INVASIVE PLANT MANAGEMENT PROGRAM

Wrangell-St. Elias National Park and Preserve

2008 Seasonal Report

Lil Gilmore and Tamara Harper
Biological Technicians
Wrangell St.-Elias National Park and Preserve
Mile 106.8 Richardson Highway
P. O. Box 439
Copper Center, Alaska 99573

TABLE OF CONTENTS

Page 2 INTRODUCTION

Page 2 OBJECTIVES

Page 4 METHODS

Page 4 RESULTS

- Eradications
- Vouchers Collected
- Fieldwork By Location

Page18 PLANT SYNOPSES AND RECOMMENDATIONS

- *Crepis tectorum*
- *Leucanthemum vulgare*
- *Melilotus alba*
- *Taraxacum officinale*
- *Vicia cracca*
- *Lappula squarrosa*
- *Tripleurospermum perforata*
- *Caragana arborescens*
- *Hordeum jubatum*
- *Bromus inermis and Phleum pratense*

Page 23 EDUCATIONAL PROJECT

Page 23 RECOMMENDATIONS

- Education and Public Involvement
- 2009 Field Season
- 2009 Recommended Schedule

Page 28 TABLE 1: PLANT LIST

Page 29 TABLE 2: AKEPIC WEED RANKING TABLE

Page 31 TABLE 3: POSTER FROM INVASIVE PLANT EXHIBIT

SOURCES

Front cover: Uncorrupted by invasive species, the natural landscape produces both beauty and sustenance for animals and humans. Photos were taken on the McCarthy Road and at the scenic overlook at Park Headquarters. All photographs in the report were taken by Lil Gilmore and Tamara Harper.

INTRODUCTION

This report, prepared jointly by Lil Gilmore and Tamara Harper, describes the 2008 season of the invasive plant management program in Wrangell-St. Elias National Park and Preserve. Wrangells is the largest park in the nation, encompassing more than 13 million acres. It is also part of the largest protected ecosystem on the planet.

Although two roads, numerous off-road vehicle trails, and 16 maintained backcountry landing strips provide access to the Park/Preserve, the majority of it remains inaccessible to all but foot traffic. This is both a blessing and a curse. Lack of motorized traffic protects the land from the worst of the disturbances that invite colonization by invasive plants. It is, however, possible for some invasive plants to establish in undisturbed locations. They also take advantage of non-human sources of disturbance such as changing streambeds, mudslides, and other natural events. Without human visitation, these populations will remain undiscovered and uncontrolled until they are beyond control. Conversely, the existing roads and trails that allow plant populations to be monitored are also a major factor in creating disturbed areas suitable for invasion. Landing strips and abandoned home sites also offer a welcome to invasive plants. In-holders in the Park/Preserve grow non-native plants for food and ornamental value. Some of these plants have escaped cultivation and are moving onto public lands. Although the majority of these escapees lack the characteristics that define an invasive plant, a few are true menaces.

Since 2004, plants designated "invasive" have been inventoried, monitored, and weeded on a small percentage of Park/Preserve lands and on the roads and trails leading into and surrounding it. Beginning in 2005, the Exotic Plant Management Program helped fund a seasonal employee at Wrangell-St. Elias to work with the invasive plant program. During the 2007 season an intern from the Chicago Botanic Garden was stationed in McCarthy. This proved beneficial to the program so, in 2008, a second Biological Technician was hired specifically for the McCarthy/Kennecott region.

Having an employee stationed in an area provides him or her with a valuable opportunity to access the knowledge of the local residents. It can also help "demystify" the concept of invasive plant control and remove it from the joke or outrage category of "What, you're wasting my tax money pulling the sweetclover! It smells so good!" to a deeper understanding of what invasive species can do to a known and loved landscape. Without help from local residents, there can be little expectation that eradication or containment of invasive plants is possible.

OBJECTIVES

This season plants assigned an invasiveness rank of 50 or higher in the Alaska Natural Heritage Program database were the primary focus of work. Work with lower ranking plants was at the discretion of the Biological Technicians. Some invasive plant populations are so pervasive that hand weeding is not a viable means of control. The technician may decide that plants with a lower ranking will need so little time to control that the return outweighs the effort. Plant rankings are noted in parenthesis after the first mention of a species and again after the plant name in the "Plant Synopses and Recommendations" section. More information about the Natural Heritage Program is available at http://akweeds.uaa.alaska.edu/.

The following objectives and goals were determined by Lil Gilmore and Tamara Harper, guided by recommendations from the 2007 Season Report:

- Airstrips
  - inventory invasive species growing on and around designated airstrips.
- Kennecott/McCarthy
  - monitor and weed *Leucanthemum vulgare* (oxeye daisy, rank 61) in Kennecott and the *Taraxacum officinale* ssp. *officinale* (common dandelion, rank 58) populations on the Root Glacier Trail, Bonanza Mine Trail, and the Jumbo Mine Trail;
  - monitor and weed populations of *Bromus inermis* (smooth brome, rank 62), *Crepis tectorum* (narrowleaf hawksbeard, rank 54), *Linaria vulgaris* (yellow toadflax, rank 69), *Phleum pratense* (common timothy, rank 56), *Trifolium hybridum* (alsike clover, rank 57), *Trifolium pratense* (red clover, rank 56), *Trifolium repens* (white clover, rank 59), and *Hordeum jubatum* (foxtail barley, rank 63);
  - survey new locations.
- McCarthy Road
  - if weather and river conditions allow, inventory and collect vouchers from a possible *Vicia* sp. reported growing on the far bank of the Lakina River;
  - inventory Mile 50 to Mile 60;
  - monitor the population of *Leucanthemum vulgare* at Mile 10.9 and, with permission, weed the area;
  - monitor and weed *Crepis tectorum* at Mile 7 and Mile 59;
  - survey new locations.
- Nabesna Road
  - monitor and weed *Melilotus alba* (white sweetclover, rank 80) at the junction of the Tok Cut-Off and Nabesna Road and on the Slana Fishwheel Trail;
  - monitor and weed *Crepis tectorum* at Mile 11;
  - inventory the first few hundred feet of the Suslota Lake Trail and the Copper Lake Trail;
  - monitor and weed *Lappula squarrosa* (European stickseed, rank 44) at Dead Dog Hill rest area;
  - survey new locations.
- Headquarters
  - continue weeding;
  - assist in formulating a landscape plan;
  - monitor and weed the *Melilotus alba* at Mile 106 on the Richardson Highway;
  - collect and spread seed from native plants.
- Copper Basin
  - continue monitoring *Melilotus alba* populations throughout the Basin; focus on side roads.

METHODS

Plants were inventoried or monitored using Trimble GeoXT handheld units programmed with TerraSync software and a data dictionary developed by Jeff Heys, Alaska Exotic Plant Management Team Liaison, and Whitney Rapp, Alaska Exotic Plant Management Team Data Manager. The data collected was differentially corrected and edited using GPS Pathfinder Office. The corrected data was sent to Whitney Rapp.

Vouchers of unidentified plants were collected on the Copper River, in McCarthy, on the McCarthy Road, and on the Nabesna Road. They were labeled, pressed, and sent to Jeff Heys for identification.

Possible Orchis sp. collected on the McCarthy Rd

Lil Gilmore and Tamara Harper, Biological Technicians at the Park/Preserve, inventoried, monitored, and weeded invasive plants. During the season they were assisted in weeding by a seven member Southeast Alaska Guidance Association (SAGA) crew, four employees of the Youth Partnership Program (YPP), and seven volunteers. Manual methods, including pulling, digging, and cutting, were used to weed. Weeds were bagged and later burned by the Wrangell-St. Elias National Park maintenance department. A total of 99 bags was collected from Kennecott, McCarthy, the McCarthy Road, the Nabesna Road, Park Headquarters, and the Copper Basin. Bags were packed full and tied tightly.

The SAGA crew pulling white sweetclover in Slana.

When looking for previously unknown invasive plant populations, "plant scans" (walking or driving very slowly) were conducted along roadsides and trails. To survey designated road areas, the employee(s) parked at each milepost marker and walked approximately one-quarter mile on each side of the marker. Particular attention was paid to areas of obvious disturbance, such as gravel pits, pullouts, new culvert sites, etc.

RESULTS

Eradications

The following plants were considered eradicated as they have not been seen for a minimum of one season. One year may be an insufficient length of time to judge an eradication, as indicated by a reappearance of *Melilotus alba* after a two year absence. (See page 13.)

- *Crepis tectorum*: junction of the Tok Cut-Off & Nabesna Road; last seen, June, 2004; last looked for, July, 2008;
- *Crepis tectorum*: Mile 11, Nabesna Road (unused gravel pit); last seen, August, 2006; last looked for, July, 2008;

- *Crepis tectorum*: Mile 31, Nabesna Road; last seen, June, 2004; last looked for, June, 2008, Several creeks run across the road between Mileposts 29 and 35. They shift channels frequently and may have washed the *C. tectorum* downstream;
- *Descurainia sophia*: Little Jack Creek Bridge; last seen, August, 2006; last looked for, July, 2008, In 2006, one very large plant was found. It was pulled before it went to seed.;
- *Lappula squarrosa*: Mile 17.9 Nabesna Road, in front of the vault toilet at the Dead Dog Hill Rest Area; last seen, August, 2007; last looked for, July, 2008.

Vouchers Collected

teh 001: possible *Taraxacum ceratophorum*, 13 June 2008, Copper River
teh 002: possible *Astragalus* sp., 13 June 2008, Copper River
teh 003: unknown, 16 June 2008, Copper River
teh 004: unknown, 24 June 2008, McCarthy westside NPS facility
teh 005: possible *Galium triflorum*, 30 July 2008, McCarthy road, mile 59
teh 006: possible *Descurainia richardsonii*, 7 August 2008, McCarthy, private property
teh 007: possible *Galeopsis tetrahit*, 21 August 2008, McCarthy, downtown road
teh 008: unknown, 3 September 2008, Rowcon gravel pit, McCarthy
teh 009: possible *Senecio* sp. and *Erigeron* sp., 3 September 2008, Rowcon gravel pit, McCarthy

There is no botanist at Wrangell-St. Elias National Park this season so the vouchers have not yet been identified.

Fieldwork By Location

Fieldwork in 2008 focused on the seven locations discussed in this report: Remote airstrips/backcountry sites, Kennecott, McCarthy, the McCarthy Road, the Nabesna Road, Park Headquarters, and the Copper Basin.

Remote Airstrips/Backcountry Sites

Remote airstrips are potential locations for introduction and dispersal of invasive plants. Two backcountry airstrips were surveyed for the first time in July. The Tana River and Ross Green Lake airstrips in the Chugach Range were both inventoried and no invasive species were found. Attempts were made to inventory several other remote airstrips in this area of the park, but poor weather conditions prevented the flights.

Possible native dandelion found along Copper River, near Spirit Mountain.

Several locations on Park/Preserve and United States Forest Service (USFS) lands along the Copper River between Chitina and Cordova were surveyed in early June. The following sites were either informally surveyed or GPS mapped/inventoried and three vouchers were gathered: a gravel bar campsite just upriver from Spirit Mountain

(possible native *Taraxacum* sp. and possible *Astragalus* sp. specimens taken); Park/Preserve land at Dewey Creek; USFS easement land at Cleave Creek; USFS easement land at Jackson Creek; USFS easement land called "Copper River site" north of the Tasnuna River; USFS easement land at Heney Glacier Creek; USFS easement land at Shiels Glacier Creek; USFS easement land at the next drainage downriver from the Wernecke River (unknown specimen taken); and a USFS easement site in Baird Canyon. No known invasives were found, but identification of the specimens will be needed for confirmation.

Students from the Wrangell Mountains Center's College Field Program's traverse a different area of the park each summer, enabling them to report invasives in remote locations that could otherwise go unnoticed. As an organization, the Wrangell Mountains Center is supportive of the invasive plant management program at the Park/Preserve and informally monitors the areas they hike for exotic species. This year they did not return to the exact location in the Hidden Creek drainage where they saw a possible invasive *Taraxacum officinale* spp. *officinale* in 2007, and so were unable to make an identification this year.

The group reported a large infestation of *Matricaria discoidea* (pineapple weed, rank 32) on the island in the Lakina River at the confluence with Mill Creek. The main airstrip on the Lakina, commonly called the "island strip", is located here and is frequently used by air charter operators. A big game hunting operation uses this airstrip and island for their guided hunting activities, including corralling and feeding their pack horses. The pineapple weed may have been introduced in imported hay or livestock feed.

Kennecott

The goal of the work done in Kennecott and on the area's trails was to keep invasive species from spreading from the town site farther into the surrounding park. *Taraxacum officinale* ssp. *officinale*, and *Leucanthemum vulgare* are the species of highest concern in the Kennecott area.

Leucanthemum vulgare remains the highest priority in the Kennecott town site. For the fifth consecutive year, the main infestation on the slope behind the Jurick building was treated again. All flowering plants were pulled, as well as many smaller plants, but the surrounding thick vegetation makes complete removal difficult. Retreatment will need to continue for several more years in order to eradicate this infestation.

The Leucanthemum vulgare infestation in Kennecott has decreased in size after five seasons of control.

Two other populations on private property were also controlled this summer. The flowerbed behind Kennicott Wilderness Guides was retreated for the second year in a row, with nearly all plants removed. The population inventoried on Silk Stocking Row last year was monitored this year and treated for the first time with consent from the owners. Kennicott Glacier Lodge was contacted again about their large oxeye daisy population, which they wish to keep. Therefore, control was not possible.

Various other invasives, including *Phleum pratense*, *Stellaria media* (common chickweed, rank 54), *Capsella bursa-pastoris* (shepherd's purse, rank 40), *Elymus repens* (quackgrass, rank 59), *Matricaria discoidea* and *Plantago major* (common plantain, rank 44), were inventoried in various locations throughout Kennecott during the 2007 season, but were not controlled this year. *Taraxacum officinale* spp. *officinale* is abundant in the town site, but due to time and personnel constraints, only a small portion was controlled.

The trails leading into the park are vectors for the dispersal of invasives from Kennecott, due to their foot, off-road vehicle (ORV), and vehicle traffic and disturbance. Kennecott has numerous invasives, *Taraxacum officinale* spp. *officinale* being the most pervasive, and it serves as a seed source for outlying areas in the park. Monitoring over the past several years and this summer shows that *T. officinale* spp. *officinale* is moving into the park along the Root Glacier, Bonanza Mine and Jumbo Mine Trails. Because they are the main avenues along which invasives spread, these trails require vigilant attention and work to prevent further colonization. The Root Glacier Trail was monitored and weeded out to Amazon Gulch, approximately 2 miles from Kennecott, with the help of three volunteers over four days. Wrangell-St. Elias National Park Education Coordinator Glenn Hart also brought four youth volunteers, as part of the Youth Partnership Program (YPP), in June and they pulled dandelions on both the Root Glacier Trail and the lower part of the Bonanza Trail for three days. The infestations on the Root Trail are mostly confined to the trail corridor and are both small and distinct enough that annual weeding seems to be adequate management.

Volunteer Jen Jolliffe pulls Taraxacum officinale spp. officinale along the Root Glacier Trail.

Taraxacum officinale spp. *officinale* was monitored and retreated on the Bonanza Mine Trail, with the highest plants found at 1,564 meters. Infestations occur sporadically all along the trail, becoming more common and larger as the trail descends. The stretch of trail between 1564 meters and 1,220 meters was weeded with the help of two volunteers, and these populations were thoroughly removed. Below this elevation, the trail becomes more infested with dandelions, as

well as *Trifolium* sp. and *Matricaria discoidea*, and a crew working for several days would be needed to make real progress on this lower section. The Jumbo Mine Trail cuts off from the Bonanza Mine Trail and is not as infested with *T. officinale* spp. *officinale* as Bonanza. Several single, small plants were found high up the trail at tree line, and were removed. A 300 foot stretch of trail, above where it crosses Bonanza Creek, is highly infested with large plants growing under thick alders. Two people weed spent one day weeding this large infestation on the Jumbo Mine Trail.

SCA volunteer Tim Cole weeds Taraxacum officinale spp. officinale from upper Bonanza Mine Trail.

McCarthy

McCarthy town site has several species of invasive weeds, many on private property. Control efforts occurred with consent of property owners. A small *Linaria vulgaris* (yellow toadflax, rank 69) population continues to grow in the Wrangell Mountains Center flowerbed, and it was retreated again this year. A new *L. vulgaris* population was discovered on Donoho Avenue in the downtown area and was treated for the first time. Donoho Avenue, alongside the Herben cabin, which is owned by the Park/Preserve, is infested with many species that arrived in some hay four years ago when it was used for a horse and goat corral. Many of these weeds continue to thrive and proliferate today. *Crepis tectorum* was retreated again this year in this area, as well as *Silene noctiflora* (night-blooming cockle, rank 45), *Hordeum jubatum* (foxtail barley, rank 63), and a newly discovered infestation of *Galeopsis tetrahit* (hempnettle, rank 40). *Bromus inermis* (smooth brome grass, rank 62) was mapped here, but the infestation is too large and dense to make any real progress by hand-pulling.

A new patch of Linaria vulgaris found in McCarthy this season.

The large *Caragana arborescens* (Siberian peashrub, rank 66) bushes on private property were monitored this year and the seedlings, all within a few feet of the bushes, were pulled with full cooperation of the owner. One seedpod full of tiny sprouts was found down the road from the bushes and was removed. The peashrubs are within 100 feet of the McCarthy Creek floodplain and therefore, the potential exists for the creek to transport seedpods downriver and into the park. McCarthy Air has two small populations of *Leucanthemum vulgare* in its front flowerbeds. They were monitored this year, but the owner did not want them pulled.

Locations in the greater McCarthy area were also surveyed and controlled. The McCarthy airstrip is of particular importance due to the high number of planes departing into the backcountry of the Park/Preserve. Early in the summer, the airstrip was inventoried for high-

priority invasives and *Hordeum jubatum*, *Taraxacum officinale* spp. *officinale*, and *Trifolium* ssp. were found. The latter two species were pervasive enough that one person could not make much progress toward eradication. The airstrip was monitored again in late July, and small infestations of *Hordeum jubatum*, *Taraxacum officinale* spp. *officinale*, *Descurainia sophia* (flixweed, rank 41), and *Chenopodium album* (common lambsquarters, rank 35) were pulled along the entire airstrip. *Trifolium hybridum* and *Trifolium repens* are still well established in the McCarthy area, including on the road to the McCarthy airstrip, the road between McCarthy and Kennecott, and in many private yards. It is widespread enough to require many people and many days of pulling.

Hordeum jubatum infestations along the McCarthy airstrip were pulled this summer.

A new, privately-owned gravel pit near the airstrip was surveyed for the first time this year. It is the gravel source for many construction jobs in the area. It could potentially spread invasives throughout the Kennicott Valley. It was initially inventoried early in the summer and only a few *Trifolium* ssp. and *Taraxacum officinale* spp. *officinale* plants were found and pulled. During another visit late in the summer, many *T. officinale*, *Trifolium* ssp. and *Matricaria discoidea* were pulled. Three vouchers of unknown plants were also taken for identification. Two of those vouchers have been identified as a native groundsel and a native fleabane, but the other remains unknown. The constant disturbance in this gravel pit and the frequent transport of material to locations all over the valley make it ideal for invasive species' establishment and dispersal. Annual monitoring and control of weeds there will be essential.

New Galeopsis tetrahit infestation found on road in McCarthy, in area formerly used as horse corral.

The Wagon Road, which parallels the main road from McCarthy to Kennecott, was monitored from where it starts just past the Tony Zak Community Center to where it cuts off to the airstrip. This stretch has small, sporadic patches of *Taraxacum officinale* spp. *officinale* and some *Trifolium* ssp., but no other higher-ranked invasives. Trails leading off the Wagon Road onto parkland at the toe of the Kennicott Glacier and the burn pits at the ends of these trails were inventoried for the first time this year. These trails and burn pits get significant foot and off-road-vehicle traffic and therefore, could be vectors of weed dispersal into the park. So far, *T. officinale* spp. *officinale* has not spread far enough to populate the park, but it is moving in that direction. The island between the two channels of the Kennicott River had a couple infestations of *Lappula squarrosa*, one previously treated and one new. The large population at the end of the island airstrip (noted in previous

reports as near the church) was treated again this summer, as was a new smaller population on the road close to the west channel footbridge. Also near this footbridge was a small population of *Thlapsi arvense* (field pennycress, N/A) that was removed.

Monitoring and control work in McCarthy also occurred on the west side of the Kennicott River. The *Linaria vulgaris* population near John Adams' airstrip that was discovered last year grew back this year and was retreated before any of the plants could flower and seed. In this same area, on the road into the Park/Preserve westside facility, the *Crepis tectorum* was retreated several times this summer. The infestation is getting smaller, but the number of tiny plants has made it hard to eradicate so far. Monitoring and continuing control efforts will be recommended next year. Also on this road near the *C. tectorum*, a large, distinct population of *Hordeum jubatum* was mapped and pulled for the first time this summer. One *C. tectorum* plant was found near the gate to the Kennicott River vehicle bridge; it was mapped and removed and no other plants were found in this area.

SCA volunteer Dana Chandler removes invasive dandelions from the NPS visitor kiosk on the McCarthy Road.

The Park/Preserve visitor kiosk had several invasive species which required attention. The grounds around the building, as well as large portions of the parking lot, are infested with *Taraxacum officinale* spp. *officinale*. Several days were spent pulling dandelions with the help of two other National Park Service employees. *Hordeum jubatum* and *Lappula squarrosa* are also prevalent and were treated several times during the season. The visitor kiosk could be a more authentic and educational place for visitors if native vegetation grows there instead of invasive weeds.

Starting at this kiosk, a trail follows along the west side of the Kennicott Glacier. The gravel path from the kiosk leading to the trailhead was surveyed for the first time this year and some dandelions were found; after the trail goes into the spruce forest in the park, no invasives were found.

The site on the west side of McCarthy with the most serious infestations is private property along the road at Mile 59. Now owned by the Kennicott River Lodge and Hostel, the invasives were brought to the site about three years ago in contaminated hay used for a former horse corral. The corral is now gone, yet the invasives remain. The owner was agreeable to monitoring and control efforts on his property, and because of the large number of species and the extent of infestation, a lot of time was spent here. *Crepis tectorum* and *Phleum pretense* are the highest-ranked species in this area and of the most concern. Both were mapped, and the *C. tectorum* was weeded many times throughout the summer, but it is far from being eradicated. *Phleum. pratense* is the most pervasive, densely covering about .2 hectares so far, and is invading the spruce forest, displacing most native vegetation. The perimeter of the infestation was mapped in order to monitor its spread over time, yet no meaningful control is possible with hand pulling. The area is also populated with *Lappula squarrosa, Silene noctiflora, Hordeum jubatum, Descurainia richardsonii* (grey tansy mustard, ran N/A), *Chenopodium album, Matricaria discoidea*, and *Taraxacum officinale* spp. *officinale*. Most of these weeds were treated several times this season, but the area is overrun with so many weeds, it is difficult to make noticeable progress. Fortunately the owner has agreed to control efforts in this area but it will continue to be a seed source of numerous invasives. Other invasive species that continue to grow around McCarthy include *Polygonum aviculare* (prostrate knotweed, rank 45), *Plantago major* (common plantain, rank 44), *Capsella bursa-pastoris, Stellaria media,* and *Lepidium densiflorum* (common peppergrass, rank 25). Lower- ranked species like these do not receive much attention or control, due to limited people-power and time.

Phleum pratense invades spruce forest on private property in westside McCarthy.

McCarthy Road

Mile 50 to Mile 60 on the McCarthy Road was inventoried intensively this season. The survey was accomplished by parking at the milepost markers and walking approximately one-quarter mile each side of the marker. Although this left gaps in the coverage, it was a consistent method that allowed for a reasonably complete survey in the time available.

With the exceptions of *Bromus inermis, Taraxacum officinale* ssp. *officinale, Trifolium hybridum, Trifolium pratense,* and *Trifolium repens,* the invasive plants in this area are ranked below 50 by the Alaska Natural Heritage Program. *Descurainia sophia, Matricaria discoidea,* and *Plantago major* are the most prevalent of the lower ranked plants. *Lappula squarrosa* grows thickly from Mile 1-7.

Between Mileposts 29 and 34, *Descurainia richardsonii* is prevalent and was inventoried for the first time this season. Although this species is exotic, it is not listed on the Alaska Natural Heritage Program invasive ranking list and therefore, is not of high concern. This infestation probably proliferated in the disturbance caused by the roadwork done in 2006.

Of the plants ranked above 50, only *Crepis tectorum* was monitored and treated. It was located at Mile 7 at Mile 59, near the parking area for the West Side housing, and also on the Kennicott River Lodge and Hostel property. *Taraxacum officinale* ssp. *officinale, Trifolium hybridum, Trifolium pratense* and *Trifolium repens* grow along the entire road. The extent of their coverage makes it impractical to map or control them.

The population of *Leucanthemum vulgare* discovered in 2007 at Mile 10.9 was monitored but not weeded since it grows on private land. No new populations were found this season. This location should be monitored again in 2009.

Slana and the Nabesna Road

The Nabesna Road was monitored at the junction with the Tok Cut-Off, and from the Betty Freed property at Mile 2.4 to Mile 29. Due to flooding early in the season, the road after Mile 29 was in poor driving condition.

Approximately the first 200 to 300 feet of the Suslota Lake Trail and the Copper Lake Trail were inventoried. Due to equipment failure, these two trails were not included in the 2007 trail inventory. They are very wet off-road-vehicle trails and conditions are not conducive to walking. No invasive plants were found on either trail.

The Slana Fishwheel Trail was one of eight trails inventoried in 2007. A small population of *Melilotus alba* thought to be eradicated in 2004 was rediscovered at that time. The trail was monitored this season and *M. alba* was again present. Caribou Creek Trail, Viking Lodge Trail, Tanada Lake Trail, Trail Creek Crossing, Lost Creek Crossing, Skookum Volcano Trail, and Reeve Field Trail were also inventoried in 2007.

Invasive plants growing along the Nabesna Road include *Hordeum jubatum, Lappula squarrosa, Matricaria discoidea, Melilotus alba, Plantago major, Taraxacum officinale* ssp. *officinale,* and *Tripleurospermum perforata* (scentless false mayweed, rank 48). With the exception of *M. alba,* and *H. jubatum,* the populations of these plants are either small and/or widely scattered. The *M. alba* is confined to the area around the junction of the Tok Cut-Off and Nabesna Road and a short section of the Slana Fishwheel Trail. *Hordeum jubatum* grows in thick stands along the entire road. No effort was made to weed it this season. Only *H. jubatum, M. alba* and *T. officinale* ssp. *officinale* rank above 50 on the Alaska Natural Heritage scale.

The intensive weeding that has been done on the *Melilotus alba* at the junction of the Tok Cut-Off and Nabesna Road during the past four years is making a noticeable difference. In some areas the native vegetation is beginning to reappear. Growth of the *M. alba* is now much sparser in all areas except the north side of the road.

Lupine and fireweed growing in an area formerly occupied by white sweetclover.

This season, crew time and effort were focused on the north side of the junction where there had been very little weeding in past years. A SAGA crew, helped by Tamara Harper and Lil Gilmore, put in approximately 213 man hours pulling *Melilotus alba*. A YPP crew of four weeded at the junction for two days, and one volunteer contributed another four hours of labor. Lil Gilmore spent an additional seven hours weeding.

On the east side of the road, *Melilotus alba* was found growing thickly in the drainage ditch where seed had evidently washed down slope. Very few plants had gained a foothold on the hillside.

White sweetclover growing in a drainage ditch on the Tok Cut-Off near the Nabesna Road.

In 2004, a population of *M. alba* on the Slana Fishwheel Trail was inventoried and weeded. No plants were reported at this site in either 2005 or 2006. During a routine monitoring in 2007, 20-30 three-to-six inch, first year plants were discovered. Motorized vehicles are allowed on this trail and all plantlets were growing in the tire tracks. During the 2008 season, 15-to-20 plants were discovered. All were small first-year plants. They were pulled and bagged for disposal.

A clearing for a power line built in 2004 was inventoried this year. Because this line is about 200 feet from the junction, it seemed possible that *Melilotus alba* had moved into the disturbance. No sign of *M. alba* or any other invasive plants were found and the area was mapped as a “clean” location.

The Betty Freed property at Mile 2.4 on the Nabesna Road was monitored. Originally a private home, the property was donated to the Park/Preserve in 2001 and is used for seasonal housing. Many employees working on the Nabesna Road or in the backcountry stay at the Freed property and may become carriers for invasive plant seeds.

Remnants of a vegetable garden and other domestic plants remain on the site. Small, scattered populations of *Taraxacum officinale* ssp. *officinale, Matricaria discoidea, Plantago major* and *Tripleurospermum perforata* were the only invasive plants found. The *T. perforata* was weeded during each stay. It blooms over a long period of time and three to ten plants were discovered each trip. Although its rank of 48 in the Alaska Natural Heritage Program database put it outside this year's parameters for monitoring and weeding, the small amount of time and effort involved justified the control effort. One other population of *T. perforata* was discovered this season. The plants are part of a grave or memorial site at Mile 2. They were not inventoried or weeded. The *T.officinale* ssp. *officinale* was mapped growing intermixed with *Taraxacum ceratophorum*. They may be hybridizing. All *T. officinale* ssp. *officinale* plants were mapped, dug, and bagged. The *M. discoidea* and *P. major* populations were not monitored or weeded.

Scentless false mayweed growing at the Betty Freed property in Slana.

Several garden plants were discovered on the Freed property this season. Eighteen *Rheum rhabarbarum* (rhubarb) plants were inventoried. As discussed in the 2007 Seasonal Report for Glacier Bay, rhubarb is not presently listed as an invasive but is an extremely long-lived plant in Alaska that is worth watching. Several small clumps of *Iris* (genus) and *Allium schoenoprasum* (chives) were also located. These were not inventoried. The *A. schoenoprasum* should be mapped next season.

One of many surviving rhubarb plants at the Betty Freed property in Slana.

During the initial 2004 exotic plant inventory in Wrangell-St. Elias, *Crepis tectorum* was found at the junction of the Tok Cut-Off and Nabesna Road and at Mile 31 on the Nabesna Road. In 2006, a small population was inventoried and weeded in an abandoned gravel pit at Mile 11. No *C. tectorum* plants were found at any location in 2007 or 2008.

Matricaria discoidea is the most common invasive plant found on the Nabesna Road. Although the plant is pervasive between Mile 4 and Mile 29, the growth is rarely heavy. It is less common past Mile 29. The low rank and the difficulty involved in eradication have precluded any attempts to weed.

During the 2006 season, a single *Descurainia sophia* plant was found at Little Jack Creek Bridge. This plant was pulled and bagged. Its large size made it memorable; it measured 5'4". No plants were found in this location in 2007 or 2008.

No *Lappula squarrosa* plants were found on the Nabesna Road in 2008.

Park Headquarters

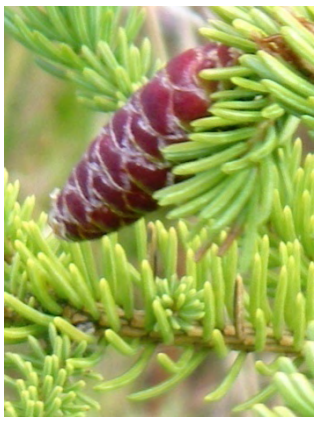
Park Headquarters moved to its current location in 2002. The surrounding area was left largely untouched during construction. The native *Populus tremuloides* (aspen) and other vegetation make an impressive backdrop. However, the actual building sites were cleared of all native vegetation and top soil contaminated with weed seed was spread around the buildings. This has led to a very weedy, unkempt landscape.

The half-mile Interpretive Trail winds through untouched native vegetation . . .

. . . and leads to occasional surprises such as this bear scat.

Crepis tectorum and *Hordeum jubatum* dominate the invasive populations that have established around Headquarters. The grounds are also infested with *Chenopodium album*, *Taraxacum officinale* ssp. *officinale*, and *Lappula squarrosa.* Attempts have been made to upgrade the grounds. It has not been a job priority and little has changed.

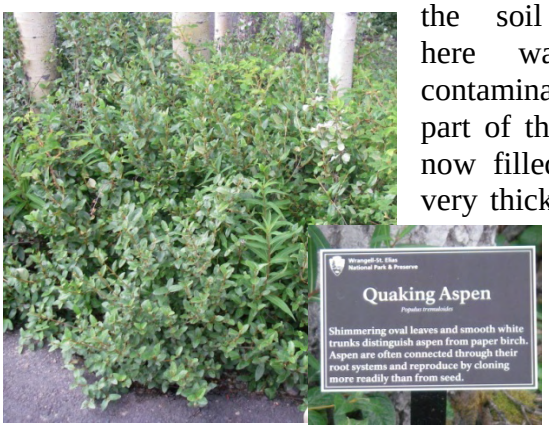
The highest priority areas are the entrance drive and sign circle, and the Visitor Center and the flag circle. These locations should be weeded each year until the more fragile native plants are established. In 2006, three *Picea glauca* (white spruce) trees, *Rosa acicularis* (rose) bushes, and *Shepherdia canadensis* (soapberry) bushes were planted in the circle. Of this planting, the three *P. glauca*, six *R. acicularis*, and one *S. canadensis* survived the last two winters. All survivors appeared to be healthy this season. The spruces showed new growth and healthy cones. Several of the rose bushes had ripening hips. Seven species of flowers were also seeded or transplanted in 2006. At least two died immediately due to lack of water. The *Lupinus nootkatensis* (lupine) has since disappeared. A few *Polemonium pulcherrimum* (beautiful Jacob's ladder), *Solidago multiradiata* (Rocky Mountain goldenrod), and *Hedysarum alpinum* (alpine sweetvetch) bloomed this year. In an attempt to keep the weeds at bay, *Lolium multiflorum* (annual ryegrass) seed was spread in 2006. This was a mistake as the circle is now overrun with large, straggling clumps of dead grass.



Many visitors like to have their picture taken in front of the beautiful sign. This season seed from *Lupinus nootkatensis* (lupine), and *Pulsatilla patens* (pasque flowers) growing around Headquarters was collected. The Plant Materials Center in Palmer donated *Hedysarum, alpinum*, *Oxytropis campestris* (black rapids), *Potentilla bimundorum* (stag horn cinquefoil), *Solidago multiradiata*, and *Astragalus alpinus* (alpine milk vetch) seeds. These will be spread before the end of September.

Visitors to Wrangell-St. Elias often like to be photographed in front of the sign.

The small area of "woodland" that was left untouched in front of the Visitor Center is attractive and the signs are helpful. Unfortunately, the soil spread here was also contaminated and part of the area is now filled with a very thick growth of *Chenopodium album*. Destroying the *C. album* and replanting native shrubs would not be difficult and the area would look much more natural. The flag circle in front of the Visitor Center and the grounds around it are very weedy. It is not a place that invites visitors to linger.



Wrangell-St. Elias is unusual in that the Park Headquarters is not situated in the actual parklands. Because the Park/Preserve is so large and much of it is not easily accessible, many visitors see only the area around Headquarters. Many are either elderly, traveling with tour groups, or both, which further limits their experience in the actual Park/Preserve. Improving the appearance of the grounds, especially with native Alaskan plants, would insure that visitors remember their time at Wrangell-St. Elias positively. Additionally, maintaining a weed-free environment at Headquarters is an important step in preventing their spread onto nearby parklands.

Copper Basin

In 2006, the invasive plant employee at Wrangell-St. Elias began monitoring the extent of *Melilotus alba* throughout the Copper Basin. Although the area of the Basin included in this survey is not in the Park, it was considered important to have documentation of the explosive growth of the *M. alba* in this area. The survey has become part of the annual work plan. It is a "quick and dirty" survey; sub-meter accuracy gives way to overall area surveyed and some parts of the survey are done from a moving vehicle. No other invasive plants are documented and no effort is made to weed.

The Edgerton, Glenn, Richardson, and Old Richardson Highways, and the Tok Cut-Off were inventoried and monitored in 2006 and 2007. The stands of *Melilotus alba*, particularly in Glennallen, Copper Center, and near the Chitina Airport, were noticeably diminished in 2007. No sections of the above named highways were monitored 2008. However, with the exception of the plants near the Chitina Airport, visual inspection showed vigorous regrowth along the highways. This is possibly due to the biennial nature of the plant; the relatively insignificant plants of last year became very visible this year.

A volunteer searching for sweetclover plants near the Chitina airstrip.

In 2008, the emphasis shifted to side roads throughout the Basin. Only a few of these roads had *Melilotus alba* infestations. Two large populations were documented on the Tazlina Terrace Road. The Copper Valley Construction equipment yard and the alley leading to it had several small populations. A small stand of *M. alba* plants was monitored on the upper section of the Klutina Lake Road but the population was not appreciably increased from 2007. Two small populations of very large plants were found growing around the sand shed at the junction of the New and Old Edgerton Highways. Plants were also present in the north section of the gravel pit between Mileposts 126-127, on the Richardson Highway.

The following side roads, gravel pits, and campgrounds were inventoried in 2008: Aurora Drive, College Drive, Co-op Drive, Copper Center Loop Road, the Copper Valley Construction equipment yard and the alley leading to it, Copperville Road, Department of Natural Resources Road, Hill Road, the upper and lower sections of the Klutina Lake Road, Larkspur Loop, Mable Drive, Old Edgerton Highway, Old School Road, Pinneo Park Road, Sasha Drive and the Wrangell-St. Elias housing compound, Silver Springs Road, Slemsek Way, Tazlina Terrace Road, and Terrace Drive; also surveyed were the Copperville gravel pit, the sand shed at the junction of the Old and New Edgerton Highways, and the north section of the gravel pit between Mileposts 126 and 127 off the Richardson Highway; the campground near Tazlina Community Hall, and Dry Creek Campground. It was often difficult to distinguish a private drive from a public access road. If there was any doubt, the road was skipped.

A small population of possible *Vicia cracca* (bird vetch, rank 73) is still evident between Mileposts 126-127 on the Richardson Highway. It is no longer possible to monitor the *V. cracca* in front of Gakona Lodge. The area has been closely mowed for the past two seasons and no plants are visible. The *V. cracca* growing on private property at Mile 2.25 on the Edgerton Highway had not been monitored since 2005. A visual inspection this season showed the plant spreading rapidly.

Other invasive plants noted visually during the *Melilotus alba* survey included *Crepis tectorum, Matricaria discoidea, Medicago lupulina* (black medic, rank 48), a small population of *Melilotus officinalis* (yellow sweet clover, rank 65), *Plantago major, Trifolium hybridum,* and *Taraxacum*

officinale ssp. *officinale.* Except for the *M. lupulina* and the *M. officinalis*, these are large populations.

Although many residents of the Basin speak of being dismayed by the rapid, vigorous spread of *Melilotus alba*, and some of the other invasive weeds moving into the area, there have been very few community weed pulls. This may be due to the lack of an organizing agency. During past meetings, members of the Copper Valley Invasive Plants Workgroup discussed applying for grants to fund a coordinator position. This person would be responsible for organizing weed pulls and promoting education about invasive plants. The group has been inactive during the past year but a meeting is scheduled for September and the coordinator position is on the agenda.

PLANT SYNOPSES

<u>*Crepis tectorum*</u> (rank: 54)
Crepis tectorum is beyond control in the southern and central areas of the Copper Basin. It is evident at Park Headquarters, and along all roadsides, in gravel pits, and parking areas. Sometimes only a few plants are noticeable but often it is growing thickly. No efforts have been made to weed on non-Park lands.

The McCarthy and Nabesna Roads are not yet heavily infested. Although populations were reported in 2004 and 2006, *C. tectorum* was not found on the Nabesna Road this season. *C. tectorum* was monitored and weeded at Mile 7 and Mile 59 on the McCarthy Road. Since the seed is easily dispersed, both roads should continue to be monitored for this plant.

Crepis tectorum remains a high priority in the McCarthy area. Control efforts continued on the known populations, and new infestations were found and treated this season as well. Since none of the populations have yet been eradicated and new infestations have been discovered, this species is not yet under control in the area. At this point, the infestations are on private property and roadways. Continued monitoring and treatments will be needed to reduce the existing populations and prevent them from spreading, particularly onto parklands. Watching for new *C. tectorum* populations, especially in newly disturbed areas, is also very important so that they can be treated when they are small and manageable. So far, *C. tectorum* remains unnoticed in Kennecott.

<u>*Leucanthemum vulgare*</u> (rank: 61)
The population of *Leucanthemum vulgare* discovered in 2007 at Mile 10.9 on the McCarthy Road was monitored. Because the plant is growing on private property, it was not weeded. It should be monitored during coming seasons.

The *Leucanthemum vulgare* population on park property below the Jurick building in Kennecott continues to decrease with each passing season, demonstrating the effectiveness of annual treatments. For this reason, it is very important to keep up the control work on as many infestations as possible in Kennecott. Pulling occurred on all the known populations in Kennecott this season, with the exception of the Kennicott Glacier Lodge property. The Park/Preserve has an agreement with two private property owners to control their infestations; therefore, continued efforts in the future should be possible. *Leucanthemum vulgare* at the lodge

remains a threat to the surrounding parkland as a seed source. The small population on private property in McCarthy remains untreated as well.

Linaria vulgaris (rank: 69)
The *Linaria vulgaris* populations found in the greater McCarthy area in the past were monitored and retreated this season. In addition, a new population was discovered and treated. So far, only three small, distinct populations are known and all were controlled this season. These populations will need continued future monitoring and control until they are eradicated.

Melilotus alba (rank: 80)
The *Melilotus alba* in Slana remains a high priority. The area around the junction should be closely monitored and plants will need to be pulled for many years.

This patch of white sweetclover across the highway from Park Headquarters is slowly decreasing.

In 2007, during a routine monitoring of the Slana Fishwheel Trail, *M. alba* was found for the first time since 2004. Plants were found in the same location in 2008. This trail should be monitored and weeded once or twice a season.

The *Melilotus alba* populations growing on the Glenn and the Richardson Highways were not mapped this year. Instead, side roads throughout the Copper Basin were inventoried. Monitoring in the Basin should be continued if time and money are available.

Monitoring and weeding the *Melilotus alba* at Mile 106 on the Richardson Highway, across from Headquarters, should be continued. This population has decreased over the past four years. Although *M. alba* has not been found growing on the grounds around Headquarters it is important to watch closely for it each season.

Taraxacum officinale ssp. *officinale* (rank: 58)
Taraxacum sp. ssp. *officinale* is pervasive in all areas covered by this report. At Park Headquarters, *T. officinale* ssp. *officinale* grows thickly along the drive to the Visitor's Center and more sparsely in other areas. The drive should be weeded at least once per season.

Taraxacum officinale ssp. *officinale* control efforts in the Kennecott area focused on the trails leading out of the town site into surrounding parkland. The Root Glacier, Bonanza Mine and Jumbo Mine Trails were each monitored and treated this season, to varying degrees. The first two miles along the Root Glacier Trail have numerous, small, manageable infestations which were pulled almost completely. The upper, above-tree line portion of the Bonanza Mine Trail has sporadic, small populations which were thoroughly pulled in a few days. The lower portion, however, is heavily infested with *T. officinale* spp. *officinale* and will require a crew working many days to make significant progress. The Jumbo Mine Trail is essentially clean, except for an infestation above Bonanza Creek, which would require a crew working several days to eradicate. Some pulling was done this year, but more effort is needed. This effort could be time

well spent, however, as it is the only major *T. officinale* spp. *officinale* population on this trail. Continued monitoring and control work on these trails in the future will help ensure that *T. officinale* spp. *officinale* does not spread further out the trails into parkland.

Taraxacum officinale spp. *officinale* is so widespread in the McCarthy-Kennecott area that it is generally beyond control by manual methods. Consequently, only specific locations of concern can be monitored and managed with the resources currently available. These high-priority areas include roads, trails, airstrips and gravel pits that can facilitate *T. officinale* spp. *officinale* spreading out of the central, inhabited areas into relatively natural parkland and currently weed-free areas. The trail leading out to the park at the terminus of the Kennicott Glacier was surveyed; *T. officinale* spp. *officinale* is moving toward the park along this ORV/foot trail, but is not there yet. The trail leading from the Park/Preserve visitor kiosk was also surveyed and is not infested. The trail up McCarthy Creek, which runs through private property and then onto parkland, was surveyed in 2007 and *T. officinale* spp. *officinale* was found mostly on private property. The human population of the valley is growing, with new homes, trails and roads built each year. These areas of disturbance will be potential sites of further infestations, especially from *T. officinale* spp. *officinale*, which is one of the most pervasive weeds in the area. *T. officinale* spp. *officinale* plants were pulled from the McCarthy airstrip, in an effort to keep them from spreading by plane onto other airstrips in the park. A few plants were pulled from a privately-owned gravel pit that is used for construction jobs throughout the valley. These areas of high priority will need continued attention in the future, from the Exotic Plant Management Program as well as the local community, to keep *T. officinale* spp. *officinale* from spreading beyond its current extent of infestation.

Volunteer Christine Johnson weeds invasive dandelions from a slide area off the upper Bonanza Mine trail.

Control work was done on the significant *Taraxacum officinale* spp. *officinale* infestation at the Wrangell-St. Elias National Park visitor kiosk at Mile 59 on the McCarthy Road. More work is needed, but significant progress was made. The goal behind this work was to prevent the invasive weeds from displacing the native vegetation at a facility used by many park visitors. Maintaining native vegetation increases its educational and aesthetic value, making control work here a priority.

In the backcountry of the park, no additional infestations of *Taraxacum officinale* spp. *officinale* were found this season. Only two remote airstrips were surveyed and both were clean. The

possibly invasive *T. officinale* spp. *officinale* found by the Wrangell Mountains Center's college group in 2007 could not be confirmed, as they did not go back to the location this summer. Poor weather and lack of time prevented other surveys of remote airstrips this season, but this should be a priority next season.

Vicia cracca (rank: 73)
The *Vicia cracca* at Mile 2.25 on the Edgerton Highway was visually monitored. It appears to be spreading more rapidly than in past years. The roadside in front of Gakona Lodge, first inventoried in 2006, has been closely mowed for the past two summers. It was impossible to determine if any *V. cracca* remained. In 2007, a possible population of *V. cracca* was discovered between Mileposts 126-127 on the Richardson Highway. The voucher collected at this location has never been positively identified. It is a comparatively small stand, approximately four meters long and one meter wide. All three locations are outside the boundary of the Park/Preserve. These locations should continue to be monitored at least visually each season.

In 2006, Danny Rosenkrans, of the Wrangell-St. Elias National Park Lands and Special Uses Department, reported a wide swath of a *Vicia* ssp. growing on the far side of the Lakina River. This area was unable to be inventoried in 2007 due to the high water level of the river. The future feasibility of an inventory will depend on weather and water levels.

Lappula squarrosa (rank: 44)
In 2006, two *Lappula Squarrosa* plants were inventoried and weeded at the Dead Dog Hill Rest Area on the Nabesna Road. Two plants were found in the same location 2007. They were again pulled and bagged. No plants were found in 2008.

Lappula squarrosa grows in several locations along the McCarthy Road. Due to its lower rank and heavy growth, no attempt has been made to weed the plant.

The large infestation on the island between the two Kennicott River channels (referred to in past reports as near the church) was weeded again this season, with most plants removed. However, many plants were in seed by the time they were weeded, so this area should be checked again next season. Other small populations were weeded on town roads, at the kiosk, and on private property in the McCarthy area.

Tripleospermum perforata (rank: 48)
Tripleospermum perforata was inventoried and weeded at the Betty Freed property on the Nabesna Road during the 2005, 2006, 2007, and 2008 field seasons. It appears to be slowly increasing, possibly due to the fact that the property is being used more. In 2008, it was found near a grave or memorial site at Mile 2 on the Nabesna Road. It had obviously been planted and tended. Due to the nature of the site, no inventory or weeding was done.

Late in the season, a patch of what is probably *Tripleospermum perforata* was found at the pullout area at the east end of Long Lake on the McCarthy road. In 2009, the plant should be positively identified and pulled if it is scentless false mayweed.

Caragana arborescens (rank: 66)
This species continues to grow only on private property in McCarthy, as a privacy hedge. The owner is aware of its invasive status and is fully cooperative about removing seedlings that spread from the main plants. The area was monitored this year and many small plantlets surrounding the bushes were removed with help from the owner. One seedpod and its many sprouts were found closer to McCarthy Creek and removed, although this demonstrates its potential to spread.

Hordeum jubatum (rank: 63)
Thick stands of Hordeum jubatum grow along the Nabesna Road. A lengthy, labor-intensive effort will be needed to control this growth but it should be a priority next season.

This species is widespread in the McCarthy-Kennecott area; it would require many people and hours to make real progress towards eradication. Therefore, only certain high-priority areas were given time and effort this season. The small populations along the McCarthy airstrip were removed, reducing the chance that planes may transport seeds to other remote airstrips in the park. A distinct population was removed from NPS land at the westside housing facility; it was growing over the road and had the potential to spread via passing vehicles. *Hordeum jubatum* was also removed from the visitor kiosk on the McCarthy Road as part of the effort to maintain the native vegetation at the facility.

Hordeum jubatum is very widespread at the end of the McCarthy road, where it meets the Kennicott River. It is spreading rapidly on the disturbed land along the river, which is currently used as a parking lot and campground. This is all private land and no control work was attempted this season; a crew would be needed to remove the large infestation and the absentee landowners are difficult to contact. Its close proximity to the river may increase the chance of seed transport downriver into the park, while the infestation of the parking lot enables seed dispersal by cars. This may be an area worth treating in the future. *H. jubatum* was also found intermittently along miles 50-60 of the McCarthy Road that were inventoried this season.

Bromus inermis and *Phleum pratense* (ranks: 62 and 56)
These two invasive grasses are not widespread in the Kennicott Valley, but they are dense and beyond manual control in a few locations. At the Kennicott River Lodge and Hostel property, *Phleum pratense*, brought in hay for livestock, is invading the spruce forest and displacing most native vegetation. Its thick growth takes over and this site has become almost exclusively *P. pratense* growing under spruce. The perimeter of the infestation was mapped, so future monitoring can track how the grass may be spreading. It is much too large an infestation to hand-pull. *Bromus inermis* grows similarly in downtown McCarthy, at the Donoho Avenue site. Again, the grass is too thick and widespread to pull by hand; the perimeter of the infestation was mapped. The infestation along McCarthy Creek was not controlled this season, and likely still exists. *B. inermis* also grows along the McCarthy Road and was found along miles 50-60, the stretch that was inventoried this season.

EDUCATIONAL PROJECT

In August, an educational display was designed for the annual Kenny Lake Fair. It shared booth space with the Copper Country Alliance, a local environmental group. The display consisted of a poster (see Table 3) with dried stems of *Crepis tectorum*, *Melilotus alba*, and *Leucanthemum vulgare* laminated around its edges. Many people who stopped at the booth were well-informed about invasive plants and the problems associated with them. Many were able to identify the plants on the poster. A brochure specific to Wrangell-St. Elias National Park and Preserve and the Copper Basin, and others supplied by the Exotic Plant Management Program, were available.

RECOMMENDATIONS

Education and Public Involvement

Key elements for success in controlling invasive plants are education and community involvement. Radio and newspaper interviews help bring the problem to public attention. The summer craft and agricultural fairs are good venues for educational displays. The Interpretive Rangers at the visitor centers at Park Headquarters, Slana, and Kennecott should include information about invasive plants in their "ranger talks".

Handouts about exotic plants, especially the easily carried booklet, *Selected Invasive Plants of Alaska*, should be widely distributed. Good distribution points include the Park Visitor Centers at Headquarters, Slana and Kennecott. Libraries, laundromats, post offices, local visitor centers, and hotels throughout the Copper Basin are also good locations to display information.

Possibly the most important aspect of community education is the involvement of residents. At this time, there is no organization in the Basin responsible for area-wide education and weeding. If the Copper Valley Invasive Plants Workgroup secures funding for a coordinator, as discussed above, it would be a positive step.

Having an employee working fulltime in McCarthy increases both the amount of work done in the area and the potential to involve local residents in this work. Several local residents helped with control work this season, either as volunteers or as property owners. Including them in control work helps educate about invasives and encourages local residents' cooperation with the park in a community-wide effort. Work crews of locals could be organized in the future, as well as continued park efforts, with owners' cooperation, on private property where invasives are a problem. Control work done in the area highlights the invasives issue, makes folks more aware of the problem, and may increase community participation.

The Wrangell Mountains Center hosted educational talks periodically in the Kennecott Recreation Hall this summer. This lecture series would be good forum for a talk about the invasives issue and the work being done by the Exotic Plant Management Team. In addition, they host an informal "walks" program, which may lend itself well to educating an interested group of participants about what invasives exist here, how to identify them, and where they are located. The WMC's college program could include an invasives talk before they leave on their three-week backcountry trip. Cooperation with this program allows monitoring to occur in areas of the park where Park/Preserve employees do not go. A program could also be developed for

the children's' Mountain Arts summer activities sponsored by the National Park Service and the WMC.

2009 Field Season

The Nabesna Road has been surveyed and is a relatively "clean" area. The McCarthy Road has not been as thoroughly surveyed although much of the section from the Gilahina Bridge at Mile 29 to the Collins Homestead at Mile 45 was walked in 2007. The same intensive "plant scan" method was applied from Mile 50 to Mile 59 during the 2008 season.

Only very short sections of the trails off the Nabesna and McCarthy Roads have been inventoried; no surveys have been done in areas requiring off-road vehicle travel. Six backcountry airstrips, Amphitheatre Creek, Chelle Lake, Doubtful Creek, Glacier Creek, Peavine, and the strip at the confluence of the Chitina and Nizina Rivers, were surveyed in 2006. In 2008, the Ross Green Lake and Tana Airstrips were inventoried. There is no data on the remaining eight strips maintained by Park Service.

Invasive control work in Kennecott and McCarthy involves a significant amount of time on trails that take a while to get to and are in bear habitat. Having a team of two in the area would make the work more efficient and safer. It takes a good portion of the day to get to the upper portions of the Bonanza and Jumbo Mine Trails and also out the Root Glacier Trail; if two people work, fewer trips will be necessary. Also, two people working together will always be safer in the case of a bear encounter than a lone worker. Surveying on the 60 mile McCarthy Road would also be much more efficient with two people. In addition, this area is the most heavily visited and inhabited in the park; human activities that cause disturbance, such as construction, road building and vehicle/ORV/plane/foot traffic, will increase the potential for weed infestations here. Infestations are increasing in the area and subsequently, control work will need to increase as well. Either another seasonal employee or a Student Conservation Association volunteer in the McCarthy-Kennecott area for the 2009 season would be very beneficial to the program.

Tamara Harper finds no invasives at the Tana River airstrip!!

The above information was considered when writing the following specific recommendations for 2009:

Kennecott/McCarthy

- Continue stationing an employee in the area with another employee or volunteer to create a two-person team.
- Donoho Peak should be mapped. It is a glacial island frequently visited by campers and experienced a major disturbance event in July 2007 when a fire burned several acres of alder habitat. This fire disturbance presents a great opportunity for invasive plants to establish themselves, making it important to begin treatment as soon as possible if they are found.
- The McCarthy Airstrip should continue to be monitored since it is a vector for weed dispersal into the backcountry landing strips.
- Backcountry airstrips around McCarthy, known to contain invasive plants, should be visited next season and the invasive plants controlled. Specifically, May Creek is infested with *Taraxacum officinale* ssp. *officinale*, the Ultima Thule Lodge strip is reportedly covered with *Hordeum jubatum,* and the airstrip up McCarthy Creek has had invasives inventoried in the past.
- Monitor and control the *Taraxacum officinale* ssp. *officinale* infestations on the Bonanza and Jumbo Mine Trails (with help from a volunteer crew).
- Monitor and control the *Taraxacum officinale* ssp. *officinale* on the Root Glacier Trail.
- The *Leucanthemum vulgare*, *Linaria vulgaris* and *Crepis tectorum* infestations in Kennecott and McCarthy should continue to be monitored and treated.
- Maintain informal partnership with The Wrangell Mountains Center's College Program and encourage continued backcountry monitoring. Develop educational talks for the students before they go on their field trip.
- Continue to monitor and control weeds at the Rowcon gravel pit, since it has the potential to spread invasives should it become highly infested.
- Inventory new roads and trails in the area, including the new subdivision at the McCarthy airstrip, new roads on the westside, and roads in the University subdivision across McCarthy Creek.
- Inventory the Nizina River airstrip and subdivision.
- Inventory/control the trail up McCarthy Creek, past where it enters parkland.
- Inventory/control the road between Kennecott and McCarthy.
- If a work crew is available, control large high-priority infestations of *Taraxacum officinale* spp. *officinale, Hordeum jubatum* and *Trifolium ssp.*

- McCarthy Road
  - Include off-road trails, specifically the Crystalline Hills and Nugget Creek Trails;
  - Intensively inventory Milepost 45 through 50 and Milepost 25 through 29;
  - Monitor the *Leucanthemum vulgare* at Mile 10.9;
- Slana/Nabesna Road
  - Inventory longer sections of as many trails as feasible;
    Continue to monitor and weed previously inventoried areas, paying particular attention to the *Melilotus alba, Crepis tectorum, Taraxacum officinale* ssp. *officinale, Tripleospermum perforata, and Lappula squarrosa* populations;

- Begin inventory and control work of *Hordeum jubatum*;
- Monitor and weed *Melilotus alba* on the Slana Fishwheel Trail at least once.

- Remote Locations
  - Inventory and weed backcountry airstrips.
- Headquarters
  - Continue to help with weeding, seed collecting and disseminating, and landscaping work.
  - A few simple changes would make the sign circle much more attractive and inviting. Laying a gravel path would provide a dry, clean walkway and help preserve the plants. Planting more native shrubs and perhaps a *Betula papyrifera* (paper birch) tree behind the sign would be attractive and eventually reduce weeding time. Cutting the dead ryegrass in the fall or early spring would make the flowers more visible when they bloom and eliminate the uncared-for look. Planting a mixture of low-growing grass and native flowers would be easy to maintain and would make the area around the flag and Visitor Center more appealing.
- Copper Basin
  - Continue to monitor *Melilotus alba* along the Edgerton, Glenn, and Richardson Highways, and on the Tok Cut-Off; include the Chitina Airstrip, side roads, trails, and gravel pits;
  - visually monitor *Vicia cracca* at Mile 2.25 on the Edgerton Highway, and in front of Gakona Lodge;
  - submit a voucher of the suspected *Vicia cracca* between Mile 126 and Mile 127 for identification.

<u>Work Schedule for 2009</u>

- **Early Season (late-May until June)**
  - Attend Exotic Plant Management Team training in Anchorage.
- **Mid-Season (June, July, August)**
  - Distribute educational literature;
  - Comply with Department of Interior security regulations: i.e. computer tests, etc;
  - Recruit volunteers and file required forms;
  - Plan work schedule for the season and reserve vehicles and lodging as needed;
  - Complete travel forms;
  - Plan for weed disposal;
  - Load GPS unit with essential software and maps;
  - Travel, inventory, monitor, and weed in the Park/Preserve, at Headquarters, and in the Copper Basin;
  - Download, correct, and post GPS files at end of each trip;
  - Keep time log, rover file log, phenology log, and collections log current;
  - Collect seeds around Headquarters as they ripen;
  - Purchase supplies;
  - Design and set-up exhibit at Kenny Lake Fair.
- **Late Season (September)**
  - Write end-of-season report;
  - Spread seeds;
  - Attend Exotic Plant Work Group meeting;

- Organize files for next season;
- Clean tools and inventory supplies for next season.

Although the following section may seem repetitious, we hope it will help stress the importance of these particular recommendations. To accomplish these goals will require more manpower.

- Plants and locations:
  - Ensure that all plants on Park/Preserve land ranking 50 or higher (see Table 1) are in the inventory database. The *Melilotus alba* and the *Vicia cracca* in the Copper Basin are relatively far from the Park/Preserve boundaries and are of lesser importance. If time allows, they should be included.
  - Continue to carefully monitor and control *Melilotus alba* in Slana. If a crew(s) is available, use it here.
  - Continue to emphasize the importance of both "clean" and attractive landscaping at Park Headquarters. Provide as much assistance as possible.
  - Continue to station an employee in the McCarthy/Kennecott area and seriously consider the need for a part-time employee there.
  - Inventory Donoho Peak. It is a glacial island frequently visited by campers. The area experienced a major disturbance event in 2007 when a fire burned several acres of alder habitat.
  - The McCarthy Airstrip is a prime vector for weed dispersal into the backcountry. This is true of all airstrips but the McCarthy Airstrip receives heavy use.
  - Monitor and control the *Taraxacum officinale* ssp. *officinale* infestations on the Bonanza and Jumbo Mine Trails, and the Root Glacier Trail. This is another prime area for the use of large crews, such as the SAGA groups.
  - Continue to monitor and control the *Leucanthemum vulgare*, and the *Linaria vulgaris* infestations in Kennecott and McCarthy.
- Training:
  - Devote more time differential correction.
  - Devote more time to navigation.

The last rose of summer (Rosa acicularis) was photographed on the McCarthy Road August 12. Except for this last flower, the plant was thickly covered with ripening hips. The roses were spectacular this summer, especially on the McCarthy Road.

Table 1. Plant List

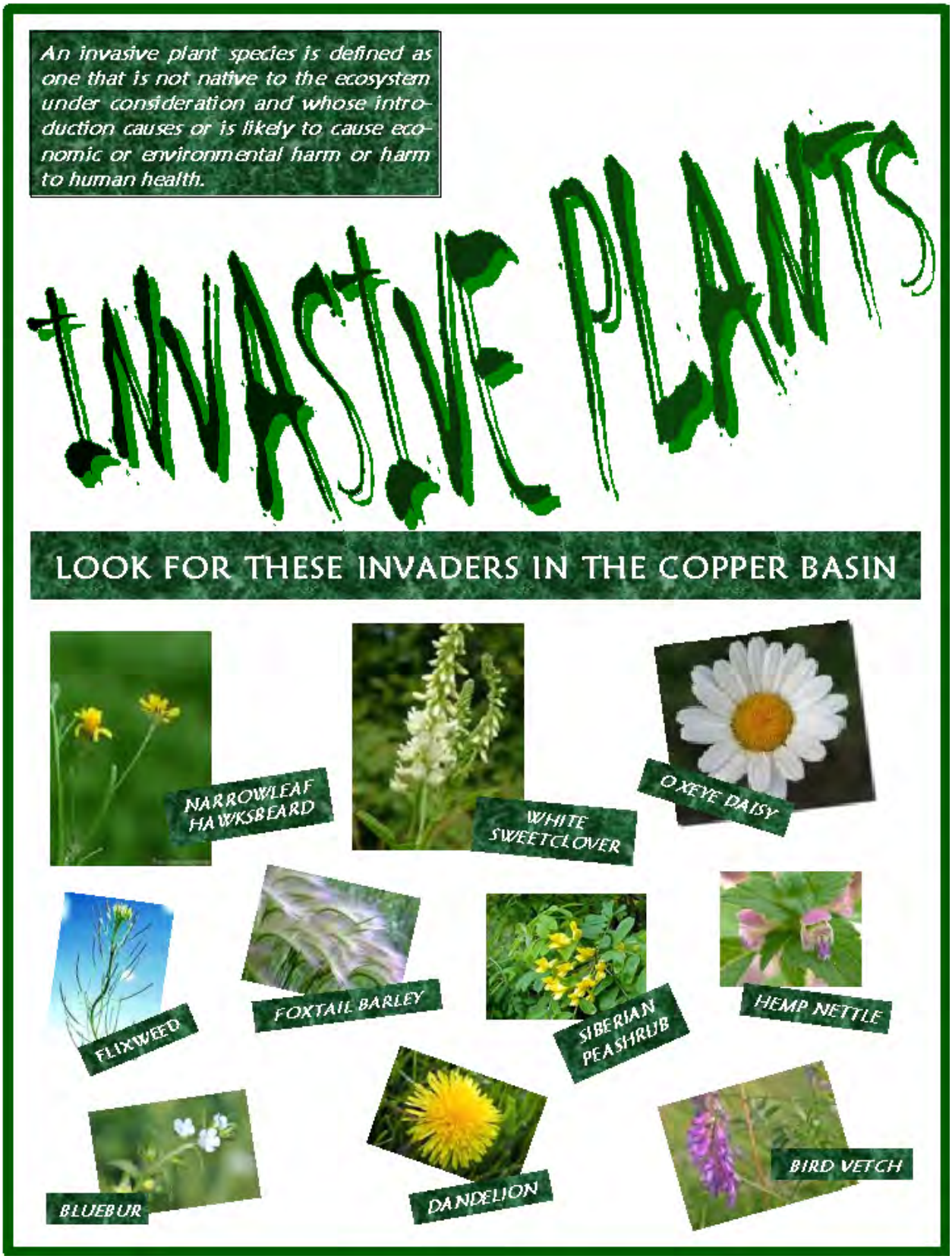
Park Unit	Taxon	Common Name	Inside Park	In 2006 annual report	In geodata base	In 2006 EPMT table	Collected	Notes	AKEPIC Ranking
WRST	Achillea millefolium	common yarrow		Y	Y	Y		2003	N/A
WRST	Allium schoenoprasum	wild chive		Y	Y	Y	Y		N/A
WRST	**Bromus inermis**	**smooth brome grass**		**Y**	**Y**	**Y**	**Y**	**2004**	**62**
WRST	Capsella bursa-pastoris	shepherd's purse		Y	Y	Y	Y	2004	40
WRST	**Caragana arborescens**	**Siberian pea shrub**		**Y**	**Y**	**Y**	**N**	**2005**	**66**
WRST	Chenopodium album	lambsquarters		Y	Y	Y	Y	2004	35
WRST	Cnidium cnidiifolium	Jakutsk snowparsley		N		N	Y	2007	N/A
WRST	**Crepis tectorum**	**narrowleaf hawksbeard**		**Y**	**Y**	**Y**	**Y**	**2004**	**54**
WRST	Descurainia sophia	flixweed		Y	Y	Y	Y	2005	41
WRST	**Elymus repens**	**quackgrass**		**Y**	**Y**	**Y**	**Y**	**2004**	**59**
WRST	Eschscholzia californica	California poppy		Y	Y	Y	Y		N/A
WRST	Galeopsis tetrahit	hempnettle		Y	Y	Y	Y	2005	40
WRST	**Hordeum jubatum**	**foxtail barley**		**Y**	**Y**	**Y**		**2003**	**63**
WRST	Lappula squarrosa	European stickseed		Y	Y	Y	Y	2003	44
WRST	Lepidium densiflorum	common peppergrass		Y	Y	Y	Y	2004	25
WRST	**Leucanthemum vulgare**	**oxeye daisy**		**Y**	**Y**	**Y**	**Y**	**2004**	**61**
WRST	**Linaria vulgaris**	**yellow toadflax**		**Y**	**Y**	**Y**	**Y**		**69**
WRST	Lolium perenne ssp. perenne	perennial ryegrass		Y	Y	Y	Y		N/A
WRST	Matricaria discoidea	pineapple weed		Y	Y	Y	Y	2004	32
WRST	Medicago lupulina	black medick		Y		Y		2006	48
WRST	**Melilotus alba**	**white sweetclover**		**Y**	**Y**	**Y**	**Y**	**2004**	**80**
WRST	**Melilotus officinalis**	**yellow sweetclover**		**Y**		**Y**	**Y**	**2006**	**65**
WRST	Papaver rhoeas	corn poppy		N		N	Y	2006	N/A
WRST	**Phleum pratense**	**timothy**		**Y**	**Y**	**Y**	**Y**		**56**
WRST	Plantago major	plantain		Y	Y	Y	Y	2004	44
WRST	Polygonum aviculare	prostrate knotweed		Y	Y	Y	Y	2004	45
WRST	Polygonum convolvulus	black bindweed		Y	Y	Y	Y	2005	N/A
WRST	Rhinanthus minor	yellow rattle		N		N	Y	2007	N/A
WRST	Senecio pauciflorus	alpine groundsel		N		N	Y	2007	N/A
WRST	Silene latifolia	bladder campion		Y	Y	Y	Y	2006	45
WRST	Silene noctiflora	night-blooming cockle		Y	Y	Y	Y	2005	45
WRST	Stellaria media	common chickweed		N			N	2007	42
WRST	Taraxacum ceratophorum	native dandelion		N		Y	Y	2007	N/A
WRST	**Taraxacum officinale ssp. officinale**	**common dandelion**		**Y**	**Y**	**Y**	**Y**	**2004**	**58**
WRST	Thlaspi arvense	field pennycress		Y	Y	Y	Y		N/A
WRST	**Trifolium hybridum**	**alsike clover**		**Y**	**Y**	**Y**	**Y**	**2004**	**57**
WRST	**Trifolium pratense**	**red clover**		**Y**	**Y**	**Y**	**Y**	**2004**	**53**
WRST	**Trifolium repens**	**white clover**		**Y**	**Y**	**Y**	**Y**	**2004**	**59**
WRST	Tripleurospermum perforata	scentless false mayweed		Y	Y	Y	Y	2005	48
WRST	Vicia americana	American vetch		Y		Y	Y	2006	N/A
WRST	**Vicia cracca**	**bird vetch**		**Y**	**Y**	**Y**	**Y**	**2005**	**73**
WRST	Vicia sativa	common vetch		Y	Y	Y			N/A

Table 2. AKEPIC Weed Ranking Table

Plant species	**Rank 0-100 (low -high)**
Achillea ptarmica L.	**46**
Alliaria petiolata (Bieb.) Cavara & Grande	**70**
Anthemis cotula L.	**41**
Bromus inermis ssp. *inermis* Leyss.	**62**
Bromus tectorum L.	**78**
Campanula rapunculoides L.	**64**
Capsella bursa-pastoris (L.) Medik.	**40**
Caragana arborescens Lam.	**66**
Centaurea biebersteinii DC	**86**
Cerastium fontanum ssp. *vulgare* (Hartman) Greuter & Burdet and *C. glomeratum* Thuill.	**39**
Chenopodium album L.	**35**
Cirsium arvense (L.) Scop.	**76**
Cirsium vulgare (Savi) Ten.	**61**
Convolvulus arvensis L.	**58**
Cotula coronopifolia L.	**42**
Crepis tectorum L.	**54**
Cytisus scoparius (L.) Link	**69**
Dactylis glomerata L.	**53**
Descurainia sophia (L.) Webb ex Prantl.	**41**
Digitalis purpurea L.	**51**
Elymus repens (L.) Gould	**59**
Fallopia convolvulus (L.) Löve	**50**
Polygonum sachalinensis (F. Schmidt ex Maxim.) R. Decr., P. X bohemica, and P. cuspidatum Sieb. & Zucc.	**87**
Galeopsis bifida Boenn. and *G. tetrahit* L.	**40**
Glechoma hederacea L.	**48**
Gypsophila paniculata L.	**57**
Hesperis matronalis L.	**41**
Hieracium aurantiacum L. & *H. caespitosum* Dumort.	**79**
Hieracium umbellatum L.	**46**
Hordeum jubatum L.	**63**
Hordeum murinum ssp. leporinum	**60**
Hypericum perforatum L.	**52**
Impatiens glandulifera Royle	**82**
Lappula squarrosa (Retz.) Dumort	**44**
Lepidium densiflorum Schrad.	**25**
Leucanthemum vulgare Lam.	**61**
Linaria vulgaris Miller	**69**
Lolium perenne ssp. *multiflorum*	**41**
Lonicera tatarica L.	**66**
Lythrum salicaria L. & *L. virgatum* L.	**84**
Matricaria discoidea DC.	**32**
Medicago lupulina L.	**48**
Medicago sativa ssp. falcata (L.) Arcang.	**64**
Medicago sativa ssp. *sativa* L.	**59**
Melilotus alba Medikus	**80**
Melilotus officinalis (L.) Lam	**65**
*Mycelis muralis (*L.) Dumort.	**32**
Myriophyllum spicatum L.	**90**

Nymphaea odorata ssp. *odorata* Ait.	**80**
Persicaria maculosa Gray & P. lapathifolia (Linnaeus) Gray	**47**
Phalaris arundinacea L.	**83**
Phleum pratense L.	**56**
Plantago major L.	**44**
Poa annua L.	**46**
Poa compressa L.	**39**
Poa pratensis ssp. *pratensis* L., *P. pratensis* ssp. *irrigata* (Lindm.) Lindb. f. & *P. trivialis* L.	**52**
Polygonum aviculare L.	**45**
Prunus padus L.	**74**
Ranunculus repens L. and R. acris	**54**
Rubus discolor Weihe & Nees	**77**
Rumex acetosella L.	**51**
Rumex crispus L., *R. obtusifolius* L. & *R. longifolius* DC	**48**
Senecio jacobaea L.	**63**
Senecio vulgaris L.	**35**
Silene noctiflora, S. dioica, S. latifolia	**45**
Sonchus arvensis ssp. *uliginosus* (Bieb.) Nyman	**61**
Sorbus aucuparia L.	**59**
Spergula arvensis L.	**32**
Stellaria media (L.) Vill./disturbed sites	**42**
Stellaria media (L.)Vill./sea bird colonies	**54**
Tanacetum vulgare L.	**57**
Taraxacum officinale G.H. Weber ex Wiggers	**58**
Tragopogon dubius L.	**50**
Trifolium hybridum L.	**57**
Trifolium pratense L.	**53**
Trifolium repens L.	**59**
Tripleurospermum perforata L	**48**
Verbascum thapsus L.	**52**
Vicia cracca L.	**73**
Vicia villosa Roth	**53**

Table 3. Poster From Invasive Plant Exhibit



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