FINAL REPORT

ENVIRONMENTALLY SIGNIFICANT AREAS: MOUNTAIN VIEW COUNTY

Prepared for:

Mountain View County
Bag 100
Didsbury, AB
T0M 0W0

Prepared by:

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Project 7512-001.01

October 2008

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October 27, 2008

Reference: 7512-001.01

Lesley Lovell P.Ag.
Sustainable Agricultural Specialist
Mountain View County
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Dear Ms. Lovell:

Re: Mountain View County Environmentally Significant Areas DRAFT Report and Mapping

Summit Environmental Consultants Ltd. (Summit) is pleased to provide the enclosed DRAFT report for Mountain View County Environmentally Significant Areas (ESAs) evaluation and mapping. The report and mapping are an update to the ESA report completed for Mountain View County by Sweetgrass Consulting Ltd. in 1991. This report details Summit's methods and findings, as well as management recommendations for ESAs. Methods involved the review of all available information (including the most up to date provincial and federal legislation), two public information sessions and an online survey for public feedback on methods and criteria, mapping natural landscape features in the county at a desktop level, completing field surveys of mapped ESAs and revising mapping accordingly. As well, Summit subcontracted Arrow Archaeology Limited to complete an historical resources report, which is an appendix in this document. The report outline is according to the Request for Proposal Terms of Reference provided by Mountain View County.

The ESAs were determined according to specified criteria that was used by Sweetgrass Consultants Ltd., and each ESA was ranked from one to four, one being the most pristine and four the least. Ranking ESAs from as low as four allowed inclusion of natural features that meet criteria but are degraded. The ESA three and fours are areas that have potential to become better functioning or higher ranked ESAs through appropriate management techniques.

Based on feedback from presentation of this report and associated ESA mapping in its draft form to the Mountain View County Council on October 8th and to the public on October 16th, 2008, potential riparian management areas have been added. Potential riparian management areas are based on Alberta Environment water coarse classification and direction from Mountain View County on additional water bodies to include. Refining the riparian management areas is

recommended for future work. It is our understanding that the ESA mapping and report will be used to aid in Mountain View County future land management planning.

Should you require father information or if you have any questions, please do not hesitate to contact me at (250)545-3672 or Erin Rooney at (403)538-4763.

Yours truly,

Summit Environmental Consultants Ltd.

Melanie Piorecky, B.Sc. Ag., P.Ag.
Terrestrial Ecologist

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1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

The Municipality of Mountain View County (MVC) in Alberta has requested Summit Environmental Consultants Ltd. (Summit) to provide an updated report and mapping of Environmentally Significant Areas (ESAs) within the county. The project aims to update a report completed by Sweetgrass Consulting Ltd. in 1991. The refined ESA definitions, mapping and report consider the extent of natural features in MVC, these features' public values, and the most current provincial views and legislation for riparian areas and wetlands.

Mountain View County, a large area totaling 1,000,000 acres, includes the towns of Olds, Carstairs, Didsbury and Sundre, as well as other communities. Conserving significant areas within the county is essential to protect overall biodiversity, natural ecosystem functions (e.g. hydrological function), rare and unique features, wildlife movement corridors, and public values. According to the B.C. Ministry of Water, Land and Air Protection (MWLAP 2004), ESAs are defined as "any parcel of land that already has, or with remedial action could achieve, desirable environmental attributes. These attributes contribute to the retention and/or creation of wildlife habitat, soil stability, water retention or recharge, vegetative cover and similar vital ecological functions. They can range in size and include rare or common habitats, plants and animals."

As per Mountain View County's request for proposal to complete this project, it was understood that this ESA document will be used by MVC to guide its land-use planning and to identify priority areas for the riparian fencing program by Agricultural Services (Appendix A: request for proposal with terms of reference provided by MVC). Given the resolution of the air photos provided, the ESAs can be used at a scale of 1:10,000 or smaller.

1.2 PROJECT OBJECTIVES

The general objective of this study was to update a report completed by Sweetgrass Consulting Ltd. ("Sweetgrass"; 1991), which identified ESAs and Hazard Lands within

Mountain View County, and to identify significant historical resources in the county (Appendix A). Specific objectives include

1. Review and revise/update the 1991 Sweetgrass report and map the environmentally significant areas within MVC, using aerial photograph interpretation and field survey observations (mapping to be compatible with MVC software);
2. Determine what ecological characteristics the public values (i.e. criteria and level of significance for ESAs);
3. Identify valuable historical resources (archaeological sites);
4. Offer guidelines for future management of the various identified ESAs and methods to fill data gaps; and
5. Provide a draft and subsequent final report summarizing methods, results and recommendations for use by MVC for planning purposes, to be presented to MVC council and the public for input.

2.0 SUMMARY OF DATA COLLECTION METHODS

2.1 INFORMATION REVIEW

The information review examined relevant reports and legislation documents (municipal and provincial) and the Sweetgrass report (1991), and contacted biologists familiar with MVC and data collection groups. The following information sources were consulted

Non-government agencies and associated persons

- Alberta Native Heritage Information Centre (ANHIC) – Element Occurrence Data; Dragomir Vujnovic
- Alberta Bird Atlas; Philip Penner
- Agriculture and Agri-Food Canada
- Alberta Geological Survey; Alyssa Barker
- Cows and Fish; Nicole Bach
- Friends of Winchell Lakes (2008); Rob Ridley

Municipal, regional, provincial and federal legislation

- Little Red Deer River Watershed Initiative (2006)
- Mountain View County land use planning initiatives – Municipal Development Plan
- Mountain View County riparian fencing program (Little Red Deer River Watershed Initiative, 2006)
- Alberta Sustainable Resource Development
- Fisheries and Oceans Canada

Alberta Sustainable Resource Development

- Draft Land Use Planning Framework
- Rangeland Monitoring Reference Areas (ASRD 2008a)
- Wetland Inventory (Red Deer corridor)
- Alberta Agriculture and Rural Development
- Area Fisheries Biologist, Vance Buchwald

The following biologists were contacted and interviewed about unique features and valuable resources within MVC:

- Kevin Heppler, Mountain View County Patrol
- Bryon Benn**,** Eastern Slopes Grizzly Bear Project Steering Committee, Calgary, AB

2.2 PUBLIC CONSULTATION

At the start of the ESA mapping, a survey was made available to the residents of MVC to encourage public input (Appendix B). As well, three public information sessions aimed to gather input about the ESA classification process. One session was in the spring (pre-field surveys), one in the summer (mid-field surveys) 2008 and one is planned for the fall (October) of 2008. The initial public information session was presented by Summit at the Mountain View Council Chambers, Didsbury, Alberta on May 26, 2008, prior to commencing mapping (see summary memo of consultation in Appendix C). An additional information session on July 10, 2008, also took place in the council chambers and allowed feedback on the mapping progress and field assessment approach. The fall public

information session will be preceded by a draft report and mapping presentation to the MVC council.

The purpose of the initial public information sessions and survey was to get input regarding 1) what the public considers to be ESAs in MVC and, 2) levels of ESAs significance. This information was used to refine Summit's ESA criteria (Appendix D) and significance ratings, which was applied to the entire county. The fall public consultation intends to solicit feedback on the report (with mapping), draft and final versions in October.

2.3 MAPPING

2.3.1 Aerial Photograph Interpretation

The first step in mapping reviewed digital aerial photographs of MVC. Although these images were taken of the county in 2007, they were not immediately available so 2005 images were analyzed for this project. The 2005 digital black and white coverage pixel sizes are equal to 1 m^2, which is considered a high level of detail allowing more accurate interpretation at the mapping stage.

Alberta Vegetation Inventory (AVI; ASRD 2008b) data was available for parts of the west side of the county (14 sections total). The AVI data, shown as polygons of homogenous tree cover in ArcGIS, included information on dominant forest tree species, stand age and anthropogenic land use classes, if applicable. The AVI data simplified interpretation and delineation of the dense forest cover.

At the initial mapping stage, any areas seeming to possess any environmental sensitivity such as water bodies, contiguous tree stands, steep slopes, riparian areas, depressions, floodplains, coulees, intact grasslands and other unique landscape features, were identified and delineated. While the entire county was reviewed for ESA potential, generally those areas smaller than $1/8^{th}$ of a section, (roughly 3,250 total acres) were not designated as ESAs in

this study as determined by the scope of the project. Delineating the aerial photographs was possible using ArcGIS 9.2. Specifically, the following types of areas were delineated

1. Environmentally Significant Areas previously mapped by Sweetgrass Consultants Ltd. (1991)
2. Areas naturally vegetated with apparent minimal disturbance
3. Springs, streams and seepage areas
4. Wetlands (marshes, bogs, fens and swamps)
5. Treed and shrubby riparian areas
6. Remnant aspen parkland and fescue grassland
7. Unusual landscape features
8. Coulees and
9. Potential old-growth forest stands (based on AVI).

Labels attached to the delineated areas (including the AVI polygons) included the dominant vegetation community type (deciduous, coniferous, mixedwood, wetland, riparian, grassland, disturbed grassland and open water), structural stage (see Table 2.1), disturbance level, and surrounding site characteristics. Survey locations were determined based on the labelled polygons.

Table 2.1 Structural Stage Classification.

Structural Stage	Description[1]
1 Sparse/bryoid	Initial stages of primary and secondary succession; bryophytes and lichens often dominant, can be up to 100%; time since disturbance less than 20 years for normal forest succession, may be prolonged (50-100+ years) where there is little or no soil development (bedrock, boulder fields); total shrub and herb cover less than 20%; total tree layer cover less than 10%.
2 Herb	Early successional stage or herbaceous communities maintained by environmental conditions or disturbance (e.g., snow fields, avalanche tracks, wetlands, grasslands, flooding, intensive grazing, intense fire damage); time since disturbance less than 20 years for normal forest succession; many herbaceous communities are perpetually maintained in this stage.
3 Shrub	Communities dominated by shrub layer vegetation; may be perpetuated indefinitely by environmental conditions or repeated disturbance; time since disturbance less than 20 years for normal forest succession.
4 Pole/Sapling	Trees greater than 5 m tall, typically densely stocked, have overtopped shrub and herb layers; younger stands are vigorous (usually greater than 10-15 years old); time since disturbance is usually less than 40 years for normal forest succession; up to 100+ years for dense (5000-15 000+ stems per hectare) stagnant stands.
5 Young Forest	Self-thinning has become evident and the forest canopy has begun differentiation into distinct layers (dominant, main canopy, and overtopped); time since disturbance is generally 40-80 years but may begin as early as age 30, depending on tree species and ecological conditions.
6 Mature Forest	Trees established after the last disturbance have matured; time since disturbance is generally 80-140 years for and 80-250 years, depending on location and tree species.
7 Old Forest	Old, structurally complex stands composed mainly of shade-tolerant and regenerating tree species; time since disturbance generally greater than 140 years and greater than 250 years, depending on location and tree species.

[1]BC Ministry of Forests 1995

2.3.2 Revisions to Mapping

Based on input from field surveys (Section 2.4) and the second public information session, mapping was refined. Environmentally Significant Areas were added or removed from maps and labelled with a rank from one to four (further described in Section 4.2). Public input entailed adding specific locations such as a named coulees, and large contiguous areas.

2.4 FIELD SURVEY

Field surveys were conducted to verify and refine mapping, to observe specific areas of public interest identified in literature, and to determine ranking for each ESA. Field surveys were completed by Summit's Melanie Piorecky, P.Ag., Erin Rooney, P. Biol., and Kristen Vinke during July 7 to 11 and July 29 to August 1, 2008.

The field survey strategy was to visit as many potential ESAs as possible, ensuring a visit to each identified ESA type at least once. Initially four large maps, together covering the entire county, were reviewed to determine the best approach to field surveys and the extent (size, location and type) of ESAs identified from aerial photographs at a desktop level. Mapped areas and ESA criteria, as identified in Appendix D, helped select areas delineated on the map for site visits, which were accessible via range and township roads. Each area deemed to meet one of the 11 ESA criteria was ranked from ESA one to four, one being the best quality of ESA and four being the lowest quality. Refer to Section 4.0 for significance ranking.

A data sheet was not completed for areas ranked as ESA 4; instead, these were marked on a map with the criteria number. A datasheet was completed for each site that was visited and ranked between ESA one to three, identifying:

- Map book sheet number (township and range, north or south)
- Location description
- Site name
- Site UTM (Universal Transverse Mercator) (Easting and Northing) location in NAD 83 (North American Datum),
- Moisture regime,
- Slope,
- Aspect,
- Stand characteristics (if treed),
- Dominant plant species composition,
- Wildlife observed,
- Possible significance (based on criteria [Appendix D] and level of disturbance),
- Management Considerations,
- Additional comments, and
- A drawing of the site.

Most ranked ESAs were visited in order to accurately rank them; however as available time and the large area to cover compromised visiting each site, not all could be surveyed. If a site was not visited, a ground inspection plot was completed in a representative community. A plot was completed in every type of natural feature identified in MVC (e.g. marsh wetland, mixedwood, riparian shrub, native grassland etc.).

2.5 HISTORICAL RESOURCES

Refer to Appendix E for the historical resources report, completed by Arrow Archeology Limited (Arrow). Research focused on archival data, published and unpublished archaeological and palaeontological literature and reports, the degree and nature of existing modern disturbances and general bio-geophysical conditions. Fieldwork was not completed as part of this assessment. General knowledge of the area's landscape and environment was included by Arrow personnel from previous systematic research in the area. The Alberta Culture and Community Spirit's *Listing of Significant Historical Sites and Areas* (Alberta Government, 2008a) was examined to determine the assessed historical resource values for land in the County. Air photos and other maps were examined for potentially unrecorded or unknown historical resources. Following that, specific site inventory data for all recorded sites was reviewed. Site locations and areas of high historical resource potential were mapped.

Due to the need to protect sites from damage by looting and other impacts, and Arrow's confidentiality agreements with the Province of Alberta, the exact position of recorded historical resources within MVC cannot be disclosed. The mapped locations in the historical resources report provide general indications of site locations.

3.0 OVERVIEW OF NATURAL FEATURES

3.1 PHYSICAL SETTING

As described in the Sweetgrass report (1991), the physical setting of Mountain View County has been greatly affected and modified by glaciations. Three main drainages dissect the area (Red Deer, Little Red Deer and Rosebud Rivers) with several other stream valleys, which adds to the rolling topography in the central and eastern sections. Along the western edge, heading towards the upper foothills of the Rocky Mountains, the hills become taller and steeper and are also dissected by stream and river valleys. The elevation ranges from a low point of approximately 900 m (3000ft) in the north eastern corner and 1230 m (4100ft) above sea level in the high south west corner. Surficial features in the MVC landscape include moraines, eskers and kames, outwash planes and glacial lake basins (Sweetgrass 1991).

3.2 LIVING COMPONENT

Mountain View County combines four natural regions: Parkland, Grassland, Foothills and Boreal Forest (Downing and Pettapiece 2006). The living component in the east and south areas is typical of prairie grasslands, specifically the Foothills Fescue Subregion (Downing and Pettapiece 2006), then it transitions to communities typical of the Parkland, Central Parkland subregion, in the central areas. In the northwest section, the living component is typical of the Boreal Forest natural region, Central Mixedwood subregion. The western most areas are in the Foothills natural region, Lower Foothills subregion (Downing and Pettapiece 2006). The central, east and southern sections have extensive agricultural activity, including cropping and seeded and unseeded pasture.

The bird and plant species recorded at each of the sites visited are listed in Table 3.1 and Appendix F, respectively. In addition, elk (*Cervus elaphus*), deer (*Odocoileus sp.*) and rodents (including Richardson's ground squirrel [*Spermophilus richardsonii*], American beaver [*Castor Canadensis*] and Red squirrels [*Tamiasciurus hudsonicus*]), were observed. No species at risk or species listed under the wildlife act were observed. Invasive agronomic and weed species were present at nearly all sites, with more extensive infestations in the agricultural areas in the south and east. Species considered invasive, noxious and nuisance

weeds that occur in Mountain View County (Alberta Agriculture and Rural Development 2008) are identified in Table 3.2. The weedy and invasive species observed during surveys are identified in Appendix F.

Table 3.1 Bird species observed in MVC during field surveys in summer 2008.

Common name	**Latin name**	**Common name**	**Latin name**
American avocet	*Recurvirostra americana*	Killdeer	*Charadrius vociferous*
American coot	*Fulica Americana*	Lesser scaup	*Aythya affinis*
American kestrel	*Falco sparverius*	Mallard	*Anas platyrhynchos*
Black capped chickadee	*Poecile atricapillus*	Northern shoveler	*Anas clypeata*
Bohemian waxwing	*Bombycilla garrukus*	Nuthatch	*Sitta Canadensis*
Canada goose	*Branta canadensis*	Red tailed hawk	*Buteo jamaicensis*
Cliff swallow	*Petrochelidon pyrrhonota*	Red-winged black bird	*Agelaius phoeniceus*
Common merganser	*Mergus merganser*	Ruddy duck	*Oxyura jamaicensis*
Common snipe	*Gallinago gallinago*	Sprague's pipit	*Anthus spragueii*
Downy woodpecker	*Picoides pubescens*	Swift	*Chaetura vauxi*
Eared grebe	*Podiceps nigricollis*	Tree swallow	*Tachycineta bicolour*
Eastern kingbird	*Tyrannus tyrannus*	Varied thrush	*Ixoreus naevius*
Goldeneye	*Bucephala clangula*	Western meadowlark	*Sturnella neglecta*
Great blue heron	*Ardea herodias*	Yellow-headed blackbird	*Xanthocephalus xanthocephalus*
Hairy woodpecker	*Picoides villosus*		

Table 3.2 Weedy and invasive species that occur in Mountain View County.

Common name	Latin name	Status[1]	Common name	Latin name	Status[1]
Quack grass	*Agropyron repens*	Nuisance	Butter and eggs / Common toadflax	*Linaria vulgaris*	Noxious
Red-root pigweed	*Amaranthus retroflexus*	Nuisance	White cockle	*Lychnis alba*	Noxious
Wild oat	*Avena fatua*	Nuisance	Round-leaved mallow	*Malva rotundifolia*	Nuisance
Wild mustard	*Brassica kaber*	Nuisance	Scentless Chamomile	*Matricaria perforata*	Noxious
Downy Brome	*Bromus tectorum*	Nuisance	Wild buckwheat	*Polygonum convolvulus*	Nuisance
Wild Caraway	*Carum carvi*	Not listed	Rough cinquefoil	*Potentilla norvegica*	Nuisance
Field Chickweed	*Cerastium arvense*	Nuisance	Tall buttercup	*Ranunculus acris*	Noxious
Oxeye Daisy	*Chrysanthemum maximum*	Noxious	Wild radish	*Raphanus raphanistrum*	Nuisance
Canada thistle	*Cirsium arvense*	Noxious	Russian Thistle	*Salsola kali*	Nuisance
Hounds Tongue	*Cynoglossum officinale*	Noxious	Green foxtail	*Setaria viridis*	Nuisance
Flixweed	*Descurania sophia*	Nuisance	Bladder campion	*Silene cucubalis*	Noxious
Wormseed mustard	*Erysimium cheiranthoides*	Nuisance	White campion	*Silene latifolia*	Not listed
Leafy Spurge	*Euphorbia esula*	Noxious	Perennial sow thistle	*Sonchus arvensis*	Noxious
Tartary buckwheat	*Fagopyrum tartaricum*	Nuisance	Spiny-leaved Sow thistle	*Sonchus asper*	Not listed
Hemp-nettle	*Galeopsis tetrahit*	Nuisance	Corn Spurry	*Spergula arvensis*	Nuisance
Cleavers	*Gallium aparine*	Noxious	Common chickweed	*Stellaria media*	Nuisance
Field Scabious	*Knautia arvensis*	Noxious	Common tansy	Tanacetum vulgare	Noxious
Bluebur	*Lappula echinata*	Nuisance	Common dandelion	*Taraxacum officinale*	Nuisance
Dalmation Toadflax	*Linaria dalmatica*	Nuisance	Stinkweed	*Thlapsi arvense*	Nuisance

1 Alberta Agriculture and Rural Development 2008

3.3 UPLAND HABITATS

Upland habitats (not depression/wetlands or river valley riparian areas) are consistent with the natural region and subregions they occur in within the county. There is a natural gradation from grasslands with small groves of aspen in the southeast to closed canopy aspen woodland in the north, evolving into mixedwood then pure conifer stands in the west. All

upland habitats observed in MVC had some level of disturbance as evident by non-native species present. Grassland areas to the southeast are, when dominated by native species, composed of Northern rough fescue (*Festuca scabrella*), green needle and thread grass (*Stipa viridula*), and prairie forbs such as little-leaf pussytoes (*Antennaria microphylla*) and old mans whiskers (*Geum triflorum*). Native grasslands in MVC are very rare and isolated pockets. The aspen parkland areas are dominated by deciduous stands of trembling aspen (*Populus tremuloides*) and balsam poplar (*Populus balsamifera*), often with white spruce (*Picea glauca*) as a sub-dominant species. Conifer dominated uplands are common in the west, in the lower foothills natural subregion. They are dominated by trees typical of the boreal forest and lower foothills, including lodgepole pine (*Pinus contorta*), white spruce, and aspen. Few stands in the western most sections consist of black spruce (*Picea maritima*), balsam poplar and paper birch (*Betula paperifera*).

3.4 RIPARIAN HABITATS

Riparian habitats vary in size and quality throughout the county. Generally the more pristine and large riparian habitats are present in the west along the river valleys, such as the Little Red Deer River. Degraded and small riparian habitats are present in the south and east, where the topography is more level and farming is extensive. Riparian habitats in general support a wide range of vegetation and wildlife diversity, because they contain the combined characteristics of both aquatic and upland areas. Riparian areas serve as a buffer, which naturally filters to improve and maintain water quality. They also retain water like a sponge, maintaining a water supply during dry times. Riparian areas include diversely vegetated river valleys, low and tall shrub thickets, poplar woodlands with dense shrub understory, white spruce and pine woodlands, abandoned channel wetlands and beaver ponds.

3.5 WETLAND HABITATS

Wetland habitats in MVC include ephemeral ponds and marshes with permanent standing water typical of the Grassland and Parkland natural regions, wet meadows in river valleys in the Foothills and Parkland natural regions, and sedge (*Carex* spp.), willow (*Salix* spp.) and swamp birch (*Betula pumila*) bogs typical of the Boreal Forest natural region. The

ephemeral ponds and marshes are often small and disturbed in the south and east portions of the county. However these areas provide important habitats for waterfowl, marsh birds and migrating shorebirds, as well as amphibians and wetland plant species.

The field work was completed after a wet spring, and a large number of ephemeral ponds were evident in areas previously cropped or lacking any riparian or aquatic vegetation. Ephemeral ponds and permanent marshes (with or without open water) were differentiated based on the presence of healthy emergent vegetation around the perimeter of the permanent marshes.

4.0 EVALUATION OF ENVIRONMENTALLY SIGNIFICANT AREAS

4.1 LEVEL OF SIGNIFICANCE

1991 Sweetgrass Summary of Approach

According to the Sweetgrass report (1991), the level of significance of ESAs was determined by gathering knowledge about rare, threatened and endangered species and by evaluating natural ecosystem complexes or landscapes. Professional judgement was heavily weighted when determining ESA levels of significance. The two levels of significance were regional and provincial. ESAs listed as having regional significance contained "features which are of limited distribution or are the best examples of a feature in the Red Deer Regional Planning area". Provincially significant ESAs contained "features which are limited in distribution at a provincial level or which are the best examples of a feature in Alberta". From this level of significance assessment, only areas of regional significance were identified in Mountain View County. While areas of local significance were not presented in the summary document, uncultivated lands that lie outside regionally significant ESA's were documented on 1:50,000 NTS working maps but were not further addressed by Sweetgrass (1991). It is assumed that these locally significant areas lacked biophysical resources to allow their inclusion as regionally significant ESAs.

2008 Summit Environmental Consultants Ltd. Summary of Approach

Specific ESAs selected are based on the criteria of Sweetgrass (1991), as outlined in Appendix D. The ESA rank was then based on the criteria, distribution, function, and social importance, with the option to overlay the historical resources mapping (Appendix E) as additional significant areas. The ESAs in MVC were ranked in four categories: 1) high significance, 2) moderate significance, 3) low significance and 4) very low significance. Our intention of ranking from one to four is to include areas that meet criteria but are degraded; however they have potential to become healthier functioning ecosystems (ESA 1 or 2), and should be considered for preservation and/or restoration. The ESAs in MVC all meet one or more criteria and are generally considered to have the following characteristics:

ESA-1 (Very High Significance)

- High habitat quality for rare and common wildlife and native plant species
- Unique ecological area, uncommon in the local area
- Low level of disturbance as indicated by heavy weed or invasive plant species presence, agricultural land development (land use alteration), industrial development (including oil and gas development) or other land fragmentation (e.g. recreational development)
- Sensitive to disturbance
- Typically meet more than three criteria (as listed in Appendix D)

ESA-2 (High Significance)

- Limited high and predominantly moderate habitat quality for rare and common wildlife and native plant species
- Limited distribution in the local area, but not uncommon
- Low to moderate level of disturbance
- Typically meet three or fewer criteria

ESA-3 (Moderate Significance)

- Limited moderate and predominantly low habitat quality for common wildlife and native plant species
- Moderate to high level of disturbance
- Typically meet two criteria

ESA-4 (Low Significance)

- Low habitat quality for common wildlife and native plant species
- Are highly disturbed
- Typically only meets one criterion
- Includes Historical Resource areas (Arrow 2008) unless captured by other criteria (may be classified as ESA 1, 2 or 3 in such cases)

4.2 SIGNIFICANT CULTURAL AND HISTORICAL RESOURCES

Arrow Archaeology Limited (Arrow) examined recorded historical resources and assessed the potential unrecorded historical resources in Mountain View County. Of the over 450 listed sites, many have been disturbed or destroyed by agriculture and other development. Due to the history of agriculture and recent development impacts, as well as the general geological, geomorphological and topographical situation as well as recent development impacts, the potential for unrecorded historical resources is limited. Most of the potential historical resource areas are located in or adjacent to river and creek valleys.

Approximately 266 km^2 of Mountain View County is considered to have moderate to high potential to contain historical resources (about 7% of the land within the County). These areas include the Rosebud River in the southeast, Spruce Creek and just west of Spruce Creek in the northeast, along the Red Deer River in the west, along the upper reaches of the Little Red Deer River in the southwest and along the northwest perimeter of the county. It is estimated that less than 100 recorded sites have known material that has not been collected or

removed (including Carstairs Pictographs, First Nations human burials, archaeological "features" including tipi rings and kill sites). Refer to Appendix E for the detailed report.

Historical Resources Impact Assessments (HRIAs) should be conducted for any developments that could potentially impact minimally disturbed native terrain that remains. Refer to Appendix E, Historical Resources Report by Arrow for further information.

5.0 UPDATED ENVIRONMENTALLY SIGNIFICANT AREAS

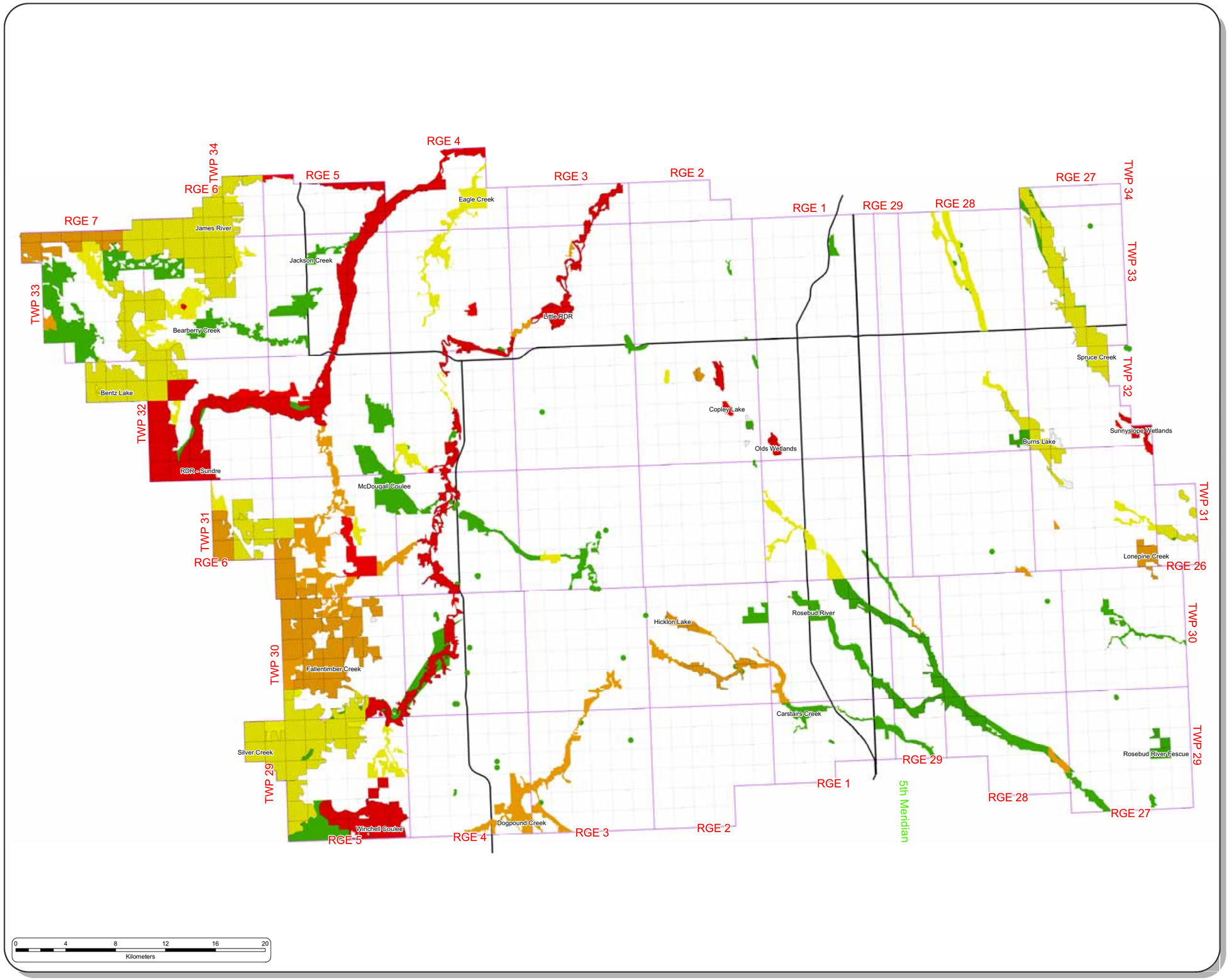
5.1 SUMMARY OF UPDATED ESAS

The majority of the updated ESAs identified were ranked as ESA 3 (Table 5.1). Environmentally Significant Areas 1, and 4 are nearly equal in area covering approximately 3% (each) of the land area in MVC. Similarly, ESA 2 and 3 cover about 4% each. ESA 4 are the least abundant covering a total of 12,849 hectares. An overview of environmentally significant areas can be found in Appendix G, which shows ESAs in all four quadrants of the county overlaid onto orthophotos. Figure 5.1 provides an overview of ESAs.

Table 5.1 Summary of ESAs in MVC

Summit ESAs	Area (acres)	Area (ha)	Percent of total MVC Area
ESA 1 (High Significance)	32,040	12,966	3.20%
ESA 2 (Moderate Significance)	41,952	16,978	4.20%
ESA 3 (Low Significance)	44,052	17,827	4.40%
ESA 4 (Very Low Significance)	31,751	12,849	3.18%
Total ESA Land	**149,795**	**60,620**	**14.98%**
Non-ESA Land	**850,205**	**350,201**	**85.02%**
Total	**1,000,000**	**404,680**	**100%**

Mountain View County Environmentally Significant Areas 2008



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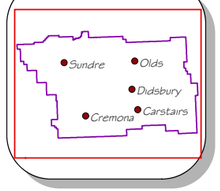
ESA Legend

- Sweetgrass ESAs
- 1 (Very High)
- 2 (High)
- 3 (Moderate)
- 4 (Low)

MOUNTAIN VIEW COUNTY

SUMMIT ENVIRONMENTAL CONSULTANTS LTD.



ESA Criteria

1 Hazard lands and areas unsafe to develop (ie floodplains, steep or unstable slopes
2 Vital environmental, ecological or hydrolical functions
3 Areas with rare or unique geological or physiographic features
4 Areas which contain significant, rare or endangered species
5 Unique habitats or remnants of once large habitats
6 Areas with unusually high diversity
7 Areas with large and relatively undisturbed habitats
8 Areas that provide a linking function and permit movement
9 Areas that are excellent representatives of one or more ecosystems or landscapes that characterize a natural region
10 Areas with intrinsic appeal or widespread community interest
11 Areas with histories of scientific research
12 Where recorded / unrecorded historical values exist

Sources: County of Mountain View, Altalis, and the Government of Alberta

Projected in UTM Zone 11N
NAD 1983

Figure 5.1 shows several large areas within MVC that have been identified as having the potential to contain historical resources as defined by the Alberta *Historical Resources Act* (Alberta Statues and Regulations 2000). Users of this data may use this information for general planning purposes and should be aware that any land development projects that occur in these areas may require *Historical Resources Act* clearance. Alberta Culture and Community Spirit are responsible for *Historical Resources Act* assessments and approvals in Alberta and should be consulted in advance of all land development projects in MVC. In general, agricultural development does not require *Historical Resources Act* clearance. More information on historical resources can be obtained by contacting Historical Resources Management at Alberta Culture and Community Spirit in Edmonton or Arrow Archaeology Limited (Appendix E).

5.2 COMPARING UPDATED ESAS TO SWEETGRASS (1991)

By creating a ranking system from one to four, those areas which may have been excluded in the 1991 report were captured and included as ESAs in 2008. Our intention of ranking from one to four is to include areas that meet criteria but are degraded; however they have potential to become healthier functioning ecosystems (ESA 1 or 2), and should be considered for preservation and/or restoration. This approach allowed for the inclusion of slightly disturbed or degraded ESAs. The Sweetgrass report (1991) ranked the ESAs as having regional or provincial significance; potentially excluding other regionally common but degraded areas that still serve an important ecological function or are important to the public. While locally significant sites were not captured in the summary documents provided by Sweetgrass, Summit included these areas because the significance criteria were applicable (Appendix D). Additional locally significant sites may have been mapped if the scale and scope of the assessment was more detailed. Based on the 2008 assessment, an additional 22,652 hectares of ESAs have been added to the 37,968 hectares identified by Sweetgrass in 1991 (Table 5.2). All of Sweetgrass ESAs were captured in the 2008 assessment except for one small wetland area that was severely degraded and no longer met the ESA criteria. The Sweetgrass report (1991), considers approximately 10% of the county to consist of

Environmentally Significant Areas. Summit's assessment estimates approximately 15% of the county to be ESAs.

Table 5.2 Total ESAs identified by Sweetgrass (1991)

Sweetgrass ESAs	Area (ha)
Bentz Lake	5,174
Burns Lake	781
Carstairs Creek	352
Fallentimber Creek	6,454
Hicklon Lake	174
James River	5,710
Little Red Deer River	3,296
Lonepine Creek	593
Olds Wetlands	345
Red Deer River - Sundre	4,839
Rosebud River	1,662
Rosebud River Fescue	240
Silver Creek	4,430
Spruce Creek	2,079
Sunnyslope Wetlands	243
Winchell Coulee	1,596
Total	**37,968**

5.3 CUMULATIVE EFFECTS OF THE LOSS OF ESAS

It is difficult to assess cumulative effects of the loss or change in size of ESAs provincially and globally. For one thing, classification and ranking of ESAs is partly based on subjective professional judgement and therefore not guaranteed to be repeatable with the same results. There is a lack of accessible methodology to systematically rank, map and capture ESAs. As well, cumulative effects assessments are generally based on all existing developments, approved land activities, and future projects or activities that have been publicly disclosed. Gathering cumulative development information was outside of the scope of this project. However, the cumulative loss of biodiversity could be detected as a loss (or decreased significance ranking) of ESAs. Specifically, reduced habitat availability and blockage of wildlife movement corridors may isolate populations and inhibit reproduction of species, thereby reducing biodiversity. As well, the cumulative fragmentation and disturbance of intact habitat correlates with ESA loss. For example, Alberta has less than 26% of native grasslands left and less than 36% of wetlands (Sweetgrass 1991).

In efforts to determine cumulative effects on ESAs in MVC in the future, the 2008 ESA mapping could be overlaid onto future aerial photographs and ESA rank and criteria contrasted to current conditions. Other existing databases including oil and gas development, agricultural land use, riparian fencing programs, and weed inventories would also aid in completing a cumulative effects assessment that could be integrated into future ESA mapping.

5.4 NON- ESA AREAS

Areas listed in this ESA study were based upon current conditions in 2008. There are a number of areas along river valleys, creeks, and other forested areas that were not included as ESAs through this process. While these areas may have the potential to become ESAs in the future, the present assessment with regards to the criteria and ranking system used did not result in their inclusion. In general, these sites did not meet the criteria due to degradation from past disturbances.

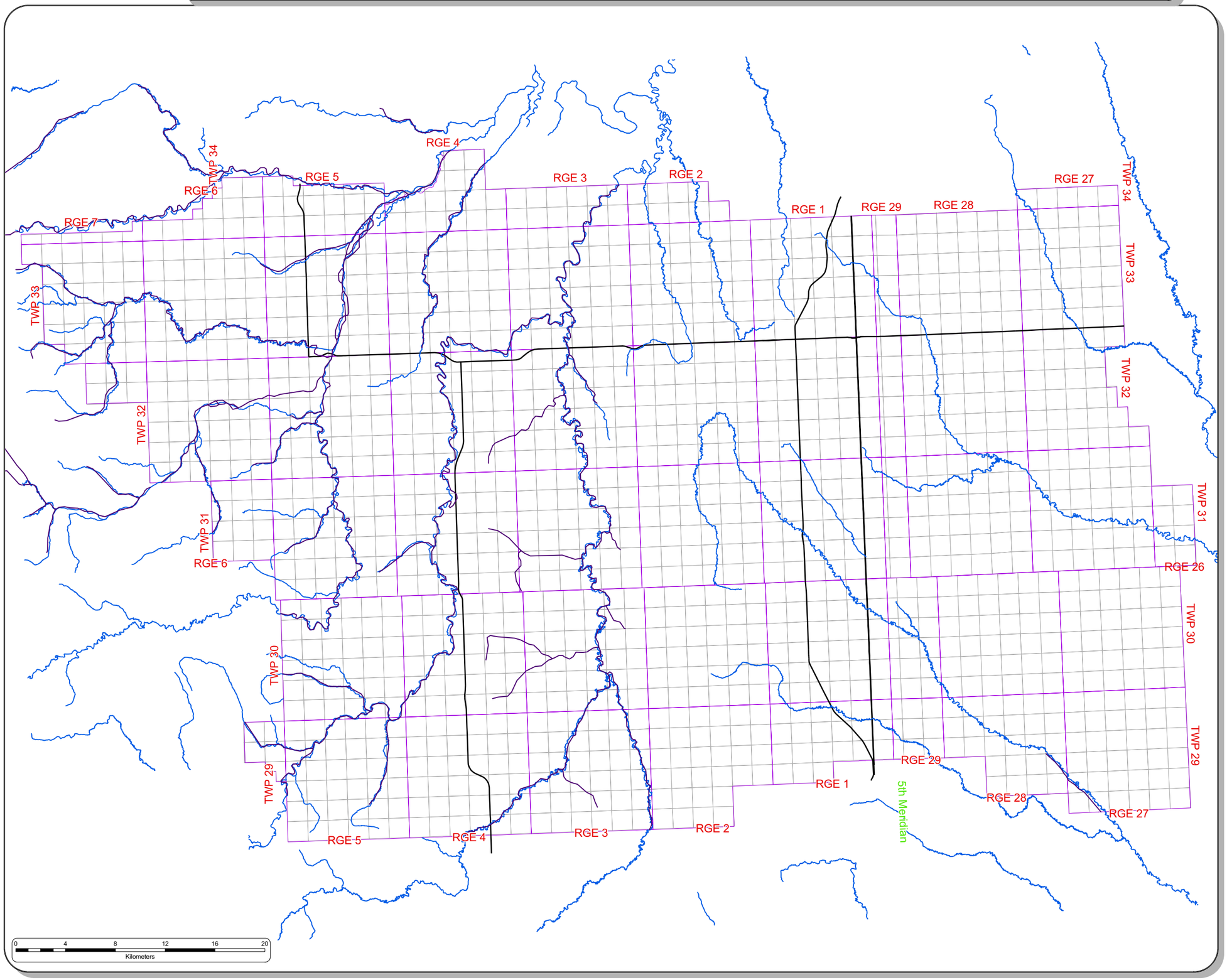
The public consultation process allowed for members of MVC to express their thoughts on areas which they would like to see included as ESAs. These comments were considered while carrying out our assessment and ranking of ESA sites. In some cases, sites may have been overlooked or omitted due to lack of information on that specific site. These locations should be flagged and perhaps highlighted for assessment in the next ESA study.

It is recommended that all riparian areas and water bodies excluded from this assessment follow management guidelines as outlined in Section 6.0. Specifically, those areas connecting existing ESAs should be considered for riparian fencing. A gap between ESAs along a contiguous creek or river feature was a common theme due to degraded riparian areas not meeting criteria.

In an effort to further address the importance and sensitivity of non-ESA water bodies, the County has provided direction on a map that refers to ‘Potential Riparian Management Water

bodies' in MVC (Figure 5.2). Figure 5.2 shows riparian areas of interest from both a provincial and municipal level. The map is based on permanent water bodies flowing year round, as determined by MVC, in conjunction with Alberta Environment watercourse classification (ASRD 2006). This map will be used by the county in addition to the ESA map as one of the tools to aid in land-use planning (Figure 5.3). As identifying water bodies for potential riparian management was at a coarse desktop level, some water bodies that will be managed may have not been included in Figure 5.2. In other words, the non-inclusion of water bodies on the map in Figure 5.2 does not signify that they will not require riparian management in the future. The need for a more detailed inventory of the riparian areas is discussed in Section 7.1 (Data Gaps).

Figure 5.2: Potential Riparian Management Water Bodies in MVC 2008



N
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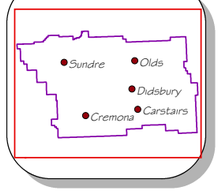
Legend
Potential Riparian Management Water Bodies

Class C (AB ENV)

Permanent Streams (MVC selected)

MOUNTAIN VIEW COUNTY

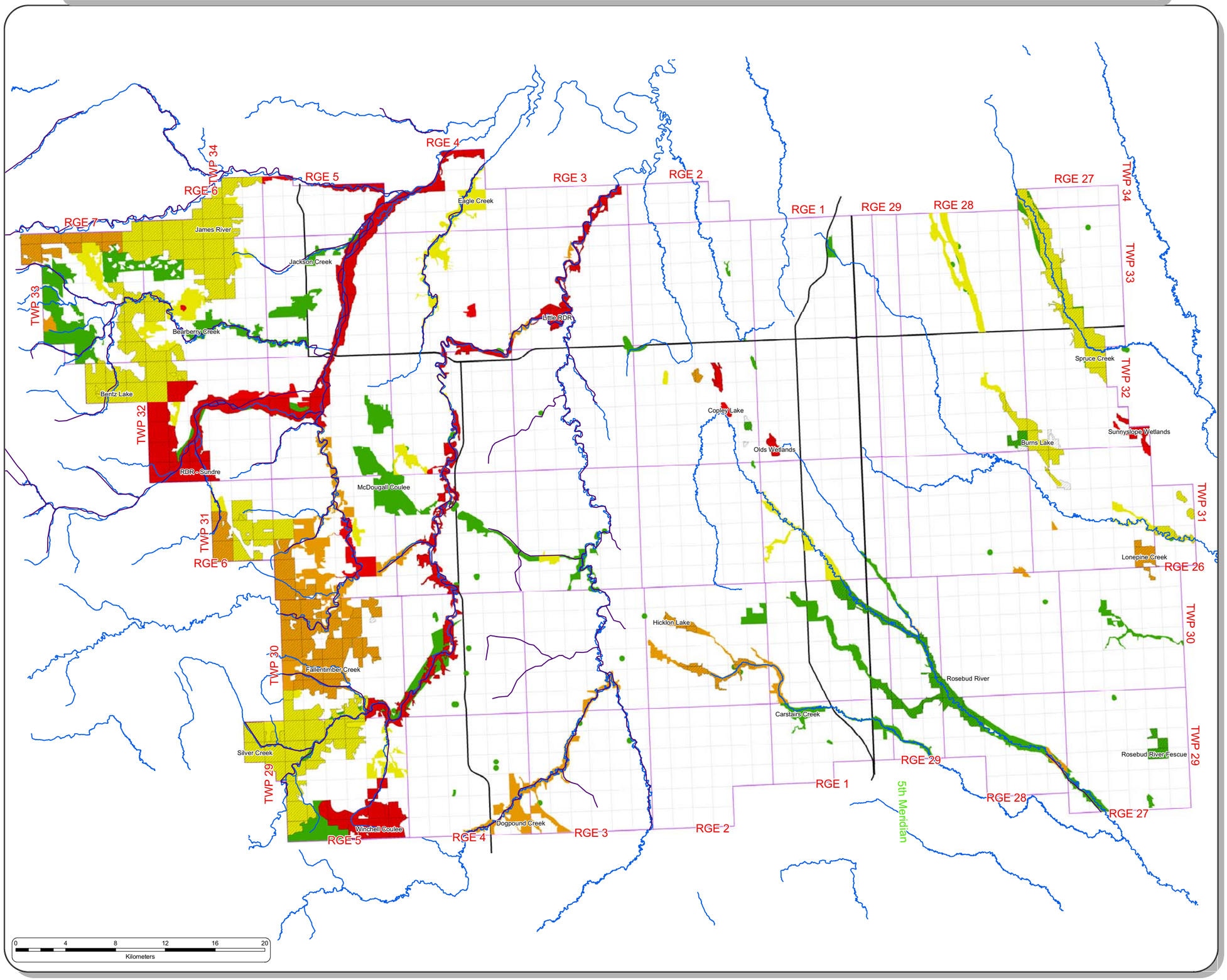
SUMMIT ENVIRONMENTAL CONSULTANTS LTD.



Sources: County of Mountain View, Altalis, and the Government of Alberta

Projected in UTM Zone 11N
NAD 1983

Figure 5.3: Potential Riparian Management Water Bodies with ESAs in MVC 2008



N
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ESA Legend

- Sweetgrass ESAs
- 1 (Very High)
- 2 (High)
- 3 (Moderate)
- 4 (Low)

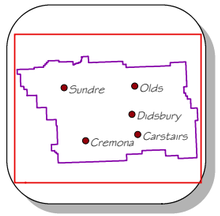
Legend
Potential Riparian Management Water Bodies

Class C (AB ENV)

Permanent Streams (MVC selected)

MOUNTAIN VIEW COUNTY

SUMMIT ENVIRONMENTAL CONSULTANTS LTD.



Sources: County of Mountain View, Altalis, and the Government of Alberta

Projected in UTM Zone 11N
NAD 1983

6.0 MANAGAMENT OF ENVIRONMENTALLY SIGNIFICANT AREAS

6.1 MANAGEMENT PLANS FOR ESAS ONE TO FOUR

Management plans for ESAs depend on the management objectives of the county. While management plans for each ESA were provided in the Sweetgrass report (1991), our approach has identified significantly more ESAs (22,652 additional hectares). Instead of individual management plans for each ESA area, overall management plans for the ESA rankings are offered. Management objectives could include protecting ecological diversity, maintaining or enhancing populations of rare species, increasing habitat diversity or protecting watersheds. Considering the Draft Land-Use Framework for Alberta goal of healthy ecosystems and environment (Alberta Government 2008b), management goals of the county should be to preserve ESA 1 and 2s and limit disturbance or improve ESA 3 and 4s. General guidelines for managing ecological features that are ESAs are described in Section 6.1, and summarized again here. In reality ESAs should be managed according to the site conditions, which can be surmised based on criteria listed for each ESA area as well as collecting specific site information through additional surveys.

ESA 1

Generally speaking, ESAs ranked as 1 are considered pristine in their existing state, potentially with low levels of disturbance but meeting several of the ESA criteria. Efforts should be made to minimize development (including grazing, cropping, land clearing, oil and gas exploration and development, intensive recreational use, etc.) in these areas by the MVC.

ESA 2

Areas ranked as 2 are considered to be of high significance but may have low to moderate levels of disturbance, and/or meet several criteria. They may achieve ESA 1 classification if: development activities are limited and areas are reclaimed with native vegetation.

ESA 3

These areas are either moderately to highly impacted, are often small contiguous areas, and meet few criteria. Similar to ESA 2's, management strategies should be put in place to move

them into a higher classification by meeting more of the criteria or making them in better functioning condition. Strategies could include riparian fencing, weed management (prevention of introduction and spread and treatment of infested areas), reduced grazing pressures as applicable, reclamation with native plant species and buffering perimeters from further disturbance.

ESA 4

These areas are labelled as low significance because they meet few criteria and are already moderate to highly impacted. There is possibility of improvement through strategies listed under ESA 3.

Management recommendations for ESAs should be tailored to specific sites whenever possible; however, distinct landscape features (e.g. wetlands, aspen parkland, native grasslands, etc.) can be managed similarly across all ESAs. Our management considerations consider municipal, provincial and federal legislations. All ESAs should be assessed individually before management decisions are chosen.

6.2 GUIDING PRINCIPLES

In order to conserve or improve ESAs in Mountain View County, it is important to have a commitment by local and regional authorities to include environmental management in all components of land use planning, development control and subdivision approval. For example, management objectives for ESAs could be included in the Municipal Development Plan (Mountain View County 2007). The Summit designated ESAs also can be added as a mapping layer to aid in identifying and prioritizing areas for development and for conservation. Below are general management guidelines and relevant federal and provincial legislative guidelines to date.

6.2.1 General guidelines

General guiding principles recommended for ESAs are as follows:

1. Development in ESAs 1 and 2 should be avoided. If unavoidable, an environmental impact assessment should be completed prior to development. Site-specific environmental impact assessments can provide detailed boundary delineation, comparison of alternatives, and assessment of long-term consequences.
2. Riparian fencing should be considered in grazed areas, particularly in ESAs 1 and 2. Mountain View County Agricultural Services currently and will continue to use ESA mapping as a tool to identify candidate riparian areas for fencing Mountain View County 2006.
3. Development in ESAs 3 and 4 should be restricted, with the end goal of improving ESA function to better meet criteria. Improvement can be through weed management programs, riparian fencing, collaborating with conservation groups (e.g. Ducks Unlimited and Cows and Fish) to restore areas and public awareness.
4. Specific to ESA classification and land feature type, place development restrictions on development density (e.g. parcel size and number of parcels per quarter), and other appropriate land use restrictions (e.g. appropriate range stocking rates, type and extent of industrial activity and resource extraction). Limit access to ESAs 1 and 2 based on what is appropriate for that land feature type (install fencing or locked gates to restrict access) (see Section 6.2 for management guidelines).
5. Publish and display the ESA mapping and supporting data as a form of environmental education to foster public awareness of significant features and management considerations, and stimulate involvement in responsible land management.
6. Maintain natural shorelines on wetlands for waterfowl nesting and foraging.
7. Diversify grazing regimes to ensure the survival of a variety of grassland plants and animals.

Additional guidelines from Sweetgrass (1991)

8. Long-term resource protection and management (and therefore long-term economic benefits) should have priority over short-term economic gains which result in the loss of future options.

9. Buffers around an ESA may be necessary but cannot be prescribed until the proposed activity is known and its impacts assessed. (Perhaps different objectives and widths of buffers around each ESA category could be formulated)
10. Environmentally Significant Areas should be recognized and provided for in official plans and not as an overriding development control over a variety of land use designations.
11. By-laws, policies and regulations should permit innovative approaches, including management agreements with owners of ESAs in concert with provincial government initiatives (consistent with the Alberta draft Land-Use Framework stating: consideration should be given to allowing land trust tax credits to be sold to third-parties [Alberta Government 2008b]).

6.2.2 Legislative Guidelines

A number of tools are available to conserve ESAs. A reference document, Legal Tools for Municipalities to Conserve Environmentally Sensitive Areas (Kwasniak 2001), which outlines a list of tools and their advantages and disadvantages, can be found in Appendix H.

Federal

Under the Federal Department of Fisheries and Oceans, the Alberta Operational Statement for the Habitat Management Program is: maintenance of riparian vegetation in existing rights-of-way. This statement pertains to riparian vegetation communities in road, pipeline and transmission line rights-of-way. Present-day healthy riparian vegetation in MVC is captured in the Summit ESA classification whether on or off existing rights-of-way.

Provincial

Draft Land-Use Framework

The province of Alberta has released a Draft Land-Use Framework of Alberta (Alberta Government 2008b). The province intends to update Alberta's land management practices to keep up with the rapid pace of development. It is a cross-ministry initiative. Participating

ministries include Sustainable Resource Development; Energy; Environment; Agriculture and Rural Development; Municipal Affairs; Tourism, Parks and Recreation; Culture and Community Spirit; Aboriginal Relations; Transportation; and Infrastructure (Alberta Government 2008b).

Three (draft) land-use framework desired outcomes will help ensure Mountain View County guiding principles are consistent with the latest Alberta land-use framework:

a) sustainable prosperity supported by our land and natural resources;
b) healthy ecosystems and environment; and
c) livable communities and recreational opportunities.

The intention of maintaining functioning ESAs in MVC is consistent with these desired outcomes. The second desired outcome of having healthy ecosystems and environment directly correlates with this ESA assessment and future management.
The Land-Use Framework is to be finalized by the Fall of 2008. After that time, regional planning will begin in the South region, under which MVC falls. It is hoped that this ESA document will integrate into the planning framework.

Alberta wetland policy

The province of Alberta has ownership over the water in permanent wetlands and water bodies through the Water Act (Alberta Environment 1996). Therefore, the province governs any activity that may affect wetlands. As well, Alberta's wetland policy for "Wetland Management in the Settled Area of Alberta" is to sustain the social and environmental benefits that functioning wetlands provide (ASRD 2004), which is consistent with classifying permanent wetlands and functioning water bodies as ESAs. As stated by Alberta Sustainable Resource Development (2004), the policy intent is to

a) Conserve slough/marsh wetlands in a natural state
b) Mitigate degradation or loss of slough/marsh wetland benefits as near to the site of disturbance as possible

c) Enhance, restore or create slough/marsh wetlands in areas where wetlands have been depleted or degraded

6.2.3 Regional Guidelines

The Mountain View County Environmentally Sustainable Agricultural Program has participated in different initiatives regionally such as the Little Red Deer River Watershed Initiative, Red Bow Regional Watersheds Alliance, Alberta Environmental Farm Planning and the Bearberry Watershed Initiative. The MVC ESA program supports and helps facilitate the implementation of the different Beneficial Management Practices such as:

- Riparian exclusion and riparian pasture fencing
- Off-site system watering
- Manure management
- Winter/Calving site relocations
- Soil Bioengineering Projects
- Increasing the understanding of a watershed
- Providing technical expertise to landowners

These guidelines can be implemented to all riparian ESAs and even non-ESAs in efforts to improve riparian functioning.

6.3 MANAGEMENT CONSIDERATIONS

Considering the guiding principles outlined above, below are management considerations for identified ESA types. The areas classified as significant fall under the following feature types, as per the Request for Proposal for Environmentally Significant Areas and Report (Mountain View County 2008):

- Landscapes
- Wildlife habitats
- Fish habitats
- Areas of biological importance

- Geological sites
- Major physical constraints

6.3.1 Landscapes

Environmentally significant landscapes are those areas that are left relatively intact and provide extensive cover for wildlife (Appendix D: criteria 7, and potentially 6 and 8). These large and relatively intact landscapes are most prominent in the west part of the county, typically with extensive forest cover that has limited fragmentation. These landscapes extend west out of MVC and into the Rocky Mountain Foothills, providing sheltered habitat and linking corridors. Large coulees and river valleys also fall in the sensitive landscape category. Coulees and river valleys in the county are somewhat disturbed landscapes; however they still provide important linking functions between habitats and shelter. Vegetation and wildlife diversity is more prominent where disturbance is limited, as potential for invasive plant species to be introduced and compete with native plant species is reduced.

For large landscape ESA features, management strategies should focus on maintaining the continuity of habitat. Extensive fragmentation and clearing undermines the function of these areas and should therefore be limited. No-development buffer areas should be maintained around contiguous landscape features. Buffer widths should be determined relative to proposed development types, the ESA class (one to four) and the size of contiguous landscape feature.

Land use should be compatible with contiguous landscapes, such as guest ranches and low impact recreation that enable preservation of large areas of land.

6.3.2 Wildlife Habitats

Sensitive wildlife habitats include almost all of the ESAs mapped, with ESAs 1 and 2 having higher habitat value than ESAs 3 and 4. A summary of identified ESAs that should be managed for wildlife habitat are: coulees, river valleys, contiguous forest, extensive riparian

habitat, aspen parkland, native grassland, and wetlands. These fall under criteria 4, 5, 6, 7, 8, 9 and 10 (Appendix D). Maintaining and improving a landscape of diverse wildlife habitats supports wildlife species diversity. Wildlife species of concern that should be considered when managing ESAs include

- Ungulates (deer, moose and elk)
- Large mammals (bear, coyote, martin, fisher and wolf)
- Small mammals (hare, mice, voles and shrews)
- Passerine birds
- Raptors (hawks, eagles, owls and falcons)
- Waterfowl (herons, ducks and shorebirds)
- Amphibians (frogs and toads)
- Reptiles (snakes and lizards)

Management strategies to conserve wildlife habitats include

- Limiting clearing and cultivation
- Leaving native vegetation communities intact;
- Avoiding fragmentation
- Controlling burning to promote restoration of native grassland communities from succession to shrubs and trees
- Managing grazing to create and maintain habitat for a variety of species using varying levels of intensity
- Using riparian fencing to protect valuable riparian wildlife habitat, and
- Prohibiting drainage and cultivation of wetlands, and creating additional wetland where possible.

Strategies should be introduced to protect ungulate winter ranges, which include river valleys and south facing valley slopes (ASRD 2000). If access or development is required into ungulate winter range areas, it should not be between January 1 and April 30 (ASRD 2000). Any vegetation clearing in ESA areas should be outside of the migratory breeding bird window, approximately April 1 to July 31.

Appropriate land use in significant wildlife habitat areas would be low to moderate intensity rangeland grazing, seasonal access, temporary access through an area to adjacent areas and other low impact activities.

6.3.3 Fish Habitats

Fish habitats include all potential fish bearing water bodies (streams and lakes). These are included in the ESA mapping if they are currently in healthy functioning condition, i.e. have intact riparian areas and meet criteria 1, 2, 7 and 8 (Appendix D).

As stated in Sweetgrass (1991), managing ESA fish habitats is more problematic than managing other terrestrial ESAs, because adjacent land uses can significantly impact fish-bearing habitats. Responsible land management practices, including maintenance of water quality and quantity, should be promoted throughout drainage basins and fish migration routes. This protection includes inhibiting herbicide use within 50 m of a water body, clearing and heavy grazing or trampling within riparian areas. The riparian fencing program is a management strategy designed to minimize impacts to riparian areas (or reduce existing impacts through exclusion) which in turn affect fish habitat. Other management strategies practiced by the MVC Environmentally Sustainable Agricultural Program that pertain to rangeland and affect fish habitat use include off site watering, relocating winter/calving away from water bodies and informing and educating landowners about the importance of riparian areas relative to fish habitat. Large nutrient producing facilities such as feedlots should be located far enough from water bodies so that leaching will not affect ground or surface water quality. Activities could create erosion and sedimentation into surface water should be subject to adequate erosion and sediment control plans.

6.3.4 Areas of Biological Importance

Areas of biological importance pertain to almost all of the ESAs identified, specifically ones that fall under criteria 1, 2, 4, 5, 6, 7, 8, 9 and sometimes 10 and 11 (Appendix D).

Management guidelines should be tailored to the area and the significant biological components comprising that area. Specific provincial guidelines for rare plants, rare ecological communities and rare wildlife species do exist, but have no legislative sanction (ASRD 2002). Federally listed rare plant and animal species are protected, and specific management guidelines exist under the Species at Risk Act (SARA 2003).

6.3.5 Geological Sites

Areas containing significant geological sites fall under criteria 3 (Appendix D). The 1991 Sweetgrass report indicates that all geological sites identified in report are most significant in their undisturbed state. According to the Arrow report (Appendix E), geological sites are often tied to archaeological importance as well. Managing these areas should require a Historical Resources Impact Assessment to be conducted for any developments potentially impacting any minimally disturbed native terrain in the MVC, particularly identified historical resource and geologically unique sites. All major development projects, such as power transmission lines, large scale residential developments and projects requiring Canadian Environmental Assessment Agency approval require predevelopment historical resources impact assessment in Alberta.

Except for intensive development such as mining or sand and gravel extraction, most land uses should be compatible with maintaining geological features (Sweetgrass 1991).

6.3.6 Major Physical Constraints

Areas deemed to have major physical constraints to development are considered ESAs, according to Appendix D, Criteria 1: “hazard” lands and areas which are unsafe for development in their natural state such as floodplains and steep and unstable slopes; or which pose severe constraints on types of development such as aeolian (wind) surficial deposits and permanent wetlands. These areas have been identified through aerial photo interpretation and field observations. Floodplains are found along major streams and rivers in MVC. Steep slopes are uncommon in most of MVC, only found along sections of the major river valleys in the west part of the county. No aeolian deposits were observed; however, they could exist

in the county. Aeolian deposits are made of fine particles and are extremely susceptible to erosion if cleared of vegetation, and are difficult to reclaim once cleared.

Management in areas with major physical constraints should be well defined to prevent irreversible impacts. Slopes over 30% should be restricted from development, as should permanent wetlands. Any developments with potential for ground contamination (drilling, septic tanks and fields, etc.) should be restricted in river valley floodplains and other areas where alluvial deposits are present. Clearing should be prohibited on aeolian deposits. Buffers are recommended around areas with major physical constraints to limit potential for impact in the event of development. Buffers should be a minimum of 30 m, and wider depending on the sensitivity of the feature and the nature of the development.

6.4 DESIGNATED ARCHEOLOGICAL SITES AND PALAEONTOLOGICAL SITES

All designated archaeological and paleontological sites should be considered for management as ESAs. They are identified in Figure 5.1, along with the ESAs identified. Ranking these resources is not possible because their exact condition is not known and level of importance is subjective. The Historical Resources branch of Alberta Culture and Community Spirit is responsible for administering the Alberta *Historical Resources Act* and determine whether Historical Resources Impact Assessments (HRIAs) are required. Planners and developers who could potentially impact those lands that have been identified as having recorded historical resources or potential to contain historical resources should seek the approval of the Historical Resources Branch of Alberta Culture and Community Development before finalizing development plans (Mirau and Temoin 2008). Refer to Arrow report in Appendix E for more detailed information.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 DATA GAPS

The colour aerial photography from 2007 was not available for mapping; therefore Summit used 2005 black and white imagery. There is very limited information specific to MVC regarding rare or endangered plant and animal species, which may be due to lack of surveys in the areas or limited habitat available for rare and endangered species. The limited scope and timing restraints of the project did not allow for specific surveys such as ungulate browse, rare plant of rare ecological community, breeding bird, raptor etc. Alberta breeding bird atlas data is available for portions of the county where surveys have been completed. To present mapping of existing breeding bird data would misrepresent the presence or absence of species because lack of data could create an assumption that birds are not nesting in an area.

Additional detailed mapping of the riparian areas within MVC would provide more information about areas along water bodies that would benefit from management, outside of designated ESAs. Thus, the map of Potential Riparian Management Water bodies (Figure 5.2) would be refined based on mapping and field surveys, detailing approximate riparian boundaries to be used in planning. The refined riparian area mapping would provide an added "riparian management" layer of data to use in conjunction with the ESA mapping database.

7.2 FUTURE RESEARCH

Future research will be linked with changes in legislation, technology and landscape. Depending on MVC initiatives, the ESA mapping and ranking should be repeated in 10 to 20 years and contrasted to current mapping. The county should continue to acquire data as it becomes available, including: breeding bird atlas data, Alberta Natural Heritage Information Centre data (rare plant, animals and rare ecological community locations), and wetland

mapping data. As well, municipal plans regarding local ecology and future environmental impact assessments should be an iterative process with local biologists.

7.2.1 Changes in Legislation

As the Draft Land-Use Framework (Alberta Government 2008b) becomes revised and finalized, legislation will likely change regarding land management. The land-use framework process has proposed opportunities for municipalities to be involved in the planning. The mapping and ranking of ESAs in MVC enables recognition of areas that require conservation and where management should be focused. Provincial and federal requirements for sustainability and protection laws continually evolve and trend towards changing to better protect ecological attributes. In the case of proposed development in an ESA 1 or 2, completing an environmental impact assessment would entail determining the most up to date legislation and its applicability.

7.2.2 Changes in Technology

Inevitably, more up to date colour imagery will be available for the county, and more comprehensive GIS programs for which to analyze data. New technology such as infrared imagery (plant type distinction) would further refine ESA mapping possibilities. As data becomes more available digitally, the county's layers of information on weeds, land use, watersheds, riparian fencing etc., could be combined to create an algorithm to calculate ESAs at a desktop level, which could be revised based on field observations.

7.2.3 Changes in the Landscape

Landscapes change naturally and through human-made disturbance. Natural succession of vegetation communities and meandering rivers creating new cut banks and depositing sand are examples of inevitable natural changes to the landscape. Resource extraction and changing agribusiness practices (e.g. to organic or agro-forestry practices) are examples of human-made changes in the landscape. These changes can be captured in future ESA mapping.

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Appendix A

Request for Proposal

Request for Proposal

The County is seeking proposals from qualified consultant to provide an updated report on the Environmentally Significant Areas (ESAs) within Mountain View County.

The County currently has a report that was done in 1991 that identifies Environmentally Significant Areas (ESA) and Hazard Lands within the County. This document is referenced in the County Municipal Development Plan and therefore should have an updated report to help guide in our County land-use planning. The report will also be used by Agricultural Services for identifying priority areas for our riparian fencing program. Since 1991 the views in Alberta on the environment and water have change significantly and hence the need for the update of this report to reflect these views. As well it needs to be further aligned with the provinces views/legislation around riparian areas and wetlands. Many departments are working on protecting ESAs and a clear definition on what an ESA is in Mountain View County is required. Alberta only has about 26 per cent of our native grasslands left and we have lost about 64 per cent of our wetlands. As part of this report a description and mapping of all designated archeological sites and paleoanthropological sites is also required. The County wishes to update the inventory of these ESAs to reflect current values and legislation.

As part of this report, associated maps would have to be in an ArcGis format compatible with Mountain View County's.

Proposals will be assessed primarily on the fee structure submitted by the consultant.

Proposals must be submitted to Mountain View County by 2 p.m. on Mar 3rd, 2008.
Attention to Jeff Holmes, Manager of Agricultural Services and Parks
Postal Bag 100, Didsbury, AB T0M 0W0

MOUNTAIN VIEW COUNTY

EX TERRA PROSPERE EVENIT

Environmentally Significant Areas Evaluation and Report

Mountain View County currently has a report, which was completed in 1991, that identifies Environmentally Significant Areas (ESA) and Hazard Lands within the County. This document is referenced in the new County Municipal Development Plan, and therefore should have an updated report to help guide in our County land use planning. This report will also be used by Agricultural Services for identifying priority areas for our riparian fencing program. Since 1991, the views in Alberta on the environment and water have change significantly and hence the need for the update of this report to reflect these views. As well it needs to be further aligned with the provinces views/legislation around riparian areas and wetlands. Many departments are working on protecting ESA's and a clear definition on what an ESA is in Mountain View County is required. Alberta only has about 26 per cent of our native grasslands left and we have lost about 64 per cent of our wetlands. Mountain View County wishes to update the inventory of these ESA to reflect current values and legislation.

As part of the review of the ESA's in Mountain View County, the Criteria for ESA should be re evaluated an amended as needed. Two public consultation meetings should be held in order to get public input on the criteria for determining ESA's and its level of significance. This criteria and level of significance should coincide with any provincial and federal legislation.

The report should update all areas covered in the 1991 Environmentally Significant Areas of Mountain View County including:

- Summary of Data Collection Methods
- Overview of Natural Features
    - Physical setting,
    - Living component
    - Upland habitats
    - Riparian habitats
- Evaluation of Environmentally Significant Areas
    - Criteria
    - Level of significance
    - Areas with major physical constraints
    - Significant cultural and historical resources
- Management of ESA's
    - Guiding principles
    - Management considerations
        - landscapes
        - wildlife habitats
        - fish habitats
        - areas of biological importance
        - geological sites
        - major physical constraints
    - Management Plans
- Designated archeological sites and paleoanthropological sites
    - Description
    - Mapping

- Data Gaps
- Future Research required and changes occurring in legislation

All mapping of these areas should be in an ArcGis format compatible with Mountain View County's. Spatial data must be in shape file format and projected to TTM, CM 115, NAD83. Color aerial photography will be supplied to the consultant for use for completing the report.

Timeline

February- Submit proposal to MVC for completing ESA's review/report for Mountain View County
March- Hiring of consultant.
March/April- Hold two public consultation meetings for input on criteria for ESA's and level of significance. Meeting locations should be held in two relatively central locations in MVC to gather input from all interested residents.
May- Overview of natural features, literature reviews, interviews, aerial photography interpretation.
June/July- Field surveys of ESA's to confirm aerial photography interpretations, literature reviews and interviews.
August- Mapping of ESA's for MVC and completion of draft report.
September- Presentation of draft report to MVC Council and public for comment and make amendments/clarification of any items
October- Presentation of final report to MVC Council and public.

Please note: The report and data collected for completing the review and report of Environmentally Significant Areas within Mountain View County is the sole property of Mountain View County.

MOUNTAIN VIEW COUNTY

EX TERRA PROSPERE EVENIT

Appendix B

Online Survey

Introduction

Summit Environmental Consultants Ltd. has been contracted by Mountain View County to determine what and where environmentally significant areas (ESAs) are in the county, and to recommend ways to manage them. Part of this process is involving you, the public, to provide input about what criteria makes an area or landscape feature significant, and ranking the significance of the ESAs. **Please read the introduction and respond to the following survey questions. Your perspective is valuable to the management of ESAs**.

Please return completed surveys using one of the following methods:

Email- er@summit-environmental.com
Fax – (403) 265-9103
Mail- #120- 1212 1st Street S.E.
Calgary, Alberta
T2G 2H8
Please call (403) 538-4763 if you have any questions about this survey.

Defining Environmentally Significant Areas:

ESAs are areas which are **vital to** the long-term maintenance of **biological diversity**, **soil or water quality**, or **other natural process**, both locally and in a regional context (Jennings & Reganold, 1991).

They are "**important**, **useful** and often **sensitive features** of the landscape…Large portions of many of Alberta's native habitats have been converted to other uses. Surface mining, forestry, agricultural, industrial and urban developments will continue to put pressure on the native species and habitats. The identification and management of ESAs is a valuable addition to the traditional socio-economic factors which have largely determined land use planning in the past. The social and economic benefits which ESAs and other natural areas provide are major and are just beginning to be recognized." (Sweetgrass Consultants Ltd. 1991)

Project objectives:

The objectives for this project are:

1. To determine what ecological characteristics the public values (i.e. criteria and level of significance for ESAs);
2. To revise/update the 1991 Sweetgrass report and mapping of the environmentally sensitive areas within Mountain View County, using aerial photograph interpretation and field survey observations (mapping to be compatible with MVC software);
3. Identifying valuable historical resources (archaeological sites); and
4. To offer guidelines for future management of the various identified ESAs and to fill data gaps.

Project methods:

For this project, ESAs will only be mapped if one km² or larger. However, the scale of mapping may be revised if a significant number of natural features less than one km² occur in the Mountain View County. Areas will be included as significant based on many criteria, which are similar to those listed in the Sweetgrass report (1991; Part 1, Section 1.0). An example of *a few* criteria used to determine if an area is considered significant includes:

- Provides habitat for rare or endangered species;
- Is representative of different habitats characteristic of each natural region in the county;
- Is a source of groundwater recharge and headwater protection for hydrological systems;
- Serves to filter air and water flows; and,
- Serves to conserve soil and protect from erosion.

The entire county will be mapped and ESAs will be identified based on criteria on aerial photos. Representative sites will be visited, as well as areas designated as significant by the public, as applicable.

Summit will go into the various ESAs identified and observe **quality** (e.g., age, forest density, plant species present), level of **disturbance** (e.g., presence of weeds, disturbed soils, development), and **function** (e.g., connection to suitable wildlife habitats, wildlife use) of each area. The ESAs will be ranked as high moderate and low significance based on quality, disturbance, function, abundance, distribution and other ranking criteria provided by the public and determined through the project process.

The project methods, including mapping, field surveys, ESA criteria and ranking will be detailed in a draft report for review in the fall of 2008. Also included will be the management recommendations for each ESA type, which will be used to aid Mountain View County land use planning.

Mountain View County – Environmentally Significant Areas Survey:

1. Do you live in Mountain View County for more than 50% of the year?
   - o YES
   - o NO

2. In what community do you live or are you closest to?
   - Carstairs
   - Bearberry
   - Cremona
   - Water Valley
   - e) Olds
   - f) Sundre
   - g) Didsbury
   - h) Other

3. How long have you been a resident in Mountain View?
   - 0-9 years
   - 10-19 years
   - 20 years or more

4. If you own land in Mountain View County, how would you classify it?
   - Residential - dwelling with little or no surrounding land (<1 acre)
   - Rural - dwelling with surrounding land (>1 acre)
   - Agricultural - cropping
   - Agricultural - rangeland
   - Timber harvest area
   - Recreational
   - Commercial
   - Other: Please Specify _____

5. Are you familiar with land-use planning initiatives in Mountain View? (Click on hyperlink to access County planning initiatives)
   - o YES
   - o NO

6. Are you familiar with the riparian fencing program in Mountain View? (Click on hyperlink to access information)
   - o YES
   - o NO

7. Which of the following wildlife (and associated habitat) do you think should be considered when defining ESAs in Mountain View County?
    - Grizzly and Black Bear
    - Elk, Deer, Moose
    - Small Mammals (e.g. voles, weasels, martin)
    - Birds of Prey (e.g. red-tailed hawk)
    - Shorebirds (e.g. sandpipers)
    - Passerine Birds (e.g. warblers)
    - Waterfowl (e.g. common merganser)
    - Amphibians (e.g. Western toad)
    - Reptiles (e.g. garter snake)
    - Other: Please Specify _____

8. The following is a list of some of the criteria or characteristics used to determine what defines an ESA in MVC (not complete list). Please add to this list as you see fit.
    - Rare and endangered species habitat
    - Wildlife movement corridors
    - Representative vegetation communities characteristic of each natural region in MVC
    - Critical habitat for sensitive wildlife life-stages
    - Protects watershed health and function
    - Steep slope
    - Aesthetically or visually important
    - Aquatic feature (wetland, stream, riparian area)
    - Provides outdoor recreation use
    - Historical site
    - Other:

_____
_____
_____
_____
_____
_____
_____

9. The following is a list of criteria to rank ESAs within MVC (high, moderate and low) and example questions as explanation. Please add to it as you see fit.
   - Function (Qs: does it provide valuable wildlife or plant habitat? does it provide connectivity between habitats?)
   - Quality (Qs: is it highly diverse? are neighbouring land uses similar?)
   - Disturbance (e.g. are there noxious weeds present? is it fragmented by roads or rights-of-way?)
   - Abundance (Qs: is this community type common or uncommon in MVC?)
   - Distribution (Qs: where does this area occur?)
   - Other:

   _____
   _____
   _____

10. On a scale of 1 to 10, with 10 being the most important, rate the following potential ESA types for how important they are to you (put a number next to named ESA type):
    - Undisturbed Native Grassland ___
    - Disturbed Grassland ___
    - Old Growth Forest (>80 years) ___
    - Deciduous forest ___
    - Conifer forest ___
    - Disturbed or Previously Logged Forest ___
    - Natural Wetland (marsh, bog, pond) ___
    - Natural Riparian Area (near a body of water) ___
    - Coulee ___
    - Disturbed Recreational Area ___
    - Other: Please Specify _____

11. Are there specific features or areas within Mountain View County (Click for map) that you would like to see listed as ESA's? Please describe them and location:

    _____
    _____
    _____
    _____
    _____
    _____
    _____

12. For those areas that will be categorized as ESA's, management recommendations will be included in the completed report. Recommendations may include:
    - Limiting or altering access,
    - Prescribing land use (agricultural, recreational, natural, sport fishing, hunting),
    - Installing fencing, or
    - Other case-specific alternatives.

    Do you have any examples of how you would like to see ESA's managed in the MVC?

    _____
    _____
    _____
    _____

13. Additional comments

    _____
    _____
    _____
    _____

14. Would you like communication updates via email? If yes, please enter your email address here:

    _____

Additional comments, questions or concerns can be emailed to mp@summit-environmental.com or er@summit-environmental.com. Thank you for taking the time to participate in this survey. Please see Mountain View County's website at http://www.mountainviewcounty.com/ for further project information and questionnaire results.

Websites linked in the questionnaire include:

- County Map available at: http://www.mountainviewcounty.com/PDF/mvcounty_map.pdf

- Land use planning initiatives available at: http://www.mountainviewcounty.com/planning.html

- Riparian Fencing powerpoint presentation – Alberta Stewardship Network available at: http://www.ab.stewardshipcanada.ca/stewardshipcanada/dynamicImages/2925_Little_Red_Deer_Watershed_Initiative.pps

References:

Sweetgrass Consultants Ltd. 1991. Environmentally Significant Areas of the County of Mountain View.

Jennings, M.D. and J.P. Reganold. 1991. Hierarchy and subsidy-stress as a theoretical basis for managing environmentally sensitive areas. Landscape and Urban Planning 21: 31-45.

Appendix C

Public Consultation May 26, 2008 Summary Memo

SUMMIT
ENVIRONMENTAL CONSULTANTS LTD.

ISO 9001 AND 14001 CERTIFIED

MEMORANDUM

DATE:	**JUNE 10, 2008**
TO:	Mountain View County c/o Lesley Lovell
FROM:	Melanie Piorecky
RE:	**PUBLIC CONSULTATION ON MAY 26, 2008**
FILE:	**7512-001.01**

On May 26, 2008, Summit Environmental Consultants Ltd. (Summit) hosted a public information meeting in Didsbury, Alberta. The meeting was on behalf of Mountain View County (MVC), to get input from the public about what they consider to be an Environmentally Significant Area (ESA) and associated levels of significance. This information will be used refine Summit's ESA criteria and significance ratings, to be applied to the entire county. For the refined ESA classification, Summit will consider the extent of natural features in MVC, public values of these features (from the public meeting and online survey) and the most up to date provincial views and legislation for riparian areas and wetlands.

Approximately 28 people attended the meeting, including five MVC council members. Information gathered at the meeting was through questions during the Summit power point presentation and a question period afterwards. Information is displayed below in the order it was received.

Q. What will be the data sources for background information gathering?

A. Summit will research all available information sources including: Alberta Natural Heritage Information Centre for rare species occurrences, Alberta Invasive Plant Council for weedy infestation occurrences, consult local biologists, MVC resources such as weed mapping, and other sources as they arise.

Q. What standards will be used for classification of ESAs?

A. ESAs will be classified according to provincial ecological community classification standards, referencing the appropriate field guides to ecosite classification for the area.

Q. Will wildlife corridors be considered?

A. Yes, functionality of ESAs will be considered, i.e. are they accessible to wildlife or close to other valuable habitats. For the purpose of retaining functioning ESAs, wildlife corridors will be considered.

Q. How much will the Sweetgrass 1991 report be used?

A. Summit will use the base mapping by Sweetgrass and add to it, as well as the general definitions used to determine what an ESA is and its ranking. The same methods of aerial photo interpretation, classification and ground verification used in Sweetgrass are being used by Summit.

Q. Why not contrast the integrity of the ESAs identified in 1991 to the integrity of those ESAs now? Why not review what has been used of the Sweetgrass report information in MVC and then commence with another ESA mapping project?

A. Contrasting past ESA mapping with ESA integrity now is outside of the scope of our contract with MVC. The Sweetgrass mapping is not in a program compatible with the MVC programs. The Summit mapping product will be in a format that is compatible with MVC map programs.

Q. Can the 1991 report be summarized for public to receive and the initial report made more accessible on the MVC website?

A. Outside of the scope of our project.

Comment. A municipal development map is available with riparian areas.

Comment. Alberta Environment is completing mapping of groundwater, aquifers and of wetlands. These components will be surveyed and mapped this summer.

Q. What about land use plans and using environmental farm plans?

A. Summit's recommendations for ESA management will consider land use plans. The environmental farm plans are private information and likely too onerous to review and fit within the scope of this project.

Comment. A member of public stated that Winchill Lakes is considered an ESA.

Comment. A member of the public recommended making the survey available on the MVC website more detailed to reflect the intent of the project.

Q. Can cumulative effects of the loss of ESAs and add information into the report as to global effects on ESAs and loss of ESAs be included in the report?

A. Cumulative and global effects of the loss of ESAs can be commented on in the final report; however an actual cumulative assessment is outside of the scope of this project.

Q. Will the information in the report be usable by the county in the future without consultation?

A. Yes. Summit will provide detailed characteristics found in ESAs, so that MVC could look at the characteristics of an area in the future to determine if is has criteria to be an ESA and its ranking.

Q. Will aquatic indicators be considered for ESAs?

A. All biophysical indicators that are relevant will be considered in ESA characterization.

Q. When will the draft be available and can it be reviewed by the public prior to finalization?

A. The draft is intended to be completed in the fall, and will be presented to MVC in October.

Q. Until when will feedback on the process be accepted?

A. The end of July.

Q. Can the power point presentation by Summit be made available online?

A. Yes. We will send it to MVC to put on MVC website.

Comment. If putting land aside as part of an ESA but there must be some incentive.

Response. Incentive for land conservation is for MVC to determine but education and awareness from this process is a valuable tool for responsible land use.

Comment. More public input should be done. Information meetings should occur in each town. The survey should be distributed through the newspaper. Random mailing of the survey should occur.

Comment. Summit/MVC should not invest a huge expense of time and energy into public consultation but should instead get the work started so they have something to work with. This is a technical document. Let Summit do their jobs.

More debate occurred that was not necessarily relevant to Summit's work.

Q. How will ESAs relate to the riparian fencing program?

A (From Lesley). The ESAs will be used by Agricultural Services as a tool to direct focus for riparian fencing energy.

Comment from council. Council will make decisions based on the ESA mapping and recommendations. The Summit document will be used as a tool.

Appendix D

ESA Criteria

The following criteria are used to determine if an area is considered environmentally significant or not. The criteria are taken from the Sweetgrass report (1991). Areas determined to meet criteria are relative to the county.

1) Hazard lands and areas which are unsafe for development in their natural state such as floodplains and steep and unstable slopes; or which pose severe constraints on types of development such as Aeolian surficial deposits and permanent wetlands;

2) Areas which perform a vital environmental, ecological or hydrological function such as a aquifer recharge;

3) Areas which contain rare or unique geological or physiographic features;

4) Areas which contain significant, rare or endangered plant or animal species;

5) Areas which are unique habitats with limited representation in the region or are a small remnant of once large habitats which have virtually disappeared;

6) Areas which contain an unusual diversity of plants and/or animal communities due to a variety of geomorphological features and microclimatic effects;

7) Areas which contain large and relatively undisturbed habitats and provide sheltered habitat for species which are intolerant of human disturbance;

8) Areas which provide an important linking function and permit the movement of wildlife over considerable distances, including migration corridors and migratory stopover points;

9) Areas that are excellent representatives of one or more ecosystems or landscapes that characterize a natural region;

10) Areas with intrinsic appeal due to widespread community interest or the presence of highly valued features or species such as game species or sport fish;

11) Areas with lengthy histories of scientific research.

Appendix E

Historical Resources Report

Arrow Archaeology Limited

Appendix F

Plant Species Observed in Mountain View County

Plant Species Observed in Mountain View County

Common Name	**Latin Name**	**Common Name**	**Latin Name**	**Common Name**	**Latin Name**
Trees		***Forbs continued***		***Forbs continued***	
White Spruce	*Picea glauca*	Meadow Larkspur	*Delphineum distichum*	Canada Golenrod	*Solidago canadensis*
Lodgepole Pine	*Pinus contorta*	Tufted Hair Grass	*Deschampsia caespitosa*	Birch-leaved spirea	*Spiraea betulifolia*
Balsam Poplar	*Populus balsamifera*	Creeping Spikerush	*Eleocharis palustris*	Marsh Hedgenettle	*Stachys palustris*
Trembling Aspen	*Populus tremuloides*	Spikerush	*Eleocharis sp.*	Longstalked Chickweed	*Stellaria longipes*
Douglas-fir	*Pseudotsuga menziesii*	Wild Rye	*Elymus ciliaris*	Green Needlegrass	*Stipa viridula*
Shrubs		Hairy Wild Rye	*Elymus innovatus*	Veiny Meadow-rue	*Thalictrum venulosum*
Saskatoon	*Amelanchier alnifolia*	Fireweed	*Epilobium angustifolium*	Golden Bean, Buffalobean	*Thermopsis rhombifolia*
Dwarf Birch, Resin Birch	*Betula glandulosa*	Common Horsetail	*Equisetum arvense*	Seaside Arrow-grass	*Triglochin maritima*
Red-osier Dogwood	*Cornus stolonifera*	Fleabane	*Erigeron sp.*	Cattail	*Typha latifolia*
Beaked Hazelnut	*Corylus cornuta*	Idaho Fescue	*Festuca idahoensis*	Wild Vetch	*Vicia americana*
Silverberry, Wolf Willow	*Elaeagnus commutata*	Fescue	*Festuca sp.*	Violet	*Viola sp.*
Creeping Juniper	*Juniperus horizontalis*	Wild Strawberry	*Fragaria virginiana*	***Invasive and Weed Species***	
Labrador tea	*Ledum groenlandacum*	Gaillardia	*Gaillardia aristata*	Quackgrass[1]	*Agropyron repens*
Twinning Honeysuckle	*Lonicera dioica*	Awned Bedstraw	*Galium aristatum*	Western Wheatgrass	*Agropyron smithii*
Bracted Honeysuckle	*Lonicera involucrate*	Northern Bedstraw	*Galium boreale*	Hair Grass, Tickle Grass	*Agrostis scabra*
Shrubby Cinquefoil	*Potentilla fruticosa*	Feltwort, Northern Gentian	*Gentianella amarella*	Red-root pigweed[1]	*Amaranthus retroflexus*
Prickly Rose, Wild Rose	*Rosa acicularis*	Wild White Geranium	*Geranium richardsonii*	Wild Oat[1]	*Avena fatua*
Wild Gooseberry	*Ribes oxyacanthoides*	Yellow Avens	*Geum aleppicum*	Wild Mustard[1]	*Brassica kaber*
	Ribes sp	Purple Avens, Water Avens	*Geum rivale*	Downy Brome[1]	*Bromus tectorum*
Sandbar Willow	*Salix exigua*	American Mannagrass	*Glyceria gracilis*	Field Chickweed[1]	*Cerastium arvense*
Willow	*Salix sp.*	Mannagrass	*Glyceria sp.*	Canada Thistle[2]	*Cirsium arvense*
Elderberry, Red Elder	*Sambucus racemosa*	Hedysarum	*Hedysarum sp.*	Narrow-leaved Hawk's-beard	*Crepis tectorum*

Canadian Buffaloberry	*Sheperdia canadensis*	Cow Parsnip	*Heracleum maximum*	Flixweed[1]	*Descurania sophia*
Snowberry	*Symphoricarpos albus*	Golden Aster, Hairy Golden Aster	*Heterotheca villosa*	Wormseed Mustard[1]	*Erysimum cheiranthoides*
Buckbrush	*Symphoricarpos occidentalis*	Mare's Tail	*Hippuris vulgaris*	Tartary Buckwheat[1]	*Fagopyrum tartaricum*
Forbs		Foxtail Barley	*Hordeum jubatum*	Hemp Nettle[1]	*Galeopsis tetrahit*
Yarrow	*Achillea milefolium*	Wire Rush, Baltic Rush	*Juncus balticus*	Cleavers[2]	*Galium aparine*
Giant Hyssop	*Agastachi foeniculum*	Rush	*Juncus sp.*	Foxtail Barley	*Hordeum jubatum*
Agrimony	*Agrimonia striata*	Sierra Pea, Purple Peavine	*Lathyrus nevadensis*	Field Scabious	*Knaitia arvensis*
Slender Wheatgrass	*Agropyron trachycaulum*	Yellow Peavine, Cream-coloured Vetch	*Lathyrus ochroleucus*	Bluebur[1]	*Lappula squarrosa*
Awned Wheatgrass	*Agropyron smithii*	Common Duckweed, Lesser Duckweed	*Lemna minor*	Common Peppergrass	*Lepidium densiflorum*
Anemone	*Anemone sp.*	Twinflower	*Linnaea borealis*	Toadflax[2]	*Linaria vulgaris*
Canada Anemone	*Anemone canadensis*	Wild Lily-of-the-valley	*Maianthemum canadense*	Round-leaved Mallow[1]	*Malva rotundifolia*
Cut-leaved Anemone, Windflower	*Anemone multifida*	Star-flowered Solomon's-seal	*Maianthemum stellatum*	Alfalfa	*Medicago sativa*
Small-leaved Everlasting	*Antennaria microphylla*	Tall Lungwort, Bluebell	*Mertensia paniculata*	White Sweet Clover	*Melilotus alba*
Common Bearberry, Kinnikinnick	*Arctostaphylos uva-ursi*	Northern Rice Grass	*Oryzopsis asperifolia*	Yello Sweet Clover	*Melilotus officinalis*
Sagebrush	*Artemisia cana*	Blunt-fruited Sweet-Cicely	*Osmorhiza depauperata*	Timothy	*Phleum pratense*
Pasture Sagewort	*Artemesia frigida*	Palmate-leaved Coltsfoot	*Petasites palmatus*	Common Plantain	*Plantago major*
Prairie Sagewort	*Artemesia ludoviciana*	Arrow-leaved Coltsfoot	*Petasites sagittatus*	Fowl Bluegrass	*Poa palustris*
Showy Aster	*Aster conspicuus*	Reed	*Phragmites australis*	Wild Buckwheat[1]	*Polygonum convolvulus*
Vetch	*Astragalus sp.*	Kentucky Bluegrass	*Poa pratensis*	Rough Cinquefoil[1]	*Potentilla norvegica*
Rattlesnake Fern	*Botrychium virginianum*	Sandberg Bluegrass	*Poa sandbergii*	Tall Buttercup[2]	*Ranunculus acris*
Awnless Brome, Smooth Brome	*Bromus inermis*	Canby Blue grass	*Poa secunda*	Wild Radish[1]	*Raphanus raphanistrum*
Fringed Brome	*Bromus ciliatus*	Bluegrass	*Poa sp.*	Curled Dock	*Rumex crispus*
Marsh Reed Grass, Bluejoint	*Calamagrostis canadensis*	Bistort	*Polygonum viviparum*	Russian Thistle[1]	*Salsola kali*
Harebell	*Campanula rotundifolia*	Pondweed	*Potamageton sp.*	Green Foxtail[1]	*Setaria viridis*
Water Sedge	*Carex aquatilis*	Silverweed	*Potentilla anserina*	Bladder Campion[2]	*Silene cucubalus*

Slender-beaked Sedge	*Carex athrostachya*	Slender Cinquefoil	*Potentilla gracilis*	White Cockle	*Silene pratensis*
Sartwell's Sedge	*Carex sartwellii*	Prairie Cinquefoil	*Potentilla pensylvanica*	White Campion	*Silene latifolia*
Hay Sedge	*Carex siccata*	Common Pink Wintergreen	*Pyrola asarifolia*	Annual Sow Thistle[1]	*Sonchus olaraceus*
Sedge	*Carex sp.*	Cursed Crowfoot	*Ranunculus scleratus*	Corn Spurry[1]	*Spergula arvensis*
Bear Sedge, Beaked Sedge	*Carex utriculata*	Dewberry, Running Raspberry	*Rubus pubescens*	Common Chickweed[1]	*Stellaria media*
Nodding Chickweed	*Cerastium nutans*	Arrowhead, Wapato	*Sagittaria cuneata*	Common Tansy[2]	*Tanacetum vulgare*
Spotted Water-hemlock	*Cicuta douglasii*	Snakeroot	*Sanicula marilandica*	Dandelion[1]	*Taraxacum officinale*
Clematis	*Clematis sp.*	False melic	*Schizachne purpurascens*	Stinkweed[1]	*Thlapsi arvense*
Bastard Toadflax	*Comandra umbellata*	Bulrush	*Scirpus sp.*	Goat's-beard	*Tragopogon dubius*
Bunchberry	*Cornus canadensis*	Balsam Ragwort	*Senecio pauperculus*	Alsike Clover	*Trifolium hybridum*
Orchard Grass	*Dactylis glomerata*	Blue-eyed Grass	*Sisyrinchium montanum*	White Clover	*Trifolium repens*

1 Nuisance Weed
2 Noxious Weed

Appendix G

ESA's in Mountain View County, 2008

Appendix H

Legal Tools for Municipalities to Conserve Environmentally Sensitive Areas

LEGAL TOOLS FOR MUNICIPALITIES TO CONSERVE ENVIRONMENTALLY SENSITIVE AREAS

(Adapted by City of Calgary from Kwasniak, A. 2001. *Alberta Wetlands – A Legal & Policy Guide.* Environmental Law Centre and Ducks Unlimited Canada.)

Note: This is a general summary of some of the tools available for conservation. Not all of these mechanisms may be applicable or appropriate to the protection of riparian areas or other environmentally significant lands.

Tool	Advantages	Disadvantages	Notes
Administrative and Planning Tools			
Municipal Reserve	• May be required by the subdivision authority as a condition for subdivision • Simple • Not costly to municipality	• Is only triggered by an application for subdivision • Amount of land is limited by ss. 666 and 668 of *Municipal Government Act*	• Priority generally given school sites, neighbourhood parks and other open space needs (see *Open Space Plan*)
Environmental Reserve	• May be required by the subdivision authority as a condition for subdivision • High degree of protection • Simple, difficult to undo • Not costly to municipality	• Is only triggered by an application for subdivision • Must comply with s. 664(1) of MGA so does not apply to all environmentally sensitive land	•
Environmental Reserve Easement	• If the owner and city agree can replace the environmental reserve • High degree of protection • Simple • Flexible • Not costly to municipality	• Is only triggered by an application for subdivision • Costly to the proponent as the easement is granted without compensation • Must comply with s. 664 of MGA so does not apply to all environmentally sensitive land	• Environmental reserve easement is dedicated without compensation • Title stays in name of proponent
Natural Area Land Use Designation under Land Use Bylaw of City and other exercising of municipal authority involving down-zoning to regulate land use	• Uses the City Land Use Bylaw and zoning powers • Simple, flexible • Binds future owners unless changed by City • If a legitimate use of zoning powers no compensation is payable	• May be politically • Requires the definition of new land use category • Can be changed by City • Down-zoning must be in pursuit of long-term planning objectives	• See s. 640 of *Municipal Government Act* • Case law has shown that there is ample scope to down-zone land for protection of environment without having to pay any compensation. See F. Laux, *Planning Law and Practice in Alberta*, Second Edition, Chapter 8.

Tool	Advantages	Disadvantages	Notes
Conservation Easements			
Sale of Conservation Easement to City, other government, ENGO[1].	• Simple, Flexible protection • Binds future owners • Less costly than sale of land itself • City does not bear responsibility for management if Cons. Easement granted to a third party • Terms of the agreement can be modified by agreement	• Voluntary • Costly to recipient • Easement must fit within purpose set out in the *Environmental Protection and Enhancement Act* (EPEA) • Easement can be terminated by agreement or by the Minister of Environment	• The City, Alberta or government agencies qualify to accept a grant of a conservation easement. • ENGO must be a qualified organization as set out in the EPEA
Gift of Conservation Easement to City or other organisation	• Simple, flexible • High degree of protection • Binds future owners • Tax benefits, esp. if deemed an ecological gift • Less costly than sale of land itself • Terms can be modified by agreement • City does not bear responsibility for management if granted to a third party	• Voluntary • Easement must fit within a purpose set out in EPEA • For best tax benefits must qualify as an ecological gift • Costly to land owner	• An ecological gift can be an easement if certified by the Minister of the Environment to be ecologically sensitive • ENGO must be a qualified organization as set out in the EPEA
Donation/Sale of property for park establishment			
Sale to the City/ENGO	• Simple, flexible protection • High degree of protection possible • City does not bear responsibility for management if sold to a third party • Less costly to City and proponent	• Costly for the City/ENGO • Owner must be willing to sell • Does not bind future owners • Development still possible	
Gift to City/ENGO	• Simple, flexible protection • Tax benefits • Could be an ecological gift • City does not bear responsibility for management if donated to a third party • Less costly to City and proponent	• Potentially costly to Owner • Land owner must be willing to give the land • For best tax benefits must qualify as an ecological gift •	• An ecological gift must be land that is certified by the federal Minister of the Environment to be ecologically sensitive land. •
Personal, term and common law partial interests			
Voluntary action by owner to refrain from or limit development	• Simple	• Easy to undo owners • Expensive to land owner • Limited protection	

[1] Environmental Non-government Organisation

Tool	Advantages	Disadvantages	Notes
Lease to City, or other party	• Simple, flexible • Unlikely to be undone during term of lease • City carries out monitoring, upkeep and enforcement • City does not bear responsibility for management if leased to a third party • Less costly to City and proponent	• Could be costly to City, or third party • Leases usually must be of an entire parcel and not to part of a parcel • Land owner must be willing to lease land • No protection after term expires	• Must be registered at Land Titles if for over three years in order to bind future purchasers
License to City or ENGO	• Owner could give a license to enter onto land to carry out a conservation program	• Is not an interest in land, so does not bind future purchasers • Could be costly to City or ENGO • No protection after term expires	
Profit à Prendre to City or ENGO (right to enter onto land and take some "profit" of the soil)	• Owner could give City or ENGO exclusive right to trees or other vegetation—no one else may remove vegetation • City/ENGO carries out monitoring, upkeep and enforcement • High degree of protection if rights not exercised • Could be for a term or granted in perpetuity	• Could be costly to City/ENGO to purchase right • Conservation goal only realized if City/ENGO chooses not to exercise right • Land owner must be willing to sell a profit à prendre	• Profits à prendre are interests in land and bind subsequent purchasers if registered on title
Common law Easement from owner regarding neighbouring land	• Binds future owners • May contain positive or negative covenants • Less expensive than sale of land itself • Could be for a term or be granted in perpetuity	• Easement on a parcel (servient tenement) must benefit another land (dominant tenement) • Can be undone by owner of the dominant tenement	• See ss.71 & 72 of *Land Titles Act*
Restrictive Covenant regarding neighbouring land	• Binds future owners • Less expensive than sale of land itself • Could be for a term or granted in perpetuity	• Restriction on one parcel (servient tenement) must benefit another parcel (dominant tenement) • Covenants can only be negative and not positive • Can be undone by owner of dominant tenement • Can be removed by the Court in the public interest	• See s. 52 of *Land Titles Act*

Tool	Advantages	Disadvantages	Notes
Park Designation			
Sale to federal government for park dedication[2]	• High degree of protection • Difficult to undo • Flexible protection • Federal government responsible for monitoring, upkeep and enforcement • Tax benefits if a gift of capital property • Could be an ecological gift	• Dependent on action from the federal government • Provincial government must agree • Costly to the federal government • Difficult to meet criteria	• See the *Canada National Parks Act*, the *Migratory Birds Convention Act*, the *Canada Wildlife Act*
Sale to provincial government as a park[3]	• Varying degrees of protection depending on designation • Some designations are difficult to undo • Flexible protection • Provincial government carries out monitoring, upkeep and enforcement • less costly to City and proponent	• Dependent on action from the provincial government • Costly to the provincial government • Difficult to meet criteria	• See the *Wilderness Areas, Ecological Reserves and Natural Areas Act*, the *Provincial Parks Act* and the *Wildlife Act*

[2] Could be designated as a national park, park reserve, national historic site, migratory bird sanctuary or national wildlife area
[3] Could be designated as a provincial park, wildlands park, recreation area, ecological reserve, natural area, wilderness area or wildlife sanctuary