

**Review of “Kansas, J.L. 2013. Protected Area Representation Gap Analysis Spray
Lake Sawmills FMA/B9 Areas”**

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For Spray Lakes Sawmills**

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1.0 Purpose:

I was asked by Spray Lakes Sawmills (SLS) to review their protected areas gap analysis paper as part of their Forest Stewardship Certification (FSC) effort. Principle 6 of FSC's boreal standard (which applies to all of Alberta) requires a gap analysis of protected areas and a peer review of that analysis. This paper is a review specific to that activity of Principle 6; it is not a review of the High Conservation Value Forest work (under Principal 9), nor of other parts of the Stewardship Plan prepared to meet FSC standards.

This review did not involve re-analysing gaps from GIS data. Rather, the GIS work is accepted as correct and the peer review focuses on the principles and results contained in the paper "Kansas, J. 2013. Protected Area Representation Gap Analysis Spray Lake Sawmills FMA/B9 Areas".

2.0 Review

This review first presents the boreal standard for Principle 6.4 as reference, then presents a discussion of the two main findings of my review: 1) the scale of the gap analysis and elements considered, and 2) the targets used. I follow that with a page by page review of specific issues. I am from BC, and the foothills forests are very similar to some of the forests in eastern BC, hence many examples of my suggestions come from a BC perspective, but I consider them appropriate for the ecology of the foothills area.

3.0 Background. The 'Protected Area Representation Gap Analysis' paper (henceforth called the SLS paper) is intended to fulfill P 6.4 of the boreal standard of FSC, which applies to all of Alberta. That principle includes the following indicators and verifiers, and provides explanation of intent. They are reproduced below from the FSC boreal standard as background and for ease of reference:

From the FSC boreal standard:

Principle 6.4 Representative samples of existing ecosystems within the landscape shall be protected in their natural state and recorded on maps, appropriate to the scale and intensity of operations and the uniqueness of the affected resources.

Intent, 6.4

The indicators and verifiers under this criterion apply to a protected areas network, which includes areas set aside to provide for sufficient ecosystem representation, to conserve enduring features, to maintain locally/regionally rare ecosystems, and to serve as scientific reference areas. It is the intent of this criterion that the protected areas on the applicant's forest should tie into a network established at a landscape level, and that the concentration of protected areas on the applicant's forest should depend on that forest's characteristics. This criterion does not apply to reserves that are routinely created for localized values such as raptor nests, or to standard riparian buffers that are not specifically intended to be part of a protected area network.

6.4.1 The applicant completes (or makes use of) a peer-reviewed scientific gap analysis to address the need for protected areas in the eco-region(s) and ecodistrict(s) in which the forest is situated. The applicant uses the gap analysis and elements including representation, connectivity, intactness, age of the forest, rare ecosystems and other HCVF attributes to identify the location and extent of additional protected areas.

Verifiers:

Terms of reference for gap analysis.

Completed gap analysis subjected to peer review.

Evidence that the applicant is supportive of and working towards the development of a protected area network at a scale larger than the average sized, individual management unit.

Intent, 6.4.1

This indicator may be achieved using a gap analysis methodology developed by the World Wildlife Fund, or an equivalent methodology.

6.4.2 The applicant designs, identifies and contributes candidate protected areas that make a maximum contribution to filling gaps in the protected areas system (per 6.4.1) based on the relative responsibility of the applicant. The level of the applicant's responsibility is determined by:

- The level of representation of enduring features within the forest; and,
- The regional significance of the conservation values (e.g., quality or rarity).

Verifiers:

Contributions of protected areas.

Records and analysis assessing potential contributions of protected areas.

Gap analysis (as per 6.4.1).

6.4.3 The applicant works cooperatively with interested parties (e.g., Environmental-NGOs, Indigenous People) in the analysis of gaps and candidate protected areas.

Verifiers:

Gap analysis methodology.

Interviews with preparers of the gap analysis.

Interviews with representatives of interested parties.

Interviews with those involved in protected areas selection process.

6.4.4 Results of the candidate protected area identification process described in indicator 6.4.2 are mapped.

6.4.5 The applicant has documentation demonstrating support by interested parties (e.g. Environmental NGOs and Indigenous Peoples)

Verifiers:

Letters of support from interested parties

Minutes of meetings with interested parties

6.4.6 Forest operations including harvesting, silviculture and road building are not undertaken in protected areas or candidate protected areas.

Verifiers:

Operational plans, including access construction.

Maps of actual harvest areas, silviculture operations, and access.

Operations compliance records.

Field inspection of candidate or designated protected areas.

6.4.7 The applicant is working within their sphere of influence to move candidate protected areas to full regulated protection as soon as possible.

Verifiers:

Interviews with relevant staff of applicant.

Interviews with staff of relevant government agency.

Review of records and files.

SLS's gap analysis paper (and this review) focuses on 6.4.1, but also ventures into 6.4.2 and suggests a candidate area to fill the gap.

4.0 Part 1: Summary comments:

Part 2 contains several suggestions on specific parts of the paper; part 1 discusses two of my main findings in more detail.

4.1 The scale of analysis and elements considered:

The SLS paper states that 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 (WWF). The WWF methodology is suggested as an example by FSC, and is an acceptable (but not required) process. The WWF approach has been adjusted somewhat by SLS so that finer resolution of features is used. That seems very appropriate because the WWF landscapes can be very large relative to the relatively diverse foothills area. The WWF process relies heavily on physical aspects of the landscape – soils, climate, and landforms (Iacobelli et al. 2006). Inclusion of species ranges is not well incorporated nor is concern for movement of species. The CBD approach (Dudley and Parish 2006) is quite general in its advice on appropriate scales. It states “protected area systems should contain adequate samples of the full range of existing ecosystems and ecological processes, configured so that populations of all their species (and preferably subspecies and populations) persist in the wild over very long periods. Conservation planning must therefore address not only the *content and location* of individual protected areas and sets of protected areas, but also their *design*, which includes variables such as size, connectivity and alignment of boundaries, for example, with watersheds. Once correctly designed, protected areas (Pas) also need to be effectively managed to ensure persistence...” The CBD further talks about the need for redundancy in a protected areas system. *In summary, then, given the guidance of the boreal FSC standard, the WWF approach and CBD guidance, I consider the use of natural subregions as a coarse filter to be appropriate.*

However, although natural subregions are an appropriate coarse filter, and an appropriate first step in a gap analysis or PA design process, a protected areas strategy should be assessed and adjusted considering other elements that are also important in a protected areas network. It is interesting that the boreal FSC standards apply to the foothills area, which is much more like BC's forests than much of the boreal. BC's FSC regional approach to P6.4 involves representation and protected areas at a finer resolution than the boreal standard. Where there is flexibility in the boreal standard (and I believe there is, but FSC auditors would know for sure), SLS should lean towards approaches suitable for their forest types that have been suggested by other areas (like eastern BC). (WWF combines the Alberta and BC foothills together for some descriptions, and includes the Alberta Mountain Forests (their ecoregion #26) and Alberta/British Columbia Foothills Forests (their ecoregion #29) as both being within the Montane Cordillera ecozone.)

The BC FSC standard for P6.4 focuses on variant level representation but also outlines additional relevant conservation biology principles to consider. Those include:

- a) ensuring representation of finer scale features (e.g. site series groups, enduring features, landforms, forest type, productivity class etc),
- b) protection of habitat features not protected elsewhere in the management unit (e.g., critical habitats for red- and blue-listed or access-sensitive species
- c) connectivity within the management area and between adjacent areas,

- d) protection of rare and endangered ecosystems and ecosystem conditions that are or are predicted to be at risk (e.g., interior forest conditions, old seral conditions), and
- e) scientific reference areas.

The minimum area requirements under this criterion *include* reserves routinely set-aside in the management unit (e.g. riparian reserves, wildlife tree patches) *provided* they are defined as permanent or dynamic reserves (In areas where disturbance is frequent, reserves are allowed to change location to maintain their function), but do not include *de facto* reserved inoperable areas unless these areas meet specific ecological objectives. The BC standards also suggest the design and management of reserves should be reassessed after any large-scale disturbance events (e.g. fires or windthrow events). This allowance for areas of the passive landbase to count if they are defined as permanent reserves, seems somewhat different than the boreal standard, but may be applicable to the foothills.

Suggestion/finding: *SLS's use of natural subregions is appropriate as a tool to build a PA system, but FSC standards (both boreal and BC) also suggests other elements are important in a gap analysis and assessment of potential new PAs. I suggest that SLS examine their existing and proposed PAs to assess representation of main forest types and special habitats, and perhaps even assess if ranges of focal or rare species (if known) are included. At the very least, forest types, elevational representation and productivity representation should be assessed. As well, SLS could assess how the PA system covers HCVF attributes. Would it be appropriate for SLS to report on WWFS enduring features in RAA and FMA and in PAs in both those areas? The WWF approach to gap analysis and PA establishment uses "enduring features" (GAIA 1996); although these are mentioned in the report, it is not clear to me is those were considered in the gap analysis. If they are finer (than subregions), they could be used to assess the PAs and suggest gaps. WWFs approach considers size, connectivity, elevational range, streams, roads and focal species. Perhaps other elements would be better to report on than enduring features (such as Natural History Themes from Alberta Protected Areas classification as suggested by Kansas pers. comm.). Can SLS report out on how the special places and habitats of figs 3 and 4 of the gap analysis paper are covered in PAs? These types of assessments would all add confidence that the PA system based on subregions is capturing important ecosystems and processes.*

As well, SLS should seek clarification as to whether the passive landbase could count towards PAs if the areas are made permanent. The passive landbase could be assessed for how it meets specific ecological criteria (such as in the BC FSC standard) and also be counted as contributing to the PA network if those areas are essentially reserve areas and contributing to a network beyond the management unit. For example, although the FSC boreal standard suggests regular riparian reserves are not considered part of P6.4, riparian reserves could serve (or could be enlarged to serve) important connections within the management unit and among the management unit and other surrounding areas. If the passive landbase was assessed for representation of productivity, forest type, elevation, etc, then SLS would likely be able to get credit for those areas towards PA targets. At the very least, SLS could better argue that the low targets (see 4.2 below) are not actually so low if the passive landbase adds significantly to ecological values. To argue that point effectively, SLS would have to assess the role of the passive landbase in a more comprehensive fashion than currently presented.

4.2 Targets:

The SLS paper states that:

"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."

The Alberta targets seem very low compared to other jurisdictions and compared to protection levels considered by available science to be adequate to maintain biological diversity (e.g., Andren 1994, Dykstra 2004, Swift and Hannon 2010, Curry et al. 2011). While it is true that BC attempts to preserve 12% of major ecosystems, regional targets are higher in many areas. For example, ecosystem based management on the coast requires minimally 30% and an average of 50% of unmanaged ecosystems across the region (this includes formal PAs and many areas of the passive landbase but covers all ecosystems). Rare ecosystems in a management unit are represented at even higher levels (70 to 100%). Clayoquot Sound and Haida Gwaii in BC also have similar targets. It could be argued that those are all coastal areas with very old forests, but many areas seeking CSA certification in BC also have targets higher than 12% (e.g., CANFOR NE BC). The 12% is simply a provincially set target. FSC in BC certainly requires more than 12%. For FSC in BC, the amount required for variant level (similar to a subregion) representation is based on the level of representation of ecosystems in the broader landscape or region surrounding the management unit. Retention levels are also to be fine-tuned by the 'responsibility' of the manager for a particular ecosystem, which is defined by the percent regional occurrence of a particular ecosystem in the management unit. Minimum levels of broad scale ecosystem representation required by FSC BC are outlined in their Table P6-1, reproduced below:

Table P6 - 1. Minimum required area of protected reserves for ecosystem representation within a management unit by BEC variant, based on the level of protection in the surrounding area.

Context Outside of Management Unit	Management Unit Requirements ³
Percentage of Protected Areas ¹ by BEC variant, Ecosystem or ² BEC variant/Ecosystem	Minimum Reserves by BEC variant (%) ⁴
>20%	12
16.1-20%	15
12.1-16%	18
8.1-12%	20
4-8%	22
<4%	24

¹ Legally established long-term protected areas that are managed to maintain and/or restore biodiversity (principally includes BC Protected Areas and Federal Parks; where appropriate, potentially includes Wildlife Management Areas and private lands secured by legal covenants). ² Select the least constraining (see also *FSC BC Guidance – A companion document to the FSC Regional Standards for BC – Guidance on Inventory*).

³ Management units meeting the “Small Operations” definition are exempt from the requirements in the table. See Small Operations Standards.

⁴Numbers refer to percentages of the naturally forested portion of the management unit applied by each BEC variant. Only the portions of the dynamic reserves that have reached an age of at least 80% of the estimated average return interval for stand-replacing events contribute to meeting these requirements (See also Indicators 6.4.3 and 6.4.4).

A review by Strittholt (2006) shows most FSC areas in the boreal also require more area set aside than required by Alberta’s provincial targets.

Scientific reviews of ‘how much is enough’ show that amounts of critical habitat vary by species, mobility, landscape type, scale etc. It is a very complex issue. Generalizations support the notion that once habitat falls below 30% of what was once there, populations of many species are at high risk of decline (Andren 1994, Dykstra 2004, Swift and Hannon 2010, Curry et al 2011). Some species will be a risk at higher levels and some at lower levels of habitat. Most species find habitat both within and beyond borders of protected areas, so having all that 30% under protection is not likely necessary to avoid high risk of declines, but the low targets for representation in Alberta suggest many species reliant on older or undisturbed forest could be in danger of decline. The appropriate amount of natural habitat will depend in part on the natural disturbance regime. What is the natural amount of old forest in the

foothills area? Do the provincial targets get anywhere close to 30% of natural (let alone 30% of total habitat?). If forests are typically young and frequently disturbed, then lower targets are appropriate (or at least dynamic reserves could be considered). In those cases, the matrix managed forest can perhaps provide the natural habitats without being in a completely protected state.

The CBD (Dudley and Parish 2006) offers references that provide help setting targets – settling for low existing legal targets is not a suggested principle.

Suggestion/finding: *SLS should increase their targets (The suggestion of 30% of a subregion may be too much of a stretch in Alberta, but something over 10% would at least be a starting place (but not a recommended ending place)). It is not sufficient rationale to say that provincial targets are chosen so that achieving legal PA status will be a better possibility. If all certification efforts fell to already established legal targets, there would be many instances of very poor conservation of biological diversity, which is what FSC certification is meant to maintain (and proclaim to customers).*

5.0 Part 2: Page by page comments

The comments below are organized so that the excerpt from the paper precedes any comment on that section. Excerpts are in plain text, *comments are in italics*.

Pages 1-6: Introduction, background and objectives:

Comment: *No issues with introduction, background, or objectives, they are good. Although the objective “Develop a process for selection of candidate protected areas including feasibility assessment, securement/agreement and compliance with existing regulatory process” is not dealt with in any depth in the report, it is not the focus of the report, so that level of detail is acceptable.*

Page 6: 2.0 Protected area gap analysis – concepts and approaches:

Comment: *The background on concepts and approaches section is good.*

Page 7: 3.1 Province of Alberta Protected Area Approach: 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.

Comment: *Targets seems very low, see discussion in part 1 above.*

Page 8: 3.2 SLS Participation in Special Places 2000 “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”

Comment: *Does this mean more was set aside than recommended?*

Similar experiences have happened in many places, where forest companies have voluntarily set aside areas from their operating landbase, then tenure boundaries shrink and they no longer appear to receive

credit for the areas they set aside. In BC, MacMillan Bloedel created old growth zones, some of which then became parks and were then placed outside their tenure. Then the tenure no longer had the protected amounts they once had and had to create different reserves. It's an aggravating problem that credit does not necessarily follow along once the boundaries change.

That being said, FSC certifies the management unit (MU) and not the whole area and so it needs to assess if the management unit has gaps in representation. If the protected areas removed from the management unit provided adequate representation at a broad level, then the MU may need only to provide small examples, or stepping stones, or provide PAs of a smaller area. Thus, FSC and SLS still need to assess how their current management unit contributes to the overall PA system, realizing that they already helped improve that system.

Page 8: “In 2006, the government of Alberta changed the ecological classification of approximately 114 km² 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.”

Comment: *Is Sheep River in or out of the FMA? If it's out (which I understand is the case) then it doesn't affect PA in FMA, rather it affects amount in the region (RAA). Should FMA in the above sentence be changed to RRA?*

SLS needs to assume that the changes in classification reflect better ecological knowledge, so that current amounts of protected area by natural subregion are more accurate than before. Perhaps this indicates that the regions are very similar and a continuum exists between areas. That similarity would argue for finer scale (smaller area) assessment and establishment of PAs to accommodate those variations. If, for example, the PAs contained a full suite of elevations, forest types and productivity classes, then the label (montane versus foothills) is less important and perhaps one could argue that an under representation of one but over representation of the other is not so important. That finer assessment has not been done, so need to stick with representing subregions.

Page 8: 3.3 Ongoing Protected Area Participation

Comment: *Good to be involved in the process and good to defer activities. Both those actions fit with Principle 6.4.*

Page 8 “...the Ghost and the Elbow/Highwood/Kananaskis Foothills, have been identified as potential protected areas within and immediately adjacent to the SLS’s FMA.”

Comment: *Do those contribute to Upper or Lower foothills? Why don't we hear about them any further as potential areas to fill gaps? Are they later just referred to by candidate area number? Make the crosswalk (name to number) to link this section with later sections.*

Page 9: 4.0 CURRENT GAP ANALYSIS FOR SPRAY LAKES FMA/B9 REGION

Comments: *Steps seem appropriate; good to recognize that WWF and CBD are both national scale and some adjustments useful.*

Not clear in the report how the HCVF of Kansas and Kelly (2011) assessment was used. Pages 2, 9, and 30 says HCVF will be used, but provide no details (which is appropriate since pages 2 and 9 introductory only). Page 12 (Figs. 3 and 4) and page 22 indicate the HCVF identified hotspots at low elevations in the Foothills. Was that the only way the HCVF document was used so far? Or were PAs assessed as to how they cover the habitats in Figures 3 and 4? That would be a good step.

Page 9: 4.1 Step #1: Gap Analysis Scope and Scale

Comment: *It is appropriate to examine an area larger than the FMA to do a gap analysis. The report should explain why this particular expanded area was chosen. It would be useful for Figure 2 to show the entire extent of foothills and montane subregions. I wonder why areas to the north and east were not also included? Does the forest stop? Is east all agricultural? On the north and east sides the reviewer (me) can't see what forest types are adjacent or what the PAs look like. Maybe it's all agricultural land, but it should be explained. If forest types are similar to the north and east, then those should also be considered to some extent to at least to put FMA in its context on all sides. What is to the south?*

Page 12: 4.2 Step #2: Identification of Focal Biodiversity Indicators/Targets

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

Comment: *As noted in part 1 above, natural area subregions are appropriate at Alberta provincial scale and possibly at the regional scale but may need a finer scale look at FMA. While it is fine to use subregions as the tool to build a PA, that PA system should then be assessed for how it represents productivity/elevation, forest types, riparian etc.*

BC standards indicate much finer reserves at 6.4 level, and foothills are more similar to BC forests than the larger boreal expanses. So tendency should be to lean to finer scale rather than broader scale gap analysis.

Same comment on targets as in part 1 above – the targets are low. That PAs within those targets have a better chance of becoming legal is not really a valid reason to not try for more. Companies can always put more aside than legally binding, and gradually work towards legal designation.

Page 12: 4.3 Step #3: Evaluate and Map Biodiversity

"The representation of deciduous and mixedwood forest cover types generally decline as elevations increase"

Comment: *The importance of elevation argues to check representation of elevation in PAs.*

"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."

Comment: *It is good that the paper notes some of the other aspects that are important to biodiversity. This type of information should come into play in the gap analysis -- do the PAs cover these ecosystems? That step does not seem to have happened.*

Page 15: 4.4 Step #4: Existing Occurrence/Status of Protected Areas

No comments

Page 15: 4.5 Step #5: Protected Area Gap Identification

"...South Saskatchewan River planning framework conservation management area candidates, and passive landbase in the FMA (permanent retention)..."

Comment: To be includes towards PA targets the passive landbase needs to contribute to ecological goals -- so SLS should see if it does! Discuss with FSC auditors and point out applicability of BC scale to foothills and that BC FSC standards allows reserves in passive landbase to contribute. SLS could describe its passive landbase better – what is the degree of retention (is it really permanent or would changing economic change the landbase?). Are they large patches or small, what ecosystems are covered? etc...Then could get credit for that landbase (or at least argue it significantly increases apparent PA levels).

Page 17: Table 1

Comment: Add columns to express Protected Areas in RAA; Protected Area Shortfall in FMA; and FMA Passive Land Base, as a percent of total land area supply in RAA. That would make things easier to interpret. (columns 8, 11 and 12 as proportion of column 3)

Page 15: 4.5.1 Rocky Mountain Natural Region

Comment: This is the first mention of Rocky Mountain Natural Region. Is it a broader region into which the subregions fit? Does the montane subregion occur only in this region (or does it occur in others too)? Provide a map so we know the area being discussed. Maybe the paper does not need to introduce regional level when everything so far has been about subregions.

Page 15: 4.5.1.1 Montane Subregion

Comment: seems reasonable interpretation that there are no large gaps in PAs in the montane, but would be nice to see elevational spread or productivity spread or forest types contained in PAs there before saying it is covered. Text does say that there are some low elevations included, but tighter analysis would be better. About 17% reserved which is large by Alberta standards, but not excessively over represented according to standards of other areas and still low biologically. The role of passive landbase could act to increase protection and could be discussed further.

Page 18: 4.5.1.2 Subalpine Subregion and 4.5.1.3 Alpine Subregion

Comment: I agree there are no significant gaps in subalpine or alpine and protection levels are well above even the 30% biological benchmarks.

Page 21: 4.5.2 Foothills Natural Region

4.5.2.1 Lower Foothills Subregion

"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"

Comment: Indicate what percent is actually protected, rather than (or as well as) what percent of the target percent is protected. (24.6% of 2.5% target is a very low amount).

Page 21 "Accepting the 2006 Natural Subregion mapping revisions, and not including passive land base as protected areas, there remain gaps in the formal protection of Lower Foothills lands in the FMA or RAA."

Comment: State the amount of the gap. If the amount of gap depends on proportionality or responsibility of SLS for lower foothills, then explain how that works. Also, that gap is in relation to the 2.5% target for the RAA which is very low. I suggest you should be striving for minimally 12 to 30% of the 635 ha, not 2.5% of 635 (or 695 km² if RAA used). There is 188 km² of passive landbase that could count

if it fills ecological roles. How much of a gap would there be with passive landbase included? Report could make more of the contribution of the passive landbase.

Page 21 "Prior to these changes, the Sheep River Provincial Park and Bluerock Wildland Provincial Parks protected a combined 114 km² of Lower Foothills habitat, respectively (see Section 3.2)"

Comment: *Presumably it now contributes to another subregion (montane), and is still within RAA you are analysing, so its contribution is not lost. Some of the tone of text seems to indicates its contribution is lost from RRA, not sure just how to alter text to change that tone.*

Page 21: 4.5.2.2 Upper Foothills Subregion

"The Upper Foothills Natural Subregion comprises 754 km² (22.3%) of the FMA and 1,129 km² (14.4%) of the RAA (Figure 2)."'

Comment: *I think the paper said perhaps 11 km² protected in RAA, that's what percent? State it so reader doesn't have to do calculations. As well there is 191 km² in passive landbase which might be acceptable to count. What are percents protected?*

Page 21: Candidate Conservation Management Area #9 (Figure 7)

Comment: *Name the CMA so as to link back to earlier section (3.3) that described them.*

Page 21: "It is concluded that gaps remain in the formal protection of Upper Foothills lands in the FMA or RAA."

Comment: *State what the gap is and explicitly state what percent is protected in RAA.*

Page 22: 4.6 Step #6: Gap Prioritization

4.6.1 Special Case of the Sheep River/Bluerock Protected Areas

Comment: *This does not seem to be a gap prioritization issue. It is great that SLS contributed that PA, and it contributes to RAA percents and was large piece of SLS's former tenure. Still, FSC needs to look at remaining gaps. I assume there is a reason it is considered Montane now, and it still makes a biologically rich contribution.*

Page 23: 4.6.2 Environmentally Significant Areas in Protected Area Selection

"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."

Comment: *How do PAs in RAA cover the 180 or the 12 ESA's?*

"...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."

Comment: *Even if an area is fragmented etc, PAs are still useful. The approach ends up being taking the best examples possible, even if they are not excellent. In some cases restoration is even necessary. Don't usually reduce targets because ecosystems are at higher risk/poorer condition.*

"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). “

Comment: Does this apply to all 180 or only to the 12 ESA's? I.e., are none of the 180 ESAs in the northern FMA area?

Page 25 Figure 9.

Comment: Figure 9 shows some high multi-species habitat ratings in eastern portion of the northern FMA area. There areas may be worth including in PAs.

Page 26: 4.6.3 Red Deer River ESA #20

“The portion of ESA #20 in the FMA is comprised of 45.6 km² of Lower Foothills and 0.37 km² of Upper Foothills lands”

Comment: Should mark and label it on Figure 8. Seems like a good choice – how much gap does it fill? Not just as km² but percent of lower and upper foothills subregions.

Page 26: 4.7 Step 7: SLS Strategy for Filling Protected Area Gaps in FMA

“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”

Comment: Should explain exactly how they are calculated. Also state protected area as percent of land area of that subregion (in FMA or RAA) so that understanding ecological contribution of those numbers is easier.

Page 26: 4.7.1 Step 1: Site Identification and Selection

“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).”

Comment: Is there more than that one suggestion? Is that the starting point or the only addition on the table? Make it clear in the text. What does “specific PA criteria” refer to?

Page 27: 4.7.2 Step2: Feasibility Assessment

Comment: Not a very in depth description of this process, but not the focus of this paper so ok.

Page 28: 5.0 SUMMARY AND CONCLUSIONS

5.1 Protected Area Gap Analysis Summary

“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 “

Comment: “Fully protected” is a bit optimistic. Always say what the provincial targets are please, and what percent is actually protected. That is about 17% of the montane subregion.

“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 km² 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 km² of Upper Foothills lands in the northern portion of the FMA region, immediately west of the FMA boundary. Another 3 km² 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 km² of lands remain to be protected in the Lower Foothills in order to meet provincial targets. “

Comment: For the upper foothills and lower foothills paragraphs, note the percent protected in province and RAA, just like you have done for preceding subregions. Referring to a percent of a target percent is difficult to decipher. As stated earlier 24.6% of 2.5% targets is very low for the province; what do those percentages look like for FMA or RAA?

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 “

Comment: I agree it’s high, but please say what the “overall high proportion” is.

“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 “

Comment: Please indicate what “well represented” means (put the 17% in brackets to indicate what the number actually is).

“Protected areas within the Foothills Natural Region are under-represented in the SLS FMA and regional environs. “

Comment: Indicate what percent is protected in RAA.

“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.”

Comment: Why the word “if”? And is the Red Deer the only candidate area?

“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. “

Comment: Instead of just saying HCVF will be used, say a bit about how the HCVF analyses will be used. Will this gap analysis be assessed for which HCVF attributes are not included in PAs so as to identify areas where there are gaps and seek the best areas to fill those? If so, add that idea and a few other ideas/details on how it will be used to the text.

6.0 Summary

SLS has completed a useful step towards meeting FSC's Principle 6.4 by undertaking this gap analysis. The gap analysis by SLS uses an appropriate scale for the main gap analysis, but should also include assessment of how that coarse filter approach (representing subregions by the current and planned suite of PAs) encompasses finer features (such as forest types, elevations, productivity classes, focal species hotspots, etc).

The targets used are very low compared to other jurisdiction and biologically-based benchmarks. The current targets do not provide confidence that biological integrity can be maintained. SLS should increase targets.

Perhaps the forest management landbase, and in particular the passive landbase, adds substantially to the effective protected area (and hence reduces the need for higher targets), but that has not been demonstrated. SLS could do more to describe the potential contributions of their passive landbase.

There are several more minor points noted in the page by page review, that would benefit from clarification.

7.0 References:

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