



Fish & Wildlife
Division

SPECIES AT RISK

Survey for Slender Mouse-ear Cress
(*Halimolobos virgata*): 2008



Alberta Species at Risk Report No. 123

**Survey for Slender Mouse-ear Cress
(*Halimolobos virgata*): 2008**

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EXECUTIVE SUMMARY

A survey for slender mouse-ear-cress (*Halimolobos virgata*), a federally listed Species at Risk, was conducted in southeastern Alberta during mid-June to early July 2008. Slender mouse-ear cress has been assessed as “data-deficient” in Alberta based on a 2004 status report. The survey was undertaken to partly address a recommendation of the provincial Endangered Species Conservation Committee that surveys be done during non-drought years to determine whether significant numbers of additional subpopulations exist in Alberta, and how limited the distribution of slender mouse-ear cress might actually be.

Information on ten occurrences (subpopulations) of slender mouse-ear cress in Alberta reported prior to 2008 was compiled. In addition search effort in potential slender mouse-ear cress habitat occurring since 2004 was summarized. Key species identification characters and habitat characteristics were summarized. Considerations regarding a sampling strategy for occupancy survey were summarized. Potential search areas were listed considering mapped information on the known provincial range of slender mouse-ear cress, terrain, soil type and distribution of native grassland. Areas were prioritized for the 2008 search effort in consultation with staff from Fish and Wildlife. Survey methods for 2008 were defined.

Twenty sites were visited and eighteen quarter sections were searched over ten days in mid June to early July. The average time to complete ten transects in a quarter section was four hours, varying from three to five hours.

Slender mouse-ear cress was found at six locations, of which two are previously reported and four are new. Slender mouse-ear cress was not found at two previously reported locations. Rare plant forms for the four new locations were completed and submitted to the Alberta Natural Heritage Information Centre where they will be entered in the database.

Results of the 2008 survey will be incorporated into a provincial status report which is currently being updated. Additional surveys in future years may be needed to completely address the objective of determining whether significant numbers of additional subpopulations exist in Alberta, and how limited the distribution of slender mouse-ear cress might actually be. Future field surveys would benefit from more timely, comprehensive and systematic evaluation of priority search areas and appropriate survey methods.

1.0 INTRODUCTION

Alberta Fish and Wildlife is interested in gathering additional information on the provincial population and habitat requirements of slender mouse-ear-cress (*Halimolobos virgata*) in order to assess its provincial status and recommend conservation and management actions to protect the species. In Canada, slender mouse-ear cress is listed as “Threatened” based on a reassessment by COSEWIC in 2000; in 1992 it was assessed as “Endangered”. Slender mouse-ear cress is included under Schedule 1 of the federal *Species at Risk Act*. In Alberta, slender mouse-ear cress is currently ranked as S1S2 (Gould 2006). It was identified as “Data Deficient” in 2005 by the Endangered Species Conservation Committee (ESCC) Scientific Sub-committee based on a status report that includes information on occurrences documented between 1894 and 2004 (ASRD 2005).

The Endangered Species Conservation Committee recommended the following (ESCC 2005):

“Professional surveys during non-drought years, including information on small-scale habitat requirements, are required to determine whether significant numbers of additional subpopulations exist in Alberta, and how limited the distribution of slender mouse-ear cress might actually be. Monitoring of known populations to better determine population numbers and trends is also needed.”

Alberta Fish and Wildlife retained a professional botanist, Cheryl Bradley, to partly address the ESCC recommendation that survey be done during non-drought years to determine whether significant numbers of additional subpopulations exist in Alberta, and how limited the distribution of slender mouse-ear cress might actually be.

Three main objectives were defined by the consultant and Alberta Fish and Wildlife for the project:

- To compile information on occurrences of slender mouse-ear cress found in Alberta since 2004 and to integrate this with information on occurrences in the 2005 status report.
- To develop a strategy for survey in 2008 and beyond.
- To conduct surveys in a few priority study areas specified according to the strategy.

Definitions

The following terms and definitions, developed through consultation with staff of the Alberta Natural Heritage Information Centre (ANHIC), are used in this report (T. Kemper pers. comm.).

Individual – Each basal leaf rosette. Reproducing plants will have a stem associated with each basal leaf rosette whereas non-reproducing plants will not.

Population/Subpopulation – Geographically or otherwise distinct groups of plants between which there is little genetic exchange (typically one successful

migrant individual or gamete per year or less (IUCN 2001) or an element occurrence as defined by ANHIC.

Element occurrence – Where information on genetics and propagule dispersal is lacking, separate populations will be no less than 1 km apart if intervening habitat conditions are unsuitable and no more than 3 km apart if intervening habitat conditions are suitable for the species (NatureServe 2004).

Location – Place where a population/subpopulation or element occurs.

2.0 INFORMATION ON OCCURRENCES PRE-2008

Since publishing of the provincial slender mouse-ear cress status in January 2005, there have been five surveys for rare plants in potential slender mouse-ear cress habitat (Table 1). Element occurrence records for slender mouse-ear cress were obtained from ANHIC on May 27, 2008. Records of slender mouse-ear cress populations found during 2006 and 2007 surveys along the proposed Keystone Pipeline right of way were not filed with ANHIC until November 2008, however UTM coordinates were provided for the purposes of this survey (A. Lees pers. comm.). A report of slender mouse-ear cress near Rosedale in 1914 is not confirmed (ASRD 2005) and therefore is not included in records provided by ANHIC or in this report. slender mouse-ear cress occurrence records prior to 2008 are listed in Table 2.

Table 1. Rare plant surveys in potential slender mouse-ear-cress habitat, 2005-2007

Area	Surveyor	Date	Results
CFB Suffield ¹	C. Elchuk, J. Neudorf, D. Nernberg	2005, 24-29 Jun	SMEC ² not found
Many Island Lake, sandy plains and dunes ²	C. Wallis, C. Wershler	2005, Apr - Sep	SMEC not found
Onefour Research Station ³	C. Wallis, C. Wershler	2006, 26 May, 20 Jun, 14-16 Jul, 28-29 Jul, 11-12 & 18 Aug	SMEC not found
Drowning Ford Grazing Association Lease and Hargraves Ranch, sandy plains and dunes ⁴	J. Lancaster	2007, 1-30 Jun & 15 Jul – 8 Aug	SMEC not found

Keystone Pipeline ROW (McNeil to Red Deer River) ⁵	D. Bush	2007, May - Jul	SMEC found
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¹ Elchuck (2005)

² SMEC – Slender mouse-ear cress

³ C. Wallis (pers. comm.)

⁴ Bradley et al. (2006)

⁵ J. Lancaster (pers. comm.)

⁶ D. Bush (pers. comm.), Keystone Pipeline (2007)

Table 2. Records of slender mouse-ear-cress prior to 2008 survey

EO# (sub)	Location	Date(s) ¹	#Plants	Surveyor
009	Duchess Pasture Matzhiwin Creek	1997	49 + 6 (old)	B. Smith
		2002	0	I. Macdonald
		2005-05-20	0	C. Elchuk
006	Buffalo-Atlee Pasture S, N Boundary CFB Suffield	1997	0 8 (old)	B. Smith
		2002	0	I. Macdonald
		2004	0	C. Elchuk
007	Remount Pasture S, N Boundary CFB Suffield	1997	4 (old)	B. Smith
		2002	0	I. Macdonald
		2004-06-07	398	C. Elchuk
003	Remount Pasture SE, N Boundary CFB Suffield	1997	216 + 8 (old)	B. Smith
		2002	0	I. Macdonald
		2004-06-26	919	C. Elchuk
001	Linstead Flats Suffield NWA	1995-06-23	20	I. Macdonald
		2004	0	I. Macdonald
		2005-06-26	0	C. Elchuk
		1997	100 + (15 old)	B. Smith
005	S. Sask. River km 260 West of McNeil	2002	0	I. Macdonald
		2004	0	C. Elchuk
		1978	>1	J. Hudson
		1884	>1	John Macoun
002	Sandy Point, Hwy 41	1991	0	B. Smith

	S. Sask R km 274			
008	Police Point Medicine Hat	1997	0	B. Smith
		2002	0	I. Macdonald
		1997	105 + 28 (old)	B. Smith
		1999	12	B. Smith
010 (0- 014)	McNeil North of Gas Facility	2002	0	I. Macdonald
		2004-06-06	145	I. Macdonald
		2004-06-24	39	C. Elchuck
		2004-09-14	14	C. Scobie
		2007-07-01	8	D. Bush
		2007-07-02	194	D. Bush
		2007-07-27	49	D. Bush
		2007-05-27	130	D. Bush
030	Bindloss W Minor Ranch			
029	Bindloss SW Remount Pasture NE			

¹Unless the exact date is known, only the year of survey is reported

3.0 METHODS

Several steps were involved in developing a survey strategy for 2008 and beyond. They include:

- Summarize key identification characters, phenology and habitat characteristics
- Summarize background considerations regarding sampling strategy
- Identify potential search areas
- Select priority search areas for 2008
- Define sampling method for 2008

3.1 Key Identification Characters, Phenology and Habitat Characteristics

To assist in planning for the 2008 survey, information was compiled regarding the key characters used to identify slender mouse-ear cress, species phenology and habitat characteristics. The following summarizes key findings.

Key Identification Characters

- biennial with rosettes of toothed basal leaves
- stems with longer straight, simple or forked hairs plus shorter branched hairs; hairs are persistent and can be seen on the dried stalk
- stem leaves entire, clasp the stem
- petals white and pinkish veined

- siliques glabrous, erect or nearly so, terete (circular in cross-section), 1.5-4 cm long, 1 mm wide
- seeds irregularly biseriate (in two ragged rows)
- cryptic; mature plant has grayish colour compared to prairie vegetation, turns brownish in senescence
- similar to *Arabis divaricarpa*, *Arabis hirsuta*, *Erysimum inconspicuum*

Phenology

- Flowers from late May thru June
- Fruits mature and dehisce before mid-July
- Late-May to June survey recommended (D. Henderson pers. comm.)
- Can be identified from dried stems and pods in July (D. Bush pers. comm.)

Habitat Characteristics

- Sandy parent material of glaciofluvial, fluvial or eolian origin; may be coarse fluvial veneer over till (SRD 2005)
- Undulating to rolling sandy plain or river valley terraces; not sand hills or dunes (D. Henderson pers. comm.)
- Orthic Brown Chernozem soils occur on sandy ecological/range sites (Adams et al. 2005)
- Native mixed grassland, sometimes associated with sagebrush (SRD 2005)
- Small-scale habitat associations have not been recognized (D. Henderson pers. comm.)
- May be associated with vernal depressions (I. Macdonald) and intermittent creeks (D. Bush)

3.2 Background Considerations Regarding a Sampling Strategy

Considerations in defining a survey strategy were investigated and listed. These include timing of survey, type of data to be collected and appropriate sampling procedures. The following summarizes these considerations.

Timing of Survey

- Mature fruit is needed to confirm identification.
- Flowers and fruits are most likely to appear in late May to early July depending on weather in survey season.
- There will be a need to conduct preliminary reconnaissance of known location(s), likely McNeil area, to determine if conditions in the year of survey are appropriate for plant growth and production of flowers and fruit.

Type of Data to be Collected

- Level of survey is an occupancy survey or inventory (Henderson 2008). Presence data is the priority, not detailed population enumeration and habitat description. Once a population is found, survey will move to a new sample unit.

- F& W wants an ANHIC occurrence report completed (population size, site description) for each new location found.
- Information on search areas (vegetation, terrain, substrate) and search effort is to be recorded.

Sampling Approach

- Focus on the southeastern portion of the Dry Mixedgrass Natural Subregion where climate is most suitable for slender mouse-ear cress. Start at known locations and move outward.
- Stratify landscape to define areas with native grassland on sandy parent materials deposited by water or wind.
- Surveyors in Saskatchewan suggest random sampling within large units of native grassland with sandy soil on glacial outwash (but not eolian dunes) (D. Henderson pers. comm.).
- Nature Saskatchewan sampling approach for occupancy survey in Great Sandhills is to do cluster sampling in quarter sections surrounding known occurrences (D. Henderson pers. comm.). When a plant is found they move on to the next quarter section.
- D. Henderson (pers. comm.) recommends searching up to 10 transects (800 m x 2 m belts) in each quarter section to achieve 90% probability of detecting slender mouse-ear cress. Rare plant surveys should have a transect width of 1m for tall vegetation and 3 m for short vegetation (Henderson 2008) and the recommended walking speed is 1 to 3 km/hour (Henderson 2008).
- J. Lancaster's (pers. comm.) sampling approach in rare plant survey of areas of sandy soils in Drowning Ford Grazing Association Lease and Hargraves Ranch was to walk transects spaced at 100 m intervals across nine quarter sections where SARA-listed species were most expected to occur. Otherwise surveys were of a proposed project footprint and up to 300 m beyond the footprint in sandy soils.

Sample Size

- Will need to be defined based on provincial extent of occurrence and frequency of detecting slender mouse-ear cress.
- May need to conduct the survey over multiple years and subdivide the potential extent of occurrence into blocks which can be adequately surveyed, given limitations on resources, within the annual four- to five-week fruiting period of slender mouse-ear cress (late May to June).
- May want to restrict survey to within close proximity of vehicle roads or trails so sample sites can be quickly reached and surveyed.

3.3 Potential Search Areas

Known locations of slender mouse-ear cress were plotted on the 72L topographic map (1:250,000 scale) to visually portray the known extent of occurrence. Some key conclusions based on this exercise follow, however these conclusions will need to be

validated using more detailed analysis which includes GIS capability for mapping native grasslands and soils.

- Known extent of occurrence is about 6500 km² (2500 mi²). This is based on estimating the area of a polygon encompassing locations of populations found prior to 2008 (Table 2).
- About half of that area – 3000 - 3500 km² (1200 - 1400 mi²) has native grasslands on Brown Chernozem soils developed on undulating sandy parent materials of fluvial or eolian origin. The estimate is based on extent of potentially suitable soils units within the extent of occurrence including Bingville (BVL), Cranford (CFD), Chin (CHN), Cavendish (CVD), Pemukan (PUN), Ramillies (RAM), Bingville-Chin (BVCH), Bingville-Cavendish (BVCV), Cavendish-Purple Springs (CVPL), Foremost-Cranford (FMCF), Foremost-Purple Springs (FMPL) and Vendisant-Cavendish (VSCV) (Kjearsgaard and Pettapiece 1986).
- Slender mouse-ear cress may occur in other mapped soil units where there are pockets of sandy substrate.
- Slender mouse-ear cress may occur beyond the current extent of occurrence in areas of native grassland on sandy soils.

A list was developed of potential search areas within the known extent of occurrence and elsewhere in the Dry Mixedgrass Natural Subregion (Table 3). Included in the list are sites where slender mouse-ear cress has previously been recorded as well as other sites with appropriate habitat characteristics. Sites are listed according to whether they are within the known extent of occurrence or range of slender mouse-ear cress, to the south of it, or to the west.

Ownership maps were used to define some survey sites according to blocks managed by one landholder. The names are arbitrary. A preferable way to approach this would be to develop a map of sandy soils on undulating terrain with native grasslands; however that was beyond the scope of this particular project.

Table 3. List of potential search areas¹ in the Dry Mixedgrass Natural Subregion

Within Known Range	South of Known Range	West of Known Range
Duchess/Matziwin Creek	Many Island Lake	Barnwell
Onetree Creek	Pakowki Lake (north and south)	Lonesome Lake
Atlee	Lost River/Onefour	Lower Bow
Remount	Wildhorse Lake (sand lenses)	Purple Springs
Bindloss/Dune Point		Rolling Hills
Empress (south and north)		Turin
McNeil		Wolf Island
Sandy Point West		
Suffield NWA (south, centre and		

north)		
Medicine Hat North (west of river)		
Drowning Ford South		
Medicine Hat North (east of river)		

¹ More detailed analysis of GIS layers with information on soils, terrain and occurrence of native grassland is required to refine the list of potential search areas and to define boundaries

Sources used to define potential search areas include:

- A soil map for Medicine Hat 72L (1:126,720) (Kjearsgaard and Pettapiece 1986)
- A soil map for the County of Forty Mile No. 8 (McNeil et al. 1994).
- A list of major soils and associated ecological range sites, by Ecodistrict (Adams et al. 2005)
- A map providing an overview of where the predominant areas of native prairie remain in southern Alberta (Prairie Conservation Forum n.d.). The map identifies those quarter sections having more than 75 percent native vegetation.
- A report of rare species conservation studies in sand hill and sand plain habitats in southern Alberta (Wallis and Wershler 1988)
- Ownership maps for the Cypress County, County of Forty Mile and Special Areas.
- Personal knowledge and communications with colleagues.

3.4 Criteria for Prioritizing Search Areas

Criteria for prioritizing search areas for occupancy survey include:

- Areas at the periphery of the known range are high priority in order to contribute to knowledge about provincial extent of occurrence. Search effort begins at or near a known occurrence and extends progressively outward from the known extent of occurrence.
- Areas with native grasslands on undulating to rolling sand plain are high priority compared to areas of sand dunes or river valley slopes and terraces.
- Areas where slender mouse-ear cress habitat may be under imminent threat of anthropogenic disturbance are high priority compared to protected areas.
- Areas that are easily accessible will be a high priority compared to areas that require considerable time and effort to access.
- Access to the area is permitted by the land owner.

3.5 Priority Search Areas for 2008

Considering all of the above information including applying the prioritization criteria and in consultation with staff of Alberta Fish and Wildlife, it was determined that the 2008 survey would include the following components, time and resources permitting:

- 1) Visit McNeil site to determine if conditions in spring 2008 have been appropriate for growth, flowering and fruiting of slender mouse-ear cress. If no slender mouse-ear cress is found, discontinue the survey. If slender mouse-ear cress is found move to a location on the periphery of known range.
- 2) Survey in Duchess Pasture/Matzihiwin Creek area, at western extent of known range, beginning in vicinity of previously reported slender mouse-ear cress locations. If slender mouse-ear cress is found, move outward; if it is not found, move inward.
- 3) If moving inward, survey the most westerly known slender mouse-ear cress location in Buffalo Atlee Pasture. If slender mouse-ear cress is found, move outward; if it is not found, move inward.
- 4) If the survey moves inward, survey most westerly known slender mouse-ear cress location Remount Pasture. If slender mouse-ear cress is found, move outward; if it is not found, move inward.
- 5) Survey area south of Empress and north of McNeil. If slender mouse-ear cress is found move outward; if it is not found, move inward.
- 6) Survey McNeill/Hilda area south of previously reported slender mouse-ear cress locations. If slender mouse-ear cress is found, move outward; if it is not found, move inward.

Permission to access was obtained from landholders in these areas.

3.6 Survey Methods for 2008

The following describes the survey methods used for the 2008 survey.

- 1) If there is a known slender mouse-ear cress location within a search area, visit this location first and record presence or absence.
- 2) The sample unit within a search area is a quarter section on undulating to rolling terrain with sandy soils and native grassland. If slender mouse-ear cress is found at a known location identify a quarter section with suitable habitat a short distance (one to several sections) outward from the known location. Soils map information, topography and ease of access according to routes marked on a topographic map are considered in identifying a quarter section within the search area that will be surveyed.
- 3) The starting point for survey of a quarter section is the most accessible corner (NE, NW, SE or SW). UTM coordinates for the starting point are determined from a

1:50,000 topographic map. The starting point is located on the ground using the “Go To” function on a GPS personal navigator.

- 4) Transects may be oriented east-west or north-south. The endpoint coordinates of the first transect are determined by adding 800 metres to the starting point coordinates.
- 5) Distances between the ten transects are determined using a random numbers table. The randomly selected two-digit number is rounded to the nearest ten (e.g. 13 is 10, 45 is 50). One hundred is added to two digit numbers that are 30 or less; hence distance between transects is no less than 40 metres and no more than 130 metres. This is to ensure that there is not overlap when navigating transects and that survey will extend across most of the quarter section.
- 6) Coordinates for both ends of all ten transects are entered into the GPS personal navigator and used to determine survey path.
- 7) Time of survey start is recorded. Two individuals walk each transect searching a belt about four to five metres wide.
- 8) If slender mouse-ear cress is not found, all ten transects are completed. General information is recorded on the vegetation and terrain of the area searched. Time of survey end is recorded.
- 9) If slender mouse-ear cress is found, an ANHIC Rare Native Plant and Lichen Survey Form is completed. Information recorded includes:
 - Survey date, purpose and effort
 - Photograph
 - Location information including UTM coordinates and directions to the population
 - Population information including number of individuals, phenology and extent
 - Habitat description including vegetation, substrate, slope/aspect
 - Land use
 - Threats
 - Conservation management needs
- 10) Move on to the next search area and/or quarter section either when slender mouse-ear cress is found and an ANHIC form completed or when all ten transects are completed.

4.0 RESULTS

The 2008 field survey for slender mouse-ear cress was conducted over ten field days including June 15th thru 18th and July 1st thru 6th. Total time spent searching on foot was 65 hours.

Twenty sites were visited and eighteen quarter sections were searched (Table 4). Average time to complete an 800 m transect was 25 minutes. The average to complete ten transects in a quarter section was four hours, varying from three to five hours.

Table 4. Areas searched in 2008

Search Area	Quarter Section	#Transects	Slender mouse-ear cress Found	Landform	Soil Unit ⁴	Vegetation and Habitat Observations
Duchess/ Matzhiwin	NW-04-22-14- W4 ¹	10	No	Sandy fluvial and eolian material; undulating	CVD1	Stip com grassland in part; pipeline ROWs in sand plain portion occupied with modified vegetation including crested wheat grass (<i>Agro cri</i>) and other non-native species
Duchess/ Matzhiwin	SE-04-22-14- W4	10	No	Sandy fluvial and eolian material; undulating	CVD1	Stip com – Koel mac grassland with patches of <i>Symp occ</i> and <i>Rosa aci</i> , in S part; pipeline ROW with modified weedy vegetation (<i>Agro cri</i>) in N part; heavy grazing effects
Duchess/ Matzhiwin	SW-03-22-14- W4 ¹	10	No	Sandy veneer over till, undulating	CVD1/ANO 1	Stip com – Koel mac grassland with patches of <i>Symp occ</i> and <i>Rosa aci</i> ; pipeline ROWs and road with modified weedy vegetation (<i>Agro cri</i>) transect diagonally
Duchess/ Matzhiwin	SE-35-21-14- W4 ¹	6 ²	No	Sandy veneer over till, undulating; valley slope	ANO1/RB2	Stip com-Koel mac-Poa san with patches of <i>Arte can</i> ; pipeline ROWs and road with modified weedy vegetation (<i>Agro cri</i>) transect diagonally; <i>Cala lon</i> and <i>Opun pol</i> on upper valley slopes and lower slopes eroding
Duchess/ Matzhiwin	SW-16-22-14- W4	10	No	Sandy eolian material; rolling	ATP1	Stip com grassland; powerline crosses southern part; this location was on a slender mouse-ear cress collection label at U of C herbarium but is not identified in ASRD (2005)

Duchess/ Matzhiwin	NW-10-22-14- W4	10	No	Sandy fluvial and eolian material; undulating to rolling	CVD7/ATP1	Stip com-Koel mac-Poa san grassland with patches of Rosa aci and Symp occ shrubland; active dune in SW
Onetree Creek	NW-36-20-13- W4	10	No	Sandy-gravelly fluvial material with solonetzic inclusions; undulating	BVL7	Stip com-Koel mac grassland with patches of Arte can; Poa san and Pasc smi more common in depressions; heavy grazing effects; transected by old irrigation ditch
Atlee	SW-34-20-07- W4	10	No	Sandy-gravelly fluvial and till material; hummocky-ridged	BVL6/FMT 6	Stip com grassland with patches of Arte can; Symp occ shrubland on lower slopes
Atlee	SE-24-20-07- W4 ¹	10	No	Sandy-stony ice- contact material; hummocky	KG01	Stip com-Koel mac grassland on slopes and hill tops with patches of Arte can; Symp occ shrubland on lower slopes; ephemeral wetlands in depressions; non-native species (Agro cris, Fest rub, Brom tec, Meli off) on compressor station site and RoWs for several pipelines and invading native prairie
Atlee	SE-22-20-06- W4 ¹	10	No	Sandy-stony ice- contact material; hummocky	KG01	Stip com-Koel mac grassland on slopes and ridge tops with patches of Arte can; Symp occ shrubland on lower slopes; ephemeral wetlands in depressions; non-native species (Agro cris, Fest rub) on RoWs for several pipelines and invading native prairie
Atlee	NW-24-21-06- W4	10	No	Silty-sandy fluvial vener over till; undulating to hummocky	CFD1	Stip com-Koel mac-Muhl asp grassland; Hord jub in depressions; Stip vir planted on two narrow pipelines persisting; Agro cri clumps invading from wellsite

Atlee-Remount	NW-19-20-04-W4	10	No	Silty fluvial veneer over till; undulating to hummocky	T1KB1/FM CF1	Stip com-Poa san grassland with Koel mac and Stip vir in moister sites; Symp occ shrublands on lower slopes; ephemeral wetlands in depressions
Atlee-Remount	SW-23-20-04-W4	4	Yes	Sandy fluvial and eolian blanket and veneer over till; undulating to ridged	CVPL1/FM T6	Stip com grassland with patches of Arte can; ephemeral wetlands in depressions
Remount	NW-20-21-04-W4	10	Yes	Sandy fluvial and eolian blanket or veneer over till; undulating to ridged	CVPL1	Stip com grassland with patches of Arte can; ephemeral wetlands in depressions; wellsites and old field or homestead site occupied by Agro cri
Remount	SW-20-20-03-W4 ¹	none ³	Yes	Sandy fluvial and eolian material; undulating	BVCV1	Stip com grassland with patches of Arte can
Empress	NE-34-21-01-W4	1	Yes	Sandy fluvial and eolian material; undulating; edge of S.Sask. R. valley	CVD1	Stip com grassland with patches of Arte can
Empress	NW-15-22-01-W4	5	Yes	Sandy fluvial and eolian material; undulating	BVCV1	Stip com grassland with patches of Arte can; Symp occ-Rosa aci shrublands at base of slopes; ephemeral wetlands; patches of Euph esu, invading
Empress Creek	SW-25-23-01-W4	10	No	Sandy fluvial and eolian material with solonetzic inclusions; undulating; includes valley slopes	CVD1/RB1	Stip com-Opun pol grasslands with patches of Arte can; Bout gra-Care ste-Care fil grassland in solonetzic blowouts; Agro cri invading from road; heavy grazing effects

McNeil	NE-02-21-01-W4 ¹	none ³	Yes	Sandy fluvial and eolian material; undulating	CVD1	Stip com-Poa san grassland with patches of Arte can
McNeil	SW-12-21-01-W4 ¹	none ³	Yes	Sandy fluvial and eolian material; undulating to ridged	VSCV1	Stip com-Poa san grassland with patches of Arte can
Hilda	SW-16-19-01-W4	8 ²	No	Sandy fluvial and eolian material; undulating to ridged	VSCV1	Symp occ-Rosa aci/Elym lan shrubland with Stip com-Psor lan grasslands on ridge tops

¹ Includes previously reported location of slender mouse-ear cress.

² Part of the quarter section was not surveyed as it was not appropriate slender mouse-ear cress habitat (e.g. wetland, steep valley slope).

³ Slender mouse-ear cress found at a previous location and presence noted; no further survey effort.

⁴ Soils map unit according to Kjearsgaard and Pettapiece (1986); Antonio (ANO), Antelope (ATP), Bingville (BVL), Cavendish (CVD), Foremost (FMT), Kangaroo (KGO), RB (Rough Broken), Bingville-Cavendish (BVCV), Cavendish-Purple Springs (CVPL) and Vendisant-Cavendish (VSCV), Tilley-Carlsbad (TIKB). The numeric modifier indicates the following: 1-map unit dominated by named soil, 2-map unit has significant wetlands, 6-map unit has significant areas of coarser textured soils, 7-map unit has significant solonetzic soils.

Agro cri – crested wheat grass (introduced), Arte can – sagebrush, Brom tec – downy brome, Care fil – threadleaf sedge, Care dur – needleleaf sedge, Elym lan – northern wheat grass, Euph esu – leafy spurge (introduced), Hord jub – foxtail barley, Fest rub – creeping red fescue (introduced), Koel mac – June grass, Meli off – yellow sweet clover, Muhl asp – scratch grass, Opun pol – prickly pear cactus, Pasc smi – western wheat grass, Poa san – Sandberg bluegrass, Rosa aci – prickly rose, Stip com – needle and thread grass, Stip vir – green needle grass, Symp occ - buckbrush

Slender mouse-ear cress was found at six locations during the 2008 survey (Table 5). Two are previously reported locations, one in the McNeil search area (two sites close to each other) and one in the Remount search area.

Slender mouse-ear cress was not found at previously reported locations in the Duchess/Matzhiwin Creek or the Atlee search areas.

Slender mouse-ear cress was found at four new locations including one between the Atlee and Remount community pastures, one in the northwest corner of the Remount community pasture and two in the sand plain area south of Empress. Rare plant forms for these four new locations were completed and were submitted to ANHIC as an excel file on September 26, 2008. ANHIC biologists will determine whether these new locations are a new element occurrence or an existing one. This report will also be submitted to ANHIC.

Table 5. Records of slender mouse-ear-cress during 2008 survey

EO# (sub)	Search Area	Date(s)	#Plants	Quarter Section
010 (004-014)	McNeil	2008-06-15	17	NE-02-21-01-W4
010 (004-014)	McNeil	2008-06-15	13	SW-12-21-01-W4
007	Remount	2008-07-02	25+	SW-20-20-03-W4
N/A ¹	Atlee - Remount	2008-07-02	47	SW-23-20-04-W4
N/A	Remount	2008-07-05	87	NW-20-21-04-W4
N/A	Empress	2008-07-03	7	NE-34-21-01-W4
N/A	Empress	2008-07-03	15	NW-15-22-01-W4

¹Element Occurrence (EO) number has not yet been assigned by ANHIC

5.0 DISCUSSION AND FUTURE DIRECTION

The results of the 2008 survey will be incorporated into an updated provincial status report. It is not yet clear if there is sufficient information to satisfy requirements for provincial evaluation of status. Additional surveys in future years may be needed to completely address the objective of determining whether significant numbers of additional subpopulations exist in Alberta, and how limited the distribution of slender mouse-ear cress might actually be. Future field surveys would benefit from more timely, comprehensive and systematic evaluation of priority search areas and appropriate survey methods.

6.0 REFERENCES AND PERSONAL COMMUNICATIONS

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Thank you!