

TOWN OF CANMORE
AGENDA
Regular Meeting of Council
Council Chamber at the Canmore Civic Centre, 902 – 7 Avenue
Tuesday, March 3, 2020 at 9:00 a.m.

Times are estimates only.

PUBLIC QUESTION PERIOD – Before meeting is called to order

- 9:00 **A. CALL TO ORDER AND APPROVAL OF AGENDA**
 1. **Agenda for the March 3, 2020 Regular Meeting of Council**
- B. PUBLIC HEARINGS**
 None
- 9:00 – 9:25 **C. DELEGATIONS**
 1. **Rick Blackwood, Government of Alberta: Three Sisters Wildlife Corridor Decision**
- 9:25 **D. APPROVAL OF MINUTES**
 1. **Minutes of the February 4, 2020 Regular Meeting of Council**
- E. BUSINESS ARISING FROM THE MINUTES**
 None
- F. UNFINISHED BUSINESS**
 None
- 9:25 – 9:35 **G. BYLAW APPROVAL**
 1. **Land Use Bylaw 2018-22 Revising Bylaw**
 Recommendation: That Council give first, second and third reading to Revised Land Use Bylaw 2018-22.
- 9:35 – 9:50 2. **Traffic and Road Use Bylaw 2020-03**
 Recommendation: That Council give first, second and third reading to Traffic and Road Use Bylaw 2020-03.
- 9:50 – 10:00 3. **Camping Bylaw 2020-04**
 Recommendation: That Council give first, second and third reading to Camping Bylaw 2020-04.
- 10:00 – 10:05 4. **Canmore-Bighorn Intermunicipal Development Plan Bylaw 2019-25**
 Recommendations:
 (1) That Council amend Bylaw 2019-25 to incorporate the changes to Section 3.3 Dispute Resolution, and Section 4.1.1 Plan Amendments as presented.
 (2) That Council give second and third reading to the Town of Canmore and M.D. of Bighorn Intermunicipal Development Plan Bylaw 2019-25 as amended.

5. Borrowing Bylaw Amendment 2020-01

This item will be considered under New Business Item H-4

H. NEW BUSINESS

10:00 – 10:10

1. Canmore-Bighorn Intermunicipal Collaboration Framework

Recommendation: That Council adopt the Town of Canmore and M.D of Bighorn Intermunicipal Collaboration Framework as presented.

10:10 – 10:40

2. Tip 20 Surface Works Funding Source Revision

Recommendation: That Council approve a revision of funding sources for CAP7078 TIP20 as follows:

- (a) Decrease Green Trip funding by \$2,500,000
- (b) Increase funding from Offsite Levy Reserve by \$700,000
- (c) Increase funding from Federal Gas Tax grant by \$800,000
- (d) Increase funding from MSI by \$1,000,000

10:40 – 10:55

BREAK

10:55 – 11:10

A portion of this discussion will be held in camera. See item L-1.

3. TIP20 Deep Utility Upgrade

Recommendations:

- (1) That Council approve a budget increase of \$1,900,000 for the deep utilities portion of CAP7078 – TIP20 for a total approved budget of \$13,835,000 to be funded with \$665,000 from the Water Reserve and \$1,235,000 from the Wastewater Reserve.
- (2) That Council approve a reduced scope of work for the deep utilities portion of TIP20 CAP7078. The new scope of work planned for 2020 will include upgrade of water and sewer lines from Lift Station 2 to Mountain Street.

11:10 – 11:15

4. Borrowing Bylaw Amendment 2020-01 Bow Valley Trail Wastewater Construction

Recommendation: That Council give second and third reading to Borrowing Bylaw Amendment 2020-01 Bow Valley Trail Wastewater Upgrade Construction.

11:15 – 11:45

5. Economic Development Strategy

Recommendation: That Council accept the Economic Development Strategy as presented for planning purposes.

11:45 – 12:45

LUNCH BREAK

12:45 – 12:55

6. Recreation Services Operating Policy

Recommendation: That Council approve Recreation Services Operating Policy as presented.

12:55 – 1:40

7. Deadman's Flats Servicing Agreement

Recommendations:

- (1) That Council approve the new Dead Man's Flats Servicing Agreement dated April 1, 2020.
- (2) That Council approve a new capital project entitled 2020 Water Pressure Upgrades for \$1,050,000 to be funded through \$700,500 from the Water Reserve and the remaining \$349,500 to be paid by the Municipal District

Agenda prepared by: Cheryl Hyde, Municipal Clerk

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of Bighorn based on the cost sharing percentages in the Servicing Agreement.

1:40 – 2:10

8. Wapiti Campground Extension

Recommendation: That Council approve the extension of the Wapiti Municipal Campground for four years by:

- (a) entering into a new lease with the Province for four years;
- (b) entering into a new operating agreement for four years with the previous campground operators; and
- (c) allocating up to \$10,000 from the General Operating Reserve in 2020 to cover the lease fee rent increase.

I. CORRESPONDENCE/INFORMATION

None

J. REPORTS FROM ADMINISTRATION

None

K. NOTICES OF MOTION

None

L. IN CAMERA

To be discussed during item H-3

1. Tip 20 Surface Works Funding Source Revision

Recommendation: that Council take the meeting in camera to protect the Town's negotiation position in accordance with section 25(1)(c)(iii) of the Freedom of Information and Protection of Privacy Act.

2:10

M. ADJOURNMENT

Decision: Three Sisters Mountain Village Properties Ltd. Smith Creek Wildlife Corridor Application
February 26, 2020

I. Introduction

This is the decision of Alberta Environment and Parks (“AEP”¹) regarding the Three Sisters Mountain Village Properties Ltd. (“TSMVPL”²) designation proposal, dated January 28, 2020, for a Smith Creek wildlife corridor.

This decision is made pursuant to Condition 14 in Appendix C of the Natural Resources Conservation Board decision referred to below.

a. NRCB Decision

On October 9, 1991, Three Sisters Golf Resorts Inc. filed an application (# 9103) with the Natural Resource Conservation Board (the “NRCB”) for approval to develop a recreation and tourism project on the present site in the Bow Valley and adjacent lands within the Wind Valley. In November 1992, the NRCB released its Decision Report³ on the application in which it approved Three Sisters Resort Golf Resorts Inc.’s tourism and recreation based project to be developed on Three Sister’s private lands in the Bow Valley but did not approve development in the Wind Valley.

The NRCB decision was provided subject to several conditions, including Condition 14 in Appendix C, page C-4 which required the following:

“Three Sisters shall incorporate into its detailed design, provision for wildlife movement corridors in as undeveloped a state as possible, and prepare a wildlife aversive conditioning plan, both satisfactory to Alberta Forestry, Lands and Wildlife”.

The NRCB’s decision was authorized by the Lieutenant Governor through Order in Council 8/93 dated January 6, 1993. This gave AEP the authority to evaluate the design of the wildlife corridor as proposed by TSMVPL to ensure functional wildlife movement. This authority has been delegated to Rick Blackwood under Ministerial Order 10/2020 dated February 25, 2020.

b. History/Background

Since 1992, TSMVPL (and its predecessors in ownership) have developed the overall Three Sisters property and wildlife corridors near to that development in stages. On February 10, 1998, AEP issued a letter in which it approved the multi-species wildlife corridors generally along the south and western boundary of Three Sisters Resorts land (currently referred to as the “1998 Along Valley Corridor”). The approval was informed using basic criteria for the identification of wildlife corridor of a linear nature of sufficient width that was unencumbered as much as possible by development, minimized impassible topographical features, and consisted of adequate vegetation to provide hiding and thermal cover requirements of wildlife. The remaining portion starting approximately 100 m east of the east boundary of Sec 11 Twp 24 Rge 10 W5th and eastward into the Wind Valley and on the west flank of Pigeon Mountain leading to the G8 Legacy wildlife underpass at Dead Man’s Flats remained to be approved.

Subsequently, some western portions of the 1998 approved corridors that were proposed to be generally within future golf course lands (such as Mineside) were thought not to function properly due

¹ References to AEP include its predecessor departments previously having responsibility for evaluating wildlife corridor designs proposed by TSMVPL pursuant to the NRCB decision report.

² References to TSMVPL include all predecessors

³ Specifically Approval No. 3 of the Natural Resources Conservation Board granted in 1992 in the matter of an Application by Three Sisters Golf Resorts Inc. to construct a recreational and tourism project in the Town of Canmore (Application #9103) (the “NRCB Decision”)

to issues with width, location and being bounded by development on both sides of some along valley corridor elements and discussions were held with the developer to improve corridor function and adjust developable area to be only on one side of a new and widened along valley south of the future Resort Centre lands of Three Sisters. On May 20, 2003, AEP (as it was then) approved a revised corridor alignment on a western portion of the previously approved corridor, resulting in a wider corridor. A 35m-wide buffer around the west and south sides of the Resort Centre lands outside the corridor was mutually agreed to between the developer and the Town of Canmore to provide for fire thinning and a potential public trail around the Resort Centre lands. This 2003 approval now forms the major western portion of the existing approved wildlife corridor, and has been since protected via a Conservation Easement around the 2004 Resort Centre ASP lands.

In the following years after the approval of the realigned and expanded western portion of the corridors, development of the existing Three Sisters Mountain Village continued generally north and east of the existing Stewart Creek Golf Course. A second golf course (Three Sisters Creek Golf Course) received a Development Permit within the 2004 Resort Centre ASP lands, and construction was initiated but not completed due to the global financial crisis that began in 2007/2008 and the receivership of a previous American based owner that occurred as a result.

Work on the eastern portion of the along valley corridor also continued, and in 2002, a report (Wind Valley Wildlife Corridor Study) recommended wildlife corridors for the eastern portion of TSMVP lands, Thunderstone lands and crown lands on the basis of approximately two years of wildlife studies. Ultimately, these corridors were not agreed to by all of the various landowners. One factor in the disagreement was that the 2002 proposal resulted in a significantly disjointed connection with the approved 1998 along valley corridor (historically referred to as “the disconnect”). Subsequent to the 2002 Wind Valley study, the G8 Legacy wildlife underpass was installed east of Dead Man’s Flats in 2004, facilitating wildlife movement under the Trans-Canada Highway east of Dead Man’s Flats to the habitat patch around the Bow River.

Significant changes have occurred in the Bow Valley since the NRCB initially rendered Decision No. 9103 regarding the Three Sisters development. These changes include ongoing population growth in the Bow Valley, the formation of the Bow Corridor Ecosystem Advisory Group (BCEAG) (1995), the designation of significant protected areas (i.e. Bow Valley Provincial Park (2002, OC 424/02, Canmore Nordic Center Provincial Park (2002, OC 426/02), and Bow Valley Wildland Provincial Park (2010, OC 268/10), the creation of wildlife underpasses at Stewart Creek (1998) and Dead Man’s Flats (2004), and more recently the recommendations for coexistence with wildlife of the Bow Valley Roundtable (2018). In many instances, these changes have resulted in positive outcomes for wildlife. The following actions in particular must be thought of when considering corridors in the Bow Valley:

- Creation of Wildlife Underpasses beneath the TransCanada Highway at Stewart Creek and Dead Man’s Flats
- The formation of the Bow Valley Wildland Park creating protected lands to the south and north (across Highway #1) of Three Sisters developments
- The proliferation of recreational pursuits in the Bow Valley (e.g. hiking, biking, dog walking, running)
- The formation of BCEAG and subsequent release of Guidelines for Wildlife corridors for lands outside of NRCB approvals (last updated in 2012). The 2012 BCEAG guidelines are viewed as guidance and information, as they outlined a framework of patches and corridors in the Bow Valley, but they are specifically not applicable and cannot be stipulations to any lands containing *“projects for which approvals have been previously granted by the Natural Resources*

Conservation Board (NRCB) prior to July 1999 (e.g., Three Sisters Mountain Village)” (taken directly from Wildlife Corridor and Habitat Patch Guidelines for the Bow Valley, Updated 2012)

- The creation of the Bow Valley WildSmart program to help educate and inform residents and visitors on ways to mitigate wildlife human conflicts in the Bow Valley
- The Town of Canmore passing *Wildlife Attractant Bylaw 2017-10* last updated on August 26, 2019 and *Recyclables and Waste Disposal Bylaw 2016-11* last updated January 1, 2019 which provides for improved wildlife human interface considerations on a town wide basis
- Finally, more recent developments resulting in additional positive impacts for wildlife include:
 - o the land exchange north of the Wind Valley underpass completed between the MD of Bighorn and the Province of Alberta,
 - o the 2018 report “Human-Wildlife Coexistence: Recommendations for Improving Human-Wildlife Coexistence in the Bow Valley”
 - o The proposed Seebe Wildlife Overpass (now confirmed in Alberta Transportation’s Capital Plan with construction planned for 2021)

On January 26, 2017, QuantumPlace Developments Ltd., on behalf of Three Sisters Mountain Village Properties Ltd., submitted an application to AEP seeking its approval of the remaining eastern portion of the wildlife corridor, within the lands known as Smith Creek. The AEP decision on this proposal was denied on June 26, 2018, on the basis of concerns regarding:

- The width of the cross-valley Stewart Creek corridor width
- The width of the wildlife corridor on the eastern edge of the Smith Creek property, given the discontinuous slopes in this area, south of the Thunderstone quarry.

Since that time, TSMVPL and AEP staff have worked on identifying a suitable wildlife movement corridor that would be considered satisfactory to AEP taking into account comments and feedback received from the public during the 2017 application process, additional data and analysis since 2017 regarding wildlife use, newer work like the 2018 report “Human-Wildlife Coexistence: Recommendations for Improving Human-Wildlife Coexistence in the Bow Valley” and TSMVPL working to address AEP concerns identified in the 2017 application. TSMVPL submitted a formal submission for approval consideration by AEP as a culmination of two years of work on January 28, 2020 that provided a proposal that built on the work of their 2017 application along with an evaluation undertaken by Golder Associates Ltd. also dated January 28, 2020. The January 28, 2020 application is the subject of this document.

II. Wildlife Aversive Conditioning Plan

The NRCB Decision also required TSMVPL to prepare a wildlife aversive conditioning plan to the satisfaction of AEP. However, the *Wildlife Act* generally prohibits threatening or harassing wildlife, which precludes TSMVPL from undertaking wildlife adverse conditioning.

Instead TSMVPL proposed developing a Wildlife Human Interaction Prevention Plan (the “WHIPP”) in lieu of an adverse conditioning plan. The WHIPP was approved in February 1999. It was later revised with further approval from AEP on September 14, 2004.

Since that time, many of the initiatives undertaken via 2004 WHIPP are more properly addressed within the work regarding the understanding of co-existence with wildlife in the Bow Valley which culminated in the 2018 report “*Human-Wildlife Coexistence: Recommendations for Improving Human-Wildlife Coexistence in the Bow Valley*” combined with Town of Canmore Bylaws implemented town-wide such

as the Town's *Wildlife Attractant Bylaw 2017-10* last updated on August 26, 2019 and *Recyclables and Waste Disposal Bylaw 2016-11* last updated January 1, 2019.

On review of the WHIPP, it is acknowledged that many of its initiatives overlap with Bylaw 2017-10 and 2016-11 and other initiatives in the region for managing human-wildlife interaction. AEP encourages TSMVPL to be involved in these initiatives, including actively participating in the ongoing discussions related to the *"Human-Wildlife Coexistence: Recommendations for Improving Human-Wildlife Coexistence in the Bow Valley"* as a roundtable member and incorporating recommendations applicable to private property owners into future designs and plans.

Accordingly, AEP is satisfied that TSMVPL has complied with Condition 14 regarding a wildlife aversive conditioning plan. Therefore, my decision will consider the remaining requirement with respect to developing a detailed design for wildlife movement corridors.

III. Wildlife Corridor Background

One of the reasons people live, recreate, and invest and create businesses in the Bow Valley is because of the nature and wildlife viewing experiences this area offers. With the increase in human activities there have also been adverse effects to the wildlife and their habitat. Increasing residential, commercial and industrial development plus tourism and recreational activity in the Bow Valley has led to degradation and fragmentation of wildlife habitat, as well as the displacement of wildlife from habitat in the Bow Valley. The designation and ongoing management of wildlife corridors is an attempt to reduce these adverse effects, largely by providing natural spaces for wildlife to live and travel in a manner that includes minimal disruption by humans or their pets.

Wildlife corridors will ideally enable movement amongst individuals and subpopulations by providing movement opportunities for breeding adults, and dispersing juveniles seeking territories, and wandering individuals during daily movements and seasonal migrations. Corridors function at scales ranging from large regional corridors, to small local corridors that link patches of local habitat. The TSMVPL Smith Creek wildlife corridor and other adjacent corridors (existing and proposed) are localised corridors that form part of the larger network of wildlife corridors in the Bow Valley that link habitat areas.

The proposed TSMVPL Smith Creek corridor connects the existing approved 1998 wildlife corridor with the existing Wind Valley Habitat Patch, and provides linkage to the G8 Legacy Wildlife underpass. The primary purpose of the wildlife corridor as identified in the NRCB Decision report is to ensure that the TSMVPL development would be built in a way that ensures wildlife movement is enabled along the valley as a primary goal (east to west) and across the valley as a secondary goal (north to south).

In my view, having regard to the NRCB decision and relevant scientific literature, a wildlife corridor will generally be considered satisfactory if it can fulfill the following purposes in the Bow Valley:

- Allow wildlife to access important seasonal habitats in order to meet year round life requirements within the Bow Valley;
- Reduce the potential for negative wildlife/human conflicts by providing safe movement options around developed portions of the valley, thereby minimizing wildlife movement through human development within the Bow Valley.
- Delineate boundaries of Bow Valley's wildlife corridors.
- Allow for dispersal of young from their natal areas to other areas in order to establish new home ranges

IV. Summary of the Three Sisters Mountain Village Properties Ltd. Smith Creek Wildlife Corridor Application dated January 28, 2020

Three Sisters Mountain Village Properties Ltd. has proposed the Smith Creek Wildlife Corridor with the following attributes:

- The Smith Creek “Along Valley Corridor” encompasses lands that lie east to west approximately 2.5 km through TSMVPL’s Smith Creek lands. This includes approximately 258 acres (104 ha) on the south side of lands known as Site 9, and another 127 acres (51 ha) and 27 acres (11 ha) within lands known as Site 7 and 8, respectively, for a total of approximately 412 acres (166 ha) of private land (including lands belonging to Thunderstone Quarry outside of Site 9 that TSMVPL was able to obtain permission to include in their January 28, 2020 proposal, noting that Thunderstone Quarries is not subject to NRCB Decision No. 9103 nor required to provide wildlife corridors from their land holdings) proposed to be dedicated as wildlife corridor⁴. The proposed corridor connects the existing 1998 wildlife corridor east of Smith Creek with the existing Wind Valley Habitat Patch in the west and the existing Bow Flats Habitat Patch through the G8 Legacy wildlife underpass at Dead Man’s Flats.
- The additional land on Sites 7/8 in this proposed corridor also addresses a portion of land on Site 7 that was considered a potential disconnect in previous wildlife corridor planning documents (i.e. 1998 Approved Along Valley Corridor and unapproved 2002 Wind Valley corridor). The northern border of the corridor now consists of a single smooth edge without any disconnects. The border was also adjusted to encompass a large fen wetland complex on the TSMVPL lands.
- The application also proposes to realign the Stewart Creek “Across Valley Corridor” approximately 300 m to the east, to a drainage which is a natural movement corridor for wildlife and centering the corridor on the location of a proposed new wildlife underpass across the TransCanada Highway. The Stewart Creek “Across Valley Corridor” realignment is proposed as an option, subject to Alberta Transportation and other appropriate regulators approving a new wildlife underpass beneath the TransCanada Highway. If approved, the existing location of the Stewart Creek “Across Valley Corridor” with the exception of the existing crossing structure and generally adjacent Province of Alberta owned lands, would revert to developable lands not needed for wildlife purposes. The existing Stewart Creek crossing structure and connection would remain as a secondary crossing.

V. Decision Making Process

An extensive process has been undertaken to review the TSMVPL application, in regards to ensuring the proposal satisfies the requirements set out in the NRCB 1992 Decision, including significant work in the last two years to discuss potential improvements to the 2017 application.

My review has been informed in part by the following recommendation set out in the NRCB Decision with respect to wildlife corridors:

Appendix D, page D-5 Recommendations to Alberta Forestry, Lands and Wildlife: It is recommended to Alberta Forestry, Lands and Wildlife that locations for wildlife corridors be legally designated and that in determining their locations and widths, primary corridors should not be narrower than 350 m except in unusual circumstances, that widths and locations be reviewed with the full range of species that may make

⁴ Reference should be made to my comments regarding a potential land exchange (as referred to in TSMVPL’s submission) following the Conclusion section of this decision. However, consideration of potential land exchanges did not form part of my evaluation of their corridor design.

use of them in mind, that corridors be located to allow movement across adjacent properties, that measures such as bundling road, utility line and pathway crossings be adopted, and that corridors correspond with known movement routes of the animals.

The intent of the review of the TSMVPL Smith Creek wildlife corridor is to ensure that the proposed corridor will delineate a wildlife corridor in Smith Creek that specifically identifies the corridor location satisfying the 1992 NRCB Decision. The corridor will be designed to facilitate the safe passage of wildlife in order to enable ecological processes, such as movement, foraging, etc., at levels reflecting persistent over generations and sustainable human-wildlife interactions. Finally, the intent is that additional management approaches are not needed outside of the delineated corridors including additional buffers, setbacks or layering of uses, and that the proposed corridor stands on its own for land requirements.

My evaluation of the application is grounded on ensuring that the above mentioned purposes of wildlife corridors will be achieved over the very long term (decades and even centuries). The development will be a permanent part of the landscape and therefore the wildlife corridors must be able to support the full range of natural wildlife movement for decades to come.

Three Sisters Mountain Village Properties Ltd. has provided the following documents as part of its proposal:

- Three Sisters Mountain Village Smith Creek Wildlife Corridor Submission January 28, 2020
- Evaluation of the Smith Creek Wildlife Corridor – Golder January 28, 2020
- Smith Creek Wildlife Corridor shapefile January 28, 2020

In making my decision I reviewed all materials provided by TSMVPL, and a multitude of publicly available scientific (peer-reviewed) and technical (non-peer reviewed) reports regarding wildlife corridors and wildlife habitat use, particularly those directly related to the Rocky Mountain ecosystem. I also referred to materials provided by residents and interested parties through letters, emails, public input sessions and meetings attended by AEP, and public open houses organized by Three Sisters Mountain Village Properties Ltd. in 2017 and 2018 as a part of their Area Structure Planning process or through other means.

VI. Evaluation Process

Despite their intuitive appeal and widespread implementation, scientific understanding of how to optimize corridor design and quantify their functionality is not a black and white issue. One of the most contentious variables in corridor design relates to width (Beier et al 2008). Following my review of the published literature, it was determined that to identify satisfactory wildlife corridors general corridor principles and criteria needed to be identified. These principles form the fundamental rules that represent what is desirable and were used to generate criteria for rendering a decision on wildlife corridors. Principles were identified developed from scientific literature, guiding documents, and expert opinion. It is noted, given the variable landscape, that deficiencies may exist relative to the corridor principles and criteria. Where deficiencies exist, functionality will be maintained through other management approaches (e.g. human use management, habitat enhancements). It must be noted that these principles are specific to the Bow Valley and may not be applicable to other corridor development. It is important to note that even with the establishment of corridors, wildlife may continue to move throughout the urban community (i.e. urban green spaces) as is currently seen in the Town of Canmore. Important green spaces will continue to provide opportunities for both people and wildlife.

Wildlife Corridor Principles and Criteria Developed by AEP for the evaluation of TSMVPL's submission:

- Corridors are designed to provide movement for wildlife, while enabling human development to proceed which is in keeping with the 1992 NRCB decision. This principle has been followed and demonstrated by the approval and development of existing phases of Three Sisters since the NRCB decision was rendered.
 - The boundaries of Three Sister wildlife corridors will be delineated to provide consistent direction for and allow for future land-use development applications, recreational planning and other activities.
- Corridors are designed to maintain the most direct, unimpeded route, while avoiding human disturbance.
 - Corridors will be delineated to provide as straight a path as possible, and to the extent possible not contain significant human impediments or presence, and/or present mitigation strategies to manage human use.
 - As the intent of corridors is to provide security for wildlife, nodes of public use (e.g. campgrounds, facilities, trail heads, etc.) within corridors are generally not aligned with this purpose. Crossings of corridors are recognized as sometimes needed for utilities, transportation, communications, trails, access, etc. and such crossings should ideally be bundled together where reasonably possible.
- Corridors that are shorter are more effective than longer corridors as wildlife are able to move more efficiently from one habitat patch to the next. Longer corridors should generally be wider to provide more efficacy for wildlife movement. Topographic constraints: Corridors and patches should not include topographical barriers that would block movement. Corridors should be designed for year round function and not be hindered by adverse environmental condition (e.g. deep snow, impermeable vegetation, larger waterways).
 - Topography can impact the effectiveness of wildlife movement through corridors. Flatter areas are preferred by most wildlife species and corridors will be delineated to include flatter areas (below 25° slope) for all portions of corridor. Species exhibit a range of slope preferences, and the 25° slope target was chosen based on local technical studies and literature. Due to the varying topographical nature of the Bow Valley, no specific limits will be identified. However a principle to include as much flatter or gently sloped terrain as reasonably possible was identified, along with respecting the NRCB's recommendation that corridors correspond with known routes of animals.
- Where possible, corridors should include existing natural habitat features, such as wetlands, licks, or other known wildlife sites.
- Corridor Width: The optimal corridor width is a function of how animals respond to the boundary of the corridor. The NRCB recommended a 350m minimum width for primary corridors. Wider corridors should be better than narrower corridors but how much wider has not been clearly demonstrated by science. Optimal corridor width is a function of how animals respond to the boundary of the corridor. Wolf behavioural response to disturbance can be used to guide corridor width that should accommodate other species.
 - Wolf behavior responded to human activity at 400m (Rogala et al. 2011). Therefore, achieving an average corridor width of 600m (400m plus 200m) should ensure functioning corridor effectiveness of at least 50%. This also indicates that corridors less than 400m wide may not function effectively for wildlife movement for all species, and 400m was a desired minimum width for corridors.

- In some cases, due to logistic or other constraints, it may not be possible to achieve the average widths referenced above. Where deficiencies exist, functionality will be maintained through other management approaches (e.g. human use management, habitat enhancements).
 - Management strategies (e.g. human use within corridors, vegetation management) will be required to be outlined to improve movement through mitigation where it is not possible to achieve the desired corridor structure. Considerations should be given to management actions that will improve corridor function, in areas where topography is steeper, or where corridor width is constrained.
 - Vegetation modification, through the thinning and delimiting of trees, can also influence wildlife behavior, by altering vegetative habitat, in the area closest to occupied structures. This could create a filtering effect of certain species using the corridor, and increasing wildlife conflict in other species. The Town of Canmore has a long history of incorporating wildlife corridors with FireSmart to achieve a combination of desired outcomes (i.e. Peaks of Grassi).

VII. Decision

I have determined that the January 28, 2020 TSMV Wildlife Corridor proposal is **Satisfactory to AEP**, as required by Condition 14 in Appendix C of the 1992 NRCB decision No. 9103.

While I have determined the proposal to be satisfactory I have also made a number of additional recommendations to TSMVPL with respect to certain actions that I feel would serve to even further support and enhance the functionality of the proposed corridor and address potential issues with respect to human-wildlife interaction in the Bow Valley. I am pleased that TSMVPL has confirmed that they accept these recommendations and that they have committed in writing to implementing each of these recommendations within the next 24 months. AEP and TSMVPL recognize that if completion of these recommendations cannot be successfully completed within this timeframe, both agree to continue to work collaboratively to bring them to completion as quickly as possible. The recommendations that TSMVPL has made a commitment to satisfy are:

- The creation of habitat enhancements within the Smith Creek wildlife corridor as agreed to by TSMVPL and AEP that provide for wildlife and/or FireSmart considerations for the community;
- TSMVPL to support the implementation of initiatives as applicable to private property owners outlined within the 2018 "Human-Wildlife Coexistence: Recommendations for Improving Human-Wildlife Coexistence in the Bow Valley" report, and participate as a roundtable member to develop and support the groups initiatives regarding wildlife conflict and co-existence education for residents and visitors to TSMVPL properties, and ongoing participation in local WildSmart initiatives to the satisfaction of AEP.
- Ongoing coordination of FireSmart planning with the Town of Canmore, Alberta Agriculture and Forestry, and AEP as may be proposed within wildlife corridors adjacent to ongoing and future Area Structure Plans on lands owned by TSMVPL.
- A detailed plan outlining the development of crossing structures and fencing to the satisfaction of AEP, which should consider the recommendations of Clevenger and Huijser 2011 or suitable alternatives to the satisfaction of AEP for both Highway 1, and Secondary Highway 742 (Three Sisters Parkway)

The current satisfactory approval with the TSMVPL Smith Creek Corridor proposal is predicated upon the Stewart Creek "Across Valley Corridor" realignment, subject to Alberta Transportation and other appropriate regulators approving a new wildlife underpass beneath the TransCanada Highway. If approved, the existing location of the Stewart Creek "Across Valley Corridor" with the exception of the

existing crossing structure and generally adjacent Province of Alberta owned lands, would revert to developable lands not needed for wildlife purposes. If the Stewart Creek "Across Valley Corridor" is not agreed to by the appropriate regulators, the existing cross-valley corridor would be maintained in perpetuity, and the along valley corridor would connect to the existing 1998 approved corridor, subject to further discussions with TSMVPL and other regulators.

The TSMVPL proposal aligns with the Wildlife Corridor Principles and Criteria identified above and contains several positive aspects to maintain wildlife movement. TSMVPL has also indicated their commitment to carry out the recommendations identified above to further support and enhance the ongoing functionality of the corridor. It is noted that no development is planned to the south of the corridor, as that area has been designated as Bow Valley Wildland Park (which was not present in the initial NRCB decision #9103). Further, I find that the TSMVPL proposal has addressed the two deficiencies identified in the AEP June 26, 2018 decision letter in the following manner:

- 1) The proposed cross valley corridor (New Stewart Creek) averaged 610m with measurements taken at the southern edge, the middle and northern edge of the corridor, and the narrowest point being 401m. This addresses a noted deficiency in the AEP's Three Sisters decision letter (June 26, 2018), whereby it recommended that "A corridor that is approximately 400m wide on average, and no less than 350m at its narrowest point, would be better able to achieve the purposes of this corridor." It should also be noted that this cross-valley corridor will be extended to the west, along the Powerline ROW, to include the currently existing wildlife underpass. This will add some width to this corridor and additional ability for wildlife to cross Highway 1.
 - a. In a letter provided leading up to the 2018 decision (Clevenger and Ford, pers comm. 2016) indicated that wildlife species will most likely adapt and use the new crossing, provided that it is designed appropriately. The proposed crossing should be similar to the current Stewart Creek underpass beneath the TransCanada and designed as a large mammal species underpass generally as described in Clevenger and Huijser 2011.
- 2) The eastern end of Smith Creek property is an important area for wildlife movement. The previous Three Sisters decision letter (June 26, 2018) identified this area as a deficiency in the proposal, due to the discontinuous steep slopes potentially limiting wildlife movement through the area. The decision further recommended that the width be increased by another 50 to 100m (to an average of 400m to 450m below slopes). This extension would require corridor being placed on lands outside of Three Sisters property, which is outside the scope of the NRCB decision. Further, it is noted that slopes greater than 25 degrees occur throughout the Bow Valley. The width of the 2017 proposal near this series of discontinuous slopes, averaged 740m. The corridor proposed by TSMVPL in their January 20, 2020 submission increased by 25-39m from the 2017 submission. Importantly, the demonstration of wildlife use of the area by data in the newest Golder report, indicate that wildlife are able to navigate the slopes, and do not represent a total barrier to wildlife movement. This corridor proposal combined with TSMVPL 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. Further:
 - b. Scientific and technical literature indicates that terrain below a 25 degree slope is preferred by most species. However there is no minimum width for corridors beyond a lower slope. Data on wildlife movement in the immediate area show utilization of areas and slopes exceeding 25 degrees in the area of discontinuous slopes south of the Thunderstone Quarry. The proposed corridor largely consists of flatter areas, with only 11% of the corridor occurring on slopes greater than 25 degrees. The wildlife use of the area is most likely a function of discontinuous slopes, numerous trails and old roads, and the presence of a power line right-of-way; that enable use and movement through area, despite the presence of slopes.

- c. The eastern end of Smith Creek property is an important area for wildlife movement. It connects the Bow Valley and the Wind Valley, and enables safe passage through the G8 Wildlife Underpass. Wildlife movement is additionally impacted in this area by the Thunderstone Quarry operations, Banff Gate resort, the Kananaskis Gun and Archery club and several recreational trails. Ongoing initiatives have occurred to improve wildlife movement potential including management of the Kananaskis Gun and Archery range, the land exchange with the MD of Bighorn to preserve habitat on the north side of the G8 Legacy underpass, and increased management of recreational use within wildlife corridors.

My decision also evaluates the entire proposal alignment with the above mentioned principles and evaluates the functional nature of the proposed wildlife corridor. The proposal describes fencing as a key strategy in the management of the corridor. AEP's evaluation will focus on corridor delineation outside of fencing mitigation such that the corridor delineation is considered sufficient without the use of fencing. A wildlife fence has been proposed as a mitigation solution to reduce both human wildlife conflict and minimize human use and disturbance within the corridor. AEP agrees that management of human activity is a key item to ensure wildlife corridor functionality. There is no one solution to preventing human-wildlife conflict and minimising human effects in the corridors. A fence alone will not prevent all wildlife issues, but it is acknowledged that fencing has been an effective tool in other areas of the Bow Valley and in North America. There needs to be an inclusion of attractant management, as well as education and enforcement by many parties. Fencing can be effective at limiting conflict with wildlife, but the social impacts of fencing could lead to some challenges to implementation within the community and education and enforcement by many parties will be key. Both wildlife and humans will cross the fence at some point and understanding what to do in these cases will be necessary. As discussed above, TSMVPL has committed to align with the 2018 report "Human-Wildlife Coexistence: Recommendations for Improving Human-Wildlife Coexistence in the Bow Valley" as applicable to private land owners and I further recommend that TSMVPL become an active member with Bow Valley WildSmart in helping to improve coexistence with wildlife.

Width:

- The average width of the entire along valley Smith Creek corridor is 789m, and at minimum is 635m, which aligns with the recommendation of the above Wildlife Corridor Principles.
- The minimum width of the Pigeon corridor leading to the G8 Legacy underpass was found to be 352m in between the Thunderstone Quarry and the Banff Gate Resort. While this portion occurs on lands outside of TSMVPL ownership, it is noted here as it part of the system of corridors that connect to enable wildlife movement. Consideration will be given to opportunity to placing further restrictions on any future human development within or adjacent to this portion of the corridor on the east side of George Biggy Sr. Road (i.e. trails, trail nodes, leases, etc.), and management efforts will focus on existing disturbances, like those that have been achieved with the Kananaskis Gun and Archery Club.

Slope:

- Generally speaking, slope by itself is not considered to be an impermeable barrier to wildlife movement, however, lower topography is preferred for wildlife corridors (based on energetics of movement). Assuming all variables being equal (e.g. forage availability, refuge, water), wildlife (with exception of sheep) tend to prefer to travel on flatter topography
- The along valley portion of the corridor averages 405m below a perceived slope line of 25 degrees (as determined by AEP). This should provide wildlife with enough areas of lower topography to traverse the corridor in addition to the well documented use of by wildlife of the discontinuous sloped area.
- Overall, 89% of the TSMV proposed corridor occurs on slopes below 25 degrees

- There are areas of greater topography, both above the across valley corridor, as well as to the south of the Thunderstone Quarry. Wildlife movement data show significant use of these areas despite topography, providing evidence of suitability for movement.
- Further these areas have been identified as areas for habitat enhancements, as well as limits on recreation development, to mitigate the risks for wildlife.

Wildlife features:

- The inclusion of known fen wetlands including one large fen is an important contribution to the wildlife corridor. Water features are of known value to wildlife, and could be of importance on their own (i.e. Birds, long-toed salamander, western toad). In my opinion, retaining the corridor to include all three known wetlands, including the large fen that makes the along valley corridor 'bump', is of significant value to wildlife.
- In an evaluation of available wildlife data, there is a high degree of wildlife use and features within the proposed corridor. Observations of bear, wolves, cougar, elk and mule deer all occur in proposed corridor, with greater frequency than the surrounding proposed developable area.

Comparison to previous corridors:

- The proposed corridor adds both width and lower topography than previously approved corridor (1998) within the area known as Site 7. The proposed corridor adds an average of 287.5m from the previously approved corridor with the majority of this addition occurring on shallower slopes.
- In comparison to the 2002 proposed Wind Valley corridor, the proposed corridor follows the general pathway, but the proposed Smith Creek corridor is an approximately 50-75m further south and as such is wider than what was considered in 2002.

Directness of corridor:

- The corridor is largely straight with few bends or turns, thus largely in alignment with the Wildlife Corridor Principles.
- There is a large bump-out to incorporate a large fen wetland, and this is supported as wildlife are most likely drawn to the fen

Human infrastructure:

- Ideally, wildlife corridors are designed for wildlife, and will have limited human development within. It is recognized that the public will also want to experience the corridor through recreational trails. Human use and infrastructure must be carefully managed so as to minimize impacts on wildlife. The human use management of the corridor may be more important than the delineation of the corridor itself, and so the proposed fence along with education and enforcement by many parties will be important going forward.
- Numerous designated and undesignated recreational trails currently occur within the corridor. To ensure the success and functionality of the corridor for wildlife these trails should not be maintained and special consideration must be given to which trails will remain and which will be removed. The final delineation of the wildlife corridor in this area will help in any future trail planning process to work to ensure that any future trail identification and/or development helps to support the key intent of the wildlife corridor as the first priority.
- Human use must be managed into the corridor. Recreational trails should be designated after planning considerations and access to the corridor should be managed to limit designated access to identified entry/exit locations to prevent the construction or use of undesignated trails like has occurred south and west of the Peaks of Grassi.
- The Three Sisters Parkway will eventually be built through this area, cutting across the Stewart Creek Across Valley corridor. Fencing alongside this road and a crossing structure for wildlife will need to be built to ensure appropriate wildlife movement along the Stewart Creek cross valley corridor, to the satisfaction of AEP with consideration for the recommendations within Clevenger and Huijser 2011, or similar.

VIII. Conclusion

TSMVPL's application has several positive aspects and we appreciate the extensive work that has been done to date that built on the high quality of work that AEP identified in the 2017 submission. When considering the improvements that have occurred within the Bow Valley over the last 25 years on the basis of wildlife and habitat protection, there is reason to be optimistic for wildlife now and in the future. The recent land exchange to improve wildlife movement through the G8 Legacy wildlife underpass, the proposed highway fencing and overpass by Seebe, and the release of the 2018 report "*Human-Wildlife Coexistence: Recommendations for Improving Human-Wildlife Coexistence*", newer Town of Canmore Bylaws implemented town-wide such as the Town's *Wildlife Attractant Bylaw 2017-10* last updated on August 26, 2019 and *Recyclables and Waste Disposal Bylaw 2016-11* last updated January 1, 2019 in the Bow Valley are all acting cumulatively to improve the ability of wildlife to navigate the Bow Valley. This proposal is satisfactory from my perspective and will formally complete the system of wildlife corridors related to Three Sisters and add to habitat patches in the Bow Valley. My reasons for this decision and suggestions for improvement are outlined in Section VI. Based on this review, AEP is satisfied with the corridors proposed by TSMVPL and formally submitted on January 28, 2020. Future work can now focus on the management of the corridor by many parties for the benefit of wildlife (e.g. Habitat enhancements, trail closures) and AEP will engage with the Town of Canmore, recreational planners, fire protection and TSMVPL representatives to ensure appropriate mitigation and planning to enable effective corridor design and management. While this decision represents an end to the formal process of delineating wildlife corridors related to Three Sisters as per the NRCB, it also is a beginning to the collaborative and cooperative process to manage these corridors. Finally, the approval of this corridor proposal provides a path forward for TSMVPL to develop their land base, and maintain a wildlife corridor. Further to this decision TSMVPL has committed to carrying out the following recommendations within 24 months of this decision. As referenced earlier, AEP and TSMVPL recognize that if completion of these recommendations cannot be successfully completed within this time frame, both agree to continue to work collaboratively to bring them to completion as quickly as possible

- The creation of habitat enhancements within the Smith Creek wildlife corridor as agreed to by TSMVPL and AEP;
- A detailed plan outlining the development of crossing structures and fencing to the satisfaction of AEP, which should consider the recommendations of Clevenger and Huijser 2011 or suitable alternatives to the satisfaction of AEP for both Highway 1, and Three Sisters Parkway.
- TSMVPL to support the implementation of initiatives as applicable to private property owners outlined within the 2018 "*Human-Wildlife Coexistence: Recommendations for Improving Human-Wildlife Coexistence in the Bow Valley*" report, and participate as a roundtable member to develop and support the groups initiatives regarding wildlife conflict and co-existence education for residents and visitors to TSMVPL properties, and ongoing participation in local WildSmart or similar initiatives to the satisfaction of AEP.
- Ongoing coordination of FireSmart planning with the Town of Canmore and AEP as may be proposed within wildlife corridors adjacent to ongoing and future Area Structure Plans or subdivisions on lands owned by TSMVPL.

IX. Post-script with respect to Potential Land Exchanges with TSMVPL

My decision has been made solely on my consideration of the merits of the submitted design, independent of any consideration of the potential ability on the part of AEP to acquire lands currently owned by TSMVPL or other parties. Having said that, I do wish to comment on the fact that in their submission TSMVPL has expressed an interest in acquiring Crown lands identified as Parcel K (27.93

ha/69.01 acres), Parcel C1 (4.87 ha/12.05 acres), a portion of Parcel U2 (area to be determined), and DLO 021340 current under assignment to TSMVPL. In my view this is not an unreasonable position on the part of TSMVPL, particularly given that some of the lands that they have included in their submission are outside of TSMVPL's own lands (see for example the discussion above with respect to the Thunderstone Quarries). I understand as well that TSMVPL is also proposing having the Province potentially acquire TSMVPL private property already within existing approved and proposed corridors.

I note that the concept of providing some form of "remedial action" for lands lost to development through land exchange or purchase was supported within the NRCB Decision. I recognize as well that the Province may be well positioned to ensure the ongoing functionality of portions of the corridor if they were to be transferred to and managed by the Crown and that a transfer to the Crown might help to carry out the recommendation of the NCRB that corridors be legally designated. With this in mind, AEP is receptive to exploring the possibility of a land exchange with TSMVPL. A land exchange would be based on fair assessment and valuation of both Crown Lands and TSMVPL lands being proposed for exchange and would follow the Government of Alberta's normal land exchange process, including any requirements for First Nations Consultation.

Sincerely,

A handwritten signature in blue ink, appearing to read "Rick Blackwood". The signature is fluid and cursive, with a large loop at the end.

Rick Blackwood
Alberta Environment and Parks

February 26, 2020



January 28, 2020

Rick Blackwood, RPF
Alberta Environment and Parks
Province of Alberta
10th Floor, 9915 108 Street
Edmonton, Alberta
T5K 2G8

Dear Mr. Blackwood,

**RE: Three Sisters Mountain Village (TSMV)
Smith Creek Wildlife Corridor – Revised Submission**

We are pleased to present to you this revised proposal for our Smith Creek Wildlife Corridor as shown in the attached figure. This proposal is based on over four years of direct work with the wildlife specialists at Golder, as well as public feedback over the course of two years in 2017 and 2018, and many meetings, discussions, reviews and comments from the Province of Alberta going back to at least 2015. We believe that we have built upon the advice contained within the Province's correspondence of June 2018, which recognized the many positive aspects of our previous submissions originating back to January 2017 and commended our previous work upon which this submission is built.

We have asked Golder to provide a professional review of Three Sisters Mountain Village Properties Ltd.'s (TSMVPL) proposal to you, and for convenience, they have packaged up several maps they developed during their evaluation, their previous background work and their review in the attached "Evaluation of the Smith Creek Wildlife Corridor" dated January 28, 20120 (Golder 2020).

Wildlife corridors are a requirement of the NRCB Decision No. 9103, in which the NRCB balanced environmental, social, and economic considerations and determined the Three Sisters project to be in the public interest. Similar to the careful balance that the NRCB undertook when weighing many factors, TSMVPL also weighed many factors into this submission including: steep creek considerations, property ownership, physical and topological constraints, recommendations from very experienced wildlife specialists, available scientific information and wildlife data from the Bow Valley, including specific to the lands discussed herein.

This submission deals with the remaining portion of the Along Valley Corridor and connectivity between the Wind Valley Habitat Patch and Bow Flats Habitat Patch at the eastern end of the TSMV property. Currently, the Along Valley Corridor is fully approved by the Province of Alberta to approximately 110 m east of the road allowance between S12-24-10-W5M and S11-24-10-W5M. This submission seeks to continue that connection approximately 2 km further east to the Wind Valley Habitat Patch, and also



would formalize the corridor connection off our property through to the G8 Underpass located east of Dead Mans Flats.

We have heard from wildlife specialists that connections to the Bow Flats Habitat Patch is quite desirable, and we have incorporated that feedback into this corridor submission. We have also heard the feedback from the Province that they would like TSMVPL to consider additional lands over and above what was already approved in 1998 for the Along Valley Corridor within Sites 7, 8 and 9 (portions of S11-24-10-W5M and S14-24-10-W5M). We have considered that request, with the acknowledgement by the Province that these lands are over and above the requirements of NRCB Decision No. 9103.

The narrowest portion of the current approved and designated Along Valley Corridor, 350 m, occurs immediately south of and above Sites 7/8. This submission will add land to the north side of the designated Along Valley Corridor, increasing the width of the corridor immediately above Sites 7 and 8 to an overall width of 550 m at its narrowest point.

The additional land on Sites 7 and 8 in this proposed corridor also addresses a portion of land on Site 7 that was considered a potential disconnect for wildlife movement in previous wildlife planning documents. The northern border of the designated Along Valley Corridor and the proposed extension will consist of a single smooth edge without any disconnects. The border was also moved north sufficiently to encompass an important large fen wetland, the largest single fen wetland on the TSMV lands. Mapped wetlands on Site 7, 8 and 9 lands identified by the NRCB are now within the proposed Smith Creek Along Valley Corridor.

This submission also proposes to relocate the Stewart Creek Across Valley Corridor approximately 630 m to the east, centering the corridor on the location of a proposed new wildlife underpass across the TransCanada Highway. The proposed new Stewart Creek Across Valley Corridor is comprised of habitat preferred by grizzly bear, elk and cougars based on habitat suitability modelling for these species in the Bow Valley (Golder 2013). It is also proposed that wildlife will also continue to have access to the existing Stewart Creek underpass via Provincially owned lands within NWS14-24-10-W5M (LINC: 0026031948), increasing the number of underpasses that cross the TransCanada Highway from two to three (i.e. G8 Legacy Underpass, two Stewart Creek Underpasses) and relocating the existing Stewart Creek Across Valley Corridor to a drainage, which is a natural movement corridor for wildlife. We also note the increase in width of the Stewart Creek Across Valley Corridor proposed in response to the Province's June 2018 correspondence, to approximately 640 m wide on average. This increase in the width of the Stewart Creek Across Valley Corridor is anticipated by wildlife specialists to provide more benefits than a wider Along Valley Corridor as the Along Valley Corridor already averages over 675 m wide and one edge is bounded by Provincial parks with lands already documented to be well used by wildlife.

The Stewart Creek Across Valley Corridor relocation is proposed as an option, subject to Alberta Transportation and other appropriate regulators approving a new wildlife underpass beneath the TransCanada Highway. Should the relocation not be approved by all necessary parties, then the existing



structure and the existing Stewart Creek Across Valley Corridor alignment would remain in place. If the alignment is relocated, retaining the existing wildlife underpass at Stewart Creek would also be subject to regulatory approval and any connection to it from the realigned Stewart Creek Across Valley Corridor comes with the stipulation from TSMVPL that no land beyond that shown in the attached figure is removed from development, whether through Provincial request or municipal land uses, setbacks or other municipal regulation with respect to layering, buffering, setbacks or similar restrictions for environmental or wildlife considerations. A portion of the existing Stewart Creek Across Valley Corridor immediately east of Stewart Creek Phase 3 (bounded to the north by the Province's NWS14-24-10-W5M parcel, bounded to the south by Stewart Creek Golf course and bounded to the east by the proposed west border of the across valley portion of the Smith Creek Along Valley Corridor) would then once again become completely developable lands under the NRCB Decision 9103 as shown in TSMVPL's proposal.

As noted previously, we retained Golder to evaluate the proposed Smith Creek Along Valley Corridor (Golder 2020). Golder determined that the proposed Smith Creek Along Valley Corridor adheres to general biophysical principals of corridor design that have been discussed with Alberta Environment and Parks in the recent past, and numerous wildlife movement studies and papers. Overall, habitat suitability modelling, based on species-specific radio telemetry data collected in the Bow Valley and shown in Golder 2020 attached, demonstrates that the majority of the proposed Smith Creek Along Valley Corridor includes habitat that is preferred by grizzly bears, cougars and elk. It is greater than 350 m in overall width, significantly so at over 675 m, and with very minor deviations is useable by wildlife over its entire width over all seasons.

Although there are a number of discontinuous small cliffs interspersed within the proposed corridor in a couple of areas, they are not acting as an impediment to movement by wildlife as shown by the data we have provided and discussed with the Province since the June 2018 correspondence. We have presented snow tracking data representing actual animal movements paths, and telemetry locations and camera data documenting substantial use by wildlife of this area. TSMVPL recognizes that there is some local narrative that assumes that slopes over 25 degrees are not used by wildlife and are an impediment to movement, however, as the in-field data we have provided, and that the Province has collected, demonstrates, this assumption underlying the local narrative is not supported scientifically in this context.

The TSMVPL team focussed on using actual location-specific movement data collected in the field for years to evaluate the effective width and location of our proposed Smith Creek Along Valley Wildlife Corridor, as was intended by the NRCB in their 1992 NRCB Decision Report, page 10-38 where they stipulated:

- 1) "The Applicant proposed that wildlife corridors be legally designated and the Board would recommend such action to (AEP)";
- 2) The minimum width for primary corridors is 350 m;



- 3) "Widths and locations of corridors be reviewed with the full range of species that are expected to make use of each corridor in mind";
- 4) "That measures such as bundling road, utility line and pathway crossings be adopted to minimize fragmentation of corridors"; and,
- 5) "That corridors correspond with known movement routes of the animals."

Multiple well-used wildlife trails above, below and through these discontinuous features demonstrate that wildlife are significantly using and moving through this area without material impediment even with the current significant level of dispersed human and pet use in the corridor. The new proposal is based on a significant amount of data that was not a part of our previous submission, also including data from the Province, that clearly show heavy, ongoing and sustained wildlife use of our proposed corridor which is physically over 675 m wide. As Golder's evaluation of corridor efficacy shows, estimated functional width exceeds 600 m for all species, and for many species such as grizzly bears, cougars, and deer, functional width is demonstrably much wider, exceeding over 1000 m. Clearly, our proposal for the Smith Creek Along Valley Wildlife Corridor meets and exceeds the intention of NRCB Decision No. 9103, as:

- 1) It is proposed to be legally designated;
- 2) Is much larger than 350 m with a proposed width of over 600 m;
- 3) Has been reviewed with the full range of species expected to make use of it;
- 4) Measures such as bundling roadways, utilities and pathways will be adopted when crossing the across valley portion; and,
- 5) Importantly, our proposed corridor corresponds with known movement routes of animals as shown by the data provided and the Province's own data.

We have widened the eastern portion of the proposed Smith Creek Along Valley Wildlife Corridor as a result of a detailed topographic survey that was reviewed in the field by experienced wildlife specialists in response to the Province's correspondence of June 2018. As such, the proposed corridor does not contain any notable or material impediments to wildlife movements. The corridor represents known movement routes of wildlife through the area and includes preferred movement routes; wildlife trails occur throughout the proposed corridor and current remote camera monitoring has shown that they are used by a wide variety of wildlife, including carnivores like cougars and wolves (Alberta Environment and Parks, unpublished remote camera data). The proposed Smith Creek Along Valley Corridor alignment has been ground-truthed numerous times, including visits with representatives of Alberta Environment and Parks, the Town of Canmore and community members. The alignment makes good use of existing abandoned mining roads which wildlife frequently use, along with numerous wildlife trails and natural breaks that contour along the slopes, creating natural movement routes for wildlife. Finally, because the proposed corridor borders a provincial park on the south side, there will only ever be development on one side of the Smith Creek Along Valley corridor.



With the proposed addition of wildlife conservation fencing along the north border of the existing designated Along Valley Corridor and this extension to the east separating wildlife from TSMV and other developments, legitimate human use in the corridors will be primarily on designated trails. Wildlife in the corridor will not be able to stray into developed areas, thereby avoiding the issues occurring on the school fields in the Stewart Creek community and elsewhere in Canmore like Centennial Park. This will also increase corridor functionality and reduce human/wildlife conflict risk. Wildlife conservation fencing will similarly increase the functionality of the Stewart Creek Across Valley Corridor.

Human use, including walking, off-leash dogs and mountain biking, in the existing approved wildlife corridors and habitat patches in and around Canmore currently has an adverse effect on the ability of these undeveloped areas to serve as undisturbed habitat and movement routes for wildlife. Although this situation has been well known for over a decade, and some progress has been made, data from remote cameras around Canmore indicate that there are more people and their pets using the wildlife corridors than wildlife. In addition, wildlife human conflict in and around Canmore is an on-going challenge for both the Town of Canmore and Alberta Environment and Parks. Elk present human safety concerns in town and bears continue to be removed at an unsustainable rate. The Bow Valley was considered a mortality sink for bears in 2013 (Golder 2013) and that situation has not changed since then. Previous development approaches using soft edges or “layers” to reduce sensory disturbance in an adjacent wildlife corridor have not been successful because habituated wildlife are attracted to development/human areas. In addition, the soft edge or layered approach has led to many questions as to where the actual corridor is by residents and visitors to Canmore, and continued heavy and dispersed use by humans of the corridor lands.

Accordingly, a hard edge in the form of a wildlife conservation fence is proposed to border the entire Along Valley Corridor to clearly demarcate the corridor. Two distinct fences will separate all new TSMV development in the Three Sisters Village and Smith Creek ASPs, respectively, and in doing so will also protect large portions of existing development around Stewart Creek and other communities on the south side of Canmore. The proposed fence will prevent wildlife from entering the developed area and will also reduce the significant amount of dispersed human use within the wildlife corridor because entry into the corridor will be restricted to designated trails connected to the regional trail network entering through designated gates in the wildlife conservation fence. Fencing has been successfully used to separate people and wildlife in a wide variety of applications across North America, including nearby Banff National Park, and globally. We believe it is a reasonable solution to help mitigate wildlife human issues currently faced by Canmore. Although it may be perceived as an inconvenience and a change of culture for some residents and visitors to Canmore, we believe it will facilitate wildlife movement for many species including grizzly bears, black bears and cougars, to continue to successfully move through the Bow Valley via the corridors.

The total area of the wildlife corridor has been increased to approximately 553 ha, and notably the vast majority of TSMVPL’s lands subject to the NRCB Decision No. 9103 and currently considered for development under Canmore’s DC1-98 land use bylaw in this area would become wildlife corridor as a



result of this submission. The submission identifies approximately 73% of TSMVs owned land in Site 9, along with approximately 63% of TSMV owned land in Sites 7 and 8 over and above what is already approved and in place today. The current land use bylaw in Sites 7, 8 and 9 permits approximately 378 acres of gross developable area in total, and our proposal would see a physically reduced gross developable area within the total Site 7, 8, and 9 area to approximately 250 acres. The proposed Smith Creek Along Valley Wildlife Corridor would likely see the need for some land use changes (which are clearly permitted under the Province's MGA, and even explicitly referenced in Section 6.9.2.7 of DC1-98).

TSMV is currently in an Area Structure Plan process with the Town of Canmore, which is the first stage to new land use bylaws in this area, and this Area Structure Plan will reflect the proposal herein should it be accepted by the Province to reflect proposed wildlife corridors and accordingly, adjusted developable land areas. New land use bylaws to replace those lands currently zoned DC1-98 are routinely undertaken as development occurs, and are even explicitly required under Sections 6.9.11.1, 6.9.11.2, 6.9.12.1, 6.9.12.2, 6.9.13.1, 6.9.13.2 and many other areas of DC1-98, Canmore's current MDP, and Canmore current Land Use Bylaw 22-2010). Such adjustments for re-allocating wildlife corridors and developable lands have occurred previously in TSMV, an example of which would include the work undertaken for Bylaw 23-2004 "Resort Centre Area Structure Plan," and so TSMV will undertake these land use considerations to reflect our proposed Smith Creek Along Valley Corridor and reallocate developable land accordingly should the Province approve our proposal.

The average overall width of the Smith Creek Along Valley Corridor has increased to over 675 m, another response to the Province's June 2018 correspondence. Over 89% of the proposed wildlife corridor consists of areas with slopes less than 25 degrees. Isolated and discontinuous slopes over 25 degrees cover approximately 11% of the area, but are found in small patches that have been documented with field data to not present impediments to movement.

To further improve this submission and building on our previous work, we are also committed to working with the Province to improve habitat in selected locations within the proposed corridor lands. This will involve signage to deter unmanaged human use by hikers, walkers, humans with pets and bikers in the corridors themselves, and by implementing the recommendations outlined as applicable to private landowners within the June 2018 Human Wildlife Coexistence Recommendations Report. TSMV will work with the Town and the Province to undertake an education and enforcement campaign to maximize efficacy of fencing and achieve compliance with trail use, off-leash dog use, and seasonal closure regulations within wildlife corridors. This is especially important for existing residents, who may be using wildlife corridors inappropriately because they may be unaware of legal requirements or the location of corridor boundaries and have been treating the corridors like recreation areas instead of wildlife spaces (Town of Canmore 2015; Derworiz 2015).

Finally, TSMVPL has secured agreement from the owners of Thunderstone Quarries, to offer land outside of our property to the Province for use as wildlife corridor as noted in the figure herein.



Importantly, Thunderstone Quarries is a private property not subject to the requirements of NRCB Decision No. 9103 and subsequently has no obligation or requirement to provide land or other measures to support wildlife corridors. TSMVPL's ability to secure such agreement should be seen as an important and highly beneficial aspect of our submission. This is notable given the existing constraints arising from the private property of Banff Gate Mountain Resort on the east side of George Biggy Sr Road, ongoing use of the Kananaskis Gun & Archery Club on George Biggy Sr Road, and the trail heads leading to the Wind Valley. TSMVPL is pleased to be able to secure the agreement of a private landowner for this supplemental land to add to the Smith Creek Along Valley Corridor for the benefit of our submission. TSMVPL would request that the Province also formally designate the portion of the proposed Smith Creek Along Valley Wildlife Corridor to the east of George Biggy Sr Road leading to the G8 underpass, such that this corridor is protected and which would also explicitly allow for Thunderstone Quarries properties to be redesignated for development. While the quarry is continuing its legal mining operations at this time, preparation of an Area Structure Plan that comprehensively includes development of Thunderstone Quarries property after mining is complete is good planning practice, would represent an excellent opportunity to reclaim a former industrial site to productive uses outside of wildlife corridors, and assist in Canmore's economic diversification.

TSMVPL's ability to secure an agreement with Thunderstone Quarries is particularly notable given the constraints in the general area arising from steep creeks, roadway connections, utilities, future access requirements, future servicing requirements, and the limited amount of land remaining after the proposed Smith Creek Along Valley Corridor is potentially established in this area. The addition of the Thunderstone Quarry lands offers additional land for corridor within a ravine well used by wildlife leading to Pigoen Creek. While we recognize that some advocates would like to see no development in Site 9 generally, the NRCB Decision No. 9103 determined that development of Site 9 and the other areas of TSMV is appropriate and in the public interest.

This proposed corridor in combination with previously-approved wildlife corridors on the south side of Canmore will result in the formal completion of a wildlife corridor and habitat patch network in the Bow Valley between Banff National Park and Kananaskis Country, a significant benefit to the wildlife and the people of the Bow Valley. The wildlife corridor network as proposed would also have no need for any additional "layers," buffers, setbacks or other similar municipal or provincial restrictions for environmental or wildlife considerations, and provide certainty for the developer and the Town alike with respect to development. We would request that should the Province approve our proposal, that Province explicitly confirm that no additional "layers," buffers, setbacks or other similar municipal or provincial restrictions for environmental or wildlife considerations, and provide clarity for the developer and the Town alike. The inclusion of a wildlife conservation fence separating development from the wildlife corridor will materially reduce the current dispersed human use in the corridor and in parallel, reduce the movement of habituated wildlife into developed areas, reducing existing and potential future wildlife conflict.



As discussed, and as the Province has agreed, the additional lands within Site 7,8 and 9 proposed herein, at the request of the Province, is over and above what TSMVPL has already provided for the provincially approved and designated Along Valley Corridor, and accordingly is over and above what the landowner is required to provide under the NRCB Decision No. 9103. This requested extra land dedication is subject to compensation to TSMVPL either in the form of a land exchange acceptable to TSMVPL and/or financial compensation or a combination of both. As discussed, TSMVPL is quite willing to potentially acquire Crown lands within the NE and NW quarters of S12-24-10-W5M or other nearby areas based on fair assessment and valuation of both Crown lands and TSMVPL lands being proposed. We also note that as discussed, TSMVPL would be open to discussing having the Province acquire TSMVPL private property already within existing approved and herein proposed corridors like the Tipple Across Valley Corridor, such that those lands become Crown property and therefore would be consequently protected from private development, and in many areas would be an easy addition to the existing Bow Valley Wildland Provincial Park should the Province so choose.

We look forward to hearing from you regarding this submission. We believe that you will find it to address all the points raised by the Province as an overall whole, incorporates two years of public feedback into its revisions, and that it represents the essence and core of the last year of discussion with you and your team, and will therefore be quite familiar to you. We thank you and your team for your guidance, feedback and patience in discussing this important matter given its history and complexity.

If you have any questions or require further information on this submission, please don't hesitate to contact me directly at any time.

Sincerely,

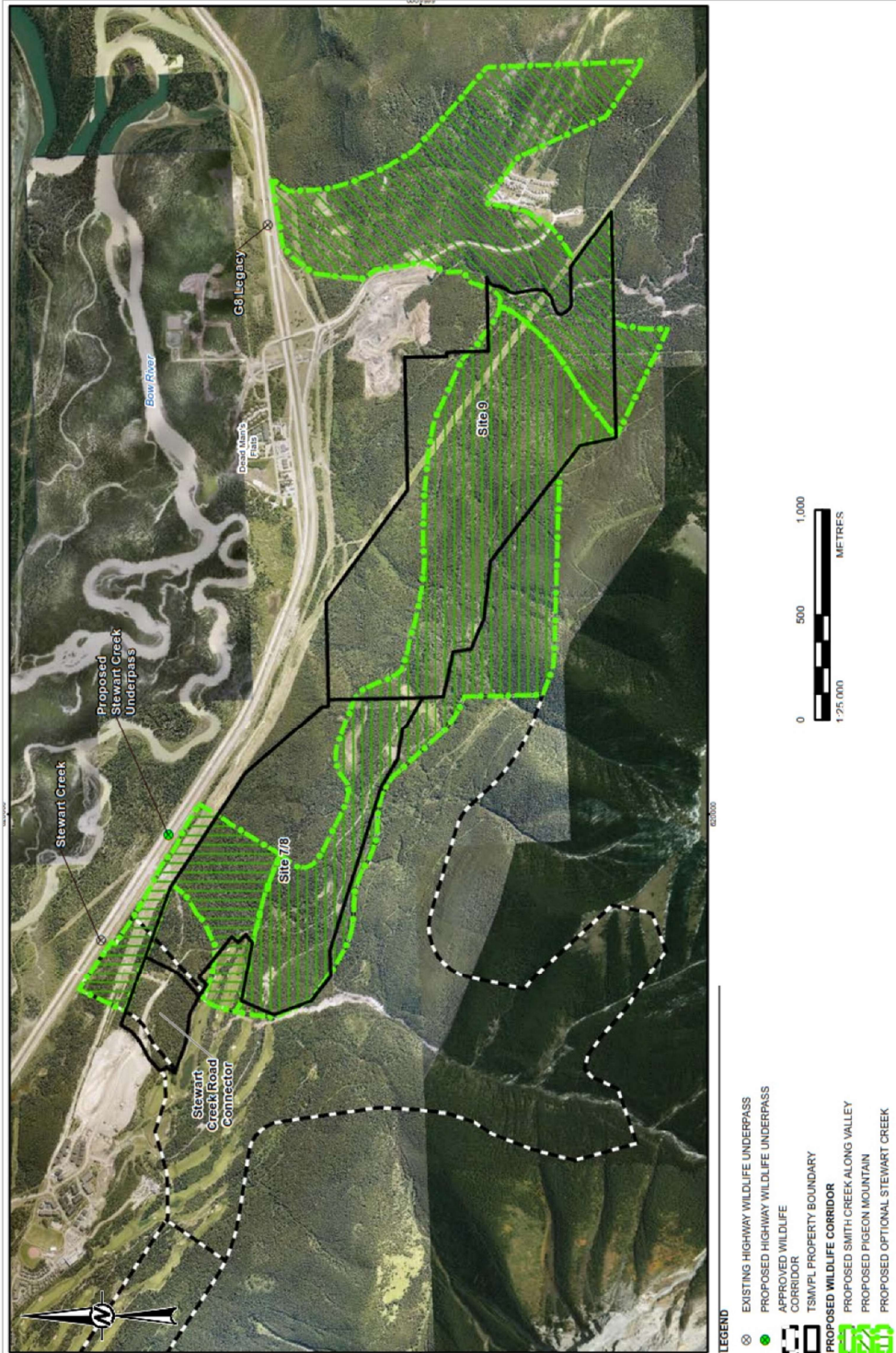
Three Sisters Mountain Village Properties Ltd.

A handwritten signature in blue ink, appearing to be "C. Ollenberger", written over a light blue horizontal line.

Chris Ollenberger, P.Eng.
Director, Strategy & Development

cc: David Taylor, Three Sisters Mountain Village
Kyle Knopff, Golder

Encl: Figure – Proposed Smith Creek Along Valley Corridor
Golder 2020 – Evaluation of the Smith Creek Wildlife Corridor





REPORT

Evaluation of the Smith Creek Wildlife Corridor

Submitted to:

Alberta Environment and Parks

On Behalf of:

Three Sisters Mountain Village Properties Ltd.

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Submitted by:

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January 28, 2020



Executive Summary

This report evaluates the effectiveness of a wildlife corridor proposed by Three Sisters Mountain Village Properties Ltd. (TSMV) to complete the wildlife corridor network with respect to TSMV properties in the South Canmore region. The proposed corridor provides the most direct link through TSMV lands between the approved Along Valley Corridor and the Wind Valley Habitat Patch and minimizes the inclusion of development. To be precautionary, the proposed Smith Creek extension of the Along Valley Corridor (i.e., the primary wildlife corridor) has been designed to exceed 635 m at its narrowest point. The proposed corridor results in TSMV designating 73% of remaining TSMV properties east of the existing approved Along Valley Corridor as a wildlife corridor. In addition, TSMV is proposing to widen the existing approved Along Valley Corridor and relocate the Stewart Creek Across Valley corridor to create a wider across valley corridor providing movement opportunity for wildlife across two highway crossing structures.

Golder's evaluation of the effectiveness of the proposal considered published scientific information, a broad compilation of recent wildlife data that have been collected in the Bow Valley, and information about mitigation that can improve the effectiveness of the wildlife corridor. The precautionary principle was applied to determine wildlife movements and use in the area proposed for the wildlife corridor by including a wide variety of information from different perspectives and incorporating data from many different sources (e.g., snowtracking, GPS collars, remote cameras). Key highlights of the evaluation of corridor effectiveness are summarized in the following paragraphs.

A key concern identified for wildlife movement in the Bow Valley has been the inclusion of steep slopes in wildlife corridors. Many wildlife species select habitats with gentle slopes, especially during winter. Slope has therefore been identified as a surrogate for corridor efficacy, often using a threshold of 25°. Over 89% of the proposed wildlife corridors consist of areas with slopes less than 25°. Isolated and discontinuous slopes >25° cover 11% of the area, but are found in small patches. No substantial cliffs or other topographical features that would create barriers to movement are present. This has been confirmed using Light Detection and Ranging (LiDAR) and field verified by Golder staff who have walked trails and transect lines throughout the proposed corridors.

Surrogates or proxies for wildlife movement, such as slope, are less important when evaluating the wildlife corridors proposed by TSMV because substantial wildlife movement data are available. Golder's evaluation focused primarily on determining whether available wildlife data identified known movement routes of animals in the proposed wildlife corridors. Empirical evidence from various data sources (e.g., snow tracking, telemetry, GPS collars, and remote cameras) clearly indicates the presence of regularly used movement routes for a wide range of wildlife species (e.g., elk, mule deer, white-tailed deer, black bears, grizzly bears, lynx, cougars, wolves) through the areas of discontinuous slopes >25°, including a large number of routes occurring on slopes >25°. Movement routes are used in all seasons when the wildlife species being evaluated are active (bears are inactive during winter).

The proposed changes to the Along Valley corridor east of the existing approved corridor result in a defined corridor that exceeds 635 m at its narrowest point. The corridor maintains an average width of 676 m between the eastern edge of the proposed Stewart Creek Across Valley Corridor and the western arm of the proposed Pigeon Mountain Across Valley Corridor. Demonstrated multi-species and multi-season wildlife movement routes occur over the entire area. Importantly, the southern boundary of the Along Valley Corridor will remain undeveloped and is protected as a provincial park. Although demonstrated use by wildlife declines at higher elevations above the proposed corridor, wildlife move through these areas, substantially increasing the effective width of the proposed along valley corridor relative to corridors that are constrained by development on both sides.

TSMV will implement several mitigations to increase the effectiveness of the Along Valley wildlife corridor, including habitat enhancements in areas away from human developments, installing a wildlife fence around the Smith Creek ASP and Three Sisters Village ASP, and providing education about attractant management and appropriate use of wildlife corridors.

The optional new alignment of the Stewart Creek Across Valley Corridor is not a requirement for future development at TSMV, but is a value-added component of TSMV's proposal. The proposed realignment of the Stewart Creek Across Valley corridor has a minimum width of 401 m and is 640 m wide on average (east to west) over its approximately 600 m length. The over 600 m average width over such a short distance is expected to be sufficient to maintain wildlife movement and would be an improvement over the currently approved (narrower) Stewart Creek Across Valley Corridor. TSMV proposes to fence development on both sides of the Stewart Creek Across Valley Corridor, install signage to promote responsible use of the wildlife corridor by residents, and install a new wildlife crossing for the extension of the Three Sister's Parkway that will bisect the Stewart Creek Across Valley Corridor. These mitigations are expected to further improve the functionality of the Stewart Creek Across Valley Corridor and wildlife population connectivity in the Bow Valley.

Overall, Golder concludes that the wildlife corridors proposed by TSMV represent an improvement over previous proposals, especially because it dramatically improves the Stewart Creek Across Valley Corridor. Wildlife movement is more constrained in a north-south direction than in an east west direction in the Bow Valley because of the arrangement of development at the valley bottom, including linear developments such as the highway and rail line. The increased width of the Stewart Creek Across Valley corridor, along with an additional crossing structure at the Trans Canada Highway and commitments by TSMV to fencing and crossing structures associated with roads crossing the corridor represents a substantial improvement over the existing approved Stewart Creek Across Valley Corridor and over the version of the new alignment of the across valley corridor proposed by TSMV in 2017.

Along valley movement by wildlife in the Bow Valley remains a substantial concern but is more easily achieved than across valley movement. The amendments and extensions to the Along Valley corridor proposed by TSMV will complete the wildlife corridor network on the south side of Canmore, through and adjacent to TSMV properties. Based on an evaluation of a large and diverse set of data available in the area, the proposed corridor network, including the Smith Creek extension of the Along Valley Corridor, are appropriately located for maintaining wildlife movement between designated wildlife habitat patches in the Bow Valley around TSMV properties and for maintaining existing regional connections between Kananaskis Country and Banff Nation Park in the Bow Valley. With appropriate management of human use, the proposed wildlife corridors are predicted to maintain connectivity at a local spatial scale (i.e., within home-range connectivity) for the wide variety of wildlife inhabiting the Bow Valley over long periods of time. The proposed wildlife corridors are also predicted to maintain the genetic diversity of wildlife by connecting habitat patches at large spatial scales. With appropriate management of human use, proposed corridors are predicted to maintain wildlife movement over the very long term.

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APPENDIX A

Biophysical Data Pertaining to the Proposed Wildlife Corridor

1.0 INTRODUCTION

The Bow Valley from the Town of Banff to where the Bow River exits the mountains east of Canmore is a key component of Alberta's Rocky Mountain ecosystem. It is a wide, low-elevation valley that supports a diverse array of wildlife, including several iconic large mammals such as grizzly bears (*Ursus arctos*), gray wolves (*Canis lupus*), elk (*Cervus canadensis*), and cougars (*Puma concolor*). Along with its considerable ecological importance, the Bow Valley provides substantial socio-economic value for Albertans. Tourism and recreation have been prevalent in the Bow Valley since at least when Banff National Park was established in 1885, and the valley has become one of the most desirable locations in Alberta for people to work, live, and play.

Because of high demand by people for property to use in conjunction with the considerable recreational opportunities available in the Bow Valley, residential and commercial development has been growing, especially in the Town of Canmore. In 1992, the Natural Resources Conservation Board (NRCB) granted approval to redevelop former coal mining lands, which included both open pit and underground industrial operations, now known as the Three Sisters Mountain Village (TSMV) properties in south-east Canmore (NRCB #9103-1992 Approval No.3; hereafter referred to as NRCB 1992). The NRCB approval permitted development of recreational opportunities such as golf courses or trails, hotels, public spaces, residential neighbourhoods, plus local and tourist-orientated commercial infrastructure on TSMV properties. Although development had been given approval, the NRCB placed conditions on the approval, including a provision that wildlife corridors be maintained around or through development property to facilitate wildlife movement and reduce the overall environmental impacts of the project. Specifically, Clause 14 of Appendix C in the 1992 NRCB Decision states:

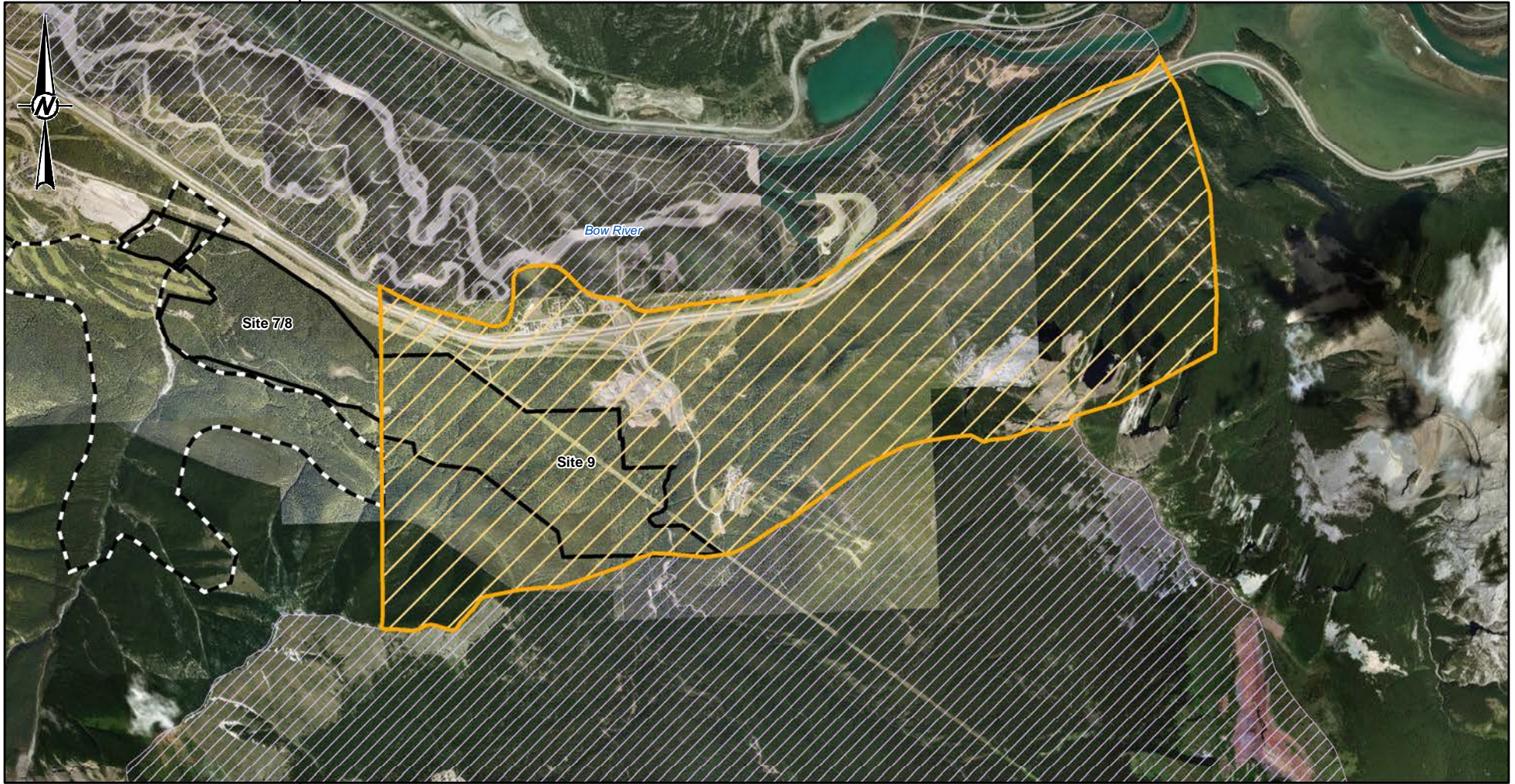
“Three Sisters shall incorporate into its detailed design, provision for wildlife movement corridors in as undeveloped a state as possible.... satisfactory to Alberta Forestry, Lands and Wildlife.”

From 1992 through to 2008 development of TSMV proceeded in stages. TSMV and AEP worked diligently to designate and protect wildlife corridors on TSMV property and on Crown land and much of the wildlife corridor network in the vicinity of TSMV has been finalized. However, designated wildlife corridors in the vicinity of the eastern portion of the TSMV property have not been defined to date. This amended application by TSMV is intended to address this final gap.

In 2015, Quantum Place Developments (QPD) was retained by TSMV to develop Area Structure Plans (ASPs) for the undeveloped portions of the TSMV property. In collaboration with the Town of Canmore, QPD is developing an ASP for an area that is known as Smith Creek. The Smith Creek ASP includes TSMV properties formerly known as Sites 7, 8, and 9, for which an approved wildlife corridor is already present south of Sites 7 and 8 (Figure 1). Final corridor delineation at the east end of TSMV properties has been challenging, and debate about the location and characteristics of a wildlife corridor in this area has been ongoing for more than 20 years. Although substantial studies have occurred and proposed wildlife corridors have been discussed, the final link to Wind Valley and the G8 wildlife underpass on the TransCanada Highway in the vicinity of Site 9 has not been approved to date in any form (Figure 1).





Prior to development of the Smith Creek ASP, Alberta Environment and Parks (AEP) must approve a wildlife corridor that completes the connection between the current approved Along Valley Corridor and the Wind Valley Habitat Patch. The boundaries of this wildlife corridor will define areas available for development as part of the Smith Creek ASP. Given this requirement, in 2017, TSMV (and their team) developed a wildlife corridor proposal to complete the wildlife corridor network in south Canmore in the vicinity of TSMV properties. The corridor proposal considered the economic and practical requirements of a new development project in Canmore as well as the large amount of data collected on wildlife use and connectivity in the area, and incorporated feedback and input from a variety of sources including open houses and input from a local community advisory group. The corridor proposal was submitted to AEP in March 2017 (Golder 2017).

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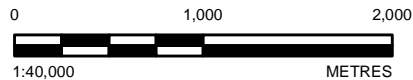
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LEGEND

-  APPROVED WILDLIFE CORRIDOR
-  HABITAT PATCH
-  TSMVPL PROPERTY BOUNDARY
-  AREA WITH NO DESIGNATED WILDLIFE CORRIDOR

REFERENCES

1. IMAGERY OBTAINED FROM THE TOWN OF CANMORE 2017015. ALL RIGHTS RESERVED
DATUM: NAD 83 PROJECTION: UTM ZONE 11



CLIENT
THREE SISTERS MOUNTAIN VILLAGE PROPERTIES LTD.

PROJECT
BIOPHYSICAL DATE PERTAINING TO THE PROPOSED WILDLIFE CORRIDOR

CONSULTANT

YYYY-MM-DD 2020-01-20



DESIGNED LD

PREPARED JE

REVIEWED LD

APPROVED KK

TITLE
APPROVED WILDLIFE CORRIDOR AND AREA WITH NO DESIGNATED WILDLIFE CORRIDOR NEAR THE TSMV PROPERTIES

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A decision letter provided by AEP on June 26, 2018 (AEP 2018) commended the overall quality of the application and identified several positive aspects to maintain wildlife movement. However, the decision determined that two main issues needed to be further addressed to achieve fully functional corridors over the long term.

- 1) The effective width of the proposed wildlife corridor at the eastern end of the Smith Creek property.
- 2) The width of the Stewart Creek Across Valley wildlife corridor.

TSMV has considered the information provided in the 2018 decision letter, and has worked with QPD, Golder Associates Ltd. (Golder), and AEP to update the proposed wildlife corridor and identify mitigation that will increase the efficacy of the wildlife corridor. Updates to the corridor further considered recent scientific information, a broader compilation of recent wildlife data that have been collected in the Bow Valley, and knowledge about effective mitigation that can improve the effectiveness of the wildlife corridor.

Golder was retained by TSMV to prepare an evaluation of the efficacy of the proposed wildlife corridor. This document presents Golder's evaluation of the amended wildlife corridor proposed by TSMV. The document using the following main sections:

- A description of TSMV's proposal (Section 2)
- The scope of Golder's analysis and the methods Golder used to evaluate corridor efficacy (Section 3)
- The results of Golder's corridor evaluation (Section 4)
- Additional commitments made by TSMV that Golder finds relevant to the corridor evaluation (Section 5)
- An overall conclusion about the proposal (Section 6)

2.0 CORRIDOR PROPOSAL

2.1 How was the Amended Corridor Alignment Determined?

A corridor proposal amendment was developed by TSMV and their team by considering input from professional biologists, input from AEP and Canmore stakeholders, property ownership, physical and topological constraints (e.g., steep creek considerations), recent scientific information available in the published literature, and wildlife data collected in the Bow Valley. TSMV also considered the intent and requirements of the 1992 NRCB decision when updating the proposed wildlife corridor. The NRCB approved development of TSMV lands, and retention of an economically viable parcel of land for development was a consideration of TSMV's proposal.

TSMV recognizes that designing and evaluating wildlife corridors can be challenging. Wildlife corridors must not simply be "plunked down willy-nilly on landscapes that have already been carved up for other purposes" (Chetkiewicz et al. 2006, p. 318). This does not mean that corridors cannot be designed in ways that accommodate development interests but points instead to the importance of careful planning so that, when corridors are defined on a landscape, they will fulfill their intended purpose. TSMV therefore carefully considered available scientific information and wildlife data for the Bow Valley when determining the proposed wildlife corridor boundaries.

AEP is responsible for approving wildlife corridor proposals, and TSMV engaged in discussions regarding the revised wildlife corridor with AEP and incorporated feedback from AEP into the revised corridor design.

2.2 Description of TSMV's Amended Corridor Proposal

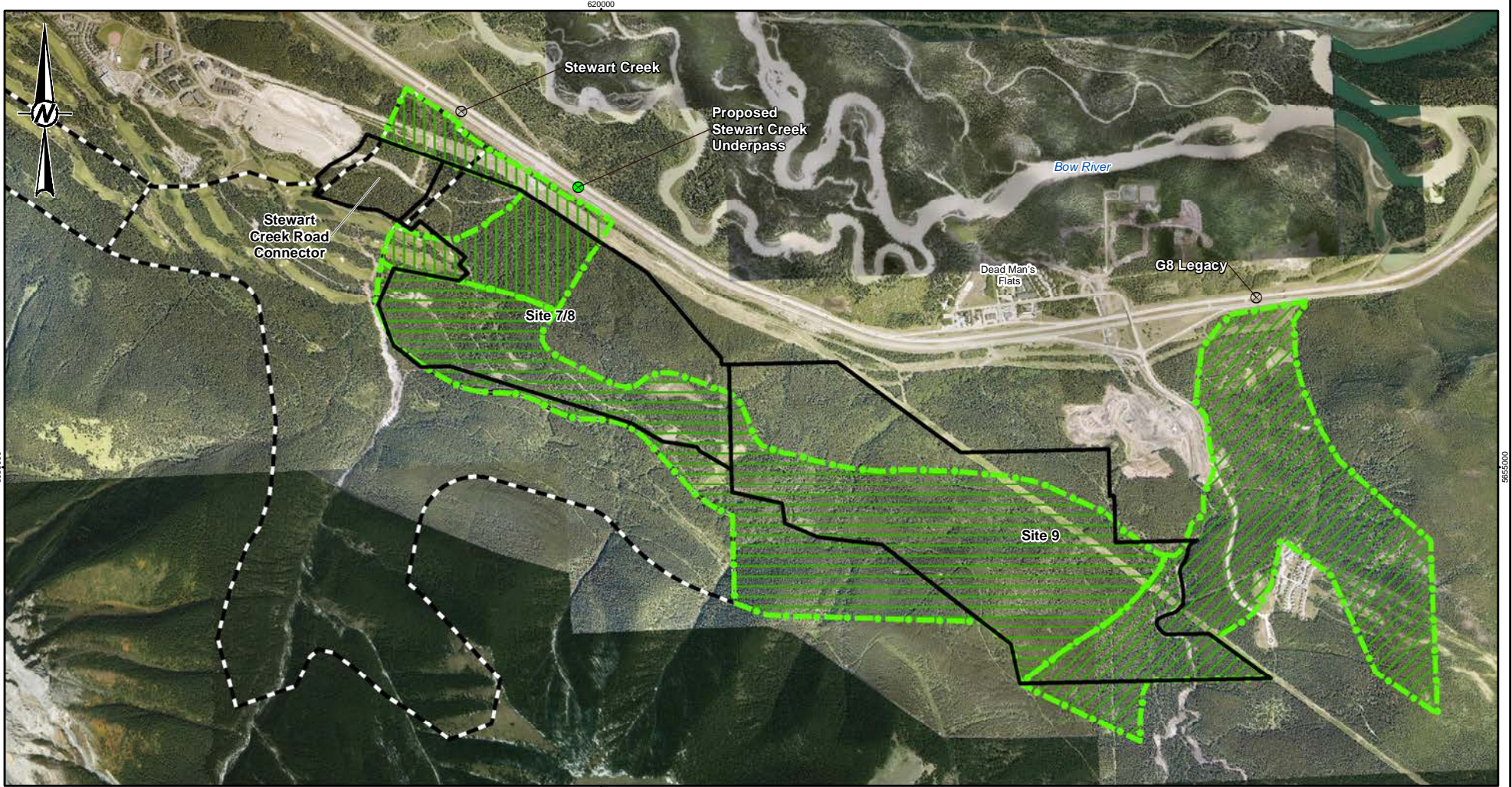
Like the original 2017 proposal, the amended wildlife corridor proposal is divided into three components (Figure 2). The first component amends and adds to the previously approved Along Valley Corridor, creating a connection between the previously approved Along Valley Corridor and the Wind Valley Habitat Patch (Figure 2). This proposed primary wildlife corridor increases the overall width of the existing approved corridor in Sites 7/8, which is portion of TSMV lands where an approved wildlife corridor has been in place since 1998 and for which no additional corridor delineation is required prior to development. TSMV is willing to provide additional land in this area in order to achieve a successful proposal that maximizes overall efficacy of the south Canmore wildlife corridor network. This segment of the corridor also extends the approved Along Valley Corridor by approximately 1.5 km through Site 9 (Figure 2). The overall width of the corridor within Sites 7/8 has been increased from the approved Along Valley Corridor, making this corridor segment much wider (i.e., >500 m). The proposed Smith Creek extension of the Along Valley Corridor would extend through Site 9 and complete the primary wildlife corridor with respect to connecting to the Wind Valley Habitat Patch.

The second component of the amended proposal is a proposed optional realignment of the Stewart Creek Across Valley Corridor (Figure 2). The existing Stewart Creek Across Valley Corridor was formally designated by the Province in 1998 and amended in 2014. However, TSMV's wildlife corridor proposal recommends moving the Stewart Creek Across Valley Corridor approximately 300 m to the east and centering the corridor on the location of a new wildlife crossing under the TransCanada Highway. The alignment was altered based on discussions with the Town of Canmore regarding potential steep creek hazards identified by the Town, drainage grade separation of the Parkway, wildlife movement, and public input.

If this option proceeds, the existing wildlife crossing structure near Stewart Creek would be retained and would be linked to the western edge of the Optional Stewart Creek Across Valley Corridor (Figure 2). The optional new alignment of the Stewart Creek Across Valley Corridor is not a requirement to develop the Smith Creek ASP and the current alignment approved in 1998 and amended in 2014 could be retained. However, moving the Stewart Creek Across Valley Corridor is the preferred option being explored by TSMV's team and the Town of Canmore for the Smith Creek ASP as a response to the Town of Canmore and public feedback. If relocated, the portion of the existing Stewart Creek Across Valley Corridor located on TSMV property would be rescinded and become developable land without restrictions. Additionally, TSMV will be implementing mitigation to improve the effectiveness of the Stewart Creek Across Valley Corridor over the previously approved across valley corridor (see Section 4.3 for details).

The third component of the amended proposal is the Pigeon Mountain Across Valley Corridor. The proposed Pigeon Mountain Across Valley Corridor is primarily located outside of TSMV lands but is considered beneficial to create a connection from the Wind Valley Habitat Patch to the Bow Flats Habitat Patch via the G8 Legacy Underpass (Figure 2). A portion of the proposed Pigeon Mountain Across Valley Corridor is found on Site 9 (Figure 2).

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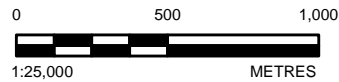
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LEGEND

- ⊗ EXISTING HIGHWAY WILDLIFE UNDERPASS
- PROPOSED HIGHWAY WILDLIFE UNDERPASS
- ⬜ APPROVED WILDLIFE CORRIDOR
- ⬜ TSMV/PL PROPERTY BOUNDARY
- PROPOSED WILDLIFE CORRIDOR**
- ▨ PROPOSED SMITH CREEK ALONG VALLEY
- ▨ PROPOSED PIGEON MOUNTAIN
- ▨ PROPOSED OPTIONAL STEWART CREEK



REFERENCES

1. IMAGERY OBTAINED FROM THE TOWN OF CANMORE 2017015. ALL RIGHTS RESERVED
- DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
THREE SISTERS MOUNTAIN VILLAGE PROPERTIES LTD.

PROJECT
THREE SISTERS MOUNTAIN VILLAGE WILDLIFE CORRIDOR PROPOSAL

CONSULTANT

YYYY-MM-DD	2020-01-20
DESIGNED	LD
PREPARED	JE
REVIEWED	LD
APPROVED	KK

TITLE
PROPOSED SMITH CREEK WILDLIFE CORRIDOR COMPONENTS



PROJECT NO. 7000
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Changes made from the 2017 corridor proposal include the following aspects, all of which are expected by TSMV to result in improvements over the corridor proposed to in 2017 and that TSMV believes addresses the two concerns identified by AEP in 2018:

- Widening the narrowest point of the Stewart Creek Across Valley corridor (Figure 2) to 401 m and the average width to 640 m.
- Inclusion of a large wetland along the northern boundary of the extended Along Valley wildlife corridor, which results in an addition of 417 m width in this portion of the corridor and increases the overall average width of the extended Along Valley corridor to 676 m (Figure 2).
- Widening the eastern portion of the extended Along Valley corridor by 24 to 39 m.
- Completion of a detailed survey of the north boundary of the proposed corridor south of the Thunderstone Quarry to confirm topographic elements so that the boundary could be determined with wildlife use in mind.

The total area of the wildlife corridor has increased by approximately 9 hectares (ha), from 544 ha (2017) to 553 ha (2019), and the increase occurs on TSMV lands. Most of the TSMV lands subject to the 1992 NRCB decision would be relinquished and assigned to wildlife corridor as a result of this proposal. The proposal designates 73% of TSMV land in Site 9 as a wildlife corridor (Figure 2). In addition, 63% of TSMV land in Sites 7 and 8 would be designated as wildlife corridor, even though these lands occur in an area with an already designated wildlife corridor (Figure 1, Figure 2).

3.0 CORRIDOR EVALUATION APPROACH

This section presents the precautionary approach applied by Golder to evaluate the wildlife corridor proposed by TSMV. Although the 1992 NRCB Decision Report, which required wildlife corridor designation as a part of TSMV development, constitutes the basis for decision making with respect to the wildlife corridor proposal submitted by TSMV to AEP, additional information about what constitutes an effective wildlife corridor, as well as recent data collected in the Bow Valley were used to evaluate the effectiveness of the wildlife corridor. This section begins by providing a definition for an effective wildlife corridor in the Bow Valley (Section 3.1). Next, criteria used to evaluate the likely ability of the proposed corridor to meet this definition are identified (Section 3.2). Finally, the data and other sources of information used to evaluate each criterion are presented (Section 3.3).

3.1 What Constitutes an Effective Wildlife Corridor in the Bow Valley?

Human development fragments wildlife habitat, reducing habitat quality and potentially restricting animal movements. Corridors are crucial conservation tools for maintaining connectivity and ecological function in developed landscapes (Beier and Noss 1998, Tewksbury et al. 2002). The NRCB (1992) makes clear that the primary purpose of wildlife movement corridors with respect to TSMV is to ensure that development will not prevent wildlife movement at broader regional scales and will not force wildlife to cross developed areas (NRCB 1992pp. 10-51).

Although BCEAG (1999) guidelines are explicitly not applicable to TSMV, they provide valuable insight that distinguishes wildlife corridors from habitat patches. In contrast to a wildlife habitat patch, which is defined as a place that meets a wide spectrum of habitat requirements for wildlife, a wildlife corridor is “an area of land designed to provide connectivity among habitat patches” (BCEAG 1999 pp. 5). As such, “wildlife corridors are generally not designed to fulfill any of the requirements of habitat patches other than some elements of security without which animals would not use them” (BCEAG 1999 pp. 5). In other words, habitat within corridors does not need to meet a wide range of ecological requirements for wildlife, so long as wildlife are willing to use the corridor to travel between habitat patches.

The BCEAG guidelines found substantial support for their definition in the literature (e.g., Herrero and Hamer 1983, Matson 1993, Harrison 1992, Noss 1992, Beier and Loe 1992, Beier 1995, Gibeau et al. 1996). More recent literature also supports this definition (Chetkiewicz et al. 2006, Beier et al. 2008). For instance, Beier et al. (2008 pp. 837) define a corridor as “a swath of land intended to allow passage by a particular wildlife species between two or more wildland areas”. Beier et al. (2008) go on to define linkages as multi-species corridors that are designed to promote movement in some cases, but also can be designed to promote more complex biological processes, depending on the biological goals set for the linkage.

Wildlife corridors in the Bow Valley fulfill several important biological processes, including maintaining meta-populations, achieving genetic connectivity, and connecting habitats within the home ranges of individual animals inhabiting the Bow Valley. Corridors designed within a meta-population framework permit animals to disperse from their natal area and travel to new habitat patches, reducing extinction risk in fragmented landscapes (Beier 1995). Corridors also can be designed to maintain the genetic diversity of wildlife. In such cases, corridors need only be used infrequently, perhaps only a handful of times in a generation (Mills and Allendorf 1996).

Although population-level corridor functions clearly are important in the Bow Valley, a third motivation for wildlife corridors in the Canmore area is to achieve connectivity at a local spatial scale and over short periods of time (i.e., within valley movements by individual animals at seasonal temporal scales or finer; BCEAG 1999).

Consequently, an effective wildlife corridor is defined for the purposes of this evaluation as a corridor that permits within home range movement of wildlife from one habitat patch to another (Taylor et al. 2006). This is the most challenging definition of an effective wildlife corridor to implement in practice and forms the basis of Golder’s evaluation of the predicted efficacy of the amended corridor proposal presented by TSMV.

3.2 Evaluation Criteria

Criteria for corridor designation that have been developed for other parts of the Bow Valley, i.e., the BCEAG guidelines, explicitly do not apply to TSMV (BCEAG 1999, 2012). However, many conservation-minded advocates oppose the exclusion of BCEAG guidelines for TSMV, arguing that these guidelines represent an application of the best available science in corridor design (e.g., letter to Environment and Sustainable Resource Development Minister Knight from the Alberta Wilderness Association dated July 18, 2011). A science-based approach to evaluate the efficacy of wildlife corridors is both objective and defensible. Moreover, a science-based approach permits a clear evaluation of whether the proposed wildlife corridors will be effective, as defined in Section 3.1.

Consequently, this wildlife corridor evaluation incorporates requirements for corridors established by the NRCB in 1992, as well as more recent science to determine corridor efficacy. This includes considering the scientific underpinnings of the BCEAG guidelines using a precautionary approach (i.e., conservative approach that minimizes the risk of identifying a functional corridor when one is not present).

To fully consider corridor efficacy for wildlife as defined in Section 3.1 and incorporate more recent available science, the evaluation criteria listed in the following bullets were identified and applied to Golder’s evaluation of TSMV’s Smith Creek wildlife corridor proposal. These criteria were based on the requirements of the NRCB, available published science, and previous work summarizing the available science (including grey literature) with respect to corridor efficacy in the Bow Valley (e.g., BCEAG 2012, Golder 2012, MSES 2013) and site-specific field monitoring of TSMV lands. Each evaluation criterion is posed as a question that will be answered in the results of the corridor evaluation.

- **Does the corridor link to other corridors on private and provincial lands at a regional scale?** – In fragmented landscapes such as the Bow Valley, meeting all the biological functions of an effective wildlife corridor identified in Section 3.1 requires wildlife corridor planning at the regional scale. Regional wildlife corridors are crucial conservation tools for maintaining connectivity and ecological function (Beier and Noss 1998, Tewksbury et al. 2002). The NRCB also requires that corridor designation should occur at a regional scale and corridors on private and provincial lands must be linked (NRCB 1992 pp. 10-38).
- **Does the corridor follow the most direct route?** – Shorter corridors will prove more effective than longer ones, especially if corridors are narrow (Beier 1995, BCEAG 2012). Consequently, the most direct route should be used to link habitat patches.
- **Is the wildlife corridor wide enough to function effectively?** – Corridors must not be too narrow or animals will not use them (Gillies and St. Clair 2008). Although corridor width might have important implications for the ability for wildlife to move effectively among habitat patches (Haddad 1999), published scientific tests of the relationship between corridor width and efficacy are only available for very few wildlife species and methods for empirically estimating the minimum effective width of corridors *a priori* are unavailable (Beier et al. 2008). As a result, prescriptions for corridor width are highly variable. However, in general, wider corridors are more effective than narrower ones (Golder 2012), and, at a minimum, the 350 m width prescribed by the NRCB (1992) and recommended by BCEAG (2012) should be met.
- **Will the proposed corridor function for multiple wildlife species?** – The Bow Valley is home to a wide variety of species for which wildlife corridors must function to maintain connectivity (BCEAG 2012; Golder 2012). The 1992 NRCB decision also requires that the width and location of corridors should be reviewed with the full range of wildlife species expected to use them in mind (NRCB 1992 pp. 10-38).
- **Does the corridor correspond to known movement routes for most wildlife species?** – To increase the likelihood that movement corridors will achieve connectivity at a local spatial scale and over short periods of time (i.e., within valley movements by individual animals at seasonal temporal scales or finer; BCEAG 1999a), corridors should correspond with known movement routes of animals. If wildlife corridors also encompass preferred routes, the likelihood that movement corridors will achieve connectivity at local spatial scales over short periods of time increases.
- **Can the corridor be used in all seasons?** – Corridors in the Bow Valley should function for multiple species and in multiple seasons. Habitat use can change substantially in different seasons. For example, elk in mountainous landscapes frequently exhibit seasonal shifts in use of elevation, preferring lower elevations in winter and moving to higher elevations during summer (Serrouya et al. 2000, Hebblewhite et al. 2008). Snow depth may inhibit movement during winter in some places and for some species in mountainous landscapes.
- **Does the corridor contain topographical features that would create barriers to movement?** – If wildlife corridors contain topographical features that create barriers to movement, efficacy of the corridor may be reduced or eliminated. For example, cliffs or other physical barriers may prevent movement. Steep slopes have also been identified in the Bow Valley as a potential factor (BCEAG 2012). However, wildlife in the Bow Valley can and do use steep slopes frequently for movement (Duke et al. 2001; Chetkiewicz and Boyce 2009) even though some species show a preference for flatter terrain (Alexander et al. 2006).
- **Is the corridor in the least developed state possible?** – Development within wildlife corridors can lead to reduced probability of use by wildlife and/or lead to increased negative wildlife human interactions (BCEAG 2012, Golder 2012). In recognition of this, the NRCB requires that corridors remain in as undeveloped a state as possible (NRCB 1992, Clause 14), and that roads, pathways and utility lines should be bundled (i.e., cross corridors in the same place) to minimize corridor fragmentation (NRCB 1992 pp. 10-38).

3.3 Data Used

The criteria defined in Section 3.2 for evaluating this amended corridor application used the following information and data sources:

- A review of the requirements for wildlife corridors with respect to TSMV property as outlined in the 1992 NRCB Decision Report issued for “Application #9103 –Three Sisters Golf Resorts Inc. Application to Construct a Recreational and Tourism Project in the Town of Canmore, Alberta.
- A review of scientific literature and other relevant reference materials pertaining to wildlife movement and wildlife corridors, with a particular emphasis on the Bow Valley recognizing TSMV is explicitly exempted from BCEAG guidelines. However, BCEAG Guidelines were referenced to help inform the evaluation.
- Site-specific reports summarizing wildlife data collected on TSMV properties.
- Light Detection and Ranging (LIDAR) data providing information about slope and elevation.
- Measurements of corridor width and other measures obtained from a GIS.
- Wildlife data collected on remote cameras, during snow tracking surveys, and from global positioning system (GPS) collars in the Bow Valley near the TSMV property.

4.0 CORRIDOR EVALUATION RESULTS

This section presents the results of the wildlife corridor evaluation for each of the criteria identified in Section 3.2.

4.1 Does the Corridor Link to Other Corridors on Private and Provincial Lands at a Regional Scale?

The proposed corridor integrates areas of private and public land to create linkages at regional scales and will complete the south Canmore corridor network. The proposed Smith Creek extension to the Along Valley corridor will connect the east end of the 1998 approved Along Valley Corridor to the Wind Valley Habitat Patch (Figure 1, Figure 2). Either the proposed re-alignment of the Stewart Creek Across Valley Corridor or the current Stewart Creek Across Valley Corridor will maintain a connection between the Along Valley Corridor and the Bow Flats Habitat Patch in the vicinity of Stewart Creek (Figure 2). The Pigeon Mountain Across Valley Corridor will create a formal connection between the Wind Valley Habitat Patch to the Bow Flats Habitat Patch via the G8 underpass (Figure 1, Figure 2). These connections represent the final pieces of the regional wildlife corridor network on the south side of the Bow Valley in the Canmore area. Designating these corridors will mean that all designated habitat patches in the Bow Valley are linked to one another with formally designated corridors. This proposed corridor is noted to be quite similar to the corridors advocated to achieve regional connectivity near TSMV lands by the Yellowstone to Yukon Conservation Initiative (Heuer and Lee 2010).

4.2 Does the Corridor Follow the Most Direct Route?

The proposed corridor provides the most direct link through TSMV lands between the ends of existing approved corridors. Shorter and more direct links between the southern arm of the existing approved Along Valley Corridor and the Wind Valley Habitat Patch are available and use of these corridors by some wildlife species has been well demonstrated (Golder 2012). However, these routes occur on Crown land, do not appear to be at risk from development, and could be designated as a wildlife corridor at the discretion of the Province. Consequently, they are not included in TSMV’s proposal, which deals with corridors intersecting with some portion of TSMV lands.

In the case of the potential realignment of the Stewart Creek Across Valley Corridor, the presence of the most direct (i.e., shortest and straightest) route assumes that a new wildlife underpass will be constructed, as identified in Figure 2.

The straightest possible route for the proposed Pigeon Mountain Across Valley Corridor is used. The presence of existing development (e.g., Dead Mans Flats, gun range, and Banff Mountain Gate) constrain the alignment of this corridor.

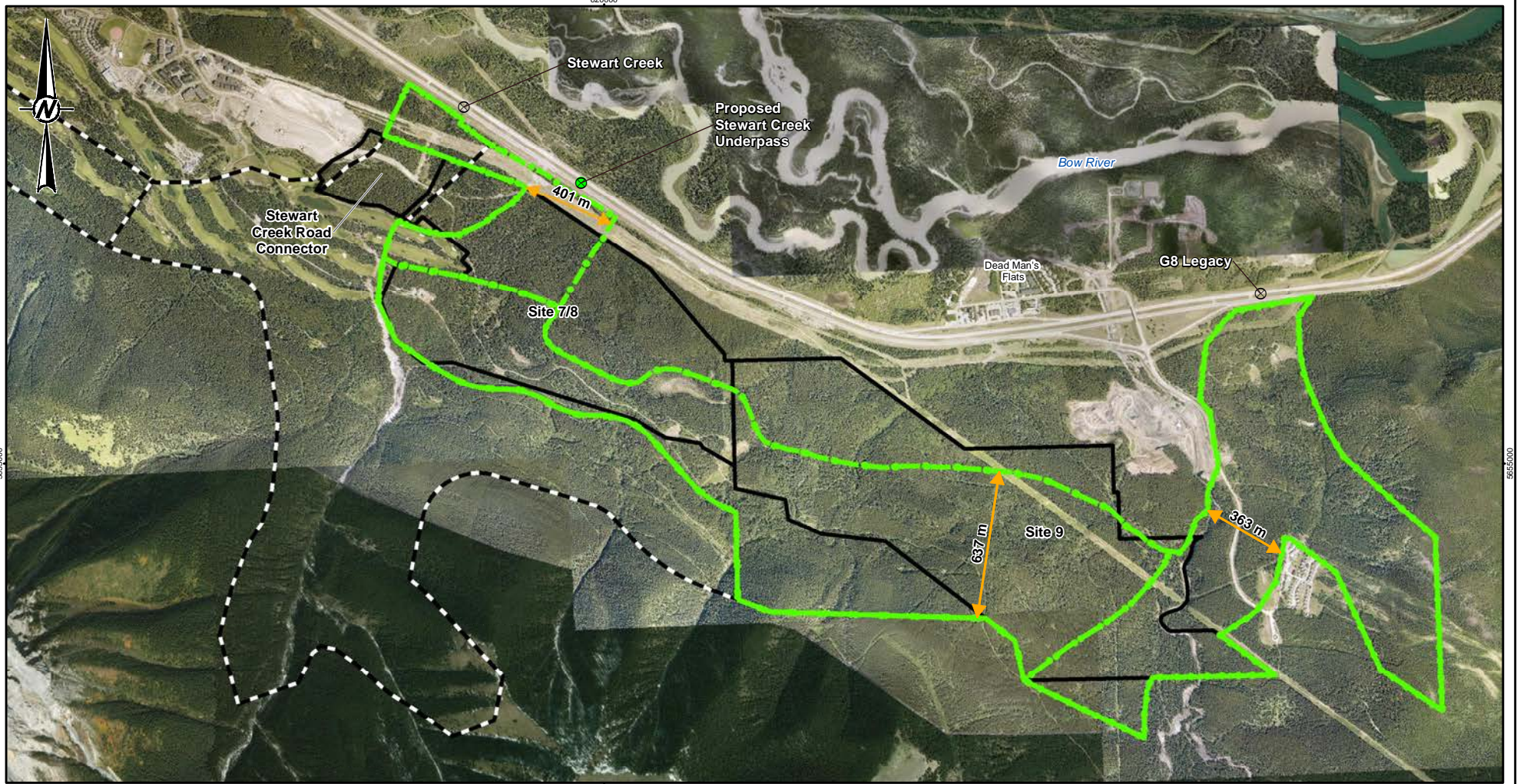
4.3 Is the Wildlife Corridor Wide Enough to Function Effectively?

Recommended widths of corridors designed for large carnivores presented in the literature vary between 100 m and several kilometres depending on the length of the corridor and its intended function (Harrison 1992, Beier 1995; Bond 2003). Although, there are discrepancies in the recommended width of wildlife corridors, it is generally accepted that wider corridors are better than narrower ones for maintaining connectivity (Beier 1995, Beier et al. 2008, Gillies and St Clair 2008). Primary wildlife corridors are recommended to be at least 300 m (Bond 2003) to 350 m wide (NRCB 2012; BCEAG 1999, 2012), or wider (Golder 2002). Additionally, as the length of a corridor increases, the width should also increase (BCEAG 2012). The original 350 m corridor width prescription of the BCEAG (1999a) guidelines were upheld by BCEAG (2012), not because scientific support for a 350 m cut-off was found, but because little evidence to either support or refute this cut-off was identified. Because experts may disagree, setting minimum corridor width where expert opinion is applied remains an important challenge for land managers (Beier et al. 2008). TSMV therefore sought to maintain corridors that were as wide as possible while retaining an economically viable development area as intended by the NRCB, which balanced environmental, economic, and social considerations in their approval decision (NRCB 1992).

To be precautionary, the proposed Smith Creek extension of the Along Valley Corridor (i.e., the primary wildlife corridor east of the existing approved corridor) is substantially wider than the recommended width of 350 m and exceeds 635 m at its narrowest point (Figure 3). Importantly, the southern boundary of the proposed Along Valley Corridor extension will remain undeveloped and is protected as part of a provincial park. The area south of this line has substantial observed wildlife movement for some species such as cougars, grizzly bears, black bears (*Ursus americanus*), bighorn sheep (*Ovis canadensis*), and mule deer (*Odocoileus hemionus*) (Appendix A; Chetkiewicz and Boyce 2009; Golder 2012). Other species, such as elk and wolves use the area south of the proposed corridor less frequently relative to other areas, but use has been documented in all seasons (Golder 2013). Consequently, movement opportunities for wildlife extend south of the proposed corridor boundary and the effective functional corridor width is substantially wider than 635 m, at least for some species in some seasons. Figures showing wildlife movements in the broader region around the proposed wildlife corridor are presented in Appendix A.

As suggested in BCEAG (2012), as corridors increase in length, the width of the corridors should also increase. The width of the proposed Along Valley corridor has been increased from the existing, approved Along Valley corridor (Figure 2). Although not required for TSMV to develop Sites 7 and 8, this widening (i.e., to >500 m) is commensurate with the increase in length of the Along Valley corridor to connect the east end of the 1998 approved Along Valley Corridor to the Wind Valley Habitat Patch and contains many movement routes regularly used by a variety of wildlife species (Appendix A).

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LEGEND

-  EXISTING HIGHWAY WILDLIFE UNDERPASS
-  PROPOSED HIGHWAY WILDLIFE UNDERPASS
-  PROPOSED CORRIDOR MINIMUM WIDTHS
-  APPROVED 1998 WILDLIFE CORRIDOR (AS AMENDED)
-  TSMVPL PROPERTY BOUNDARY
-  PROPOSED WILDLIFE CORRIDOR



REFERENCES

1. IMAGERY OBTAINED FROM THE TOWN OF CANMORE 2017015. ALL RIGHTS RESERVED
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CLIENT
THREE SISTERS MOUNTAIN VILLAGE PROPERTIES LTD.

PROJECT
THREE SISTERS MOUNTAIN VILLAGE WILDLIFE CORRIDOR PROPOSAL

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	REVIEWED	LD
	APPROVED	KK

TITLE
MINIMUM WIDTHS FOR PROPOSED WILDLIFE CORRIDORS



PROJECT NO. 7000
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FIGURE
3

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The width of the Along Valley corridor has been increased over the corridor proposed in 2017 with the inclusion of a large wetland along the north boundary of the Along Valley corridor and an expansion at the eastern end of the corridor (Figure 2, Figure 3). The inclusion of the wetland increases the width in this portion of the corridor by 417 m relative to the approved corridor above Sites 7/8, and the eastern expansion increases the width of the proposed wildlife corridor by 24 to 39 m at the eastern end of Site 9. Importantly, the overall average width of the Across-Valley corridor increases through Site 7/8 and Site 9, partially addressing AEP's first concern with the wildlife corridor submitted by TSMV in 2017 (Section 1.0; AEP 2018).

Additionally, available telemetry, snow-tracking, and camera data clearly demonstrate that the effective width (i.e., the area used regularly for movement) extends south from the proposed boundary by up to 2 km for many species, especially grizzly bears, cougars, and deer (*Odocoileus* spp.) (unpublished Provincial data; Golder 2012). The width of this corridor is therefore expected to be sufficient to maintain along valley movement. Moreover, the area south of the Along Valley Corridor is largely protected as provincial parks and development will not occur on both sides of this corridor. Consequently, the area available for animals to move is much greater than 600 m in all areas of the Smith Creek extension of the Along Valley Corridor and this width is expected to be maintained indefinitely.

The across valley corridors proposed by TSMV are narrower at their narrowest point than the proposed Along Valley Corridor extension but are still greater than 350 m, and the narrower width is generally considered more acceptable given the shorter distance that animals need to move through these corridors (BCEAG 2012). However, development will occur on both sides of the across valley corridor and wildlife generally face greater challenges moving across valley than along valley in the Bow Valley. Therefore, the width of across valley corridors remains an important consideration. The proposed realignment of the Stewart Creek Across Valley corridor has a minimum width of 401 m and is 640 m wide on average (east to west) over its approximately 600 m length. The over 600 m average width over such a short distance is expected to be sufficient to maintain wildlife movement, and would be an improvement over the currently approved (narrower) Stewart Creek Across Valley Corridor. The increase in the width of the Stewart Creek Across Valley Corridor is anticipated to provide more benefits than additional widening of the Along Valley Corridor because the Along Valley Corridor is already greater than 600 m wide and is bounded along its southern edge by provincial parks, whereas the across valley corridor will have development on either side.

The minimum width of the Pigeon Mountain Corridor is 363 m and the corridor averages 442 m wide (east to west) over its approximately 1.8 km length. The narrowest point in the proposed Pigeon Mountain Across Valley Corridor cannot be adjusted because it is constrained by pre-existing developments unrelated to TSMV or the NRCB decision (i.e., Dead Mans Flats and Banff Mountain Gate). In the case of the proposed Pigeon Mountain Across Valley Corridor, corridor width is the maximum possible between pre-existing provincially approved developments on the west arm (Figure 2, Figure 3). Like the southern boundary of the proposed Smith Creek Along Valley Corridor extension, the eastern boundary of the proposed Pigeon Mountain Corridor is unconstrained by development, and movement has been demonstrated for many species east of the proposed boundary (unpublished Provincial data; Golder 2012). Functional width of this corridor is therefore substantial and is expected to continue to maintain movement.

Risk to maintaining wildlife movement is higher for the Across Valley Corridors than the Along Valley Corridor because of human development on both sides of the Across Valley Corridors. Consequently, mitigations should be directed at controlling human use in the corridor (See Section 5.2 and 5.3 for more details). Using a precautionary approach, widening the corridor is not predicted to increase effectiveness if human use is not managed; Stewart Creek Across Valley corridor effectiveness will depend substantially on how human use within the corridor is managed after development of TSMV occurs. If human use is managed well, potentially through mitigation such as fencing (Section 5.2) and education (Section 5.3), the corridor width is expected to function well, but the corridor may be at risk of reduced function otherwise. TSMV is therefore committed to implementing mitigation that will improve function of the Stewart Creek Across Valley corridor over the currently approved across valley corridor. TSMV proposes to fence development on both sides of the Stewart Creek Across Valley Corridor, install signage to promote responsible use of the wildlife corridor by residents, and install a new wildlife crossing for the extension of the Three Sister's Parkway that will bisect the Stewart Creek Across Valley Corridor (Sections 5.2 and 5.3). These mitigations are expected to further improve the functionality of the Stewart Creek Across Valley Corridor and wildlife population connectivity in the Bow Valley.

Importantly, function of the proposed optional re-alignment of the Stewart Creek Across Valley Corridor is predicted to be a substantial improvement relative to the functionality of the already approved Stewart Creek Across Valley Corridor, especially through implementation of mitigation committed to by TSMV (i.e., wildlife fencing, an underpass for a road bisecting the corridor, and education).

4.4 Will the Proposed Corridor Function for Multiple Wildlife Species?

Data from the approved Along Valley Corridor indicate that all key wildlife species in the Bow Valley are using the corridor (Jacques Whitford AXYS 2008, Garrow and Everett Environmental Services 2009). In addition, according to many different data sources, the areas in which the Smith Creek Along Valley Corridor has been proposed by TSMV have demonstrated use by a wide variety of wildlife (Regional Wildlife Corridor Study 2002, unpublished Provincial data, Golder 2013; Appendix A). The precautionary principle was applied to determine the use of the wildlife corridor by incorporating data from many different sources (e.g., snowtracking, GPS collars, remote cameras) and evaluating use during the most constraining season (i.e., winter). The available data clearly indicate that the proposed corridor can be expected to function as a multi-species corridor.

4.5 Does the Corridor Correspond to Known Movement Routes for Most Species?

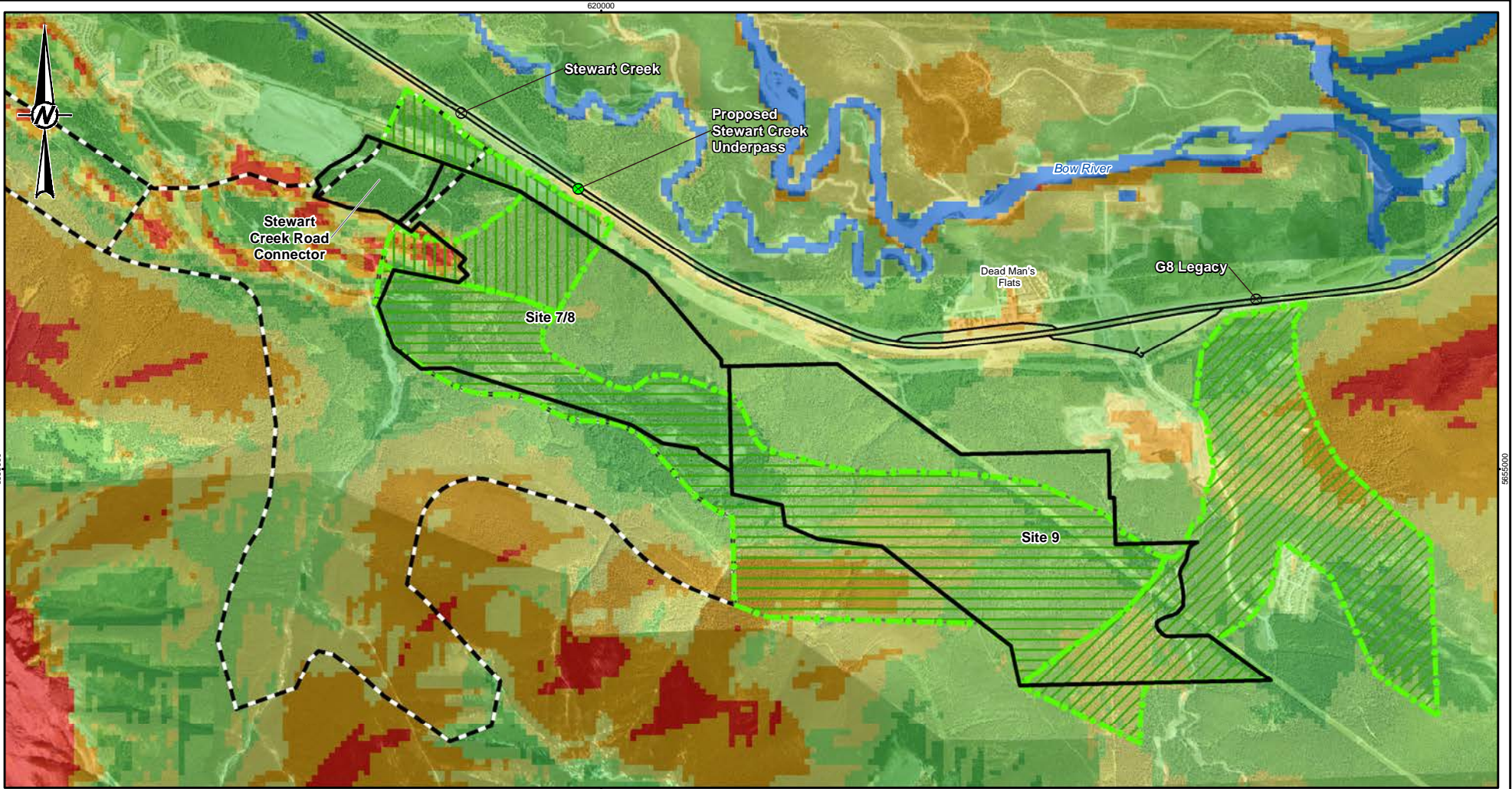
A precautionary approach was applied to evaluating this criterion and known multi-species movement routes were identified only when data from multiple sources (e.g., snowtracking, GPS collars, remote cameras) indicated substantial demonstrated use by a broad range of wildlife species over all seasons. Even when applying this precautionary approach, the proposed corridors align well with known multi species movement routes. Data from several studies, including unpublished Provincial data, demonstrate the proposed corridors align well with known movement routes for a wide variety of species (Appendix A). For example, remote cameras deployed throughout the south Canmore region show that deer and elk use a variety of areas, both inside and outside of the proposed corridors, with the highest use at lower elevations, including substantial use within the proposed movement corridor, which is made up of relatively gentle slopes at relatively low elevation (Appendix A). Additionally, almost all images obtained for black bears, grizzly bears, wolves, and cougars from remote cameras were either located in already approved corridors or in the area of corridors proposed by TSMV (Appendix A).

Conclusions drawn about the substantial known movement routes identified with data in the Smith Creek Along-Valley Corridor alignment were also verified by ground truthing to locate wildlife trails and wildlife sign, including visits with members of the Community Advisory Group and the Town of Canmore and with AEP representatives. The alignment includes existing deactivated mining roads, which data show are used extensively by wildlife for movement. Wildlife trails and natural breaks that contour along the slopes also create natural movement routes for wildlife.

4.6 Can the Corridor be Used in all Seasons?

Wildlife movement is most strongly constrained in the Bow Valley during winter because deep snow at high elevations makes travel more difficult. The proposed corridors occur at low elevations and on gentle slopes, consist of habitat that is of a relatively high probability of use for movement during winter in the Bow Valley. These corridors occur in locations with demonstrated movement by a variety of wildlife species during winter and summer (Regional Wildlife Corridor Study 2002, Golder 2013, Appendix A). Habitat models developed using winter data also indicate relatively high probability of selection in these areas (Figures 4 to 7; Golder 2012, 2017). Consequently, the corridor is expected to be used by wildlife in all seasons and data demonstrating use in all seasons are available.

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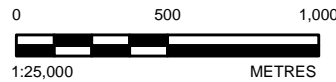
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LEGEND

- | | |
|---|--|
| <ul style="list-style-type: none"> EXISTING HIGHWAY WILDLIFE UNDERPASS PROPOSED HIGHWAY WILDLIFE UNDERPASS PRIMARY HIGHWAY APPROVED WILDLIFE CORRIDOR PROPOSED SMITH CREEK ALONG VALLEY WILDLIFE CORRIDOR PROPOSED PIGEON MOUNTAIN WILDLIFE CORRIDOR PROPOSED OPTIONAL STEWART CREEK WILDLIFE CORRIDOR TSMVPL PROPERTY BOUNDARY | <p>PROBABILITY OF SELECTION</p> <ul style="list-style-type: none"> SELECTED USED AS AVAILABLE SOMEWHAT AVOIDED STRONGLY AVOIDED RARELY USED WATERBODY |
|---|--|



REFERENCES

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APPROVED	KK

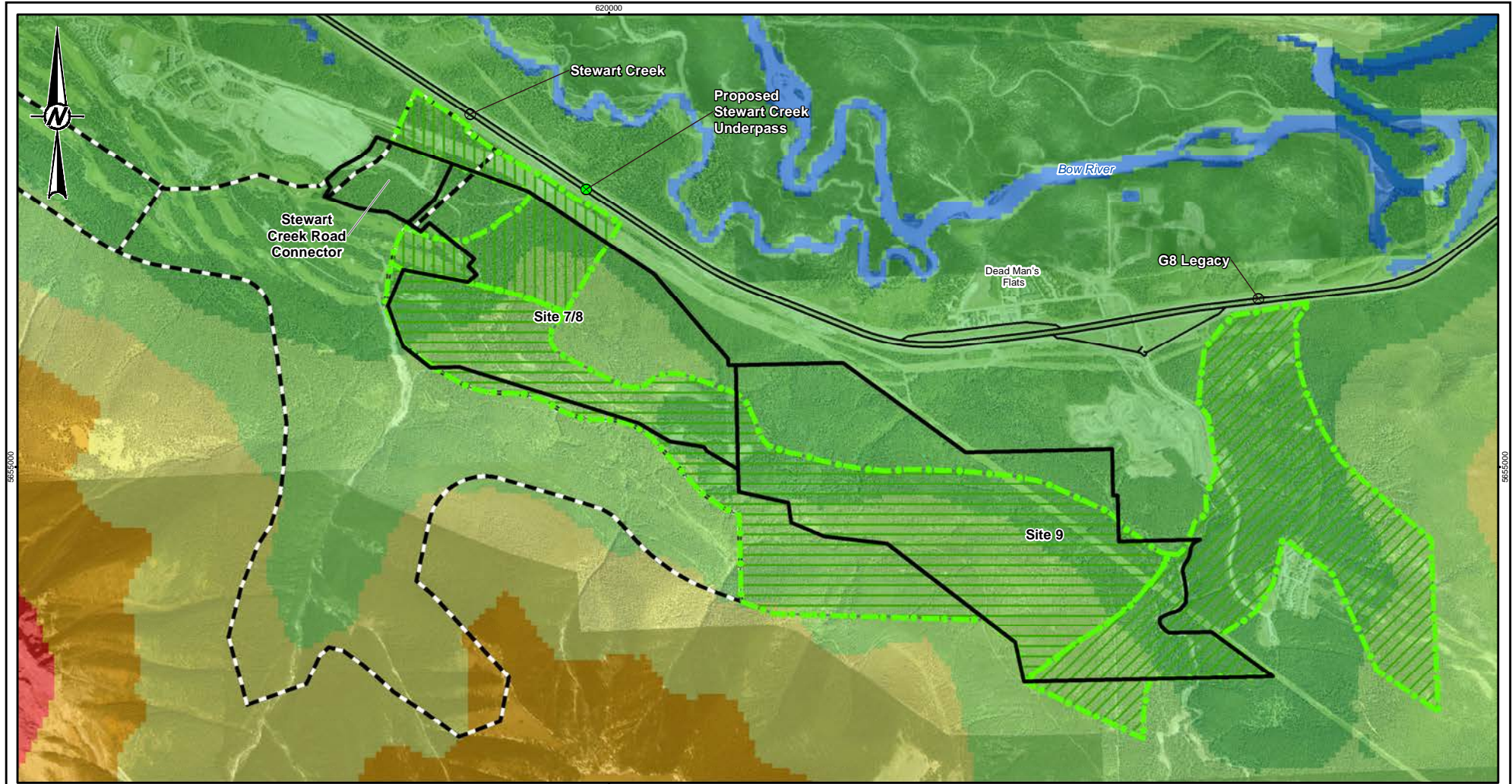
TITLE
SUMMER GRIZZLY BEAR RESOURCE SELECTION FUNCTION

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18109757 7000
9300

REV
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FIGURE
4

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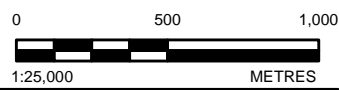


LEGEND

- EXISTING HIGHWAY WILDLIFE UNDERPASS
- PROPOSED HIGHWAY WILDLIFE UNDERPASS
- PRIMARY HIGHWAY
- APPROVED WILDLIFE CORRIDOR
- PROPOSED SMITH CREEK ALONG VALLEY WILDLIFE CORRIDOR
- PROPOSED PIGEON MOUNTAIN WILDLIFE CORRIDOR
- PROPOSED OPTIONAL STEWART CREEK WILDLIFE CORRIDOR
- TSMVPL PROPERTY BOUNDARY

PROBABILITY OF SELECTION

- SELECTED
- USED AS AVAILABLE
- SOMEWHAT AVOIDED
- STRONGLY AVOIDED
- RARELY USED
- WATERBODY



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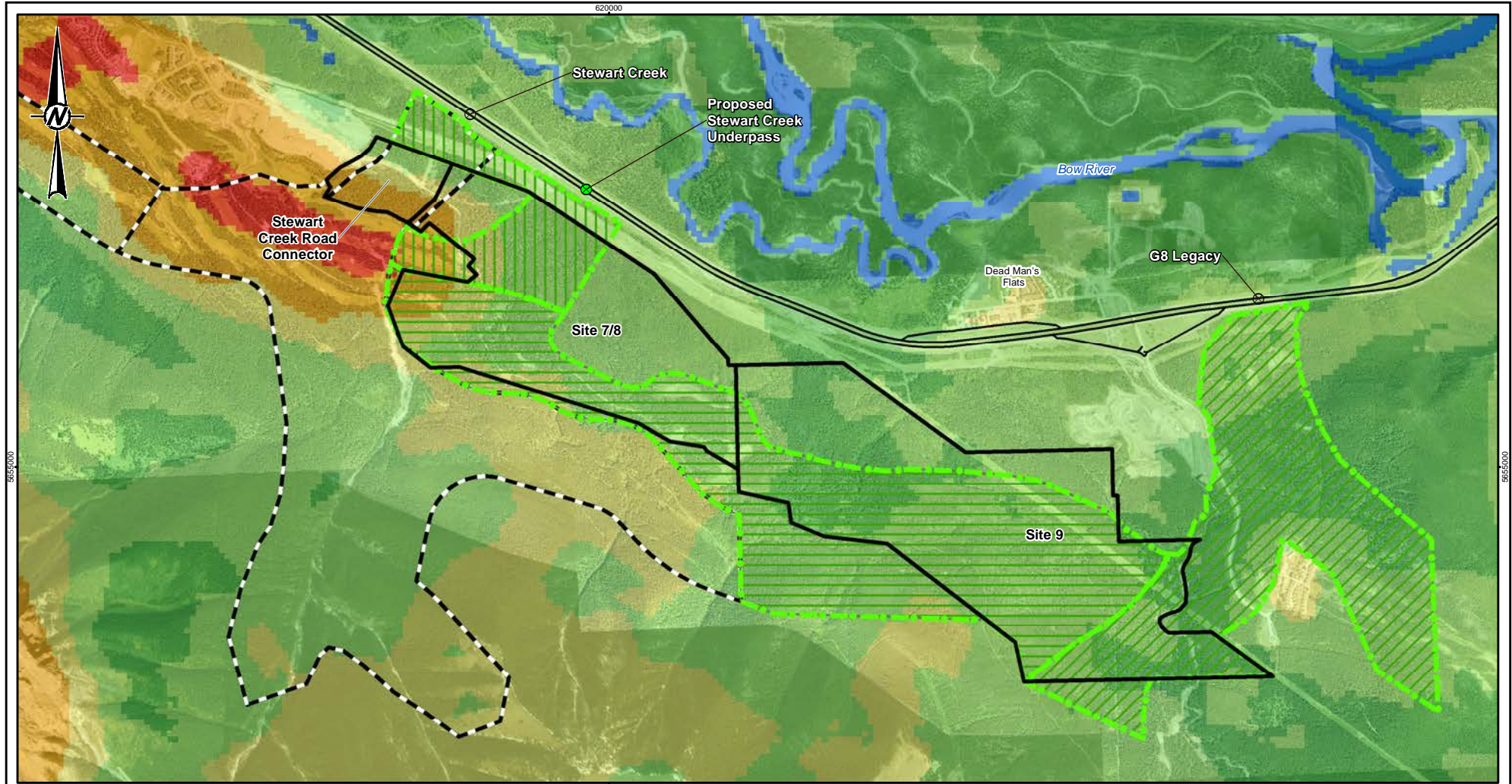
TITLE
WINTER ELK RESOURCE SELECTION FUNCTION

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FIGURE **5**

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- LEGEND**
- EXISTING HIGHWAY WILDLIFE UNDERPASS
 - PROPOSED HIGHWAY WILDLIFE UNDERPASS
 - PRIMARY HIGHWAY
 - APPROVED WILDLIFE CORRIDOR
 - PROPOSED SMITH CREEK ALONG VALLEY WILDLIFE CORRIDOR
 - PROPOSED PIGEON MOUNTAIN WILDLIFE CORRIDOR
 - PROPOSED OPTIONAL STEWART CREEK WILDLIFE CORRIDOR
 - TSMVPL PROPERTY BOUNDARY
- PROBABILITY OF SELECTION**
- SELECTED
 - USED AS AVAILABLE
 - SOMEWHAT AVOIDED
 - STRONGLY AVOIDED
 - RARELY USED
 - WATERBODY



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TITLE
WINTER COUGAR RESOURCE SELECTION FUNCTION

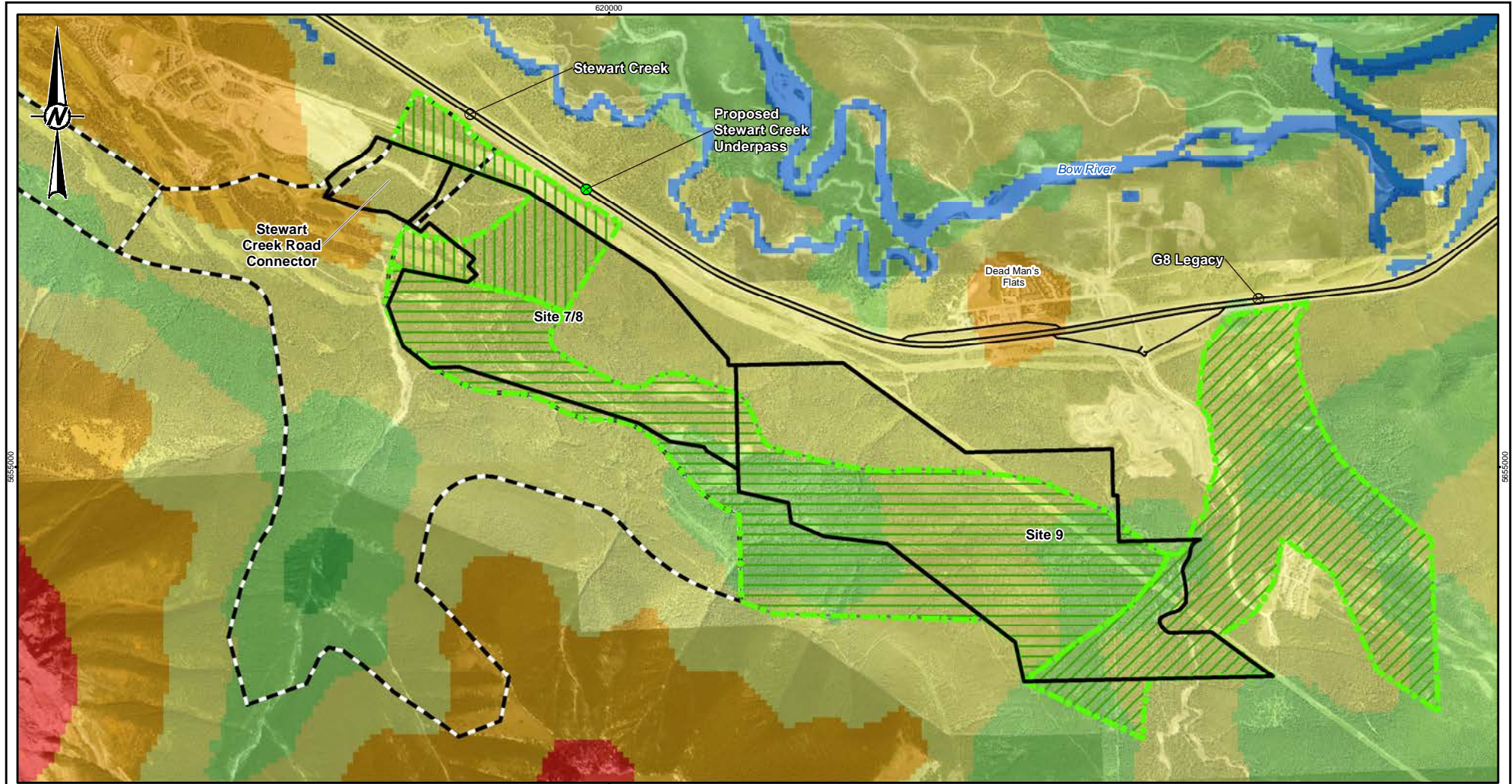
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18109757 7000 9300

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FIGURE
6

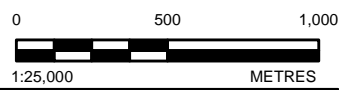
March 3, 2020 Regular Council Meeting 9 a.m.

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LEGEND

	EXISTING HIGHWAY WILDLIFE UNDERPASS	PROBABILITY OF SELECTION
	PROPOSED HIGHWAY WILDLIFE UNDERPASS	SELECTED
	PRIMARY HIGHWAY	USED AS AVAILABLE
	APPROVED WILDLIFE CORRIDOR	SOMEWHAT AVOIDED
	PROPOSED SMITH CREEK ALONG VALLEY WILDLIFE CORRIDOR	STRONGLY AVOIDED
	PROPOSED PIGEON MOUNTAIN WILDLIFE CORRIDOR	RARELY USED
	PROPOSED OPTIONAL STEWART CREEK WILDLIFE CORRIDOR	WATERBODY
	TSMVPL PROPERTY BOUNDARY	



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	REVIEWED	LD
	APPROVED	KK

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TITLE
WINTER WOLF RESOURCE SELECTION FUNCTION

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4.7 Does the Corridor Contain Topographical Features that would Create Barriers to Movement?

The proposed corridor occurs primarily in forested habitats at low elevations. No substantial cliffs or other topographical features that would create barriers to movement are present. This has been confirmed using LiDAR and field verified by Golder staff who have walked trails and transect lines throughout the proposed corridors.

Slope has been identified by the BCEAG (1999) as a potential concern affecting wildlife corridor efficacy. Specifically, the BCEAG guidelines suggest that slopes $>25^\circ$ render corridors less effective. Many concerned members of the public and some environmental groups consistently raise the presence of any slopes $>25^\circ$ in a wildlife corridor as an issue of primary concern. This concern is rooted in data indicating that steeper slopes are less often used by wildlife for movement, which is broadly true (e.g., Alexander et al. 2006). To address this concern explicitly, Golder evaluated the area of slopes $> 25^\circ$ present in the proposed wildlife corridors using LiDAR. The proposed corridors consist primarily (i.e., $>89\%$) of gentle slopes less than $<25^\circ$. Slopes $> 25^\circ$ do occur over approximately 11% of the proposed corridors but are discontinuous and patchily distributed in both the proposed Along Valley and proposed Pigeon Mountain Across Valley corridors (Figure 8).

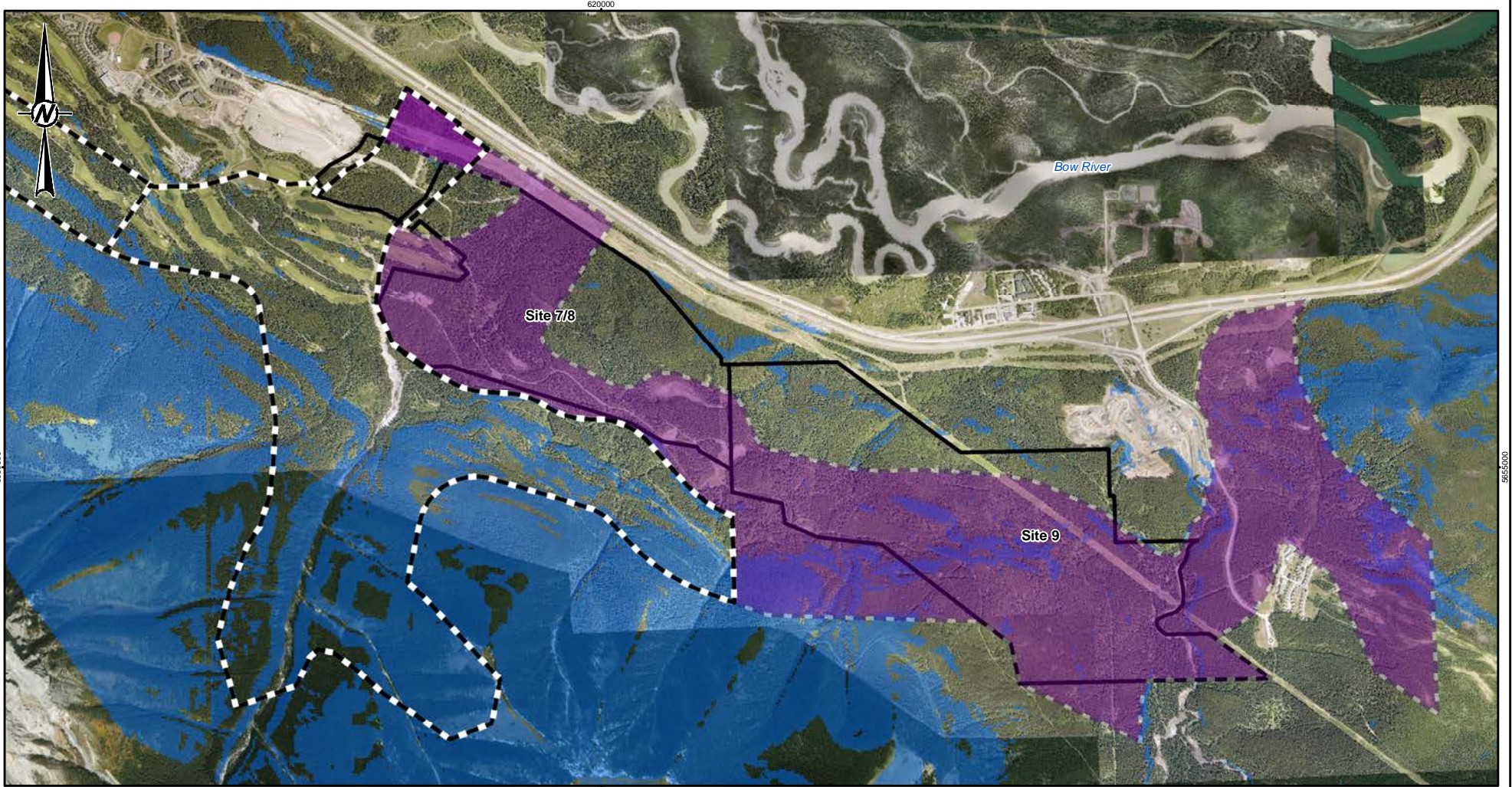
Although the scientific literature clearly indicates that some wildlife species prefer shallower slopes, particularly during winter (Alexander et al. 2006), there is no scientific indication that corridors containing some slopes $>25^\circ$ are automatically ineffective. Some studies clearly identify multi-season and multi-species wildlife corridors in the Bow Valley that incorporate slopes greater $>25^\circ$ (Chetkiewicz and Boyce 2009) and the Cascade corridor in Banff National Park is widely considered effective (Duke et al. 2001), despite having substantial area with slopes $>25^\circ$.

Wolves can adjust their behaviour to move across steep slopes when preferred valley bottom habitat is no longer available (Duke 2001, Shepherd and Whittington 2006). Similarly, elk have been reported using slopes $>30^\circ$ for movement in west-central Alberta (Frair et al. 2005). In the Bow Valley, the steep slopes on the east side of Wind Ridge are considered critical elk winter range (NRCB 1992 pp. 10-34). In fact, the importance of these steep slopes for wildlife was a primary reason that development of the Wind Valley portion of the TSMV property was not approved (NRCB 1992 pp. 10-39). Grizzly bears and cougars also prefer to use higher elevations and steeper slopes in some cases and can move easily across such terrain (Chetkiewicz and Boyce 2009; Golder 2013).

Slope therefore represents a generalized surrogate for wildlife movement, with substantial variation in actual use of local areas of different slope values depending on specific conditions. Surrogates or proxies for wildlife movement, such as slope, are less important when evaluating the wildlife corridors proposed by TSMV because substantial wildlife movement data are available. Consequently, Golder's evaluation of whether the corridor contained topographical features that might create barriers to wildlife movement focused primarily on determining whether available wildlife data identified known movement routes of animals through the proposed corridors, including through areas containing discontinuous steep slopes $> 25^\circ$.

Golder carefully evaluated and reviewed evidence of wildlife use in areas containing discontinuous steep slopes $>25^\circ$. Not only do RSF models suggest relatively high probability of selection in these areas (Figures 4-7) but empirical evidence from several data sources (e.g., snow tracking, telemetry, GPS collars, and remote cameras) clearly indicates substantial movement by wildlife in the small areas of discontinuous steep slopes identified within the proposed wildlife corridors (Figure 9). Consequently, Golder concludes that these areas do not represent impediments or barriers to wildlife movement and that the full width of the proposed wildlife corridors in the areas with discontinuous steep slopes represent known multi-species, multi-season wildlife movement routes.

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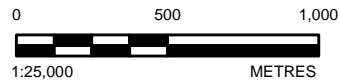
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LEGEND

- TSMVPL PROPERTY BOUNDARY
- APPROVED WILDLIFE CORRIDOR
- PROPOSED WILDLIFE CORRIDOR

SLOPE

- 0 - 25 DEGREE SLOPE
- > 25 DEGREE SLOPE



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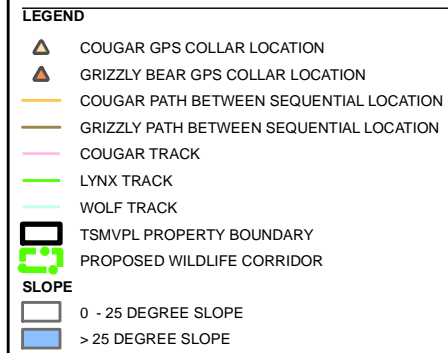
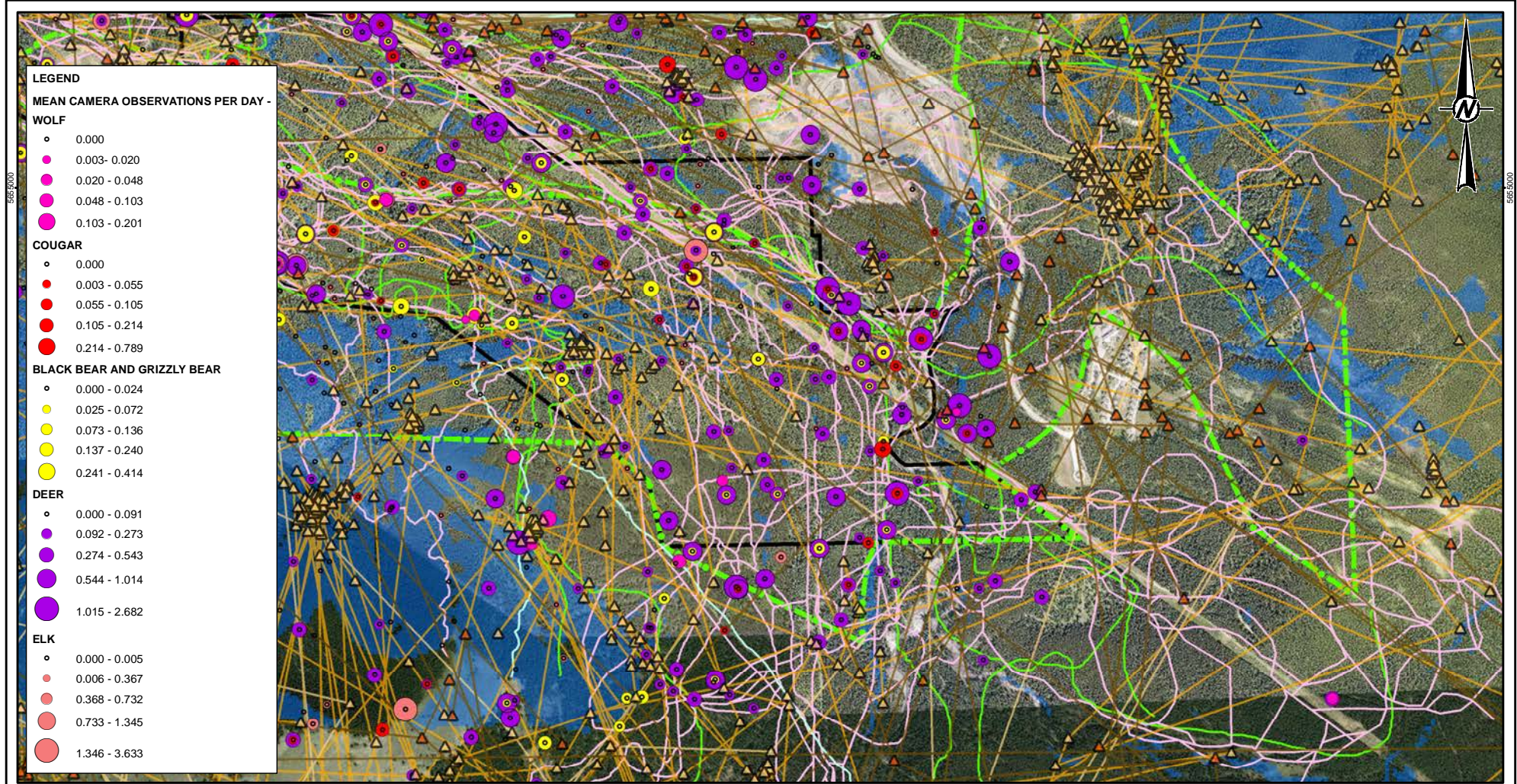
TITLE
AREAS OF DISCONTINUOUS SLOPES (>25°) IN THE WILDLIFE CORRIDOR

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FIGURE
8

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THREE SISTERS MOUNTAIN VILLAGE PROPERTIES LTD.

CONSULTANT



YYYY-MM-DD	2020-01-20
DESIGNED	LD
PREPARED	JE
REVIEWED	LD
APPROVED	KK

REFERENCES

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DATUM: NAD 83 PROJECTION: UTM ZONE 11

PROJECT
THREE SISTERS MOUNTAIN VILLAGE WILDLIFE CORRIDOR PROPOSAL

TITLE
AREAS OF DISCONTINUOUS SLOPES (>25°) AND WILDLIFE MOVEMENTS IN THE WILDLIFE CORRIDOR

PROJECT NO. 18109757
7000 9300

REV
Page 51 of 957

FIGURE
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4.8 Is the Corridor in the Least Developed State Possible?

Corridors occur in areas with limited existing development, although much of the Crown and TSMV property on the south side of the Bow Valley has been subject to mining, logging and other forms of disturbance for over 100 years and is not without human impact of any kind. In cases where development is already present, such as in the vicinity of the proposed Pigeon Mountain Cross Valley Corridor, the delineation proposed by TSMV minimizes the inclusion of development (i.e., excludes Dead Mans Flats, and Banff Mountain Gate). Importantly, AEP must take responsibility for effectiveness of proposed corridors on lands not provided by TSMV where other developments and activities may occur. For example, TSMV cannot address public land use that may hamper corridor functionality, such as the Kananaskis Gun and Archery Club whose shooting range lease in the Pigeon Mountain Cross Valley Corridor was recently renewed by Province and Town of Canmore, or the provision of freehold title versus a previous lease arrangement for Banff Mountain Gate development. Golder understands that the gun range lease has been recently modified in collaboration with AEP to constrain use to certain days of the week and times of day, which will aid the connection to the G8 underpass.

5.0 ADDITIONAL COMMITMENTS

This section presents some additional commitments made by TSMV that are not part of the conditions of NRCB Decision #9103 but are nevertheless related to corridor function. Discussion of additional commitments in this section focuses on habitat enhancement, wildlife fencing, and education and outreach. Habitat enhancement can be applied to increase probability that wildlife will use corridors and could encourage greater use away from development areas. Wildlife fencing can reduce the probability of negative interactions between wildlife and people and will likely dramatically improve the function of designated corridors occurring adjacent to development, such as the corridors proposed here that occur adjacent to TSMV properties. Similarly, educating the public about appropriate use of wildlife corridors is likely to increase overall function of the proposed corridor. These additional considerations are discussed in turn in the following sections.

5.1 Habitat Enhancements

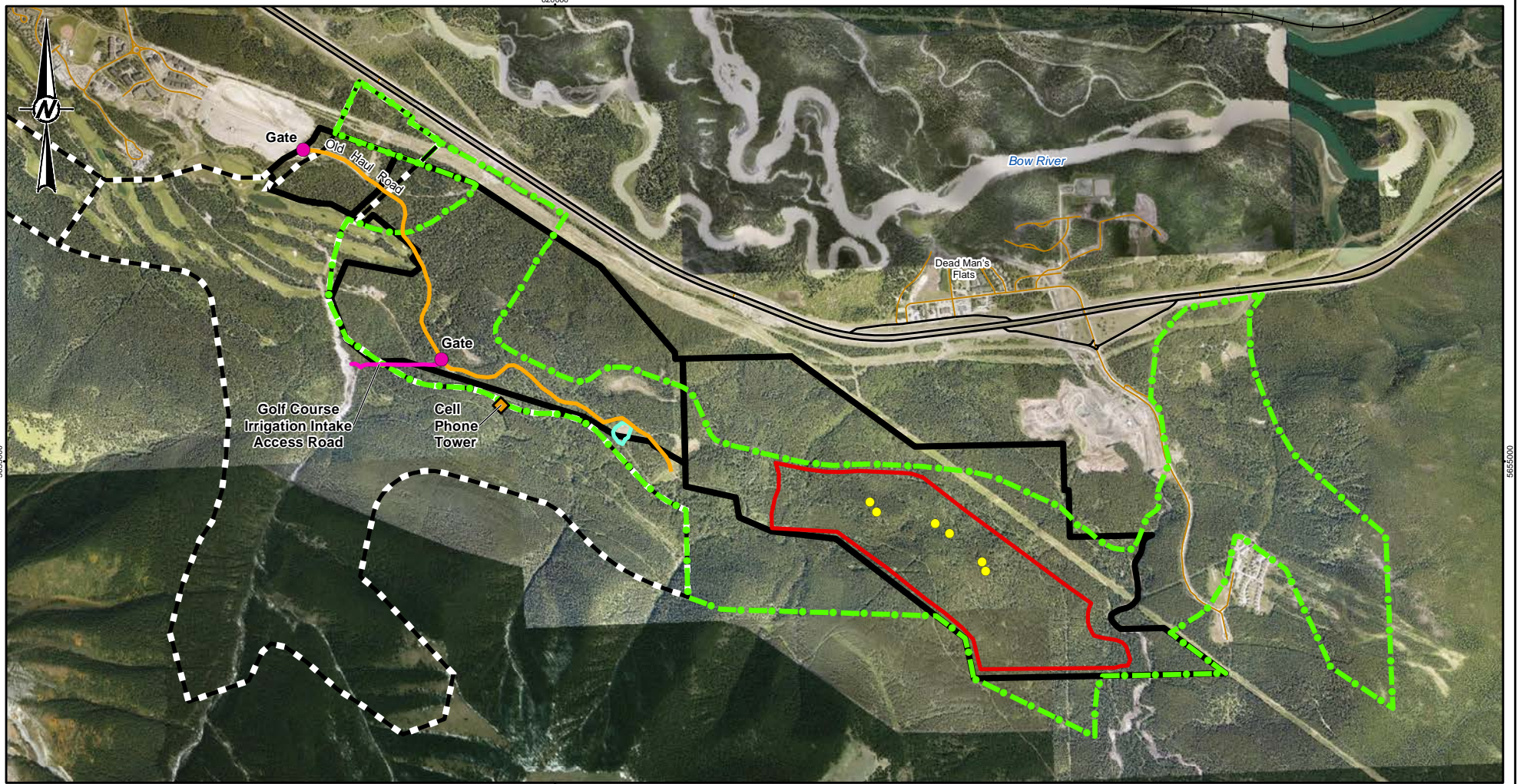
Habitat enhancements have been identified as one way to improve the efficacy of wildlife corridors (Golder 2012, Section 3.2, p.88), if they are placed away from human developments to discourage habituation. The NRCB recommended habitat enhancement as mitigation with the caveat that vegetation management be addressed at a regional scale (NRCB 1992 pp. 10-38). Concerns identified by the NRCB include placing enhancement sites too close to development, which might cause habituation by wildlife and negative human-wildlife interactions, or wildlife failing to use the enhancement sites because developments are avoided (NRCB 1992 pp. 10-35).

Enhancements that reduce forest cover can provide increased forage for ungulates, enhance habitat for large carnivores (i.e., increase prey) and provide increased berry production that can benefit bears (NRCB 1992). Enhancements have previously been created in the approved 1998 Along Valley Corridor during early phases of TSMV development and remote camera studies conducted by Chinook Company Environmental Ltd (Chinook Co.) for PricewaterhouseCoopers (unpublished data) indicate that these areas are used extensively by wildlife, especially bears (Garrow and Everett Environmental Services 2009). Previous modelling conducted by Golder (2012) indicates that clearing vegetation as a habitat improvement technique in the existing approved Along Valley Corridor will increase probability of selection for many wildlife species, including all of the large mammal species for which Golder conducted habitat suitability modelling. Golder continues to recommend this approach to increase probability of selection by wildlife in wildlife corridors with the caution that high quality habitat directly adjacent to development be monitored and managed so that habitat enhancements do not increase negative human-wildlife interactions.

TSMV is committed to working with AEP to define habitat enhancement plots in the broad area depicted in Figure 10. Potential habitat enhancements plot locations are identified in Figure 10, but these require additional discussion and definition with AEP. The locations presented in Figure 10 were selected to be in the more remote portions of the corridor away from areas of human habitation to draw wildlife away from human settlements and reduce the potential for negative human-wildlife interactions.

To limit human access in the proposed wildlife corridor, TSMV has already installed two gates along the old haul road (Figure 10). One gate is installed at the west end of the old haul road and another gate is installed at the entrance to the Stewart Creek Golf Course irrigation intake access road (Figure 10). TSMV is considering additional mitigation to reduce use of the haul road, including placing boulders or planting trees on the road to discourage mountain bikers. However, there is a cell phone tower that is accessed from the old haul road. As such, access requirements for the cell phone tower need to be confirmed with the cell phone tower operator before these mitigations can be implemented. It should be noted that there is an existing trail that is routed parallel to the old haul road and that this trail can be used by hikers and mountain bikers to access areas in the wildlife corridor. To further discourage inappropriate human use in the wildlife corridor, TSMV will install signs at the west end of the old haul road to inform people of activity and timing restrictions in wildlife corridors. Additional mitigation, such as reclaiming an existing storage yard (Figure 10), is also being considered as a way to enhance wildlife habitat in the wildlife corridor.

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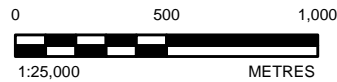
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LEGEND

- CELL TOWER
- GATE
- POTENTIAL HABITAT ENHANCEMENT PLOT LOCATIONS
- GOLF COURSE IRRIGATION INTAKE ACCESS ROAD
- OLD HAUL ROAD
- PRIMARY HIGHWAY
- LOCAL ROAD
- RAILWAY
- APPROVED WILDLIFE CORRIDOR
- SUGGESTED HABITAT ENHANCEMENT AREA
- PROPOSED WILDLIFE CORRIDOR
- STORAGE YARD
- TSMVPL PROPERTY BOUNDARY



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PROJECT
THREE SISTERS MOUNTAIN VILLAGE WILDLIFE CORRIDOR PROPOSAL

CONSULTANT

YYYY-MM-DD	2020-01-20
DESIGNED	LD
PREPARED	JE
REVIEWED	LD
APPROVED	KK

TITLE
PROPOSED AREAS FOR HABITAT ENHANCEMENT WITHIN THE PROPOSED WILDLIFE CORRIDOR



PROJECT NO.
18109757

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Page 54 of 957

FIGURE
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5.2 Wildlife Fencing

Corridor efficacy should also be considered in light of negative human-wildlife interactions, especially given that interactions between people and wildlife are common in the Bow Valley, sometimes with significant negative consequences (Chetkiewicz et al. 2006). Fencing used to enclose relatively small areas with a potential for high levels of conflict, such as human settlements, may achieve important conservation benefits (Woodroffe et al. 2014a; Kuijper et al. 2017). As such, wildlife fencing is another important commitment that will likely improve corridor function as development proceeds at TSMV, both in the Smith Creek ASP and Three Sisters Village ASP.

Although humans often view wildlife habitat in binary terms as either habitat or unsuitable matrix (Bender and Fahrig 2005), animals rarely use landscapes this way. Wildlife often enter the development because there are attractants, such as food sources. This is especially true in the Bow Valley, where, despite local bylaws, proliferation of attractants in the overall Town of Canmore like fruit trees, barbeques, and bird feeders create substantial incentives for wildlife to enter developed areas.

The potential for wildlife to enter unsuitable habitat (e.g., human developments) is higher when wildlife corridors connect fragmented patches of habitat through developed areas.

An ideal situation for corridor efficacy from the perspective of human-wildlife interactions in the Bow Valley would be the following:

- To reduce the habitat suitability of developed landscapes to be near nil using by managing attractants and applying fencing.
- For wildlife to use corridors of moderate quality near development for movement, but for animals to spend most of their time in high-quality habitat patches away from development.
- For the amount of “soft” corridor edge bordering development to be minimized.

Wildlife fencing (e.g., 2.5 m page wire fence with a buried apron) will help resolve future problems associated with wildlife entering developments adjacent to the corridors proposed by TSMV. A page wire fence is recommended because it can address both primary wildlife issues that currently exist in the Bow Valley: wildlife incursion into developed areas and inappropriate human use in wildlife corridors (BVHWCR 2018). The fence will substantially reduce or eliminate the ability of mammals larger than a coyote to enter the development from the wildlife corridor.

5.3 Education and Outreach

5.3.1 Attractant Management

Human developments and facilities can introduce wildlife attractants that include food, garbage, compost, recycling materials, pet food, pets, petroleum products, barbecues, and palatable landscaping materials (e.g., apple trees). The presence of these attractants can induce wildlife to leave the wildlife corridor and enter developed areas, which will limit the effectiveness of the wildlife corridor. The Town of Canmore *Waste Control Bylaw* 2016-11 provides guidelines and prohibitions related to the appropriate management waste, while the *Wildlife Attractant Bylaw* 2017-10 regulates wildlife attractants (Town of Canmore 2016, 2017). TSMV will provide educational material about attractant management to new homeowners.

5.3.2 Human Use in the Wildlife Corridor

In addition to problems caused by animals entering development, available data clearly shows that human use in wildlife corridors is high and human use is known to adversely affect corridor function (BCEAG 1999, 2012). An analysis of remote camera data are available from more than 1,000 monitoring locations in and around the existing Along Valley, Tipple, and Stewart Creek wildlife corridors and on Resort Centre, Stewart Creek, Smith Creek, and Wind Ridge showed that the numbers of humans and their dogs are approximately double the number of wildlife recorded in existing wildlife corridors adjacent to TSMV. Consequently, wildlife corridors in the Bow Valley are not as effective as they could be because high human use and off-leash dog use in the corridor leads to an increased potential for negative interactions. Indeed, the greatest risk to wildlife associated with human use of wildlife corridors near Canmore under existing conditions does not stem from a reduced probability of corridor use by wildlife, but rather from an increased risk of negative human-wildlife interactions as animals use corridors that are also heavily used by people (Golder 2013).

Much of the human use within existing corridors that increases potential for negative human-wildlife interactions is contrary to existing regulations. For example, use in wildlife corridors is only permitted on designated trails (Government of Alberta 2002). However, undesignated trails are more common than designated trails in wildlife corridors (Golder 2013), and trails often radiate out from many backyards of residences adjacent to corridors, such as the peaks of Grassi area. Moreover, the Bow Valley Protected Areas Management Plan designates the Along Valley Corridor as a P-4 Wildlife Corridor, which means that most trails are closed during December 1 to June 15 (Government of Alberta 2002). Analysis of remote camera data shows 35% of human use occurred during months when the corridor was closed to use. Use of corridors by people was highest in May, a time period which is critical for wildlife species such as elk, deer, and moose (*Alces alces*), which may be calving and therefore more susceptible to human disturbance. Similarly, off-leash dog use is not permitted in wildlife corridors, and such use has been considered one of the most important factors adversely affecting wildlife use of corridors and habitat patches in the Bow Valley (BCEAG 1999). Between 2009 and 2012, remote camera data on TSMV property and adjacent wildlife corridors identified 818 records of dogs, of which 609 or 74.5% were off-leash.

TSMV aims to reduce human use of wildlife corridors adjacent to TSMV by implementing the recommendations outlined in the June 2018 Human Wildlife Coexistence Recommendations Report (BVHWCR 2018). TSMV will work with the Town and the Province to undertake an education and enforcement campaign to maximize efficacy of fencing and achieve compliance with trail use, off-leash dog use, and seasonal closure regulations within wildlife corridors. This is especially important for existing residents, who may be using wildlife corridors inappropriately because they may be unaware of legal requirements or the location of corridor boundaries or are used to treating the corridors like recreation areas instead of wildlife spaces (Town of Canmore 2015; Derworiz 2015). TSMV will also provide educational material about trail use to new homeowners.

6.0 SUMMARY AND CONCLUSION

The amended wildlife corridor proposed by TSMV improves the original corridor proposed in 2017. The following are key characteristics of the amended wildlife corridor proposed by TSMV:

- The proposed corridor completes the regional wildlife corridor network on the south side of the Bow Valley in the Canmore area. Designating these corridors will mean that all designated habitat patches in the Bow Valley are linked to one another with formally designated corridors. Increasing and expanded functionality of the corridor network can be anticipated through additional highway fencing and a crossing structure announced by the Province east of Pigeon Mountain and protection of provincial lands on the north side of the G8 underpass near Dead Man's Flats.
- The proposed corridors occur substantially on private land and will remove 73% of developable lands in TSMV's Site 9 and 63% of developable lands in Sites 7/8.
- The proposed corridors give up land on Sites 7/8 where a corridor is already designated, and present an option to improve the previously designated Stewart Creek Across Valley Corridor (including a net loss in developable land for TSMV relative to using the existing across valley corridor).
- The proposed Smith Creek extension of the Along Valley Corridor (i.e., the primary wildlife corridor) is substantially wider than the approved wildlife corridor and the updated proposal includes a large wetland that is frequented by wildlife in the corridor.
- The proposed Along Valley corridor extension exceeds 635 m at its narrowest point; the overall average width of the proposed Along Valley corridor is 676 m.
- The proposed realignment of the Stewart Creek Across Valley corridor has a minimum width of 401 m and is 640 m wide on average (east to west) over its approximately 600 m length.
- The minimum width of the Pigeon Mountain Corridor is 363 m and the corridor averages 442 m wide (east to west) over its approximately 1.8 km length.
- Over 89% of the proposed wildlife corridors consist of areas with slopes less than 25°. Isolated and discontinuous slopes >25° cover 11% of the area, but are found in small patches that do not present evidence of acting as barriers to movement.

The amended wildlife corridor is expected to be effective because:

- Data from several studies, including unpublished Provincial data, demonstrate the proposed corridors align with known movement routes for a wide variety of wildlife species.
- The alignment makes use of existing wildlife trails and natural breaks that contour along the slopes, encompassing natural movement routes for wildlife.
- Data from all seasons demonstrate that the proposed wildlife corridors represent known multi-species multi-season wildlife movement routes over the entire width of the proposed corridors.
- Data from wildlife movement studies (e.g., snow tracking) clearly demonstrate that physical barriers to movement are not present in the proposed wildlife corridors and that areas of discontinuous steep slopes are regularly used by wildlife under existing conditions.

- Corridors are wide enough to permit movement by wildlife over the long-term.

Although the biophysical characteristics of the proposed corridors appear sufficient to preserve movement, human use could reduce corridor efficacy if it were too high and wildlife populations may be put in jeopardy if incursions from the wildlife corridor into developed areas result in mortality. Golder therefore recommends that:

- Wildlife fencing be applied to reduce the probability of wildlife incursion into development, and to reduce human use and incursion into wildlife corridors.
- Education programs be implemented to appropriately limit wildlife attractants in TSMV properties and human use of wildlife corridors (e.g., use constrained to designated trails, no off-leash dogs).

The amended wildlife corridor also addresses both concerns raised by AEP in the decision letter about TSMV's 2017 corridor proposal provided on June 26, 2018 (AEP 2018).

- 1) The width of the Stewart Creek Across Valley Corridor has been increased substantially to exceed the minimum width of 350 m and an average width of 400 m recommended in the decision letter (AEP 2018).
- 2) The decision letter (AEP 2018) identified a second concern about the effective width of the wildlife corridor below an area of discontinuous steep slopes at the eastern edge of the proposed Smith Creek extension of the Along Valley Corridor. The decision noted that the data provided by TSMV accompanying the proposal showed some wildlife telemetry data on either side of the slopes and noted that wildlife trails occur throughout the discontinuous steep slopes. These data were noted by AEP to not be enough to confirm movement during all seasons by all species. The decision letter notes that an effective width of 400 to 450 m below areas for which movement has not been sufficiently demonstrated by wildlife (i.e., the areas of discontinuous steep slopes) would be required for wildlife to move through the area unimpeded. To address this concern TSMV has:
 - a. Increased the width of the corridor in this area by 24 to 39 m and increased the total average width of the extended Along Valley Corridor to 676 m between the eastern edge of the proposed Stewart Creek Across Valley Corridor and the western arm of the proposed Pigeon Mountain Across Valley Corridor. If accepted, this proposal would result in TSMV designating 73% of Site 9 as wildlife corridor.
 - b. Worked with adjacent property owners (i.e., Thunderstone Quarry) to assign other private lands outside of the NRCB decision as wildlife corridor to achieve the straightest possible route for wildlife and minimize the creation of cul-de-sacs that have the potential to increase human wildlife conflict. Further extensions onto other private lands not subject to the 1992 NRCB decision will not be possible, constraining corridor designation options at the east end of TSMV property in the vicinity of discontinuous steep slopes.
 - c. Used LiDAR to show that defining an area 400 to 450 m wide that contains no discontinuous slopes over 25° is not possible in this region because discontinuous steep slopes extend to the highway (Figure 8).

- d. Presented additional wildlife data (Appendix A), demonstrating substantial use by a wide variety of large mammal species throughout and upslope (i.e., south) of the proposed Smith Creek Along Valley Corridor in all seasons. These data include snow-tracking, GPS telemetry, and remote camera data clearly demonstrating substantial use of areas of discontinuous slopes over 25° by wolves, cougars, lynx (*Lynx canadensis*), grizzly bears, black bears, deer, and elk. These data address the original AEP conclusion that full movement by all species, and age and sex classes within species during all seasons might not be possible in areas of discontinuous steep slopes. These data show that wildlife consistently use this area under existing conditions, and even during winter when snow conditions may further constrain movement potential (Appendix A). The data also indicate that movement within the proposed wildlife corridor is equal to and, for many species, greater than recorded movement immediately north of the northern boundary of the proposed corridor (Appendix A). The effective width of the proposed corridor for wildlife movement can therefore clearly be demonstrated to be greater than the 400 to 450 m width identified in the decision letter (AEP 2018).
- e. In full recognition of the concerns that have been raised about wildlife movement at the eastern end of TSMV properties and concerns about the potential impacts of future development, TSMV is committed to achieving effective corridors through habitat enhancements, wildlife fencing, and education and outreach, as described in Section 5.0.

Overall, Golder concludes that the wildlife corridor proposed by TSMV represents an improvement over previous proposals, especially because it dramatically improves the Stewart Creek Across Valley Corridor. Wildlife movement is more constrained in a north-south direction than in an east west direction in the Bow Valley because of the arrangement of development at the valley bottom, including linear developments such as the highway and rail line. The increased width of the Stewart Creek Across Valley corridor, along with an additional crossing structure at the Trans Canada Highway and commitments by TSMV to fencing and crossing structures associated with roads crossing the corridor represents a substantial improvement over the existing approved Stewart Creek Across Valley Corridor and over the version of the new alignment of the across valley corridor proposed by TSMV in 2017.

Along valley movement by wildlife in the Bow Valley remains a substantial concern but is more easily achieved than across valley movement. The amendments and extensions to the Along Valley corridor proposed by TSMV will complete the wildlife corridor network on the south side of Canmore, through and adjacent to TSMV properties. Based on an evaluation of a large and diverse set of data available in the area, the proposed corridor network, including the Smith Creek extension of the Along Valley Corridor, are appropriately located for maintaining wildlife movement between designated wildlife habitat patches in the Bow Valley around TSMV properties and for maintaining existing regional connections between Kananaskis Country and Banff Nation Park in the Bow Valley. With appropriate management of human use, the proposed wildlife corridors are predicted to maintain connectivity at a local spatial scale (i.e., within home-range connectivity) for the wide variety of wildlife inhabiting the Bow Valley over long periods of time. The proposed wildlife corridors are also predicted to maintain the genetic diversity of wildlife by connecting habitat patches at large spatial scales. With appropriate management of human use, proposed corridors are predicted to maintain wildlife movement over the very long term.

7.0 CLOSING

This report was prepared by Golder for TSMV. The material in this report reflects Golder's best judgment with the information available at the time of preparation. If TSMV edits, revises, alters, or adds to the material in this report in any way, all reference to Golder and Golder's employees must be removed unless TSMV changes are agreed to by Golder. Any use which a third party makes of this report or any reliance on or decisions to be made based on it, are the responsibility of such third party. Golder accepts no responsibility for damages, if any, suffered by any third party as a result of decision made or action based on this report.

We trust the information contained in this report is sufficient for your present needs. Should you have any questions regarding this memorandum, please do not hesitate to contact Kyle Knopff at (403) 519-6479.

Golder Associates Ltd.



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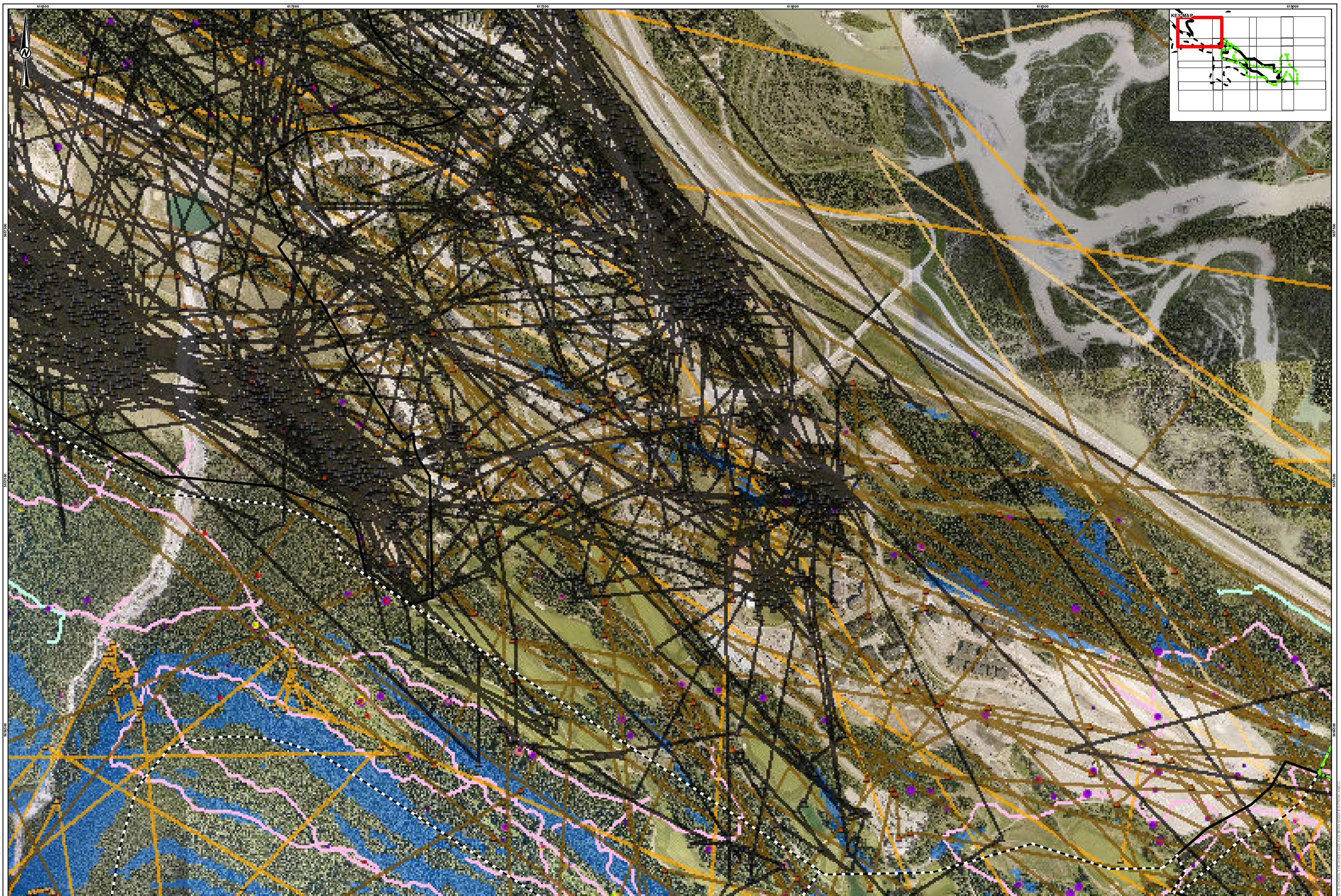
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APPENDIX A

**Biophysical Data Pertaining to the
Proposed Wildlife Corridor**



LEGEND

MEAN CAMERA OBSERVATIONS PER DAY - BLACK BEAR AND GRIZZLY BEAR	DEER	WOLF	LYNX TRACK
0.000 - 0.024	0.000 - 0.091	0.000	LYNX TRACK
0.025 - 0.072	0.092 - 0.273	0.003 - 0.020	WOLF TRACK
0.073 - 0.136	0.274 - 0.543	0.020 - 0.048	TSMVPL PROPERTY BOUNDARY
0.137 - 0.240	0.544 - 1.014	0.048 - 0.103	APPROVED WILDLIFE CORRIDOR
0.241 - 0.414	1.015 - 2.682	0.103 - 0.201	PROPOSED WILDLIFE CORRIDOR
COUGAR	ELK	COUGAR GPS COLLAR LOCATION	SLOPE
0.000	0.000 - 0.005	▲ COUGAR GPS COLLAR LOCATION	0 - 25 DEGREE SLOPE
0.003 - 0.055	0.006 - 0.367	▲ ELK GPS COLLAR LOCATION	> 25 DEGREE SLOPE
0.055 - 0.105	0.368 - 0.732	▲ GRIZZLY BEAR GPS COLLAR LOCATION	
0.105 - 0.214	0.733 - 1.345	▲ COUGAR PATH BETWEEN SEQUENTIAL LOCATION	
0.214 - 0.195		▲ ELK PATH BETWEEN SEQUENTIAL LOCATION	
		▲ GRIZZLY PATH BETWEEN SEQUENTIAL LOCATION	
		▲ COUGAR TRACK	



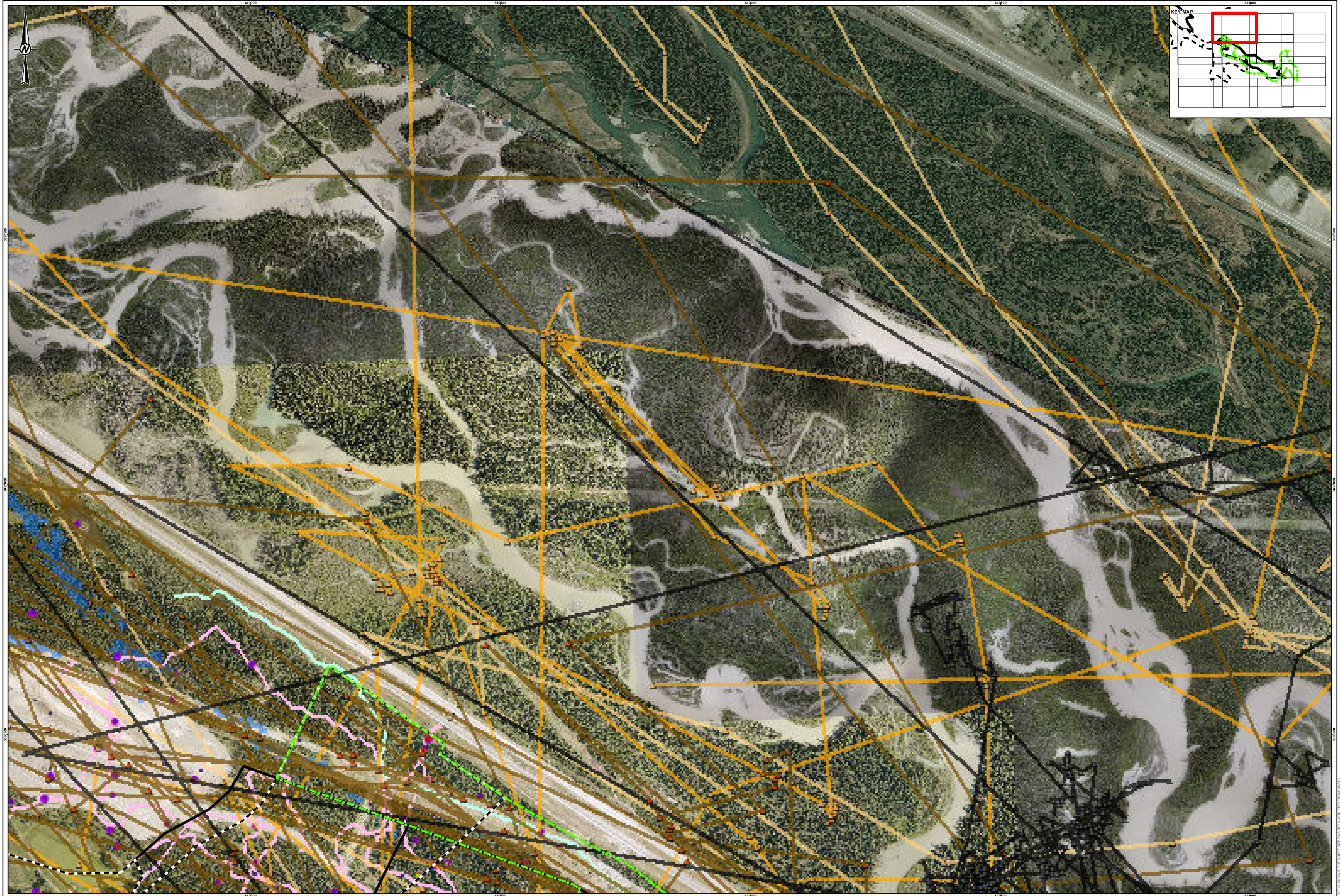
REFERENCE(S)
 1. IMAGERY OBTAINED FROM THE TOWN OF CANMORE 2017015. ALL RIGHTS RESERVED
 DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT	THREE SISTERS MOUNTAIN VILLAGE PROPERTIES LTD.	
CONSULTANT	GOLDER	
	YYYYMM-DD	2020-01-20
	DESIGNED	LD
	PREPARED	JE
	REVIEWED	LD
	APPROVED	KK

PROJECT	THREE SISTERS MOUNTAIN VILLAGE WILDLIFE CORRIDOR PROPOSAL	
TITLE	BIOPHYSICAL DATA PERTAINING TO THE PROPOSED WILDLIFE CORRIDOR	
PROJECT NO.	18109757	CONTROL 7000
FIGURE	A - 01	REV 0

DATE: 12/01/2020 10:00 AM
 PROJECT: 18109757
 DRAWING: 18109757-01-01
 TITLE: BIOPHYSICAL DATA PERTAINING TO THE PROPOSED WILDLIFE CORRIDOR
 SCALE: 1:5,000
 DATUM: NAD 83
 PROJECTION: UTM ZONE 11
 AUTHOR: J. L. [unreadable]
 CHECKED: [unreadable]
 APPROVED: [unreadable]
 PRINTED: 2020-01-20 10:00 AM

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LEGEND

<p>MEAN CAMERA OBSERVATIONS PER DAY - BLACK BEAR AND GRIZZLY BEAR</p> <ul style="list-style-type: none"> 0.000 - 0.024 0.025 - 0.072 0.073 - 0.136 0.137 - 0.240 0.241 - 0.414 	<p>DEER</p> <ul style="list-style-type: none"> 0.000 - 0.091 0.092 - 0.273 0.274 - 0.543 0.544 - 1.014 1.015 - 2.682 <p>ELK</p> <ul style="list-style-type: none"> 0.000 - 0.005 0.006 - 0.367 0.368 - 0.732 0.733 - 1.345 1.346 - 2.682 	<p>WOLF</p> <ul style="list-style-type: none"> 0.000 0.003 - 0.020 0.020 - 0.048 0.048 - 0.103 0.103 - 0.201 <p>COUGAR GPS COLLAR LOCATION</p> <p>ELK GPS COLLAR LOCATION</p> <p>GRIZZLY BEAR GPS COLLAR LOCATION</p> <p>COUGAR PATH BETWEEN SEQUENTIAL LOCATION</p> <p>ELK PATH BETWEEN SEQUENTIAL LOCATION</p> <p>GRIZZLY PATH BETWEEN SEQUENTIAL LOCATION</p> <p>COUGAR TRACK</p>	<p>LYNX TRACK</p> <p>WOLF TRACK</p> <p>TSMVPL PROPERTY BOUNDARY</p> <p>APPROVED WILDLIFE CORRIDOR</p> <p>PROPOSED WILDLIFE CORRIDOR</p> <p>SLOPE</p> <ul style="list-style-type: none"> 0 - 25 DEGREE SLOPE > 25 DEGREE SLOPE
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CLIENT
THREE SISTERS MOUNTAIN VILLAGE PROPERTIES LTD.



CONSULTANT	YYYYMM-DD	2020-01-20
DESIGNED	LD	
PREPARED	JE	
REVIEWED	LD	
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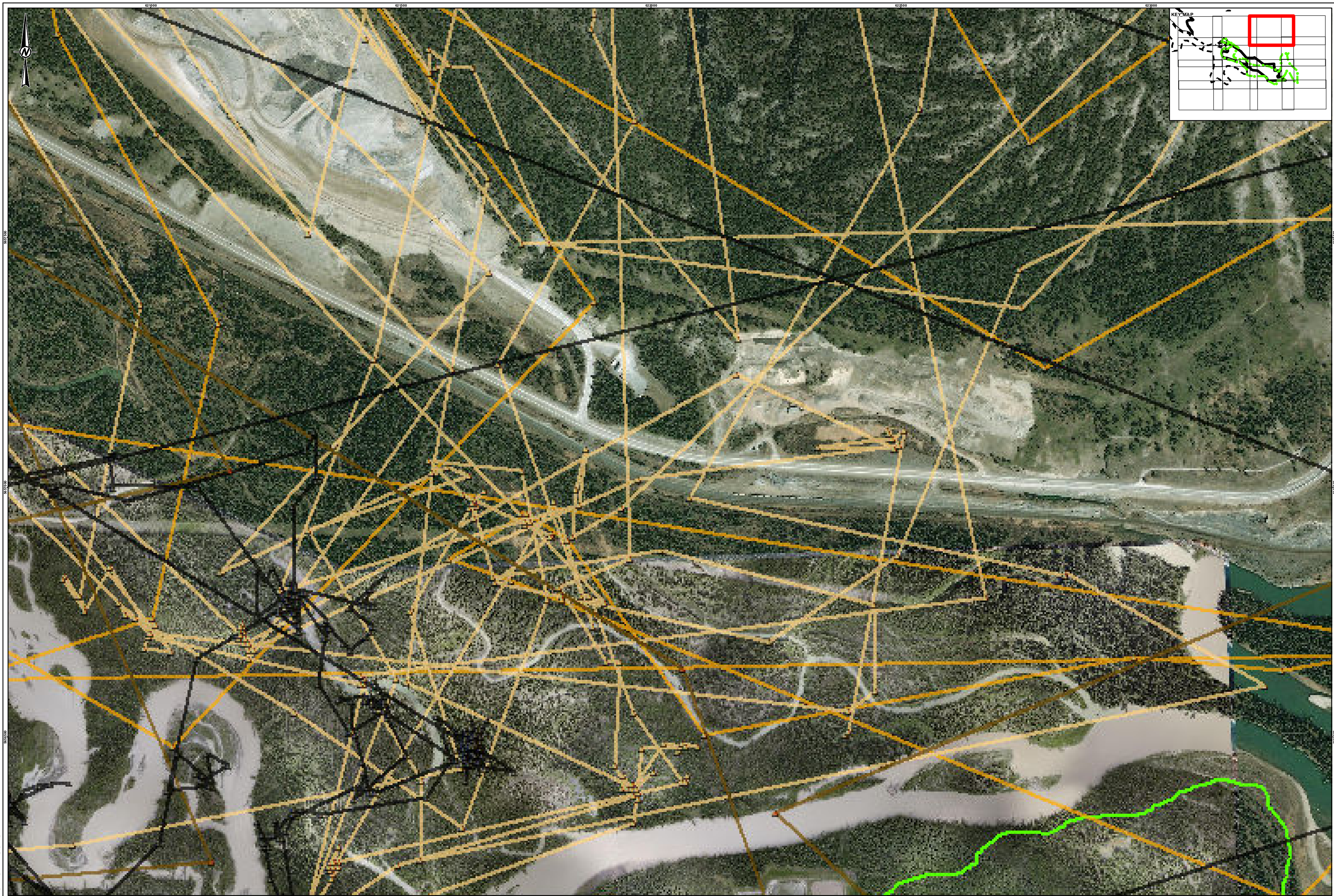
PROJECT
THREE SISTERS MOUNTAIN VILLAGE WILDLIFE CORRIDOR PROPOSAL

TITLE
BIOPHYSICAL DATA PERTAINING TO THE PROPOSED WILDLIFE CORRIDOR

PROJECT NO. 18109757	CONTROL 7000	REV 0	FIGURE A - 02
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DATE: 12/08/2019 10:52:37 AM PROJECT: C:\Users\jgibson\Documents\Projects\Three Sisters Mountain Village\GIS\Biophysical Data\Map_Series\BIOPHYSICAL_DATA_PERTAINING_TO_THE_PROPOSED_WILDLIFE_CORRIDOR.aprx PRINTED ON: 2020-02-24 10:52:37 AM

FILE: C:\Users\jgibson\Documents\Projects\Three Sisters Mountain Village\GIS\Biophysical Data\Map_Series\BIOPHYSICAL_DATA_PERTAINING_TO_THE_PROPOSED_WILDLIFE_CORRIDOR.aprx



LEGEND

<p>MEAN CAMERA OBSERVATIONS PER DAY - BLACK BEAR AND GRIZZLY BEAR</p> <ul style="list-style-type: none"> 0.000 - 0.024 0.025 - 0.072 0.073 - 0.136 0.137 - 0.240 0.241 - 0.414 <p>COUGAR</p> <ul style="list-style-type: none"> 0.000 0.003 - 0.055 0.055 - 0.105 0.105 - 0.214 0.214 - 0.195 <p>DEER</p> <ul style="list-style-type: none"> 0.000 - 0.091 0.092 - 0.273 0.274 - 0.543 0.544 - 1.014 1.015 - 2.682 <p>ELK</p> <ul style="list-style-type: none"> 0.000 - 0.005 0.006 - 0.367 0.368 - 0.732 0.733 - 1.345 <p>WOLF</p> <ul style="list-style-type: none"> 0.000 0.003 - 0.020 0.020 - 0.048 0.048 - 0.103 0.103 - 0.201 <p>COUGAR GPS COLLAR LOCATION</p> <p>ELK GPS COLLAR LOCATION</p> <p>GRIZZLY BEAR GPS COLLAR LOCATION</p> <p>COUGAR PATH BETWEEN SEQUENTIAL LOCATION</p> <p>ELK PATH BETWEEN SEQUENTIAL LOCATION</p> <p>GRIZZLY PATH BETWEEN SEQUENTIAL LOCATION</p> <p>COUGAR TRACK</p>	<p>LYNX TRACK</p> <p>WOLF TRACK</p> <p>TSMVPL PROPERTY BOUNDARY</p> <p>APPROVED WILDLIFE CORRIDOR</p> <p>PROPOSED WILDLIFE CORRIDOR</p> <p>SLOPE</p> <ul style="list-style-type: none"> 0 - 25 DEGREE SLOPE > 25 DEGREE SLOPE
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REFERENCE(S)
 1. IMAGERY OBTAINED FROM THE TOWN OF CANMORE 2017015. ALL RIGHTS RESERVED DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT	THREE SISTERS MOUNTAIN VILLAGE PROPERTIES LTD.		PROJECT	THREE SISTERS MOUNTAIN VILLAGE WILDLIFE CORRIDOR PROPOSAL	
CONSULTANT	GOLDER		TITLE	BIOPHYSICAL DATA PERTAINING TO THE PROPOSED WILDLIFE CORRIDOR	
	YYYYMM-DD	2020-01-20	PROJECT NO.	CONTROL	REV
	DESIGNED	LD	18109757	7000	0
	PREPARED	JE			
	REVIEWED	LD			
	APPROVED	KK			



LEGEND

MEAN CAMERA OBSERVATIONS PER DAY - BLACK BEAR AND GRIZZLY BEAR	DEER	WOLF
○ 0.000 - 0.024	○ 0.000 - 0.091	○ 0.000
○ 0.025 - 0.072	○ 0.092 - 0.273	○ 0.003 - 0.020
○ 0.073 - 0.136	○ 0.274 - 0.543	○ 0.020 - 0.048
○ 0.137 - 0.240	○ 0.544 - 1.014	○ 0.048 - 0.103
○ 0.241 - 0.414	○ 1.015 - 2.682	○ 0.103 - 0.201
COUGAR	ELK	▲ COUGAR GPS COLLAR LOCATION
○ 0.000	○ 0.000 - 0.005	▲ ELK GPS COLLAR LOCATION
○ 0.003 - 0.055	○ 0.006 - 0.367	▲ GRIZZLY BEAR GPS COLLAR LOCATION
○ 0.055 - 0.105	○ 0.368 - 0.732	— COUGAR PATH BETWEEN SEQUENTIAL LOCATION
○ 0.105 - 0.214	○ 0.733 - 1.345	— ELK PATH BETWEEN SEQUENTIAL LOCATION
○ 0.214 - 0.195	○ 1.346 - 1.959	— GRIZZLY PATH BETWEEN SEQUENTIAL LOCATION
		— COUGAR TRACK

— LYNX TRACK
— WOLF TRACK
— TSMVPL PROPERTY BOUNDARY
— APPROVED WILDLIFE CORRIDOR
— PROPOSED WILDLIFE CORRIDOR
□ 0 - 25 DEGREE SLOPE
□ > 25 DEGREE SLOPE



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CONSULTANT	YYYYMM-DD	2020-01-20
	DESIGNED	LD
	PREPARED	JE
	REVIEWED	LD
	APPROVED	KK

REFERENCE(S)
1. IMAGERY OBTAINED FROM THE TOWN OF CANMORE 2017015. ALL RIGHTS RESERVED DATUM: NAD 83 PROJECTION: UTM ZONE 11

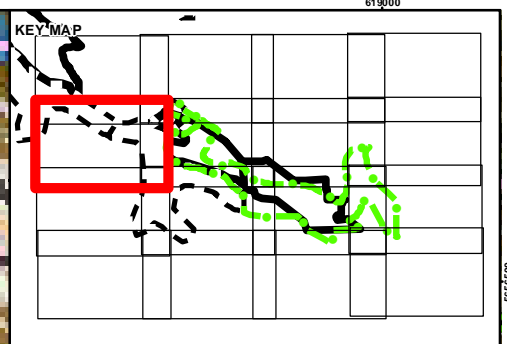
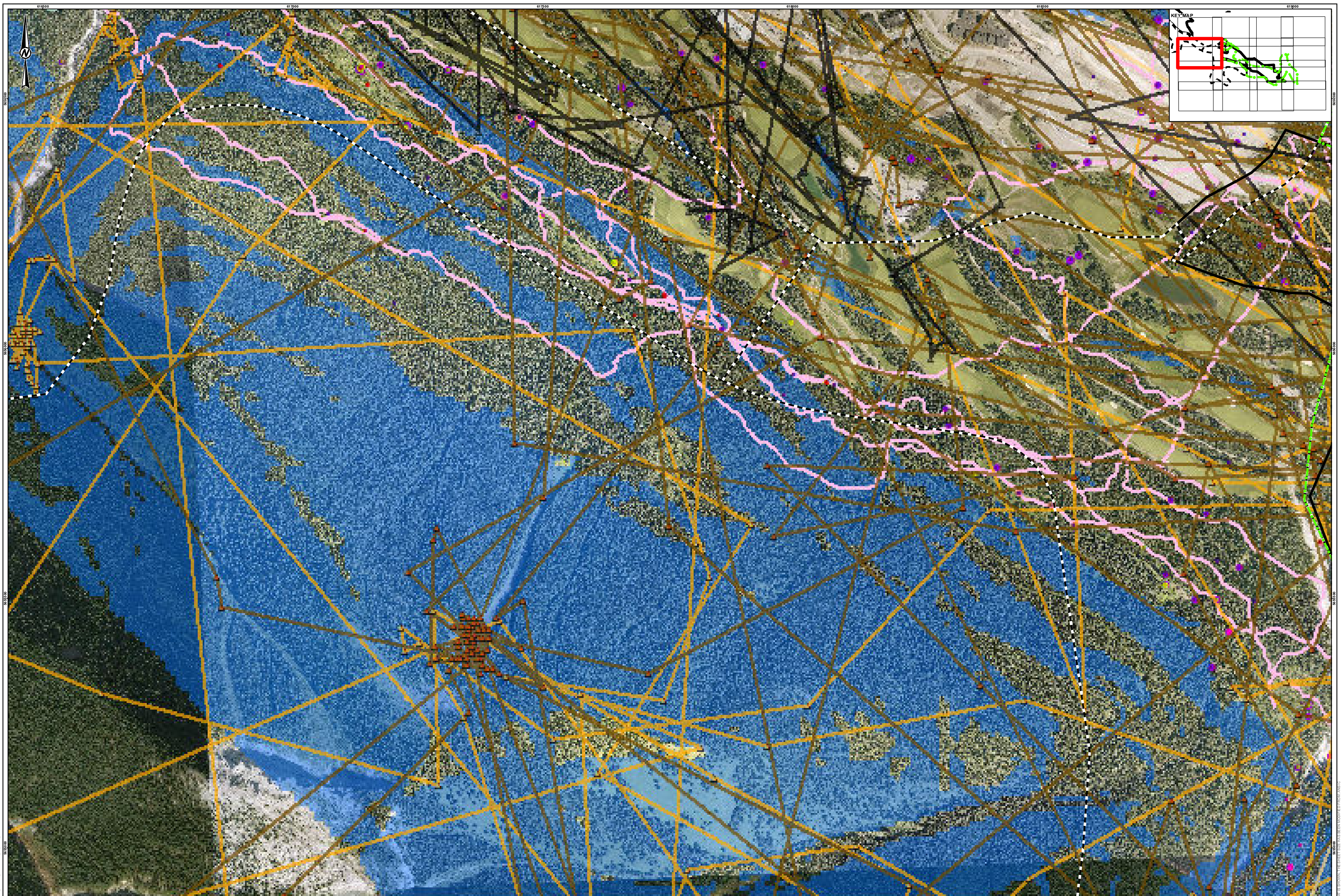
PROJECT
THREE SISTERS MOUNTAIN VILLAGE WILDLIFE CORRIDOR PROPOSAL

TITLE
BIOPHYSICAL DATA PERTAINING TO THE PROPOSED WILDLIFE CORRIDOR

PROJECT NO.	CONTROL	REV	FIGURE
18109757	7000	0	Page 68 of 957 A - 04

DATE: 12/01/2019 10:00:00 AM PROJECT: C:\Users\jgibson\OneDrive\Documents\Projects\Three Sisters Mountain Village\GIS\Map_Series\Map_Series_01.mxd PRINTED ON: 2020-02-24 10:11:30 AM

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LEGEND

<p>MEAN CAMERA OBSERVATIONS PER DAY - BLACK BEAR AND GRIZZLY BEAR</p> <ul style="list-style-type: none"> 0.000 - 0.024 0.025 - 0.072 0.073 - 0.136 0.137 - 0.240 0.241 - 0.414 <p>COUGAR</p> <ul style="list-style-type: none"> 0.000 0.003 - 0.055 0.055 - 0.105 0.105 - 0.214 0.214 - 0.195 	<p>DEER</p> <ul style="list-style-type: none"> 0.000 - 0.091 0.092 - 0.273 0.274 - 0.543 0.544 - 1.014 1.015 - 2.682 <p>ELK</p> <ul style="list-style-type: none"> 0.000 - 0.005 0.006 - 0.367 0.368 - 0.732 0.733 - 1.345 	<p>WOLF</p> <ul style="list-style-type: none"> 0.000 0.003 - 0.020 0.020 - 0.048 0.048 - 0.103 0.103 - 0.201 <p>COUGAR GPS COLLAR LOCATION</p> <p>ELK GPS COLLAR LOCATION</p> <p>GRIZZLY BEAR GPS COLLAR LOCATION</p> <p>COUGAR PATH BETWEEN SEQUENTIAL LOCATION</p> <p>ELK PATH BETWEEN SEQUENTIAL LOCATION</p> <p>GRIZZLY PATH BETWEEN SEQUENTIAL LOCATION</p> <p>COUGAR TRACK</p>	<p>LYNX TRACK</p> <p>WOLF TRACK</p> <p>TSMVPL PROPERTY BOUNDARY</p> <p>APPROVED WILDLIFE CORRIDOR</p> <p>PROPOSED WILDLIFE CORRIDOR</p> <p>SLOPE</p> <ul style="list-style-type: none"> 0 - 25 DEGREE SLOPE > 25 DEGREE SLOPE
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CLIENT
THREE SISTERS MOUNTAIN VILLAGE PROPERTIES LTD.

CONSULTANT

YYYYMM-DD	2020-01-20
DESIGNED	LD
PREPARED	JE
REVIEWED	LD
APPROVED	KK

REFERENCE(S)
1. IMAGERY OBTAINED FROM THE TOWN OF CANMORE 2017015. ALL RIGHTS RESERVED
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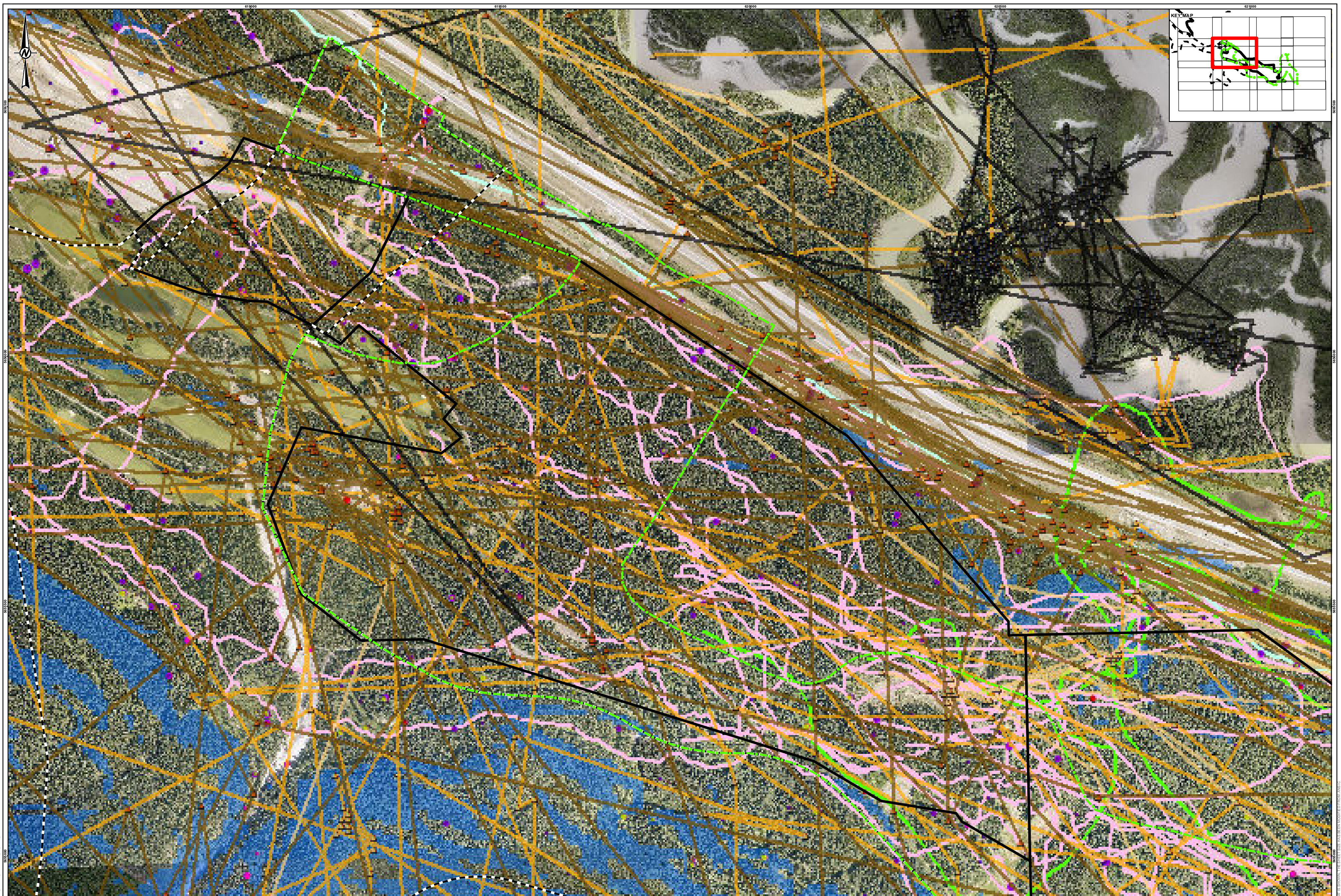
PROJECT
THREE SISTERS MOUNTAIN VILLAGE WILDLIFE CORRIDOR PROPOSAL

TITLE
BIOPHYSICAL DATA PERTAINING TO THE PROPOSED WILDLIFE CORRIDOR

PROJECT NO. 18109757 CONTROL 7000
REV 0
Page 69 of 957
FIGURE A - 05

DATE: 12/08/2019 10:07:37 AM PROJECT: C:\Users\jgibson\Documents\Projects\Three Sisters Mountain Village\GIS\Map_Series\Map_Series_PDF.mxd PRINTED ON: 2020-02-24 10:31:11 PM

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LEGEND

<p>MEAN CAMERA OBSERVATIONS PER DAY - BLACK BEAR AND GRIZZLY BEAR</p> <ul style="list-style-type: none"> ○ 0.000 - 0.024 ○ 0.025 - 0.072 ○ 0.073 - 0.136 ○ 0.137 - 0.240 ○ 0.241 - 0.414 <p>COUGAR</p> <ul style="list-style-type: none"> ○ 0.000 ○ 0.003 - 0.055 ○ 0.055 - 0.105 ○ 0.105 - 0.214 ○ 0.214 - 0.195 	<p>DEER</p> <ul style="list-style-type: none"> ○ 0.000 - 0.091 ○ 0.092 - 0.273 ○ 0.274 - 0.543 ○ 0.544 - 1.014 ○ 1.015 - 2.682 <p>ELK</p> <ul style="list-style-type: none"> ○ 0.000 - 0.005 ○ 0.006 - 0.367 ○ 0.368 - 0.732 ○ 0.733 - 1.345 	<p>WOLF</p> <ul style="list-style-type: none"> ○ 0.000 ○ 0.003 - 0.020 ○ 0.020 - 0.048 ○ 0.048 - 0.103 ○ 0.103 - 0.201 <p>COUGAR GPS COLLAR LOCATION</p> <p>ELK GPS COLLAR LOCATION</p> <p>GRIZZLY BEAR GPS COLLAR LOCATION</p> <p>COUGAR PATH BETWEEN SEQUENTIAL LOCATION</p> <p>ELK PATH BETWEEN SEQUENTIAL LOCATION</p> <p>GRIZZLY PATH BETWEEN SEQUENTIAL LOCATION</p> <p>COUGAR TRACK</p>	<p>LYNX TRACK</p> <p>WOLF TRACK</p> <p>TSMVPL PROPERTY BOUNDARY</p> <p>APPROVED WILDLIFE CORRIDOR</p> <p>PROPOSED WILDLIFE CORRIDOR</p> <p>SLOPE</p> <ul style="list-style-type: none"> □ 0 - 25 DEGREE SLOPE □ > 25 DEGREE SLOPE
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CLIENT
THREE SISTERS MOUNTAIN VILLAGE PROPERTIES LTD.

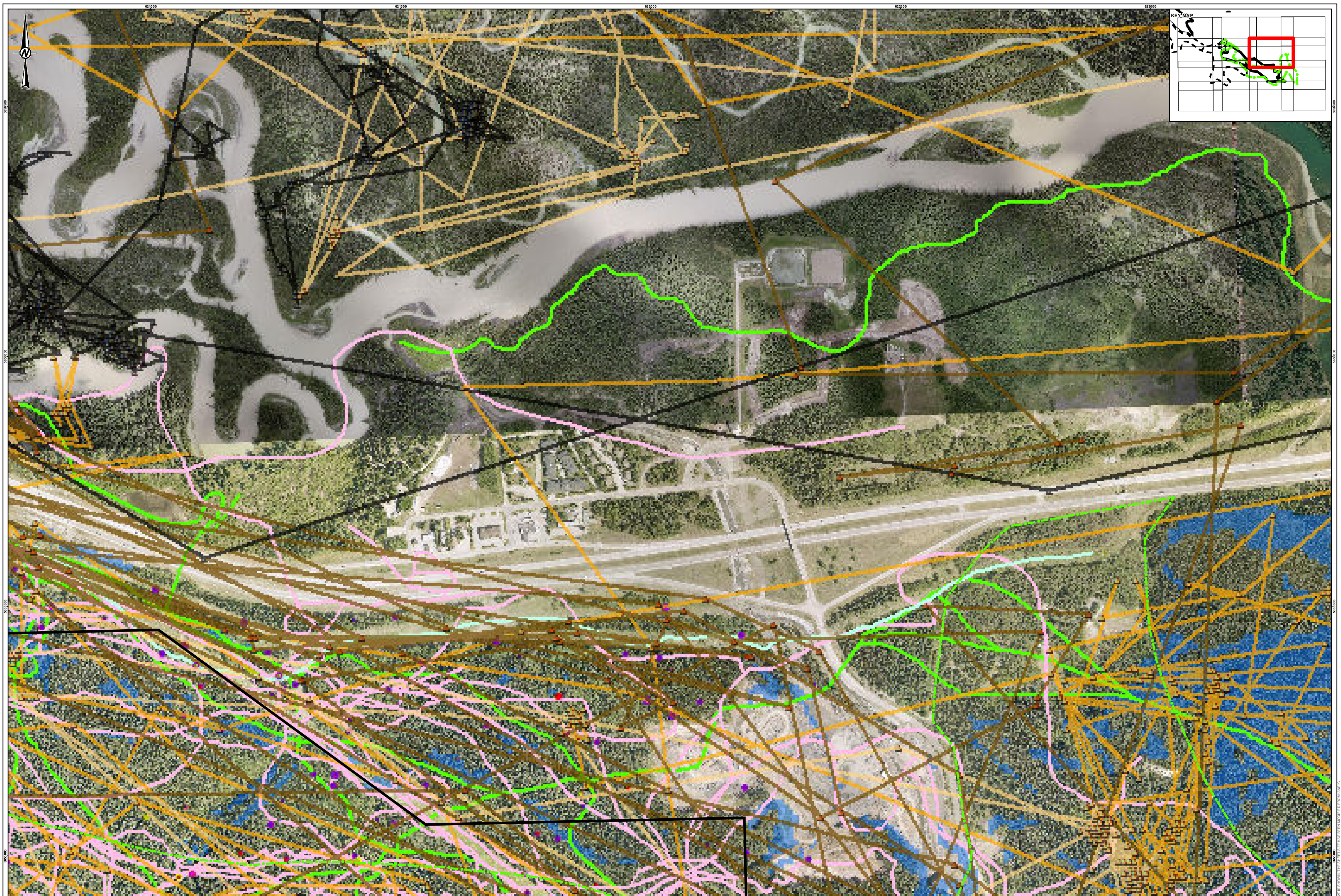
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YYYYMM-DD	2020-01-20
DESIGNED	LD
PREPARED	JE
REVIEWED	LD
APPROVED	KK

REFERENCE(S)
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PROJECT
THREE SISTERS MOUNTAIN VILLAGE WILDLIFE CORRIDOR PROPOSAL

TITLE
BIOPHYSICAL DATA PERTAINING TO THE PROPOSED WILDLIFE CORRIDOR



LEGEND

<p>MEAN CAMERA OBSERVATIONS PER DAY - BLACK BEAR AND GRIZZLY BEAR</p> <ul style="list-style-type: none"> 0.000 - 0.024 0.025 - 0.072 0.073 - 0.136 0.137 - 0.240 0.241 - 0.414 <p>COUGAR</p> <ul style="list-style-type: none"> 0.000 0.003 - 0.055 0.055 - 0.105 0.105 - 0.214 0.214 - 0.195 	<p>DEER</p> <ul style="list-style-type: none"> 0.000 - 0.091 0.092 - 0.273 0.274 - 0.543 0.544 - 1.014 1.015 - 2.682 <p>ELK</p> <ul style="list-style-type: none"> 0.000 - 0.005 0.006 - 0.367 0.368 - 0.732 0.733 - 1.345 	<p>WOLF</p> <ul style="list-style-type: none"> 0.000 0.003 - 0.020 0.020 - 0.048 0.048 - 0.103 0.103 - 0.201 <p>COUGAR GPS COLLAR LOCATION</p> <p>ELK GPS COLLAR LOCATION</p> <p>GRIZZLY BEAR GPS COLLAR LOCATION</p> <p>COUGAR PATH BETWEEN SEQUENTIAL LOCATION</p> <p>ELK PATH BETWEEN SEQUENTIAL LOCATION</p> <p>GRIZZLY PATH BETWEEN SEQUENTIAL LOCATION</p> <p>COUGAR TRACK</p>	<p>LYNX TRACK</p> <p>WOLF TRACK</p> <p>TSMVPL PROPERTY BOUNDARY</p> <p>APPROVED WILDLIFE CORRIDOR</p> <p>PROPOSED WILDLIFE CORRIDOR</p> <p>SLOPE</p> <ul style="list-style-type: none"> 0 - 25 DEGREE SLOPE > 25 DEGREE SLOPE
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THREE SISTERS MOUNTAIN VILLAGE PROPERTIES LTD.

CONSULTANT
GOLDER

YYYYMM-DD	2020-01-20
DESIGNED	LD
PREPARED	JE
REVIEWED	LD
APPROVED	KK

REFERENCE(S)
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PROJECT
THREE SISTERS MOUNTAIN VILLAGE WILDLIFE CORRIDOR PROPOSAL

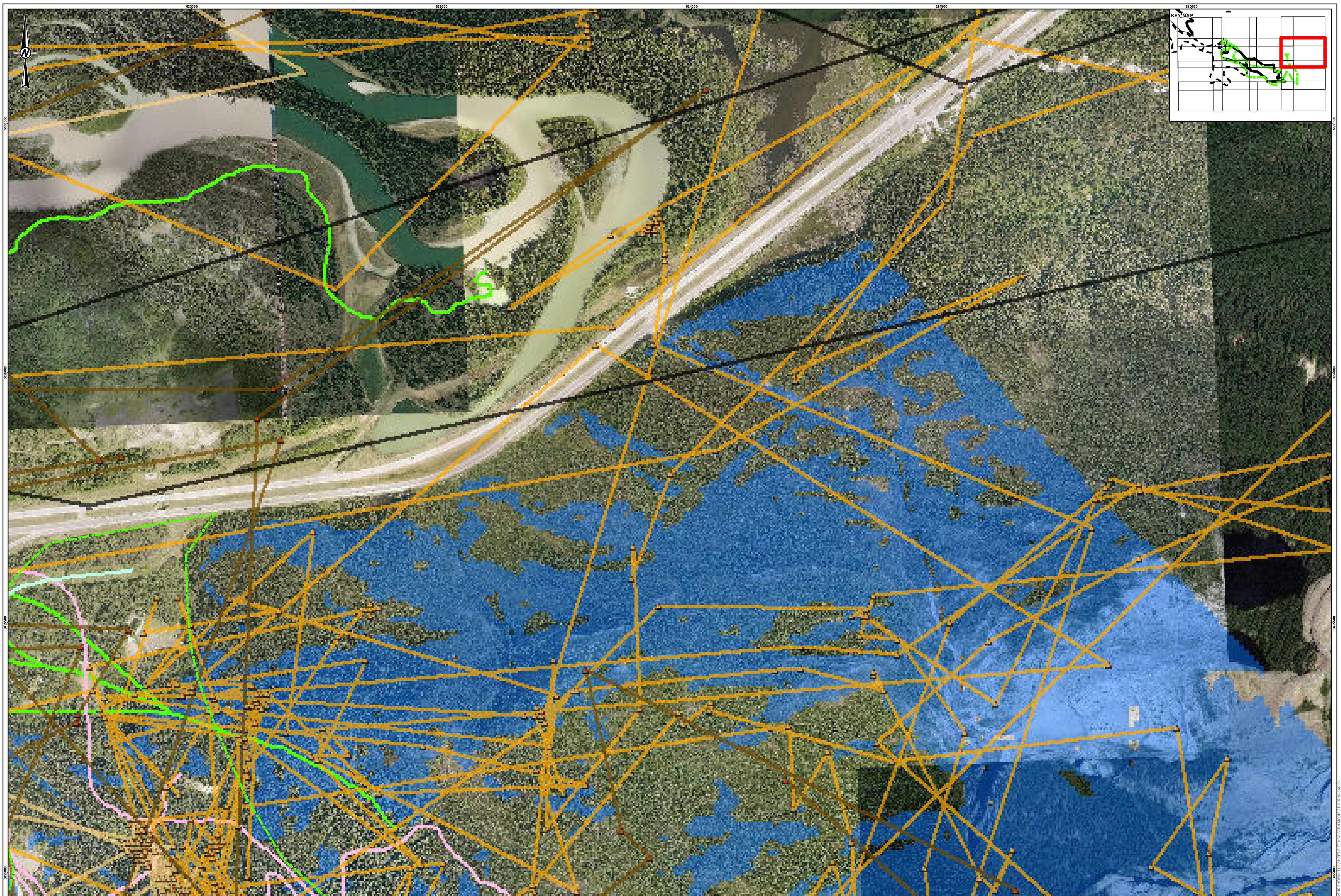
TITLE
BIOPHYSICAL DATA PERTAINING TO THE PROPOSED WILDLIFE CORRIDOR

PROJECT NO. 18109757	CONTROL 7000	REV 0	FIGURE A - 07
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Page 71 of 957

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 DATA: COURTESY OF THE TOWN OF CANMORE
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LEGEND

MEAN CAMERA OBSERVATIONS PER DAY - BLACK BEAR AND GRIZZLY BEAR	DEER	WOLF	LYNX TRACK
○ 0.000 - 0.024	○ 0.000 - 0.091	○ 0.000	—
○ 0.025 - 0.072	○ 0.092 - 0.273	○ 0.003 - 0.020	—
○ 0.073 - 0.136	○ 0.274 - 0.543	○ 0.020 - 0.048	—
○ 0.137 - 0.240	○ 0.544 - 1.014	○ 0.048 - 0.103	—
○ 0.241 - 0.414	○ 1.015 - 2.682	○ 0.103 - 0.201	—
COUGAR	ELK	▲ COUGAR GPS COLLAR LOCATION	— TSMVPL PROPERTY BOUNDARY
○ 0.000	○ 0.000 - 0.005	▲ ELK GPS COLLAR LOCATION	— APPROVED WILDLIFE CORRIDOR
○ 0.003 - 0.055	○ 0.006 - 0.367	▲ GRIZZLY BEAR GPS COLLAR LOCATION	— PROPOSED WILDLIFE CORRIDOR
○ 0.055 - 0.105	○ 0.368 - 0.732	— COUGAR PATH BETWEEN SEQUENTIAL LOCATION	□ 0 - 25 DEGREE SLOPE
○ 0.105 - 0.214	○ 0.733 - 1.345	— ELK PATH BETWEEN SEQUENTIAL LOCATION	■ > 25 DEGREE SLOPE
● 0.214 - 0.195	○ 0.105 - 0.214	— GRIZZLY PATH BETWEEN SEQUENTIAL LOCATION	
	● March 3, 2020 Regular Council Meeting 9 a.m.	— COUGAR TRACK	



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 THREE SISTERS MOUNTAIN VILLAGE PROPERTIES LTD.

PROJECT
 THREE SISTERS MOUNTAIN VILLAGE WILDLIFE CORRIDOR PROPOSAL

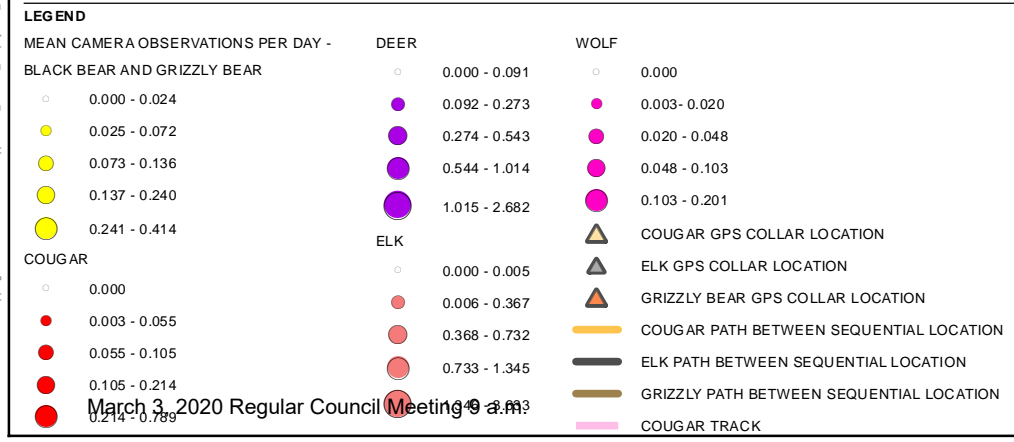
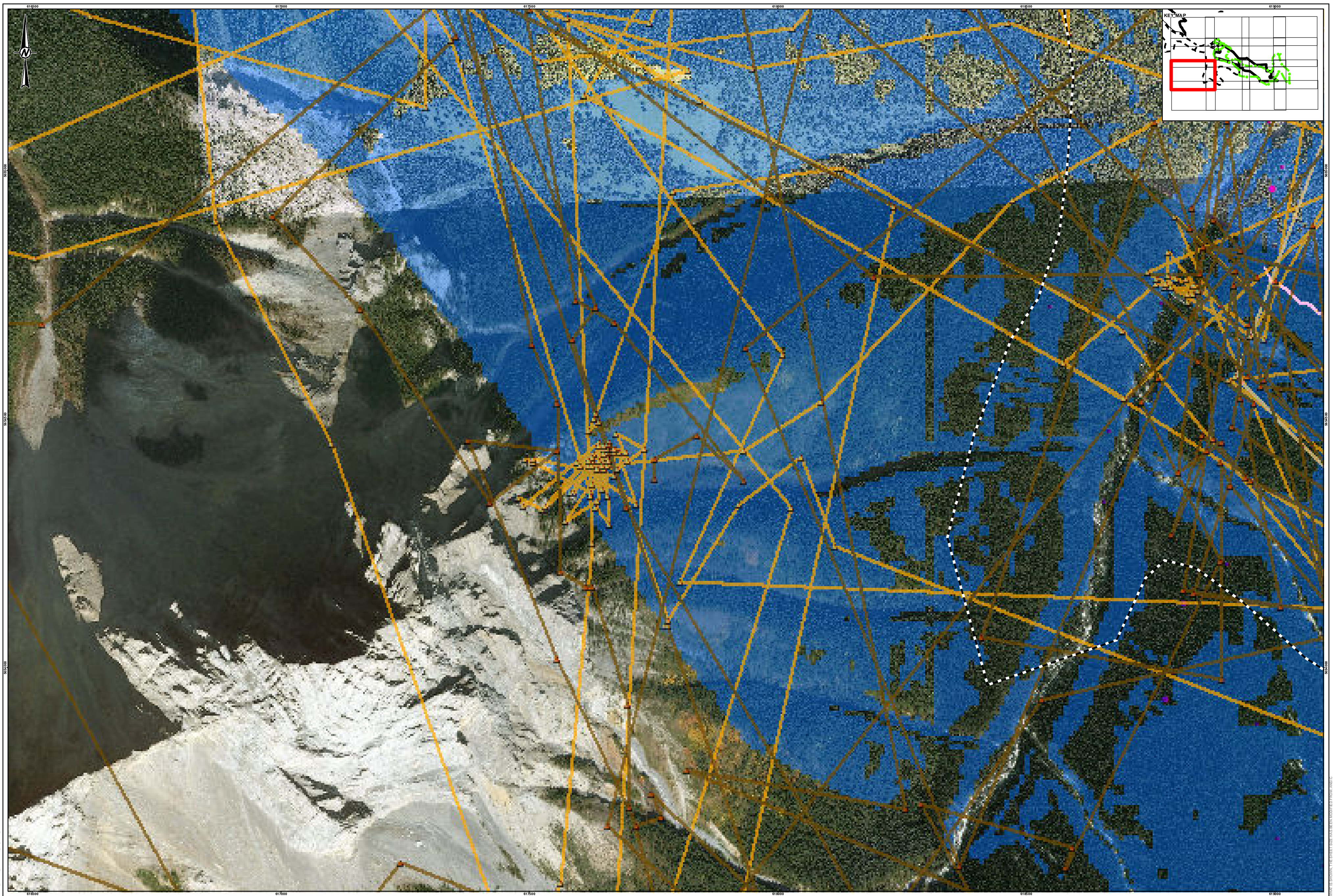
CONSULTANT

	YYYYMM-DD	2020-01-20
DESIGNED	LD	
PREPARED	JE	
REVIEWED	LD	
APPROVED	KK	

TITLE
BIOPHYSICAL DATA PERTAINING TO THE PROPOSED WILDLIFE CORRIDOR

PROJECT NO. 18109757 CONTROL 7000
 REV 0
 Page 72 of 957
 FIGURE A-08

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THREE SISTERS MOUNTAIN VILLAGE PROPERTIES LTD.

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YYYYMM-DD	2020-01-20
DESIGNED	LD
PREPARED	JE
REVIEWED	LD
APPROVED	KK

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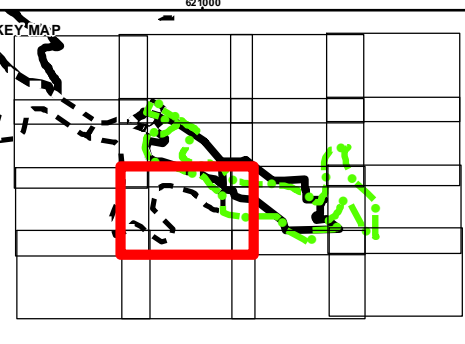
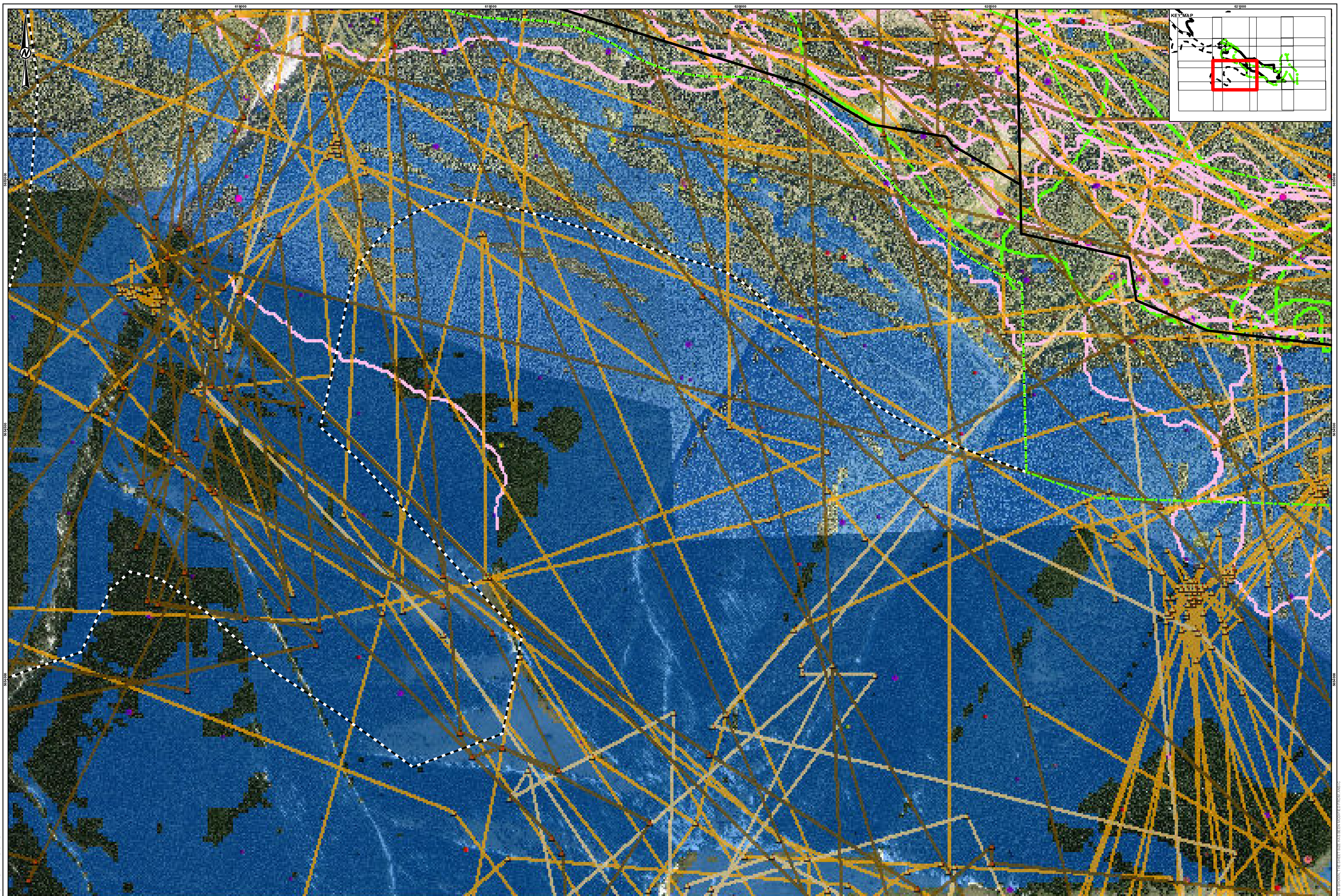
PROJECT
THREE SISTERS MOUNTAIN VILLAGE WILDLIFE CORRIDOR PROPOSAL

TITLE
BIOPHYSICAL DATA PERTAINING TO THE PROPOSED WILDLIFE CORRIDOR

PROJECT NO.	CONTROL	REV	FIGURE
18109757	7000	0	Page 73 of 957 A - 09

DATE: 12/28/19 11:30:37 AM PROJECT: D:\Projects\2020\18109757\18109757_Wildlife_Corridor_Proposal\Map_Series\Map_Series_V1.mxd PRINTED ON: 2020/02/25 AT 10:04:26 PM

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LEGEND

MEAN CAMERA OBSERVATIONS PER DAY - BLACK BEAR AND GRIZZLY BEAR

0.000 - 0.024	DEER	0.000 - 0.091	WOLF	0.000
0.025 - 0.072	0.092 - 0.273	0.003 - 0.020	0.003 - 0.020	0.003 - 0.020
0.073 - 0.136	0.274 - 0.543	0.020 - 0.048	0.020 - 0.048	0.048 - 0.103
0.137 - 0.240	0.544 - 1.014	0.048 - 0.103	0.048 - 0.103	0.103 - 0.201
0.241 - 0.414	1.015 - 2.682	0.103 - 0.201	0.103 - 0.201	0.201 - 0.401

COUGAR

0.000	0.000 - 0.005	0.006 - 0.367	0.368 - 0.732	0.733 - 1.345	1.346 - 2.690
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ELK

0.000 - 0.005	0.006 - 0.367	0.368 - 0.732	0.733 - 1.345	1.346 - 2.690
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LYNX TRACK

WOLF TRACK

TSMVPL PROPERTY BOUNDARY

APPROVED WILDLIFE CORRIDOR

PROPOSED WILDLIFE CORRIDOR

SLOPE

0 - 25 DEGREE SLOPE	> 25 DEGREE SLOPE
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COUGAR GPS COLLAR LOCATION

ELK GPS COLLAR LOCATION

GRIZZLY BEAR GPS COLLAR LOCATION

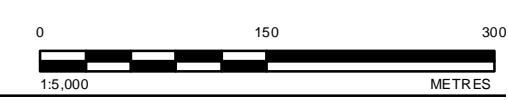
COUGAR PATH BETWEEN SEQUENTIAL LOCATION

ELK PATH BETWEEN SEQUENTIAL LOCATION

GRIZZLY PATH BETWEEN SEQUENTIAL LOCATION

COUGAR TRACK

DATE: 12/08/2019 11:52:37 AM
 PROJECT: 18109757
 DRAWING: 18109757-01-010
 SCALE: 1:5000
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 FILE: 18109757-01-010.dwg



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THREE SISTERS MOUNTAIN VILLAGE PROPERTIES LTD.

CONSULTANT
GOLDER

YYYYMM-DD	2020-01-20
DESIGNED	LD
PREPARED	JE
REVIEWED	LD
APPROVED	KK

REFERENCE(S)
1. IMAGERY OBTAINED FROM THE TOWN OF CANMORE 2017015. ALL RIGHTS RESERVED DATUM: NAD 83 PROJECTION: UTM ZONE 11

PROJECT
THREE SISTERS MOUNTAIN VILLAGE WILDLIFE CORRIDOR PROPOSAL

TITLE
BIOPHYSICAL DATA PERTAINING TO THE PROPOSED WILDLIFE CORRIDOR

PROJECT NO.	18109757	CONTROL	7000
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REV 0
Page 74 of 957
FIGURE A - 010



LEGEND

<p>MEAN CAMERA OBSERVATIONS PER DAY - BLACK BEAR AND GRIZZLY BEAR</p> <ul style="list-style-type: none"> ○ 0.000 - 0.024 ● 0.025 - 0.072 ● 0.073 - 0.136 ● 0.137 - 0.240 ● 0.241 - 0.414 <p>COUGAR</p> <ul style="list-style-type: none"> ○ 0.000 ● 0.003 - 0.055 ● 0.055 - 0.105 ● 0.105 - 0.214 ● 0.214 - 0.195 	<p>DEER</p> <ul style="list-style-type: none"> ○ 0.000 - 0.091 ● 0.092 - 0.273 ● 0.274 - 0.543 ● 0.544 - 1.014 ● 1.015 - 2.682 <p>ELK</p> <ul style="list-style-type: none"> ○ 0.000 - 0.005 ● 0.006 - 0.367 ● 0.368 - 0.732 ● 0.733 - 1.345 	<p>WOLF</p> <ul style="list-style-type: none"> ○ 0.000 ● 0.003 - 0.020 ● 0.020 - 0.048 ● 0.048 - 0.103 ● 0.103 - 0.201 <p>COUGAR GPS COLLAR LOCATION</p> <p>ELK GPS COLLAR LOCATION</p> <p>GRIZZLY BEAR GPS COLLAR LOCATION</p> <p>COUGAR PATH BETWEEN SEQUENTIAL LOCATION</p> <p>ELK PATH BETWEEN SEQUENTIAL LOCATION</p> <p>GRIZZLY PATH BETWEEN SEQUENTIAL LOCATION</p> <p>COUGAR TRACK</p>	<p>LYNX TRACK</p> <p>WOLF TRACK</p> <p>TSMVPL PROPERTY BOUNDARY</p> <p>APPROVED WILDLIFE CORRIDOR</p> <p>PROPOSED WILDLIFE CORRIDOR</p> <p>SLOPE</p> <ul style="list-style-type: none"> □ 0 - 25 DEGREE SLOPE ■ > 25 DEGREE SLOPE
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PROJECT
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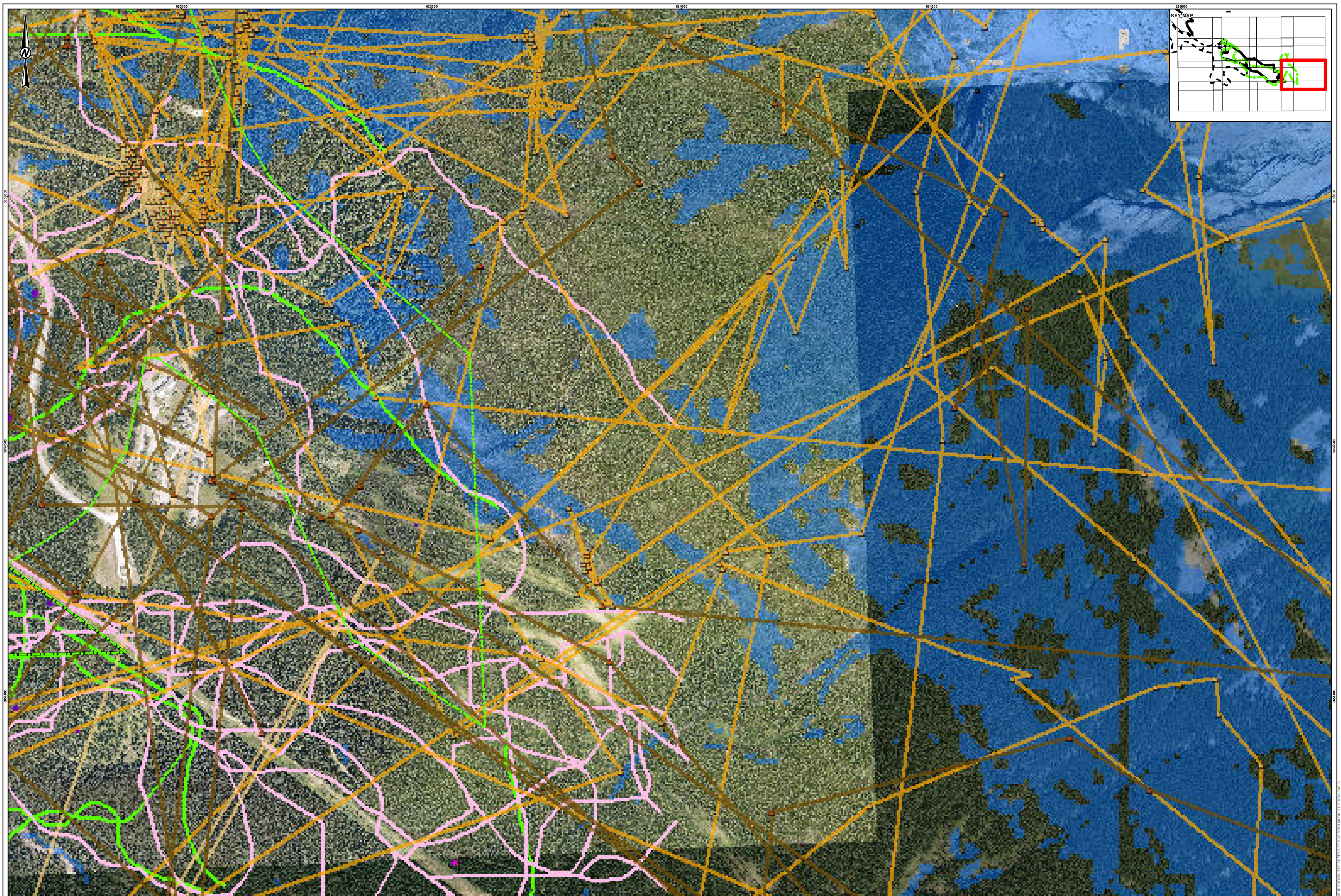
TITLE
 BIOPHYSICAL DATA PERTAINING TO THE PROPOSED WILDLIFE CORRIDOR

PROJECT NO. 18109757 CONTROL 7000

REV 0

FIGURE A - 011

DATE: 12/01/2020 11:58:57 AM PROJECT: C:\Users\jgoldr\Documents\Projects\Three Sisters Mountain Village\GIS\Map_Series\Map_Series_Proposed_Wildlife_Corridor.aprx
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LEGEND

<p>MEAN CAMERA OBSERVATIONS PER DAY - BLACK BEAR AND GRIZZLY BEAR</p> <ul style="list-style-type: none"> ○ 0.000 - 0.024 ● 0.025 - 0.072 ● 0.073 - 0.136 ● 0.137 - 0.240 ● 0.241 - 0.414 <p>COUGAR</p> <ul style="list-style-type: none"> ○ 0.000 ● 0.003 - 0.055 ● 0.055 - 0.105 ● 0.105 - 0.214 ● 0.214 - 0.195 	<p>DEER</p> <ul style="list-style-type: none"> ○ 0.000 - 0.091 ● 0.092 - 0.273 ● 0.274 - 0.543 ● 0.544 - 1.014 ● 1.015 - 2.682 <p>ELK</p> <ul style="list-style-type: none"> ○ 0.000 - 0.005 ● 0.006 - 0.367 ● 0.368 - 0.732 ● 0.733 - 1.345 	<p>WOLF</p> <ul style="list-style-type: none"> ○ 0.000 ● 0.003 - 0.020 ● 0.020 - 0.048 ● 0.048 - 0.103 ● 0.103 - 0.201 <p>COUGAR GPS COLLAR LOCATION</p> <ul style="list-style-type: none"> ▲ <p>ELK GPS COLLAR LOCATION</p> <ul style="list-style-type: none"> ▲ <p>GRIZZLY BEAR GPS COLLAR LOCATION</p> <ul style="list-style-type: none"> ▲ <p>COUGAR PATH BETWEEN SEQUENTIAL LOCATION</p> <ul style="list-style-type: none"> — <p>ELK PATH BETWEEN SEQUENTIAL LOCATION</p> <ul style="list-style-type: none"> — <p>GRIZZLY PATH BETWEEN SEQUENTIAL LOCATION</p> <ul style="list-style-type: none"> — <p>COUGAR TRACK</p> <ul style="list-style-type: none"> — 	<p>LYNX TRACK</p> <ul style="list-style-type: none"> — <p>WOLF TRACK</p> <ul style="list-style-type: none"> — <p>TSMVPL PROPERTY BOUNDARY</p> <ul style="list-style-type: none"> — <p>APPROVED WILDLIFE CORRIDOR</p> <ul style="list-style-type: none"> — <p>PROPOSED WILDLIFE CORRIDOR</p> <ul style="list-style-type: none"> — <p>SLOPE</p> <ul style="list-style-type: none"> □ 0 - 25 DEGREE SLOPE ■ > 25 DEGREE SLOPE
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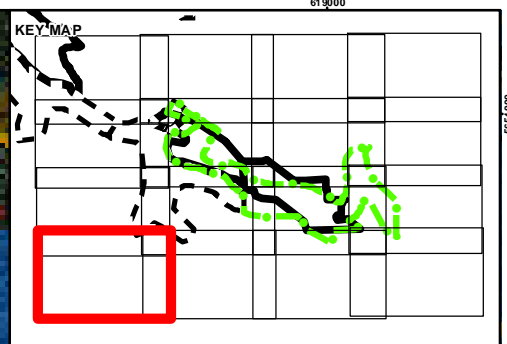
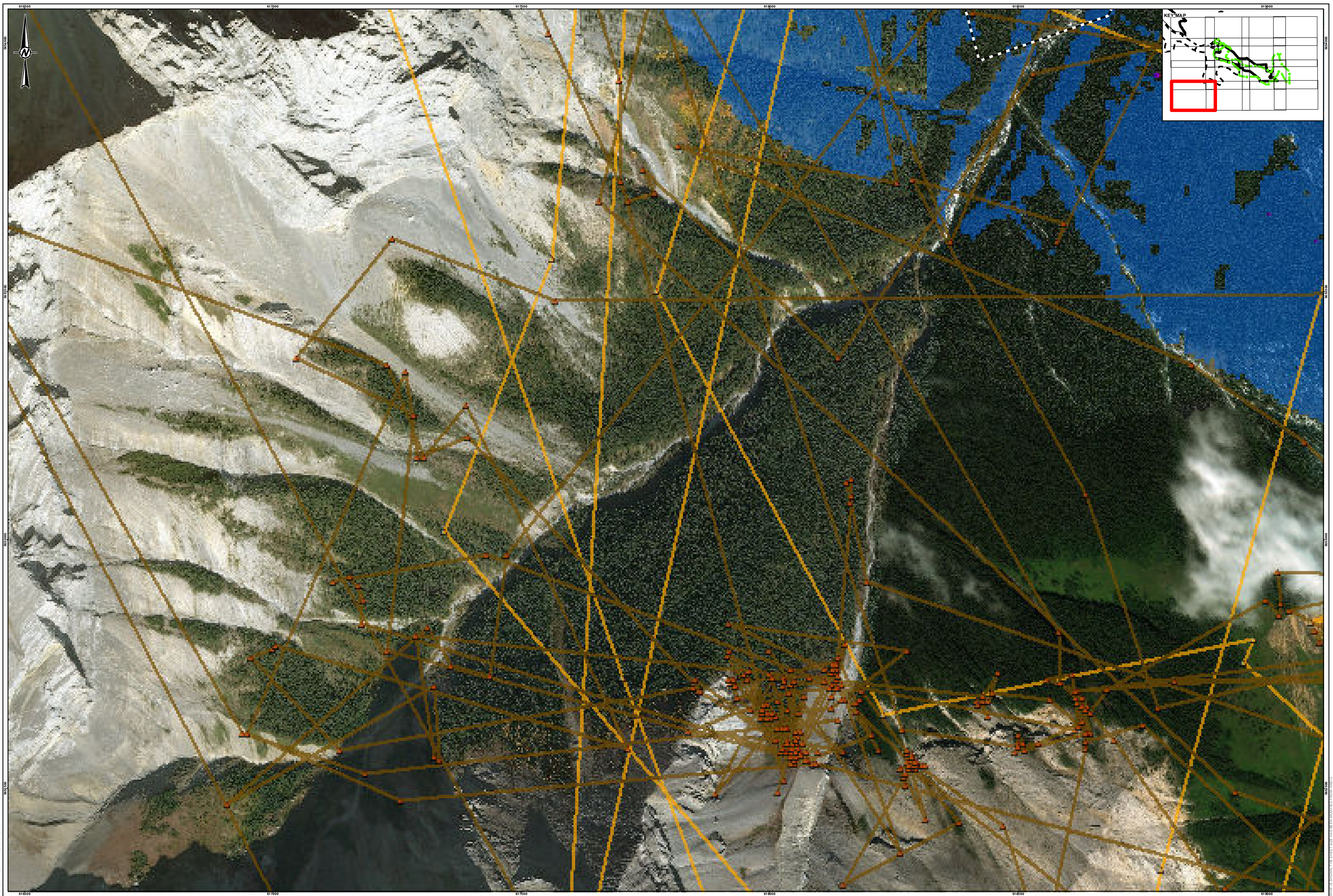
PROJECT
THREE SISTERS MOUNTAIN VILLAGE WILDLIFE CORRIDOR PROPOSAL

TITLE
BIOPHYSICAL DATA PERTAINING TO THE PROPOSED WILDLIFE CORRIDOR

PROJECT NO. 18109757	CONTROL 7000	REV 0	FIGURE A - 012
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DATE: 12/01/2020 11:58:57 AM PROJECT: C:\Users\jgoldr\Documents\Projects\THREE SISTERS MOUNTAIN VILLAGE PROPERTIES LTD\BIOPHYSICAL DATA\BIOPHYSICAL DATA.mxd PRINTED ON: 2020/02/24 AT 11:58:57 AM

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LEGEND

MEAN CAMERA OBSERVATIONS PER DAY - BLACK BEAR AND GRIZZLY BEAR	DEER	WOLF	LYNX TRACK
○ 0.000 - 0.024	○ 0.000 - 0.091	○ 0.000	— WOLF TRACK
○ 0.025 - 0.072	○ 0.092 - 0.273	○ 0.003 - 0.020	— TSMVPL PROPERTY BOUNDARY
○ 0.073 - 0.136	○ 0.274 - 0.543	○ 0.020 - 0.048	— APPROVED WILDLIFE CORRIDOR
○ 0.137 - 0.240	○ 0.544 - 1.014	○ 0.048 - 0.103	— PROPOSED WILDLIFE CORRIDOR
○ 0.241 - 0.414	○ 1.015 - 2.682	○ 0.103 - 0.201	
COUGAR	ELK	▲ COUGAR GPS COLLAR LOCATION	SLOPE
○ 0.000	○ 0.000 - 0.005	▲ ELK GPS COLLAR LOCATION	□ 0 - 25 DEGREE SLOPE
○ 0.003 - 0.055	○ 0.006 - 0.367	▲ GRIZZLY BEAR GPS COLLAR LOCATION	■ > 25 DEGREE SLOPE
○ 0.055 - 0.105	○ 0.368 - 0.732	— COUGAR PATH BETWEEN SEQUENTIAL LOCATION	
○ 0.105 - 0.214	○ 0.733 - 1.345	— ELK PATH BETWEEN SEQUENTIAL LOCATION	
○ 0.214 - 0.195		— GRIZZLY PATH BETWEEN SEQUENTIAL LOCATION	
		— COUGAR TRACK	



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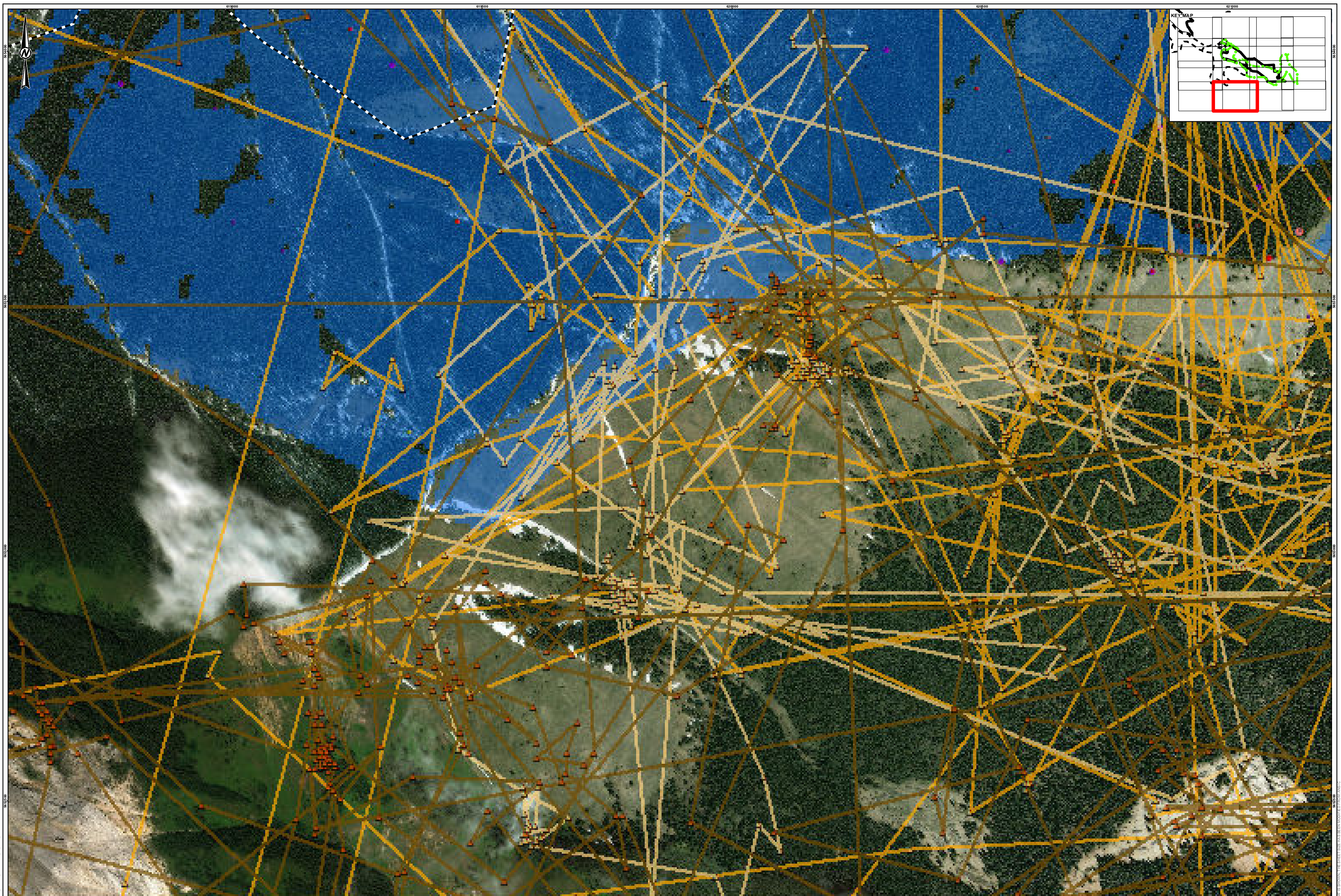
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PROJECT
THREE SISTERS MOUNTAIN VILLAGE WILDLIFE CORRIDOR PROPOSAL

TITLE
BIOPHYSICAL DATA PERTAINING TO THE PROPOSED WILDLIFE CORRIDOR

PROJECT NO. 18109757 CONTROL 7000

DATE: 12/01/2020 10:58:27 AM PROJECT: C:\Users\jgibson\Documents\Projects\Three Sisters Mountain Village Properties Ltd.\Three Sisters Mountain Village Wildlife Corridor\Map\Map_20200220_11:50:30.PLM



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<p>MEAN CAMERA OBSERVATIONS PER DAY - BLACK BEAR AND GRIZZLY BEAR</p> <ul style="list-style-type: none"> 0.000 - 0.024 0.025 - 0.072 0.073 - 0.136 0.137 - 0.240 0.241 - 0.414 <p>COUGAR</p> <ul style="list-style-type: none"> 0.000 0.003 - 0.055 0.055 - 0.105 0.105 - 0.214 0.214 - 0.195 <p>DEER</p> <ul style="list-style-type: none"> 0.000 - 0.091 0.092 - 0.273 0.274 - 0.543 0.544 - 1.014 1.015 - 2.682 <p>ELK</p> <ul style="list-style-type: none"> 0.000 - 0.005 0.006 - 0.367 0.368 - 0.732 0.733 - 1.345 <p>WOLF</p> <ul style="list-style-type: none"> 0.000 0.003 - 0.020 0.020 - 0.048 0.048 - 0.103 0.103 - 0.201 <p>COUGAR GPS COLLAR LOCATION</p> <ul style="list-style-type: none"> ▲ <p>ELK GPS COLLAR LOCATION</p> <ul style="list-style-type: none"> ▲ <p>GRIZZLY BEAR GPS COLLAR LOCATION</p> <ul style="list-style-type: none"> ▲ <p>COUGAR PATH BETWEEN SEQUENTIAL LOCATION</p> <ul style="list-style-type: none"> — <p>ELK PATH BETWEEN SEQUENTIAL LOCATION</p> <ul style="list-style-type: none"> — <p>GRIZZLY PATH BETWEEN SEQUENTIAL LOCATION</p> <ul style="list-style-type: none"> — <p>COUGAR TRACK</p> <ul style="list-style-type: none"> — 	<p>LYNX TRACK</p> <ul style="list-style-type: none"> — <p>WOLF TRACK</p> <ul style="list-style-type: none"> — <p>TSMVPL PROPERTY BOUNDARY</p> <ul style="list-style-type: none"> — <p>APPROVED WILDLIFE CORRIDOR</p> <ul style="list-style-type: none"> — <p>PROPOSED WILDLIFE CORRIDOR</p> <ul style="list-style-type: none"> — <p>SLOPE</p> <ul style="list-style-type: none"> 0 - 25 DEGREE SLOPE > 25 DEGREE SLOPE
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CONSULTANT	GOLDER	
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	APPROVED	KK

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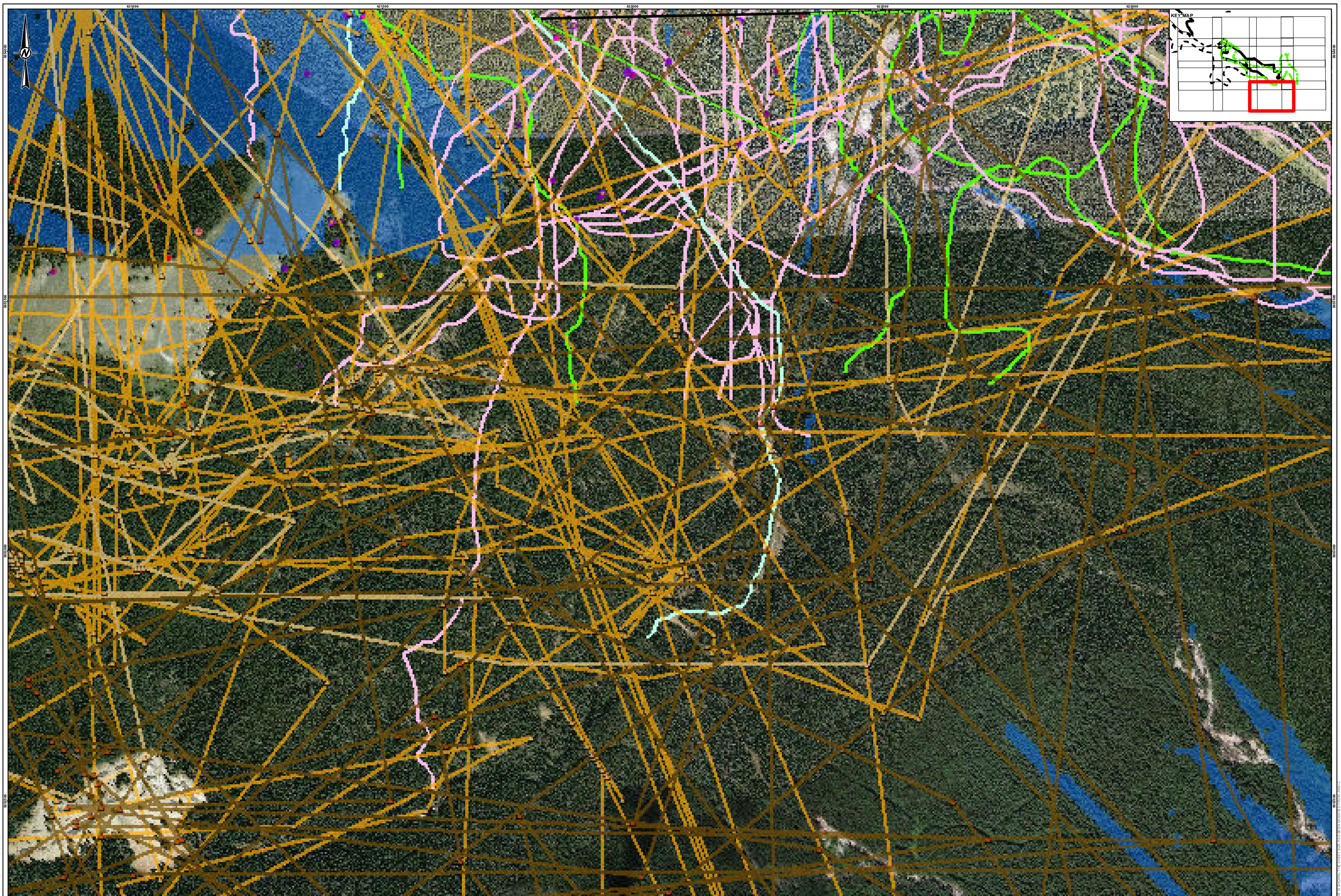
PROJECT
THREE SISTERS MOUNTAIN VILLAGE WILDLIFE CORRIDOR PROPOSAL

TITLE
BIOPHYSICAL DATA PERTAINING TO THE PROPOSED WILDLIFE CORRIDOR

PROJECT NO.	CONTROL	REV	FIGURE
18109757	7000	0	Page 78 of 957 A - 014

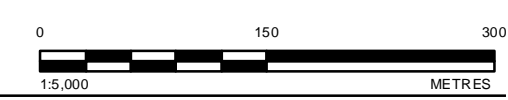
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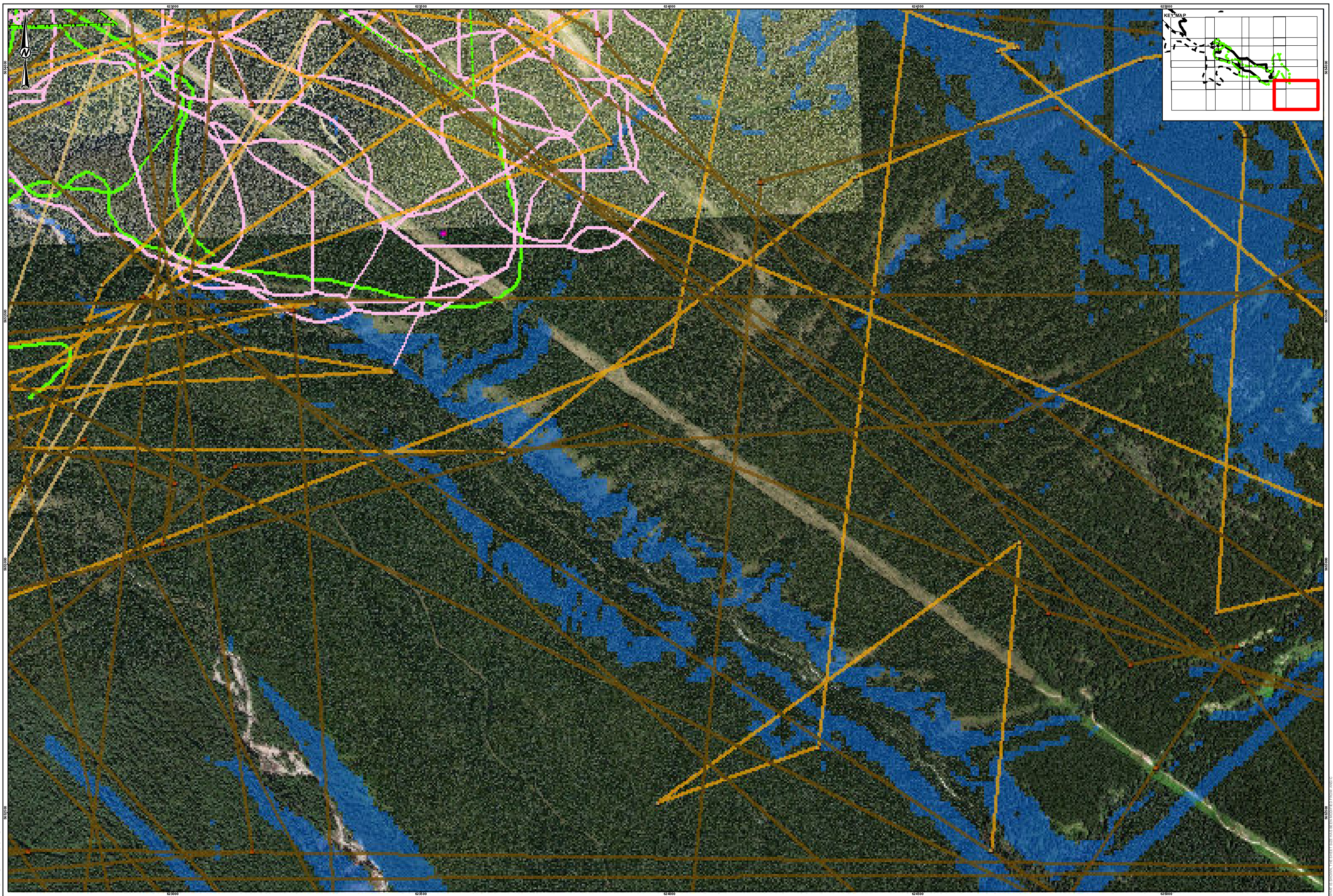
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LEGEND

MEAN CAMERA OBSERVATIONS PER DAY - BLACK BEAR AND GRIZZLY BEAR	DEER	WOLF	LYNX TRACK
○ 0.000 - 0.024	○ 0.000 - 0.091	○ 0.000	—
○ 0.025 - 0.072	○ 0.092 - 0.273	○ 0.003 - 0.020	—
○ 0.073 - 0.136	○ 0.274 - 0.543	○ 0.020 - 0.048	—
○ 0.137 - 0.240	○ 0.544 - 1.014	○ 0.048 - 0.103	—
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COUGAR	ELK	▲ COUGAR GPS COLLAR LOCATION	— TSMVPL PROPERTY BOUNDARY
○ 0.000	○ 0.000 - 0.005	▲ ELK GPS COLLAR LOCATION	— APPROVED WILDLIFE CORRIDOR
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○ 0.214 - 0.195	—	— GRIZZLY PATH BETWEEN SEQUENTIAL LOCATION	
		— COUGAR TRACK	



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CLIENT THREE SISTERS MOUNTAIN VILLAGE PROPERTIES LTD.	DATE 2020-01-20	PROJECT THREE SISTERS MOUNTAIN VILLAGE WILDLIFE CORRIDOR PROPOSAL
CONSULTANT	DESIGNED LD	TITLE BIOPHYSICAL DATA PERTAINING TO THE PROPOSED WILDLIFE CORRIDOR
GOLDER	PREPARED JE	PROJECT NO. 18109757
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