PROTECTED AREA REPRESENTATION GAP ANALYSIS

Spray Lake Sawmills FMA/B9 Areas

Prepared for:

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March, 2013

EXECUTIVE SUMMARY

This report presents a protected area gap analysis for the Spray Lake Sawmills FMA/B9 Quota area, as required for Forest Stewardship Council (FSC) certification. The analysis follows standard scientific approaches for representation gap analysis used by the Secretariat for the Convention on Biological Diversity (CBD) and World Wildlife Fund. The approach compared the distribution of key biodiversity areas with the distribution of protected areas, as a means of finding where important elements of biodiversity (i.e. habitat, ecosystems) remained unprotected or under-protected. Natural Subregions were used as a coarse-filter surrogate for landscape, community and species-level biodiversity in the SLS FMA/B9 Quota area. Alberta Tourism, Parks and Recreation protected areas targets were used as benchmarks for achieving Natural Subregion protected area goals.

The FMA comprises portions of five Natural Subregions (from lower to higher elevation) - Montane, Lower Foothills, Upper Foothills, Subalpine and Alpine. Lower elevation lands in the Montane and Lower Foothills subregions support disproportionately higher levels of vegetation composition, structure (vertical and horizontal) and vertebrate wildlife diversity than do the Upper Foothills, Subalpine and Alpine natural regions.

Protected areas are withdrawn from FMAs in the province of Alberta. Therefore, formally protected lands do not currently occur in the FMA. Although, a large amount of protected area, primarily in the form of Wildland Provincial Parks (WPP) and Provincial Parks (PP) (Don Getty WPP, Elbow-Sheep WPP, Bluerock WPP, Sheep River PP), occurs immediately adjacent to the FMA. More than 188 km^2 of currently protected lands were former timber quota lands voluntarily contributed by SLS to the Crown for the purpose of protecting lower elevation Foothills landscapes. Protected areas (including Candidate Conservation Management Areas from the South Saskatchewan River Basin planning process) are abundant in the FMA and region for the Alpine, Subalpine and Montane subregions. Provincial targets for these three subregions have been exceeded. No further protected areas are recommended for the SLS FMA/B9 Quota area.

Protected areas within the Foothills Natural Region are under-represented in the province. The Lower Foothills subregion is more biologically diverse than the Upper Foothills and as such, is of higher priority for protection. Existing, provincially designated ESA's in the Foothills Natural Region, should be prioritized for assessing potential protected area candidates. The Red Deer River portion, of nationally significant ESA #20 occurs in the northern portion of the FMA and crosses mainly Lower Foothills lands, with some Upper Foothills. This ESA (or portions thereof) offers potential as a protected areas candidate for Foothills habitats in the FMA.

Spray Lake Sawmills' goal is to assess the region for representative samples of Lower and Upper Foothills landscapes as candidates for protection. Information from this gap analysis and the HCVF report (Kansas and Kelly 2011) will be used in this process. SLS will seek input from First Nations, government, commercial interests, disposition holders, NGO stakeholders and the public in assessing the FMA and surrounding region for new candidate protected areas to meet its proportionate share of provincial protected area targets in the Foothills Natural Region.

ACKNOWLEDGMENTS

Jason Mogilefsky, Stewardship Forester, and Ed Kulcsar Woodlands Manager for Spray Lake Sawmills provided ideas, guidance and research. Glen Dunsworth offered sage advice on FSC certification requirements. Kim McNeil of Tesera Systems Inc. and Jordan Dyck of Spray Lake Sawmills conducted GIS mapping. Thanks to all!

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1.0 INTRODUCTION

1.1 Background

Spray Lake Sawmills (1980) Ltd. (SLS) is pursuing Forest Stewardship Council (FSC) forest management certification for the SLS Forest Management Agreement Area (FMA) and B9 Quota area. SLS is currently being audited to the FSC's National Boreal Standard (FSC Canada 2004). In May 2012, an independent FSC accredited certification body submitted a Forest Management Certification Assessment report (Rainforest Alliance - SmartWood 2012). The report presented an evaluation of the ecological, economic and social performance of Spray Lake Sawmills Ltd. as defined by the Forest Stewardship Council. Discrepancies or gaps were identified between some aspects of SLS's management system and one or more of the requirements of the forest stewardship standard, resulting in non-conformance reports (NCR). The assessment team differentiated between major and minor non conformances depending on the severity of the non-conformance. Major non conformances must be corrected before the certificate can be issued. Minor non-conformances do not prohibit issuing the certificate, but they must be addressed within the given timeframe to maintain the certificate.

Principle 6 (Environmental Impact) of FSC's National Boreal Standard calls for forest management that conserves biological diversity and its associated values. Criteria 6.4 of Principle 6 requires the applicant "*.....to protect representative samples of existing ecosystems within the landscape in their natural state and to record these ecosystems on maps, appropriate to the scale and intensity of operations and the uniqueness of the affected resources*" (FSC Canada 2004). Indicator 6.4.1 of Criteria 6.4 requires that "*.....the applicant completes (or makes use of) a peer-reviewed gap analysis to address the need for protected areas in the eco-region(s) and ecodistrict(s) in which the forest is situated*". A major NCR (04/12) was issued to SLS pertaining to Indicator 6.4.1, with the rationale being that "*....SLS has not completed a peer-reviewed scientific gap analysis and has not used the gap analysis and other HCVF attributes to locate additional protected areas.*" This report constitutes SLS's corrective actions to demonstrate conformance with the requirement(s) referenced above.

1.2 Objectives

- Summarize concepts and approaches for protected area representation gap analysis;
- Review the history and current status of key biodiversity elements and protected areas within and surrounding the SLS FMA and B9 Quota areas;
- Identify gaps in protection of important elements of biodiversity in the SLS FMA and B9 Quota areas and region.
- Determine if the current and additional protected areas in the SLS's management areas contribute to long-term protection of biodiversity and that these protected areas tie into a landscape-level network.
- Develop a process for selection of candidate protected areas including feasibility assessment, securement/agreement and compliance with existing regulatory process.

2.0 PROTECTED AREA GAP ANALYSIS - CONCEPTS AND APPROACHES

Gap analysis is a land planning approach, that assesses the comprehensiveness of existing protected areas networks and identifies underrepresented elements of biological diversity (Scott et al. 1993; Flather et al. 1997). Gap analysis methodologies grew out of a concern for nationally and globally declining biological diversity (Scott et al. 1987; CBD 1992; Lawton and May 1995), combined with general scientific acceptance that protected areas offered the most effective tool for safeguarding biodiversity through limiting habitat loss (Soule 1991, Balmford et al. 1995; Margules and Pressey 2000; Bruner et al. 2001). In its simplest form, gap analysis entails comparing the distribution of key biodiversity areas with the distribution of protected areas and finding where important elements of biodiversity (i.e. habitat, ecosystems) remain unprotected or under-protected (Dudley and Parrish 2006).

Gap analysis is completed at a number of different scales depending largely on the jurisdiction in question. Most gap analysis to date has been conducted for large land areas including at global (Rodrigues et al. 2004), national (Jennings 2000; Iacobelli et al. 2006; Dudley and Parish 2006;), state/provincial (Lowry et al. 2007), and regional (Davis et al. 1995; Stoms et al. 1998) scales. Gap analysis is less commonly completed at the scale of an administratively delineated land management concession (Dudley and Parish 2006) such as the SLS FMA.

Gap analysis methods can range from simple descriptive or matrix (i.e. map-less) comparisons of biodiversity and protected areas distribution to spatially explicit digital overlays backed by algorithms to select optimum protected areas networks. The level of sophistication of the intended gap analysis is influenced by the quantity and quality of existing biodiversity data, scale of assessment, and understanding of the responses of species, ecosystems and landscapes to human land uses.

Contemporary approaches to protected area gap analysis generally require the identification and mapping of biodiversity elements against which protected areas distribution can be compared. A variety of biodiversity elements can and have been used for gap analysis including: focal species, habitat types of key wildlife species, vegetation alliances, ecological land units, and enduring features (landforms) (Jennings 2000; Iacobelli et al. 2006). Although the ultimate goal is to preserve individual species, most gap analyses are of the coarse-filter variety and use surrogates of species-level biodiversity such as representative landscapes/ecosystem types, enduring features, or focal species/assemblages. This is because detailed knowledge of the status, distribution and trend of all species is not available in most regions (Margules and Pressey 2000; Higgins et al. 2004).

3.0 HISTORY OF GAP ANALYSIS IN THE SLS FMA/B9 REGION

3.1 Province of Alberta Protected Areas Approach

The Government of Alberta, Tourism, Parks, and Recreation (TPR) has created a network of parks and protected areas which are assigned different land classifications providing varying degrees of protection. These areas are referred to as a 'spectrum of sites' that allow for a range of activity from preservation to developed recreation sites. The purpose of these protected lands is to preserve the natural landscapes, features, and processes that represent the province's environmental diversity (Koch 2011). Gap analysis as part of the Special Places 2000 program was used to identify and select candidate protected areas. An example is the report by GAIA (1996) which used enduring features gap analysis (Kavanagh and Iacobelli 1995) to identify and select a number of candidates for protection in the Foothills Natural Region of Alberta.

Alberta TPR uses Natural Subregions as their framework for protection. Area-based protection targets range from 1.3% (Mixedgrass subregion) to 7.1% (Montane subregion) and average 2.7% for the 16 Natural Subregions. In the SLS FMA/B9 region provincial targets for Natural Subregion protection range from a low of 2.5% in the Lower Foothills to a high of 7.1% in the Montane. Targets for protection vary widely between jurisdictions. For example, IUCN The World Conservation Union has suggested that countries set aside at least 10 per cent of their terrestrial area into protected areas, British Columbia targets 12%, whereas Mongolia targets 30% protection nationally.

3.2 SLS Participation in Special Places 2000

SLS participated on the Special Places 2000 Provincial Coordinating Committee and fully supported the establishment of The Sheep River Provincial Park and Bluerock, Wildland Provincial Parks. The Special Places 2000 Committee was the result of the World Wildlife Fund Canada's Endangered Spaces Campaign launched in 1989. The purpose of this campaign was to create protected area networks to maintain biological diversity in Canada.

In 1996, GAIA Environmental completed a Gap analysis of the Foothills Natural Region for the World Wildlife Fund Canada to be used by the Special Places Committee, to fill ecological gaps in the provincial protected areas network. The GAIA report (GAIA 1996) focused specifically on identifying gaps within the Foothills Natural Region of Alberta. Specific study objectives of the GAIA report included:…."*an assessment of representation of ecological diversity in the Foothills Natural Region, through a gap analysis of enduring features; an evaluation of the adequacy of enduring feature representation; and the development of recommendations regarding candidate site boundaries and sizes, and their adequacy in securing long-term conservation of biological diversity in the Foothills Natural Region."*

After GAIA reviewed the entire Alberta foothills ecoregion, 14 areas were recommended for formal protection. The Sheep River area, located within the SLS timber quota, was the only area identified meeting the study objectives near the FMA. Prior to park establishment in 2001, the Sheep River and Bluerock Wildland Provincial Parks were identified in the Provincial Integrated Resource Plan (IRP) as "permanent timber land base".

The GAIA report identified 5,045 hectares of land be included into a regulated protected area. As part of the establishment of the FMA, 18,889 hectares of SLS timber quota areas were voluntarily contributed by SLS and incorporated in to the Sheep River Provincial Park and Bluerock, Wildland Provincial Parks. In 2001, SLS received a plaque in recognition from the Minister of Environmental Protection of Alberta for its participation and contribution to the provincial protected areas network.

In 2006, the government of Alberta changed the ecological classification of approximately 114 km^2 of the Sheep River Provincial Park and Bluerock, Wildland Provincial Parks, originally classified as Foothills Natural Region to Montane. Prior to the classification change the FMA area had a surplus of Foothills Natural region in Protected Areas. Due to the classification change, the FMA area now has surplus of Montane Natural Region and a deficit of Foothills Natural Region in protected areas.

3.3 Ongoing Protected Area Participation

SLS participated on the 18 member South Saskatchewan Regional Advisory Council (RAC) from June of 2010 through December of 2011. The purpose of the RAC was to provide advice to the Alberta government on future resource management plans for the South Saskatchewan Region. As part of that work, the RAC nominated, 9 Candidate Conservation Management Areas using gap analysis methods. Two of the Candidate Conservation Management Areas, the Ghost and the Elbow/Highwood/Kananaskis Fooothills, have been identified as potential protected areas within and immediately adjacent to the SLS's FMA.

SLS is deferring management activities in the proposed conservation management areas and will support protected area designation as agreement is reached with all stakeholders, the public and the government of Alberta.

The government completed public and stakeholder consultation for plan awareness and input in January of 2010 and received feedback on the Regional Advisory Council advice, in December of 2012. The next step, involves the government planning team, reviewing public and stakeholder information and the RAC advice, to complete a draft regional plan. The government is estimating the draft South Saskatchewan Region Plan will be available for public and stakeholder review by the fall of 2013.

4.0 CURRENT GAP ANALYSIS FOR SPRAY LAKES FMA/B9 REGION

The gap analysis for SLS FMA and B9 Quota follows 7 steps guided by recent scientific literature. These steps are adopted mainly from the Secretariat of the Convention on Biological Diversity, which published a guide to gap analysis for protected areas networks (Dudley and Parish 2006). The approach also follows principles outlined in the WWF's landscape based approach to gap analysis (Iacobelli et al. 2006). The WWF approach is a coarse-scale, landscape-based assessment of ecological representation wherein spatial units delineated by landform and climate are used as surrogates for biological diversity at multiple scales. Both of the above-mentioned approaches are designed for national-level gap analysis. Because the SLS gap analysis is for a much smaller and administratively-based jurisdiction, we've added an initial step designed to clarify the geographic context and scale of the assessment.

Step #1	Determine the gap analysis landscape scope and scale.
Step #2	Identify focal biodiversity and set key targets.
Step #3	Evaluate and map occurrence and status of biodiversity.
Step #4	Analyse and map the occurrence and status of protected areas.
Step #5	Use the information to identify gaps.
Step #6	Prioritise gaps to be filled.
Step #7	Develop a strategy and take action.

In the next several sections of this report, each of the above steps will be completed using biodiversity information and evidence from the recent High Conservation Value Forest (HCVF) report by Kansas and Kelly (2011), and protected areas information from a review of protected areas and gap analysis in the SLS FMA by Koch (2011). This analysis also takes into account past, present and future gap analysis studies as summarized in Section 3.0 above.

4.1 Step #1: Gap Analysis Scope and Scale

The SLS FMA and B9 Quota areas are based on administrative (as opposed to ecological) boundaries as dictated by timber harvest management agreements. The FMA extends in a narrow band from Sundre in the north to the southern end of Kananaskis Country. Total area of the gross land base is 3,374 km^2 of which a maximum of 2,232 km^2 is subject to timber harvest. The assigned timber management areas are discontinuous from north to south with significant breaks in the FMA along the Bow River (20-km) and Sheep River (10-km) valleys (Figure 1). The boundaries of the FMA/B9 Quota intersect Alberta Natural Region and Subregions in a somewhat 'haphazard' manner (Figure 2).

Dudley and Parish (2006) contend that *".....protected areas should never be regarded as separate from the wider landscape*"....and that "*...protected areas should be integrated into wider management systems, to ensure both the long-term survival of the biodiversity contained within the protected area....*". For the above reason and for the purpose of meeting size criteria for large landscape-level forest criteria of the FSC Boreal Standard, SLS designated a larger regional area for landscape-level gap analysis purposes. Figure 2 illustrates this region and its relationship with the SLS FMA and Alberta Natural Regions and Subregions. This expanded regional assessment area (RAA) is 7,863 km^2 in size.

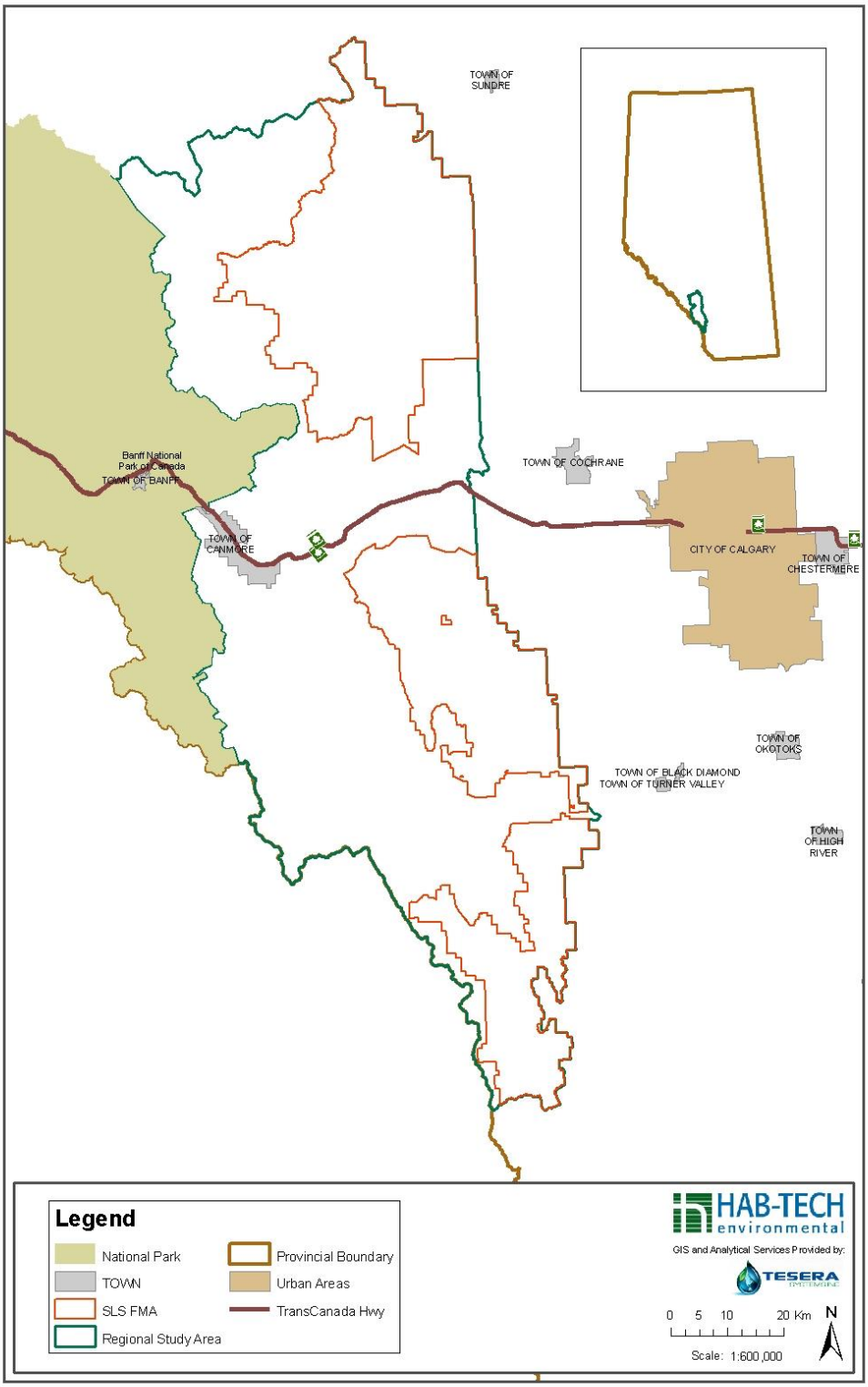

Figure 1. Spray Lake Sawmills Ltd. Forest Management Area.

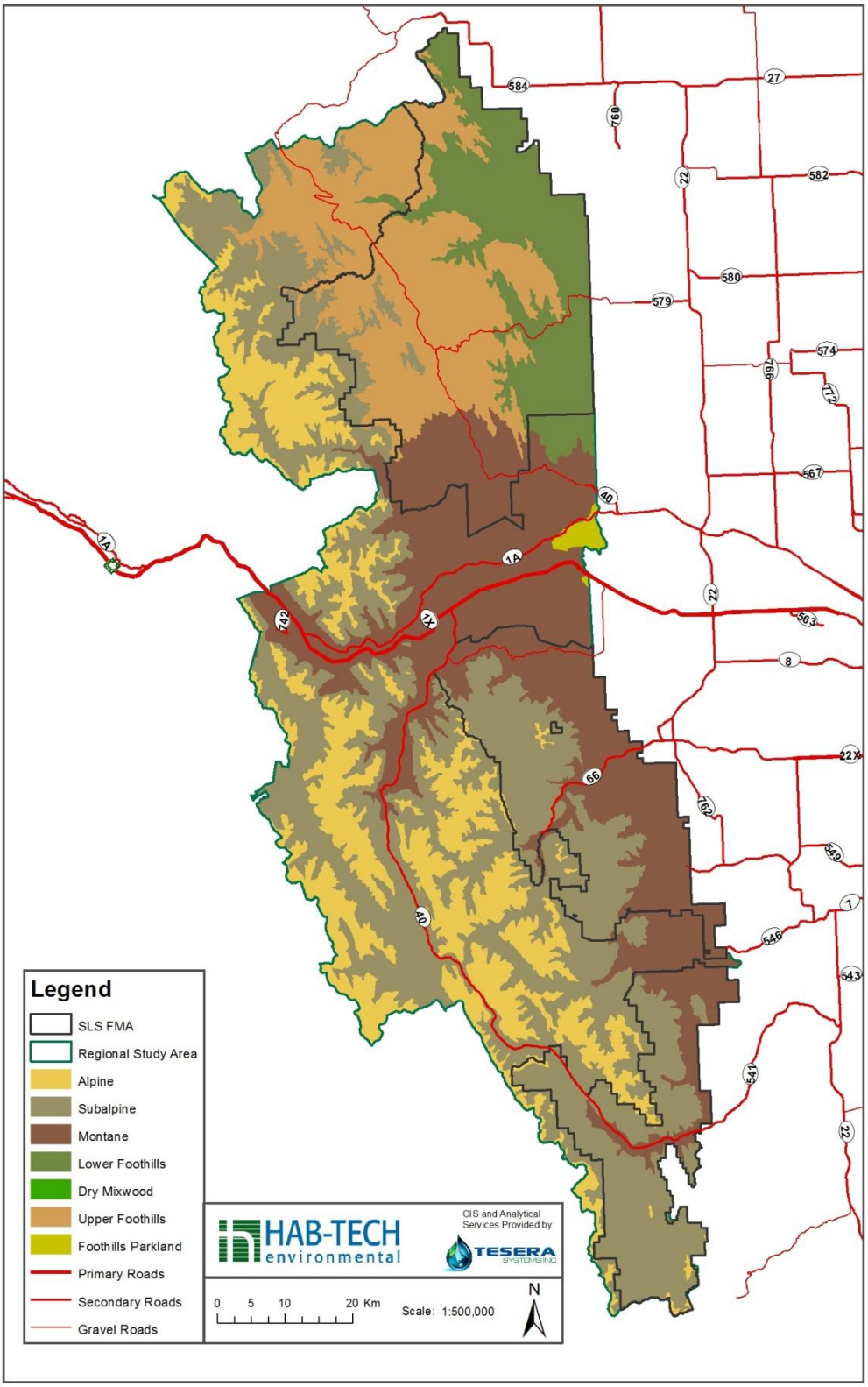

Figure 2. SLS Regional Gap Analysis Area and Natural Subregions.

Natural Subregion representation in the RAA/FMA include (in descending order of land area): Subalpine (35.7%/33.7%), Montane (24.6%/21.6%), Alpine (16.1%/0.6%), Upper Foothills (14.4%/22.3%), Lower Foothills (8.8%/18.8%). Negligible areas of Boreal Mixedwood (<0.1%) and Foothills Parkland (0.4%) also occur in the FMA but not in the RAA. As such these subregions are not included as part of the gap analysis.

4.2 Step #2: Identification of Focal Biodiversity Indicators/Targets

Natural Subregions will serve as the key biodiversity indicator at the provincial (Alberta) and regional (FMA region) scales, consistent with Alberta government and WWF methodology (GAIA 1996; Iacobelli et al. 2006). Natural Subregions are used as a coarse-filter surrogate for landscape, community and species-level biodiversity in the SLS FMA/B9 Quota area. Provincial targets associated with this indicator are based on the Level 1 Natural History theme targets at the provincial scale. Alberta Provincial Natural Subregion targets, while relatively low when compared to most jurisdictions, were selected because they have the greatest chance of achieving legal protected status. Details on biodiversity indicators and targets are discussed in Sections 4.3 and 4.5.

4.3 Step #3: Evaluate and Map Biodiversity

Figure 2 shows the distribution of Natural Regions and Subregions in the SLS FMA/B9 Quota area and adjacent regional area. The FMA lies within the Front Ranges and foothills of the eastern slopes of the Rocky Mountains. Elevations increase from east to west in the study region, with lowest elevations occurring in the Montane and Lower Foothills subregions, intermediate elevations in the Upper Foothills subregion, and highest elevations in the Subalpine and Alpine subregions. The representation of deciduous and mixedwood forest cover types generally decline as elevations increase.

Plant species richness, vegetation structural diversity, landscape level diversity, and vertebrate wildlife species richness are all highest in the lower elevation portions of the FMA (Collister and Kansas 2003; SLS 2006; Kansas and Kelly 2011), largely in association with mixedwood, deciduous and riparian forests. Riparian mixedwood forest, shallow marsh wetlands, old growth deciduous forests, upland grasslands, and old growth conifer forests were identified as ecosystem-level, High Conservation Value Forest attributes because of their regional uniqueness/rarity and their floristic, structural and vertebrate species at risk diversity (Kansas and Kelly 2011). The distribution of these habitat types are shown in the Figures 3 and 4.

A disproportionate amount of the biodiversity-rich ecosystems occur in the Montane and Lower Foothills Natural subregions and along major river and creek valleys (e,g, Highwood, Sheep, Elbow, Jumpingpound, Ghost and Red Deer). Ecologically-sensitive management and protection of lower elevation lands in the Montane and Lower Foothills subregions near the eastern boundary of the FMA/B9 Quota is important to maintain and conserve long-term biological diversity in the FMA (Kansas and Kelly 2011).

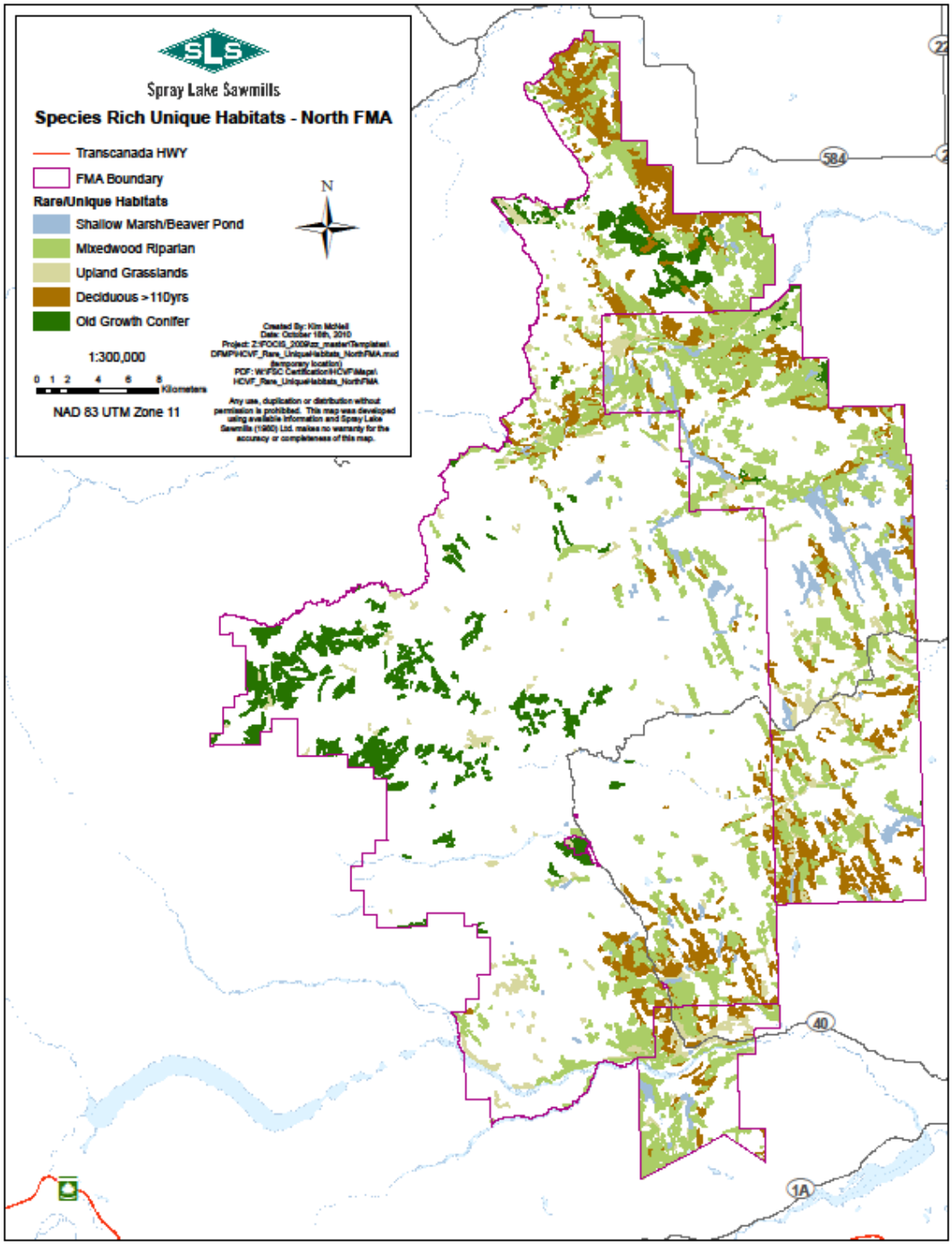

Figure 3. Species rich and uncommon habitat types in the FMA-North

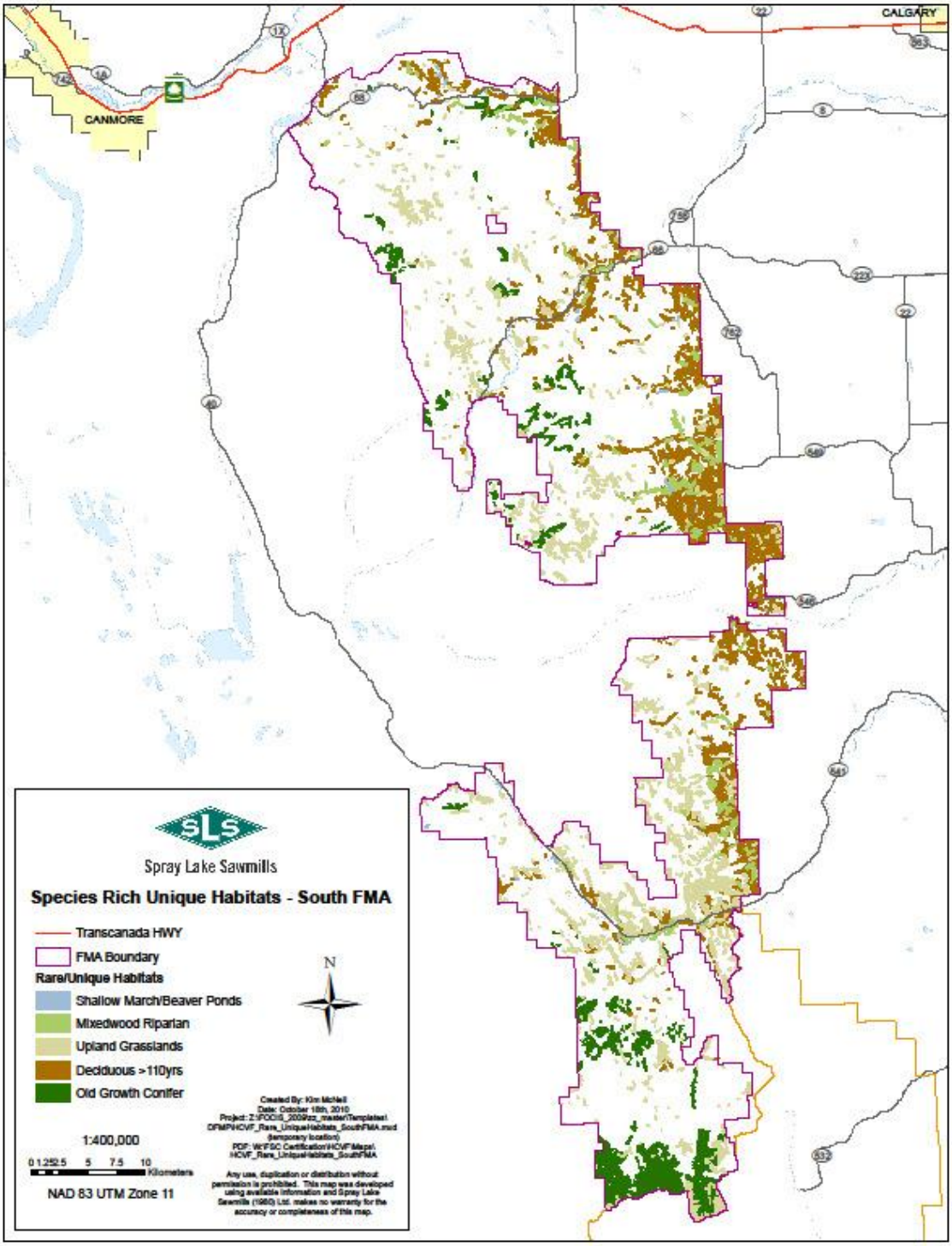

Figure 4. Species rich and uncommon habitat types in the FMA-South

4.4 Step #4: Existing Occurrence/Status of Protected Areas

Figure 5 shows the distribution of currently protected areas within the regional vicinity of the SLS FMA/B9 Quota. Protected areas are withdrawn from FMA's in the province of Alberta. Therefore, formally protected lands do not occur within the FMA. Although a large amount of protected area, primarily in the form of Wildland Provincial Parks (WPP) and Provincial Parks (PP) (Don Getty WPP, Elbow-Sheep WPP, Bluerock WPP, Sheep River PP), occurs immediately adjacent to the FMA. The majority of protected land occurs at higher elevations west of the FMA in a mosaic of Subalpine and Alpine subregional lands in the Elbow-Sheep WPP and Don Getty WPP.

Relatively large patches of protected land also occur along the Sheep River and Bow River valleys in what is now mapped as the Montane Natural Subregion. Industrial activity does not occur in PPs or WPPs. Although backcountry recreation is common, these areas are wilderness in nature and offer a level of protection commensurate with Level II of the IUCN classification of protected areas management (IUCN 1994; Dudley and Parish 2006).

4.5 Step #5: Protected Area Gap Identification

This section of the report identifies current status and gaps in protected areas coverage in the SLS FMA. Natural Subregion representation is used as a coarse-filter surrogate for landscape, ecosystem and species level biodiversity (Section 4.3). Table 1 provides a summary of the land area supply of provincial protected area targets by Natural Subregion in the FMA and RAA. It also identifies protected area gaps by Natural Subregion in the FMA and summarizes SLS's historic protected area contributions including South Saskatchewan River planning framework conservation management area candidates, and passive landbase in the FMA (permanent retention).

4.5.1 Rocky Mountain Natural Region

The Rocky Mountain Natural Region comprises three subregions based on elevation, topography and vegetation characteristics. These include (at increasing elevations) Montane, Subalpine and Alpine.

4.5.1.1 Montane Subregion

The Montane Subregion occupies 8,768 km^2 (1.3%) of the province of Alberta. The Alberta government targeted 620 km^2 (7.1%) of the Montane's 4 Level 1 Natural History themes for protection. All of the targets for Montane subregion protection have been reached in the form of 26 parks and protected areas (Koch 2011). No gaps in protected areas coverage occur at the provincial scale for the Montane subregion, based on Alberta Tourism, Recreation and Parks targets.

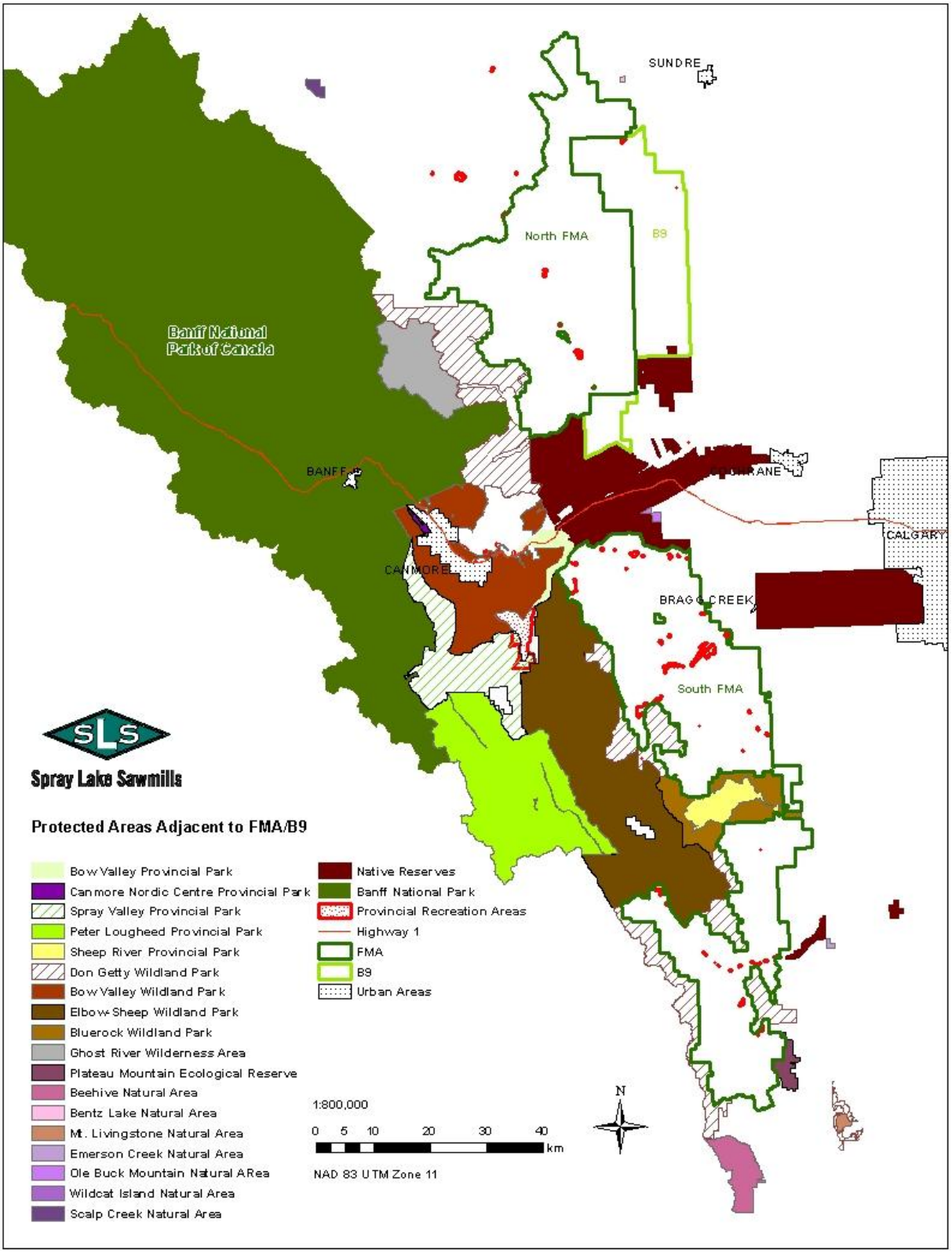

Figure 5. Protected Areas within and Adjacent to the SLS FMA/B9 Quota

Table 1. Protected Area Coverage and Targets in Alberta and SLS FMA/B9 Quota, by Natural Subregion.

Natural Subregion	Land Area Supply in Province	Land Area Supply in RAA	Land Area Supply in FMA	% Provincial Supply in FMA	Provincial Protected Area Targets	Provincial Target Met?	Protected Areas in RAA	Protected Areas in FMA	SSRP Candidate Protected Areas	Protected Area Shortfall in FMA	FMA Passive Land Base***
Alpine	15,084 km^2	1,266 km^2	21 km^2	<0.1%	645 km^2 (4.3%)	100%	1,146 km^2	0	54.4km^2 *(in RAA) including 3.2* km^2 *in the FMA*	0	20 km^2
SubAlpine	25,218 km^2	2,807 km^2	1,138 km^2	4.5%	645 km^2 (2.6%)	100%	1,396 km^2	0	171km^2 *(in RAA) including 5.3* km^2 *in FMA*	0	507 km^2
Upper Foothills	21,537 km^2	1,129km^2	754 km^2	3.5%	710 km^2 (3.3%)	75%	8.0 km^2	0	3.0 km^2 (None in the FMA)	5.5 km^2 *	191 km^2
Montane*	8,768 km^2	1,934 km^2	730km^2	8.3%	620 km^2 (7.1%)	100%	329.4 km^2	0	2.9 km^2 *(All in the FMA)*	*0*	238 km^2
Lower Foothills	44,899 km^2	695 km^2	635 km^2	1.4%	1125 km^2 (2.5%)	25%	0.0	0.0**	0.0	11.8 km^2	188 km^2

* Based on remaining provincial targets and proportional provincial supply of Subregion in SLS FMA/B9 Quota
** Assumes that Lower Foothills does not occur south of Bow River. Prior to 2006 revisions 114 km^2 of Lower Foothills lands were protected in Sheep River/Bluerock PA.
*** The SLS passive landbase is primarily contiguous forested retention retention that is not actively managed for forestry.

The Montane subregion comprises 730 km^2 (21.6%) of the FMA and 1,934 km^2 (24.6%) of the RAA (Figure 2). No formally protected areas occur within the Montane subregion lands within the FMA. A total of 329.4 km^2 (17.0%) of Montane lands are currently in protected area status in the context of the RAA. This includes lower elevation portions of the following protected areas: Bow Valley WPP, Bluerock WPP, Sheep River PP, Elbow-Sheep WPP, Spray Valley PP, Don Getty WPP. All of these protected areas are sufficiently intact, close to, and connected to the SLS FMA to provide sources of biological diversity for the FMA. An additional 2.9 km^2 of Montane occurs in Candidate Conservation Management Area #8 in the southern portion of the FMA (Figure 6). We conclude that no significant gaps in protected areas coverage occur at the regional scale for the Montane subregion.

4.5.1.2 Subalpine Subregion

The Subalpine Subregion occupies 25,218 km^2 (3.8%) of the province of Alberta. The Alberta government targeted 645 km^2 (2.6%) of the Subalpine's 5 Level 1 Natural History themes for protection. All of the provincial targets for Subalpine subregion protection have been reached in the form of 30 parks and protected areas (Koch 2011). No gaps in protected areas coverage occur at the provincial scale for the Subalpine subregion, based on Alberta Tourism, Recreation and Parks targets.

The Subalpine subregion comprises 1,138 km^2 (33.7%) of the FMA and 2,807 km2 (35.7%) of the RAA region (Figure 2). No formally protected areas occur within the Subalpine subregion lands within the FMA or RAA, although CCMA #8 (Figure 6) and CCMA #9 (Figure 7) would add an additional 171.1 km^2 of protected Subalpine habitat if selected. Of this total, 5.3 km^2 lies within the FMA. Large amounts of subalpine forest occur in the higher elevation portions of the FMA and are also informally protected from timber harvest as passive landbase (Table 1). A total of 1,396 km^2 (49.7%) of Subalpine lands are currently in formal protected area status in the RAA. This includes portions of the following protected areas: Bow Valley WPP, Bluerock WPP, Sheep River PP, Elbow-Sheep WPP, Spray Valley PP, Don Getty WPP and Ghost River Wilderness Area. These large landscape-level subalpine forests occur immediately adjacent to the western boundary of the FMA. Combined with the occurrence of passive landbase in the high elevation portions of the FMA (Table 1), protected subalpine lands offer reservoirs of biological diversity for the FMA and region. No significant gaps in protected areas coverage occur at the regional scale for the Subalpine subregion.

4.5.1.3 Alpine Subregion

The Alpine Subregion occupies 15,084 km^2 (2.3%) of the province of Alberta. The Alberta government targeted 645 km^2 (4.3%) of the Alpine's 5 Level 1 Natural History themes for protection. All of the provincial targets for Alpine subregion protection have been reached in the form of 30 parks and protected areas (Koch 2011). No gaps in protected areas coverage occur at the provincial scale for the Alpine subregion, based on Alberta Tourism, Recreation and Parks targets. Alpine habitats are scarce in the FMA occupying just 21 km^2 (<1.0%). This subregion does not support commercial timber harvest. Protected areas in the RAA cover 1,146 km^2 or 90.6% of the Alpine subregion occurring in the FMA region. No gaps in protected areas coverage of Alpine lands occur at the regional scale.

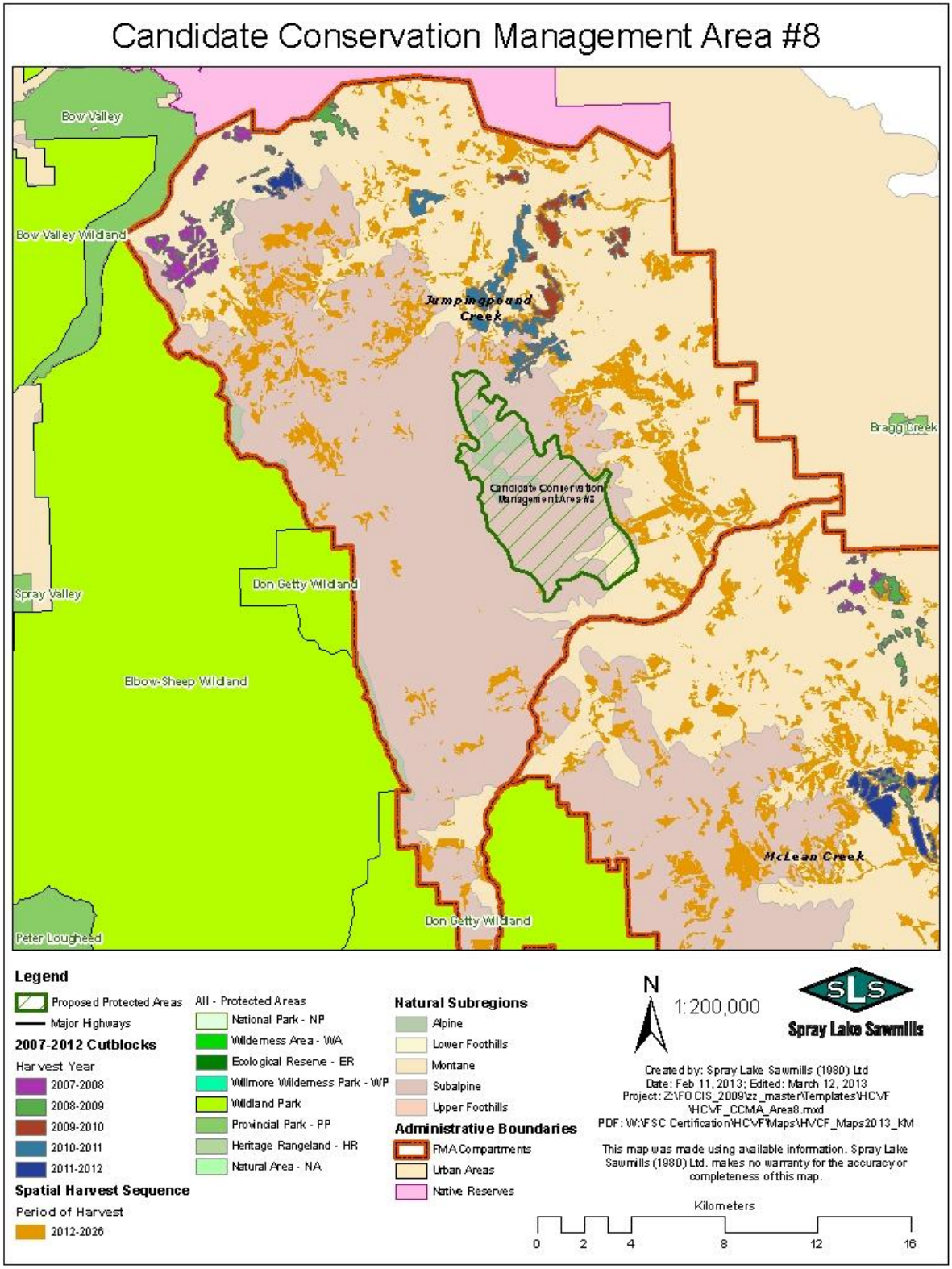

Figure 6. Candidate Conservation Management Area #8 - SSRB Planning Process

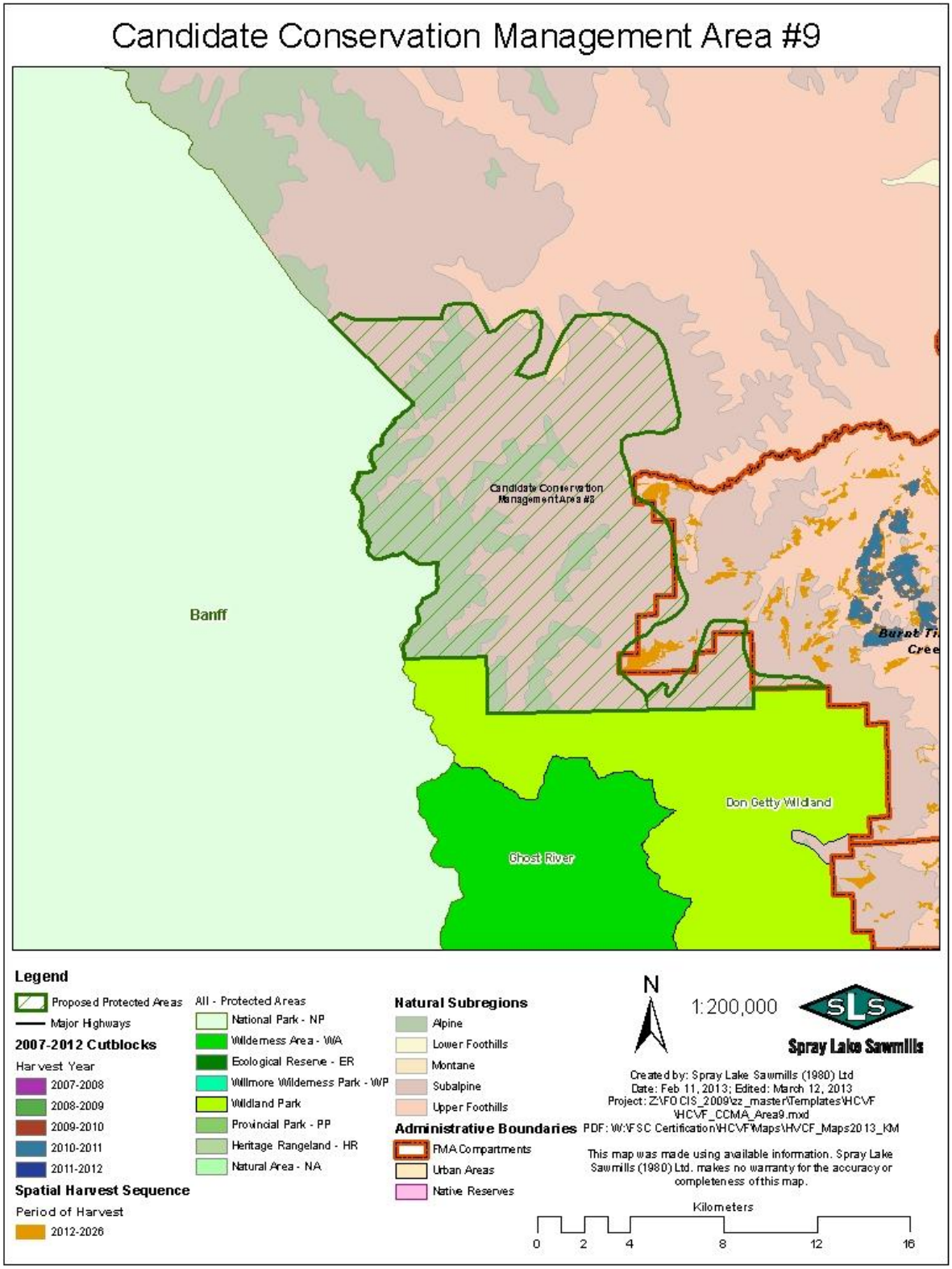

Figure 7. Candidate Conservation Management Area #9 - SSRB Planning Process

4.5.2 Foothills Natural Region

The Foothills Natural Region comprises two subregions based on differences in elevation, topography and vegetation. The Lower Foothills Natural Subregion occurs at lower elevations and has warmer summers and colder winters than the Upper Foothills Natural Subregion. The boundary between the Lower and Upper Foothills is characterised by a change in dominance from mixedwood and deciduous forest stands on all aspects in the Lower Foothills Natural Subregion to conifer-dominated forests in the Upper Foothills Natural Subregion (Natural Regions Committee 2006).

4.5.2.1 Lower Foothills Subregion

The Lower Foothills Subregion occupies 44,899 km^2 (6.8%) of the province of Alberta. The Alberta government targeted 1125 km^2 (2.5%) of the Lower Foothills five Level 1 Natural History themes for protection. Currently a total of 276.7 km^2 of Lower Foothills lands in the Province of Alberta is in protected status in the form of 12 parks and protected areas (Koch 2011). As such, approximately one-quarter or 24.6% of the Level 1 targets have been reached for Lower Foothills protection in the province, based on Alberta Tourism, Recreation and Parks information. Approximately 848 km^2 of lands remain to be protected in the Lower Foothills in order to meet provincial targets.

The Lower Foothills subregion comprises 635 km^2 (18.8%) of the FMA and 695 km^2 (8.8%) of the RAA region (Figure 2). No formally protected areas occur within the Lower Foothills subregion lands within the FMA and RAA, based on revised Natural Regions/Subregions mapping (Natural Regions Committee 2006). Prior to these changes, the Sheep River Provincial Park and Bluerock Wildland Provincial Parks protected a combined 114 km^2 of Lower Foothills habitat, respectively (see Section 3.2). A total of 188 km^2 of Lower Foothills lands in the SLS FMA/B9 Quota area is in the form of passive land base (e.g. riparian area, non-timber lands, steep slopes) and is protected from timber harvest.

Accepting the 2006 Natural Subregion mapping revisions, and <u>not</u> including passive land base as protected areas, there remain gaps in the formal protection of Lower Foothills lands in the FMA or RAA.

4.5.2.2 Upper Foothills Subregion

The Upper Foothills Subregion occupies 21,537 km^2 (3.2%) of the province of Alberta. The Alberta government targets 710 km^2 (3.3%) of the Upper Foothills five Level 1 Natural History themes for protection. Currently, a total of 551.4 km^2 of Upper Foothills lands in the Province of Alberta is in protected status in the form of 19 parks and protected areas (Koch 2011). As such, approximately three-quarters or 77.6% of the Level 1 targets have been reached for Upper Foothills protection in the province, based on Alberta Tourism, Recreation and Parks information. Approximately 159 km^2 of lands remain to be protected in the Upper Foothills in order to meet provincial targets.

The Upper Foothills Natural Subregion comprises 754 km^2 (22.3%) of the FMA and 1,129 km^2 (14.4%) of the RAA (Figure 2). A total of 8.0 km^2 of Upper Foothills lands are currently protected in the RAA immediately adjacent to, but outside of the FMA (Koch 2011). This area is east of the Ghost River Wilderness area in Don Getty WPP (Figure 5). If selected, Candidate Conservation Management Area #9 (Figure 7) from the South Saskatchewan River basin planning process would add another 3.0 $km^2$of protected Upper Foothills land, but outside of the FMA. A total of 191 km^2 of Upper Foothills lands in the SLS FMA/B9 Quota area is in the form of passive landbase (e.g. riparian area, non-timber lands, steep slopes) and is protected from timber harvest.

It is concluded that gaps remain in the formal protection of Upper Foothills lands in the FMA or RAA.

4.6 Step #6: Gap Prioritization

It is clear from Section 4.5 that representation gaps in protected areas currently occur in the Upper and Lower Foothills Natural Subregions (as currently mapped) at both provincial and regional scales. The High Conservation Forest Assessment (Kansas and Kelly 2011) and Section 3.3 of this report identified lower elevation lands, including those in the Lower Foothills and Montane subregions, as biodiversity 'hotspots'. Upper Foothills lands do not tend to be as diverse as Lower Foothills and Montane lands because of the scarcity of deciduous and mixedwood forests, riparian forests, and marsh wetlands (Natural Regions Committee 2006). From a biodiversity richness perspective, Upper Foothill habitats are more similar to Subalpine habitats than they are to the Lower Foothills or Montane.

4.6.1 Special Case of the Sheep River/Bluerock Protected Areas

In Section 3.2, the origins of the Sheep River Provincial Park and adjacent Bluerock Wildland Provincial Park were described. This protected area was established to assist in fulfilling Foothills Natural Region protected area targets, since at the time these areas were located almost entirely in the Lower Foothills Natural Subregion. As recognized by GAIA (1996) this area is a hot-spot of vegetation, wildlife biodiversity, because of the occurrence of lower elevation deciduous, mixedwood and riparian forest cover types (Kansas and Kelly 2011; Collister and Kansas 2003). Figure 9 illustrates the disproportionate abundance of very high and high suitability habitat for multiple focal vertebrate wildlife species in the area, in the context of the remainder of the southern portion of the FMA.

No other portion of the SLS FMA region or B9 Quota offers an equivalent combination of vegetation and wildlife biodiversity, lack of industrial development, and limits to motorized vehicles as does the Sheep/Bluerock protected area. The Conservation Biology Institute (2007) singled out the Sheep River Provincial Park/Bluerock Wildland Park block (approx. 19,000 ha) as being one of only two protected areas larger than 10,000 ha in the Foothills of Alberta and northeast British Columbia. The other was Bearhole Lake Provincial Park (~18,000 ha) which occurs in the province of British Columbia.

Regardless of whether the Sheep River/Bluerock protected areas are classified as Lower Foothills or Montane, this area is a vital reservoir of lower elevation vegetation and wildlife diversity in the heart of the former SLS FMA. This protected area connects two large chunks of Spray Lake's FMA as well as higher elevation Subalpine and Alpine protected lands of the Elbow-Sheep Wildland Provincial Park to the west.

Prior to the changes in Natural Region and Subregion classification (Natural Regions Committee 2006), the voluntary removal of these areas from the SLS FMA and conversion to protected areas would have resulted in an additional 114 km^2 of Lower Foothills protected land. This level of contribution would have represented 10.1% of the total target for protected Lower Foothill lands in the Province of Alberta. This is a disproportionately high contribution considering that the SLS FMA contains just 1.4% of the total supply of Lower Foothills lands in the province. Based on current classification of these lands, the designation of Sheep River/Bluerock as a protected area adds to a regional and provincial surplus of Montane protected lands.

4.6.2 Environmentally Significant Areas in Protected Area Selection

Both GAIA (1996) and the government of Alberta relied heavily on existing Environmentally Significant Areas (ESAs) as the preliminary basis for selection of candidate sites for protection. Alberta Tourism, Parks and Recreation state that..... *".....ESAs represent places in Alberta that are important to the long-term maintenance of biological diversity, soil, water, or other natural processes, at multiple spatial scales. They are identified as areas containing rare or unique elements in the province, or areas that include elements that may require special management consideration due to their conservation needs."* In the case of GAIA's gap analysis process, 180 existing ESAs in the Foothills Natural Region were initially considered as candidates for protection under Special Places 2000 mandate. These were eventually filtered down to 12, which included the Sheep River area.

GAIA (1996) noted that all short-listed candidates were...*".....by and large....the least developed*" and that in Alberta, ESAs are used as planning tools for conservation and protected areas designation. GAIA (1996) further stated that.... *"the results of this report underscore the difficulty in developing an adequate protected areas network for the Foothills Natural Region primarily because of the extent to which the land base is already fragmented by various resource and recreational activities. No pristine or wilderness areas remain that have not suffered some loss of their original ecological integrity"*. The Conservation Biology Institute (2007) echoed GAIA's comments stating.... *"It is difficult to predict how much of the ecoregion could be placed into new protected areas via the existing political process. With over 86 percent of the ecoregion already allocated in logging tenures and with oil and gas development widespread, it is going to be difficult to establish many new protected areas even though the science strongly argues for much more land placed under protection status."*

According to changes in Alberta Natural Regions mapping (Natural Regions Committee 2006), both Lower and Upper Foothills Subregions occur only in the northern portion of the SLS FMA north of the Bow River (Figure 2). It is noteworthy that neither the GAIA (1996) gap analysis nor the recent SSRB gap analysis selected either Lower or Upper Foothills habitats in the SLS FMA north of the Bow River as protected area candidates or CCMAs. This is likely because of the levels of multiple land use and relative shortage of ESAs in this area (Figure 8).

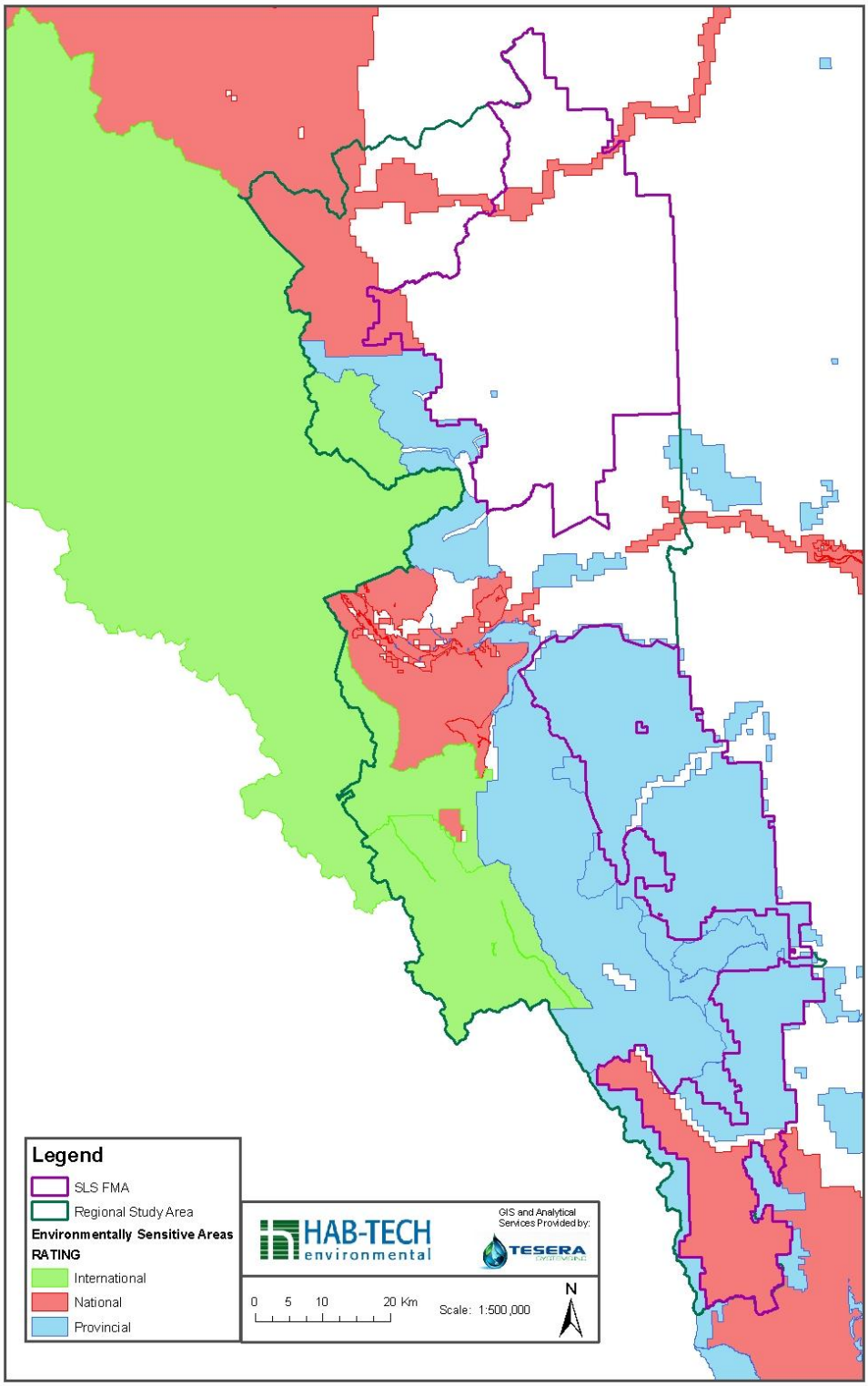

Figure 8. Environmentally Significant Areas in the SLS FMA and Region.

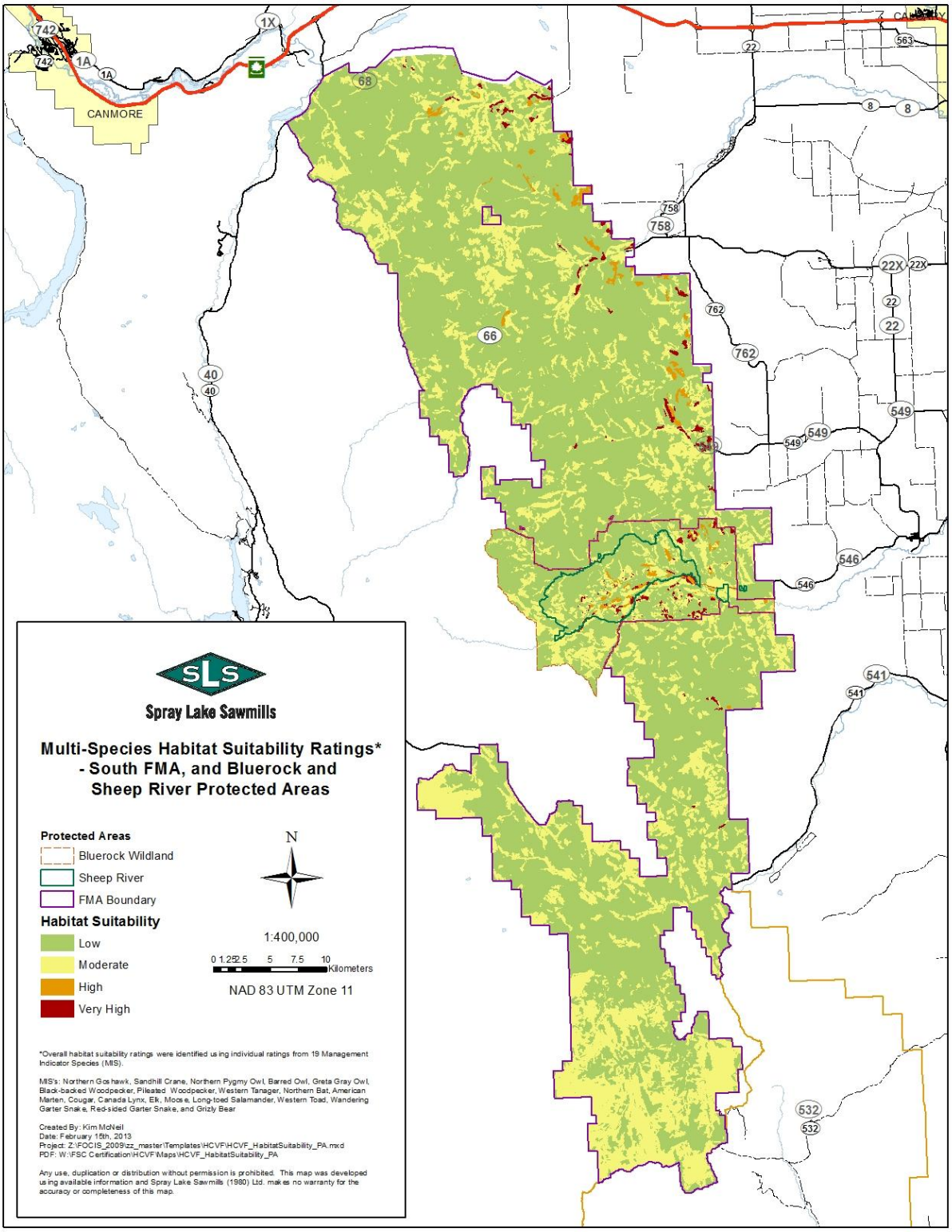

Figure 9. Multi-species Habitat Ratings in the Sheep River/Bluerock areas and region.

4.6.3 Red Deer River ESA #20

A single nationally ranked Environmentally Significant Area occurs in and adjacent to the northern portion of the FMA, with its eastern extent - the Red Deer River valley - traversing both Lower and Upper Foothills lands in the FMA (Figure 8). ESA (#20) is very large (943,828 ha) and extends north to the Brazeau/Cardinal River confluence area. The Red Deer River portion of this ESA transects the FMA from east to west. The portion of ESA #20 in the FMA is comprised of 45.6 km^2 of Lower Foothills and 0.37 km^2 of Upper Foothills lands. The HCVF report for SLS selected the Red Deer River valley portion of ESA #20 as a High Conservation Value Forest attribute because it represents a natural east-west movement corridor for numerous species of wildlife, as well as a wintering area for ungulate populations and spawning habitat for a number of fish species. Figure 3 shows the disproportionate amount of species rich and uncommon habitat types along the Red Deer River corridor including riparian mixedwood forests and old growth deciduous forests.

The Conservation Biology Institute (2007) report stressed the importance of main river corridors in the Foothills region as potential protected or special management areas. They noted that ..... *"Functionally connecting existing and new protected areas is an important consideration in this ecoregion and the main river segments highlighted offer an important opportunity to do that both from the standpoint of aquatic and terrestrial conservation values."*

We conclude that portions of the Red Deer River ESA #20 and immediate environs offer strong potential to serve as a protected area candidate in the FMA, primarily to fill the gaps identified in the biologically diverse Lower Foothills subregion.

4.7 Step 7: SLS Strategy for Filling Protected Area Gaps in FMA

Based on the previous steps of this gap analysis, SLS's goal is to locate representative samples of Lower and Upper Foothills landscapes as candidates for protection. SLS will seek input from First Nations, government, commercial interests, disposition holders, NGO stakeholders and the public in assessing the FMA and RAA for new candidate protected areas to meet its proportionate share of provincial protected area targets in the Foothills Natural Region. Targets for protection inside of the FMA are 1,180 ha for Lower Foothills and 620 ha for Upper Foothills. These targets are based on outstanding deficits in Provincial Foothills subregion targets and SLS's proportionate share of provincial land area supply of these two Subregions.

The following outlines SLS’s approach to Foothills protection in the FMA.

4.7.1 Step 1: Site Identification and Selection

This is an SLS led process involving coordination with First Nations, government, commercial interests, disposition holders, NGO stakeholders and the public, that have interests in the potential protected area(s). SLS will begin by delineating possible PA candidates on a map based on specific PA criteria and the results of this gap analysis (e.g Red deer River ESA).

4.7.2 Step2: Feasibility Assessment

The second step is to conduct a series of feasibility assessments. These will include an ecosystem assessment and a strategic environmental assessment, to evaluate the environmental condition of the candidate site and the impact that the potential new protected area could have socially and environmentally. In addition, First Nations, government, commercial interests, disposition holders, NGO stakeholders and public consultations will be conducted to determine the feasibility of turning a candidate site into a protected area.

Consultations will be designed to create meaningful participation. Interested and affected parties have knowledge and expertise, especially pertaining to local conditions, which will benefit the planning process. The results of these ecological, social and economic assessments will help to determine the boundaries and the various options available for protection, in accordance with the ownership and jurisdiction of the land area targeted.

4.7.3 Step 3: Securement & Agreement

Once a candidate site(s) is selected, the type of protected area will determine the instruments available for securing the lands.

4.7.4 Step 4: Regulatory Process

SLS will commit to deferred timber harvesting in nominated site(s) to help meet Protected Area gaps in the Upper and Lower Foothills Natural Regions. The provincial government will then lead this process. In Alberta, protected areas are legally designated in two ways.

- Provincial parks, wildland provincial parks, heritage rangelands, provincial recreation areas, natural areas and ecological reserves are established by order-in-council under their respective *Acts*. Orders-in-council are issued by the Lieutenant Governor-in-Council.

- Wilderness protected areas such as White Goat, Ghost River and Siffleur wilderness areas and Willmore Wilderness Park were established in legislation. Their boundaries are described in "schedules" under their respective *Acts*.

5.0 SUMMARY AND CONCLUSIONS

5.1 Protected Area Gap Analysis Summary

- The purpose of this gap analysis was to assess the comprehensiveness of the existing protected area network in the SLS FMA/B9 Quota and region and to identify and prioritize underrepresented elements of biological diversity.

- Two previous representation gap analyses were conducted in the area: 1) for the Foothills Natural Region at a provincial scale in the mid-1990s; and, 2) on-going for the South Saskatchewan River Basin planning area at a watershed/regional scale. These gap analyses resulted in selection of several existing or candidate protected areas in and immediately adjacent to the FMA. SLS officials were actively involved in the two previous gap analyses/planning processes.

- The current gap analysis conducted for the SLS FMA/B9 Quota follows standard scientific approaches used by the Secretariat for the Convention on Biological Diversity (CBD) and World Wildlife Fund.

- The gap analysis considers both the SLS FMA/B9 Quota and a broader region of contiguous Natural Subregions surrounding the FMA. This is consistent with methods used for the HCVF and by the Secretariat for the Convention on Biological Diversity.

- Natural Subregions were used as a coarse-filter surrogate for landscape, community and species-level biodiversity in the SLS FMA/B9 Quota area.

- The FMA region comprises portions of five Natural Subregions (from lower to higher elevation) - Montane, Lower Foothills, Upper Foothills, Subalpine and Alpine.

- Lower elevation lands in the Montane and Lower Foothills subregions support disproportionately high levels of vegetation composition, structure (vertical and horizontal) and vertebrate wildlife diversity than do the Upper Foothills, Subalpine and Alpine natural regions.

- Formally protected lands do not currently occur in the FMA, although a large amount of protected area, primarily in the form of Wildland Provincial Parks (WPP) and Provincial Parks (PP) (Don Getty WPP, Elbow-Sheep WPP, Bluerock WPP, Sheep River PP), occurs immediately adjacent to the FMA.

- The majority of protected land occurs at higher elevations west of the FMA in a mosaic of Subalpine and Alpine subregional lands in the Elbow-Sheep and Don Getty WPPs. Relatively large patches of protected land also occur along the Sheep River and Bow River valleys in what is now mapped as the Montane Natural Subregion.

- Upper elevation Subalpine and Alpine Subregion lands are fully protected in the Province of Alberta, exceeding Level 1 protected area targets used by Alberta Tourism, Parks and Recreation. Almost 50% of the Subalpine Subregion lands are protected in the RAA, and an additional 8.5 km^2 of mixed Subalpine/Alpine lands in the SLS FMA are candidates for protection as part of the South Saskatchewan River Basin planning framework.

- The Montane Natural Subregion is fully protected in the Province of Alberta, exceeding Level 1 protected area targets used by Alberta Tourism, Parks and Recreation. A total of 329.4 km^2 (17.0%) of Montane lands are currently in protected area status in the context of the RAA. This includes lower elevation portions of the following protected areas: Bow Valley WPP, Bluerock WPP, Sheep River PP, Elbow-Sheep WPP, Spray Valley PP, Don Getty WPP. An additional 3 km^2 of Montane is being considered as a candidate for protection in the FMA as part of the South Saskatchewan River Basin planning framework.

- Over three-quarters (77.6%) of the provincial Level 1 targets have been reached for Upper Foothills protection, based on Alberta Tourism, Recreation and Parks information. Approximately 159 km^2 of lands remain to be protected (province-wide) in the Upper Foothills in order to meet provincial targets. The Don Getty Wildland Provincial Park protects 8 km^2 of Upper Foothills lands in the northern portion of the FMA region, immediately west of the FMA boundary. Another 3 km^2 of Upper Foothills land is under candidate protection as part of the SSRB planning process.

- Approximately one-quarter (24.6%) of the Level 1 targets have been reached for Lower Foothills protection in the province, based on Alberta Tourism, Recreation and Parks information. Approximately 848 km^2 of lands remain to be protected in the Lower Foothills in order to meet provincial targets.

- No formally protected areas occur within the Lower or Upper Foothills subregion lands within the FMA region, based on revised Natural Regions/Subregions mapping (Natural Regions Committee 2006). Prior to these changes the Sheep River Provincial Park and Bluerock Wildland Provincial Parks protected a combined 114 km^2 of Lower Foothills habitat, respectively. This land was voluntarily removed from the Spray Lake FMA during negotiations in the early 2000s for the purpose of protecting (Lower) Foothills landscapes.

5.2 Protected Area Gap Analysis Conclusions

- The SLS FMA region (RAA) currently contains an overall high proportion of protected areas, especially in the high elevation Subalpine and Alpine subregions. Additional Subalpine, and Alpine lands have potential to be added within the FMA (8.8 km^2) and immediately adjacent (217 km^2) the FMA, as part of the SSRB planning process.

- The above protected lands in conjunction with: 1) passive landbase in the FMA; and 2) ecologically sensitive timber harvest and access management practices, is sufficient to protect biological diversity in the Subalpine and Alpine zones of the FMA and region. No further protected areas are recommended in these two Natural Subregions, other than the 8.5 km^2 of land being considered for protection as part of the SSRB planning process.

- The Montane Natural Subregion is well represented by protected areas in the SLS FMA region, including the Sheep River Provincial Park/Bluerock Wildland Provincial Park block. No further protected areas are recommended in this subregion in the FMA, other than the 3 km^2 of land being considered for protection as part of the SSRB planning process.

- Protected areas within the Foothills Natural Region are under-represented in the SLS FMA and regional environs. The Lower Foothills subregion is more biologically diverse than the Upper Foothills and as such is of higher priority for protection.

- If formal protection of additional Foothills Natural Region lands is considered then these lands should occupy an existing provincially designated ESA. The Red Deer River portion of nationally significant ESA #20 occurs in the northern portion of the FMA and crosses mainly Lower Foothills lands, with some Upper Foothills. This ESA (or portions thereof) offers potential as a protected areas candidate for Foothills habitats in the FMA.

- Spray Lake Sawmills' goal is to assess representative samples of Lower and Upper Foothills landscapes as candidates for protection. Information from this gap analysis and the HCVF report (Kansas and Kelly 2011) will be used in this process. SLS will seek input from First Nations, government, commercial interests, disposition holders, NGO stakeholders and the public in assessing the region for new candidate protected areas to meet its proportionate share of provincial protected area targets in the Foothills Natural Region.

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