NON-NATIVE PLANT SPECIES INVENTORY of SOUTHCENTRAL ALASKA: CHUGACH NATIONAL FOREST

SUMMARY OF 2007 SURVEY FINDINGS

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Final Report for
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1. Introduction

The USDA Forest Service is dedicated to gaining a better understanding of the number, identity and biology of non-native plants in Alaska and how these species may be impacting intact plant communities and timber-producing areas. To address these concerns, the Forest Health Protection State and Private Forestry and the USDA Forest Service initiated a contract to survey and identify non-native plant species infesting the road systems of the Kenai Peninsula and Cordova within the Chugach National Forest. From July 11th through August 7th of 2007 botanists from Turnstone Environmental Consultants, Inc. surveyed an estimated 258 miles of state, local, and Forest Service roads on main road systems throughout the region. This report summarizes the initial findings from our field season of research and data collection.

Alaska is in a unique position to prevent large scale infestations of non-native species as parts of the state are in the first stages of experience with non-native plant species (Borchett, 2004). While its remote location and the lack of terrestrial connectivity of many regions have enabled many types of habitats to remain free of non native infestations, Alaska is now entering a phase of both increased introductions and establishment of non native species (Carlson and Shephard, 2007). The importance of early detection and control cannot be overstated in the early phases of establishment.

The native plant communities of southcentral Alaska in general are vulnerable to aggressive competition from invasive, non-native species. The unique ecosystems have a fragile balance with climatic conditions that can potentially be disrupted by an invader. While the state has historically been free of infestations, the popularity of tourism on the Kenai Peninsula in particular has brought recreational vehicles from all over the world. As people travel long distances to reach Alaska, they bring along hitchhikers from their past traverses. The highways bisecting the peninsula provide open pathways in which non-native species can travel and colonize new areas. Additionally, urban places like the cities of Anchorage, Girdwood, and Seward attract horticulturists who often unknowingly introduce threatening species to the island ecosystem. The Kenai Peninsula is also located a relatively short driving distance from the Matunuska Valley, which is the major agricultural region of the state. Agricultural regions have long been harbingers of non native weed introductions, as imported seed and other farming supplies often contain contaminants. Many tourists reaching Alaska by the Alaska Highway visit the Matunuska Valley before spending time on the Kenai.

The goal of the project is to assess the extent of non-native plant populations on the Chugach National Forest road systems. As other past survey efforts have focused on other parts of the Chugach including the Kenai trail system (DeVelice, 2003) and the western part of the peninsula (Chumley and Klausner, 2005), this inventory concentrated on the eastern and central Kenai Peninsula and Cordova to identify areas of particular concern. The data collected for this project is intended to help guide future management and control efforts.

Specifically, the project involved the following data collection and deliverables:

- AKEPIC Inventory Field Data Sheets were completed for each point surveyed along the roads, regardless of whether invasive species were found.
- Maps provided by the Forest Service are submitted showing the locations of all high priority species/areas of interest.
- A summary report giving a synopsis of the contract work and findings.
- Data entry into the AKEPIC database for future tracking and management.
- Digital photos of High Priority populations
- Two voucher specimens of each species located were collected, pressed, dried, and labeled and will be submitted to the appropriate herbarium for use as a teaching collection.

Photo 1. Muskeg roadside ecosystem in Girdwood, Alaska is a fragile environment that could be threatened by invasion of non native species.

2. Methods

Field data on non-native plants was collected on road right-of-ways on state and local lands and Forest Service controlled road rights-of-way on private land. An estimated 290 miles of road right-of-way were inspected for survey suitability, with 258 miles thoroughly surveyed using the AKEPIC protocol. The discrepancy in mileage likely comes from a combination of map inaccuracy and inaccessible road systems, and road ownership discrepancy. Forest Service roads slated for survey were designated as maintenance levels 3 and 4 (suitable for passenger car and moderate degree of user comfort). The reasoning for surveying the more major road systems was to capture areas of heavier use, and therefore more susceptible to invasion by non-native species.

Table 1. Road miles slated for survey at each location involved in the study.

Road System	Local/ State	USFS	Total
Girdwood/ Kenai Peninsula	173	43	216
Cordova	49	25	74
Total miles			***290***

Surveyors walked an area every ¼ mile along the roads. At each survey point the botanists surveyed both sides of the road for 25 meters each direction, recording all non-native plant species encountered. We also surveyed the area around each road intersection, Recreation Site, pull-out, rock pit, and parking area as specified by the contract. Occasionally survey points were spaced slightly more or less then the required ¼ mile interval. Some roadsides, particularly the Seward and Sterling Highways, did not offer safe locations to park and we parked at the nearest possible location. We did not cross the highway on foot due to high traffic volumes and speeds on the main highways, and often there was only room to park on one side of the highway. On these occasions, we noted the area surveyed and other parking limitations on the data forms. At other times we altered the survey point slightly to include a nearby visible area of higher disturbance and therefore higher likelihood of the presence of non-native species. A few additional times we did not survey a point due to extraordinary conditions. Private property or areas difficult to deduce jurisdiction such as backyards bordering right-of-ways were not systematically searched, but presence of high priority species and other exotic plants was noted when observed from a distance. It is also worth noting that we did not make special stops for private driveways when in urban environs in the interest of time and efficiency.

Non-native species were assigned to one of three categories by the agencies prior to survey work. Class One species are those which are known or potential invasives, Class Two species are very common throughout Alaska, and High Priority Species are those species singled out for extra effort and concern. When a Class One invasive species was found, we noted its extent on the data form. When high priority species were encountered, the site was flagged with white flagging and location data recorded.

Flagging was labeled with species name, surveyor's initials, and date. When Class Two invasive species were encountered, presence was recorded but the extent of the populations was not noted, as these species are ubiquitous throughout Alaska.

Table 2. Designated High Priority Species for the Chugach National Forest

Scientific Name	Common Name	Exclusions
Centaurea biebersteinii DC	spotted knapweed	-
Phalaris arundinacea L.	reed canary grass	from Cordova to the Eyak River; Alyeska Highway (Girdwood)
Hieracium aurantiacum L. & H. caespitosum Dumort.	orange hawkweed & meadow hawkweed	Alyeska Highway (Girdwood)
Cirsium arvense (L.) Scop.	Canada thistle	-
Vicia cracca L.	bird vetch	Alyeska Highway (Girdwood)
Medicago sativa ssp. falcata (L.) Arcang.	yellow alfalfa	Exit Glacier Highway
Senecio jacobaea L.	ragwort	-
Sonchus arvensis L. ssp. *uliginosus* (Bieb.) Nyman	perennial sowthistle	-
Hieracium umbellatum L.	narrow-leaved hawkweed	-

Field surveys were conducted using protocols developed by the Alaska Exotic Plants Mapping Program (see http://aknhp.uaa.alaska.edu/). Data forms were also developed by AKEPIC and are consistent with their data dictionary and recording methods. Data recorded in the surveys includes presence or absence of non-native plants, specific location, type of disturbance, lists of exotic plants at each locality, canopy cover, and area of infestation. More than 1000 points were taken throughout our survey work. At each site, area surveyed ranged from 0.1 acre to 4 acres. Most sites were considered 0.1 acre, which was a pre-determined standard number for a roadside survey point 50 m long and 8 m wide (not including the roadway itself). Area of infestation for each species identified the acreage within the survey point containing individuals of that species. Canopy cover was estimated as the percentage of cover occupied by the species within its area of infestation. For Class One and high priority species, we also recorded stem counts of the population and noted its extent in the comments.

We utilized and researched lists generated by various agencies to guide our survey efforts. Lists were developed by the USFS to highlight species with a high likelihood of occurrence on the island, and we researched these species prior to the commencement of field work to ensure accurate observations. Lists used include:

- "State of Alaska Prohibited and Restricted Noxious Weeds", Alaska Department of Natural Resources
- "Class 1 Known and Potential Invasive Plants of Concern",
- "Class 2 Widespread Lower-Priority Invasive Plants"
- "USDA Forest Service, Alaska Region Sensitive Plant List"

- High Priority Noxious Weed Species (provided under RFQ #AG-0109-S-07_0007

Field survey work was performed from July 11-August 7, 2007. Data was collected using a standard form along roadsides and other disturbed areas. Utilizing two field crews, the field surveys began on the Kenai Peninsula in the north on the Alyeska Highway by Girdwood, and continued down the peninsula to Seward. The crews then traveled to Cordova via the Alaska Marine Highway at Whittier and continued their survey efforts into August.

More than 100 voucher specimens were collected. Collections were made of all non-native species encountered during our surveys, with a few exceptions due to phenological reasons or contract specifications. Specimens will become part of a teaching collection and also to verify identifications made during the course of the project. For a complete list of voucher specimens, see Appendix D.

Data was collected on all known non-native plants encountered. A few exceptions to the "Class 1 Known and Potential Invasive Plants of Concern" list (see Appendix A) were made. Based on pre-field work conversations with Michael Shephard, former Vegetation Ecologist for Forest Health and Protection, State and Private Forestry, Rob Develice, and Betty Charnon, we incorporated into our survey effort recent updates to the AKEPIC list. Based on the species listed in the *Species removed from AKEPIC plant list* (Shephard, personal comm.), we did not consider yarrow *(Achillea millefolium)* or silverweed *(Potentilla anserina)* to be non-native. We also considered pearly everlasting *(Anaphalis margaritacea)* to be a native species. Although these species were rarely observed outside the disturbance footprint, they were considered native for our purposes. Therefore, when encountered these species were not recorded on our field forms.

3. Results

In all, a total of 1067 points were surveyed throughout all the Chugach National Forest road systems in the 2007 surveys. The survey area includes an estimated 257.2 miles of state, local, and Forest Service roads. The length of road miles surveyed is less than the originally expected 290 miles due to map or odometer inaccuracies, land ownership discrepancy, changes in road conditions and maintenance levels since the generation of the maps. Spur roads frequently ended prematurely, often due to the removal of culverts or overgrown alders. The latter occurred more frequently in the remote reaches of our survey roads.

The surveys recorded 65 non-native species along the roads and adjacent disturbed areas. This represents approximately 33% of the 197 known exotic species in Alaska. Additional species may have been present, but escaped notice. The Kenai Peninsula had significantly more diversity than Cordova, containing 64 of the 65 species recorded. Cordova had 30 non native species recorded.

3.1 Species Diversity

The areas of our surveys typically with the greatest weed diversity were residential areas, towns, paved state roads, pullouts with scenic views, and rock pits. The diversity was at its highest in these areas and then decreased with distance. This trend is also apparent on Forest Service spur roads; diversity at these roads is at its highest at the junction with the paved state roads, and then systematically decreases with distance away. Sites directly nearby towns and along the state highways contained up to 20 species of exotics. Stretches of paved state road in between communities typically contained around 10-12 species of exotics. Locations with lowest number of weed species were stretches of roads farthest from main population centers or paved roads, these often contained only the 2-4 most common species.

The most common species encountered differed from Cordova to the Kenai but were somewhat consistent with the findings of previous survey work. Of a noticeable abundance were Timothy grass (Phleum pretense), common plantain *(Plantago major),* annual bluegrass *(Poa annua),* white clover *(Trifolium repens),* alsike clover *(Trifolim hybridum),* strawberry clover *(Trifolium pratense),* and common dandelion *(Taraxacum officinale).*

For the purposes of discussion, survey results from the Kenai Peninsula and Cordova are discussed separately due to the relative isolation of the Cordova road system from the other areas surveyed on the Chugach National Forest.

Kenai Peninsula

The Kenai Peninsula contained a higher diversity of non native species than Cordova. Our surveys on the Kenai Peninsula road systems recorded 64 non native species, representing approximately 32% of the 197 known exotic species in Alaska. These results are unsurprising, given that the Peninsula is adjacent to the most densely populated

location in Alaska, Anchorage. In addition to its proximity to this urban area, it is one of the most frequently visited localities by tourists, particularly those that drive the length of the Alaska Highway. 35 species recorded were unique to the Kenai Peninsula from the other localities we surveyed on the Chugach during this field season.

Contributing to the relatively high diversity was the ratio of state and private survey miles to federal survey miles. On the Girdwood/Kenai road system, 173 miles of private and state highway miles and only 43 miles of forest service roads were surveyed. State and private roads tend to be more diverse due to their structure, location, and amount of use received when compared with the more remote Forest Service roads.

Species diversity on the Kenai Peninsula loosely followed a trend with the north end of the peninsula in the Girdwood area and the south end by Seward experiencing higher degrees of diversity. Girdwood and the surrounding Alyeska Highway had the highest diversity of weed infestations on the peninsula, with an average diversity of 15 species per plot. Many of the infestations along the highway itself into Girdwood are already being addressed by removal crews, which we encountered during the course of our survey work. As a result, some cover classes and species list may reflect conditions either immediately after or before control efforts. Bird vetch *(Vicia cracca ssp. cracca)*, white sweetclover *(Melilotus alba)*, orange hawkweed *(Hieracium aurantiacum)*, and oxeye daisy *(Leucanthemum vulgare)* are all very abundant along the Alyeska Highway. Additional areas of concern here include the well established patches of reed canary grass *(Phalaris arundinacea)* which did not seem to be targeted by removal crews.

Other areas of high diversity included the toll booth parking lot along the Portage Highway directly adjacent to the entrance to the Whittier tunnel. This large cleared area is heavily utilized by the public as people tend to get out and wander while awaiting their turn through the tunnel. Numerous weeds exist here not seen elsewhere on the peninsula, including a small patch of Canada thistle *(Cirsium arvense)*.

Gravel roads connecting the more remote communities remained relatively weed free. Crow Creek Road and Hope Road, with the exception of a few scattered planter boxes along the roadsides associated with private residences, containing low species diversity. Noted in the containers were the occasional orange hawkweed *(Hieracium aurantiacum)* and a few horticultural varieties of mint that appear to be clambering out of their boxes.

Photo 2. Team of botanists surveying along the Seward Highway on the Kenai Peninsula. Population of Vicia cracca ssp. cracca is visible in the foreground.

Cordova

The Cordova road systems contained a significantly lower diversity of non native species than the Kenai Peninsula. Our surveys on the Cordova road systems recorded 30 non native species, representing approximately 15% of the 197 known exotic species in Alaska. Cordova is unconnected from the main road systems and is accessible only by ferry. It is also less visited by tourists than the Kenai Peninsula, meaning fewer vectors upon which for weeds to travel. One plant species recorded were unique to the Cordova from the other localities we surveyed on the Chugach during this field season: maltese cross *(Lychnis chalcedonia).*

The Cordova area, including the Copper River highway, was one of the least diverse areas surveyed throughout the three years of survey effort. The only species that remained consistent throughout the surveys was common dandelion *(Taraxacum officinale)* with large stretches along the Copper River Highway recording no weedy

species at all. Several populations of reed canary grass *(Phalaris arundinacea)* continue to be a problem in and around Cordova and on to the Eyak River.

Cordova is adjacent to the Copper River delta, which has relatively high water discharges and suspended sediment loads relative to other rivers in Alaska (Wooster, 2002). Flood events are particularly destructive in the Copper River Delta area, necessitating new gravel to be imported regularly. As a result, many of the road miles surveyed were newly graded and contained limited vegetation. Many of the roadside miles that were vegetated were boggy areas surrounded by willow or alder thicket, and do not contain many weeds at all. The alders are nitrogen fixing and may be helpful in keeping out non-native plants while preparing the soil for the re-colonization of native ground holders.

Photo 3. Snapshot of Cordova roadside, with butter and eggs (Linaria vulgaris) visible in foreground. Native species, including fireweed (Epilobium angustifolum) are visible in background.

3.2 Canopy Cover

Most species at most sites had a percent canopy cover of fewer than 10% with a few exceptions. Only a few species occurred in larger densities, but often did so consistently. Attaining high covers were all three *Trifolium spp.*, which occasionally had covers up to 40%. Although uncommon, reed canary grass *(Phalaris arundinacea)* when present often had a canopy cover of 30-40%. On roadsides where Timothy grass *(Phleum pratense)* was seeded, this species also attain high covers of 25% or higher. Orange hawkweed *(Hieracium aurantiacum),* when present, can attain high cover, especially in mature infestations. This was seen in the Girdwood area with covers recorded of over 20%. Oxeye daisy *(Leucanthemum vulgare)* also attains high covers along the Kenai Peninsula, sometimes upwards of 50%.

3.3 Aggressiveness

Aggressive species are typically those that are invading out of the "disturbance footprint" (AKEPIC Database 2005). The most commonly aggressive species encountered were *Trifolium repens, Trifolium hybridum, Trifolium pratense,* and *Phleum pretense.* These species were often observed extending out of the road footprint and entering marginal areas or clearcuts of forests and meadows. Other species were less common, but were also spotted behaving aggressively. Reed canary grass *(Phalaris arundinacea)* was spotted entering riparian areas in Cordova and on the Kenai.

4.0 Discussion

4.1 Overview of Non-native Species Patterns

Surveys of 1067 sites along roadsides on the Chugach National Forest road systems revealed 63 non-native taxa (see Appendix C), of which 1 was unrecorded in the Alaska Weeds Database- common mullein *(Verbascum thapsus)*. This represents 32% of the 197 recorded non-native species in Alaska.

Non-native species were not evenly distributed. The roads in and around the residential and urban areas of Girdwood and Seward contained the highest diversity of non-native species and also had more extensive invasions. In particular, the paved state highways also had higher diversities which spiked around recreational pullouts, rest areas, and trailheads. The Seward Highway, stretching from Girdwood to Seward, and the Portage Highway which connects the Seward Highway with the Whittier Tunnel, contained a great diversity of weed species as well as numerous infestations of High Priority Species. The state roads generally have a much larger footprint and utilize a greater amount of heavy equipment, making them more susceptible to invasions.

High diversities and large infestations were largely limited to state and local roads on the Chugach National Forest road system. Unpaved roads consistently had reduced levels of diversity and cover. Factors seemingly affecting the infestation rate on roads are: the type and rate of seeding that occurred after the road was built, the type and habit of traffic the road receives, the number of pullouts and other recreational sites available for travelers and the amount of rock pits, staging areas for equipment, and log transfer facilities existing along the road.

Traffic. The type and habits of traffic on the roads seems to affect the composition of species. On roads with heavy traffic and recreation opportunities, the diversity of weeds appears to be higher. Pullouts for fishing areas, scenic views, and picnic areas have a higher concentration of weeds then do pullouts serving as “j-holes”, which drivers use on one lane roads in the north to make room for oncoming traffic while not typically getting out of their vehicles.

Rest areas. Diversity of non-native plants typically increased at rest areas and recreational stops, particularly along the Seward and Portage Highways on the Kenai Peninsula. Populations of high priority species were often found infesting the most popular public stops, including the rest stop at Bird Point on the Seward Highway, and the pullout just before the Whittier Tunnel on the Portage Highway. The problem is potentially exacerbated by tourists walking through the infestations of bird vetch *(Vicia cracca ssp. cracca)* to snap a photo and inadvertently carrying the seeds to the next stop. These types of sites tend to serve as the population centers for high priority species and species unrecorded elsewhere.

Areas with very few non-native species included the Cordova road system in general, with the exception of the mainline areas around the community. Many of the roads on Cordova had data points recording no non-native species.

Patterns of species composition and diversity occur at each roadside profile. With some exceptions for severe infestations, there was generally a constant, low degree of infestation. This usually took the form of minimal percent cover (typically 1% throughout) of annual bluegrass *(Poa annua)* on the road itself and of common plantain *(Plantago major)* and common dandelion *(Taraxacum officinale)* at the edge of the road. Moving away from the roadbed species of clover *(Trifolium spp.)* and mouse-ear chickweed *(Cerastium fontanum)* become more common and have an increased cover (1-5%). Just beyond, exotic grasses *(Dactylis glomerata, Festuca arundinacea, Phleum pratense)* predominate at collective percent covers of around 20-30%. Other less common species tend to occur at preferred areas along the profile. Species such as fall dandelion *(Leontodon autumnalis)* and oxeye daisy *(Leucanthemum vulgare)* grow amongst the exotic grasses and seem to prefer disturbed slopes.

Reed canary grass *(Phalaris arundinacea)*, white sweetclover *(Melilotus alba)*, the three common clovers *(T. repens, pretense,* and *hybridum)* were observed out-competing native species and entering intact forests, muskegs, and riparian areas. In some populations along the Seward Highway, bird vetch (Vicia cracca ssp. cracca) was observed crawling out of the roadside footprint and into nearby shaded areas.

4.2 High Priority Species

9 non native species were identified under the contract as "high priority", due to their invasiveness rankings, land managers' concerns, or burgeoning infestation patterns in Alaska. Species identified in this category differed on each locality and in some cases, jurisdiction to jurisdiction. All of them are considered below.

Spotted Knapweed *(Centaurea biebersteinii):* 0 populations
Spotted knapweed is a high priority for both the Cordova and Kenai road systems. No populations of spotted knapweed were located during our surveys.

Reed Canary Grass *(Phalaris arundinacea):* 11 populations, Kenai and Cordova
Reed canary grass is a high priority species for both the Cordova and Kenai road systems, with the exception of the Alyeska Highway (Girdwood), and from Cordova to the Eyak River. 5 populations were located on the Kenai Peninsula, including at both ends of the Whittier tunnel on the Portage Highway, the Bird Point rest area along the Seward Highway, and at a small visitor's center along the Sterling Highway. The populations seem to be fairly localized for the time being and typically contained around 150 individuals. In Cordova, six high priority populations were encountered on the Copper River. The center of the infestation appeared to be centered on a private driveway 2.5 miles east of the Copper River and Orca Highway junction. Reed canary grass is also

prevalent on the Alyeska Highway and in and around Cordova, although additional documentation was not completed for these previously known sites.

Orange hawkweed *(Hieracium aurantiacum)*: 5 populations, Kenai only
Orange hawkweed is a high priority for both road systems, with the exception of the Alyeska Highway around Girdwood, where it is quite common along the bike path. All five populations of this species were encountered on the Kenai peninsula, with Cordova remaining free of the species. 4 of the populations were located on the central part of the Seward Highway or within one mile of the Seward Highway. The notable exception was some planted orange hawkweed in a raised bed in the town of Hope.

Canada thistle *(Cirsium arvense)*: 1 population, Kenai only
Canada thistle is a high priority for both road systems surveyed without exception. Only one population of Canada thistle was located, directly adjacent to the tool booth area on the west side of the Whittier Tunnel on the Portage Highway. The population is associated with a large parking lot and staging area for vehicles entering the tunnel. At the time of discovery, the population contained around 15 individuals.

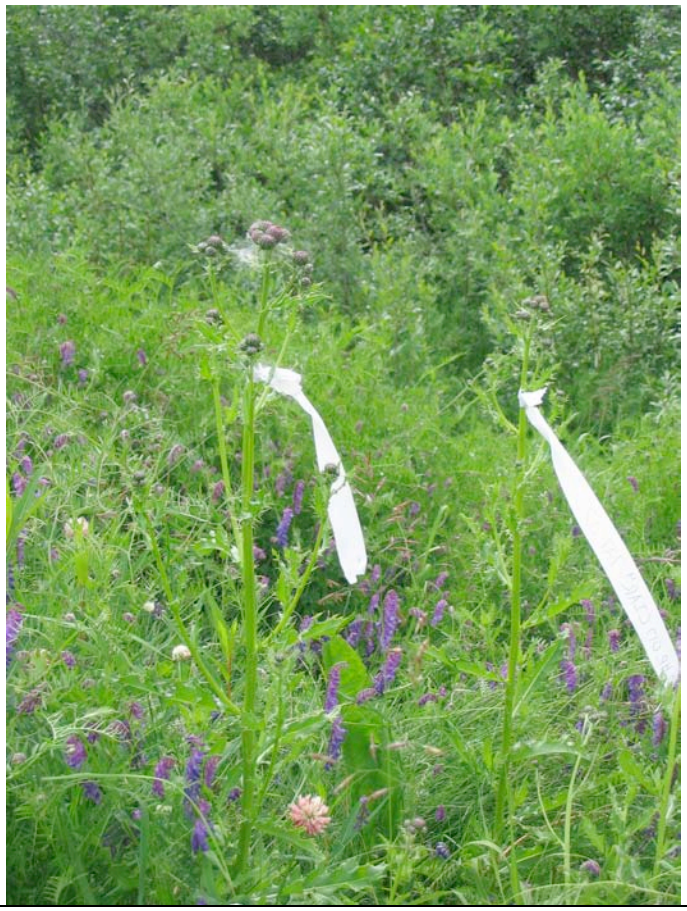

Photo 5. Cirsium arvense and Vicia cracca populations, found at the tollbooth for the Whittier Tunnel, east side, growing together.

Bird vetch *(Vicia cracca ssp. cracca):* 19 populations, Kenai only
Bird vetch is considered a high priority species for both road systems with the exception of the Alyeska Highway in Girdwood. We located 19 populations of this species on the Kenai road systems, mainly along the main Seward Highway. Several of these populations were quite extensive and spanned for several data points with no interruption. The species is also prevalent to a lesser degree on the Portage and Sterling Highways.

Yellow alfalfa *(Medicago sativa ssp. falcata)*: 0 populations
Yellow alfalfa is considered a high priority for both road systems with the exception of the Glacier Exit Highway. We encountered no populations of this species during our surveys.

Ragwort *(Senecio jacobaea)*: 0 populations
Ragwort is considered a high priority for both road systems without exception. We encountered no populations of this species during our surveys.

Perennial sow thistle *(Sonchus arvensis ssp. uliginosus):* 0 populations
Perennial sow thistle is considered a high priority for both road systems without exception. We encountered no populations of this species during our surveys.

Narrow leaf hawkweed *(Hieracium umbellatum)*: 0 populations
Narrow leaf hawkweed is a high priority for both road systems without exception. No populations of the species were located during our surveys.

4.3 Species suggested for immediate control

Selected species with high invasiveness rankings are of particular concern to the ecosystems of Southcentral Alaska. Additionally, burgeoning infestations are of particular interest because they may be responsive to early control effort. Species discussed below are recommended for immediate control or further observation in addition to the high priority species detailed above. These species were selected because they have been awarded high invasiveness rankings by the Alaska Natural Heritage Program (2004), or because they have been observed invading natural areas.

High Priority Species
All of the high priority species located during our surveys are recommended for immediate control. Of these a few populations in particular are important due to the early state of the infestation. They are highlighted below.

Table 4. High Priority populations recommended for immediate control.

Species	*Road System*	*ID*	*Location*	*Comments*
Reed canary grass *(Phalaris arundinacea)*	Glacier Ranger District	GRD_HP2_002	Bird Point Rest Area	This population is in a frequently used location that receives lots of travelers, increasing the likelihood of spreading the species.
	Glacier Ranger District	GRD_HP_011	Portage Highway	This population is located at an information kiosk that receives quite a few travelers.
	Glacier Ranger District	GRD_HP_016	Portage Highway	Located at the western side of the Whittier Tunnel right by the tool booth, it is a small cluster of plants that could be easily controlled.
	Seward Ranger District	SRD_HP2_041	Sterling Highway	These 3 small populations are good targets for control since they represent the southern most range of the species on the Kenai Peninsula.
	Cordova Ranger District	CRD_HP_003	Crater Lake Trailhead	The presence of this species at a trailhead allows hikers to serve as unwitting vectors for the spread of the plant into natural areas.
	Cordova Ranger District	CRD_HP_001	60.53669, 145.76741	This population is a good target for control as it is the only one found around this area.
Orange hawkweed *(Hieracium aurantiacum)*	Glacier Ranger District	GRD_HP_003	Hope Road	This small population consists of only a few plants in a planter in town. It might be helpful to talk to property owners about the plants.
	Glacier Ranger District	GRD_HP_038	Seward Highway	Only one plant located, could easily be removed.
Canada thistle *(Cirsium arvense)*	Glacier Ranger District	GRD_HP_017	Portage Highway	This was the only population of Canada thistle located on the Kenai Peninsula during our surveys. It should be controlled immediately.
Bird vetch (Vicia cracca ssp. cracca)	Glacier Ranger District	GRD_SHA_014	Seward Highway	On median between road and parking lot, small patch- good opportunity for removal
	Glacier Ranger District	GRD_SHA_004	Seward Highway	Only 20 plants located. Good opportunity for eradication.

	Glacier Ranger District	GRD_CCR_028	Crow Creek Road	As the only population found on Crow Creek Road in the Girdwood area, its removal would stop the spread into the more remote areas.
	Glacier Ranger District	GRD_HP_006	Portage Highway	A few scattered individuals only.
	Glacier Ranger District	GRD_HP_018	intersection of Portage and Seward Highways	A few scattered individuals only.
	Glacier Ranger District	GRD_HP_032	Seward Highway	Small population- 6 to 25 individuals.
	Seward Ranger District	SRD_HP2_001	Sterling Highway	5 plants located, this population should be removed as it represents the extent of bird vetch infestation in this region.

White sweetclover *(Melilotus alba)*, with an invasiveness ranking of 80, is an aggressive species that has infested large areas of the Kenai peninsula and other riparian areas throughout southcentral Alaska. It tends to form monospecific stands along rivers and has the potential to alter sedimentation of river ecosystems (AKEPIC 2005). The populations on the Kenai Peninsula are extensive, but control efforts would be useful targeting areas with very few individuals or populations directly adjacent to currently non-infested rivers and streams.

Yellow sweetclover *(Melilotus officinalis),* has an invasive ranking of 65 and is significantly less common than white sweetclover, having only been recorded in ___ plots. However, the plant is threatening to native plant communities in a similar manner to its congener, by fixing nitrogen, altering soil composition, and changing species diversity by shading out many smaller herbaceous species (AKEPIC 2005). Manual control has the potential to be effective due to the relatively few locations of this species.

Butter and eggs *(Linaria vulgaris),* while a somewhat common Class 2 species on the Chugach road systems, has an invasiveness ranking of 69. Smaller populations at the extremities of the infestations or at popular recreation sites could be targeted to decrease the spread of this species. Particularly at locations like the Portage Highway where travelers stop prior to embarking on the Alaska Marine Highway, targeted control could prevent the eventual spread of this species to other more remote localities. Butter and eggs has the tendency to form dense colonies and suppress native grasses (AKEPIC 2005).

Common mullein *(Verbascum thapsus)* has not been assigned an invasiveness ranking but should be controlled due to its rarity. Prompt removal of this species will prevent future infestations.

4.4 Species for further observation

The planter boxes in the town of Hope, one of which continued orange hawkweed *(Hieracium aurantiacum),* should be monitored for other escapees. Likewise on Crow Creek Road in the Girdwood area, where some ornamental mints appeared to be escaping from the planters in the residential areas.

Fall dandelion *(Leontodon autumnalis)* has not been assigned an invasiveness ranking, but where it does occur along the Seward Highway it behaves somewhat aggressively and occasionally forms dense mats.

Maltese cross *(Lchynis chalcedonica)* is a popular ornamental species that commonly escapes and has been naturalized in some areas. Only one population was recorded during our surveys on the Copper River Highway in Cordova just outside of town. As the invasive qualities and level of aggression in this species are somewhat unknown, this species should be watched carefully.

5. References

AKEPIC – Alaska Exotic Plant Information Clearinghouse. 2005. Invasive Plants of Alaska. Alaska Association of Conservation Districts Publication. Anchorage, Alaska.

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Appendix A- Class I Species List

Appendix A.
Class 1. Currently uncommon and/or high ranked invasives: Known invasive plants from in or around the Chugach National Forest with invasiveness ranks greater than 60 (or not ranked) and/or with less than 100 records of occurrence. If found, two vouchers of these species will be collected.

NRCS Code	Scientific Name	Common Name	Family
AMRE	*Amaranthus retroflexus L.*	redroot pigweed	Amaranthaceae
CEBI2	*Centaurea biebersteinii*	Spotted knapweed	Asteraceae
CIAR4	*Cirsium arvense (L.) Scop.*	Canada thistle	Asteraceae
CIVU	*Cirsium vulgare (Savi) Ten.*	bull thistle	Asteraceae
HEAN3	*Helianthus annuus L.*	annual (common) sunflower	Asteraceae
HIAU	*Hieracium aurantiacum L.*	orange hawkweed	Asteraceae
HICA10	*Hieracium caespitosum Dumort.*	meadow hawkweed	Asteraceae
HIPIP	*Hieracium pilosella L.*	mouseear hawkweed	Asteraceae
HYRA3	*Hypochoeris radicata L.*	cat's-ears	Asteraceae
LASE	*Lactuca serriola L.*	prickly lettuce	Asteraceae
LEAU2	*Leontodon autumnalis L.*	fall dandelion	Asteraceae
SEJA	*Senecio jacobea L.*	tansy ragwort, stinky Willie	Asteraceae
SESY	*Senecio sylvaticus*	woodland ragwort	Asteraceae
SOAR2	*Sonchus arvensis*	Perennial Sowthistle	Asteraceae
SOAS	*Sonchus asper (L.) Hill*	spiny sowthistle	Asteraceae
SOOL	*Sonchus oleraceous L.*	common sowthistle	Asteraceae
IMGL	*Impatiens glandulifera*	ornamental jewelweed	Balsaminaceae
BEPE3	*Betula pendula*	European white birch	Betulaceae
ASPR	*Asperugo procumbens L.*	catchweed, mudwort	Boraginaceae
MYSC	*Myosotis scorpioides L.*	true forget-me-not	Boraginaceae
ARGL	*Arabis glabra L. Bernh.*	tower rockcress	Brassicaceae
BEIN2	*Berteroa incana*	hoary false madwort	Brassicaceae
BRJU	*Brassica juncea (L.) Czern.*	indian mustard	Brassicaceae
BRNA	*Brassica napus L.*	rape	Brassicaceae
BRRA	*Brassica rapa L.*	field mustard	Brassicaceae
DEPI	*Descurainia pinnata*	western tansy mustard	Brassicaceae
ERGA	*Erucastrum gallicum (Willd.) O.E. Schulz*	common dogmustard	Brassicaceae
ERCH9	*Erysimum cheiranthoides L. subsp. cheiranthoides*	wormseed mustard	Brassicaceae
LERA2	*Lepidium ramosissimum*	manybranched pepperwood	Brassicaceae
NEPA3	*Neslia paniculata (L.) Desv.*	ball mustard	Brassicaceae
ROSY	*Rorippa sylvestris (L.) Bess.*	creeping yellowcress	Brassicaceae
SIAL2	*Sisymbrium altissimum L.*	tumbling mustard	Brassicaceae

THAR5	*Thlaspi arvense L.*	pennycress	Brassicaceae
VIOP	*Viburnum opulus*	American cranberrybush	Caprifoliaceae
CEGL2	*Cerastium glomeratum Thuill.*	stickt chickweed	Caryophyllaceae
DIDE	*Dianthus deltoides L.*	maiden pink	Caryophyllaceae
LYCH3	*Lychnis chalcedonica L.*	maltesecross	Caryophyllaceae
SINO	*Melandrium noctiflorum (L.) Fries*	night-flowering catchfly	Caryophyllaceae
SIAR	*Silene armeria*	sweet William silene	Caryophyllaceae
SPRU	*Spergularia rubra (L.) J.& K. Presl*	purple sand spurry	Caryophyllaceae
CHBE4	*Chenopodium berlanderieri L.*	pitseed goosefoot	Chenopodiaceae
ASCI4	*Astragalus cicer L.?*	chickpea milkvetch, cicer milkvetch	Fabaceae
CAAR18	*Caragana arborescens Lam.*	Siberian peashrub	Fabaceae
CYSC4	*Cytisis scoparius (L.) Link*	Scotch Broom	Fabaceae
LUPOP4	*Lupinus polyphyllus Lindl.*	large-leaf lupine	Fabaceae
MESAF	*Medicago falcata L.*	yellow alfalfa	Fabaceae
VICRC	*Vicia cracca L.*	bird vetch, dog pea	Fabaceae
VITR	*Viola tricolor L.*	johnny jumpup	Fabaceae
LYSA2	*Lythrum salicaria*	Purple Loosestrife	Lythraceae
PANU3	*Papaver nudicaule L.*	Iceland poppy	Papaveraceae
AGCR	*Agropyron cristatum L. Gaertn.*	crested wheatgrass	Poaceae
AGGI2	*Agrostis gigantea Roth*	creeping bentgrass, red top	Poaceae
ALGE2	*Alopecurus geniculatus L.*	water foxtail	Poaceae
AVFA	*Avena fatua L.*	wildoats	Poaceae
BRHO2	*Bromus hordeaceus L.*	soft brome	Poaceae
BRTE	*Bromus tectorum L.*	cheatgrass, downy brome	Poaceae
DEEL	*Deschampsia elongata (Hook.) Munro*	slender hairgrass	Poaceae
ELSI	*Elymus sibiricus L.*	Siberian wild rye	Poaceae
ELTRS	*Elymus trachycaulus*	slender wheatgrass	Poaceae
HOMUL	*Hordeum murinum L. spp leporinum (Link)*	Leporinum barley	Poaceae
HOVU	*Hordeum vulgare L.*	common barley	Poaceae
PHAR3	*Phalaris arundinacea*	Reed Canary Grass	Poaceae
POPRP2	*Poa angustifolia L.*	Kentucky bluegrass	Poaceae
POGL	*Poa glauca Vahl.*	glaucous bluegrass	Poaceae
POPA2	*Poa palustris L.*	fowl bluegrass	Poaceae
POPRI2	*Poa subcoerulea Sm.*	spreading bluegrass	Poaceae
POTR2	*Poa trivialis L.*	rough bluegrass	Poaceae
SEVI4	*Setaria virdis L. Beauv.*	green bristlegrass	Poaceae
TRAE	*Triticum aestivum L.*	wheat	Poaceae
COLI2	*Collomia linearis*	tiny trumpet	Polemoniacea

POCO10	*Polygonum convolvulus L.*	black bindweed, wild buckwheat	Polygonaceae
POCU6	*Polygonum cuspidatum*	Japanese knotweed	Polygonaceae
POLA4	*Polygonum lapathifolium L.*	willow weed	Polygonaceae
POPE3	*Polygonum persicaria l.*	lady's-thumb	Polygonaceae
POBO10	*Polygonum x bohemicum*	bohemian knotweed	Polygonaceae
DESO	*Delphinium sonnei Greene*	Sonny Bono larkspur	Ranunculaceae
RAAC3	*Ranunculus acris L.*	tall buttercup	Ranunculaceae
FRAN	*Fragaria ananassa Duchesne (pro sp.) [chiloensis virginiana]*	domestic strawberry	Rosaceae
ARAN7	*Potentilla anserina L.*	silverweed	Rosaceae
PRPA5	*Prunus padus L.*	European birdcherry	Rosaceae
SOSO2	*Sorbaria sorbifolia (L.) A.Braun*	false spiraea	Rosaceae
LIPI3	*Linaria pinifolia*	pineneedle toadflax	Scrophulariaceae
VESES	*Veronica serpyllifolia L. subsp. serpyllifolia*	thyme-leaf speedwell	Scrophulariaceae

Appendix B- Class II Species List

Appendix B.

Class 2. Widespread and/or low ranked invasives: Known non-native plants from in or around the Chugach National Forest with invasiveness ranks less than 60 OR with more than 100 records of occurrence. If found, one voucher of these species will be collected.

NRCS Code	Scientific Name	Common Name	Family
ACMIM2	*Achillea millefolium L. sens. str.*	common yarrow	Asteraceae
ACPT	*Achillea ptarmica L.*	sneezeweed	Asteraceae
ANCO2	*Anthemis cotula L.*	mayweed, stinking chamomile	Asteraceae
CRTE3	*Crepis tectorum L.*	annual hawksbeard	Asteraceae
HIUM	*Hieracium umbellatum*	Narrow-leaf Hawkweed	Asteraceae
LEVU	*Leucanthemum vulgare Lam.*	ox-eye daisy	Asteraceae
MADI6	*Matricaria discoidea DC*	pineappleweed	Asteraceae
SEVU	*Senecio vulgaris L.*	common groundsel	Asteraceae
TAVU	*Tanacetum vulgare L.*	common tansy	Asteraceae
TAOF	*Taraxacum officinale Weber*	common dandelion	Asteraceae
TRDU	*Tragopogon dubius Scop.*	yellow salsify, goatsbeard	Asteraceae
TRPE21	*Tripleurospermum inodorum (L.) Schultz-Bip.*	scentless mayweed	Asteraceae
LASQ	*Lappula squarrosa*	European stickweed	Boraginaceae
CABU2	*Capsella bursa-pastoris (L.) Medik.*	shepherd's purse	Brassicaceae
DESO2	*Descurainia sophia (L.) Webb ex Prantl*	tansy mustard	Brassicaceae
LEDE	*Lepidium densiflorum Schrad*	common peppergrass	Brassicaceae
CEFO2	*Cerastium fontanum Baumg. ssp. triviale (Link) Jalas*	larger mouse-eared chickweed	Caryophyllaceae
SIDI4	*Silene dioica (L.) Clairville*	red catchfly	Caryophyllaceae
SILA21	*Silene latifolia Poir.*	bladder campion	Caryophyllaceae
SILAA3	*Silene latifolia Poir. ssp. alba (P. Mill.) Greuter & Burdet*	bladder campion	Caryophyllaceae
SPAR	*Spergula arvensis L.*	spurry	Caryophyllaceae
STME2	*Stellaria media (L.) Vill.*	common chickweed	Caryophyllaceae
CHALA	*Chenopodium album L.*	lamb's quarters	Chenopodiaceae
HYPE	*Hypericum perforatum L.*	common St. Johnswort	Clusiaceae
MELU	*Medicago lupulina L.*	black medic, hop clover	Fabaceae
MESAS	*Medicago sativa L.*	alfalfa	Fabaceae
MEAL12	*Melilotus alba Medikus*	white sweet clover	Fabaceae
MEOF	*Melilotus officinalis (L.) Lam.*	yellow sweet clover	Fabaceae
TRHY	*Trifolium hybridum L.*	alsike clover	Fabaceae
TRPR2	*Trifolium pratense L.*	red clover	Fabaceae

TRRE3	*Trifolium repens L.*	white clover	Fabaceae
GABI3	*Galeopsis bifida Boenn.*	splitlip hemp-nettle	Lamiaceae
GATE2	*Galeopsis tetrahit L.*	brittlestem hempnettle	Lamiaceae
PLMA2	*Plantago major L. var. major*	common plantain	Plantaginaceae
ALPR3	*Alopecurus pratensis L.*	meadow foxtail	Poaceae
BRINI	*Bromus inermis Leyss.*	smooth brome	Poaceae
DAGL	*Dactylis glomerata L.*	orchard grass	Poaceae
ELRE4	*Elymus repens (L.) Beauv.*	quackgrass	Poaceae
HOJU	*Hordeum jubatum L.*	foxtail barley	Poaceae
LOPEM2	*Lolium multiflorum Lam.*	Italian rye grass	Poaceae
LOPEP	*Lolium perenne L.*	perennial rye grass	Poaceae
PHPR3	*Phleum pratense L.*	Timothy	Poaceae
POAN	*Poa annua L.*	annual bluegrass	Poaceae
POCO	*Poa compressa L.*	Canada bluegrass	Poaceae
POPR	*Poa pratensis L.*	bluegrass	Poaceae
POAV	*Polygonum aviculare L.*	knotweed	Polygonaceae
RUAC3	*Rumex acetosella L. ssp. acetosella*	sheep sorel	Polygonaceae
RUACA5	*Rumex acetosella L. ssp. angiocarpus (Murb.) Murb.*	sheep sorel	Polygonaceae
RUCR	*Rumex crispus L.*	curled dock	Polygonaceae
RULO2	*Rumex longifolius DC.*	garden dock	Polygonaceae
RARE3	*Ranunculus repens L.*	creeping buttercup	Ranunculaceae
PONO3	*Potentilla norvegica L.*	Norwegian cinquefoil	Rosaceae
SOAU	*Sorbus aucuparia*	European mountain ash	Rosaceae
DIPU	*Digitalis purpurea L.*	purple foxglove, foxglove	Scrophulariaceae
LIVU2	*Linaria vulgaris P. Mill.*	butter and eggs	Scrophulariaceae

Appendix C- Non Native Species Lists

Table C.1 Non-native species recorded during the 2007 surveys on the Chugach National Forest Road Systems.

Code	Species	Common name	Family	Class
ALGE2	Alopecurus geniculatus	water foxtail	Poaceae	1
ALPR3	Alopecurus pratensis	meadow foxtail	Poaceae	2
ARGL	Arabis glabra	tower rockcress	Brassicaceae	1
AVFA	Avena fatua	oats	Poaceae	1
BRINI	Bromus inermis ssp. inermis	smooth brome	Poaceae	2
CABU2	Capsella bursa-pastoris	shepard's purse	Brassicaceae	2
CEFO2	Cerastium fontanum	mouse ear chickweed	Caryophyllaceae	2
CEGL	Cerastium glomeratum	mouse ear chickweed	Caryophyllaceae	1
CHALA	Chenopodium album	lamb's quarters	Chenopodiaceae	2
CIAR4	Cirsium arvensis	Canada thistle	Asteraceae	HP
CRTE3	Crepis tectorum	narrow hawk's beard	Asteraceae	2
DAGL	Dactylis glomerata	orchard grass	Poaceae	2
ELRE4	Elymus repens	quackgrass	Poaceae	2
ELSI	Elymus sibericus	Siberian wildrye	Poaceae	1
ELTRS	Elymus trachycaulus	slender wheatgrass	Poaceae	1
ERCH9	Erysimum cheiranthoides	common dog mustard	Brassicaceae	1
FRAN	Fragaria ananassa	strawberry	Rosaceae	1
GABI3	Galeopsis bifida	hemp nettle	Lamiaceae	2
HIAU	Hieracium aurantiacum	orange hawkweed	Asteraceae	HP
HOJU	Hordeum jubatum	fox tail barley	Poaceae	2
LEAU2	Leontodon autumnalis	fall dandelion	Asteraceae	1
LERA2	Lepidium ramosissimum	many branched pepperwood	Brassicaceae	1
LEVU	Leucanthemum vulgare	oxeye daisy	Asteraceae	2
LIVU2	Linaria vulgaris	butter-n-eggs	Scrophulariaceae	2
LOMU	Lolium multiflorum	annual ryegrass	Poaceae	2
LOPE	Lolium perenne	perennial bluegrass	Poaceae	2
LUPOP4	Lupinus polyphyllus	Kenai lupine	Fabaceae	1
LYCH3	Lychnis chalcedonica	maltsecross	Caryophyllaceae	1
MADI6	Matricaria discoidea	pineapple weed	Asteraceae	2
MESAS	Medicago sativa	alfalfa	Fabaceae	2
MEAL12	Melilotus alba	white sweet clover	Fabaceae	2
MEOF	Melilotus officinalis	yellow sweet clover	Fabaceae	2
MYSC	Myosotis scirpoides	forget me not	Boraginaceae	1
PANU3	Papaver nudicaule	Iceland poppy	Papaveraceae	1
PHAR3	Phalaris arundinacea	reed canary grass	Poaceae	HP
PHPR3	Phleum pratense	common Timothy	Poaceae	2
PLMA2	Plantago major	common plantain	Plantaginaceae	2
POAN	Poa annua	annual bluegrass	Poaceae	2
POCO	Poa compressa	Canada bluegrass	Poaceae	2
POGL	Poa glauca	glaucous bluegrass	Poaceae	1
POPR	Poa pratensis	Kentucky bluegrass	Poaceae	2

POAV	Polygonum aviculare	prostrate knotweed	Polygonaceae	2
POCO10	Polygonum convolvulus	buckwheat	Polygonaceae	1
PONO3	Potentilla norvegica	silverweed	Rosaceae	2
RAAC3	Ranunculus acris	tall buttercup	Ranunculaceae	1
RARE3	Ranunculus repens	creeping buttercup	Ranunculaceae	2
RUAC3	Rumex acetosella	sheep sorrel	Polygonaceae	2
RUCR	Rumex crispus	curly dock	Polygonaceae	2
RULO	Rumex longifolia	dooryard dock	Polygonaceae	1
SEVU	Senecio vulgaris	old man's beard	Asteraceae	2
SPAR	Spergula arvensis	spurry	Caryophyllaceae	2
SPRU	Spergularia rubra	purple sand spurry	Caryophyllaceae	1
STME2	Stellaria media	chickweed	Caryophyllaceae	2
TAOF	Taraxacum officinale	common dandelion	Asteraceae	2
TRDU	Tragopogon dubius	common salisfy	Asteraceae	2
TRAU2	Trifolium aureum	golden clover	Fabaceae	1
TRDU2	Trifolium dubium	suckling clover	Fabaceae	1
TRHY	Trifolium hybridum	alsike clover	Fabaceae	2
TRPR2	Trifolium pratense	strawberry clover	Fabaceae	2
TRRE3	Trifolium repens	white clover	Fabaceae	2
TRPE21	Tripleurospermum perforata	scentless false mayweed	Asteraceae	2
TRAE	Triticum aestivum	wheat	Poaceae	1
VETH	Verbascum …	mullein	Scrophulariaceae	1
VESES	Veronica serpyfolia ssp. serpyfolia	thyme-leaf speedwell	Scrophulariaceae	1
VICRC	Vicia cracca ssp. cracca	bird vetch	Fabaceae	HP

Kenai Peninsula Non Native Species List

Table C.2 Non-native Species Recorded on the Kenai Peninsula

Code	Species	Common name	Family	Class
ALGE2	Alopecurus geniculatus	water foxtail	Poaceae	1
ALPR3	Alopecurus pratensis	meadow foxtail	Poaceae	2
ARGL	Arabis glabra	tower rockcress	Brassicaceae	1
AVFA	Avena fatua	oats	Poaceae	1
BRINI	Bromus inermis ssp. inermis	smooth brome	Poaceae	2
CABU2	Capsella bursa-pastoris	shepard's purse	Brassicaceae	2
CEFO2	Cerastium fontanum	mouse ear chickweed	Caryophyllaceae	2
CEGL	Cerastium glomeratum	mouse ear chickweed	Caryophyllaceae	1
CHALA	Chenopodium album	lamb's quarters	Chenopodiaceae	2
CIAR4	Cirsium arvensis	Canada thistle	Asteraceae	HP
CRTE3	Crepis tectorum	narrow hawk's beard	Asteraceae	2
DAGL	Dactylis glomerata	orchard grass	Poaceae	2
ELRE4	Elymus repens	quackgrass	Poaceae	2
ELSI	Elymus sibericus	Siberian wildrye	Poaceae	1
ELTRS	Elymus trachycaulus	slender wheatgrass	Poaceae	1
ERCH9	Erysimum cheiranthoides	common dog mustard	Brassicaceae	1
FRAN	Fragaria ananassa	strawberry	Rosaceae	1
GABI3	Galeopsis bifida	hemp nettle	Lamiaceae	2
HIAU	Hieracium aurantiacum	orange hawkweed	Asteraceae	HP
HOJU	Hordeum jubatum	fox tail barley	Poaceae	2
LEAU2	Leontodon autumnalis	fall dandelion	Asteraceae	1
LERA2	Lepidium ramosissimum	many branched pepperwood	Brassicaceae	1
LEVU	Leucanthemum vulgare	oxeye daisy	Asteraceae	2
LIVU2	Linaria vulgaris	butter-n-eggs	Scrophulariaceae	2
LOMU	Lolium multiflorum	annual ryegrass	Poaceae	2
LOPE	Lolium perenne	perennial bluegrass	Poaceae	2
LUPOP4	Lupinus polyphyllus	Kenai lupine	Fabaceae	1
MADI6	Matricaria discoidea	pineapple weed	Asteraceae	2
MESAS	Medicago sativa	alfalfa	Fabaceae	2
MEAL12	Melilotus alba	white sweet clover	Fabaceae	2
MEOF	Melilotus officinalis	yellow sweet clover	Fabaceae	2
MYSC	Myosotis scirpoides	forget me not	Boraginaceae	1
PANU3	Papaver nudicaule	Iceland poppy	Papaveraceae	1
PHAR3	Phalaris arundinacea	reed canary grass	Poaceae	HP
PHPR3	Phleum pratense	common Timothy	Poaceae	2
PLMA2	Plantago major	common plantain	Plantaginaceae	2
POAN	Poa annua	annual bluegrass	Poaceae	2
POCO	Poa compressa	Canada bluegrass	Poaceae	2
POGL	Poa glauca	glaucous bluegrass	Poaceae	1
POPR	Poa pratensis	Kentucky bluegrass	Poaceae	2
POAV	Polygonum aviculare	prostrate knotweed	Polygonaceae	2
POCO10	Polygonum convolvulus	buckwheat	Polygonaceae	1

PONO3	Potentilla norvegica	silverweed	Rosaceae	2
RAAC3	Ranunculus acris	tall buttercup	Ranunculaceae	1
RARE3	Ranunculus repens	creeping buttercup	Ranunculaceae	2
RUAC3	Rumex acetosella	sheep sorrel	Polygonaceae	2
RUCR	Rumex crispus	curly dock	Polygonaceae	2
RULO	Rumex longifolia	dooryard dock	Polygonaceae	1
SEVU	Senecio vulgaris	old man's beard	Asteraceae	2
SPAR	Spergula arvensis	spurry	Caryophyllaceae	2
SPRU	Spergularia rubra	purple sand spurry	Caryophyllaceae	1
STME2	Stellaria media	chickweed	Caryophyllaceae	2
TAOF	Taraxacum officinale	common dandelion	Asteraceae	2
TRDU	Tragopogon dubius	common salisfy	Asteraceae	2
TRAU2	Trifolium aureum	golden clover	Fabaceae	1
TRDU2	Trifolium dubium	suckling clover	Fabaceae	1
TRHY	Trifolium hybridum	alsike clover	Fabaceae	2
TRPR2	Trifolium pratense	strawberry clover	Fabaceae	2
TRRE3	Trifolium repens	white clover	Fabaceae	2
TRPE21	Tripleurospermum perforata	scentless false mayweed	Asteraceae	2
TRAE	Triticum aestivum	wheat	Poaceae	1
VETH	Verbascum …	mullein	Scrophulariaceae	1
VESES	Veronica serpyfolia ssp. serpyfolia	thyme-leaf speedwell	Scrophulariaceae	1
VICRC	Vicia cracca ssp. cracca	bird vetch	Fabaceae	HP

Cordova Non Native Species List

Table C.3 Non-native Species Recorded on the Cordova road systems

Code	*Species*	*Common name*	*Family*	*Class*
ALPR3	Alopecurus pratensis	meadow foxtail	Poaceae	2
CEFO2	Cerastium fontanum	mouse ear chickweed	Caryophyllaceae	2
DAGL	Dactylis glomerata	orchard grass	Poaceae	2
FRAN	Fragaria ananassa	strawberry	Rosaceae	1
LEAU2	Leontodon autumnalis	fall dandelion	Asteraceae	1
LEVU	Leucanthemum vulgare	oxeye daisy	Asteraceae	2
LIVU2	Linaria vulgaris	butter-n-eggs	Scrophulariaceae	2
LYCH3	Lychnis chalcedonica	maltsecross	Caryophyllaceae	1
MADI6	Matricaria discoidea	pineapple weed	Asteraceae	2
MYSC	Myosotis scirpoides	forget me not	Boraginaceae	1
PHAR3	Phalaris arundinacea	reed canary grass	Poaceae	HP
PHPR3	Phleum pratense	common Timothy	Poaceae	2
PLMA2	Plantago major	common plantain	Plantaginaceae	2
POAN	Poa annua	annual bluegrass	Poaceae	2
POPR	Poa pratensis	Kentucky bluegrass	Poaceae	2
POAV	Polygonum aviculare	prostrate knotweed	Polygonaceae	2
PONO3	Potentilla norvegica	silverweed	Rosaceae	2
RAAC3	Ranunculus acris	tall buttercup	Ranunculaceae	1
RARE3	Ranunculus repens	creeping buttercup	Ranunculaceae	2
RUAC3	Rumex acetosella	sheep sorrel	Polygonaceae	2
RUCR	Rumex crispus	curly dock	Polygonaceae	2
SEVU	Senecio vulgaris	old man's beard	Asteraceae	2
SPAR	Spergula arvensis	spurry	Caryophyllaceae	2
STME2	Stellaria media	chickweed	Caryophyllaceae	2
TAOF	Taraxacum officinale	common dandelion	Asteraceae	2
TRHY	Trifolium hybridum	alsike clover	Fabaceae	2
TRPR2	Trifolium pratense	strawberry clover	Fabaceae	2
TRRE3	Trifolium repens	white clover	Fabaceae	2
TRPE21	Tripleurospermum perforata	scentless false mayweed	Asteraceae	2
VESES	Veronica serpyfolia ssp. serpyfolia	thyme-leaf speedwell	Scrophulariaceae	1