

North East Invasive Plant Committee

NEIPC

2006 Plan and Profile

Approved by the membership May 2, 2006



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GOAL OF THE NORTH EAST INVASIVE PLANT COMMITTEE, (NEIPC):

To prevent further damage to the ecosystems of northeast BC from invasive alien plants and begin to rehabilitate ecosystems that have been degraded by invasive alien plants.

OPERATING PRINCIPLES OF NEIPC:

- Encourage the public to report invasive plant sightings. (This requires adequate and prompt feedback to persons who report invasive plants).
- Inform the public about invasive plant programs so they can provide relevant comment.
- Develop and maintain a shared invasive plant inventory.
- Assess problems and threats that various invasive plants present to the environment and economy of the area. Categorize invasive plants and prioritize sites for control.
- Prevent the establishment of invasive plants not currently in the region. Prevent or minimize the spread of the invasive plants present in the region.
- Conduct invasive plant programs in the northeast using Integrated Pest Management, IPM, principles as described in the 'Invasive Plant Strategy for BC'.
- Coordinate the activities and responsibilities of the various agencies and private landowners to meet the NEIPC goal.

INTRODUCTION:

This invasive plant plan and profile is for northeast BC. The area of concern includes east of the Rocky Mountains to the Alberta border and north from Kakwa Provincial Park to the Yukon border. Invasive plants that cause serious problems in other parts of BC are either absent from or present in small populations in Northeast BC. This is in spite of extensive suitable habitat. Invasive plants are very damaging to the environment and economy. To prevent the spread of invasive plants and degradation of susceptible habitats in northeast BC an organized and coordinated approach is required.

The Northeast Invasive Plant Committee (NEIPC) has many agencies, organizations and private citizens as members, (Appendix A). This plan, drafted by the committee, is modeled after similar approaches taken by other regional invasive plant committees and follows the principles in the 'Invasive Plant Strategy for British Columbia'.

The intent is to have as wide an audience as possible review and comment on the plan in the winter so that NEIPC can update and approve the plan at spring meetings. The plan states principles for IP programs, tracks invasive plant populations, categorizes and prioritizes invasive plants and sites for control and outlines required actions so that resources can be allocated and coordinated for northeast BC.

The speed at which invasive plants invade and degrade habitats depends on the suitability and state of health of the habitat. Habitats in poor condition, weak or degraded plant communities, and disturbed ground such as construction sites, allow invasive plants to establish and spread rapidly. Prevention of invasive plant problems requires management of susceptible sites. Some of the actions NEIPC supports and encourages are:

- Farming and grazing practices that prevent invasive plant establishment.
- Seeding all disturbances as quickly as possible.
- Use of local clean or weed free seed and adherence to the Seed Act.
- Cleaning of equipment before it is moved.
- Tarping or covering grain, hay and other agriculture loads when transporting.
- Harvesting of hay before weed seeds are viable.
- Using locally grown weed free feed when taking livestock into the wilderness.
- Controlling invasive plants at chronic sources of seed pick up and spread such as gravel pits.

APPENDIX 1: ACTIONS FOR 2006

OPERATING PRINCIPLE	ACTION	STATUS
Encourage the public to report invasive plant sightings. (This requires adequate and prompt feedback to persons who report invasive plants).	Direct individuals to report IP sightings to the Regional District and ask agencies to let the Regional District know how many reports they are receiving.	A letter requesting this will be drafted with the RDs 1-800 number. Review the NWIPC report on their pilot and 1-800 number at the fall meeting.
Inform the public about invasive plant programs so they can provide relevant comment.	See events table below.	
Develop and maintain a shared invasive plant inventory.	Training on the Invasive Alien Plant Program, IAPP, will be conducted in May – June. IAPP is the shared provincial inventory for invasive plants. The training will provide information on standards, forms and data entry and retrieval for contractors, agencies, companies and other interested persons.	Training will be coordinated by the Invasive Plant Council of BC, IPC. Training will be provided at various locations, (Ft. Nelson, Ft. St. John and Dawson Creek), as early as possible in May and June. IPC will look after delivery and NEIPC will assist with promotion of the training.
Assess problems and threats that various invasive plants present to the environment and economy of the area. Categorize invasive plants and prioritize sites for control.	The overview profile needs to be updated with both field checks and threat assessment.	Work will continue on the profile. Info should be sent to MoF who will report at the fall meeting.
Prevent the establishment of invasive plants not currently in the region. Prevent or minimize the spread of the invasive plants present in the region.	Continue to develop and document the New Invaders Program, (Early Detection Rapid Response, EDRR). Ensure that Licences and PMPs are in place for EDRR. Work with IPC and the Interministerial Invasive Plant Committee to harmonize legislation to provide an	The New Invaders program is an effective EDRR program. Broadening support for the New Invaders program will increase its effectiveness. NEIPC members will be

	appropriate enforcement component to the EDRR program.	asked to support the New Invaders Program
Conduct invasive plant programs in the North East using Integrated Pest Management principles as described in the 'Invasive Plant Strategy for BC'.	Develop and implement the NEIPC Plan and accompanying PMPs.	NEIPC Plan approved _____. Notice of Intent to treat for PMPs done in April.
Coordinate the activities and responsibilities of the various agencies and private landowners to ensure NEIPC goals are met	Encourage organization at the local level providing mentoring and assistance through NEIPC. Assist with training, field days and centralized reporting to the Regional District.	For 2006 a single agency approach will be tested for the Pine Pass to Chetwynd area.

**2006 EVENTS WHERE IT IS PLANNED
TO PROMOTE AWARENESS OF INVASIVE PLANTS**

DATE	EVENT	LOCATION	CONTACT
May – June	IAPP training	Ft. St. John & possibly Ft. Nelson	Gail Wallin, IPC or Bob Drinkwater
to be determined	Weed identification for contractors	(use to be at Taylor but may be moved)	Jill Copes and Dennis Meier
May	Weed identification for the District of Hudson's Hope	Hudson's Hope	Jill Copes
August	Dawson Creek Fall Fair	Dawson Creek	Jill Copes
August	North Peace, Kiskatinaw and Tumbler Ridge Fairs	Various	Jill Copes
August	Hudson's Hope Fall Fair	Hudson's Hope	Jill Copes
May to August	Advertisement and Contest	Newspaper	Jill Copes

APPENDIX 2: CATEGORIZING INVASIVE PLANTS AND PRIORIZING SITES

Budget and staff limitations and the varying threats each invasive plant species poses to the northeast requires systems to guide and prioritize actions. For this reason invasive plants are categorized and sites are prioritized.

The aggressiveness and range of habitats that invasive plants will infest and dominate are estimated. This is done by reviewing literature on the habitat range and aggressiveness of invasive plants, having scientists review and advise NEIPC and having the collective membership of NEIPC, which has substantial expertise and experience, assess invasive plants. The various invasive plants present or threatening northeastern BC are then categorized. The process is flexible and reviewed by NEIPC on an ongoing basis. When additional information becomes available NEIPC is able to work towards a consensus to retain or change an invasive plant's category. Based on similar provincial groupings, invasive plants are given a rating or category as indicated in the following table.

INVASIVE PLANT CATEGORIES FOR NORTH EAST BC

1. Prohibited Invasive Plants Prohibited invasive plants are highly competitive with an ability to spread rapidly.	2. Primary Invasive Plants. Primary invasive plants have the ability to spread rapidly but are not as aggressive as prohibited invasive plants.	Category 3 Secondary Invasive Plants Secondary invasive plants can spread easily but the requirement to contain them is usually site specific. Invasive plants under successful biological control and native plants that behave in a weedy like fashion may be included in this category.
<ul style="list-style-type: none"> • hawkweeds, orange & yellow, <u>Hieracium spp</u> • hound's tongue, <u>Cynoglossum officinale</u>. (not reported in the region but expected to show up soon). • goatgrass, jointed, <u>Aegilops cylindrica</u> • knapweeds, <u>Centaurea diffusa</u>, diffuse knapweed, <u>C. maculosa</u>, spotted knapweed; and others that may show up • knotweed, Japanese & giant – <u>Polygonum spp</u> • leafy spurge & cypress spurge, <u>Euphorbia esula</u> & <u>cyparissias</u> • marsh plume thistle, <u>Cirsium palustre</u> • scabious, field or blue buttons <u>Knautia arvensis</u> • rush skeletonweed <u>Chondrilla juncea</u>, • tansy, common, <u>Tanacetum vulgare</u> • velvetleaf, <u>Abutilon theophrasti</u> 	<ul style="list-style-type: none"> • blueweed, <u>Echium vulgare</u> • buckwheat, tartary, <u>Fagopyrum tataricum</u> • burdocks, <u>Arctium spp.</u> • canada thistle, <u>Cirsium arvense</u> • chamomile, scentless, <u>Matricaria maritima</u> • cockle or campion, white <u>Lychnis alba</u>, • Hoary Cress, <u>Cardaria drapa</u> • green foxtail, <u>Sertaria viridis</u> • Pepper weed, <u>Lepidium spp</u> • plumeless thistle, (not reported in the region), <u>Carduus acanthoides</u>, • kochia, <u>Kochia scoparia</u> • loosestrife, <u>Lythrum spp.</u> • mustard, wild, <u>Sinapsis arvensis</u> • night-flowering catchfly, <u>Silene noctiflora</u> • oxeye daisy, <u>Chrysanthemum leucanthemum</u> • pepperweed – <u>Lepidium spp.</u> • russian thistle, <u>Salsola kali</u> • sow thistles, <u>Sonchus spp.</u> • tansy ragwort, (not reported in the region), <u>Senecio jacobaeae</u> • toadflax, dalmation & common, <u>Linaria dalmatica</u> & <u>vulgaris</u> 	<ul style="list-style-type: none"> • bladder campion, <u>Silene cucubalus</u> • bluebur, western, <u>Lappula echinata</u> • buckwheat, wild, <u>Polygonum convolvulus</u> • bull thistle, <u>Cirsium vulgare</u> • chickweed, mouse eared – <u>Cerastium spp.</u> • chicory, <u>Cichorium intybus</u> • cleavers, <u>Galium aparine</u> • curled dock and sheep sorrel, <u>Rumex spp.</u> • dragonhead, American - <u>Dracocephalum parviflorum</u> - native • goat's-beard or oyster plant, <u>Tragopogon dubius</u> • Flixweed, <u>Descurainia sophia</u> • foxtail barley (native?), <u>Hordeum jubatum</u> • groundsel, common, <u>Senecio vulgaris</u> • hawksbeard, narrowleaf, <u>Crepis tectorum</u> • hemp nettle, <u>Galeopsis tetrahit</u> • lamb's-quarters, <u>Chenopodium spp.</u> • mallow, <u>Malva neglecta</u> • mullein, <u>Verbascum thapsus</u> • mustard, dog - <u>Eruscastrum gallicum</u> • mustards, <u>Sisymbrium spp.</u> • nodding thistle, <u>Carduus nutans</u> • pineapple weed, <u>Matricaria matricarioides</u> • Prickly lettuce – <u>Lactuca serriola</u> • quackgrass, <u>Agropyron repens</u> • smartweed – <u>Polygonum spp.</u> • St. John's-wort, <u>Hypericum perforatum</u> • stinkweed, <u>Thlaspi arvense</u> • stork's bill, <u>Erodium spp.</u> • spurry, corn, <u>Spergula arvensis</u> • tarweed, (native?), <u>Madia glomerata</u> • water hemlock, western, (native), <u>Cicuta douglasii</u> • wild carrot – <u>Daucus carota</u> • wild oats, <u>Avena fatua</u> • wormwood or absinthium, <u>Artemisia absinthium</u> • yarrow – <u>Achillea millefolium</u> - native

Categorizing invasive plants helps with decisions in allocating resources and determining control methods. A further refinement is to prioritize sites. Some of the newly arrived invasive plants, such as spotted knapweed, infest only a few sites in the region and these sites have been kept small or eliminated. This is in spite of millions of hectares of habitat susceptible to invasion and degradation by spotted knapweed in northeast BC. With available resources it is feasible to keep spotted knapweed from spreading in northeast BC. This is done through prevention as discussed in the summary and by quickly detecting and controlling new infestations that show up, Early Detection Rapid Response, EDRR, or New Invaders program.

Some invasive plants have been in the region for quite a while and have established on a lot of sites covering large areas. Canada thistle is an example of such an invasive plant. Canada thistle aggressively invades cropland, pastures, grasslands, aspen forests, disturbed forests and other habitats. There are numerous Canada thistle infestations, some of which are large. To appropriately direct resources to deal with the degradation and threatened degradation caused by Canada thistle it is necessary to prioritize Canada thistle sites for control.

When Canada thistle has become well established and occupies a substantial portion of the susceptible habitat in an area, it is no longer feasible to control or kill the entire invasive plant population. Emphasis shifts to preventing spread off the site and reducing the aggressiveness of the invasive plant through the use of biological control agents. Biological control agents are usually insects and plant diseases that come from the invasive plant's place of origin and attack only the invasive plant.

In the southern parts of the northeast or Peace region, particularly where agriculture and other settlement activities occur, there are numerous Canada thistle infestations, some of which are quite large. Control in these areas includes mowing, herbicide application and release of biocontrol agents. A different situation with Canada thistle occurs in the northern part of the region, e.g., Ft. Nelson Forest District. There are few Canada thistle infestations in the Fort Nelson Forest District but millions of hectares of susceptible habitat, (grasslands, scrub steppe, open aspen stands, etc.) are threatened. In these lightly or uninfested areas it is important and feasible to try and control and eventually eliminate Canada thistle.

The location and surrounding habitat of invasive plant infestations needs to be assessed to assist in decisions and resource allocations for invasive plant control. Based on similar provincial groupings, invasive plant sites are given a rating or priority as follows:

SITE PRIORITIES

Priority	Purpose or Intent
1 Extremely High Opportunity for Control	To stop the spread of invasive plants threatening currently uninfested, highly susceptible areas. These sites are less than or equal to 0.25 ha. and there is a good expectation of control. This priority also includes sites that are threatening a large neighbouring economic base, for example, seed and other high value crops.
2 High Opportunity for Control	To stop the enlargement of sites in highly susceptible areas. These sites are less than or equal to 0.5 ha. Must have a reasonably good expectation of control.
3 Moderate Opportunity for Control	To stop the enlargement of sites that are greater than or equal to 0.5 ha in highly susceptible areas, or less than or equal to 0.5 ha in moderately susceptible areas.
4 Low Opportunity for Control	To stop the enlargement/contain sites greater than 0.5 ha.

Using categories of invasive plants and site priorities it is possible to define various levels for the invasive plant programs. The critical level is where control measures are targeted to prohibited invasive and primary invasive plants on small sites, less than .25 ha, that are threatening larger areas of uninfested, highly susceptible habitats. Members of NEIPC agree to operate, at a minimum, at the critical level. The following table indicates program levels.

PROGRAM THRESHOLD TABLE

INVASIVE PLANT CATEGORY	SITE PRIORITY	CONTROL REQUIREMENT
1 1 1 1 2	1 2 3 4 1	Critical level - control is required. The immediate requirement is to prevent newly arriving and invasive plants that have low population in northeast BC from establishing and or spreading. The goal is to eliminate the local population of the IP.
2 2 3	2 3 1	Containment level – Control is usually required but the need for control is reviewed in the context of the support and demands of agencies, area residents and goals for the area. The requirement is to identify the areas infested with invasive plants, as well as uninfested habitats, and use this information to prevent further expansion of invasive plant populations. This level doesn't deal with all invasive plant problems but keeps things from getting worse.
3 3	2 3	Comprehensive level –Control and rehabilitation will be attempted when biological control agents are available and effective. Control and rehabilitation using methods other than biological control require specific requests and justification by an analysis of risk, cost and benefit.

PROGRAM BY INVASIVE PLANT SPECIES

INVENTORY & TREATMENT REQUIREMENT	SPECIES	NOTES
All sites must be inventoried & treated	Spotted knapweed, spurges, marsh thistle, hawkweeds, scabious, etc.	Containment species not to be allowed to establish
Inventory and treat sites that meet matrix	Canada thistle, burdock, chamomile, sow thistle, toadflax, etc	
Inventory and treatment optional and not usually done	Bull thistle, pineapple weed, hawksbeard, etc.	Available biological control agents should be released on these invasive plants
Special status – must inventory all sites and treat all sites in the Chetwynd area and all other sites that meet matrix	Oxeye daisy	Containment status to be determined by 2007
Special status – risk assessment required	Wild carrot, goat’s beard	

APPENDIX 3: PROFILE OF INVASIVE PLANTS IN NORTHEAST BC

The profile has a summary of information on the invasive plants ordered similarly to the Categories of Invasive Plants for North East BC Table on page 5. They are organized by Category and within categories, alphabetically by the common name of the invasive plant.

Information is formatted as follows:

CATEGORY

common name, Latin name

- A brief description of where the invasive plant is found and how much of a problem or threat it is expected to present.

- Current availability of biocontrol agents, cultural controls, herbicides and other control strategies that may be effective. Information on biocontrol agents is also available at the following web site: http://res2.agr.ca/lethbridge/weedbio/index_e.htm. Current recommendations for herbicides to control invasive species in an agricultural environment can be found at:

<http://www1.agric.gov.ab.ca/general/pesticide.nsf/herbicidelisting?openview>

Another web site which searches the labels of all pesticides registered in Canada for key words can also provide a match for specific weed in a certain crop: The label must be read carefully to be sure it says a product CAN be used with (say) oats, rather than NOT to use it in oats. <http://www.eddenet.pmra-arla.gc.ca/4.0/4.0.asp> Hint: use the full-text search at the bottom of the page: enter both the crop and the weed. You will get a list of products that mention both words. “

- Suggested action for the immediate future.

CATEGORY 1 INVASIVE PLANTS

Hawkweeds, orange & yellow, Hieracium spp

- Some taxonomy work is required to differentiate between the various hawkweeds. At the rosette stage it is difficult to differentiate the various hawkweeds including orange from some of the yellow. There are at least three yellow flowered hawkweeds in northern BC that are introduced invasive plants, a hairy stemmed yellow flowered hawkweed that is probably H. pratense, narrow-leaved hawkweed, H. umbellatum, and a spotted leaved yellow flowered hawkweed, H. maculatum. There could also be several yellow flowered hawkweeds that are native to the area as well as the native white flowered hawkweed H. albiflorum. Distribution of hawkweeds has not been determined. Orange hawkweed, H. aurantiacum, and some yellow hawkweeds are extremely invasive in the rest of BC and are causing serious problems.

Hawkweeds have progressed north along Highway 97 from central BC and are common up to the Pine Pass. There have been numerous sites reported in the NEIPC area since 1999 and there are likely quite a few unrecorded sites. The most northerly site recorded is an orange hawkweed site inventoried and controlled in 2005, (site ID 205303). This site is north of Fort Nelson near steam boat. In 2005 a large yellow hawkweed site, (site ID 205220), was found, inventoried and treated near Pink Mountain at mile 134. This site was estimated to be 3 ha in size. Hawkweeds represent a serious threat to the NEIPC area.

- There are no biological control agents available for orange hawkweed. There are indications that orange hawkweed can be reduced with applications of ammonium sulfate, 21-0-0-25, in the spring or fall or prior to a wet period if a good grass stand is present.
 - Hawkweed sites that are reported will be investigated and treated using a combination of herbicides and pulling.

Hounds tongue, Cynoglossum officinale

- There are no reported sightings of hound's tongue in the region. Given the ease of transporting burrs it will likely appear in the future. Its first appearance will probably be in livestock facilities used for handling cattle from southern BC. Hounds tongue has an economic impact on the livestock industry at low levels because of the burrs. Because of its impacts on the livestock industry, the ability to detect, control and eliminate hounds tongue as it arrives is necessary.
 - To prevent seed production, control activities must occur before bloom. This plant blooms very early in the southern part of the province. Small patches of hound's tongue can be successfully hand pulled and rouged. The plant is a biennial and the rosettes must be controlled as well. Hounds tongue has a high ranking as a problem invasive plant and biological control work has begun. The root weevil Mogulones cruciger (first released 1997) and the root-feeding flea beetle Longitarsus quadriguttatus (first released 1998) are established in British Columbia.
 - It is important that people are able to identify and report this plant. Any sites found will be controlled by hand pulling and herbicides.

Goatgrass, jointed, Aegilops cylindrica

- There are no reports of this plant in the region.

Knapweeds, brown, black, yellow starthistle, & others, Centaurea jacea, C. nigra, C. solstitialis

- None reported – distribution to be determined. Brown knapweed demonstrates an aggressive nature in northwest BC. Black knapweed has been controlled on the few sites it has shown up on in northern BC. Yellow starthistle has not been reported in northern BC. Several ornamental knapweeds including bluet, C. montana, and greater knapweed, C. scabiosa, have appeared in northern BC but do not appear to be that aggressive though the sites are controlled before a clear indication is possible.
 - In Europe C. jacea is attacked by the root mining moth Agapeta zoegana but it may not have been purposefully tried on C. jacea in North America. Similar control approaches used on spotted knapweed should work for these other species.

- Occurrences of any of these knapweeds should be controlled by hand pulling or with herbicides.

Knapweed, diffuse, Centaurea diffusa

- Given the proven ability of this plant to dominate a variety of habitats, diffuse knapweed represents a threat to the region particularly in drier areas such as the grassland breaks along the Peace and other rivers. Left undetected and uncontrolled diffuse knapweed will cause serious environmental and economic damage. It is currently found at a BC Hydro site south of Fort St. John and a second site a half a mile from the first site.
 - Numerous biocontrol agents, approximately 12, have been released or will be released on diffuse knapweed in BC. There are indications that diffuse knapweed on dry bunch grass ranges is declining. Small diffuse knapweed infestations can be controlled by hand pulling.
 - Sites will be controlled with herbicides, (recommendations should be site specific), and hand pulling.

Knapweed, spotted, Centaurea maculosa

- Spotted knapweed has dominated all open habitats it has managed to infest in BC and has found its way as far north as Dease Lake in northwest BC. Given the proven ability of this plant to dominate a variety of habitats, it presents a serious threat to the region. Left undetected and uncontrolled spotted knapweed will cause serious economic and environmental damage. From the New Invaders Report, there were 12 spotted knapweed sites in 1999, 14 in 2000 and 15 in 2001, 2002 and 2003 in the NEIPC area.
 - Numerous biocontrol agents, approximately 12, have been released or will be released on spotted knapweed in BC. Biocontrol has not significantly reduced spotted knapweed populations but there are some indications that in certain habitats biocontrol agents may be having impacts. Small spotted knapweed infestations can be controlled by hand pulling. A prescription using an integrated approach should be developed for each site.
 - All spotted knapweed sites will be controlled using an integrated approach including herbicides, (recommendations should be site specific), and hand pulling.

Knotweed, Polygonum spp.

- In 2002 Japanese and Giant Knotweed were reported as spreading along access corridors on the Queen Charlotte Islands. Japanese knotweed is an escaped ornamental that is becoming increasingly common along stream corridors and rights-of-way in Washington State. Alaska reports Japanese knotweed as an aggressive invader and increasing in Southeast Alaska. It is very aggressive and capable of crowding out all other vegetation forming dense stands degrading native plant and animal habitat.
 - Knotweed is difficult to control because it has extremely vigorous rhizomes that form a deep, dense mat. In addition, the plant can sprout from fragments along streams; plant parts may fall into the water to create new infestations downstream. Trials using a hot water foam mix are been conducted in southern BC. (Additional control information will be added as it found).

- Knotweed has been identified as high priority under the Terrestrial Ecosystem Restoration Program, TERP. Funding may be available and clarification on control actions should be forthcoming.

Leafy spurge and cypress spurge, Euphorbia esula & E. cyparissias, cypress spurge

- One leafy spurge site has been reported in the region at the intersection of Highway 97 and Road 41. Leafy spurge probably arrived in the early 2000s. This invasive plant does not spread rapidly but it does progress with a fierce tenacity and is difficult to control because of its extensive rhizomatous roots. Caution should be taken when handling the plant as it exudes latex that can cause skin irritation and blindness. Leafy spurge may be toxic to cattle and horses but sheep can be forced to eat it and may develop a preference for it.
- The New Invaders Program notes cypress spurge to be a problem in the Hudson's Hope area. Five sites were noted in 1999. The number of sites does not seem to have increased indicating success in control efforts. It is expected that cypress spurge could be a serious problem in the NEIPC area. There are two kinds of cypress spurge. The diploid form is sterile and does not produce viable seeds. It does spread by roots. There is also a fertile form that can reproduce by seed and roots. This second form is causing serious problems in Ontario. Caution should be taken when handling the plant as it exudes latex that can cause skin irritation and blindness. Cypress spurge may be toxic to cattle and horses but sheep can be forced to eat it and may develop a preference for it.
 - Control of the spurges involves an integrated approach prescribed on a site specific basis. There has been some success in controlling spurges with herbicides, biologically, (using sheep and goat grazing), and with biocontrol agents. Leafy spurge is a problem in the Prairie Provinces and numerous agents are being investigated including Aphthona lacertosa, A. nigriscutis, Spurgia esulae, Oberea erythrocephala, Lobesia euphorbiana, and Pegomya curticornis.
 - Any sites found will be controlled by digging and or herbicides.

Marsh plume thistle, Cirsium palustre

- Marsh thistle has exploded in the Robson Valley and in the Prince George Forest District. From a small infestation noted in the 1950s and inventoried in 1971 marsh thistle has expanded in the Robson Valley to infest thousands of hectares. The first site of marsh thistle in the northeast was found in 2004. The site was about 3 to 4 hectares in the Rainy Creek Pasture near Groundbirch.

Marsh thistle grows very tall, 1.2 to 2.4 meters, and the rosettes can form continuous mats preventing germination and limiting growth of other plants. It is considered very aggressive and has invaded and dominated very resistant plant communities like thick sods in sedge stands. The plant presents a very serious threat and will dramatically affect riparian, upland and seral plant communities. It may also have impacts on regeneration of conifer stands. Spread is primarily by wind blown seed.

- A seed-feeding weevil, Rhinocyllus conicus, which was introduced to BC to attack plumeless and nodding thistle, was released on marsh thistle in the Robson Valley in 1998. The weevil has overwintered and will be monitored. The seed eating weevil Larinus planus and the weevil, Trichosiocalus horridus, which attacks just below

vegetative buds, have also been tried. There may be some adventive insects like the achene-feeding fly Terellia ruficauda feeding on marsh thistle as well. Cutting seems to enhance the plant. Reference for herbicide control could not be found but the standard control for thistles should be effective.

- A close watch and quick reaction will be needed to keep this thistle from becoming established in the NEIPC area. Any reports of strange or new thistles will have to be checked quickly to deal with marsh plume thistle and prevent it from establishing. Particular attention will have to be paid in the Pine Pass and the Hooke Lake area. All marsh thistle sites will be controlled by hand pulling or herbicides.

Rush Skeletonweed, Chondrilla juncea.

- Rush skeletonweed was first discovered in B.C. in the North Okanagan region of Spallumcheen in 1983. Subsequent infestations have been found in the Kootenays. Native to southern Russia and now spread throughout much of the world, this weed poses a serious threat to BC rangelands and other agricultural resources including both dryland and irrigated cereal production. No sites have been reported in northeast BC. Additional information is available at <http://www.agf.gov.bc.ca/cropprot/rushskel.htm>

- Biological control information is available @ http://res2.agr.ca/lethbridge/weedbio/plant/brshskel_e.htm Small patches can be controlled by handpulling and herbicides are available to provide control.

- All rush skeletonweed sites will be controlled using combinations of pulling, digging and herbicides.

Scabious, field or blue buttons, Knautia arvensis

- This invasive plant is a problem in northwest BC at Fort Fraser and south of Houston. It is also a problem in parts of western Alberta on native and mountain pastures and is beginning to show up in several locations in southern BC. It is present on Highway 97, one mile east of Braden Road. Given the degradation it has caused in northwest BC scabious is thought to represent a serious threat to the NEIPC area.

- This invasive plant is reported to be difficult to remove once established. Where practical, cultivation should eliminate or control the invasive plant. The plant is palatable early in the season, until it is about eight inches tall and early season grazing may help reduce seed production. Mowing has not been very effective in controlling scabious.

- All sites found will be controlled by hand pulling and with herbicides.

Tansy, common, Tanacetum vulgare

- This invasive plant is adapting to a wide range of habitats and is quite aggressive. It is moving from coastal and southern areas where it has been established for quite some time to the northern interior of BC. It is proving to be very aggressive in all areas that it establishes in. It is spreading into drier pastures, forest types and agriculture lands and looks like it will cause problems in northeast BC if it is allowed to establish. There are three tansy sites inventoried in

the northeast, (the MFR Compound in Dawson Creek, Elevator road in Pouce Coupe and on the Groundbirch FSR). There are likely additional sites that have not been entered into the data base. Tansy is present along Highway 16 from Prince Rupert to McBride and Highway 97 north of Prince George and it is only a matter of time before tansy starts showing up along roads in north east BC. Common tansy contains alkaloids and is slightly toxic.

- The plant, particularly if a few years old, has an extensive fibrous root but the root comes together in a crown and though it can be hard to pull, handpulling is an effective control treatment for small patches. A trial evaluating mowing regimes in the Kispiox Valley in northwest BC showed mowing to be ineffective.
 - Invasive plants that are reported as ‘bushes with bright yellow flowers’ should be checked immediately. Hand pulling should be attempted on isolated patches. ***Herbicides*** should be used to control other patches and common tansy should be carried forward as one that requires biological control work. Contact with and possibly a survey of the Alberta side of the Peace is needed to see if tansy is present.

Velvet leaf, Abutilon theophrasti

- None reported at this time.
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CATEGORY 2 INVASIVE PLANTS

Blueweed Echium vulgare

- Blueweed causes problems in several areas of the province, e.g., East Kootenays, Christina Lake and Lower Nicola. There is no record of sites in northeast BC and the threat that blueweed represents in northeast BC has not been determined but it likely will cause damage in some localities.
 - The plant can be hand pulled but it has a tremendous tap root with an elongated crown so care must be taken to pull the entire root as well as rosettes. Herbicides are available to control blueweed.
 - Any blueweed sites found will be inventoried and controlled.

Buckwheat tartary, Fagopyrum tataricum

- Annual spreading by seed. A problem in cultivated fields, disturbed ground and waste areas. The seeds are difficult to separate from cereals and cause a downgrade in quality. No known sites in the Peace.

Burdock, common & giant, Arctium spp

- . Burdock is found scattered throughout the region. It has been found at Taylor along the rail line, Lynx Creek subdivision at Hudson’s Hope, Clayhurst area and areas along the Peace, Jackfish Lake area, and community pastures in the South Peace.
 - Common Burdock cannot tolerate cultivation, so control may be possible with repeated tillage. Young Common Burdock plants do not produce seeds, therefore they do not

need to be pulled up or cut down. When cut down or uprooted, any root fragment that is left behind can grow into an entirely new plant and can contribute to Common Burdock's spread. An effective control is to cut off emerging flower buds. The plants will have to be monitored throughout the summer as buds can reform after cutting. Herbicides are available to control burdock.

- When considered a problem, the landowner or occupier will control burdock.

Canada thistle, Cirsium arvense

- Canada thistle is widely distributed in the southern part of the region on farm lands, community and private pastures and roadsides. There appears to be very little Canada thistle in the northern part of the region, Ft. Nelson Forest District. Canada thistle is quite aggressive in the region and is causing significant problems.

- The following is from the Agriculture Canada Web site on biocontrol of invasive plants at http://res2.agr.ca/lethbridge/weedbio/index_e.htm. "Four biocontrol agents are established in Canada: the stem gall fly, Urophora cardui, the stem weevil, Ceutorhynchus litura, the defoliating beetle, Lema cyanella, and the seed-head weevil Rhinocyllus conicus. The thistle is also attacked by six adventitious and one native insect¹: the root-crown weevil Cleonis pigra, the defoliating beetle Cassida rubiginosus, the seed-head weevil Larinus planus, the seed-head fly, Terellia ruficauda which is also known as Orellia ruficauda, the systemic rust fungus, Puccinia punctiformis, and a small midge with yellow-orange larvae Dasineura gibsoni (not discussed) that feeds on the seed hairs. Finally, there is the native painted lady butterfly, Vanessa cardui, and over 70 general feeders³. In spite of the plethora of enemies, the thistle is still a problem. However, strategies are suggested for increasing the impact of several species. There are still prospects for additional biocontrol agents: a defoliating beetle, Altica carduorum, that in NW China favours thistles regenerating after cultivation, and a stem mining weevil, Lixus sp. Both are restricted to Canada thistle in the field, although they develop on native Cirsium spp. in no-choice tests. However, if the biocontrol of Canada thistle is to continue, it will be necessary to get regulatory acceptance of a test that shows which species will not attack native Cirsium spp. in the field." O. ruficauda is reported on Canada thistle in northeast BC. L. planus has been released in northeast BC but status is unknown.

Herbicide recommendations are available for Canada thistle. Mowing or cutting the thistle has limited effect on the populations but can be used to keep critical sites in check until integrated control approaches are prescribed. If thistle is in grazing areas adjusting the livestock management and trying techniques like placing salt in thistle patches should be attempted.

- When Canada thistle infestations are identified as threatening uninfested lands or causing serious economic or environmental damage they will be controlled. That is, Canada thistle will be controlled on priority 1 sites and on other sites if the land owner or occupier thinks it is necessary. Control will be prescribed on a site specific basis using integrated approaches. Biological control agents, herbicides, and / or cultural techniques will be used. Mapping of Canada thistle will continue so that strategies for managing can be adjusted. L. planus adults should be released onto thistle

patches that are in bloom. Suitable release sites for biocontrol agents will be identified and other agents that become available will be released.

Chamomile, scentless, Matricaria maritima

- Scentless chamomile has a wide distribution in the region in pastures and along roadsides. There are sites or problem areas reported at the Peace Canyon Generating Station and the Chetwynd gravel pit area including Jack Fish Lake and Sukunka area. Pineapple weed, Matricaria matricarioides looks similar to chamomile before bloom and is widespread in the region. Chamomile causes problems for commercial fine seed production as it is a secondary noxious weed in the Seed Act and is difficult to clean out of some fine seeds.
 - A seed head weevil, Omphalopion hookeri, a gall midge Rhaphomyia hookeri, and the stem-boring weevil Microplontus edentulus have been released on scentless chamomile in the Fort St. John area. Sheep have also been used to control Chamomile. The Chamomile must be grazed before viable seed forms. Hand pulling of small patches of chamomile is effective and herbicides are available for control.
 - Mapping and evaluation of chamomile infestations will continue. Smaller infestations will be controlled by hand pulling and / or with herbicides, while biological releases and monitoring continues.

Cockle or campion, white, Lychnis alba

- Distribution needs to be determined but numerous reports and sites are known. White cockle needs to be monitored and controlled as it is a threat to alfalfa and clover seed production. White cockle, night flowering catch-fly and bladder campion are very similar. An easy differentiation is that night flowering catch-fly is sticky if squeezed.
 - Control options need to be investigated.
 - Reports of these invasive plants will continue to be recorded to see if they are spreading and sites will be controlled if resources are available.

Green foxtail, Setaria viridis

- Green foxtail is a heavy seed producing annual that can cause problems in grain production. Although green foxtail requires higher heat units to grow it will grow and reproduce seed in this region. However, it is a poor competitor, unless it grows in dense stands. Green foxtail is found along highways and within the city boundaries of Dawson Creek, Fort St. John, Chetwynd, Taylor, and the District of Hudson's Hope. An infestation is also noted on the 103 road.
 - Control options need to be explored.
 - Continue to control sites as they appear.

Hoary cress, lens podded Hoary cress, white top or perennial pepper grass, Cardaria drapa

- Profile information needed.

Pepperweed, Lepidium spp.

- Perennial pepperweed (*Lepidium latifolium*) is native to southern Europe and western Asia. It spreads by seed and creeping roots under many different environmental conditions. It has a wide distribution across most of North America and is causing problems in some areas. Its

distribution and invasiveness in northeastern BC need to be determined. Additional information is available @ <http://www.agf.gov.bc.ca/cropprot/pepperweed.htm>

- No biological control agents are available for perennial pepperweed, but herbicides are available to provide control.

- All pepperweed sites reported will be controlled using combinations of pulling, digging and herbicides.

Plumeless thistle, Carduus acanthoides

- There are no reported sightings of plumeless thistle in northeast BC. Plumeless thistle has been reported at numerous locations in north central and northwest BC as well as through most of the United States. Due to the transport of seeds long distances by wind the plant may be in the NEIPC region or will be arriving soon.

- In southern BC plumeless and nodding thistle have been controlled with biocontrol agents. The two agents with the most impact are a flower-head weevil, Rhinocyllus conicus, and a weevil, Trichosiromus horridus, which attack just below vegetative buds. T. horridus has been effective in regions with cool moist summers such as Southern New Zealand and should be considered if infestations reach sizes that warrant biocontrol. Biocontrol seems to be a little more effective against nodding thistle than plumeless thistle hence the difference in categories. Cutting the thistles in bud is reasonable effective. Herbicide recommendations are available if needed.

- Sites will be controlled by cutting or herbicide applications by the landowner or occupier. Extension work will continue to encourage people to look for and report 'strange' thistles. If a sizable patch is found requests will be made for biological control agents

Kochia, Kochia scoparia

- Kochia is reported in the commercial lots, the landfill site and the gas plant at Taylor. It has not become an agriculture problem yet and proper management will help avoid problems with this plant.

- Small patches of Kochia can be pulled and herbicide recommendations are available.

- Kochia is in the new invaders program and sites will continue to be controlled.

Loosestrife, Lythrum salicaria

- This aquatic invasive plant is gaining prominence as a problem plant in northern BC. However, it has not been reported in the NEIPC region.

- Four biological control agents have been tried in BC and the NW States. These are: the leaf beetles Galerucella pusilla and G. calmariensis, a root weevil Hylobius transversovittatus and a seed weevil Nanophyes marmoratus. Some sites in BC have been effectively controlled with the introduction of Galerucella calmariensis. Digging can control small sites and pulling plants and herbicides can be used in some situations. Further control information is available at:

- <http://www.invasivespecies.gov/profiles/purplstrf.shtml>

- Sites that are reported will be investigated and hand pulled

Mustard, wild, Sinapis arvensis

- Wild mustard is a common annual invasive plant and is found in most cultivated fields. If land is cultivated and crop species not quickly established wild mustard occupies the site. It is also a minor component in many established hay fields and pastures.
 - Early harvesting of fields, before wild mustard sets seed, helps reduce populations. Mowing, (not harvesting), new fields or pasture before mustard set seed is effective in reducing populations until the crop is well established. There are herbicide recommendations available.
 - No action planned at this time.

Night-flowering catchfly, Silene noctiflora

- Annual reproducing by seed. A similar plant is white cockle *lychnis alba*. However white cockle is a perennial and is not sticky. Night-flowering catchfly only flowers at dusk. It is a problem in the production of clover seed.

Oxeye daisy, Chrysanthemum leucanthemum

- Oxeye daisy has inundated most of the area south and west of northeast BC. It is present along most highways and secondary roads from Pine Pass south to Prince George and west to Terrace. There is a relatively small distribution in northeast BC. Along Highway 97 within the Pine Pass there it has a continuous to patchy distribution from the southern edge of the region to approximately 35 km south of Chetwynd. Further north sites occur more sporadically including a site on Red Creek Road just north of Fort St. John and six sites along the Alaska Highway between Liard River and Fort St. John. There are sites along Canyon drive and secondary roads in Hudson's Hope. Oxeye daisy is a primary noxious weed in the Seed Act and is difficult to clean out of some fine seeds. Allowing it to expand in the region may seriously affect the fine seed industry.
 - Trials indicated that sulfur containing fertilizers such as ammonium sulfate, 21-0-0-24, might have an effect on oxeye daisy. Several farms in other parts of BC have noticed dramatic reduction in oxeye daisy after fertilizing with ammonium sulfate. Small patches of oxeye daisy can be hand pulled and herbicide recommendations are available.
 - Several new initiatives are proposed for oxeye daisy starting in 2006. A study to assess presence, impacts and risks will be initiated. Inventory work will be intensified across the region and a concerted coordinated effort will begin from the Pine / Halfway River to Pine Pass to inventory and treat oxeye daisy. A preliminary containment line has been established at Mount Lemoray. During the winter of 2006-07 NEIPC will investigate the possibility of refining the containment line for oxeye daisy.

Russian thistle, Salsola kali

- Russian thistle is reported in the commercial lots, the landfill site and the gas plant at Taylor. It has not become an agriculture problem yet and proper management will help avoid problems with this plant.

- Need to investigate control tools.
 - Russian thistle is in the new invaders program and sites will be controlled.

Sow thistles, Sonchus spp.

- Perennial sow thistle has a wide distribution in the region along roadsides and in cultivated fields. The northern limit of this plant is approximately 30 km north of Fort Nelson.
 - Mowing in waste places to prevent seed production is an effective mean of preventing introduction to adjacent range and croplands. Small isolated patches of sow thistle can be hand pulled. Two biocontrol agents are mentioned in the literature, Liriomyza spp. and Cystiphora spp. Herbicide recommendations are available for sow thistle.
 - A more detailed survey that notes possible release sites for Cystiphora will be conducted if resources become available. Sow thistle sites should be controlled along the Alaska Highway north of Fort Nelson.

Tansy ragwort, Senecio jacobaea

- None reported at this time.

Toadflax, Dalmatian, Linaria dalmatica

- There is currently one site of dalmatian toadflax reported in the region. The occurrence of common toadflax may be masking the presence of dalmatian toadflax. Dalmatian toadflax seems to be adapted to a wide range of habitats and is quite aggressive particularly on well drained soils. Dalmatian toadflax is spreading rapidly in the rest of BC and is expected to cause problems in this region if it becomes established.
 - Small patches can be controlled with repeated hand pulling. The invasive plant is ranked high in the biocontrol program and work is progressing on development of biocontrol. Release attempts of a leaf feeding moth, Calophasia lunula have not been very successful. A root feeding moth, Eteobalea intermediella is being propagated at Kamloops. A stem mining weevil, Mecinus janthinus, is doing well at Kamloops north to Williams Lake and seems to be reducing dalmatian toadflax populations. M. janthinus has been released in central and northwest BC and if sites that cannot be controlled using other techniques are found in northeast BC it should be considered for release. A dalmatian strain of Gymnaetron antirrhini, an agent found on common toadflax in this region, has completed one generation on dalmatian toadflax at Kamloops and it may transfer to dalmatian toadflax on its own. There are herbicide recommendations for toadflax.
 - Ensure that people are aware dalmatian toadflax presents a serious threat and are familiar enough to differentiate between common and dalmatian toadflax. Sightings should be reported and recorded. New small infestations should be controlled using an integrated approach of pulling and spraying.

Toadflax, common, Linaria vulgaris

- Common toadflax is wide spread in the south Peace around Dawson Creek and near any grain elevator sites. Common toadflax cycles up and down in population. This could be do to biological control agents. The biocontrol agents were released in the early 1950s and have spread to most infestations of common toadflax.

- Two flower-head weevils, Gymnetron antirrhini, and G. netum, and a flower-head beetle, Brachypterolus pulicarius, are involved in controlling common toadflax. Another agent, Gymnetron linariae, may soon be available for release.
- Spraying and hand pulling will control smaller sites. Common toadflax will continue to be monitored and if larger sites are found they will be checked for the presence of biological agents. Extension will be done so that people can differentiate between common and dalmatian toadflax.

CATEGORY 3 INVASIVE PLANTS

Bladder campion, Silene cucubalus

- Distribution unknown. This plant is often confused with white cockle and night flowering catchfly.
- A beetle, Cassida azurea, that defoliates stands of bladder campion may be available.
- A more detailed survey that notes possible release sites for Cassida azurea will be conducted if resources become available.

Bluebur, western or stickseed, Lappula echinata

- This weed is a common problem on most cultivated acres in the Peace. The seeds have hooked bristles that catch on clothing causing problems for hikers, farmers, livestock, etc.
- Bluebur can be hand pulled when small infestations are found and herbicide recommendations are available.
- Sites will only be controlled if the land owner or occupier feels control is warranted.

Buckwheat, wild, Polygonum convolvulus

- Common problem in cultivated lands but is not considered a threat to rangelands and is reasonably palatable to grazing animals.
- Herbicide recommendations are available.
- No action is planned.

Bull thistle, Cirsium vulgare

- Bull thistle is considered a nuisance invasive plant that can become a problem on some disturbed sites. Distribution needs to be determined but it is thought to have a wide distribution in the region. Bull thistle can be a problem for a few years after a disturbance but it does not compete with the healthy plant communities that develop over time. If poor management keeps an area disturbed then bull thistle problems can persist. Seeding of disturbances dramatically shortens the time bull thistles occupy a site and usually prevents it from becoming a problem.
- A seed head gall fly, Urophora stylata, has shown some effect in reducing seed production from bull thistle. Three releases of Urophora stylata were made in the south peace in 2004 and an additional 3 releases were made in 2005. This agent, in

combination with seeding or controlled grazing to give healthy competing vegetation can reduce the time which bull thistle dominates sites. Rhinocyllus conicus, a seed head weevil, has also been found on bull thistle in southern BC. Bull thistle is susceptible to cutting or mowing in bud just prior to bloom and there are herbicide recommendations available.

- The first strategy for bull thistle is prevention. Susceptible sites should be kept at a minimum by reducing and seeding disturbances. Bull thistle seed sources near planned disturbances such as road construction should be controlled by cutting or with herbicides before the disturbances occur. Bull thistle sites will be checked for the presence of U. stylata. This is done by squeezing the heads while wearing gloves. Squeeze the heads in the late summer or fall. If the head is hard it contains the marble sized gall. If it is determined after checking 50 or more bull thistle heads that U. stylata is not present then the site will be noted for a release.

Chickweed, mouse eared, Cerastium spp.

- This nuisance plant has a distribution that covers North America. Though its genetic origins are probably Europe, <http://www.amjbot.org/cgi/content/full/91/6/943>, many species of chickweed are considered to have circumpolar distribution. Chickweeds can cause some concern in situations where management is keeping vegetation in a poor state. Contamination of grain and other agriculture crops with chickweed may also be a concern.
 - Chickweed is usually not controlled outside of an agriculture setting. If it is expected to cause problems control usually involves an integration of many techniques including herbicides, cultivation, timing of cropping, drainage, etc.
 - No control work is planned for chickweed on road rights of way or rangelands. If chickweed in such sites is found to be threatening agriculture areas the situation will be assessed.

Chicory, Cichorium intybus

- Chicory has a wide distribution and is considered naturalized in much of Canada and the U.S. There have been no reports of chicory in northeast BC and its distribution to be determined.
 - Control recommendations need to be investigated. Small patches of chicory can be hand pulled.
 - Watch for and note this invasive plant. When found chicory will be hand pulled or treated with herbicides.

Cleavers, Galium aparine

- Cleavers is usually found on moderately dry to moist fields, lawns, gardens, disturbed areas, beaches, and open forests at low- to mid-elevations. It is considered a major concern in the Peace River region. Planting contaminated canola is the main cause of spread, as seeds are similar and difficult to separate. Harvesting equipment, animals, humans, and contaminated manure also disperse the seeds. Cleavers seed will cause a loss of grade if found in the grass seed.

- Herbicide recommendations are available.
 - Overview surveys of cleavers is needed but resources are not available at this time.

Curled dock Rumex spp.

- Curled dock has been reported on numerous farms in the region. In this region it is usually found in the low lying areas, ditches. Curled dock is a problem on acid soils in the Lower Mainland and should be watched.
 - There is a native agent, Luperina passer, that attacks the roots of curled dock.
 - An overview survey of curled dock is needed but resources are not available at this time.

Dragonhead, America – Dracocephalum parviflorum

- This native plant often behaves in a weedy fashion and as such is reported as a problem.
 - No action planned or necessary for this native plant.

Goat's-beard or salsify, Tragopogon dubious & T. pratensis

- Tragopogon is abundant along roadsides and the CN rail. It may be spreading onto adjacent rangeland in these locations. Meadow goat's beard, Tragopogon pratensis, infests large areas in the Cariboo and is very cyclic and quite aggressive.
 - Cutting early in season before flowering followed by repeat mowing later in the season and cultivation over a season give some level of control. Herbicide recommendations are also available.
 - A survey and assessment of goat's-beard is required to determine if the goat's beard in the north east is T. dubious or T. pratensis and how aggressive it is.

Flixweed, Descurainia sophin

- The distribution for flixweed needs to be determined. It usually grows in gardens, roadsides, and anywhere the land has been cultivated or native vegetation destroyed. Winter annual biotypes are a particular problem in reduced tillage systems and winter annual crops such as winter wheat and dormant seeded canola. Flixweed is a vigorous plant and a prolific seed producer, enabling it to be highly competitive to desirable plant species. This weed is also an early spring food source for flea beetles which can cause problems for canola production.
 - In an agriculture setting flixweed is usually controlled by integrating cultivation, cropping techniques and herbicide applications. Small isolated patches can be hand pulled.
 - Control of flixweed is not usually undertaken by the invasive plant program unless a small patch is threatening a large uninfested susceptible area or crop.

Foxtail barley, Hordeum jubatum

- The Yukon Territory reports that foxtail barley is causing problems. Foxtail barley has a wide distribution in the region and is native to much of North America.

- There are herbicide recommendations available for suppression. Cultivation is a good method of control. Foxtail barley is a problem to grass seed growers
- No action planned at this time.

Groundsel, common, Senecio vulgaris

- Groundsel is distributed throughout the southern parts of the region. It is not considered a problem or threat to range lands but can cause problems in cultivated fields such as vegetable farms.
 - Herbicide recommendations are available. Groundsel has become resistant to the triazine herbicides in many parts of the province.
 - Field margins or borders should be checked prior to cultivation and if groundsel is present it should be controlled with herbicides or mowing.

Hawksbeard, narrowleaf, Crepis tectorum

- Hawk's-beard probably has a wide distribution and occurrence in the region. It is common in the first year of establishment of forage crops. Its status is masked by a similar flower appearance with other yellow flowering plants such as perennial sow-thistle.
 - Mowing more than once in waste places to prevent seed production is an effective means of preventing introduction to adjacent range and croplands. Herbicide recommendations are available.
 - No action planned at this time.

Hemp nettle, Galeopsis tetrahit

- Hemp nettle is often found on disturbed sites including clear-cuts, roadsides and utility corridors. This plant can be a problem in cultivated areas. Distribution for northeast BC needs to be determined.
 - Herbicide recommendations are available.
 - No action planned at this time.

Lamb's-quarters, Chenopodium spp.

- Lamb's quarters is probably widely distributed in the region. Lamb's-quarters has some forage value but can occasionally cause nitrate poisoning. Lamb's quarters can be a problem for canola producers.
 - Herbicide recommendations are available.
 - No action planned.

Mallow, Malva neglecta

- Distribution of mallow needs to be determined but it is known to be present in all of the northwestern states, all of BC and Alaska. It is introduced from Europe and tends to be found in waste areas, gardens and cultivated lands.

- An integrated approach using cultivation, cropping techniques and herbicides can be used to control mallow.
 - As a category 3 weed, control work on mallow by the invasive plant program will only occur when it is found in small patches threatening large areas of susceptible uninfested habitat or crop land.

Mullein, Verbascum thapsus

- Distribution unknown. Mullein is generally considered to be a nuisance invasive plant that pioneers disturbed ground and is not usually controlled. It is also an alternate host for an apple pest and is sometimes controlled for that reason.
 - No action planned at this time.

Mustard, dog – Eruscastrum gallicum

- This species is not widely reported and so far has been found at Radium in the East Kootenays and Smithers in the Bulkley Valley. It is quite likely that this species is much more widely distributed than is currently believed as the leaves are very similar in appearance to those of tumble mustard, (Sisymbrium altissimum). Dog mustard has seed pods located in the axils of the leaves or leaf like bracts.
 - Watch for, report and record dog mustard sites.

Mustards, Sisymbrium spp., tumble, & Sisymbrium officinale, hedge

- Distribution of mustards needs to be determined. These mustards have not been noted as causing problems in range or pasture lands but can cause problems in cropping situations.

Nodding thistle, Carduus nutans

- Nodding thistle has been reported at numerous locations in north central and north west BC as well as through most of the United States. In 2004, a site was reported on BC Rail property in Taylor. The plant was removed. Due to the transport of seeds long distances by wind the plant will likely continue to show up at new locations in the NEIPC region. Nodding thistle aggressively invades most open habitats when it first establishes then its aggressiveness seems to decrease which might be resultant from subsequent establishment of biological control agents.
 - In southern BC nodding thistle has been controlled with biocontrol agents. The two agents with the most impact are a flower-head weevil, Rhinocyllus conicus, and a weevil, Trichosirocalus horridus, that attacks just below vegetative buds. T. horridus has been effective in regions with cool moist summers such as Southern New Zealand and should be considered if infestations reach sizes that warrant biocontrol. Biocontrol seems to be a little more effective against nodding thistle than plumeless thistle hence the difference in categories. Cutting the thistles in bud is reasonable effective. Herbicide recommendations are available.
 - Sites will be controlled by cutting or herbicide applications by the landowner or occupier. Extension work will continue to encourage people to look for and report 'strange' thistles. If a sizable patch is found requests will be made for biological control agents

Pineapple weed, Matricaria matricarioides

- Pineapple weed is very extensive in the region in pastures, among corrals, and along roadsides. Pineapple weed can grow very tall in this region and before bloom can be mistaken for scentless chamomile, M. maritima. Pineapple weed is not considered a problem.

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- No action is planned.

Quackgrass, Agropyron repens or Elymus r.

- Quackgrass likely has a wide distribution in the northeast and is expected to be extensive in the agriculture areas of the peace. Quackgrass presents a serious problem for fine seed growers.

- No specific action is planned on quackgrass at this time.

Smartweed, Polygonum spp.

- There are numerous smartweed, Polygonum, species. Distribution and the invasiveness of the various smartweeds in northeast BC need to be determined.

- No action planned at this time.

St. John's-wort or goatweed, Hypericum perforatum

- No reports of St. John's-wort have been received for the NEIPC area and its distribution is unknown but it is likely either not present or only present at a few sites. St. John's-wort has a wide distribution in the rest of BC including the northwest. In the 1940s, 50s and 60s St. John's-wort infested millions of acres of rangelands in Canada, the US, Australia and South Africa. It was considered one of the worst invasive plant problems in BC. The plant contains toxins that effect white hair areas on animals causing severe irritation and loss of weight after exposure to strong sunlight.

- In the mid '60s biological control caused a rapid decline in St. John's-wort infestations. Seven biocontrol agents have been released in BC and a complex of 3 agents seems to be controlling the plant in many locations. There are still extensive infestations that do not seem to be under biocontrol in BC.

- The action for St. John's-wort requires discussion and determination. Even though it is usually controlled using biological agents, if it is not present in the region there is merit in keeping the region free of this weed. I.e., hand pulling and herbicide treatments might be warranted on small sites that show up.

Stinkweed or pennycress, Thlaspi arvense

- Stinkweed is not considered to be a rangeland problem but can be a problem in some agriculture settings. Feed containing excessive amounts of stinkweed seed may be toxic to horses.

- Herbicide recommendations are available.

- No action planned at this time.

Stork's bill, Erodium spp.,

- Stork's bill is an annual, winter annual or biennial. It is usually a low prostrate plant, consisting of a basal rosette and flowering stalks. Its distribution and invasiveness in northeast BC needs to be determined. Stork's bill seed can be hard to clean out of commercial seed production so it is a concern in seed growing areas.
 - In agriculture settings stork's bill can be controlled with fall tillage after the majority of the plants have germinated. Herbicides are also available for stork's bill control.
 - No action planned at this time.

Spurry, corn, Spergula arvensis,

- Corn spurry is an annual that spreads by seeds and is usually found in cultivated fields, gardens and roadsides. Corn spurry is an aggressive weed in cultivated acres once established. It produces seed throughout the season. It spread by equipment, contaminated hay. Its distribution and invasiveness in northeast BC needs to be determined
 - Summer fallowing can be used to help control badly infested fields. Herbicides are also available for controlling corn spurry.
 - No action planned at this time.

Tarweed plant, Madia glomerata

- Distribution unknown. This plant is native to some parts of BC but probably not northern BC. It has a pungent odour and generates lots of complaints once established. It is very cyclic in nature and on disturbed sites and poor ground it can form large, smelly, patches.
 - Tarweed does respond to management factors such as fertilizing and proper grazing.
 - Because of the pungent odor and this plants ability to cycle up to high populations, land owners and occupiers may choose to control this invasive plant.

Water hemlock, western, Cicuta douglasii

- Western water hemlock is a native plant that is not common but has a fairly wide distribution. It is found in wet areas. Water hemlock is poisonous and occasionally causes cattle deaths.
 - It is sometimes possible to dig or rogue out hemlock in the wet areas and herbicide recommendations, such as wipe on applications of glyphosate, are available.
 - Note any occurrences and take control action if there is a risk of livestock poisoning.

Wild carrot, Daucus carota

- There are scattered infestations of wild carrot along the Alaska Highway. These infestations have been noted between Fort St. John and Fort Nelson, south of Fort Nelson and at site C. Distribution of the plant in the rest of the region as well as the risk it presents have not been assessed. Wild carrot is considered a 'serious weed' in some jurisdictions such as Missouri and is a listed noxious weed in Ontario.

- Cutting in mid summer cuts off seed umbels in the second year of growth. Annual cultivation destroys the first year plants and promotes germination to reduce the soil seed bank. Herbicide recommendations are available.
- An assessment of the risk that wild carrot presents needs to be undertaken. Attempts will be made to start this risk assessment in 2006.

Wild oats, Avena fatua

- Wild oats has a wide distribution in the agriculture areas of northeast BC. It can cause problems in an agriculture setting but is not generally aggressive in range and pasture settings.
- Herbicide recommendations are available.
- No action will be taken unless wild oats is threatening an agriculture area.

Wormwood or absinthium, Artemisia absinthium

- Wormwood is found along roadsides in the region but the exact distribution needs to be determined.
- Control methods are being researched. Individual plants and small clumps are easily pulled.
- Individual plants and small clumps of wormwood should be pulled when found. Assessment of the threat will be made.

Yarrow, Achillea millefolium

- Yarrow is a native plant that periodically, usually after a disturbance or on poor sites, behaves in a weedy manner.
- No action will be taken on yarrow.

APPENDIX 4: NEIPC MEMBERS

(Some members are involved through correspondence only)

PERSON	AFFILIATION	ADDRESS
Andy Ackerman	Parks BC – Peace Liard District	#400 – 10003 0 110th Avenue, Fort St. John, BC V1J 6M7
Bill Bentley	South Peace Cattleman’s Association	General Delivery, Progress, BC V2C 2E0
Tim Caton	Peace River Regional District & Chair of NEIPC	Box 413, Chetwynd, BC VOC 1J0
Dean Cherkas & Manny Mariotto	Ministry of Environment - Environmental Protection Division	3rd floor – 1011 – 4th Avenue, Prince George, BC V2L 3H9
Kerry Clark	Ministry of Agriculture, and Lands	4th Floor - 1201 103rd Avenue, Dawson Creek, BC v1g 4j2
Jill Copes	Consultant / contractor – New Invaders Program	Box 44, Cecil Lake, BC V0C 1G0
Michael Betts	Ministry of Agriculture, Food & Fisheries	3rd Floor, 808 Douglas Street, Victoria, BC V8W 2Z7
Bob Drinkwater	Ministry of Forests and Range	1011 – 4th Avenue, Prince George, BC V2L 3H9
	Forage Association	Box 908, Dawson Creek, BC V1G 1L6
Karen Goodings	Peace River Regional District	Box 55 Cecil Lake, BC V0C 1G0
Ross Green	Ministry of Forests and Range	9000 – 17th Street, Dawson Creek, BC V1G 4A4
Dixie Hammett	Guide Outfitters Association	10818 – 102nd Street, Fort St. John, BC V1J 4X7
Heather Hansen	Ministry of Forests	RR1-Mile 301, Alaska Hwy, Fort Nelson, BC V0C 1R0
Marion Johansen and Bruce Kosugi	Duke Energy	Bag Service 6180, Mile 53, Alaska Highway Fort St. John, British Columbia, V1J 4H7
Pamela Laron	Ministry of Health	1001 – 110th Avenue, Dawson Creek, BC V1G 4X3
Dave Krezanoski	BC Oil and Gas Commission	#200 – 10003 – 110th Avenue, Fort St. John, BC V1J 6M7
Glen Landry	Organic Producers Association	Box 425 Dawson Creek, BC V1G 4H3
Denis Meier	Consultant / contractor – Peace River Regional District	Box 2025 Dawson Creek, BC V1G 4K8
Gord Gosse	District of Chetwynd	Box 357 Chetwynd, BC V0C 1J0
Darcy Perrin	City of Dawson Creek	Box 150 Dawson Creek, BC V1G 4G4
Victor Shopland	City of Fort St. John	10631 – 100th, Fort St. John, BC V1J 3Z5
Public Works Supervisor	Town of Fort Nelson	Bag Service 399, Fort Nelson, BC V0C 1R0
Public Works Supervisor	District of Hudson’s Hope	Box 330 Hudson Hope, BC V0C 1V0
Public Works Supervisor	Village of Pouce Coupe	Box 190 Pouce Coupe, BC V0C 2C0
Public Works Supervisor	District of Taylor	Box 300, Taylor, BC V0C 2K0
Public Works Supervisor	District of Tumbler Ridge	Box 100, Tumbler Ridge, BC V0C 2W0

Department of Public Works	Government of Yukon	Box 2703, Whitehorse, YUKON Y1A 2C6
Randy McLean	Northern Rockies Regional District	Bag Service 399, Fort Nelson, BC V0C 1R0
Darrell Peterson	Peace River Regional Cattlemen's Association	Box 143 Farmington, BC V0C 1N0
Paul Stevens	Pickseed	Denman Place, Box 47042, Vancouver, BC V3T 1Y9
David Spata	BC Rail	1108 Industrial Way, Prince George, BC V2N 2K8
Rob Struthers & Danny Morris	Ministry of Transportation	#213 – 1011 – 4th Avenue, Prince George, BC V2L 3H9
Angela Thomas	BC Timber Sales	RR#1 – Mile 301 – Alaska Highway, Fort Nelson, BC V0C 1R0
Meredith Thornton	Federation of BC Naturalists	701 – 105th street, Dawson Creek, BC V1G 2B8
Susan Turner	Ministry of Forests	515 Columbia Street, Kamloops, BC V2C 2T7
	Treaty 8 Tribal Association	10233 – 100th Avenue, Fort St. John, BC V1J 1Y8
Robert Vander Linden	BC Grain Producers	General Delivery, Clayhurst, BC V0C 1K0
Michael Verschoor, (Mr. Ian Stacey – Hudson Hope)	BC Transmission Corp. (BC Hydro)	Box 6500 3333 – 22nd Avenue, Prince George, BC V2N 2K4
	Integrated Land Management	10003 – 110th Avenue, Fort St. John, BC V1J 6M7