly mobile. Pulling of plants can be effective for small populations (the entire plant, including root, must be pulled), but herbicidal spraying has been found to be necessary in many areas of western North America, mainly because mowing is not an effective control measure for infestations as it does not kill the plants. Likewise, the complete extrication of every individual plant through hand pulling is not realistic for large infestations.

Bird vetch: As in 2016, we encountered a colony of bird vetch approximately 10 m^2 in size growing at the entrance to a private driveway at km 10.5 of the Atlin Road. Last year we approached the property owner, who said he was aware of the presence of the plants and said he has been battling infestations on his property. Apparently, a previous owner planted the vetch, and likely the other invasive species (scentless chamomile) found growing next to the driveway. The property has changed hands since last year and we did not contact the new owner (gate was closed), but we think that arranging a meeting with them to discuss potential spread from this property to other areas may be in TMB's interest in an effort to avoid the spread of this species.

Bird vetch also is a very invasive species that is difficult to eradicate once it becomes established, and it can spread quickly and smother other vegetation soon after its first appearance. It has become a very problematic invasive species in interior Alaska. Consequently, it should be given high priority for monitoring and control.

Perennial sow thistle: In previous years, we reported the presence of six sow thistle colonies in the study area: 1) three on the Tagish Road, including two fairly extenive colonies (~5 m^2 at Km 5.5 and ~50 m^2 at Km 19.5), and one small patch at Km 41.5, 2) two small patches on the Atlin Road at Km 9.5 and Km 10, and 3) one small colony on the SKH at Km 157.5.

In 2017, we found that the three colonies on the Tagish Road had regrown. The two large colonies were once again too large to pull individual plants, but we did cut all flowering tips and new rosettes. The colony at Km 41.5 was small enough that the plants could be pulled and bagged. It will be important to control plants in these colonies each year in the future in order to exhaust the entrenched seedbank and prevent further spread. If the two large colonies continue to persist, it may be prudent to conduct a small herbicidal spraying program to eliminate them, as this may be the only way to prevent them from becoming the seed source for a serious outbreak.

On a positive note, we found no sow thistle growing on the Atlin Road this year; it appears that pulling plants at the two colonies found in 2015 and 2016 was effective at eradicating the colonies.

The sow thistle previously encountered at Km 157.5 of the SKH regrew in 2017, despite pulling efforts in the previous two years. As well, a second patch was discovered this year in front of the CTFN offices (Km 105.5). That patch appeared to be well-established so it is likely that we missed it in previous years. The plants from both colonies on the SKH were pulled and bagged.

Yellow lucerne: In 2016, two lucerne plants were pulled near km 20 of the Atlin Road. No lucerne regrew at this location in 2017, but one new plant was found (and removed) nearby at km 19.5. At this time, yellow lucerne does not represent a large threat because there is no sign of an established colony or deep seedbank. However, it would be prudent to re-examine this stretch of road annually to ensure any germinating lucerne is pulled or cut. Yellow lucerne is an invasive plant that can take over agricultural fields

and severley reduce crop growth. It already is problematic in the Haines Junction area, where it has invaded hay fields. *(We also noticed this year that it is spreading on the North Klondike Highway south of Carmacks.)*

Yellow clematis: This non-native, vine-like climbing plant has been observed for many years in the Carcross area, as well as in Whitehorse (see Section 3). It is not strongly invasive, does not appear to be a biological threat, and is not spreading in any significant way. We did not pull or cut any clematis in this study, and we do not believe that any control measures need to be taken at this time, other than continued monitoring.

Unscented chamomile: In 2015 and 2016, unscented chamomile was encountered on both sides of the entrance to a private driveway at km 10.5 of the Atlin Road. It was growing in the same area as Shasta daisy, another ornamental seeded plant. We pulled the chamomile in both years, which must have been fairly effective because we found only a few plants growing there in 2017. These also were pulled.

In 2016, we also reported finding unscented chamomile at km 79.5 of the SKH, but we now believe those plants on the SKH were misidentified and were actually oxeye daisy (they were pulled and bagged).

Chamomile is only weakly invasive in Yukon, and the current control measures appear to be adequate at controlling the species.

Altai lyme grass: Altai lyme grass populations in 2017 are essentially unchanged from previous years. It is only a problem on the southern portions of the SKH, where 50 of the 51 total colonies were encountered (the other colony was on the Tagish Road, see below). Forty-six of the 50 colonies found on the SKH were in the vicinity of the BC-Alaska border, between Km 24 and 56. The colonies range in size from 1-25 m^2. However, there also is a very large infestation of >100 m^2 in Carcross between the Nares River Bridge (Km 105) and Montana Services gas station (Km 106). Because this species grows in tight, large tufts that are very well rooted, it is nearly impossible to effectively pull the plants in a colony, unless it consists of only a few plants. Mowing also is not effective, since it is a grass that will simply regrow. Consequently, no control measures could be employed at these extensive colonies along the SKH, except for two small colonies near Km 144 where the patches were small enough to pull.

There is a single established colony of Altai lyme grass growing on the Tagish Road at Km 28 (RHS). In 2015 and 2016, all plants in this colony were pulled and bagged (with much effort), and this year only 20 plants were found (these also were pulled and bagged). There is a very good chance that continued pulling for a few more years at this location will eliminate the only colony of Altai lyme grass on the Tagish Road.

In all three years of this program, no Altai lyme grass has been found growing on the Atlin Road.

Echoing our comments in the 2016 report, Altai lyme grass is a challenging species in terms of assessing its level of threat and the appropriate management response. It is not an extremely invasive species, yet it will readily colonize newly disturbed ground, particularly nutrient-poor sandy soil; and it is tenacious, forming dense patches when it gains a foothold. Controlling Altai lyme grass by hand or mowing is difficult, which adds to the challenge of chosing an effective management plan. It is a tufted grass that develops strong root systems, making all but the youngest plants difficult to pull. Pulling large or well entrenched patches is not realistic, and like other grasses, mowing will not eliminate it.

Altai lyme grass is a species of concern around the Carcross Desert area, where patches of the grass have become well established and compete with rare endemic grass species in this unique boreal dune system. In

the course of a few decades, as dune areas are continually exposed by wind erosion and colonized, Altai lyme grass could take over as a dominant grass, at the expense of rare endemic species. This is a real concern, but so far it has not come to fruition, and the Altai lyme grass is mostly restricted to the road ROW, especially along the South Klondike Highway south of Carcross to the BC-Alaska border. Around Carcross, however, it has spread outside of the ROW and there are some very large patches in the vicinity over 100 m^2 in size. This may indeed be a situation where it might be prudent to intervene with strong measures, such as herbicidal spraying, in order to stop the spread of an invasive plant that could cause real biological degredation to a unique ecosystem if its expansion suddenly becomes exponential.

5 Overall Situational Assessment and Recommendations

1. Sweetclover continues to be the most prominent invasive plant growing along Southern Lakes roadways. So far, the Patrol and Pull program seems to be effectively containing this species, but not reducing its overall extent. The five large colonies are not spreading, and in fact there is some diminishment in density after three years of mowing. The fact that small colonies (<20 plants) continue to persist into year three indicates that two years of mowing/pulling is not enough to eradicate them, due to a persistent seedbank. The continued appearance of single plant colonies probably reflects the sporadic influx of new seed from highway traffic. However, in terms of alternative control strategies, we cannot envision one that would be more effective than Patrol and Pull, especially given its straight-forward nature and relatively low cost.

While Patrol and Pull is providing containment for existing populations of sweetclover, and will likely result in the elimination of many colonies over time, it should be pointed out that an important strategy for managing the future spread of sweetclover on Southern Lakes roadways will be to ensure that road upgrades and maintenance work do not truck in aggregates from borrow pits that are contaminated with sweetclover seeds. The use of contaminated fill can create an instant and deep seedbank that spawns colonies that are extremely difficult to eradicate.

2. One of the main goals—and strength—of the Patrol and Pull program is that it appears to be preventing a number of other species from gaining a foothold in the region that currently exist in low numbers but could become very problematic if not controlled. In that regard, the principle species of concern are sow thistle, spotted knapweed, bird vetch, and oxeye daisy. If these species become well established with entrenched seed sources, then they will be nearly impossible to eradicate. Other species of concern include yellow lucerne and Altai lyme grass.

3. We suggest that it is time to consider herbicidal spraying for the control of oxeye daisy and perennial sow thistle because there are several fairly large infestations in the Southern Lakes area and these perennial species are essentially impossible to manage with pulling alone.

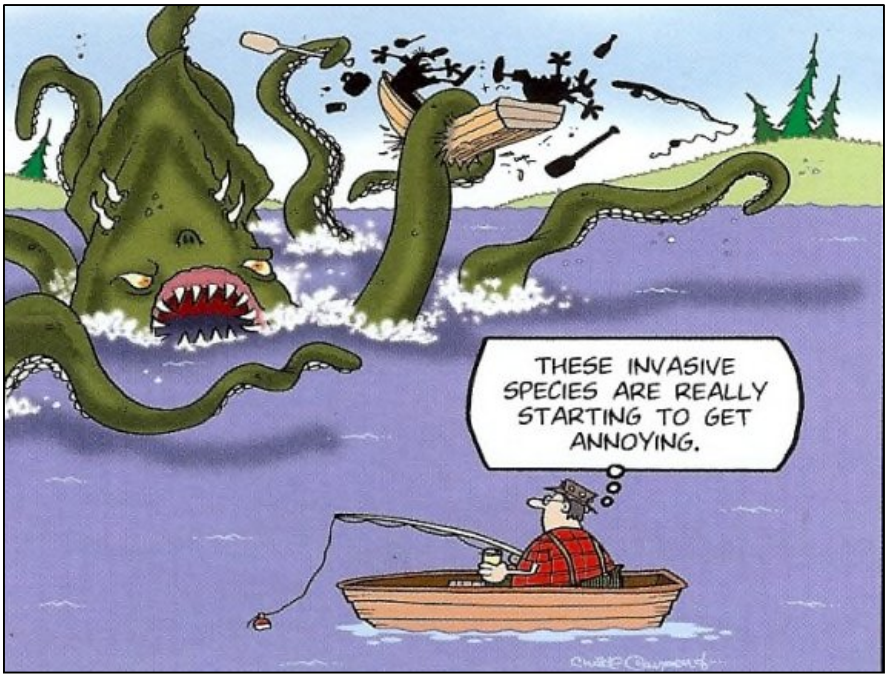
4. Timing: Patrol and Pull should be completed when most of the plants are flowering, but no sooner than late July in most years. If done earlier, many of the species of concern have not grown large enough to detect. Likewise, we found it is almost essential to patrol the roads twice each season, separated by about two weeks, to pull/cut plants that regrow or that were missed in the first patrol. As well, some species and individual plants mature later in the season and would be missed by a single, early-season patrol.

5. While we were originally quite satisfied with the use of a gas-powered brush cutter for mowing large patches of sweetclover, we now are starting to see that it only effectively cuts and kills ~90-95% of the plants in thick patches. Young shoots can be missed, or can regrow after mowing and sometimes even large plants are not cut all the way through, but only slightly severed simply pushed over. This problem arises in part because the operator will naturally try to protect the cutter head by avoiding contact with the ground or rocks, leading to a less aggressive mowing style in order to protect equipment (and for safety).

6. It was reinforced this year that driving speeds should be kept below 40 km/hr during the patrol phase; otherwise individual plants and even small colonies will be missed.

7. The Altai lyme grass situation on the SKH is not yet critical, but the species should be closely monitored for its spread from the highway ROW into dune areas where it is a real threat to rare endemic plants. Herbicidal spraying may be prudent where Altai lyme grass is encroaching on the Carcross Dunes.

8. As stated above, oxeye daisy and bird vetch are species that could cause large scale harm if their populations expand. Yet their occurrence along Southern Lakes roadways is the result of a few private property owners planting them as ornamentals. A public awareness campaign and direct contact with specific property owners to dissuade people from cultivating these species could go a long way towards eliminating the threat.



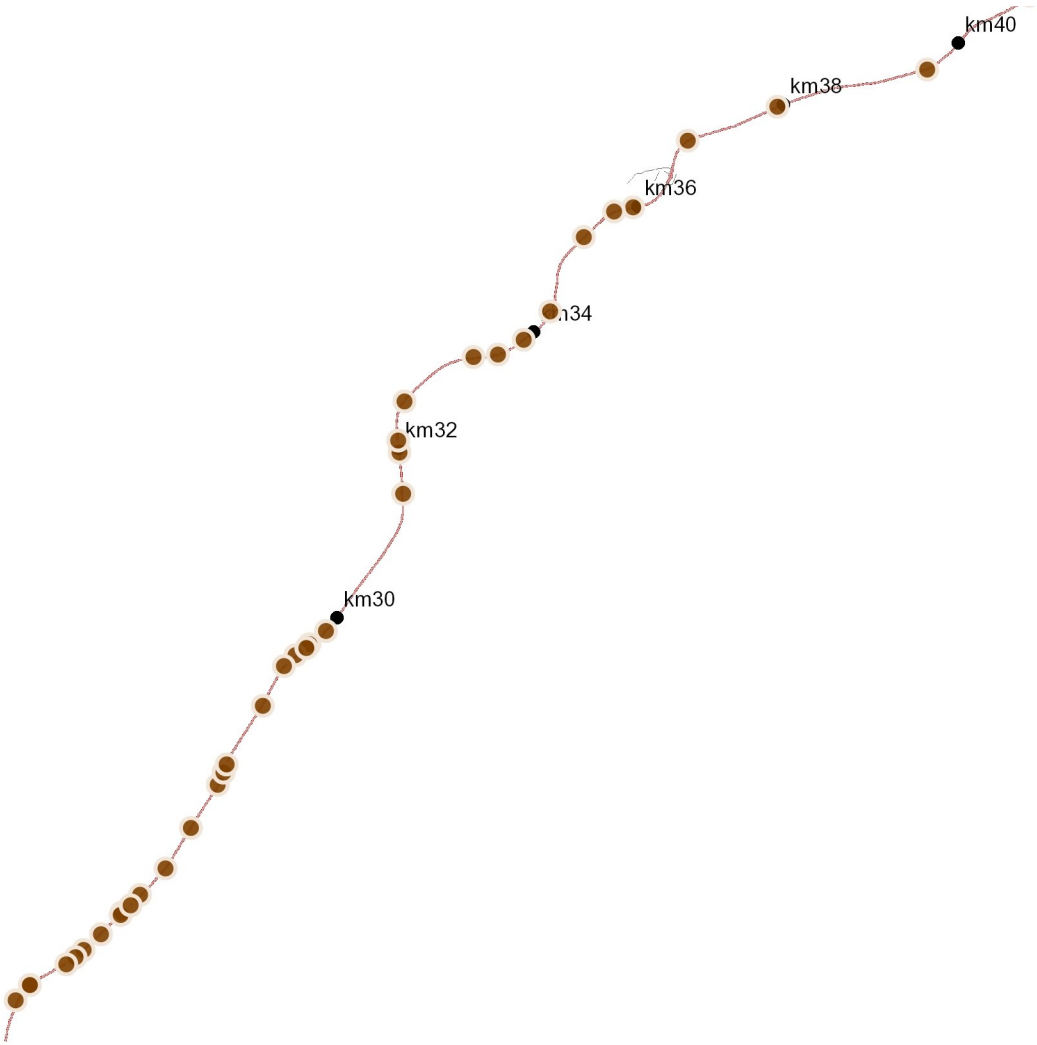
Tundra **by Chad Carpenter**

2017 MAPS

Note: overlap of the locations of different species occurs on these maps. As a result some plant locations are not visible.

Southern Lakes Roadways 2017 Invasive Plant Survey

S. Klondike Highway km 24-40



Legend

- Highway Kilometre Posts
- White sweetclover
- Yellow sweetclover
- Yellow lucerne
- Yellow clematis
- Spotted knapweed
- Scentless chamomile
- Perennial sowthistle
- Oxeye daisy
- Bird vetch
- Altai lyme grass

1: 80,000

Notes

Map 1

4.1 0 2.03 4.1 Kilometers

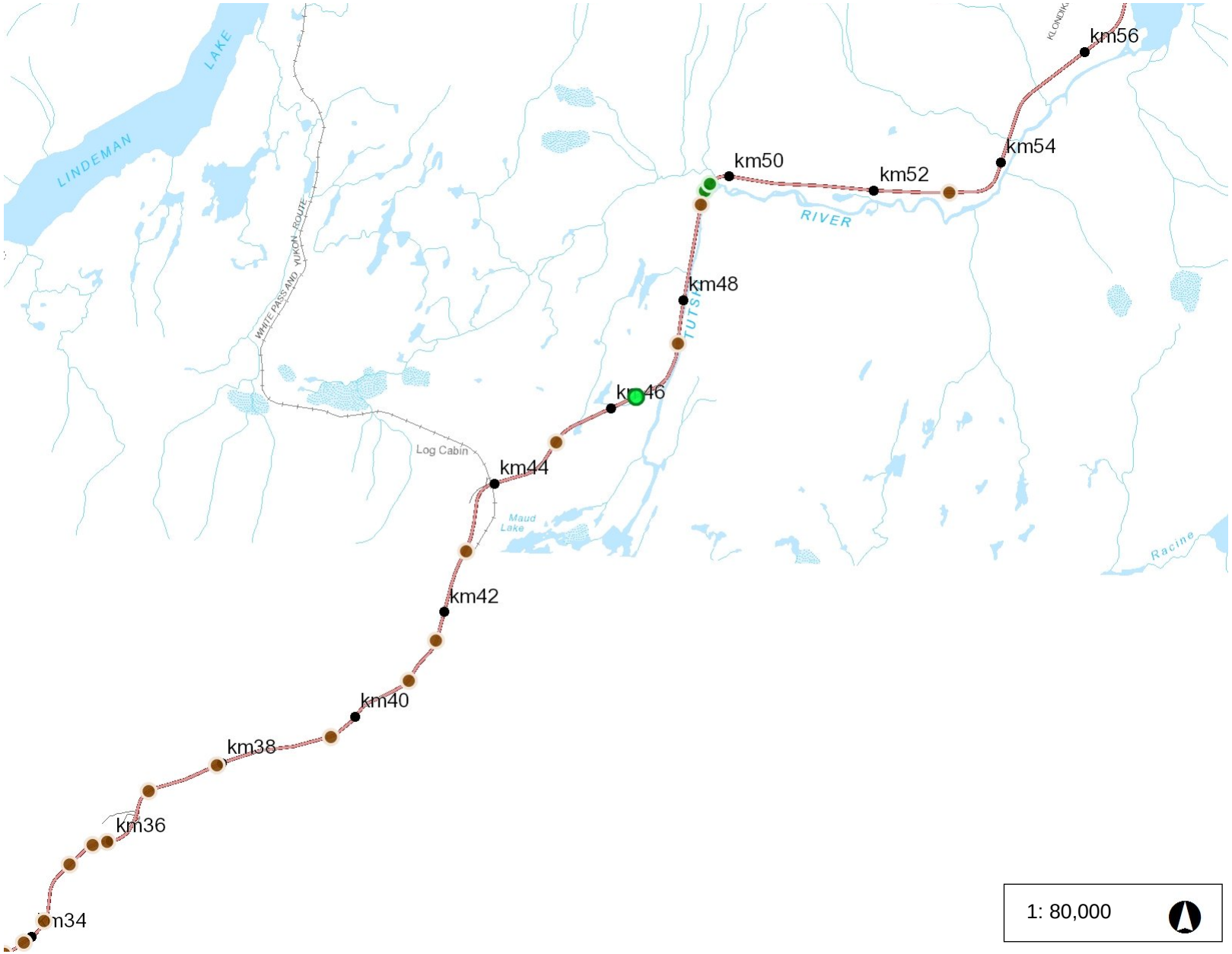
Yukon Albers

Produced from: Yukon Lands Viewer

Date Printed: 04-Aug-2017

Southern Lakes Roadways 2017 Invasive Plant Survey

S. Klondike Highway km 34-56



Legend

- Highway Kilometre Posts
- White sweetclover
- Yellow sweetclover
- Yellow lucerne
- Yellow clematis
- Spotted knapweed
- Scentless chamomile
- Perennial sowthistle
- Oxeye daisy
- Bird vetch
- Altai lyme grass

1: 80,000

4.1 0 2.03 4.1 Kilometers

Yukon Albers

Produced from: Yukon Lands Viewer

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Date Printed: 14-Aug-2017

Notes

Map 2

Southern Lakes Roadways 2017 Invasive Plant Survey

S. Klondike Highway km 56-70

Legend

- Highway Kilometre Posts
- White sweetclover
- Yellow sweetclover
- Yellow lucerne
- Yellow clematis
- Spotted knapweed
- Scentless chamomile
- Perennial sowthistle
- Oxeye daisy
- Bird vetch
- Altai lyme grass

1: 80,000

4.1 0 2.03 4.1 Kilometers

Yukon Albers

Produced from: Yukon Lands Viewer

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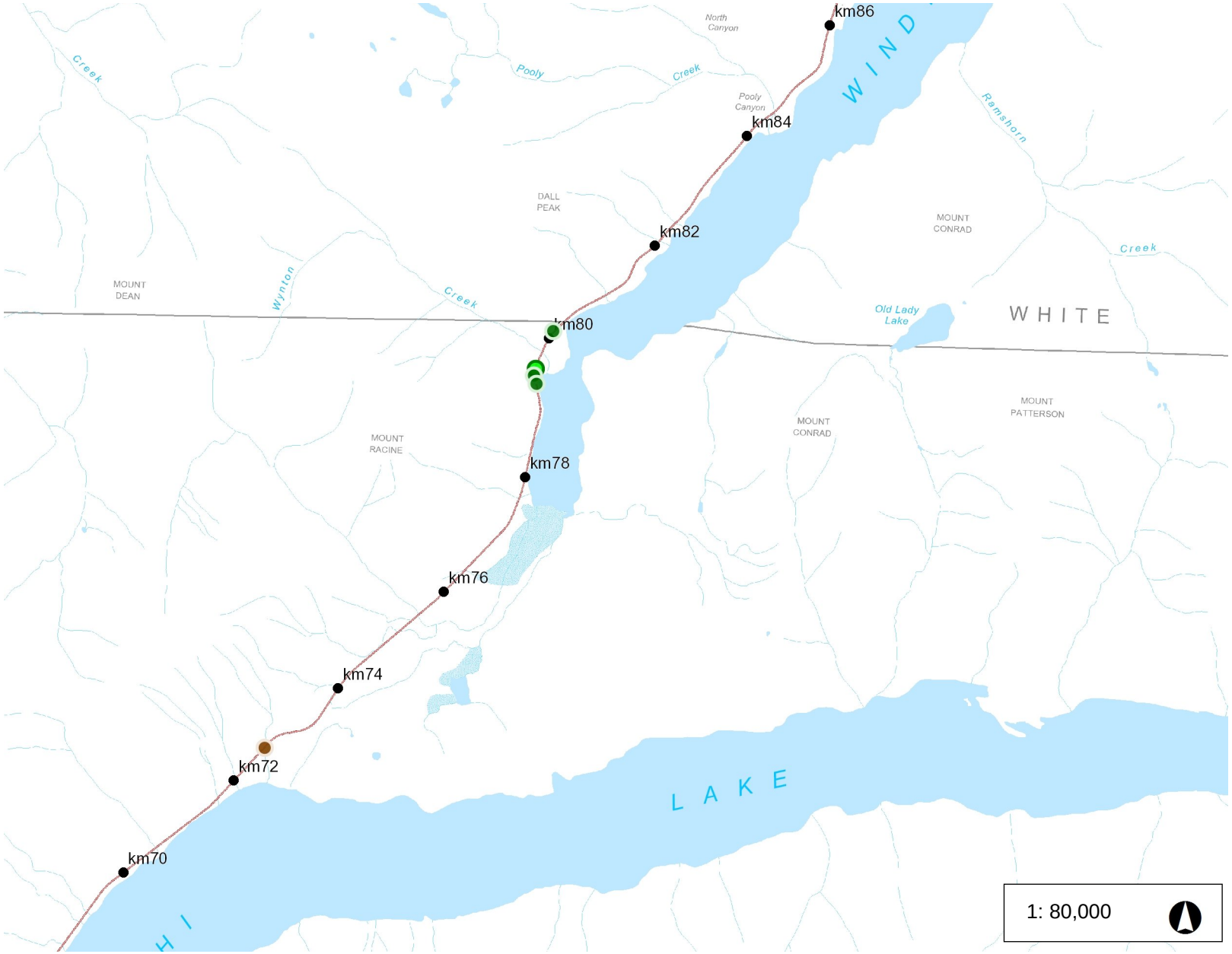
Date Printed: 04-Aug-2017

Notes

Map 3

Southern Lakes Roadways 2017 Invasive Plant Survey

S. Klondike Highway km 70-86



Legend

- Highway Kilometre Posts
- White sweetclover
- Yellow sweetclover
- Yellow lucerne
- Yellow clematis
- Spotted knapweed
- Scentless chamomile
- Perennial sowthistle
- Oxeye daisy
- Bird vetch
- Altai lyme grass

1: 80,000

4.1 0 2.03 4.1 Kilometers

Yukon Albers

Produced from: Yukon Lands Viewer

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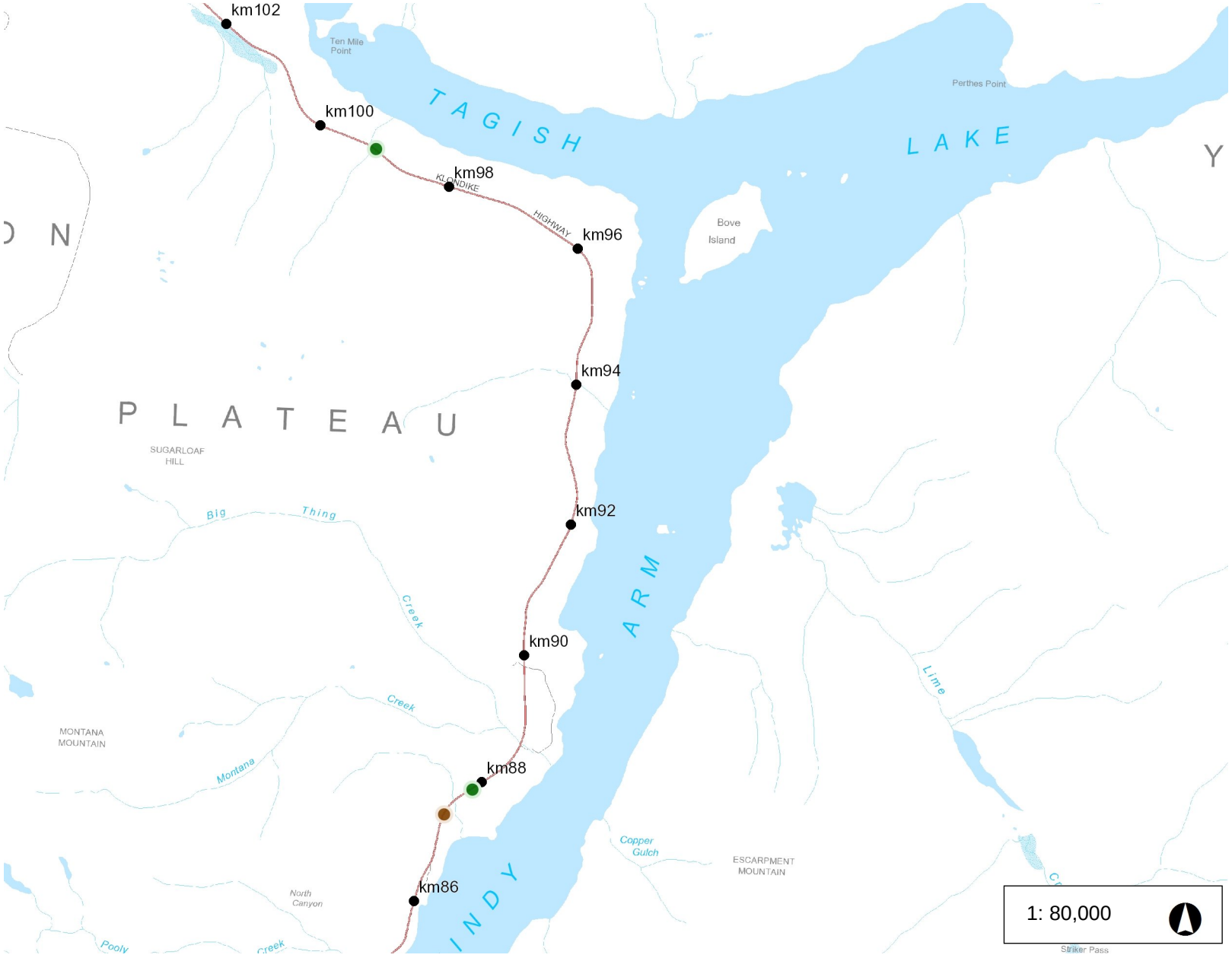
Date Printed: 04-Aug-2017

Notes

Map 4

Southern Lakes Roadways 2017 Invasive Plant Survey

S. Klondike Highway km 86-102



Legend

- Highway Kilometre Posts
- White sweetclover
- Yellow sweetclover
- Yellow lucerne
- Yellow clematis
- Spotted knapweed
- Scentless chamomile
- Perennial sowthistle
- Oxeye daisy
- Bird vetch
- Altai lyme grass

1: 80,000

4.1 0 2.03 4.1 Kilometers

Yukon Albers

Produced from: Yukon Lands Viewer

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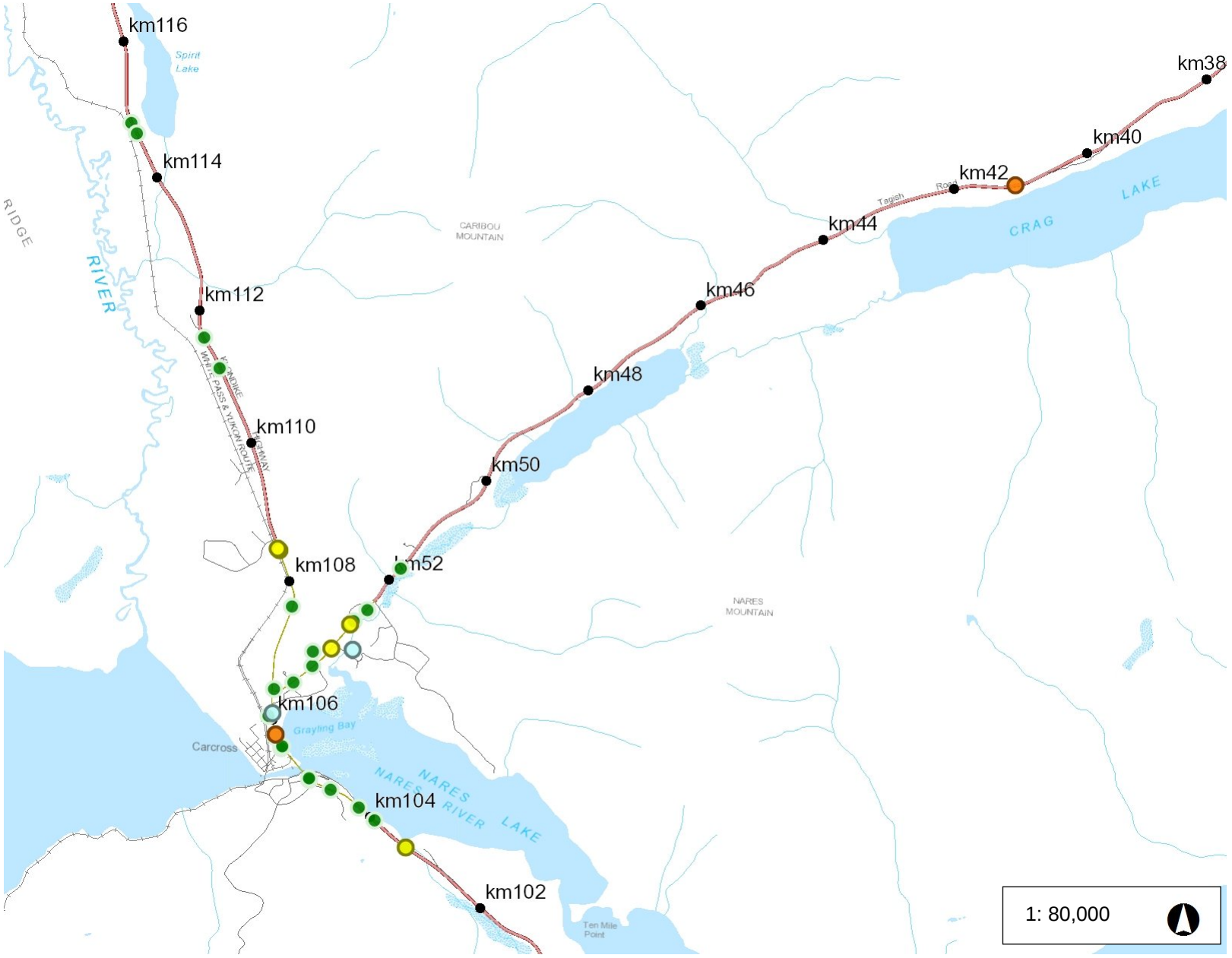
Date Printed: 04-Aug-2017

Notes

Map 5

Southern Lakes Roadways 2017 Invasive Plant Survey

S. Klondike Highway km 102-116 and Tagish Road km 38-55



Legend

- Highway Kilometre Posts
- White sweetclover
- Yellow sweetclover
- Yellow lucerne
- Yellow clematis
- Spotted knapweed
- Scentless chamomile
- Perennial sowthistle
- Oxeye daisy
- Bird vetch
- Altai lyme grass

Notes

Map 6

4.1 0 2.03 4.1 Kilometers

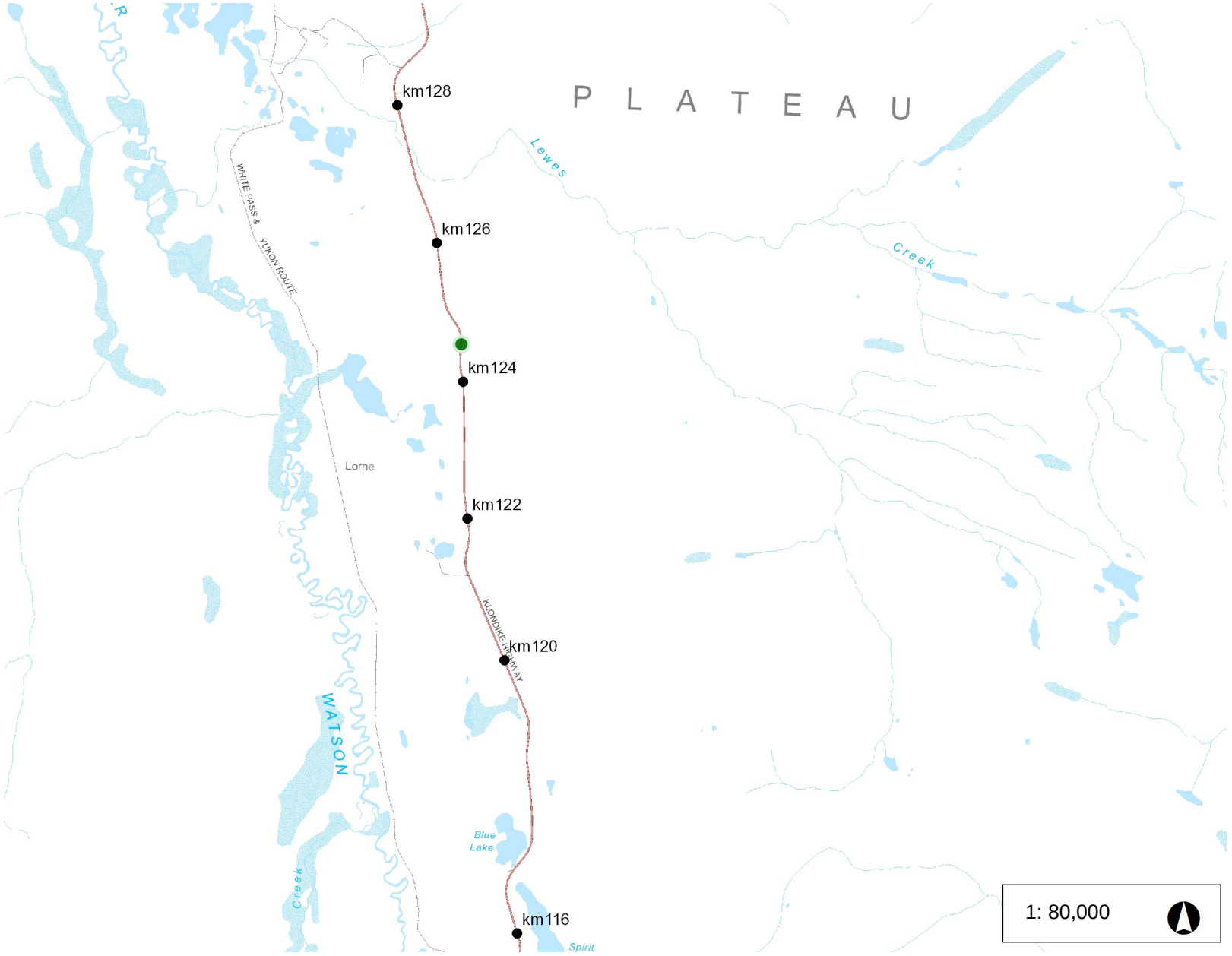
Yukon Albers

Produced from: Yukon Lands Viewer

Date Printed: 14-Aug-2017

Southern Lakes Roadways 2017 Invasive Plant Survey

S. Klondike Highway km 116-130



Legend

- Highway Kilometre Posts
- White sweetclover
- Yellow sweetclover
- Yellow lucerne
- Yellow clematis
- Spotted knapweed
- Scentless chamomile
- Perennial sowthistle
- Oxeye daisy
- Bird vetch
- Altai lyme grass

1: 80,000

4.1 0 2.03 4.1 Kilometers

Yukon Albers

Produced from: Yukon Lands Viewer

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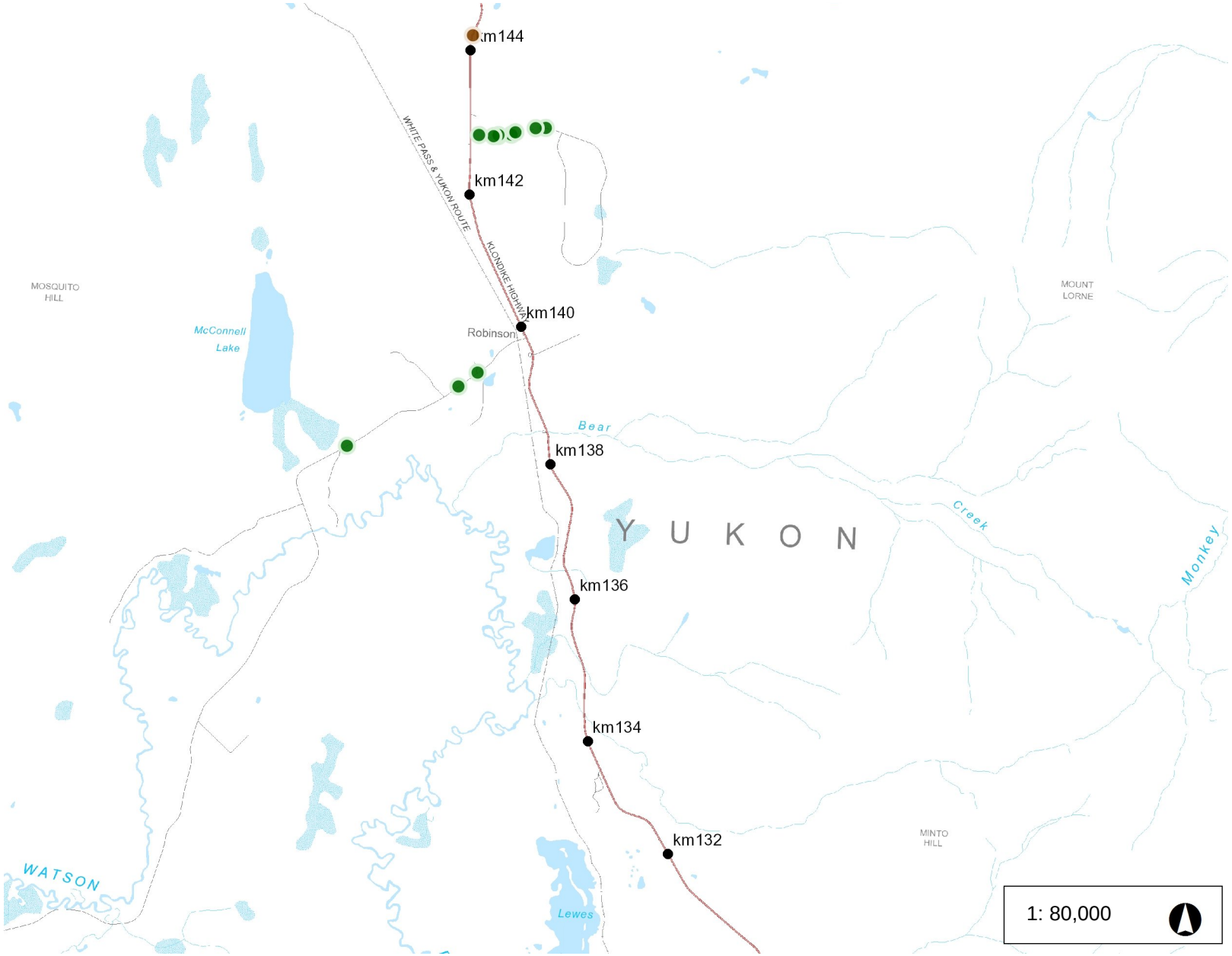
Date Printed: 04-Aug-2017

Notes

Map 7

Southern Lakes Roadways 2017 Invasive Plant Survey

S. Klondike Highway km 130-144



Legend

- Highway Kilometre Posts
- White sweetclover
- Yellow sweetclover
- Yellow lucerne
- Yellow clematis
- Spotted knapweed
- Scentless chamomile
- Perennial sowthistle
- Oxeye daisy
- Bird vetch
- Altai lyme grass

1: 80,000

4.1 0 2.03 4.1 Kilometers

Yukon Albers

Produced from: Yukon Lands Viewer

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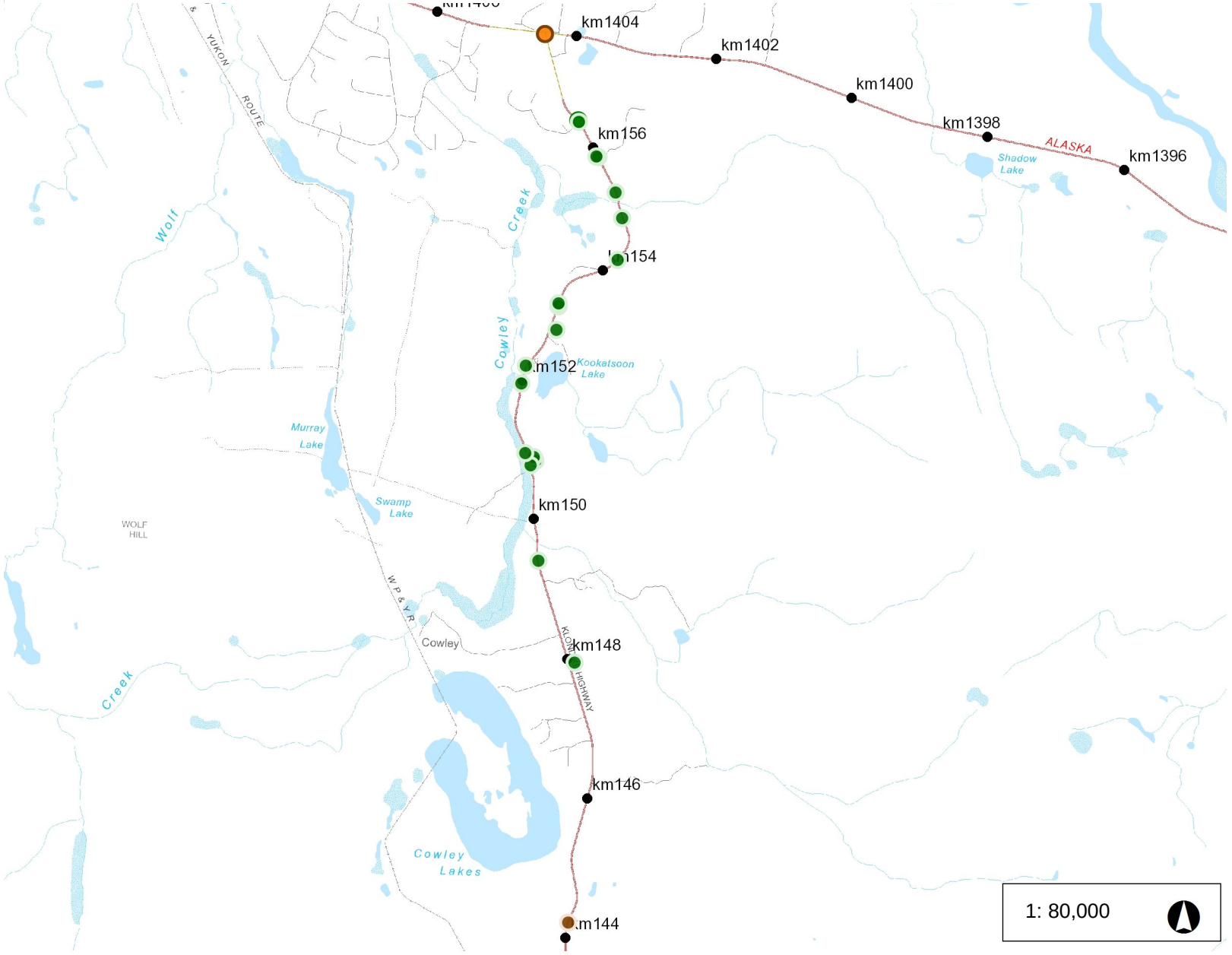
Date Printed: 04-Aug-2017

Notes

Map 8

Southern Lakes Roadways 2017 Invasive Plant Survey

S. Klondike Highway km 144-157



Legend

- Highway Kilometre Posts
- White sweetclover
- Yellow sweetclover
- Yellow lucerne
- Yellow clematis
- Spotted knapweed
- Scentless chamomile
- Perennial sowthistle
- Oxeye daisy
- Bird vetch
- Altai lyme grass

1: 80,000

4.1 0 2.03 4.1 Kilometers

Yukon Albers

Produced from: Yukon Lands Viewer

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Date Printed: 04-Aug-2017

Notes

Map 9

Southern Lakes Roadways 2017 Invasive Plant Survey

Tagish Road km 0-16 and Atlin Road km 0-12

Legend

- Highway Kilometre Posts
- White sweetclover
- Yellow sweetclover
- Yellow lucerne
- Yellow clematis
- Spotted knapweed
- Scentless chamomile
- Perennial sowthistle
- Oxeye daisy
- Bird vetch
- Altai lyme grass

Notes

Map 10

4.1 0 2.03 4.1 Kilometers

Yukon Albers

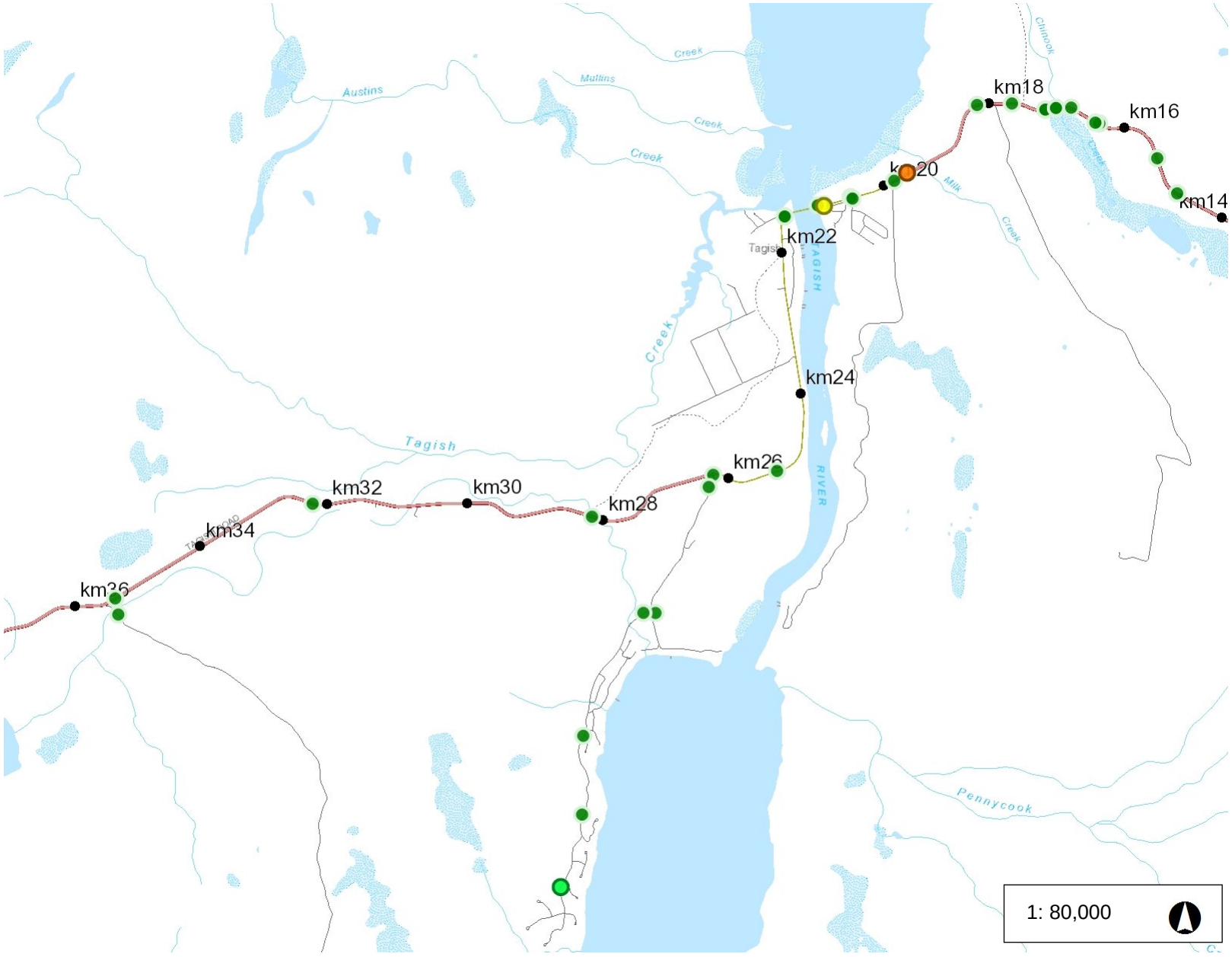
Produced from: Yukon Lands Viewer

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Date Printed: 14-Aug-2017

Southern Lakes Roadways 2017 Invasive Plant Survey

Tagish Road km 15-37



Legend

- Highway Kilometre Posts
- White sweetclover
- Yellow sweetclover
- Yellow lucerne
- Yellow clematis
- Spotted knapweed
- Scentless chamomile
- Perennial sowthistle
- Oxeye daisy
- Bird vetch
- Altai lyme grass

Notes

Map 11

4.1 0 2.03 4.1 Kilometers

Yukon Albers

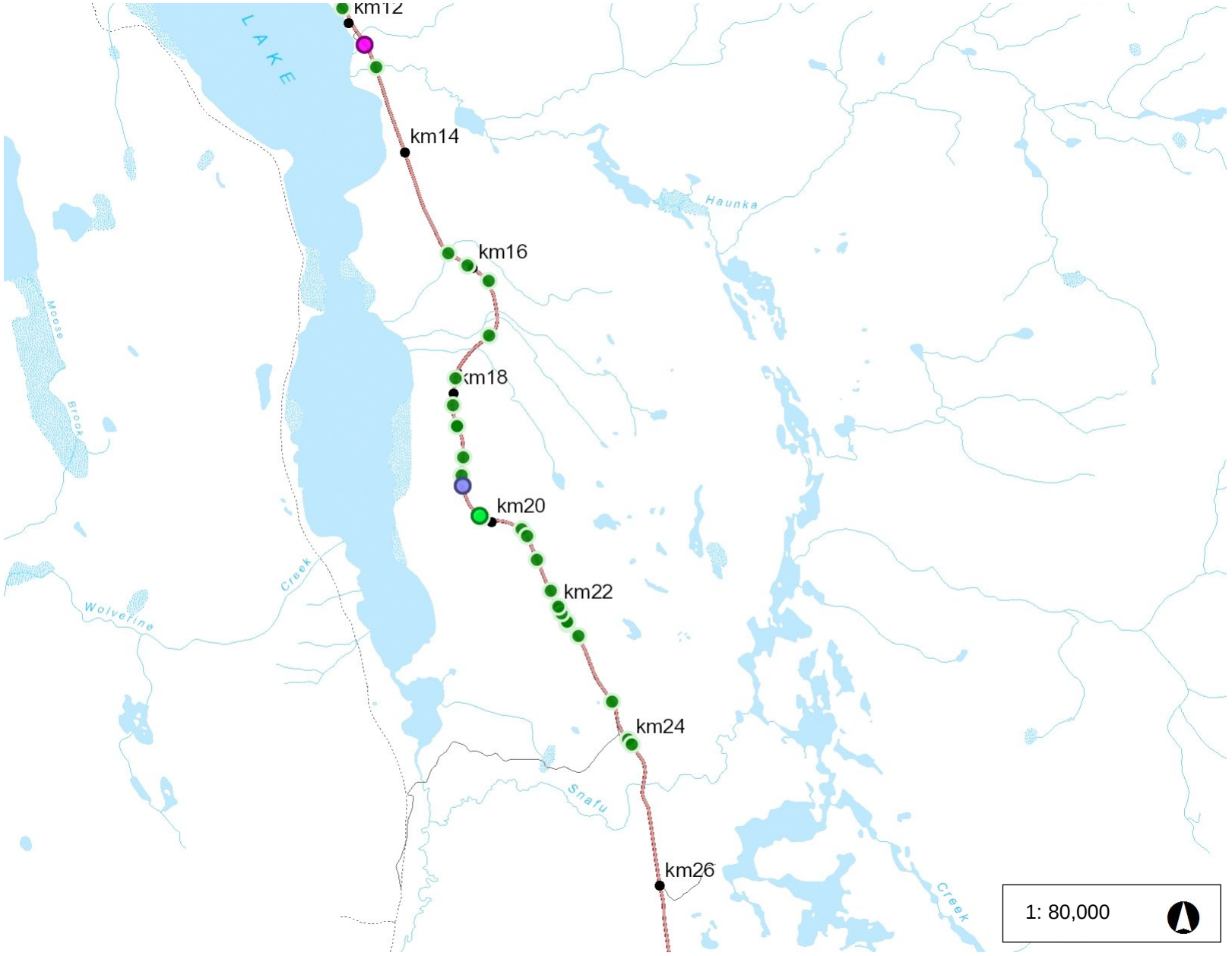
Produced from: Yukon Lands Viewer

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Date Printed: 14-Aug-2017

Southern Lakes Roadways 2017 Invasive Plant Survey

Atlin Road km 12-26



Legend

- Highway Kilometre Posts
- White sweetclover
- Yellow sweetclover
- Yellow lucerne
- Yellow clematis
- Spotted knapweed
- Scentless chamomile
- Perennial sowthistle
- Oxeye daisy
- Bird vetch
- Altai lyme grass

1: 80,000

4.1 0 2.03 4.1 Kilometers

Yukon Albers

Produced from: Yukon Lands Viewer

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

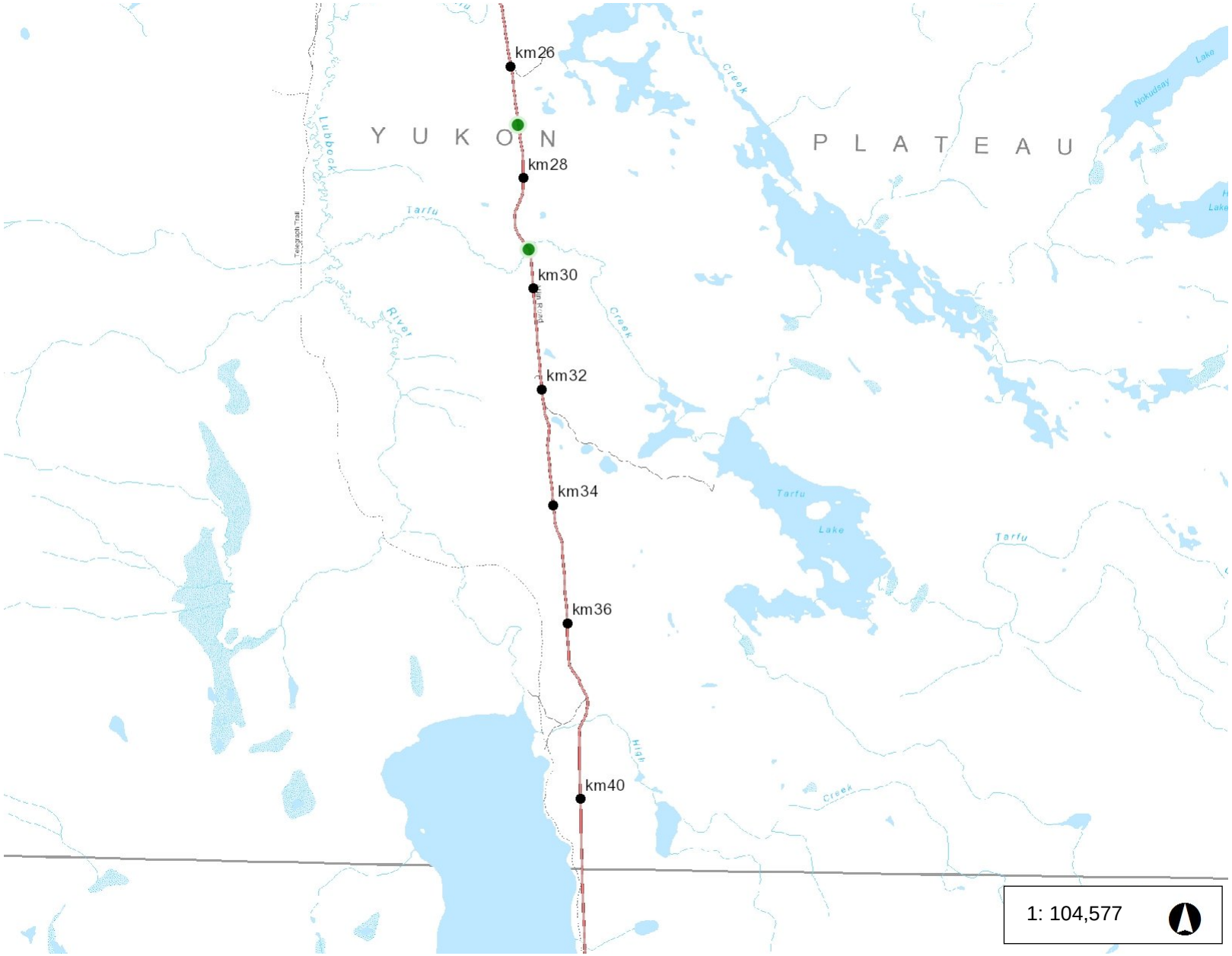
Date Printed: 14-Aug-2017

Notes

Map 12

Southern Lakes Roadways 2017 Invasive Plant Survey

Atlin Road km 26-41



Legend

- Highway Kilometre Posts
- White sweetclover
- Yellow sweetclover
- Yellow lucerne
- Yellow clematis
- Spotted knapweed
- Scentless chamomile
- Perennial sowthistle
- Oxeye daisy
- Bird vetch
- Altai lyme grass

1: 104,577

5.3 0 2.66 5.3 Kilometers

Yukon Albers

Produced from: Yukon Lands Viewer

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Date Printed: 14-Aug-2017

Notes

Map 13

2017 DATA LOGS

Table 2. South Klondike Highway 2017 Invasive Plant Survey

Data collected in WGS 84

Site ID	Nearest Km	Side of Road	GPS Latitude	GPS Longitude	Latitude	Longitude	Species	Notes	Photo File Name
SKH 17-01	144	RHS	60° 29' 18.432" N	134° 51' 49.644" W	60.488453	-134.86379	**Altai lyme grass**	1 plant	SKH 17-01.JPG
SKH 17-02	149	RHS	60° 32' 0.564" N	134° 52' 29.070" W	60.53349	-134.874742	White sweetclover	5m2	SKH 17-02.JPG
SKH 17-03	153	RHS	60° 32' 45.384" N	134° 52' 35.178" W	60.54594	-134.876438	White sweetclover	5m2 in gravel pit	SKH 17-03.JPG
SKH 17-04	153	RHS	60° 32' 47.088" N	134° 52' 36.798" W	60.546413	-134.876888	White sweetclover	2 plants in gravel pit	SKH 17-04.JPG
SKH 17-05	153	RHS	60° 32' 43.356" N	134° 52' 39.426" W	60.545377	-134.877618	White sweetclover	~2m2 along 100m	SKH 17-05.JPG
SKH 17-06	152	RHS	60° 33' 19.980" N	134° 52' 50.646" W	60.55555	-134.880735	White sweetclover	10 plants at driveway	SKH 17-06.JPG
SKH 17-07	153	RHS	60° 33' 55.284" N	134° 52' 19.446" W	60.565357	-134.872068	White sweetclover	0.5m2	SKH 17-07.JPG
SKH 17-08	154	RHS	60° 34' 17.118" N	134° 51' 27.078" W	60.571422	-134.857522	White sweetclover	3m2	SKH 17-08.JPG
SKH 17-09	156	RHS	60° 35' 3.042" N	134° 51' 48.084" W	60.584178	-134.863357	White sweetclover	1 plant	SKH 17-09.JPG
SKH 17-10	156.5	RHS/LHS	60° 35' 18.534" N	134° 52' 7.080" W	60.588482	-134.868633	White sweetclover	start Carcross Corner section; 100m2 on RHS and 50m2 on LHS over 500 m	SKH 17-10.JPG
SKH 17-11	156.5	RHS	60° 35' 19.200" N	134° 52' 7.680" W	60.588667	-134.8688	**Oxeye daisy**	1 plant	SKH 17-11.JPG
SKH 17-12	157.5	LHS	60° 35' 57.480" N	134° 52' 41.022" W	60.5993	-134.878062	**Perennial sowthistle**	1 plant; driven over by construction work	SKH 17-12.JPG
SKH 17-13	156	LHS	60° 35' 3.288" N	134° 51' 49.938" W	60.584247	-134.863872	White sweetclover	1 plant	SKH 17-13.JPG
SKH 17-14	155	LHS	60° 34' 47.406" N	134° 51' 31.218" W	60.579835	-134.858672	White sweetclover	1 plant	SKH 17-14.JPG
SKH 17-15	155	LHS	60° 34' 35.994" N	134° 51' 24.342" W	60.576665	-134.856762	White sweetclover	5 plants	SKH 17-15.JPG
SKH 17-16	153	LHS	60° 33' 56.610" N	134° 52' 19.434" W	60.565725	-134.872065	White sweetclover	1m2	SKH 17-16.JPG
SKH 17-17	152	LHS	60° 33' 28.068" N	134° 52' 47.184" W	60.557797	-134.879773	White sweetclover	2 plants	SKH 17-17.JPG
SKH 17-18	153	LHS	60° 32' 48.750" N	134° 52' 44.724" W	60.546875	-134.87909	White sweetclover	5 plants	SKH 17-18.JPG
SKH 17-19	115	LHS	60° 14' 42.006" N	134° 44' 44.136" W	60.245002	-134.745593	White sweetclover	3 plants	SKH 17-19.JPG
SKH 17-20	111	LHS	60° 12' 52.974" N	134° 43' 16.728" W	60.214715	-134.721313	White sweetclover	1m2 in 30m2 area	SKH 17-20.JPG
SKH 17-21	107.5	LHS	60° 11' 6.876" N	134° 42' 3.990" W	60.185243	-134.701108	White sweetclover	3 plants	SKH 17-21.JPG
SKH 17-22	148	RHS	60° 31' 17.627" N	134° 52' 5.883" W	60.52094	-134.86462	White sweetclover	2 plants	no photo
SKH 17-23	153	RHS	60° 33' 44.407" N	134° 52' 15.613" W	60.56241	-134.87236	White sweetclover	0.5m2 at driveway	no photo
SKH 17-24	108.5	RHS	60° 26' 47.028" N	134° 51' 34.008" W	60.192217	-134.704728	**Yellow sweetclover**	30m2	SKH 17-24.JPG
SKH 17-25	111.5	RHS	60° 11' 31.980" N	134° 42' 17.022" W	60.218482	-134.72545	White sweetclover	1m2	SKH 17-25.JPG
SKH 17-26	115	RHS	60° 13' 6.534" N	134° 43' 31.620" W	60.243715	-134.74412	White sweetclover	0.5m2	SKH 17-26.JPG
SKH 17-27	124.5	RHS	60° 14' 37.374" N	134° 44' 38.832" W	60.32856	-134.767633	White sweetclover	5m2 along 250m	SKH 17-27.JPG
SKH 17-28	108.5	LHS	60° 19' 42.816" N	134° 46' 3.480" W	60.192427	-134.705195	**Yellow sweetclover**	4 plants	SKH 17-28.JPG
SKH 17-29	106	LHS	60° 11' 32.736" N	134° 42' 18.702" W	60.171473	-134.706015	White sweetclover	1m2 in 10m2 area	SKH 17-29.JPG
SKH 17-30	105.5	LHS	60° 10' 17.304" N	134° 42' 21.654" W	60.168843	-134.70409	White sweetclover	1m2	SKH 17-30.JPG
SKH 17-31	105.5	LHS	60° 10' 7.836" N	134° 42' 14.724" W	60.168843	-134.70409	**Altai lyme grass**	100m2	SKH 17-31.JPG
SKH 17-32	105.5	LHS	60° 10' 7.836" N	134° 42' 14.724" W	60.167472	-134.702548	White sweetclover	1.5m2	SKH 17-32.JPG
SKH 17-33	105	LHS	60° 10' 2.898" N	134° 42' 9.174" W	60.163638	-134.695307	White sweetclover	150m2	SKH 17-33.JPG
SKH 17-34	105	LHS	60° 9' 49.098" N	134° 41' 43.104" W	60.163837	-134.695355	White sweetclover	100m2	SKH 17-34.JPG
SKH 17-35	104.5	LHS	60° 9' 49.812" N	134° 41' 43.278" W	60.162493	-134.689862	White sweetclover	25m2	SKH 17-35.JPG
SKH 17-36	104	LHS	60° 9' 44.976" N	134° 41' 23.502" W	60.160385	-134.682653	White sweetclover	5m2	SKH 17-36.JPG
SKH 17-37	103	LHS	60° 9' 37.386" N	134° 40' 57.552" W	60.155598	-134.670582	**Yellow sweetclover**	3 plants	SKH 17-37.JPG
SKH 17-38	103	LHS	60° 9' 20.154" N	134° 40' 14.094" W	60.155592	-134.670647	White sweetclover	2m2	SKH 17-38.JPG
SKH 17-39	80	LHS	60° 9' 20.130" N	134° 40' 14.328" W	60.000232	-134.663575	White sweetclover	2m2 along 50m	SKH 17-39.JPG
SKH 17-41	79	LHS	60° 0' 0.834" N	134° 39' 48.870" W	59.994603	-134.667995	White sweetclover	75m2 along 200m	SKH 17-41.JPG
SKH 17-42	79	LHS	59° 59' 40.572" N	134° 40' 4.782" W	59.993575	-134.667278	White sweetclover	50m2 along 100m	SKH 17-42.JPG

Table 2. South Klondike Highway 2017 Invasive Plant Survey

Data collected in WGS 84

Site ID	Nearest Km	Side of Road	GPS Latitude	GPS Longitude	Latitude	Longitude	Species	Notes	Photo File Name
SKH 17-43	41.5	LHS	59° 59' 36.870" N	134° 40' 2.202" W	59.73869	-134.97412	**Altai lyme grass**	3m2	SKH 17-43.JPG
SKH 17-44	36	LHS	59° 44' 19.284" N	134° 58' 26.832" W	59.711918	-135.053135	**Altai lyme grass**	1m2	SKH 17-44.JPG
SKH 17-45	35.5	LHS	59° 42' 42.906" N	135° 3' 11.286" W	59.711445	-135.056683	**Altai lyme grass**	10m2	SKH 17-45.JPG
SKH 17-46	35	LHS	59° 42' 41.202" N	135° 3' 24.060" W	59.708898	-135.06216	**Altai lyme grass**	5m2	SKH 17-46.JPG
SKH 17-47	34	LHS	59° 42' 32.034" N	135° 3' 43.776" W	59.701708	-135.067903	**Altai lyme grass**	2m2	SKH 17-47.JPG
SKH 17-48	33.5	LHS	59° 42' 6.150" N	135° 4' 4.452" W	59.697405	-135.077355	**Altai lyme grass**	2 areas, each 5m2	SKH 17-48.JPG
SKH 17-49	33	LHS	59° 41' 50.658" N	135° 4' 38.478" W	59.697078	-135.081915	**Altai lyme grass**	2 areas, 5m2 and 2m2	SKH 17-49.JPG
SKH 17-50	29.5	LHS	59° 41' 49.482" N	135° 4' 54.894" W	59.669138	-135.110435	**Altai lyme grass**	3m2	SKH 17-50.JPG
SKH 17-51	28	LHS	59° 40' 8.898" N	135° 6' 37.566" W	59.668043	-135.112958	**Altai lyme grass**	5m2	SKH 17-51.JPG
SKH 17-52	28	LHS	59° 40' 4.956" N	135° 6' 46.650" W	59.666963	-135.115032	**Altai lyme grass**	5m2	SKH 17-52.JPG
SKH 17-53	28	LHS	59° 40' 1.068" N	135° 6' 54.114" W	59.65542	-135.126512	**Altai lyme grass**	8m2	SKH 17-53.JPG
SKH 17-54	27	LHS	59° 39' 19.512" N	135° 7' 35.442" W	59.644658	-135.140177	**Altai lyme grass**	2m2	SKH 17-54.JPG
SKH 17-55	26.5	LHS	59° 38' 40.770" N	135° 8' 24.636" W	59.642882	-135.143522	**Altai lyme grass**	1m2	SKH 17-55.JPG
SKH 17-56	26	LHS	59° 38' 34.374" N	135° 8' 36.678" W	59.639192	-135.150298	**Altai lyme grass**	2 areas, each 1m2	SKH 17-56.JPG
SKH 17-57	26	LHS	59° 38' 21.090" N	135° 9' 1.074" W	59.638468	-135.151757	**Altai lyme grass**	2 areas, each 2m2	SKH 17-57.JPG
SKH 17-58	25.5	LHS	59° 38' 18.486" N	135° 9' 6.324" W	59.634132	-135.16261	**Altai lyme grass**	3 areas, each 2m2	SKH 17-58.JPG
SKH 17-59	25.5	LHS	59° 38' 2.874" N	135° 9' 45.396" W	59.635642	-135.160068	**Altai lyme grass**	3m2	SKH 17-59.JPG
SKH 17-60	26	RHS	59° 38' 8.310" N	135° 9' 36.246" W	59.635642	-135.160068	**Altai lyme grass**	4m2	SKH 17-60.JPG
SKH 17-61	26	RHS	59° 38' 8.310" N	135° 9' 36.246" W	59.637755	-135.153423	**Altai lyme grass**	3 areas, 2m2, 5m2 and 10m2	SKH 17-61.JPG
SKH 17-62	26	RHS	59° 38' 15.918" N	135° 9' 12.324" W	59.64075	-135.14718	**Altai lyme grass**	4 areas, 25m2, 10m2, 10m2, 5m2	SKH 17-62.JPG
SKH 17-63	26.5	RHS	59° 38' 26.700" N	135° 8' 49.848" W	59.642662	-135.143643	**Altai lyme grass**	25m2	SKH 17-63.JPG
SKH 17-64	26.5	RHS	59° 38' 33.582" N	135° 8' 37.116" W	59.64362	-135.141857	**Altai lyme grass**	25m2	SKH 17-64.JPG
SKH 17-65	27	RHS	59° 38' 37.032" N	135° 8' 30.684" W	59.647263	-135.135627	**Altai lyme grass**	10m2	SKH 17-65.JPG
SKH 17-66	27.5	RHS	59° 38' 50.148" N	135° 8' 8.256" W	59.651212	-135.131185	**Altai lyme grass**	5m2	SKH 17-66.JPG
SKH 17-67	28	RHS	59° 39' 4.362" N	135° 7' 52.266" W	59.656605	-135.12552	**Altai lyme grass**	10m2	SKH 17-67.JPG
SKH 17-68	28.5	RHS	59° 39' 23.778" N	135° 7' 31.872" W	59.657392	-135.124997	**Altai lyme grass**	2 areas, 1m2 and 2m2	SKH 17-68.JPG
SKH 17-69	29	RHS	59° 39' 26.610" N	135° 7' 29.988" W	59.663102	-135.118678	**Altai lyme grass**	2 areas, 1m2 and 2m2	SKH 17-69.JPG
SKH 17-70	29.5	RHS	59° 39' 47.166" N	135° 7' 7.242" W	59.668767	-135.11098	**Altai lyme grass**	5m2	SKH 17-70.JPG
SKH 17-71	30	RHS	59° 40' 7.560" N	135° 6' 39.528" W	59.670463	-135.107437	**Altai lyme grass**	2m2	SKH 17-71.JPG
SKH 17-72	31	RHS	59° 40' 13.668" N	135° 6' 26.772" W	59.683803	-135.09405	**Altai lyme grass**	5m2	SKH 17-72.JPG
SKH 17-73	31.5	RHS	59° 41' 1.692" N	135° 5' 38.580" W	59.687708	-135.09505	**Altai lyme grass**	10m2	SKH 17-73.JPG
SKH 17-74	32	RHS	59° 41' 15.750" N	135° 5' 42.180" W	59.688843	-135.095387	**Altai lyme grass**	10m2	SKH 17-74.JPG
SKH 17-75	32	RHS	59° 41' 19.836" N	135° 5' 43.392" W	59.692585	-135.094502	**Altai lyme grass**	10m2	SKH 17-75.JPG
SKH 17-76	34	RHS	59° 41' 33.306" N	135° 5' 40.206" W	59.698907	-135.072643	**Altai lyme grass**	10m2	SKH 17-76.JPG
SKH 17-77	37	RHS	59° 41' 56.064" N	135° 4' 21.516" W	59.718462	-135.04341	**Altai lyme grass**	2m2	SKH 17-77.JPG
SKH 17-78	38	RHS	59° 43' 6.462" N	135° 2' 36.276" W	59.722028	-135.026867	**Altai lyme grass**	1m2	SKH 17-78.JPG
SKH 17-79	39.5	RHS	59° 43' 19.302" N	135° 1' 36.720" W	59.726127	-134.999052	**Altai lyme grass**	1m2	SKH 17-79.JPG
SKH 17-80	41	RHS	59° 43' 34.056" N	134° 59' 56.586" W	59.733535	-134.980407	**Altai lyme grass**	10m2	SKH 17-80.JPG
SKH 17-81	43	RHS	59° 44' 0.726" N	134° 58' 49.464" W	59.749988	-134.967517	**Altai lyme grass**	5m2	SKH 17-81.JPG
SKH 17-82	45	RHS	59° 44' 59.958" N	134° 58' 3.060" W	59.764038	-134.946345	**Altai lyme grass**	2m2	SKH 17-82.JPG
SKH 17-83	46	RHS	59° 45' 50.538" N	134° 56' 46.842" W	59.770092	-134.927083	**Oxeye daisy**	5 plants	SKH 17-83.JPG
SKH 17-84	45.5	RHS	59° 46' 12.330" N	134° 55' 37.500" W	59.76659	-134.940368		old herbicide sign (writing is gone)	SKH 17-84.JPG

Table 2. South Klondike Highway 2017 Invasive Plant Survey

Data collected in WGS 84

Site ID	Nearest Km	Side of Road	GPS Latitude	GPS Longitude	Latitude	Longitude	Species	Notes	Photo File Name
SKH 17-85	47.4	RHS	59° 45' 59.724" N	134° 56' 25.326" W	59.776957	-134.917255	**Altai lyme grass**	2m2	SKH 17-85.JPG
SKH 17-86	49.5	RHS	59° 46' 37.044" N	134° 55' 2.118" W	59.794417	-134.9129	**Altai lyme grass**	10m2	SKH 17-86.JPG
SKH 17-87	49.5	RHS	59° 47' 39.900" N	134° 54' 46.440" W	59.796153	-134.912008	White sweetclover	1 plant	SKH 17-87.JPG
SKH 17-88	50	RHS	59° 47' 46.152" N	134° 54' 43.230" W	59.797052	-134.91087	White sweetclover	1 plant	SKH 17-88.JPG
SKH 17-89	53	RHS	59° 47' 49.386" N	134° 54' 39.132" W	59.79709	-134.851693	**Altai lyme grass**	2m2	SKH 17-89.JPG
SKH 17-90	66.5	RHS	59° 47' 49.524" N	134° 51' 6.096" W	59.906488	-134.794387	**Altai lyme grass**	10m2	SKH 17-90.JPG
SKH 17-91	72.5	RHS	59° 54' 23.358" N	134° 47' 39.792" W	59.946925	-134.731648	**Altai lyme grass**	20m2	SKH 17-91.JPG
SKH 17-92	79.5	RHS	59° 56' 48.930" N	134° 43' 53.934" W	59.995447	-134.667587	**Oxeye daisy**	20 plants in 10m2 area	SKH 17-92.JPG
SKH 17-93	87.5	RHS	59° 59' 43.608" N	134° 40' 3.312" W	60.050533	-134.590598	**Altai lyme grass**	3m2	SKH 17-93.JPG
SKH 17-94	88	RHS	60° 3' 1.920" N	134° 35' 26.154" W	60.053747	-134.583752	White sweetclover	1m2 along 20m	SKH 17-94.JPG
SKH 17-95	101	RHS	60° 3' 13.488" N	134° 35' 1.506" W	60.133338	-134.613048	White sweetclover	5m2	SKH 17-95.JPG
SKH 17-96	104	RHS	60° 8' 0.018" N	134° 36' 46.974" W	60.158855	-134.678603	White sweetclover	1m2 along 20m	SKH 17-96.JPG
SKH 17-97	105.5	RHS	60° 8' 0.018" N	134° 36' 46.974" W	60.158855	-134.678603	**Altai lyme grass**	0.5m2	no photo
SKH 17-98	105.5	RHS	60° 9' 31.878" N	134° 40' 42.972" W	60.167723	-134.702332	White sweetclover	5m2 along 25m	SKH 17-98.JPG
SKH 17-99a	105.5	RHS	60° 10' 3.804" N	134° 42' 8.394" W	60.169173	-134.704088	**Altai lyme grass**	15m2	SKH 17-99.JPG
SKH 17-99b	105.5	RHS	60° 10' 3.804" N	134° 42' 8.394" W	60.169173	-134.704088	White sweetclover	4 plants	SKH 17-99.JPG
SKH 17-99c	105.5	RHS	60° 10' 3.804" N	134° 42' 8.394" W	60.169173	-134.704088	**Perennial sowthistle**	5m2	SKH 17-99.JPG
SKH 17-99d	105.5	RHS	60° 10' 3.804" N	134° 42' 8.394" W	60.169173	-134.704088	**Yellow clematis**	50 m2 along 100 long section	SKH 17-99.JPG
SKH 17-100a	106	RHS	60° 10' 9.024" N	134° 42' 14.718" W	60.171823	-134.705055	**White sweetclover**	1m2	SKH 17-100.JPG
SKH 17-100b	106	RHS	60° 10' 9.024" N	134° 42' 14.718" W	60.171823	-134.705055	**Yellow clematis**	end of 100m long section	SKH 17-100.JPG
Annie Lk Rd 17-01	1	RHS	60° 10' 18.564" N	134° 42' 18.198" W	60.444577	-134.864155	White sweetclover	1 plant	Annie Lk Rd 17-01.JPG
Annie Lk Rd 17-02	3	RHS	60° 26' 40.476" N	134° 51' 50.958" W	60.43665	-134.89169	White sweetclover	20m2	Annie Lk Rd 17-02.JPG
Annie Lk Rd 17-03	1	LHS	60° 26' 11.940" N	134° 53' 30.084" W	60.446397	-134.859447	White sweetclover	1 plant	Annie Lk Rd 17-03.JPG
Robinson Rd 17-01	0.5	RHS	60° 28' 33.600" N	134° 51' 23.190" W	60.476	-134.856442	White sweetclover	1 plant	Robinson Rd 17-01.JPG
Robinson Rd 17-02	0.5	RHS	60° 28' 34.440" N	134° 51' 11.286" W	60.476233	-134.853135	White sweetclover	12 plants	Robinson Rd 17-02.JPG
Robinson Rd 17-03	1	LHS	60° 28' 38.040" N	134° 50' 40.326" W	60.477233	-134.844535	White sweetclover	30m2	Robinson Rd 17-03.JPG
Robinson Rd 17-04	1	LHS	60° 28' 37.758" N	134° 50' 49.530" W	60.477155	-134.847092	White sweetclover	5m2	Robinson Rd 17-04.JPG
Robinson Rd 17-05a	0.5	LHS	60° 28' 35.574" N	134° 51' 7.764" W	60.476548	-134.852157	White sweetclover	250m2	Robinson Rd 17-05a.JPG
Robinson Rd 17-05b	0.5	LHS	60° 28' 34.050" N	134° 51' 23.076" W	60.476125	-134.85641	White sweetclover	end of 17-5a section	Robinson Rd 17-05b.JPG
Robinson Rd 17-06	0	LHS	60° 28' 33.474" N	134° 51' 27.486" W	60.475965	-134.857635	White sweetclover	30m2	Robinson Rd 17-06.JPG
Robinson Rd 17-07	0	LHS	60° 28' 33.768" N	134° 51' 40.722" W	60.476047	-134.861312	White sweetclover	12 plants	Robinson Rd 17-07.JPG

Table 3. Tagish Road 2017 Invasive Plant Survey

Data collected in WGS 84

Site ID	Nearest Km	Side of Road	GPS Latitude	GPS Longitude	Latitude	Longitude	Species	Notes	Photo File Name
Tagish Rd 17-01	0	LHS	60° 20' 19.770" N	133° 59' 3.852" W	60.338825	-133.984403	White sweetclover	~10m2 along 100m	Tagish Rd 17-01.JPG
Tagish Rd 17-02	0	RHS	60° 20' 13.674" N	133° 59' 9.198" W	60.337132	-133.985888	White sweetclover	100m2 along 500m	Tagish Rd 17-02.JPG
Tagish Rd 17-03	0.5	RHS	60° 20' 9.900" N	133° 59' 20.046" W	60.336083	-133.988902	White sweetclover	3 plants	Tagish Rd 17-03.JPG
Tagish Rd 17-04	1	LHS	60° 20' 8.070" N	133° 59' 24.534" W	60.335575	-133.990148	White sweetclover	1 plant	Tagish Rd 17-04.JPG
Tagish Rd 17-05	2	RHS	60° 19' 41.832" N	134° 0' 21.168" W	60.328287	-134.00588	White sweetclover	100m2 along 200m	Tagish Rd 17-05.JPG
Tagish Rd 17-06	9.5	RHS	60° 19' 14.286" N	134° 5' 53.280" W	60.320635	-134.098133	White sweetclover	2 m2 along 15m	Tagish Rd 17-06.JPG
Tagish Rd 17-07	11.5	RHS	60° 18' 29.982" N	134° 6' 53.034" W	60.308328	-134.114732	White sweetclover	3 plants	Tagish Rd 17-07.JPG
Tagish Rd 17-08	13	RHS	60° 18' 43.164" N	134° 8' 50.376" W	60.31199	-134.147327	White sweetclover	20m2 along 100m	Tagish Rd 17-08.JPG
Tagish Rd 17-09	14.5	RHS	60° 19' 9.066" N	134° 10' 23.382" W	60.319185	-134.173162	White sweetclover	2m2 along 30m	Tagish Rd 17-09.JPG
Tagish Rd 17-10	15	RHS	60° 19' 24.600" N	134° 10' 42.246" W	60.3235	-134.178402	White sweetclover	1m2 along 100m	Tagish Rd 17-10.JPG
Tagish Rd 17-11	16	RHS	60° 19' 39.564" N	134° 11' 35.436" W	60.327657	-134.193177	White sweetclover	50m2 along 200m	Tagish Rd 17-11.JPG
Tagish Rd 17-12	16.5	RHS	60° 19' 46.326" N	134° 12' 1.236" W	60.329535	-134.200343	White sweetclover	10m2 of small plants	Tagish Rd 17-12.JPG
Tagish Rd 17-13	17	RHS	60° 19' 45.126" N	134° 12' 24.588" W	60.329202	-134.20683	White sweetclover	100m2 along 200m	Tagish Rd 17-13.JPG
Tagish Rd 17-14		RHS					White sweetclover	end of 17-13	no photo
Tagish Rd 17-15	19.5	RHS	60° 19' 15.060" N	134° 14' 28.050" W	60.32085	-134.241125	**Perennial sowthistle**	50 m2 in an area 100m2	Tagish Rd 17-15.JPG
Tagish Rd 17-16	20.5	RHS	60° 19' 3.402" N	134° 15' 18.468" W	60.317612	-134.25513	White sweetclover	2 plants	Tagish Rd 17-16.JPG
Tagish Rd 17-17	21	RHS	60° 18' 59.838" N	134° 15' 42.714" W	60.316622	-134.261865	White sweetclover	0.5m2 in steep ditch	Tagish Rd 17-17.JPG
Tagish Rd 17-18	21	RHS	60° 18' 59.310" N	134° 15' 47.982" W	60.316475	-134.263328	White sweetclover	0.5m2 along river's edge	Tagish Rd 17-18.JPG
Tagish Rd 17-19	28	RHS	60° 16' 35.832" N	134° 18' 54.252" W	60.27662	-134.31507	**Altai lyme grass**	20 plnats	Tagish Rd 17-19.JPG
Tagish Rd 17-20	53	RHS	60° 10' 59.688" N	134° 41' 11.076" W	60.183247	-134.68641	**Yellow sweetclover**	small plants in 10m2	Tagish Rd 17-20.JPG
Tagish Rd 17-21	54	RHS	60° 10' 40.422" N	134° 41' 43.794" W	60.177895	-134.695498	White sweetclover	1 plant	Tagish Rd 17-21.JPG
Tagish Rd 17-22	54.5	RHS	60° 10' 29.436" N	134° 42' 17.592" W	60.174843	-134.704887	White sweetclover	2m2 at corner with SKH	Tagish Rd 17-22.JPG
Tagish Rd 17-23	54	LHS	60° 10' 32.712" N	134° 42' 0.324" W	60.175753	-134.70009	White sweetclover	10m2 of small plants	Tagish Road 17-23.JPG
Tagish Rd 17-24	53	LHS	60° 10' 48.576" N	134° 41' 27.198" W	60.18016	-134.690888	**Yellow sweetclover**	2m2	Tagish Road 17-24.JPG
Tagish Rd 17-25	53	LHS	60° 10' 48.354" N	134° 41' 27.960" W	60.180098	-134.685544	**Yellow clematis**	2m2	Tagish Road 17-25.JPG
Tagish Rd 17-26	52.5	LHS	60° 11' 6.426" N	134° 40' 55.944" W	60.185118	-134.682207	White sweetclover	10m2	Tagish Road 17-26.JPG
Tagish Rd 17-27	52	LHS	60° 11' 25.608" N	134° 40' 27.204" W	60.190447	-134.674223	White sweetclover	1 plant	Tagish Road 17-27.JPG
Tagish Rd 17-28	35.5	LHS	60° 15' 53.526" N	134° 26' 12.006" W	60.264868	-134.436668	White sweetclover	1.5m2	Tagish Road 17-28.JPG
Tagish Rd 17-29	32	LHS	60° 16' 38.712" N	134° 23' 16.380" W	60.27742	-134.387883	White sweetclover	1 plant	Tagish Road 17-29.JPG
Tagish Rd 17-30	28	LHS	60° 16' 36.558" N	134° 19' 3.888" W	60.276822	-134.317747	White sweetclover	0.5m2	Tagish Road 17-30.JPG
Tagish Rd 17-31	26	LHS	60° 16' 56.922" N	134° 17' 15.522" W	60.282478	-134.287645	White sweetclover	10m2 at corner with Reid Rd	Tagish Road 17-31.JPG
Tagish Rd 17-32	22	LHS	60° 18' 53.946" N	134° 16' 17.496" W	60.314985	-134.271527	White sweetclover	1 plant	Tagish Rd 17-32.JPG
Tagish Rd 17-33	22	RHS	60° 18' 53.904" N	134° 16' 17.550" W	60.314973	-134.271542	White sweetclover	1 plant	Tagish Rd 17-33.JPG
Tagish Rd 17-34	25.5	RHS	60° 16' 59.484" N	134° 16' 18.030" W	60.28319	-134.271675	White sweetclover	1 plant	Tagish Rd 17-34.JPG
Tagish Rd 17-35	21	LHS	60° 18' 59.088" N	134° 15' 42.348" W	60.316413	-134.261763	**Yellow sweetclover**	10m2	Tagish Rd 17-35.JPG
Tagish Rd 17-36	21.5	LHS	60° 19' 2.784" N	134° 15' 16.722" W	60.31744	-134.254645	White sweetclover	50m2 along 75m	Tagish Rd 17-36.JPG
Tagish Rd 17-37	20	LHS	60° 19' 11.292" N	134° 14' 39.444" W	60.319803	-134.24429	White sweetclover	2m2	Tagish Rd 17-37.JPG
Tagish Rd 17-38	18	LHS	60° 19' 46.362" N	134° 13' 26.442" W	60.329545	-134.224012	White sweetclover	1m2	Tagish Rd 17-38.JPG
Tagish Rd 17-39	17.5	LHS	60° 19' 47.466" N	134° 12' 54.918" W	60.329852	-134.215255	White sweetclover	15m2	Tagish Rd 17-39.JPG

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Data collected in WGS 84

Site ID	Nearest Km	Side of Road	GPS Latitude	GPS Longitude	Latitude	Longitude	Species	Notes	Photo File Name
Tagish Rd 17-40	17	LHS	60° 19' 45.966" N	134° 12' 15.024" W	60.329435	-134.204173	White sweetclover	200m2 along 500m	Tagish Rd 17-40.JPG
Tagish Rd 17-41		LHS					White sweetclover	end of section 17-40	
Tagish Rd 17-42	16	LHS	60° 19' 39.858" N	134° 11' 39.030" W	60.327738	-134.194175	White sweetclover	50m2 along 100m	Tagish Rd 17-42.JPG
Tagish Rd 17-43	13	LHS	60° 18' 47.814" N	134° 9' 5.142" W	60.313282	-134.151428	White sweetclover	5m2	Tagish Rd 17-43.JPG
Tagish Rd 17-44	13	LHS	60° 18' 44.310" N	134° 8' 55.836" W	60.312308	-134.148843	White sweetclover	5m2	Tagish Rd 17-44.JPG
Tagish Rd 17-45	12	LHS	60° 18' 26.394" N	134° 7' 24.258" W	60.307332	-134.123405	White sweetclover	2m2	Tagish Rd 17-45.JPG
Tagish Rd 17-46	11.5	LHS	60° 18' 27.08942" N	134° 7' 1.62765" W	60.30829	-134.11706	White sweetclover	5m2	no photo
Tagish Rd 17-47	11.5	LHS	60° 18' 34.24766" N	134° 6' 23.78144" W	60.30979	-134.10853	White sweetclover	75m2 at corner w/ Secret V Rd	no photo
Tagish Rd 17-48	11	LHS	60° 18' 39.264" N	134° 6' 27.204" W	60.310907	-134.107557	White sweetclover	25m2	Tagish Rd 17-48.JPG
Tagish Rd 17-49	9.5	LHS	60° 19' 10.578" N	134° 5' 54.852" W	60.319605	-134.09857	White sweetclover	0.5m2	Tagish Rd 17-49.JPG
Tagish Rd 17-50	8	LHS	60° 19' 51.762" N	134° 5' 35.094" W	60.331045	-134.093082	White sweetclover	5m2 along 50m	Tagish Rd 17-50.JPG
Tagish Rd 17-51	5.5	LHS	60° 19' 52.998" N	134° 3' 18.480" W	60.331388	-134.055133	**Perennial sowthistle**	5m2	Tagish Rd 17-51.JPG
HPW TMB	53.5	RHS	60° 10' 46.956" N	134° 41' 43.740" W	60.1797	-134.695483	White sweetclover	30 m2	Maint station.JPG
Tagish Rd 17-52	53	LHS	60° 11' 0.22487" N	134° 41' 11.80610" W	60.18367	-134.68554	White sweetclover	10 m2	no photo
Tagish Rd 17-53	41.5	RHS	60° 14' 27.336" N	134° 31' 24.288" W	60.240927	-134.523413	**Perennial sowthistle**	15 plants, mostly small plants; 4 flowering	no photo
10 Mile Rd 17-01	0.2	LHS	60° 15' 46.314" N	134° 26' 8.790" W	60.262865	-134.435775	White sweetclover	1m2	10 Mile Rd 17-01.JPG
Reid Rd 17-01	0	RHS	60° 16' 51.408" N	134° 17' 19.260" W	60.280947	-134.288683	White sweetclover	1m2 at cenetary parking lot	Reid Rd 17-01.JPG
Reid Rd 17-02	2	LHS	60° 15' 54.132" N	134° 18' 4.110" W	60.265037	-134.301142	White sweetclover	20m2 at firehall lot	Reid Rd 17-02.JPG
Taku Blvd 17-01	0	RHS	60° 15' 54.030" N	134° 18' 15.024" W	60.265008	-134.304173	White sweetclover	0.5m2	Taku Blvd 17-01.JPG
Taku Blvd 17-02	1	RHS	60° 14' 58.032" N	134° 19' 6.114" W	60.249453	-134.318365	White sweetclover	5m2	Taku Blvd 17-02.JPG
Taku Blvd 17-03	1.5	RHS	60° 14' 22.614" N	134° 19' 5.142" W	60.239615	-134.318095	White sweetclover	10m2 along 50m	Taku Blvd 17-03.JPG
Taku Blvd 17-04	2	LHS	60° 13' 49.794" N	134° 19' 22.506" W	60.230498	-134.322918	**Oxeye daisy**	1m2 at driveway	Taku Blvd 17-04.JPG

Table 4. Atlin Road 2017 Invasive Plant Survey

Data collected in WGS 84

Site ID	Nearest Km	Side of Road	GPS Latitude	GPS Longitude	Latitude	Longitude	Species	Notes	Photo File Name
Atlin Rd 17-01a	0.5	RHS	60° 19' 33.432" N	134° 0' 6.672" W	60.325953	-134.001853	White sweetclover	30 m2 spread out along 50 m	Atlin Rd 17-01a.JPG
Atlin Rd 17-01b	0.5	RHS	60° 19' 33.432" N	134° 0' 6.672" W	60.325953	-134.001853	White sweetclover	same as site 17-01a	Atlin Rd 17-01b.JPG
Atlin Rd 17-02	1.5	RHS	60° 19' 0.816" N	134° 0' 7.476" W	60.316893	-134.002077	White sweetclover	1 m2 spread out along10 m	Atlin Rd 17-02.JPG
Atlin Rd 17-03a	3	RHS	60° 18' 14.526" N	133° 59' 58.596" W	60.304035	-133.99961	**Oxeye daisy**	100m2 spread over 50 m in 2 main locations	Atlin Rd 17-03a.JPG
Atlin Rd 17-3b	3	RHS	60° 18' 14.526" N	133° 59' 58.596" W	60.304035	-133.99961	**Oxeye daisy**	same as site 17-03a	Atlin Rd 17-3b.JPG
Atlin Rd 17-04	4	RHS	60° 17' 49.476" N	133° 59' 6.588" W	60.297077	-133.985163	White sweetclover	1 m2 spread out along10 m	Atlin Rd 17-04.JPG
Atlin Rd 17-05	4	RHS	60° 17' 45.954" N	133° 58' 49.434" W	60.296098	-133.980398	White sweetclover	1 m2	Atlin Rd 17-05.JPG
Atlin Rd 17-06	8.5	RHS	60° 15' 53.340" N	133° 56' 19.710" W	60.264817	-133.938808	White sweetclover	1 plant	Atlin Rd 17-06.JPG
Atlin Rd 17-07	19.5	RHS	60° 15' 24.834" N	133° 55' 55.014" W	60.256898	-133.931948	White sweetclover	2 plants	Atlin Rd 17-07.JPG
Atlin Rd 17-08	10	RHS	60° 15' 8.394" N	133° 55' 42.612" W	60.252332	-133.928503	White sweetclover	7 plants	Atlin Rd 17-08.JPG
Atlin Rd 17-09	10	RHS	60° 15' 5.442" N	133° 55' 39.606" W	60.251512	-133.927668	White sweetclover	3 plants	Atlin Rd 17-09.JPG
Atlin Rd 17-10	10.5	RHS	60° 14' 56.490" N	133° 55' 23.418" W	60.249025	-133.923172	**Tufted (bird) vetch**	5 m2 along driveway	Atlin Rd 17-10.JPG
Atlin Rd 17-11	10.5	RHS	60° 14' 55.758" N	133° 55' 21.318" W	60.248822	-133.922588	**Scentless chamomile**	near driveway, ~1m2 over area of 10m2. Area includes shasta daisies	Atlin Rd 17-11.JPG
Atlin Rd 17-12	11	RHS	60° 14' 47.904" N	133° 55' 5.766" W	60.24664	-133.918268	White sweetclover	1 m2	Atlin Rd 17-12.JPG
Atlin Rd 17-13	11.5	RHS	60° 14' 24.024" N	133° 54' 28.140" W	60.240007	-133.907817	White sweetclover	1 plant	Atlin Rd 17-13.JPG
Atlin Rd 17-14	12.5	RHS	60° 14' 7.764" N	133° 54' 7.356" W	60.23549	-133.902043	**Spotted knapweed**	11 plants; several additional smaller leave rosettes	Atlin Rd 17-14.JPG
Atlin Rd 17-15	15.5	RHS	60° 12' 34.704" N	133° 52' 47.736" W	60.20964	-133.879927	White sweetclover	1 plant	Atlin Rd 17-15.JPG
Atlin Rd 17-16	16	LHS	60° 12' 29.406" N	133° 52' 30.144" W	60.208168	-133.87504	White sweetclover	4 plants	Atlin Rd 17-16.JPG
Atlin Rd 17-17	17	RHS	60° 11' 58.062" N	133° 52' 9.306" W	60.199462	-133.869252	White sweetclover	1 m2 spread out along 20m	Atlin Rd 17-17.JPG
Atlin Rd 17-18	18	RHS	60° 11' 38.478" N	133° 52' 38.742" W	60.194022	-133.877428	White sweetclover	1 plant	Atlin Rd 17-18.JPG
Atlin Rd 17-19	18.5	RHS	60° 11' 16.974" N	133° 52' 36.402" W	60.188048	-133.876778	White sweetclover	5 m2 spread out along 50 m	Atlin Rd 17-19.JPG
Atlin Rd 17-20	18.5	RHS	60° 11' 16.974" N	133° 52' 36.402" W	60.188048	-133.876778	White sweetclover	10 m2	Atlin Rd 17-20.JPG
Atlin Rd 17-21	19	RHS	60° 11' 3.000" N	133° 52' 30.228" W	60.184167	-133.875063	White sweetclover	6 plants at a driveway	Atlin Rd 17-21.JPG
Atlin Rd 17-22	20	RHS	60° 10' 36.036" N	133° 52' 12.684" W	60.176677	-133.87019	White sweetclover	2 m2	Atlin Rd 17-22.JPG
Atlin Rd 17-23	20	RHS	60° 10' 36.852" N	133° 52' 14.352" W	60.176903	-133.870653	**Oxeye daisy**	1 plant	Atlin Rd 17-23.JPG
Atlin Rd 17-24	20.5	RHS	60° 10' 31.176" N	133° 51' 36.132" W	60.175327	-133.860037	White sweetclover	2 m2	Atlin Rd 17-24.JPG
Atlin Rd 17-25	21	RHS	60° 10' 17.592" N	133° 51' 21.882" W	60.171553	-133.856078	White sweetclover	4 m2 along the edge of a pull-off	Atlin Rd 17-25.JPG
Atlin Rd 17-26	22.5	RHS	60° 9' 48.948" N	133° 50' 53.358" W	60.163597	-133.848155	White sweetclover	~10m2 spread out over 100 m2 at an old pit	Atlin Rd 17-26.JPG
Atlin Rd 17-27	23.5	LHS	60° 9' 14.430" N	133° 50' 11.436" W	60.154008	-133.83651	White sweetclover	2 plants	Atlin Rd 17-27.JPG
Atlin Rd 17-28	24	LHS	60° 8' 57.576" N	133° 49' 56.238" W	60.149327	-133.832288	White sweetclover	1 plant	Atlin Rd 17-28.JPG
Atlin Rd 17-29	27	LHS	60° 7' 17.616" N	133° 49' 14.754" W	60.12156	-133.820765	White sweetclover	1 plant	Atlin Rd 17-29.JPG
Atlin Rd 17-30	28.5	LHS	60° 6' 4.572" N	133° 48' 58.992" W	60.10127	-133.816387	White sweetclover	1 plant	Atlin Rd 17-30.JPG
Atlin Rd 17-31	24	LHS	60° 8' 55.356" N	133° 49' 52.842" W	60.14871	-133.831345	White sweetclover	1 m2	Atlin Rd 17-31.JPG
Atlin Rd 17-32	23	LHS	60° 9' 43.680" N	133° 50' 42.972" W	60.162133	-133.84527	White sweetclover	1 plant	Atlin Rd 17-32.JPG
Atlin Rd 17-33	22.5	LHS	60° 9' 49.998" N	133° 50' 53.496" W	60.163888	-133.848193	White sweetclover	1 pant	Atlin Rd 17-33.JPG
Atlin Rd 17-34	22	LHS	60° 9' 53.712" N	133° 50' 58.728" W	60.16492	-133.849647	White sweetclover	1 plant	Atlin Rd 17-34.JPG
Atlin Rd 17-35	22	LHS	60° 9' 56.682" N	133° 51' 1.656" W	60.165745	-133.85046	White sweetclover	1 plant	Atlin Rd 17-35.JPG
Atlin Rd 17-36	21.5	LHS	60° 10' 3.762" N	133° 51' 8.748" W	60.167712	-133.85243	White sweetclover	1 plant	Atlin Rd 17-36.JPG
Atlin Rd 17-37	20.5	LHS	60° 10' 28.194" N	133° 51' 31.170" W	60.174498	-133.858658	White sweetclover	1 plant	Atlin Rd 17-37.JPG
Atlin Rd 17-38	19.5	LHS	60° 10' 50.202" N	133° 52' 30.162" W	60.180612	-133.875045	**Yellow lucerne**	1 plant	Atlin Rd 17-38.JPG
Atlin Rd 17-39	19	LHS	60° 10' 54.864" N	133° 52' 31.284" W	60.181907	-133.875357	White sweetclover	1 plant	Atlin Rd 17-39.JPG
Atlin Rd 17-40	18	LHS	60° 11' 26.346" N	133° 52' 40.500" W	60.190652	-133.877917	White sweetclover	5 plants	Atlin Rd 17-40.JPG
Atlin Rd 17-41	16.5	LHS	60° 12' 22.674" N	133° 52' 10.710" W	60.206298	-133.869642	White sweetclover	4 m2 spread out along 20m	Atlin Rd 17-41.JPG
Atlin Rd 17-42	13	LHS	60° 13' 57.792" N	133° 53' 56.436" W	60.23272	-133.89901	White sweetclover	1 m2 behind guiderail at bridge	Atlin Rd 17-42.JPG
Atlin Rd 17-43	10	LHS	60° 15' 1.974" N	133° 55' 33.012" W	60.250548	-133.925837	White sweetclover	3 m2	Atlin Rd 17-43.JPG

Table 4. Atlin Road 2017 Invasive Plant Survey

Data collected in WGS 84

Site ID	Nearest Km	Side of Road	GPS Latitude	GPS Longitude	Latitude	Longitude	Species	Notes	Photo File Name
Atlin Rd 17-44	7	LHS	60° 16' 41.394" N	133° 57' 9.534" W	60.278165	-133.952648	White sweetclover	1 plant	Atlin Rd 17-44.JPG
Atlin Rd 17-45	7	LHS	60° 16' 48.048" N	133° 57' 14.820" W	60.280013	-133.954117	White sweetclover	40 m2 spread out over 100 m2 at old alignment	Atlin Rd 17-45.JPG
Atlin Rd 17-46	0.5	LHS	60° 19' 33.888" N	134° 0' 5.472" W	60.32608	-134.00152	White sweetclover	1 m2	Atlin Rd 17-46.JPG
Atlin Rd 17-47	10	RHS	60° 15' 1.458" N	133° 55' 31.434" W	60.250405	-133.925398	White sweetclover	10 m2	Atlin Rd 17-47.JPG