



City of Northglenn Noxious Weed Management Plan

Prepared by the

Northglenn Noxious Weed

Advisory Committee

January, 2010

City of Northglenn Noxious Weed Management Plan Table of Contents

I. Introduction	
A. Purpose of City of Northglenn Noxious Weed Management Plan	3
B. Enactment authority	3
C. Jurisdiction and scope of plan	4
D. Definitions	4
II. Northglenn Noxious Weed Overview	
A. Designated Noxious Weeds	7
B. Colorado Noxious Weed Law: Priority noxious weeds	7
C. Colorado Noxious Weed Law: Northglenn noxious weeds	7
III. Objectives and goals	
A. Objectives	7
B. Short-term goals (1 to 5 years)	8
C. Long-term goals (5 to 10 years)	8
IV. Plan of Work	
A. Description of integrated weed management	8
B. Prevention measures	9
C. Educational programs	9
D. Mapping	10
E. Intergovernmental agreements and contracts	10
F. Adopt-A-Roadside or Greenway program	10
G. Private and governmental properties	11
1. Individual management plans	11
H. Scheduled Northglenn Parks Activities	13
V. Appendices	14
A. Integrated Management for Priority Weed Species	15
B. Northglenn Priority noxious weed descriptions	39
C. Colorado noxious weed list	43
D. References	45

City of Northglenn Noxious Weed Management Plan

Introduction

Purpose of This Plan

The purpose of this City of Northglenn Noxious Weed Management Plan is to provide guidelines for effectively managing priority noxious weeds, which constitute a present threat to the natural resources of lands in the City of Northglenn. This plan implements the mandates of the Colorado Noxious Weed Act (also referred to herein as the Act) by detailing integrated management options for certain noxious weeds. Such options include education, preventive measures, good stewardship, and control techniques. It is this plan's intent to incorporate those options that are the least environmentally damaging, yet practical, timely, and economically feasible.

Enactment Authority

The Undesirable Plant Management Act (C.R.S. 35-5.5) was signed into state law in 1991 and amended in 1996, 2000 and 2003. Now known as the **Colorado Noxious Weed Act, §§ 35-5.5 (2003)**. It states that certain noxious weeds pose a threat to the natural resources of Colorado. It also states that it is the duty of all persons to use integrated methods to manage noxious weeds if the same are likely to be materially damaging to the land of neighboring landowners. It further directs that the cities of each county in the state shall adopt a Noxious Weed Management Plan for all incorporated land within the county. Northglenn ordinance Chapter 9, Article 15 declares noxious weeds to be a public nuisance under the Northglenn Noxious Weeds Ordinance.

The Northglenn Parks and Recreation Advisory Board established the Northglenn Noxious Weed Advisory Committee on March 12, 2001. The committee consists of the Northglenn Parks and Recreation Advisory Board, with assistance from the Weed Supervisor of the Adams County Extension Service, Two Representatives from the Parks, Recreation and Cultural Services Department, and the City Manager or his designee.

The Act (C.R.S. 35-5.5-106) directs the governing body of each municipality to adopt a noxious weed management plan, "The governing body of each municipality in the state shall adopt a noxious weed management plan for all lands within the territorial limits of the municipality."

The Northglenn Noxious Weed Advisory Committee shall:

1. Develop recommended management criteria and integrated weed management plans for managing priority noxious weeds;
2. Declare noxious weeds and any Colorado and/or Adams County noxious weeds designated by rule to be subject to integrated management; and

3. Recommend to the Northglenn City Council an integrated weed management plan for managing priority noxious weeds within the City.
4. The jurisdictional area of the Northglenn Noxious Weed Advisory Committee is the City of Northglenn. This plan shall be referred to as the City of Northglenn Noxious Weed Management Plan.

Jurisdiction and Scope of Plan

This plan shall apply to all lands managed by Northglenn. It does not preclude the City from entering into intergovernmental agreements with other governmental entities towards managing noxious weeds under the Colorado Noxious Weed Act. The City of Northglenn is aware that the Federal Noxious Weed Act (1974), as amended by Section 15 (management of undesirable plants on Federal Lands (1990), directs federal agencies to have an office or person trained to coordinate a noxious weed management program, to adequately fund the program, to implement cooperative agreements and to conduct integrated weed management. It also directs that such agencies manage on Federal lands those noxious weeds that are designated in the City or County within which the Federal land lies. Northglenn recognizes that a Memorandum of Agreement regarding noxious weed management was signed in Colorado in 1996 among 13 federal and state agencies with land management and natural resource protection responsibilities. Colorado Executive Order #D 006 99, dated July 19, 1999 requires state agencies and departments to cooperate with the local governing bodies of counties and municipalities to achieve shared noxious weed management objectives.

Definitions

The following definitions shall apply to terms used in this plan:

1. "**Act**": the Colorado Noxious Weed Act (2003), Article 5.5 of Title 35, C.R.S., as amended.
2. "**Adjacent**": meeting or touching at some point, or having nothing of the same kind intervening.
3. "**Agriculture**": uses involving the cultivation of land, production of crops, and/or the keeping of livestock; but not including commercial feed yards; the slaughter or processing of animals for commercial purposes; kennels; horses; veterinary hospitals; or riding academies.
4. "**Alien Plant**": a plant species that is not indigenous to the State of Colorado.
5. "**Biological Management**": the use of an organism to disrupt the growth of noxious weeds.
6. "**Council**": the Northglenn City Council.
7. "**City**": the area of Adams County, Colorado, which is incorporated as the City of Northglenn.

8. "**Cultural Management**": methodologies or management practices conducted which favor the growth of desirable plants over noxious weeds, including maintaining an optimum fertility and plant moisture status in an area, planting at optimum density and spatial arrangement in an area, and planting species most suited to an area.
9. "**Forb**": a broad-leafed plant; not a grass, shrub, or tree.
10. "**Herbicide Management**": the use of herbicides or plant growth regulators to disrupt the growth of noxious weeds.
11. "**IMP**": an individual noxious weed management plan, as further defined under "Integrated Management Plan" below.
12. "**Infestation**": to have overrun or inhabit, so as to be harmful or bothersome.
13. "**Integrated Management Plan or IMP**": the planning and implementation of a coordinated program utilizing a variety of methods for managing noxious weeds, the purpose of which is to achieve desirable plant communities. Such methods may include but are not limited to education, preventive measures, good stewardship, and biological cultural, herbicide, and mechanical management.
14. "**Landowner**": any owner of record of state, municipal, or private land and includes an owner of any easement, right-of-way, or estate in the land.
15. "**Local Noxious Weed**": any plant of local importance, which has been declared a "Northglenn Noxious Weed" by the City Council.
16. "**NWMP**": the City of Northglenn Noxious Weed Management Plan, and as further defined under "Management Plan" below.
17. "**Northglenn Noxious Weed Advisory Committee** ": the Northglenn Parks and Recreation Advisory Board , with assistance from the Weed Supervisor of the Adams County Extension Service (Holly Postmus), Jim Umland and Mark Arado of the Northglenn Maintenance and Operations Department, and the City Manager or his designee.
18. "**Management**": any activity that prevents a plant from establishing, reproducing, or dispersing itself.
19. "**Management Plan**": a noxious weed management plan developed by any person, the Northglenn Noxious Weed Advisory Committee or the designee of the City Manager using integrated management. The "City of Northglenn Noxious Weed Management Plan" (NWMP or this plan) shall refer to the integrated management plan adopted by the Board for the subject lands. An "Individual Management Plan" (IMP) shall refer to an integrated management plan for a specific property or group of properties as submitted by a landowner(s), and

approved by the Northglenn Noxious Weed Advisory Committee, the Northglenn City Council or their designee.

20. "**Mechanical Management**": those methodologies or management practices that physically disrupt plant growth, including tilling, mowing, burning, flooding, mulching, hand-pulling, shoveling, hoeing, and chopping.
21. "**Native Plant**": a plant species that is indigenous to the State of Colorado.
22. "**Neighboring**": any property located within a one-half mile radius of the boundary of the subject property.
23. "**Noxious Weed**": an alien plant or parts of an alien plant that has been designated by rule as being noxious or has been declared a noxious weed by the City Council, and meets one or more of the following additional criteria:
 - a. Aggressively invades or is detrimental to economic crops or native plant communities;
 - b. Is poisonous;
 - c. Is a carrier of detrimental insects, diseases, or parasites;
 - d. The direct or indirect effect of the presence of this plant is detrimental to the environmentally sound management of natural, open-space or agricultural ecosystems.
24. "**Noxious Weed Management**": the planning and implementation of an integrated program to manage noxious weeds.
25. "**Person**" or "**Occupant**": an individual, partnership, corporation, association, or federal, state, or local government or agency owning, occupying, or controlling any land, easement, or right-of-way, including but not limited to any county, state, or federally owned and controlled highway, drainage, or irrigation ditch, spoil bank, borrow pit, gas and oil pipeline, high voltage electrical transmission line, or right-of-way for a canal or lateral.
26. "**Plant Growth Regulator**": a substance used for controlling or modifying plant growth processes without appreciable undesirable phytotoxic effect at the dosage applied.
27. "**State Noxious Weed**": any noxious weed identified by the commissioner of the Colorado Department of Agriculture by rule after surveying the Local Advisory Boards and prioritizing the top ten weeds. Said survey is to be conducted every three years.
28. "**Subject Lands**": all public lands within incorporated Northglenn, with the exceptions of any land administered or managed by a federal, state or county agency.
29. "**Weed Inspector**": the agent or employee as appointed by the City Manager in concert with the Neighborhood Service Officers of the Neighborhood Services

Division or any other employees or agents designated by the City Manager, to conduct the duties and functions of the Weed Inspector under this plan

30. **"Weed Office" (303-280-7818):** the office of the Weed Inspector where noxious weed administration and education activities are centered.

Colorado Noxious Weed Act: State-Listed Noxious Weeds

A state noxious weed list and rules and regulations under the Act are developed by the Commissioner of the Colorado Department of Agriculture (CDA). The State requirements and the complete state list is found in Appendix C. The Northglenn Weed Office (303-280-7818) will monitor and comply with any amendments to the rules and regulations. The following plants were priority noxious weeds found in Northglenn. They must be managed where found on any subject lands. Their control is described in Appendix A and their biology is detailed in Appendix B. Additional noxious weeds from the state list will be added as discovered to exist or probably exist in Northglenn.

Northglenn Priority Noxious Weeds

NAME	Management	Description
	Page	Page
Canada thistle (<i>Cirsium arvense</i>)	15	39
dalmatian toadflax (<i>Linaria dalmatica</i>)	17	39
diffuse knapweed (<i>Centaurea diffusa</i>)	19	39
field bindweed (<i>Convolvulus arvensis</i>)	21	39
hoary cress (whitetop) (<i>Cardaria draba</i>)	23	39
leafy spurge (<i>Euphorbia esula</i>)	25	40
musk thistle (<i>Carduus nutans</i>)	27	40
Myrtle spurge (<i>Euphorbia myrsinites</i>) List A	30	40
poison hemlock (<i>Conium maculatum</i>)	31	40
purple loosestrife (<i>Lythrum salicaria</i>) List A	32	40
Russian knapweed (<i>Acroptilon repens</i>) (<i>Centaurea</i>)	33	41
saltcedar (<i>Tamarix ramosissima</i>)	34	41
Scotch thistle (<i>Onopordum acanthium</i>)	27	42
spotted knapweed (<i>Centaurea biebersteinii</i>) (C.)	36	41
yellow toadflax (<i>Linaria vulgaris</i>)	17	42
Teasel (<i>Dipsacus fullonum</i>)	36	42

Objectives and Goals

Objectives

The objectives of the City of Northglenn Noxious Weed Management Plan (NWMP) are to:

1. Develop and implement integrated management programs for Northglenn Noxious Weeds within Northglenn.
2. Continue and improve educational programs that effectively will communicate noxious weed impacts and management.
3. Utilize "Partners with Parks" to organize volunteers to implement certain objectives.
4. Offer to provide landowners/occupants with technical support in weed management.
5. Work with other government agencies towards establishing effective integrated noxious weed management programs on their properties, such as highway rights-of-way.
6. Outline processes for obtaining control of Northglenn Noxious Weeds on private and public properties.
7. Wherever possible, to identify and select the least environmentally damaging weed management methods that will provide desired control of infestations.
8. Select control methods that are practical and economically reasonable.
9. Seed native or adapted species on areas of bare soil or areas occupied by weeds, including non-noxious weeds.

Short-Term Goals

Short-term (1 to 5 years) goals for the City of Northglenn Noxious Weed Management Plan (NWMP) are to:

1. Educate landowners/occupants and selected city employees and volunteers on awareness, identification, prevention, control and eradication of Northglenn Noxious Weeds.
2. Concentrate on early detection and control of new noxious weed infestations. These are the easiest and most affordable to control, and prevent larger infestations from developing.
3. Maintain a current noxious weed infestation map.
4. Establish contact with landowners/occupants who have a noxious weed infestation through Neighborhood Services.
5. Reduce the noxious weed acreage on city land by 5%.
6. Reduce Poison hemlock by 50%.
7. Increase the areas occupied by native grasses or other suitable plant materials by 5% or more.

Long-Term Goals

Long-term (5 to 10 years) goals for the City of Northglenn Noxious Weed Management Plan (NWMP) are to:

1. Increase the use of biological control methods, wherever feasible.
2. Reduce noxious weed acreage within Northglenn by 15%.
3. Release appropriate insects for bio-control of select noxious weeds (i.e., Canada thistle).

4. Continue educational efforts focused on awareness, prevention control, and eradication of noxious weeds.
5. Reduce noxious weed populations on city lands by 20%.
6. Reduce poison hemlock by 90%. Eradicate poison hemlock on playgrounds.
7. Develop inter-governmental agreements to coordinate weed inventory, priorities and control.
8. Encourage planting of native grasses or other suitable plant materials to protect the soil and reduce weeds.

Plan of Work

Description of Integrated Weed Management

The Act requires all persons to use integrated methods to manage noxious weeds if such plants are likely to be materially damaging to neighboring lands.

Integrated management of noxious weeds is fully defined in the "definitions" section of this NWMP. In short, it includes the coordinated use of education, preventive measures, good stewardship, and control methods, the purpose of which is to achieve desirable plant communities.

Control methods include cultural, mechanical, biological and herbicidal. Definitions of these terms are also in the "definitions" section of this plan.

Integrated management of "Northglenn Noxious Weeds" will vary depending upon plant site location. Management options for noxious weeds will be evaluated and approved by Adams County and the State of Colorado..

Prevention Measures

Preventive control involves use of measures that will prevent the introduction or establishment of noxious weeds into areas not currently infested with noxious weeds. Prevention also includes the eradication of small new infestations. These measures usually are the most practical and cost-effective means of integrated weed management. The least expensive weed to manage is one that does not infest an area.

Preventive measures that have applicability to the subject lands are: 1) using weed-free seed and mulch, 2) promoting the Colorado Weed Free Hay and Forage program, 3) prioritizing weed management areas along routes of entry and dispersal, and monitoring noxious weed infestations in bordering cities.

With regard to measure number 3, the Weed Inspector will manage Northglenn Noxious Weeds on Northglenn properties and Rights-of-Way from March through October. Public education programs will emphasize weed infestation prevention. Sites found to have small, eradicable infestations of new; uncommon noxious weeds will be given high priority for management purposes. A coordinated control effort with private landowners will be organized, where applicable. The Colorado Department of Transportation, Adams County and ditch companies will be contacted. They will be encouraged to cooperate on

projects along ditches and roadways within the City of Northglenn boundaries with noxious weed infestations."

Educational Programs

Education of the public is one of the most important aspects of integrated weed management. Emphasis will be made on continuing and expanding educational noxious weed programs, such as the following:

1. Timely media articles concerned with noxious weed identification and management. Emphasis will be made of the alien origin of noxious weeds and the consequences of not managing them through the City of Northglenn website and the Northglenn Connection.
2. Via the media and seminars, offer the assistance of the Northglenn Noxious Weed Management Committee and Colorado State University Cooperative Extension office in weed management and IMP matters.
3. Conduct landowner/occupant noxious weed management seminars or talks.
4. Conduct "Northglenn Noxious Weeds" identification, management, and awareness seminars with Maintenance and Operations and Public Works personnel, Neighborhood Service Officers of the Neighborhood Services Division and volunteers. This is done on an annual basis.
5. Utilize Extension Fact Sheets and websites when possible. Prepare informational brochures on integrated noxious weed management for the public. Make selected herbicide labels and MSDS available at public and educational events.
6. Work with the Adams County Weed Department in educating staff, residents, developing research test plots, etc....

Mapping

Mapping is a valuable tool in integrated weed management. As such, the Weed Inspector or his designee will establish and maintain visual maps of past and current infestations of selected Northglenn Noxious Weeds. From these, a graphic representation of weed management progress and needs will be evident. Google's "Earth" computer program will be the primary mapping tool. Adams County weed supervisor will be advised on new infestations and any sighting of purple loosestrife.

The primary goal of mapping is to record the "Northglenn Noxious Weeds" species present, the area infested, density of the infestation, soil types, groundwater depth, and other site factors pertinent to managing the infestation successfully.

Intergovernmental Agreements and Contracts

Intergovernmental Agreements (IGAs) and contracts are useful tools towards more effective noxious weed management among agencies and governments. Through cooperation, more is understood and more is done. Towards this end, the Weed

Inspector may contact certain entities concerning compliance with the Act. Contracts and IGAs will be encouraged towards cooperative efforts in managing Northglenn Noxious Weeds. Assistance will be offered towards helping each agency developing IMPs for their lands. The following organizations will be contacted, initially.

1. Colorado Department of Agriculture, Division of Plant Industry
2. Colorado Department of Transportation
3. Colorado Division of Wildlife
4. CSU Cooperative Extension
5. Adams County Weed Department

Adopt-A-Roadside or Greenway Program

An Adopt-A-Roadside or Greenway program will be established which would give landowners/occupants the ability to assist in managing Northglenn Noxious Weeds on Northglenn land. Volunteers could cut or dig up noxious weeds on city property.

Noxious Weeds on Private Property

Cooperation from all landowners/occupants regarding timely noxious weed management will be encouraged via positive communication and education efforts. The Weed Inspector will work with Neighborhood Services. Noxious weeds on private property should be reported to the Neighborhood Services Supervisor at 303-280-7840 for appropriate educational and enforcement measures.

Notices under the Northglenn's Noxious Weed Management Plan (NWMP) and the Northglenn Noxious Weeds Ordinance Chapter 9 Article 15 are mailed to owners of land having Northglenn Noxious Weeds, as observed and recorded by the Weed Inspector or Neighborhood Service Officers of the Neighborhood Services Division. County Assessor records are used to identify landowner names and addresses. Notices are delivered by both regular and certified mail. A reasonable effort is made to identify tenants, if any, who then are concurrently, sent notices.

In the event the landowner/tenant fails to comply with the Notice, they will have due process before the Weed Inspector or his/her agent develops an IMP to manage the Northglenn Noxious Weeds. Due process includes being invited to a hearing before the City Council.

The Northglenn City Council, the Maintenance and Operations Director or Neighborhood Service Officers of the Neighborhood Services Division may direct the Weed Inspector to assist the landowner in implementing an IMP.

It is desirable that the Weed Office (303-280-7810) has work priorities with regard to mapping and managing Northglenn Noxious Weeds on subject lands. This is due to the size of the subject area and to the number of landowners with existing noxious weed infestations. The following list prioritizes the development of Individual Management plans (IMP):

1. Eradication of purple loosestrife and eradication of poison hemlock in playground areas.
2. Any List A species or populations of List B species designated for eradication.
3. Northglenn Parks, Open-space, Greenways and right-of-ways in cooperation with the Parks Superintendent.
4. Complaint properties.
5. Significant infestation of the Northglenn Noxious Weeds.
6. Lands bordering waterways (i.e. ditches, canals, rivers, creeks)
7. Lands currently managed by Northglenn in cooperation with the Parks Superintendent.
8. Land under cooperative agreement with other jurisdictions.

Scheduled Northglenn Parks Activities (Noxious Weed Control Measures to be done on City Property)

February

Call to order biological controls (insects) for use on thistle infestations and to get instructions on when to place insects.

March

1. Mow sections of Oscar Arnold Nature Area where existing tall vegetation would interfere with spraying.
2. Scout for poison hemlock and teasel infestations along the Farmer's Highline Canal Trail and E. B. Rains Jr. Memorial Park, spray early growth of poison hemlock.

Late April to mid May

1. Spray Canada thistle, musk thistle and hoary cress at Oscar Arnold Nature Area.
2. Spray hoary cress in other areas along the Farmer's Highline Canal trail.
3. Spray additional growth of poison hemlock.

June

1. Dig up poison hemlock plants missed earlier, before flowering occurs (volunteers).

Early July

1. Spray knapweed at E.B. Rains Park and Fox Run Open Space.

Late July to Early August

1. Second spraying of knapweed.
2. Scout for purple loosestrife at Fox Run Open Space (wetland area), cut and bag flowers, and spray.
3. Spray yellow toadflax at Northwest Open Space, along Farmer's Highline Canal Trail and at Croke Reservoir (second application in late August if necessary).

Any infestations on private property, contact Neighborhood Services.

APPENDICES

Appendices

A. Integrated Management for Northglenn Priority Weed Species	15	
1. Canada thistle (<i>Cirsium arvense</i>)		15
2. dalmatian toadflax (<i>Linaria dalmatica</i>)		17
3. diffuse knapweed (<i>Centaurea diffusa</i>)		19
4. field bindweed (<i>Convolvulus arvensis</i>)		21
5. hoary cress (whitetop) (<i>Cardaria draba</i>)		23
6. leafy spurge (<i>Euphorbia esula</i>)		25
7. musk thistle (<i>Carduus nutans</i>)	27	
8. Myrtle spurge (<i>Euphorbia myrsinites</i>)	30	
9. poison hemlock (<i>Conium maculatum</i>)		31
10. purple loosestrife (<i>Lythrum salicaria</i>)	32	
11. Russian knapweed (<i>Centaurea repens</i>)		33
12. saltcedar (<i>Tamarix ramosissima</i>)		34
13. Scotch thistle (<i>Onopordum acanthium</i>)		27
14. spotted knapweed (<i>Centaurea maculosa</i>)		36
15. yellow toadflax (<i>Linaria vulgaris</i>)	17	
14. teasel (<i>Dipsacus fullonum</i>)	36	
B. Northglenn priority noxious weed descriptions	38	
C. Colorado noxious weed list	42	
D. References		44

APPENDIX A

Integrated Management for Northglenn Noxious Weeds

Management techniques must be approved by the Commissioner of Agriculture, locally the Adams County Weed Management Specialist, is a source for approved techniques. The integrated management options listed below are meant to provide proven management techniques for controlling noxious weeds on various sites. Additional viable options likely will become available in the future. Site-specific options are presented only for sites where the noxious weed is expected to be found in Northglenn, either now or in the near future. Native vegetation in place of introduced species requires site-specific investigation of the soil and moisture regime.

Planting of native species, like western wheatgrass (*Agropyron smithii*) or blue grama (*Bouteloua gracilis*), should always be considered in developing an IMP. In some cases, non-native plant materials may be preferred to limit the establishment of noxious weeds. E.P.A. labels are getting more specific on the type of land that a pesticide may be used. Check the official Label for applicability before using any pesticide. Manufacturer's lists are available at: <http://www.cdms.net/manuf/manuf.asp>

Adam's County has noxious weed fact sheets at:

<http://www.colostate.edu/Depts/CoopExt/Adams/weed/factsheet.htm>

The State of Colorado has noxious weed lists and fact sheets at:

<http://www.colorado.gov/cs/Satellite?c=Page&childpagename=Agriculture-Main%2FCDAGLayout&cid=1167928170082&p=1167928170082&pagename=CDAGWrapper>

Canada thistle

Canada thistle is an alien, deep-rooted perennial that spreads by seeds and creeping, horizontal roots. Its vast root system makes it very difficult to control. This is reflected by its wide distribution on subject lands, both on dryland and riparian sites. Its fluffy seeds are especially adept at traveling with wind and colonizing new areas.

1. Management Measures

A. Cultural Management

Establishing and maintaining selected, aggressive grasses can be a management control tool used alone, however, Canada thistle will spread on moist or riparian sites, even among a very aggressive smooth brome grass stand.

B. Mechanical Management

Mowing, or similar efforts that mechanically damage the above ground thistle plant, is effective in decreasing infestations. Perform these activities two or more times per growing season. The goal is to stress the plant, making it use root food reserves and reduce (or eliminate) seed set. Canada thistle is known to set seed on plants lower than mower cutting height. To eliminate an infestation of Canada thistle by cultivation, begin this activity when root food reserves are low. This time generally is 4 to 6 weeks after emergence (very early bud stage) in the spring.

From 90 to 98 percent of a thistle infestation can be eliminated by deep cultivation (4 to 6 inches deep) repeated every 21 days during a growing season, and continued to freeze up. Care must be taken to not have cultivation interfere with soil conservation plans, nor result in soil erosion.

C. Biological Control

Grazing may have a slight effect on reducing vigor, but is not an effective management practice. Insects have been released in Colorado on an experimental basis to control Canada thistle. *Ceutorhynchus litura*, a predator of Canada thistle, feeds on the plant externally as an adult, while the larvae mine the leaves and stems. A gall forming fly, *Urophora cardui*, has been released to help combat Canada thistle. At this time their effectiveness has been marginal. Some are available to the general public.

D. Herbicide Control

Herbicides that are recommended for use on Canada thistle, either independently or in combination, are: picloram (Tordon22K®), triclopyr & clopyralid (Redeem R&P®), clopyralid (Stinger® or Transline®), clopyralid plus 2, 4-D premix (Curtail®), chlorsulfuron (Telar®), dicycloamine (Vanquish®), metsulfuron methyl (Escort XP), glyphosate (Roundup®, Rodeo®), and dicamba (Banvel®), quinclorac (Paramount® or Drive 75 DF®). Dicamba, 2,4-D and mecoprop (Weed-B-Gon MAX®) or (Super Trimec®). Proper timing of applications, according to label directions, is critical. Picloram and dicamba can injure woody plants by being exuded through weed roots and being up taken by trees and shrubs within three times their drip lines. Always follow herbicide label directions for application and environmental protection guidelines.

Integrated Management Options by Site

A. Open-space, Pasture and Riparian Sites

Option #1. Biological and Herbicide Control

A herbicide treatment in late September or early October. On riparian sites, use only appropriately labeled products. This is an effective management method. Grazing or insects are not feasible.

Option #2. Mechanical and Herbicide Control

Mow two to four times from May to late August. Follow with a reduced-rate herbicide treatment in late September or early October. On riparian sites, use only appropriately labeled products. This is a very effective integrated management method.

Option #3. Mechanical Control Only

Use mowing or cultivation throughout the growing season with the primary goal of preventing seed set.

Option #4. Herbicide Control Only

Herbicides used will be at labeled rates and labeled for the target site. Depending on the product, make application in late-spring and in September/October, in the fall only, or at any time during the growing season. On riparian sites, use only appropriately labeled products.

B. Along irrigation and storm water ditches

Option #1. Mechanical and Herbicide Control
Same as for riparian sites as described above.

Option #2. Mechanical Control Only
Same as for Option #3 as described above. Mechanical control limited to chopping, weed-eating, hoeing, etc.

Option #3. Herbicide Control Only
Same as for Option #4 as described above.

C. Road Rights-of-Way and other Non-crop Areas.

Option #1. Mechanical and Herbicide Control
Mow or flail Canada thistle 2 to 4 times from May to September. A reduced herbicide application will be made to visible re-growth in the fall.

Option #2. Herbicide Control Only
On sites that cannot be mowed, apply approved herbicides at labeled rates. Depending on the product, apply herbicides in spring and fall, fall only, or at any time during the growing season.

http://www.colostate.edu/Depts/CoopExt/Adams/weed/pdf/Canada_thistle.pdf

Dalmatian and Yellow toadflax

Toadflax is an alien perennial weed that spreads by seeds and creeping roots. It has somewhat waxy leaves and produces numerous hard black seeds, which are easily transported on tires. Toadflax is difficult to control. Yellow toadflax is found at the Oscar Arnold Nature area, Croke Reservoir and along the Farmer's Highline Canal at E. B. Rains Park. Dalmatian toadflax is rare in Northglenn.

1. Management Measures

A. Cultural Management

Cultural control methods tend to work poorly towards controlling toadflax. A productive, aggressive grass stand will tend to slow the spread of toadflax, and to deter the establishment of new infestations. toadflax will survive and spread, even in a bluegrass lawn.

B. Mechanical Management

Mechanical control of toadflax is difficult because it sprouts from underground rhizomes. Mowing generally has little or no effect. Hoeing or grubbing is more

effective. Flailing or cultivation at intervals of 10 to 14 days can be effective, but 2 or more growing seasons of diligent effort are needed to achieve stand reduction. Cultivation intervals must be religiously maintained. Cultivation can spread toadflax rhizomes to non-infected sites via dragging, or from being transported on the cultivation or flailing equipment.

C. Biological Management

Biological control of toadflax is difficult.. *Brachypterolus pulicarius*, *Calophasia lunula*, *Eteobalea intermediella*, *Gymnetron antirrhini*, *Gymnetron linariae*, and *Mecinus janthinus* are being investigated for use on both toadflaxes. Grazing is not effective.

D. Herbicide Management

Herbicides labeled for use on toadflax, either singly or cooperatively are: picloram (Tordon22K®), quinclorac (Paramount® or Drive® 75 DF), dicamba (Banvel®), glyphosate (Roundup®, Rodeo®), diclycolamine (Vanquish®), fosamine (Krenite®), and 2, 4-D,. Dicamba + 2, 4-D; chlorsulfuron (Telar®); Dicamba, 2,4-D and mecoprop (Weed-B-Gon MAX®) or (Super Trimec®). or metsulfuron methyl (Escort XP®) + 2, 4-D gives good control when applied before the bloom stage. Imapazapic (Plateau® or **Journey®**) is effective on Dalmatian toadflax only when applied in the fall.

Dicamba and picloram can injure woody plants by being exuded through weed roots and being uptaken by trees and shrubs within three times their drip lines. Effective control can take many years with some herbicide use strategies. Proper timing of application, according to label directions, is critical, especially with 2, 4-D. Always follow herbicide label directions for application and environmental protection guidelines. Near ground or surface water use only 2,4-D type products labeled for “near water” use and/or Rodeo®. Glyphosate and some amine forms of 2, 4-D are compatible in mixtures.

Nonionic surfactants need to be added to the herbicide in order to increase effectiveness.

2. Integrated Management Options by Site

A. Open-space, Pasture, and Riparian Sites

Option #1. Biological and herbicide Control

Graze livestock from May through late August. Follow in September/October with a herbicide treatment to toadflax. On riparian sites apply glyphosate, fosamine, and aquatic labeled 2, 4-D according to label guidelines.

Option #2. Mechanical and Herbicide Control

Cultivate or use manual efforts (shoveling, hoeing, weed eating, etc.) to stress toadflax from May through late August. Allow regrowth of toadflax before applying a herbicide in September. On riparian sites apply glyphosate, fosamine, and aquatic-labeled 2, 4-D according to label guidelines.

Option #3. Herbicide Control Only

Apply herbicides in the spring and fall, fall only, or at times during the growing season, depending on the product. Use appropriate products for the site, and at labeled rates.

B. Along Irrigation and storm water ditches

Option #1. Mechanical and Herbicide Control

Same as for option #2 for riparian sites as described above, except cultivation cannot be done. Use only herbicides labeled for ditch site. Do not spray ditch water.

Option #2. Herbicide Control Only

Same as for Option #3 as described above. Use only products labeled for irrigation ditches. Do not spray ditch water. Near ground or surface water use only 2,4-D type products labeled for “near water” use and/or Rodeo®.

C. Road Right-of-Ways and Other Non-Crop Areas

Option #1. Mechanical and Herbicide Control

Cultivate these sites 2 to 4 times per growing season. Apply herbicides to toadflax at labeled rates. Depending on the product and site, the applications will be made in spring and fall, fall only, or at any time during the growing season.

Option #2. Herbicide Control Only

On sites that cannot be cultivated, apply labeled herbicides to toadflax in a strategy as described in Option #1 above.

Diffuse knapweed

Diffuse knapweed is an alien, biennial to short-lived perennial weed that reproduces by seed. It is a pioneer species that quickly invades disturbed, dry sites. This knapweed is located around gravel pit areas near the South Platte River in the County, on rangelands between Bennett and Strasburg, and in some waste areas in the Watkins area. It has not been identified in Northglenn, but is nearby.

1. Management Measures

A. Cultural Management

Use similar methods as those stated for Russian knapweed. Although diffuse knapweed is not known to be allelopathic, seeding alone in infested sites will not provide adequate control. It produces early spring growth that is difficult to compete against.

B. Mechanical Management

Mowing (or other mechanical efforts) diffuse knapweed when it is in the bud stage, and again when it flowers, can significantly reduce seed production but will not eliminate the infestation. Mowing usually increases diffuse knapweed density, due to increased germination from the soil seed bank. Mowing should be followed by a fall herbicide treatment. This weed has been known to flower at a plant height below mower level.

Hand-pulling is effective if done frequently for control of scattered diffuse knapweed plants. It may also be appropriate in areas where other treatments are not feasible or are prohibited. Optimum time for pulling is in the spring when the soil is moist and allows for extraction of a lethal portion of the taproot. Pulling can also be used during the bolting stage in June and again before seed dispersal.

C. Biological Management

Two species of seedhead flies (*Urophora alibis* and *U. quadrifasciata*) or *Metzneria paucipunctella*), a flower-feeding gelechiid moth and *Larinus obtusus* reduce the seed production of this weed. When combined with a root-boring beetle (*Sphnoptera jugoslavica*) or (*Agapeta zoegana*) a root boring moth, diffuse knapweed control is increased. (*Cyphocleonus achates*), a root boring weevil shows promise.

Sheep will graze diffuse knapweed when it is green and succulent (rosette through bud stage) and when there is no other forage available.

D. Herbicide Management

Herbicides that can be used independently or in combination with each other are: picloram (Tordon22K®), dicamba (Banvel®), clopyralid (Stinger®, Transline®), clopyralid + triclopyr (Redeem R&P), diclycolamine (Vanquish®), clopyralid + 2,4-D (Curtail®) and 2, 4-D. The latter used alone works poorly. Metsulfuron methyl (Escort XP®) and chlorsulfuron (Telar®) are somewhat effective when applied during the flowering stage in order to inhibit seed formation and production of viable seed. Glyphosate can work well at the rate of 1 quart of product per acre, applied twice in a season. Picloram and dicamba can injure woody plants by being exuded through weed roots and being uptaken by trees and shrubs within three times their drip lines. Always follow herbicide label directions for application and environmental protection guidelines.

2. Integrated Management Options by Site

A. Open-space and Pasturelands, Riparian and Non-Crop Areas, and Right-of-Ways

Option #1. Cultural and Herbicide Control

Make a short-residual herbicide application to diffuse knapweed early summer when diffuse knapweed is in the rosette to bolting stages. Another application may be needed in late summer. Then seed selected competitive, perennial grasses

anytime between late October through early April. Use aquatic-labeled 2, 4-D, Rodeo® (glyphosate), or clopyralid in riparian areas and gravel pits, and according to their labels.

Option #2. Biological and Herbicide Control

Seedhead flies and root-boring beetles or weevils will be released where they show promise. Introduction of seedhead flies by transporting infested plants to diffuse knapweed sites in Adams County can be done in the fall. Flies from the plants will release themselves in the next spring, and infest new knapweed plants. Apply an herbicide treatment to weed rosettes in the fall, after the flies have completed their life cycle. Use aquatic-labeled 2, 4-D, Roundup® (glyphosate), or clopyralid in riparian areas and gravel pits, and according to their labels.

Option #3. Mechanical and Herbicide Control

Mow diffuse knapweed (or use other mechanical efforts) when this weed is in the bud stage, and again at flowering after regrowth. Then apply a herbicide application to plant regrowth that shows signs of flowering. Use aquatic-labeled 2, 4-D, Roundup® (glyphosate), or clopyralid in riparian areas and gravel pits' and according to their labels.

Option #4. Mechanical Control Only

Mow or use other mechanical treatments throughout the growing season, as needed, to reduce seed set.

Option #5. Herbicide Control Only

Apply herbicides to weeds in the rosette stage during or fall. Bolting plants also will receive treatments. Herbicides should not be applied after mature plants have set seed or effectiveness will be lost. Use aquatic-labeled 2, 4-D, glyphosate (Roundup®), or clopyralid in riparian areas and gravel pits, and according to their labels.

http://www.colostate.edu/Depts/CoopExt/Adams/weed/pdf/Diffuse_knapweed.pdf

Field bindweed

Field bindweed is an alien perennial weed that spreads by seeds and creeping roots. It has a creeping growth habit whereby it grows close to the ground or climbs up structures or other plants. This habit makes it more difficult to control than weeds that grow upright. The lengthy seed viability, 20 to 50 years, also makes field bindweed difficult to control.

1. Management Measures

A. Cultural Management

Cultural control methods tend to work poorly towards controlling bindweed. A productive, aggressive grass stand will tend to slow the spread of bindweed, and to deter the establishment of new infestations. Field bindweed will survive and spread, even in a bluegrass lawn.

B. Mechanical Management

Mechanical control of field bindweed is difficult because of its low growth habit. Mowing generally has little or no effect. Hoeing or grubbing is more effective. Flailing or cultivation at intervals of 10 to 14 days can be effective, but 2 or more growing seasons of diligent effort are needed to achieve stand reduction. Cultivation intervals must diligently be maintained. Cultivation can spread bindweed rhizomes to non-infested sites via dragging, or from being transported on the cultivation or flailing equipment. Plastic or fabric can be used to place on the soil over an infested patch. The infestation will be eliminated in three years through this effort.

C. Biological Management

Two species of natural enemies are presently being released in Northglenn for the suppression of field bindweed. A small eriophyid mite, *Aceria malherbae*, is available for release and has proven to be quite effective on large bindweed infestations in Northglenn, and the bindweed moth, *Tyta luctuosa*. Grazing is not effective.

D. Herbicide Management

Herbicides labeled for use on field bindweed, either singly or cooperatively are: quinclorac (Paramount® or Drive 75 DF®) picloram (Tordon22K®) dicamba (Banvel®), glyphosate (Roundup®, Rodeo®), fosamine (Krenite®), diclycolamine (Vanquish®), 2, 4-D, fluroxypyr (Vista®), and 2,4-d+MCP+dicamba+Sulfentrazone (Surge®) Dicamba, 2,4-D and mecoprop (Weed-B-Gon MAX®) or (Super Trimec®).

Dicamba and picloram can injure woody plants by being exuded through weed roots and being uptaken by trees and shrubs within three times their drip lines. Effective control can take many years with some herbicide use strategies. Proper timing of application, according to label directions, is critical, especially with 2, 4-D. Always follow herbicide label directions for application and environmental protection guidelines. Near ground or surface water use only 2,4-D type products labeled for “near water” use and/or Rodeo. Glyphosate and some amine forms of 2, 4-D is compatible in mixtures.

2. Integrated Management Options by Site

A. Open-space, Pasture, and Riparian Sites

Option #1. Biological and herbicide Control

Graze livestock from May through late August. Follow in September/October with an herbicide treatment to bindweed. On riparian sites apply glyphosate, fosamine, and aquatic labeled 2, 4-D according to label guidelines.

Option #2. Mechanical and Herbicide Control

Cultivate or use manual efforts (shoveling, hoeing, weed eating, etc.) to stress bindweed from May through late August. Allow regrowth of bindweed runners to 8- to 12-inch lengths before applying an herbicide in September/October. Quinclorac (Paramount® or Drive® 75 DF) for three years has been successful. On riparian

sites apply glyphosate, fosamine, and aquatic-labeled 2, 4-D according to label guidelines.

Option #3. Herbicide Control Only

Apply herbicides in the spring and fall, fall only, or at times during the growing season, depending on the product. Quinclorac (Paramount® or Drive® 75 DF) for three years has been successful. Use appropriate products for the site, and at labeled rates.

Option #4. Biological Control

Biological control of field bindweed is difficult. Two species of natural enemies are presently being released in Colorado for the suppression of field bindweed. The first, a small eriophyid mite, *Aceria malherbae*, and the bindweed moth, *Tyta luctuosa*, is also being reared at the Colorado Insectary for release to the field. Grazing is not effective.

B. Along Irrigation and storm water ditches

Option #1. Mechanical and Herbicide Control

Same as for option #2 for riparian sites as described above, except cultivation cannot be done. Use only herbicides labeled for ditch site. Do not spray ditch water.

Option #2. Herbicide Control Only

Same as for Option #3 as described above. Use only products labeled for irrigation ditches. Do not spray ditch water. Near ground or surface water use only 2,4-D type products labeled for “near water” use and/or Rodeo®.

Option #3. Biological Control

Biological control of Field bindweed is difficult. Two species of natural enemies are presently being released in Northglenn and Colorado for the suppression of field bindweed. The first, a small eriophyid mite, *Aceria malherbae*, and the bindweed moth, *Tyta luctuosa*, is also being reared at the Colorado Insectary for release to the field. Grazing is not effective.

C. Road Rights-of-Way and Other Non-Crop Areas

Option #1. Mechanical and Herbicide Control

Cultivate these sites 2 to 4 times per growing season. Apply herbicides to field bindweed at labeled rates. Depending on the product and site, the applications will be made in spring and fall, fall only, or at any time during the growing season.

Option #2. Herbicide Control Only

On sites that cannot be cultivated, apply labeled herbicides to field bindweed in a strategy as described in Option #1 above.

Option #3. Biological Control

Biological control of field bindweed is difficult. Two species of natural enemies are presently being released in Colorado for the suppression of field bindweed. The first, a small eriophyid mite, *Aceria malherbae*, (used in Northglenn) and the bindweed moth, *Tyta luctuosa*, is also being reared at the Colorado Insectary for release to the field. Grazing is not effective.

http://www.colostate.edu/Depts/CoopExt/Adams/weed/pdf/Field_bindweed.pdf

Hoary Cress (Whitetop)

Hoary cress is an alien perennial weed that spreads by seeds and creeping roots. Hoary cress is difficult to control. It is common at the Oscar Arnold Nature area along canals and in vacant areas in Northglenn. Seeds are produced in June and July.

1. Management Measures

A. Cultural Management

Cultural control methods tend to work poorly towards controlling Hoary cress unless performed on a consistent basis. A productive, aggressive grass stand will tend to slow the spread of hoary cress, and to deter the establishment of new infestations.

B. Mechanical Management

Mechanical control of hoary cress is difficult because it sprouts from underground rhizomes. Mowing generally has little or no effect. Hoeing or grubbing is more effective. Flailing or cultivation at intervals of 10 to 14 days can be effective, but 3 or more growing seasons of diligent effort are needed to achieve stand reduction. Cultivation intervals must be maintained. Cultivation can spread hoary cress rhizomes to non-infected sites via dragging, or from being transported on the cultivation or flailing equipment. Seeds may be transported by cultivation equipment.

C. Biological Management

Biological control of hoary cress is difficult or impossible. No insects are available that effectively control this weed. Grazing is not effective.

D. Herbicide Management

Herbicides labeled for use on hoary cress, either singly or cooperatively are: metsulfuron methyl (Escort®), chlorsulfuron (Telar®), dicamba (Banvel®), imazethapyr (Pursuit) glyphosate (Roundup®, Rodeo®) imazapic (Plateau®), 2,4-D+MCPA+dicamba+sulfentrazone (Surge®) and 2, 4-D. Dicamba can injure woody plants by being exuded through weed roots and being uptaken by trees and shrubs within three times their drip lines. Effective control can take many years with some herbicide use strategies. Proper timing of application, according to label directions, is critical, especially with 2, 4-D. Always follow herbicide label directions for application and environmental protection guidelines. Near ground or surface

water use only 2,4-D type products labeled for “near water” use and/or Rodeo®. Glyphosate and some amine forms of 2, 4-D are compatible in mixtures. Nonionic surfactants need to be added to the herbicide.

2. Integrated Management Options by Site

A. Open-space, Pasture, and Riparian Sites

Option #1. Biological and herbicide Control

Livestock will not eat Hoary cress. Apply a herbicide during pre-flower to flowering stage in the spring or to rosettes in the fall. On riparian or ditch bank sites apply glyphosate, fosamine, and aquatic labeled 2, 4-D according to label guidelines.

Option #2. Mechanical and Herbicide Control

Apply a herbicide to infestations prior to or at the flowering stage, follow treatment with mowing. On riparian sites apply glyphosate, fosamine, and aquatic-labeled 2, 4-D according to label guidelines.

Option #3. Herbicide Control Only

Apply herbicides in the spring and fall or spring only. depending on the product. Use appropriate products for the site, and at labeled rates.

B. Along Irrigation and storm water ditches

Option #1. Mechanical and Herbicide Control

Same as for option #2 for riparian sites as described above, except cultivation cannot be done. Use only herbicides labeled for ditch site. Do not spray ditch water.

Option #2. Herbicide Control Only

Same as for Option #3 as described above. Use only products labeled for irrigation ditches. Do not spray ditch water. Near ground or surface water use only 2,4-D type products labeled for “near water” use and/or Rodeo®.

C. Road Rights-of-Way and Other Non-Crop Areas

Option #1. Mechanical and Herbicide Control

Cultivate these sites 2 to 4 times per growing season. Apply herbicides to Hoary cress at labeled rates. Depending on the product and site, the applications will be made in spring and fall or spring only depending on the label requirements.

Option #2. Herbicide Control Only

On sites that cannot be cultivated, apply labeled herbicides to Hoary cress in a strategy as described in Option #1 above.

<http://www.whitman.wsu.edu/weeds/hoarycress.html>

Leafy Spurge

Leafy spurge is an alien, deep-rooted perennial that spreads by seeds and creeping, horizontal roots. It exists in or near riparian sites.

1. Management Measures

A. Cultural Management

Seeding and maintaining selected perennial grasses has been found to be an effective tool. Early emerging grasses, like western wheatgrass and pubescent wheatgrass, that utilize early season moisture have reduced spurge density and limited the spread and establishment of new infestations. Sequential glyphosate (e.g. Roundup®) applications followed by a seeding of Luna pubescent wheatgrass, Ephraim crested wheatgrass, intermediate wheatgrass, Sherman big bluegrass, or Bozoiisky Russian wild rye, has shown to be effective in reducing an infestation of spurge in Wyoming. Proper grazing management is always a desirable cultural tool.

B. Mechanical Management

Mechanical control of spurge is difficult, at best, and may actually increase the stand density of spurge. Mowing spurge at regular intervals 4 to 6 times per spring/summer will reduce seed production, but will provide little long-term control. Mow as plants re-grow and before flowering stage. Spurge's milky sap has been known to gum up mowers. Mowing may not be effective even when combined with herbicide applications.

Cultivation can be done at two- to four-week intervals, but is costly and can bare soil to erosive factors. Research results are not available that indicate whether stand reduction or eradication can occur from the sole use of mechanical treatments. Tillage throughout the growing season or fall-only cultivation have proven useful. Care should be taken not to transport roots caught on machinery into uninfested portions of the field or other areas.

C. Biological Management

Grazing should take place only on large infestations of leafy spurge. Much research is being done with using sheep to graze spurge as a stress treatment. Thus far both sheep and goats have been found to be effective grazers of spurge. Do not overgraze. If animals are turned in to a site after spurge has set seed, quarantine animals in a corral for seven days before releasing them into a non-infested pasture.

Several insect species have been released by the USDA/APHIS (Animal and Plant Health Inspection Service) that affect spurge. *Aphthona abdominalis*, was released in 1996. This is the smallest of the flea beetles and causes similar damage to the plants as the other *Aphthona* species. *Aphthona nigricutis*, *A. cyparissiae* and *A. czwalinae/lacertosa* have all become established at field insectary sites and can be collected in large numbers. Insect releases should take place only on large infestations of leafy spurge.

D. Herbicide Management

Some herbicides are currently labeled for use on Leafy spurge. The following can be used independently or in some combinations: picloram (Tordon22K®), dicamba (Banvel®) 2, 4-D, glyphosate (Roundup®, Rodeo®) imazapic (Plateau®) and fosamine (Krenite®). Imazapic Plateau®, 2, 4-D (some formulations), glyphosate and fosamine are labeled for use on riparian sites. Picloram and dicamba can injure woody plants by being exuded through weed roots and being uptaken by trees and shrubs within three times their drip lines. If a solo herbicide treatment is used, application during the flowering stage is usually effective when applying picloram, dicamba, or 2, 4-D. Fall treatments are highly effective when applying imazapic or picloram. Fall is typically the most effective time for applications. Always follow herbicide label directions for application and environmental protection guidelines. If the infestation is small, herbicide applications may be the only management method required to achieve eradication.

2. Integrated Management Options by Site

A. Open-space, Pasture, Parks, and Riparian

Option #1. Biological and Herbicide Control

Graze leafy spurge with sheep or goats from April through late May, release biocontrol insects on the site during early summer, follow with a herbicide treatment in late September or early October. Use aquatic-labeled 2, 4-D, fosamine, or imazapic in riparian sites.

Aphthona abdominalis is the smallest of the flea beetles and causes similar damage to the plants as the other *Aphthona* species. *Aphthona nigriscutis*, *A. cyparissiae* and *A. czwalinae* have all become established at field insectary sites and can be collected in large numbers.

Apply imazapic only in the fall

Option #2. Mechanical and Herbicide Control

Mow at least two times per spring/summer. Cease mowing in late August. Follow with an herbicide treatment during late September or early October. Use aquatic-labeled 2, 4-D, fosamine, or imazapic in riparian sites.

Option #3. Biological or Mechanical Control Only

Use sheep or goats, blading or mowing (or shoveling, hoeing, chopping, etc.) all growing season with the expressed purpose of keeping spurge from setting seed. Use of these methods may still allow the spread of rhizomes. Once the methods have been discontinued, the spurge will quickly return. *Aphthona abdominalis* is the smallest of the flea beetles and causes similar damage to the plants as the other *Aphthona* species. *Aphthona nigriscutis*, *A. cyparissiae* and *A. czwalinae* have all become established at field insectary sites.

Option #4. Herbicide Control Only

Use herbicides such as picloram, dicamba, or 2,4-D in the late-spring during the true-flower stage. This stage is impossible to determine without close inspection of the opened, yellowish-green flower within the yellowish bracts. If possible a treatment will also be made in early fall. Use only herbicides labeled for the site and that do not harm woody vegetation. Apply imazapic as a fall treatment only. Picloram may be applied as a fall treatment as well.

B. Irrigation and storm water ditches

Option #1. Mechanical and Herbicide Control

Hand chop hoes weed-eat, etc. three (3) to six (6) times per growing season to prevent seed set and to stress the plants. Apply labeled herbicides in late September/early October. Do not spray ditch water.

Option #2. Herbicide Control Only

Use herbicides labeled for this site on Leafy spurge in late spring during the true-flowering stage and in early-fall after a light freeze. Do not spray ditch water.

C. Rights-of-way and other Non-Crop Areas

Option #1. Mechanical and Herbicide Control

Paved Rights-of-Way will be mowed, or otherwise mechanically controlled, two or more time per growing season. An herbicide application will be made to visible regrowth in the fall.

Option #2. Herbicide Control Only

On sites that cannot be mowed, Leafy spurge will be controlled by labeled herbicides.

Treatments will be made in late-spring and/or early fall, just after a light frost.

http://www.colostate.edu/Depts/CoopExt/Adams/weed/pdf/Leafy_spurge.pdf

Musk and Scotch Thistle

Musk and Scotch thistles are alien, biennial forbs that reproduce solely by seed. Their seeds have feathery plumules attached that allow them to travel with the wind and infest remote sites. They can maintain good germination (better than 30%) after years of being buried in soil. Buried Scotch thistle seeds can have 30% germination after nine years. Prevention of seed formation by these two plants, therefore, is imperative. Musk and Scotch thistles are found in many locations, primarily on open-space land and riparian areas.

1. Management Measures

A. Cultural Management

Establishment of selected, aggressive grasses can be an effective cultural control of these thistles. This weed seems to invade primarily overgrazed or dryland sites with a poor plant population. Unfortunately few, if any aggressive grasses will adequately populate upland sites.

B. Mechanical Management

Mowing (or chopping), is most effective when done to musk and Scotch thistle plants at full bloom. Unfortunately, these weeds do not bloom as individual plants at the same time; thus, repeat mowing is necessary.

As biennials, grubbing effectively can control these weeds or digging below the crown level doing so when they are in the rosette stage is easiest. The key to eradication of these thistles is to prevent seed production.

C. Biological Management

Again, the key to controlling musk and Scotch thistles is the prevention of seed production. This is very difficult with biological controls. Use of other management methods, together with biological, are recommended for eradicating, or reducing large populations of these thistles.

Livestock tend to avoid musk and Scotch thistle, patches, especially heavily infested ones. Horses and cattle have been known to eat flowering heads.

One bio-control agent for musk thistle is the seed head weevil (*Rhinocyllus conicus*), which is well distributed in the subject area and spreads on its own. The larval stage of this weevil devours most of the seeds in a head that it infests. This insect alone has not, and will not, effect total control of musk thistle infestations. The crown weevil (*Trichosiromus horridus*) attacks the crown and reduces the flowering potential of Musk thistle. When used together, the crown and seedhead weevils provide fair to good control of Musk thistle. *Cassida rubiginosa*, a leaf-feeding tortoise beetle that causes considerable damage to musk thistle plants by skeletonizing the leaves may be used in combination with the other insects. No biological agents are currently available for Scotch thistle.

D. Herbicide Management

Herbicides labeled for control of these weeds are: clopyralid (Stinger®), Transline®), clopyralid + 2,4-D (Curtail®), glyphosate (Rodeo®, Roundup®), triclopyr & clopyralid (Redeem R&P®), diclofopamine (Vanquish®), Dicamba, 2,4-D and mecoprop (Weed-B-Gon MAX®) or (Super Trimec®), chlorsulfuron (Telar®), metsulfuron methyl (Escort XP®), dicamba (Banvel®), 2, 4-D, and picloram (Tordon22K®). 2, 4-D will do an excellent job if applied during the early bud stage or to rosettes in the fall. 2, 4-D and glyphosate can be used on riparian sites. Metsulfuron and chlorsulfuron are most effective when applied during the bolt to bud growth stages in order to eliminate viable seed production, but are not effective when applied to the rosette stage. Dicamba and picloram can injure woody plants by being exuded through weed roots and being uptaken by trees and shrubs within three times their drip lines. Always follow herbicide label directions

for application and environmental protection guidelines. Near ground or surface water use only 2,4-D type products labeled for “near water” use and/or Rodeo®.

3. Integrated Management Options by Site

A. Open-space and Pasture Lands, and Riparian Sites

Option #1. Biological and Herbicide Control

Treat thistle rosettes in the fall with herbicide. Allow the seed head weevil to infest Musk thistle flower heads in the spring and early summer. If a thistle patch is a moderate or severe infestation, treat 50% of it with an herbicide in the spring on the rosettes. Glyphosate and aquatic labeled 2,4-D can be used in riparian sites, and according to label directions.

Option #2. Mechanical and Herbicide Control

Mow, or otherwise mechanically injure these thistles in the bloom stage. Treat any regrowth and fall rosettes with herbicide. Grub out bolted plants where possible. Use appropriate herbicides for riparian areas

Option #3. Mechanical Control Only

Mow or chop musk and Scotch thistle at the bloom stage. Retreat as necessary to prevent seed set. Grub out plants, where possible, before seed set.

Option #4. Herbicide Control Only

Apply herbicides to rosettes in either spring or fall. If plants have already bolted, apply Escort XP or Telar to eliminate viable seed production. Use appropriate herbicides for riparian areas.

B. Along Irrigation and storm water ditches

Option #1. Biological and Herbicide Control

Same as described in Option #1 above. Use only herbicides labeled for ditch sites. Do not spray ditch water.

Option #2. Mechanical and Herbicide Control

Same as Option #2 above, except mowing cannot be employed. Use only herbicides labeled for ditch sites. Do not spray ditch water.

Option #3. Mechanical Control Only

Same as Option #3 above, except mowing cannot be used.

Option #4. Herbicide Control Only

Same as Option #4 above. Use only herbicides labeled for ditch sites. Do not spray ditch water.

C. Rights-of-Way and other Non-Crop Areas. Option #1. Mechanical and Herbicide Control

Mow musk and Scotch thistle 2 to 4 times per growing season. Treat any regrowth and fall or spring rosettes with herbicide.

Option #2. Mechanical Control Only

Mow, grub out, or otherwise mechanically control these thistles with the purpose of preventing seed set.

Option #3. Herbicide Control Only

On sites that cannot be mowed or otherwise mechanically controlled, treat Musk and Scotch thistle with an appropriate herbicide.

http://www.colostate.edu/Depts/CoopExt/Adams/weed/pdf/Musk_thistle.pdf

Myrtle Spurge

Myrtle Spurge has recently been designated as an "A" listed noxious weed by Colorado. This perennial weed is often found in rock gardens and is moving into natural areas where it has the potential to do enormous environmental damage. In Northglenn it has only been found in gardens, especially xeriscapes.

Although easily removed by hand, this member of the spurge family (Euphorbiaceae), contains a milky sap that is caustic to skin and eyes.

1. Management Measures

A. Cultural Management

Do not plant. Do not till, if tap roots are present

B. Mechanical Management

Dig out the entire tap root. Avoid getting the irritating milky juice on anything and wash tools and hands. Pieces of the tap root sprout, so do not till.

C. Biological Management

NONE

D. Herbicide Management

A number of herbicides are available. Those that can be used independently or in combination with each other are: 2,4-D, glyphosate (Roundup®, Rodeo®) Dicamba, 2,4-D and mecoprop (Weed-B-Gon MAX®) or (Super Trimec®).

<http://www.colorado.gov/cs/Satellite?c=Page&cid=1184920449268&pagename=Agriculture-Main%2FCDAGLayout>

Poison Hemlock

Poison hemlock is a very poisonous introduced biennial noxious weed that reproduces by seed. Poison hemlock has killed children who use the hollow stems to blow through. People have been killed by consuming plant parts wrongly identified as anise, wild parsley or wild parsnip.

The toxins in this plant are teratogenic and create gross skeletal deformities during the first trimester of embryonic development. Women of childbearing age are advised to avoid handling or cutting this plant. Poison hemlock exists along the Farmer's Highline Ditch, E.B. Rains Park, Grange Hall creek, Croke Reservoir and the Oscar Arnold Nature Area usually along ditches or roadsides.

Report any sightings to the Northglenn Maintenance and Operations Department.

1. Management Measures

A. Cultural Management

Since poison hemlock invades wet or riparian habitats, cultural management techniques are difficult to use. This means that supplemental management methods are needed. Any grazing animal will die after consuming a small amount.

B. Mechanical Management

For infestations of a few plants, poison hemlock can be controlled by digging seedlings in the fall or in the spring before they produce seed. Remove all stems and roots by putting them in bags to prevent accidental poisoning. Another mechanical method is to cut flower heads before they seed. Wear gloves and coveralls. Wash hands before eating, drinking or smoking. Women of childbearing age should not handle cut plants or use a weed-eater on this plant because the toxins may be absorbed through the skin and deform embryos.

C. Biological Management

(*Agonopterix alstroemerian*) defoliates young and adult plants. Hemlock is toxic to many insects.

D. Herbicide Management

For fall control of seedlings and spring growth of less than 1 to 2 feet tall, use of an aquatic-labeled 2, 4-D is effective. Look for seedlings where adult plants have grown. Glyphosate (Rodeo) is effective on plants, but is a nonselective product that will kill all other vegetation that is sprayed. On sites away from water, the following can be used independently or in some combinations: picloram (Tordon22K®), sulfometuron methyl (Oust®), dicamba (Banvel®) 2, 4-D, diclycolamine (Vanquish®), glyphosate (Roundup®, Rodeo®) imazapic (Plateau®) and fosamine (Krenite®). Dicamba, 2,4-D and mecoprop (Weed-B-Gon MAX®) or (Super Trimec®) are readily available herbicides, which cannot be used near water, and are labeled only for use on turf sites, not range and pasturelands

3. Integrated Management in Riparian Sites

Dig out small infestations or cut growth back every two weeks. Apply herbicide to larger infestations to reduce their size for mechanical treatment. Apply herbicides in September on newly germinated plants. Do not scatter plant pieces where pets or small children may chew on them.

Purple Loosestrife

An “A” List species - Must be eradicated by law.

Purple loosestrife is an alien perennial noxious weed that reproduces by seed (three million seeds per plant), and secondarily by short rhizomes and pieces of stems and roots. It is highly competitive and will drive out native wetland vegetation, including cattails. It provides very poor habitat for birds, fur-bearers, or other wildlife. Only a few plants are known to exist in the Fox Run Open-space. Report any sightings to the Northglenn Maintenance and Operations and Recreation Department and the Adams County Weed Department.

1. Management Measures

A. Cultural Management

Since purple loosestrife invades wet habitats, cultural management techniques are difficult to use. Vegetation should not be overgrazed. Sites without vegetation should be reseeded to adaptable, competitive plants. However, purple loosestrife has the ability to continue to invade even heavily vegetated sites. This means that supplemental management methods are needed, in addition to cultural management.

B. Mechanical Management

For infestations of a few plants, purple loosestrife can be controlled, especially on sandy soils, by hand-pulling or digging seedlings before they produce seed. More mature plants may require digging to be uprooted. Remove all stems and roots by putting them in bags to prevent them from sprouting new plants. Another mechanical method is to cut flower heads before they seed.

C. Biological Management

Two species of beetles (*Galerucella calmariensis* and *Galerucella pucilla*) are showing some promise for biological control of loosestrife. Releases of at least 500 beetles per infested site are needed. These beetles eat leaves, small stems, and flowers, and can completely defoliate loosestrife plants. Two other insects, a root weevil (*Hylobius transversovitatus*) and seed weevil (*Nanothyes spp.*) are in early research stages. Use as an option only for heavily infested sites. Since purple loosestrife is designated as an “A” list species on the Colorado Noxious Weed Act, eradication is mandatory, therefore biological control agents will not be utilized.

D. Herbicide Management

For early-season control of seedling and regrowth plants less than 1 to 2 feet tall, use of an aquatic-labeled 2, 4-D is effective. Look for seedlings where adult plants have grown. Glyphosate (Rodeo®) is effective on plants less than 12 inches tall, but is a nonselective product that will kill all other vegetation that is sprayed.

For mature plants, glyphosate (Rodeo®) and triclopyr (Garlon 3A®) are effective when applied at pre-flowering to post-bloom stages. For spot spraying use a 1.0 to 1.5% solution plus 0.5% of nonionic surfactant. A wiper application can be used with a 33.3% percent solution of Rodeo®, plus 5 to 10% surfactant, at the full flower stage.. Always follow herbicide label directions. Due to massive seed production, all purple loosestrife flowerheads must be clipped and bagged prior to any herbicide application.

3. Integrated Management in Riparian Sites

Hand-pull or dig out small infestations. Apply herbicide to larger infestations to reduce their size for mechanical treatment. Apply 2, 4-D to early growing plants to avoid killing desirable vegetation with use of Rodeo®.

http://www.colostate.edu/Depts/CoopExt/Adams/weed/pdf/Purple_loosestrife.pdf
<http://www.colorado.gov/cs/Satellite?c=Page&cid=1178305507411&pagename=Agriculture-Main%2FCDAGLayout>

Russian Knapweed

Russian knapweed is an alien perennial weed, which spreads by seeds and creeping roots. It has the ability to release chemicals into the environment as foliage decays, which inhibits the growth of vegetation in close proximity (allelopathic properties). In Adams County, it has been found on open-space, pasture sites, and Rights-of-Way.

1. Management Measures

A. Cultural Management

Seeding and maintaining aggressive grasses such as Critana thickspike wheatgrass or Sodar streambank wheatgrass will help in competing with Russian knapweed and slow its spread. Proper fertilization, grazing and supplemental irrigation of grasses are always effective cultural control methods.

Due to the allelopathic properties of this weed, supplemental control methods, such as judicious use of herbicides, may be needed to give grasses a chance to compete. Applying clopyralid + 2,4-D (Curtail®), metsulfuron methyl (Escort XP®, aminopyrralid (Milestone®) or chlorosulfuron (Telar®) followed by seeding of a bunchgrass and a sod-forming grass, has worked well to revegetate infested sites. Additional herbicide treatments after grass establishment are needed to keep Russian knapweed populations reduced to an acceptable level.

B. Mechanical Management

Cutting or removing the above-ground portion of the plant reduces the current year growth, and may eliminate seed production, but will not kill Russian knapweed. Cutting several times before the plants bolt stresses

Russian knapweed plants and forces them to use nutrient reserves stored in the root system.

C. Biological Management

No effective biological control agents are known currently for this weed. Horses cannot be allowed to graze this knapweed as they can develop chewing disease. A root nematode (*Subanguina picridis*) has provided poor control.

D. Herbicide Management

A number of herbicides are labeled for use on Russian knapweed. Those that can be used independently or in combination with each other are: chlorsulfuron (Telar®), aminopyralid (Milestone®), picloram (Tordon22K®), triclopyr + clopyralid (Redeem R&P®), clopyralid (Stinger®, Transline®), diclycolamine (Vanquish®), 2,4-D, and glyphosate (Roundup®, Rodeo®) dicamba (Banvel®) and clopyralid + 2,4-D (Curtail®), Dicamba, 2,4-D and mecoprop (Weed-B-Gon MAX®) or (Super Trimec®). Picloram and dicamba can injure woody plants by being exuded through weed roots and being uptaken by trees and shrubs within three times their drip line. Always follow herbicide label directions for application and environmental protection guidelines.

2. Integrated Management Options by Site

A. Open-space and Pasturelands, Rights-of-Way, Riparian, and Non-Crop Areas

Option #1. Mechanical and Herbicide Control

Mow or use other mechanical efforts throughout the growing season, with the first and successive efforts done at the bud stage. Apply herbicide in early fall, after a light freeze. Use glyphosate or Curtail® in riparian areas, and according to their labels.

Options #2. Cultural and Herbicide Control

To an existing infestation of Russian knapweed apply a short-residual herbicide, such as glyphosate or 2, 4-D. Follow-up by successfully seeding a competitive grass. Fertilize adequately and in a timely manner to stimulate grass growth. Apply a labeled herbicide to any knapweed that is out competing grass. Use glyphosate or Curtail® in riparian areas, and according to their labels.

Option #3. Herbicide Control

Apply labeled herbicides to Russian knapweed during the bud stage, bloom to post-bloom, and/or in early fall, depending on type of herbicide. Use glyphosate or Curtail® in riparian areas, and according to their labels.

<http://www.ext.colostate.edu/pubs/natres/03111.html>

Saltcedar is an alien perennial noxious weed that reproduces by seed, and secondarily by short rhizomes and pieces of stems and roots. It is highly competitive and will drive out native wetland vegetation, including cattails. It provides very poor habitat for birds, fur-bearers, or other wildlife. Only a few plants are known to exist in the Fox Run Open-space. Report any sightings to the Northglenn Maintenance and Operations Department 303-280-7810 and/or the Adams County Weed Department.

1. Management Measures

A. Cultural Management

Since saltcedar invades wet habitats, cultural management techniques are difficult to use. Vegetation should not be overgrazed. Sites without vegetation should be reseeded to adaptable, competitive plants. However, saltcedar has the ability to continue to invade even heavily vegetated sites. This means that supplemental management methods are needed, in addition to cultural management.

B. Mechanical Management

A bulldozer or prescribed fire can be used to open up large stands of saltcedar. These methods must be followed up with a herbicide treatment of the resprouts when they are 1 to 2 meters tall.

C. Biological Management

Saltcedar leaf beetles, *Diorhabda elongate*, the Chinese leaf beetles (*Diorhabda elongata*) and mealybug (*Trabutina mannipara*) are showing some promise for biological control of saltcedar. They are not currently approved for use.

D. Herbicide Management

For small patches, cutting the stem and immediately applying a herbicide (known as the cut-stump method) is most often employed. The cut-stump method is used in stands where woody native plants are present and where their continued existence is desired. Individual tamarisk plants are cut as close to the ground as possible with chainsaws, loppers or axes, and a herbicide is applied immediately thereafter to the perimeters of the cut stems. The herbicides triclopyr (e.g. Garlon4® or PathfinderII®) and imazapyr (Arsenal®) can be very effective when used in this fashion. This treatment appears to be most effective in the fall when plants are translocating materials to their roots. The efficacy of treatments is enhanced by cutting the stems within 5 cm of the soil surface, applying herbicide within one minute of cutting, applying herbicide all around the perimeter of the cut stems, and retreating any resprouts 4 to 12 months following initial treatment.

For large stands of saltcedar that would essentially be monotypic, foliar applications of the herbicides imazapyr (Arsenal®) or a combination with glyphosate (Roundup®) are effective. Late summer/early fall are optimum treatment times. This is recommended for areas that have little to no desirable shrubs or trees.

3. Integrated Management in Riparian Sites

Hand-pull or dig out small infestations. The cut-stump method is used in stands where woody native plants are present and where their continued existence is desired. Individual tamarisk plants are cut as close to the ground as possible with chainsaws, loppers or axes, and herbicide is applied immediately thereafter to the perimeters of the cut stems. The herbicides triclopyr (e.g. Garlon4® or PathfinderII®) and imazapyr (Arsenal®) can be very effective when used in this fashion. This treatment appears to be most effective in the fall when plants are translocating materials to their roots.

<http://www.colostate.edu/Depts/CoopExt/Adams/weed/pdf/Saltcedar.pdf>

Spotted Knapweed

Spotted knapweed is an alien, perennial forb that reproduces solely from seed. It is highly competitive on Open-space land, and will exclude many grasses and forbs over time. .

1. Management Measures

A. Cultural, Mechanical and Biological Management

These methods for control of Spotted knapweed are similar to those for the other two knapweeds previously addressed.

B. Herbicide Control

Some herbicides are labeled for control of spotted knapweed. Those that can be used independently or in combination with each other are: picloram (Tordon22K®), triclopyr & clopyralid (Redeem R&P®), clopyralid (Stinger® or Transline®), dicamba (Banvel®), diclycolamine (Vanquish®), 2,4-D, Dicamba, 2,4-D and mecoprop (Weed-B-Gon MAX®) or (Super Trimec®) and a premix of clopyralid and 2,4-D (Curtail®). Picloram has been found to be most effective. 2, 4-D, when used alone, results in poor control.

TEASEL

Teasel is an alien biennial or sometimes monocarpic perennial weed that spreads by seeds. It is usually found in relatively moist, disturbed situations. In Northglenn it is known near the inlet of the FHL canal at E.B.Rains park.

1. Management Measures

A. Cultural Management

Cultural control methods tend to work poorly towards controlling teasel. A productive, aggressive grass stand will tend to slow the spread of teasel, and to deter the establishment of new infestations.

B. Mechanical Management

Mechanical control of teasel is difficult because it sprouts from underground roots. Mowing generally has little or no effect. Hoeing or grubbing is more effective. Flailing or cultivation at intervals of 10 to 14 days can be effective, but 2 or more

growing seasons of diligent effort are needed to achieve stand reduction. Cultivation intervals must be religiously maintained.

C. Biological Management

Biological control of teasel is unknown. Grazing is not effective.

D. Herbicide Management

Herbicides labeled for use on teasel, either singly or cooperatively are: picloram (Tordon22K®), diclycolamine (Vanquish®), dicamba (Banvel®), glyphosate (Roundup®, Rodeo®), Dicamba + 2, 4-D; chlorsulfuron (Telar®); or metsulfuron methyl (Escort XP®) + 2, 4-D, Dicamba, 2,4-D and mecoprop (Weed-B-Gon MAX®) or (Super Trimec®) gives good control when applied before the bloom stage. Metsulfuron (Ally®) is effective during bolt.

Dicamba and picloram can injure woody plants by being exuded through weed roots and being uptaken by trees and shrubs within three times their drip lines. Proper timing of application, according to label directions, is critical, especially with 2, 4-D. Always follow herbicide label directions for application and environmental protection guidelines. Near ground or surface water use only 2,4-D type products labeled for “near water” use and/or Rodeo®. Glyphosate and some amine forms of 2, 4-D are compatible in mixtures.

Nonionic surfactants need to be added to the herbicide in order to increase effectiveness.

2. Integrated Management Options by Site

A. Open-space, Pasture, and Riparian Sites

Option #1. Biological and herbicide Control

No insect or grazing is effective. On riparian sites apply glyphosate, fosamine, and aquatic labeled 2, 4-D according to label guidelines.

Option #2. Mechanical and Herbicide Control

Cultivate or use manual efforts (shoveling, hoeing, weed eating, etc.) to stress teasel from May through late August. Cut stems to eliminate seed production in July. On riparian sites apply glyphosate, fosamine, and aquatic-labeled 2, 4-D according to label guidelines.

Option #3. Herbicide Control Only

Apply herbicides in the spring and summer or at times during the growing season, depending on the product. Use appropriate products for the site, and at labeled rates.

B. Along Irrigation and storm water ditches

Option #1. Mechanical and Herbicide Control

Same as for option #2 for riparian sites as described above, except cultivation cannot be done. Use only herbicides labeled for ditch site. Do not spray ditch water.

Option #2. Herbicide Control Only

Same as for Option #3 as described above. Use only products labeled for irrigation ditches. Do not spray ditch water. Near ground or surface water use only 2,4-D type products labeled for “near water” use and/or Rodeo®.

C. Road Right-of-Ways and Other Non-Crop Areas

Option #1. Mechanical and Herbicide Control

Cultivate these sites 2 to 4 times per growing season. Apply herbicides to teasel at labeled rates. Depending on the product and site, the applications will be made in spring and fall, fall only, or at any time during the growing season.

Option #2. Herbicide Control Only

On sites that cannot be cultivated, apply labeled herbicides to teasel in a strategy as described in Option #1 above.

http://www.co.jefferson.co.us/jeffco/weed_uploads/teas.pdf

Trade Name Disclaimer

®The use of trade names does not constitute or imply a recommendation by the City of Northglenn. There are dozens of herbicide manufacturers and hundreds of trade names for various chemicals, concentrations and mixes. Any herbicide used by the City of Northglenn will have the label and material safety data sheet (MSDS) available for public inspection, and will be used in strict accordance with the label.

Some Herbicide Manufacturers:

<http://www.wssa.net/Weeds/Tools/Herbicides/Manufacturers.htm>

APPENDIX B Northglenn Priority Noxious Weed Descriptions

Canada thistle (*Cirsium arvense*) was early introduced into America from the Old World. It is a deep-rooted perennial that spreads by seeds and aggressive, creeping, horizontal root-stocks (rhizomes). The seeds have a tuft of hairs attached to their tips that greatly assists in dispersal by wind. Stems are 1 to 4 feet tall, erect, rigid, and only slightly hairy. Leaves are alternate on the stems, oblong or lance-shaped, and deeply cut into spiny-tipped irregular lobes. They are a bright green and only slightly hairy on the undersurface. Flowers are small, bristly, (but bracts are spineless) clusters varying in color from light lavender to a bright rose-purple. The heads are about one-half inch across, tubular shaped, and arranged in a flat-top inflorescence. Canada thistle is one of the most feared noxious weeds in the U.S. as it can infest many land types, from roadsides; ditch banks, riparian zones, pastures, irrigated cropland, to the most productive dry cropland.

http://www.colostate.edu/Depts/CoopExt/Adams/weed/canada_thistle_mgt.html

Dalmatian toadflax (*Linaria dalmatica* & *Linaria genisitifolia*) is an alien perennial up to three feet tall, reproducing by seed and underground root stalks. Leaves are dense, alternate, entire and broad-based. Flowers are yellow, some with orange throat or spot, and resemble common snapdragon, except the “mouth” opens towards the sky. Leaves are waxy and repel spray. Seeds are numerous, hard and black. Seeds are easily transported on vehicle tires.

<http://www.ext.colostate.edu/pubs/natres/03114.html>

Diffuse knapweed (*Centaurea diffusa*) is of European origin; it is a biennial to short-lived perennial forb that reproduces solely by seed. Growing 1 to 2 feet tall, it is diffusely branched above ground. Leaves are small, and are reduced in size near the flowering heads. These heads are numerous. Showy flowers are white to rose, or sometimes purple. Bracts that enclose the heads are divided like teeth of a comb, and are tipped with a definite slender spine. Upon drying the bracts become rough, rendering them injurious to the touch. Diffuse knapweed is mostly found on dry, disturbed sites.

http://www.colostate.edu/Depts/CoopExt/Adams/weed/dknapweed_mgt.htm

Field bindweed (*Convolvulus arvensis*) was introduced from Europe. It is a perennial forb that reproduces from seed and creeping rhizomes. It is an extremely difficult noxious weed to control because, in part, of its taproot that may go 20 feet deep into the soil, and which repeatedly gives rise to numerous long rhizomes. Field bindweed stems are prostrate and twining, up to 6 feet long. They are not coarse. Leaves are distinguishable by their arrow shapes, with rounded or blunt tips. Leaves are 1 to 2 inches long. Flowers are funnel- or bell-shaped with colors of white to pale pink. They are about 1 inch long and very evident. Seed viability can be retained over a period of 30 or more years. Field bindweed is well adapted to the Northglenn and is widespread. It is extensively found in cultivated fields, waste areas, roadside, and open-space lands.

http://www.colostate.edu/Depts/CoopExt/Adams/weed/bindweed_mgt.html

Hoary cress (whitetop) (*Cardaria draba*) is an alien perennial reproducing by seeds and

creeping rhizomes. It is a difficult noxious weed to control because, in part, of its taproot which repeatedly gives rise to numerous long rhizomes. Leaves are blue-green in color, lance-shaped. Upper leaves clasp the stem. Flowers have four white petals and appear in large flat-topped clusters in June, seed is set by August. There are four species, which look similarly, and all are alien noxious weeds.

Leafy spurge (*Euphorbia esula*) is of European origin. It is a deep-rooted perennial forb that spreads by seeds and aggressive, creeping, horizontal roots (rhizomes). Vertical roots can penetrate to a depth of 15 feet. Consequently, this weed seldom experiences a deficiency of water. It grows up to three (3) feet tall. Leaves are alternate, narrow, linear, and 1 to 4 inches long. Stems are thickly clustered. Flowers are very small and yellowish-green. They are enclosed by very visible yellowish-green, heart shaped bracts. The stems contain a milky sap that exudes readily upon stem breakage. Seeds are contained in a visibly divided, three-celled capsule. Roots are brown and contain numerous pink buds that generally produce new shoots or roots. Leafy spurge will grow on good cultivated lands, shallow rocky soils, open-space lands and along waterways. Where it becomes established it crowds out all other vegetation. It is considered a more serious weed than Canada thistle.

http://www.colostate.edu/Depts/CoopExt/Adams/weed/spurge_mgt.htm

Musk thistle (*Carduus nutans*) is a native of Europe and Western Asia. It is a forb that usually has a biennial habit. However, it has performed as a winter annual. It reproduces by seed only; healthy plants have produced 40,000 seeds. Seeds have a tuft of hairs attached to one end, which allows them to be transported great distances by wind. Leaves are dark green, hairless on both sides, and coarse lobed with 3 to 5 leaf points per lobe. Each lobe ends in a prominent white to yellowish spine. Spiny leaves extend on the stem, giving a winged appearance. Stems are hairless, and may reach 7 feet tall; it can grow as low as 2 feet tall. Flowering heads are solitary on stem branches, and usually nod or bend over; hence the weed is also known as nodding thistle. Flowers usually are deep rose, violet or purple. White-flowered plants have been observed. Bracts surrounding the heads are conspicuously broad with spine-pointed tips. Musk thistle typically is found on drier sites, but does infest creek bottoms and ditch banks.

http://www.colostate.edu/Depts/CoopExt/Adams/weed/msthistle_mgt.htm

Myrtle spurge (*Euphorbia myrsinites*) is a biennial or perennial. The plant grows from a taproot, with new stems emerging in early spring and dying back in the winter. Myrtle spurge has trailing stems, growing close to the ground. Stems and leaves are fleshy and grayish-green in color, and the leaves are attached to the stems in close spirals. Inconspicuous flowers, with showy yellowish bracts, are borne in clusters at the ends of the stems. Flowering occurs in March and April. Like other euphorbias, the plant contains a milky sap. Plants can grow up to 8-12 inches high and 12-18 inches in width.

<http://plants.usda.gov/java/profile?symbol=EUMY2>

Poison hemlock (*Conium maculatum*) is an alien biennial (sometimes perennial in favorable locations) that reproduces from seeds. Flowering plants are usually over four feet tall and may reach 10 feet tall. Stems are erect; red to purple spotted and extensively branched. Leaves are finely divided three or four times. Flowers are small and white in many umbrella-shaped clusters, each cluster supported by a distinct stalk. Plants bloom in June and July. Seeds start germination as early as August and may form

low rosettes three feet across by September. Hemlock is extremely poisonous and tetragenic, handle with extreme care.

<http://plants.usda.gov/java/profile?symbol=COMA2>

Purple loosestrife (*Lythrum salicaria*) (also known as purple lythrum) is a native forb of Eurasia and Africa. It is a tap rooted perennial; short rhizomes also exist. This noxious weed has escaped from ornamental plantings to aquatic sites such as riverbanks, ditches, shorelines and wet meadows. Infestations rapidly replace native vegetation, can impede water flow in canals and ditches, and have little wildlife habitat value. This noxious weed spreads primarily by seeds carried in water, in fur or feather of animals, and from human activities. Mature plants can produce three million seeds per year. Seeds survive for 5 to 20 years. Pieces of roots or stems also can produce new plants. It is adapted to a wide range of soils, including mucks, and can survive shallow flooding of 12 to 18 inches. Purple loosestrife produces multiple stems, 2 to 8 feet tall and 4-sided. They can be either smooth or hairy. Leaves are opposite or whorled on stems, 2 to 5 inches long, tongue-shaped with pointed tips, undivided, and attached directly to the stem (no petiole). Flowers are tightly grouped in long, vertical heads; they bloom from the bottom up on heads. They are reddish-purple in color, about one-inch long, have 5 to 7 petals, and a tube-shaped group of sepals that are pubescent. Plants can flower continuously from late June through September. In the county, purple loosestrife is found along the South Platte and scattered wet sites. Some ornamental cultivars of purple loosestrife, like Morden's Pink, are reported to be sterile. However, research has shown that while they may be self-sterile, they can cross with other cultivars and produce viable seed.

http://www.colostate.edu/Depts/CoopExt/Adams/weed/loosestrife_mgt.htm

Russian knapweed (*Centaurea repens* & *Acroptilon repens*) is of European origin. It is a perennial forb, spreading by creeping rootstocks (rhizomes) and seed. The rhizomes may penetrate to a depth of more than 2 feet in good soils. They are characteristically dark brown and black, and heavily scaled. This assists in easy identification of the plant. Stems become 2 to 3 feet tall. Lower leaves are deeply lobed and 2 to 4 inches long. Stem leaves usually are 1 to 2 inches long, oblong, with entire or toothed margins. Stems are erect and openly branched. Leaves, stems, and covering head bracts are covered with short, stiff hairs, giving them an appearance of knap; hence the plant's name. Cone-shaped flowering heads are less than one-half inch broad, and are solitary at tips of upper stem branches. Showy flowers are pink, purple to lavender. Russian knapweed can be found on open-space land, both irrigated and dry cropland, meadows, ditch banks, and roadsides.

http://www.colostate.edu/Depts/CoopExt/Adams/weed/rknapweed_mgt.htm

Saltcedar (*Tamarix ramosissima* & *Tamarix parviflora*) was introduced from Eurasia, but soon escaped cultivation. Now it is becoming common in bottomlands, banks, and drainage washes. Saltcedar is a beautiful shrub or small tree, especially in flower, which reproduces by seeds. The long slender grayish green branches are upright or spreading, often forming shrubby thickets many feet in diameter, mostly 10 to 12 (or to 15) feet high. The small grayish green narrow pointed leaves, about 1/16 inch long, are crowded on the stems often overlapping one another. They have the appearance of evergreen leaves, but are actually deciduous.

The myriads of little flowers, from deep pink to nearly white, are about 1/16 inch in diameter and crowded in many slender spikes, 1/2 to 2 inches long, forming a dense showy mass at the top of the branches. The slender tapering many seeded pods are pinkish red to greenish yellow, 1/8 to nearly 1/5 inch long, splitting into 3 to 5 parts when mature. The tiny seeds are less than 1/25 inch long, and have a tuft of fine silky hairs at the tip. The bark is reddish brown and fairly smooth at first, but becomes ridged and furrowed.

<http://plants.usda.gov/java/imageGallery?category=sciname&txtparm=Tamarix&familycategory=all&growthhabit=all&duration=all&origin=all&wetland=all&imagetype=all&artist=all©right=all&location=all&stateSelect=all&cite=all&viewsort=15&sort=sciname>

Spotted knapweed (*Centaurea maculosa* & *Centaurea biebersteinii*) is of European origin. It is a biennial or short-lived perennial forb with a stout taproot. It can have one or more stems that are branched, and from 1 to 3 feet tall. Basal leaves are up to 6 inches long, and narrowly elliptic in shape, but can vary. Flowering heads are solitary on top stem branches. Bracts around the heads are stiff and tipped with a dark, comb-like fringe. This is a key difference between spotted and diffuse knapweeds; the bracts of diffuse are tipped with a definite slender spine. The showy flowers of spotted knapweed are pinkish-purple, or rarely cream colored. Spotted knapweed is often found on open-space lands and other drier sites.

http://www.colostate.edu/Depts/CoopExt/Adams/weed/spotted_mgt.htm

Scotch thistle (*Onopordum acanthium* & *Onopordum tauricum*) is a native of Europe and eastern Asia. It is a biennial or sometimes an annual reproducing by seed. Rosettes two feet across are not uncommon for this hearty plant. Stems are erect, have broad spiny wings, and are up to 8 feet tall. Leaves are large, spiny, and covered with fine dense hair, giving a grayish appearance. Upper leaves are alternate, coarsely lobed; basal leaves may be up to 2 feet long and 1 foot wide. The leaf and stem lobes end in a sharp, conspicuous spine. Flower heads are flat with short spines on the bracts that are not extremely harsh to touch. The flowers are large, violet to reddish in color. Scotch thistle can be found along waste areas and roadsides. It is an aggressive plant and may form stands so dense that they are impenetrable to livestock.

http://www.colostate.edu/Depts/CoopExt/Adams/weed/msthistle_mgt.htm

Teasel (*Dipsacus fullonum*)  is an alien biennial or sometimes monocarpic perennial weed that spreads by seeds. It is usually found in relatively moist, disturbed situations. The first year a basal rosette forms and the second year a three to six foot stem develops. The leaves are oblong, hairy, clasps the stem, forming cup-like structures. Flowers in July to August with white to purple egg-shaped blossoms. Rosette leaves are oval in outline, have a wrinkled appearance, and have margins with rounded or 'scalloped' teeth. Leaves that occur on the flowering stems are opposite, without petioles (sessile), and are lanceolate in outline. Leaves that occur on the flowering stems are also 'clasping', with their leaf bases completely surrounding the stem. All leaf midveins have short prickles on them.

<http://plants.usda.gov/java/imageGallery?category=sciname&txtparm=Dipsacus&familycategory=all&growthhabit=all&duration=all&origin=all&wetland=all&imagetype=all&artist=all©right=all&location=all&stateSelect=all&cite=all&viewsort=15&sort=sciname>

Yellow toadflax (*Linaria vulgaris*) is an alien perennial from eight inches to two feet tall, reproducing by seed and underground rootstocks. Leaves are pale green, numerous, narrow and pointed at both ends, 2 1/2 inches long. Flowers are yellow, some with orange throat or spot, and resemble common snapdragon, except the “mouth” opens towards the sky. Leaves are waxy and repel spray. Seeds are numerous, hard and black. Seeds are easily transported on vehicle tires. Flowers allow easy identification in August. http://www.colostate.edu/Depts/CoopExt/Adams/weed/ytoadflax_mgt.htm

APPENDIX C
January 2008
Colorado Designated Noxious Weeds

List A

Eradication required. The plant known to occur in Northglenn is in **bold type**.

African rue (*Peganum harmala*)
Camelthorn (*Alhagi pseudalhagi*)
Common crupina (*Crupina vulgaris*)
Cypress spurge (*Euphorbia cyparissias*)
Dyer's woad (*Isatis tinctoria*)
Giant salvinia (*Salvinia molesta*)
Hydrilla (*Hydrilla verticillata*)
Meadow knapweed (*Centaurea pratensis*)
Mediterranean sage (*Salvia aethiopsis*)
Medusahead (*Taeniatherum caput-medusae*)
Myrtle spurge (*Euphorbia myrsinites*)
Orangehawkweed (*Hieracium aurantiacum*)
Purple loosestrife (*Lythrum salicaria*) REPORT TO 303-280-7810 & 303-637-8115
Rush skeletonweed (*Chondrilla juncea*)
Sericea lespedeza (*Lespedeza cuneata*)
Squarrose knapweed (*Centaurea virgata*)
Tansy ragwort (*Senecio jacobaea*)
Yellow starthistle (*Centaurea solstitialis*)

List B

Management plan required. Plants known to occur in Northglenn are in **bold type**.

Absinth wormwood (*Artemisia absinthium*)
Black henbane (*Hyoscyamus niger*)
Bouncingbet (*Saponaria officinalis*)
Bull thistle (*Cirsium vulgare*)
Canada thistle (*Cirsium arvense*)
Chinese clematis (*Clematis orientalis*)
Common Buckthorn (*Rhamnus cathartica*)
Common tansy (*Tanacetum vulgare*)
Common teasel (*Dipsacus fullonum*)
Corn chamomile (*Anthemis arvensis*)
Cutleaf teasel (*Dipsacus laciniatus*)
Dalmatian toadflax, broad-leaved (*Linaria dalmatica*)
Dalmatian toadflax, narrow-leaved (*Linaria genistifolia*)
Dame's rocket (*Hesperis matronalis*)
Diffuse knapweed (*Centaurea diffusa*)
Eurasian watermilfoil (*Myriophyllum spicatum*)
Hoary cress (*Cardaria draba*) a.k.a. Whitetop
Houndstongue (*Cynoglossum officinale*)
Leafy spurge (*Euphorbia esula*)

Mayweed chamomile (*Anthemis cotula*)
Moth mullein (*Verbascum blattaria*)
Musk thistle (*Carduus nutans*)
Oxeye daisy (*Chrysanthemum leucanthemum*)
Perennial pepperweed (*Lepidium latifolium*)
Plumeless thistle (*Carduus acanthoides*)
Quackgrass (*Elytrigia repens*)
Redstem filaree (*Erodium cicutarium*)
Russian knapweed (*Acroptilon repens*)
Russian-olive (*Elaeagnus angustifolia*)
Salt cedar (*Tamarix chinensis*, *T. parviflora*, and *T. ramosissima*)
Scentless chamomile (*Matricaria perforata*)
Scotch thistle (*Onopordum acanthium*)
Scotch thistle (*Onopordum tauricum*)
Spotted knapweed (*Centaurea maculosa*)
Spurred anoda (*Anoda cristata*)
Sulfur cinquefoil (*Potentilla recta*)
Venice mallow (*Hibiscus trionum*)
Wild caraway (*Carum carvi*)
Yellow nutsedge (*Cyperus esculentus*)
Yellow toadflax (*Linaria vulgaris*)

List C

Management plan desired. Known to occur in Northglenn is in **bold type**.

Chicory (*Cichorium intybus*)
Common burdock (*Arctium minus*)
Common mullein (*Verbascum thapsus*)
Common St. Johnswort (*Hypericum perforatum*)
Downy brome (*Bromus tectorum*)
Field bindweed (*Convolvulus arvensis*)
Halogeton (*Halogeton glomeratus*)
Johnsongrass (*Sorghum halepense*)
Jointed goatgrass (*Aegilops cylindrica*)
Perennial sowthistle (*Sonchus arvensis*)
Poison hemlock (*Conium maculatum*) REPORT to 303-280-7810
Puncturevine (*Tribulus terrestris*)
Velvetleaf (*Abutilon theophrasti*)
Wild proso millet (*Panicum miliaceum*)

APPENDIX D

References

Books

Weeds of the West by Western Society of Weed Management and the Cooperative Extension Service, 1996. Colorado State University at

<http://www.wsweedscience.org/Products/Products.asp?cat=1>

Noxious Weeds of Colorado by the Colorado Weed Management Association, 1999.

<http://www.cwma.org/>

CD-ROM Call 601-634-2972 ask for "Noxious and Nuisance Plant Management Information (PMIS)

Internet Resources

Adams County: <http://www.adamscountyextension.org>

The scientific names in Appendix C have descriptions at: <http://plants.usda.gov/>

Herbicide information at: <http://www.weedscience.org/summary/ChemFamilySum.asp>

Colorado Insectary at : <http://www.colorado.gov/cs/Satellite/Agriculture-Main/CDAG/1167928159775>

Colorado noxious weed program

<http://www.colorado.gov/cs/Satellite?c=Page&cid=1174084048733&pagename=Agriculture-Main/CDAGLayout>

Invasive Species Specialist Group (ISSG) at :

<http://www.issg.org/database/species/List.asp>

Many good photos of weeds are at:

<http://www.weedscience.org/photos/Photodisplayall.asp> ,

<http://www.colorado.gov/cs/Satellite?c=Page&childpagename=Agriculture-Main%2FCDAGLayout&cid=1167928184099&p=1167928184099&pagename=CDAGWrapper&rendermode=preview> and <http://tncweeds.ucdavis.edu/handbook.html> which links

to the Nature Conservancy.

Colorado noxious weed list:

<http://www.colorado.gov/cs/Satellite?c=Page&cid=1174084048733&pagename=Agriculture-Main%2FCDAGLayout>

Biological insect controls: <http://www.bio-control.com/>

Colorado Weed Management Association:

<http://www.swcoloradowildflowers.com/noxious%20weeds.htm>

Labels and MSDS <http://www.chem-online.org/agrochemical.htm>

U.S. Forest Service at: <http://www.fs.fed.us/ipnf/eco/yourforest/noxiousweeds/index.html>

U.C. Davis, control at: <http://tncweeds.ucdavis.edu/esadocs.html>

U. S. Park Service <http://www.nps.gov/plants/alien/factmain.htm#p1lists>

Some Herbicide Manufacturers:

<http://www.wssa.net/Weeds/Tools/Herbicides/Manufacturers.htm>

Electronic copy available from at: http://www.northglenn.org/WEB-PDF/noxious_weed_mgmt_2009.pdf