

# Invasive Plant Management Strategies for the village of Port Graham Alaska



A comprehensive look at the invasive plants in the Port Graham area with recommendations on management of current infestations and prevention of future introduction and spread



Matt Steffy – September 2014

## OVERVIEW

During the summer of 2014 the Homer Soil & Water Conservation District has worked on a project to map out invasive plants in the Port Graham area. This project will provide the necessary ground work for the district to make recommendations on managing existing infestations, as well as preventing further spread and introduction of future invasives. Prior to this survey project, minimal reports had been registered with the Alaska Natural Heritage Projects Alaska Exotic Plant Inventory Clearinghouse database (<http://aknhp.uaa.alaska.edu/botany/akepic/>) and the initial goal of this project is to supplement this database with more information regarding invasive populations in Port Graham.

Survey work was conducted on Friday, August 1<sup>st</sup> 2014 and the majority of town was mapped using pedestrian roadside survey methods. A total of eight priority invasive species were identified and mapped (see project maps). This report will provide a summary of that data as well as some management recommendations for short term and long term invasive damage mitigation.

## GENERAL DISTRIBUTIONS AROUND TOWN

The majority of the primary streets in town have sparse but consistent populations of tall buttercup (*Ranunculus acris*) and orange hawkweed (*Hieracium aurantiacum*). These infestations are patchy, but consistent enough that it would not be useful to map them on a point basis. The right-of-ways of the whole Port Graham road system should be considered infested to varying degrees by orange hawkweed and tall buttercup throughout town. To a slightly lesser degree, there is also oxeye daisy (*Leucanthemum vulgare*) spread throughout many of the right-of-ways in town. There are a few sections of road, such as Duncan Road, the southwestern end of 1<sup>st</sup> Street, and Suqviag Road that are currently mostly void of invasives.

There are a couple of locations in town that are worth discussing. The lot containing the school and adjacent maintenance grounds have an elevated level of tall buttercup and orange hawkweed. The



Orange hawkweed adjacent to gate in the NE corner of schoolyard. Photo by Matt Steffy.

orange hawkweed is in a large patch by the gate in the northern corner of the lot (see photo), and also spread along the western edge of the building. Tall buttercup is along the fence line, but particularly



Orange hawkweed growing in gravel piles next to equipment in SW corner of school property. Photo by Matt Steffy.

dense in the fenced in area on the north end of the building. On the southeast corner of the building there is some maintenance equipment and gravel piles (see photo) that have several patches of orange hawkweed growing around them.

The fenced in landfill area has quite an extensive infestation of hempnettle (*Galeopsis bifida*). It is quite noticeable next to the “Deposit Waste Here” sign (see photo below), but also spreads along the



Hempnettle growing at the landfill site

northern fence line and the southern corner of fill material. Hempnettle is also present on the north side of the road near the tree line and equipment. Perennial cornflower (*Centaurea montana*) is also present on the north side of the road. This plant has most likely spread from the infestation along the water treatment pond to the south on 1<sup>st</sup> Street.

#### CONSIDERATIONS BY PLANT

The invasiveness ranking system has been developed by the Alaska Natural Heritage Program and is based on a species' ecological impacts, biological attributes, distribution, and response to control measures. The ranks are scaled from 0 to 100, with 0 representing a plant that poses no threat to native ecosystems and 100 representing a plant that poses a major threat to native ecosystems.

#### **Orange hawkweed** (*Hieracium aurantiacum*)

Invasiveness rating: 79



Photo by Michael Shepard,  
USDA Forest Service,  
Bugwood.org

**Distribution & Impact.** This plant is scattered throughout the village. It is thin or sparse in some locations, and extremely dense in others. Our survey covered roads and right-of-ways, but incidental observations indicate that it is also spread extensively on many private parcels. This plant spreads aggressively by seeds as well as rhizomes and stolons. It can form very dense monocultures that carpet the ground and crowd out all native plants. Orange hawkweed has also been shown to be allelopathic, in that it chemically inhibits the growth and germination of neighboring plants and even the pollen carried from its' flowers can inhibit other flowering plants.

**Management.** Mowing this plant will only stimulate further growth and reproduction through rhizomes and stolons. Manual control by digging is only effective for small patches. The entire root system and plant must be removed as it can easily sprout from small root fragments left behind. It is also important to revegetate the area immediately to prevent reintroduction. This plant can only be effectively controlled or eradicated using herbicides. In roadsides and non turf areas, herbicides with an aminopyralid such as Milestone are very effective. In residential turf and lawn areas, a combination of 2,4 D and dicamba such as Weed-B-Gon can be used. It is important to use a surfactant in order to get the herbicide past the dense hairs on the plant. Orange hawkweed should be sprayed early in the season at the rosette stage before the flowers have started to bolt.

**Future Considerations.** Unless the entire community of Port Graham embraces an exhaustive eradication program this plant is unfortunately here to stay. Some dedicated property owners may be

able to hold it back, but reintroduction from adjacent infestations is highly likely. Extreme caution should be exercised whenever equipment is used on projects in areas of orange hawkweed infestation. This plant can be transported very easily in contaminated soil on equipment. Thoroughly cleaning equipment, tools, and gear between projects is very important.

### **Meadow hawkweed** (*Hieracium caespitosum*)

Invasive ranking: 46



Photo by Richard Old, XIV  
Services Inc., Bugwood.org

**Distribution & Impact.** This plant was located in one location in Port Graham along the western edge of the square building closest to the end of Duncan Road. There is relatively low stem count and this patch could be eliminated easily. This plant is similar in growth habits and ecological impacts to orange hawkweed and can be handled the same way. This patch is most likely the result of contaminated fill material brought to the job site.

**Management.** A patch of hawkweed this small may be dug out manually, as long as all root material is removed and the area is revegetated and monitored. If the population continues to spread it should be treated with herbicide. Milestone is an aminopyralid based herbicide that has proven to be very effective against hawkweeds but can damage turf. If lawn or turf are a concern in this area, a 2,4 D combined with another herbicide can be

effective (i.e. Weed-B-Gon).

**Future Considerations.** If this infestation can be addressed quickly, it should be easy to eliminate. As control measures are taken this area should be closely monitored.

### **Hempnettle** (*Galeopsis bifida*)

Invasiveness ranking: 50



Photo by Michael Shepard, USDA  
Forest Service, Bugwood.org

**Distribution & Impact.** This plant is predominantly focused in the landfill area. Throughout the fenced in area there are multiple stands of various sizes. There is some spreading just outside of the fence and it is present across the road to the north along the tree line. While this survey did not detect hempnettle elsewhere in town that does not mean that it is strictly isolated to the landfill. Given that many vehicles travel to and from the landfill on a regular basis, we should expect to see this plant on private property around town.

**Management.** Hempnettle can be easily eradicated by hand pulling. This will need to be done multiple times as there will be seeds in the

soil from the previous year. After two full growing seasons all the seeds in the soil should have germinated or will no longer be viable. It is important to pull the plant before it goes to seed.

**Future Considerations.** This plant is one of the invasives most commonly associated with disturbed soils and heavy equipment. It has a highly viable seed and can spread over a large area in just a few growing

seasons if the conditions are right. At the least, this plant should be eradicated from the public areas of the landfill (i.e. next to “Deposit Waste Here” sign) to prevent it spreading to more parcels in town.

**Tall buttercup** (*Ranunculus acris*)

Invasiveness ranking: 54



Photo by John Cardina,  
Ohio State University

Distribution & Impact. This plant is spread consistently throughout the village. It is mostly along the roadsides, but also extends along a few tree lines and driveways. Tall buttercup is toxic to grazing animals and can impact birds as well as grazing mammals. It spreads easily by passing animals and people as its seed head has a very pronounced hook. This plant is also known as meadow buttercup due to its ability to dominate open meadows and clearings.

Management. To prevent tall buttercup from spreading off of roadsides and into yards and driveways, residents can keep their turf fertilized and supplemented with an appropriate amount of lime to encourage healthy grass growth. Aeration can also help improve soil drainage and give native plants or grasses the advantage against tall buttercup. To eliminate this plant from its current distribution either manual or chemical methods can be considered. It is a short lived perennial, so digging it up by the roots and disposing of the plant can be effective, but may take several rounds to eliminate the seed bank. Herbicides can be used where appropriate. Spot spraying with

a glyphosate based herbicide (i.e. Roundup, Aquamaster) can be effective, though care should be taken not to spray adjacent non-target plants. Follow-up and monitoring will be necessary.

Future Considerations. This plant is a talented hitch-hiker, and care should be exercised whenever the plant is in seed. Equipment, people, dogs, wild animals, and any other traveling vessel can easily pick up and distribute seeds. Cutting the plants before they go to seed (i.e. roadside mowing) will not eliminate the plant, but will prevent spreading it to other locations.



Photo by John Cardina,  
Ohio State University

**Oxeye daisy** (*Leucanthemum vulgare*)

Invasiveness ranking: 61



Photo by Micahel Shepard,  
USDA Forest Service,  
Bugwood.org

**Distribution & Impact.** The oxeye daisy population in Port Graham is scattered around, but in enough locations to be considered generally infested. This plant can reproduce with great efficiency and produce fairly dense stands when left unmanaged. It outcompetes native plants and grazing animals find it unpalatable.

**Management.** Regular cultivation can control the plant, but low frequency disturbance can actually stimulate its production. Spot applications of glyphosate (Roundup, Aquamaster) can be effective, but the addition of heavy nitrogen fertilizer can be just as effective in controlling oxeye without as much non-target effects.

**Future Considerations.** This plant is most commonly associated with disturbed roadsides and trailheads that are poorly maintained. While it spreads by seed and rhizomes, its dispersal can be controlled by cutting the plant before it goes to seed. Movement of equipment or fill material through infested areas should not take place while plants are at seed.

**Creeping buttercup** (*Ranunculus repens*)

Invasiveness ranking: 54



Photo courtesy Ohio State Weed Lab Archive,  
Ohio State University, Bugwood.org

**Distribution & Impact.** There are two noticeable patches in Port Graham, but there may be other smaller infestations on private land that have not been identified. There is a small patch along the western side of 1<sup>st</sup> Street and a small patch between the community center and the runway along the NE border of the vegetation. Both of these patches are growing aggressively and will continue to do so if unchecked. Creeping buttercup spreads as a dense canopy cover

close to the ground, outcompeting and choking out other vegetation. Creeping buttercup is toxic to grazing birds and animals, it draws native pollinators away from native plants, and is known to harbor many different pests.

**Management.** Creeping buttercup does not respond well to mechanical removal, as it can regenerate from fragments of stolons. Herbicides are effective, but revegetation should be actively monitored to ensure the plant did not reestablish.

**Future Considerations.** Great care should be exercised whenever equipment is moved through these areas, especially while the plant is in seed. This plant will be very easily spread by seed and



Photo by John Cardina, Ohio State  
University, Bugwood.org

vegetation fragments, and will establish a dense colony in just a few seasons.

**Common tansy** (*Tanacetum vulgare*)

Invasiveness ranking: 60

**Distribution & Impact.** There is only one stand of common tansy that has been identified in Port Graham. It is located along the southern ditch of Spruce Road about midway down. This plant can form dense stands composing up to 50% of local canopy. Its dense roots can decrease soil drainage and impact adjacent plant populations. The plant is toxic when consumed in enough quantity. Its fragrant



Common tansy in the ditch in Port Graham. Photo by Matt Steffy.

flowers attract pollinators and disrupt local pollinator relationships.

**Management.** In small stands, this plant can be dug up as long as care is expressed to remove all root fragments. Repeated cutting of this plant before it goes to seed can also be effective over a few growing seasons. Herbicides can be used, and the plant is susceptible to a wide range, including dicamba, picloram, glyphosate, and 2,4 D. Care should be used to ensure herbicide is applied to target plant and not adjacent native vegetation.

**Future Considerations.** Elimination of this small infestation should be fairly easy and set as a high priority. Other communities that have let this plant go unchecked have quickly reached levels of infestation where management becomes very difficult.

**Bachelor's button or perennial cornflower** (*Centaurea montana*)

Invasive ranking: 46



Photo courtesy of the Dow Gardens Archive, Dow Gardens, Bugwood.org

**Distribution & Impact.** This is an ornamental plant that has escaped cultivation and is beginning to spread in some areas of town. There is a large stand between the road and the pond on 1<sup>st</sup> Street near the intersection of Graham Road. There is also a notable patch across the road from the landfill along the tree line where some equipment and small buildings are located. This plant is not generally considered to have an aggressive growth

habit, but that is up for debate among a few wildland managers in Alaska. It is closely related to spotted knapweed (*Centaurea stoebe*) which is a very high priority invasive across most of North America. Knapweeds are allelopathic and inhibit the growth and establishment of surrounding vegetation.

Management. The current infestations of this plant can be eliminated by hand digging. Care should be taken to remove all root matter. Herbicides can be combined with mechanical removal if the infestations prove stubborn, but this should not be necessary for this location. The plant was also identified in a plot at the cemetery, but does not appear to be escaping that location.

Future Considerations. Areas where this plant has escaped cultivation should be monitored for elimination effort efficacy.

### **Other invasives of less concern**

During the course of our survey work there were several invasive plants identified that are of either low ranking, or low priority based on distribution, potential impact, and effective management potential. Throughout the right-of-ways and disturbed areas we encountered common dandelion (*Taraxicum officinale*), common plantain (*Plantago major*), and pineapple weed (*Matricaria discoidea*). These three plants are fairly persistent around town but do not appear to be spreading into the native vegetation. These plants can be controlled or eradicated on individual parcels of as seen fit by landowners, but would be difficult to eradicate on a community wide level.

### MANAGEMENT CONCERNS FOR FUTURE DEVELOPMENT

In order to reduce the spread of invasives in the Port Graham area, there should be a combined effort to eliminate current infestations while preventing the spread into new areas. This is especially important in regards to large scale construction projects such as the upcoming airport and road construction between Port Graham and Nanwalek, but should be kept in mind during a wide range of regular maintenance, private construction, and small scale projects around town.

Wherever possible, eradication of existing infestation should be pursued. For example, an area like the landfill is effectively serving as a large nursery for hempnettle in a location that has frequent traffic. Our survey team did not enter onto private parcels, but I would anticipate that hempnettle is found in fairly high frequency around town based on its distribution at the landfill. Elimination of the common community source will help prevent reintroduction as smaller infestations are addressed around town. Infestations which are small and discrete, such as the common tansy and meadow hawkweed, should be eradicated as quickly as possible before they have the opportunity to spread. These are prolific invasives that are present in small enough numbers to be effectively eliminated with minimal effort. This will not be the case in a few years.



Vegetation can be seen hanging from this container unit as it is moved from one site to another in Port Graham. While the vegetation pictured is not invasive, this illustrates how easily plants can be unintentionally transported by equipment. Photo by Matt Steffy

The Kenai Peninsula Cooperative Weed Management Area has formulated a set of Best Management Practices for preventing the spread of invasives while working in the field. The following suggestions should be considered by the Port Graham community and the contractors who do work there.

Clean and inspect equipment. Everything from heavy equipment, to shovels and rakes, to footwear should be inspected and cleaned before transporting from one job site to another. Vegetation fragments and seed can get caught up in bits of dirt on the underside of a loader or in between the treads on a pair of work boots. Power washing heavy equipment as it moves from one job site to another is relatively easy to do, and should be part of good equipment maintenance practices regardless. This is most important when moving equipment from known infestation sites to uninfested areas, but should be generally adopted as a regular practice. For the Port Graham area, this will be especially important as an influx of heavy equipment comes into town on barges for the road and airport construction project. These pieces of equipment will be coming from various locations, having operated mostly in gravel pits and right-of-ways which are both very probable vectors of invasive vegetation. A pressure washing station on the beach to wash off equipment as it's unloaded would be effective, as most vegetation of concern will not be salt tolerant. Washing would not need to involve a detergent, so site contamination would be limited to concerns regarding grease and other petroleum products present on the equipment. Items like hand tools and boots can easily be cleaned prior to being used on a new job site.

Utilize Weed Free Material. Contaminated gravel and fill material are common vectors for invasive introduction and spreading on projects. When possible, gravel and fill should come from a certified weed free site. The Alaska Department of Natural Resources maintains a Weed Free certification program that certifies gravel pits for material and agricultural fields for straw and forage. This program is expanding quickly, and with many agencies such as the Kenai National Wildlife Refuge requiring weed free products in their contracts, more and more providers are seeking the certification. A list of providers that are actively certified can be obtained from the Plant Materials Center at (907) 745-4469. Any providers on the southern peninsula that are seeking certification can contact the Homer Soil and Water Conservation District at (907)-235-8177 x5. There is currently no fee for this program.

The program also covers straw production so that straw bales used for erosion control and rolled erosion control logs made with straw mulch can be sourced from certified weed free fields. Straw and hay from weed infested fields have been identified as a common source of invasive seeds.

When official weed free certified sources are not available, care should still be taken when sourcing materials. Inspect local gravel pits before material is extracted. There may be areas of the gravel pit that are weed free and some that are not. If discretion can be used when selecting an extraction location on site, it may be possible to avoid activity when the weeds are in seed or select a location without any weeds. Avoid transporting material from areas of known infestation. The mapping work that was conducted with this survey should be referenced when planning projects, though a site inspection is always recommended when extracting and moving material.



Spotted knapweed in a gravel pit on the Dalton Highway. Photo courtesy of DNR.