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MSES
Management and Solutions in Environmental Science

Technical Review of the Environmental Impact Statement: Smith Creek Area Structure Plan

Prepared for Town of Canmore

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Image: Wikimedia Commons 2007

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Executive Summary

Management and Solutions in Environmental Science (MSES), as third-party technical reviewers on behalf of the Town of Canmore (the Town), was requested to participate in the Environmental Impact Statement (EIS) review for the Smith Creek Area Structure Plan (ASP) (the Project). Three Sisters Mountain Village Properties Ltd. (TSMVP) are the current owners of the property, which is located within the eastern boundary of the Town of Canmore. On behalf of TSMVP, QuantumPlace Developments Ltd. (QPD) is working to develop the new Smith Creek ASP, which includes properties formerly known as Sites 7, 8, and 9, and lands currently occupied by Thunderstone Quarries Ltd. Golder Associates Ltd. (Golder) prepared the draft Smith Creek EIS. The Smith Creek ASP also includes the proposed realignment of the Stewart Creek Across Valley corridor that was recently approved by Alberta Environment (AEP, 2020). The Three Sisters Parkway will extend across the Stewart Creek Across Valley corridor and is proposed to be fenced along the north and south sides of the right of way to guide wildlife through a planned underpass. The proposed Project will include homes, a commercial component, a flex commercial-industrial district, open space, and a multi-modal transportation network that will cover 154 hectares of land.

Our role in this process is to scientifically review the EIS through the drafting process and provide a final opinion on the adequacy of the assessment of environmental risk and proposed mitigation and monitoring in the EIS. Our review will assist the Town of Canmore to ensure they have the necessary tools and knowledge at hand to inform the decision-making process. This includes consideration of the management and mitigation of future risks, and identification of any uncertainty surrounding potential impacts of the proposed development and associated mitigation measures.

Our detailed review focused primarily on wildlife and wildlife habitat concerns, with vegetation and aquatic experts providing a high-level review on those relevant disciplines. Given the close proximity and potential additive effects from the proposed Three Sisters Village (TSV) development, we ask that the Town jointly consider our recommendations and comments from both our review of the EIS for the TSV ASP and this current report.

Conformity Review

Overall, we concluded that the information provided in the final EIS met the Terms of Reference (ToR) and followed the agreed upon approaches. However, this conclusion does not necessarily signify our agreement with the conclusions or approaches outlined the EIS, or that potential limitations surrounding approaches used in the assessment or overall knowledge gaps in environmental data have been addressed. For example, since no direct movement data for the Canmore area has been collected by developers, the province or other research organizations, the assessment relies upon outdated spatial data (>10 years old) to inform the wildlife models. Given this data gap, Golder relies on resource selection function models and step lengths from the older data to infer movement. If the time between relocations is long, it may mean that animals did not move directly between relocation points and, as such, the habitat values along the straight line path may not reflect the actual habitats chosen by animals traversing the landscape. This does not invalidate the analysis Golder conducted but is reason to be cautious about how much can be inferred about animal movement through the local study area (LSA) and regional study area (RSA).

Given the existing environmental concerns for wildlife in the Bow Valley, the ToR required that Golder identify and discuss potential monitoring programs that link to potential thresholds. The EIS does outline some of the overarching research objectives for the future monitoring program to evaluate mitigation success and accuracy of impact predictions, but details have not been developed yet. As stated in the EIS, details such as the development footprint and details for follow up programs will be provided at future stages (i.e. Conceptual Scheme approval). Although there are commitments to complete these next steps, it is clear that these are not trivial tasks and will need to be discussed and explored in depth with all jurisdictions involved, prior to the Conceptual Scheme approval.

Technical Review

Many of the issues we identified in our previous review of the TSV EIS (MSES 2020) are also relevant for the Smith Creek EIS. These include: the age of some of the data, lack of information on changes in wildlife use over time, and unintended impacts of the primary mitigation, such as the displacement of negative human-wildlife interactions to areas outside the fenced development and increases in conflict inside wildlife corridors. We have also noted some additional issues that are unique to the Smith Creek Project, as follows:

- Given that the Smith Creek portion of the Along Valley Corridor currently sees the least amount of human use, it stands to reason that it will see the largest relative change in human use compared to the Along Valley Corridor adjacent to the TSV ASP area. This is where the lack of information regarding how increasing levels of human use have changed wildlife use of the corridor over the last two decades is detrimental to our overall understanding of the Project impacts on wildlife use in the adjacent corridors. This information gap will need to be addressed to help build the foundation for the future monitoring program.
- Bighorn sheep movement routes have been identified from the Wind Ridge, through the southeastern branch of the Along Valley corridor, through the existing Stewart Creek Across Valley corridor to the underpass at the TransCanada Highway. Assessment of impacts to bighorn sheep were considered under a general assessment for "*Other Species and Species at Risk*". Golder acknowledges the uncertainty surrounding our understanding of potential impacts to bighorn sheep but concludes that Project impacts will be negligible. Our confidence in this prediction is limited because the EIS does not address the current abundance of sheep in this area or how sheep populations may change with changes to predator abundance and distribution which would help to substantiate Golder's predictions.

Overall, we feel that Golder's assessment of unmitigated impacts on valued ecosystem components (VEC) are reasonable. We would be more precautionary in our predictions of effect magnitude for unmitigated risk on grizzly bear and wolf habitat quality and quantity and their use of approved corridors. However, our differences of opinion on these predictions are relatively minor. Golder's assessment of Project-specific residual impacts on VECs predicts that with mitigation, the Project itself will not contribute to any of the serious risks identified for wildlife under existing conditions, nor will it create or contribute to the serious risks for other VECs. Our concerns with this conclusion relate to the uncertainty in the mitigation effectiveness and the potential for increasing wildlife conflict in other areas of Canmore associated with fencing. We have also identified several gaps or concerns for water quality and vegetation that contribute to the uncertainty in our understanding of impacts to these resources or that may limit the scope of future monitoring of impacts to these resources. Although these concerns and gaps may not require a change in overall conclusions, they do highlight a gap in our understanding of corridor functionality and changes in

wildlife habitat use over time, as well as, the need for the development of detailed follow-up plans based on testable hypotheses and actionable management measures as early in the process as possible.

We agree with QPD/Golder that the management of impacts related to the proposed development will require a complex set of mitigations, potentially including a wildlife exclusion fence. However, we do not share their confidence that all the mitigations will be effective, simply because successful mitigation will require multiple measures acting in concert to address the issues stemming from development and increased human use in the area. As we note in our review, many examples of fencing exist, but no direct analogues can be used to predict the efficacy of a fence in the situation faced in Canmore. Management of human use in a narrow, mostly developed valley, presents a unique application of wildlife exclusion fencing.

The EIS outlines potential adaptive management actions and presents an approach to phased development that could allow for results from the monitoring program to inform the development and implementation of mitigations for later phases of the Smith Creek project. As currently written, the EIS indicates that monitoring data will be reviewed and adaptive management invoked as needed when construction is set to occur within 200 m of the wildlife corridors (Golder, 2020, pg. 177). We also think there is an opportunity to do something similar for the phased development approach proposed for the ASP area over time (Golder, 2020, Figure 8 and pg. 136). With some uncertainty about how the suite of proposed mitigations will work in concert when they are all in place, and the central role they play in plans to maintain corridor functionality, phased development should include links to successful demonstrations of ongoing corridor functionality and mitigation effectiveness. Linking phased development to the output from the monitoring program and invoking adaptive management is not currently proposed for the development of Phases 1-3 in the EIS.

There are also no proposed adaptive management actions related to the final location or presence/absence of the fence provided in the EIS. Given the novel application of wildlife exclusion fencing around large parts of an urban development in a narrow, highly developed valley, we suggest that options for adjustment to the final fence location or its' removal in whole or in part, should at least be considered in follow-up planning. If monitoring data demonstrates that everything is working as predicted in the EIS, then no further action will be required. However, given the sensitivity of the corridor issue in Canmore and controversial nature of the main proposed mitigation, it seems prudent to at least consider the conditions under which potential adaptive management actions include alterations to the form, density, or location of development in areas adjacent to wildlife corridors. Based on the current discussion of the adaptive management approach in the EIS, once maximum build-out is reached, adaptive management options for the fence are relatively limited. It is our opinion that some level of flexibility is required to allow for future adjustments to ensure impacts from the development are sufficiently mitigated and wildlife corridors remain functional.

Acronyms

AEP	Alberta Environment and Parks
ASP	Area Structure Plan
CEA	Cumulative Effects Analysis
EIS	Environmental Impact Statement
ESA	Environmentally Sensitive Area
Golder	Golder Associates Ltd.
ha	hectare
HBI	Human-bear interactions
hr	hour
HUMR	Human Use Management Review
LSA	Local Study Area
m	metre
MDP	Municipal District Plan
MSES	Management and Solutions in Environmental Science
NRCB	Natural Resources Conservation Board
QPD	Quantum Place Developments Ltd.
RFD	Reasonably Foreseeable Developments
RSA	Regional Study Area
RSF	Resource Selection Function model
ToR	Terms of Reference
TPR	Third Party Reviewer
TSV	Three Sister's Village
TSMVP	Three Sister's Mountain Village Properties Ltd.
TSS	Total Suspended Solids
VEC	Valued Ecosystem Components

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1.0 Introduction

Management and Solutions in Environmental Science (MSES), as third-party technical reviewers on behalf of the Town of Canmore (the Town), was requested to participate in the Environmental Impact Statement (EIS) review for the Smith Creek Area Structure Plan (ASP) (the Project). Three Sisters Mountain Village Properties Ltd. (TSMVP) are the current owners of the property which is located within the eastern boundary of the Town of Canmore. On behalf of TSMVP, QuantumPlace Developments Ltd. (QPD) is working to develop the new Smith Creek ASP which includes properties formerly known as Sites 7, 8, and 9, and lands currently occupied by Thunderstone Quarries Ltd. Golder Associates Ltd. (Golder) prepared the draft Smith Creek EIS. The Smith Creek ASP also includes the proposed realignment of the Stewart Creek Across Valley corridor that was recently approved by Alberta Environment (AEP, 2020). The Three Sisters Parkway will extend across the Stewart Creek Across Valley corridor and is proposed to be fenced along the north and south sides of the right of way to guide wildlife through a planned underpass. The proposed Project will include homes, a commercial component, a flex commercial-industrial district, open space, and a multi-modal transportation network that will cover 154 hectares of land.

The TSMVP lands are adjacent to environmentally sensitive areas, primarily provincially designated wildlife corridors that are meant to facilitate animal movement through the Bow Valley and past Canmore. A wide range of environmental issues and concerns surround the approval of the ASP, including the potential impacts of development of Smith Creek on wildlife habitat availability, human-wildlife conflict and wildlife movement through, along and across (i.e. Stewart Creek, Pigeon Mountain) wildlife corridors adjacent to Smith Creek. These corridors form critical connections between local and regional habitat patches in the Wind Valley and Bow Flats to habitats west of Canmore in Banff National Park and beyond (Lee et al., 2010).

Our role in this process is to scientifically review the EIS through the drafting process and provide a final opinion on the adequacy of the assessment of environmental risk and proposed mitigation and monitoring in the EIS. Our review will assist the Town of Canmore to ensure they have the necessary tools and knowledge at hand to inform the decision-making process. This includes consideration of the management and mitigation of future risks, and identification of any uncertainty surrounding potential impacts of the proposed development and associated mitigation measures.

1.1 Report Approach and Format

As outlined in the Terms of Reference (ToR) (ToC 2018a), the third party reviewer (TPR) will assess whether the EIS meets the requirements of the Town's EIS policy (ToC 2018b), identify gaps in the EIS, and provide recommendations on additional, mitigation, monitoring, or future studies required. The ToR directs the following three questions to be addressed as part of our review:

1. Does the EIS include the required information, as outlined in this ToR? If any information is missing, the third-party reviewer will identify the deficiency.

2. Does the EIS follow agreed upon methods and analysis, as outlined in this ToR?

3. Does the third-party reviewer agree with the assessment of unmitigated risks, the mitigation identified, and the assessment of residual effects?

Our detailed review focused on wildlife and wildlife habitat concerns, with vegetation and aquatic experts providing a high-level review on those relevant disciplines. Given the close proximity and potential additive effects from the proposed Three Sisters Village (TSV) development, we ask that the Town to jointly consider our recommendations and comments from both our review of the EIS for the TSV ASP and this current report.

We have separated this report into a Conformity Review Section (Section 2.0) that provides our conclusions as to whether the EIS has met the requirements of the ToR by providing the required information and follows the agreed upon methods and analysis. The Technical Review Section (Section 3.0) presents our perspective on the overall EIS conclusions, unmitigated and residual impacts, and assumptions regarding the efficacy of proposed mitigations. Throughout this report, direct quotes from the EIS are in italics while quotes from other sources and literature remain in plain text.

2.0 Conformity Review

2.1 Does the EIS include the required information, including methods and analysis, as outlined in the Terms of Reference?

The ToR for an EIS provides guidance for an assessment of the potential impacts on the biophysical and human environment that may occur as a result of a proposed development, if it were allowed to proceed. Our conformity review considered whether information has been included in the EIS to a level of detail that is sufficient to proceed to the next phase of the regulatory process. Overall, we concluded that the information provided in the final EIS met the conditions as outlined in the ToR. However, this conclusion does not necessarily signify our agreement with the conclusions or approaches outlined the EIS, or that potential limitations surrounding approaches used in the assessment or overall knowledge gaps in environmental data have been addressed. Although the methods and analysis used in the EIS assessment followed the agreed upon approaches, as noted in a previous MSES review of the Three Sisters Village ASP (MSES 2020), there are some outstanding concerns overall that carry through on both Projects (please see MSES 2020 for full discussion). For example, since no direct movement data for the Canmore area has been collected by developers, the province or other research organizations, the assessment includes outdated spatial data (>10 years old) to inform the wildlife models. Given this data gap, Golder relies on resource selection function models and step lengths from the older spatial data to infer movement. A limitation to this approach involves the length of time between relocations. If the time between relocations is long (e.g. 2-4 hours), it may mean that animals did not move directly between relocation points and thus habitat values along the straight-line path may not reflect the actual habitats chosen by animals traversing the landscape. This does not invalidate the analysis Golder conducted but is reason to be cautious about how much can be inferred about animal movement through the local study area (LSA) and regional study area (RSA). As well, due to the methods used in the camera program (non-fixed locations), changes in wildlife use across time is not presented in the EIS. Therefore, there is a lack of quantifiable data as to how much wildlife occurrence has declined or increased which would be important for defining thresholds and triggers for the Monitoring and Adaptive Management Plan.

The Terms of Reference required that Golder identify and discuss potential monitoring programs that link to potential thresholds. The EIS does outline some of the overarching research objectives for the future monitoring program that would evaluate mitigation success and impact prediction accuracy, but details have not been developed yet. As stated in the EIS, details such as the development footprint and details for follow up programs will be provided at future stages (i.e. Conceptual Scheme approval). Although there are commitments to complete these next steps, it is clear that these are not trivial tasks and will need to be discussed and explored in depth with all jurisdictions involved prior to the Conceptual Scheme approval. For example, baseline data will need to be collected regarding wildlife movement, changes in wildlife use over time and bighorn sheep use of the Stewart Creek Across Valley corridor. This information will be essential to inform the development or identification of specific metrics, targets and thresholds for verifying impact predictions and mitigation success in follow up programs. It will also be important to review details of how the phased development approach will tie into the Monitoring and Adaptive Management Plan to ensure that there are options available to mitigate any potential impacts to wildlife if monitoring results indicate EIS predictions were incorrect. For example, this could include using monitoring data gathered during each phase to inform the application and design of mitigations for subsequent phases. The EIS mentions a potential pathway for this, by proposing a phased approach to fencing the Smith Creek ASP area (Golder, 2020, Section 5.6.4, pg. 135), but it does not tie the phased fencing approach to the results of monitoring. This is something we think could be explored during the development of the Monitoring and Adaptative Management Plan scheduled to occur before Conceptual Scheme approval.

3.0 Technical Review

The Project area is surrounded by important wildlife habitat including the Along Valley Corridor, Stewart Creek Across Valley Corridor and Pigeon Mountain Across Valley Corridor (Figure 2, Golder 2020, pg. 4). These corridors are part of the broader network of wildlife corridors and habitat patches that support wildlife use and movement in the Bow Valley. The Project area is largely forested, and the surrounding wildlife corridors are considered relatively less disturbed (e.g. fewer kilometres of designated and undesignated human use trails) compared to corridors adjacent to the Three Sisters Village (TSV) property. Therefore, it is essential that the Town consider how approval of both the TSV and Smith Creek developments will cumulatively change human and wildlife use in adjacent corridors and the broader corridor network overall. As described in the EIS, even with the successful implementation of the proposed mitigation, the Project will cumulatively contribute to the already existing serious environmental risk for grizzly bears, wolves and potentially elk. It is likely that this will be exacerbated further when continued development in the Bow Valley is considered and population growth in nearby towns (and from this Project), could result in "*doubling the number of people residing in the RSA and more than tripling the number recreating in the RSA by 2055*" (Golder, 2020, pg. 177).

Many of the comments and recommendations within our previous review of the TSV ASP EIS (MSES 2020) are also relevant for the Smith Creek EIS, including the age of some of the data, lack of information on changes in wildlife use over time, and unintended impacts of the primary mitigation such as the displacement of negative human-wildlife interactions to areas outside the fenced development and increases in conflict inside wildlife corridors. We have noted some additional issues that are unique to the Smith Creek Project, such as use of the area by bighorn sheep, impacts of the Three Sisters Parkway on wildlife use of the Stewart Creek underpass, and that overall, this area is less disturbed compared to other

developments with adjacent corridors. We discuss some of these concerns and make additional recommendations below in Section 3.2.

3.1 Summary of Wildlife EIS Conclusions

Our technical review evaluated the evidence presented by Golder to assess and conclude the following:

- **In the EIS, Golder concludes that a serious risk is present in the RSA for grizzly bears, wolves and elk.** "*A serious risk is any factor that put the viability of the portion of a wildlife species population inhabiting the RSA at risk (i.e., causes or contributes to a declining population trajectory that is not predicted to recover or stabilize without substantial immigration*)." (Golder, 2020, pg. 49). Under existing conditions, the RSA is considered a population sink for grizzly bears because bears are exposed to high mortality rates. Wolf use in the current corridor network is compromised (i.e. low use) and there is limited information regarding the stability of the regional wolf population. Although elk may be habituated to human activity and use human-modified habitats, they do not function in their natural ecological role so are not considered ecologically effective.
- Due to the number of new people likely to occur in the ASP area as a result of the Project and an increased concentration of existing users on designated trails because of the fence and improved education, **use of designated trails in wildlife corridors adjacent to the ASP area could more than double from existing conditions**, although the amount of increase is uncertain.
- Golder concludes that the Project is not expected to contribute to the serious risk identified for grizzly bears under existing conditions and may have a net benefit because the serious risk identified under existing conditions is driven by negative human-bear encounters and bear mortality. Golder states that mitigations associated with the Project could reduce these adverse effects relative to existing conditions. **Yet, the cumulative effects of this project and other future projects are predicted to contribute to the existing serious risk for grizzly bears** (Golder, 2020, pg. 184).
- Golder predicts that the Project will have low impacts on wolf habitat loss and use of the corridor and negligible impacts on negative human-wolf interactions, but these impacts will not change how wolves use or move through the RSA so will not contribute to the serious risk for wolves. However, **cumulatively, the adverse Project effects with other future projects will contribute to the serious risk to wolves** (Golder, 2020, pg. 197).
- Impacts to elk from habitat loss (low), use of corridors (negligible) and negative human-elk interactions (negligible) is predicted to not contribute to the existing serious risk if elk use habitat in the corridor compared to human-modified habitats in Canmore. However, because there is uncertainty as to how the fence will affect elk movement into other areas of Canmore, **if elk continue to concentrate in Canmore, this will contribute to the serious risk under current conditions. Golder states that this is the most likely outcome** (Golder, 2020, pg. 239).
- Cougars are expected to remain self-sustaining and ecologically effective in the RSA as the Project is not expected to introduce a serious risk to the regional population, even under cumulative effects scenarios.

3.2 Does the TPR agree with the assessment of unmitigated risks, the mitigation identified, and the assessment of residual effects?

In this section, we present our opinion on the assessment of unmitigated risks associated with the proposed Project as presented in the EIS. We also discuss the mitigations proposed in the EIS, our thoughts on their potential effectiveness and how that relates to the assessment of residual effects. In addition, the Smith Creek ToR requested the TPR to identify gaps in the EIS "and provide recommendations on additional mitigation, monitoring, or future studies required" (ToC 2018a, pg. 9). We were also asked to identify appropriate timing for future studies as necessary.

MSES recently completed a review of QPD's Three Sisters Village ASP which is located west of the Smith Creek ASP. Many of our comments and recommendations identified in the TSV ASP EIS Review (MSES 2020) also apply to the Smith Creek ASP EIS.

3.2.1 Assessment of Unmitigated Risks Associated with the Project

Without mitigation, Golder predicts the Project will contribute adversely to all wildlife valued ecosystem components (VECs). Some habitat will change but the key concern is associated with the Project's contribution to increases in mortality from negative human-wildlife interactions. In general, we found that the assessment of unmitigated effects on wildlife VECs reflects plausible overall outcomes which predicts that the Project will lead to a high environmental consequence and contribute to the already existing serious risk to most wildlife VECs (i.e. grizzly bears, wolves and elk). However, we feel that some predictions surrounding magnitude for loss of habitat and use of wildlife corridors could actually be considered higher than the low or small designations. For example, grizzly bear habitat loss from Project development will lead to a loss of 8 hectares (8ha) of selected habitat in the ASP which will be offset because the Project will increase forest edge and thus increase selected habitat in the LSA. It is noted that additional "*habitat loss could occur if unsanctioned trails are constructed*" in the LSA (Golder, 2020, Table 19 pg. 108). As this evaluation is considering conditions with no mitigations, it would seem very likely that unsanctioned trails would occur given experiences in other areas of Canmore. In Section 5.3.2, Golder discusses how undesignated trails are more common than designated trails in wildlife corridors and that trails often connect to backyards of residences when located adjacent to corridors (Golder, 2020, pg. 69). We would have preferred to see an even more precautionary assessment of magnitude because it is unknown how grizzly bear habitat use may change if human use in the corridors increases from current levels.

The magnitude rating for wolves for habitat loss is also considered small because although strongly avoided habitat increased within the LSA, Golder predicts the change in habitat quantity may have a limited effect because wolf use of the area is very low (based on wolf data). This change in habitat quantity could be even higher if there is an increase in undesignated trails. We would again prefer a more precautionary assessment of magnitude given that data suggests that a few wolves have been recorded in the area more recently.

Overall, we would be more precautionary in our magnitude predictions of unmitigated risk on grizzly bear and wolf habitat quality and quantity and use of approved corridors. However, we also recognize that changing the magnitude prediction does not fundamentally change the overall conclusion that, without mitigation, the Project would have serious consequences to wildlife. It simply highlights a gap in our

understanding of corridor functionality and changes in wildlife habitat use over time, as well as, the need for detailed follow-up plans based on testable hypotheses and actionable management measures.

3.2.2 Adequacy of Proposed Mitigation

Section 5.6 in the EIS discusses the various mitigation measures that may be employed to reduce impacts to wildlife. This includes mitigations that would fall under the responsibility of the Developer, Town, Municipal District of Bighorn and the province. Mitigations proposed to reduce Project-specific effects associated with increased human use in the wildlife corridors includes education, wildlife fencing and providing alternative recreational activities within the Project footprint which Golder predicts will "*substantially*" (Golder, 2020, pg. 138) reduce Project effects. As described in the EIS, there is a degree of uncertainty as to the effectiveness of several of the proposed mitigations and, if these mitigations do not work as predicted, there can be serious consequences for wildlife in the Bow Valley. Education (e.g. WildSmart), enforcement, habitat enhancements and removal of undesignated trails are measures that have been undertaken previously. Although Golder provides a few successful examples (e.g. Long Road to Ruin trail), there are also examples where these mitigations have been less effective. For example, remote camera data has shown year-round human use and high human use during April and May, which overlaps with the trail closure period for the Along Valley corridor (Golder, 2020, pg. 69). It is evident that managing human use in the corridors is an ongoing challenge and that further management efforts are required.

Golder states that undesignated trail use is common because "*many residents and visitors appear to be unaware of the restrictions that apply in designated corridors*" (Golder, 2020, pg. 281). This implies that the current education efforts are insufficient. Golder highlights that the Human Use Management Review (HUMR) survey (Town of Canmore 2015) supported more community education strategies, but the report also indicated that there were concerns with people being resistant to the education efforts. Golder recommends that the Town and province undertake an education and enforcement campaign for the first 5 years of the monitoring program, but it is unclear what types of educational strategies will be employed (other than providing educational signs) because these details will be developed at later stages of development. It was recommended in the HUMR report that education needed to be supported by enforcement activities so that people understand the consequences of non-compliance. We understand that enforcement would be the responsibility of the province and Town but, as presented in the EIS, efforts by these other stakeholders are an essential part of the proposed mitigation framework. We are told that the effectiveness of these mitigations will be assessed as part of the Monitoring and Adaptive Management Plan. Some statistics on enforcement efforts and education success since the 2015 HUMR report was published would be helpful to get a more thorough understanding of the effectiveness of existing education and enforcement effort. Although outside of the Developer's jurisdiction, enforcement will be an important tool for increasing compliance and, given the ongoing concerns about undesignated trail use and off leash dog occurrence in the corridors, the Town and Province will need to evaluate how efforts can be increased and sustained within their jurisdiction, if the Project is approved.

Another mitigation proposed to reduce impacts of increasing human use from the Project in the corridors is to create recreational amenities within the developed area to provide people with alternative recreational activities and off-leash dog parks. The ASP is proposing to add 840-1,730 dwelling units to the area which could increase the Canmore population by 2,200-4,500 people (Golder, 2020, pg. 33). The total land area is approximately 154 hectares and it is stated in the EIS that a "*notable*" amount of open

space is spread throughout the ASP plan (Figure 9) to provide recreational opportunities inside the development area. However, looking at Figure 9, it is difficult to imagine that the proposed outdoor recreational areas within the ASP footprint will be able to support and sustain use by potentially up to 4,500 people. It is stated in the EIS that trail systems will be connected to the TSV ASP area, where 40% of that ASP area is dedicated to some form of recreational area, including planning a mountain biking trail system. Golder predicts that these areas will help reduce human use in the corridors because it provides residents opportunities to recreate and walk their dogs in places other than the wildlife corridors (Golder 2020, pg. 135). We agree that these opportunities are important to provide to residents to help reduce human use in wildlife corridors since the development will increase the amount of people in the area, but their effectiveness remains uncertain. Ensuring the sustainability of these areas to remain more attractive than recreating in the corridors will be a critical piece of mitigating human use in areas meant for wildlife. As noted in the above paragraph, management of human use in the wildlife corridor will need to be substantially improved to ensure that new residents understand how their recreating choices can impact wildlife and the financial risks of non-compliance.

Fencing is a key mitigation proposed in the EIS and more detailed information will be developed following approval of the ASP and prior to the Conceptual Scheme approval. We agree in concept that a wildlife exclusion fence has the potential to mitigate some of the impacts associated with the proposed development. However, we also think there is substantial uncertainty about the potential effectiveness of a fence to mitigate the entire range of impacts it is being proposed for (see MSES 2020 for more discussion and recommendations). The fence is intended to direct human use in the corridors, lower incursions by wildlife into designated areas, and maintain corridor functionality for wildlife. The EIS presents a number of examples of the effective use of wildlife fencing for keeping wildlife off highways, directing human use to specific trailheads, reducing negative interactions at campgrounds and keeping ungulates out of urban areas. Although Golder states that incursions related to wildlife exclusionary fencing is rare, the data to support these conclusions is not publicly available. It is also unknown how increased human use in a confined space (i.e., corridor with a hard boundary) could impact the probability of negative human-wildlife interactions in the corridor. While the fencing examples provided in the EIS show different ways in which wildlife fencing can be successfully implemented, none of them are direct analogues to the situation being proposed for the Smith Creek development. In the EIS, the presence of a fence is predicted to simultaneously limit negative interactions and reduce human use in the corridors, and the failure of the mitigation to be effective could have significant consequences for wildlife corridor functionality.

Successfully limiting the impacts of the development on wildlife movement requires a complex set of mitigations in an area that is already facing considerable pressure from urban development and human use. The EIS says that the suite of mitigations is '<u>most likely</u>' to be successful (Golder, 2020, pg. 137), and we would say it '<u>might</u>' be successful. For example, as noted in the EIS, "[t]*he fence will not be effective unless it is implemented in conjunction with strong attractant management and education initiatives as well as recreational amenities within the developed area to provide people with an alternative to recreating in the wildlife corridor."* (Golder, 2020, pg. 13). However, we do not share their confidence that all the mitigations will be successful in achieving EIS predictions, simply because successful mitigation will require multiple measures acting in concert by multiple jurisdictions to address the issues stemming from development and increased human use in the area. Golder and QPD highlight that adaptive management will mitigate this scenario, but the details of the future Monitoring and Adaptive Management Plan will not be developed until later phases of the regulatory process for the Project. This includes developing future monitoring targets and tying them to thresholds for management action or potential management responses: 1) in conjunction

with a multi-stakeholder working group with various management agendas; 2) in a situation where wildlife is currently under a serious risk, and 3) in a situation where baseline data for wildlife movement and changes in wildlife use across time in response to increasing human use need more thorough assessments. Given the uncertainty surrounding how the total amount of human use in the adjacent corridors will be managed in the future and what adaptive management tools are available to mitigate this potential impact, our difference in opinion relates to our confidence in the predicted mitigation effectiveness and yet to be developed, Monitoring and Adaptive Management Plan.

The importance of ensuring all mitigations function as predicted in the EIS is also apparent in the recent AEP Smith Creek corridor decision (AEP 2020). The intent of the decision is that no additional land is required for the wildlife corridors (i.e., no need for additional buffers, setbacks or layering of uses). However, we also note the AEP decision goes on to say "[t]his corridor proposal combined with [TSVMP] commitment to habitat enhancements, human use management and education provide a satisfactory resolution to achieve wildlife movement through this area and addresses the deficiency of the previous decision." (AEP 2020, pg. 9) This statement highlights how AEP's decision is dependent on the mitigations proposed by TSMVP being effective. Yet, as our review indicates, there is a lack of information on how increasing levels of human use have changed wildlife use of the corridor over the last two decades. Until there is monitoring data available, it remains unclear how effective the fence will be at directing and reducing human use inside corridors. Given that the Smith Creek portion of the Along Valley Corridor currently sees the least amount of human use, it stands to reason that it will see the largest relative change in human use compared to the Along Valley Corridor adjacent to the TSV ASP area.

3.2.3 Assessment of Project Specific Residual Effects

The EIS predicts that with mitigation, the Project will not contribute to any of the serious risks identified for wildlife under existing conditions, nor will it create or contribute to the serious risks for other VECs (Golder, 2020, pg. xviii). Golder acknowledges that these conclusions are uncertain because it depends on people responding appropriately to the fencing and signs, and their good behaviour once within the corridor. However, we do not have the same confidence in these assumptions given the current lack of compliance with existing management efforts which "are limited due to insufficient resources and differences in legislation amongst jurisdictions (Bow Valley Human-Wildlife Coexistence Technical Working Group, 2018, pg. 39). Further discussion about some of our concerns with Golder's assessment of residual effects on wildlife given the uncertainty in mitigation efficacy are discussed below.

3.2.3.1 Grizzly Bears

With respect to 'Grizzly Bear Use of Approved Corridors', the probability of bear selection in the corridors is expected to remain high because the Project will create some forest edge habitat (i.e. selected habitat). Golder predicts that since grizzly bears respond "weakly" to human use at existing conditions, that they will respond similarly in the future when human use in the corridor has potentially doubled, including expecting grizzly bears to use existing wildlife trails for movement after development of the Project. It is possible that grizzly bears may behave differently than they do now if human use in corridors doubles from current levels. Without understanding how grizzly bear use has changed over time in response to human use increasing 6% per year from 2003 to 2012 (Golder, 2020, pg. 67), it is difficult to clearly understand how additional human use inside the corridors will impact grizzly bear movement. It is possible the serious existing risks faced by most wildlife VECs would be exacerbated by increases in human

use, further compromising corridor functionality. There is currently no data available on how much grizzly bear use of the corridor has changed over time in relation to increases in human use. Having this information would provide insight into how grizzly bear behaviour changes with different levels of human use, which would inform the environmental consequence prediction and would be useful baseline information to inform the definition of thresholds for management action in the follow-up plans outlined in the EIS.

As mortality is a key factor in Golder's designation of serious risk for grizzly bears in the RSA, their consideration of impacts from negative human-bear interactions (HBI) in the corridor is based on several assumptions. Golder predicts that negative HBI within the Project area will decline substantially due to the fence and would have a positive outcome in reducing these types of conflicts. However, their prediction that these interactions will also decrease in the corridor is not well substantiated. Golder does state that there is uncertainty in their assumptions that people will use the recreational amenities within the Project area and elsewhere more than the corridors, and that people will use designated trails more than undesignated trails in the corridor. If this is not the case, there is concern that conflict in the corridor may increase as humans and wildlife would be sharing a space restrained by a hard boundary that may prevent wildlife escape or movement away from people. It will be imperative this be monitored closely with options for adaptive management measures in place.

3.2.3.2 ***Wolves***

Overall, Golder concludes that the Project will contribute adversely to the serious risk to wolves but that with mitigations (e.g. fencing, on-site recreational trails and off leash dog areas), the Project will have a small negative effect on the Along Valley corridor. Project effects on the Stewart Creek Across Valley corridor will also be small because wolves have not been seen using the Stewart Creek Underpass (2007-2012). Although wolf use may be rare, there have been recordings of wolves using the Along Valley Corridor and adjacent TSMVP lands, including near the Smith Creek ASP area (Golder, 2020, pg. 96) that confounds the argument that the Project contribution will be small. Similar to the grizzly bear discussion (Section 3.2.3.1 in this report), we would be more cautionary in categorizing the negative effects as small because wolf use of the corridors, although rare, does occur. Given the zones of influence for wolves towards residential developments (1,000-6,100 m; (Ford et al 2020)) and the width of this newly approved corridor design (averaged 610 m with the narrowest point being 401m (AEP 2020)), we are not as confident that impacts to the few wolves who may use the area will be small. Although changing this magnitude prediction would not change the overall conclusion that the Project is predicted to contribute to the decline in wolf use of the corridors, it does re-enforce the need for a monitoring program that measures changes in wildlife corridor use over time.

3.2.3.3 Bighorn Sheep

Bighorn sheep movement routes have been identified from the Wind Ridge, through the southeastern branch of the Along Valley corridor, through the existing Stewart Creek Across Valley corridor to the underpass at the TransCanada Highway. The EIS also identified current use by sheep at a mineral lick near the highway and Golder concludes that fencing will alter the route sheep take to access the Stewart Creek underpass. Golder notes that "*species at risk and other non-listed wildlife species may change their use of wildlife corridors*" and that these changes are predicted to be negligible (Golder, 2020, pg. 171). Specifically, for bighorn sheep, Golder discusses impacts on bighorn sheep use of an anthropogenic mineral source at the

Stewart Creek underpass but notes that alternative mineral licks can be deployed if the Project impacts access to the Stewart Creek underpass lick (Golder 2020, pg. 179).

Golder also concludes that mortality related to Project activities of large to medium bodied mammals (Section 5.7.6) will have a negligible impact because the fence will exclude wildlife from the LSA. There is no discussion as to how the fence could influence predator-prey relationships. Golder predicts that cougars may increase their selection of habitat along edges of development with a fence if prey aggregate in these areas. There is no discussion as to the current abundance of sheep in this area or how sheep populations may change with changes to predator abundance and distribution. Lastly, a cumulative effects assessment for wildlife species under "*Other Species and Species at Risk*" was not conducted because Golder concluded that Project impacts will be negligible in these cases which does increase the uncertainty in our understanding of potential impacts to bighorn sheep.

3.2.3.4 Smith Creek Corridor and Extension of the Three Sisters Parkway

The ASP includes the Three Sisters Parkway through the Stewart Creek Across Valley Corridor which will connect the two development areas. The proposed road will be fenced on the north and south sides of the right of way and include a wildlife crossing structure. As proposed, and pending approval by Alberta Transportation, the existing Stewart Creek underpass will be retained but a new crossing under the TransCanada Highway will be centered in the re-aligned Stewart Creek Across Valley corridor (moved 300 m to the east).

Existing traffic volumes on the Three Sisters Parkway in other areas of the LSA ranges from 5,000-8,000 vehicles per day (higher on the weekends) and the Project is likely to add between 10,000 to 30,000 vehicles per day on a weekday. There is no discussion as to what linear disturbance currently exists at the proposed Parkway location or a comparison of current activity levels at the proposed Parkway location to these predicted future traffic levels.

Golder's conclusions are based on a general assumption that the design of the underpass for the Three Sisters Parkway will be similar to other underpasses in the region which have been successful. Research has shown that use of crossing structures may be influenced by several variables including the type of crossing structure itself (Clevenger and Barrueto 2014); therefore, inclusion of regional experts in the final design of the underpass will be essential to increase the likelihood that an underpass would be utilized by multiple species. Furthermore, effectiveness of the underpass will be critical to monitor to ensure that wildlife use of the Stewart Creek Across Valley corridor continues. It should be noted that species will require some time to adapt to any new crossing structure; therefore, long-term monitoring will be required (Clevenger and Barrueto 2014). Commitments to include regional experts in the design of the final fence design and commitments to monitor the efficacy of the underpass are outlined in the EIS (Golder 2020, Table 50).

3.2.3.5 Displacement of Wildlife into Other Areas of Canmore

In the EIS, Golder discusses the potential for elk to be displaced from the ASP area once it is fenced. Displacement of elk into other unfenced parts of Canmore could increase the probability of negative human-elk interactions in these other areas. Is the fencing mitigation effective if it does not reduce the overall number of conflict interactions but simply relocates them to other parts of town? No data on the

distribution and type of human-elk interactions was reported in the EIS, and it is not clear if that type of data is available from AEP. This is a potential residual effect of the proposed mitigation that must be monitored in the future. The EIS indicates that habitat enhancements in the corridor may offset the displacement of elk into other parts of Canmore because there will be high quality forage resources available outside of town. However, if the fence operates as predicted and concentrates predators in the wildlife corridors, there is uncertainty whether food availability or predator avoidance will have a stronger effect on elk habitat selection.

There is a lack of discussion in the EIS about the potential for human-black bear interactions to increase in other parts of Canmore as a result of the fence. An analysis of HBI from 2016 and 2017 in and around Canmore, showed that out of a total of 1,241 HBI, 75% occurred with black bears, while 20% occurred with grizzly bears. HBI were categorized as incidents (i.e., conflict; physical attack, property damage, bear consuming human food) or sightings (i.e., animal, property, and person are unharmed), and the chances of an incident are ~4 x higher with black bears compared to grizzly bears (Sunter, 2020) in the Canmore region. Figures 28 and 29 in the EIS show that black bears are ~4x more abundant in the local study area than grizzly bears. Not only are black bears more abundant in the region, but Sunter (2020) used camera data to demonstrate that some segregation of space use is occurring between black bears and grizzly bears. Black bears were more active closer to Canmore, while grizzly bears were more active further away from Canmore. As black bears are the most common source of negative HBIs and they frequently use habitats close to Canmore, perhaps to avoid interactions with grizzlies in other habitats (Sunter, 2020), black bears will likely continue to be an issue in Canmore. Even if they are successfully excluded from the ASP area, the Town of Canmore will have to determine what level of increase, if any, in HBIs is acceptable in other, unfenced, parts of town. As with elk, the distribution of HBIs will need to be a part of future monitoring efforts to test the prediction.

3.2.4 Assessment of Risks Associated with Cumulative Effects

Golder predicts that the Project will have "*mixed contributions to cumulative effects*" but in general the contributions of the Project are expected to be low provided that the mitigations recommended in this EIS are implemented (Golder, 2020, pg. xviii). This statement seems to try to soften the outcome that the Project and other foreseen projects will contribute incremental effects (Duinker et al. 2013) to the already existing serious risk to grizzly bears, wolves and elk. Overall, we concur that the cumulative effects analysis (CEA) in the EIS presents an accurate picture of the set of risks currently facing wildlife VECs in the Bow Valley. The EIS also predicts significant growth in human use of trails in the RSA, including those inside wildlife corridors, potentially tripling by 2055.

As in the assessment of project-related impacts, the CEA focuses on impacts to wildlife VEC habitat quantity and quality, wildlife use of corridors and the likelihood of negative human-wildlife interactions. In summary, the environmental consequences of cumulative effects are predicted to be high for 3 of 4 wildlife VECs (i.e., grizzly bears, wolves, elk). For some species, the addition of reasonably foreseeable developments (RFDs) is expected to exacerbate existing risks (e.g., the likelihood of negative human-bear interactions (HBI)), while for others, the Project and RFDs are predicted to not contribute to existing risks, but uncertainty around mitigation effectiveness means consequences of cumulative effects are high (e.g., elk).

For grizzly bears, serious risks exist at baseline. The EIS notes the most important impact on grizzly bears may end up being an increase in negative HBI that results in an increase grizzly bear mortality. As a result, the EIS concludes that the "*environmental consequence of RFDs and other future activities is expected to be high because these developments and activities contribute to an existing serious risk.*" (Golder, 2020, pg. 185) The assumption is that the proposed mitigations will be sufficient to negate the impact of the Project, but risks associated with cumulative effects will remain high. The EIS does a reasonable job pointing out the uncertainties in the proposed mitigations, but given the precarious situation facing grizzly bears (and other VECs) around Canmore, it will be critical that monitoring actions are sufficient to demonstrate mitigation effectiveness to ensure Project-related impacts are addressed. Failure to do so could irreversibly sever connectivity in the Bow Valley or lead to unacceptable levels of mortality in regional wildlife populations.

For elk, there are serious existing risks at baseline. The EIS predicts that the Project and other RFDs are not expected to contribute adversely to the already diminished ecological efficacy of elk in the region under existing conditions. However, the EIS also acknowledges there is uncertainty in how elk will redistribute once mitigations are in place. As a result, even with mitigation, it is possible that the environmental consequences of cumulative effects for elk remain high.

To address the contribution of the Project to cumulative effects, the EIS predicts mitigation will be effective. As we note elsewhere in this report, these remain a set of predictions/hypotheses that must be tested with monitoring data because mitigation failure has the potential to significantly harm regional wildlife populations given the precarious situation they are already facing around Canmore.

3.2.5 Gaps Identified in Assessment

3.2.5.1 Wildlife

The lack of explicit wildlife movement data is a knowledge gap faced by all stakeholders and decision makers in the Canmore region. Filling this was beyond the control of TSMVP or Golder, who used the most recent available data to inform the assessment. However, if this ASP is approved, it will be their job, along with the Town of Canmore and Government of Alberta, to find ways to fill that gap in order to adequately test impact predictions and mitigation effectiveness.

There is camera data available that can provide insight into the spatial distribution of wildlife and human use around the LSA, but even this data is getting older now, as it was last collected in 2016. Perhaps most concerning is the lack of information on the change in use over time and the inability to relate wildlife use patterns to levels of human use, which is the central concern regarding wildlife corridor functionality and the encroachment of development. As the space for coexistence shrinks, this data gap becomes more glaring because it is that level of understanding that is required to inform decision making.

In several cases, abundance or population estimates for some wildlife VECs are outdated or unknown for the LSA and RSA. For example, grizzly bear population estimates for the Clearwater and Livingstone areas reflected estimates from 2005 and 2006. Lack of understanding of regional populations may make defining future thresholds or targets for monitoring to assess Project impacts to populations more difficult. Although Golder does note that work to re-estimate grizzly bear populations in this area was initiated in 2016 and 2018 by AEP, the data is not available yet. As noted above in the first point, these data gaps will need to be addressed by several stakeholders to support future monitoring.

3.2.5.2 Surface Water

There is a lack of baseline information for the five streams identified in the ASP. This includes missing a recent site visit and accompanying photos. The current assessment is based on a desktop review and an electrofishing report from 1991 for one of the streams. The 2013 floods caused extensive changes in the Bow River watershed: "*the banks and the creeks that flow through the Project ASP and their associated riparian areas were heavily scoured during the 2013 flood event and the banks were reinforced by the municipality to channelize the flood.*" (Golder, 2020, pg. 231). There is no water quality or quantity baseline information presented in the EIS which substantially increases the uncertainty of the assessments and conclusions in the EIS.

The proposed stream crossings and riparian areas are not specifically addressed in the EIS Sections 5.19-5.27 or Section 6.2, other than to commit to maintaining riparian buffers, where available. The proposed water crossings and riparian zone development will require more detailed discussions as the project moves into future phases.

The EIS commits to the development of a Stormwater Plan, a Spill Response Plan, and an Erosion and Sediment Control Plan prior to construction. There is currently no discussion of a site-specific Water Quality Monitoring Plan; the EIS relies on water quality monitoring conducted on the Bow River by the AEP. Utilizing only the AEP monitoring site downstream on the Bow River will result in substantially less certainty in determining whether the mitigation measures outlined in the EIS are effective in mitigating sediment and contaminant loading to the watersheds. Furthermore, in order to ascertain the effectiveness of the proposed mitigations contained within the developed plans (in future phases) it will be necessary to review all of the plans prior to construction.

3.2.5.3 Vegetation

Relevant guidelines for vegetation include the Town's Municipal District Plan (MDP) Bylaw 2016-03 (Town of Canmore (2016) and the NRCB (1992). The MDP Bylaw requires that lands identified as Environmentally Sensitive Areas (ESAs) (wetlands, riparian areas) should be conserved or protected. The NRCB (1992) required that ESAs (old growth stands of Douglas fir and subalpine fir, wetlands, and riparian areas) be considered in the development of the Project. The project will remove approximately 2.25 ha of old-growth Douglas fir and 0.1 ha of wetlands. The EIS states that the Developer will follow the Canmore MDP regarding the conservation and protection of ESAs (Golder, 2020, pg. 225), but the EIS is lacking in clarity as to how this Project is adhering to the MDP Bylaw and NRCB (1992) when old-growth Douglas fir and wetlands will be removed.

3.2.6 Recommendations for Follow-up Plans

The discussion of phased development in the EIS focuses on two aspects of phasing: 1) the development of different parts of the Smith Creek ASP area over time (Golder, 2020, Figure 8 and pg. 136) and discussion of a spatial threshold (i.e., within 200 m of a wildlife corridor) within the entire ASP area where monitoring data will be used to identify, if necessary, the need for adaptive management. The EIS identifies potential adaptive management actions such as different lighting, noise attenuation, additional enforcement, changing trails and access points, and adjusting elements of final fence design. While we agree with the

approach of reviewing monitoring results and taking adaptive management action where necessary before developing within 200 m of a wildlife corridor, the EIS does not indicate a similar approach to review monitoring results and invoke adaptive management as development is phased in along the east-west axis through the Smith Creek ASP area. While we generally agree with the approach of not fencing the entire ASP area at once, instead doing it in parts as development proceeds, we think this phased approach to fencing presents a potential opportunity to collect monitoring data from fenced portions of the TSV and Smith Creek Phase 1 areas to inform the development of the future phases.

While the EIS includes 'adjusting fence design' as a potential adaptive management action, it is our understanding this does not include adjustments to the final location of the fence, adjusting sections of the fence, or removing the fence in future should conditions warrant. Because the fence is the primary mitigation, and given the novelty and uncertainty of the fencing mitigation in the proposed context, we believe it is important that the possibility of having to adjust its final location, in whole or in part, or removing it all together, be acknowledged in the EIS or be considered by the multi-stakeholder group during the development of the Monitoring and Adaptive Management Plan. While the intent of the recent AEP Smith Creek corridor decision was that no additional land or buffers would be required, as we noted in Section 3.2.2 of this report, AEP's decision also states that the mitigations proposed in the Smith Creek EIS by TSMVP are required to ensure wildlife movement through the area continues. In our opinion, this means it is imperative that the mitigations are effective, otherwise impacts to wildlife VECs could be significantly greater than predicted in the EIS. Until there is evidence of effectiveness of all proposed mitigations using the results of the monitoring program, we think it is necessary to maintain planning flexibility by keeping all adaptive management options on the table. Decisions about the final fence location or removal should be based on demonstrations of the accuracy of impact predictions and mitigation effectiveness. We can think of no ecological reason why these should not be included among the potential adaptive management measures.

While it is clear the wildlife corridors adjacent to the Smith Creek ASP area are under Provincial jurisdiction, we also note that the Town of Canmore's MDP states:

> "The protection of functional wildlife corridors and habitat patches is primarily a Provincial responsibility, in particular for Three Sister's lands pursuant to th1992 NRCB Decision. However, it is also a valid and important land use planning consideration for the Town of Canmore. Where it has jurisdiction, the Town will work with landowners in the protection of wildlife corridor and habitat patches through land use districts, reserve designations where appropriate, or conservation easements."
>
> (Town of Canmore, 2016, pg. 22)

Since the Town has planning authority regarding detailed timing, specific land uses and population densities of TSMV property, we recommend the Town of Canmore determine whether or not they see value in having fence realignment or removal, in whole or in part, included as adaptive management options. Another potential option under the MDP is the creation of conservation districts along the corridor should monitoring data indicate that corridors are not functioning as predicted in the future. We recognize this may require adjustments to the location of certain development elements, not necessarily reducing development footprint, but adjustment to their locations. This would be an issue that needs to be negotiated between the Town and the Developer. Our review of the EIS comes from an ecological perspective and we understand that municipal planners may have other considerations and constraints,

but we think these options should be identified for Town's consideration as they make decisions about the proposed ASP and participate in the development of the Monitoring and Adaptive Management Plans for TSMV properties.

Because the primary mitigation (i.e. fencing the development) proposed in the EIS goes beyond the recommendations of the Human-Wildlife Coexistence Roundtable for keeping wildlife out of developed areas, we recommend the Town of Canmore define what coexistence with wildlife means to the Town and its citizens. Does it mean excluding wildlife from Canmore entirely? How many and what type of human-wildlife interactions are acceptable to the Town and its citizens? Clarifying positions on important questions around coexistence and establishing their own clear goals will assist the Town of Canmore decision makers as they assess the proposals in the TSMVP EIS'.

The mitigations presented in the EIS to manage human use will require a collaborative effort from the province, Town and Developer. It would be important for the Town to evaluate the success and challenges related to human use management efforts (trail design, enforcement, etc.) within their own jurisdiction in order to establish benchmarks and possibly predict the efforts that will be required in the future as the population of Canmore increases as a part of Smith Creek and Three Sisters Village developments. Mechanisms will need to be established in advance of development as to what options the Town can implement within their jurisdiction if future monitoring indicates that that additional adaptive measures are required.

The EIS states that the adaptive monitoring for the Project should be integrated with and implemented as part of a broader working group and suggests the example of the Human-Wildlife Coexistence Technical Working Group. In our previous review of TSV ASP EIS (MSES 2020), we provide some options for a multi-stakeholder group that would oversee the design and monitoring work. These included funding graduate student positions to address key questions that will be identified in the follow-up plans with guidance from a multi-stakeholder Technical team to a third-party Conservation Stewardship Organization. Regardless of the form of the working group, we recommend that an outline of the group's mandate (e.g. decision-making structure, dispute resolution) be developed prior to the Conceptual Scheme phase. It should describe how the group will make decisions regarding the design of the monitoring program, determination of thresholds for testing EIS predictions and mitigation efficacy, as well as, determining the selection and implementation of adaptive management measures if monitoring data indicates wildlife are not responding as predicted in the EIS.

QPD should provide more clarity on the developer's responsibility to the monitoring of Project impacts. The EIS states that the decision to stop monitoring would occur up to the issuance of the Final Acceptance Certificate. This appears to be linked to completion of full buildout and once the "*developer has incorporated any adaptations that may be required*" (Golder, 2020, pg. 177). If monitoring results indicate that Project effects and mitigations are not performing as predicted in the EIS, this will trigger adaptive measures. However, once additional mitigations are implemented, it will require some time and effort in the monitoring program to be able to detect whether these changes have been successful. We recommend that commitments be included in the EIS regarding the responsibility to continue monitoring be tied to the phased approach and demonstrations of mitigation effectiveness and not just by invoking adaptive management measures. If not appropriate at the ASP stage, then we recommend that these commitments and discussions be completed prior to the Conceptual Scheme phase.

Given the impact of the 2013 flooding event in the project ASP, a current site visit is necessary (as recommended by Golder; Golder, 2020, pg. 235) to properly ascertain the current status of the streams, the aquatic ecology and the surface water flows. Currently, it is not clear when or whether a site visit prior to construction activities will be completed.

A full water quality monitoring plan that includes details on the locations of water quality monitoring and what will be monitored should be in place prior to construction. Given the potential sediment loading during construction and contaminants, the water quality data should include analysis of parameters such as alkalinity, dissolved organic carbon, conductivity, metals (total and dissolved) and total suspended solids (TSS). The watercourses that will be impacted during construction should be monitored.

Plans and mitigations regarding proposed stream crossings and riparian zone development areas should be reviewed in order to determine if the mitigations for stream crossings and riparian zone buffers will be adequate to maintain riparian zone functionality and stream integrity.

The recommendations we make in this section should be considered simultaneously with recommendations outlined in our review of the TSV ASP EIS (MSES 2020). As the data, analysis and assessment approach overlap considerably in the two EIS'.

4.0 Conclusion

Compared to previous assessments for this property (e.g., Golder 2013, MSES 2013), utilizing similar data, methods and mitigation proposals, the 2020 Smith Creek ASP EIS does a better job discussing the uncertainty around impact predictions or mitigation effectiveness, the potential impact of future cumulative effects of development, and the consequences of mitigation failure. It utilizes the most recent available data on key wildlife VECs, but the data is old at this point and lacks a connection to information on human use which clouds our ability to clearly understand important aspects of the baseline conditions (e.g. how has wildlife use of corridors, or the area generally, changed over time?). As a result, we do not share Golders confidence in proposed mitigation effectiveness but, given the existing serious risk to most wildlife VECs and increasing human use in the region, also recognize some form of novel management action may be necessary.

Fencing entire suburban developments might have some merit given the existing challenges of managing wildlife and human use around Canmore. However, it remains an experiment as a mitigation for impacts related to urban development, and as a hard boundary for a wildlife corridor. Whether or not fully enclosing developments with a fence is the preferred approach to coexistence with wildlife that the Town of Canmore and its citizens would like to pursue will depend upon the values and importance placed on wildlife and human recreational use in wildlife corridors around Canmore. Given the range of potential impacts the fence is meant to mitigate, and the novel application around entire developments in a narrow, heavily used valley, we feel there is merit in maintaining flexibility for future decision makers when it comes to the footprint of development and/or fence presence/final location. Future monitoring data, if rigorously gathered, should inform regional stakeholders about wildlife movement and mitigation effectiveness to finally answer questions such as: Are the wildlife corridors functional? Is the wildlife exclusion fence effective, or does it have residual impacts of its own on wildlife?

Statements such as "[f]*encing will reduce human activity in the corridor and increase the corridor's effectiveness for wildlife movement.*" (Golder, 2020, Section 5.9.2.2, pg.181) are predictions at this point but read like facts even though using a wildlife exclusion fence in this context is novel. Because of the uncertainty about the effectiveness of this potential mitigation, we think the suite of potential 'adjustments to the fence' proposed in the EIS could be expanded to include adjusting the location of the fence or fence sections, removing the fence or sections of the fence, or creating a conservation buffer by purchasing land from the developer. It is not our role to say which, if any, of those options are feasible for the Town to enact, we simply are identifying issues and options for decision-makers to consider. Obviously, all future adaptive management actions should be clearly tied to the results of the monitoring program. Given the importance of managing wildlife issues and maintaining connectivity for regional wildlife populations it is critical that impact predictions are correct and mitigation is effective.

We think it is critical to keep in mind when reviewing the EIS that the proposed mitigations are hypotheses about what might work to lessen project-related impacts, not statements of fact about what will happen. These hypotheses remain to be tested and, at this point, it cannot be said with absolute certainty that all mitigations will be effective as proposed. Only the meticulous gathering of monitoring data will answer questions about mitigation effectiveness and given the number and complexity of issues facing wildlife VECs related to this development, and cumulatively with existing and future developments, adaptive management action will likely be required. As a result, options for future management action, including adjustments to the fence beyond moving gates and changing access points, should not be limited at this time. It will be necessary to verify impact predictions and mitigation effectiveness before the maximum development footprint is reached to ensure human-wildlife coexistence around Canmore is functioning successfully for Canmore residents and regional wildlife populations. Once maximum build-out is reached, adaptive management options will be limited.

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