APPENDIX 17-A

Bird Baseline Report

Coffee Gold Mine:
Bird Baseline Report
Version 1.2

Prepared For
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ENVIRONMENTAL DYNAMICS INC.
Down to Earth Biology

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REVISION SUMMARY

Version No.	Date	Revision Notes	Revision Authors
1.0	1 April 2016	Draft report for review by Project team	Schonewille and others
1.1	21 September 2016	Final baseline report for Project Proposal, incorporation of 2016 field data (through June 2016)	Schonewille, MacLeod, Russell
1.2	12 March 2017	Update final baseline report to include all 2016 field data and incorporate revisions based on review by TH and WRFN.	Schonewille and MacLeod

EXECUTIVE SUMMARY

The Coffee Gold Mine (Coffee Project, the Project) is a proposed gold mine in west-central Yukon located 130 km south of Dawson. To receive authorization for the Project to proceed, it must be evaluated under the *Yukon Environmental and Socio-Economical Assessment Act* (YESAA), and obtain a Quartz Mining License, a Type A Water License, and other associated authorizations. During the environmental assessment process, potential Project effects on valued environmental and socio-economic components, including birds, are determined and mitigations are developed to reduce or eliminate potential adverse effects. To assess the potential effects of the proposed Project on birds, an understanding of baseline conditions in the Project area is required. In anticipation of this requirement, this bird baseline report was developed to summarize existing information on birds in the Project area and present the results of field surveys conducted in the area during 2013, 2014, 2015, and 2016. Field studies for birds included cliff-nesting raptor surveys, common nighthawk/short-eared owl stand-watch surveys, waterfowl surveys, point count surveys for upland birds, sharp-tailed grouse lek surveys, and the collection of incidental observations.

The Project area lies within the core of Bird Conservation Region (BCR) 4, the Northwestern Boreal Forest. The BCR 4 conservation plan identifies 77 priority bird species for conservation within the region of which 55 are known or expected to occur within the Regional Study Area (RSA). The RSA provides habitat for nine species at risk or species of conservation concern assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and listed under the federal *Species at Risk Act* (SARA). These species include: horned grebe, red-necked phalarope, peregrine falcon, common nighthawk, short-eared owl, olive-sided flycatcher, bank swallow, barn swallow, and rusty blackbird. These species have all been documented in the area or are expected to occur based on knowledge of regional bird distribution. The Project's potential species list includes 13 species which are on the Yukon Conservation Data Centre (Yukon CDC) Track List and 14 species on the Watch List.

The Project area contains a wide variety of habitats ranging from dense lowland riparian forest to sparsely vegetated alpine areas, and correspondingly, supports a wide variety of bird species. A total of 119 bird species are expected to occur in the RSA of which 88 have been documented to date, including seven species of conservation concern under COSEWIC and/or SARA (horned grebe, peregrine falcon, short-eared owl, common nighthawk, olive-sided flycatcher, bank swallow, and rusty blackbird). The diversity of birds within the Project area is representative of the avian community within the central Yukon; however, the lack of lakes and large waterbodies in the RSA is reflected by the absence of species associated with those habitats.

Important raptor habitats within the RSA include cliff faces along the Yukon and Stewart rivers and rock outcroppings (tors) in alpine and subalpine areas which provide nesting sites for golden eagle, peregrine falcon, and potentially gyrfalcon. Forested habitats also provide habitat for a number of other raptor species including several species of hawks and owls. Most raptor species found in the RSA are migratory and spend only the summer months in the area; however, some species such as northern goshawk, gyrfalcon, and most of the owl species may be year round residents.

Waterfowl (i.e. ducks, swans, and geese) and other waterbirds (e.g. loons, grebes, gulls) are relatively uncommon in the RSA due to the limited availability of lakes and large wetlands. Some species of waterfowl can be found in small wetlands within the Yukon River floodplain and along the Stewart River where suitable habitat is present. In the case of the Stewart River, a relatively large wetland complex on the margin of the Local Study Area (LSA), upstream of Maisy May Creek, had the greatest diversity of waterfowl with species such as trumpeter swan and Pacific loon encountered. Along the Northern Access Route (NAR), the Indian River and Dominion Creek valleys contain a combination of natural ponds and ponds created due to placer mining activity which also provide habitat for some species of waterfowl.

Shorebirds in the RSA occupy a variety of habitats including stream margins, wetlands, and alpine areas. The most common shorebird species detected were associated with wetland habitats and included Wilson's snipe, solitary sandpiper, and lesser yellowlegs. Spotted sandpiper is also relatively common along the margins of larger streams within the study area. A single surfbird was detected at the extreme southeast margin of the RSA and is notable given that this species is relatively uncommon within the alpine areas of the Dawson Range. Additional shorebird species associated with alpine habitats may also occur within the RSA despite not being detected during field surveys; examples of such species include American golden-plover and upland sandpiper. Alpine habitats are limited in extent within the RSA and located only at the southern margin of the area.

Upland bird species within the RSA include game birds (grouse, ptarmigan), common nighthawk, belted kingfisher, woodpeckers, and passerines (songbirds); passerine species include flycatchers, shrikes and vireos, jays and crows, larks, swallows, chickadees, kinglets, thrushes, waxwings, warblers, longspurs and sparrows, blackbirds, and finches. Densities of upland bird species are variable throughout the Project area with the highest density and species diversity occurring in areas disturbed due to forest fires and placer mining activities. Upland coniferous and riparian forest (coniferous, deciduous, and mixed) also had notable densities of birds and contained habitat specialists (e.g. Townsend's warbler) and species at the northern extent of the breeding range in Yukon (e.g. warbling vireo). Sharp-tailed grouse surveys completed along the NAR confirmed the presence of six probable leks in a variety of disturbed habitats including regenerating burns and areas in various stages of placer mining activity.

ACKNOWLEDGEMENTS

Bird baseline field studies for the Coffee Gold Mine were conducted by Access Consulting in 2013 and EDI Environmental Dynamics Inc. during 2014 – 2016. Regional biologists from Government of Yukon, Department of Environment (Environment Yukon) and Environment Canada provided valuable background information on regional bird populations and input into the design of field studies and baseline analysis. Mike Suitor (Environment Yukon, Dawson Regional Biologist) provided insight on field methods and survey areas during the sharp-tailed grouse lek surveys carried out as a component of the bird baseline surveys. Mr. Suitor also participated in an initial overflight of the Northern Access Route during 2014 to identify priority areas for sharp-tailed grouse lek surveys. Dave Mossop (Yukon College and regional raptor expert) shared knowledge on raptor and sharp-tailed grouse in the region. Kaminak's environmental monitors (Robert Farr, Derek Scheffen and Andrew Taylor) also assisted with the field components of a number of the breeding bird field surveys.

AUTHORSHIP

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TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

LIST OF PHOTOGRAPHS

ACRONYMS AND ABBREVIATIONS

BCR	Bird Conservation Region
BEM	Broad Ecosystem Mapping
Coffee Project, the Project	Coffee Gold Mine
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DRPC	Dawson Regional Planning Commission
EDI	Environmental Dynamics Inc
ELC	Ecological Land Classification
FNNND	First Nation of Na-cho Nyak Dun
GPS	Global Positioning System
Kaminak, the Company	Kaminak Gold Corporation
RSA	Regional Study Area
LSA	Local Study Area
NAR	Northern Access Route
SARA	*Species at Risk Act*
SFN	Selkirk First Nation
TH	Tr'ondëk Hwëch'in
Yukon CDC	Yukon Conservation Data Centre
WKA	Wildlife Key Area
WRFN	White River First Nation
YESAB	Yukon Environmental and Socio-economic Assessment Board

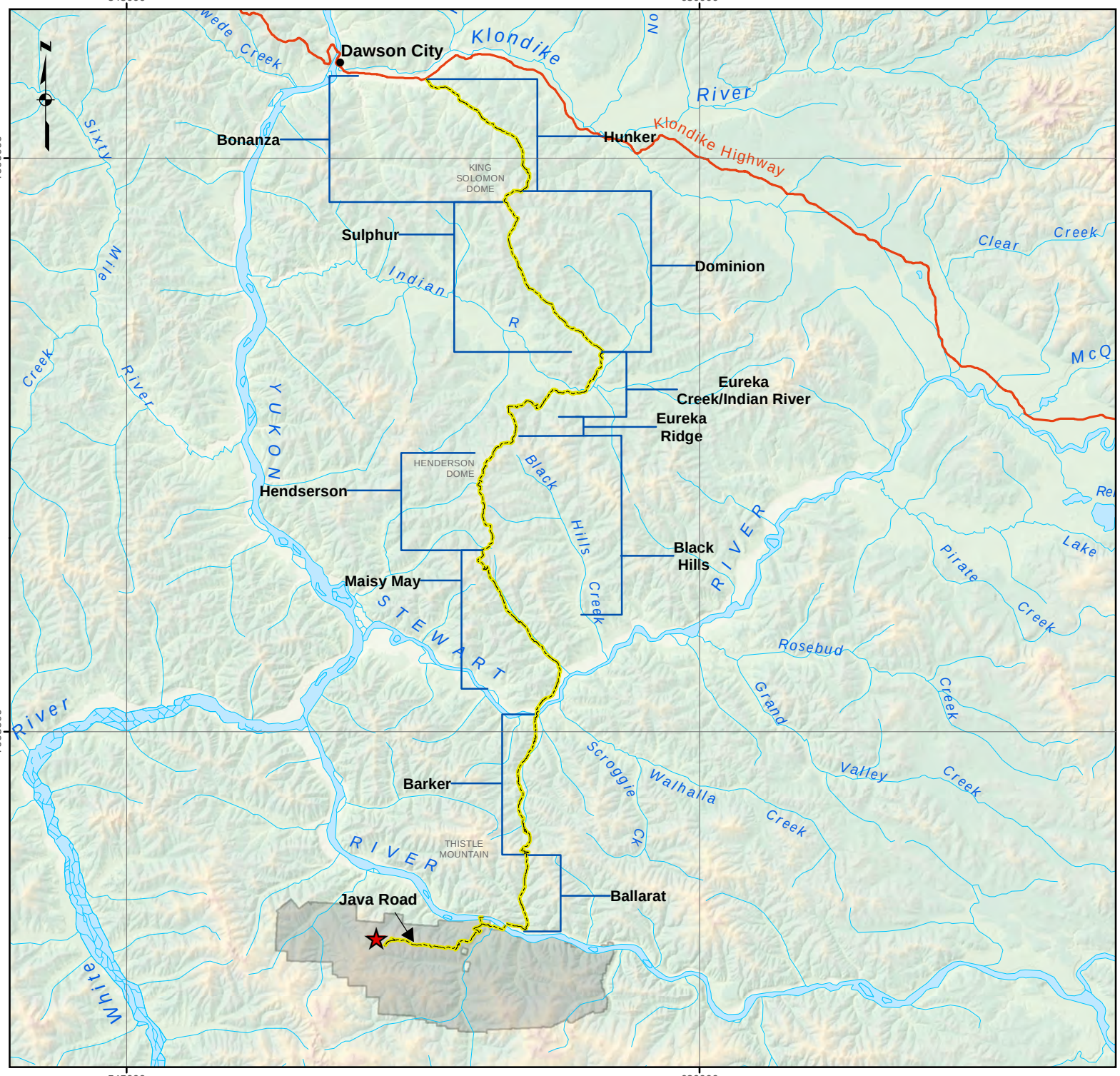
1 INTRODUCTION

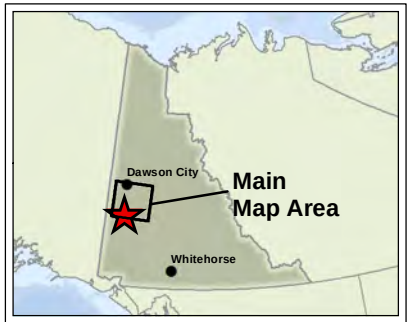
1.1 PROJECT OVERVIEW

The Coffee Gold Mine (Coffee Project; Project), fully owned by the Kaminak Gold Corporation, a wholly owned subsidiary of Goldcorp Inc. (Kaminak; the Company), is a proposed gold development project in west-central Yukon, located approximately 130 kilometres (km) south of Dawson (Figure 1-1). The Project (including the proposed access corridor) is located on Crown Land and overlaps the asserted area or established traditional territories of Tr'ondëk Hwëch'in (TH), Selkirk First Nation (SFN), First Nation of Na-cho Nyäk Dun (FNNND) and White River First Nation (WRFN).

The proposed Project will consist of an open pit gold mine using a cyanide heap leach process to extract gold from the ore. The Project will have a mine life of approximately 22 years, including construction, operation, and reclamation and closure, followed by post closure monitoring. The Project will include four open pits (Latte, Double Double, Supremo, and Kona) developed using standard drill and blast methods and mined using conventional shovel and truck methods. Other Project infrastructure will include waste rock storage facilities, a conventional heap leach facility, a processing plant, a camp site, an airstrip and other support infrastructure. The Project will be accessed by the Northern Access Route (NAR) from Dawson via a 214 km single-lane, gravel road with pull outs. The majority of the access is along existing road which will be upgraded.

The proposed Project will require an Executive Committee screening from the Yukon Environmental and Socio-economic Assessment Board (YESAB), a Quartz Mining License, and a Type A Water License from the Yukon Water Board, among other permits and licences. During the environmental assessment process, potential Project effects on valued environmental and socio-economic components are determined and mitigations are developed to reduce or eliminate potential adverse effects. To assess the potential effects of the proposed Project on birds, an understanding of baseline conditions relating to the bird species present in the Project area and important habitats for those species is required. In anticipation of regulatory requirements, Kaminak retained EDI Environmental Dynamics (EDI) to conduct baseline studies on the local bird population. This report summarizes current knowledge and baseline conditions of birds in the Project area in support of a Project Proposal submission to YESAB.





Legend

- Location of Coffee Gold Mine
- Proposed Route
- Highway
- Coffee Property

FIGURE: 1-1

Overview of the Coffee Project

Data Sources
Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Models (30 m and 90 m) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

Project data displayed is site specific. Survey data collected by EDI Environmental Dynamics Inc. (2015).

Disclaimer
This document is not an official land survey and the spatial data presented is subject to change.

0 10 20 30
KM

Map Reference Scale: 1:800,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

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MP	BS/AM	3/7/2017

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1.2 STUDY OBJECTIVES

This report summarizes baseline information related to birds within the Project area and was prepared in support of an environmental effects assessment for the Project. The objective of this report is to characterize the current status of the bird populations within the Project area using the best available information including published and unpublished scientific data, Traditional Knowledge, local knowledge, and baseline survey data. Specific objectives, as identified in YESAB's *Proponents Guide to Information Requirements for Executive Committee Project Proposal Submissions* (2005), are to:

- Describe abundance and distribution characteristics of major wildlife species (including birds) within the project area and vicinity (including rare/endangered species);
- Describe the habitat classifications used in the Project area, and any implications concerning the distribution and abundance of habitat types that may influence the Project;
- Provide a map showing the spatial arrangement of habitats of special interest, if applicable;
- Identify and describe transportation corridors and critical, key, and sensitive habitats. Include periods of habitat use in the Project area and vicinity;
- Identify any species listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the *Species at Risk Act* (SARA);
- Describe any special management requirements due to vulnerability, threatened, or endangered status; and
- Identify and describe any ongoing studies in the Project area.

1.3 SPATIAL BOUNDARIES

1.3.1 LOCAL STUDY AREA

The Local Study Area (LSA) for the bird baseline studies includes the proposed Project footprint and a buffer around proposed Project infrastructure including both the proposed mine site and access roads (Figure 1-2). Since the initiation of bird baseline studies in 2013, the study area has shifted several times to accommodate changes related to Project access. Specifically:

- In 2014, Kaminak was considering an access road connecting to the existing Freegold Road which would provide access to the mine site via Carmacks, Yukon. This is similar to the access road proposed by Casino Mining Corporation for their Casino Project, located approximately 31 km southeast of the Coffee mine site. Consequently, the 2014 baseline surveys included a possible road alignment extending southeast. This potential access road was dropped by Kaminak prior to the 2015 baseline surveys.
- In 2015, Kaminak was considering an access road through the Dawson Goldfields which would provide access to the mine site via Dawson, Yukon. This would ultimately become the currently

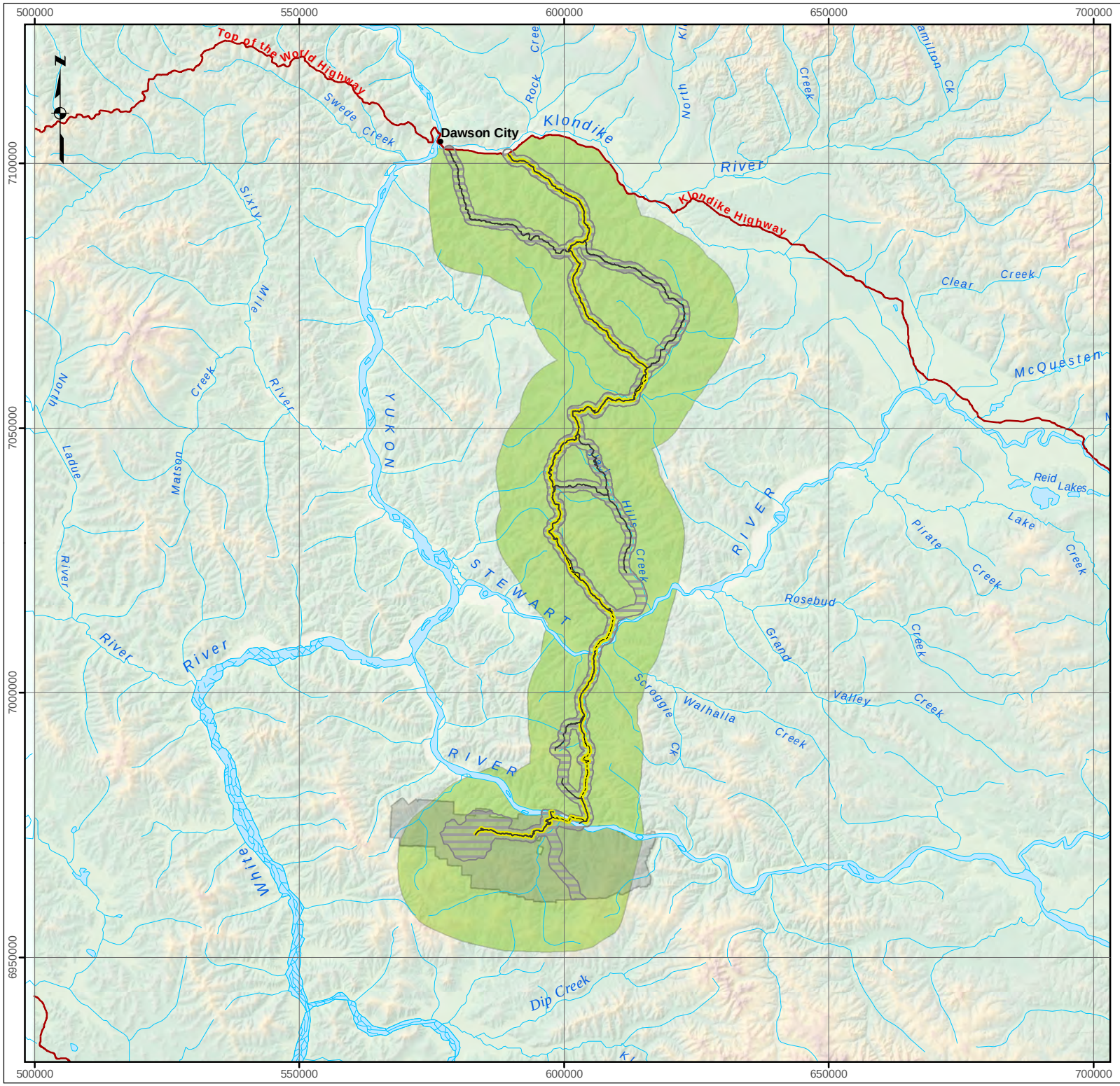
proposed NAR; however, when bird baseline surveys commenced in 2015, the final alignment was not yet determined. Thus, the 2015 baseline surveys included several road alignment options through the Goldfields.

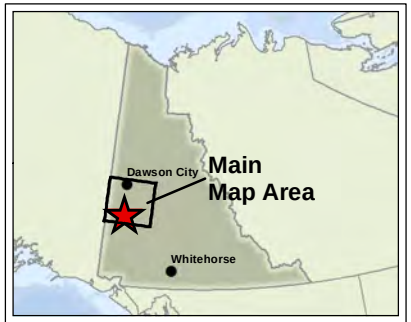
The final bird LSA includes the proposed mine site area, the existing road between Coffee Camp and the deposit (i.e., the Java Road), the proposed NAR including both the new sections of proposed road and sections of the road to be upgraded, as well as previous road alignments to Casino and through the Dawson Goldfields. Data collected along the alternate road alignments is maintained in this baseline report due to the potential to better describe and characterize the breeding bird communities within the vicinity of the Project. Around the mine site, the LSA is delineated based on the height of land while encompassing a minimum buffer of 1 km around the proposed development. Along the various road alignments, the LSA includes a 1 km buffer on either side of the road.

The majority of the baseline field studies and analyses for the Bird Baseline Report were located within the LSA. However, field surveys for some species did not extend to the full boundaries of the LSA. For those surveys, discussion of survey results in this report references the Survey Extent. Similarly, for some species groups, the survey extended outside of the LSA due to differences in response to potential disturbance — for example, the sharp-tailed grouse surveys were conducted within a 3 km buffer and the cliff-nesting raptor surveys within a buffer of approximately 5 km. All field surveys and baseline analyses were located within the Regional Study Area (RSA).

1.3.2 REGIONAL STUDY AREA

The RSA for the assessment of bird populations in the Coffee Project area is used to provide a broader context to observations within the LSA, and to incorporate the full extent of all bird baseline studies. The northern section of the RSA (north of the Yukon River) is based on a 10 km buffer around the various road alignment options through the Dawson Goldfields, bounded on the north by the Klondike Highway. It includes the Bonanza Creek, Hunker Creek, Sulphur Creek, Eureka Creek, Maisy May Creek, Black Hills Creek, Barker Creek, and Ballarat Creek drainages in their entirety. The Dominion Creek drainage is also mostly covered by the RSA, with the exception of the upper reaches located outside of the 10 km buffer. South of the Yukon River, the RSA is bounded by Independence Creek to the west, the Casino Project to the southeast, and encompasses the entire Coffee Creek watershed.





Legend

- Settlement/Community
- Highway
- Existing Access
- Proposed Route
- Coffee Property
- Local Study Area
- Regional Study Area

FIGURE: 1 - 2

Overview of Bird Study Area for the Coffee Project

Data Sources
Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Models (30 m and 90 m) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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KAMINAK GOLD CORPORATION EDI

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1.4 ECOLOGICAL DESCRIPTION

The Project is located in west-central Yukon, within the Boreal Cordillera Ecozone, and within that, the Klondike Plateau Ecoregion (Yukon Ecoregions Working Group 2004). Much of the RSA remained unglaciated during the most recent Ice Age, and as a result, the landscape is defined by smooth-topped ridges, dissected by steep-sided V-shaped valleys. Alpine and subalpine ridges within the RSA also show rock outcroppings called tors (bedrock remnants that remain after long periods of weathering) that are characteristic of unglaciated areas. Two of the most notable physical features in the RSA are the Yukon and Stewart rivers which both flow in an east-west direction through the study area. Numerous creeks can also be found throughout the RSA; however, the area does not contain any lakes, and open-water wetlands and ponds are mainly limited to the floodplains along the Yukon and Stewart rivers and reclaimed placer ponds in the Dawson Goldfields. Elevations within the RSA range from approximately 320 m along the Yukon River to over 1,700 m.

The southern portion of the RSA, including the proposed mine site, overlaps the northwestern extent of the Dawson Range; however, alpine habitats are very limited within the RSA and are confined to a small area in the southeast section of the RSA. The study area is primarily composed of boreal forest and subalpine habitats. Boreal forest habitats are generally dominated by white spruce (*Picea glauca*) and/or black spruce (*P. mariana*) forests, with mixed forests and stands of aspen (*Populus tremuloides*), balsam poplar (*P. balsamifera*), and/or birch (*Betula neoalaskana*) on warmer aspects, well-drained slopes, and valley bottoms. Steep south-facing slopes are dominated by deciduous vegetation including aspen and birch and/or grassland ecosystems, while stunted black spruce forests occur on cold, north-facing slopes due to near surface permafrost. Understory vegetation varies across aspect and slope position with nutrient-rich sites supporting willows, alders, and a variety of other shrubs, grasses, horsetails and forbs, while poorly drained depressions and upland sites include sphagnum mosses, tussock grass, sedges, shrubs, and lichens. This region has frequent forest fires, and as a result, forests are a mosaic of seral stands, with young, deciduous-dominated, and mixedwood stands more common than mature conifer-dominated stands in much of the RSA. Subalpine areas are characterized by dense shrub communities overlaying a well-developed feathermoss and lichen layer. Communities of scrub birch (*Betula glandulosa*), Labrador tea (*Rhododendron groenlandicum*), bog blueberry (*Vaccinium uliginosum*), lowbush cranberry (*Vaccinium vitis-idaea*), and crowberry (*Empetrum nigrum*) are common, with dwarf shrubs becoming more common with an increase in elevation. Alpine habitats are characterised by primarily unvegetated areas and sparsely vegetated tundra; tors and felsenmeer are also found on the high elevation ridges.

The northern portion of the NAR passes through the Dawson Goldfields. This area has a long history of placer mining activity with a number of active mine sites and extensive areas of disturbed ground. This disturbance is limited primarily to the valley bottoms with relatively intact and unmined vegetated areas on the hillsides. The disturbed areas include a wide range of reclaimed sites ranging from those in a very early successional state, dominated by bare ground and grasses to areas in a more advanced successional state where dense stands of young aspen, balsam poplar, and willow predominate.

1.5 INFORMATION SOURCES

The data sources incorporated into this baseline report include a combination of field data collected for the Project and other published and unpublished information sources from the Dawson region of the central Yukon. The data sources used to characterize bird occurrence and distribution in the Coffee Project study area are summarized in Table 1-1.

Table 1-1. Summary of existing sources of bird survey data incorporated into the Bird Baseline Report.

Title	Reference	Relevant Content
Notes on birds and their habitats, Klaza – Prospector mountain area, Dawson range, Yukon Territory	Frisch 1983	Bird survey results in the Dawson Range (no overlap with Project RSA)
Birds by the Dempster Highway	Frisch 1987	Region specific information on species distribution and habitat use
Birds of the Yukon Territory.[1]	Sinclair et al. 2003	Yukon wide information on species distribution and habitat use
Dawson planning region resource assessment report – fish and wildlife habitat	DRPC 2013	General information on bird presence and important habitats within the Dawson region.
Dawson Range — summary of spring 2013 sheep and alpine raptors habitat survey	O'Donoghue 2013	Survey of previously identified and new alpine raptor nest sites in the region (no overlap with Project RSA; confidential report)
Casino Project: bird baseline report	EDI 2013	Breeding bird baseline surveys and habitat modelling (adjacent to Project RSA)
Bird baseline study, Indian River valley.	Chevreux 2014	Breeding bird study aimed at comparing bird communities in mined and unmined areas
Roadside breeding bird survey data	USGS 2015	Survey data for the Goldfields route (93055; surveyed once during 2006)
Environment Yukon raptor nest database (confidential)	Environment Yukon 2014	Location information for previously documented raptor nests in the RSA.
Yukon wildlife key areas	Environment Yukon 2015	Areas used by wildlife in the RSA for important, seasonal life functions

[1] This includes the Birds of the Yukon Database which was queried to obtain existing bird records for the study area.

Field surveys for birds at the Coffee Project were conducted between June 2013 and June 2016. In 2013, a small number of point counts were conducted to develop a preliminary understanding of breeding songbirds and other upland bird species in the Project area. Between 2014 and 2016, several baseline surveys were conducted including aerial surveys for cliff-nesting raptors, stand-watch surveys for short-eared owl and common nighthawks, incidental aerial surveys for waterfowl, sharp-tailed grouse lek surveys, and point count surveys for breeding songbirds and other upland bird species (Table 1-2). In addition to focussed surveys, incidental observations of bird species within the RSA were collected each year. Field surveys for birds were conducted by Access Consulting (2013) and EDI (2014, 2015, and 2016).

Table 1-2. Overview of bird surveys conducted for the Coffee Project from June 2013 through June 2016

Survey Year	Aerial Raptor Surveys	Stand-Watch Surveys (short-eared owl and common nighthawk)	Aerial Waterfowl Surveys (incidental)	Sharp-Tailed Grouse Surveys	Point Count Surveys
2013					✓
2014	✓	✓	✓		✓
2015	✓	✓	✓	✓	✓
2016	✓	✓		✓	

1.6 FOCAL SPECIES

Baseline surveys for birds included both broad surveys for a wide range of species and targeted surveys for select species. Similarly, discussion of baseline conditions in this Bird Baseline Report includes a broad discussion of the species and habitats present, as well as more detailed discussion on specific species. Focal species selected for the field surveys and baseline reporting include both species of conservation concern and species with social, cultural, or economic value. They reflect recommendations received during Project consultation with Environment Canada, the Yukon Government, Department of Environment (Environment Yukon), local First Nations, and other stakeholders, as well as a review of relevant Traditional Knowledge. Consideration for the selection of focal species or species groups included:

- Species of conservation concern including both federal (COSEWIC and SARA), territorial (Yukon CDC), and regional (Bird Conservation Region (BCR)) listings;
- Species harvested by First Nations or other local harvesters in the RSA;
- Species selected as focal species for previous environmental assessments in the Yukon; and
- Species raised as a concern during Project consultation including:
    - Cliff nesting raptors (including golden eagle, peregrine falcon, gyrfalcon) — raised as a concern by Environment Yukon (Suitor 2015);
    - Sharp-tailed grouse — raised as a concern by Environment Yukon (Suitor 2015);
    - Species of conservation concern (including both COSEWIC and SARA-listed species, and priority species for the local BCR)— raised as a concern by Environment Canada (Environment Canada, pers. comm., 2015);
    - Game birds — raised as a concern by the TH Technical Working Group (TH TWG, pers. comm., 2016); the importance of game birds such as ducks, geese, swans, grouse and ptarmigan was also apparent in the local Traditional Knowledge (e.g., Dawson Indian Band 1988; Pearse and Weinstein 1988; Mishler and Simeone 2004; InterGroup Consultants Ltd. 2009; Calliou Group 2012; Tr'ondëk Hwëch'in 2012; Bates and DeRoy 2014).

In total 14 species or species groups were chosen as focal species for the Bird Baseline Report (Table 1-3). During the selection process several other species or species groups were considered as potential focal

species, but ultimately not carried forward; these species and the rationale for not including them as focal species are provided in Table 1-4.

Table 1-3. Focal species or species groups selected for the Bird Baseline Report.

Species/Species Group	Rationale for Selection as a Focal Species
Golden Eagle	Raised as a concern by Environment Yukon
American Kestrel	Listed as Imperiled in the Yukon (Yukon CDC)
Gyrfalcon	Raised as a concern by Environment Yukon
Peregrine Falcon	Raised as a concern by Environment Yukon; listed on Schedule 1 of the SARA and assessed as Special Concern by COSEWIC
Short-eared Owl	Listed on Schedule 1 of the SARA and assessed as Special Concern by COSEWIC
Horned Grebe	Assessed as Special Concern by COSEWIC
Red-necked Phalarope	Assessed as Special Concern by COSEWIC
Sharp-tailed Grouse	Raised as a concern by Environment Yukon
Upland Game Birds	Primary harvest species present within the RSA; raised as a concern by local First Nations
Common Nighthawk	Listed on Schedule 1 of the SARA and assessed as Threatened by COSEWIC
Olive-sided Flycatcher	Listed on Schedule 1 of the SARA and assessed as Threatened by COSEWIC
Bank Swallow	Assessed as Threatened by COSEWIC
Barn Swallow	Assessed as Threatened by COSEWIC; listed as Imperiled in the Yukon (Yukon CDC)
Rusty Blackbird	Listed on Schedule 1 of the SARA and assessed as Threatened by COSEWIC

Table 1-4. Additional species or species groups considered but not selected as focal species for the Bird Baseline Report.

Species/Species Group	Concern	Rationale for Exclusion from Focal Species
BCR 4 Priority Species with a high threat level	Raised as a concern by Environment Canada; identified as an information gap for the neighboring Casino Project (YESAB 2015)	The seven species assigned a high threat score are all alpine-associated species. Alpine habitats are found only in the southeastern extent of the RSA and no interaction with the proposed Project is anticipated. Refer to Section 2.1.
Other BCR 4 Priority Species	Raised as a concern by Environment Canada	A total of 55 species potentially present within the RSA are listed as priority species for BCR 4; selecting all 55 species as focal species was not practicable. Refer to Section 2.1
Other waterfowl species	Raised as a concern by local First Nations	Given that the RSA does not contain any lakes, habitat modelling for Horned Grebe can be used to provide perspective on effects to other waterfowl species.

2 BIRD SPECIES OVERVIEW

The Project area provides breeding habitat for a variety of bird species including waterbirds, waterfowl, raptors, shorebirds, game birds, and upland birds. The majority of bird species found within the study area are widespread throughout much of the central Yukon. However, portions of the Dawson Range are known to contain some unique species which are typically found further north. This includes species associated with alpine tundra habitats such as long-tailed jaeger, surfbird, and Smith's longspur (Frisch 1983).

Based on Project field surveys, previous studies in the region, and other background information on bird distributions within Yukon, a list of 119 species having the potential to occur within the RSA was compiled (Appendix A). This species list includes birds that are year-round residents in the region and those that are migratory and spend only the breeding season in Yukon. There are additional species that may use habitats within the RSA during spring and fall migration; however, these species were not included in the species list compiled.

Habitats within the RSA are variable and range from lowland riparian areas along the major river valleys, to rocky alpine peaks, and from dense subalpine shrublands to grasslands or open aspen forests on steep south-facing slopes. Due to this habitat diversity, there is a relatively diverse assemblage of species expected and/or known to occur within the study area. Overall, the diversity of birds in the RSA is reflective of the avian community in this portion of the central Yukon, although a few unique species were detected during the field surveys. Lakes and large bodies of standing water are not found in the RSA. There were, therefore, a lack of species which are found in this type of habitat, including many species of waterbirds and waterfowl.

Of the 119 species suspected to occur within the RSA, 88 were confirmed present during field surveys within the RSA during 2013, 2014, 2015, and 2016 (Appendix A). There are differences in habitat availability for the various bird species throughout the RSA and some are only known to occur, or are suspected to occur only within specific portions of the RSA. For example, within the area south of the Yukon River, a total of 109 species are expected to occur, of which 74 were confirmed present during the Project field surveys. Given the large size of the RSA, habitats are variable and not all species occur equally throughout the area.

2.1 BIRD CONSERVATION STRATEGY FOR BCR 4

The Project is located within Bird Conservation Region (BCR) 4, the Northwestern Boreal Forest. This BCR is comprised of an inland area of mountainous forest, taiga, shrub flats, and tundra which includes much of Yukon, a large portion of Alaska, portions of northern British Columbia, and a small portion of the Northwest Territories (Environment Canada 2013). This BCR contains a wide range of elevations and therefore vegetation communities are variable and range from lowland white spruce forests and fire-driven lodgepole pine at lower elevations to taiga, shrub flats, and alpine tundra at higher elevations. A total of

201 bird species are known to breed with BCR 4, including 174 species that are migratory, with the remainder being year-round residents (Environment Canada 2013).

A primary component of the bird conservation region strategy is the identification of priority species for conservation within each BCR. The process for the prioritization of species incorporates a wide range of factors including: population trends, population sizes, proportion of population/breeding range within the BCR, and in some cases, expert opinion. A total of 77 priority bird species are identified for BCR 4, of which 55 may be expected to occur within the Project RSA, and 40 of which were documented in the RSA during breeding bird surveys (Appendix A). A summary of Project observations combined with regional knowledge of each of the priority species expected or known to occur within the Project RSA is included in Appendix B.

Within BCR 4, bird population trend information is generally lacking and therefore the population objective for most species is to assess and maintain the current population size (Environment Canada 2013). However, there are a small number of priority species where the objective is to increase the population size by 50% due to evidence of regional declines. These species include: American wigeon, lesser scaup, lesser yellowlegs, olive-sided flycatcher, blackpoll warbler, white-crowned sparrow, and rusty blackbird. All seven of these species are documented and presumed to be breeding within the RSA.

An assessment of threats to the BCR 4 priority species included the categorization of each species into low, medium, high, and very high levels of relative threats. None of the species were determined to have a very high level of threat; however, seven priority species associated with alpine habitats were given a high threat score due to potential reductions in alpine habitat from climate change (Environment Canada 2013). These species include: white-tailed ptarmigan, American golden-plover, wandering tattler, whimbrel, surfbird, Smith's longspur, and gray-crowned rosy-finch. All of these species have the potential to occur within the RSA, although suitable alpine breeding habitat is limited to a small area in the southeastern section of the RSA. Likely as a result of the limited availability of alpine habitats, only two of these species (white-tailed ptarmigan and surfbird) have been detected to date (Appendix A) and both species appear to be relatively uncommon within the RSA.

2.2 YUKON CONSERVATION DATA CENTRE

There are 13 bird species potentially found in the RSA that are on the Yukon Conservation Data Centre's Track List (Yukon CDC 2015a; Table 2-1). This includes species which are apparently secure, vulnerable, or imperiled in Yukon due to a combination of factors including population trends, few occurrences/restricted range, severe threats, or other factors[1]. Of those species, gyrfalcon, sharp-tailed grouse, barn swallow and mountain bluebird are additional to the BCR 4 priority species listed above.

[1] Apparently Secure — uncommon but not rare, some cause for long-term concern due to declines or other factors. Vulnerable — at moderate risk of extinction or elimination due to restricted range, relatively few populations, recent and widespread declines, or other factors.

The Yukon CDC also maintains a Watch List of species that are considered to potentially be at risk in Yukon, although additional information is required to confirm status designations; 14 species found within the RSA are included on this list (Table 2-1). Summary information on the occurrence of Track List and Watch List bird species found with the RSA is included in Appendix B.

Table 2-1. Summary of bird species included on the Yukon Conservation Data Centre's Track List and Watch List which may occur within the Coffee Project RSA

Common Name	Latin Name	Track List	Watch List	Confirmed Present in the RSA
Horned Grebe	*Podiceps auratus*	Apparently Secure		✓
Trumpeter Swan	*Cygnus buccinators*	Apparently Secure		✓
Lesser Scaup	*Aythya affinis*		Apparently Secure	✓
Bufflehead	*Bucephala albeola*		Apparently Secure	✓
Golden Eagle	*Auila chrysaetos*		Vulnerable	✓
American Kestrel	*Falco sparverius*	Imperiled		✓
Gyrfalcon	*Falco rusticolus*		Vulnerable	
Peregrine Falcon	*Falco peregrinus*	Vulnerable		✓
Sharp-tailed Grouse	*Tympanchus phasianellus*	Vulnerable		✓
American Golden-Plover	*Pluvialis dominica*		Vulnerable	
Lesser Yellowlegs	*Tringa flavipes*		Apparently Secure	✓
Wandering Tattler	*Heteroscelus incanus*	Vulnerable		
Whimbrel	*Numenius phaeopus*	Vulnerable		
Surfbird	*Calidris virgate*	Vulnerable		✓
Short-eared Owl	*Asio flammeus*	Vulnerable		✓
Common Nighthawk	*Chordeiles minor*	Vulnerable		✓
Belted Kingfisher	*Ceryle alcyon*		Apparently Secure	
Olive-sided Flycatcher	*Contopus cooperi*		Vulnerable	✓
Yellow-bellied Flycatcher	*Empidonax flaviventris*		Apparently Secure	✓
Northern Shrike	*Lanius excubitor*		Vulnerable	
Bank Swallow	*Riparia riparia*	Apparently Secure		✓
Barn Swallow	*Hirundo rustica*	Imperiled		
Mountain Bluebird	*Sialia currocoides*		Vulnerable	
Townsend's Warbler	*Setophaga townsendi*		Vulnerable	✓
American Redstart	*Setophaga ruticilla*		Apparently Secure	✓
Smith's Longspur	*Calcarius pictus*		Vulnerable	
Rusty Blackbird	*Euphagus carolinus*	Vulnerable		✓

Imperiled — at high risk of extinction or elimination due to very restricted range, very few populations, steep declines or other factors.

2.3 COSEWIC AND SARA

Of the 119 species that are known or suspected to occur within the RSA, COSEWIC has assessed four species as Threatened[2] and five species as Special Concern[2] (Table 2-2). Of these nine species, five are listed on Schedule 1 of the SARA with the remaining three species not yet listed. A detailed description of the occurrence of each of these species within the RSA is included in Sections 3.3, 4.3 and 6.3.

Table 2-2. Summary of bird species listed by COSEWIC and SARA which may occur within the Coffee Project RSA

Common Name	Latin Name	COSEWIC Status (Year)	SARA Status	Confirmed Present in the RSA
Horned Grebe	*Podiceps auratus*	Special Concern (2009)	Not listed	✓
Peregrine Falcon	*Falco peregrinus*	Special Concern (2007)[1]	Schedule 1	✓
Red-necked Phalarope	*Phalaropus lobatus*	Special Concern (2014)	Not listed	
Short-eared Owl	*Asio flammeus*	Special Concern (2008)	Schedule 1	✓
Common Nighthawk	*Chordeiles minor*	Threatened (2007)	Schedule 1	✓
Olive-sided Flycatcher	*Contopus cooperi*	Threatened (2007)	Schedule 1	✓
Bank Swallow	*Riparia riparia*	Threatened (2013)	Not listed	✓
Barn Swallow	*Hirundo rustica*	Threatened (2011)	Not listed	
Rusty Blackbird	*Euphagus carolinus*	Special Concern (2006)	Schedule 1	✓

[1] The *anatum* subspecies was previously assessed as Endangered in 1978, reassessed as Threatened in 1999 and again reassessed as Special Concern in 2007.

[2]Threatened — a species which is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction. Special Concern — a species which may become threatened or endangered because of a combination of biological characteristics and identified threats.

3 RAPTORS

3.1 FIELD SURVEY METHODS

Baseline studies for raptors included a combination of aerial surveys (focused on cliff-nesting raptors) and targeted stand-watch surveys for short-eared owl (Table 3-1). To maximize species detections, bird baseline surveys also included the collection of incidental observations of raptors while flying in helicopters or while on the ground conducting surveys for upland birds (standardized point counts). Migratory birds detected outside of the breeding season were recorded but not included as breeding species within this baseline. For example, during the sharp-tailed grouse surveys in late April 2015 and 2016, a number of raptors were observed within the RSA; however, many of these species were likely migrating to breeding areas further north and as such were excluded from the bird species list compiled for this baseline.

Raptor presence was also studied within the Indian River Valley, immediately to the west of the Project LSA, from May to July 2014 (Chevreux 2014). The study included daytime roadside surveys and stand-watch surveys which also provided information on raptor species distribution in the study area.

Table 3-1. Summary of raptor surveys conducted for the Coffee Project

Survey	Survey Type	Survey Timing	Target Species	General Survey Area[1]
Cliff nesting raptors	Aerial	5–6 June 2014	Peregrine falcon, golden eagle	Mine Site
Short-eared owl	Stand-watch	23 June 2014	Short-eared owl	Mine Site
Cliff nesting raptors	Aerial	23 April 2015	Gyrfalcon	Mine Site and NAR
Cliff nesting raptors	Aerial	17, 20–21, 23 June 2015	Peregrine falcon, golden eagle	Mine Site and NAR
Short-eared owl	Stand-watch	16-19, 22 June 2015	Short-eared owl	Mine Site and NAR
Cliff nesting raptors	Aerial	13, 15 June 2016	Peregrine falcon, golden eagle	Mine Site and NAR
Short-eared owl	Stand-watch	15–16 June 2016	Short-eared owl	Mine Site

[1] Mine Site refers to suitable habitats along the Yukon River and south of the Yukon River; Northern Access Route refers to suitable habitats north of the Yukon River.

3.1.1 AERIAL SURVEYS FOR CLIFF NESTING RAPTORS

Aerial surveys for cliff-nesting raptors were conducted within the RSA in June 2014, April 2015, June 2015, and June 2016 to document the location and status of any nests that may be influenced by Project activities (Table 3-2, Figure 3-1). All aerial surveys were conducted by helicopter, and consisted of a visual search of suitable cliff-nesting habitats for raptors, particularly golden eagle, peregrine falcon, and gyrfalcon. Surveyors looked for signs of nesting, including adults flushing from a nest, nest platforms, whitewash, and orange

lichen growing on rocks. Any raptors or raptor nests observed during the survey were recorded using a GPS unit and photos were taken of any nests. Nest-specific information was collected including: species using the nest, number of adults present, number of eggs or young present, type of nest structure, habitat type, and aspect of the nest. The track file of the helicopter flight path was recorded to document the search area.

Prior to the commencement of raptor surveys for the Coffee Project, biologists compiled a list of all known raptor nests based on previous surveys conducted in the RSA including surveys conducted for the neighboring Casino Project (EDI 2013) and raptor surveys conducted by the Environment Yukon (YG 2015, O'Donoghue 2013). In addition to searching suitable habitats for new nest sites, the raptor surveys revisited all previously identified sites within 5 km of the proposed Project to document the current status of known nests in the survey area. Some of the previously identified nests were located by Environment Yukon during the 1970s and 1980s; the documented location of these nests were not always accurate, so during the Project surveys an observed nest site was assumed to be the same as an historic site if it was of the same species and located within 500 m of the historic site. Any nests beyond 500 m were generally assumed to be a different site.

Raptor surveys were generally limited to areas within 5 km of the proposed Project (including previously considered access routes that are now dropped from the Project) except along the Yukon River where the survey extent was extended in consultation with Environment Yukon (M. Suitor and B. McLean, pers. comm. 2014). As indicated in Table 3-1, the survey extent for the raptor surveys changed between 2014 and 2015/2016. The 2014 survey was limited to the southern sections of the RSA and included only those areas along and south of the Yukon River. Within this area, suitable cliff-nesting raptor habitat was found within two focal areas: the lowland cliffs along the Yukon River and lower Coffee Creek, and the subalpine and alpine tors and rock faces of the Dawson Range. In 2015, the survey area was expanded to encompass the proposed Northern Access Route — the 2015 raptor survey included the same geographical extent as 2014 with the addition of a 25 km section of the Stewart River. This portion of the raptor survey extent included the lowland cliffs along the Stewart River from approximately the Black Hills Creek confluence to the Brewer Creek confluence. Other than along the Stewart River, cliff-nesting raptor habitat north of the Yukon River is relatively limited. A cursory investigation of potential habitats in this area was conducted during late April 2015 and included the area around Thistle Mountain and the subalpine ridgeline to the west of the Black Hills Creek drainage; however, no suitable habitat was located (Figure 3-1). The 2016 raptor survey extent was the same as the 2015 extent with the exception of the high elevation habitats in the southeast of the RSA — the 2014 and 2015 surveys had included suitable habitats along a potential road connecting to the Freegold Road; this potential road was dropped in 2015 and therefore, not included in the 2016 survey extent.

Table 3-2. Aerial cliff-nesting raptor surveys for the Coffee Project

Date	Survey Effort	Location	Survey Conditions	Survey Speed	Height above Ground
5-6 June 2014	4.25 hrs	Coffee Property, proposed road alignment to Casino, Yukon River	Wind: 0–20 km/h Cloud Cover: 30–70% Temperature: 15°C Precipitation: localized light shower, otherwise none	15 km/hr	~25 m around tors, multiple passes along cliffs up to 300 m
23 April 2015	3.2 hrs	Coffee Property west of Coffee Creek, Yukon River, Thistle Mountain, Stewart River	Wind: 5–20 km/h Cloud Cover: 0% Temperature: -5°C Precipitation: none	15 km/hr	~25 m around tors, multiple passes along cliffs up to 300 m
17–23 June 2015	7.25 hrs	Coffee Property, Yukon River, Stewart River	Wind: 15–25 km/h Cloud Cover: 15–20% Temperature: 19–26°C Precipitation: none	15 km/hr	10-30 m around tors, multiple passes along cliffs up to 300 m
13, 15 June 2016	5.3 hrs	Coffee Property west of Coffee Creek, Yukon River, Stewart River	Wind: 12–28 km/h Cloud Cover: 30–60% Temperature: 12–18°C Precipitation: none	15 km/hr	10-30 m around tors, multiple passes along cliffs up to 300 m

3.1.2 SHORT-EARED OWL SURVEYS

Stand-watch surveys (or crepuscular scans) were conducted for short-eared owl in 2014, 2015, and 2016 (Table 3-1). Although this species at risk (Special Concern, Schedule 1) had not previously been documented in the RSA, there is potential for nesting within alpine and subalpine tundra habitats and wetlands, in addition to potential foraging within open burn areas. Conducted in combination with common nighthawk surveys (Section 6.1.2), short-eared owl surveys were conducted along existing roads within the Coffee Property (2014 – 2016) and along the NAR corridor (2015). Survey points were selected in high elevation areas and open burn habitats with good vantage points, and were spaced at a minimum of 1.6 km[3]. Each survey point was surveyed for ten minutes, where a biologist used binoculars to scan for foraging birds and locate any perch or nest sites. Surveys were conducted starting from one hour before sunset to approximately one hour before sunrise (as late as viewing conditions were suitable, i.e. not too dark). The following information was recorded for each survey point: GPS coordinates, date, start and end time, general weather conditions (cloud cover, air temperature, and wind), habitat description (forest cover species, stand age, etc.), and site photos.

Five points were surveyed on June 23, 2014, adjacent to the proposed mine site to determine if the species occurs within the proposed development area (Figure 3-1). Surveys in 2015 included an additional nine survey points in the mine site area (June 22, 2015) as well as forty-two survey points along the proposed NAR (June 16–19, 2015). Surveys in 2016 included seven survey points in the mine site area (June 15–16,

[3] This spacing was used to allow for consistent methods to common nighthawk surveys conducted during 2014 and 2015 by the Canadian Wildlife Service as per Sinclair, 2016, pers. comm.

2016). All short-eared owl survey points were completed in combination with species specific surveys for common nighthawks due to the similarity in methods.

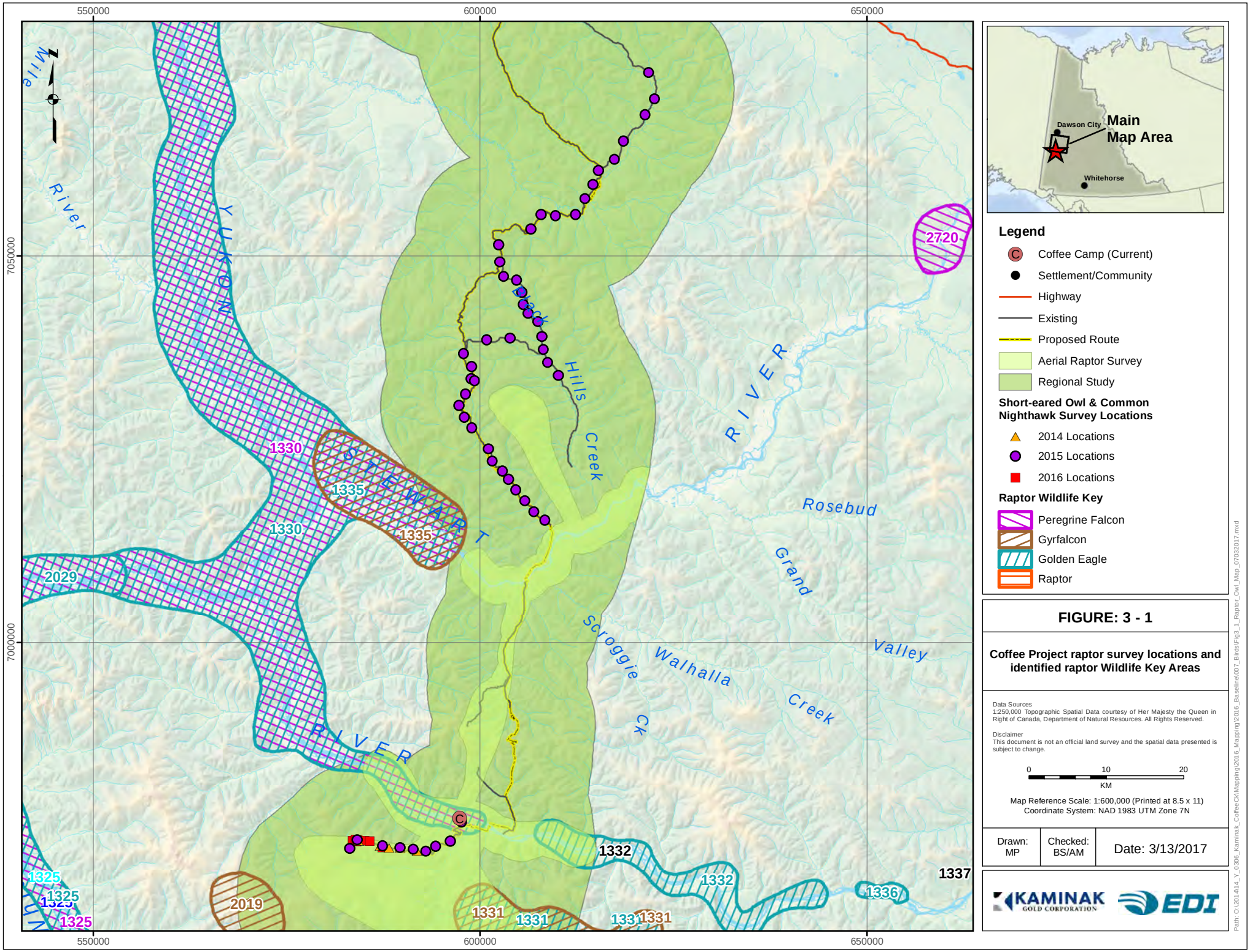


FIGURE: 3 - 1

Coffee Project raptor survey locations and identified raptor Wildlife Key Areas

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Disclaimer
This document is not an official land survey and the spatial data presented is subject to change.

0 10 20
KM

Map Reference Scale: 1:600,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn: MP	Checked: BS/AM	Date: 3/13/2017

KAMINAK GOLD CORPORATION EDI

Path: O:\2014\14_Y_0306_Kaminak_CoffeeCk\Mapping\2016_Mapping\2016_Baseline\007_Birds\Fig3_1_Raptor_Owl_Map_07032017.mxd

3.2 GENERAL RESULTS

Sixteen raptor species are expected to occur within the RSA (Appendix A), including both golden and bald eagle, nine hawk or falcon species, and five species of owls. Raptors within the RSA include both migratory species and year-round residents, and can be found in a variety of habitat types ranging from alpine and subalpine tors and rock faces (e.g., gyrfalcon), to rocky cliffs above the Yukon and Stewart rivers (e.g. peregrine falcon, golden eagle), to forested habitats (e.g. northern goshawk, great horned owl). Additionally, although actually passerines, common ravens are often considered 'functional raptors' (e.g. Poole and Bromley 1988) since they nest on cliffs, interact with raptors for nesting territories and build stick nests which can be used by raptors for nests.

Of the 16 expected raptor species, ten were detected during field surveys conducted for the Project, including: golden eagle, bald eagle, northern harrier, sharp-shinned hawk, northern goshawk, red-tailed hawk, American kestrel, peregrine falcon, great horned owl and short-eared owl. Another raptor survey within the Indian River Valley (Chevreux 2014) documented a similar list of six raptor species, including: bald eagle, northern harrier, red-tailed hawk, golden eagle, American kestrel, and great horned owl. More than 30 visual observations of raptors were made in the RSA between 2014 and 2016; of these, peregrine falcon and great horned owl were the most commonly observed species. During Project surveys, breeding was confirmed for golden eagle, peregrine falcon and great horned owl; however it is expected that most of the raptor species present likely nest in the RSA. Common raven were also detected in the RSA on numerous occasions and were confirmed nesting in the area.

The remaining six raptor species potentially present in the RSA include: merlin, gyrfalcon, osprey, northern hawk owl, great grey owl and boreal owl. While these species have not been documented in the RSA during the breeding season, other studies in the surrounding region have records for some of these species. Studies from the neighboring Casino Project have documented osprey, northern hawk owl, and boreal owl (EDI 2013), while gyrfalcon was documented in the Dawson Range by O'Donoghue (2013). Merlin and gyrfalcon were also observed by Frisch (1983) in a 1982 study of the Dawson Range.

Raptor surveys documented a total of 42 nests within 25 nest areas (Table 3-3). These include six golden eagle nest areas, five peregrine falcon nest areas, four common raven nest areas, and 10 nest areas where the species was unknown. Common raven nests are included in raptor nest sightings because ravens can use the stick nests of golden eagles and vice versa. The following bullets include results of the aerial surveys for cliff-nesting raptors within each of the three focal areas:

- Yukon River: The cliffs along the Yukon River are very extensive (Photo 3-1) and provide suitable habitat for cliff nesting raptors. During surveys in all years, numerous inactive stick nests and perch sites were observed. In 2014, three active/occupied raptor nests were identified, including one stick nest of a common raven and two golden eagle nests. During the 2015 surveys, the only active nest observed was a common raven, and similarly in 2016, only one common raven nest was observed active. Peregrine falcons were observed in the area in all three years. No active nest sites have been located to date; however given repeat observations of

peregrine falcons in certain areas (including observations of territorial behaviour), the extensive and complex nature of cliffs in this area (making nest location challenging) and given previously documented nests in the area (e.g., Environment Yukon 2014; Environment Yukon 2015; D. Mossop, pers. comm., 2015) nesting is suspected. Three peregrine falcon nest areas have been delineated along the Yukon River, of these, based on survey observations, one was assumed to be occupied in 2014, and two were assumed occupied in 2015 and 2016.

- Alpine and Subalpine Tors: Suitable nesting habitats in alpine and upper subalpine tors are only found in a few areas at the southern extent of the RSA. Several whitewash and potential perch sites were recorded during the baseline surveys along with one golden eagle nest area. No active nests were observed during Project surveys, and no confirmed observations of gyrfalcon have been made to date.
- Stewart River: The cliffs along the Stewart River are less extensive than those on the Yukon River (Photo 3-2) but do appear to provide suitable nesting habitat for cliff nesting raptors, particularly peregrine falcons. Nest areas for golden eagle, peregrine falcon and common raven have been documented in this area. In 2015, one occupied common raven nest was observed, while in 2016, two active peregrine falcon nests and one active common raven nest were located.
- Along the Northern Access Route, a desktop investigation of imagery indicated that suitable cliff nesting raptor habitat appeared to the limited to the area around Thistle Mountain (Ballarat Creek headwaters) and the subalpine ridge which represents the drainage divide between Black Hills and Maisy May creeks. These areas were investigated during late April 2015 and although some rocky outcroppings were observed in both areas (Photo 3-3, Photo 3-4), the potential for cliff nesting raptors appeared to be very low and no evidence of use by golden eagle, peregrine falcon or gyrfalcon was noted.

Several Wildlife Key Areas (WKAs) for raptors overlap the RSA, including WKAs for golden eagle, gyrfalcon, and peregrine falcon (Figure 3-1). Specific WKAs that overlap the RSA include:

- WKA 1335 (golden eagle and gyrfalcon) — nesting habitat along the Stewart River bluffs along the western edge of the RSA, downstream towards the Yukon River confluence.
- WKA 1330 (golden eagle and peregrine falcon) — nesting along the Yukon River bluffs from Coffee Creek downstream to a point well below the RSA. Also overlaps the northwest corner of the RSA near Dawson.
- WKA 1332 (golden eagle and riparian raptor) — nesting habitat along the Yukon River bluffs in the eastern section of the RSA, upstream of Excelsior Creek.
- WKA 1331 (golden eagle and gyrfalcon) — alpine and subalpine nesting habitats in the southeast of the RSA and including the upper Excelsior Creek, Canadian Creek and Patton Peak areas.
- WKA 2019 (gyrfalcon) — nesting habitat along the southwest border of the RSA in the alpine area between the headwaters of Independence Creek and Mount Maclennan.
- WKA 2717 (raptor) — nesting habitat in the Australian Hill area along the northern edge of the RSA.

Photo 3-1. Example of cliff nesting habitat on the Yukon River (April 24, 2015).

Photo 3-2. Example of cliff nesting habitat on the Stewart River (June 20, 2015).

Photo 3-3. Example of rocky outcroppings along the subalpine drainage divide between Black Hills and Maisy May creeks north of the Stewart River; note the limited potential for cliff nesting raptors (April 23, 2015).

Photo 3-4. View of the summit of Thistle Mountain near the headwaters of Ballarat Creek; note the lack of suitable cliffs or rocky outcrops for cliff nesting raptors (April 20, 2015).

Table 3-3. Known cliff-nesting raptors nest sites within or adjacent the Coffee RSA

Location[1]	Nest area	Associated nest site(s)	Nest site source	Site description	Species[2] (suspect species)	Habitat type	Survey observations[3]
Subalpine/ Alpine areas south of Yukon River	001	YG1244 (2)	Environment Yukon	Two old stick nests in very poor shape. Located 790 m SW of YG1244 but based on available habitat assumed to be the same site.	Golden eagle	Tors	2014 – Inactive 2015 & 2016 – Not surveyed
	N/A	YG1245	Environment Yukon	Surveyed in 2014 & 2015, but no evidence of raptors was found within 500 m.	Golden eagle	Alpine/ Subalpine	2014 & 2015 – Not located 2016 – Not surveyed
Yukon River	002	2014-037 (3)	2014 Survey	Three stick nest aligned vertically along ridge\cliff. Nest Area is actually located just outside RSA.	Golden eagle	Cliff	2014 – Active: middle of three nests had an adult golden eagle incubating 2015 & 2016 – Not surveyed
	N/A	YG1257	Environment Yukon	Surveyed in 2014 & 2015, but no nest located within 500 m.	Golden eagle	Cliff	2014 & 2015 – Not located 2016 – Not surveyed
	003	2015-068	2015 Survey	One stick nest	Unknown (common raven)	Cliff	2014 – Not located 2015 – Inactive 2016 –Not surveyed
	004	2016-237	2016 Survey	One stick nest	Unknown	Cliff	2014 & 2015 – Not located 2016 – Inactive
	005	YG1258	Environment Yukon	One stick nest	Golden eagle	Cliff	2014, 2015, 2016 – Inactive
	006	2014-041 (2), 2014-042, 2016-228	2014 & 2016 Surveys	Four stick nests, all confirmed or suspected common raven nests, located on the same cliff face (all within 600 m)	Common raven	Cliff	2014 & 2015 – Inactive 2016 – Active: Nest site 2016-228
	007	N/A	2015 Survey	One suspected nest location and repeat observations of peregrine falcon in 2015 & 2016, including observations of territorial behaviour. Cliffs are extensive.	Peregrine falcon	Cliff	2014 – Not located 2015 & 2016 – Nest Area Occupied: Peregrine falcon observed in April & June 2015 and June 2016, included pair defending the site in 2015, and pair circling the site in 2016 (specific Nest Site not located).
	008	2014-W26	2014 Waterfowl Survey	Large stick nest in spruce tree on island in the Yukon River.	Unknown (bald eagle)	Tree	2014 & 2015 – Inactive 2016 – Not surveyed

Location[1]	Nest area	Associated nest site(s)	Nest site source	Site description	Species[2] (suspect species)	Habitat type	Survey observations[3]
Yukon River	009	2014-031 (2), 2015-044	2014 & 2015 Surveys	Three large stick nests, all confirmed or suspected golden eagle, located within 1.8 km.	Golden eagle	Cliff	2014 – Occupied: Nest site 2014-031 had adult golden eagle perched at nest site 2015 – Inactive 2016 – Inactive
	010	YG1260	Environment Yukon	YG nest located in this area. Project surveys found a couple of potential nest sites and a peregrine falcon was observed in 2014. Cliffs are extensive.	Peregrine falcon	Cliff	2014 – Nest Area Occupied: Peregrine falcon observed (active Nest Site not located) 2015 & 2016 – Inactive
	011	YG1259, 2016-216, 2016-218, 2016-223	Environment Yukon, 2016 Survey	Four stick nests, confirmed or suspected common raven, located on the same cliff face.	Common raven	Cliff	2014 – Active: Nest site YG1259 had 3 feathered nestlings 2015 & 2016 – Inactive
	012	YG1261	Environment Yukon	Large stick nest	Golden eagle	Cliff	2014 & 2015 & 2016 – Inactive
	013	2015-029, 2015-030	2015 Survey	Two stick nests, confirmed or suspected common raven, located on the same cliff face (within 300 m)	Common raven	Cliff	2014 – Not located 2015 – Active: Nest site 2015-030 had 1 nestling 2016 – Inactive
	N/A	YG1263	Environment Yukon	Surveyed in 2014, 2015 & 2016 but no evidence of raptors within 500 m.	Peregrine falcon	Cliff	2014 & 2015 & 2016 – Not located and no evidence of peregrine falcon
	N/A	YG1263	Environment Yukon	Surveyed in 2014, 2015 & 2016 but no evidence of raptors within 500 m.	Peregrine falcon	Cliff	2014 & 2015 & 2016 – Not located and no evidence of peregrine falcon
	014	2014-W23	2014 Waterfowl Survey	Large stick nest in a tree on an island in the Yukon River; originally located during a moose survey (Access 2011)	Unknown (bald eagle)	Tree	2014 & 2015 & 2016 – Inactive
	015	2014-006	2014 Survey	One stick nest	Unknown (common raven)	Cliff	2014 – Inactive 2015 – Not located 2016 – Inactive
	N/A	YG1264	Environment Yukon	Surveyed in 2014, 2015 & 2016 but no evidence of raptors within 500 m.	Golden eagle	Cliff	2014 & 2015 & 2016 – Not located

Location[1]	Nest area	Associated nest site(s)	Nest site source	Site description	Species[2] (suspect species)	Habitat type	Survey observations[3]
Yukon River	016	YG1265	Environment Yukon	One stick nest located within 207 m of YG1265 – assumed to be the same site.	Golden eagle	Cliff	2014 & 2015 – Not surveyed 2016 – Inactive
	017	N/A	2015 Survey	One suspected nest site and repeat observations of peregrine falcon at this site in 2015 & 2016. Cliffs are extensive.	Peregrine falcon	Cliff	2014 – Not located 2015 & 2016 – Occupied: Peregrine falcon observed (specific Nest Site not located)
Stewart River	100	2016-270	2016 Survey	Nest site is on a grassy ledge just above nest site 2015-118. The peregrine falcon nest wasn't identified until 2016 but a peregrine falcon was seen here in 2015.	Peregrine falcon	Grassy/ rocky ledge	2014 – Not surveyed 2015 – Occupied: peregrine falcon observed 2016 – Active: 1 adult and 3 downy young present
	101	2015-116	2015 Survey	One stick nest	Unknown	Cliff	2014 – Not surveyed 2015 & 2016 – Inactive
	102	2015-106	2015 Survey	One stick nest	Unknown (common raven)	Cliff	2014 – Not surveyed 2015 & 2016 – Inactive
	103	2015-022, 2015-105 (2)	2015 Survey	Three large stick nests located within 800 m	Unknown (golden eagle)	Cliff	2014 – Not surveyed 2015 & 2016 – Inactive
	104	2015-099 (4), 2016-284, 2016-285	2015 Survey, 2016 Survey	Six stick nests, confirmed or suspected common raven, present within 600 m	Common raven	Cliff	2014 – Not surveyed 2015 – Occupied: nest 2015-099 had 2 adults present during April survey. 2016 – Active: Nests vacant in June survey but recently fledged young were observed in Nest Area.
	105	2015-118 (2)	2015 Survey	Two stick nests located vertically on same cliff.	Unknown	Cliff	2014 – Not surveyed 2015 & 2016 – Inactive
	106	2016-283	2016 Survey	Confirmed nest site is located on a grassy/rocky ledge. A couple of alternative nest sites/perches also identified in the Nest Area.	Peregrine falcon	Grassy/ rocky ledge	2014 – Not surveyed 2015 – Inactive 2016 – Active: 1 adult and 4 eggs present

Location[1]	Nest area	Associated nest site(s)	Nest site source	Site description	Species[2] (suspect species)	Habitat type	Survey observations[3]
Stewart River	107	2016-281	2016 Survey	One stick nest	Unknown (common raven)	Cliff	2014 – Not surveyed 2015 – Not located 2016 – Inactive

1 Note that maps of raptor nest sites and search effort are not included in this report at the request of Environment Yukon (M. Suitor and B. McLean, pers. comm. 2014) due to the sensitive nature of these important areas. This information has been provided to the Yukon Government through research permit reporting for the surveys.

2 The nest sites provided by Environment Yukon were identified to species previous to the Project surveys. For nests identified by Project biologists, active nests were identified to species, inactive nests were described as 'Unknown' species and the suspected species was identified based on nest structure when possible.

3 Not surveyed = Nest Area not covered by the survey. Not located = Nest Area was covered by the survey but nest wasn't found. Inactive = Nest was observed but no sign of raptors. Active = Breeding activity detected; nest contained an incubating adult, eggs, or nestlings. Occupied = Adult birds present but no breeding activity detected.

3.3 SPECIES SPECIFIC RESULTS

Of the raptor species observed or expected to occur within the RSA, five are listed as species of concern within Yukon (Yukon CDC) or Canada (COSEWIC, SARA) — see Section 2. These five species are discussed in more detail in the following sections.

3.3.1 GOLDEN EAGLE

The golden eagle is a relatively common and widespread raptor of alpine and Arctic tundra landscapes across Yukon from the Coast Mountains to the North Slope. They can be seen foraging over tundra slopes in search of their primary prey, Arctic ground squirrel. The golden eagle is not listed on COSEWIC or SARA, but is a priority species for conservation in BCR 4 (Environment Canada 2014) and listed as Vulnerable in Yukon (Yukon CDC 2015b). As of June 2015, the Yukon CDC considers that more information is needed on golden eagle before a conservation status can be determined (Yukon CDC 2015b).

There are few records of golden eagles overwintering in Yukon, and accounts are limited to the southern and central Yukon (Sinclair et al. 2003). The first spring migrants arrive in early March or even late February, with the peak of spring migration around the last week of March. Nesting is almost exclusive to cliff faces in remote mountainous terrain; however, two nests in trees have also been reported. Golden eagles often reuse and add to their nests each year, forming large stick nest structures over time. They may also have several nests in their territory, using different nests in successive years. Nesting occurs from southern to northern Yukon, where eggs are laid in May (in the south) with hatching in the first week of June. Nestlings are often still in the nest in early August. In the fall, the last birds have left the central Yukon by the end of September (latest observation from October 17, 1980). In southern Yukon, there is a more concentrated fall migration in mid-October.

During the Project baseline studies, six golden eagle nest areas were documented along the Yukon and Stewart rivers and the alpine and subalpine tors in the southeastern section of the RSA (Table 3-3). Two active/occupied golden eagle nests were located along the Yukon River in June 2014 — at the first site, an adult golden eagle was observed incubating (Photo 3-5), at the second site, an adult golden eagle was observed perched at a nest site (although no eggs or young were present in the nest). Both active sites had inactive alternative nest sites nearby. The 2015 and 2016 raptor surveys did not detect any active nests or adults in the RSA. During a study of the Indian River Valley, Chevreux (2014) observed three golden eagles on the edge of the study area from late-May to mid-June, flying above the hillsides that border the valley. Chevreux (2014) concluded that there is no nesting or foraging habitat within the Indian River study area, and birds were likely just passing through.

Photo 3-5. Adult golden eagle sitting on an active nest on the cliffs along the Yukon River upstream of Coffee Creek (June 6, 2014).

3.3.2 AMERICAN KESTREL

The American kestrel is a relatively uncommon and widespread raptor throughout much of Yukon. This species is not listed on COSEWIC or SARA, but is a priority species for conservation in BCR 4 (Environment Canada 2014) and listed as Imperilled in Yukon (Yukon CDC 2015b). The kestrel is listed as imperilled due to evidence of a serious decline based upon decreases in nest box occupancy in Yukon (Sinclair et al. 2003). The species is not well monitored by breeding bird surveys or other long term data sets currently in place in the region, thus nest box occupancy provides the best available information on population trends in Yukon.

American kestrel is found in a variety of habitat types during the breeding season ranging from meadows and wetland to old burns, open forests and subalpine areas (Sinclair et al. 2003). This species is a secondary cavity nester and therefore requires tree cavities that are excavated by other species, particularly woodpeckers such as northern flicker.

During Project baseline studies, there were two detections of an adult American kestrel (June 22, 2015 and August 4, 2015) along lower Ballarat Creek (Yukon River floodplain). Despite the limited number of detections, this species is likely to occur throughout the RSA as there is extensive habitat present in the form of old burns, open forests and subalpine areas.

American kestrel is a confirmed breeding species in the Dawson region (Sinclair et al. 2003) and is relatively common along the Dempster Highway (Frisch 1987). Stand watch surveys conducted in the Indian River valley during 2014 by Chevreux (2014) included five detections of American kestrel, although it is unknown if this represented five different individuals or multiple observations of the same individual(s).

3.3.3 GYRFALCON

The gyrfalcon is a year-round resident in Yukon, and a widespread breeder of alpine and Arctic tundra habitats. In Yukon they occur from the Coast Mountains to the North Slope, with the highest densities on the North Slope and the lowest densities in the east along the border with the Northwest Territories (Sinclair et al. 2003). The gyrfalcon is not listed on COSEWIC or SARA, but is listed as Vulnerable in Yukon (Yukon CDC 2015b). As of June 2015, the Yukon CDC considers that more information is needed on gyrfalcon before a conservation status can be determined (Yukon CDC 2015b).

Gyrfalcons rely heavily on the abundance of the three Yukon ptarmigan species, and therefore their densities are closely linked with ptarmigan densities and population cycles (Sinclair et al. 2003). In the fall, they may also feed on waterfowl at important staging areas. Nest sites are always on cliff ledges, often protected from above by cliff overhangs. They also use the abandoned stick nests of golden eagle and common raven. Eggs typically hatch in the beginning of May in their southern range and up to three weeks later in the far north. Current information from monitoring elsewhere in Yukon indicates that gyrfalcon numbers are declining in the region; presumably due to destabilization of the ptarmigan population cycle (Mossop 2011).

During the Project baseline studies to date, there have not been any confirmed sightings of gyrfalcon; however, several potential perch sites were observed on rocky outcroppings (tors) in the alpine and higher elevation subalpine areas of the RSA (Photo 3-6). These observations have been on small rock ledges with some whitewash present, but no nests were identified. Common ravens have been observed on these tors occasionally so some of the whitewash observed at potential gyrfalcon perch sites could in fact be from common ravens.

Suspected gyrfalcon nests were documented south of the RSA for the Casino Project (EDI 2013), further south in the Dawson Range by Frisch (1983) and also along the Dempster Highway where Frisch (1987) noted that it was 'not an uncommon resident'. In addition to these information sources Environment Yukon conducted a survey of alpine raptors in portions of the Dawson Range in conjunction with a sheep survey in the area during 2012 and 2013 (O'Donoghue 2013). Although this survey extent did not overlap with the Project RSA, the survey did locate one active gyrfalcon nest on tors and evidence of alpine raptors (whitewash) in a number of locations.

Photo 3-6. Raptor perch site (note whitewash) in subalpine/alpine tor habitat at the southern extent of the Coffee Gold Mine LSA (April 23, 2015).

3.3.4 PEREGRINE FALCON

The peregrine falcon is listed as Special Concern (COSEWIC 2007c). This species is also included on Schedule 1 of SARA, is considered Vulnerable in Yukon, and is included as a priority species within BCR 4 (Environment Canada 2013; Yukon CDC 2015a). Peregrine falcon was originally assessed by COSEWIC as Endangered in 1978, and subsequently was down-listed to Threatened in April 1999, and then to Special Concern in 2007.

Peregrine falcon is a summer resident of Yukon, inhabiting large river valleys, such as the Yukon, Peel and Porcupine river valleys (Sinclair et al. 2003). The largest subpopulation nests along the Yukon River with highest densities between the Pelly River and Alaska border. Nesting sites are scraped in substrate on cliff ledges or occasionally on cliff tops, overlooking bodies of water. Occasionally, they re-use nests of raven, rough-legged hawk and golden eagle. This species shows breeding site fidelity, using the same nesting cliffs for decades. Within the central Yukon, nests can occur as close as 5 km apart, although nest spacing is often much greater. Most adults arrive in April and immediately occupy their riverside nesting cliffs. In central Yukon, birds occupy nest sites beginning in mid-April. Eggs hatch around end of June in southern Yukon and end of July in northern Yukon. Young birds begin to fly about a month and a half after hatching but may not disperse far from the nest in those first few weeks. By early September, most adults have left their nesting sites, followed shortly afterwards by the young birds. The last birds are seen in late September in the

central and northern Yukon. These birds may stay in southern Yukon to feed at waterfowl staging areas, until mid-October, after which most have left Yukon for wintering sites.

During the Project baseline studies, peregrine falcon were recorded in every year, and were observed along both the Yukon and Stewart rivers. Two nest areas were documented along the Stewart River, both of which were active in 2016 (Table 3-3). Along the Yukon River, three nest areas have been delineated based on previously documented nests in the area (e.g., Environment Yukon 2014; Environment Yukon 2015; D. Mossop, pers. comm., 2015) and repeat observations of peregrine falcon along certain sections of cliff (including observations of territorial behaviour). During the 2014 survey, one of these three nest areas was observed to be occupied, while in 2015 and 2016, two of the nest areas were occupied.

3.3.5 SHORT-EARED OWL

The short-eared owl is listed as Special Concern by COSEWIC (April 2008). This species has seen continued population decline over the past 40 years, including a loss of 23% in the last decade. Short-eared owl is also included on Schedule 1 of SARA, is considered Vulnerable in Yukon, and is included as a priority species within BCR 4 (Environment Canada 2013; Yukon CDC 2015a). Threats include habitat loss and degradation in their wintering grounds (central, southern and northeastern United States, south to central Mexico) as well as in their breeding grounds in southern Canada (BC, southeastern Ontario and Quebec; COSEWIC 2008).

Short-eared owls are associated with open habitats, such as alpine and Arctic tundra, wetlands and meadow habitats (Sinclair et al. 2003). The species is widespread across the Yukon Arctic tundra, from the Coastal Plain and Hershel Island to the Old Crow Flats. In central Yukon it is considered widespread in tundra habitats. In southern Yukon, the owl appears to only occur west of Teslin to Beaver Creek. No nesting has been reported in southern Yukon, but there have been numerous summer records in the Kluane area and the Dawson Range that suggest that nesting is likely in these areas. In Yukon, nesting has only been documented in tundra habitats, but it may also occur at lower elevations in open wetland areas. Within the central Yukon, nesting has been documented along the Dempster Highway north of the RSA where Frisch (1987) noted that it is a 'fairly regular sight' along portions of the highway. Nests are located on the ground, in dwarf shrub areas or in wet sedge meadows.

The first short-eared owls arrive in southern Yukon by April, with the most frequent sightings in the second half of April and beginning of May (Sinclair et al. 2003). They arrive in central Yukon in May. Nests have been documented with eggs as early as mid-May (central Yukon, 1998) with nesting activity extending to mid-July (Dempster Highway, 1980). During migration, they are often seen at lower elevations along wetlands, fields, and grassy roadsides. At the end of the breeding season, most birds have left by October. A 1982 survey of the Dawson Range (Frisch 1983) documented one short-eared owl in alpine heath tundra near the "Miner Mountains" (June 9, 1982). Baseline studies for the Casino Project (south of the Coffee Project LSA) had one observation of a short-eared owl hunting in moist shrub habitats near the camp in 2011 (EDI 2013). An additional stand-watch survey was completed in June 2013, in the Casino Project area but no owls were detected (EDI 2013). Raptor surveys within the Indian River Valley in 2014 (Chevreux

2014) had no observations of short-eared owl; however, these surveys were completed in the daytime from late-May to mid-June.

During the Project baseline studies, only one short-eared owl was observed during the three years of short-eared owl surveys conducted in mine site area (i.e. south of the Yukon River) and one year of short-eared owl surveys along the NAR (2015). The one short-eared owl detected was observed in the mine site area flying high over the Java Road ridge, heading southwest. The nature of the flight appeared to be a long-distance movement, and there was no evidence to suggest the owl was actively using the area. The lack of detections within the RSA is likely due to the scarcity of this species in the region during the breeding season and limited availability of suitable nesting habitat. The RSA does provide suitable hunting areas as they are known to forage over burns and shrubby areas; however, suitable nesting areas (low dwarf shrub and/or wet sedge meadows; Sinclair et al. 2003) are limited to the extreme southeast portion of the RSA (Photo 3-7). For more detailed information on the suitability and availability of habitat for short-eared owl in the RSA, refer to Section 7.3 for habitat modelling information.

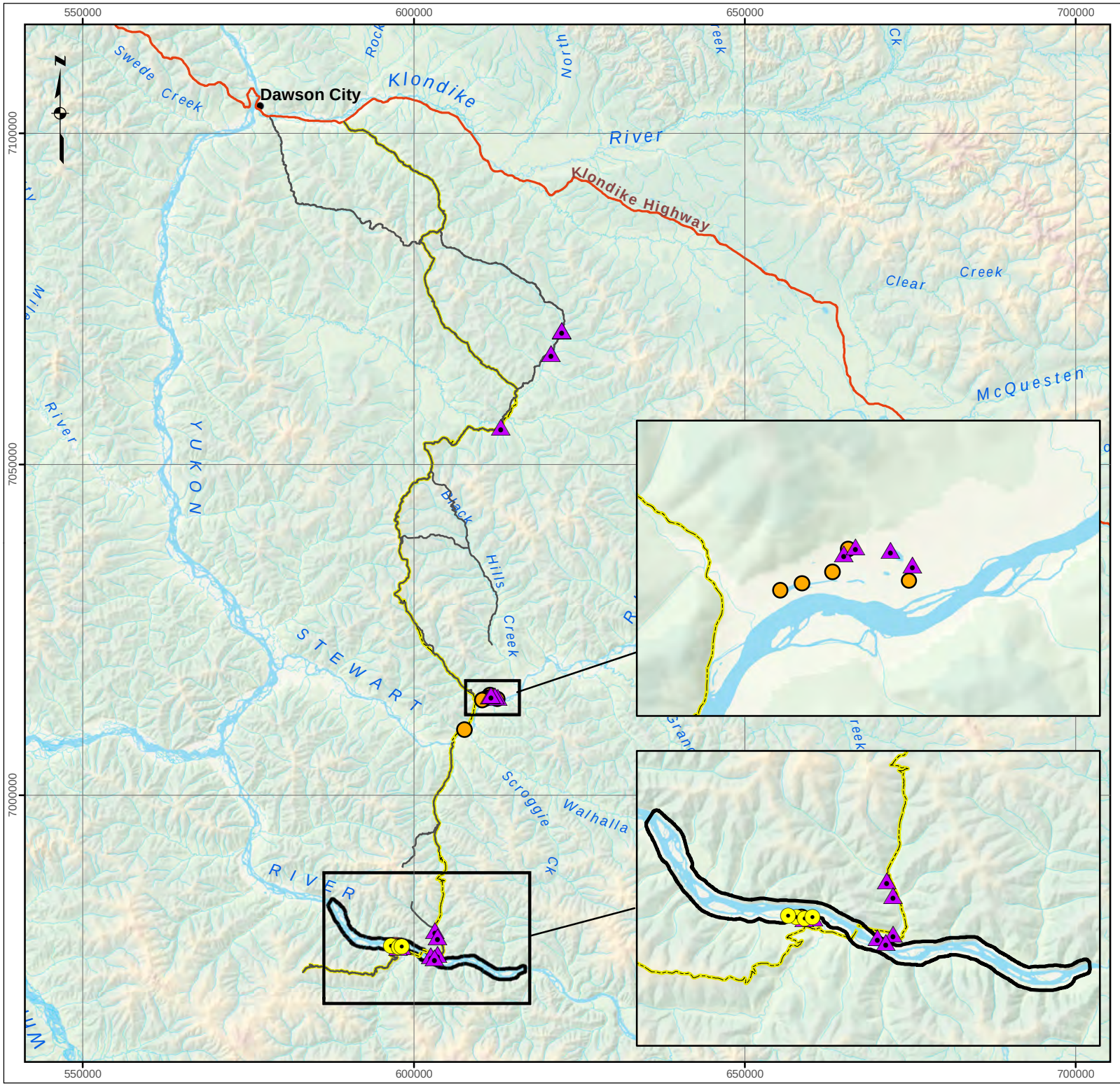
Photo 3-7. Potential short-eared owl nesting habitat at the extreme southeast of the Coffee Project RSA (point count 53 shown, June 24 2014).

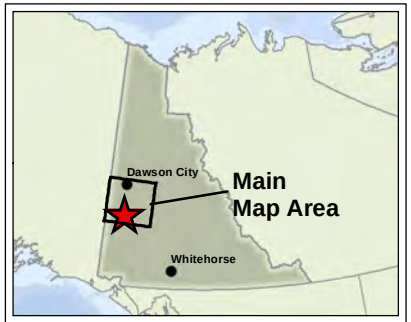
4 WATERBIRDS, WATERFOWL AND SHOREBIRDS

4.1 FIELD SURVEY METHODS

The RSA contains no large lakes and pond habitats are limited; therefore, no large-scale surveys for waterfowl were conducted during field studies. However, biologists did conduct an incidental waterfowl survey by helicopter on June 21, 2014. This survey focused on suitable waterfowl habitats within the Yukon River floodplain (Figure 4-1). The survey was conducted in the afternoon under ideal survey conditions with partly cloudy skies, minimal winds and no precipitation. All birds observed were identified to species and sex where possible. Total survey time was 55 minutes.

Biologists also collected information on waterfowl occurrence by conducting ground investigations of wetland habitats within the LSA in both 2014 and 2015. Targeted areas included wetland habitats along the Yukon River and Stewart River floodplains, and along the Indian River and Dominion Creek valleys. Wetland habitats were surveyed opportunistically for waterfowl and other incidental bird species including shorebirds and waterbirds, with species observed and/or heard recorded and GPS coordinates and photographs collected. A description of the wetland habitat was also collected and the potential for species at risk (e.g. horned grebe) was assessed.





Legend

- Coffee Camp (Current)
- 2014 Incidental Waterfowl Survey Location
- 2015 Incidental Waterfowl Survey Location
- Breeding Bid Point Counts Overlapping Waterfowl Habitat
- Highway
- Existing
- Proposed Route
- 2014 Waterfowl Aerial Survey Area

FIGURE: 4 - 1

Coffee Project aerial waterfowl survey and ground investigations

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

Project data displayed is site specific. Survey data collected by EDI Environmental Dynamics Inc. (2015).

Disclaimer
This document is not an official land survey and the spatial data presented is subject to change.

0 10 20 30
KM

Map Reference Scale: 1:800,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn: MS	Checked: BS/MP	Date: 3/9/2017

KAMINAK GOLD CORPORATION EDI

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4.2 GENERAL RESULTS

The Project species list includes 32 species of waterbirds, waterfowl and shorebirds known or likely to occur within the RSA. Several of these species are reported to be currently, or have been previously, harvested by First Nations, including several species of ducks, Canada geese and swans (Dawson Indian Band 1988, Pearse and Weinstein 1988, Mishler and Simeone 2004, InterGroup Consultants Ltd. 2009, Calliou Group 2012, Bates and DeRoy 2014), although it is unknown whether harvesting of these species has occurred within the RSA.

4.2.1 WATERFOWL, LOONS AND GREBES

This group of birds were detected incidentally while surveying for upland birds or during targeted wetland specific investigations (including aerial surveys) to document the presence of breeding species in such habitats. Habitats containing open water are not widespread within the RSA and primarily limited to the three general areas: Yukon River floodplain, Stewart River floodplain and ponds/wetlands associated with placer mining activity along the NAR, particularly in the Indian River/Dominion Creek area. A total of 17 species of waterfowl and loon/grebe are expected to breed within the RSA based on the regional distribution of these species and knowledge of habitats present in the area (Appendix A). Of these 17 species, 13 were observed throughout the RSA during baseline studies (Table 4-1) with the most common species being mallard and bufflehead. Survey observations indicated that waterfowl are not found in high densities within the RSA and although breeding was only confirmed for two species (horned grebe, American wigeon), other species are also suspected to breed within the area in low densities. The most productive area for waterfowl and loons/grebes appeared to be the wetland complex in the Stewart River floodplain upstream of Maisy May Creek. This area was included within the survey area during 2015, although more recent alignments for the NAR indicate that there will not be an interaction with this wetland habitat.

Breeding bird surveys conducted by Chevreux (2014) within the Indian River valley documented 12 species of waterfowl, loons, and grebes during the breeding season. During that study, the most common breeding species in post-mined areas were bufflehead, American wigeon, and mallard with green-winged teal and mallard being the most common in unmined areas. Although that study did document more waterfowl breeding activity than the current study within the LSA, it is likely due to the middle portion of the Indian River valley containing many more ponds than the areas surveyed for this Project.

Table 4-1. Summary of waterfowl and waterbirds (loons/grebes) detected during bird baseline studies for the Coffee Project during 2014 and 2015.

Species	Locations detected			Comments
	Yukon River floodplain	Stewart River floodplain	NAR corridor (Indian River and Dominion Creek areas)	
Red-throated Loon	✓			Two separate flybys on the Yukon River at the existing Coffee Creek barge landing. One additional observation of lone adult on a small pond near the mouth of Coffee Creek.
Pacific Loon		✓		One pair observed on a pond in the Stewart River floodplain upstream of Maisy May Creek.
Horned Grebe			✓	Detected in 3 ponds along Dominion Creek/Indian River, refer to Section 4.3.1.
Canada Goose		✓		One detection (calling) in wetland complex in the Stewart River floodplain upstream of Maisy May Creek.
Trumpeter Swan		✓		One pair observed on a pond in the Stewart River floodplain upstream of Maisy May Creek.
American Wigeon	✓	✓	✓	Low numbers of adult males and females in all three areas. One brood (8) in a small pond near the mouth of Ballarat Creek.
Mallard	✓	✓		Most common waterfowl species, adults (male and female) and juveniles observed primarily along the Yukon River floodplain.
Northern Shoveler	✓	✓		Single detections along within the Yukon and Stewart river floodplains.
Northern Pintail	✓			One detection of a pair in the Yukon River floodplain.
Green-winged Teal	✓	✓		Two detections of adult males.
Lesser Scaup			✓	Seven birds observed in three ponds (natural and placer disturbed) along Dominion Creek.
Bufflehead	✓	✓	✓	Small groups of up to 5 individuals observed on 4 occasions
Common Goldeneye			✓	One detection (male) on placer mining pond.

4.2.2 SHOREBIRDS AND GULLS

Similar to waterfowl/loons/grebes, shorebirds and gulls were not targeted specifically during the breeding bird surveys but were surveyed incidentally during the upland bird surveys and targeted wetland investigations. Fifteen species of shorebirds and gulls have the potential to breed within the RSA, of which six were detected over the course of breeding bird surveys during 2013, 2014 and 2015. Six of the 15 potential species are associated with alpine habitats and are expected to occur in low densities within the Dawson Range to the south of the Yukon River. There was a single detection of one such species (surfbird) during the breeding bird surveys and the lack of additional observations is likely related to the very small

amount of suitable alpine tundra nesting habitat within the RSA. The remaining nine species of shorebirds and gulls are expected to occur in lowland habitats, particularly adjacent to wetlands or streams. The most common species observed in these habitats included Wilson's snipe, solitary sandpiper, and lesser yellowlegs with 14, 11, and 7 detections, respectively. These results are comparable to those from Chevreux (2014) who noted relatively low densities of breeding shorebirds in the Indian River valley. The shorebird and gull species composition in Chevreux's survey was also similar to surveys conducted for the Project, although the most common species was lesser yellowlegs and two additional species were observed (least sandpiper and mew gull).

4.3 SPECIES SPECIFIC RESULTS

Of the waterfowl, waterbird, and shorebird species observed or expected to occur within the RSA, nine are listed as species of concern within Yukon (Yukon CDC) or Canada (COSEWIC, SARA) — see Section 2. Of these species, two are discussed in further detail in the following section. Given the level of concern for these species, additional background information is provided for each along with survey results for the species within the RSA. The remaining seven species are not discussed in detail because they occur infrequently within the RSA, and/or have limited habitat available in the RSA.

4.3.1 HORNED GREBE

The western population of horned grebe was listed as a Species of Special Concern in 2009; this population includes the geographical area from Ontario west to British Columbia north to Yukon and Northwest Territories. This population is estimated to contain 200,000 to 500,000 individuals and has experienced a long-term population decline of 1.5% per year from 1966 to 2005 or a cumulative decline of 45% over this time period (COSEWIC 2009). Shorter term trend analysis (1993 to 2005) shows a similar declining trend. Trend estimates from Yukon are unavailable as this is not sampled adequately during the territory wide Roadside Breeding Bird Survey. Threats to horned grebes are primarily associated with changes or losses to the wetland breeding habitats including droughts and accumulation of fertilizers used in agriculture (referenced in COSEWIC 2009). Oil spills in the marine wintering grounds in the Pacific Ocean may also constitute a threat to this species.

The breeding habitat for horned grebe in Yukon includes small lakes and ponds with marshy margins (Sinclair et al. 2003). Nests are typically constructed over water in areas of dense emergent vegetation including reeds/horsetails (Grunberg 1994) and may be secured to woody vegetation protruding from the water. Breeding pairs are typically located at low densities across the southern and central Yukon although very productive wetlands may host several nesting pairs (Sinclair et al. 2003).

Over the course of breeding bird studies, horned grebes were detected on four occasions on two different ponds along lower Dominion Creek only (Maps C1–C3 in Appendix C). Up to six individuals and one active nest were observed on an old placer mining pond. At the time of the survey (June 18, 2015), the nest contained five eggs, was constructed of aquatic vegetation, and secured to willows protruding from the

water (Photo 4-1). A pair of horned grebes was also observed on a natural pond along lower Dominion Creek (near Bullfrog Creek; Photo 4-2) and although no nests were located, breeding on this pond was possible. Wetland investigations elsewhere in the LSA did not locate any horned grebes; however, suitable habitat was present in the wetlands along the Stewart River floodplain and breeding may occur in this area. Breeding bird surveys by Chevreux (2014) in the Indian River valley noted four breeding pairs of horned grebe on ponds in post-mined areas which were similar to the pond where an active nest was found during the 2015 surveys for the Project.

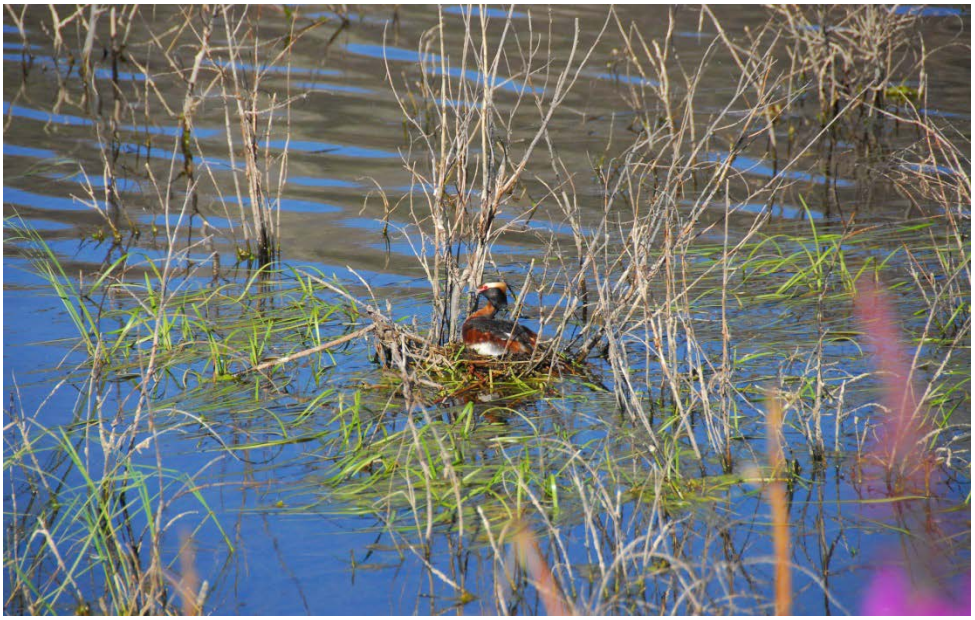


Photo 4-1 Active horned grebe nest observed on June 18, 2015 in an old placer mining pond along Dominion Creek.

Photo 4-2. Natural wetland habitat along lower Dominion Creek where a pair of horned grebes were observed on June 18, 2015.

4.3.2 RED-NECKED PHALAROPE

Red-necked phalarope was listed as a species of Special Concern in 2014 based on long-term population declines which was determined primarily by expert opinion. Notable declines have been observed at a key staging ground in eastern Canada and also on Arctic breeding grounds including the Yukon North Slope (COSEWIC 2014). Identifying threats to this species has been challenging given that there are many uncertainties pertaining to its ecology; however, expert opinion indicates that the primary threats include the effects of climate change on breeding habitats and changes to stopover/wintering habitats in marine environments (COSEWIC 2014).

The primary breeding habitat for red-necked phalarope in Yukon includes wet sedge tundra with small scattered ponds; although it breeds throughout Yukon in low densities, it is most common on the North Slope (Sinclair et al. 2003). In the southern and central portions of the territory, it is an uncommon breeding species at the marshy edges of small lakes. Breeding has been confirmed in the far north and in the south near Whitehorse and Beaver Creek; there are very few records from central Yukon (Sinclair et al. 2003).

During breeding bird baseline studies for the Project, there were no detections of red-necked phalarope within the RSA. However, Chevreux (2014) carried out breeding bird surveys in the Indian River valley during 2014 and documented two pairs of red-necked phalarope which were present on an unmined pond throughout the breeding season. Although breeding could not be confirmed, it was determined to be very probable. This information suggests that red-necked phalarope may nest within the RSA although it is suspected to occur at very low densities given the limited amount of suitable wetland habitat in the area.

5 UPLAND GAME BIRDS

Upland game bird species known or likely to occur within the RSA include four species of grouse and three species of ptarmigan. Of these species, the primary focus of the breeding bird baseline studies was sharp-tailed grouse with incidental information collected for the other species. Upland game bird species are believed to be the primary bird species harvested within the RSA. Species that are reported to be currently, or previously, harvested by First Nations include: blue (dusky) grouse, ruffed grouse, spruce grouse, sharp-tailed grouse, willow ptarmigan, and rock ptarmigan (Pearse and Weinstein 1988, Mishler and Simeone 2004, InterGroup Consultants Ltd. 2009, Calliou Group 2012, Bates and DeRoy 2014). Traditional knowledge studies available for the Project area include specific reports of ptarmigan in the Coffee Creek area and some TH members report harvesting grouse there (Tr'ondëk Hwëch'in 2012).

Sharp-tailed grouse are not considered to be at risk in Canada, although they are listed as 'vulnerable' in Yukon (Yukon CDC 2016a) largely due to limited information on distribution and population numbers/trends. This species can also be sensitive to disturbance around leks during the spring breeding period, particularly for females which can easily be displaced from disturbed leks (Baydack and Hein 1987). Sharp-tailed grouse populations are cyclical (Sinclair et al. 2003) and based on regional observations (Suitor, 2015 pers. comm.), as of 2015, the population within the Dawson Goldfields appears to be in a high. The reason for this is unknown, although it is suspected that the extensive forest fires in the region during 2004 and 2007 may currently provide optimal habitat for the species. During times when populations are in a cyclical low, they can be relatively rare with small groups of individuals scattered across a large area. The level of knowledge pertaining to this species is still developing in Yukon and much of the existing information comes from work done by Mossop et al. (1979) in the southwest Yukon where the species is found in both burned areas and more undisturbed aspen parkland habitat. More recently, Chevreux (2014) conducted a bird baseline study in the Indian River to investigate differences in breeding bird communities within areas previously disturbed by placer mining and other areas which have not been previously disturbed by mining activities. The study area for these investigations was located immediately to the west of the RSA and thus provides additional data on the distribution of birds in the region, including sharp-tailed grouse. During these investigations, sharp-tailed grouse were observed on numerous occasions in both mined and unmined areas during the spring, summer and fall. One lek was also identified in an abandoned farm area where the dominant vegetation included grasses and shrubs.

To collect more information on sharp-tailed grouse in the central Yukon, Environment Yukon initiated a research project in the Dawson Goldfields during 2015, but no analysis is available for summary in this baseline. The geographical extent of this research project includes portions of the RSA (particularly along Dominion Creek; Figure 5-1) but also includes areas outside of the RSA (Indian River and North Fork Road). Over the course of the field surveys during 2015 and 2016, EDI field crews shared information with Environment Yukon personnel on lek sites and sharp-tailed grouse activity.

5.1 FIELD SURVEY METHODS

Field studies for upland birds included a combination of standardized surveys and the collection of incidental bird observations. The primary method of surveying for game birds included the use of standardized point counts for sharp-tailed grouse which also provided survey data for ruffed grouse. To maximize species detections, the surveys also included the collection of incidental bird observations while travelling between point count locations or driving on existing roads in the study area.

5.1.1 SHARP-TAILED GROUSE SURVEYS

Surveys for sharp-tailed grouse were conducted within the RSA to document the presence of leks which may interact with the project, particularly along the northern portion of the RSA through the Dawson Goldfields. Leks are communal breeding areas used by this species where the male birds congregate and display for the opportunity to breed. Lekking activities often result in high concentrations of individuals and attendance at the leks by both males and females is important to ensure successful reproduction. Prior to the 2015 surveys, the Dawson region, including the Dawson Goldfields, was known to provide habitat for this species, although there was relatively little information specific to the RSA aside from incidental observations.

The initial step in conducting the lek surveys was an aerial reconnaissance survey along the entire study area to identify suitable lekking areas for sharp-tailed grouse where follow up aerial/ground based surveys would be required. The aerial survey was completed on April 20, 2015 with a C-206 Stationair and included the proposed road corridor between Dawson and the Project. Over the course of ungulate surveys in the winter of 2015/2016, sharp-tailed grouse were observed in a number of locations where they were not previously known to occur and this information was incorporated into the 2016 field surveys.

Based on the results of the reconnaissance flight and winter ungulate surveys, lek surveys were carried out in areas with suitable sharp-tailed grouse habitat including burns and other open (disturbed) areas. Portions of the study area with mature forest was excluded from the sharp-tailed grouse surveys due to the very low habitat suitability for sharp-tailed grouse leks in such areas. Input from Environment Yukon biologists conducting similar surveys in the region was used to determine the survey extent which focused on areas within 3 km of the proposed road alignment. These surveys were completed using a combination of helicopter, fixed wing and ground based methods; all surveys were completed within three hours of official sunrise to coincide with the daily timing when the sharp-tailed grouse are visiting the leks. Helicopter methods involved flying slowly over burned areas that were identified from the aerial reconnaissance flight. Flying in a Bell Jet Ranger 206L (2015) or Eurocopter EC-120 (2016), two observers looked on both sides of the helicopter during the flights watching for flushing grouse and track marks in the snow. Aerial surveys included the use of a FLIR infrared/high definition colour camera mounted on a Cessna 180. The camera was first tested at known leks in the Dominion Creek area and then focused on the areas with the highest probability of finding new probable leks. The plane was flown at variable heights and speed based on ground and wind conditions and areas with lek potential were flown a minimum of three times.

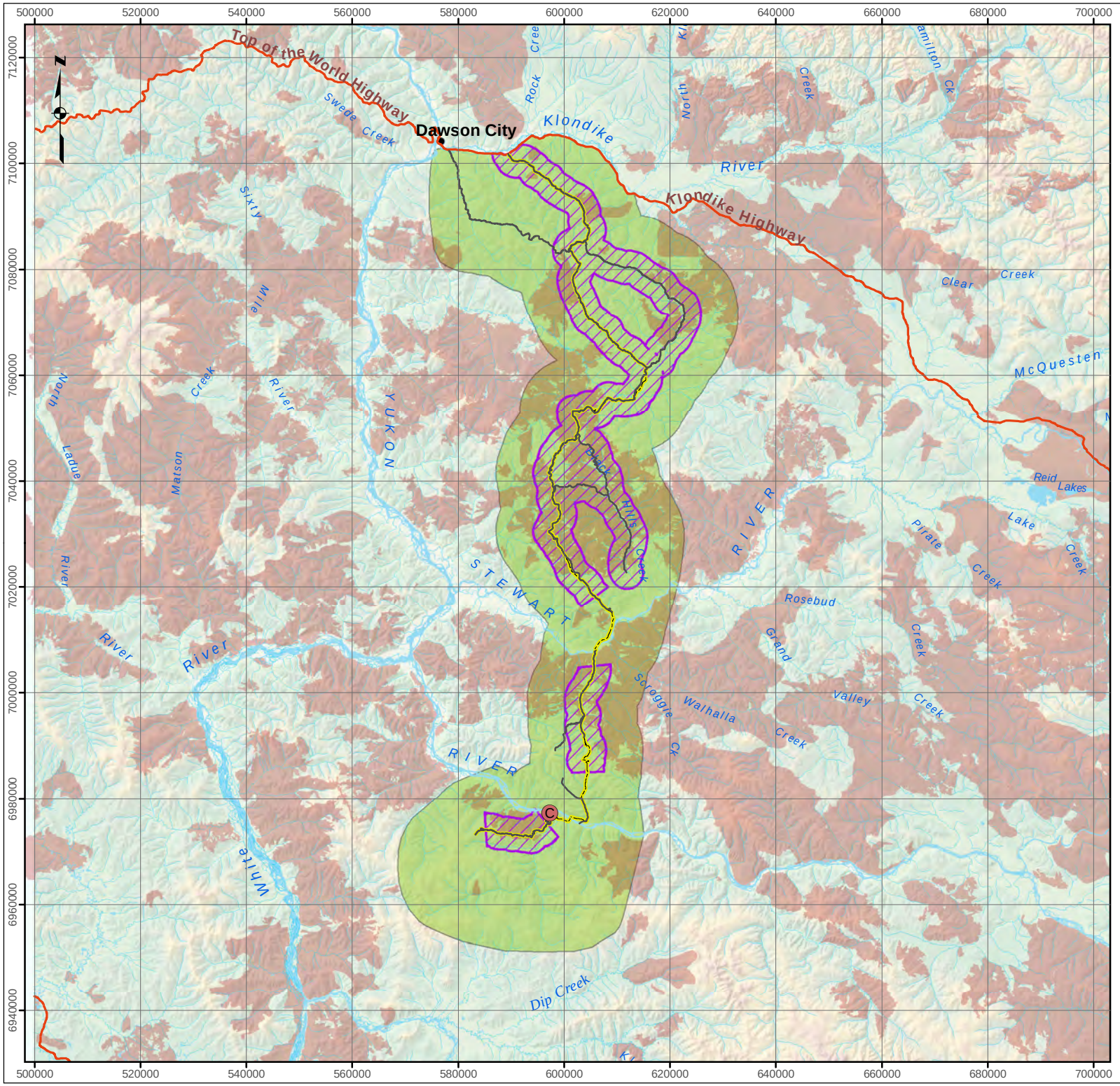
The ground-based methods for lek identification involved the use of point counts where a single observer listened for displaying male sharp-tailed grouse for 5–10 minutes at a fixed location; count locations were spaced apart by a minimum of 500 m. Surveys were conducted within three hours of official sunrise to coincide with peak attendance on the leks and corresponding vocalizations. Information collected at each point surveyed included: GPS coordinates, date, time (start and finish), observer, photos, percentage of snow cover, air temperature, wind and weather, general habitat comments and observations of all birds detected.

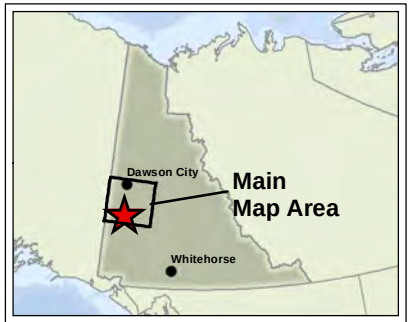
Locations with detections of displaying grouse were revisited later during the day or on subsequent days to determine probable lek locations and to obtain a count of the number of individuals present. During 2015 and 2016, a total of 128 and 121 point counts were conducted, respectively within the survey area (Figure 5-1). While travelling the existing roads within the LSA, all incidental observations of sharp-tailed grouse were also recorded with geographic coordinates collected along with a count of the number of individuals observed.

To collect data on daily and seasonal timing of lek attendance, two remote cameras (Reconyx PC900 HyperFire with No Glow Covert Infrared Night Vision) were installed at each of two probable sharp-tailed grouse leks, BH-01 and EUR-01. Cameras were set to take a photo every five minutes from 05:00 to 11:00 between the install date of April 25, 2015 and mid-June 2015 when the cameras were collected. In order to collect information on the onset of lek attendance, two of the same cameras used in 2015 were deployed on the BH-01 lek on March 4, 2106 and set to take a single photo every five minutes between 04:00 and 15:00 from the date of installation until retrieval in fall 2016.

5.1.2 RUFFED GROUSE SURVEYS

Due to similarities in the breeding season of sharp-tailed and ruffed grouse, the sharp-tailed lek surveys also served as a drumming survey for displaying ruffed grouse. This survey was consistent with the sharp-tailed grouse surveys and simply involved recording the number of ruffed grouse heard drumming on each point. Refer to Section 5.1.1 for additional information on this survey method.





Legend

- Coffee Camp (Current)
- Highway
- Existing Access
- Proposed Route
- Regional Study Area
- Sharp-tailed Grouse Survey Extent
- Historical Fire Extent

FIGURE: 5 - 1

Coffee Project sharp-tailed grouse survey extent

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

Project data displayed is site specific. Survey data collected by EDI Environmental Dynamics Inc. (2015).

Disclaimer
This document is not an official land survey and the spatial data presented is subject to change.

0 20 40
KM

Map Reference Scale: 1:1,000,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn: MS	Checked: BS/MP	Date: 3/7/2017

KAMINAK GOLD CORPORATION EDI

Path: O:\2014\14_Y_0306_Kaminak_CoffeeCk\Mapping\2016_Mapping\2016_Baseline\007_Birds\Fig5_1_SharpTailedGrouse_07032017.mxd

5.2 GENERAL RESULTS

Six species of game birds were detected in the RSA during 2014, 2015, and 2016 through standardized surveys for sharp-tailed grouse/ruffed grouse and incidental observations (Table 5-1, Appendix A). The relative number of detections are likely biased to the areas surveyed and the methods used for the sharp-tailed grouse surveys. Field crews were focused on locating sharp-tailed grouse which are localized within the RSA and are likely outnumbered across the RSA by other species of game birds. For example, spruce grouse is likely the most common and widespread game bird within the RSA, although this is not reflected by number of detections because the surveys were focused on sharp-tailed grouse.

Table 5-1. Summary of game bird detections in the LSA during 2014, 2015 and 2016.

Species	Total Number of Detections[1]	Area Detected	
		Coffee Area	NAR
Ruffed Grouse	41	✓	✓
Spruce Grouse	16	✓	✓
Willow Ptarmigan	6	✓	
Rock Ptarmigan	3	✓	
White-tailed Ptarmigan	1	✓	
Sharp-tailed Grouse	44		✓

[1] Detections do not account for possible double counting of some individuals and is intended to provide a general indication of the total number of detections only. These include incidental observations while travelling on roads and drumming individuals detected during surveys.

5.3 SPECIES SPECIFIC RESULTS

Of the gamebird species observed or expected to occur within the RSA, one is listed as a species of concern within Yukon (Yukon CDC) — see Section 2. All of the species are discussed in further detail in the following section.

5.3.1 RUFFED GROUSE

During the sharp-tailed grouse surveys (late April 2015 and 2016), there were a total of 18 detections of drumming ruffed grouse (Table 5-2). The highest detection rate of this species was in the Sulphur Creek and Maisy May Creek (lower) areas where areas of regenerating vegetation in lowland areas have created suitable habitat for this species. Ruffed grouse are likely widespread within the RSA and would be expected to occur throughout the area at lower elevations where areas of suitable habitat are present (deciduous forests and regenerating deciduous vegetation).

Table 5-2. Summary of drumming ruffed grouse detections during sharp-tailed grouse surveys in late April 2015 and 2016.

Survey area	Survey year	Number of points surveyed	Number of points with ruffed grouse detected	Average number of ruffed grouse per count
Sulphur Creek	2015	6	3	0.50
	2016	10	2	0.20
Dominion Creek	2015	37	4	0.11
Indian River	2015	2	0	0.00
Eureka Ridge	2015	29	0	0.00
Black Hills Creek	2015	54	3	0.06
Henderson Dome	2016	15	0	0.00
Maisy May Creek (upper pass)	2016	27	0	0.00
Maisy May Creek (lower)	2016	22	6	0.27
Barker Creek	2016	18	0	0.00
Barker/Ballarat Pass	2016	5	0	0.00
Java Road	2016	24	0	0.00
TOTAL		249	18	0.07

[1] Does not account for potential double counting of displaying birds detected on adjacent counts. Males can often be heard from a considerable distance and it is likely that some of these detections represent the same group of displaying birds.

5.3.2 SPRUCE GROUSE

Spruce grouse detections within the RSA were limited to incidental observations while surveying for sharp-tailed grouse or incidentally while travelling by vehicle or on foot. This species is relatively cryptic compared to sharp-tailed grouse as it does not vocalize loudly during the breeding season. There were 16 detections of spruce grouse in the RSA during 2014 and 2015 which included a female with a brood of four chicks along the Java Road. This species is expected to breed throughout coniferous/mixed forests throughout the RSA and is likely the most abundant gamebird species present.

5.3.3 DUSKY GROUSE

Dusky grouse (also called blue grouse) was not detected in the RSA during 2014, 2015, and 2016 bird baseline studies. However, this species is known to occur within the Dawson region (Sinclair et al. 2003, Frisch 1987) and therefore it likely occurs at low densities in subalpine habitats of the RSA.

5.3.4 WILLOW, ROCK, AND WHITE-TAILED PTARMIGAN

There were a total of ten detections of ptarmigan in the RSA during 2014, 2015, and 2016 with the number of occurrences being representative of the assumed relative abundance in the RSA. Willow ptarmigan (six detections) were detected most frequently, followed by rock ptarmigan (three detections) and white-tailed

ptarmigan (one detection). The majority of ptarmigan observations were made in subalpine and alpine habitats in the southern portion of the RSA to the south of the Java Road. The far southern portion of the RSA (including the area known locally as 'Sugar Mountain') provides the most extensive habitat for ptarmigan in the RSA and is the only area where rock and white-tailed ptarmigan were detected and expected to occur during the breeding season. Willow ptarmigan often use more subalpine habitat for breeding and therefore are also known to occur in other portions of the RSA including the Barker/Ballarat Pass and the Henderson Dome/upper Maisy May areas. During the winter months, all three species of ptarmigan make seasonal migrations and could be expected throughout subalpine habitats and areas at lower elevations with a high proportion of shrub cover.

5.3.5 SHARP-TAILED GROUSE

Surveys for sharp-tailed grouse were conducted by the EDI project team during the spring of 2015 and 2016 to document leks within 3 km of the NAR through the Dawson Goldfields in the northern portion of the RSA. A total of 128 point counts were surveyed from April 21–25, 2015 (16 hours and 55 minutes of survey effort) and included the following general areas: Sulphur Creek, Dominion Creek, Indian River, Eureka Ridge, and Black Hills Creek. Sharp-tailed grouse were detected (heard or observed) at 31 of the counts surveyed and included all general areas surveyed with the exception of Sulphur Creek[4] (Table 5-3). During 2016, a total of 121 point count surveys were completed (10 hours and 46 minutes of survey effort) from April 23–28 and included the following areas: Sulphur Creek, Henderson Dome, Maisy May Creek (upper pass and lower portion), Barker Creek, the Barker/Ballarat Pass, and the Java Road on the south side of the Yukon River (Table 5-4). Sharp-tailed grouse were detected on three of the point counts and included a single displaying male detected at two locations (lower Maisy May Creek) and a single female (upper Maisy May). No new probable lek sites were identified during the 2016 surveys.

Table 5-3. Summary of sharp-tailed grouse point count surveys during 2015.

Survey area	Survey year	Number of points surveyed	Number of points with sharp-tailed grouse detected[1]	Number of incidental observation locations	Number of probable leks identified [2]
Sulphur Creek	2015	6	0	0	0
Dominion Creek	2015	37	12	3	4
Indian River	2015	2	1	0	0
Eureka Ridge	2015	29	9	4	1
Black Hills Creek	2015	54	9	2	1
TOTAL		128	31	9	6

1 Does not account for potential double counting of displaying birds detected on adjacent counts. Males can often be heard from a considerable distance and it is likely that some of these detections represent the same group of displaying birds.

2 Leks are identified as 'probable' given the dynamic nature of the use of leks by displaying males. Additional surveys in subsequent years may be required to confirm these lek locations.

4 Maps of sharp-tailed grouse detections and probable lek sites are not included in this report due to the sensitive nature of these important areas. This information has been provided to Environment Yukon through research permit reporting for the surveys.

Table 5-4. Summary of sharp-tailed grouse point count surveys during 2016.

Survey Area	Survey Year	Number of Points Surveyed	Number of Points with Sharp-tailed Grouse Detected [1]	Number of Incidental Observation Locations	Number of Probable Leks Identified [2, 3]
Sulphur Creek	2016	10	0	0	0
Henderson Dome	2016	15	0	0	0
Maisy May Creek (upper pass)	2016	27	1	1	0
Maisy May Creek (lower)	2016	22	2	0	0
Barker Creek	2016	18	0	0	0
Barker/Ballarat Pass	2016	5	0	0	0
Java Road	2016	24	0	0	0
TOTAL		121	3	1	0

1 Does not account for potential double counting of displaying birds detected on adjacent counts. Males can often be heard from a considerable distance and it is likely that some of these detections represent the same group of displaying birds.

2 Leks are identified as 'probable' given the dynamic nature of the use of leks by displaying males. Addition surveys in subsequent years may be required to confirm these lek locations.

3 For areas surveyed during 2015, information shown only includes new leks identified.

In addition to the point counts, aerial surveys (Bell Jet Ranger 206L – 2015 and Eurocopter EC-120 – 2016) were attempted to locate potential lek sites. This method was not preferred over the use of ground surveys due to the difficultly in observing the grouse from the air; however, it had to be attempted for areas without existing road access. The helicopter surveys during both years did not locate any probable leks; however, the observations of grouse tracks at the EUR-01 lek during 2015 did lead to the subsequent finding of a probable lek at this location through the use of ground surveys. The 2015 helicopter survey was conducted on April 23, 2015 and was 2.8 hrs in duration. During 2016, a helicopter based survey was conducted in combination with ground surveys in the Barker/Ballarat Pass area and was 20 minutes in duration (April 27).

During 2016, aerial infrared surveys were attempted for inaccessible portions of the NAR and involved the use of a cryogenically cooled FLIR infrared/high definition colour video camera mounted on a Cessna 180. The camera was successful in viewing sharp-tailed grouse and obtaining a count on two of the previously documented leks on Dominion Creek. The infrared survey focused on high probability areas where probable leks may occur and included the Eureka Ridge/Henderson Dome and Barker/Ballarat Pass areas where access for ground based surveys was absent. No new probable leks were located using this method and the surveys were discontinued in favour of the other survey methods outlined above. The FLIR surveys were completed on April 21 and 22, 2016 and included a total of 5.75 hours of survey effort.

The point count surveys covered a relatively large area efficiently to focus additional ground surveys in areas where leks may be present based upon the occurrence of displaying males. Once the site of a potential lek was identified, ground investigations were done to confirm the probable lek and if possible, obtain a count of the number of grouse attending each lek. A total of six probable leks were identified during the 2015

surveys[1] (Table 5-3), with count of birds obtained for each lek where possible. The probable leks identified were located in both disturbed and natural habitats and all six sites were located on flat areas (valley bottoms of subalpine ridges) with minimal vegetation aside from grasses and sparse shrubs (Table 5-5).

Table 5-5. Summary of probable sharp-tailed grouse leks identified during 2015.

Survey Area	Survey Year	Probable Lek Identifier	Habitat Comments	Number of Sharp-tailed Grouse Observed
Dominion Creek	2015	DOM-01	Ridge adjacent to existing roadway. Mostly bare ground, some grass and willow; see Photo 5-1	Approximately 20 including at least 8 males.
Dominion Creek	2015	DOM-02	Disturbed ground, old placer mining area. Mostly grass covered, some bare ground and willows to 2 m height; see Photo 5-2	Obtained a minimum count of 19 including 6 males and 7 females positively identified.
Dominion Creek	2015	DOM-03	On a ridge of disturbed ground, some grasses and bare ground, mostly short willow.	Could not access to obtain count.
Dominion Creek	2015	DOM-04	Actual lek site not determined and unable to obtain count. Site appears to be located in a natural bog habitat.	
Eureka Ridge	2015	EUR-01	Subalpine ridge, 100% snow covered during survey; see Photo 5-3	Approximately 8 birds counted.
Black Hills Creek	2015	BH-01	Appears to be an old fire break with natural vegetation (mostly grasses) and few short trees/shrubs; see Photo 5-4	Approximately 10 birds counted but most flushed prior to arrival; considered a minimum count.

Photo 5-1. View of habitat at probable sharp-tailed grouse lek DOM-01 (April 21, 2015)

Photo 5-2. View of habitat at probable sharp-tailed grouse lek DOM-02 (April 21 2015).

Photo 5-3 View of habitat at probable sharp-tailed grouse lek EUR-01 (April 24 2015). Note the tracks from stomping grounds visible in the foreground.

Photo 5-4. View of habitat at probable sharp-tailed grouse lek BH-01 (April 25 2015) shown.

Additional to the field surveys conducted in late April 2015 and 2016, remote cameras were deployed on two of the probable lek locations in an attempt to refine the counts of birds using these leks and to determine the daily timing of attendance at the leks.

The two cameras deployed on the EUR-01 probable lek (2015 only) had very few detections of sharp-tailed grouse (five photos in total); however, these photos did confirm the presence of displaying male grouse at this site (Photo 5-5). The ground investigations conducted at this site indicated that the grouse were spread over a larger area and were less concentrated than at some of the other probable leks identified. This helps to explain the low number of grouse detected on the remote cameras.

On the BH-01 probable lek during both 2015 and 2016, one of the two cameras had a relatively high number of detections of sharp-tailed grouse with a total of 589 detections of at least one individual bird between April 25 (when the cameras were first deployed) and May 29 during 2015 (Photo 5-6; Figure 5-2). During 2016, there were a total of 558 detections between March 23 and May 27 when the last individual was observed (Figure 5-3). There were no detections of sharp-tailed grouse from the 2016 deployment date on March 3 and the first detection on March 23 or after May 27. The highest number of grouse detected was six individuals on May 1, 2015 at 5:50 AM; however, this should be considered a minimum count as much of the lek is not visible within the view of the remote camera.

The camera data from 2016 is useful in determining the seasonal presence of sharp-tailed grouse on the lek as the camera was in place well before and after birds were on the lek. The first birds were observed on the lek during late March in 2016 and increased rapidly to the peak activity period during the first three weeks of April (Figure 5-3). After April 25, 2016, activity was reduced considerably on the lek aside from two days

(May 3 and 5) when there was also a considerable number of observations on the lek. Although the 2015 camera deployment did not encompass the entire lekking period, the available data suggests that the seasonal attendance on the lek may have been earlier during 2016 as compared to 2015. This may have been due to the very early onset of spring during 2016. Collectively, the data collected on the BH-01 lek is consistent with the findings by Mossop et al. (1979) in the southwest Yukon where it was noted that the first grouse begin to attend the leks by mid-March when weather conditions are favorable with the peak of courtship behaviour occurring during the last week of April and first week of May (attendance was not documented after 20 May).

The attendance at this lek by males during the spring of 2015 (Figure 5-4) and 2016 (Figure 5-5) indicate that the peak of activity on the lek occurred from two hours prior to sunrise until two hours after sunrise. Later in the morning, the amount of activity on the lek was found to decline rapidly.

Photo 5-5. View of two displaying male sharp-tailed grouse at the EUR-01 lek on April 28 2015 at 7:30 AM (remote camera photo).

Photo 5-6. View of five male sharp-tailed grouse displaying at the BH-01 lek on 26 Apr 2015 at 7:55 AM (remote camera photo).

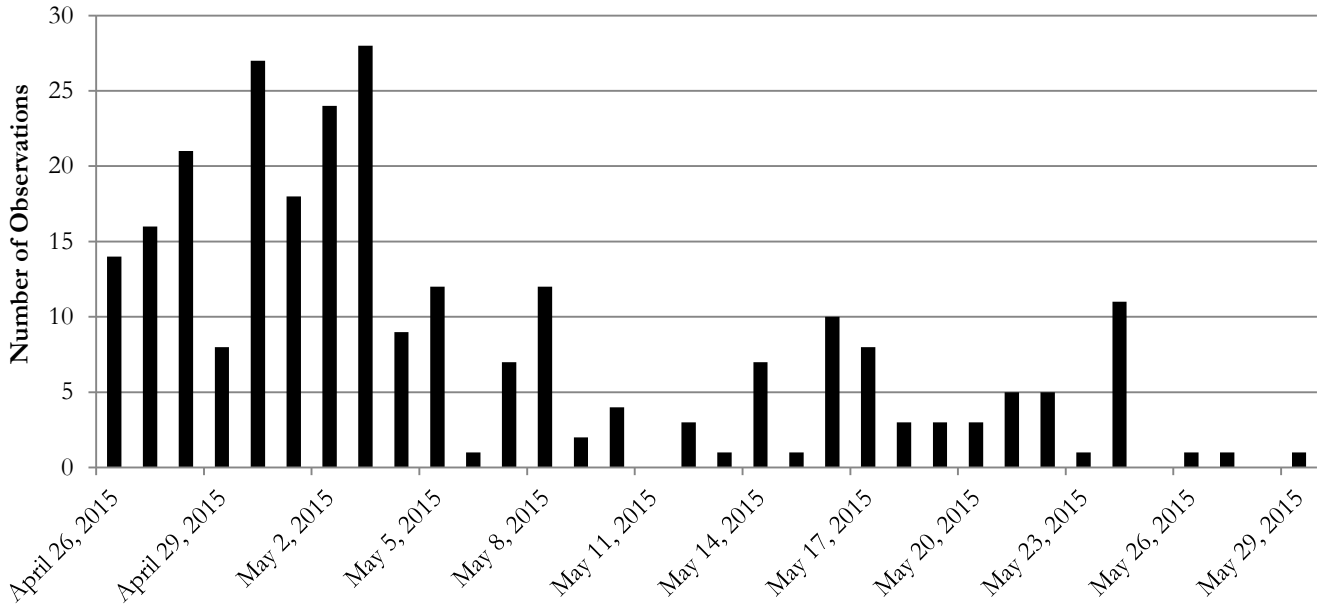


Figure 5-2. Attendance on the BH-01 lek (by date) by male sharp-tailed grouse as determined by remote camera photos from April 26 to May 29, 2015. Note that a total of 72 remote camera photos were taken per day. The number of observations indicates the number of camera photos with the target species observed.

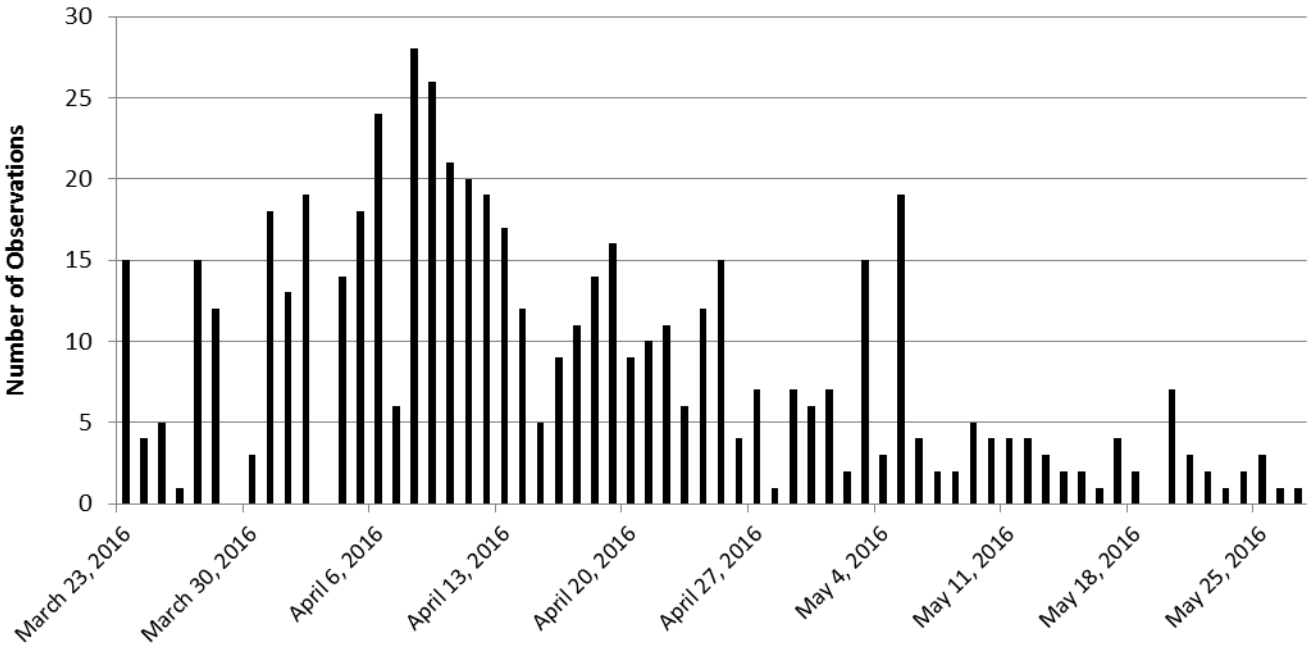


Figure 5-3. Attendance on the BH-01 lek (by date) by male sharp-tailed grouse as determined by remote camera photos from March 23 to May 27, 2016. Note that a total of 132 remote camera photos were taken per day and no grouse were observed between the camera deployment date on March 4 and March 22, 2016 or after May 27, 2016. The number of observations indicates the number of camera photos with the target species observed.

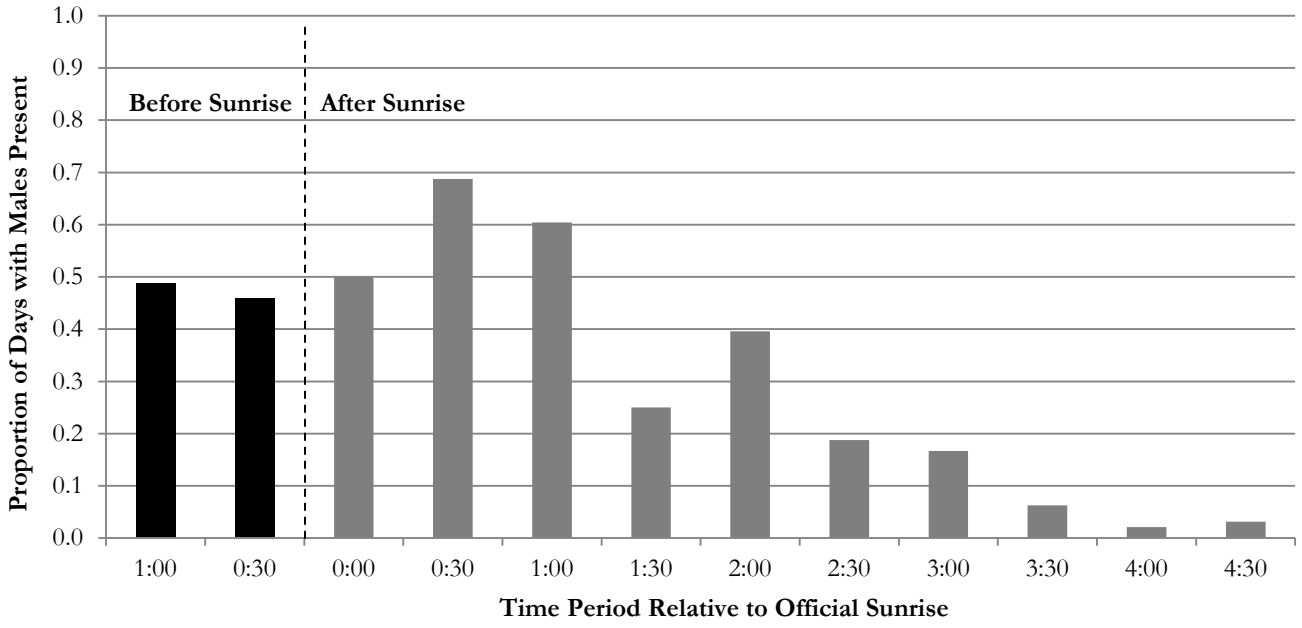


Figure 5-4. Attendance on the BH-01 lek (by time of day relative to sunrise) by male sharp-tailed grouse as determined by remote camera photos from April 26 to May 8, 2015.

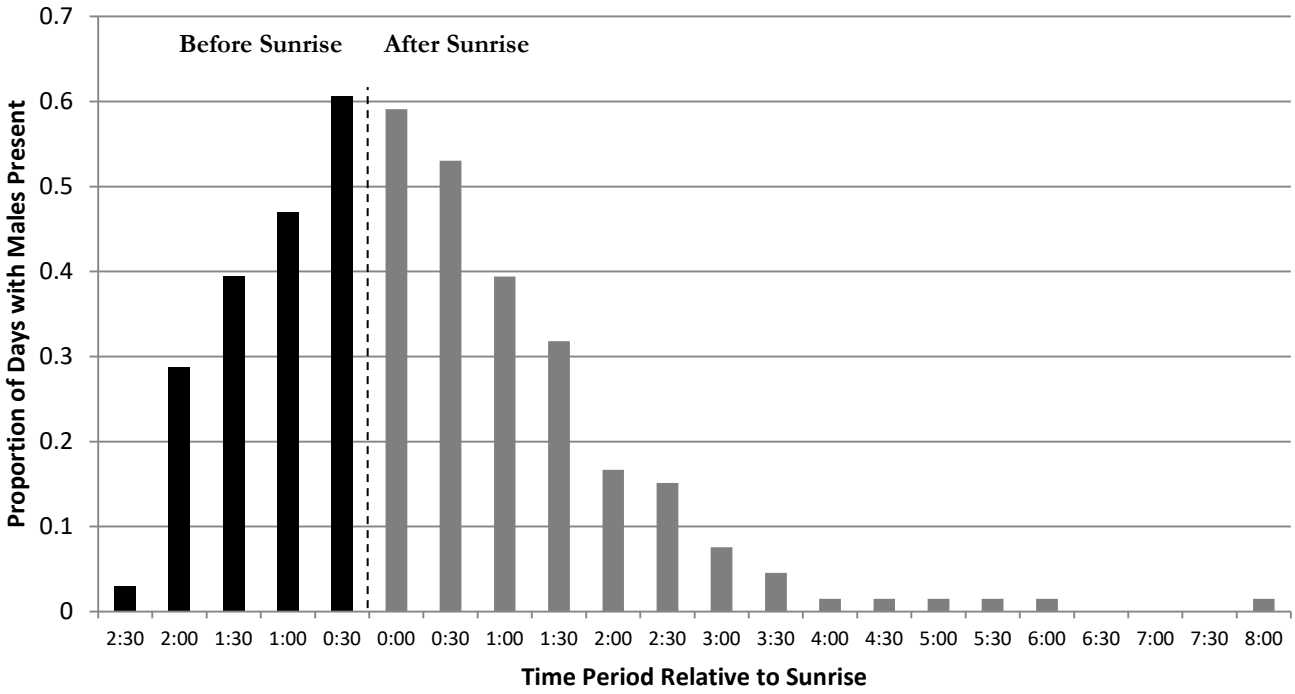


Figure 5-5. Attendance on the BH-01 lek (by time of day relative to sunrise) by male sharp-tailed grouse as determined by remote camera photos from March 23 to May 27, 2016.

6 UPLAND BIRDS

6.1 FIELD SURVEY METHODS

Field studies for upland birds included a combination of standardized surveys and the collection of incidental bird observations. The primary method of surveying for upland birds included the use of standardized point counts in representative habitats throughout the LSA. Additionally, species-specific surveys were conducted for common nighthawk. To maximize species detections, the 2014 and 2015 surveys also included the collection of incidental bird observations while travelling between point count locations, as well as during other surveys for raptors, common nighthawk, and waterfowl. Only birds not detected during the point counts were recorded to ensure that double counting of birds did not occur. Migratory birds detected outside of the breeding season were recorded during field surveys but not included as breeding species within this baseline.

6.1.1 STANDARDIZED POINT COUNTS

Standardized point counts were used to survey for upland breeding birds in the LSA during 2013, 2014, and 2015 (Figure 6-1). These surveys were conducted during the breeding season, from mid- to late-June, to coincide with the peak in singing activity of territorial males (Table 6-1). The survey data is intended to provide information on the species composition and abundance of breeding birds within the LSA, the presence of species of conservation concern, and the location of any important habitat features for birds in the LSA.

Table 6-1. Summary of upland bird surveys conducted in the Project area during 2013, 2014 and 2015.

Survey Year	LSA Extent	Survey Timing	Number of Point Counts
2013	Mine site	12 – 14 June	16
2014	Mine site	18 – 25 June	62
2015	Mine site	18 June	16
	NAR	16 – 24 June	117

Point count surveys consisted of fixed radius point count (100 m) surveys where all birds were recorded within or flying over the plot during a 10 minute count period. The activity of each individual observed was recorded, as was the sex and behaviour (singing, calling, flying overhead, etc.), when possible. The 2014 and 2015 surveys assigned individual birds observed to four separate zones with the 100 m radius count: 0–25 m, 25–50 m, 50–75 m and 75–100 m. Birds were also recorded outside of the 100 m radius although these individuals are treated as incidental observations only.

In general, surveys were placed within a single vegetation type based on stand type, age, and vegetation species composition. However, certain habitat types did not lend themselves to a single habitat 100 m radius plot (e.g. riparian shrub habitats are typically distributed in narrow strips and are rarely large enough to

encompass an entire plot). In order to survey these habitats and document any species using these areas, mixed habitat plots were conducted. Whenever more than one habitat type was present within a plot, surveyors estimated the percent of each habitat within the plot and documented which habitat type any birds were observed within.

In addition to bird observations, additional information recorded at each point count included the following: surveyor, date, start time, wind (Beaufort scale), sky conditions, air temperature, precipitation, geographic co-ordinates, photo documentation, and a general description of habitat (2014 and 2015 only). The habitat description included the following data:

- General habitat type (forest, wetland, shrubland, etc.)
- Wetland type, if present (lake, marsh, bog, swamp, fen, flood)
- Forest age/class (regenerating, young, mature, old, logged, burn)
- Forest type (deciduous, coniferous, mixed wood)
- Composition of dominant tree species (% of each)
- Canopy coverage (open, sparse, closed, dense)
- Average shrub height and percent cover
- Percent cover of herbs

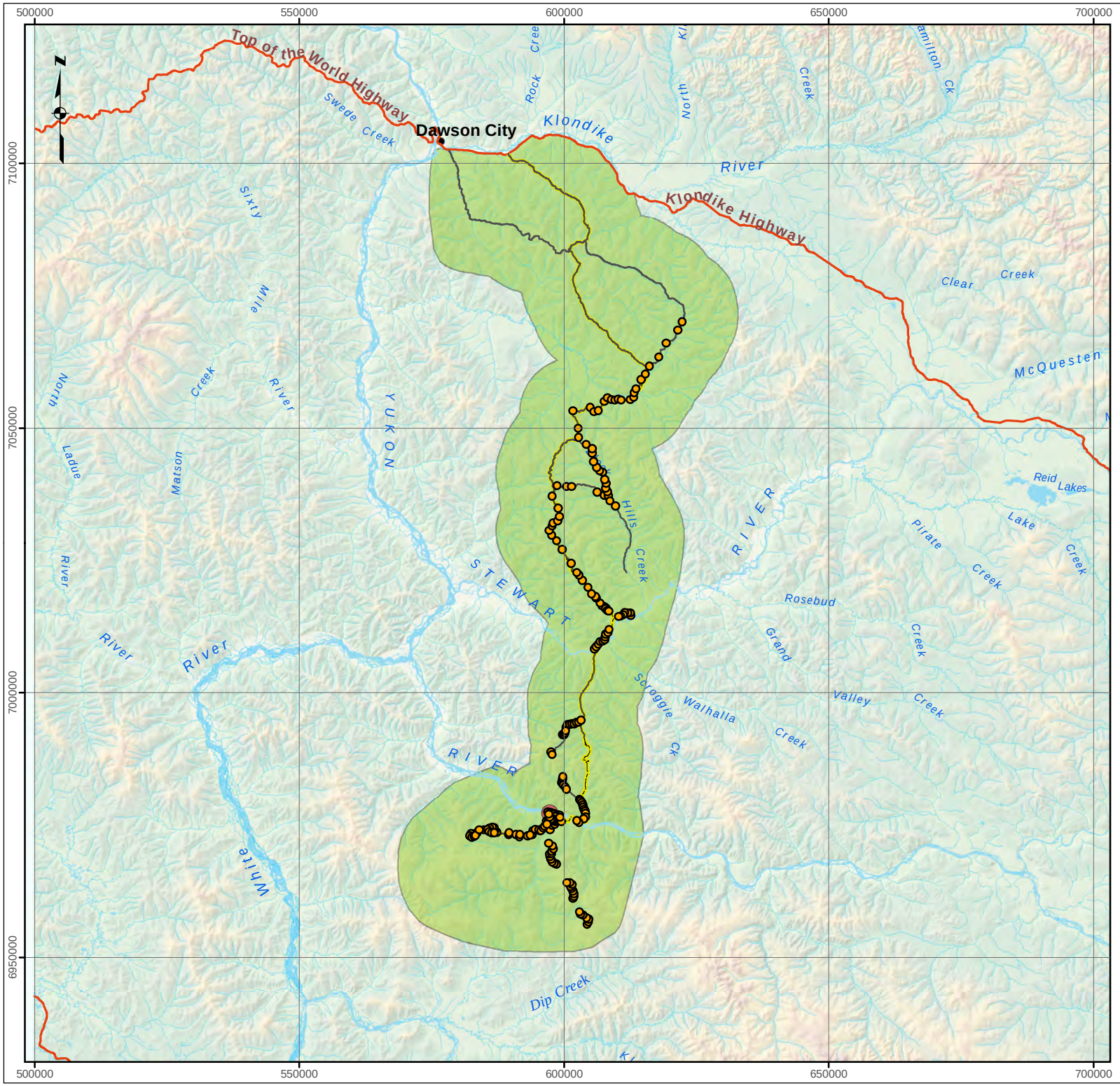
The daily timing of the breeding bird surveys was scheduled to begin one half hour prior to official sunrise until approximately 10:00 AM. All point counts were surveyed in near ideal conditions (minimal wind or precipitation) and surveys were postponed when weather conditions were unsuitable.

6.1.2 COMMON NIGHTHAWK SURVEYS

Prior to the commencement of the 2014 bird baseline studies for the Project, this species at risk (Special Concern, SARA Schedule 1) was not known to occur within the LSA which is located near the northern extent of the species' breeding range in Yukon. Despite the pre-existing lack of information on the species within the LSA, the presence of suitable nesting habitat (open forests, old burns, anthropogenically disturbed areas), warranted species-specific surveys.

Species-specific surveys for common nighthawks were conducted in 2014, 2015 and 2016 along existing roads in both the northern (2015 only) and southern portions of the LSA (2014–2016; Figure 3-1). In all years and across all areas, the common nighthawk survey was done concurrently with a stand-watch survey for short-eared owl (see Section 3.1.2) and took place from one hour before sunset to one hour before sunrise. Survey points were located along existing roads and were spaced a minimum of 1.6 km apart to be consistent with similar surveys conducted by the Canadian Wildlife Service in Yukon during 2014 and 2015 (Sinclair pers. comm. 2016). Each site was surveyed for six minutes, unless the survey point was also a suitable short-eared owl site, whereby the surveys were combined for the two species with the survey time extended to ten minutes. The biologist listened for vocalizations of common nighthawks and used binoculars to scan for foraging birds. The following information was recorded for each survey point: geographic coordinates, date, start and end time, general weather conditions (cloud cover, air temperature,

precipitation, and wind), general habitat description (forest cover species, stand age, etc.), and site photos. In 2014, five points were surveyed south of the Yukon River (June 23). In 2015, nine points were surveyed (June 22) south of the Yukon River, and 42 points were surveyed along the NAR (June 16–19, 2015). Surveys in 2016 included seven survey points south of the Yukon River (June 15–16, 2016).



Legend

- Coffee Camp (Current)
- Settlement/Community
- Highway
- Existing Access
- Proposed Route
- Regional Study Area

Breeding Bird Point Count Survey

- Survey location

FIGURE: 6 - 1

Coffee Project standardized point count survey locations

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

Project data displayed is site specific. Survey data collected by EDI Environmental Dynamics Inc. (2015).

Disclaimer
This document is not an official land survey and the spatial data presented is subject to change.

0 20 40
KM

Map Reference Scale: 1:1,000,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn: MS	Checked: BS/MP	Date: 3/7/2017

KAMINAK GOLD CORPORATION EDI

Path: O:\2014\14_Y_0306_Kaminak_CoffeeCk\Mapping\2016_Mapping\2016_Baseline\007_Birds\Fig6_1_Pointcountsurveys_07032017.mxd

6.2 GENERAL RESULTS

The analysis of the standardized point count data provides an indication of overall diversity of breeding upland birds within the LSA. Project baseline surveys confirmed the presence of 52 upland bird species (excluding game birds) within the LSA including six species found only in the southern portion of the LSA (mine area) and four different species unique to the northern portion of the LSA (road area; Appendix A). All species detected during 2013 were also detected during the more comprehensive 2014 and 2015 surveys with the exception of one species (golden-crowned sparrow). With the expanded LSA during 2015, there were eight new species of upland birds (excluding game birds) detected with the most notable species being horned grebe, common nighthawk, Tennessee warbler, and rusty blackbird. There were a total of 2,462 upland birds detected during the standardized surveys (point counts) during 2014 and 2015 combined.

The majority of upland bird species were detected on a number of occasions; however, there were three species detected on only one occasion across all survey methods during 2013, 2014, and 2015: horned lark, American redstart, and red crossbill. Horned lark associated exclusively with alpine habitats during the breeding season and the low number of detections for these species is related to the small amount of this habitat present in the LSA. American redstart is considered an extralimital species within the LSA as it is typically restricted to the southern margin of Yukon only. Photo documentation could not be collected for this bird, however it was observed within the Yukon River floodplain on June 22, 2014 by an experienced field ornithologist and determined to be a young male. Red crossbill is not a common species in the Dawson region (casual) which accounts for the low number of detections.

Standardized point counts were conducted within three bioclimate zones during 2014 and 2015, including alpine, subalpine, and boreal forest. Few counts were conducted within alpine habitats due to the small amount of that habitat present within the LSA. Within the southern portion of the LSA (mine area; south of the Yukon River), the majority of counts were conducted in the boreal forest zone (58%), followed by subalpine (34%), and alpine (8%; Table 6-2). Both the number of individual upland birds and number of species detected per point count was highest in the boreal forest zone where the most common species detected were dark-eyed junco and Swainson's thrush. It is notable that there were numerous detections of white-winged crossbill in this zone during 2014 (15 of 35 point counts) and zero detections during 2015 when 11 point counts were surveyed in the zone. This species of finch is considered nomadic and the number of individuals found in a given area often fluctuates considerably between years in response to changes in conifer seed crops. The number of upland birds detected within the subalpine bioclimate zone was similar to the boreal forest zone with the most common species detected being white-crowned sparrow. This species is widespread in subalpine habitats throughout much of Yukon (Sinclair et al. 2003) where it is often one of the most common breeding bird species. Within the alpine bioclimatic zone, the number of point counts was relatively low and the corresponding number of upland birds detected was considerably lower than the boreal forest and subalpine zones. Given that bird densities were relatively low and there was a small amount of this habitat present in the LSA, many of the species detected in this habitat were documented by incidental observations.

Table 6-2. Most common upland bird species detected during 2014 and 2015 by bioclimate zone (mine area only).

Bioclimate Zone	Number of plots	Birds detected/plot	Bird species detected/plot	Total Species Detected	Five most common species (birds/plot)[1, 2]
Alpine	6	2.7	2.2	10	1 – White-crowned Sparrow (0.67) 2 – American Pipit (0.17) American Robin (0.17) American Tree Sparrow (0.17) Common Redpoll (0.17) Gray Jay (0.17) Orange-crowned Warbler (0.17) Savannah Sparrow (0.17) Slate-colored Junco (0.17) Townsend's Solitaire (0.17)
Subalpine	26	5.4	3.4	18	1 – White-crowned Sparrow (1.50) 2 – Common Redpoll (0.65) 3 – Dark-eyed Junco (0.50) White-winged Crossbill (0.50) 4 – Savannah Sparrow (0.46)
Boreal Forest	46	5.7	4.3	30	1 – Dark-eyed Junco (1.31) 2 – Swainson's Thrush (0.62) 3 – White-winged Crossbill (0.55) 4 – Yellow-rumped Warbler (0.50) American Robin (0.50)

[1] Densities are calculated as simply the number of birds detected per plot with no attempt made to account for birds not detected (i.e. the majority of the birds detected are singing males, in many cases female birds are likely also present but are silently sitting on nests; however, only those birds seen or heard by the observer are included here).

[2] Only birds detected within the 100 m count radius included; individuals detected outside of this radius are considered incidental observations only.

Within the northern portion of the LSA (road area; north of the Yukon River), a total of 117 standardized points were surveyed. The majority of these counts were conducted in the boreal forest zone (97%) due to the prevalence of this habitat within this portion of the LSA. A relatively high number of birds were detected within this zone (14.3 birds/plot on average; Table 6-3). This may partially be due to the prevalence of anthropogenic (placer mining) and naturally disturbed (old burns) areas which contain substantial regenerating vegetation (shrubs) and various edge habitats. There were also a number of point counts within that zone which were located near wetland habitats where upland bird abundance is expected to be relatively high. The three most common species detected within this zone included dark-eyed junco, Swainson's thrush, and American robin.

Subalpine habitats within this section of the LSA are limited to small areas near Thistle Mountain, Eureka Dome, and Henderson Dome. Point counts were conducted within each of these areas and the total number of counts (four) accounted for 3% of all point counts surveyed in the northern portion of the LSA. The overall number of birds detected within this habitat was relatively high (10.5 birds/plot on average; Table 6-3; however, this is skewed by the small sample size and two plots with high numbers of white-

crowned sparrows detected which may have inflated these estimates. Given the similarities in subalpine habitats in the northern and southern portions of the LSA, the data from the latter can be used to predict upland bird breeding communities within this zone throughout the LSA. Alpine habitats are not found within the northern portion of the LSA.

Table 6-3. Most common upland bird species detected during 2014 and 2015 by bioclimate zone (road area only)

Bioclimate Zone	Number of plots	Birds detected/plot	Bird species detected/plot	Total Species Detected	Five most common species (birds/plot)[1, 2]
Alpine	0	-	-	-	-
Subalpine	4	10.5	4.5	12	1 – White-crowned Sparrow (4.50) 2 – Alder Flycatcher (1.00) 3 – Dark-eyed Junco (1.00) 4 – American Robin (0.75) Common Redpoll (0.75)
Boreal Forest	113	14.3	7.8	48	1 – Dark-eyed Junco (1.83) 2 – Swainson's Thrush (1.61) 3 – American Robin (1.32) 4 – White-crowned Sparrow (1.19) 5 – Alder Flycatcher (0.92)

1 Densities are calculated as simply the number of birds detected per plot with no attempt made to account for birds not detected (i.e. the majority of the birds detected are singing males, in many cases female birds are likely also present but are silently sitting on nests; however, only those birds seen or heard by the observer are included here).

2 Only birds detected within the 100 m count radius included; individuals detected outside of this radius are considered incidental observations only.

6.2.1 DENSITY AND DIVERSITY

The 2014 and 2015 standardized point count data was used to determine the density and diversity of upland bird species throughout the LSA. These measures were determined through the compilation of species accumulation curves and an analysis of breeding bird density by habitat type as described in the following sections.

6.2.1.1 Species Accumulation Curves

Species accumulation curves provide a representation of the number of bird species detected with increasing level of survey effort. For each of the three bioclimate zones surveyed for breeding birds, the points were sequentially ordered to display the number of species detected across the total amount of surveys conducted. Within the subalpine and boreal forest zones, there is a large amount of variability in the habitat potential for breeding birds (e.g., presence of wetlands or areas dominated by shrubs) and although the species accumulation curves do not take these factors into consideration, this method does provide a coarse indicator of whether the level of effort was sufficient to obtain an accurate representation of breeding bird communities within each zone.

As noted in Section 6.2, the number of point counts sampled in the alpine zone (six) was relatively low due to the limited amount of the habitat in the LSA. This small sample size is reflected in the species accumulation curve for this zone (Figure 6-2), which does not show a plateau in the number of bird species detected as compared to the amount of effort. Within the boreal forest and subalpine zones, the species accumulation curves show that the level of effort was sufficient to obtain representative data on breeding bird species in these zones (Figure 6-3). In the boreal forest zone, there is a notable plateau in the curve after 31 counts; after which only a single new species was added following count 39. In the subalpine, this plateau occurred after count 19 with only one additional species detected on the final count (26).

Along the road area, only four counts were conducted in the subalpine zone and as such a species accumulation curve is not shown for this data. With the relatively high number of counts surveyed in the boreal forest zone, this data can be displayed in the form of a species accumulation curve. This curve demonstrates that the level of survey was more than adequate to detect the species found within these habitats. With a total of 113 counts surveyed and 45 species detected, the first plateau occurs after 21 counts when 35 species were detected and a second plateau at 77 counts when 45 species were detected (Figure 6-4).

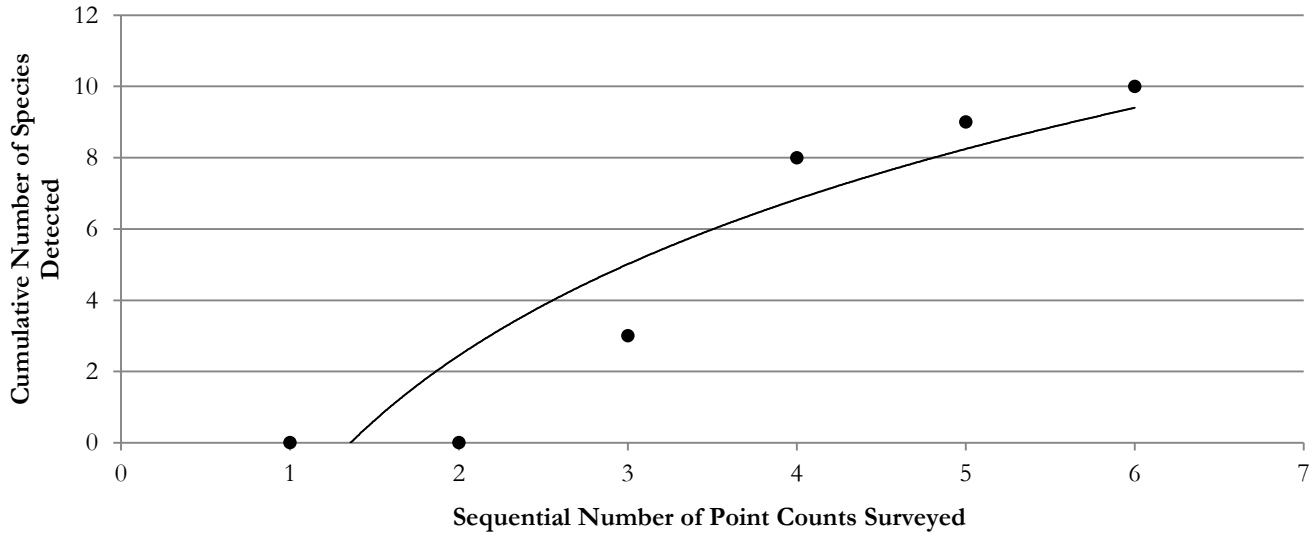


Figure 6-2. Upland bird point count accumulation curve for the alpine bioclimate zone in the southern portion of the LSA (mine site area).

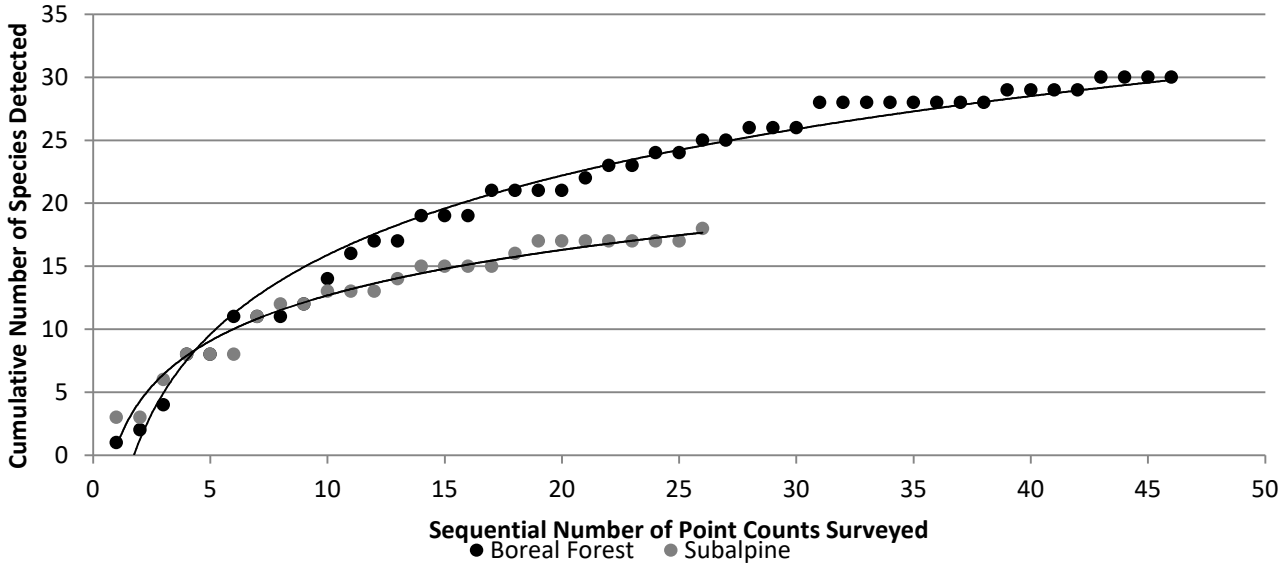


Figure 6-3. Upland bird point count accumulation curve for the boreal forest and subalpine bioclimate zones in the southern portion of the LSA (mine site area).

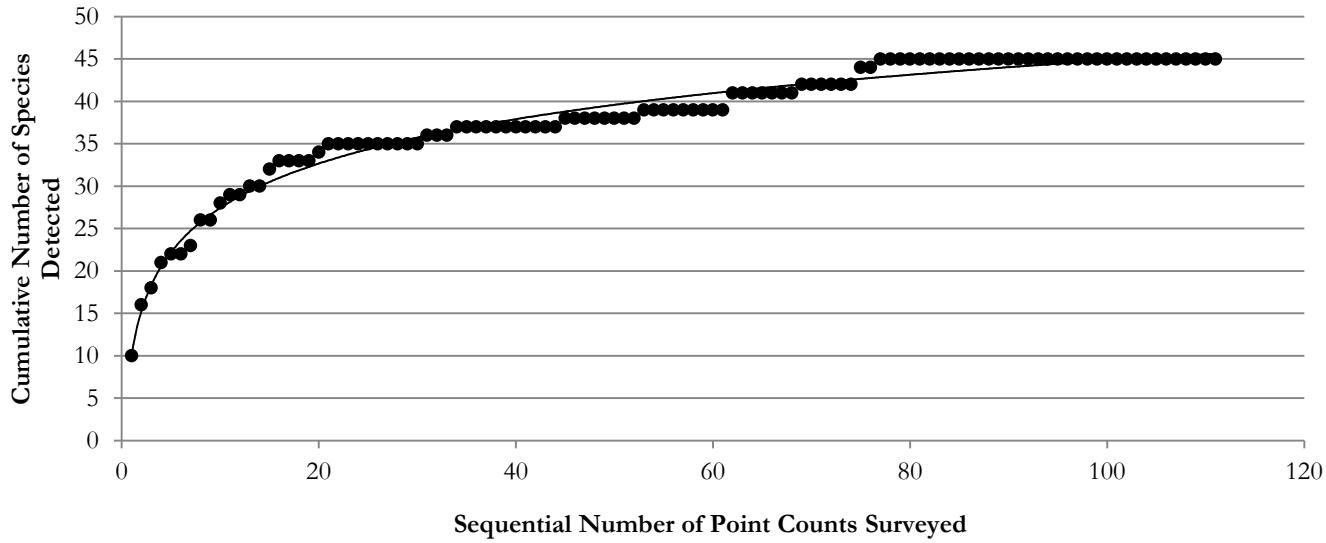


Figure 6-4. Upland bird point count accumulation curve for the boreal forest bioclimate zone along the Northern Access Road.

6.2.1.2 Bird Density and Diversity by Habitat Type

Breeding upland bird density and diversity was calculated for a number of different habitat types throughout the LSA. Habitat mapping was used to determine general habitat types for birds and included a combination of Ecological Land Classification (ELC) and Broad Ecosystem Mapping (BEM; EDI 2017).

Virtually all areas of the LSA provide habitat for breeding birds, although there is considerable variation in the density and diversity of birds across habitat types. The habitats with the lowest density of breeding birds included subalpine/alpine areas such as the felsenmeer, subalpine/alpine shrub, and high elevation

sparse/open forest (Table 6-4). Habitats with the highest density of breeding birds included placer mined areas and old burns; these areas are dominated by regenerating vegetation and typically have a large component of shrubs. In the case of the placer mined areas, these are located almost exclusively in lowland areas, are often in proximity to water (placer mined ponds and streams), and contain extensive edge habitat. These areas were found to often contain a high number of habitat generalists such as American robin and dark-eyed junco with relatively few habitat specialists. Riparian forests, stunted coniferous forests, and upland closed canopy forests (coniferous) were found to have an intermediate density of breeding birds, although this often included habitat specialists such as Townsend's warbler, boreal chickadee, and varied thrush. Species at the northern extent of Yukon breeding range were also found in these habitats (particularly riparian forests) and included yellow-bellied sapsucker and warbling vireo. For more detailed information on the suitability and availability of habitat for passerine birds in the LSA, refer to Section 7.5 for habitat modelling information.

Table 6-4. Density and diversity of upland birds in the LSA based on 2014 and 2015 point count results and ELC/BEM data.

Habitat Type[1]	# of Birds / Plot [2]			# of Species / Plot		
	Mean ± SE	Median	Range	Mean ± SE	Median	Range
Felsenmeer (n=4)	2.75 ± 0.95	3.5	0 – 4	1.75 ± 0.63	2	0 – 3
Subalpine/alpine shrub (n=25)	3.84 ± 0.45	4	0 – 8	2.72 ± 0.35	2	0 – 7
High elevation sparse/open forest (n=7)	4.71 ± 0.78	4	2 – 8	3.71 ± 0.71	3	2 – 6
Old Burns (n=27)	12.52 ± 1.00	11	4 – 25	6.26 ± 0.59	6	1 – 17
Upland closed canopy forest (coniferous; n=16)	8.88 ± 1.56	6.5	0 – 20	5.50 ± 0.68	5.5	0 – 10
Upland closed canopy forest (deciduous; n= 22)	8.32 ± 1.00	8	1 – 16	5.23 ± 0.49	6	1 – 9
Upland closed canopy forest (mixed; n=20)	5.00 ± 0.74	4	0 – 13	3.70 ± 0.41	3.5	0 – 8
Riparian forests (coniferous, deciduous and mixed; n= 19)	7.11 ± 0.76	6	3 – 14	5.26 ± 0.61	4	2 – 11
Stunted coniferous forest (n=15)	8.20 ± 1.56	7	3 – 22	5.33 ± 0.71	5	2 – 10
Marsh/swamp (n=4)	7.75 ± 2.29	7	3 – 14	5.00 ± 1.47	5.5	1 – 8
Fen (n=13)	6.15 ± 1.08	5	3 – 16	4.69 ± 0.67	4	3 – 11
Placer mined (n=15)	16.93 ± 1.39	18	7 – 23	9.07 ± 0.54	9	6 – 12
All Plots with ELC/BEM Coverage (n=190)	8.11 ± 0.41	6	0 – 25	5.02 ± 0.21	5	0 – 17
All Plots without ELC/BEM Coverage (n=5)[3]	14.80 ± 2.27	16	6 – 19	6.60 ± 0.81	7	4 – 9
ALL PLOTS (n=195)	8.27 ± 0.41	6	0 – 26	5.06 ± 0.20	5	0 – 17

1 Additional point counts were surveyed in grassland (n=1) and low elevation riparian shrub (n=2) habitats; however, are excluded here due to low sample sizes. These counts are included in the summary portion of the table (bottom three rows).

2 The densities reported here included only the birds detected within the plots surveyed with the exception of those which were detected outside of the 100 m point count radius. The birds detected included a combination or visual and auditory detections with no efforts made to extrapolate the presence of singing males to pairs of breeding birds.

3 The majority of the counts without ELC/BEM coverage were located along lower Dominion Creek in an area dominated by ponds, placer ponds, old burns, and previously placer mined areas. This accounts for the relatively high density of birds within these plots.

6.3 SPECIES SPECIFIC RESULTS

Of the upland bird species observed or expected to occur within the LSA, 12 are listed as species of concern within Yukon (Yukon CDC) or Canada (COSEWIC, SARA) — see Section 2. Of these species, the five species listed under COSEWIC and/or SARA (Common Nighthawk, Olive-sided Flycatcher, Bank Swallow, Barn Swallow, and Rusty Blackbird) are discussed in further detail in the following section. Given the concern for these species, additional background information is provided for each species along with survey results for the species within the LSA. The remaining seven species are not discussed in detail as they are not listed by COSEWIC/SARA, occur infrequently within the LSA and/or have very limited habitat available in the LSA.

6.3.1 COMMON NIGHTHAWK

Common nighthawk was listed as Threatened in Canada in 2007 due to both short and long term population declines (COSEWIC 2007a); it is also included on Schedule 1 of SARA. Long-term population trend data from across Canada indicates a 4.2% decline per year from 1968 to 2005 which represents an overall decline of 80% over this time period (COSEWIC 2007a). Data from the Yukon portion of the Roadside Breeding Bird Survey shows an overall increase of 6.8% per year from 1986 to 2012, but a 6.5% decline per year from 2002 to 2012; however, the estimates have a low overall reliability due to a relatively small sample size and high amount of variability (Environment Canada 2014). This is particularly important to consider for this species which is detected infrequently during conventional breeding bird surveys. As with other species of aerial insectivores, this decline is thought to be largely due to reductions in insect abundance from large scale use of insecticides since the mid-1900s (referenced in COSEWIC 2007a). Additional threats which have been identified (COSEWIC 2007a) and may be relevant to Yukon include fire suppression which may reduce nesting habitat availability, collisions with motor vehicles, and climatic variation.

In Yukon, the preferred nesting habitat of common nighthawk includes lodgepole pine forests, old burned areas, and open mixed forests, with wetlands also being important foraging areas (Sinclair et al. 2003). The distribution of this species in Yukon is restricted to the southern portion of the territory and it is known to occur regularly as far north as Dawson. Until recently, there was relatively little species-specific information in Yukon. Common nighthawk are not effectively surveyed using methods for survey other species of upland birds (i.e., point counts) and due to the largely nocturnal habits of the species, more specialized survey methods are required. The most relevant existing information for this species in the vicinity of the Coffee RSA is the breeding bird surveys conducted in the Indian River valley by Chevreux (2014). During these surveys, common nighthawk booming flights were detected on two occasions over a post-mined area.

To collect more information on common nighthawk distribution and abundance in Yukon, Environment Canada (Canadian Wildlife Service) initiated species-specific surveys on previously established roadside breeding bird survey (BBS) routes throughout the territory. A total of 14 routes were surveyed in both 2014 and 2015 and ranged throughout the southern and central Yukon to north of the Dempster Corner near Dawson (Sinclair, pers. comm. 2016). These surveys consisted of the first 20 odd-numbered stops (1.6 km

apart) at each of the established BBS routes with a six minute count at each stop and were conducted from one hour before local sunset between June 22 and August 1. On average, 11.5 common nighthawks were detected per 20 stop route with a range of 0 to 52 detected per route (Sinclair, 2016, pers. comm.).

Over the course of Project baseline surveys there were a total of 23 common nighthawk detected at 16 different sites, all of which occurred during 2015 (Maps C4–C6 in Appendix C). All but one of the observations occurred along the NAR, north of the Stewart River. In the southern portion of the LSA there was a single incidental observation of one bird flying overhead (west) at the Coffee Camp helipad on June 24, 2015. The availability of suitable habitat for this species is relatively limited in this portion of the LSA and as such, baseline studies indicate that this area does not appear to be an important area for this species at risk. The presence of some small wetlands along the Yukon River floodplain may provide suitable foraging habitat and likely explains the incidental observation of a single bird during 2015. Along the NAR, there were a total of 22 detections that included 15 individuals on species-specific surveys and an additional seven observations during standardized point counts for other upland birds during the early morning hours. A combination of both booms and calls were heard. Over the duration of the surveys air temperatures ranged from 4 to 15°C.

During the species-specific surveys in the road area, survey points were located across elevations which ranged from 449 to 1,116 m although the survey points were not equally distributed within this range (Figure 6-5). Common nighthawks were detected at elevations ranging from 531 to 1,067 m; however, the territorial booming displays were detected to a maximum elevation of 611 m. These displays have been found to indicate proximity to nesting sites (Brigham et al. 2011) and this may suggest that within this portion of the LSA, the valley bottoms are used for nesting and the areas above the subalpine ridges may be used for foraging or are traversed while travelling to and from foraging areas.

The species-specific surveys for common nighthawk were completed across a broad range of habitat types in the LSA including old burns, placer mined areas, subalpine/alpine shrub, and upland/closed canopy forests (coniferous, deciduous, mixed). A portion of the survey points along Dominion Creek were located outside of the geographical boundary of the habitat mapping; however, the habitats in this area appeared to include a combination of old burns, placer mined areas, and small ponds (natural and placer). When the results of the species-specific surveys are combined with the results from the standardized point counts, all detections of common nighthawk were located in old burns and placer mined areas. All eight locations with detections of territorial booms were located in placer mined areas suggesting that these disturbed habitats are likely important breeding habitat for common nighthawks within the LSA. For more detailed information on the suitability and availability of habitat for common nighthawk in the LSA, refer to Section 7.4.

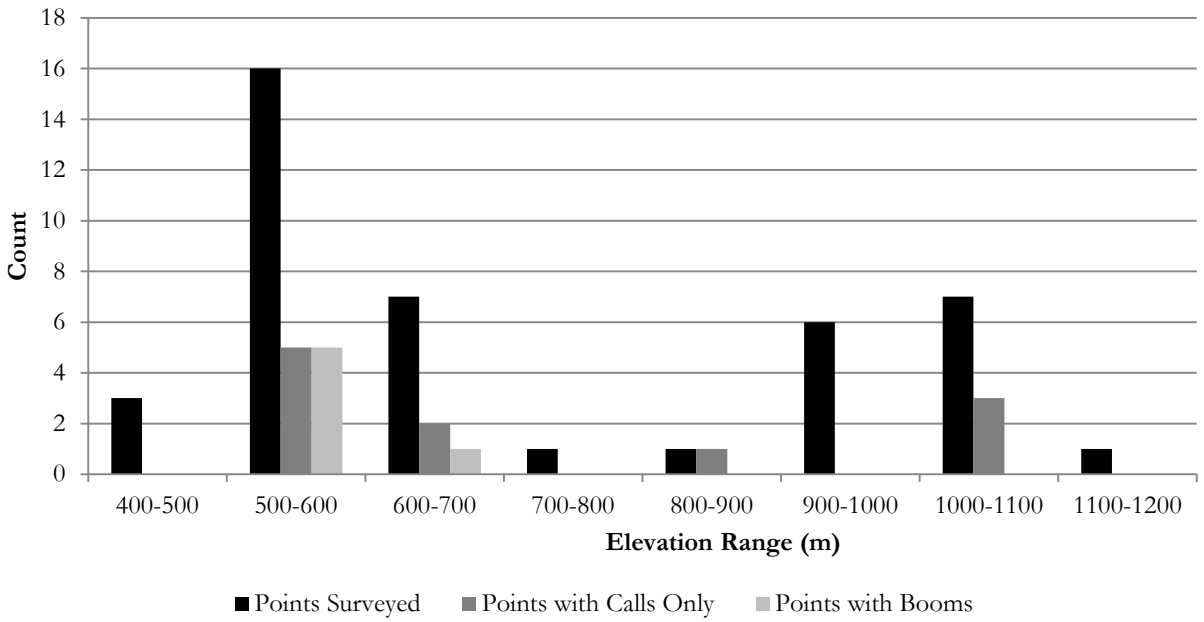


Figure 6-5. Summary of results of common nighthawk species specific surveys in the road area portion of the LSA by elevation.

6.3.2 OLIVE-SIDED FLYCATCHER

Olive-sided flycatcher was listed as Threatened in Canada in 2007 due to a widespread and consistent population decline over the last 30 years with the Canadian population showing a decline of 79% from 1968 to 2006 or a 3.5% annual decline (COSEWIC 2007b). Nationwide trend estimates indicate that the decline has been greatest to the west of the Rocky Mountains where the species is more common (Altman and Sallabanks 2000). Data from the Yukon portion of the Roadside Breeding Bird Survey shows a decline of 2.7% per year from 1986 to 2012 and a 2.3% decline per year from 2002 to 2012; however, the estimates have a low overall reliability due to a relatively small sample size and high amount of data variability (Environment Canada 2014). The reason for this long-term negative trend is unclear. Numerous researchers have suggested that this decline is most likely related to habitat loss and/or change, particularly on the wintering grounds in Central and South America (referenced in COSEWIC 2007b). In some regions, changes in timber harvesting practices have been suggested to act as ecological sinks although this is not likely a concern for Yukon populations given the lack of timber harvesting in the territory. Conversely, the increased frequency of forest fires in the region could result in an increase in breeding habitat for this species which is often found in post-fire habitats.

In Yukon, breeding habitat includes a wide range of habitats including black and white spruce, lodgepole pine, and deciduous forests across a wide range of elevations. These are often found in proximity to wetlands, bogs, and old burns where dead trees provide suitable foraging and singing perches (Sinclair et al. 2003). In the Dempster Highway region, Frisch (1987) described breeding habitat as 'spruce forest with at least some tall trees.' and noted that it may occur to the treeline. The breeding distribution includes the entire Yukon with the exception of the far northern portion of the territory (north of the extent of trees).

Due to the species' very distinctive and loud song, it is readily detected incidentally or during breeding bird surveys, often from a considerable distance from which most bird species cannot be detected.

Over the course of breeding bird studies there were a total of 13 olive-sided flycatcher detected at 12 different sites, all of which occurred during 2014 and 2015 (Maps C7–C9 in Appendix C). In the southern portion of the LSA (south of the Yukon River) there were a total of six detections including five during the standardized point counts. Along the NAR, an additional five individuals were detected on point counts and two individuals were detected while surveying for common nighthawk during the evening hours. During breeding bird surveys along the Indian River in 2014, Chevreux (2014) did not encounter this species frequently; a single bird observed in late May could have been a migrant or a local breeder.

Of the ten individuals detected on the standardized point counts, two were located within the 100 m count radius and can be assigned to a habitat category with confidence. These two individuals occurred within an old burn and upland/closed canopy forest (coniferous) based on BEM and ELC habitat mapping (EDI 2017). The remaining eight individuals were located outside of the 100 m count radius. For more detailed information on the suitability and availability of habitat for olive-sided flycatcher in the LSA, refer to Section 7.6.

6.3.3 BANK SWALLOW

Bank swallow was listed as threatened in Canada during 2013 due to a severe long-term decline which includes an annual decline of nearly 9% between 1970 and 2011 which amounts to a loss of 98% of the Canadian population over this time period (COSEWIC 2013). The most recent trend information (2001 to 2011) continues to show a decline, albeit at a slower rate. Data from the Yukon portion of the Roadside Breeding Bird Survey shows a decline of 5.4% per year from 1986 to 2012 and a 7.2% decline per year from 2002 to 2012; however, the estimates have a low overall reliability due to a relatively small sample size and high amount of data variability (Environment Canada 2014). The reason for this dramatic decline across Canada is not well understood and is suspected to be a combination of a number of factors. The species' use of aggregate collection areas (i.e., gravel pits) can make the nests susceptible to incidental take in some areas which has the potential to directly reduced reproductive output. Other suspected reasons for the decline include loss of foraging habitat, collisions with vehicles, pesticide use which may reduce insect prey abundance, and impacts of climate change on food availability (referenced in COSEWIC 2013).

As with other portions of the breeding range, bank swallows in Yukon use both natural and man-made habitats for nesting. Nesting sites typically include steep embankments comprised of sand, silt, or clay where the swallows can excavate burrows for nesting sites. These nesting areas are often located adjacent to waterways, particularly large rivers and in some cases adjacent to lakes; nesting colonies can range from less than half a dozen burrows to hundreds of burrows (Sinclair et al. 2003). In other portions of the breeding range, man-made habitats have historically constituted important nesting sites for the species; however, since the 1970s, these areas appear to be used less frequently. In Yukon, nesting colonies in man-made habitats are much less frequent than those in natural habitats. For example, a description of 90 colonies in Yukon indicated that 74 were in river banks, 11 in roadside cutbanks, four in banks adjacent to lakes and

one in a gravel extraction pit (Sinclair et al. 2003). Colonies are often reused in subsequent years, but patterns of reoccupancy vary and are not well understood. It is common for portions of colonies or complete colonies to become inactive and for new colonies to be established. It is unclear if inactive colonies may be reoccupied in the future. The observation of large foraging flocks away from breeding areas is a common occurrence, particularly in wetland habitats up to 2 km away from nesting colonies (Sinclair et al. 2003).

A total of 12 Bank Swallow colonies were located during Project baseline surveys (Table 6-5); of these five were confirmed active, three were inactive, and the remaining four had an unknown status. Of the colonies identified, two were located in a natural habitat (river or stream bank; Photo 6-1) and the remainder were located in embankments created due to roads and placer mining activity (Photo 6-2). During point count surveys, more than 30 individuals were recorded on 12 of the standardized point counts. For the most part, these observations included single birds or small groups of up to four individuals. One observation of >10 individuals was made on a point count in an area disturbed by placer mining activity near the Indian River bridge. The majority of Bank Swallow detections were in the road area portion of the LSA with the exception of one inactive colony near the existing Coffee Creek airstrip (Maps C10–C12 in Appendix C).

Breeding bird surveys conducted by Chevreux (2014) in the middle portion of the Indian River valley noted bank swallows on a number of occasions and a total of four colonies were identified in areas previously disturbed by placer mining.

Table 6-5. Summary of bank swallow colonies identified during Coffee Project bird baseline surveys.

Colony ID	Active during baseline studies (Y/N)	General Location	Habitat Type	Comments
BANS_1	Y	Stewart River	Natural river bank	Approximately 40 burrows, numerous adults present; Photo 6-1. Another 10 burrows approximately 100 m away.
BANS_2	Y	Upper Ballarat Creek	Stream bank, placer mined area	12 burrows
BANS_3	Y	Upper Ballarat Creek	Stream bank, placer mined area	16 burrows, one flushed
BANS_4	Unknown	Black Hills Creek	Cutbank, placer mined area	Status unknown, only visited during April (2015) prior to breeding season
BANS_5	Unknown	Lower Sulphur Creek	Road embankment	
BANS_6	N	Eureka Creek	Cutbank, placer mined area	25 + burrows
BANS_7	Y	Indian River	Cutbank, placer mined area	Adults seen entering sand embankment near pond, could not access to count.
BANS_8	Y	Bullfrog Creek	Cutbank, placer mined area	Active colony, could not access to count burrows, approximately 25 adults present; Photo 6-2.
BANS_9	N	Coffee Creek airstrip	Road embankment	9 burrows
BANS_10	N	Ballarat Creek barge landing	Stream bank	6+ burrows
BANS_12	Unknown	Barker Creek road	Road embankment	4 burrows
BANS_13	Unknown	Barker Creek road	Road embankment	2 burrows

Photo 6-1. Active bank swallow colony (BANS_1) on the Stewart River.

Photo 6-2 Active bank swallow colony (BANS_8) along lower Dominion Creek near Bullfrog Creek.

6.3.4 BARN SWALLOW

Barn swallow was listed as threatened in Canada in 2011 due to very large declines which began during the 1980s. A very widespread species across the world, the current population size in Canada is likely higher than pre-European settlement due to the increase in the number of artificial nesting structures such as bridges, buildings, etc. (COSEWIC 2011). Trend information from 1970 to 2009 indicate a statistically significant decline of 3.5% per year or an overall population decline of 76% over this time (COSEWIC 2011) with the declining trend being most pronounced after the mid-1980s. As with many bird species, the reasons for this decline are not well understood although there are a number of potential explanations with the most widely accepted factors being: habitat loss and degradation on the breeding grounds and large scale changes in insect prey (COSEWIC 2011). Changes in the breeding habitat have included changes in barn construction which affects the availability of nesting sites in more southern locations and reductions in the amount of open habitats used for foraging (referenced in COSEWIC 2011). Barn swallows feed exclusively on insects captured in flight and the large and widespread population decline has been suggested to be due to large scale changes in the abundance or seasonal availability of insect prey.

Barn swallow was not detected within the LSA during breeding bird surveys conducted during 2013, 2014, and 2015. Breeding bird surveys conducted in the Indian River valley by Chevreux (2014) also did not detect this species despite a considerable amount of survey effort. This species is found regularly in the southern Yukon and it reaches the northern extent of its breeding range in the Dawson area where it has been encountered on a small number of occasions; there is also a confirmed breeding record at the 40 Mile River downstream of Dawson (Sinclair et al. 2003). Within the LSA, this species may breed in low densities where it would be expected to use active and/or abandoned buildings, bridges, or large culverts as nesting sites. This species is known to occur across a wide range of elevations and therefore could occur from the lowland valleys along the Yukon and Stewart rivers to subalpine and alpine areas if suitable nesting sites are present.

6.3.5 RUSTY BLACKBIRD

Rusty Blackbird was listed as a species of Special Concern in 2006 based on an annual decline of 5.1% per year between 1966 and 2003; this equates to a population decrease of 85.7% over this time period (COSEWIC 2006). As with many bird species showing long-term population declines, the more recent trend information also shows a decline (-2.1%/year; 1994 to2003) although at a slower rate. Data from the Yukon portion of the Roadside Breeding Bird Survey shows a decline of 1.4% per year from 1986 to 2012 and a 0.8% decline per year from 2002 to 2012; however, these estimates have a low overall reliability due to a relatively small sample size and high amount of data variability (Environment Canada 2014). The reason for the long-term population decline is suspected to be due to the loss of wintering habitats and blackbird control programs in the southern United States where this species winters (COSEWIC 2006). Aside from these two primary factors, additional threats to this species may include: changes to boreal forest wetlands due to climate change and acidification/mercury contamination of wetlands due to industrial activity (COSEWIC 2006).

Rusty blackbird is an iconic breeding species in forested boreal wetlands. The breeding habitat for this species in Yukon includes wetland habitats usually along the margins of lakes or ponds in areas with dense marsh vegetation including grasses/shrubs and often standing dead trees (Sinclair et al. 2003). The breeding habitat consistently includes areas of standing water in the form of ponds, meandering creeks, or back channels. Nests are often placed in close proximity to the water — in Alaska (Matsuoka et al. 2010) nests were, on average, 8.2 m from the water. In the Dempster Highway region, Frisch (1987) described its' habitat as brushy bog near still water, and at Swan Lake near Whitehorse, Grunberg (1994) noted that it was typically located along the forest edge adjacent to the lake.

Over the course of Project breeding bird studies there were a total of 13 rusty blackbird detected at eight sites, all of which occurred during 2015 within the road portion of the LSA (Map C13–C15 in Appendix C). The Coffee portion of the LSA does appear to have a limited amount of suitable habitat for this species within the Yukon River floodplain, although a number of standardized point counts (19) and wetland investigations in this area during 2014 and 2015 did not detect this species. The 2015 point counts detected singing male rusty blackbirds in two locations: a complex of reclaimed placer mining ponds along Dominion Creek and a wetland complex within the Stewart River floodplain. The wetlands along the Stewart River upstream of Maisy May Creek appear to provide highly suitable breeding habitat for this species (Photo 6-3). In addition to the point count detection in the Stewart River wetlands, there were four additional incidental observations in this area, totaling six individuals with signs of probable breeding including singing males, an adult carrying food, and a probable nest location. For more detailed information on the suitability and availability of habitat for rusty blackbird in the LSA, refer to Section 7.7.

During breeding bird surveys along the Indian River during 2014, Chevreux (2014) noted that this species was encountered frequently in both post-mined and unmined habitats with evidence of probable breeding in both habitat types.

Photo 6-3. Wetland habitat within the Stewart River floodplain upstream of Maisy May Creek where rusty blackbirds were observed during 2015 breeding bird surveys.

7 HABITAT MODELLING

Habitat modelling was conducted for four species at risk including: short-eared owl, common nighthawk, olive-sided flycatcher, and rusty blackbird. As a group, passerine bird habitats were also modelled to provide an indication of overall upland breeding bird density and diversity throughout the LSA. Modelling was not conducted for sharp-tailed grouse or bank swallows because it was more relevant to focus on key habitat features for those species. In the case of the sharp-tailed grouse, these features include the leks which are important communal breeding areas. For bank swallows, the focus was placed upon the identification of breeding colonies given the communal breeding behaviour of the species. Mapping of small waterbodies (ponds) was conducted for horned grebe and red-necked phalarope.

The habitat suitability models were developed to quantify the amount of habitat available for bird species of interest within the LSA. These species are likely to be considered as key species for the effects assessment of the Project. Also, given the available data, habitat modelling for these species was determined to be most applicable. The models were developed using a four-class rating system as a predictor of habitat quality and included high, moderate, low, and nil suitability. Inputs to the habitat models for passerine birds, common nighthawk, olive-sided flycatcher, and rusty blackbird involved a combination of the following information sources:

- Bird species distribution and density information based on survey data collected for the Project during 2014 and 2015 (see Section 6.2.1.2);
- Ecological land classification (ELC) in the southern portion of the LSA (mine site) and the new sections of the NAR (EDI 2017);
- Broad ecosystem mapping along the existing portions of the NAR (EDI 2017);
- Bioclimatic zone delineation Environment Yukon (Flynn and Francis 2011);
- 1:50,000 Canvec waterbody layers obtained through Natural Resources Canada;
- 1:50,000 digital elevation data obtained online through Geobase Digital Elevation Model;
- Forest cover data provided by Yukon Government – Forest Management Branch;
- High resolution imagery (LIDAR; 5 m resolution) throughout the LSA including the vicinity of the mine site and both the new and proposed upgraded sections of the NAR.

7.1 SPECIES SPECIFIC MODELLING APPROACH

Habitat suitability modelling was based on ELC and BEM classification completed in the LSA (EDI 2017). Given that full ELC mapping was only conducted in portions of the LSA, this information was summarized and condensed to the categories used for the BEM to allow for consistent models to be developed across the LSA. The methods used to develop the species-specific models are provided in the following sections; refer to Table 7-2 for a description of the habitat categories used for the models and the species specific ratings by habitat type. The models developed are not focused exclusively on nesting habitat but are intended to include all habitats used during the breeding season including those used for hunting/foraging,

roosting, and/or nesting. In the case of horned grebe and red-necked phalarope, wetland mapping (BEM/ELC) was used to identify potential breeding habitat for these species. Due to the relatively small number of suitable ponds for breeding, all areas (natural and man-made) of habitat were assumed to be suitable for these species.

7.2 HORNED GREBE AND RED-NECKED PHALAROPE

The mapping of potential wetland nesting habitat for horned grebe and red-necked phalarope indicates that this habitat is relatively limited within the modelling extent. A total of 18 marshes and 28 small ponds are present in the area which total 184.13 ha or 3% of the total area mapped (Table 7-1; Maps D1-D3 in Appendix D). Marshes are found throughout the extent of the area with habitat mapping although they occur most frequently within the Stewart and Yukon River floodplains. The majority of ponds are present in areas of previous placer mining disturbance and the availability of undisturbed pond habitat is limited to four small waterbodies.

Table 7-1. Habitat availability for horned grebe and red-necked phalarope within the extent of the BEM/ELC mapping conducted for the Coffee Project.

Marshes		Natural ponds		Placer Mined Ponds	
Number of marshes	Total habitat area (ha)	Number of wetland waterbodies	Total habitat area (ha)	Number of wetland waterbodies	Total habitat area (ha)
18	65.47	4	7.04	25	111.62

7.3 SHORT-EARED OWL

In the short-eared owl model, subalpine/alpine shrub dominated by mountain avens (*Dryas octopetala*)/sparse herbs, low/dwarf shrubs were rated as high suitability (Table 7-2). Other open habitats such as old burns, fens, swamps, marshes, and bogs were rated as moderate suitability. Areas with a low rating included recently placer mined areas, exposed rock (felsenmeer, talus, rock outcrop), and all areas dominated by tall shrubs or closed canopy/riparian forests. Grassland habitats within the Boreal High ecozone were also rated as low suitability given that these areas were typically located on steep slopes intermixed with deciduous forest (trembling aspen) and are not typical breeding habitat. Areas of open water and anthropogenically disturbed areas were rated as nil.

The habitat model (Table 7-3; Maps D4-D6 in Appendix D) indicates that over 72% of the LSA contains low and nil suitability habitat for short-eared owl. Moderate quality habitats include nearly 27% of the LSA and are located throughout the LSA due to the extensive area of old burns which were rated as moderate suitability. High quality habitats (< 1% of the LSA) are found in the southern portion of the LSA and are reflective of the presence of alpine habitats in the LSA.

7.4 COMMON NIGHTHAWK

In Yukon, the preferred nesting habitat of common nighthawk includes lodgepole pine forests, old burned areas, and open mixed forests with wetlands also being important foraging areas (Sinclair et al. 2003). During the breeding bird surveys within the LSA, this species was detected exclusively in old burns and areas disturbed by recent placer mining activity (including placer ponds). Based on this information and the regional knowledge of the breeding habitats, areas with a high rating included old burns, placer mined areas, and wetlands with standing water (swamp, marsh, pond, placer pond; Table 7-2). Areas with a moderate rating included anthropogenically disturbed sites (camps, airstrips, etc.), fens and bogs due to potential nesting in these areas, and lakes/rivers due to potential use of these areas as foraging habitat. All other areas including exposed rock (talus, felsenmeer) and those dominated by shrubs and closed canopy forests were rated as low suitability.

The habitat model (Table 7-3; Maps D7-D9 in Appendix D) indicates that over 66% of the LSA contains habitat with low and nil suitability for common nighthawk and moderate quality habitats encompass a small portion of the LSA (2.8%). High quality habitats are relatively extensive for this species in the LSA, comprising 30.3% of the total area. This is due in large part to the extensive amount of disturbed habitat (old burns and placer mined areas) which are rated as high suitability. The high quality habitats are located throughout the LSA with the most extensive habitat located along the NAR in the vicinity of upper Maisy May Creek/Eureka Ridge.

7.5 PASSERINE BIRDS

Passerine birds use a wide range of habitats for breeding and this is supported by the presence of birds in all habitats surveyed during the baseline studies. The bird density and diversity by habitat type were combined with professional knowledge and judgement of breeding bird habitats in Yukon to determine habitat ratings for passerine birds. The presence of habitat specialists (boreal chickadee, Townsend's warbler) and species at the northern extent of the breeding range (yellow-bellied sapsucker, warbling vireo) was also taken into consideration, particularly in the case of the riparian forests where these species are most frequently encountered. Habitats with a high rating for passerines included: old burns, placer mined areas, upland coniferous forest, riparian forest, high/low elevation shrubby areas, swamps, and marshes (Table 7-2). Placer mined areas are located almost exclusively in the valley bottoms and are often characterized by dense regenerating areas of shrubs/deciduous vegetation and located in proximity to water (small ponds and/or streams). The majority of other vegetated areas were rated as moderate suitability for passerines and included: high elevation sparse/open coniferous forest, stunted coniferous forest, subalpine/alpine shrub, grassland, upland deciduous and mixed forests, and fens. Habitats rated as low for passerine birds include felsenmeer, exposed rock/talus, areas of open water (river, pond, etc.) and anthropogenically disturbed areas not covered by the placer mining habitat category (bare ground).

The habitat model (Table 7-3; Maps D10–D12 in Appendix D) indicates that a very small portion of the LSA (1.7%) has low or nil suitability for passerines birds. Moderate and high quality habitats each constitute

approximately 49% of the total area of the LSA. These habitats are located throughout the LSA but the high quality habitats are most extensive in the upper Maisy May Creek/Eureka Ridge/Henderson Dome and the Coffee areas due to the expanse of disturbed area (old burns and placer mining). The portions of the LSA which cover the Yukon and Stewart rivers floodplains are also dominated by high quality habitats due to the presence of riparian forests and wetlands in these areas.

7.6 OLIVE-SIDED FLYCATCHER

In Yukon, breeding habitat for this species includes a wide range of habitats including black and white spruce, lodgepole pine, and deciduous forests across a wide range of elevations. These are often found in proximity to wetlands, bogs, and old burns where dead trees provide suitable foraging and singing perches (Sinclair et al. 2003). During breeding bird surveys within the LSA, this species was detected on two points, one in an old burn and one in an upland coniferous forest. Based on this information and the regional information on habitat associations, habitats rated as high suitability for this species include old burns, fens, stunted coniferous forests, and high elevation sparse/open coniferous forests (Table 7-2). Other forested habitats and wetlands were rated as moderate suitability and include upland coniferous, riparian forests, swamps, and marshes. Habitats dominated by deciduous/mixed forests, shrubs, sparse vegetation, or open water were rated as low suitability.

The habitat model (Table 7-3; Maps D10–D12 in Appendix D) indicates that a considerable portion of the LSA (29%) has low or nil suitability for olive-sided flycatcher. Moderate and high quality habitats represent 35 and 36% of the LSA, respectively. The high quality habitats are located throughout the LSA but are concentrated in the Coffee and upper Maisy May Creek/Eureka Ridge/Henderson Dome areas due to the prevalence of old burns and stunted coniferous forests which are rated as high suitability.

7.7 RUSTY BLACKBIRD

The breeding habitat for rusty blackbird in Yukon includes wetland habitats usually along the margins of lakes or ponds in areas with dense marsh vegetation including grasses/shrubs and often standing dead trees (Sinclair et al. 2003). Habitats rated as high suitability for this species include swamps and marshes. Fens, riparian forests and low elevation shrubby areas were rated as low suitability (Table 7-2). In addition to these habitat ratings, all areas located with 75 m of wetlands and ponds (marsh, swamp, pond, placer pond) were also rated as high suitability.

The habitat model (Table 7-3; Maps D13–D15 in Appendix D) indicates that the majority of the LSA (99.2%) has low or nil suitability for rusty blackbird. Habitats rated as high suitability are very limited (0.8%) due to the limited amount of wetland habitat present in the LSA.

Table 7-2. Habitat ratings for bird species or species groups for vegetation classes based upon ELC and BEM completed for the Coffee Project. Ecosystem codes, names and descriptions adapted from EDI 2017.

Code	Ecosystem		Bird Habitat Ratings				
	Name	Description	Short-eared owl	Common nighthawk	Passerine birds	Olive-sided flycatcher	Rusty blackbird
Alpine/Subalpine Bioclimatic Zones							
Fe	Felsenmeer	Boulder fields, upper slope and crests	L	L	L	L	N
Ss	Subalpine/alpine shrub	Mountain avens and shrub dominated areas	H / L [1]	L	M	L	N
Fcs	High elevation sparse/ open coniferous forest	Sparsely treed areas often near the boundary with the Boreal High Ecozone	L	L	M	M	N
Stcs	Stunted coniferous forest	Mixed of shrub and stunted black spruce which is often in the shrub stage	L	L	M	H	N
HSr	High elevation shrubby riparian	Willow dominated riparian, low structural stage	L	L	M	L	N
Boreal High and Boreal Low Bioclimatic Zones							
Gg	Grassland	Grass, herb and ground shrub dominated areas on steep south-facing slopes	L	L	M	L	N
UpF – c	Upland/closed canopy forest – coniferous	Spruce (primarily white) dominated	L	L	H	M	N
UpF – d	Upland/closed canopy forest – deciduous	Drier areas dominated by aspen and more moist sites dominated by birch	L	L	M	L	N
UpF – m	Upland/closed canopy forest – mixedwood	Mixed spruce and aspen/birch	L	L	M	M	N
-	Old burns	Areas burned in the last 30 years.	M	H	H	H	N
RF	Riparian forest	Spruce, balsam poplar and birch dominated areas in floodplains and gullies	L	L	H	M	L
Stcs	Stunted coniferous forest	Permafrost influenced sloping black spruce stands	L	L	M	H	N
LSr	Low elevation shrubby riparian	Shrubby balsam poplar and willow dominated floodplain	L	L	H	L	L
F	Fen	Tree or shrub-dominated fens	M	M	M	H	L
S	Swamp	Willow and reedgrass dominated swamps	M	H	H	M	H
M	Marsh	Sedge and horsetail dominated marshes	M	H	H	M	H
Other Codes							
Ro	Rock	Gentle to steep, bedrock escarpment or outcropping, with little soil and sparse vegetative cover.	L	L	L	L	N

Table 7-2. Habitat ratings for bird species or species groups for vegetation classes based upon ELC and BEM completed for the Coffee Project. Ecosystem codes, names and descriptions adapted from EDI 2017.

Code	Ecosystem		Bird Habitat Ratings				
	Name	Description	Short-eared owl	Common nighthawk	Passerine birds	Olive-sided flycatcher	Rusty blackbird
Rt	Talus	Active and inactive talus and scree; typically have a low herb layer cover because of mobile substrates or lack of soil.	L	L	L	L	N
Ri	River	watercourse formed when water flows between continuous, definable banks; the flow may be intermittent or perennial	N	M	L	L	N
Pd	Pond	Small body of water greater than 2 m deep, but not large enough to be classified as a lake.	N	H	L	L	N
Pm	Placer mined area	Includes a wide range of mined areas including active mine sites with minimal vegetation to reclaimed sites with dense regeneration of shrubs and deciduous trees in the pole/sapling stage. Typically located in valley bottoms in proximity to water (ponds, streams) and with extensive edge habitat.	L	H	H	L	N
PPd	Pond in placer mined area	Small body of water greater than 2 m deep, but not large enough to be classified as a lake and located adjacent to a placer mined area.	N	H	L	L	N
An	Anthropogenic	Areas of anthropogenic disturbance including areas cleared for camps, homesteads and airstrips.	N	M	L	L	N

[1] All areas classified as low with the exception of the scrub birch - mountain avens - lichen (SA-12), scrub birch – crowberry – lowbush cranberry (SA-13) and scrub birch – willow – mountain avens (SA-14) ELC ecosites which were rated as high.

Table 7-3. Baseline habitat quality and quantity in Coffee Project LSA.

Habitat Rating	Short-eared owl		Common nighthawk		Passerine		Olive-sided flycatcher		Rusty blackbird	
	km²	% of LSA	km²	% of LSA	km²	% of LSA	km²	% of LSA	km²	% of LSA
High	5.22	0.86	182.97	30.28	299.13	49.50	218.71	36.19	4.90	0.81
Moderate	159.53	26.40	16.91	2.80	295.11	48.84	209.15	34.61	-	-
Low	431.19	71.36	404.38	66.92	10.02	1.66	176.39	29.19	49.82	8.24
Nil	8.32	1.38	-	-	-	-	-	-	549.52	90.94

8 SUMMARY

The Coffee Project RSA provides habitat for a diverse assemblage of breeding birds which reflects the distribution and abundance of birds in the west-central Yukon. A total of 119 species have the potential to occur within the LSA, of which 88 were confirmed present in the RSA during field surveys conducted in 2013, 2014, and 2015. Of the 119 species, nine have been identified as species at risk in Canada by COSEWIC and seven of these species have been confirmed to be present within the LSA including: horned grebe, short-eared owl, peregrine falcon, common nighthawk, olive-sided flycatcher, bank swallow, and rusty blackbird. The bird species list for the LSA also includes 55 priority bird species as indicated by the BCR 4 Plan and 13 species which are on the Yukon CDC Track List.

Based on the distribution of bird species at risk and the abundance of upland birds within the LSA, there are a number areas in the LSA that provide habitat for important, seasonal life functions for birds which include:

- Ponds and wetlands (marshes, swamps) — these habitats are relatively limited in extent within the LSA but provide breeding and/or foraging habitat for a number of bird species at risk including horned grebe, common nighthawk, and rusty blackbird. Numerous additional bird species also use these habitats including many species of passerines, waterbirds/waterfowl and shorebirds.
- Alpine areas — the total extent of alpine habitats is limited within the LSA and is primarily restricted to the extreme southeast portion of the Coffee property. These areas provide habitat for short-eared owl and a number of other regionally important bird species of conservation focus including white-tailed ptarmigan and surfbird.
- Riparian forests — these habitats are typically located in lowland areas along streams and in proximity to wetlands. The overall density and diversity of breeding birds is lower than within some of disturbed habitats within the LSA; however, habitat specialists such as Townsend's warbler, boreal chickadee and varied thrush are almost exclusively associated with this habitat type. Species at the northern extent of their Yukon breeding range in the LSA such as yellow-bellied sapsucker and warbling vireo are associated with these habitats.
- Tors and cliffs — these habitats provide nesting sites for raptors in the LSA. Both golden eagle and peregrine falcon have been confirmed in these habitats and gyrfalcon may also occur.
- Disturbed sites (fire and placer mining) — these habitats contain the highest density and diversity of upland birds in the LSA due to the prevalence of shrub habitats and extensive edge habitat. A number of bird species at risk also used these habitats including common nighthawk and olive-sided flycatcher. Sharp-tailed grouse also appear to use these habitats extensively during the spring lekking period and therefore provide critical habitat for this species.

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APPENDIX A. COFFEE PROJECT RSA BIRD SPECIES LIST

Table A1. Coffee Project RSA bird species list.

Common Name	Latin Name	COSEWIC, SARA [1]	Yukon Conservation Data Centre [2]		BCR 4 Priority Species [3]	Expected Occurrence[4]		Documented in RSA[4]	
			Tracklist	Watchlist		Mine Area	Access Road	Mine Area	Access Road
Red-throated Loon	*Gavia stellata*					✓	✓	✓	
Pacific Loon	*Gavia pacifica*				✓		✓		✓
Horned Grebe	*Podiceps auratus*	Special Concern, Not Listed	Apparently Secure		✓	✓	✓		✓
Canada Goose	*Branta candensis*				✓	✓	✓	✓	✓
Trumpeter Swan	*Cygnus buccinator*		Apparently Secure		✓		✓	✓	✓
American Wigeon	*Anas americana*				✓	✓	✓	✓	✓
Mallard	*Anas platyrhynchos*				✓	✓	✓	✓	✓
Blue-winged Teal	*Anas discors*				✓	✓	✓		
Northern Shoveler	*Anas clypeata*				✓	✓	✓	✓	✓
Northern Pintail	*Anas acuta*				✓	✓	✓	✓	
Green-winged Teal	*Anas crecca*				✓	✓	✓	✓	✓
Ring-necked Duck	*Aythya collaris*						✓		
Lesser Scaup	*Aythya affinis*			Apparently Secure	✓		✓		✓
Bufflehead	*Bucephala albeola*			Apparently Secure	✓	✓	✓	✓	✓
Common Goldeneye	*Bucephala clangula*				✓		✓		✓
Barrow's Goldeneye	*Bucephala islandica*				✓		✓		
Common Merganser	*Mergus merganser*					✓	✓		
Bald Eagle	*Haliaeetus leucocephalus*					✓	✓	✓	
Northern Harrier	*Circus cyaneus*					✓	✓	✓	✓
Sharp-shinned Hawk	*Accipiter striatus*					✓	✓		✓
Northern Goshawk	*Accipiter gentilis*				✓	✓	✓		✓
Red-tailed Hawk	*Buteo jamaicensis*					✓	✓	✓	✓
Golden Eagle	*Aquila chrysaetos*			Vulnerable	✓	✓	✓	✓	

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Common Name	Latin Name	COSEWIC, SARA [1]	Yukon Conservation Data Centre [2]		BCR 4 Priority Species [3]	Expected Occurrence[4]		Documented in RSA[4]	
			Tracklist	Watchlist		Mine Area	Access Road	Mine Area	Access Road
American Kestrel	*Falco sparverius*		Imperiled		✓	✓	✓		✓
Merlin	*Falco columbarius*					✓	✓		
Gyrfalcon	*Falco rusticolus*			Vulnerable		✓	✓		
Peregrine Falcon	*Falco peregrinus*	Special Concern, Schedule 1	Vulnerable		✓	✓	✓	✓	✓
Osprey	*Pandion haliaetus*					✓	✓		
Ruffed Grouse	*Bonasa umbellus*					✓	✓	✓	✓
Spruce Grouse	*Falcipennis canadensis*					✓	✓	✓	✓
Willow Ptarmigan	*Lagopus lagopus*					✓	✓	✓	✓
Rock Ptarmigan	*Lagopus muta*					✓		✓	
White-tailed Ptarmigan	*Lagopus leucera*				✓	✓		✓	
Dusky Grouse	*Dendragapus obscurus*				✓	✓	✓		
Sharp-tailed Grouse	*Tympanchus phasianellus*		Vulnerable				✓		✓
American Golden-Plover	*Pluvialis dominica*			Vulnerable	✓	✓			
Semipalmated Plover	*Charadrius semipalmatus*					✓	✓		✓
Lesser Yellowlegs	*Tringa flavipes*			Apparently Secure	✓	✓	✓	✓	✓
Solitary Sandpiper	*Tringa solitaria*				✓	✓	✓	✓	✓
Wandering Tattler	*Heteroscelus incanus*		Vulnerable		✓	✓			
Spotted Sandpiper	*Actitis macularius*				✓	✓	✓	✓	✓
Upland Sandpiper	*Bartramia longicauda*				✓	✓			
Whimbrel	*Numenius phaeopus*		Vulnerable		✓	✓			
Surfbird	*Calidris virgata*		Vulnerable		✓	✓		✓	
Least Sandpiper	*Calidris minutilla*					✓	✓		
Wilson's Snipe	*Gallinago delicata*				✓	✓	✓		✓
Red-necked Phalarope	*Phalaropus lobatus*	Special Concern,			✓		✓		

Table A1. Coffee Project RSA bird species list.

Common Name	Latin Name	COSEWIC, SARA [1]	Yukon Conservation Data Centre [2]		BCR 4 Priority Species [3]	Expected Occurrence[4]		Documented in RSA[4]	
			Tracklist	Watchlist		Mine Area	Access Road	Mine Area	Access Road
		Not Listed							
Long-tailed Jaeger	*Stercoradius longicaudus*					✓			
Mew Gull	*Marus canus*				✓	✓	✓		
Herring Gull	*Larus argentus*				✓	✓	✓	✓	
Great Horned Owl	*Bubo virginianus*					✓	✓	✓	✓
Northern Hawk Owl	*Surnia ulula*				✓	✓	✓		
Great Gray Owl	*Strix nebulosa*				✓	✓	✓		
Short-eared Owl	*Asio flammeus*	Special Concern, Schedule 1	Vulnerable		✓	✓	✓	✓	
Boreal Owl	*Aegolius funerus*				✓	✓	✓		
Common Nighthawk	*Chordeiles minor*	Threatened, Schedule 1	Vulnerable		✓	✓	✓	✓	✓
Belted Kingfisher	*Ceryle alcyon*			Apparently Secure		✓	✓		
Yellow-bellied Sapsucker	*Sphyrapicus varius*					✓	✓	✓	✓
Hairy Woodpecker	*Picoides villosus*					✓	✓		
American Three-toed Woodpecker	*Picoides dorsalis*				✓	✓	✓	✓	✓
Black-backed Woodpecker	*Picoides arcticus*					✓	✓		
Northern Flicker	*Colaptes auratus*					✓	✓	✓	✓
Olive-sided Flycatcher	*Contopus cooperi*	Threatened, Schedule 1		Vulnerable	✓	✓	✓	✓	✓
Western Wood-Pewee	*Contopus sordidulus*					✓	✓	✓	✓
Yellow-bellied Flycatcher	*Empidonax flaviventris*			Apparently Secure		✓	✓	✓	✓
Alder Flycatcher	*Empidonax alnorum*				✓	✓	✓	✓	✓

Table A1. Coffee Project RSA bird species list.

Common Name	Latin Name	COSEWIC, SARA [1]	Yukon Conservation Data Centre [2]		BCR 4 Priority Species [3]	Expected Occurrence[4]		Documented in RSA[4]	
			Tracklist	Watchlist		Mine Area	Access Road	Mine Area	Access Road
Hammond's Flycatcher	*Empidonax hammondii*					✓	✓	✓	✓
Say's Phoebe	*Sayornis saya*					✓	✓		
Northern Shrike	*Lanius excubitor*			Vulnerable	✓	✓	✓		
Warbling Vireo	*Vireo gilvus*					✓	✓	✓	
Gray Jay	*Perisoreus canadensis*				✓	✓	✓	✓	✓
Common Raven	*Corvus corax*					✓	✓	✓	✓
Horned Lark	*Eremophila alpestris*					✓		✓	
Tree Swallow	*Tachycineta bicolor*					✓	✓	✓	✓
Violet-green Swallow	*Tachycineta thalassina*					✓	✓	✓	✓
Bank Swallow	*Riparia riparia*	Threatened, Not Listed	Apparently Secure			✓	✓	✓	✓
Cliff Swallow	*Petrochelidon pyrrhonota*					✓	✓		
Barn Swallow	*Hirundo rustica*	Threatened, Not Listed	Imperiled			✓	✓		
Black-capped Chickadee	*Poecile atricapillus*					✓	✓	✓	✓
Boreal Chickadee	*Poecile hudsonica*				✓	✓	✓	✓	✓
American Dipper	*Cinclus mexicanus*					✓	✓		
Ruby-crowned Kinglet	*Regulus calendula*					✓	✓	✓	✓
Mountain Bluebird	*Sialia currocoides*			Vulnerable			✓		
Townsend's Solitaire	*Myadestes townsendi*					✓	✓	✓	✓
Gray-cheeked Thrush	*Catharus minimus*					✓	✓		✓
Swainson's Thrush	*Catharus ustulatus*					✓	✓	✓	✓
Hermit Thrush	*Catharus guttatus*					✓	✓	✓	✓
American Robin	*Turdus migratorius*					✓	✓	✓	✓
Varied Thrush	*Ixoreus naevius*				✓	✓	✓	✓	✓
American Pipit	*Anthus rubescens*					✓		✓	

Table A1. Coffee Project RSA bird species list.

Common Name	Latin Name	COSEWIC, SARA [1]	Yukon Conservation Data Centre [2]		BCR 4 Priority Species [3]	Expected Occurrence[4]		Documented in RSA[4]	
			Tracklist	Watchlist		Mine Area	Access Road	Mine Area	Access Road
Bohemian Waxwing	*Bombycilla garrulus*				✓	✓	✓	✓	✓
Northern Waterthrush	*Parkesia noveboracensis*					✓	✓	✓	✓
Tennessee Warbler	*Oreothlypis peregrina*					✓	✓	✓	✓
Orange-crowned Warbler	*Oreothlypis celata*					✓	✓	✓	✓
Common Yellowthroat	*Geothlypis trichas*					✓	✓	✓	✓
Yellow Warbler	*Setophaga petechia*					✓	✓	✓	✓
Myrtle Warbler	*Setophaga coronata*					✓	✓	✓	✓
Townsend's Warbler	*Setophaga townsendi*			Vulnerable	✓	✓	✓	✓	✓
Blackpoll Warbler	*Setophaga striata*				✓	✓	✓	✓	✓
American Redstart [5]	*Setophaga ruticilla*			Apparently Secure		✓		✓	
Wilson's Warbler	*Cardellina pusilla*				✓	✓	✓	✓	✓
Lapland Longspur	*Calcarius lapponicus*					✓			
Smith's Longspur	*Calcarius pictus*			Vulnerable	✓	✓			
American Tree Sparrow	*Spizella arborea*					✓	✓	✓	
Chipping Sparrow	*Spizella passerina*					✓	✓	✓	✓
Savannah Sparrow	*Passerculus sandwichensis*					✓	✓	✓	✓
Fox Sparrow	*Passerella iliaca*					✓	✓	✓	✓
Lincoln's Sparrow	*Melospiza lincolnii*					✓	✓	✓	✓
White-crowned Sparrow	*Zonotrichia leucophyrs*				✓	✓	✓	✓	✓
Golden-crowned Sparrow	*Zonotrichia atricapilla*				✓	✓	✓	✓	
Slate-colored Junco	*Junco hyemalis*					✓	✓	✓	✓
Rusty Blackbird	*Euphagus carolinus*	Special Concern, Schedule 1	Vulnerable		✓	✓	✓		✓

Table A1. Coffee Project RSA bird species list.

Common Name	Latin Name	COSEWIC, SARA [1]	Yukon Conservation Data Centre [2]		BCR 4 Priority Species [3]	Expected Occurrence[4]		Documented in RSA[4]	
			Tracklist	Watchlist		Mine Area	Access Road	Mine Area	Access Road
Red-winged Blackbird	*Agelaius phoeniceus*					✓	✓		✓
Pine Grosbeak	*Pinicola enucleator*				✓	✓	✓	✓	✓
Gray-crowned Rosy-Finch	*Leucosticte tephrocotis*				✓	✓			
Red Crossbill	*Loxia curvirostra*						✓		✓
White-winged Crossbill	*Loxia leucoptera*				✓	✓	✓	✓	✓
Common Redpoll	*Acanthis flammea*					✓	✓	✓	✓
Pine Siskin	*Spinus pinus*					✓	✓	✓	✓

1 COSEWIC 2016, SARA 2016.

2 Yukon CDC 2015a, 2015b.

3 Environment Canada 2013.

4 Expected occurrence and documented presence within the RSA is limited to species potentially breeding within the study area (i.e. includes birds that are year round residents in the region and those which are migratory and spend only the breeding season in Yukon). There are additional species which may utilize habitats within the RSA during spring and fall migration; however, these species were not included in the species list compiled.

5 Extralimital species within the RSA, one individual was observed by an experienced field ornithologist and confirmed.

APPENDIX B. OBSERVATIONS OF SPECIES AT RISK AND PRIORITY SPECIES WITHIN THE COFFEE BIRD RSA

Table B1. Observations of bird species at risk and BCR priority species within the Coffee Bird RSA.

Common Name	Conservation Status	Confirmed Within the LSA		Observations Within the Coffee Project RSA
		Mine site	NAR	
Pacific Loon	BCR Priority Species		✓	One observation of a pair of adults on a pond in the Stewart River wetland complex upstream of Maisy May Creek. Probable breeding in this location but unlikely elsewhere in the RSA due to limited amount of suitable habitat present.
Horned Grebe	Special Concern (COSEWIC), Schedule 1 (SARA), Yukon CDC Watch list, BCR Priority Species		✓	Pairs observed on 3 ponds (1 natural, 2 old placer disturbed) ponds along Dominion Creek; this included one active nest with five eggs. Not located elsewhere despite the presence of suitable habitat in the Yukon and Stewart river floodplains.
Canada Goose	BCR Priority Species	✓	✓	One observation (single bird calling) in the Stewart River wetland complex upstream of Maisy May Creek. A second observation of a single adult along a back channel in the Yukon River. Breeding very likely in the RSA within wetland habitats and at placer mined areas at lower elevations.
Trumpeter Swan	Yukon CDC Track list, BCR Priority Species	✓	✓	One observation of a pair of adults on a pond in the Stewart River wetland complex upstream of Maisy May Creek. A second observation of two adult on the Yukon River in June 2014. Probable breeding at the Maisy May location but unlikely elsewhere in the RSA due to limited amount of suitable habitat present.
American Wigeon	BCR Priority Species	✓	✓	Low numbers of adults observed at ponds and wetlands throughout the RSA and likely breeds throughout at low densities. One brood (8) observed at a small wetland along lower Ballarat Creek near the Yukon River.
Mallard	BCR Priority Species	✓	✓	Most common waterfowl species observed in the RSA. Adults (male and female) and juveniles observed throughout the area in relatively low densities, primarily in the Yukon River floodplain. Highest count included 15 during an overflight of this area on 21 Jun 2014.
Blue-winged Teal	BCR Priority Species			Not observed in the RSA to date but known to occur in the Indian River valley (Chevreux 2014) where it is a possible breeder. A known breeder in the central Yukon including the southern portion of the Dempster Highway (Sinclair et al. 2003) directly to the east of the RSA.
Northern Shoveler	BCR Priority Species	✓	✓	Observed on two occasions with single birds in both location; the Yukon River floodplain and the Stewart River wetland complex upstream of Maisy May Creek. Possible breeding at low densities in these areas.
Northern Pintail	BCR Priority Species	✓		One observation of a pair in the Yukon River floodplain on 19 Jun 2014. Possible breeder in this area, the Stewart River wetland complex upstream of Maisy May Creek and the old placer mining ponds along Dominion Creek.
Green-winged Teal	BCR Priority Species	✓	✓	Two observations each of single adult males; the Yukon River floodplain the Stewart River wetland complex upstream of Maisy May Creek. Possible breeding at low densities in these areas.

Table B1. Observations of bird species at risk and BCR priority species within the Coffee Bird RSA.

Common Name	Conservation Status	Confirmed Within the LSA		Observations Within the Coffee Project RSA
		Mine site	NAR	
Lesser Scaup	Yukon CDC Watch list, BCR Priority Species		✓	Observed on two occasions on two ponds along Dominion Creek including a pair on a natural pond near Gold Run.
Bufflehead	Yukon CDC Watch list, BCR Priority Species	✓	✓	The second most common waterfowl species observed in the RSA. A total of 11 individuals observed in 4 locations including the Yukon River floodplain, Stewart River wetlands upstream of Maisy May Creek and the ponds along Dominion Creek/Indian River.
Common Goldeneye	BCR Priority Species		✓	One observation of a male on a placer mining pond along Dominion Creek near Gold Run.
Barrow's Goldeneye	BCR Priority Species			Not observed in the RSA to date but known to occur in the Indian River valley (Chevreux 2014) where it is a confirmed breeder.
Northern Goshawk	BCR Priority Species		✓	One observation of an adult carrying prey along the lower portion of Maisy May Creek. This species is found throughout Yukon and is likely a breeding species throughout the RSA at low densities.
Golden Eagle	Yukon CDC Watch list, BCR Priority Species	✓		Breeding was confirmed on the bluffs along the Yukon River during 2014. Inactive nests were also found on the bluffs along the Stewart River, and on tors in the southeast section of the RSA.
American Kestrel	Yukon CDC Track list, BCR Priority Species		✓	A couple of observations of an adult along lower Ballarat Creek near the Yukon River. This species is expected to breed throughout the RSA in low densities where suitable habitat is present including wetlands, subalpine areas and old burns.
Gyrfalcon	Yukon CDC Watch list			Not observed within the RSA during field surveys although there are historical records of nests on tors at the southern margin of the RSA. During the 2014 and 2015 field surveys, signs of past use (white wash) were observed at a small number of sites.
Peregrine Falcon	Special Concern (COSEWIC), Schedule 1 (SARA), Yukon CDC Tracklist, BCR Priority Species	✓	✓	Observed along both the Yukon and Stewart rivers during field surveys during 2014 and 2015. Two active nests located along the Stewart River in 2016. Although no active nests have been found along the Yukon to date, based on behavioural observations, breeding is presumed to occur.
White-tailed Ptarmigan	BCR Priority Species	✓		One observation of a single adult in the alpine (felsenmeer) in the southeast of the RSA. A potential breeder within the RSA; however, suitable alpine habitat is very limited in extent.
Dusky Grouse	BCR Priority Species			Not observed in the RSA date but presumed to be a possible breeder in the area. The Klondike River area represents the northern most extent of this species' range in Yukon and it has previously been observed (including confirmed breeding) in subalpine habitats in the region.
Sharp-tailed Grouse	Yukon CDC Track list		✓	A localized breeding species in disturbed habitats (old burns and placer mining areas) along the NAR. A total of six probable leks where identified in the RSA during 2015 and 2016; additional

Table B1. Observations of bird species at risk and BCR priority species within the Coffee Bird RSA.

Common Name	Conservation Status	Confirmed Within the LSA		Observations Within the Coffee Project RSA
		Mine site	NAR	
				leks may occur in the area. Most common north of the Stewart River but may also occur further south within the RSA.
American Golden-Plover	Yukon CDC Watch list, BCR Priority Species			Not observed in the RSA to date but presumed to be a possible breeder in alpine tundra habitats (alpine grassland) in the area. It is a more common breeding species in the northern portion of Yukon; however, it is also known from the Dawson Range to the south of the RSA (Frisch 1983).
Lesser Yellowlegs	Yukon CDC Watch list, BCR Priority Species	✓	✓	Observed in wetland habitats in several different locations along the NAR and the Yukon River floodplain. Presumed to be a localized breeding species in areas with suitable habitat.
Solitary Sandpiper	BCR Priority Species	✓	✓	Observed in forested wetland habitats in various locations throughout the study area. Distress and alarm calls observed in a number of these locations; presumed to be a localized breeding species in areas with suitable habitat.
Wandering Tattler	Yukon CDC Track list, BCR Priority Species			Not observed in the RSA to date but presumed to be a possible breeder in alpine tundra habitats in the area. It is not known to be a common breeding species in the central Yukon although it is known from the Dempster Highway area (Frisch 1987) and may therefore occur in the RSA at low densities.
Spotted Sandpiper	BCR Priority Species	✓	✓	Observed in six locations throughout the RSA and likely the most common shorebird species in the area. Breeding was confirmed in the middle portion of Ballarat Creek although breeding is expected to occur along streams and in disturbed riparian areas (placer mined) throughout the RSA.
Upland Sandpiper	BCR Priority Species			Not documented in the RSA, but possible breeder in alpine grassland habitats. During baseline studies for the Casino Project, this species was encountered on one occasion in alpine/subalpine habitat (EDI 2013). Frisch (1987) noted that it was fairly common in open areas along the Dempster Highway. It is also known from the southern portion of the Dawson Range (Frisch 1984) where it was noted to occur in areas with more shrub cover than is typical for the species.
Whimbrel	Yukon CDC Track list, BCR Priority Species			Not documented within the RSA nor during the Casino Project bird baseline studies (EDI 2013). Possible breeder in alpine grassland habitats within the RSA. This species breeds locally in portions of Yukon and is known from both the Dempster Highway area (Frisch 1987) and the Dawson Range near Klaza Mountain (Frisch 1983).
Surfbird	Yukon CDC Track list, BCR Priority Species	✓		One observation within the RSA in alpine tundra habitat (felsenmeer) in the southeastern extent of the study area. Although no direct evidence of breeding was observed, breeding is probable within this area. This species has been previously documented in the Dawson Range in the appropriate habitat (Frisch 1983) although it is by no means a common species.
Wilson's	BCR Priority Species		✓	A total of fourteen detections in the RSA to date; one of the

Table B1. Observations of bird species at risk and BCR priority species within the Coffee Bird RSA.

Common Name	Conservation Status	Confirmed Within the LSA		Observations Within the Coffee Project RSA
		Mine site	NAR	
Snipe				more common species of shorebirds encountered in wetland habitats along the NAR.
Red-necked Phalarope	Special Concern (COSEWIC), BCR Priority Species			Not recorded in the RSA to date but its presence in the Indian River valley (Chevreux 2014) indicates that it may occur at wetland habitats in the RSA, although expected in low densities only. Elsewhere in Yukon, this species is most common in tundra ponds although it occurs much less frequently at wetlands in forested areas (Sinclair et al. 2003).
Mew Gull	BCR Priority Species			Not recorded to date in the RSA, but may occur in low numbers in wetland habitats and along the Yukon and Stewart rivers.
Herring Gull	BCR Priority Species	✓		A single observation of birds flying down the Yukon River, but the species is expected to occur along the Yukon and Stewart rivers.
Northern Hawk Owl	BCR Priority Species			Not recorded to date in the LSA, but expected to occur throughout much of the area due to the presence of suitable burn habitat used for breeding. This species is a year round resident throughout Yukon although it is not encountered frequently during the breeding season.
Great Gray Owl	BCR Priority Species			Not recorded to date in the LSA, but expected to occur throughout much of the area at low densities. This species is a year round resident throughout Yukon although it is not encountered frequently.
Short-eared Owl	Special Concern (COSEWIC), Schedule 1 (SARA), Yukon CDC Track list, BCR Priority Species	✓		To date, only one observation of short-eared owl in the RSA during the breeding season — in June 2016 a single adult was observed flying over a subalpine ridge in the mine site area. The RSA appears to provide suitable hunting habitat for this species, although suitable nesting habitats may be limited. Note that extensive breeding bird surveys for the nearby Casino Project (EDI 2013) had only one detection of this species which is also known to be more common along the Dempster Highway where more suitable tundra nesting habitat is more extensive (Frisch 1987). Breeding bird surveys in the Dawson Range (Apex/Prospector mountains; Frisch 1984) also had one detection of this species.
Boreal Owl	BCR Priority Species			Not recorded to date in the RSA, but expected to occur in coniferous forests within the area. One of Yukon's most common and widespread owl species, numbers are known to fluctuate considerably from year to year in response to changes in small mammal abundance.
Common Nighthawk	Threatened (COSEWIC), Schedule 1 (SARA), Yukon CDC Track list, BCR Priority Species	✓	✓	A total of 23 detections over the course of bird surveys for the Project. Encountered most frequently along the NAR, particularly in the areas near Henderson Dome/Black Hills Creek and lower Dominion Creek. Encounters near the mine site limited to a single incidental observation near the existing camp location. Note that the RSA is very near the limit of this species' breeding range which reaches its northern limited in the Dawson

Table B1. Observations of bird species at risk and BCR priority species within the Coffee Bird RSA.

Common Name	Conservation Status	Confirmed Within the LSA		Observations Within the Coffee Project RSA
		Mine site	NAR	
				area.
Belted Kingfisher	Yukon CDC Watch list			Not encountered in the RSA to date; however, this species is widespread in Yukon and expected to occur along the larger streams and at wetlands within the RSA.
Three-toed Woodpecker	BCR Priority Species	✓	✓	A total of 19 detections throughout the RSA to date. Encountered most frequently along the NAR corridor but expected to occur throughout the RSA where suitable habitat (coniferous forest, old burns) is present.
Olive-sided Flycatcher	Threatened (COSEWIC), Schedule 1 (SARA), Yukon CDC Watch list, BCR Priority Species	✓	✓	A total of 13 detections throughout the RSA to date and based upon habitat mapping data, appears to be most common in old burns, stunted coniferous forests and upland/closed canopy coniferous forests. A widespread breeding species throughout Yukon also expected to occur at low densities throughout much of the RSA.
Yellow-bellied Flycatcher	Yukon CDC Watch list	✓	✓	The status and distribution of this species in Yukon is somewhat uncertain and new information is beginning to suggest it is much more common than initially thought. To date, there have been a total of 24 detections of this species in the RSA with the majority of detections in old burns and upland/closed canopy deciduous forests.
Alder Flycatcher	BCR Priority Species	✓	✓	A widespread and common breeding bird species throughout the RSA with 181 detections to date. Most common in habitats dominated by shrubs including riparian areas and old burns.
Northern Shrike	Yukon CDC Watch list, BCR Priority Species			Not recorded to date in the RSA, but expected to occur in low numbers within subalpine and alpine portions of the study area. Frisch (1987) noted that the species 'breeds sparsely throughout the region at timberline'.
Gray Jay	BCR Priority Species	✓	✓	A widespread and common year round resident within the RSA with more than 100 detections to date. Observations included numerous family groups with juveniles in a wide variety of habitats.
Bank Swallow	Threatened (COSEWIC), Yukon CDC Track list	✓	✓	More than 20 detections in the RSA to date including the identification of thirteen nesting colonies. Colonies were found in both natural habitats (e.g. river bank) and man-made habitats (e.g. road embankments).
Barn Swallow	Threatened (COSEWIC), Yukon CDC Track list			Not recorded to date in the RSA but known to occur sporadically in the Dawson region (Sinclair et al. 2003). This species is known to occur across a wide range of elevations from lowland river valleys to subalpine areas where active or abdandoned structures provide nesting sites.
Boreal Chickadee	BCR Priority Species	✓	✓	A widespread year round resident within coniferous forests of the RSA with a total of 18 detections to date. Most frequently detected in upland/closed canopy coniferous forests and riparian areas.

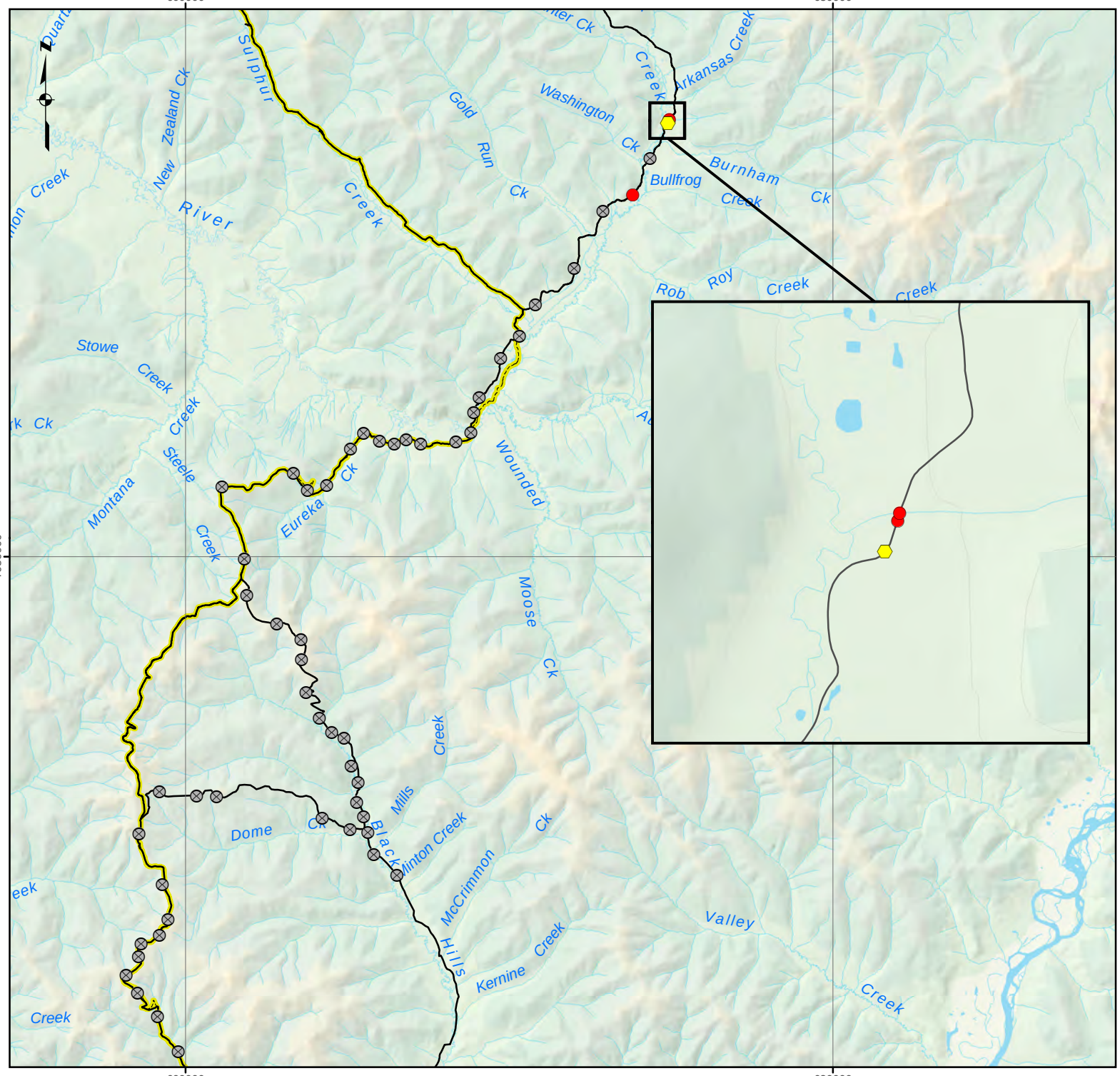
Table B1. Observations of bird species at risk and BCR priority species within the Coffee Bird RSA.

Common Name	Conservation Status	Confirmed Within the LSA		Observations Within the Coffee Project RSA
		Mine site	NAR	
Mountain Bluebird	Yukon CDC Watch list			Not recorded in the RSA to date during the breeding season (seen on two occasions during spring migration; 2015). This species is quite uncommon in the Dawson area. However, the presence of extensive breeding habitat for this species (old burns) suggest that it likely occurs in low numbers, particularly along the NAR.
Varied Thrush	BCR Priority Species	✓	✓	A widespread breeding species throughout the RSA with 48 detections to date. Most frequently detected in upland/closed canopy coniferous forests and riparian areas.
Bohemian Waxwing	BCR Priority Species	✓	✓	An uncommon breeding species throughout the RSA with 44 detections to date. Most frequently detected in high elevation sparse/open coniferous forests and stunted lower elevation coniferous forests.
Townsend's Warbler	Yukon CDC Watch list, BCR Priority Species	✓	✓	One of the more common warbler species encountered in the RSA with a total of 61 detections to date. Most common in riparian areas and other locations with old coniferous forest.
Blackpoll Warbler	BCR Priority Species	✓	✓	An infrequent breeding species detected on only 3 occasions to date, 2 along the NAR and one near the current Coffee Camp.
American Redstart	Yukon CDC Watch list	✓		One record during 2014 in the Yukon River floodplain. This is considered an extralimital species in the RSA as it is typically only found in the southern portion of Yukon, especially the southeast.
Wilson's Warbler	BCR Priority Species	✓	✓	A widespread but uncommon breeding species throughout the RSA with 23 detections to date. More common in the vicinity of the mine site due to more of the preferred habitat (higher elevation shrubs). Most frequently detected in old burns, subalpine/alpine shrubs and placer mined areas.
Smith's Longspur	Yukon CDC Watch list, BCR Priority Species			Not documented in the RSA to date nor during breeding bird surveys at the Casino Project (EDI 2013), but may occur in alpine tundra habitats at the extreme southeast of the study area. Has been previously documented in both the Dawson Range (Frisch 1983) and the Dempster Highway region (Frisch 1987).
White-crowned Sparrow	BCR Priority Species	✓	✓	One of the most widespread and common breeding bird species within the RSA (301 detections), particularly in the southern portion of the RSA (mine site) where it was the most common bird species encountered. Most frequently detected in old burns and subalpine/ alpine shrub habitats.
Golden-crowned Sparrow	BCR Priority Species	✓		An uncommon breeding bird species within subalpine and alpine habitats (two detections to date during 2013 only).
Rusty Blackbird	Special Concern (COSEWIC), Schedule 1 (SARA), Yukon CDC Track list, BCR Priority Species		✓	A localized breeding bird species within the RSA which was detected in two general areas during the breeding bird surveys: the Stewart River wetlands upstream of Maisy May Creek and the placer ponds along the Dominion Creek portion of the existing Dawson Goldfields road network. Although not documented, also expected to occur in other small forested wetlands in

Table B1. Observations of bird species at risk and BCR priority species within the Coffee Bird RSA.

Common Name	Conservation Status	Confirmed Within the LSA		Observations Within the Coffee Project RSA
		Mine site	NAR	
				lowland portions of the RSA (particularly in the Yukon River floodplain).
Pine Grosbeak	BCR Priority Species	✓	✓	An uncommon breeding species throughout the RSA with a total of 9 detections to date. A probable year round resident in the area.
Gray-crowned Rosy Finch	BCR Priority Species			Not documented in the RSA to date nor during breeding bird surveys at the Casino Project (EDI 2013), but may occur in alpine tundra habitats at the extreme southeast of the study area. Has been previously documented in both the Dawson Range (Frisch 1983) and the Dempster Highway region (Frisch 1987).
White-winged Crossbill	BCR Priority Species	✓	✓	A widespread breeding species and presumed year round resident within the RSA. Relatively low numbers were detected during 2015 in comparison to 2014 when they were widespread and observed frequently.

APPENDIX C. SPECIES AT RISK DETECTION MAPS



Legend

- Settlement/Community
- Existing Access
- Proposed Route
- Coffee Property

Breeding Bird Point Count Survey

- Horned grebe detected
- No horned grebe detected

Incidental Detection

- Horned grebe detected

Map C1

Coffee Project horned grebe detection locations

Data Sources
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Map Reference Scale: 1:250,000 (Printed at 8.5 x 11)
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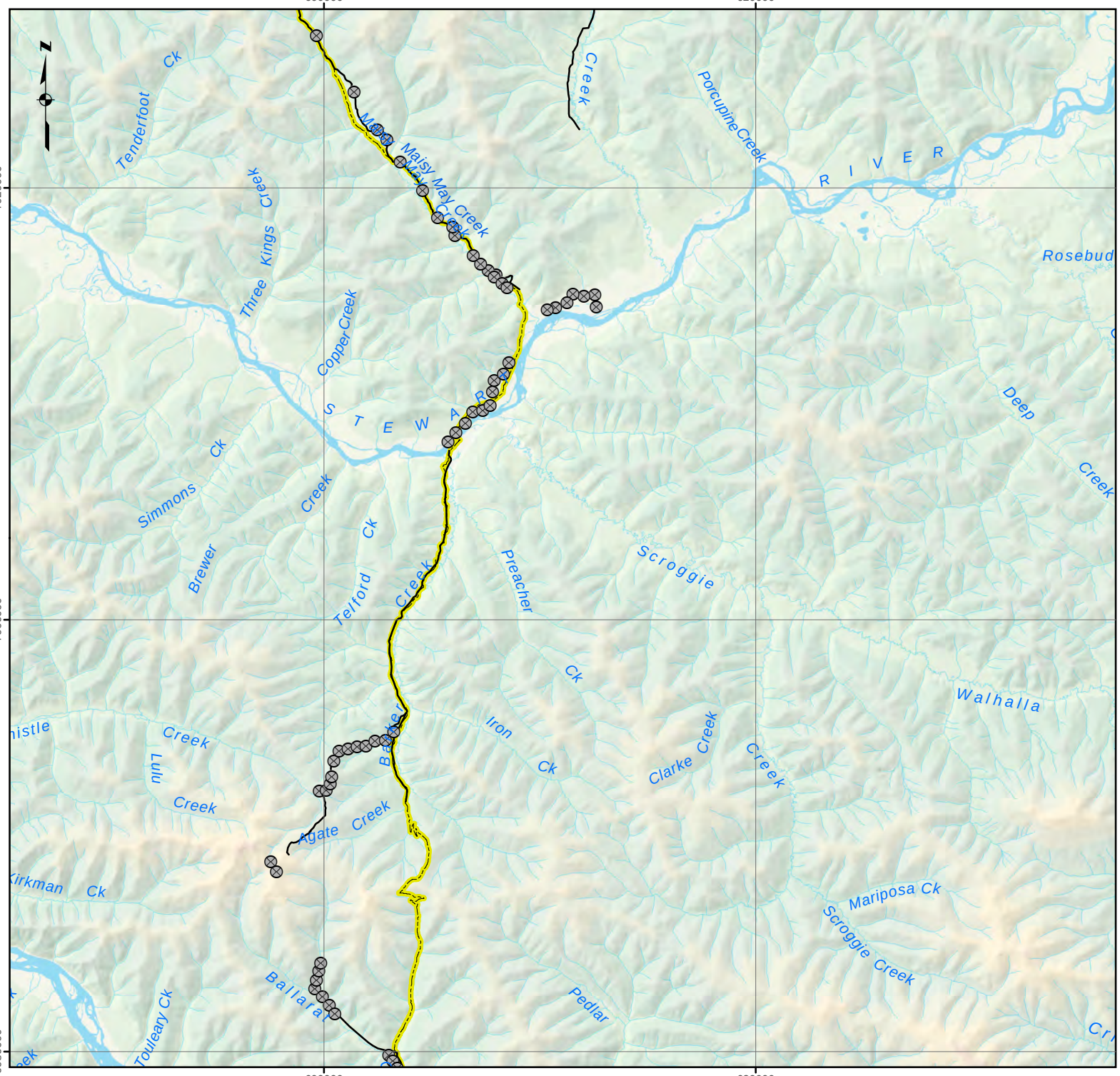

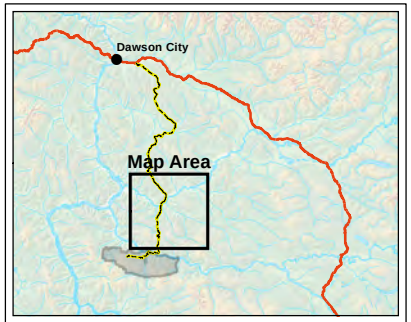

Legend

- Settlement/Community
- Highway
- Existing Access
- Proposed Route
- Coffee Property

Breeding Bird Point Count Survey

- Horned grebe detected
- No horned grebe detected

Map C2

Coffee Project horned grebe detection locations

Data Sources
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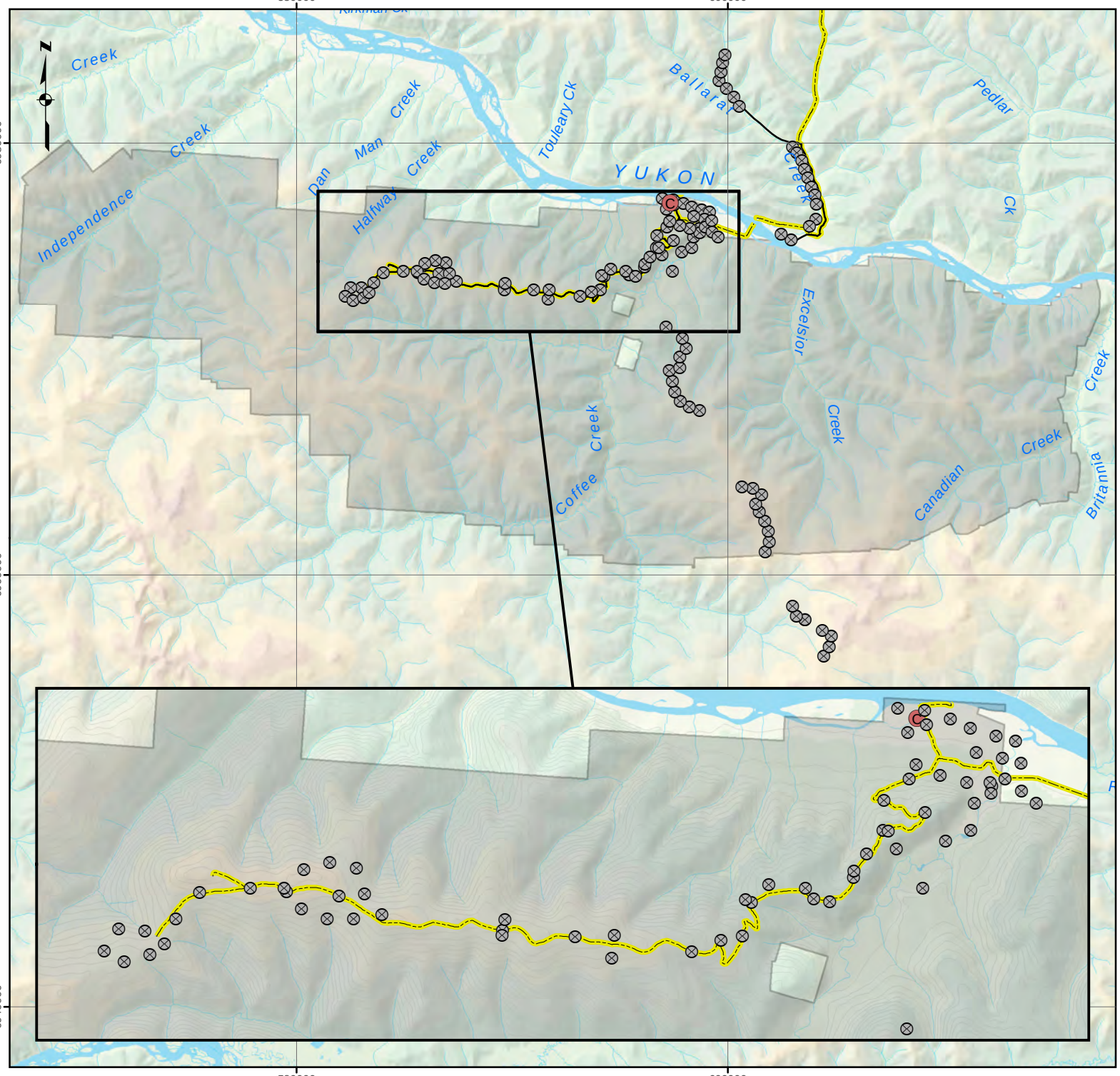

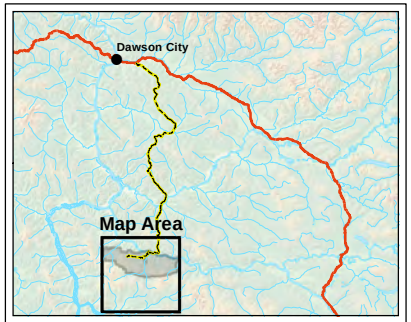

Legend

- Settlement/Community
- Coffee Project Camp (Current)
- Highway
- Existing Access
- Proposed Route
- Coffee Property

Breeding Bird Point Count Survey

- Horned grebe detected
- No horned grebe detected

Map C3

Coffee Project horned grebe detection locations

Data Sources
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Coordinate System: NAD 1983 UTM Zone 7N

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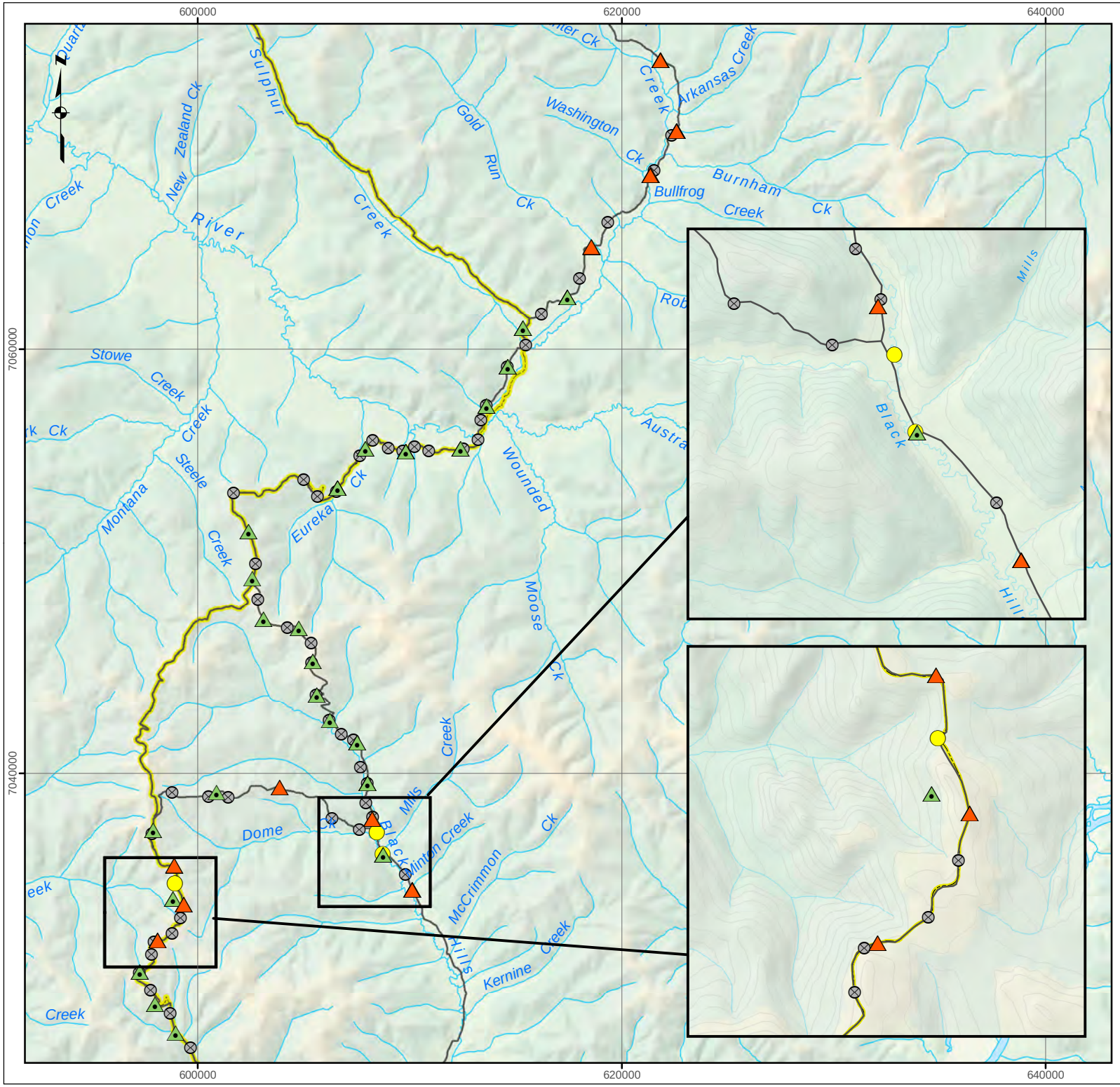

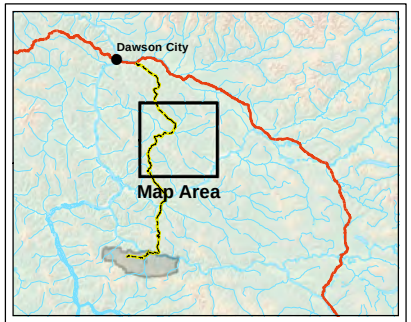

Legend

- Settlement/Community
- Highway
- Existing Access
- Proposed Route
- Coffee Property

Common Nighthawk Survey

- Common Nighthawk Observation
- No Common Nighthawk Observation

Breeding Bird Point Count Survey

- Common Nighthawk Observation
- No Common Nighthawk Observation

Map C4

Coffee Project common nighthawk detection locations

Data Sources
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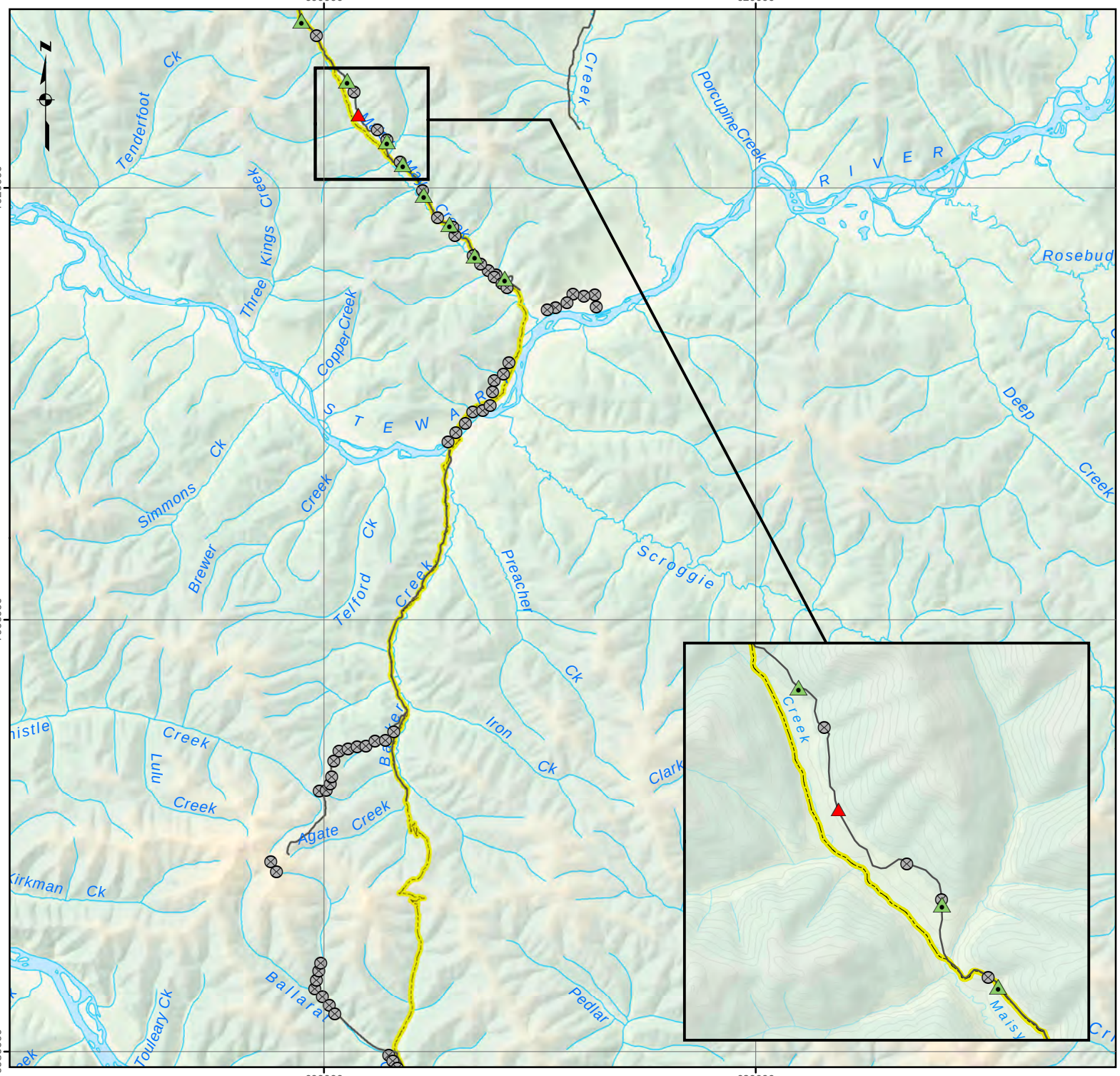

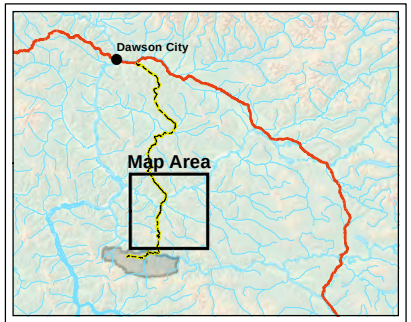

Legend

- Settlement/Community
- Highway
- Existing
- Proposed Route
- Coffee Property

Common Nighthawk Survey

- Common Nighthawk Observation
- No Common Nighthawk Observation

Breeding Bird Point Count Survey

- Common Nighthawk Observation
- No Common Nighthawk Observations

Map C5

Coffee Project common nighthawk detection locations

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Map Reference Scale: 1:250,000 (Printed at 8.5 x 11)
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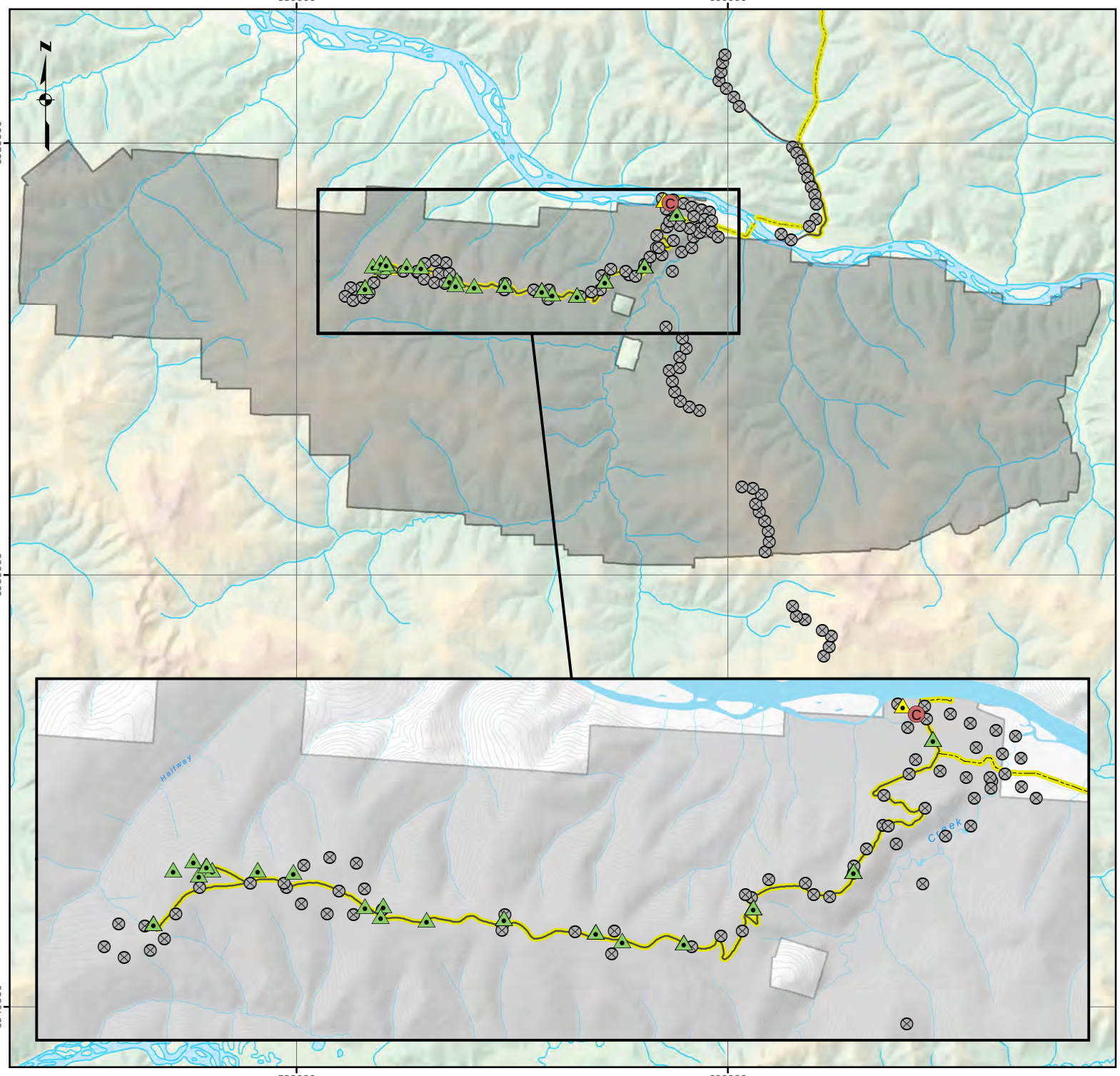

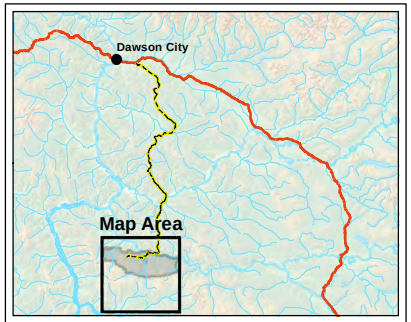

Legend

- Settlement/Community
- Coffee Gold Project Camp (Current)
- Highway
- Existing Access
- Proposed Route

Common Nighthawk Survey

- Common Nighthawk Observation
- No Common Nighthawk Observation
- Incidental Common Nighthawk Observation

Breeding Bird Point Count Survey

- Common Nighthawk Observation
- No Common Nighthawk Observation

Map C6

Coffee Project common nighthawk detection locations

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Map Reference Scale: 1:250,000 (Printed at 8.5 x 11)
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MS	BS/MP	3/13/2017	**3 of 3**

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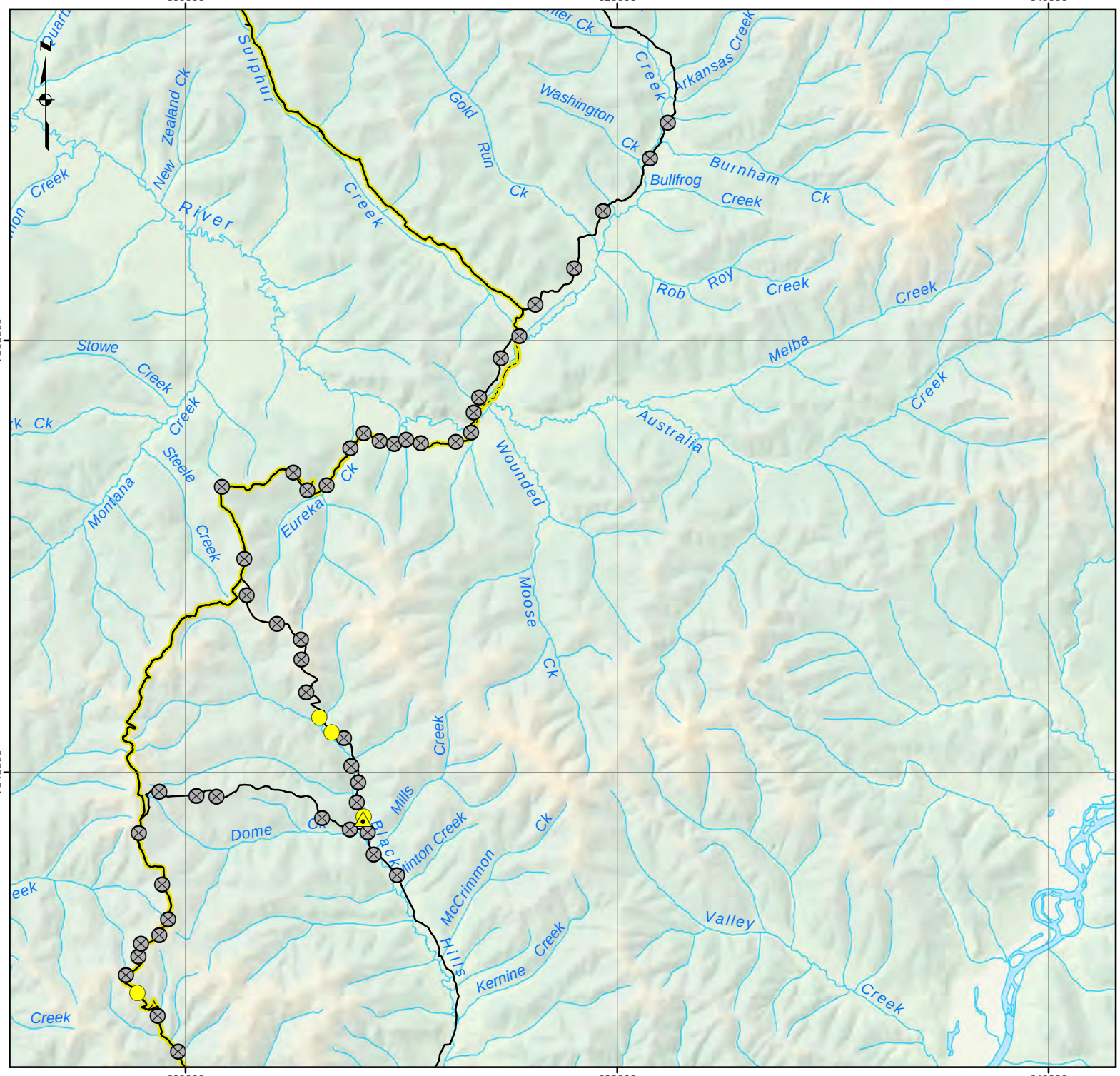

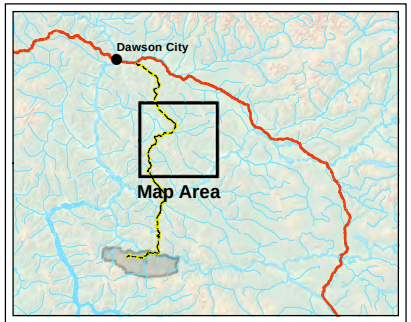

Legend

- Settlement/Community
- Highway
- Existing Access
- Proposed Route
- Incidental Olive-sided Flycatcher Observation

Breeding Bird Point Count Survey

- Olive-sided flycatcher detected
- No olive-sided flycatcher detected

Map C7

Coffee Project olive-sided flycatcher detection locations

Data Sources
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Map Reference Scale: 1:250,000 (Printed at 8.5 x 11)
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KAMINAK GOLD CORPORATION EDI

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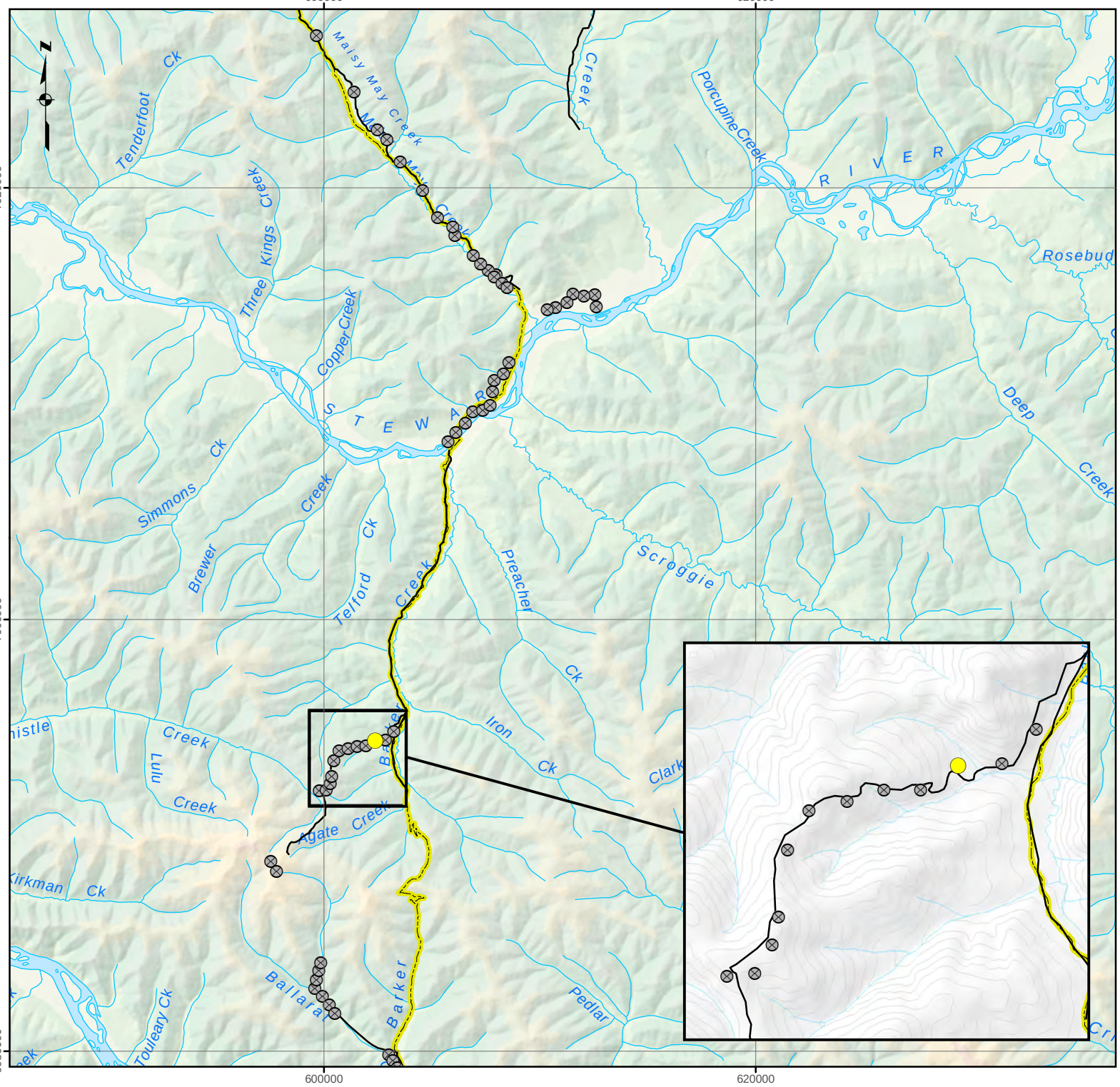

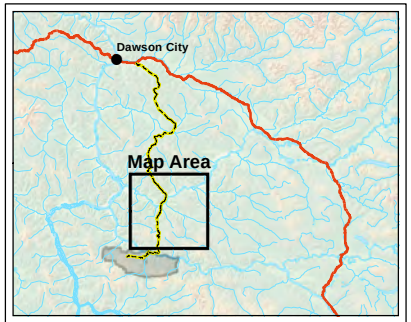

Legend

- Settlement/Community
- Highway
- Existing Access
- Proposed Route

Breeding Bird Point Count Survey

- Olive-sided flycatcher detected
- No olive-sided flycatcher detected

Map C8

Coffee Property olive-sided flycatcher detection locations

Data Sources
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Map Reference Scale: 1:250,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	3/10/2017	**2 of 3**

KAMINAK GOLD CORPORATION EDI

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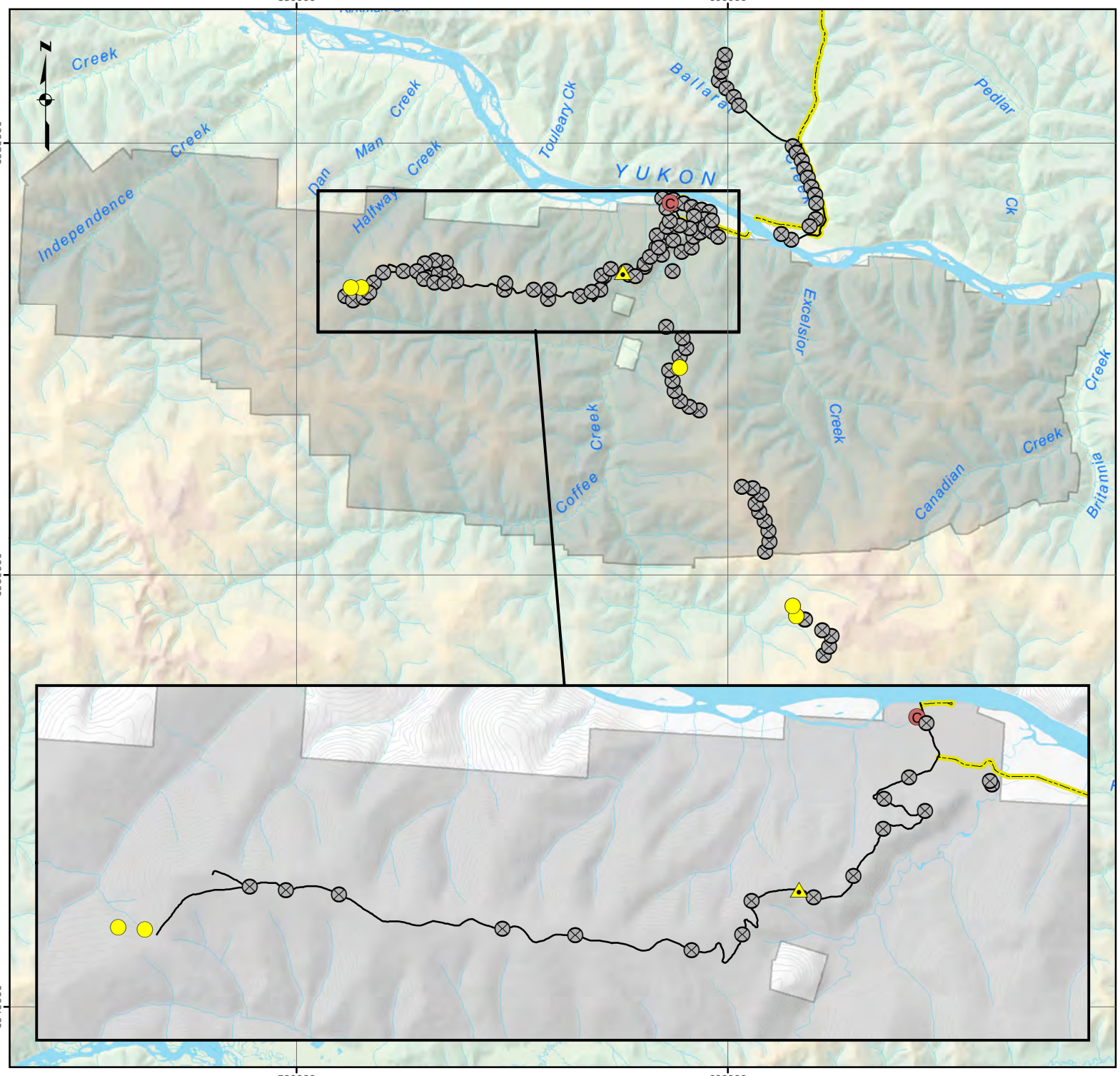

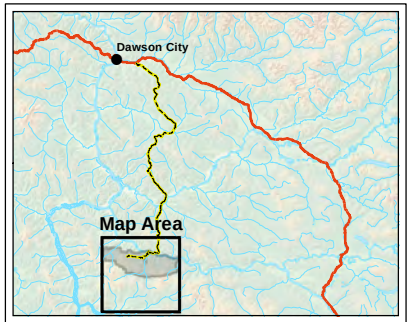

Legend

- Settlement/Community
- Coffee Gold Project Camp (Current)
- Highway
- Existing
- Coffee Property
- Incidental Olive-sided Flycatcher Observation

Breeding Bird Point Count Survey

- Olive-sided flycatcher detected
- No olive-sided flycatcher detected

Map C9

Coffee Project olive-sided flycatcher detection locations

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

Project data displayed is site specific. Survey data collected by EDI Environmental Dynamics Inc. (2015).

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KM

Map Reference Scale: 1:250,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	3/13/2017	**3 of 3**

KAMINAK GOLD CORPORATION EDI

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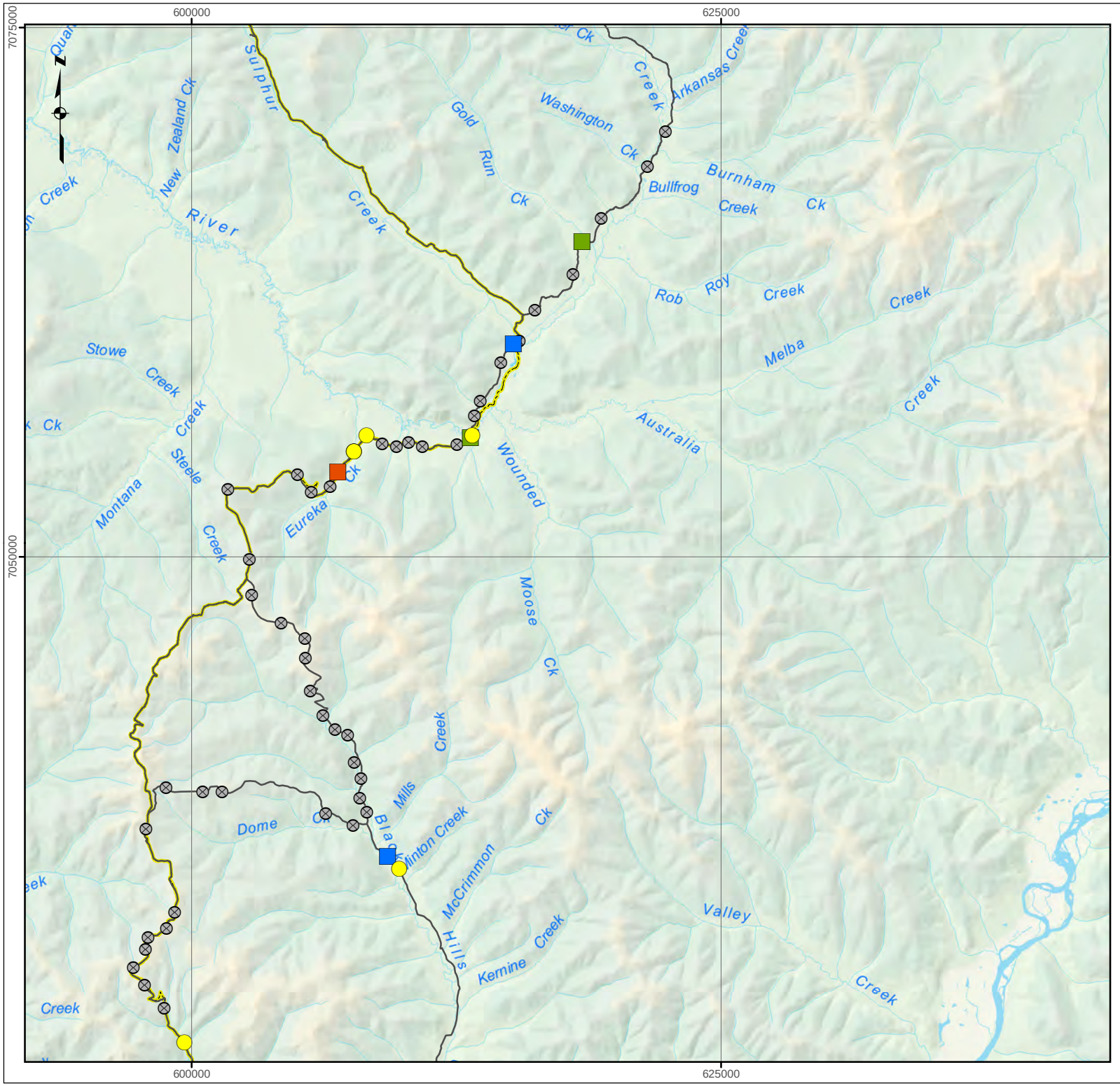

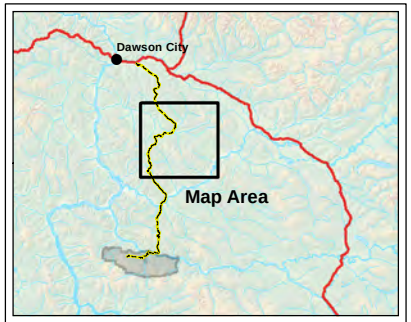

Legend

- Settlement/Community
- Highway
- Existing Access
- Proposed Route
- Coffee Property

Breeding Bird Point Count Surveys

- Bank swallow detected
- No bank swallow detected

Bank Swallow Colony

- Active Colony
- Inactive Colony
- Colony Activity Unknown

Map C10

Coffee Property bank swallow detection and colony locations

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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KM

Map Reference Scale: 1:250,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	3/10/2017	1 of 3

KAMINAK GOLD CORPORATION EDI

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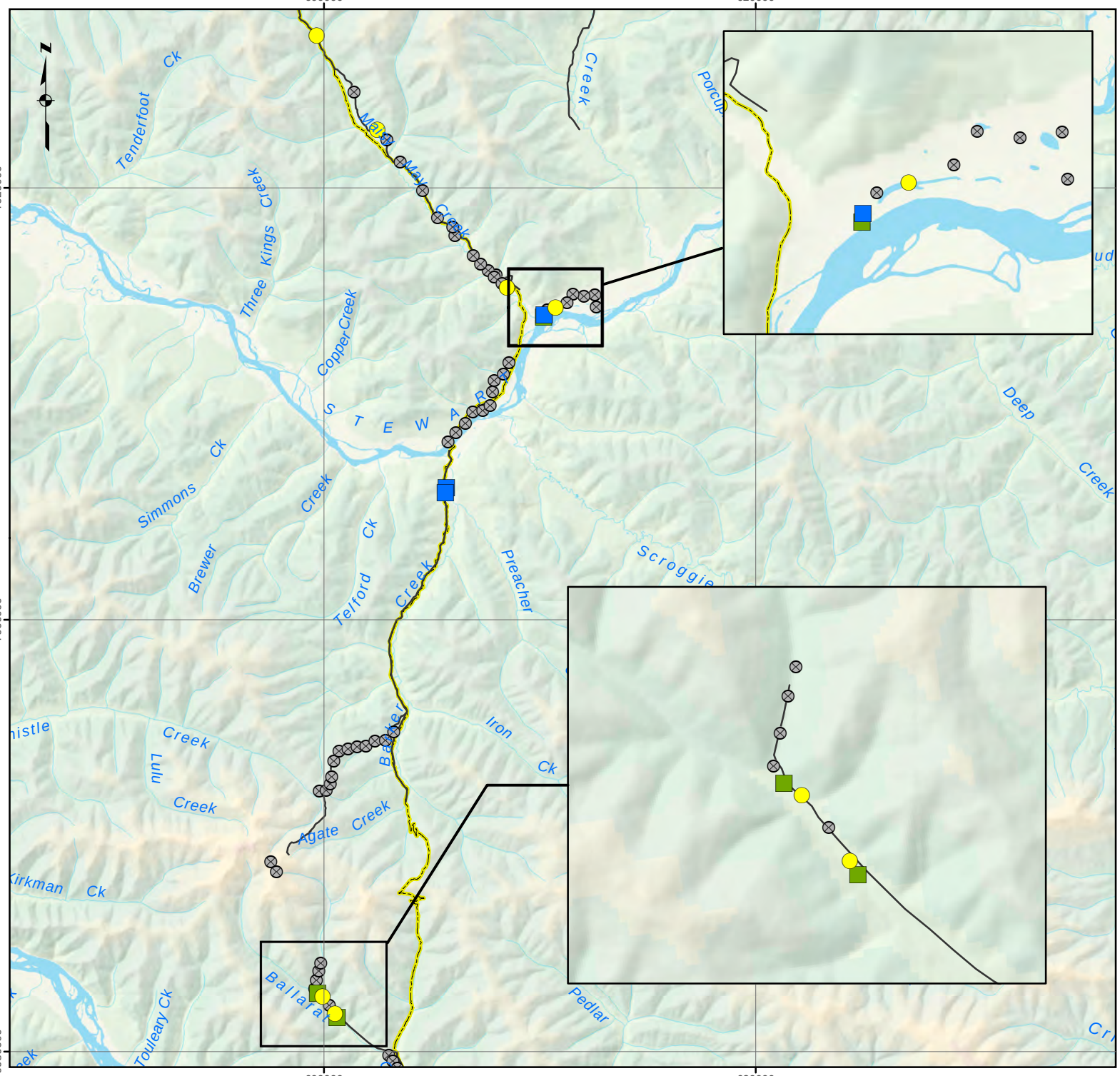

Legend

- Settlement/Community
- Highway
- Existing Access
- Proposed Route
- Coffee Property

Breeding Bird Point Count Surveys

- Bank swallow detected
- No bank swallow detected

Bank Swallow Colony

- Active Colony
- Inactive Colony
- Colony Activity Unknown

Map C11

Coffee Property bank swallow detection and colony locations

Project data displayed is site specific. Survey data collected by EDI Environmental Dynamics Inc. (2015).

Disclaimer
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0 5 10
KM

Map Reference Scale: 1:250,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	3/13/2017	2 of 3

KAMINAK GOLD CORPORATION EDI

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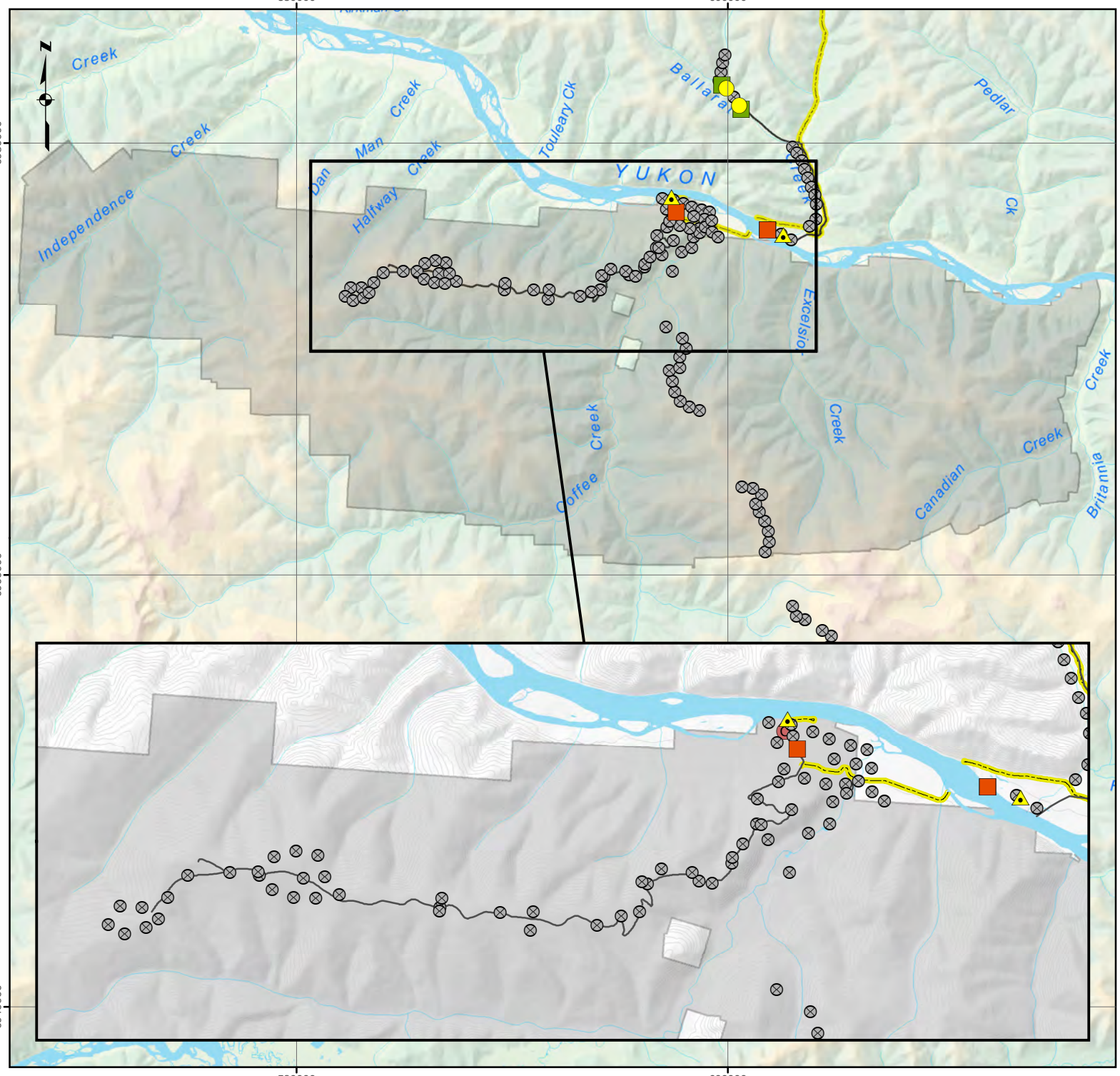

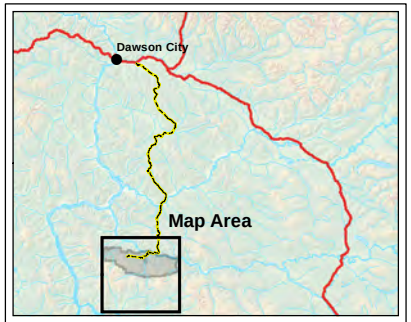

Legend

- Settlement/Community
- Coffee Gold Project Camp (Current)
- Highway
- Existing Access
- Coffee Property
- Incidental Bank Swallow Observation

Breeding Bird Point Count Surveys

- Bank swallow detected
- No bank swallow detected

Bank Swallow Colony

- Active Colony
- Inactive Colony
- Colony Activity Unknown

Map C12

Coffee Property bank swallow detection and colony locations

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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KM

Map Reference Scale: 1:250,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	3/13/2017	**3 of 3**

KAMINAK GOLD CORPORATION EDI

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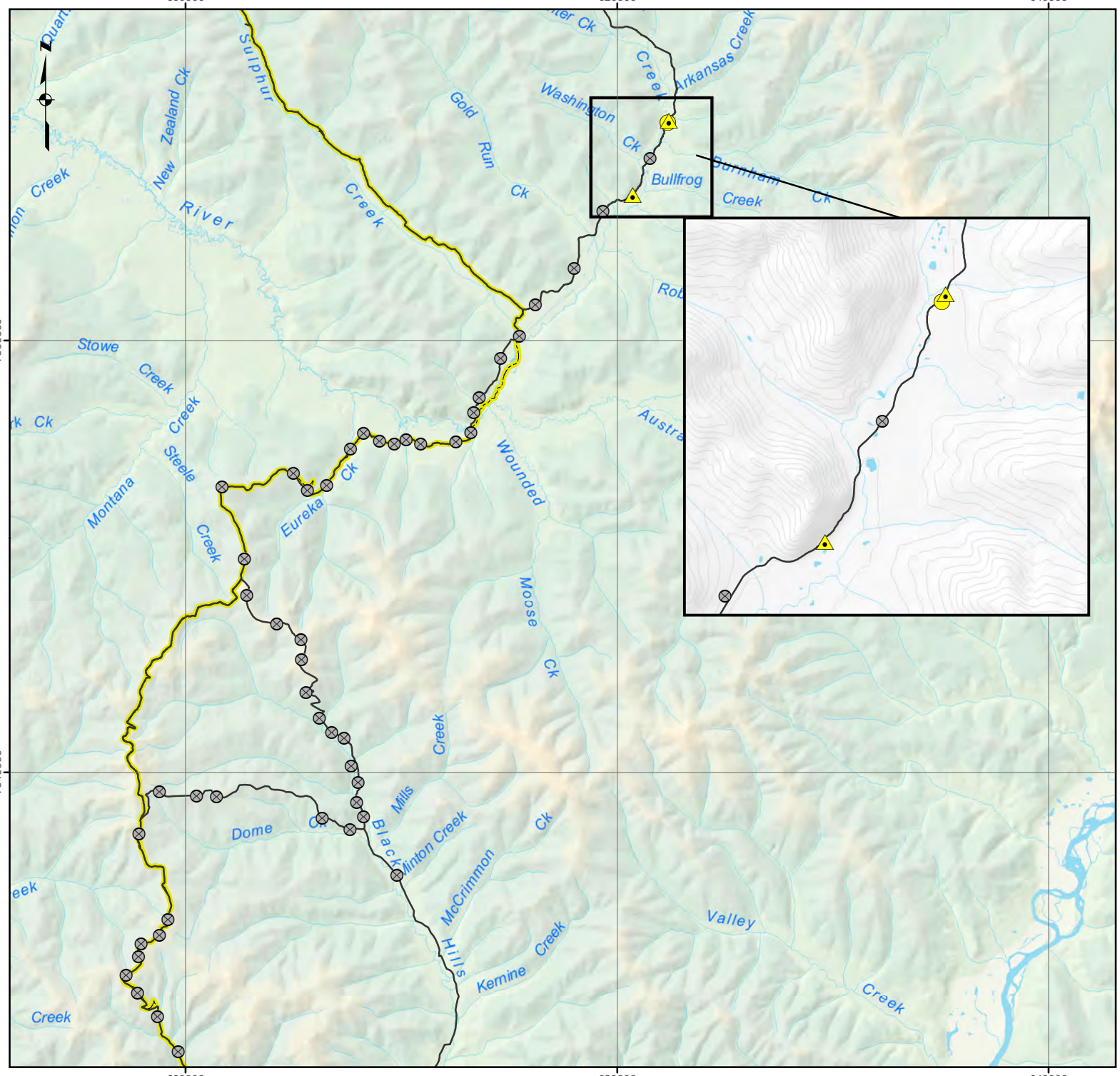

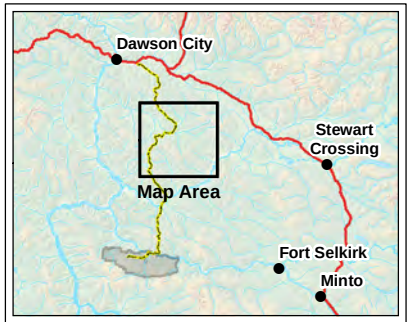

Legend

- Settlement/Community
- Highway
- Existing Access
- Coffee Property
- Incidental Rusty Blackbird Detection

Breeding Bird Point Count Surveys

- Rusty blackbird detected
- No rusty blackbird detected

Map C13

Coffee Project rusty blackbird detection locations

Data Sources
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0 5 10
KM

Map Reference Scale: 1:250,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	3/10/2017	**1 of 3**

KAMINAK GOLD CORPORATION EDI

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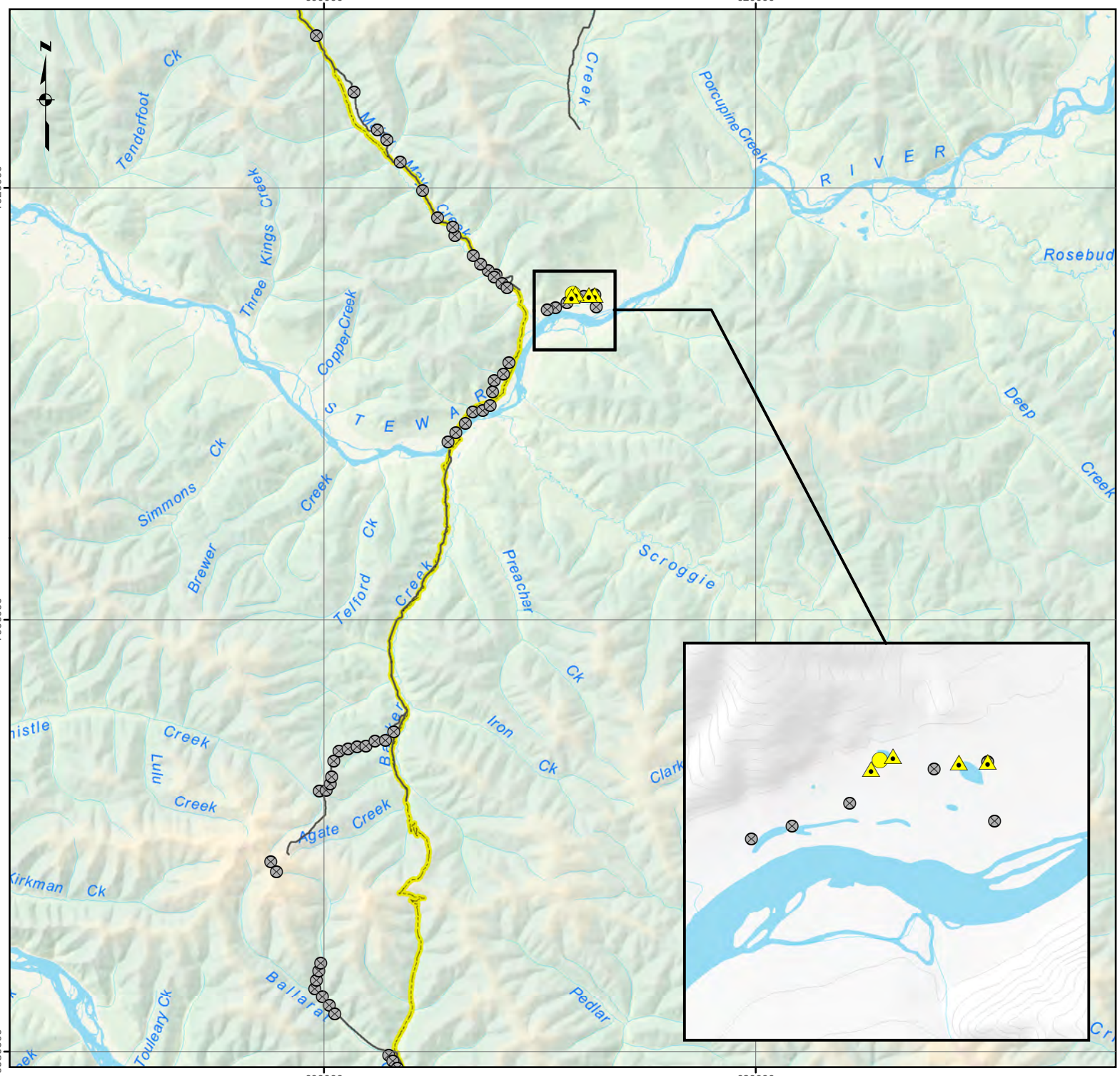

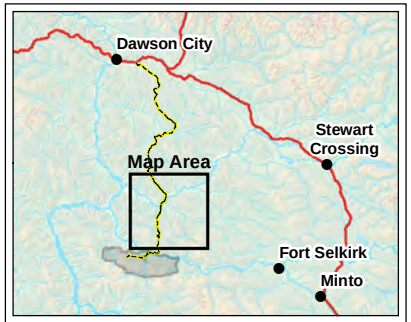

Legend

- Settlement/Community
- Highway
- Existing Access
- Proposed Route
- Coffee Property
- Incidental Rusty Blackbird Detection

Breeding Bird Point Count Surveys

- Rusty Blackbird Detected
- No Rusty Blackbird Detected

Map C14

Coffee Project rusty blackbird detection locations

Project data displayed is site specific. Survey data collected by EDI Environmental Dynamics Inc. (2015).

Disclaimer
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0 5 10
KM

Map Reference Scale: 1:250,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MP	BSc/LP	3/10/2017	2 of 3

KAMINAK GOLD CORPORATION EDI

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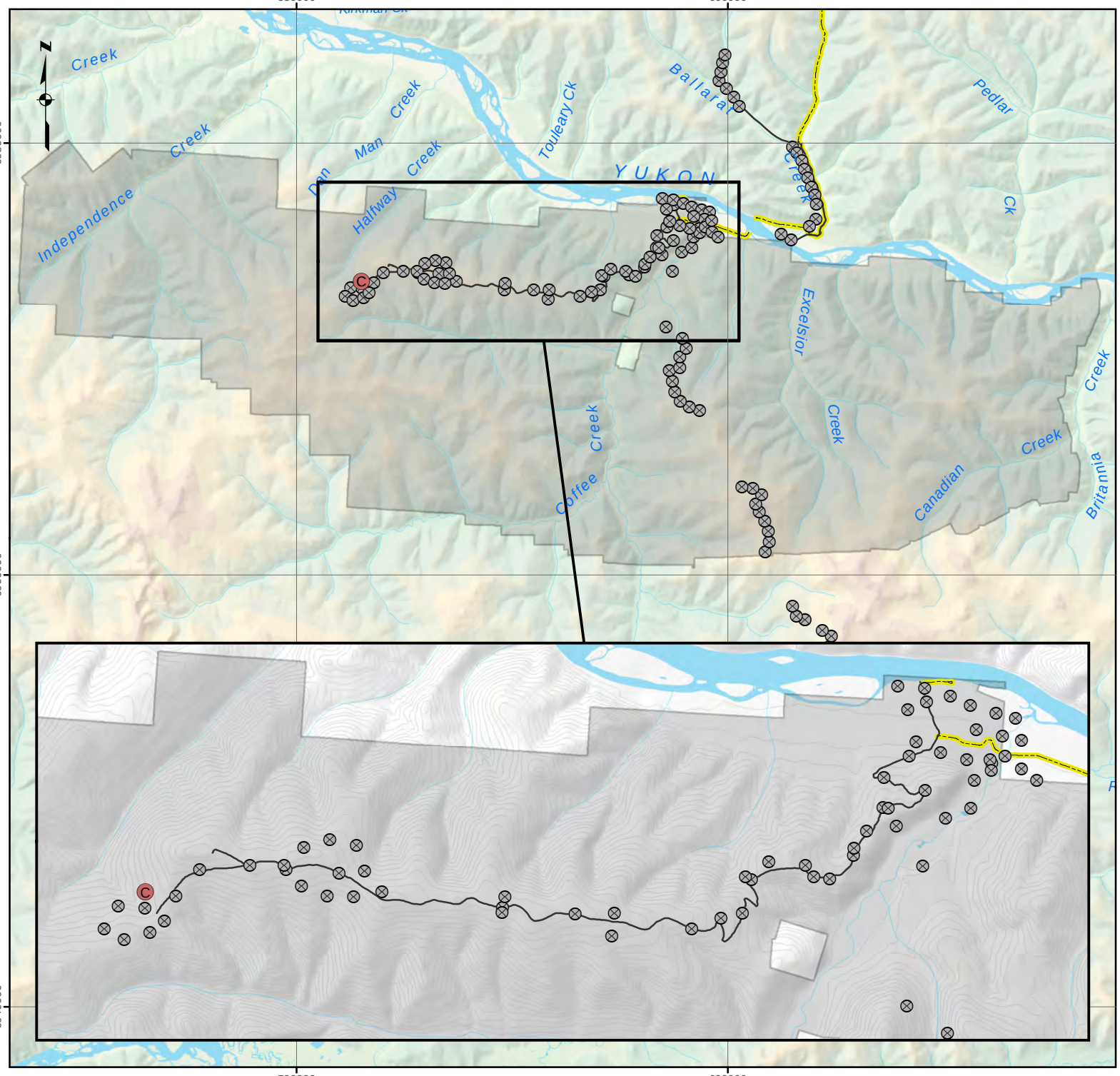

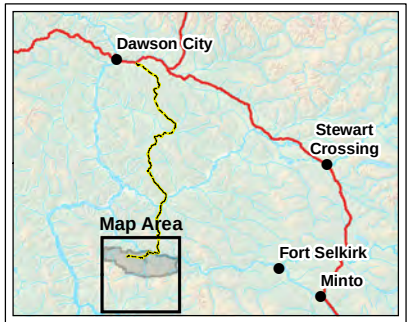

Legend

- Settlement/Community
- Coffee Gold Project Camp (Current)
- Highway
- Existing Access
- Proposed Route
- Coffee Property

Breeding Bird Point Count Surveys

- Rusty Blackbird Detected
- No Rusty Blackbird Detected

Map C15

Coffee Project rusty blackbird detection locations

Data Sources
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0 5 10
KM

Map Reference Scale: 1:250,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MP	BSc/LP	3/10/2017	**3 of 3**

KAMINAK GOLD CORPORATION EDI

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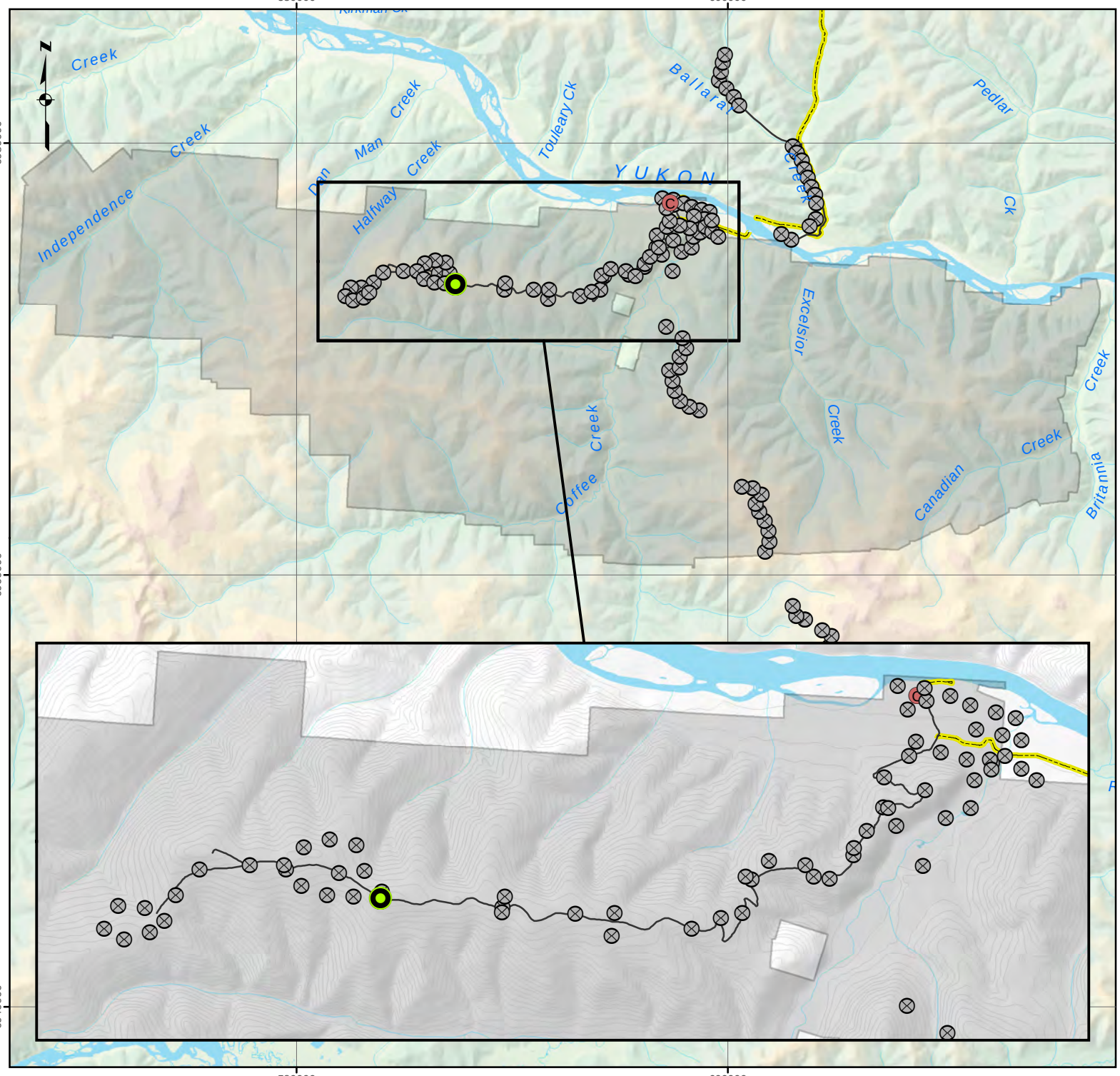

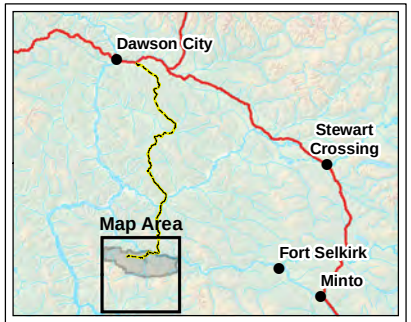

Legend

- Settlement/Community
- Coffee Gold Project Camp (Current)
- Highway
- Existing Access
- Proposed Route
- Coffee Property

Breeding Bird Point Count Surveys

- Short-Eared Owl Detected
- No Short-Eared Owl Detected

Map C16

Coffee Project Short-eared owl detection locations

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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0 5 10
KM

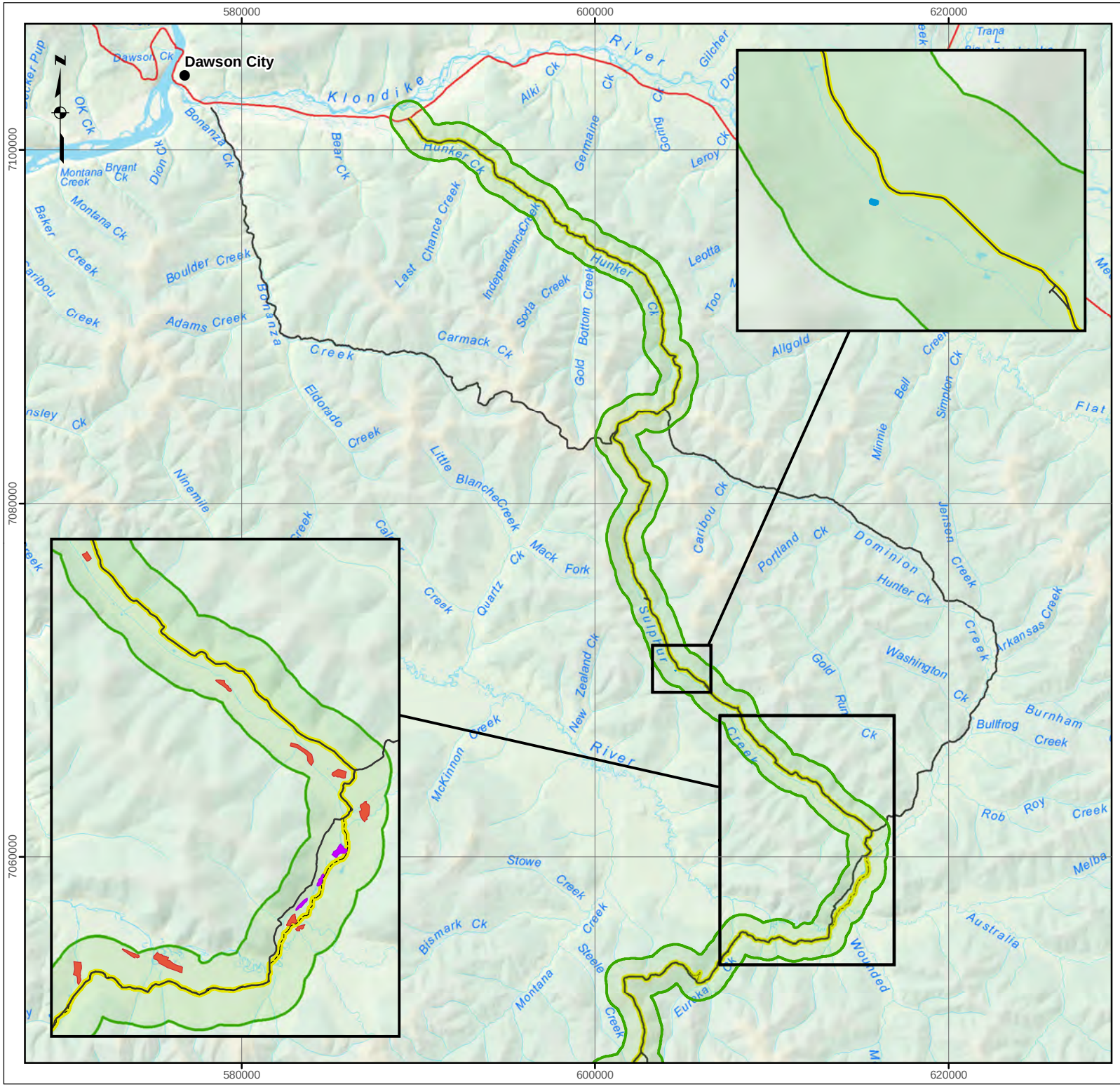
Map Reference Scale: 1:250,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MP	BSc/LP	3/9/2017	1

KAMINAK GOLD CORPORATION EDI

Path: O:\2014\14_Y_0306_Kaminak_CoffeeCk\Mapping\2016_Mapping\2016_Baseline\007_Birds\Map_C16_SEOWdetection.mxd

APPENDIX D. BASELINE HABITAT QUALITY MAPS



Legend

- Settlement/Community
- Highway
- Existing Access
- Proposed Route
- Coffee Property

Habitat Type

- Pond
- Marsh
- Placer Mine Pond
- BEM and ELC Extent

Map D1

Horned grebe and red-necked phalarope breeding habitat availability in the Coffee Project LSA

Data Sources
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KM

Map Reference Scale: 1:300,000 (Printed at 8.5 x 11)
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Drawn:	Checked:	Date:	MAP
MS	BS/MP	3/9/2017	1 of 3

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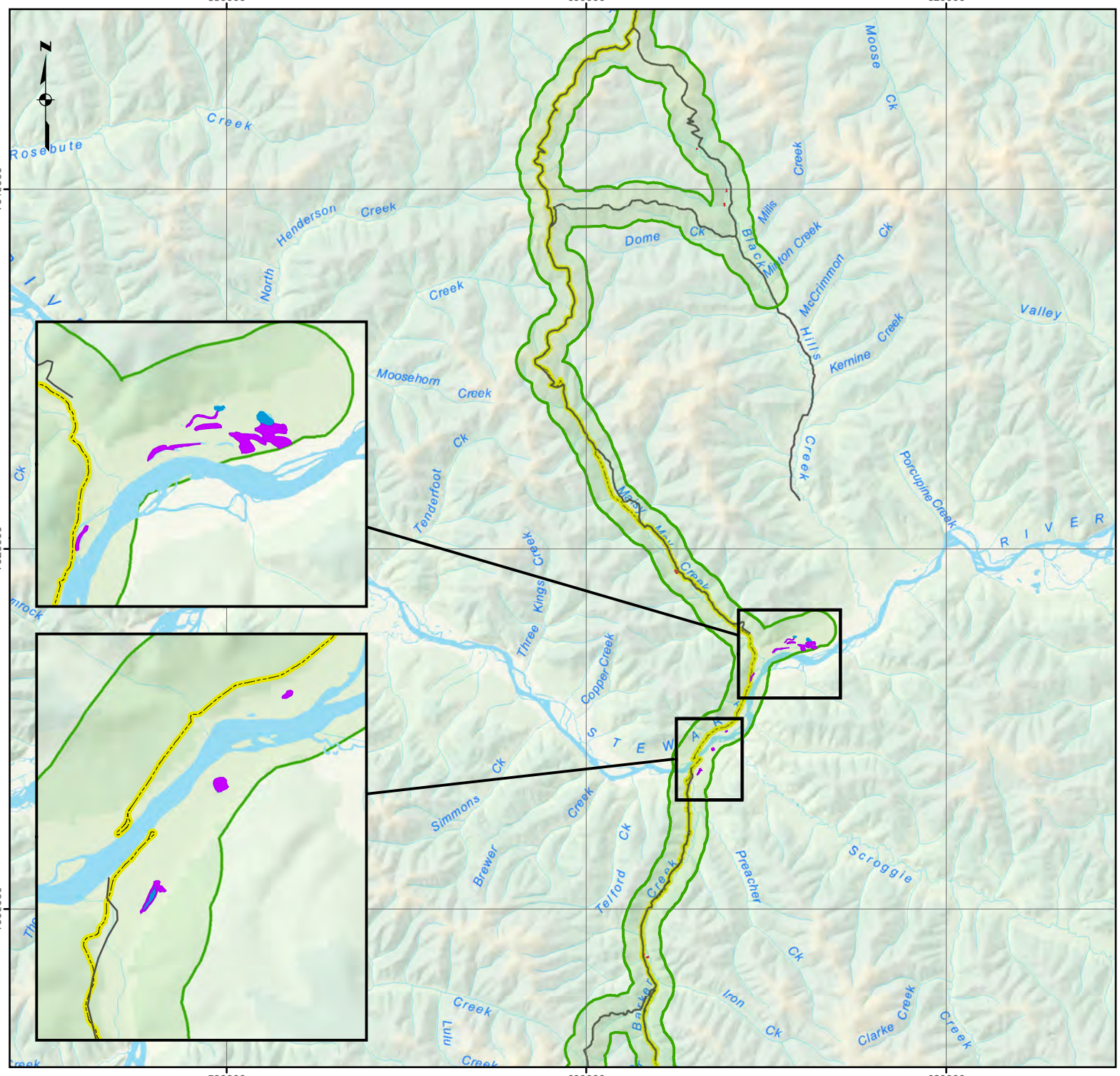

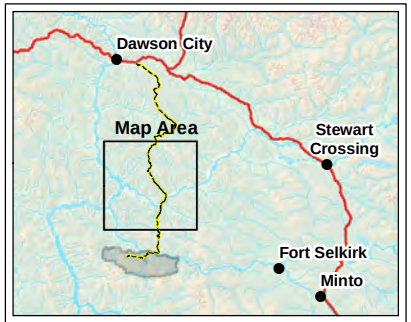

Legend

- Settlement/Community
- Highway
- Existing Access
- Proposed Route
- Coffee Property

Habitat Type

- Pond
- Marsh
- Placer Mine Pond
- BEM and ELC Extent

Map D2

Horned grebe and red-necked phalarope breeding habitat availability in the Coffee Project LSA

Data Sources
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0 5 10
KM

Map Reference Scale: 1:300,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
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KAMINAK GOLD CORPORATION EDI

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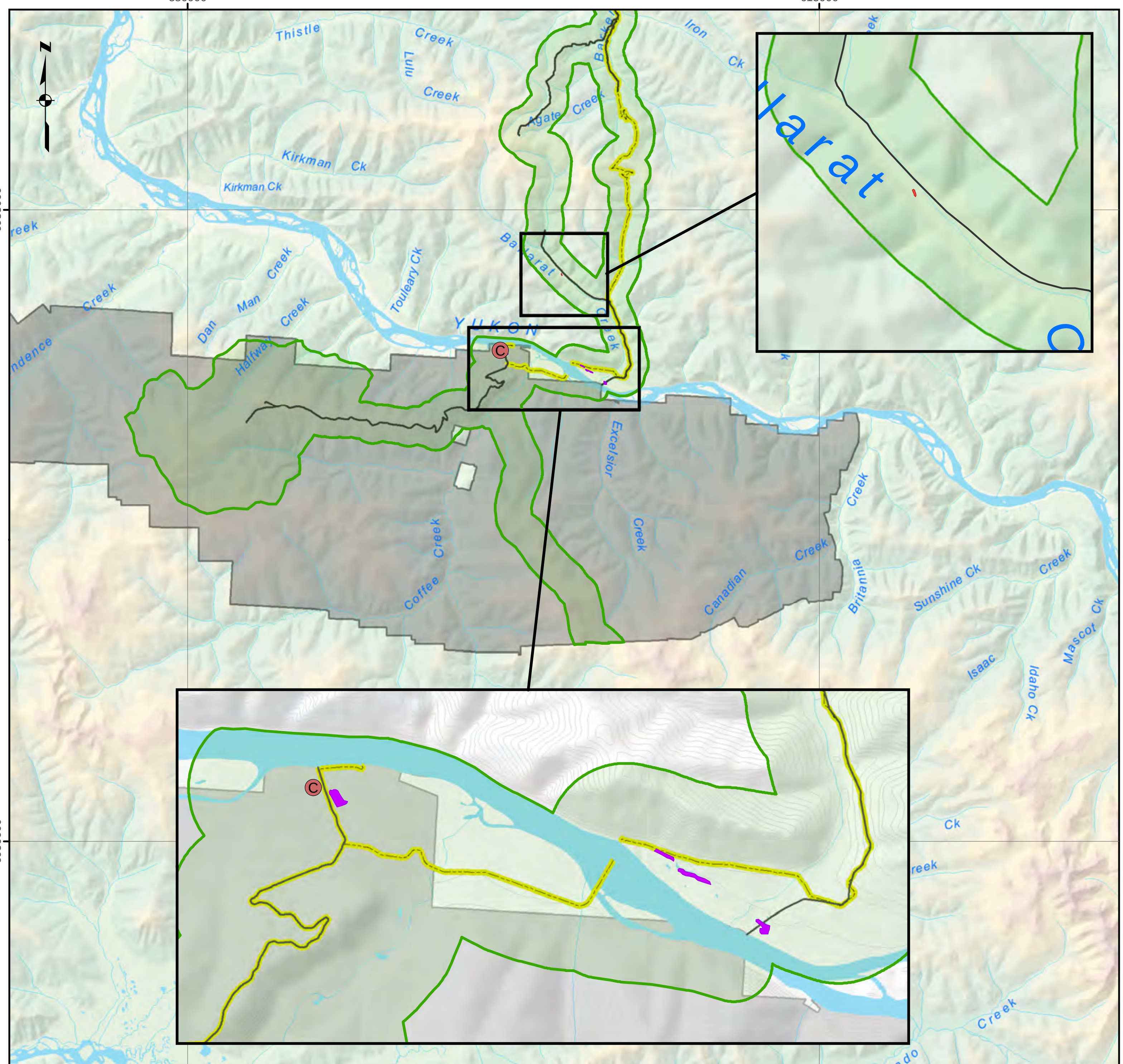

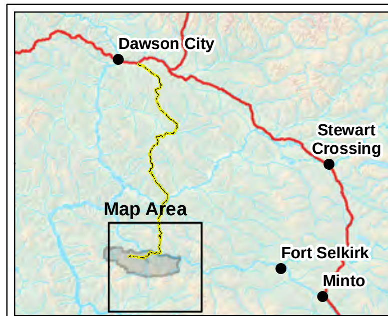

Legend

- Settlement/Community
- Coffee Gold Project Camp (Current)
- Highway
- Existing Access
- Proposed Route
- Coffee Property

Habitat Type

- Pond
- Marsh
- Placer Mine Pond
- BEM and ELC Extent

Map D3

Horned grebe and red-necked phalarope breeding habitat availability in the Coffee Project LSA

Data Sources
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0 5 10
KM

Map Reference Scale: 1:300,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	3/13/2017	3 of 3

KAMINAK GOLD CORPORATION
EDI

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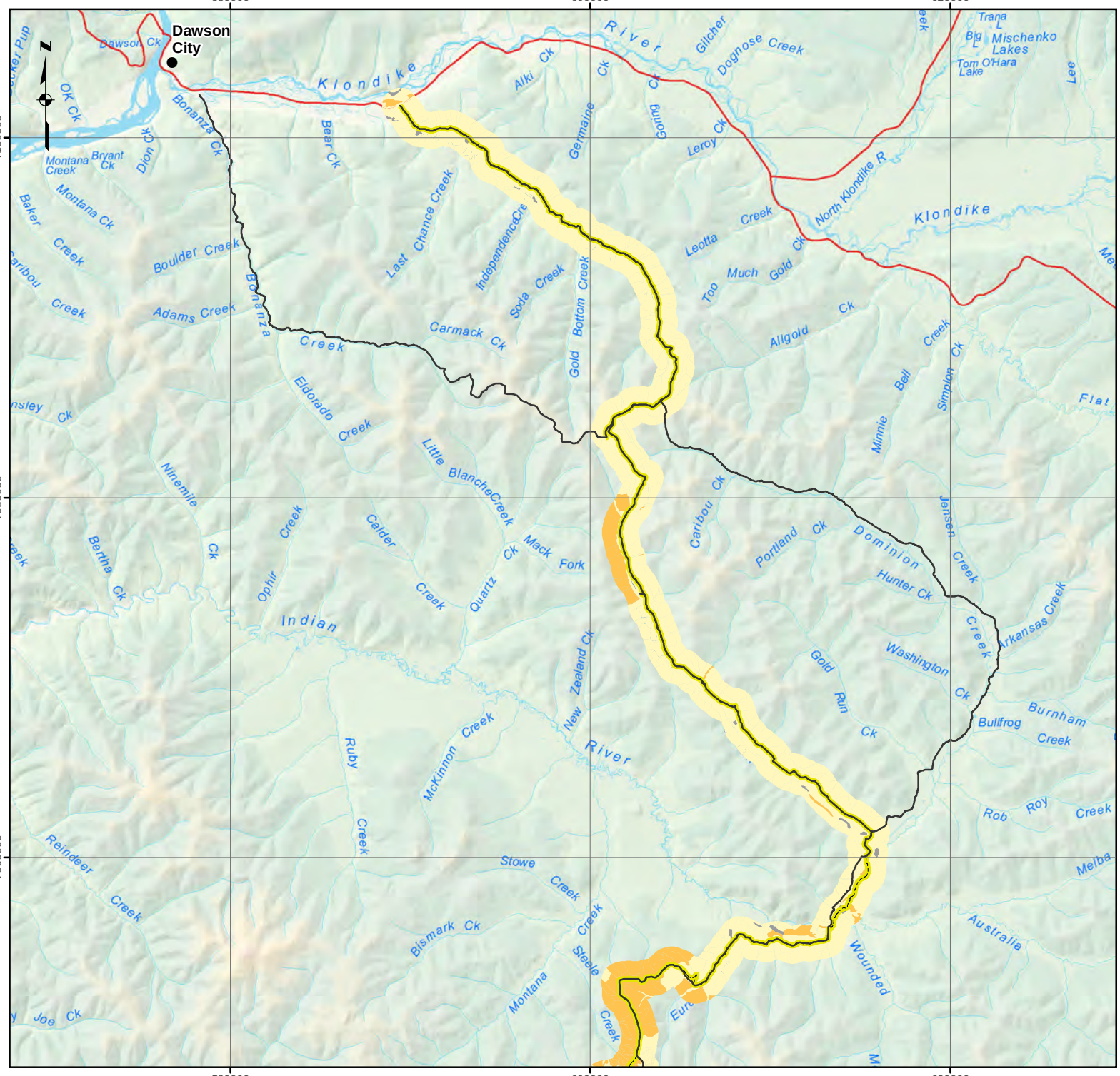

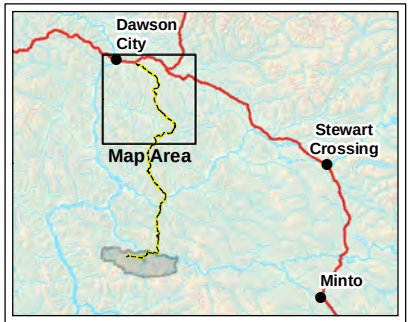

Legend

- Settlement/Community
- Highway
- Existing
- Proposed Route
- Coffee Property

Short-eared owl habitat quality rating

- Nil
- Low
- Moderate
- High

Map D4

Baseline habitat quality for short-eared owl in the Coffee Project LSA

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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0 5 10
KM

Map Reference Scale: 1:300,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	01/04/2016	**1 of 3**

KAMINAK GOLD CORPORATION EDI

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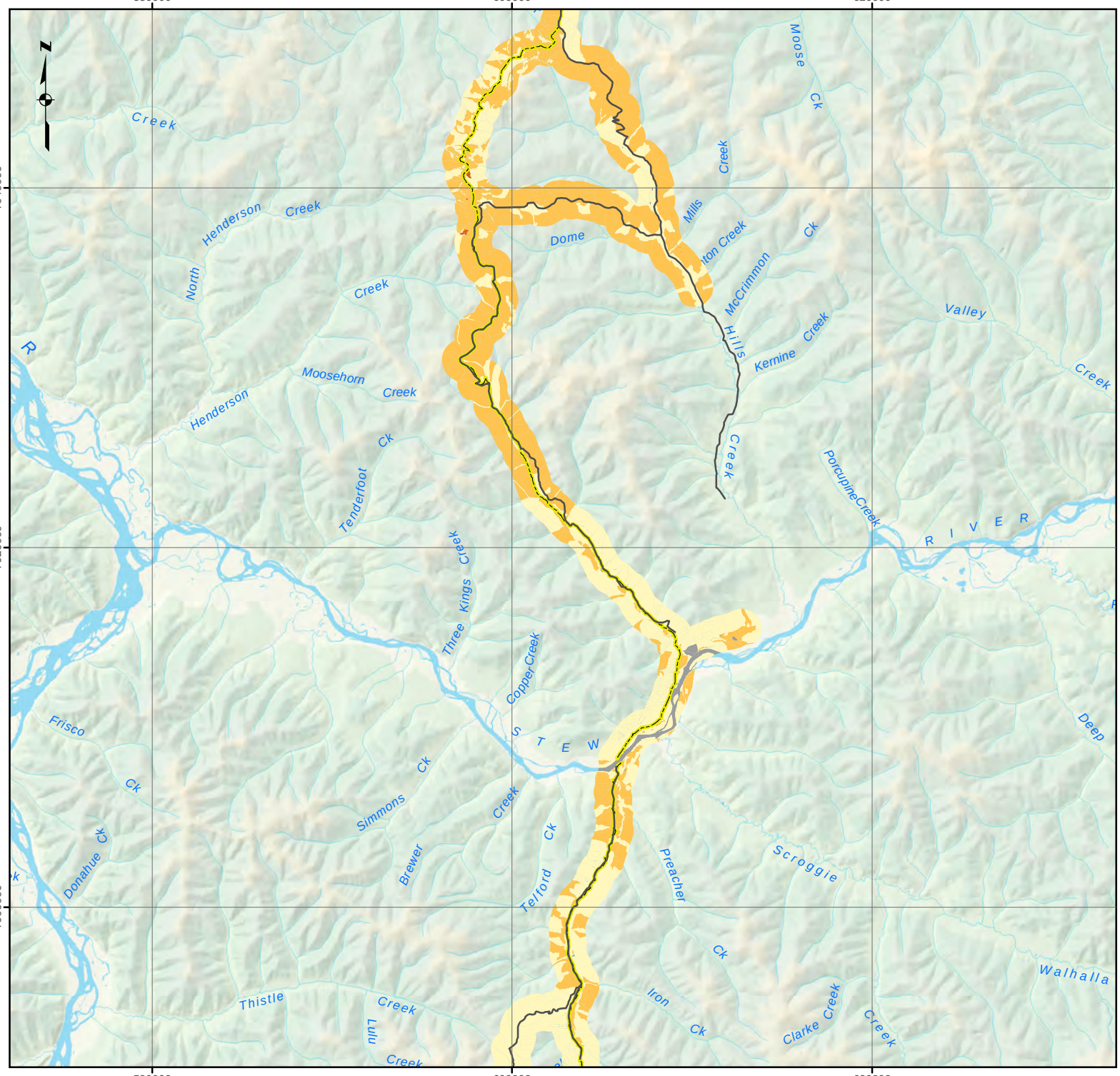

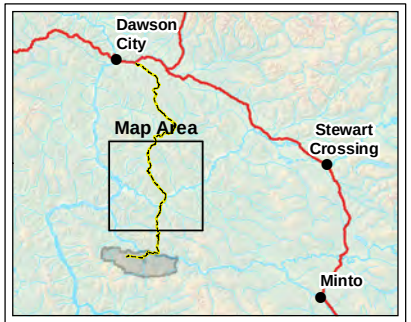

Legend

- Settlement/Community
- Highway
- Existing Access
- Proposed Route
- Coffee Property

Short-eared owl habitat quality rating

- Nil
- Low
- Moderate
- High

Map D5

Baseline habitat quality for short-eared owl in the Coffee Project LSA

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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0 5 10
KM

Map Reference Scale: 1:300,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	01/04/2016	**2 of 3**

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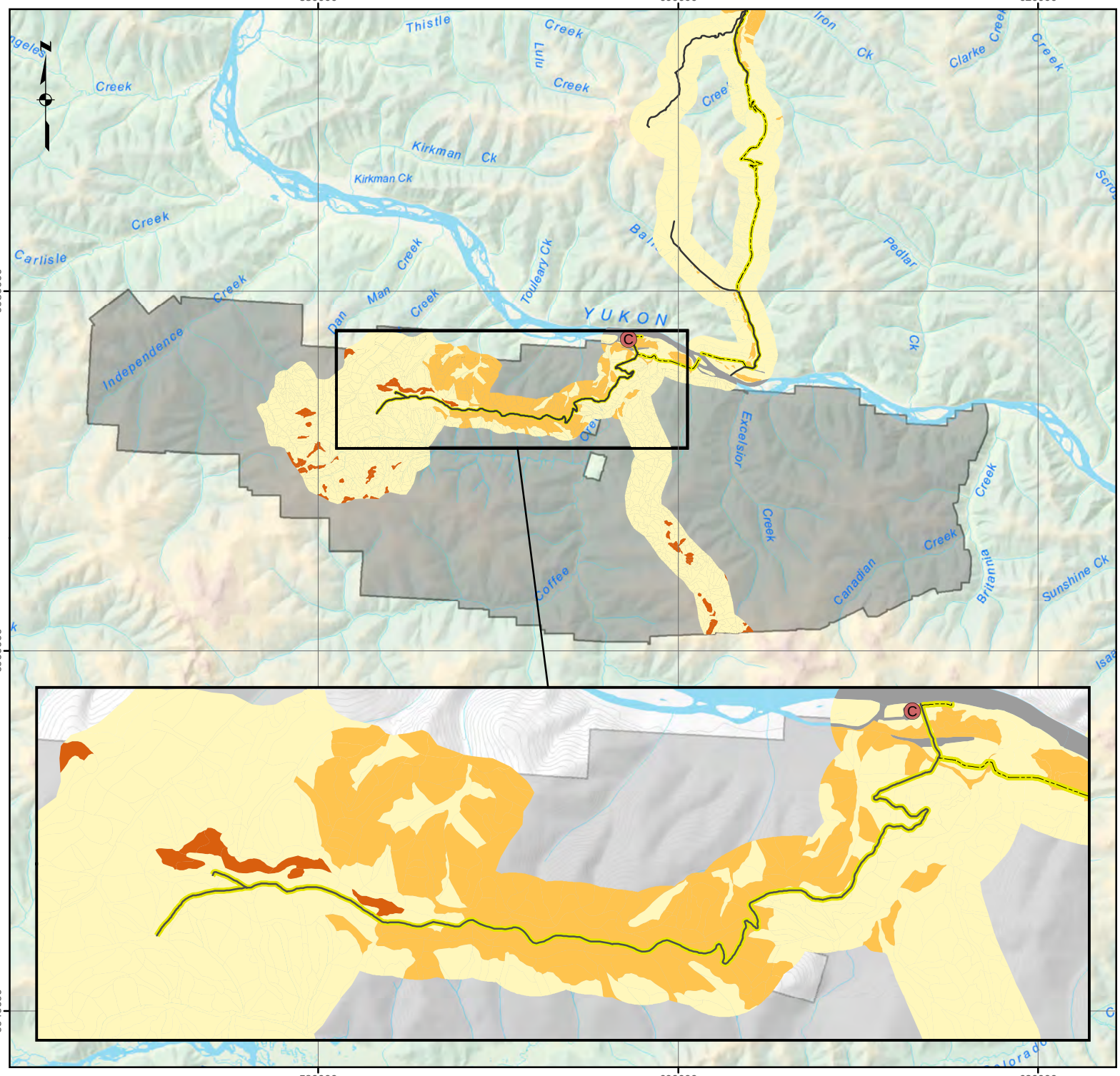

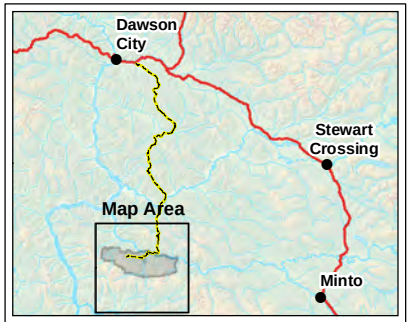

Legend

- Settlement/Community
- Coffee Gold Project Camp (Current)
- Highway
- Existing
- Proposed Route
- Coffee Property

Short-eared owl habitat quality rating

- Nil
- Low
- Moderate
- High

Map D6

Baseline habitat quality for short-eared owl in the Coffee Project LSA

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

Project data displayed is site specific. Survey data collected by EDI Environmental Dynamics Inc. (2015).

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KM

Map Reference Scale: 1:300,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	01/04/2016	3 of 3

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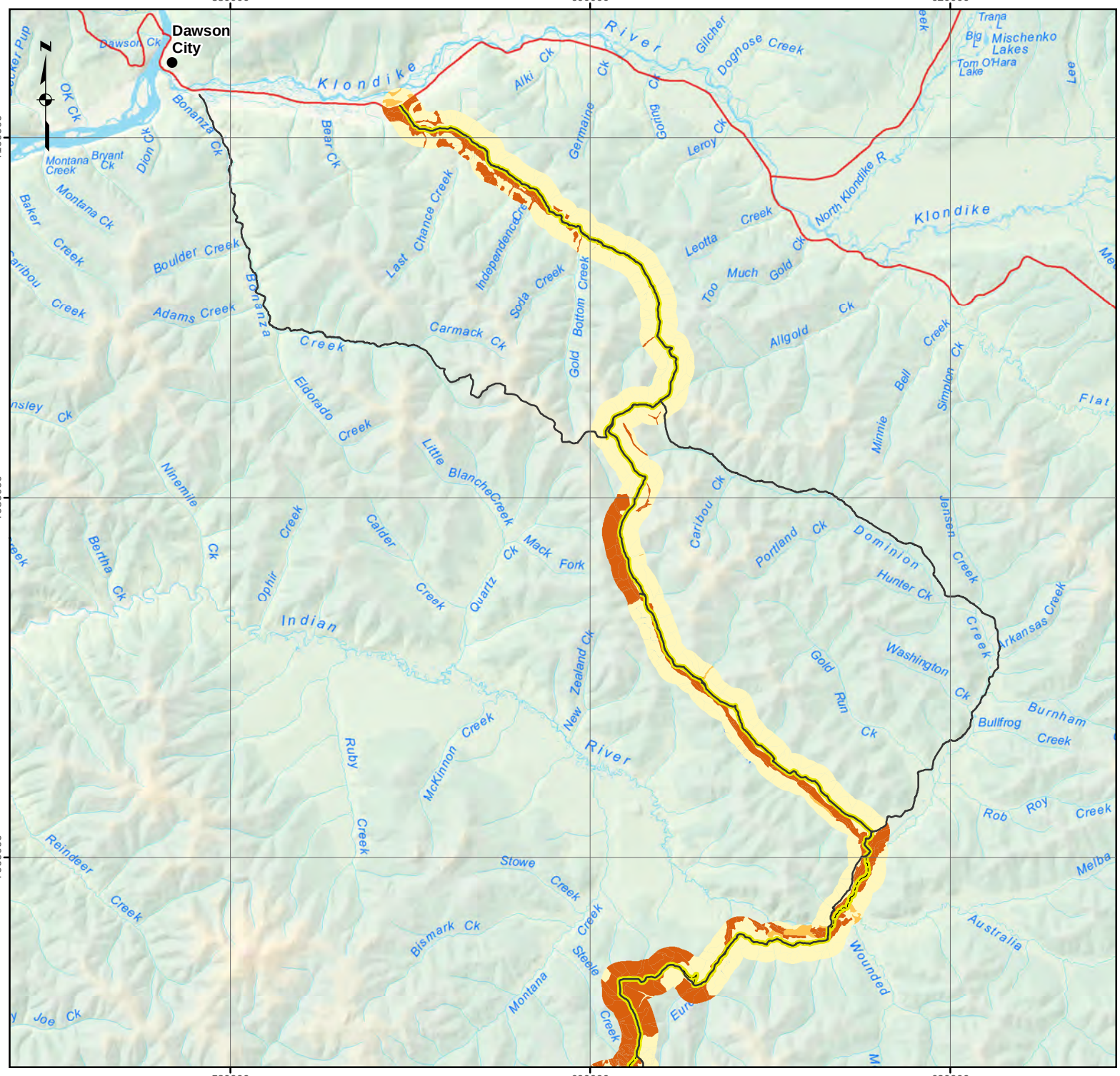

Legend

- Settlement/Community
- Highway
- Existing
- Proposed Route
- Coffee Property

Common nighthawk habitat quality rating

- Low
- Moderate
- High

Map D7

Baseline habitat quality for common nighthawk in the Coffee Project LSA

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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KM

Map Reference Scale: 1:300,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	01/04/2016	1 of 3

KAMINAK GOLD CORPORATION EDI

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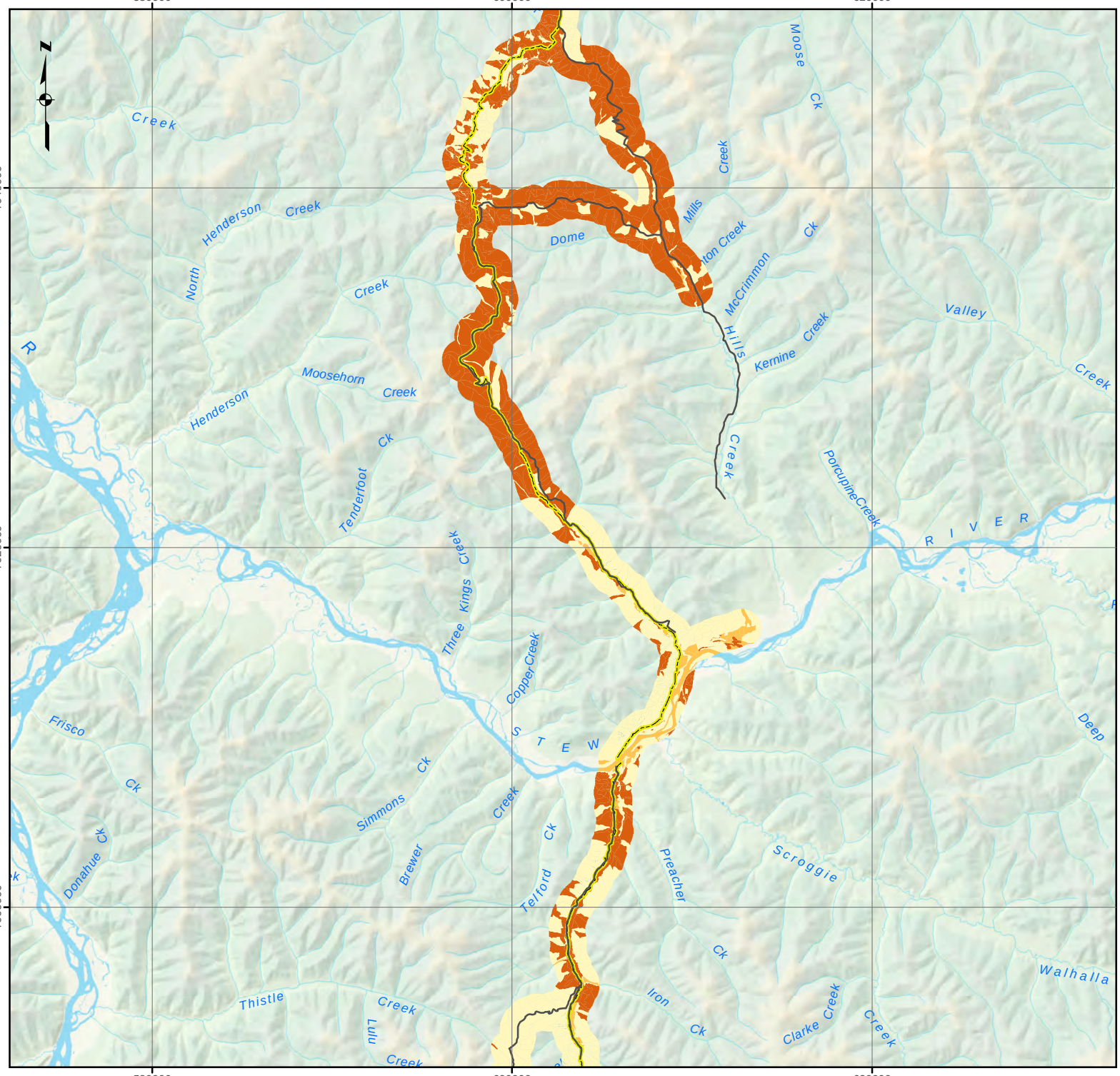

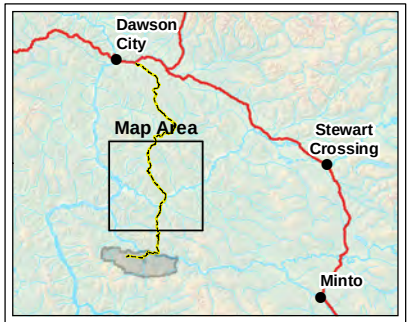

Legend

- Settlement/Community
- Highway
- Existing
- Proposed Route
- Coffee Property

Common nighthawk habitat quality rating

- Low
- Moderate
- High

Map D8

Baseline habitat quality for common nighthawk in the Coffee Project LSA

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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KM

Map Reference Scale: 1:300,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	01/04/2016	**2 of 3**

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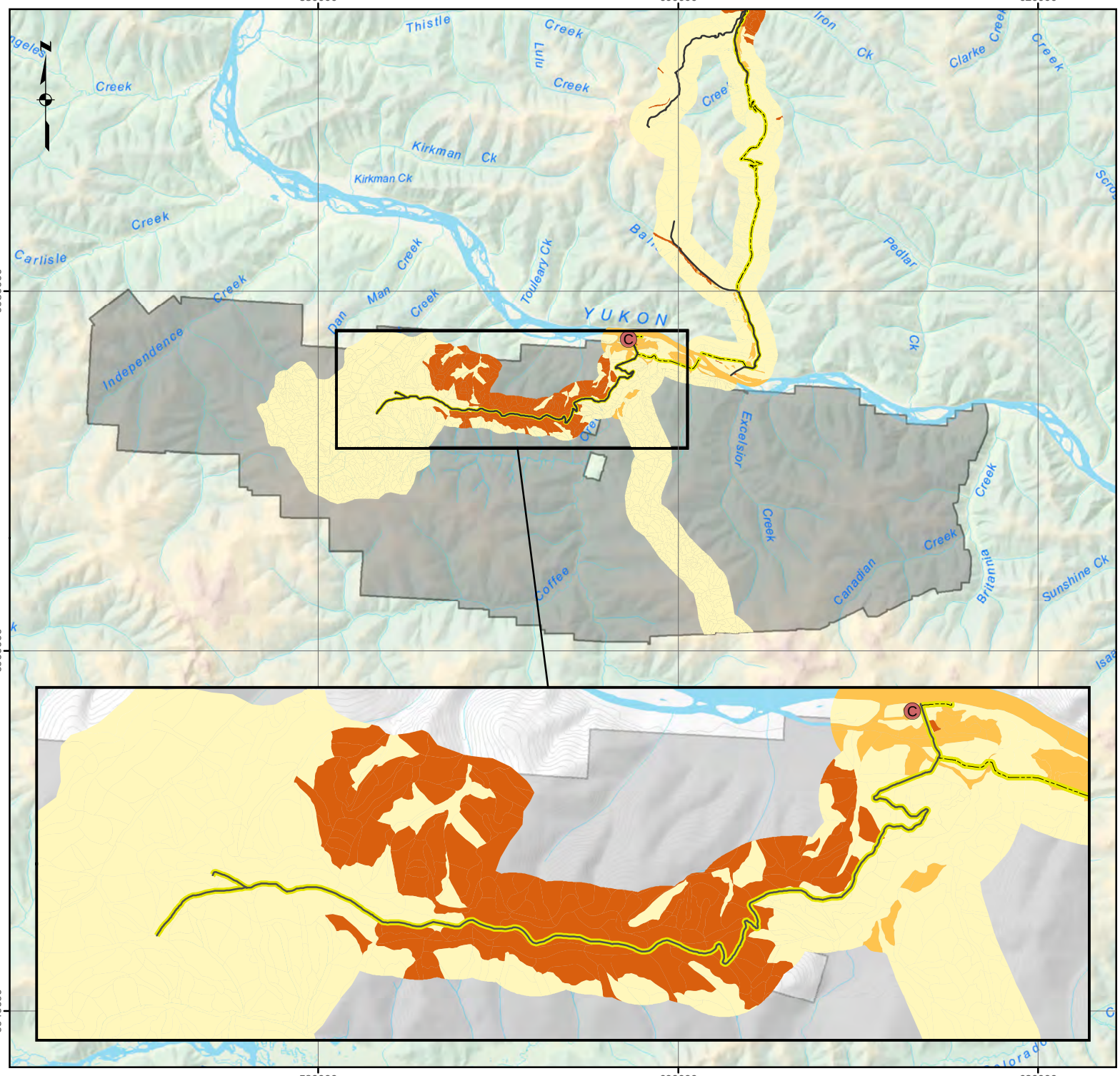

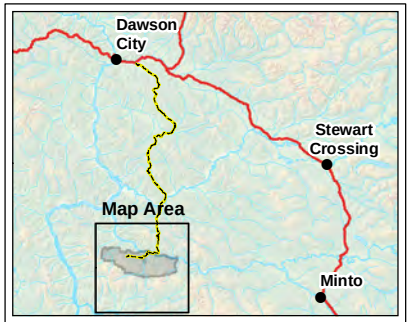

Legend

- Settlement/Community
- Coffee Gold Project Camp (Current)
- Highway
- Existing
- Proposed Route
- Coffee Property

Common nighthawk habitat quality rating

- Low
- Moderate
- High

Map D9

Baseline habitat quality for common nighthawk in the Coffee Project LSA

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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0 5 10
KM

Map Reference Scale: 1:300,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	01/04/2016	3 of 3

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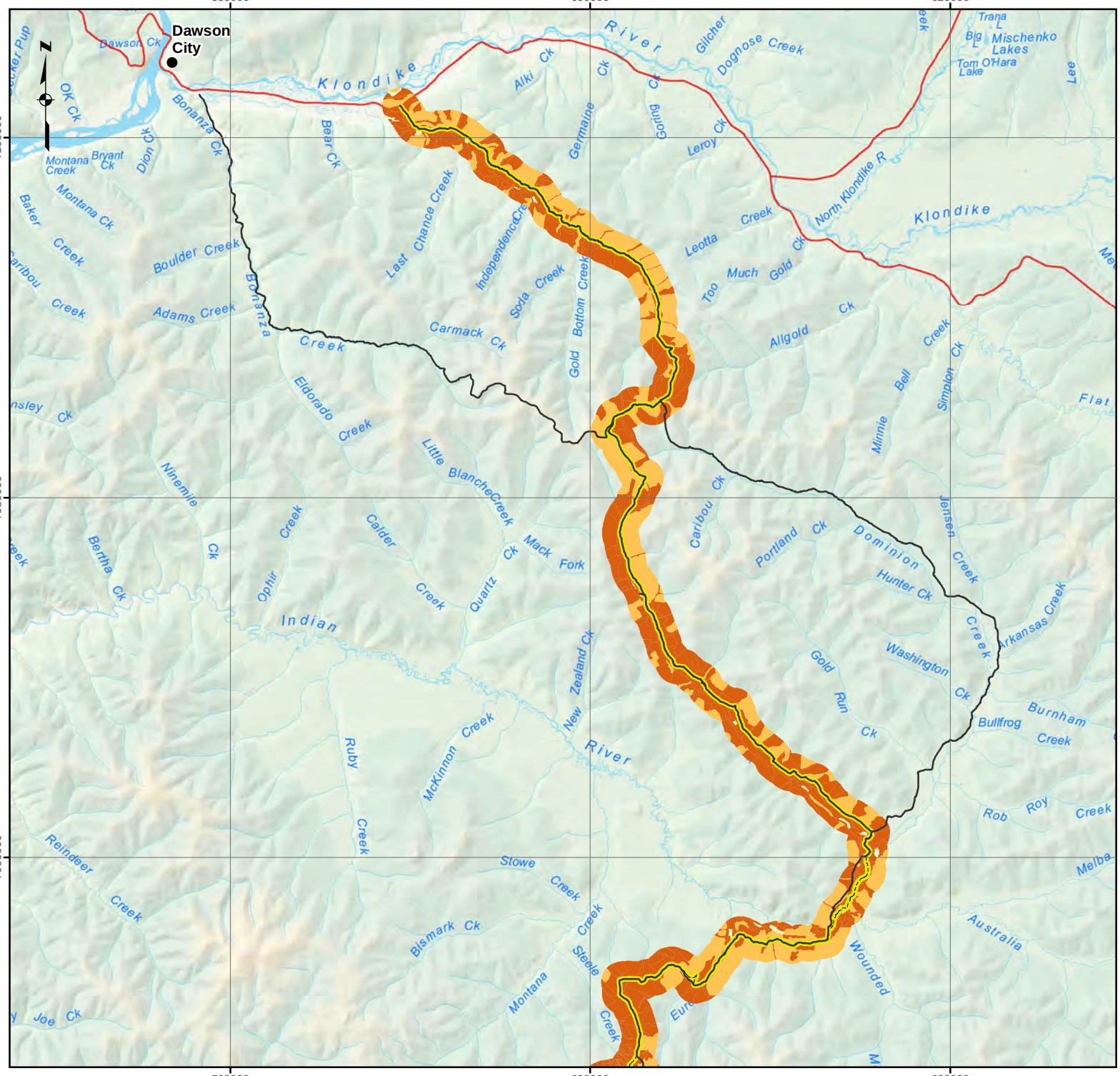

Legend

- Settlement/Community
- Highway
- Existing
- Proposed Route
- Coffee Property

Passerine bird habitat quality rating

- Low
- Moderate
- High

Map D10

Baseline habitat quality for passerine birds in the Coffee Project LSA

Data Sources
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Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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KM

Map Reference Scale: 1:300,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	01/04/2016	1 of 3

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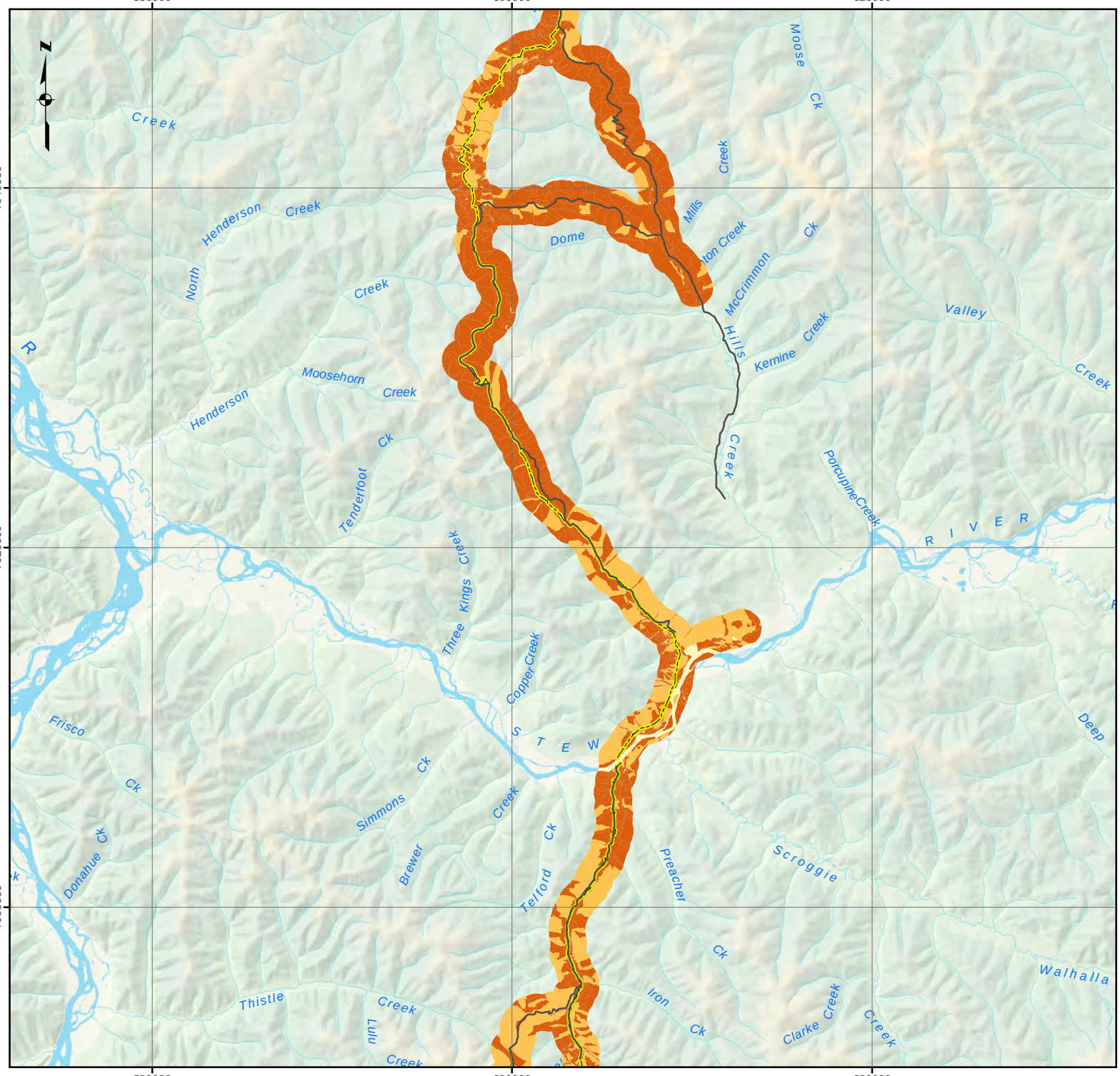

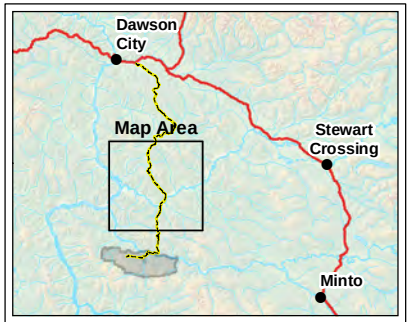

Legend

- Settlement/Community
- Highway
- Existing
- Proposed Route
- Coffee Property

Passerine bird habitat quality rating

- Low
- Moderate
- High

Map D11

Baseline habitat quality for passerine birds in the Coffee Project LSA

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

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KM

Map Reference Scale: 1:300,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	01/04/2016	2 of 3

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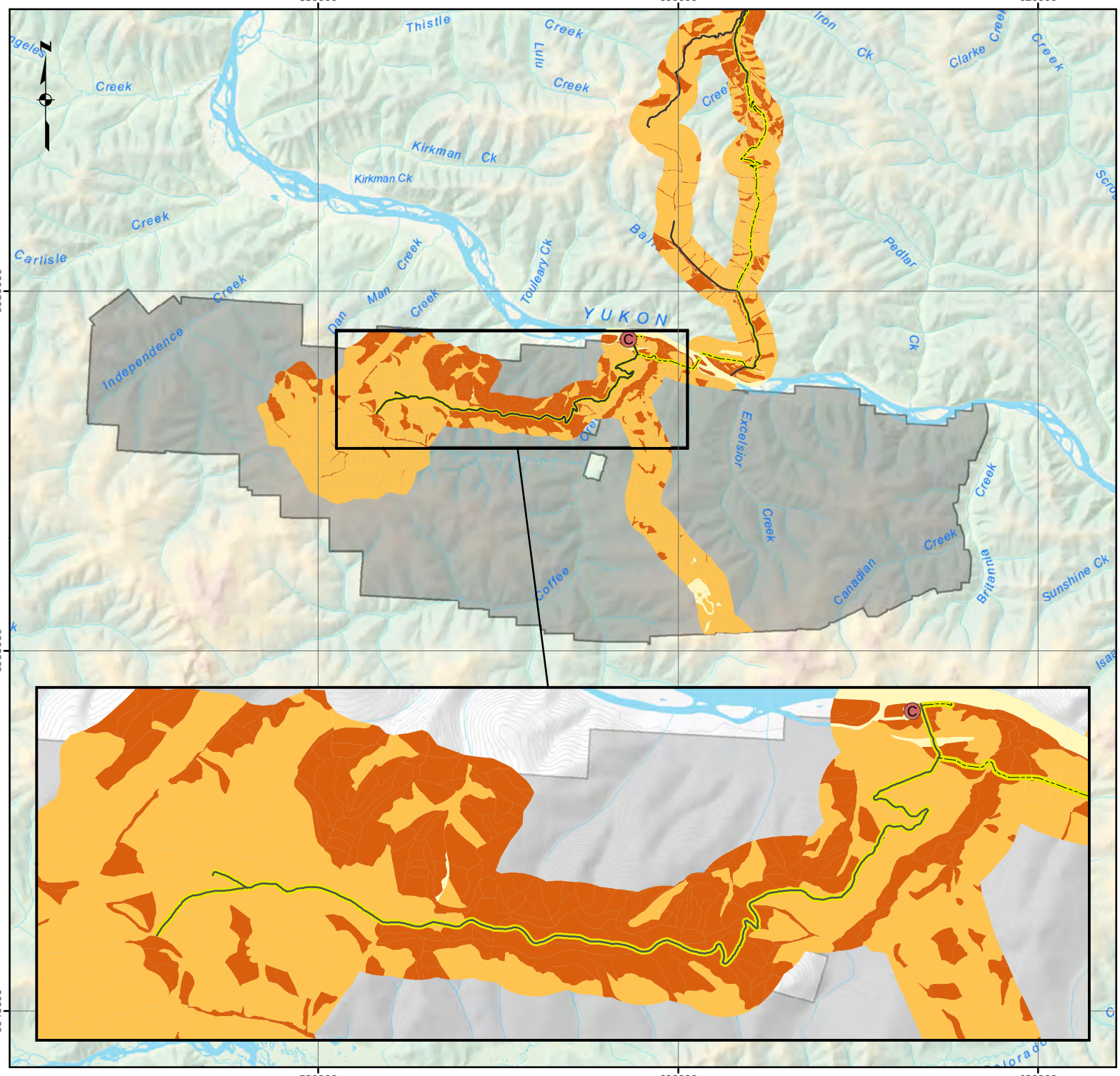

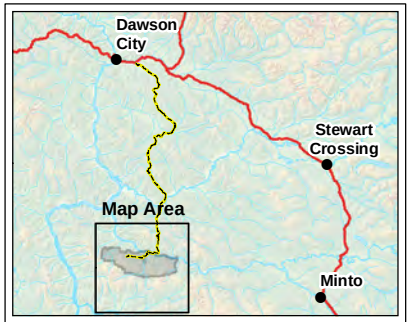

Legend

- Settlement/Community
- Coffee Gold Project Camp (Current)
- Highway
- Existing
- Proposed Route
- Coffee Property

Passerine bird habitat quality rating

- Low
- Moderate
- High

Map D12

Baseline habitat quality for passerine birds in the Coffee Project LSA

Data Sources
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Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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0 5 10
KM

Map Reference Scale: 1:300,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	01/04/2016	3 of 3

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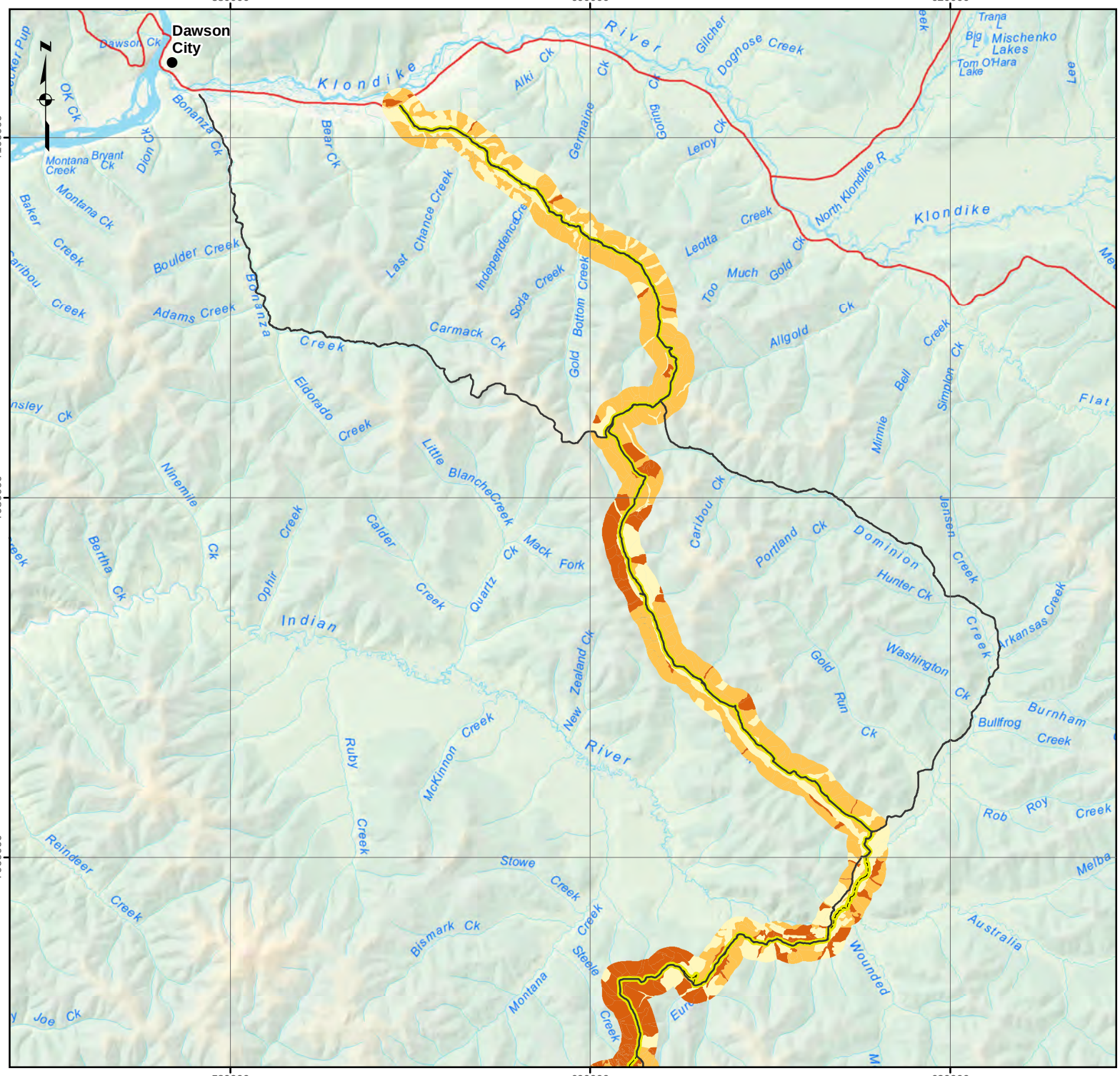

Legend

- Settlement/Community
- Highway
- Existing Access
- Proposed Route
- Coffee Property

Olive-sided flycatcher habitat quality rating

- Low
- Moderate
- High

Map D13

Baseline habitat quality for olive-sided flycatcher in the Coffee Project LSA

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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KM

Map Reference Scale: 1:300,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	01/04/2016	1 of 3

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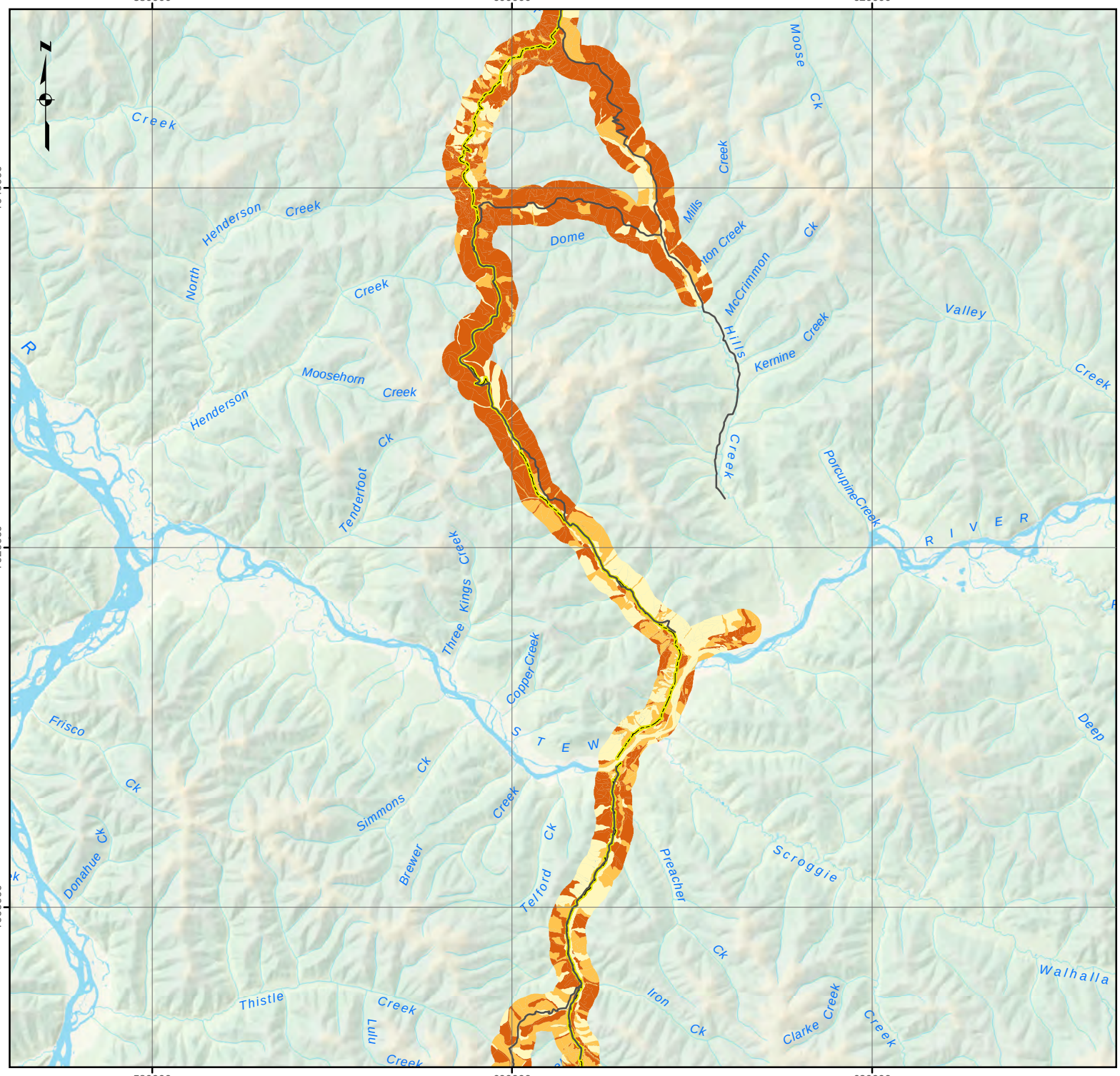

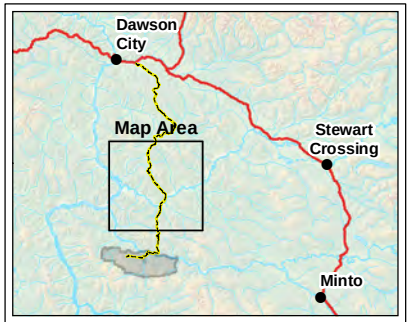

Legend

- Settlement/Community
- Highway
- Existing
- Proposed Route
- Coffee Property

Olive-sided flycatcher habitat quality rating

- Low
- Moderate
- High

Map D14

Baseline habitat quality for olive-sided flycatcher in the Coffee Project LSA

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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0 5 10
KM

Map Reference Scale: 1:300,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	01/04/2016	**2 of 3**

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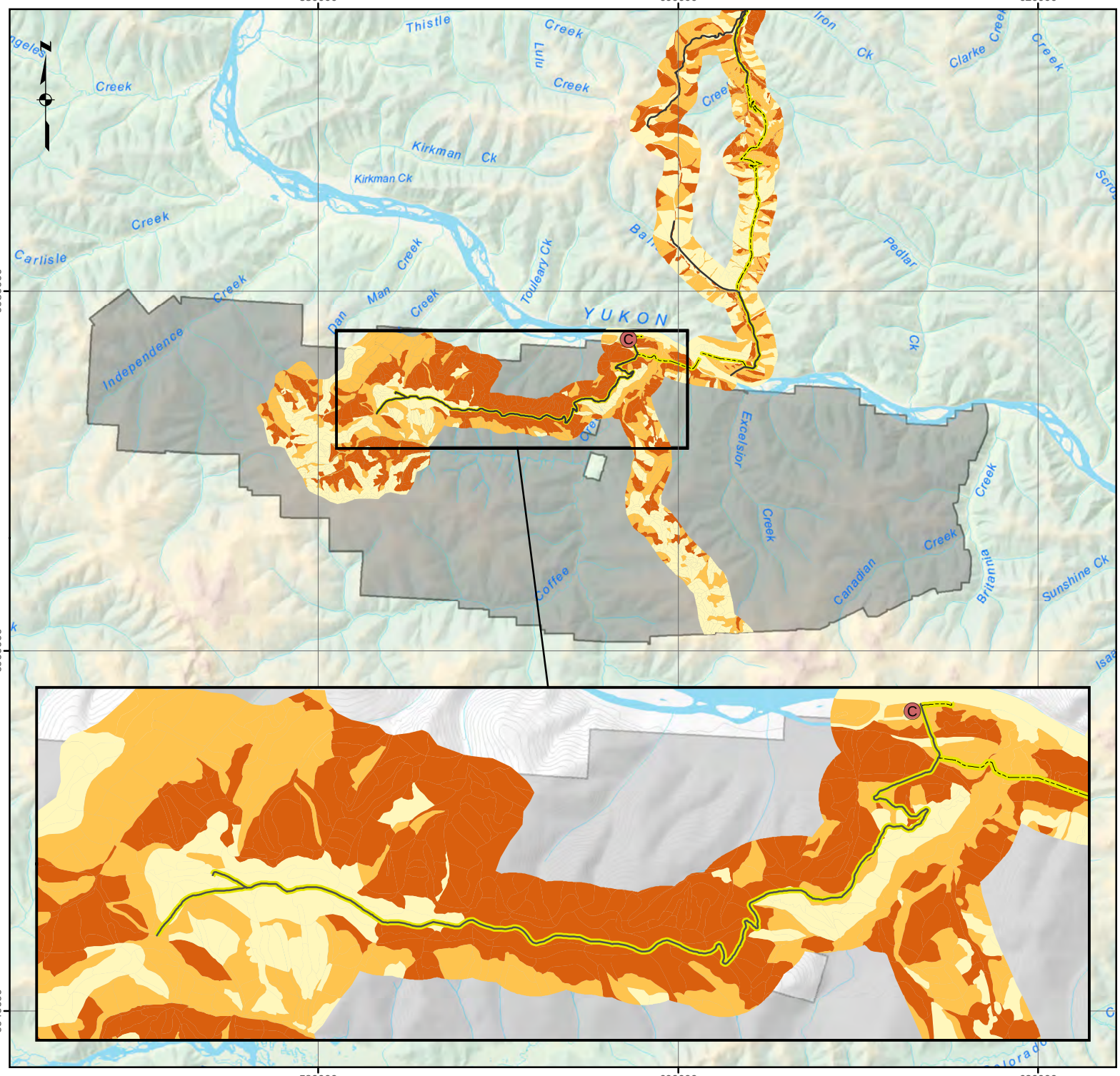

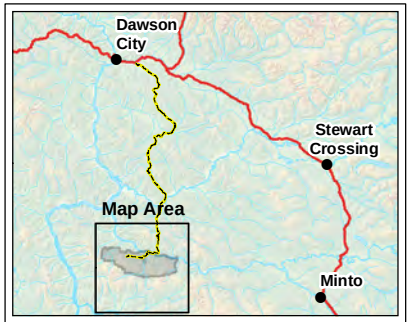

Legend

- Settlement/Community
- Coffee Gold Project Camp (Current)
- Highway
- Existing
- Proposed Route
- Coffee Property

Olive-sided flycatcher habitat quality rating

- Low
- Moderate
- High

Map D15

Baseline habitat quality for olive-sided flycatcher in the Coffee Project LSA

Data Sources
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0 5 10
KM

Map Reference Scale: 1:300,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	01/04/2016	3 of 3

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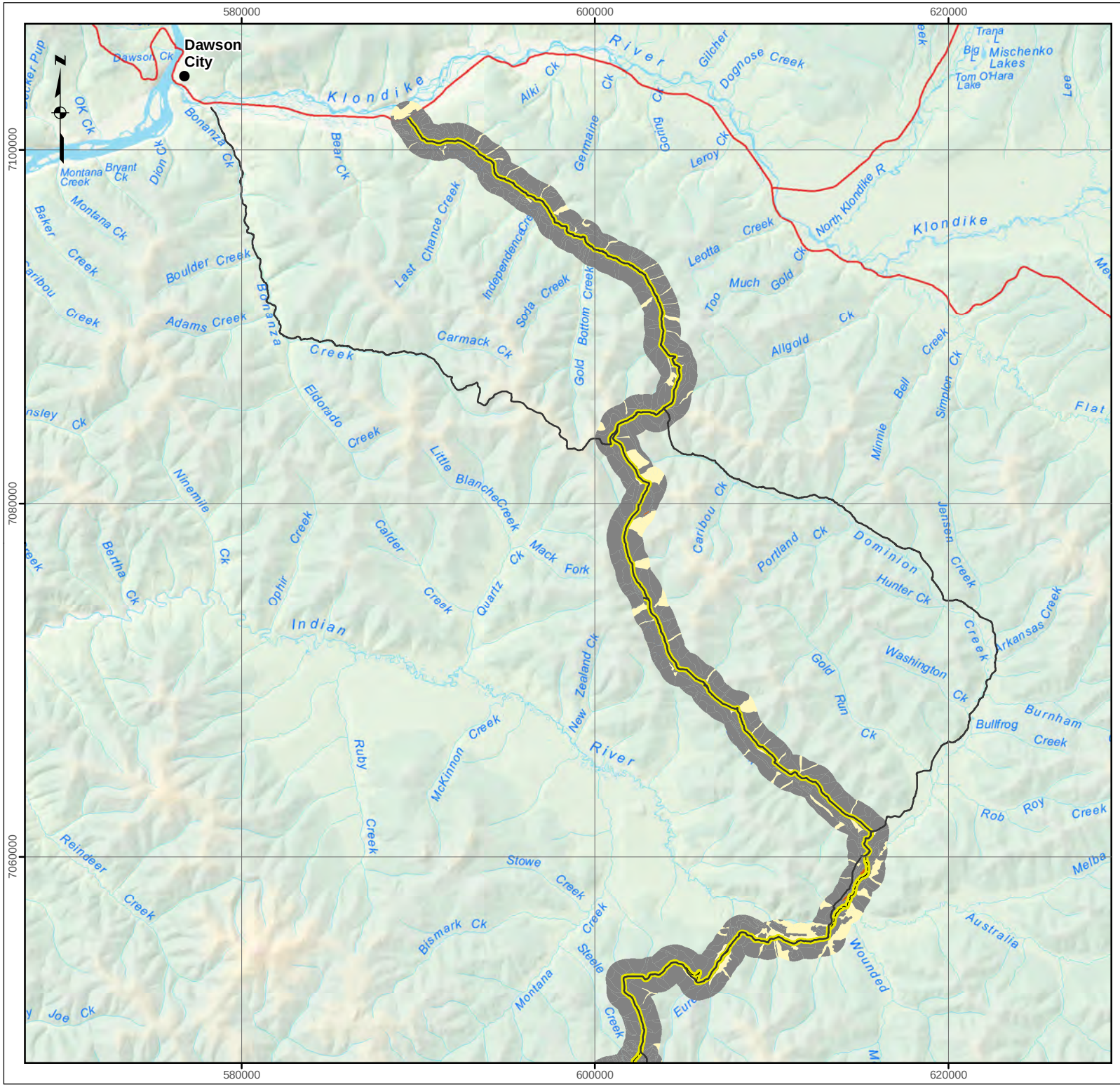

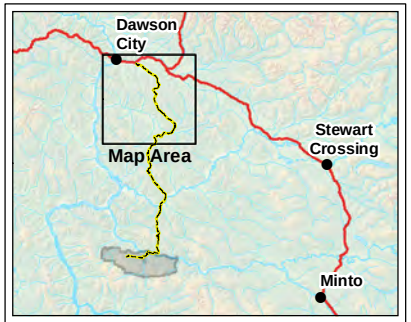

Legend

- Settlement/Community
- Highway
- Existing
- Proposed Route
- Coffee Property

Rusty blackbird habitat quality rating

- Nil
- Low
- High

Map D16

Baseline habitat quality for rusty blackbird in the Coffee Project LSA

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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0 5 10
KM

Map Reference Scale: 1:300,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	01/04/2016	1 of 3

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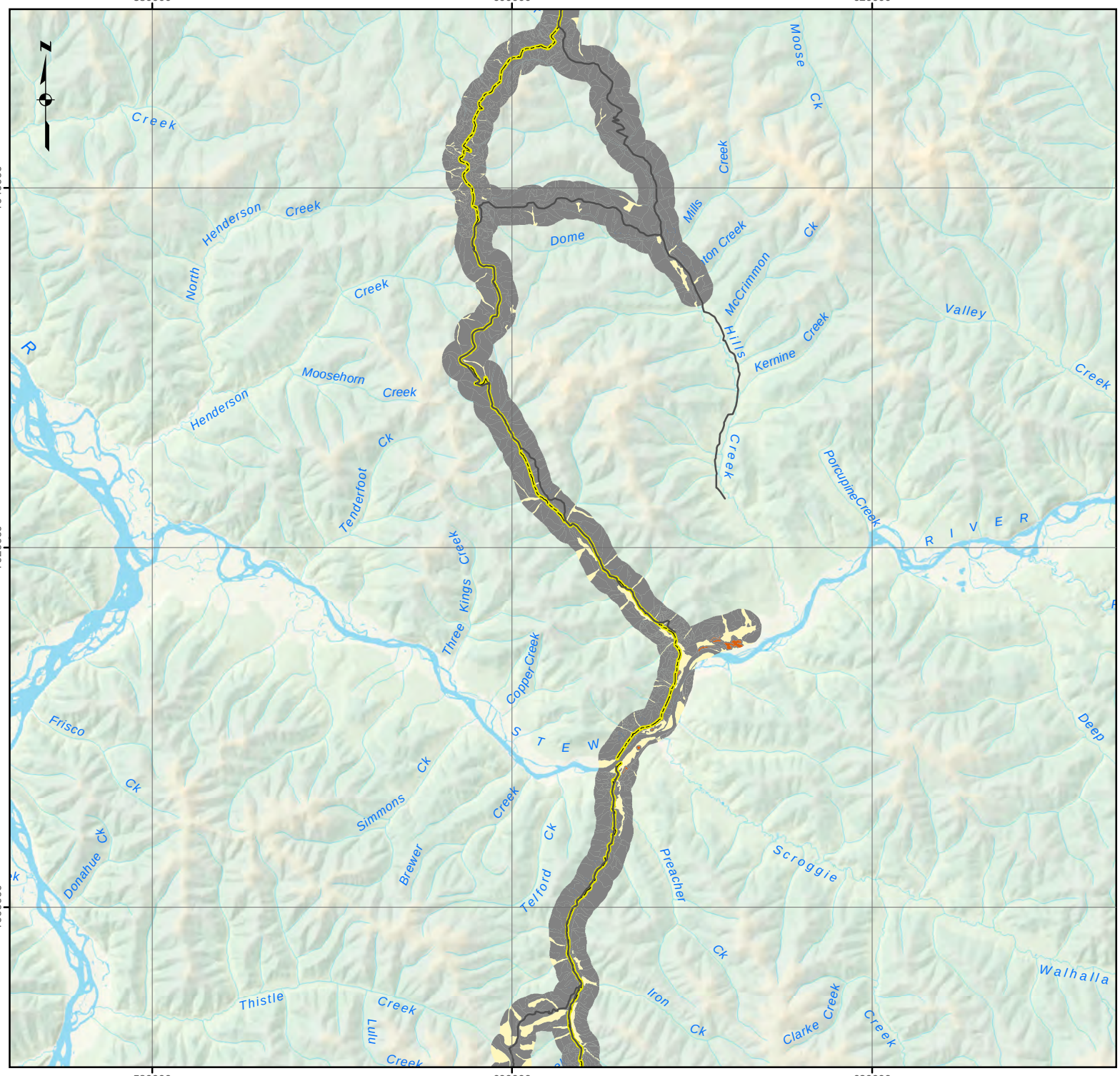

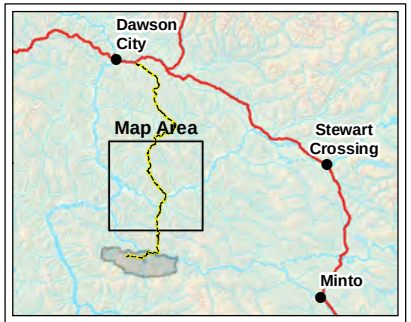

Legend

- Settlement/Community
- Highway
- Existing
- Proposed Route
- Coffee Property

Rusty blackbird habitat quality rating

- Nil
- Low
- High

Map D17

Baseline habitat quality for rusty blackbird in the Coffee Project LSA

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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0 5 10
KM

Map Reference Scale: 1:300,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	01/04/2016	2 of 3

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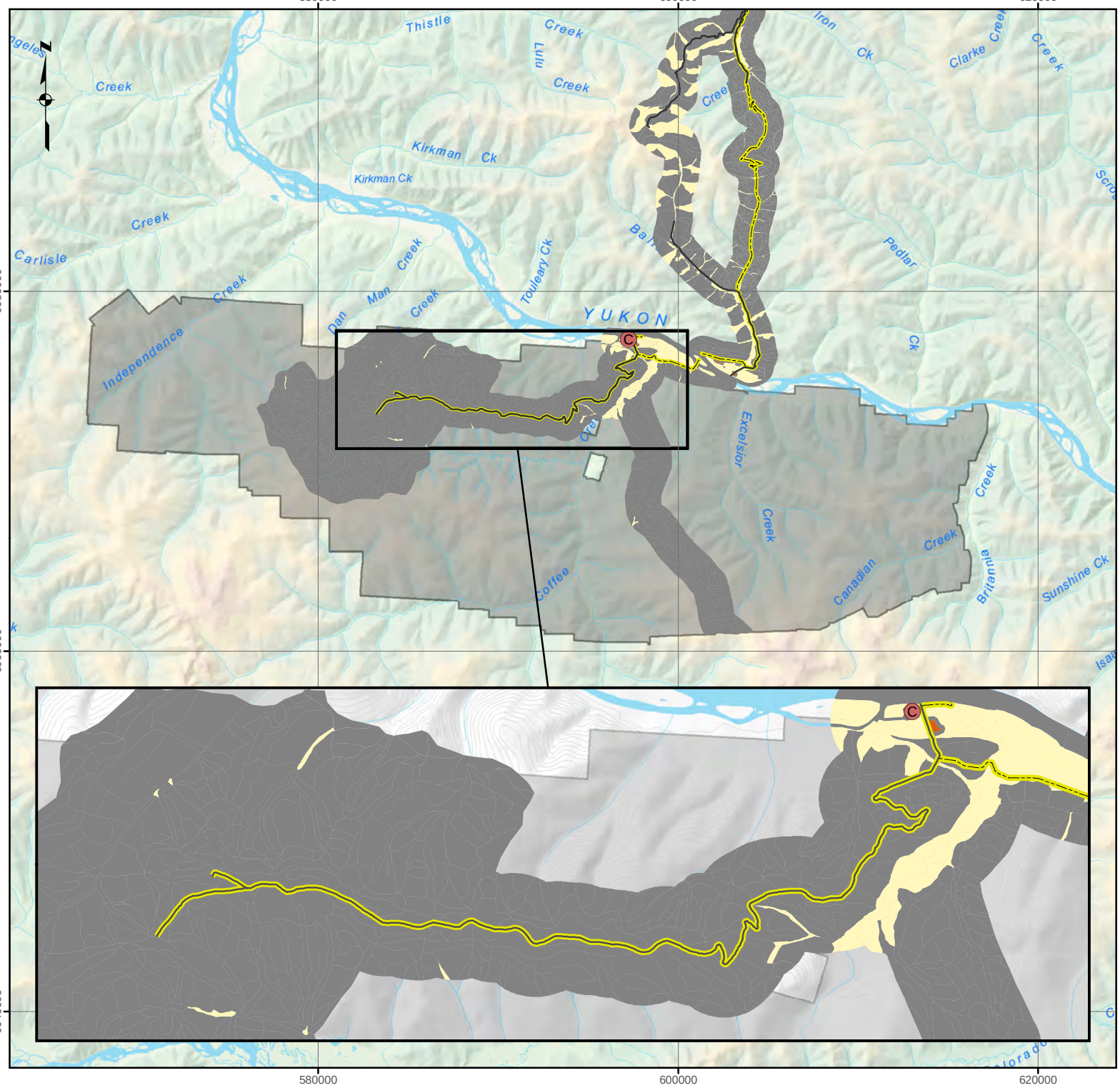

Legend

- Settlement/Community
- Coffee Gold Project Camp (Current)
- Highway
- Existing Access
- Proposed Route
- Coffee Property

Rusty blackbird habitat quality rating

- Nil
- Low
- High

Map D18

Baseline habitat quality for rusty blackbird in the Coffee Project LSA

Data Sources
1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model and 1:250,000 National Topographic Database (NTDB) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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0 5 10
KM

Map Reference Scale: 1:300,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn:	Checked:	Date:	MAP
MS	BS/MP	01/04/2016	3 of 3

KAMINAK GOLD CORPORATION EDI

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