

Exotic Plant Management Team

Denali National Park and Preserve

2009 Season Report

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Introduction

The 2009 season demarcates the ninth year in which exotic plants have been inventoried and the sixth year in which the Alaska's Exotic Plant Management Team (AKEMPT) program has conducted extrication efforts of exotic plants in Denali National Park and Preserve. Through manual treatment, GPS mapping, photographic record, specimen collections, educational outreach, and seed collection for re-vegetation efforts, the Exotic Plant Management Team (EMPT) of Denali National Park continues to monitor, inventory, and diminish the quantity and abundance of exotic species observed within the park and its' boundaries.

As invasive exotic plant species contribute to the change of ecosystem function, species and structural composition, and food-web interactions, the importance of their inventory, monitoring, and eventual elimination is the mission of the EPMT. These hitchhiking invaders threaten to forever change the natural landscape in which the National Park Service seeks to protect and preserve. Alaska has been fortunate to escape much of the rampant and enterprising invasive plant population establishments of the lower contiguous United States, but in spite of its remoteness, northern latitudinal position, and short growing season, the Alaskan landscape cannot venture to be entirely excluded from the realm of invasive plant establishment.

Decreased visitation levels from previous years are expected in 2009 for Denali National Park and Preserve, but with the new arrival of people and goods into the park each and every year, comes the opportunity for a new invasion to take place. Seed coming into the park on the tread of tires of vehicles, shoes and clothing, and even pets of visitors provide a vector in which dispersal can occur. Construction projects supply an ever present means in which seed can strike bare mineral soil and establish a pioneer population. With this in mind, areas of human disturbance remain the focus of the efforts of the EPMT.

Areas where human traffic is highest are considered prime targets for invasive plant management and control. With access to the backcountry limited by the National Park Service in which only buses are allowed on the park road to shuttle in visitors, this factor greatly limits the opportunity of spread of invasive plants into the backcountry. Front-country areas from the entrance area of the park to Park Headquarters are of primary concern to the EPMT for monitoring and control measures. Any known infestations along the park road of *Taraxacum officinale* (common dandelion) beyond the first three miles and park headquarters are targeted and other invasive plants are sought after in construction areas and disturbed sites as well along the park road during the Dandelion De-Vegetation week. Re-vegetation measures implemented in newly finished construction projects and disturbance sites will further prevent invasive plant colonization. In monitoring and control of these areas now and in the future, the goal of decreasing and eradicating new and recurring populations of invasive plants will be achieved.

Efforts for control are made based upon a number of factors. One such factor is the overall ability of the EPMT to effectively control a given population before the population has a chance to spread. Outlier populations are usually targeted first for quarantine and eradication efforts as they can be easily contained for prevention of future continuous propagation. Any large, pervasive populations are secondary priorities and are managed solely for containment until further resources can be applied to effectively manage these populations.

Another factor in the consideration of control is the ranking of a given invasive plant. The Alaska Committee for Noxious and Invasive Plants Management (CNIPM) provides a ranking list for given invasive plants in Alaska. This list considers a complex number of factors such as the ecological impact, biological character and dispersal ability, ecological amplitude and distribution, and the feasibility of control (source). These factors are assigned a given value and totaled to create a ranking for each invasive. The result is a on a scale from one to one hundred, one being low priority and one hundred having high priority. For the 2009 season, the EPMT will primarily focus attention to those invasive plants with the higher ranking.

Highlights and Specific Goals of the 2009 Season

- Herbicide application of *Crepis tectorum* in the Sewage Lagoon and control of *Crepis tectorum* in the immediate vicinity of the Sewage Lagoon and burn pile.
- Dandelion De-vegetation of the park road from the Savage River Box to the Kantishna Airstrip.
- Inventory, monitor, and control of *Crepis tectorum*, *Linaria vulgaris*, *Melilotus spp.*, *Vicia cracca*, *Tripleurospermum perforata* and other noxious weeds.
- Seed collection of *Agropyron spp.*, *Hedysarum alpinum*, *Poa alpina*, and *Oxytropis campestris* for re-vegetation projects.

Methods

Manual treatment efforts are conducted by use of hand tools such as a dandelion digger, a spade, shovels, rakes, and mere hand-pulling of weeds to remove the plant in its entirety from the soil substrate. All parts of the plant are collectively placed in green plastic bags labeled derisively as, “Not All Alien Invaders Come From Outer Space.” These bags are then weighed to the closest pound, sealed, and then subsequently placed in the burn pile for extermination. The weight is then recorded with the location in which the plant came, the species epithet, and the date.

Chemical treatment efforts were solely conducted inside the Sewage Lagoon area with *Crepis tectorum* as the targeted species. Use of the herbicide Milestone VM was applied with use of a backpack sprayer to repress the prolific infestation at this site. Permission was sought in order to conduct such an endeavor and proper instructions were followed in accordance with the licensing authority and oversight from the Regional Integrated Pest Management Coordinator. All users were required to read application instructions, cautions, and procedures regarding the product. The use of TYVEX suits, nylon gloves, and safety eyewear were employed while product was being applied. Calibration of the sprayer was conducted before use of the herbicide in order to get an appropriate and accurate rate of flow for the area of application. Intricate calculations were performed to accurately measure the amount of herbicide to dilute in water for the size of the container the sprayer was.

A GeoXT Trimble GPS unit was used to map all infestations encountered. A line, point, and polygon were the main features that were applied when considering an infestation in question. A point would be applied if a there was a localized infestation only a meter or so in diameter. A polygon was mapped if there was a particularly large infestation that would require a fair amount of time and effort to

control. A line was mapped if the infestation fell within a certain distance of a line walked on the ground. Table 1 gives a synopsis of information to be collected.

Table 1. The Data Dictionary of Exotic Plant Management Team 2009 Protocol is provided. (source)

Location_Name	This is the general area where the activity takes place with several possible in and around each park unit. For a description of each area, see the LocationID table below.
Disturbance_Type	Because most of Alaska's exotic plants grow only on disturbed sites, we are tracking what disturbance types are being invaded by what species in NPS units. The options are listed in the Disturbance Type table below. The most frequently applicable type is fill importation, which includes roadsides and construction sites.
Site_Description	The location description is an opportunity to delineate in words the exact location, as well as any information about that location that might be important. The first provision should enable someone who looks at a table of the data to understand where within the LocationID the work took place without having to use GIS.
Buffer_Distance_M	This is the buffer distance in meters that will be used to convert points and lines into polygons, extending the point or line to the boundary of the infestation at its maximum distance from the center point or line.
Taxon	This is the dominant exotic plant species of a particular infestation.
Phenology	The dominant phenology at the time of the exotic species is especially important for control timing and future planning.
%_Cover	The cover class percentage of the dominant exotic species is a critical measure of an infestation's density.
Stem_Count	This is a stem count of the dominant exotic species. Only recorded in cases of a control event in which a fairly accurate number can be prescribed to the population.
Action	"Inventory" is the first documentation of a particular infestation, whereas "Monitor" is a follow-up visit to a previously inventoried site from this year or previous years. "Treatment" is the first control effort for a particular infestation and "Retreatment" applies to any subsequent control efforts in either the same or successive years. "Manual" involves pulling or digging. "Mechanical" involves actions like mowing, weed-whacking, chain-sawing, etc. "Chemical" involves the use of herbicides.
%_Treated	Percentage of area treated – 0, 1-25%, 26-50%, 51-75%, 76-95%, 96-100%. Make notes in comment field what was/wasn't treated. For example, removed

	all flowering plants or many seedlings left.
Control_pers_hrs	Actual person hours spent doing control work for all people involved.
CntrlEffrt	Standardize, “low” refers to an infestation that could be manually controlled by one person in less than an hour. “Medium” infestations could be controlled by one person in less than an 8-hr. day. “High” infestations would require multiple people or multiple days to control.
Is_Exhaustive	If all the exotic plants encountered were recorded, enter “yes.” If only a subset of species are recorded, enter “no.”
Comments	Convey anything that seems important about an infestation or uninfested area, such as: control might not work for a particular reason; species’ identity is uncertain or not listed in the species list; components of the native plant community; potential for spread if left untreated; data collection is incomplete; where to look if hidden; invading undisturbed plant community; apparent source of infestation; similar native species in the same area; need for monitoring, etc.
Park_Unit	Associated park is the four-letter code for whatever park unit one is working in, which should be set as the default value.
Is_Inside_Park	If the area mapped is located on park land, enter “yes”; if it lies outside of the park boundary or on inholdings, enter “no”.
Recorder_Name	These are the initials of the person using the Trimble unit.
Team_Name	AKEPMT is the standard team but if a volunteer group is involved, this would apply as well.
Secondary , Tertiary Taxon, Phenology etcetera...	Additional fields for 9 more exotic species other than the dominant species at a particular site are provided. This option is provided to save time when there is a whole complement of species infesting the same area.

For seed collection, *Poa alpina* (alpine bluegrass), *Agropyron ssp.* (wheatgrass), *Oxytropis campestris* (milk vetch), and *Hedysarum alpinum* (Eskimo potato) were targeted. These seeds were collected by hand by pulling off the seed heads or cutting of the seed heads. They were then placed in brown paper bags which were labeled with the date, location, and species. Each bag contains only one species from one location. The seeds were then placed on trays so they could dry with the date, location, and species recorded by the seed with each species having its own tray. After drying occurs each species is placed in their own bag with the date, location and species labeled on the bag. The bags are then placed

in a freezer for storage. Eventually, the seeds would be removed from the seed heads by a cleaning process specific to each seed type. The final product would be applied to re-vegetation sites.

Specimen collection was done in order to have a current physical record of an invasive plant to be placed in a herbarium. An invasive is pulled and then placed within a folded sheet of newspaper. This paper is then labeled in the lower right hand corner with the genus and species, the date, the location, and the recorder's initials and a number. The specimen inside the paper is then delicately placed between two sheets of blotter to paper to ensure that moisture is minimal around the specimen. The specimen, paper, and blotter paper are subsequently sandwiched between two pieces of foam. This is all supported by two pieces of cardboard and wooden bracing that is lashed down to flatten the specimen. It will remain like this for at least a week to ensure proper drying. Photographic records of specimens are taken as well to ensure that proper identification reference.

Results



XID Services photo by Richard Old

Smooth brome.

Bromus inermis (smooth brome grass) has not been observed this year in Denali. This does not necessarily disqualify it from being considered in the inventory of invasive plants for the season. This grass can be distinguished by its pubescent nodes and leaf blades from the native variety (AKEPIC 119). The ranking for this species is a 62. As there were no observations made in regards to this invasive, no weights were collected of this specimen.

Capsella bursa-pastoris (shepherd's purse) has a basal rosette of deeply incised leaves and stem leaves that are delicate and alternating. The flowers are small and white with very small petals. It can be distinguished from a native mustard, *Arabis lyrata*, by the shape of its fruit which is narrower than that of shepherd's purse. The ranking of this plant was placed at 40. This plant was not observed this season thus no specimens were collected or weighted.



National Park Service photo by Jeff Keys



National Park Service photo by Penny Brander

Shepherd's purse flowers and fruits.



Chenopodium album (lambsquarter) is distinguished by its bluish green leaves that are somewhat triangular to diamond-shaped with small white flowers that grow in clusters. This plant is variable in size. The ranking for *C. album* is 37. Lambsquarter was observed in many areas of the frontcountry in disturbed rocky soils. No weights are recorded as this was not a high priority species.



Crepis tectorum (narrowleaf hawksbeard) is the bane of EPMT Student Conservation Association (SCA) intern's existence, and also is an annual distinguished by its very thin narrow leaves and small yellow flowers with a small basal rosette. The ranking for *C. tectorum* is 54. Areas of the park where this plant has been observed have been primarily along the first mile of the park road from the entrance area, as well

as a very large population in and around the Sewage Lagoon area. Many hours have been spent hand pulling this particular invasive over the years and this season is no exception. A new approach has been taken with the Sewage Lagoon population by use of an herbicide treatment that has been applied within the fenced area of the Sewage Lagoon, shown in Figure 1. The total weight collected for this invasive was approximately 135 pounds.

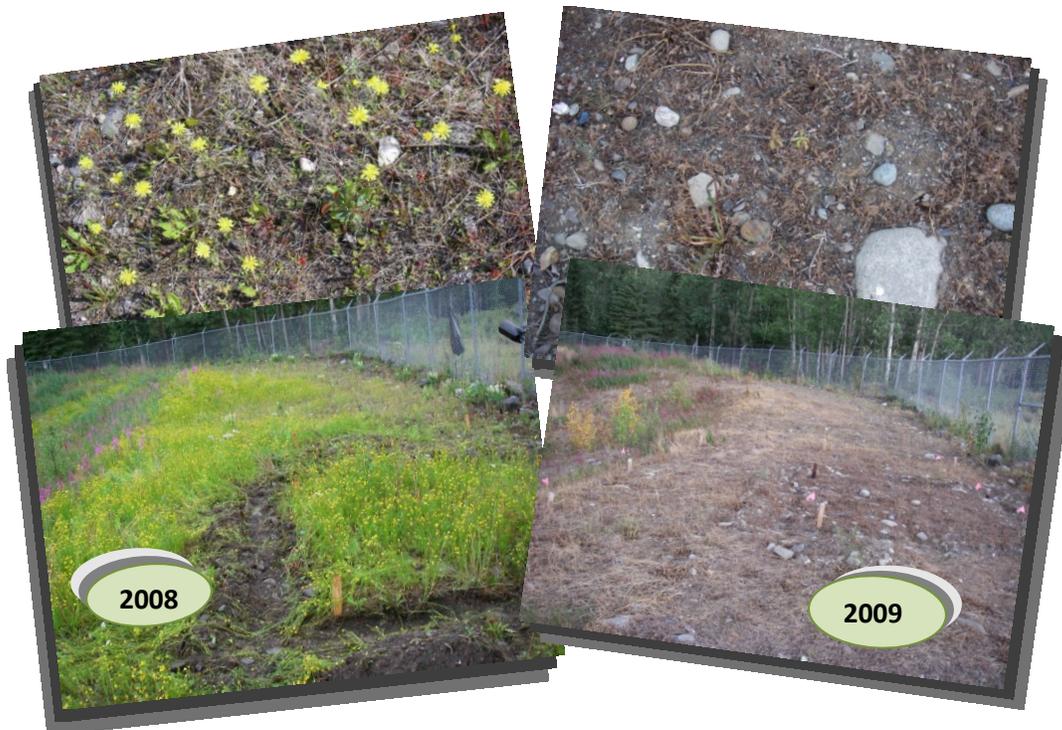


Figure 1. Before and after treatments with chemical herbicide application is shown.



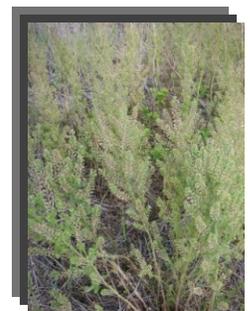
Erysimum cheiranthoides (wormseed mustard) is described as having, “stems 80cm or more high, pubescent with malpighiaceous hairs, leafy, much branched.” (Hulten 350) It has minute yellow flowers that grow in racemes. This invasive was collected on the Park Road between Wonder Lake Campground and Kantishna, approximately miles 85-92. This particular mustard tends to come in on construction equipment that is used on culvert replacements. With the help of volunteers during the Dandelion De-Vegetation project, eighty five pounds of the mustard were collected. The ranking of this particular invasive is not considered in the weed ranking project.

Hieracium umbellatum (narrow leaf hawkweed) was discovered growing along the Parks Highway around mile 232 with numerous other invasive plants. Five pounds were collected. The ranking of this species on the weed ranking list is 54. With the threat of the closely related *Hieracium aurantiacum* (orange hawkweed) down the Parks Highway near Talkeetna, Alaska, this particular invasive will need to be closely monitored in the future. The distinguishing characteristic of this invasive from that of *C. tectorum* is the larger flower that is over a half inch in width and doesn't have a basal rosette.



Hordeum jubatum (foxtail barley) is a grass that has pale green to reddish spikes on the inflorescence with numerous bristle-like awns (AKEPIC 142). This is considered a native grass with aggressive invasive tendencies in frequently disturbed sites. The invasiveness ranking for foxtail barley is sixty three. There were several areas where *H. jubatum* was particularly aggressive in the frontcountry around the train depot, the I & R airstrip, and the Sewage Lagoon. No weights were recorded as other invasives were focused upon.

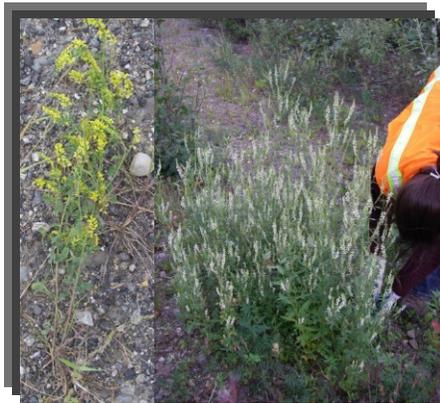
Lepidium densiflorum (common peppergrass) is a grass characterized by its branched stem, inconspicuous flowers, and abundant seed pods. It is distinguished from other *Lepidium* species by absent petals (AKEPIC 94). The invasive ranking for this species is 25 and is therefore not considered high priority. With low priority status, there were no weights recorded. This weed can be observed throughout the frontcountry region.





Linaria vulgaris (yellow toadflax) is distinctive by its terminal cluster of yellow and orange flowers and narrow pale green leaves that are alternating all the way up the stem to the terminus (AKEPIC 182). Toadflax has rhizomes that are difficult to remove from the rock of the train depot area where it is found. Assistance of dandelion diggers is needed to gently remove from the rocky substrate as well as a good deal of patience. Three pounds were pulled. No other populations have been noted. The invasive ranking of this plant is 61.

Matricaria discoidea (pineapple weed) can be distinctive by the terminal bud having a rounded pineapple textured appearance, hence its designation. The ranking for pineapple weed is 32. No specimens were weighed as it is deemed low priority. This species is found throughout the frontcountry in highly disturbed gravel sites.



Melilotus spp. (tall white sweetclover and yellow sweetclover) are three leaved, branching, upright, and have multiple floral racemes (AKEPIC 102). The invasiveness ranking is 81 and 69 respectively. *Melilotus spp.* was primarily observed around the train depot, along the Parks Highway, and in Glitter Gulch. Several isolated populations were found along the park road by the Rock Creek Bridge, the C-Camp propane field, and along the park road between the train depot and the Wilderness Access Center. Easily removed by hand pulling and the use of dandelion diggers, ninety five pounds were collected and

disposed of.

Phleum pretense (timothy grass) was suspected to be found in a ditch near Glitter Gulch. The seed head is distinctive, “by its compact, cylindrical panicles that are spike-like, dense, and several times longer than wide,” from that of the native variety which is half the size or smaller. (AKEPIC 146) The invasiveness ranking is 54. No specimens were collected or weighed.



Plantago major (common plantain) is characterized by its deeply ribbed ovate wide margin leaves that form a basal rosette. The flowers are formed in stalks and are a greenish white color that becomes brown (AKEPIC 211). This species is frequently found in highly disturbed gravel sites in the frontcountry. It has a ranking of 44. No control efforts were made.

Stellaria media (common chickweed) creeps along the ground by stems that root at node on one side and is distinguished from the native species by the notched petals of the flowers (AKEPIC 203). The invasive ranking is 42. This species can be found around in the frontcountry area around heavy foot and vehicle traffic areas. No specimens were collected or weighed.



T. officinale, the common dandelion, has deeply toothed leaves, a lighter green color, and bracts that fold downward toward the soil versus the native variety, *T. ceratophorum* (AKEPIC 78), that has a more delicate habit, a deeper green color to the leaves, and bracts that are upright. The Dandelion De-Vegetation Project was designed to address this tenacious invasive in which volunteers and the EPMT collected two hundred twenty five pounds by use of dandelion diggers and hand pulling methods.

The areas that were targeted were miles 1-42 and miles 75-92 along the park road, Wonder Lake Campground, and the Kantishna Airstrip. The invasiveness ranking for common dandelion is 58.

Trifolium spp. (alsike, red and white clovers) are a palmate three-leaved plants that have red to whitish flowered, with erect stems that do not root at the nodes (AKEPIC 115). These perennials are found throughout the front country along roadsides and in gravel parking lots. The white clover (*T. repens*) and alsike clover (*T. hybridum*) are highly abundant in the park headquarters and train depot areas. The red clover (*T. pretense*) was pulled along the park road between the Wilderness Access Center and the railroad crossing in which 10 pounds were collected with the use of a shovel. The invasive ranking for these species is between 53 and 59.



Tripleurospermum perforata (false scentless mayweed) have distinctive narrow branched threadlike leaves alternately arrange on the stem and a flower head that has white petals and yellow center disc (AKEPIC 57). This weed is ranked 48 according to the Alaska Weed Ranking Project. False scentless mayweed was found at the train depot where 20 pounds were removed by hand-pulling.

Vicia cracca (bird vetch) has tendrils that grasp on to other plants for support at the end of the each leaflet, rhizomes, and one-side purple multi-flowered racemes (AKEPIC 107). The invasiveness ranking for this species is 73. Many sites were returned to this season to inventory and control bird vetch where 15 pounds were collected. The power plant, the park road between the Wilderness Access Center and the railroad, the northeast end of the I&R Airstrip, the McKinley Chalet entrance area, and the Riley Creek Mercantile bus stop, and the train depot on the northwest side of the tracks were such sites. A new population of *V. cracca* was found along the Parks Highway near mile 232. The C-Camp propane field population was no longer noted to exist. Dandelion diggers were effective tools in gently removing the rhizominous root system of bird vetch from the soil. Figure 2 illustrates the locations of the *V. cracca* sites.

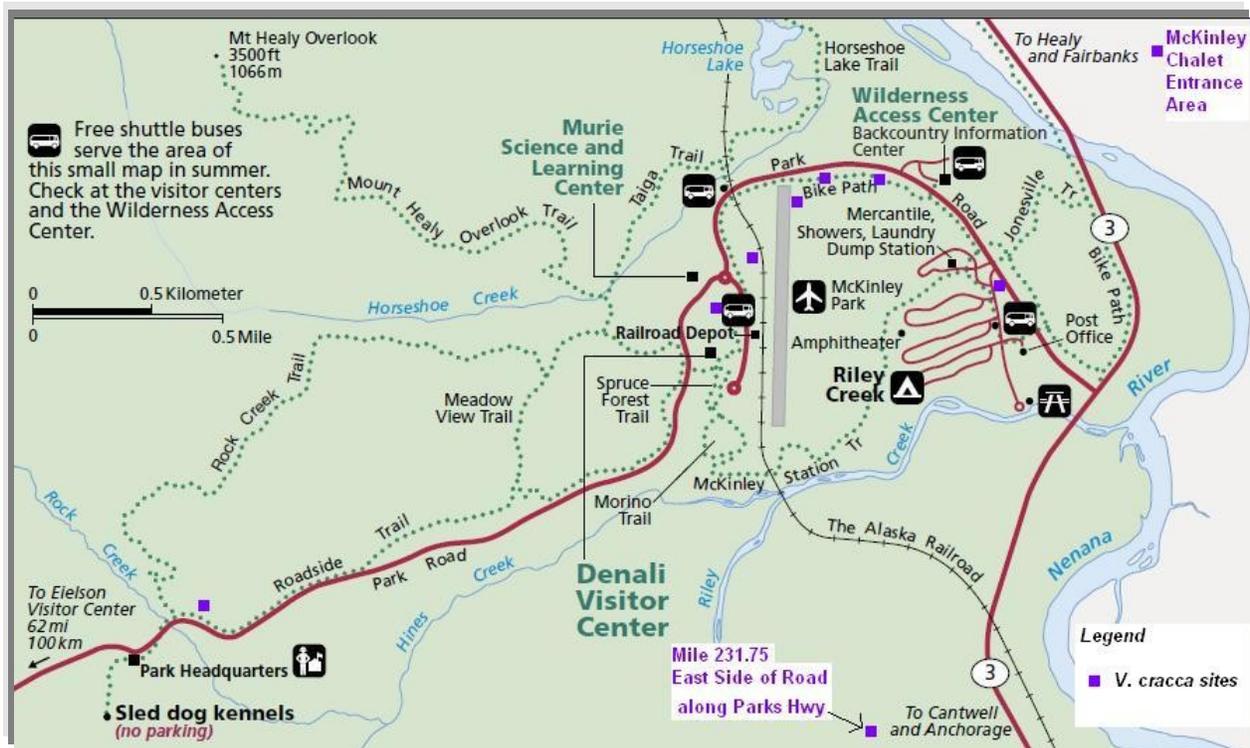


Figure 2. *Vicia cracca* sites are shown in this entrance area map of Denali National Park. (Map source: <http://www.nps.gov/dena/planyourvisit/maps.htm>)

Discussion

Successes

Drastic measures were taken with the *Crepis tectorum* population due to a scheduled construction project that will take place later this season and next year at the Sewage Lagoon. With the hopes that by applying the herbicide, this application would dramatically decrease the seed source for next year's

population in so as to prevent the further spread of seed by construction disturbance. Several sweeps have occurred to control the population that is creeping out of the Sewage Lagoon and along the park road from the George Parks Highway entrance to the Denali Visitor Center. With these sweeps, fewer are needed and resulting weights compiled from these sweeps are less this season in previous years.

In years past, many volunteer groups and EPMT members have spent many hours and days pulling thousands of pounds of *C. tectorum* with little to no improvement in reduction of the population. The EPMT has devoted approximately 20 hours to this invasive this year in herbicide application and approximately 50 hours in hand pulling treatment. Inside the lagoon, the herbicide treatment appears to have significantly impacted the population growing inside the fence this season and thus the EPMT feels confident that the treatment will produce expected results of significantly reduced seed population.

Melilotus alba proved to be another invasive in which the EPMT allocated a large amount of time in controlling this season. Taking the control efforts outside the park along the George Parks Highway is a means of prevention of spread into the park along the Park Road where several small populations are established. The train depot continues to be an avenue in which this invasive is vectored and thusly will be a constant monitoring concern.

There is a credible difference observed from years past to this year in regards to the Kingfisher Creek Sign population along the Parks Highway. In previous years, several volunteers and EPMT staff took many hours to remove the *M. alba* from beneath the sign and surrounding hillside. This season only one EPMT staff member required forty five minutes to remove the population beneath the sign and one hour to remove surrounding escaped specimens from the hillside down slope of the sign. In 2006, a total of thirty six hours by volunteers and EPMT staff was spent working by the Kingfisher sign. Further success is observed on the hillside by the McKinley Village in which it appears to be free of any *M. alba*. In the past, several volunteers and staff took an hour to control the population on this hillside.

Along the Parks Highway at mile 232.5, the massive population of *M. alba* has since dwindled to a much smaller population in which the 2 members of the EPMT staff could effectively control in just a matter of a few hours. In 2005, 13 people took 65 hours to collect 200 pounds compared to 2009, in which two team members collected approximately 20 pounds in less than two hours.

Historical populations of *Vicia cracca* were returned to and removed in order to prevent further spread of this precarious weed. A new and rather large population had been discovered along the Parks Highway while another population appears to have been eradicated from the C-Camp propane field. The steam plant near Park Headquarters is a location historically known to have bird vetch but is not detected this season. The few stems that were removed beside the auto shop in the last two years have not made a re-emergence nor has there been detection of the bird vetch at Fanny Quigley's cabin at the end of the park road this season. The *V. cracca* near the large *Melilotus officinale* population on the hillside near Aramark housing has appeared to have disappeared as well.

Volunteer Efforts

Volunteers remain a large proponent of the achievements made in eradication and control efforts in the park. During the second and third weeks in June, 147



of volunteer hours were devoted to removing *Taraxacum officinale* from the park road. Six volunteers helped to remove one hundred eighty five pounds of dandelions during the Dandelion De-Vegetation Project. With their assistance, the EPMT were able to remove all visible populations from the Park Headquarters to end of the park road at the Kantishna Airstrip.

Their assistance is also vital in the collection of seed for the Need for Seed Project. One hundred eighty six hours total volunteer hours from ten volunteers were devoted to collecting the seeds of *Poa*



alpina (alpine bluegrass), *Agropyron ssp.* (wheatgrass), *Oxytropis campestris* (milk vetch), and *Hedysarum alpinum* (Eskimo potato). These efforts continually re-supply the seed bank for future re-vegetation projects after construction disturbance. This in turn helps to keep these areas seeded with native plants rather than create areas in which invasive plants can gain a foothold.

Education & Outreach

The Murie Science and Learning Center (MSLC) allow visitors an opportunity to learn about the exotic plant management efforts in the park as well as the Denali Visitor Center through an interactive media console. Pamphlets are frequently re-supplied to the MSLC as many visitors take an interest in the need to control invasive plants. In many ways, this could be considered a success as indirect education is accomplished through the supplication of these pamphlets. Visitors are becoming more informed and will learn how to take appropriate measures to reduce the spread of invasive plants and in turn also learn about their impact on the natural landscape.

Encounters with the public while monitoring and control measures are being made are also a way in which to educate and engage the public in the efforts of the EPMT. Often, word of mouth can be a very powerful tool in creating awareness of invasive plant management issues. Volunteer education is important as well in that these individuals can better impart the knowledge gained from their experience as a volunteer to others to encourage prevention measures of spreading invasives in the future.

Informational reports inserted into weekly employee newsletters encourages park staff to better seek out populations of exotic plants in so that more eyes are on the lookout for invasions. Interpretative rangers seek out information from the EPMT to further enhance their programs to the public on invasive plants. These programs further indirectly help the mission of the EPMT as well in informing the public of invasive plant issues.

The EPMT spent two days with the Denali Discovery Camp (organized by the Murie Science and Learning Center and the Denali Education Center) for children which provided an avenue that created awareness in young adolescents for the need to control invasive plants and why.

Issues

With a lack of funding this season for several large volunteer groups, such as Youth Conservation Corps (YCC) and Southeast Alaska Guidance Association (SAGA), many invasive populations were overlooked or only mildly controlled. As these groups are essential to the control of invasive plants, prioritizing certain populations given the resources of the EPMT was a delicate matter. Only the most aggressive invasive plants were targeted. *T. officinale* and *H. jubatum* proved too large of populations for the EPMT to target this season in the front country area of the park. With limited resources as well, the EPMT had to manage the infestations differently in that only larger blooming plants were focused upon as they were easily identifiable and required less time and energy to control. Sites would be returned to if there appeared to be a resurgence of blooms such as in the case of *C. tectorum* sweeps.

The application of herbicide proved to have many political and legal issues tied to the treatment of *C. tectorum*. Application could only occur within the fence of the Sewage Lagoon because historically this area had been sprayed with herbicide before and the approval for such treatment had already been achieved. This approval was provided in order to keep vegetation growth to a minimum so that there would not be perforations in the lining of the sewage treatment ponds. Any approval sought for herbicide application outside the Sewage Lagoon has proven futile. Legal issues prevent this despite the need for application directly outside the Sewage Lagoon near the burn pile. Hand pulling treatments will continue in this area until such time these issues are resolved.

Future Goals

- Monitoring and control of *C. tectorum* in the Sewage Lagoon area.
- Re-vegetation of the Mile 4 slopes.
- Monitoring and control of train depot invasives; Parks Highway mile 231.75 plethora of invasives.
- Monitoring and control of the heavy infestations of *H. jubatum* and *T. officinale* in the front country.
- Seed collection activities for future re-vegetation projects.
- Continued focus on a high disturbance and human traffic areas for possible new pioneering populations.

Summary

Table 2. Species, location and the weight in pounds of invasives are displayed for the 2009 field season for the Exotic Plant Management Team monitoring and control efforts. The location summary is F = Frontcountry general; PK = Park Road; PH = Parks Highway; and TD is for Train Depot.

Species	Common Name	Location	Lbs
<i>Chenopodium album</i>	Lambsquarter	F	0
<i>Crepis tectorum</i>	Narrowleaf hawksbeard	F, PK, PH, TD	135
<i>Erysimum cheranthoides</i>	Wormseed mustard	PK	85
<i>Heiracium umbellatum</i>	Narrow leaf hawkweed	PH	5
<i>Hordeum jubatum</i>	Foxtail barley	F	0
<i>Lepidium densiflorum</i>	Peppergrass	F	0
<i>Linaria vulgaris</i>	Yellow toadflax	TD	3
<i>Matricaria discoidea</i>	Pineapple weed	F	0
<i>Melilotus alba</i>	Tall white sweetclover	F, PK, PH, TD	95
<i>Melilotus officinalis</i>	Yellow sweetclover	PH	1
<i>Phleum pratense</i>	Timothy grass	PH	0
<i>Plantago major</i>	Common plantain	F	0
<i>Stellaria media</i>	Common chickweed	F	0
<i>Taraxacum officinale</i>	Common dandelion	F, PK, PH, TD	225
<i>Trifolium spp.</i>	Alsike, red, and white clover	F	10
<i>Tripleurospermum perforata</i>	Scentless false mayweed	TD	20
<i>Vicia cracca</i>	Bird vetch	F, PK, PH, TD	15

Sources

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