WEED MANAGEMENT REPORT

SUMMER 2005

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INCLUDING ANALYSIS ON:

HOUND'S-TONGUE
FIELD SCABIOUS
FLIXWEED
LEAFY SPURGE
CANADA THISTLE
COMMON BURDOCK
YELLOW TOADFLAX

TABLE OF CONTENTS

1. WEED IDENTIFICATION AND WORK SUMMARY

1.1 **Hound's-tongue** *(Cynoglossum officinale)*

Features

- Biennial weed that spreads by prickly seeds which stick to animals or clothing (2)
- Flowers and goes to seed in 2nd year
- Reddish-purple flowers and leaves shaped like a dog's tongue (1)

Second year hound's-tongue.

MAP NUMBER	MAP POINT(S)	LOCATION	DATES OF WORK	OBSERVATIONS	GPS WAYPOINT(S)
1	1	Sec. 17A Belvedere House	29-Jun	One mature plant in flowering stage. Approximately 10 immature plants removed by root.	A001

Summary

Only one mature Hound's-tongue plant in the flowering stage along with several 1st year plants were removed by shovel. The plant was discovered by one of the

volunteers and was removed very early in the season, as it had already begun to flower.

Be sure to check this spot early in the season.

1.2 **Field Scabious** *(Knautia arvensis)*

Features

- Head of densely clustered pink to blue flowers on a long slender stem (1)
- Perennial weed that spreads by seed (2)

MAP NUMBER	MAP POINT(S)	LOCATION	DATES OF WORK	OBSERVATIONS	GPS WAYPOINT(S)
2	1-9	85th. Street	29-Jun, 5-Jul	Both sides of 85th St. from Hwy 22x to 218th Ave. contained field scabious, which was removed by hand pulling.	B001-B020

Summary

The majority of the field scabious removed was found along the west side of 85th St. from Hwy 22x to 218th Ave. A couple of plants were also found along 218th Ave. Large patches were discovered on several acreages, the largest being the Zschockelt

property. This weed is going to continue to be a problem unless acreage owners along 85th St. start controlling it because the seeds can easily spread along the gravel road as a result of vehicle traffic. Tackling field scabious early in the season is best because it flowers quickly and can easily be recognized.

1.3 **Flixweed** *(Descurainia sophia)*

Features

- Clusters of small yellow flowers at the tops of many-branched stems
- Annual weed that spreads by seed pods that crack open and release seeds (3)

MAP NUMBER	MAP POINT(S)	LOCATION	DATES OF WORK	OBSERVATIONS	GPS WAYPOINT(S)
3	1	Sec-9J North Coral	30-Jun	Mowed a thick patch of flixweed that had filled up the North corral.	I001-I007
	2	Sec-5A Goodwin Coral	5-Jul	Mowed dense patch inside the Goodwin corral as well as a dense strip along the east entrance to the corral.	I008-I012

Summary

Only two patches of flixweed were found in the Conservation Area and both were discovered in and around corals where livestock had been congregating. Both patches were quite dense and were mowed with the small Kubota tractor. This weed should be mowed early because it flowers quickly and therefore produces seed pods soon after. The seedpods can easily be broken releasing more seed by the mower.

1.4 **Leafy Spurge** *(Euphorbia esula)*

Features

- All parts of the plant produce a white, sticky liquid when handled
- Two rounded, leaf-like bracts are present under the flowers and are greenish-yellow in colour (1)
- Perennial weed that spreads by creeping roots and seeds (2)

MAP NUMBER	MAP POINT(S)	LOCATION	DATES OF WORK	OBSERVATIONS	GPS WAYPOINT(S)
4	1	Sec 5A	6-Jul	Removed two patches of plants, some flowering.	C001-C008

	2	Sec 5H	6-Jul	No plants found at post marked from previous season. C009
	3	Sec 17D	6-Jul, mid-July	Removed a medium size patch near lower tepee. C010-C013
	4,5	Sec 8E	3-Aug	Weed-whipped two previously undiscovered patches of dense leafy spurge. C014-C018

Summary

This weed was not found to be overly common in the Conservation Area, however each patch should be treated **very seriously**, as this weed spreads by both root and seed (see Weed Control section). Map points 1-3 were hit too early in the season as the plants found were small and immature and it was difficult to pick out the leafy spurge amongst the other vegetation. We returned to point 3 in mid-July and found more plants that we had missed the first time around. Points 4 and 5 were hit quite late and the plants had nearly gone to seed. The middle of July is probably the best time to go after leafy spurge.

1.5 **Canada Thistle** *(Cirsium arvense)*

Features

- Small heads, compared to other thistle species, containing many white to purple flowers (1)
- Lobed leaves with thorns along margins
- Perennial weed that spreads by root and seed (2)

MAP NUMBER	MAP POINT(S)	LOCATION/ AREA	DATES OF WORK	OBSERVATIONS	GPS WAYPOINT(S)
5	1	Sec 8D (9.49 acres)	12-Jul	Section around the shop. Heavy thistles although most had not begun to flower.	D001-D007, D018-D028
	2	Sec 5A (46.8 acres)	12-15 Jul	Heavy thistles throughout most of the section. Many of the thistles were beginning to flower. Terrain very rough and in some instances quite steep.	D029-D061
	3	Sec 9A (44.2 acres)	18-Jul	Thistles were in very early stages. Not many had reached flowering stage.	D062-D073

4	Sec 9B (39.2 acres)	19-21 Jul	Heavy concentration of thistles with about 40% starting to flower.	D074-D084
5	Sec 9K (12.2 acres)	22-Jul	Heavy concentration of thistles with about 40% starting to flower.	D085-D091
6a, 6b	Sec 9F (16.82 acres)	22-25 Jul	Medium concentration of thistles with about 40% starting to flower. Terrain is quite rough. Note: large rock near the road that must be avoided with mower.	D092-D103
7	Sec 4E (101 acres)	26-29 Jul	Heavy concentration of plants with about 70% starting to flower. The terrain is extremely rough. Note: There is a well casing that must be avoided on the south side of the log barn.	D148-D153
8a, 8b	Sec 4F (14.56 acres)	29-Jul	Medium concentration of mature thistle plants.	D135-D147
9	Sec 8C (48.9acres)	2-4 Aug	Heavy concentration of mature plants in and around U of C test plots. The concentration lessons as you travel further north throughout the section. Severity of the weeds increases as you approach section 8B.	D104-D125

10	Sec 8B (7.66 acres)	4-Aug	Heavy concentration of mature plants in and around old farmyard. The terrain is very rough. Note: There is an old foundation that must be avoided west of the row of planted trees.	D126-D134
11	Sec 4D (27.9 acres)	5-Aug	Heavy concentration of mature plants throughout the section.	D154-D157
12	Sec 4B	5-Aug	Mowed the southwest corner of the section along the fence-line. Heavy concentration of mature plants.	N/A
13	Sec 8A	19-Jul	Mowed patch of mature plants around spring 11.	D012-D017
14	Sec 5B	11-Jul	Mowed inside of Mill coral with tractor.	D008-D011

Summary

Mowing of Canada thistle began in mid July and continued until the beginning of August. After a very wet spring, we had dry, hot weather that made it ideal for mowing. The new 15-foot mower acquired by the Conservation Area allowed one of us to mow while the other concentrated on controlling other weeds. The total area of thistles cut with the mower was 368 acres. The order in which the fields were mowed was chosen based on the level of maturity of the thistles and the fields' proximity to roads. Vehicle traffic along roads aids in the spread of seed and therefore these areas were made a priority. The perimeters of the large areas mowed were mapped with GPS. This allowed

us to accurately determine the size of the fields mowed and will provide a roadmap for students next year to follow.

1.6 **Common Burdock** *(Arctium minus)*

Second year burdock.

Features

- Biennial weed that spreads by burs (1)
- 1st year plants are small with large heart-shaped leaves (1)
- 2nd year plants grow larger with similar basal leaves and stalks which spawn burs
- The dried stalks and burs of 2nd year plants remain after the plant dies (termed a 3rd year plant here)

MAP NUMBER	MAP POINT(S)	LOCATION	DATES OF WORK	OBSERVATIONS	GPS WAYPOINT(S)
6	1	Sec 16C	30-Jun, 4-Jul	Discovered several single 2nd and 3rd year plants.	G001-G004
	2	Sec 5A	5-Jul	Removed one burdock that had gone to seed and several 1st year plants.	G005
	3	Sec 5A	7-Jul	Weed-whipped medium size patch of 1st and 2nd year plants.	G006-G016

	4	Sec 5A/Sec 6A border	7-Jul	Removed small burdock patch of 2nd year plants near the magpie trap.	G017
	5	Sec 9L	14-Jul	Weed-whipped 2nd year plants and removed a couple of third year plants. These were found in a very large patch adjacent to the ranch house on Reg's property.	G018-G021
	6	Sec 9L	14-Jul	Weed-whipped large area of 1st and 2nd year plants located on hillside north of Reg's house. Some 3rd year plants also located.	G022-G030
	7	Sec 5B Mill Coral	11-Jul	Weed-whipped/mowed second year plants in and surrounding the Mills corral and farmyard.	G031-G034
	8	Sec 4E	18-Jul	Small patch of burdock removed near spring #3.	G035-G038
	9	Sec 8C	18-Jul	Lone 2nd year plant removed.	G039
	10	Sec 8A	19-Jul	Small number of burdock plants located and mowed near spring #11.	G040
	11	Sec 9J	20-Jul	Small patch 1st year plants weed-whipped.	G041
	12	Sec 8B	20-Jul	Weed-whipped medium patch of 1st and 2nd year plants near spring #13.	G042
	13	Sec 4E	21-Jul	Removed a couple of first year plants.	G043
	14	Sec5A	21-Jul	Found and removed 2nd year plants on both sides of the trail near the shop.	G044

	15	Sec 8C	25-Jul	Removed several 1st and 2nd year plants around spring #12. There was a large patch above the fenced off area of the spring.	G045
	16	Sec 7A Stuart Barn	25-Jul	Several plants spread out over a large area in the trees adjacent to the Stuart barn.	G046
	17	Sec 8E	26-Jul	Removed 2nd year burdock patch near spring #10.	G047
	18	Sec 5A Goodwin Coral	27-Jul	Removed several 2nd year plants around the coral.	G048
	19	Sec 9J	27-Jul	Removed two extremely dense patches of 2nd year plants.	G049-G050
	20	Sec 9J	28-Jul	Removed one 3rd year plant near Spring #14 and found some 1st years.	G051
	21	Sec 9J	28-Jul	Removed a couple 2nd year plants near rock outcrop.	G052
	22	Sec 7A	28-Jul	Removed small patch of 2nd year plants.	G053
*	23	Sec 17C	29-Jul	Removed large patch of 2nd year plants near spring #18.	G054-G058
*	24	Sec 17B	29-Jul	Removed large patch of 2nd year plants near draw.	G059
*	25	Sec 8C/8E	2-Aug	Gigantic patch of 2nd year plants removed. Patch stretched from edge of bush west of the shop about 1km into Sec 8E.	G060-G064

***** These locations contained large patches of burdock and help from volunteers is recommended.

Summary

Burdock is one of the more common weeds in the Conservation Area and the patches are spread out over a large area. Removal and weed whipping of burdock began the end of June and ran until the beginning of August. We found that 2nd year plants that had been cut down early in the season actually grew back and produced burs again (see Weed Control section). Upon realizing this, we stopped weed whipping and began cutting plants down at or below soil level with a shovel. Once the burs on 2nd year plants had begun to flower we started collecting and bagging the weeds due to the risk of the burs containing viable seed. However, the amount of plant material collected became too great and so we then started removing and bagging the burs alone. This presents a dilemma: (1) Cut the plants down too early and they return. (2) Wait too long and the seed must be collected, which takes more time. We suggest some experimentation with plants next year to determine the best time and method of removal for control of burdock (see Weed Control section for suggestions).

1.7 **Yellow Toadflax** *(Linaria vulgaris)*

Features

- Pale yellow flowers with orange centres that look like snapdragons (1)
- Many narrow, linear leaves arranged alternately on stem (1)
- Perennial weed that spreads by creeping roots and seeds (2)

MAP NUMBER	MAP POINT(S)	LOCATION	DATES OF WORK	OBSERVATIONS	GPS WAYPOINT(S)
7	1 to 4	Sec 8C	18-Jul	Four single-post patches. Plants were small and immature.	F001-F004
	5	Sec 8C	18-Jul	Two-post patch near U of C test plot with immature plants.	F005-F006
	6	Sec 8C	18-Jul	Four-post patch of immature plants with a handful of flowering plants.	F007-F010
	7	Sec 8D	18-Jul	Three-post patch near shop with no visible plants.	F011-F013
	8 to 13	Sec 8A	19-Jul	Six single-post patches with no visible flowering plants.	F014-F016, F020-F022

14	Sec 8A	19-Jul	One three-post patch with no flowering plants.	F017-F019
15	Sec 8A	19-Jul	One four-post patch with no flowering plants.	F023-F026
16	Sec 8A	19-Jul	One large four-post patch with some flowering plants.	F027-F030
17	Sec 9J	20-Jul	Medium sized newly discovered patch with flowering plants.	F031-F034
18	Sec 4G	21-Jul	One-post patch.	F035
19 to 20	Sec 4E	21-Jul	Two single-post patches.	F036-F037
21	Sec 5A	21-Jul	Two single-post patches with flowering plants. Plants had spread into treed area.	F038-F039
22 to 23	Sec 6A	21-Jul	Two double-post patches with several flowering and many immature plants.	F040-F043
24	Sec 16A	21-Jul	Five patches of flowering plants. Three patches were marked while two patches were newly discovered.	F044-F049
25	Sec 9E	22-Jul	Weed whipped a one-post patch with flowering plants south of 218th Ave (township road #221).	F050
26	Sec 7A	25-Jul	Four-post patch at Stewart barn containing many flowering plants.	F051-F054
27	Sec 18A	25-Jul	Four-post patch with flowering plants.	F056-F058
28	Sec 5D	27-Jul	Two-post patch marked by green metal rods.	F059-F060

29	Sec 9J	28-Jul	One-post patch with several flowering plants bordering Sec 8A.	F063
30	Sec 7A	28-Jul	Two single-post patches with plants spanning a large area.	F064-F065
31 to 32	Sec 18B	28-Jul	Two unmarked patches on Abbott land containing flowering plants.	F066-F067
33	Sec 18B	28-Jul	Unmarked patch at the west boundary of conservation area.	F068
34	Sec 17C	28-Jul	Two-post patch in hayfield beside the U of C test plot.	F069-F070
35	Sec 17B	29-Jul	Large three-post patch at the pine creek lookout.	F071-F073
36	Sec 17A	29-Jul	Medium unmarked patch between the lower and upper tepee.	F074
37	Sec 8C	27-Jul	Large two-post patch west of shop near the electric fence.	F075-F082
38	Sec 4D	4-Aug	Small, unmarked patch near 160th street (range road 23A).	F083

*** Note:** Several patches of flowering toadflax were discovered in late August that had gone undetected earlier, but are not included in the above table or accompanying map. These were either mowed or hand-picked and marked by GPS. The sites were found in Sections 8A, 8C and 17E. The GPS waypoints are:

F061-F062

F84-F089

Summary

Yellow toadflax is quite widespread throughout the Conservation Area, although most patches are relatively small and isolated. Like leafy spurge, this weed should be treated **very seriously** because it spreads by both root and seed (see Weed Control section). Nearly all of the sites were mowed with the small Kubota tractor from the middle of July to the beginning of August. Toadflax was late to flower this year and this made it difficult to mow because many plants were too short and were not cut. Some of these plants proceeded to grow and flower after an area had been mowed. This may have been due to the very wet spring we had. It is important to set the mower to a low setting to cut as many plants as possible and prevent them from maturing. Several new patches of toadflax were discovered this year and were mowed and marked by GPS. These were spotted because the plants were flowering and easy to distinguish.

2. WEED CONTROL & RECOMMENDATIONS

2.1 Hound's-tongue

Hand pulling and mowing of 1st and 2nd year plants is an effective way of controlling this weed (4). Since hound's-tongue reproduces only by seed, preventing it from maturing stops it from spreading and will eliminate the weed over time. Seeds have prickles along their margins that help them stick to passing animals (1). We recommend keeping cattle away from effected areas until the plants are dealt with to minimize the spread of seed. Take care when handling this weed and make sure to remove any seeds from clothing before proceeding otherwise you could spread seed.

Only one patch of hound's-tongue was found in the Conservation Area making it the least predominant weed. It should not be difficult to bring this one site under control by hand-pulling the plants next year.

2.2 Field Scabious

The key with controlling this weed is the prevention of seed production (4). We recommend hand-pulling the entire plant and bagging for sparsely populated areas, such as the ditches along 85th street. Field scabious is becoming an epidemic on acreages along 85th St. and the problem will continue to intensify unless some form of control is sought. We recommend notifying landowners in the area about the plant and informing them about weed management strategies. Sending out newsletters educating landowners on the problems weeds pose to the Conservation Area and about steps we are taking to control them may help to promote cooperation. Areas densely populated with field scabious should be mowed each year shortly after the plants flower. Resources available to the Conservation Area could be offered to assist neighbours in managing this weed (i.e. Mower, volunteers/summer students).

2.3 Flixweed

This weed thrives in disturbed areas and is unsuccessful when competition from natural plants, such as grasses, is high (4). We found flixweed to be predominant in and around corals where cattle congregate. This represents a disturbed area since the intense stomping on the ground and grazing by the cattle has removed much of the native vegetation. Like field scabious, preventing production of seed is paramount because flixweed spreads by seed alone. We recommend weed whipping and mowing to control this weed.

Flixweed does not present much of a treat to the native plants in the Conservation Area because it is limited to disturbed areas and is easily out competed by other plants. The only effected areas were the Goodwin and North corals. Limiting overgrazing by cattle on pastures is the most effective way of protecting against this weed by maintaining competition by native plants.

2.4 Common Burdock

This weed also spreads only be seed, therefore eliminating 2nd year plants is important in managing common burdock. It is recommended that 2nd year plants be removed after bolting but before flowering (4). We found that weed whipping bolted plants, or those that bore burs, too early was ineffective because some plants were able to grow back and produce seed. We recommend students next year experiment with 2nd year plants by cutting them just below soil level with a shovel early in the season to see if this method prevents them from growing back compared to weed-whipping. The students should also experiment with cutting plants late in the season to see if they grow back or just removing the burs and leaving the rest of the plant. Tillage on cropland kills 1st year burdock plants (4), therefore removing 1st year plants with a shovel may be effective in preventing the growth of plants in the second year.

2.5 Canada Thistle

This weed is more difficult to control because it spreads by roots as well as seed. In fact, the majority of the plant exists under the ground in a very extensive root system and so killing the roots is key (5). Due to the shear number of weeds and extent of invasion into many of the pastures on the Conservation Area, mowing is really the only alternative besides herbicide application to control Canada thistle. (5) states that mowing

continually over several years can be effective because it slowly uses up energy stored in the root system. The most effective form of control is mowing combined with fall herbicide application (5), however considering the aim of conservation chemicals are not an option. We recommend a continued, intense mowing effort to control this weed.

2.6 Leafy Spurge & Yellow Toadflax

The Conservation Area should be most concerned with these two weed species because they are very difficult to manage, as they reproduce by both roots and seed. Leafy spurge for instance spreads mainly by roots, which can extend up to 4.5m laterally and 9m deep (4). Therefore simply mowing effected areas is not a long-term solution. (4) states that herbicides such as picloram, dicamba, 2,4-D and glyphosate can be effective in managing small infestations, but that biocontrol with insects and sheep is a better option for larger areas infected by leafy spurge.

Mowing alone is also not effective in controlling yellow toadflax because it only prevents seed production and does not kill the plant (4). However, (5) found that hand-pulling toadflax can be successful in areas where the plant roots can be removed, although persistence is key. Care must also be taken not to drop root pieces because this can result in spreading the problem. As with leafy spurge, picloram, dicamba and 2,4-D herbicides and biocontrol using insects is recommended for larger areas infected with the weed (4).

The long-term solution to leafy spurge and yellow toadflax infestations is a combination of mechanical, chemical and biological control coupled with prevention practices aimed as increasing the competitiveness of native vegetation (4,5). At present, the leafy spurge in the Conservation Area is isolated and the patches are relatively small.

Yellow toadflax is more common and widespread throughout the Conservation Area and we suggest some alternative methods of control be used, besides mowing, to limit the spread of this weed. For small patches of toadflax, we suggest hand-pulling because it has very little environmental impact. However, more volunteer help is required to make this method of control effective. We recommend that more research into control methods be sought to determine an effective control plan suited to the Conservation Area. Further professional assistance may be helpful in preparing a weed management plan.

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