NON-NATIVE PLANT SPECIES OF PRINCE OF WALES ISLAND, ALASKA

SUMMARY OF SURVEY FINDINGS

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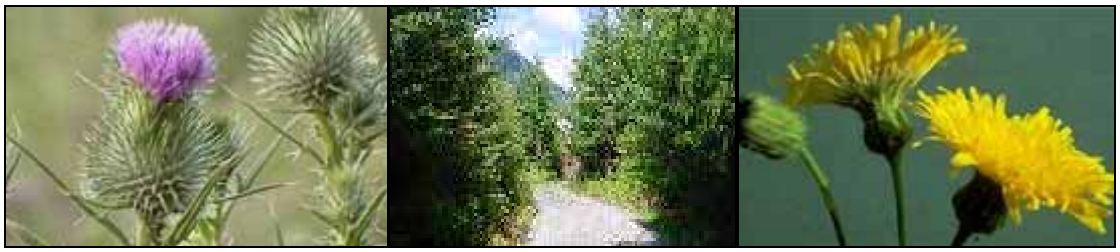
Final Report for
USDA Forest Service, State and Private Forestry



Katie Arhangelsky
Turnstone Environmental Consultants, Inc.
Portland, Oregon

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Introduction

The USDA Forest Service is dedicated to gaining a better understanding of the number, identity and biology of non-native plants in Alaska and how these species may be impacting intact plant communities and timber-producing areas. To address these concerns, the Forest Health Protection State and Private Forestry and the USDA Forest Service initiated a contract to survey and identify non-native plant species infesting the roadways of Prince of Wales Island, Alaska, within the Tongass National Forest. From June 20th through September 9th of 2005, botanists from Turnstone Environmental Consultants, Inc. surveyed an estimated 584 miles of state, local, and Forest Service roads on the main road system of POW This report summarizes the initial findings from our field season of research and data collection.

Southeast Alaska is in a unique position to prevent large scale infestations of non-native species. Its remote location and the lack of terrestrial connectivity of many regions has enabled much of the land to remain free of serious infestations. Southeast Alaska is in the first stages of experience with non-native plant species (Borchett, 2004).

The native plant communities of Prince of Wales Island in particular and Southeast Alaska in general are vulnerable to aggressive competition from invasive, non-native species. The large number of roads traversing the island's terrain provides open pathways in which non-native species can travel and colonize new areas. Additionally, the rate of disturbance in Prince of Wales Island's remote areas is high. Industrial logging and road building are prevalent, providing ideal vectors for invasive plant dispersal. Plants commonly hitch rides on the large equipment and machinery used in these operations, helping to spread the species throughout the island. Infestations of invasive exotic species in rock pits are common, with the population dispersing out along the neighboring roads.

The goal of the project is to assess the extent of non-native plant populations on Prince of Wales Island and identify areas of particular concern. The data collected for this project can help guide future management and control efforts.

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

- AKEPIC Inventory Field Data Sheets were completed for each point surveyed along the roads, regardless of whether invasive species were found.
- Maps provided by the Forest Service are submitted showing the locations of all data points/infestations.
- A summary report giving a synopsis of the contract work and findings.
- Data entry into the AKEPIC database for future tracking and management.

- Two voucher specimens of each species located were collected, pressed, dried, and labeled and will be submitted to the appropriate herbarium for use as a teaching collection.

During the course of the project, our botanists also engaged in community education. Curious passersby were provided with informative brochures and had questions answered on the spot about invasive species on the island. An estimated 75 “Selected Invasive Plants of Alaska” pamphlets were distributed to residents and visitors of the island during the course of our field work.

Methods

Field data on non-native plants was collected on road right-of-ways on state and local lands and Forest Service controlled road rights-of-way on private land on Prince of Wales Island, Alaska. An estimated 121 miles of state and locally maintained road right-of-way and 463 miles of Forest Service road right-of-way were inventoried. Forest Service roads slated for survey were designated as maintenance levels 3 and 4 (suitable for passenger car and moderate degree of user comfort). The reasoning for surveying the more major road systems on the island was to capture areas of heavier use, and therefore more susceptible to invasion by non-native species.

Surveyors walked an area every ¼ mile along the roads. At each survey point the botanists surveyed both sides of the road for 25 meters each direction, recording all non-native plant species encountered. We also surveyed the area around each road intersection, Recreation Site, pull-out, and parking area as specified by the contract. Additionally, we decided to survey all rock pits or mine areas as we discovered that these areas had a high diversity of non-natives and often included species not observed elsewhere. Occasionally survey points were spaced slightly more or less then the required ¼ mile interval. Some roadsides did not offer safe locations to park and we parked at the nearest possible location. At other times we altered the survey point slightly to include a nearby visible area of higher disturbance and therefore higher likelihood of the presence of non-native species. A few additional times we did not survey a point due to extraordinary conditions. For example, in the Naukati area we encountered a rock pit with target practice underway at two separate visits. Similarly we found several pullouts used as impromptu campsites with sleeping occupants in the north of the island. Private property or areas difficult to deduce jurisdiction such as backyards bordering right-of-ways were not systematically searched, but presence of high priority species and other exotic plants was noted when observed from a distance. It is also worth noting that we did not make special stops for private driveways when in urban environs in the interest of time and efficiency.

Non-native species were assigned to one of three categories by the agencies prior to survey work. Class One species are those which are known or potential invasives, Class Two species are very common throughout Alaska, and High Priority Species are those species singled out for extra effort and concern. When a Class One invasive species was found, we followed out the population and noted its extent on the data form. When high priority species were encountered, the site was flagged with white flagging and location data recorded. Flagging was labeled with species name, surveyor's initials, and date. When Class Two invasive species were encountered, presence was recorded but the populations were not followed out, as these species are ubiquitous throughout Alaska.

Species code	Scientific name	Common name
CIVU	Cirsium vulgare	bull thistle
SOAR2	Sonchus arvensis	perennial sow thistle
CEBI2	Centaurea biebersteinii	spotted knapweed

Table 1. Species considered High Priority Species for this project.

Field surveys were conducted using protocols developed by the Alaska Exotic Plants Mapping Program (see http://aknhp.uaa.alaska.edu/). Data forms were also developed by AKEPIC and are consistent with their data dictionary and recording methods. Data recorded in the surveys includes presence or absence of non-native plants, specific location, type of disturbance, lists of exotic plants at each locality, canopy cover, and area of infestation. More than 2600 points were taken throughout our survey work. At each site, area surveyed ranged from 0.1 acre to 4 acres. Most sites were 0.1 acre, which was a pre-determined standard number for a roadside survey point 50 m long and 8 m wide (not including the roadway itself). Area of infestation for each species identified the acreage within the survey point containing individuals of that species. Canopy cover was estimated as the percentage of cover occupied by the species within its area of infestation. For Class One and high priority species, we also recorded stem counts of the population and noted its extent in the comments.

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

- "State of Alaska Prohibited and Restricted Noxious Weeds", Alaska Department of Natural Resources
- "Class 1 Known and Potential Invasive Plants of Concern",
- "Class 2 Widespread Lower-Priority Invasive Plants"
- "USDA Forest Service, Alaska Region Sensitive Plant List"
- High Priority Noxious Weed Species (provided under RFQ section C.6.1.1)

Field survey work was performed from June 20-July 22 and August 8-September 9, 2005. Data was collected using a standard form along roadsides and other disturbed areas. The field survey in June-July concentrated on the main state roads and Forest Services roads in the south and eastern regions of the island: major roads surveyed include the paved state roads from Hollis to Craig, from Harris River to Hydaburg, and the highway from Klawock to Thorne Bay. Forest Service roads surveyed were around Coffman Cove and Polk Inlet. In August-September, surveys were concentrated in the north and west of the island. The main road to Whale Pass, the state road from Control Lake Junction to Naukati, and forest service roads in the extreme north of the island and those southwest of Naukati were among the areas surveyed during this period.

More than 100 voucher specimens were collected. Collections were made of all non-native species encountered during our surveys, with a few exceptions due to phenological

reasons or contract specifications. Specimens will become part of a teaching collection and also to verify identifications made during the course of the project. For a complete list of voucher specimens, see Appendix D.

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

Results

In all, 2635 sites were surveyed on Prince of Wales Island. The survey area includes an estimated 553 miles of state, local, and Forest Service roads. The length of road miles surveyed is slightly less than the originally expected 584 miles due to changes in road conditions and maintenance levels since the generation of the maps. Spur roads frequently ended prematurely, often due to the removal of culverts or overgrown alders. The latter occurred more frequently in the northern reaches of our survey roads.

The survey found 62 non-native species along the roads and adjacent disturbed areas. This represents approximately 38% of the 164 known exotic species in Alaska. Additional species may have been present, but escaped notice.

Species Diversity

The areas on the island with the greatest weed diversity were residential areas, towns, paved state roads and rock pits. Typically, the diversity was at its highest in these areas and then decreased with distance. This trend is also apparent on Forest Service spur roads; diversity at these roads is at its highest at the junction with the paved state roads, and then systemically decreases with distance away. Areas with consistently high weed diversity include the state road from the Hollis ferry terminal to Klawock, the state road from Thorne Bay to Control Lake Junction, the city of Craig, and the state road to Hydaburg. Sites directly nearby communities typically contained 15-20 species of exotics. Stretches of paved state road in between communities typically contained 10-15 species of exotics. Locations with lowest number of weed species were stretches of Forest Service roads farthest from main population centers or paved roads, these often contained only 2-4 species.

Increases in weed diversity were observed at rock pits, log transfer facilities and pullouts, possibly due to the use of heavy machinery in these areas. These increases in diversity were often isolated with species beginning to colonize outwards. It was not uncommon to detect Canada thistle *(Cirsium arvense)* in a remote area with no connectivity to other populations, or meadow hawkweed *(Hieracium caespitosum)* fifteen miles from a state road on a degraded spur nearby a mine site. Also in rock pits we discovered several species isolated to one or two rock pits that were not encountered elsewhere on the island. Bladder campion *(Silene latifolia)* was seen in two separate rock pits off of FS road 2000 in the north of the island, and was not observed elsewhere. Both populations consisted of just one individual. Yellow salsify *(Tragopogon dubium)* was encountered only once in one rock pit, also in the north of the island.

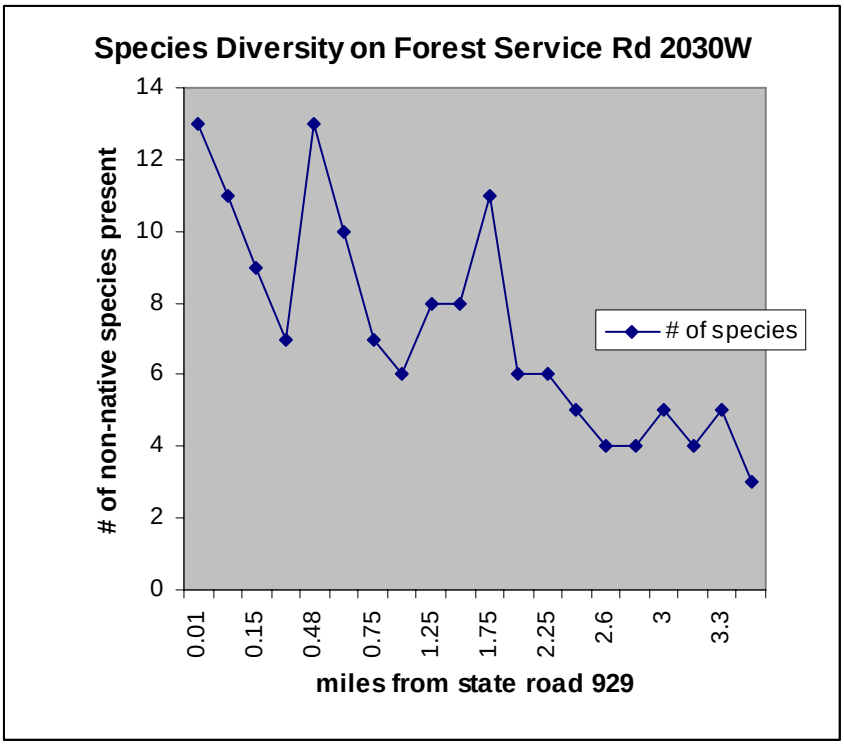

Table 2. Species diversity on Forest Service road 2030W decreases as distance from the main state road increases. Increases in diversity at miles 0.48 and 1.75 represents the location of rock pits.

The least impacted areas on the island were those roads farthest away from population centers where a large right-of-way was not cleared and limited or no re-seeding took place during road construction. Such areas of note are the road to Kasaan and Forest Service spurs off of road 3030.

Only 6 of the 2635 sites surveyed were free of non-native plants. Such weed free sites were recorded on Forest Service road 3030.5 and the local road to Kasaan.

Our surveys did not reveal the presence of any non-native species new to the state of Alaska.

A group of exotic species are widely spread throughout Prince of Wales and are extremely abundant. The following species occurred at more than 30% of all sites; these were: reed canary grass *(Phalaris arundincea),* common plaintain *(Plantago major),* dandelion *(Taraxacum officinale),* white clover *(Trifolium repens),* and mouse ear chickweed *(Cerastium fontanum).* These species occur in both remote and higher traffic areas on a wide variety of disturbance levels. The initial seeding of the roadsides could have played in role in the composition- reed canary grass and white clover were both seeded throughout the island. Reed canary grass *(Phalaris arundinacea)* was present at the large majority of sites, with only a handful having no coverage of the grass.

Several species on our Class 2 list considered ubiquitous throughout Alaska were noticeably absent on Prince of Wales. We found no populations of golden clover *(Trifolium aureum),* quackgrass *(Elymus repens),* or lambsquarters *(Chenopodium album).* Only two populations of common chickweed *(Stelleria media)* were observed by a fishing pullout on the Klawock-Hollis highway. We also found only one shepard's purse *(Capsella bursa-pastoris)* plant in all our surveys, it was located on the main 2500 road to Whale Pass.

Species Code	Scientific name	Common name	Family	Location	Habitat
SOOL	Sonchus oleraceus	Annual sowthistle	Asteraceae	by APT building in Craig	parking lot
SOAS	Sonchus asper	spiny sowthistle	Asteraceae	throughout island	rock pits, residential areas
LEHI4	Leontodon hirtus	rough hawksbit	Asteraceae	Klawock-Thorne Bay hwy, Klawock-Hollis hwy	roadsides
LOCO6	Lotus corniculatus	Bird's foot trefoil	Fabaceae	Scattered throughout island, uncommon	Roadsides, parking lots

Table 3. Non-native plants encountered in survey area, which were previously unrecorded in the Alaska Weeds Database. Species names, common names, and taxon codes follow USDA PLANTS database standards.

Size of infestation

The largest infestation area was as large as the site area, which never exceeded 7 acres. The smallest area of infestation was set at a circular area, 3.7 foot radius (1/1000 acre) in accordance with the AKEPIC manual. Many infestations, particularly those of the more common species, were contiguous between survey sites. At most sites, the infested area ranged from 0.001 to 0.1 acre.

Canopy cover

Most species at most sites had a percent canopy cover of fewer than 10% with a few exceptions. Only a few species occurred in larger densities, but often did so consistently. Reed canary grass *(Phalaris arundinacea)* often had a canopy cover of 30-40%, and occasionally reached upwards of 80%. White clover *(Trifolium repens)* also repeatedly had a cover of 20-30%, especially in seeded areas. Orange hawkweed *(Hieracium*

aurantiacum), when present, can attain high cover, especially in mature infestations. It was not uncommon to record orange hawkweed at a cover of 20-30%. Hairy cat's ear *(Hypochaeris radicata)* is another such species that occasionally attained a cover of 20-30%.

Aggressiveness

The most aggressive species encountered were *Phalaris arundinacea, Trifolium repens, Phleum pretense,* and *Hypochaeris radicata.* These species were often observed extending out of the roadside corridor and entering marginal areas or clearcuts of forests and meadows. The *Phalaris arundinacea* in particular was most often observed exhibiting this behavior and even was observed moving down waterways underneath a forest canopy. The *Hypochaeris radicata* was less prone then the others on this list to move into undisturbed areas, but on several occasions we did find adult plants under a canopy growing to great heights.

Discussion

Overview of non-native species patterns

Surveys of 2635 sites along roadsides on Prince of Wales Island revealed 62 non-native taxa (see Appendix C), of which 4 were unrecorded in Alaska Weeds Database (see Table 2). This represents 38% of the 164 recorded non-native species in Alaska. The large number of roads and mine sites on the island are good vectors of weed dispersal; however, the islands' relative isolation has kept it free of some of the more aggressive species plaguing other parts of the state.

Non-native species were not evenly distributed throughout the island. The roads in and around the residential areas of Craig, Thorne Bay, Whale Pass, and Hydaburg contained the highest diversity of non-native species and also had more extensive invasions. In particular, the paved state roads also had higher diversities, with the exception of the paved road from Control Lake Junction to the Coffman Cove Rd, which had a lesser degree of infestations and diversity. This could be due to the lower traffic level the road receives. The state roads from the Hollis ferry terminal to Klawock and Control Lake Junction to Klawock contained a great diversity of weed species as well as numerous infestations of High Priority Species. The state roads generally have a much larger footprint and utilize a greater amount of heavy equipment, making them more susceptible to invasions.

High diversities and large infestations are not limited to state and local roads. Several Forest Service roads also have high diversities. Mainline roads such as FS rd 2500, which serves Whale Pass and FS rd 2100, which runs out to Polk Inlet, also have high diversities. High diversities and large infestations also occur on areas of remote roads. Common sources for populations were the ubiquitous rock pits used in road building. Often times populations of bull thistle *(Cirsium vulgare)* and species not observed elsewhere were recorded inside old rock pits and then were observed spreading along the adjacent roads, in areas several miles from a major road system. An example of this is the *Cirsium vulgare* population on FS road 2054, which is centered around a rock pit. Pioneers are colonizing the road along to the south and north. Factors seemingly affecting the infestation rate on forest service spurs are: the type and rate of seeding that occurred after the road was built, the type and habit of traffic the road receives and the amount of rock pits, staging areas for equipment, and log transfer facilities existing along the road.

Seeding. The rate and type of re-seeding after road construction affects not only the species composition, but also may increase diversity of non-native species over time by initially creating a plant community difficult for native species to compete with (Borchett, 2004). Seed mixes have changed over time. We have no records of the seed mixes used specifically on Prince of Wales, but in the 1970s and 1980s seed mixes in the Tongass National Forest, Ketchikan area, included perennial rye grass *(Lolium perenne)*, alta fescue *(Festuca arundinacea)*, reed canary grass *(Phalaris arundincea)*, white clover

(Trifolium repens), and red clover *(Trifolium pratense)* (personal communication, M. Dillman). Many of these species still attain a high dominance and cover on the island, particularly the clovers and reed canary grass. Reed canary grass was considered desirable in seed mixes as good erosion control due to its sod-forming ability (Krosse, 1990). It fell out of use on roads because its relatively large height created a sight problem for traffic on curves (Loggy, 1990), but not before being seeded on most of Prince of Wales Island. Today, the seed mix being sprayed on the recently constructed roads by Coffman Cove is without reed canary grass and contains primarily perennial rye grass *(Lolium perenne).*

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

Rock pits. Diversity of non-native plants typically increased at rock pits, pullouts, log transfer facilities and staging areas for large equipment. Diversity and infestation size varied and was not consistently high in rock pits. The rock pits sometimes contained only red alder, bracken fern, and a smattering of reed canary grass. It can be deduced that the level of activity and condition of machinery might influence the resulting infestation of exotic plant species. These types of sites tend to serve as the population centers for high priority species and species unrecorded elsewhere, likely hitching rides on the heavy machinery used in road-building and rock mining.

Figure 1. Reed canary grass and mouse ear chickweed affixed to a backhoe in a rock pit on FS road 3013.

Areas with very few non-native species were the Forest Service roads by Coffman Cove, the local road to Kasaan, Forest Service spur roads off the main 2100 road by Polk Inlet, and spur roads in the very north of the island receiving limited traffic. Typically the more remote roads had the least diversity of non-native species with the exception of rock pits. Disturbance along these roads tends to be narrower than roads with high diversity of exotics and occasionally re-seeding did not appear to have taken place after disturbance; particularly on the local road to Kasaan. Last, few non-native species were found on parts of Forest Service roads 2300, 3000, and 3030 in the Coffman Cove area since road construction has cleared all plants from the roadside. This area should be monitored in the following years to investigate the colonization of non-native species into the cleared area.

Patterns of species composition and diversity occur at each roadside profile. With the exception of the reed canary grass *(Phalaris arundinacea)*, there was generally a constant, low degree of infestation. This usually took the form of minimal percent cover (typically 1% throughout) of annual bluegrass *(Poa annua)* on the road itself and of common plantain *(Plantago major)* and common dandelion *(Taraxacum officinale)* at the edge of the road. Moving away from the roadbed species of clover *(Trifolium spp.)*, mouse-ear chickweed *(Cerastium fontanum)*, and several other *Poa* species become more common and have an increased cover (1-5%). Just beyond, exotic grasses *(Phalaris arundinacea, Phleum pratense,* and *Dactylis glomerata)* predominate at collective percent covers to 50 or 60%. Other less common species tend to occur at preferred areas along the profile. Prickly sow thistle *(Sonchus asper)* seemed to grow in old ruts on the road itself, hairy cat's ear *(Hypochaeris radicata)* grows amongst the exotic grasses and seems to prefer disturbed slopes.

Figure 2. *Phalaris arundinacea* invading a recently logged area. This phenomenon may influence successional patterns.

Only reed canary grass *(Phalaris arundinacea)* and the clovers *(Trifolium spp.)* were observed out-competing native species and entering intact forests and muskegs. Hairy cat's ear *(Hypochaeris radicata)* was also observed moving out of the roadside area and into shaded areas, but these areas were always somewhat disturbed, i.e. second growth, alder thickets, etc. Bull thistle *(Cirsium vulgare)* was also observed moving a great distance from the road into logged areas and up slopes, but not into the forest proper.

High Priority Species

Three species were identified as High Priority Species for the purposes of this project: bull thistle *(Cirsium vulgare)*, perennial sow thistle *(Sonchus arvensis)*, and spotted knapweed *(Centaurea biebersteinii)*. Populations of bull thistle and knapweed were located during our surveys. Populations were flagged with white flagging and location data taken.

Bull thistle *(Cirsium vulgare).* Bull thistle populations on the island occur primarily in the large disturbance footprint of the paved state roads, rock pits and pullouts used for recreation. Twenty-nine locations of bull thistle were located during our surveys. The populations varied in their aggressiveness and infestation size, but typically the most serious infestations occurred on the paved state roads. Six populations contain over 1000 plants each, and two contain over 500 plants. All six of the large infestations (1000+ plants) are located on or directly adjacent to paved state roads. Five populations occurred on or adjacent to state road 929, which connects Klawock with Thorne Bay, and one population was located on state road 924, which connects the Hollis ferry terminal with Klawock. The 924 population spans nearly 4.5 miles along the road, beginning 3.75 miles west of the ferry terminal and continuing west. The plants are scattered and of relatively low density throughout. Mowing seems to be destroying adults while the rosettes persist. Three of the large populations on state road 929 were located just south of Control Lake Junction, one located about 5 miles west of Thorne Bay and one located at a large pullout adjacent to the highway at the intersection with Forest Service road 2030W. The two populations numbering between 500-1000 plants are both associated with rock pits on Forest Service spur roads. One population is centered around a rock pit on road 2054, with pioneers colonizing the road along to the south and north. Another population was found associated with a large rock pit on road 2360 and has no individual growing within the pit itself, but instead with the entrance to the mine. The majority of the additional populations found had a small number of plants, occasionally only a few rosettes were found. These populations in particular should be high priorities for eradication efforts, as they are typically spread out throughout the island and of a lower aggressiveness.

The prevalence of this species in rock pits and other pullouts used as staging areas for large equipment suggests that heavy machinery plays a significant role in the dispersal of this species. Most alarming is the widely spread out presence of bull thistle associated with rock pits on remote roads, as the probability of colonizing recently logged areas is high.

Figure 3. The small rosettes of the juvenile bull thistle often escape mowing pressure and persist for years.

This species also has the potential to colonize riparian areas, making it of special concern. In some of the large populations along state road 929 south of Control Lake Junction, the plants have spread a great distance from the road and have colonized upslope of the steep cliffs on the west side of the road. These plants could escape notice during removal as they are difficult to access and are often not visible from the road itself. Eradication efforts appear to be underway at the population at the large pullout south at the 2030W intersection, but efforts need to be adjusted to the outer limits of these areas rather than the center in order to slow the advance of the infestation along neighboring roads.

Spotted knapweed *(Centaurea biebersteinii)*. Two populations of spotted knapweed were located on roads in the north of the island. Both populations were very small, containing just 1-5 plants each. One population was located on state road 925, which travels from Control Lake Junction to Naukati, and another was located on Forest Service road 2079. The population on the state road was found just below a stop sign in a very disturbed area at an intersection, and the population on the more remote road was found at an intersection with a gated road and had only one adult and one rosette. The great distance and seemingly random location of these two plants creates speculation as to dispersal methods.

Both populations were found in late August and early September respectively, when *Centaurea biebersteinii* is typically in full flower and easily identifiable. Further road surveys should be conducted in other areas of the island during this identification window to ensure accurate population mapping. It is also possible that plants exist in between our 0.25 mile survey points; target surveys for this species would be required to gauge the range of the plants on the island.

Figure 4. *Centaurea biebersteinii* at Location 49, 11.0 miles north of state road 929 junction on state road 925, at the intersection with FS road 2054.

Species suggested for immediate control

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

Hairy cat's ear *(Hypochaeris radicata),* although with an invasiveness ranking of only 52, was observed on more than one occasion growing under a canopy, where it achieved heights of over 1 m. Mature infestations in open areas tend to out compete most other vegetation and the ground becomes a veritable carpet. In western Oregon and Washington, this plant is very aggressive and is known as the "worst weed in Western Oregon" (Dennis, 1980). The species needs a good deal of moisture to reproduce well, making Southeast Alaska an ideal environment for invasion.

Figure 5. Hairy cat's ear *(Hypochaeris radicata)* infestation on FS road 2079, a northern spur road. This population was the only one along the stretch of road, making it a good candidate for an eradication effort.

Hypochaeris radicata is present throughout the island, but is much more prevalent in the southern reaches, where it may be too far established to respond well to eradication efforts. The plant achieves particularly high densities along state road 913 to Hydaburg and along spur roads to Polk Inlet. More isolated populations in the north of the island may be a better use of control efforts.

Canada thistle *(Cirsium arvense),* with an invasiveness ranking of 76, should be a priority for control. Its deep, extensive roots and perennial habit create management problems. It also produces allelopathic chemicals that assist in displacing competing plant species (Evans, 1984). It appears from preliminary review of our data that this plant is less common on the island than its' close relative *Cirsium vulgare*. Populations are spread out and do occur in remote areas, but are for the most part contained. Land managers have a unique chance to stop its spread and potentially eradicate it from the island before it becomes a more serious problem.

We recorded 12 populations of Canada thistle during the course of our surveys. The largest population is on state road 929 south of Control Lake Junction. Other more isolated populations occur on FS road 3505, where 500+ plants are growing in a rock pit at an intersection and at the end of road 2060 in the Naukati area, where 151-500 plants are clustered in soil deposits. Another small population was observed in the Thorne Bay

Ranger District housing area. The plants were inside a 6 x 10' fenced area in the center of a traffic island.

Non-native hawkweeds *(Hieracium spp.)* occur in various degrees of aggressiveness around the island, with *Hieracium aurantiacum* and *Hieracium caespitosum* of particular concern due to their high invasiveness ranking of 71. *Hieracium aurantiacum* invades moist pastures, forest openings, clearcuts and roadsides with vigor. It colonizes extremely rapidly, forming a solid mat of rosettes. The plant may have allelopathic effects on neighboring plants (Sheley, 1999). *Hieracium caespitosum* has a history itself of rapid colonization, and is a good target for control due to the limited number of existing populations on the island.

Hieracium aurantiacum is widespread on the island and may be beyond eradication efforts in many places. It achieves very high dominance along the state roads, within all residential areas, particularly Thorne Bay and Klawock, in areas of Polk Inlet and also along more remote areas with pullouts and rock pits. Eradication efforts should be focused on those isolated populations to prevent the spread. Just the opposite is the *Hieracium caespitosum*, of which we found just two populations. One is located at a log transfer facility at Polk Inlet, and the other is on a remote spur also in Polk Inlet.

White sweetclover *(Melilotus alba),* with a high invasiveness ranking of 80 and a limited distribution on Prince of Wales, would also make a good candidate for control. The plant is of particular concern for its ability to colonize intact stream and river systems. Plants have been known to spread from the disturbed roadsides to the naturally disturbed river corridors, as they prefer open gravel or sandy areas (Lapine, 2004).

The only area of the island where we observed the species was on state road 929 just north of Klawock. We recorded two populations, one 0.1 miles north of the 924 junction and also at 2.4 miles north of the 924 junction. At the latter location, the species also occurs alongside *Melilotus officinale*.

Species for further observation

We found only one population of yellow salsify *(Tragopogon dubius)* and two populations of bladder campion *(Silene latifolia).* We eradicated all bladder campion encountered, but the salsify should be watched to see if it spreads successfully in the environmental conditions of Southeast Alaska. St. John's wort *(Hypericum perforatum)* is also of a seemingly low aggressiveness and density but is scattered throughout the island. I am not sure if it will achieve the same exclusive dominance that it does farther south, but it should definitely be observed and if possible, eradicated. Tansy ragwort *(Senecio jacobea)* has a high invasiveness ranking but was observed very rarely on the island. Plants were noted along the 2500 road to Whale Pass, but all adults were taken for collection. Further observation is recommended along this road during proper identification times.

We conversed with Jeanette several times in the field, who is a woman working on the Coffman Cove road construction. She is educated in weed identification and has observed in the past Dalmatian toadflax *(Linaria dalmatica)* growing in the pullout by Control Lake Junction. She has been eradicating the plants herself for several years now. We did not record any *Linaria dalmatica* during our surveys which included that pullout, but would recommend further observation in this area to prevent the recurrence of infestation.

Native species on the roadsides

A selection of native species on Prince of Wales are adapted to disturbance and often observed competing with the exotics, even reed canary grass *(Phalaris arundinacea).* Occasionally the natives even out-compete the exotics. This is especially true when environmental conditions on the roadsides present obstacles to non-natives where natives have adaptations: such as the acidic soils of the muskeg communities or ultramafic rocks used in road building.

Figure 6 (left). *Calamagrostis candensis* growing successfully on a roadside in acidic soil and successfully out-competing potential exotics in a survey point on FS road 3030.5 by Coffman Cove.
Figure 7 (right). A roadside native plant community also on FS road 3030.5 containing young hemlocks *(Tsuga heterophylla),* native sedges (*Carex spp.),* skunk cabbage *(Lystichiton americanum)* stabilizing the roadside.

We created a list of natives observed competing successfully with exotic species in disturbed areas throughout our surveys. The species below could be considered for potential use in restoration of natural areas in the future due to their ability to thrive in disturbed environments. We did not research the viability of inclusion in seed mixes or consider planting effort.

Grasses			
Scientific Name	***Common name***	***Family***	***Comments***
Calamagrostis canadensis	Bluejoint	Poaceae	Very common, particularly in north of island. Grows well in acidic soil, often dominate.
Elymus hirsutus	lyme grass	Poaceae	common but low density along roadsides
Festuca rubra	red fescue	Poaceae	very common, can grow at high densities, does very well in disturbance
Hordeum brachyantherum	California barley	Poaceae	Common on roadsides in low densities throughout island.
Deschampsia caespitosa	tufted hairgrass	Poaceae	Tolerant of disturbance, but uncommon.
Festuca subulata	bearded fescue	Poaceae	Common by Polk Inlet roads, does well in disturbed but shaded areas.
Herbs			
Scientific Name	***Common name***	***Family***	***Comments***
Cornus canadensis	bunchberry	Cornaceae	Very common in a variety of soil types on roadsides. Attains high coverage in both shaded and open areas.
Pteridium aquilinu	bracken fern	Polypodiaceae	Very common on roadsides and rockpits. Competes with reed canary grass.
Epilobium angustifolium	fireweed	Onagraceae	Common on roadsides, can out-compete reed canary grass and achieve high cover. Beneficial for wildlife.
Epilobium latifolium	broad-leaved willowherb	Onagraceae	Very common in rockpits, as prefers scree and drier areas.
Euphrasia mollis	eyebright	Schrophulariaceae	Very common in rockpits, where it can achieve dominance. Also frequent on roadsides.
Lysichiton americanum	skunk cabbage	Araceae	Very common in wet ditches, outcompetes exotics.
Aquilegia formosa	western columbine	Ranunculaceae	Common on roadsides but achieves low coverage. Prefers open to partly shaded areas
Geum macrophyllum	large-leaved avens	Rosaceae	Very common on roadsides and pullouts.
Achillea millefolium	yarrow	Asteraceae	Somewhat common on roadsides, particularly the state roads. Nativity in debate.
Anaphalis margaritacea	pearly everlasting	Asteraceae	Fairly common on roadsides, prefers disturbed, drier areas. It may be non-native in some parts of Alaska? Not observed growing in natural communities on the island.

Shrubs			
Scientific Name	***Common name***	***Family***	***Comments***
Linnaea borealis	twinflower	Caprifoliaceae	very common on roadsides, usually on more remote spurs.
Aruncus sylvester	Goatsbeard	Rosaceae	common on roadsides, successfully competes with exotics.
Alnus rubra	red alder	Betulaceae	Very common on roadsides and rockpits, out-competes most exotics, but difficult to maintain.
Rubus parviflora	thimbleberry	Rosaceae	common on roadsides, successfully competes with exotics.
Rubus spectabilis	salmonberry	Rosaceae	common on roadsides, successfully competes with exotics.

Table 4. Native species observed in disturbed areas during the course of our surveys.

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Appendix A: Class I species list

Class I. Known and Potential Invasive Plants of Alaska that may occur on POW Island

CODE			Scientific name (Hulten 19 Kartesz *)
ACPT	Achillea ptarmica L.	sneezeweed	**family**
AGCA5	Agrostis capillaris L.	colonial bentgrass	Asteraceae
AGCR	Agropyron cristatum (L.) Gaertn.	Crested weatgraa	Poaceae
AGGI2	Agrostis gigantea Roth	creeping bentgrass, red top	Poaceae
AGST2	Agrostis stolonifera L.	creeping bentgrass, red top	Poaceae
ALGE2	Alopecurus geniculatus L.	water foxtail	Poaceae
ALPE4	Alliaria petiolata (Bieb.) Cavara & Grande	garlic mustard	Poaceae
ALPR3	Alopecurus pratensis L.	meadow foxtail	Brassicaceae
AMRE	Amaranthus retroflexus L.	redroot pigweed	Poaceae
ANCO2	Anthemis cotula L.	mayweed	Amaranthaceae
ANTI	Anthemis tinctoria L.	yellow chamomile	Asteraceae
ARAN7	Potentilla anserina L.	silverweed	Asteraceae
ARGL	Arabis glabra (L.) Bernh.	Tower rockcress	Rosaceae
ASCI4	Astragalus cicer L.?*	chickpea milkvetch, cicer milkvetch	Brassicaceae
ASPR	Asperugo procumbens L.	catchweed, mudwort	Fabaceae
AVFA	Avena fatua L.	wildoats	Boraginaceae
BICE	Bidens cernua L.	bur-marigold, nodding beggar-ticks	Poaceae
BRHO2	Bromus hordeaceus L.	soft brome	Asteraceae
BRINI	Bromus inermis Leyss. Ssp. Inermis	smooth brome	Poaceae
BRJU	Brassica juncea (L.) Czern.	indian mustard	Poaceae
BRNA	Brassica napus L.	Rape	Brassicaceae
BRRA	Brassica rapa L.	field mustard	Brassicaceae
BRRAR	Brassica rapa L.var. rapa	Purple-topped Turnip	Brassicaceae
BRSE	Bromus secalinus L.	rye brome, cheat	Brassicaceae
BRTE	Bromus tectorum L.	cheatgrass, downy brome	Poaceae
CADE9	Carex deweyana Schwein.	Dewey sedge	Poaceae
CEBI2	Centaurea biebersteinii	Spotted knapweed	Cyperaceae
CEFO2	Cerastium fontanum Baumg.	larger mouse-eared chickweed	Asteraceae
CEGL2	Cerastium glomeratum Thuill.	Sticky chickweed	Caryophyllaceae
CHBE4	Chenopodium L.berlanderieri	Pitseed goosefoot	Caryophyllaceae
CIAR4	Cirsium arvense (L.) Scop.	Canada thistle	Chenopodiaceae
CIIN	Cichorium intybus L.	chicory	Asteraceae
CIVU	Cirsium vulgare (Savi) Ten.	Bull thistle	Asteraceae
COAR4	Convolvulus arvensis	field bindweed	Asteraceae
COCO7	Cotula coronopifolia L.	Brass Buttons	Convolvulaceae
CYSC4	Cytisis scoparius (L.) Link	Scotch Broom	Asteraceae
DEEL	Deschampsia elongata (Hook.) Munro	slender hairgrass	Fabaceae
DESO2	Descurainia sophia (L.) Webb ex Prantl	tansy mustard	Poaceae
ELSI	Elymus sibiricus L.	Siberian wild rye	Brassicaceae
ERCH9	Erysimum cheiranthoides L.	wormseed mustard	Poaceae
ERGA	Erucastrum gallicum (Willd.) O.E. Schulz*	common dogmustard	Brassicaceae
GABI3	Galeopsis bifida Boenn.	splitlip hempnettle	Brassicaceae
GATE2	Galeopsis tetrahit L.	brittlestem hempnettle	Lamiaceae
GEPU2	Geranium pusillum L.*	small geranium	Lamiaceae

GNPA	Gnaphalium palustre	Marsh cudweed	Geraniaceae
HEAN3	Helianthus annuus L.	annual (common) sunflower	Asteraceae
HIAU	Hieracium aurantiacum L.	Orange Hawkweed	Asteraceae
HIUM	Hieracium umbellatum	Narrow-leaf Hawkweed	Asteraceae
HOJU	Hordeum jubatum L.	Foxtail barley	Asteraceae
HOMUL	Hordeum murinum L. spp leporinum (Link)	Leporinum barley	Poaceae
HYPE	Hypericum perforatum L.	Common St. Johnswort	Poaceae
HYRA3	Hypochoeris radicata L.	cat's-ears	Clusiaceae
IMGL	Impatiens glandulifera	Oramental jewelweed	Asteraceae
LASC	Lappula myosotis Moench	European beggar's lice	Balsaminaceae
LASE	Lactuca serriola L.	Prickly lettuce	Boraginaceae
LEAU2	Leontodon autumnalis L.	fall dandelion	Asteraceae
LEDE	Lepidium densiflorum Schrad	common peppergrass	Asteraceae
LIVU2	Linaria vulgaris P. Mill.	butter and eggs	Brassicaceae
LOAR10	Festuca arundinacea (Schreb.) S.J. Darbyshire	tall fescue	Scrophulariaceae
LOPEM2	Lolium multiflorum Lam.	Italian rye grass	Poaceae
LOPEP	Lolium perenne L.	perennial rye grass	Poaceae
LUPOP4	Lupinus x pseudopolyphyllus*	Kenai lupine	Poaceae
LUPOP4	Lupinus polyphyllus Lindl.	large-leaf lupine	Fabaceae
LYHY2	Lythrum hyssopifolia L.*	hyssop loosestrife	Fabaceae
LYSA2	Lathrum salicaria	Purple Loosestrife	Lythraceae
MEAL12	Melilotus alba Medikus	white sweet clover	Lythraceae
MELU	Medicago lupulina L.	black medic, hop clover	Fabaceae
MEMI	Medicago minima L.	burr medic	Fabaceae
MEOF	Melilotus officinalis (L.) Lam.	yellow sweet clover	Fabaceae
MESAF	Medicago falcata L.	yellow alfalfa	Fabaceae
MESAS	Medicago sativa L.	alfalfa	Fabaceae
MESP3	Mentha spicata L.	spearmint	Fabaceae
MIOR	Antirrhinum orontium L.	snapdragon	Lamiaceae
MYMU	Mycelis muralis L.	wall lettuce	Scrophulariaceae
MYSC	Myosotis scorpioides L.	true forget-me-not	Asteraceae
MYSP2	Myriophyllum spicatum L.	Eurasian watermilfoil	Boraginaceae
NEPA3	Neslia paniculata (L.) Desv.	ball mustard	Halagoraceae
ONAC	Onopordum acanthium	Scotch Thistle	Brassicaceae
ONVI	Onobrychis viciifolia Scop.*	sainfoin, saintfoin	Asteraceae
PANU3	Papaver nudicaule L.	Iceland poppy	Fabaceae
PASM	Agropyron smithii Rydb.	western wheatgrass, quakegrass	Papaveraceae
PHCA5	Phalaris canariensis L.	Canary grass	Poaceae
PLLA	Plantago lanceolata L.	ribgrass, buckhorn, English plantain	Poaceae
POAV	Polygonum aviculare L.	knotweed	Plantaginaceae
POCO	Poa compressa L.	Canada bluegrass	Polygonaceae
POCO10	Polygonum convolvulus L.	black bindweed, wild buckwheat	Poaceae
POCU6	Polygonum cuspidatum Sieb. & Zucc.	Japanese knotweed	Polygonaceae
POGR9	Potentilla gracilis Dougl. ex Hook.	slender cinquefoil	Polygonaceae
POLA4	Polygonum lapathifolium L.	willow weed	Rosaceae
PONO3	Potentilla norvegica L.	Norwegian cinquefoil	Polygonaceae
POPA2	Poa palustris L.	fowl bluegrass	Rosaceae
POPE3	Polygonum persicaria l.	lady's-thumb	Poaceae
POPRI2	Poa subcoerulea Sm.	spreading bluegrass	Polygonaceae
POPRP2	Poa angustifolia L.	Kentucky bluegrass	Poaceae
POTR2	Poa trivialis L.	rough bluegrass	Poaceae
RASA2	Raphanus sativus L.	cultivated radish	Poaceae
ROSY	Rorippa sylvestris (L.) Bess.*	creeping yellowcress	Brassicaceae

RUAC3	Rumex acetosella L. ssp. acetosella	sheep sorel	Brassicaceae
RUAC3	Rumex acetosella L. ssp. angiocarpus (Murb.) Murb.	sheep sorel	Polygonaceae
RUOB	Rumex obtusifolius L.	bitter dock	Polygonaceae
SAOF4	Saponaria officinalis L.	Bouncingbet	Polygonaceae
SCMA8	Scirpus paludosus A. Nels.	bayonet grass	Caryophyllaceae
SEJA	Senecio jacobea L.	Tansy ragwort, Stinky willie	Cyperaceae
SEVI4	Setaria viridis (L.) Beauv.	Green bristlegrass	Asteraceae
SIAL2	Sisymbrium altissimum L.	tumbling mustard	Poaceae
SIAR4	Sinapsis arvensis L.	charlock	Brassicaceae
SILA21	Silene latifolia Poir.	Bladder campion	Brassicaceae
SINO	Melandrium noctiflorum (L.) Fries	night-flowering catchfly	Caryophyllaceae
SOAR2	Sonchus arvensis L.	Perennial Sowthistle	Caryophyllaceae
SOAU	Sorbus aucuparia L.	European mountain ash	Asteraceae
SPAR	Spergula arvensis L.	spurry	Rosaceae
SPRU	Spergularia rubra (L.) J.& K. Presl	purple sand spurry	Caryophyllaceae
SYOF	Symphytum officinale L.	common comfrey	Caryophyllaceae
TALA2	Taraxacum scanicum Dahlst.	rock dandelion	Boraginaceae
TAVU	Tanacetum vulgare L.	Common Tansy, golden buttons	Asteraceae
THAR5	Thlaspi arvense L.	pennycress	Asteraceae
TRAE	Triticum aestivum L.	wheat	Brassicaceae
TRDU	Tragopogon dubius Scop.	yellow salsify, goatsbeard	Poaceae
TRPE21	Tripleurospermum inodorum (L.) Schultz-Bip.	scentless mayweed	Asteraceae
VESES	Veronica serpyllifolia L. subsp. serpyllifolia	thyme-leaf speedwell	Asteraceae
VICRC	Vicia cracca L. ssp. Cracca	bird vetch, dog pea	Scrophulariaceae
VITR	Viola tricolor L.	johnny jumpup	Fabaceae
LYCH3	Lychnis chalcedonica L.	maltesecross	Fabaceae
RAAC3	Ranunculus acris L.	tall buttercup	Caryophyllaceae
SIAL5	Sinapis alba L.	white mustard	Ranunculaceae
ACFI	Achillea filipendulina Lam.	fernleaf yarrow	Brassicaceae
HICA10	Hieracium caespitosum Dumort.	meadow hawkweed	Asteraceae
HIPIP	Hieracium pilosella L.	mouseear hawkweed	Asteraceae

Appendix B: Class II species list

Class II. Widespread Lower-Priority Invasive Plants
(invasive plants that are widespread across Southeast Alaska)

These species Do Not need to be vouchered. They need to be recorded when they occur at a survey point, but they Do Not need to be followed out along the road corridor to assess the extent of their coverage along the roadway.

Taraxacum officinale G.H. Weber ex Wiggers,	common dandelion
Leucanthemum vulgare Lam.,	oxeye daisy
Matricaria discoidea DC.,	disk mayweed or pineappleweed
Achillea millefolium ssp. *millefolium* L.,	common yarrow
Crepis tectorum L.	annual hawksbeard
Senecio vulgaris L.	common groundsel
Trifolium repens L.,	white clover
Trifolium hybridum L.,	alsike clover
Trifolium pratense L. .,	red clover
Trifolium aureum Pollich.,	golden clover
Ranunculus repens L. ,	creeping buttercup
Elymus repens (L.) Gould,	quackgrass
Poa pratensis L.,	Kentucky bluegrass
Phleum pratense L.,	common timothy
Poa annua L.,	annual bluegrass
Phalaris arundinacea.,	reed canary grass
Dactylis glomerata L. .,	orchard grass
Rumex crispus L.	curled dock
Rumex longifolius DC.	Garden dock
Plantago major L.,	common plantain
Stelleria media (L) Vill. .,	common chickweed
Capsella bursa-pastoris (L.) Medik	shepherd's purse
Capsella rubella Reut.	shepherd's purse
Digitalis purpurea L.,	purple foxglove
Chenopodium album L.,	lambsquarters

Appendix C: Non-native species recorded during surveys

Species code	Scientific name	Common name	Family	Distribution/ Location	Class
AGGI2	Agrostis gigantea	creeping bentgrass, redtop	Poaceae	northern part of the island	1
AGST2	Agrostis stolonifera	creeping bentgrass, redtop	Poaceae	very disturbed areas, by Hydaburg, main roads	1
ALPR3	Alopecurus pratensis	meadow foxtail	Poaceae	scattered, road to Hydaburg	1
ANCO2	Anthemis cotula	mayweed	Asteraceae	one plant only, in Craig urban area	1
CABU	Capsella bursa-pastoris	shepard's purse	Brassicaceae	one plant only, in Whale Pass area	2
CEBI2	Centaurea biebersteinii	spotted knapweed	Asteraceae	two populations in the north	HP
CEFO2	Cerastium fontanum	large mouse ear chickweed	Caryophyllaceae	ubiquitious throughout island	2
CIAR4	Cirsium arvensis	Canada thistle	Asteraceae	scattered, State roads, rock pits	1
CIVU	Cirsium vulgare	Bull thistle	Asteraceae	scattered, dense populations on State roads and disturbed FS rds	HP
CRTE	Crepis tectorum	Annual hawksbear	Asteraceae	uncommon and scattered on state roads	2
DAGL	Dactylis glomerata	orchard grass	Poaceae	common throughout island	2
DEEL	Deschampsia elongata	slender hairgrass	Poaceae	FS roadsides, common	1
DIPU	Digitalis purpurea	purple foxglove	Scrophulariaceae	common in urban areas and areas of heavy disturbance	2
ERGA	Erucastrum gallicum	dog mustard	Brassicaceae	scattered around Coffman Cove	1
GNPA	Gnaphalium palustre	Marsh cudweed	Asteraceae	uncommon near FS intersections and rock pits	1
HIAU	Hieracium aurantiacum	orange hawkweed	Asteraceae	common in urban areas, scattered but common in remote FS roads, rock pits	1
HICA10	Hieracium caespitosum	meadow hawkweed	Asteraceae	rare: two populations recorded	1
HIMU	Hieracium murorum	wall hawkweed	Asteraceae	collected from one rockpit, not sure of id	1

Species code	Scientific name	Common name	Family	Distribution/ Location	Class
HIUM	Hieracium umbellatum	narrow leaved hawkweed	Asteraceae	not sure of id	1
HOJU	Hordeum jubatum	Foxtail barley	Poaceae	only two populations found- on Klawock-Thorne Bay highway	1
HYPE	Hypericum perforatum	Common St. John's wort	Clusiaceae	uncommon but widely distributed	1
HYRA3	Hypochaeris radicata	cat's ears	Asteraceae	common in south region, especially by Polk Inlet, State roads. More uncommon in the northern region	1
LASE	Lactuca serriola	prickly lettuce	Asteraceae	not sure of id	1
LEHI4	Leontodon hirtus	rough hawkbit	Asteraceae	syn. Leontodon nudicaulis, not previously known in AK?	1 or HP
LEVU	Leucanthemum vulgare	oxeye daisy	Asteraceae	Common throughout island, more common in urban areas/areas of heavy disturbance	2
LOCO6	Lotus corniculatus	Bird's foot trefoil	Fabaceae	Scattered and uncommon.	1
LOPEP	Lolium perenne	perennial ryegrass	Poaceae	ubiquitious by Coffman Cove (seeded in new construction zones), scattered but with a wide distribution in remainder of island	1
LUPOP4	Lupinus polyphyllus	large-leaf lupine	Fabaceae	one population at each FS campground	1
MADI6	Matricaria discoidea	pineapple weed	Asteraceae	common in areas of heavy disturbance: rock pits, pullouts, urban areas	2
MEAL12	Melilotus alba	white sweet clover	Fabaceae	Uncommon on Klawock-Thorne Bay State rd.	1
MELU	Medicago lupulina	black medic	Fabaceae	Common in rock pits, pullouts throughout island	1
MEOF	Melilotus officinalis	yellow sweet clover	Fabaceae	Uncommon on Klawock-Thorne Bay State rd.	1

Species code	Scientific name	Common name	Family	Distribution/ Location	Class
MESES	Medicago sativa	alfalfa	Fabaceae	one plant recorded on Klawock-Thorne Bay State rd.	1
MYMU	Mycelis muralis	wall lettuce	Asteraceae	somewhat uncommon and scattered throughout island, usually dense when present	1
MYSC	Myosotis scorpioides	true forget-me-not	Boraginaceae	uncommon on roadsides, mainly near urban areas	1
PHAR3	Phalaris arundinacea	reed canary grass	Poaceae	ubiquitous throughout island	2
PHPR3	Phleum pratense	common timothy	Poaceae	ubiquitous throughout island	2
PLLA	Plantago lanceolata	English plaintain	Plantaginaceae	one population found at Hollis ferry terminal	1
PLMA2	Plantago major	common plaintain	Plantaginaceae	ubiquitous throughout island	2
POAN	Poa annua	annual bluegrass	Poaceae	common throughout island	2
POCO	Poa compressa	Canada bluegrass	Poaceae	uncommon but widely distributed	1
POLA4	Polygonum lapathifolium	willow weed	Polygonaceae	uncommon on pullouts and other areas of heavy disturbance	1
POPA2	Poa palustris	fowl bluegrass	Poaceae	common throughout island	1
POPR	Poa pratensis	Kentucky bluegrass	Poaceae	common throughout island	2
POTR2	Poa trivialis	rough bluegrass	Poaceae	uncommon, in south of island	1
RARE3	Ranunculus repens	creeping buttercup	Ranunculaceae	ubiquitous throughout island	
RUAC3	Rumex acetosella	sheep sorel	Polygonaceae	uncommon, but dense when present	1
RUCR	Rumex crispus	curled dock	Polygonaceae	common in urban areas, areas of heavy disturbance	2
SEJA	Senecio jacobea	Tansy ragwort	Asteraceae	uncommon on road to Whale Pass	1
SEVU	Senecio vulgaris	common groundsel	Asteraceae	common but scattered, more common in urban areas	2
SILA21	Silene latifolia	Bladder campion	Caryophyllaceae	rare: only two plants found, both in rock pits in the north of the island	1

Species code	Scientific name	Common name	Family	Distribution/ Location	Class
SOAS	Sonchus asper	Prickly sow thistle	Asteraceae	common in urban areas, rock pits, road ruts	1
SOOL	Sonchus oleraceous	Annual sow thistle	Asteraceae	one population in Craig in ATS parking lot	1
STME	Stellaria media	common chickweed	Caryophyllaceae	rare: one population on Hollis-Klawock State rd	2
SYOF	Symphytum officinale	common comfrey	Boraginaceae	rare: one population on Klawock-Thorne Bay highway, also one plant in Thorne Bay	1
TAOF	Taraxacum officinale	common dandelion	Asteraceae	ubiquitious throughout island	2
TAVU	Tanacetum vulgare	Common tansy	Asteraceae	uncommon: a handful of widely scattered populations at Hollis ferry terminal, Polk inlet	1
TRDU	Tragopogon dubius	yellow salisfy	Asteraceae	rare: one population found in a rock pit south of Naukati	1
TRRE3	Trifolium repens	white clover	Fabaceae	ubiquitious throughout island	2
TRHY	Trifolium hybridum	alsike clover	Fabaceae	common throughout island	2
TRPR2	Trifolium pratense	red clover	Fabaceae	common throughout island	2
VESES	Veronica serpyllifolia	thyme-leaved speedwell	Scrophulariaceae	common but widely scattered in heavily disturbed areas	1

Appendix D: List of voucher specimens

Scientific name	Common name	Latitude	Longitude	Location Notes	Associated species	Date collected	Collector
Agrostis gigantea	redtop	56.06233	-133.18613	1.1 miles from end of road at intersection	PHAR3, PLMA2	8/21/2005	KAA
Agrostis stolonifera	creeping bentgrass	55.56497	-133.06913	1.0 mile N of 924 jct	POAN, LEVU, PHAR3	7/16/2005	KAA
Agrostis tenuis	colonial bentgrass	55.54001	-132.39917	16.95 miles from jct 2030 on Kasaan Rd	POPR,AGST2, HOLA	7/4/2005	KAA
Alopecurus pratensis	meadow foxtail	55.30750	-132.86582	12.8 miles south of 924 @ pullout on east side of rd	RARE3, POPR, TRHY, PHPR3	6/24/2005	KAA
Cerastium fontanum	mouse ear chickweed	56.15430	-133.19362	0.55 miles from rd 2700	HIAU, PLMA2, TAOF, PHAR3	9/5/2005	KAA
Chrysanthemum maximum	Shasta daisy	55.46274	-132.77432	7.75 miles from Hollis ferry terminal on SR 924	TRRE3, CIVU, TRHY, TAOF, RUAC3	7/19/2005	KAA
Cirsium arvensis	Canada thistle	55.87288	-133.21898	2.6 miles from rd 2000	POPR, CEFO, TAOF	8/15/2005	KAA
Cirsium vulgare	bull thistle	55.462590	-132.71441	0.5 miles from SR 929	RARE3, CEFO2, AGGI2, PHAR3	9/8/2005	KAA
Dactylis glomerata	orchard grass	55.80883	-133.05434	0.3 miles from rd 2054	PHAR3. PLMA2, TRRE3	8/16/2005	KAA
Deschampsia elongata	slender hairgrass	56.06212	-133.19009	0.95 miles from end of rd at two intersections w spurs	PHAR3, POAN, AGGI2	8/21/2005	KAA
Digitalis purpurea	foxglove	56.13919	-133.15013	0.8 miles from 2700/3000 at pullout	HOLA, MYSC, RARE3	9/3/2005	KAA

Scientific name	Common name	Latitude	Longitude	Location Notes	Associated species	Date collected	Collector
Erucastrum gallicum	dog mustard	55.61423	-132.45373	10.7 MI FROM JCT 2030	PLMA2, TAOF, LEVU	7/4/2005	KAA
Gnaphalium palustre	western marsh cudweed	55.36298	-132.48971	7.6 miles from rd 21 @ intersection w rd 2150	TRRE3, PHAR3, PHPR3	6/29/2005	KAA
Hieracium aurantiacum	orange hawkweed	56.28474	-133.27294	2.5 miles from rd 2000	PHAR3, PHPR3, TRRE3	9/6/2005	KAA
Hieracium caespitosum	meadow hawkweed	55.35506	-132.50251	0.5 miles from fs 21 at LTF, mining area	POAN, LOPEP, TRHY	6/28/2005	KAA
Hieracium murorum	wall hawkweed	55.86626	-132.97584	rock pit off of 3035_019	PHAR3, CEFO2	8/30/2005	KAA
Hieracium umbellatum	narrow-leaved hawkweed	55.68609	-132.71834	SR 929	PHAR3, TAOF, PLMA2	7/2/2005	KAA
Holcus lanatus	velvet grass	55.38960	-132.83686	1.6 miles from SR 913 at intersection w spur road 021	LOPEP, PLMA2, PHAR3	6/21/2005	KAA
Hordeum jubatum	foxtail barley	55.58164	-133.05111	2.5 miles north of sr 924 junction on SR 929.	PHAR3, CEFO2, TRRE3	7/16/2005	KAA
Hypericum perforatum	St. John's wort	55.55130	-133.03636	11.0 miles west of 913 jct	TRHY, AGST2, PLMA2	7/19/2005	KAA
Hypochaeris radicata	hairy cat's ear	56.27782	-133.25455	3.5 miles from rd 2000	TRHY, CEFO2, PLMA2	9/6/2005	KAA
Lactuca serriola	Prickly lettuce	55.48196	-132.86334	1.9 miles west of 913 jct on 924	PHPR3, TRRE3, PLMA2	7/18/2005	KAA
Leontondon hirtus	rough hawkbit	55.58515	-133.04252	3.0 miles north of sr 924 junct on SR 929.	POPR, CEFO, PHAR, TAOF, RUCR, HYRA	7/16/2005	KAA

Scientific name	Common name	Latitude	Longitude	Location Notes	Associated species	Date collected	Collector
Leucanthemum vulgare	oxeye daisy	56.15143	-133.15353	1.75 miles from 3000/2700 jct at rock pit	CEFO2, PHAR3, POPA2	9/3/2005	KAA
Lolium perenne	perennial ryegrass	56.25676	-133.35729	1.0 miles from rd 2000	PHPR3, TAOF, TRRE3	9/7/2005	KAA
Lotus corniculatus	bird's foot trefoil	55.54749	-133.01893	10.25 miles past SR 913 jct on SR 924	TAOF, HOLA, MYMU	7/19/2005	KAA
Lupinus polyphyllus ssp. polyphyllus	bigleaf lupine	55.48196	-132.86334	at the Harris River picnic area parking area, by trailhead	MEAL, CEFO2, TRPR2, POPA2, MADI6	9/8/2005	KAA
Matricaria discoidea	pineapple weed	55.55965	-133.07865	0.5 miles north of 924 jct	RARE3, POPA2, POPR, POAN	7/16/2005	KAA
Medicago lupulina	black medick	55.92320	-133.14342	4.4 miles from FS 2000 at end of road	TRRE3, DAGL, PHPR3	8/15/2005	KAA
Medicago sativa ssp. sativa	alfalfa	55.65101	-132.92276	4.3 miles South of jct 925 on SR 929	TRRE3, PHAR3, HYRA3	7/6/2005	KAA
Melilotus alba	white sweetclover	55.57993	-133.05366	2.4 miles from SR 924 at intersection	TRHY, RARE3, TAOF	7/16/2005	KAA
Melilotus officinale	yellow sweet clover	55.57993	-133.05366	2.4 miles from SR 924 at intersection	MEAL12, POPA2, LEVU	7/16/2005	KAA
Mycelis muralis	wall lettuce	55.56136	-133.07560	0.6 miles N of 924 jct at intersection	LEVU, RARE3, TRHY	7/16/2005	KAA
Myosotis scirpioides	true forget-me-not	55.34132	-132.70224	7.25 miles from sr 913, moist roadside	with natives, RARE3, PHAR3, PLMA2	6/22/2005	KAA

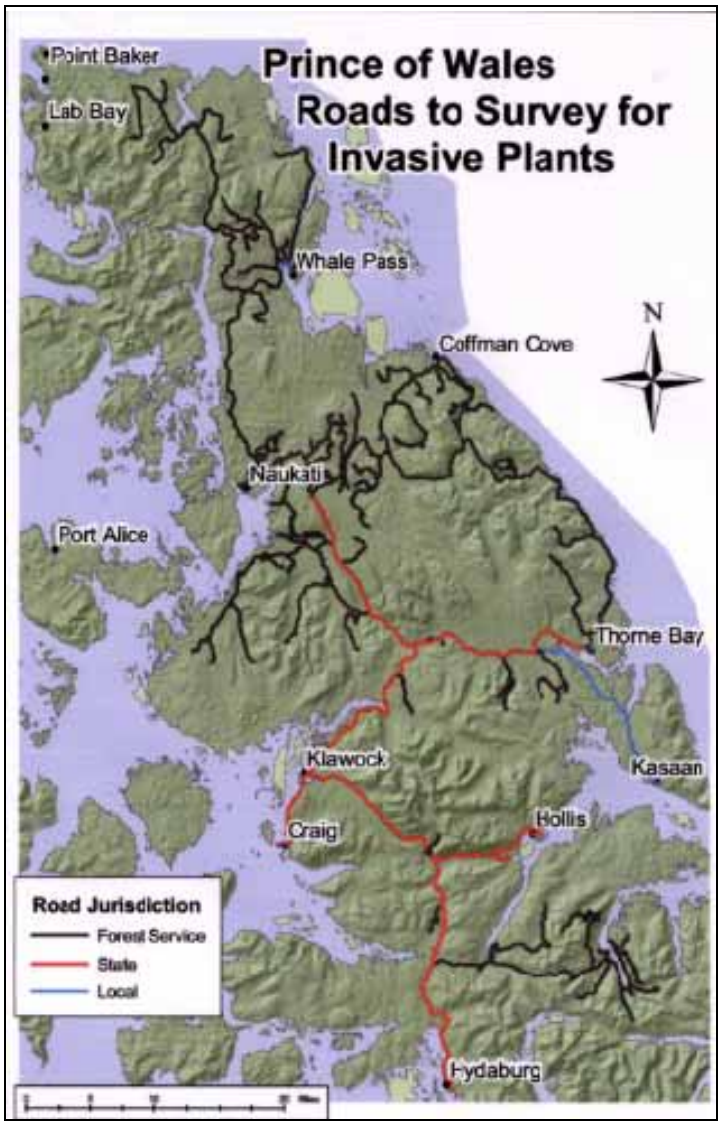
Scientific name	Common name	Latitude	Longitude	Location Notes	Associated species	Date collected	Collector
Phalaris arundinacea	reed canary grass	56.27284	-133.30989	.25 mi N of 2000/2079 jct	PLMA2, TAOF, TRRE3	9/7/2005	KAA
Phloem pratense	timothy grass	56.27032	-133.29904	0.3 miles from road 2000 at intersection	PLMA2, TRRE3, PHAR3	9/6/2005	KAA
Plantago lanceolata	narrow-leaved plaintain	55.49215	-132.62109	at the Hollis ferry terminal in the parking lot	PHAR3, TRRE3, PLMA2,RARE3, LEVU	7/17/2005	KAA
Plantago major	common plantain	55.47737	-133.13904	19.95 miles west of 913 @ intersection w Hilltop St and Cold Storage Rd	TRRE3, SEVU, SOAS	9/9/2005	KAA
Poa annua	annual bluegrass	56.11801	-133.11018	1.95 MI FROM 3000/3065	PHAR3, DEEL, RARE3	9/3/2005	KAA
Poa compressa	Canada bluegrass	55.56729	-133.06439	1.3 miles N of SR 924 about 300' south of Bennet Creek	RARE3, SYOF, TRRE3	7/16/2005	KAA
Poa palustris	fowl bluegrass	55.68797	-132.52701	At the pullout for TBRD office	POAN, PLMA2, PHPR3, LEVU	7/2/2005	KAA
Poa pratensis	Kentucky bluegrass	55.68914	-132.60520	.95 MI FROM JCT 2030	TAOF, CEFO2, POPA2	7/4/2005	KAA
Poa trivialis	rough bluegrass	55.46744	-132.85533	at Harris River Campground	LEVU, POPR, TRRE3	7/19/2005	KAA
Polygonum lapathifolium	curlytop knotweed	55.69176	-132.54707	1.0 miles w of tbrd office @ pullout on n side and intersection on south side.	MYMU, HIAU, LEVU	7/2/2005	KAA

Scientific name	Common name	Latitude	Longitude	Location Notes	Associated species	Date collected	Collector
Ranunculus repens	creeping buttercup	55.46259	-132.71441	0.5 miles from SR 929	PLMA2, PHAR3, TAOF, TRRE3, CEFO2, CIVU, AGGI2	9/8/2005	KAA
Rumex acetosella	sheep sorrel	55.43108	-132.84070	2.25 miles south of 924 @ large pullout w mining site, machinery storage.	CEFO2, TRRE3, PHPR3	6/24/2005	KAA
Rumex crispus	curly dock	55.58511	-133.04404	2.9 miles from SR 924 at intersection	CEFO2, TAOF, LEVU	7/16/2005	KAA
Senecio jacobeana	tansy ragwort	56.09855	-133.18486	1.05 miles from jct 2000 at pullout adj. to Neck Lake on rd 2500	PHAR3, TAOF, PLMA2	8/28/2005	KAA
Senecio vulgaris	common groundsel	55.53829	-132.39560	17.1 MI FROM JCT 2030 on Kasaan Rd	HOLA, AGCA5, RARE3	7/4/2005	KAA
Silene latifolia	bladder campion	56.06129	-133.22014	14.3 mi from jct 2060 @ rock pit	CEFO2, PHPR3, POPR	8/20/2005	KAA
Sonchus asper	annual sow thistle, prickly sow thistle	55.51488	-132.9573	6.9 miles west of sr 913 at pullout	PLMA2, TRRE3, PHAR3	8/16/2005	KAA
Stellaria media	common chickweed	55.54738	-133.05622	11.95 miles est of sr 913 @ pullout/ trail to bay	POTR2, RARE3, POCO, TRRE3	7/19/2005	KAA
Symphytum officinale	common comfrey	55.56729	-133.06439	1.3 miles N of SR 924 about 300' south of Bennet Creek	RARE3, TRRE3, POCO, TRPR2, LEVU	6/21/2005	KAA

Scientific name	Common name	Latitude	Longitude	Location Notes	Associated species	Date collected	Collector
Tanacetum vulgare	common tansy	55.36453	-132.68101	3.95 miles from 21 at pullout	POPA2, DEEL, LEVU	6/22/2005	KAA
Taraxacum officinale	common dandelion	55.47784	-133.12866	19.5 miles west of 913 jct @ intersection with residential rd	AGST2, POPR, TRHY	9/7/2005	KAA
Tragopogon dubius	yellow salsify	55.80820	-133.08266	in rock pit	Alder, POCO	8/11/2005	KAA
Trifolium hybridum	alsike clover	55.47740	-133.13694	19.85 miles west of 913 at intersection w School Dr and T+H St	LEVU, AGST2, TRPR2, RARE3	7/21/2005	KAA
Trifolium pratense	red clover	56.28431	-133.28833	1.5 miles from rd 2000	PHPR3, TRHY, PLMA	9/6/2005	KAA
Trifolium repens	White clover	56.18243	-133.08818	7.75 mi from end of 3000N	PHPR3, AGGI2, CEFO2	9/6/2005	KAA
Veronica serpyllifolia var. serpyllifolia	thyme leaved speedwell	55.36286	-132.63482	6.29 miles past jct with 21 on rd 2120	TRRE3, PHAR3	6/22/2005	KAA

Appendix E: Map of survey area

Map of roads surveyed on Prince of Wales Island, Alaska.



Appendix F: Progress reports

POW Non-native Plant Survey 2005
Progress Report 1

K. Arhangelsky
Turnstone Environmental Consultants
July 1, 2005

Summary
Field work began in the southern region of Prince of Wales Island, and to date we have surveyed 93.26 miles of road for a total of 436 data points.

Detail of Work Completed
Field surveys began on 21 June after a day of introduction, discussion and practice with agency personnel. Our field team surveyed both State and Forest Service managed roads from June 21-29. Information on roads surveyed is displayed in the table below.

Road #	Mileage	# of Data Points	Date Surveyed	Jurisdiction	Description	Notes
913	22.65	101	24-26-Jun	State	from SR 914 to Hydaburg	CIVU at data points 001, 004. SOAR2 at data point 098.
2014	3	15	21-Jun	FS- CRD	spur west of 913	
2025	1.85	11	21-Jun	FS- CRD	to 21 Mile trailhead	
21	22.45	107	22-27-Jun	FS- CRD	to Polk Inlet	Dog Salmon Fish Pass parking area included in this data
2120	11.3	53	21-22-Jun	FS- CRD	12 Mile Arm	
2135	5	25	28-Jun	FS- CRD	west side of Polk Inlet	SOAR2 found on point 003. Road washed out at 4.75 mi, at least 4 years ago judged by age of trees growing in road. From map, road looks to continue an additional 2 mi, which we did not survey.
2135.5	6.02	25	28-Jun	FS- CRD	spur from rd 2135	
2140	1.4	7	28-Jun	FS- CRD	to FS Work Camp on Polk Inlet	SOAR2 found on point 002 at old LTF.
2150	9.5	46	29-Jun	FS- CRD	spur from rd 21 on east side of Polk Inlet	
2150.2	1.4	6	29-Jun	FS- CRD	spur off 2150	Road ends much earlier than on map. Completely overgrown with Alder, barely discernable. Remainder was not surveyed.
2150.3	0.4	3	29-Jun	FS- CRD	spur off 2150	Tree fallen at start of spur. Road was hiked.
2150.4	2.75	11	29-Jun	FS- CRD	spur off 2150	
2150.5	0.4	3	29-Jun	FS- CRD	spur off 2150	
2150.6	5.14	25	29-Jun	FS- CRD	spur off 2150	Tree fallen 1.5 mi before end of road. Last mileage was hiked.
Total	**93.26**	**436**				

High Priority Species

New populations of high priority species were located of Bull Thistle *(Cirsium vulgare)* and Perennial Sow Thistle *(Sonchus arvensis).* Three previously unrecorded populations of Bull Thistle were found along the road to Hydaburg. Three populations of Perennial Sow Thistle were found in areas of mining and logging activity. Details of these locations are included in the accompanying High Priority Species report.

Additional Notes

Unknown specimens. Several grass specimens were collected by both Michael Shepard and myself on 22 June and assigned identical codes. Michael brought the specimens to the Sitka Herbarium for identification. As we identify the specimens in conjunction with herbarium experts, we will fill in our data sheets with the appropriate codes.

Road conditions. During our surveys of FS roads by Polk Inlet, we experienced some adverse road conditions on some of the more remote spur roads. Twice, the spurs had been un-maintained for several years or decommissioned at a different location then shown on our GIS maps provided by the USFS. In these cases, we did not survey the remained of the road (never more than 1.5 mi in length). An additional two times, the roads had a recent wash out or downed tree. We still considered them maintained and surveyed the remaining mileage on foot (also never greater than 1.5 mi in length). We clarified this issue with the FS during our scheduled audio conference call on July 1, 2005. Our procedure will be as follows:

1. In the event a road is decommissioned or has not been maintained for several years (judged by the age of shrubs and trees and severity of condition) we will not survey the remainder.
2. In the event of a recent obstruction on a road that is otherwise maintained, and with a remaining survey distance of 2 mi or less, we will survey the remainder on foot.
3. In the event of a recent obstruction on an otherwise maintained road, and with a remaining survey distance of 2 mi or greater, we will contact the appropriate ranger district to request road maintenance.

POW Non-native Plant Survey 2005
Progress Report 2

K. Arhangelsky
Turnstone Environmental Consultants
July 15, 2005

Summary

Field work continued in the Thorne Bay Ranger District in the vicinity of Thorne Bay on Prince of Wales Island. From July 2-14 we surveyed 149.15 miles for a total of 694 data points. To date, we have surveyed 242.40 miles of road for a total of 1110 data points.

Detail of Work Completed

Our field team surveyed both State and Forest Service managed roads from July 2-14. Information on roads surveyed is displayed in the table below.

Road #	Mileage	# of Data Points	Date Surveyed	Jurisdiction	Description	Notes
3020	4.7	21	7-Jul	FS- TBRD	Spur rd off Rd 3000	
3000	38	170	7-14 Jul	State	Thorne Bay to Coffman Cove	Road not surveyed to completion due to construction. Will be finished in August. (survey skips #005)- human error.
ENC	1.0	4	8-Jul	FS- TBRD	Eagle's Nest Campground	High traffic areas were surveyed within camp.
3030.2	3.05	14	12-Jul	FS- TBRD	Spur off 3030	
3030	19.8	88	12-Jul	FS- TBRD	Coffman Cove Loop	
LUCK	0.25	1	12-Jul	FS- TBRD	Luck Lake Access Site	
3030.1	1.25	6	12-Jul	FS- TBRD	Spur off of 3030	Road ends before shown on map- decommissioned.
3030.5	4.9	24	12-Jul	FS- TBRD	Spur off of 3030	
3030.85	0.75	4	13-Jul	FS- TBRD	Spur off of 3030	
3030.6	3.1	15	13-Jul	FS- TBRD	Spur off 3030	
3026	5.1	22	11-Jul	FS-TBRD	Spur	
KR	17.25	83	4-Jul	Local	Road to Kasaan	
3013.2	2.1	10	8-Jul	FS- TBRD	Spur off 3013	
SB	1.25	8	7-Jul	Local/FS	Sandy Beach Rd	Roads within city of Thorne Bay surveyed in this section, from RD office northeast.
3013	4.25	23	8-Jul	TBRD		

Road #	Mileage	# of Data Points	Date Surveyed	Jurisdiction	Description	Notes
2030.79	0.85	5	6-Jul	FS- TBRD	Lake No 3 Campground	
3018	6.2	31	6-Jul	FS- TBRD	Off 3000	
2030	5.85	31	6-Jul	FS- TBRD	East 2030 road	There are two roads in the TBRD called 2030, this is the east one.
2030.7	3.5	18	6-Jul	FS- TBRD	Spur off 2030	This road is decommissioned before shown on map- 0.25 mi closed.
3010	0.5	2	3-Jul	FS- TBRD	Short spur	
929	25.5	114	2-5-Jul	State	Thorne Bay to Klawock	This road not surveyed to completion- work is in progress.
Total	**149.15**	**694**				

High Priority Species

New populations of high priority species were located of Bull Thistle *(Cirsium vulgare)* and Perennial Sow Thistle *(Sonchus arvensis).* Eight populations of Bull Thistle and eleven populations of Sow Thistle were flagged and mapped. There were eighteen new locations of high priority species, with one location containing both SOAR and CIVU, bringing our total to 24 locations. It is possible that many of the Bull Thistle locations are already known to the FS, as control measures appear to be in place along SR 929. Details of these locations are included in the accompanying High Priority Species report.

Additional Notes

Unknown specimens. There is a "*Crepis sp*." recorded on our data forms. We need to return to this site and make a updated collection (ours did not have developed achenes). This revisit is scheduled for the week of July 18.

Road conditions. We have continued to encounter spur roads that are decommissioned prior to where they are shown on the map. These are noted where this occurred. We have been photographing the trapped roads, photos are available upon request.

Inspection issues. Inspection of our work took place on July 8 and 9. As part of our agreement outlined in the letter dated 7-15-05, we will return to the south of the island and check a portion of the survey points and include the data in a separate progress report. Additionally, we have instituted a process of random internal inspections to hopefully catch some species omissions before data is submitted.

POW Non-native Plant Survey 2005
Progress Report 3, Special Edition

K. Arhangelsky
Turnstone Environmental Consultants
July 25, 2005

Summary
This Special Edition Progress Report details the re-check of the work we completed as specified by the letter addressed to K. Arhangelsky regarding the first Inspection Report, dated July 13, 2005.

Detail of Work Completed
We re-checked 60 data points in the region covered by the first inspection on July 20 and 21. As instructed, we checked 30 points on the road to Hydaburg, and 30 points on the Forest Service Roads #21 and #2120. Forest Service Rd #21 was closed at milepost 14, preventing us from accessing other FS roads. Closures are expected throughout the summer at various mileposts, making it difficult if not impossible to recheck data points farther east. ***All additional species located by both inspectors and contractors during the inspection/re-check process were added to the data sheets and will be entered into the AKEPIC database.***

Results
The table below details survey points rechecked. We chose to additionally re-check four survey points that had been inspected on July 8 and 9, so that these points received a total of three visits, spaced two weeks apart. On all four plots, we found species that were missed on both the first visit (by the contractors) and on the second visit (by the inspectors). Highlighted survey points are ones which were inspected by the USFS and re-checked by the contractors..

Plot	Missed spp.	Comments
Hydaburg Rd.		
CRD_913_002	POPA2	Survey area just mowed, we found less species this time.
CRD_913_005	POPR	Survey area mowed while we surveyed (I had to get out of the way), we didn't find ALPR this time.
CRD_913_007	None	
CRD_913_009	POCO, POPA2	Our GPS was jumping around, not sure if we were in the right spot.
CRD_913_013	POPA2, TRHY, PHPR3	We couldn't relocate DAGL, which was recorded before.
CRD_913_018	TRHY, PLMA2, POPR	RARE3 at end of transect was not recorded, the PLMA2 was really hard to spot (seedlings). LEVU not relocated.
CRD_913_023	TAOF, PHPR3, POPA2, MADI6, SEVU	Many of these species most likely missed due to phenological reasons.
CRD_913_027	POPR, HOLA, POPA2, DAGL	
CRD_913_031	TAOF, POPR, PHPR3, CEFO2, POPA2	This plot was inspected, the species at left were missed by both contractors and inspectors.
CRD_913_032	PLMA2, POPA2, POAN, TRHY	

CRD_913_034	PHPR3	PHPR3 newly flowering.
CRD_913_037	TRHY, POCO	could not relocate LEVU
CRD_913_039	TRHY, DAGL	
CRD_913_042	POPR, PLMA2, POTR2, AGST2, HOLA, POPA2, POCO	These species, particularly the grasses, likely missed due to phenological reasons.
CRD_913_047	POAN, HOLA, TRHY, DAGL, POPA2	
CRD_913_050	TRHY, POPR	Survey area recently mowed. ALPR not relocated.
CRD_913_053	PHPR3, PLMA2, CEFO2, POPR, TRHY, POPA2	
CRD_913_056	ALPR3, RARE3, POPR, TRHY	
CRD_913_059	POPA2	
CRD_913_061	CEFO2, VESES, HOLA, POPR, PHPR3, POPA2	All looked young, likely phenological.
CRD_913_062	LEVU, CEFO2, POCO, POAN	may not have surveyed entire pullout before, area of survey unclear due to coordinates.
CRD_913_065	POPR, POPA2	
CRD_913_067	DAGL, CEFO2, PHPR3, POAN	did not relocate POLA4
CRD_913_070	LOCO6	LOCO6 definitely not at this pullout at prior site visit.
CRD_913_072	TRPR2, DAGL	looked new
CRD_913_073	DAGL, BR, POPR, POPA2	Species missed by both contractors and inspectors.
CRD_913_078	POPR	LEVU not relocated.
CRD_913_080	CEFO2, POPR, DAGL, LEVU	LEVU brand new. HYRA3 not relocated.
CRD_913_083	None	
CRD_913_086	None	LEVU not relocated.
CRD_913_091	None	
CRD_913_094	None	
FS Rd 21		
CRD_21_004	POPR, POCO, POPA	
CRD_21_007	HOLA, POPR, PHPR3,	Phenological omissions.

	RARE3	
CRD_21_010	TRRE3, PHPR3	Phenological omissions.
CRD_21_012	PLMA2, POPR, TRRE3, PHPR3	
CRD_21_027	POPR, CEFO2, HYRA3, PHPR3	
CRD_21_029	None	
CRD_21_031	DEEL	TRRE3 not relocated.
CRD_21_033	DAGL, POAN, POPR, CEFO2	TRRE3 not relocated.
CRD_21_036	LOPEP, CEFO2, HOLA	TRRE3 not relocated.
CRD_21_038	AGST2, HOLA, RARE3, PLMA2, POPA2	HOLA, PLMA2 both brand new- young shoots. Inspectors also missed species at left.
CRD_21_042	DEEL, AGST2, PLMA2, PHPR3, HOLA	TRRE3 located- we missed first time. Species at left, both contractors and inspectors missed.
CRD_21_046	AGST2, PLMA2	TRRE3, HOLA, not relocated,
CRD_21_048	TAOF, HOLA	
CRD_21_052	BR, DEEL, AGST2, PHPR3, POAN	
CRD_21_054	PLMA2, PHPR3, DEEL	
CRD_21_056	PHPR3, PLMA2	
CRD_21_058	POAN, POPA2, PLMA2	
CRD_21_059	TRRE3, POAN, CEFO2	
CRD_21_060	POPA2, AGST2, TAOF	Species at left missed by both contractors and inspectors on earlier visits.
CRD_21_062	POCO	
FS Rd 2120		
CRD_2120_002	DEEL, CEFO2, HOLA, TRRE3, AGST2	
CRD_2120_004	CEFO2, AGST2, DEEL	
CRD_2120_007	None	

CRD_2120_008	TRRE3, POPA2	
CRD_2120_010	None	
CRD_2120_012	None	
CRD_2120_015	PLMA2	Phenological omissions.
CRD_2120_016	PLMA2, CEFO2	Phenological omissions.
CRD_2120_018	AGST2, POPA2, DEEL	
CRD_2120_020	None	
CRD_2120_026	None	
CRD_2120_031	None	

Conclusions

On nearly all of the points we re-checked, we found species that were not picked up on previous visits. Since the surveyors were the same as those who conducted the first visits, it seems likely that species composition, especially when dealing with weedy species, continually undergoes phenological changes during the growing season.

The margin of error in the protocol makes replication of the survey data difficult. The combination of GPS error and odometer error means it is difficult to re-locate the exact survey point. Since we do not flag our plot centers, we found that being off just slightly with the odometer and GPS can shift plots in a direction and cover ground we did not survey. We discovered this first hand while checking our points; several times we had difficulty locating the exact spot of the survey and occasionally were not sure we were at the same location where we had once surveyed. We experimented and found that shifting the plot in a direction along the road just 20 feet changed the species we captured during our surveys, even with omitting outlying plants.

Species phenology means that the species composition is slightly different over a two week time period. In addition to locating new species at each plot, we also often could not relocate species we had found on the first visit. In particular, *Trifolium repens* was often already gone to seed in places and not re-locatable in areas with small infestations. In other places still, we found new *Trifolium* seedlings. *Plantago major* in particular seems to have undergone a growth increase in the past month, and we continually see new cotyledons of this species on our points.

In order to achieve 100% accuracy between inspections and survey work, survey point centers would need to be marked clearly with flagging, and inspectors would need to visit within a few days of the surveyors.

POW Non-native Plant Survey 2005
Progress Report 4

K. Arhangelsky
Turnstone Environmental Consultants
July 29, 2005

Summary
Field work continued in the Craig and Thorne Bay Ranger Districts on Prince of Wales Island. From July 16-21 we surveyed 41.25 miles for a total of 227 data points. To date, we have surveyed 283.85 miles of road for a total of 1338 data points.

Detail of Work Completed
Our field team surveyed both State and Forest Service managed roads. Information on roads surveyed is displayed in the table below.

Road #	Mileage	# of Data Points	Date Surveyed	Jurisdiction	Description	Notes
2030W	3.5	20	16-Jul	FS- TBRD	Spur road off SR 929	
929	7.5	36	16-Jul	State	Thorne Bay to Klawock	Final mileage surveyed on this road, continuation from last survey period.
924	30.25	157	17-20 Jul	State	Hollis to Craig	Not entirely finished, remainder will be surveyed in August. (only points within Craig need surveys). Extensive populations of CIVU along this road.
HRC	0.25	1	19-Jul	FS- CRD	Harris River Campground	Entire campground
Total	**41.25**	**227**				

High Priority Species
New populations of high priority species were located of Bull Thistle *(Cirsium vulgare)* and Perennial Sow Thistle *(Sonchus arvensis).* Thirteen populations of Bull Thistle and five populations of Sow Thistle were flagged and mapped. There were seventeen new locations of high priority species, with one location containing both SOAR2 and CIVU, bringing our total to 41 locations. We did not flag locations in urban areas where jurisdiction was questionable. Details of these locations are included in the accompanying High Priority Species report.

Additional Notes
Species of interest. Several new species of note were observed during our surveys. *Lotus corniculatus* (bird's foot trefoil) was collected and identified from two survey points. *Leontodon nudicaule* was also located both on SR 924 and SR 929. Populations of *Sonchus asper* were also recorded along SR 924.

Inspection issues. We re-checked 60 survey points in the southern region of our survey area as suggested by the July 8th letter regarding the first Inspection Report. Our findings have been summarized in the "Special Edition" July 25th Progress Report 3.

Halfway mark. Although we are slightly under the halfway mark of the total mileage requiring surveying, we are over halfway complete with the workload. Our reasoning is that the state managed, paved roads take a good deal longer to complete due to the greater diversity of weeds and higher frequency of pullouts and intersections along these roads. We have surveyed the majority of these roads and primarily forest service spurs in the north of the island will be surveyed in the second half. Our field team is currently taking our halfway recess, and field work will commence again on August 8th, 2005, and continue through September 15th, 2005.

POW Non-native Plant Survey 2005
Progress Report 5

K. Arhangelsky
Turnstone Environmental Consultants
August 19, 2005

Summary
After a two week break, field work continued in the Thorne Bay Ranger District on Prince of Wales Island. From August 9-19 we surveyed 110.15 miles for a total of 553 data points. To date, we have surveyed 394 miles of road for a total of 1891 data points.

Detail of Work Completed
Our field team surveyed both State and Forest Service managed roads. Information on roads surveyed is displayed in the table below.

Road #	Mileage	# of Data Points	Date Surveyed	Jurisdiction	Description	Notes
2050	23.5	118		FS- TBRD		Pam has this data
2050.05	5.3	25		FS- TBRD	Spur off 2050	Pam has this data
2050.3	6.8	29		FS- TBRD	Spur off 2050	Pam has this data
2050.505	0.1	1		FS- TBRD	Staney Creek Campsite	Pam has this data
2058	**4.75**	**22**		FS- TBRD		Pam has this data
2050.6	**2.5**	**13**		FS- TBRD	Spur off 2050	Pam has this data
2051.1	**2.5**	**11**		FS- TBRD	Spur off 2051	Pam has this data
2050.7	**2.5**	**11**		FS- TBRD	Spur off 2050	Pam has this data
2051	**6.1**	**33**		FS- TBRD		Pam has this data
2057.3	**2.4**	**11**	8/18	FS- TBRD	Spur off 2057	
2057	**3.9**	**22**	8/18	FS- TBRD		
925	**14.8**	**64**	8/17	State	Rd to Naukati	Population of CEBI2 encountered at 11.0 mi mark.
2056.1	**2.55**	**14**	8/18	FS- TBRD	Spur off 2056	
2056.2	**1.4**	**6**	8/18	FS- TBRD	Spur off 2056	
2056	**2.45**	**14**	8/15	FS- TBRD	Spur off 2000	
2059.4	**1.5**	**8**	8/15	FS- TBRD	Spur off 2059	
2059	**4.4**	**23**	8/15	FS- TBRD		

2060	**2.6**	**14**	8/15	FS- TBRD	To Naukati	
2060.5	**0.1**	**1**	8/15	FS- TBRD	Adj. to Naukati	
2054.3	**1.25**	**7**	8/16	FS- TBRD	Spur off 2054	
2054.2	**1.4**	**7**	8/16	FS- TBRD	Spur off 2054	
2050.2	**0.75**	**3**	8/15	FS- TBRD	Spur off 2050	
2000	**8.5**	**45**	8/16	FS- TBRD	Main route north	Section only from pavement ending to Naukati turn off completed.
2059.3	**1.1**	**7**	8/15	FS- TBRD	Spur off 2059	
2054	**7.0**	**44**	8/12 to 8/15	FS- TBRD		
Total	**110.15**	**553**				

High Priority Species

New populations of high priority species were located of Bull Thistle *(Cirsium vulgare),* Perennial Sow Thistle *(Sonchus arvensis),* and Spotted Knapweed *(Centaurea biebersteinii).* There were nine new locations of high priority species, bringing our total to 50 locations. One population of Bull Thistle, seven populations of Sow Thistle, and one population of Spotted Knapweed were flagged and mapped. We did not flag locations in urban areas where jurisdiction was questionable. Details of these locations are included in the accompanying High Priority Species report.

Additional Notes

Species of interest. Several new species of note were observed during our surveys. *Lotus corniculatus* (bird's foot trefoil) has continued to show up on our surveys of the state road from Control Lake to Naukati. Salsify (*Tragopogon dubium)* was collected from a rock pit along FS road 2050, this is the only population we have observed so far. Bladder campion (*Silene latifolia)* was collected from a rock pit as well in the Naukati vicinity, only one plant was found and was pulled for a collection. Also of a great significance was our first encounter with Spotted Knapweed *(Centaurea biebersteinii)* on the state road to Naukati. We would recommend prompt eradication as the plants were in full bloom on August 17.

Inspection. I met with Pam Fletcher on Monday, August 15, to pass off one week's worth of data. Data handed off to Pam on this date is noted in the table above. We talked about having the originals sent to Marla and multiple copies made for insurance.

POW Non-native Plant Survey 2005
Progress Report #6

K. Arhangelsky
Turnstone Environmental Consultants
September 2, 2005

Summary
Field work continued in the Thorne Bay Ranger District on Prince of Wales Island. From August 20-September 2, 2005 we surveyed 100.65 miles for a total of 477 data points. To date, we have surveyed 494.65 miles of road for a total of 2368 data points.

Detail of Work Completed
Our field team surveyed Forest Service managed roads, primarily in the north of the island. Information on roads surveyed is displayed in the table below.

Road #	Mileage	# of Data Points	Date Surveyed	Jurisdiction	Description	Notes
2505	4.5	22	21-Aug	FS- TBRD	Spur off 2500	
2000	36.65	168	20-31 Aug	FS- TBRD	Main road up north	To be continued, several miles left to survey in the north of the island
3036	2.4	13	28-Aug	FS- TBRD		Rd ends 0.25 mi prematurely, tank trapped.
2300	4.3	20	28-Aug	FS- TBRD	Part of Coffman Cove-Naukati loop	Parts under construction, access possible only at 8 am 12 pm, and 4 pm, or Sundays.
3036.6	0.25	2	28-Aug	FS- TBRD		Rd ends prematurely.
3000	10.1	50	28-Aug	FS- TBRD	Coffman Cove-Naukati	This road continues from a previous survey. Parts are under construction, access possible only at 8 am, 12 pm, and 4 pm, or Sundays.
3060	2.75	12	27-Aug	FS- TBRD		
2500	3.6	19	27-Aug	FS- TBRD	Road to Whale Pass	
2360	2.8	13	29-Aug	FS- TBRD	Fish City	Ends prematurely- tank trapped and culvert removed. Main route under construction, access possible only at 8 am, 12 pm, and 4 pm, or Sundays.
2360.4	0.75	3	29-Aug	FS- TBRD	Spur off 2360	
2360.3	0	0	N/A	FS- TBRD	Spur off 2360	Not surveyed- access blocked by culvert removal/tank trap.
3030.3	3.5	19	29-Aug	FS- TBRD	Spur off Coffman Cove loop	Rd ends 0.75 mi early.
3030.4	3.0	14	30-Aug	FS- TBRD	Spur off Coffman Cove loop	
3035	8.5	40	30-Aug	FS- TBRD	Wolf Pup	Access difficult due to construction. See above
3035.2	2.25	11	30-Aug	FS- TBRD	Spur off 3035	Access difficult due to construction. See above.
3035.1	2.75	14	01-Sep	FS- TBRD	Spur off 3035	Access difficult due to construction. See above.
3030.7	8.75	38	01-Sep	FS- TBRD	Spur off Coffman Cove loop	

2052	3.8	19	02-Sep	FS- TBRD	Spur off SR 925	Population of SOAR2 at rock pit, 0.3 mi in
Total	**100.65**	**477**				

High Priority Species

New populations of high priority species were located of Bull Thistle *(Cirsium vulgare)* and Perennial Sow Thistle *(Sonchus arvensis).* There were five new locations of high priority species, bringing our total to 55 locations. One population of Bull Thistle, and four populations of Sow Thistle were flagged and mapped. In particular, the population of Bull Thistle may be difficult to access due to the ongoing road construction on the Coffman Cove Road. Details of these locations are included in the accompanying High Priority Species report.

Additional Notes

Species of interest. Mouse ear hawkweed *(Hieracium pilosella)* was observed and collected from a rock pit on road 3505, off the Coffman Cove Road. This is our first observation of this species. Of a lesser priority but still interesting was shepard's purse *(Capsella bursa-pastoris)* on the 2500 road to Whale Pass, perhaps of note because it is our first observation of a species often considered ubiquitous. Also on this road were several rosettes of tansy ragwort *(Senecio jacobeana)* and one adult plant, the latter of which we pulled. We have not recorded this plant since the ferry terminal in Hollis.

Voucher specimens. I have collected and pressed voucher specimens for nearly all of the Class One species encountered during our surveys. Much of the collecting was done during the first stint of survey work, during the height of flowering, but a few species still remain to be collected. We are keeping an eye out for them and will revisit survey points if necessary.

Decommissioned roads. We have continued to experience spur roads ending prematurely from where they are shown on the map. Usually a large culvert is removed, or less frequently, the road has not been maintained in such a length of time that it is not passable due to alder thickets or intimidating sinkholes. It is possible that the GIS layer is slightly outdated and that some maintenance levels have been changed for these roads. All premature road endings have been clearly mapped and photographed.

Road construction. The road from Coffman Cove to Naukati is currently under construction and is closed for much of the day, making access difficult for roads 2300, 3000, and their associated spurs. Access may be permitted to the spurs at 8 am, 12 pm, and 4 pm, and the main roads can be inspected on Sundays. The nine miles of roads 2300 and 3000 are currently under intensive construction and our survey results may be of limited use. I would recommend a revisit in a year or two to see what transpires after all the heavy equipment and seeding has run its course.

POW Non-native Plant Survey 2005
Progress Report #7

K. Arhangelsky
Turnstone Environmental Consultants
September 16, 2005

Summary
Field work continued in the Thorne Bay Ranger District on Prince of Wales Island and was completed on September 8, 2005. From September 3-8, 2005 we surveyed 58.15 miles for a total of 267 data points. We have surveyed 552.8 miles of road for a total of 2635 data points.

Detail of Work Completed
Our field team surveyed Forest Service, local, and state managed roads, primarily in the north of the island. Information on roads surveyed is displayed in the table below.

Road #	Mileage	# of Data Points	Date Surveyed	Jurisdiction	Description	Notes
2024.1	0.75	3	08-Sept	State	Spur off Klawock-Hollis highway	Ends prematurely- bridge over creek removed. Population of CIVU located at data point #002 at intersection
2000	7.75	36	07-Sept	FS- TBRD	Rd to Lab Bay	Continuation from previous surveys- road now completed. Portion of road slated for survey seems to end at arbitrary point.
2080	1.5	6	07-Sept	FS- TBRD	Spur in the north of the island	Road ends prematurely- becomes an alder tunnel and is not distinguishable.
2082	2.0	9	07-Sept	FS- TBRD	Spur in the north	Road ends prematurely by 0.15 mile, too overgrown to continue.
2083	4.75	20	07-Sept	FS- TBRD	Spur in the north	
2079	6.9	29	06-Sept	FS- TBRD	Spur off 2000	CEBI 2 located at data point #012.
924	1.0	4	03-Sept	State/FS	Roads around Craig	Completion of roads in the Craig urban area. We combined intersections here due to large number of stops- while walking on foot through town. Point completed at the Craig Ranger District also included here.
3065	1.95	9	03-Sept	FS- TBRD	Road northeast of Whale Pass	SOAR2 populations found throughout the survey. When only one rosette was found- I pulled the rosette but noted this on the data form.
2700	6.05	29	04-Sept	FS- TBRD	Road to Whale Pass	
2720	3.4	18	05-Sept	FS- TBRD	Spur off 2700	Road ends prematurely- not passable after this point.
2710	0.75	4	05-Sept	FS- TBRD	Spur off 2700	Road ends prematurely- becomes alder thicket.
3000N	16.55	76	06-Sept	FS- TBRD	Road north of Whale Pass	There are two 3000 roads- this is the northern one. SOAR2 at several data points.
3062	1.9	9	05-Sept	FS- TBRD	Spur off 3000 by Whale Pass	Road ends prematurely- washed out. Not stable or maintained after this point.
2730	2.4	13	04-Sept	FS- TBRD	Spur off 2700	Road ends prematurely- becomes impassable as an alder thicket. Not maintained.
3065A	0.5	2	03-Sept	Local	Roads in Whale Pass	Major intersections in Whale Pass surveyed. SOAR2 ubiquitous in town and not flagged.
Total	**58.15**	**267**				

High Priority Species
New populations of high priority species were located of Bull Thistle *(Cirsium vulgare)* and Perennial Sow Thistle *(Sonchus arvensis).* There were thirteen new locations of high priority species, bringing our total to 68 locations. Ten populations of *Sonchus arvensis*, three populations of *Cirsium vulgare*, and one population of *Centaurea biebersteinii.* One location contained both CIVU and SOAR2. Details of these locations are included in the accompanying High Priority Species report. Around the urban areas of Craig and Whale Pass, *Sonchus arvensis* is ubiquitous, found throughout private gardens, driveways, sidewalks, even in front of the Craig Ranger District office. We found mapping and flagging to be a challenge given the prevalence of the plants. In places, we pulled single rosettes while noting this on the data sheet. In other places, we did not flag plants due to private property or questions about property jurisdiction.

Additional Notes
Species of interest. Several new species in the mustard family were observed around Craig and in the north of the island. Collections were taken and the specimens await identification. Data sheets will be updated accordingly.

Voucher specimens. I collected nearly all Class Two and the remaining Class One species during this survey session, with a few exceptions. I am still compiling information on these specimens and will provide a complete list with the final report.

Decommissioned roads. We have continued to experience spur roads ending prematurely from where they are shown on the map, with perhaps a higher frequency in the north of the island. All premature road endings are mapped and photographed.

Discrepancy in total mileage. We have surveyed to completion all of the roads identified on the survey maps provided in June. The discrepancy in our mileage calculation and that of the one specified in the contract (552.8 vs. 584) could be due to a variety of reasons.

- Our mileage calculation is just a rough estimate based on odometer readings. GIS work will calculate the length more accurately.
- Many roads ended prematurely from where they are shown on the map and 2 roads did not exist. This were all shorter lengths, usually under a mile, but when combined could represent a significant amount of mileage. Again, GIS work would resolve this.
- Several roads were mapped as 2 different jurisdictions. An example of this is around Whale Pass, where roads were identified as both FS and Local management.

Appendix G: High Priority Species reports

POW Non-native Plant Survey 2005
High Priority Species Report

K. Arhangelsky
Turnstone Environmental Consultants
July 1, 2005

Summary
During our first survey period of June 21-29, 2005, we located three populations of High Priority Species: three populations of *Cirsium vulgare.* The populations of *Cirsium vulgare* were all located on SR 913 to Hydaburg.

Location 1
Species: *Cirsium vulgare*
# of plants: 13
Data point: CRD_913_001
Location: SR 913, 0.05 mile south of SR 924 adjacent to large pullout. 55.42938 N, 132.84354 W
Surveyors: K. Arhangelsky S. McDowell
Date: 6/24/05

Notes: a relatively recently established population with only 13 plants, spreading south along pullout. Flagged with white flagging and labeled appropriately. Aggressiveness is medium. Area infested is 0.01 acre.

Location 2
Species: *Cirsium vulgare*
# of plants: 9
Data point: CRD_913_004
Location: On the west side of SR 913 to Hydaburg, 0.75 mile south of SR 924. 55.45053 N, 132.83639 W
Surveyors: K. Arhangelsky, S. McDowell
Date: 6/24/05

Notes: A plant from last year visible amongst new rosettes, population may have been established here for a few seasons. Flagged with white flagging. Aggressiveness is medium. Area infested is 0.01 acre.

Location 3
Species: *Cirsium vulgare*
# of plants: 26-50
Data point: CRD_913_082
Location: SR 913, 18.8 miles past junction with SR 924, by quarry. West side of road: 55.25221 N, 132.82797 W. East side of road: 55.20596 N, 132.82792 W.
Surveyors: K. Arhangelsky, S. McDowell
Date: 6/26/05

Notes: Population on both sides of road adjacent to quarry entrance. Flagged with white flagging. Aggressiveness is high, due to movement of species across road. Area infested is 0.01 acre.

POW Non-native Plant Survey 2005
High Priority Species Report #2

K. Arhangelsky
Turnstone Environmental Consultants
July 15, 2005

Summary
During our second survey period of July 2-14, 2005, we located eight populations of High Priority Species: of *Cirsium vulgare.* The populations were located on SR 929 from Thorne Bay to Klawock, FS rd 3000, and along the road to Kasaan.

Location 8
Species: *Cirsium vulgare*
# of plants: 1000+
Data point: TBRD_929_026, 027
Location: Both sides of road- East end of population: 55.70419 N, 132.82802 W. West end of population on the north side of road: 55.70129 N, 132.63303. West end of population on the south side of road: 55.70032 N, 132.63417 W.
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/2/05

Notes: We did not flag each plant due to the size of this population, but rather the ends. Population very extensive, east end begins on both sides of road just W of survey point 026 and continues on both sides of the road for 0.25 mi. Start of the E end of population located at the 30 mph Curve sign. The W end of the population ends at two different locations, coordinates provided above. Towards the W end, population density is low (1 plant/20 m) and eradicators should look out for hard-to-see rosettes.

Location 9
Species: *Cirsium vulgare*
# of plants: 1000+
Data point: TBRD_929_083, 084
Location: SR 929, 0.75 mi south of junction with SR 925. N limit of population: 55.68707 N, 132.87244. S limit of population: 55.68278 N, 132.88207 W.
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/3/05

Notes: Population runs continuously for 0.3 mi along both sides of the road. On the W side of the road, it advances up the steep embankment when not visible on the roadside. This population is already known, some control measures appear to be in place. We double flagged the limits of this population. The population extends almost back to the trees and sedges on the east side of the road south of the guardrail.

Location 11
Species: *Cirsium vulgare*
# of plants: 1000+
Data point: TBRD_929_085-090
Location: SR 929, 1.25 mi south of 925 junction. N limit, 55.68278 N, 132.88337 W. S limit at point 090- 55.66969, 132. 90062.
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/3/05

Notes: This population is disjunct from Location 9 by about 100 m. It continues south from this survey point for 1.25 mi to survey point 090.

Location 14
Species: *Cirsium vulgare*
# of plants: 1000+
Data point: TBRD_929_092, 093
Location: SR 929, 3.1 mi south of junction 925 by intersection with two spur roads. N limit- 55.66249 N, 132.90500 W.
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/5/05

Notes: This is the population we encountered on our first day in the field with the FS. Population continues 0.15 mi through to next survey point 093. It also continues farther down road 2030, we will map this section when this spur is surveyed. It is also contiguous up on the west embankment on the road which is too steep to access.

Location 15
Species: *Cirsium vulgare*
# of plants: 6-25
Data point: TBRD_929_097
Location: SR 929, 4.3 mi south of junction with 929. N limit is on east side of road: 55.65184 N, 132.92412 W. S limit is at creek.
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/5/05

Notes: Population is spread out- just a few plants scattered on both sides of road. Starts just at Steelhead Creek and logging road with recent activity and spreads north. One CIVU on logging road going west 20m from SR 929.

Location 16
Species: *Cirsium vulgare*
# of plants: 51-150
Data point: TBRD_929_098
Location: SR 929, 4.5 mi south of junction with 929. N limit- 55.64992 N, 132.92467 W.
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/5/05

Notes: Runs 60 m S from coordinates above to double flag. This population is disjunct from Location 16 by about 100 m, starts 20 m south of Steelhead Creek bridge. The population appears to only exist on the W side of the road.

Location 17
Species: *Cirsium vulgare*
# of plants: 51-150
Data point: TBRD_3000_002
Location: FS rd 3000, 0.3 mi N from SR 929. 55.69275 N, 132.53356 W.
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/7/05

Notes: This population should be a high priority for control, as it is the only Bull Thistle we found in the vicinity. Population continues NW from coordinates for 20 m. Is likely associated with disturbed logging road/gravel.

Location 23
Species:*, Cirsium vulgare*
# of plants: CIVU- 51-150
Data point: TBRD_KR_075
Location: 15.8 mi south of 2030 on Kasaan Rd. 55.55008 N, 132.41699 N.
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/4/05

Notes: Species occurs in a weedy area peppered with *Digitalis*. Start and end points of population are flagged, including the 3 disjunct CIVU plants on opposite side of road from coordinates.

POW Non-native Plant Survey 2005
High Priority Species Report #3

K. Arhangelsky
Turnstone Environmental Consultants
July 29, 2005

Summary
During our second survey period of July 16-21, 2005, we located 13 populations of *Cirsium vulgare.*. The populations were located on SR 929 from Thorne Bay to Klawock, FS Rd 2030W, and along SR 924 from Hollis to Craig. Several populations were found in urban areas or in private yards. We did not flag these populations, as noted in location information.

Location 25
Species: *Cirsium vulgare*
# of plants: 1000+
Data point: TBRD_2030W_001, 002
Location: 0.01 mi from SR 929 on FS 2030W at large landing. 55.66177 N, 132.90473 W.
Surveyors: K. Arhangelsky S. McDowell
Date: 7/16/2005

Notes: CIVU rings the landing and is especially abundant along the backslope, where it travels down to our next survey point. **The FS observed this population alongside our surveyors on our first day of field work. This is a known population with some control measures in place.**

Location 26
Species: *Cirsium vulgare*
# of plants: 1
Data point: TBRD_2030W_003
Location: 0.15 mi from SR 929 on FS 2030W at intersection w/ spur rd. 55.66070 N, 132.90179 W.
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/16/2005

Notes: One adult plant located up spur road about 10 m from rd 2030W on west side. Could be a pioneer from neighboring, extensive population (Location 25).

Location 27
Species: *Cirsium vulgare*
# of plants: 1-5
Data point: CRD_924_003
Location: 0.5 mi west of Hollis ferry terminal on SR 924. 55.49048 N, 132.63337 W.
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/17/05

Notes: Only 4 rosettes located, mowing on the roadside is probably affecting this population adversely. Only 1 plant found on the N side of the road. Flagged is placed back from the population on shrubs so as not to be disturbed by mowing.

Location 28
Species: *Cirsium vulgare*
# of plants: 26-50
Data point: CRD_924_007
Location: 1.25 mi west of Hollis ferry terminal on SR 924. 55.48550 N, 132.64623 W.
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/17/05

Notes: Population is on south side of road and widely scattered.

Location 29
Species: *Cirsium vulgare*
# of plants: 1-5
Data point: CRD_924_008
Location: 1.3 mi west of Hollis ferry terminal on SR 924. 55.48644 N, 132.64842 W.
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/16/05

Notes: Only one plant, an adult, on N side of road.

Location 30
Species: *Cirsium vulgare*
# of plants: 1-5
Data point: CRD_924_009
Location: 1.5 mi west of Hollis ferry terminal on SR 924. 55.48806 N, 132.65053 W.
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/17/05

Notes: Only one plant, on N side of road, right by the center of the plot.

Location 31
Species: *Cirsium vulgare*
# of plants: 1-5
Data point: CRD_924_010
Location: 1.75 mi west of Hollis ferry terminal on SR 924. 55.49029 N, 132.65463 W.
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/17/05

Notes: One adult plant, south side of road.

Location 32
Species: *Cirsium vulgare*
# of plants: 6-25
Data point: CRD_924_018
Location: 3.25 mi west of Hollis ferry terminal on SR 924. 55.47719 N, 132.67454.
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/17/05

Notes: Plants mostly located on south side of road, one plant on north side of road flagged.

Location 33
Species: *Cirsium vulgare*
# of plants: 51-150
Data point: CRD_924_019, 020, 021
Location: 3.5 to 3.75 mi west of Hollis ferry terminal on SR 924. East boundary- 55.47415 N, 132.67823 W. West boundary- 55.47270 N, 132.67823 W.
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/17/05

Notes: Spread out, low density population spans these three data points. One large adult plant encountered every 30 m through mine site/rock pit.

Location 34
Species: *Cirsium vulgare*
# of plants: 1000+
Data point: CRD_924_021 thru 041
Location: 3.75-8.25 mi west of Hollis ferry terminal on SR 924. East boundary- 55.47238 N, 132.68372 W. West boundary- 55.46305 N, 132.78703 N
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/17/05

Notes: Extensive population runs 4.5 miles along SR 924. Plants are scattered and of relatively low density throughout, one large plant occurs every 20 m or so, with greater densities around data points 025 and 038. This population is difficult to track, as mowing makes visibility tough. The majority of individuals are persisting as basal rosettes. Appropriate control measures would require eradicators to walk the full length of population of both sides of road in between the coordinates listed above. In places, the population continues on top of steep embankments which are difficult to access.

Location 35
Species: *Cirsium vulgare*
# of plants: 6-25
Data point: CRD_924_052
Location: 0.3 mi west of junction with SR 913 on SR 924. 55.46353 N, 132.84810 W.
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/18/05

Notes: Small, dense population, all basal rosettes.

Location 36
Species: *Cirsium vulgare*
# of plants: 6-25
Data point: CRD_924_084, 085
Location: 6.9-7.0 mi west of junction with SR 913 on SR 924. East boundary- 55.51463 N, 132.95739 W. West boundary- 55.51546 N, 132.95892 W.
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/18/05

Notes: Population spans two data points and is on south side of road only. The east end of population begins east of the pullout and continue to the next point. Low density.

Location 40
Species:*, Cirsium vulgare*
# of plants: CIVU- 6-25.
Data point: CRD_924_146
Location: 18.75 mi west of SR 913 jct on SR 924 @ intersection w/ Tanner Crab Court, 55.48673 N, 133.12616
Surveyors: K. Arhangelsky, S. McDowell
Date: 7/19/05

Notes: This population begins nearby the state road but primarily is centered along Tanner Crab Court, which is a residential street. CIVU goes up the block to the end, lines both sides of the street. Population is not flagged, as they are very close to homes and may lie within the jurisdiction of the homeowners.

POW Non-native Plant Survey 2005
High Priority Species Report #4

K. Arhangelsky
Turnstone Environmental Consultants
August 19, 2005

Summary
During our fourth survey period of Aug 9-19 2005, we located two populations of High Priority Species: one population of *Cirsium vulgare,* and one population of *Centaurea biebersteinii.* The populations were located on SR 925 from Control Lake to Naukati, FS rd 2050, FS rd 2054, and FS rd 2060.

Location 42
Species: *Cirsium vulgare*
# of plants: 500+
Data point: TBRD_2054_011, 012
Location: 1.5 mi south of FS 2058 on FS 2054. N limit: 55.83459 N, 133.11813 W. S limit: 55.83273 N, 133.11976 W. Epicenter: 55.83358 N, 133.12002 W.
Surveyors: K. Arhangelsky, T. Martin
Date: 8/12/05

Notes: This population is centered around a rock pit, just north of the intersection with a mine-associated road along a slope. Pioneers are colonizing the road along to the south and north, those limits were flagged and coordinates taken.

Location 49
Species: *Centaurea biebersteinii*
# of plants: 1-5
Data point: TBRD_925_047
Location: 11.0 mi north of SR 929 junction on SR 925 at intersection with FS rd 2054. 55.80734 N, 133.03480 W.
Surveyors: K. Arhangelsky, T. Martin
Date: 8/17/05

Notes: Plants in full flower, would be best pulled soon! Located by stop sign in big intersection.

POW Non-native Plant Survey 2005
High Priority Species Report #5

K. Arhangelsky
Turnstone Environmental Consultants
September 2, 2005

Summary
During our fifth survey period of Aug 20-Sept 1, 2005, we located one population of *Cirsium vulgare.* The populations were located on Forest Service Road 2360 in the Thorne Bay Ranger District.

Location 54
Species: *Cirsium vulgare*
# of plants: 500+
Data point: TBRD_2360_008, 009
Location: Southern end: 55.92138 N, 133.00971 W. Northern end: 55.92357 N, 133.00977 W.
Surveyors: K. Arhangelsky, T. Martin
Date: 8/29/05

Notes: A large population associated with the large rock pit area, although no individuals are actually growing within the pit. The rosettes begin on the west side of the road, and run 0.05 mi to just before the mine entrance, on the east side of the road.

POW Non-native Plant Survey 2005
High Priority Species Report #6

K. Arhangelsky
Turnstone Environmental Consultants
September 16, 2005

Summary
During our sixth survey period of Sept 3-Sept 8, 2005, we found four locations of High Priority Species: three populations of *Cirsium vulgare*, and one population of *Centaurea biebersteinii.* populations were located on Forest Service Roads 3065, 3000N, 3065A, 2730, 2079 in the Thorne Bay Ranger District, and on State road 2024.1 in the Craig Ranger District.

Location 59
Species: *Cirsium vulgare*
# of plants: CIVU: 1
Data point: TBRD_3065A_002
Location: 56.12151 N, 133.12792 W.
Surveyors: K. Arhangelsky, T. Martin
Date: 9/3/05

Notes: Population is not flagged, looks to be on private property/ no trespassing signs. CIVU is one adult plant only.

Location 64
Species: *Cirsium vulgare*
# of plants: 1
Data point: TBRD_3000N_075
Location: 12.6 miles S of end of rd. 56.12057 N, 133.12364 W.

Surveyors: K. Arhangelsky, T. Martin
Date: 9/6/05

Notes: One adult plant only, flagged.

Location 67
Species: *Centaurea biebersteinii*
# of plants: 1-5
Data point: TBRD_2079_012
Location: 2.75 miles from rd 2000 at intersection. 56.28309 N, 133.26741 W.
Surveyors: K. Arhangelsky, T. Martin
Date: 9/6/05
Notes: 1 rosette, 1 adult. Plants on N side of road before gate.

Location 68
Species: *Cirsium vulgare*
# of plants: 6-25
Data point: CRD_2024.1_002
Location: 0.5 miles from SR 929. 55.46259 N, 132.71422 W.
Surveyors: K. Arhangelsky, T. Martin
Date: 9/8/05
Notes: One adult on SE side of road, flagged. Population extends from here up private driveway, and also in triangle/intersection.
