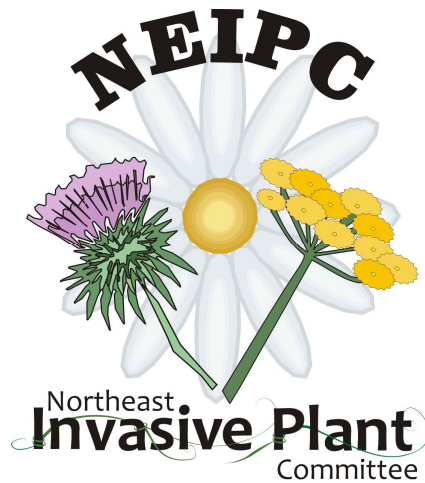


April 2011



Northeast Invasive Plant

Committee

NEIPC

2011 Plan and Profile

April 27, 2011

April 2011

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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 agriculture, the environment and the 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 6). 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.

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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.

IDENTIFICATION of invasive alien species including plant species, can be provided by staff of PRRD, Ministry of Agriculture and Lands MAL (Dawson Creek office) or by submission of samples to MAL's Plant Diagnostic Laboratory according to instructions on the web site at www.al.gov.bc.ca/cropprot/lab.htm .

APPENDIX 1: ACTIONS FOR 2010

| 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 -670-7773 number. |
| Improve awareness of invasive plants among Peace youth and other community groups, by establishing a “weed warrior” type program. | Implement project. | Funding may be available but coordinator needs to be arranged. |
| 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 as needed. IAPP is the shared provincial inventory for invasive plants. The training will provide information on NEIPC program, standards, forms and data entry and retrieval for contractors, agencies, companies and other interested persons. | Training will be collaboration between NEIPC, the Invasive Plant Council of BC and the Ministry of Forests and Range. Training will be provided at various locations, (Ft. Nelson, Ft. St. John and Dawson Creek). |
| 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 or risk assessments. NEIPC will prioritize invasive plant species for risk assessments. | Work will continue on the profile. Risk assessments are available for some species. An assessment for hawkweeds in northeast BC was completed in 2006 and an assessment for oxeye daisy was completed in 2007. Assessments will be initiated on one or more species in 2010. |
| 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 and Early Detection Rapid Response, EDRR programs. Ensure that Licences and PMPs are in place for EDRR. Work with IPC and the | The New Invaders program is an effective EDRR program. Broadening support for the New Invaders program will increase its |

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| | | |
|---|--|--|
| | Interministerial Invasive Plant Working Group to harmonize legislation to provide an appropriate enforcement component to the EDRR program. | effectiveness. NEIPC members will be asked to support the New Invaders Program. See Appendix 4 for the EDRR plan. <i>Contractor retired /may be available for transition. New staff needs to be arranged.</i> |
| 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 April 27, 2011. Work on multi agency PMP will begin in the fall of 2010 as existing PMPs are ending. |
| 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 2010 the single agency approach will be retained for the Pine Pass and Fort Nelson Invasive Plant Management Areas, IPMAs. |

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**Events in 2011 where it is planned
to promote awareness of Invasive Plants**

| DATE | EVENT | LOCATION | CONTACT |
|-------------------------|---|----------------------------------|----------------------------------|
| May – June | IAPP training | To be determined | PRRD and Laura Kristianson |
| to be determined | Weed identification for contractors and other agencies | to be arranged | Elaine Armagost |
| June – October | Weed Warrior style events | To be arranged: Hudson's Hope | Elaine Armagost |
| July and August | Dawson Creek Farmers Market | Dawson Creek | Elaine Armagost |
| August 7-10, ? | Dawson Creek, North Peace, and Kiskatinaw Fall Fairs | Various | Elaine Armagost |
| August | Hudson's Hope Fall Fair | Hudson's Hope | Elaine Armagost |
| August | Tumbler Ridge community pull /Weed Warrior style event oriented to hawkweed | Tumbler Ridge | Elaine Armagost |
| To be arranged: Fall | Presentation to back country organizations, horticulture clubs, etc | various | Elaine Armagost |

APPENDIX 2: Management priorities for invasive plants in Northeast BC

Weed legislation, mandates and priorities can appear complicated and confusing. Different weed species have been labeled in various ways by local, provincial and federal laws, and the mandate to control weeds may be interpreted in different ways for lands with various types of tenure in private, local government, provincial crown land and federal jurisdiction situations.

To reduce the confusion and resulting ineffective results that might result from this, the wide range of stakeholders within the Northeast Invasive Plant Committee have taken a co-operative approach to try to reach more effective and accepted management of invasive plants.

There are about 70 plant species that could become or already are, invasive in the area. It would be impossible with the resources available, to eliminate all occurrences of each of these species, so a system has been developed to guide and prioritize the management efforts each year. The system involves a decision-making grid or matrix of 3 plant **invasiveness categories** and a range of 4 **site conditions**, applied to a selected list of species. The list was compiled by reviewing the literature on the habitat range and aggressiveness of invasive plants, having scientists advise NEIPC, and incorporating the substantial expertise and experience of the collective NEIPC membership.

The 3 **invasiveness categories** are labeled A, B and C in decreasing expected potential for invasion and impact: Group "A" is most invasive, while groups B and C have progressively lower invasiveness. Invasive species considered for Northeast BC are categorized in the table below:

Plant species invasiveness in Northeast BC

| <p>A. Prohibited Invasive Species</p> <p>Prohibited invasive plants are highly competitive with an ability to spread rapidly.</p> | <p>B. Primary Invasive Species</p> <p>Primary invasive plants have the ability to spread rapidly but are not as aggressive as prohibited invasive plants.</p> | <p>C. Secondary Invasive Species</p> <p>Secondary invasive plants can spread easily but the requirement to contain them is usually site specific. Invasive plants under successful biological control and certain native plants may be included in this category.</p> |
|--|---|---|
| <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>Fallopia 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> • yellow starthistle – centaurea solstitialis | <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>, • wild caraway – Carvi commun • Hoary Cress, <u>Lepidium draba</u> • green foxtail, <u>Sertaria viridis</u> • Pepper weed, <u>Lepidium latifolium</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> • russian thistle, <u>Salsola kali</u> • sow thistles, <u>Sonchus spp.</u> • tansy ragwort, (not reported in the region), <u>Senecio jacobaeae</u> • toadflax, common: <u>Linaria vulgaris and</u> • dalmatian: <u>L. dalmatica</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 oats, <u>Avena fatua</u> • wormwood or absinthium, <u>Artemisia absinthium</u> • yarrow (native) – <u>Achillea millefolium</u> |

Through the management season, when an observation of invasive plants is made, the matrix can be consulted to determine which of the 12 different combinations applies; and control efforts or resources can be applied appropriately.

Results of the growing season's experiences and observations are brought to a fall meeting of NEIPC, where new information can be considered to incorporate into the new plan being developed for the next year.

Site conditions are divided into 4 groups in decreasing expected potential for control: "1" being the highest opportunity for control, to 4: sites that have a much lower potential or opportunity (a high cost:benefit ratio) .

SITE PRIORITIZATION

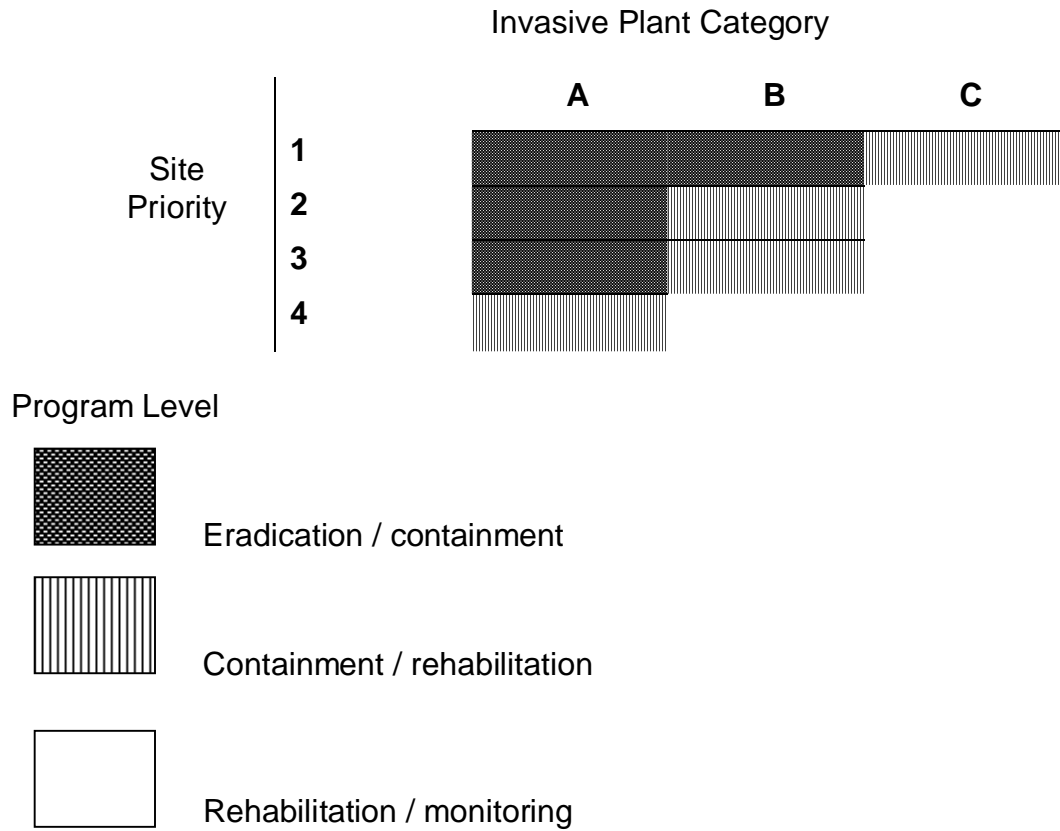
| Priority / Opportunity for Control | Site condition / management intent or goal |
|--|---|
| <p>1 Extremely High</p> | <p>A relatively small infestation (up to ¼ ha or ½ acre) likely to spread to large highly susceptible areas or high value crops (e.g. certified seed). Intent is to prevent establishment or spread, and to eliminate the local population. Effective treatment (eradication or containment) is critical.</p> |
| <p>2 High</p> | <p>Moderate sized infested area (about half a hectare or 1 ¼ acres) in susceptible areas, and with a good expectation that control will be effective. Goal is to contain the infested area.</p> |
| <p>3 Moderate</p> | <p>Larger infested area (greater than half a hectare or 1 ¼ acres) in less susceptible areas, and with some expectation that control will be effective. Goal is to stop the enlargement of the infested area.</p> |
| <p>4 Low Opportunity for Control</p> | <p>Infested areas larger than five hectares or 12 acres, where control would require prohibitively high investment of resources Goal is to reduce the damage from the infested area if possible, or at least record changes in the extent.</p> |

In early spring each year, the known or expected occurrences of invasive plants within 12 combinations of invasiveness and site condition described in the matrix are considered in relation to resources available for that year's invasive plant management.

A consensus is sought among members of NEIPC, that control efforts over the range of situations in the matrix, will be guided by the priorities.

It should be noted that commonly **observed** weeds may not be the species that are considered most invasive or economically damaging: species that would become extremely damaging may be under careful management (e.g. knapweeds) and not usually observed; or (like hawkweeds) may be at the edge of the region, where they are expected to quickly invade the area if not excluded or contained.

The northeast region has recently been divided into Invasive Plant Management Areas (IPMAs) for more operational consistency. Three of the areas are within the Peace River Regional District (PRRD): Pine Pass (a defined area between the height of land at the western edge of the region, to approximately Chetwynd); and the South Peace and North Peace IPMAs (the remainder of the region, divided by the Peace River). North of this, the Fort Nelson Invasive Plant Management Area extends from the border of the PRRD to the Yukon border.



Combining categories of invasive plants with site priorities, it is possible to describe various levels for invasive plant programs in the region. The EDRR level applies if a species not currently present in BC is discovered and the Provincial EDRR Program can be engaged. The eradication / containment level is where control measures are targeted to the most invasive plant species on small sites, less than ¼ ha or half acre, that are threatening larger areas of uninfested, highly susceptible habitats. Members of NEIPC agree to operate, at a minimum, at this level. The following table indicates these and other program level thresholds.

PROGRAM THRESHOLD TABLE

| INVASIVE PLANT CATEGORY | SITE PRIORITY | PROGRAM LEVEL | CONTROL OBJECTIVE or REQUIREMENT |
|-------------------------|------------------|--|---|
| A | 1 | EDRR Early Detection Rapid Response | Regional or local eradication. The goal is to eradicate the local population of the invasive plant, and to prevent new invaders, or stop the spread of recently established invaders that have low populations in northeast BC. |
| A A A B | 1 2 3 1 | ERADICATION / CONTAINMENT – where containment lines are outside NEIPC, eg., marsh thistle and knapweeds | Treatment or some form of management is mandatory. The immediate requirement is to prevent newly arriving invasive plants or those that have low population in northeast BC from establishing or spreading. The mid and long term goal is to eliminate the population of the IP from northeast BC. |
| A B B C | 4 2 3 1 | CONTAINMENT / REHABILITATION– where containment lines are within NEIPC, eg. ox-eye daisy and hawkweeds | Treatments are mandatory for sites outside of containment lines or areas. Within containment areas, treatments occur when protection or rehabilitation of important habitats or cropping areas is required, or a need is indicated by cost – benefit analysis, or other reasons of the land owner or occupier |
| B C C C | 4 2 3 4 | REHABILITATION / MONITORING– widely established species, eg., Canada thistle, sow thistles and narrow leaved hawksbeard | 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

| PROGRAM DESCRIPTION | ACTION REQUIRED | SPECIES | NOTES |
|-----------------------------------|---|---|--|
| <i>Provincial EDRR</i> | <i>All sites inventoried, treated and reported to InterMinistry Invasive Plant Working Group (IMIPWG)</i> | <i>Yellow star thistle, common crupina</i> | <i>These species are not present in BC</i> |
| <i>Eradication/ Containment</i> | <i>All sites inventoried and treated.</i> | <i>Knapweeds, knotweeds, spurge, marsh thistle, field scabious, blueweed, plumeless thistle, loosestrife, tansy ragwort, nodding thistle, St. John's-wort</i> | <i>These species are present in the rest of BC but are either not present in northeast BC or considered to be present in only a few spots.</i> |
| <i>Containment</i> | <i>Inventory and treat all sites found outside containment lines. Inventory and treat within containment lines as indicated in matrix.</i> | <i>Hawkweeds, common tansy, oxeye daisy, Dalmation toadflax</i> | <i>These species have established in northeast BC but have not spread to the extent of their range.</i> |
| <i>Rehabilitation/ monitoring</i> | <i>Inventory sites. Treat as indicated in matrix.</i> | <i>Burdock, Canada thistle, sow thistle</i> | <i>These species are well established in northeast BC</i> |
| <i>Rehabilitation</i> | <i>Release biocontrol agents when appropriate. Cost benefit analysis and justification before other treatments undertaken. Inventory all sites treated.</i> | <i>Common toadflax, scentless chamomile, bull thistle, common groundsel, narrowleaf hawksbeard</i> | |
| <i>Risk assessment</i> | <i>Inventory and treat all sites until risk assessment indicates otherwise</i> | <i>Blueweed, chicory, Goat's-beard, wild caraway</i> | |

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, if known, when it arrived 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://www.agric.gov.ab.ca/app23/herbssel>

Another web site which searches the labels of all pesticides registered in Canada for key words can also provide a match for a certain weed in a specific crop or situation: 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.

CATEGORY A

PROHIBITED INVASIVE PLANTS

Hawkweeds, orange & yellow, Hieracium spp – Containment

- A key to assist in identifying the various hawkweed species and a risk assessment for hawkweeds is available at: <http://www.for.gov.bc.ca/hra/Plants/> At the rosette stage it is difficult to differentiate hawkweed species including orange and some of the yellow. There are at least three yellow flowered introduced hawkweeds in northern BC including a hairy stemmed, yellow flowered species: probably H. caespitosum 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. The risk assessment indicates: "Invasive hawkweeds should be managed actively by stakeholder agencies in northeastern BC." Inventory work indicates that distribution of hawkweeds is not extensive but there are some substantial infestations in the Monkman and Pine Pass areas and one large infestation at Mile 137 of the Alaska Highway that is being effectively managed. Inventory and treatment of hawkweeds began in earnest in 2005 and inventory records, IAPP information, should be used cautiously as the numbers reflect inventory efforts more so than spread. In 2005 a total of 3 sites covering .0021 ha were inventoried but inventory of the Tumbler Ridge to Monkman area had not been done. By 2008 199 sites covering an estimated 172 ha had been inventoried. There are still areas in the Tumber Ridge Monkman area and Pine Pass area that have a likelihood of hawkweed infestation that not been inventoried

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- Orange hawkweed, H. aurantiacum, and some yellow hawkweeds are extremely invasive in the rest of BC and are causing serious problems. Hawkweeds are moving north along Highway 97 from central BC and are common up to to the Pine Pass. 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 Mountain.

Orange and yellow hawkweed inventories began in June 2007 in the Monkman Park area and they were found extensively along roads south of Tumbler Ridge to south of Kinuseo Falls. Resources were made available through the Pine Pass Project budget and treatment of the infestations began in July 2007. Inventory and treatments are continuing under the South Peace MFR Contract.

- 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.
 - *NEIPCs' goal is to prevent alien hawkweeds from spreading in northeast BC. To attain this goal inventory and control work on known hawkweed infestations, e.g., the sites in the Pine Pass, Monkman, Lone Prairie and Mile 137 areas will be inventoried, monitored and treated each year. New infestations that that are found or reported will be treated with herbicides. Due to specific requirements for herbicide use in Wildlife Habitat Areas (WHAs), plans will be developed for the proposed warbler WHAs so that reconnaissance will allow for the early detection of hawkweeds and the development of prescriptions to prevent the establishment of hawkweeds in those WHAs.*

Hounds tongue, Cynoglossum officinale – Containment – Regional EDRR

- 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 cylindrical - EDRR

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

Knapweeds, brown, black, yellow starthistle, & others, Centaurea jacea, C. nigra, C. solstitialis – Containment, Regional EDRR & EDRR for yellow star thistle

- 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 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.

THIS PLAN APPROVED BY THE NEIPC MEMBERSHIP ON APRIL 27, 2011

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- 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 – Containment Regional EDRR

- 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. The sites will be considered for suitability for inclusion in the “weed warrior” community-group awareness and hand-pull program.
 - 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 – Containment - Regional EDRR

- 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 and Alaska. 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. Current IAPP records indicate a total of 17 sites infesting approximately 10.2 ha in 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. A major site on the north banks of the Peace near Clayhurst bridge was treated in 2007 and 2008, both in a community pull project and by PRRD weed control contractor. Weed management staff from Alberta examined Peace banks downstream of the site and found some occurrences, NEIPC will coordinate treatment with Alberta. This and other sites will be considered for suitability for inclusion in any “weed warrior” community-group awareness and hand-pull programs.

Knotweeds, Giant, Japanese, Bohemian and Himalayan, Polygonum spp. – Containment - Regional EDRR

- 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. In 2006 surveys and confirmation of taxonomy work was undertaken across coastal BC.

The hybrid, (Japanese x Giant) bohemian knotweed is also present in BC. A site at Hazelton was checked during the survey and it appears that knotweeds will flourish in northern BC. Knotweeds are very aggressive and capable of crowding out all other vegetation forming dense stands degrading native plant and animal habitat. There are no reported knotweed sites in the NEIPC area as of 2008.

- Knotweeds are difficult to control because they have 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 being conducted in southern BC. (Additional control information will be added as it is found). On the Queen Charlottes, knotweed sites adjacent to the ocean are being treated with an integrated approach of light suppression, (mulching), hand pulling and irrigation with salt water.

- Knotweeds have been identified as high priority under the Terrestrial Ecosystem Restoration Program, TERP. Funding may be available and clarification on control actions should be forthcoming. Awareness work with local gardeners is needed as this plant is usually introduced as a garden plant. All knotweed found will be inventoried and treated.

Leafy spurge and cypress spurge, Euphorbia esula & E. cyparissias, cypress spurge – Containment - Regional EDRR

- There are no spurge records in IAPP but 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.

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 – Containment - Regional EDRR

- Marsh thistle has exploded in the eastern end of the Robson Valley. From a small infestation noted 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 but was reduced to a few plants when re-inventoried and treated in 2006. The site is checked annually.

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A report was received in the winter of 2008-09 of another site in Groundbirch Community Pasture that will have to be inventoried and treated in 2010.

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 equipment and 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, Trichosirocalus 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 and or herbicides.

Rush Skeletonweed, Chondrilla juncea. – Containment – Regional EDRR

- 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 – Containment - Regional EDRR

- This invasive plant is a problem in northwest BC at Stony Creek near Vanderhoof, 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 – Containment

- 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 several tansy sites inventoried in the northeast, (e.g., the MFR Compound in Dawson Creek, Elevator road in Pouce Coupe, residence near One Island Community Pasture, Bear Mountain Community Pasture 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 starting to show up not only along roads in north east BC but also out in the bush. 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.

CATEGORY B INVASIVE PLANTS

Blueweed *Echium vulgare* – Containment – Regional EDRR

- 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 – Spread prevention

- . 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* – Containment north of Pink Mountain

- 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 IPMA. 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.

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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.

A Urophora carduii, stem gall fly, release made in the summer of 2008 had formed substantial number of galls and appears to have established. It will need to be checked to see if it overwintered in 2010.

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. Requests have been made for U. carduii and addition releases may be made in 2010. Suitable release sites for biocontrol agents will be identified and other agents that become available will be released.

Caraway, wild – *Carvi commun* – Containment - Risk assessment required

- There are scattered infestations of wild caraway along the Alaska Highway. These infestations have been noted between Fort St. John and Fort Nelson, south of Fort Nelson and at site C. Clarification of the identification is required, as some may have been misidentified as wild carrot Daucus carota. Distribution of the plant in the rest of the region as well as the risk it presents have not been assessed. Wild caraway is considered a serious weed in some jurisdictions such as Colorado where it is on the same weed list as knapweeds and Canada thistle.

-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 caraway presents needs to be undertaken. A containment line is being investigated between Fort St John and Wild Horse Creek on the Alaska Highway. Treatment of caraway sites north of Fort St John has begun. Sites found north of Ft St John should be inventoried and treated

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Chamomile, scentless, Matricaria maritime

- 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, Omphalapion 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.

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Plumeless thistle, Carduus acanthoides – Containment - Regional EDRR

- 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, Trichosiocalus 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 – Containment - Regional EDRR

- 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. californiensis, a root weevil Hylobius transversovittatus and a seed weevil Nanophyes marmoratus. Some sites in BC have been effectively controlled with the introduction of Galerucella californiensis. 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.

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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 – Containment

- 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. Sites in the Alberta Peace region confirm that the species can thrive and invade pasture and agricultural land under Peace region conditions. 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.

In 2006 a risk assessment was commissioned on oxeye daisy and was available in 2007. The risk assessment was a component of a larger project, the Pine Pass Project, which is investigating the possibility of keeping several species, such as hawkweeds and oxeye daisy, which are prevalent in central BC from spreading into the northeast.

- Small patches of oxeye daisy can be hand pulled and herbicide recommendations are available. Herbicide trials including new products were conducted in spring and fall 2006 in the Salmon Valley area west of the Pine Pass. Re-assessment of the site in May 2007, adding fertilization to the treatments, was completed. By summer of 2007 it was clear that fall treatments had been more effective. Detailed results are available.
 - An initiative named the Pine Pass Project was conducted in 2006. Control efforts under a pooled resources delivery model were focused on treating all occurrences of the species east of a containment line at Mount Lemoray. The project has been moved to designation as the Pine Pass Invasive Plant Management Area, IPMA, and will be funded as a pooled resources approach. A new containment line is designated at the NEIPC – NWIPC boundary in Pine Pass. NWIPC conducted additional work on oxeye daisy and hawkweeds on their side of the Pine Pass in 2008 to assist in containment efforts. All oxeye daisy sites found will be inventoried and treated.

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.

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- A more detailed survey that notes possible biocontrol release sites 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 – Containment - Regional EDRR

- None reported at this time.

Toadflax, Dalmatian, Linaria dalmatica – Containment - Regional EDRR

- There is currently a couple of sites of dalmatian toadflax reported in the region along the Peace River at Fort St John, (site ID 128867). 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, recorded and treated using an integrated approach of pulling and spraying. The sites at the look out and along the Peace River in Fort St John area are being worked on but some of the area is very steep and is very difficult if not impossible to access with spray equipment. Work on these sites will continue in 2010 and a request will be made to obtain and release M. janthinus to try and reduce seed production while attempts are made to access and control the sites.

Toadflax, common, Linaria vulgaris - Restoration

- Common toadflax is wide spread in the south Peace around Dawson Creek and near any grain elevator sites. It has also managed to make its way to some remote areas such as the Guide Outfitters camp at the base of Terminus Mountain in the Kechika Valley. 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, have established on 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 C 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 or occidentalis

- 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 – Rehabilitation

- 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. Monitoring in 2008 indicate that this agent has established and spread quite a distance from the release sites. 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

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a release. Agents can be accessed from the various areas including the Groundbirch Community pasture.

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 – Risk assessment needed

- 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 in 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.

Goat's-beard or salsify, Tragopogon dubious & T. pratensis – Risk assessment required

- 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 - Though it is a native species, foxtail barley can be invasive in or near disturbed areas such as oil and gas leases, may injure livestock (awns may catch in throat) and is undesirable where grass seed is grown. It should be controlled in these situations.

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 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.

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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 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 – Containment - Regional EDRR

- 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.

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Nodding thistle aggressively invades most open habitats when it first establishes then its aggressiveness seems to decrease which might result 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, Trichosiromus 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.
 - 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 – Containment - Regional EDRR

- 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.

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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 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.

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-Hay products crossing the Alaskan border cannot contain wild oats

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.

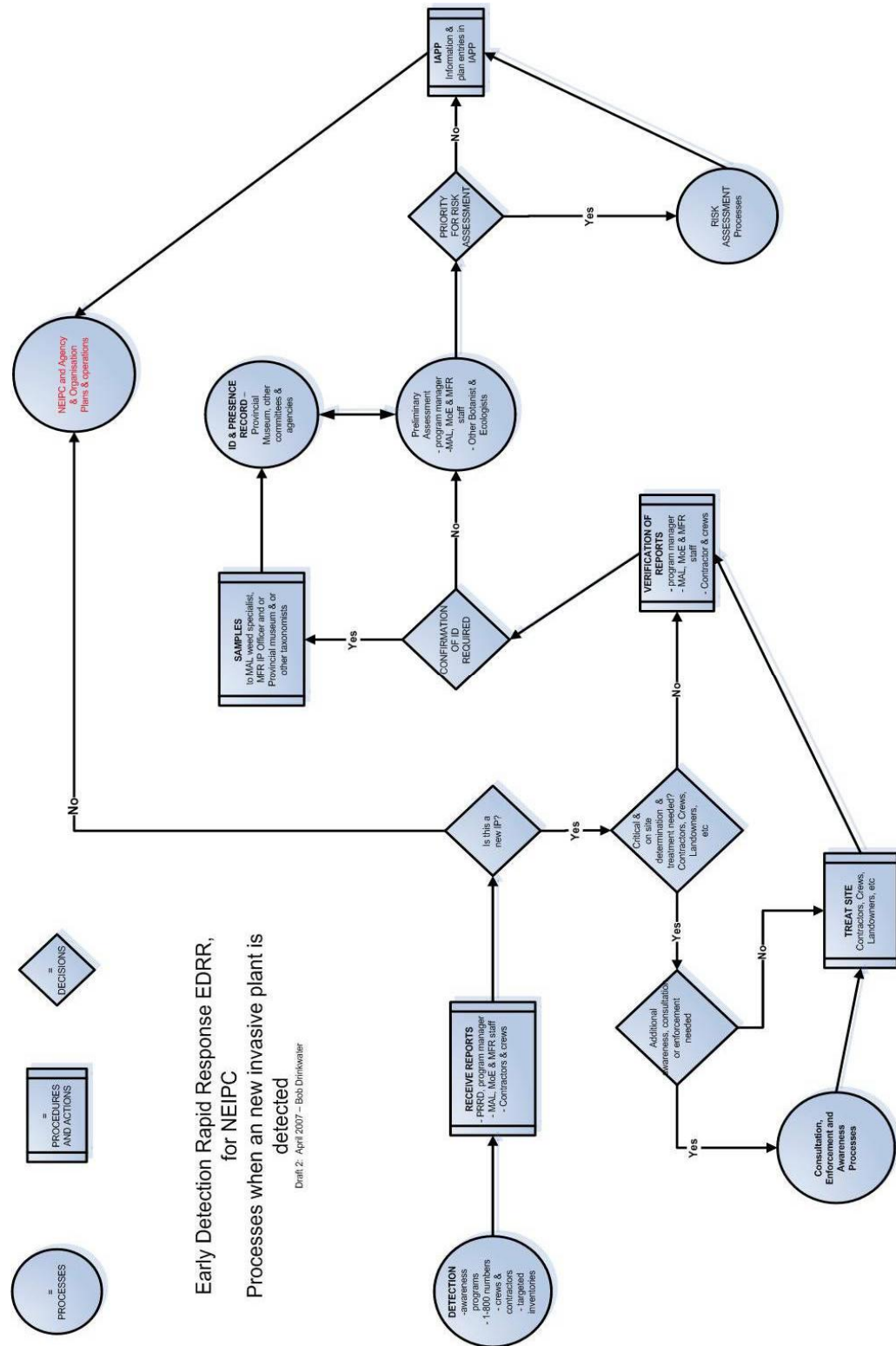
- Individual plants and small clumps of wormwood should be pulled when found. Assessment of the threat will be made.

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 – EDRR PLAN: There is also a BC Invasive Plant Council framework for EDRR.



APPENDIX 5 – INVASIVE PLANT CONTAINMENT LINES

DEFINITION:

The objective of containment in invasive plant management is to prevent large infestations from spreading to un-infested areas. Establishing containment lines around targeted invasive plant species' infestations defines the areas that require treatment and assists in management planning. Inside the containment line the infestation of the invasive plant species is extensive and it is not possible to eradicate the target species. Outside the line the infestation is limited and preventing spread and achieving a long term goal of eradication is possible.

The establishment and location of containment lines is determined through stakeholder consensus and are set within geographic areas such as Regional Invasive Plant Committee boundaries or cross-regional areas of the Province. The location of the containment line is based on considerations of the following: a) target invasive plant species' current distribution and abundance; b) known vectors and projected rate of spread; c) natural barriers to movement (e.g. height of land, lakes or rivers), and d) other management objectives within the area. Containment lines are housed in the Invasive Alien Plant Program (IAPP) Application, so that their locations are communicated and clear to all stakeholders and their invasive plant management crews.

Outside the containment polygon or area all sites of the species being contained need to be managed including enhanced awareness work, inventory, treatment, and monitoring. Management objectives inside a containment line may include rehabilitation of sites, or specific inventory and control actions on areas deemed to be critical from an economic or conservation perspective.

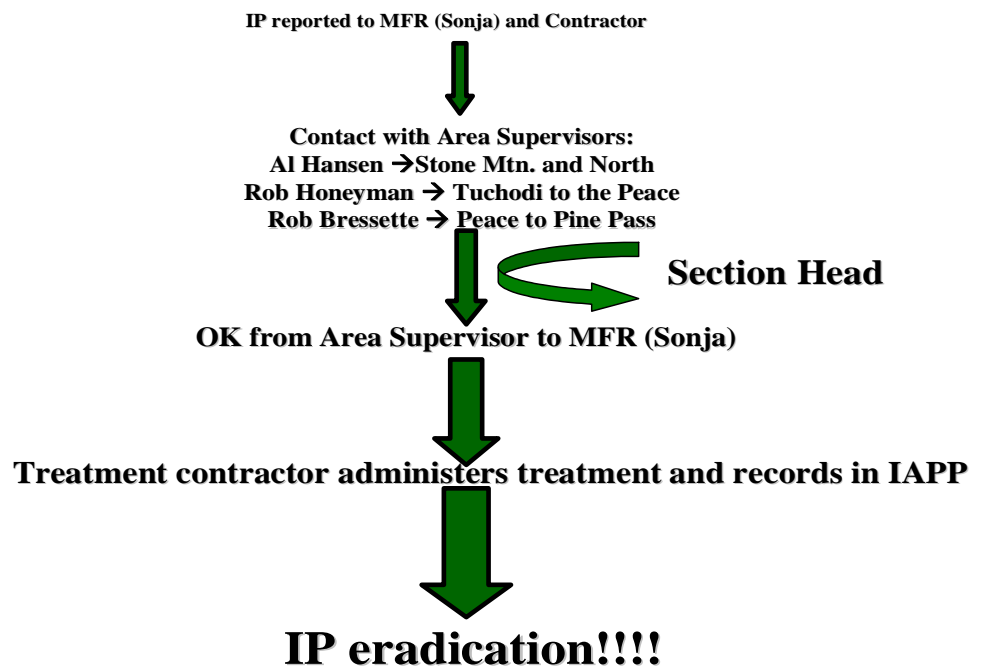
PROCEDURES:

As the support and action of all stakeholders and partners is required for successful containment of invasive plants, the following steps are required to establish containment lines:

- 1) Members of regional Invasive Plant Committees can propose and discuss containment lines. If lines are wholly within the regional invasive plant committee's area and consensus agreement on the location of the line can be reached, the request is forwarded to the Inter-Ministry Invasive Plant Working Group (IMIPWG) for review.
- 2) If proposed lines cross the boundaries of two or more regional invasive plant committees, all committees affected must agree to the lines and locations before they are forwarded to the IMIPWG.
- 3) An agency or organisation can propose containment lines to the IMIPWG, the Invasive Plant Council of BC (IPCBC), as well as to regional invasive plant committees. Proposals received by the IMIPWG or IPCBC will be referred to the affected regional committee(s) for consideration and support, and the committee will ensure final submission to the IMIPWG.
- 4) The IMIPWG will review proposed containment lines and either approve their inclusion in IAPP or discuss with those making the proposal why inclusion is not approved at that time or at that location.
- 5) If lines are approved for inclusion in IAPP, those making the proposal will work with the IAPP Technician to have the lines uploaded into IAPP.
- 6) Regular review and adjustment of containment lines is the responsibility of the sponsoring regional committees, agencies and organisations, and the IMIPWG.

**Planning flow chart for management (including authorization) of invasive plants in parks.
Prepared for "Weeds Know No Boundaries" Conference, Fort Nelson. Sonja Leverkus,
BC Min of Forests and Range**

IP Treatment in Northern Parks and Protected Areas



Other comments:

- *Treatment before May long weekend if possible*
- *Ranger training in June by MFR Staff (Bob and Sonja)*
- *Open communication between Parks, MFR and Trt Contractor*

Process created by:

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April 2011

PEACE RIVER REGIONAL DISTRICT Northeast Invasive Plant Committee

Director Tim Caton
Director Karen Goodings

Chair
Ex Officio

Agriculture Producer Groups

Bill Bentley, South Peace Cattleman's Association
Mike McConnell, PR Regional Cattlemen's Association
Art Seidl, SP Cattlemen's Association

Agriculture and Lands

Aaron Zylstra, Agricultural Fieldman, Clear Hills County
Kerry Clark, P. Ag., Crop Protection Specialist
Julie Robinson, P. Ag., Regional Agrologist
Shelley Kirk, Regional Agrologist
Denise McLean, Ministry of Agriculture and Lands
Layne Lybbert, ILMB
Linda M. Wilson

Chemical Companies

Vaughn Leuschen, Dow Agra Sciences

Coal

Colleen Hughes, Western Canadian Coal
Sigrid Robertson, Western Coal
Scott Trusler, Trend Mine NEMI
Tim Caldwell, Peace River Coal
Adriana MacLeod, Peace River Coal Inc.

Contractors

Mike Deliman, Spectrum Resource Group Inc.
Kim McNalley, K.A.M. Ventures
Andy Shwetz, Sunrise Environmental Inc.

Environment

Manuel Mariotto, Ministry of Environment

Timberline Trail and Nature Club

Marilyn Belak

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Sonja Leverkus, Fort Nelson Forest District
Stephanie Haight, Peace Forest District
Stephanie Smith, BCTS – Fort Nelson Field Office

Forest Industry

Adam Campbell and Mr. Mark Phinney, LP / Tembec Operations

April 2011

Hydro

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James Rowed, Williston Water License and Debris Initiatives
Erik Swanson, Vegetation Mgmt. Specialist
K. Anré McIntosh, Wildlife Lead Site C Project
Tom Wells, BC Transmission Corporation

Integrated Land Management Bureau

Jocelyn Elliott

Interested Stakeholder

Jill Copes
Dennis Meier

Invasive Plant Council of BC

Municipalities

Rob Crisfield or Mr. Gord Gosse, District of Chetwynd
Darcy Perrin, City of Dawson Creek
Victor Shopland or Bob Daum, City of Fort St. John
Public Works Director, Northern Rockies Regional Municipality
District of Hudson's Hope
Village of Pouce Coupe
Troy Gould, District of Taylor
Clark Hazelhurst or Ms. Alissia Sawiki, District of Tumbler Ridge

National Energy Board

Sherri Dunne, Operations Inspector
Jeff Enns, Alliance and Northern Pipelines

Oil and Gas Commission

Dan Hanson
Bob Purdon
Mohammad Farah

Oil and Gas Companies

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April 2011

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Transportation

Eric Chapman, Caribou Road Services Ltd.

Eric Weetman, Caribou Road Service

Daryl Nolan, Min. Transportation & Infrastructure, Northern Region

Dusty Cooper, Consultant, Min. Transportation & Infrastructure

Treaty 8 Association (First Nations)

West Moberly First Nations

Saulteau First Nations

Treaty 8 Tribal Association

Luke Gleeson, Tsay Keh Dene Band

Wind Consultant

Caroline Astley or Mr. Charlie Palmer, Hemmera

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