TERRESTRIAL WILDLIFE AND HABITAT ASSESSMENT

Constantine Metal Resources

Palmer Project Site

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HEMMERA | 20 YEARS 1994 – 2014

EXECUTIVE SUMMARY

This report summarizes an evaluation of wildlife habitat, including an assessment of suitability for selected Species of Interest (SOI), within the Constantine Metal Resources Palmer Project (the Project) study area (hereafter referred to as the study area). An understanding of habitat suitability for selected SOI will facilitate subsequent baseline Environmental Assessment (EA) and monitoring studies should they be required.

In Phase 1 of this assessment, Hemmera Envirochem Inc. ("Hemmera") completed a desktop review of available literature including, available data from the State of Alaska, Department of Fish and Game (ADF&G), the Alaska Natural Heritage Program (Biotics tool), regional bird checklists, published literature, the BC Conservation Data Centre (BC Species and Ecosystem Explorer) & E-Fauna BC (Electronic Atlas of the Fauna of British Columbia)). Phase 2 comprised habitat mapping, using available ortho-imagery. This information was incorporated into an iPad based software platform to facilitate data collection and in field habitat assessment. Sixteen habitat types were assigned to a total of 134 polygons within the 11,729 hectare (ha) study area.

Phase 3 comprised field verification of the habitat assignations and field deployment of wildlife data capture tools. Hemmera conducted on-site aerial assessments of strata types, from multiple polygons, to ensure accurate mapping of habitat types within the Project area. Habitat values for identified SOI (n=19) were also noted during field assessments using expert-based field interpretation of habitat values within each habitat strata type. Incidental observations of wildlife and/or wildlife sign were also recorded during the site visit and field tablet training and support was provided to facilitate collection of wildlife data by Project field staff.

Phase 4 (reporting) incorporated information from all three preceding project phases as described above. Report objectives included quantification of habitat types and assignment of suitability ratings to each habitat type. Ratings of High, Medium, Low and Nil were assigned for identified SOI within the study area. Methods and results are presented, summarized and discussed in this report.

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LIST OF ACRONYMS

ADF&G	State of Alaska, Department of Fish and Game
AWAP	Alaska's Wildlife Action Plan
AKNHP	Alaska Natural Heritage Program
BAFA	Boreal Altai Fescu Alpine biogeoclimatic zone
BLM	Bureau of Land Management
CWH	Cedar Western Hemlock biogeoclimatic zone
CMA	Coastal Mountain Heather biogeoclimatic zone
EA	Environmental Assessment
MH	Mountain Hemlock biogeoclimatic zone
SOI	Species of Interest
SSOC	State Species of Conservation Concern
SWB	Spruce-Willow-Birch biogeoclimatic zone
WHA	Wildlife Habitat Assessment

1.0 INTRODUCTION

Hemmera Envirochem Inc. ("Hemmera") is pleased to submit this Wildlife Habitat Assessment report documenting terrestrial wildlife habitat suitability for Species of Interest (SOI) that have been provisionally identified for future consideration during the Environmental Assessment (EA) process with the Constantine Palmer Project (the Project) study area. Future EA considerations may include baseline studies and ongoing monitoring as deemed appropriate or as required during subsequent permitting stages.

This information in this report is intended to support subsequent permitting and approval requirements for the Palmer Project as it advances further towards full operation. This preliminary list of SOI was developed, by Hemmera, to stimulate future discussion and consideration during community engagement and consultation, and during a future potential regulatory approval process. Both of these processes will likely benefit from an improved understanding of wildlife use of core areas of activity, and a surrounding buffer, that may ultimately be influenced by Project operations. Specific objectives of this Wildlife Habitat Assessment (WHA) include the following:

- Review of best available information from published literature to develop a list of terrestrial vertebrate species, with potential to occur in the study area.
- Collection of wildlife observation data. Anecdotal observations were collected by mine field staff conducting project-related activities in the study area. Wildlife observations were recorded using iPad based software (Do-Forms) during the summer and fall of 2014.
- Development of a GIS-based habitat mapping product to depict available habitats within the study area for selected SOI. Fifteen habitat types were identified and mapped, and suitability was estimated for 19 SOI using best available information and ortho-imagery for the study area,
- Field evaluation of wildlife and habitat values completed by a qualified environmental professional between June 30 to July 6, 2014. This assessment focused on verification of the habitat assignations and polygon boundaries in the study area. Mapped habitats will be used, during the reporting phase, to define and estimate available wildlife habitat and suitability in relation to known habitat values for SOI; and,
- Completion of species assessments for each SOI and development of GIS based suitability ratings based on both field-assessment and expert interpretation of habitat suitability for identified SOI.

These objectives were addressed in this study and findings are reported herein. This study was limited to terrestrial SOI and did not consider invertebrates, plants (other than as represented at a high level in the description of vegetation for each habitat type) or fully aquatic receptors such as fish. Hemmera will use the information collected for terrestrial SOI to support subsequent work-planning if baseline studies are requested.

1.1 BACKGROUND INFORMATION

The Palmer Project is a mineral exploration project, led by Constantine Metal Resources (Constantine), located in coastal southeast Alaska, on the southeast margin of the Saint Elias Mountain Range. The Project area is easily accessible by existing road infrastructure (Highway 7 and Highway 3) connecting Haines, Alaska, through British Columbia, with Haines Junction in the Yukon.

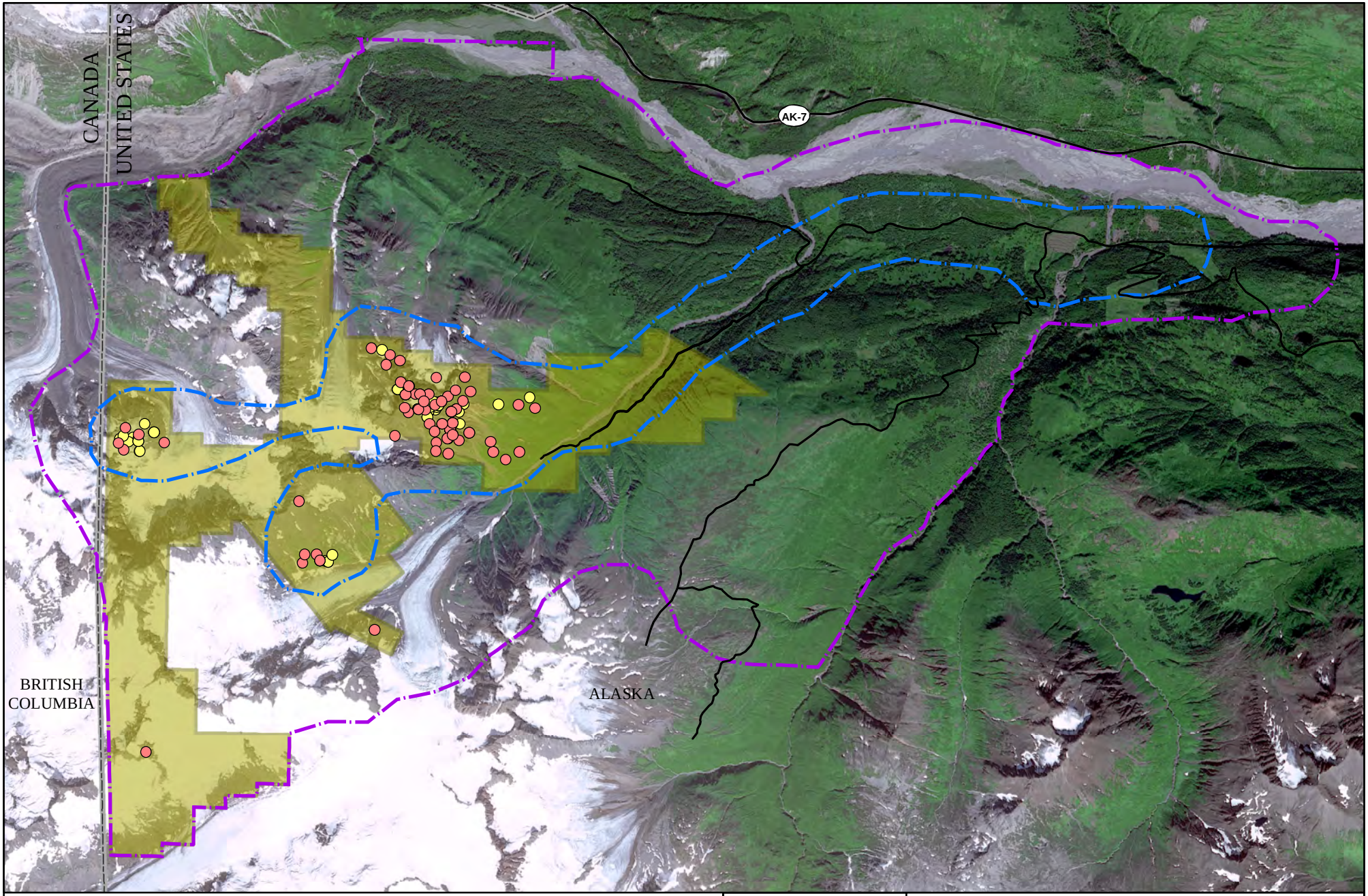
The Project area hosts high-grade volcanogenic massive sulphide (VMS) mineralization within the Alexander Triassic Metallogenic Belt. A mineral exploration project is being advanced by Constantine Metal Resources Ltd. Project related work in 2014 included exploration drilling, road construction and environmental and geotechnical programs.

2.0 PHYSICAL SETTING

The year-round deep sea port of Haines is located 60 kilometers south of the Project area. Average annual weather patterns are described for Haines as follows: average temperature varies between -7°C to 18°C and rarely below -15°C. The warm season extends from May 18 through to September 8 with average daily high temperatures above 14°C. The cold season extends from November 14 through to March 14 with average daily high temperatures below 2°C. Daylight hours at the summer solstice (June 21) are 18:34 hours (hrs); by winter solstice there are only 6:06 hours of daylight. Median cloud cover ranges from 69% (partly cloudy) to 99% (overcast). The climate is temperate rain forest with average precipitation of 47 inches (119 cm), approximately two-thirds of which occurs as snow.

The Project study area is situated in the Glacier Creek watershed and includes 11,729 hectares (ha) of largely undeveloped habitats. The study area includes the Glacier Creek watershed and portions of the Porcupine Creek watershed and the Klehini River drainage catchment. The Project area is in steep, mountainous terrain, with 1,219 m (4,000 ft.) of relief. At upper elevations several glaciers originate from the summit of Mt. Henry Clay at the western edge of the Project area.

For the purpose of this assessment, Hemmera focused on a core study area that encompassed the area of anticipated and current high levels of human activity including current drilling activities, the camp and areas of road improvement. A variable width buffer was applied to this area to delineate a zone of influence for habitats that may be affected by disturbance from Project activity and noise; disturbance is primarily associated with operation of helicopters, heavy machinery, generators and blasting. The core area encompassed a total of 2,401 ha. The buffer area encompassed a total of 11,729 ha (including the core area) (**Figure 1**).



Legend

- Proposed Drill Hole
- 2010 Drill Hole
- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

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Aerial Image: SPOT 5 m Colour

HEMMERA

CLIENT: CONSTANTINE metal resources ltd.

Terrestrial Wildlife and Habitat Assessment
Constantine Metal Resources
Palmer Project Site

STUDY AREA AND BUFFER AREAS USED FOR WILDLIFE HABITAT ASSESSMENTS (WHA)

PROJECT No.		
1679-001.01	January 2015	FIGURE 1

Path: O:\1600\1679\mxd\Fig1_1679_001_01_StudyArea_150109.mxd

3.0 METHODS

In Phase 1 Hemmera completed a comprehensive desktop review of available literature relevant the ecology of the Project area. In Phase 2 habitat mapping of 15 habitat types was completed within the Project study area. Habitat mapping was completed to facilitate subsequent field and GIS association of wildlife SOI to specific habitat types. Assumptions regarding habitat type assignations were field verified in Phase 3. In Phase 4 (Reporting) species-habitat associations within the study area were described, mapped and quantified in a GIS environment using the field-truthed habitat types assigned in the habitat mapping product.

3.1 DESKTOP REVIEW AND IDENTIFICATION OF SPECIES OF INTEREST (SOI)

A desktop review of available literature regarding habitat and wildlife use and occurrence was conducted. This review incorporated available information for equivalent habitats in Alaska and British Columbia (BC). The results were used to develop a complete list of terrestrial vertebrate species that may potentially occur within the study area. Information from BC was considered relevant as the site is proximal to the BC-Alaska international border and similar species-habitat associations are expected within the study area. Satellite imagery (open source imagery and ortho-photo imagery provided by Constantine) was also reviewed to assess habitat connectivity, abundance and distribution with the study area. Data was compiled from several sources including the ADF&G, the Alaska Natural Heritage Program (AKNHP), published literature, the BC Conservation Data Centre (BC Species and Ecosystem Explorer) & E-Fauna BC (Electronic Atlas of the Fauna of British Columbia)].

3.2 HABITAT MAPPING

Habitat types were assigned and mapped within the study area using expert-based ortho-image interpretation (**Figure 2**) through the use of a Geographic Information System (GIS). Initial delineation of habitat polygons was conducted using slope breaks (changes in slope, elevation and aspect) and obvious changes in vegetation type (i.e., forested, upland shrub, alpine etc.). Polygons were reconciled against ortho-imagery in ArcGIS and each polygon was assessed and labelled using a pre-defined classification of habitat types that occur in the study area (**Section 4.2**). Structural stage, climax conditions for vegetation, solar exposure (aspect) and elevation were each considered when assigning a polygon to a particular habitat type. Only landscape features large enough to register in available ortho-imagery (Palmer AK Spot 5m color image) were delineated and mapped.

3.3 ANECDOTAL WILDLIFE OBSERVATIONS

Data forms were developed for field use on an Apple iPad using Do-Forms data capture server-based software. Interactive forms were developed using a Do-Forms proprietary online form builder and loaded onto four Project iPad's prior to field deployment. Habitat polygons and sample locations were also loaded using iOS compatible GIS software (MotionX GPS™) developed for use on a tablet (128gb 3G iPad Air) for reference in the field. Apple iBooks software was used to store and view reference material.

iBird Pro™ and Audubon Mammals™ applications were also loaded onto field iPads for subsequent reference by Project field staff. The use of a GIS capable tablet facilitated efficient navigation and collection of wildlife observation data, within the study area, by Project field staff during the 2014 field season.

Project iPads were delivered to the Project site and field staff were trained on proper use of field devices and data capture software. LifeProof ™ waterproof protective cases were used to prevent damage to the tables during field use. Digital data capture in the field was facilitated by the use of a secure remote server-based data capture program (Do Forms). Observations were collected offline, uploaded at camp (by Project staff) as required and subsequently downloaded and plotted, in ArcGIS, by Constantine staff at the end of the 2014 field season.

Field verification of habitat type assignments was also conducted during the WHA field program. Habitat polygons were assessed, by helicopter or on foot, to confirm assumptions regarding site series and structural stage. Each identified habitat type was assessed during the field site visit. Habitat mapping verification ensured consideration was afforded to all habitat types within the study area (**Section 3.3**).

3.4 REPORTING – WILDLIFE HABITAT ASSESSMENTS, SOI SELECTION, AND SUITABILITY ASSIGNATIONS

Field survey of the study area was preceded by desktop review (Phase 1) of available literature including the state of Alaska's Wildlife Action Plan (AWAP. 2005). This information was summarized in the reporting phase of the study. Careful review of habitat mapping, completed during Phase 2, was also considered during reporting and habitat mapping was updated to reflect data collected during the Phase 3. The list of species with potential to occur within the study area was reviewed to identify SOI. This process included consideration of four criteria including:

- **Criteria 1: Federal Endangered Species Recognition** – The Environmental Protection Agency has assigned responsibility to the Alaska Regional office (Region 10) to maintain and enforce national standards under a variety of environmental laws including the United States (US) Environmental Protection Act (EPA). The *Endangered Species Act* (*ESA*) recognizes species as endangered, threatened or under consideration in Alaska. Special management is required and enforced for listed species by the ADF&G.
- **Criteria 2: State of Alaska Conservation Concern** – Risk is influenced by dispersal/motility capabilities and species' utilization of different habitat types (i.e., generalist or specialist species). To recognize and incorporate management planning for Alaskan species of conservation concern the ADF&G developed, and is the main coordinator of, Alaska's Wildlife Action Plan (AWAP)[1]. The AWAP serves to: fulfill the department's legal mandate to protect and conserve the state's natural resources, to ensure responsible development and to prevent new species listings under the federal and state *Endangered Species Act(s).*

[1] The AWAP is currently undergoing a required 10 year review; an updated AWAP is scheduled by October 1, 2015.

- **Criteria 3: Societal Value** – species of high cultural significance (sustenance, societal value and/or traditional value). (e.g., moose, grizzly bear, golden eagle etc.)
- **Criteria 4: Resident Species with Localized/Limited Distribution within the State of Alaska** – Some species have a very restricted distribution in the State of Alaska and are limited to the southeast region of the state where the Projected is sited. For these species the study area may support significant occurrences with the species' range in the state and hence higher conservation concern may be prudent or warranted.

Once accepted as an SOI, each species was assessed with a focus on habitat associations within the Project area. These assessments were used to assign a qualitative value of High, Medium, Low or Nil to each of the 15 habitat types within the study area. These values were used, in a GIS environment, to develop predictive models depicting anticipated potential habitat suitability, for each SOI, for all available habitat types within the study area (n=15). Anecdotal observations collected by Project field staff were also considered during the assignation of qualitative habitat value for identified SOI.

4.0 RESULTS

4.1 DESKTOP REVIEW – IDENTIFICATION OF SPECIES OF INTEREST (SOI)

Alaska recognizes 648 species of terrestrial vertebrates as occurring within state boundaries (**Appendix 1**). There are six species of amphibian, 39 species of marine mammal, 526 species of avifauna and 77 species of mammal. A desktop review of all Alaskan terrestrial vertebrates informed the selection of species for inclusion as SOI for potential subsequent studies

- **Criteria 1:** The Endangered Species Act (ESA) recognizes only 13 species (one plant, two birds, one reptile & nine marine mammals) as endangered in Alaska: no endangered species are known or likely to occur within the Project study area. Nine threatened species are also recognized on the ESA; however, again, none are confirmed or likely to occur within the Project study area. There are three species under consideration but, again, none are likely to occur in the Project study area.
- **Criteria 2:** Consideration for inclusion on the list of SOI was based largely on review of the Nominee Species List (Appendix 7 of the AWAP) (AWAP. 2005); the ADF&G maintains this list to monitor and recognize conservation needs for all species in Alaska.

A total of 35 species were listed, in the AWAP, as “sensitive” by the Bureau of Land Management (BLM) and / or as endangered or as a “State Species of Conservation Concern” (SSOC) (**Appendix 2)**. These species were next assessed for potential to occur within the Project study area using information from the Alaska Natural Heritage Program (AKNHP); occurrence records were queried using the AKNHP Biotics online GIS query tool to ensure accuracy and currency of information. Best available information regarding known occurrence records, and detailed information about each species’ distribution and abundance (in Alaska), threats, level of protection, conservation status and potential conservation and management actions for all 35 listed species were considered. Based on this assessment only six (of 35) AWAP-listed species (i.e., listed as sensitive, endangered or SSOC by the SOA or BLM) are known or suspected to occur in the Project study area.

- **Criteria 3 and 4:** Next, vertebrates with potential to occur in the study area that have a high cultural significance (i.e., local concern and / or cultural or sustenance value) (criteria 3) and vertebrates with localized or restricted distributions within the state of Alaska (Criteria 4) were also identified and included as SOI. Existing anecdotal observations collected by Project field staff during the 2014 field season were also considered (**Section 4.3**) (**Appendix 3**). Consideration of these criteria recognized an additional 13 SOI for the Palmer Project.

Consideration of all four criteria resulted in recognition of a total of 19 SOI that have potential to occur within the study area. The ecology of each identified SOI informed determination regarding anticipated potential to interact with Project related activities. SOI include six species of amphibian, nine species of bird and four species of mammal. Each of these species was assessed; ecology (including foraging behaviour and habitat) were considered. Anticipated potential mechanisms to interact with Project-related activities were also considered for each listed SOI.

Table 1 Terrestrial Species of Interest and Project Interaction Pathways

Species of Interest	Clade	SoA[2] status	BLM status	Potential to Occur	Potential to Interact	Interaction Comment
Red-legged frog	Amphibians	Not listed	Not listed	Low	High	Habitat loss, water contamination and road mortality
Long-toed salamander	Amphibians	Not listed	Not listed	High	High	Habitat loss, water contamination and road mortality
Northwestern salamander	Amphibians	Not listed	Not listed	Moderate	High	Habitat loss, water contamination and road mortality
Rough-skinned newt	Amphibians	Not listed	Not listed	High	High	Habitat loss, water contamination and road mortality
Western toad	Amphibians	Not listed	Not listed	High	High	Habitat loss, water contamination and road mortality
Wood frog	Amphibians	Not listed	Not listed	High	High	Habitat loss, water contamination and road mortality
Northern goshawk	Birds	SSOC	Sensitive	High	Moderate	Habitat loss, disturbance
Peale's peregrine falcon	Birds	Not listed	Sensitive	Moderate	Moderate	Disturbance
Marbled murrelet	Birds	Not listed	Sensitive	Moderate	High	Habitat loss, disturbance
Olive-sided flycatcher	Birds	SSOC	Sensitive	High	Moderate	Habitat loss, disturbance
Gray-cheeked thrush	Birds	SSOC	Sensitive	High	High	Habitat loss, disturbance
Townsend's warbler	Birds	SSOC	Sensitive	High	Low	Habitat loss, disturbance
Rock ptarmigan	Birds	Not listed	Not listed	High	HIgh	Habitat loss, disturbance
Golden eagle	Birds	Not listed	Not listed	High	HIgh	Habitat loss, disturbance
Western screech-owl	Birds	Not listed	Not listed	High	High	Habitat loss, disturbance
Brown bear	Mammals	Not listed	Not listed	High	HIgh	Habitat loss, disturbance
Mountain goat	Mammals	Not listed	Not listed	High	HIgh	Habitat loss, disturbance
Moose	Mammals	Not listed	Not listed	High	HIgh	Habitat loss, disturbance
Wolverine	Mammals	Not listed	Not listed	High	High	Habitat loss, disturbance

[2] State of Alaska

4.2 HABITAT MAPPING

Habitats within the Project area include forested and non-forested habitats, riparian habitat and both lotic and lentic aquatic systems (e.g., creeks and wetlands and open water). Upper elevations in the study area include portions of the Saksei, Jarvis, and Boundary Glacier at the summit of Mount Henry Clay. Portions of the forested areas within the study area (**Figure 2**) are in various stages of succession as they have been influenced by previous and ongoing forest harvest and land use.

4.2.1 Description of Dominant Habitat Types

4.2.1.1 Coniferous Forest

The forested portions of the study area include both Mountain Hemlock (MH) (*Tsuga mertensiana*) forest at upper elevations (400 – 1000 m) and Cedar (*Thuja plicata*) and Western Hemlock (*Tsuga heterophylla*) (CWH) forests at lower elevations (0 - 400m). CWH forests occur at lower elevations west of the Coast Mountains. These coastal forests have a rich ecology forming a barrier between warm Pacific air masses and cold continental air masses creating one of the wettest climates in Alaska; this ecosystem is often referred to as a temperate rainforest and is complex and highly productive (MoF 2014a). Wind is the primary disturbance mechanism in this zone, and creates a mosaic of trees of various sizes and species within many standing dead trees, or snags. This creates a highly heterogeneous multi-layered vertical canopy structure supporting a wealth of biodiversity. Western redcedar and western hemlock are common; amabilis fir (*Abies amabilis*) and yellow cedar (*Callitropsis nootkatensis*) occur in wetter cooler depressions with Douglas fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), western white pine (*Pinus monticola*) and Bigleaf maple (*Acer macrophyllum*) in warmer and drier areas (MoF 2014a). Red alder (*Alnus rubra*) is a pioneering species on disturbed sites. The CWH zone supports the greatest diversity and abundance of wildlife habitat in the study area and may provide important nesting habitat for marbled murrelet *(Brachyramphus marmoratus*); however, this species typically nests closer to the coastline and is not anticipated to occur within the study area.

As elevation increases, within the study area, CWH transitions to MH. Mountain Hemlock forests are characterized as dense closed canopy forests transitioning to parkland, heath and meadow with deep snowpack at upper elevations (MoF 2014b). This is also a very wet habitat type, receiving up to 196 inches of precipitation annually with up to 70% falling as snow. Persistence of snowpack results in a shorter annual growing season in this zone relative to the CWH; biodiversity is lower at upper elevations within this zone. Mountain hemlock is the dominant tree type at lower elevations but amabilis fir and yellow-cedar also occur. Understory can be dense; oval-leaved (or Alaska) blueberry (*Vaccinium ovalifolium*), black huckleberry (*Gaylussacia baccata*) and false azalea (*Menziesia ferruginea*) are common. The forest floor is covered with a thick and diverse layer of moss. Subalpine wetlands and meadow ecosystems occur along streams and seep sites (MoF 2014b). Openings are created in areas too wet for trees and in areas of frequent natural disturbance (e.g., avalanche chutes). Disturbed areas

are dominated by Indian hellebore (*Veratum viride*), Sitka valerian (*Valeriana sitchensis*), arrow-leaved groundsel (*Senecio triangularis*), sweet coltsfoot (*Petasites figidus*), buttercup (*Ranunculus sp.*), paintbrush and mountain arnica (*Arnica montana*). Black alpine sedge (*Carex nigricans*) dominates wet areas in subalpine snow basins. At higher elevations forests succeed to subalpine parkland and Spruce-Willow-Birch. These areas are frequently used by large mammals including black bear (*Ursus americanus*) and grizzly bear (*Ursus arctos*), elk (*Cervus elaphus*), black-tailed deer (*Odocoileus hemionus*) and mountain goat (*Oreamnos americanus*). These areas are used for foraging by mountain goat in the summer; grizzly bear commonly den in these areas in the winter. Common birds in this habitat type include great grey owl (*Strix nebulosi*), Clark's nutcracker (*Nucifraga columbiana*), common raven (*Corvus corax*), Northern Flicker (*Colaptes auratus*), three-toed, pileated and hairy woodpeckers (*Picoides dorsalis, Dryocopus pileatus* and *Picoides villosus*), chickadee, nuthatch and kinglet. Sooty grouse (*Dendragapus fuliginosus*) and ptarmigan occur at the transition zone at upper elevations (MoF 2014b).

4.2.1.2 Upland Shrub

At elevations above approximately 1000 m the MH transitions to Spruce-Willow-Birch habitat (SWB). The SWB zone has one of the harshest climates of any 'forested' zone in Alaska, second only to alpine tundra habitats. In the transition zone, at the edge of the lower elevation forested areas, white spruce (*Picea glauca*) and subalpine fir typically persist, but in the Alsek-Tatshenshini balsam poplar (*Populus balsamifera*) is widespread at the timberline; this is an unusual characteristic of this zone (MoF 2014c). This ecosystem is shrub-dominated; typically scrub-birch and willow (including grey-leaved willow, Barclay's willow, tea-leaved willow, Barratt's willow, Alaska willow and woolly willow (*Salix sp*.). These shrubs grow quickly during the short summer and then lose leaves in late summer before fall frost. Where wetlands occur in this zone, sedge fens and marshes occur. Wildlife is uncommon in the winter; although, mountain goats remain at upper elevations in this zone in the winter where they retreat to steep rocky slopes. During the summer this zone provides important foraging habitat for moose (*Alces americanus*), mule deer, elk, caribou (*Rangifer tarandus*), wolves (*Canis lupus*), mustelids (wolverine (*Gulo gulo*) and marten (*Martes americana*)), and bears. Grizzly bear is more common than black bear in the SWB zone. Small mammals include arctic ground squirrel (*Urocitellus parryii*), snowshoe hare (*Lepus americanus*), lynx (*Lynx lynx*), and porcupine (*Erithizon dorsatum*). Bird life may include hardy species such as grey jay (*Perisoreus canadensis*), common raven, boreal chickadee (*Poecile hudsonicus*), ptarmigan, golden eagle (*Aquila chrysaetos*) and gyrfalcon (*Falco rusticolus*).

4.2.1.3 Alpine

Alpine habitats occur in the Project area above the SWB zone; typically above 1,100 m elevation. These are classified into two zones including the Coastal Mountain Heather Alpine (CMA) at lower elevation alpine habitat and the Boreal Altai Fescue Alpine (BAFA) zone. In the CMA mountain-heather and clubmoss are common. Alpine habitats have the harshest climate in Alaska with year-round cold

temperatures; wind and snow are frequent. Cold temperatures and a relatively short frost-free period result in a very short growing season in alpine habitats with mean summer temperatures below 10°C. Most of the precipitation that occurs is snow and snow pack is deep; snow persists year round in sheltered areas and at upper elevations deep permanent glaciers form extensive ice fields around Mount Henry Clay. Cryoturbation features are common. Terrain is steep and rugged with tall cliffs and snow-capped peaks at the highest elevations along the western edge of the study area. Soils are shallow and vegetation is scarce or absent. Talus slopes and bare rock are common in these habitats within the study area. Mountain hemlock and sub-alpine fir may occur in patches and are often stunted; these "Krummholz" patches may be surrounded by meadow or tundra where ground cover is comprised of mountain-heather, dwarf willow, grasses, sedges and lichens. In the brief growing season showy-flowered broad-leaved herbs (e.g., arctic lupine, arrow-leaved groundsel, subalpine daisy, Sitka valerian, Indian hellebore, arnicas, cow-parsnip, cinquefoils, louseworts, paintbrushes and glacier lily) provide food for ptarmigan and arctic ground squirrels with flower petals that are relatively rich in protein. Mosses, liverworts and lichens cover bare rocks in the frequent talus slopes that occur around the main drilling areas. Extensive human activity associated with Project operation has likely reduced use, by some species, of these habitats, within the core of the study area; only more human-tolerant species will likely continue to use these habitats during periods of high Project activity. Arctic ground squirrel, rock ptarmigan and hoary marmots (*Marmota caligata*) have been observed in these areas. In more remote, isolated areas within the study area other hardy species including mountain goat, grizzly bear and golden eagle have been documented by Project field staff (**Section 4.3**). Other species that may also occur include gyrfalcon, willow and white-tailed ptarmigan, wolverine and arctic lemming (*Dicrostonyx torquatus*). Horned lark (*Eremophila alpestris*), snow bunting (*Plectrophenax nivalis*) and rosy finches (*Leucosticte sp.*) are likely common avian fauna in these habitats within the Project area.

The study area for mapping and assessment included 11,729 ha of habitat mapped within the five habitat Biogeoclimatic zones described above. Fifteen habitat types (including seven non-vegetated types) were assigned to 134 polygons within the study area (**Table 2**). Mapping results are described and quantified in **Table 2** and Illustrated in **Figure 3**.

4.2.2 Habitat Mapping Verification

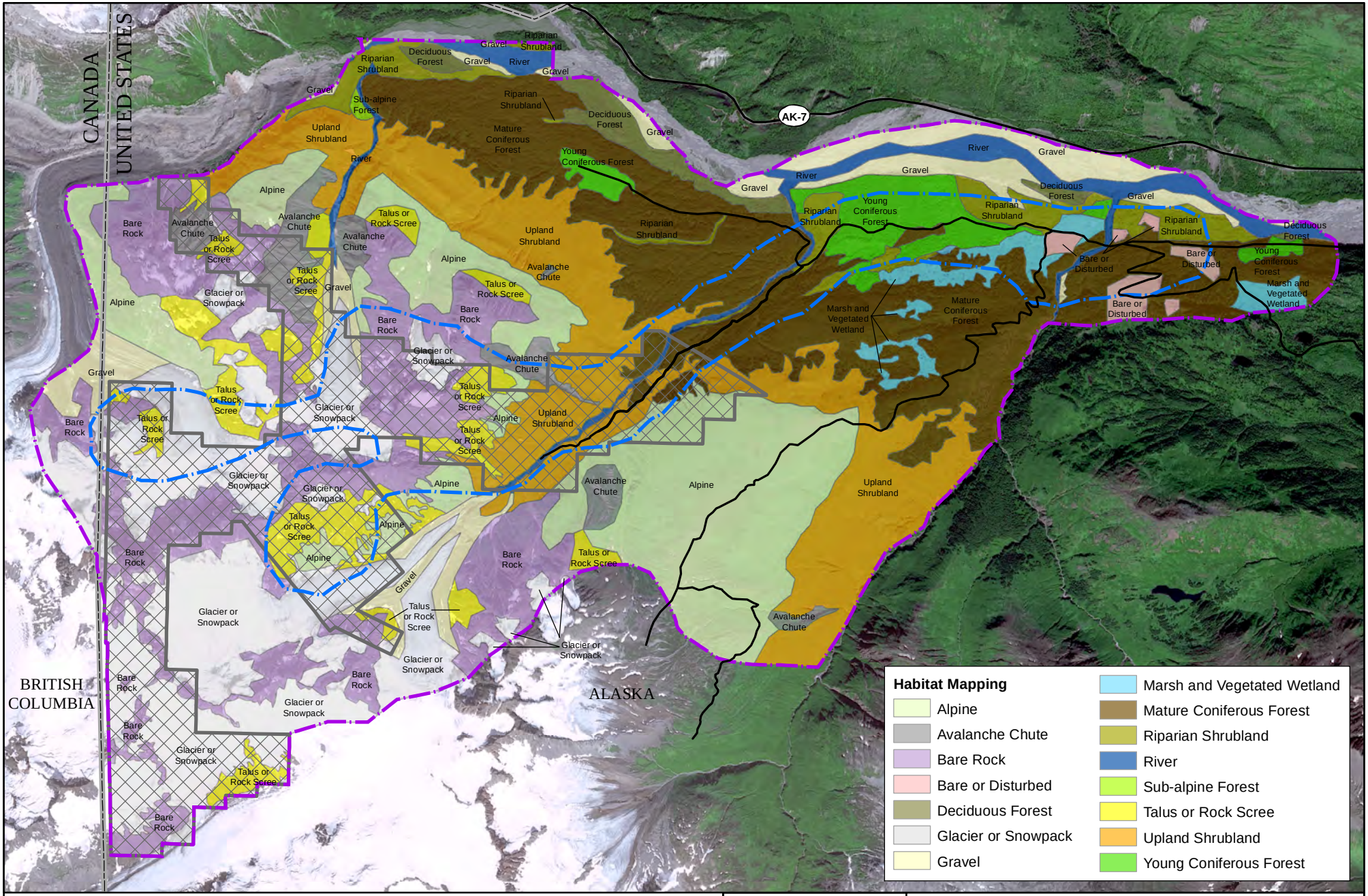
A site visit was completed between June 30 and July 6, 2014. During this visit both aerial (helicopter) and ground-based (on foot or by vehicle) assessments were completed to verify habitat mapping (**Figure 2**). Several errors were noted and corrected during the site visit. In addition, the area of mapped habitat was expanded to include a variable-width buffer zone to facilitate inference regarding effects of habitat isolation that may occur from Project related activities. Including both core and buffer areas the study area encompassed 11,729 ha of habitat.

Table 2 Habitat Types Mapped within the Study Area

Site Code	BEC Zone	Expanded Label	Description	Area (ha)	% of Study Area
Vegetated Habitat Types					
SBSdw2 – Sub-boreal Spruce Blackwater Dry Warm					
MW	CWH and MH	Marsh and Vegetated Wetland	Small isolated areas that are inundated or saturated by surface groundwater at a frequency and duration to support vegetation typically adapted for life in saturated soil conditions. These areas are colloquially described as marshes, bogs or wetlands.	179.13	1.53%
RS	CWH, MH and SWB	Riparian Shrub	Mesic or hygric soil conditions, associated with lentic or lotic aquatic features (stream, river, water body or wetland) with plant community dominated by willow sp., scrub birch, devils club, horsetail etc.	326.39	2.78%
DF	CWH	Deciduous Forest	Forests dominated by deciduous broadleaf species such as cottonwood alder and aspen. This habitat type typically occurs at lower elevations within the study area in river floodplain areas.	160.21	1.37%
YCF	CWH and MH	Young Coniferous Forest	Young coniferous forests are generally at or below age Class (AC) 6. These early seral (i.e. early succession stage) coniferous forest habitat are naturally dominated by western redcedar and western hemlock and occur most commonly at lower elevations in the study area. Amabilis fir and yellow cedar occur in wetter cooler depressions with grand fir, western white pine and bigleaf maple in warmer and drier areas. In reforested areas species composition may differ. At elevations above 400 m mountain hemlock is the dominant tree type. Understory can be dense; oval-leaved blueberry, Alaska blueberry, black huckleberry, false azalea, and white-flowered rhododendron are common. The understory and/or herb layer is typically sparse. Moss is the dominant ground cover and may form a thick matt on the forest floor.	319.46	2.72%
MCF	CWH and MH	Mature Coniferous Forest	Late seral (i.e. late succession stage) climax coniferous forests are generally classified as greater than AC 6. In these climax conditions at lower elevation (<400 m) coniferous forest habitats are dominated by western redcedar and western hemlock. Amabilis fir and yellow cedar occur in wetter cooler depressions with grand fir, western white pine and bigleaf maple in warmer and drier areas. Predominant tree species include subalpine fir and white spruce with lodgepole pine potentially occurring in more xeric areas of the site. Understory layer is typically more diverse and may feature oval-leaved blueberry, Alaska blueberry, black huckleberry, false azalea, and white-flowered rhododendron. . The forest floor is covered with a thick and diverse layer of moss. Subalpine wetlands and small forest-meadow ecosystems occur along streams and seep sites.	2,017.85	17.20%

Site Code	BEC Zone	Expanded Label	Description	Area (ha)	% of Study Area
US	SWB	Upland Shrub	This habitat type occurs most frequently in the transition zone between coniferous forest and Alpine habitats between 1000 and 1100 m. Early seral (pioneering) species dominate and typically include Sitka alder and willow. In the transition zone, at the edge of the lower elevation forested areas, white spruce and subalpine fir typically persist but in the Alsek-Tatshenshini area balsam poplar is widespread at the timberline; this is an unusual characteristic of this zone. This ecosystem is shrub-dominated; typically scrub-birch and willow (including grey-leaved willow, Barclay's willow, tea-leaved willow, Barratt's willow, Alaska willow and woolly willow).	1,576.09	13.44%
AC	CMA, SWB and MH	Avalanche Chute	Generally characterized by dense stands of young coniferous trees, willow and berry producing shrubs	290.05	2.47%
SF	SWB	Sub-alpine Forest	This habitat type has a patchy distribution in an elevation band between 1,000 to 1,100 m at the upper limits of mature coniferous forest. In this habitat type mountain hemlock and sub-alpine fir often occurs in patches and trees are often stunted; these "Krummholz" patches may be surrounded by meadow or tundra where ground cover is comprised of mountain-heather, dwarf willow, grasses, sedges and lichens. In the brief growing season showy-flowered broad-leaved herbs (e.g. arctic lupine, arrow-leaved groundsel, subalpine daisy, Sitka valerian, Indian hellebore, arnicas, cow-parsnip, cinquefoils, louseworts, paintbrushes and glacier lily) provide food for ptarmigan and arctic ground squirrels with flower petals that are relatively rich in protein.	7.59	0.06%

Site Code	BEC Zone	Expanded Label	Description	Area (ha)	% of Study Area
A	CMA and BAFA	Alpine	Widespread in the study area at higher elevations. These are classified into two zones including the coastal mountain heather alpine (CMA) at lower elevation alpine habitat and the Boreal Altai Fescue Alpine (BAFA) zone at upper elevations (e.g. above Porcupine Creek). This habitat type is characterized by persistent snowpack and deep snow accumulation. Exposed areas are vegetated by hardy ground-hugging vegetation.	1,669.38	14.23%
Non-vegetated Habitat Types					
Ri	CWH	River	A watercourse formed when water flows between continuous, definable banks.	1,669.38	14.23%
GS	BAFA and CMA	Glacier or Snowpack	Areas of permanent or semi-permanent snowpack that persists year round. In non-glaciated areas, snow persists for extended durations; typically lasting until July or August in the study area.	306.40	2.61%
Rk	BAFA and CMA	Bare Rock	Areas of bare rock where vegetation is sparse or absent. Dominant species are bryophytes and lichen. Terrain is steep and rugged with tall cliffs and snow-capped peaks at the highest elevations along the western edge of the study area. Soils are shallow and vegetation is scarce or absent. Talus slopes and bare rock are common in these habitats within the study area.	1,627.69	13.88%
G	CWH, MH, SWB and CMA	Gravel	Exposed gravel and pebble bars within a river bed or at the toe of a glacier, usually heavily eroded by water with scoured boulders and abundant cobble and gravel exposed during low flows.	615.95	5.25%
T	BAFA and CMA	Talus or Rock Scree	These are likely limited on the site and occur in association with steep cliff faces. Talus may be course (rock comprised of boulder sized particles) or fine: south aspect course talus slopes may have high wildlife use value. Mosses, liverworts and lichens cover bare rocks in the talus slopes around the main drilling areas.	581.87	4.96%
BD	All zones	Bare or Disturbed	Unnatural areas, modified by human disturbance and typically related to mine development activities including roads, drill sites, camp buildings, sample processing area, exploration areas etc.	86.73	0.74%
			Total	**11,729**	**100.00%**


CANADA
UNITED STATES
BRITISH COLUMBIA
ALASKA
AK-7
Habitat Mapping
Alpine
Avalanche Chute
Bare Rock
Bare or Disturbed
Deciduous Forest
Glacier or Snowpack
Gravel
Marsh and Vegetated Wetland
Mature Coniferous Forest
Riparian Shrubland
River
Sub-alpine Forest
Talus or Rock Scree
Upland Shrubland
Young Coniferous Forest
Legend
WHA Buffer
WHA Core
2009 Claim Boundary
International Boundary
Road
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HEMMERA
CLIENT:
CONSTANTINE metal resources ltd.
Terrestrial Wildlife and Habitat Assessment
Constantine Metal Resources
Palmer Project Site
STUDY AREA HABITAT MAPPING
PROJECT No.
1679-001.01
January 2015
FIGURE 2
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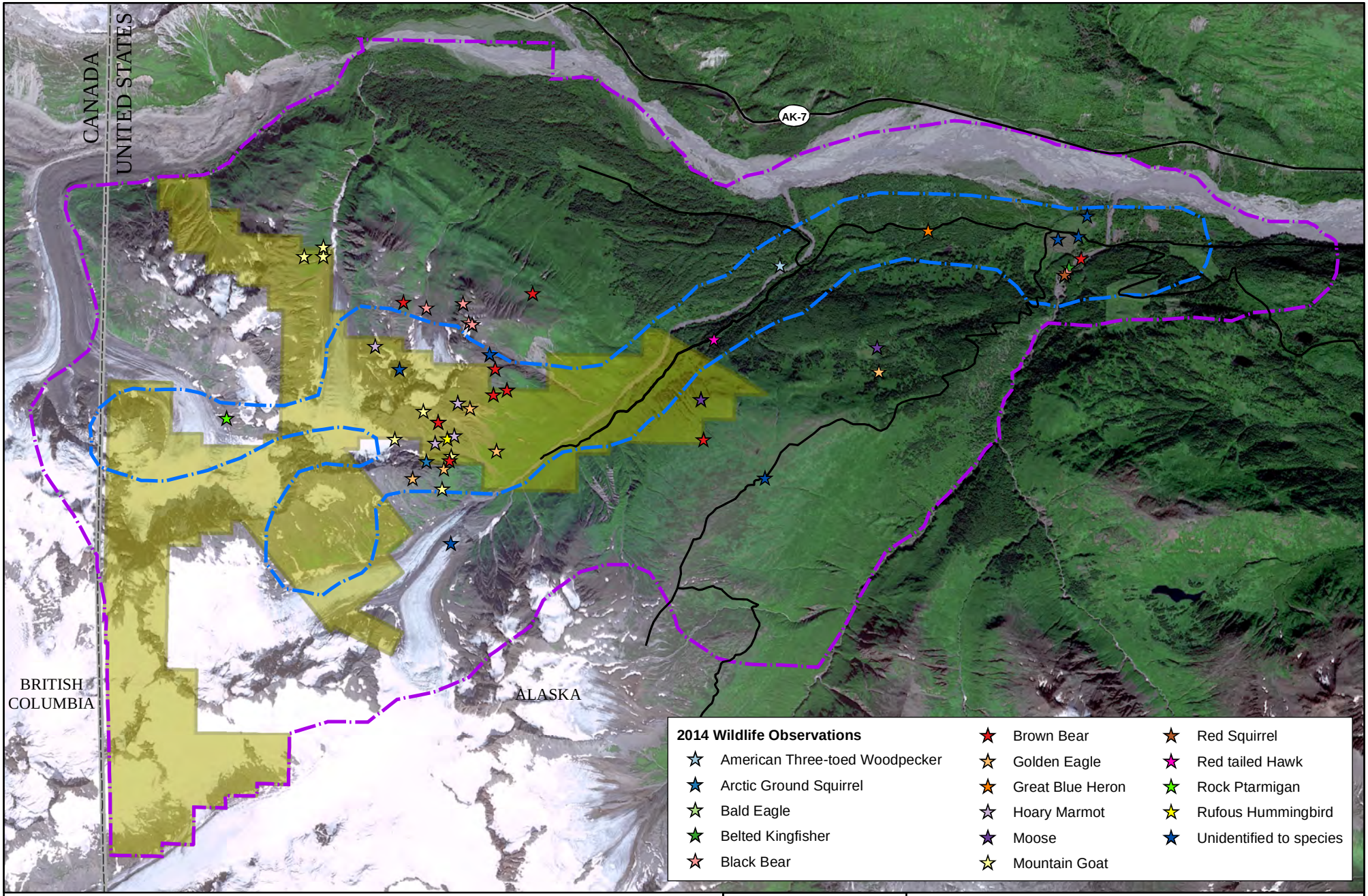
4.3 ANECDOTAL WILDLIFE OBSERVATIONS

4.3.1 Anecdotal Wildlife Observations

A total of 51 anecdotal observations were documented, by 12 Project field staff, during the 2014 field season. These observations included location and behavioural information for five SOI including mountain goat (n=7), brown bear (n=9), golden eagle (n=6), moose (n=2) and rock ptarmigan (n=1). Observations are presented in **Appendix 3** and depicted in Figure 3.

Focused species-specific inventory for species of interest was not within the scope of this assessment; survey timing was also not optimal for inventory of many of the selected SOI during this initial site visit. As such, no species-at-risk, or evidence of habitat use by species-at-risk, were observed during the site visit.



Legend

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

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Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

CLIENT: CONSTANTINE metal resources ltd.

Terrestrial Wildlife and Habitat Assessment
Constantine Metal Resources
Palmer Project Site

STUDY AREA ANECDOTAL WILDLIFE OBSERVATIONS

PROJECT No.		
1679-001.01	January 2015	FIGURE 3

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4.4 WILDLIFE HABITAT ASSESSMENTS: SPECIES ACCOUNTS AND HABITAT SUITABILITY FOR SELECTED SPECIES OF INTEREST

Prior to the fieldwork, a total of 134 polygons representing 15 habitat types were mapped against ortho-imagery in ArcGIS (**Table 2**). Suitability estimates, or rankings, were assigned to 19 SOIs (see **Table 1**): a four-scale predictive rating (High, Moderate, Low or Nil) was assigned to each of the sixteen habitat types to indicate available habitat suitability based on current conditions. A GIS-based model was then developed, using assigned habitat rating values, to depict predicted habitat quality for each SOI with the study area to visually depict the extent and distribution of recognized habitat types within the study area; these maps are an important component of the project results and are included in **Appendix 4**.

Results of the habitat suitability assessment are quantified, in **Table 3**, to indicate hectares (ha) of available habitat within the study area for each SOI.

Table 3 Hectares of Available High, Moderate, Low and Nil Value Habitats within the Study Area for Each Species of Interest

Species	High (ha)	Moderate (ha)	Low (ha)	Nil (ha)	Total Area (ha)
Mammals					
Brown bear	3,869.50	3,258.51	4,514.72	86.73	11,729.47
Mountain goat	4,176.58	0.00	3,540.77	4,012.11	11,729.47
Moose	2,249.40	2,337.31	2,265.84	4,876.92	11,729.47
Wolverine	5,270.91	3,212.27	2,853.15	393.13	11,729.47
Avifauna					
Northern goshawk	2,017.85	339.34	2,949.72	6,422.56	11,729.47
Peale's peregrine falcon	1,806.82	2,135.99	4,537.43	3,249.23	11,729.47
Marbled murrelet	2,017.85	0.00	0.00	9,711.62	11,729.47
Olive-sided flycatcher	2,676.65	333.98	1,662.81	7,056.03	11,729.47
Gray-cheeked thrush	2,178.06	824.98	1,583.68	7,142.76	11,729.47
Townsend's warbler	2,504.44	498.59	7.59	8,718.84	11,729.47
Rock ptarmigan	3,253.06	3,115.56	2,291.07	3,069.78	11,729.47
Golden eagle	2,548.90	2,243.64	4,079.47	2,857.47	11,729.47
Western screech-owl	2,683.57	319.46	0.00	8,726.43	11,729.47
Amphibians					
Red-legged frog	179.13	486.60	2,337.31	8,726.43	11,729.47
Long-toed salamander	2,683.57	319.46	7.59	8,718.84	11,729.47
Northwestern salamander	2,683.57	319.46	7.59	8,718.84	11,729.47
Rough-skinned newt	179.13	2,504.44	327.05	8,718.84	11,729.47
Western toad	179.13	2,504.44	327.05	8,718.84	11,729.47
Wood frog	179.13	2,504.44	327.05	8,718.84	11,729.47

5.0 DISCUSSION

Alaska is recognized for its diversity and abundance of wildlife and natural areas. The ADF&G recognizes over 1,000 species of vertebrates to occur within Alaska; of these, there are at least 648 species of terrestrial vertebrates confirmed to occur. Despite this diversity, Alaska has only 22 federally-listed species; the lowest number of federally-listed species of any state in the nation. As human densities increase, and resource extraction continues to grow and contribute to Alaska's developing economy, the ADF&G are committed to the conservation of all terrestrial and aquatic species with state boundaries. The AWAP provides a strategic framework to facilitate effective conservation and management of wildlife in Alaska. AWAP is a key strategic component in the ADF&G's legal mandate to protect and conserve the state's natural resources.

The AWAP was released in 2005 and is currently under review; an updated version is anticipated for release in October 2015. The key objective of the AWAP is to provide conservation guidance, to coordinate and integrate new conservation actions and strategies with existing wildlife management and research programs, and to build upon existing conservation efforts. Ensuring responsible development is a recognized ADF&G objective; AWAP is a key ADF&G planning tool for implementation of sound conservation practices during development.

The key objective of this Terrestrial Wildlife and Habitat Assessment for the Palmer Project was to inform and support potential future baseline, monitoring and reclamation efforts that may arise as the Project advances through the development process. To inform biological considerations, Hemmera developed a GIS based habitat mapping product to facilitate quantification of habitat ecotypes and to facilitate the development of subsequent species-specific habitat suitability modelling. The resulting habitat mapping product depicts the geospatial distribution of 15 key habitat types (134 mapped polygons) within the Project study area. Two zones (core and buffer) were delineated to define the study area. The core (2,401 ha) represents the area of anticipated high activity associated with mine development and potential future operation. The buffer (11,729 ha) represents the area of associated surrounding habitat that may be affected by human activity (e.g., noise from machinery, blasting, road construction, drilling operations, helicopter operations etc.).

The habitat mapping product was then interpreted to depict wildlife values within the Palmer Project study area. To refine and focus wildlife considerations Hemmera developed a list of Species of Interest (SOI) for the Palmer Project. These are species that may receive conservation attention as the Project advances through the development process. Nineteen SOI were identified with full consideration afforded to four criteria (**Section 3.4**) to ensure responsible inclusion of species; however, this list should be viewed as preliminary guidance. Species may be added or deleted as Project stakeholder consultation proceeds.

To develop the preliminary list, the federal ESA and the AWAP was reviewed to identify species that may be of regulatory concern. There are no federally-listed species (threatened or endangered) that may potentially occur within the Palmer Project area. Only six of 35 AWAP-listed species are listed as sensitive, endangered or SSOC by the SOA or BLM with potential to occur in the Project study area. Finally, to recognize species of high potential social significance (e.g., harvestable species or species of cultural value) and to recognize species with localized or restricted distributions within the state of Alaska an additional13 species were also identified and included as SOI.

In the summer of 2014 Constantine implemented a wildlife program to enable Project field staff to collection anecdotal information. Staff response and engagement was positive. In total, 12 staff contributed 52 wildlife observations in the summer and fall field season. These observations included occurrence records for five SOI including: moose, brown bear, mountain goat, golden eagle and ptarmigan. In addition, this program promoted engagement and awareness, amongst Project staff, of ecological resource values associated with the Project area. Although this program is viewed as a success, caution is advised during interpretation of results. It is recognized that the anecdotal wildlife observations data contributed by Project field staff during 2014 does not adequately facilitate quantification of effort associated with wildlife observations. Spatial comparison of observed/reported densities across mapped habitat types will not be meaningful without more rigorous quantification of applied effort. As such, interpretation of relative abundance data in relation to habitat type is not feasible or prudent with this dataset. In addition, future attempt at temporal comparison of results over successive years will not yield meaningful inferences regarding trends. Finally, even with robust data collection standards in place (as a component of field program design) accurate species identification may not be reliable; as observations were not collected by Qualified Environmental Professionals (QEPs). These concerns are frequently raised during data analysis and interpretation of data collected using “citizen science” (i.e. untrained observers). These concerns do not negate the validity and merit of the 2014 field program as there were several recognized ancillary benefits related to program implementation. In addition, data collected was used to support suppositions, for the modelling process reported here.

The final component of the Terrestrial Wildlife and Habitat Assessment was the development of predictive habitat suitability models for each SOI. These models were developed to geo-spatially depict and quantify habitat availability and distribution with the study area. A review of these models (**Appendix 1**), and consideration of the habitat mapping product, illustrates that areas with high associated biodiversity and ecological richness occur in areas with the lowest levels of anticipated Project-related disturbance. By contrast however, in these harsh alpine environments reclamation, by native ecosystems, will be slow. Information collected from anticipated future baseline studies will be important for future anticipated considerations regarding Project related effects on local wildlife and wildlife habitat at the Palmer Project site.

This document provides information to facilitate future studies that may be required during subsequent stages of the permitting process. To inform potential future studies assessment, and at the Clients request, Hemmera will present recommendations, in a separate document, regarding future recommended studies to support conservation, mitigation and management of terrestrial wildlife and vegetation values that might be influenced by current and future Project activity.

6.0 CLOSURE

We sincerely appreciate the opportunity to have assisted you with this project and if there are any questions, please do not hesitate to contact the undersigned.

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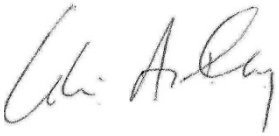

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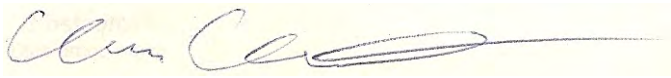

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7.0 STATEMENT OF LIMITATIONS

This report was prepared by Hemmera Envirochem Inc. ("Hemmera"), based on previous investigations reports, for the sole benefit and exclusive use of the Constantine Metals Resources Ltd. The material in it reflects Hemmera's best judgment in light of the information available to it at the time of preparing this report. Any use that a third party makes of this report, or any reliance on or decision made based on it, is the responsibility of such third parties. Hemmera accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

Hemmera has performed the work as described above and made the findings and conclusions set out in this report in a manner consistent with the level of care and skill normally exercised by members of the environmental science profession practicing under similar conditions at the time the work was performed.

This report represents a reasonable review of the information available to Hemmera within the established scope, work schedule and budgetary constraints. The conclusions and recommendations contained in this report are based upon applicable legislation existing at the time the report was drafted. Any changes in the legislation may alter the conclusions and/or recommendations contained in the report. Regulatory implications discussed in this report were based on the applicable legislation existing at the time this report was written.

In preparing this report, Hemmera has relied in good faith on information provided by others as noted in this report, and has assumed that the information provided by those individuals is both factual and accurate. Hemmera accepts no responsibility for any deficiency, mis-statement or inaccuracy in this report resulting from the information provided by those individuals.

The liability of Hemmera to Constantine Metals Resources shall be limited to injury or loss caused by the negligent acts of Hemmera. The total aggregate liability of Hemmera related to this agreement shall not exceed the lesser of the actual damages incurred, or the total fee of Hemmera for services rendered on this project.

8.0 LITERATURE CITED

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8.1 ONLINE RESOURCES

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http://www.adfg.alaska.gov/index.cfm?adfg=specialstatus.main (ESA)

http://www.adfg.alaska.gov/index.cfm?adfg=animals.main (Accounts)

https://weatherspark.com/averages/32966/Haines-Alaska-United-States (Weather)

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(Coastal Western Hemlock BEC zone)

MOF 2014b. http://www.for.gov.bc.ca/hre/becweb/Downloads/Downloads_SubzoneReports/IMA.pdf (Alpine BEC zones)

MOF 2014c. http://www.for.gov.bc.ca/hfd/pubs/docs/Bro/bro61.pdf (Spruce-Willow-Birch BEC zone)

MOF 2014d. https://www.for.gov.bc.ca/hfd/pubs/docs/Bro/bro51.pdf (Mountain Hemlock BEC zone)

http://www.adfg.alaska.gov/index.cfm?adfg=species.wapabout (Alaska Wildlife Action Plan)

http://aknhp.uaa.alaska.edu/maps-js/integrated-map/biotics.php# (Alaska Natural Heritage Program, Biotics species explorer tool)

APPENDIX 1

Alaska: Terrestrial Vertebrate List

MAMMALS

Common Name	Scientific Name	Species Group	Additional Information	Anticipated to Occur
Big Brown Bat	*Eptesicus fuscus*	Bat	Only one big brown bat has ever been confirmed in Alaska. It is the largest bat in Alaska, weighing on average 14g (0.5 oz	No
California Myotis	*Myotis californicus*	Bat	As with other myotis species in Alaska, the California myotis often roosts in abandoned buildings and old mines; they may also be found roosting alone in trees or rock crevices. California bats have been observed hibernating in Southeast Alaska.	Yes
Keen's Myotis	*Myotis keenii*	Bat	As with other myotis species in Alaska, Keen's myotis often roosts in abandoned buildings and old mines; they may also be found roosting alone in trees or rock crevices. It is suspected that it hibernates in Southeast Alaska.	Yes
Little Brown Myotis	*Myotis lucifugus*	Bat	The little brown bat is the most common and widespread bat in Alaska. As with other *myotis* species in Alaska, little brown bats often roost in abandoned buildings and old mines; they may also be found roosting alone in trees or rock crevices.[4] Little brown bats have been observed hibernating in Southeast Alaska and Kodiak Island	Yes
Long-legged Myotis	*Myotis volans*	Bat	As with other *myotis* species in Alaska, the long-legged myotis often roosts in abandoned buildings and old mines; they may also be found roosting alone in trees or rock crevices. It is suspected that it hibernates in Southeast Alaska.	Yes
Silver-haired bat	*Lasionycteris noctivagans*	Bat	After the big brown bat, the silver-haired bats is the largest bat in Alaska. It is only found in Southeast Alaska, and only during winter. It roosts alone in trees	Yes
Black Bear	*Ursus americanus*	Bear	Black bears, which are much smaller than the state's brown bears, are found in larger numbers on the mainland of Alaska, but are not found on the islands off of the Gulf of Alaska and the Seward Peninsula. Black bears have been seen in Alaska in a few different shades of colors such as black, brown, cinnamon, and even a rare blue shade. They are widely scattered over Alaska, and pose more of a problem to humans because they come in close contact with them on a regular basis. They are considered a nuisance because they frequently stroll through local towns, camps, backyards, and streets because of their curiosity and easy food sources such as garbage. Black bears didn't live in Alaska until the end of the last ice age.	Yes
Brown Bear	*Ursus arctos*	Bear	Alaska contains about 98% of the U.S. brown bear population and 70% of the total North American population. Brown bears can be found throughout the state, with the exclusion of some outlying islands. Most brown bears in Alaska are grizzly bears (the subspecies of brown bear found throughout North America), but Kodiak Island is home to Kodiak bears, another subspecies of brown bear that is the largest of all the Brown Bears and second only to the Polar Bear in size. The density of brown bear populations in Alaska varies according to the availability of food, and in some places is as high as one bear per square mile.	Yes
Polar Bear	*Ursus maritimus*	Bear	Alaska's polar bear populations are concentrated along its Arctic coastlines. In the winter, they are most common in the Kuskokwim Delta, St. Matthew Island, and at the southernmost portion of St. Lawrence Island. During the summer months, they migrate to the coastlines of the Arctic Ocean and the Chukchi Sea.[9] Conservation efforts, including the 1972 Marine Mammal Protection Act, have limited polar bear hunts, though polar bear populations may be threatened by oil development and global warming	No
Dall Sheep	*Ovis dalli dalli*	Bovid	Dall sheep live in the mountain regions of Alaska where there is rocky terrain and steep, inclined land. The mountain setting is an ideal place for them to rest and feed. They are occasionally seen below their usual high elevation only when food is scarce. Alaska contains a good size population of Dall sheep. In their rocky environment, they are able to avoid predators and human activities	No
Mountain Goat	*Oreamnos americanus*	Bovid	Found in the rough and rocky mountain regions of Alaska, throughout the Southeast and along the Coastal Mountains of the Cook Inlet. Populations are generally confined in the areas of the Chugach and Wrangell Mountains. Mountain goats have been transplanted to the islands of Baranof and Kodiak, where they have maintained a steady population. The mountain goat is the only representation in North America of the goat-like ungulates. Very little was known about mountain goats up until 1900. They constantly migrate to different areas from the alpine ridges in the summer, and to the tree-line in the winter	Yes
Muskox	*Ovibos moschatus*	Bovid	Re-introduced; spread from Alaska refugium after the Pleistocene era, then died out in the state.	No
Plains Bison	*Bison bison bison*	Bovid	The ancestors of the American bison (*Bison bison*) were introduced to Alaska in 1928. In 2003, there were approximately 900 wild American bison in Alaska. Their numbers are controlled by managed sport hunting, as predation is not common. Bison can occasionally be seen on their summer range from the Richardson Highway south of Delta Junction, on the Delta Junction Bison range and on the Delta Agricultural Project. Another sub-species of bison, the wood bison (*b. b. athabascae*) was once present in Alaska but is no longer. There are plans to reintroduce wood bison to Alaska in the near future	No
Wood Bison	*Bison bison athabascae*	Bovid	Another sub-species of bison, the wood bison (b. b. athabascae) was once present in Alaska but is no longer. There are plans to reintroduce wood bison to Alaska in the near future.	No
Arctic Fox	*Alopex lagopus*	Canid	Arctic foxes are found in treeless coastal areas in the Aleutian Islands and on the state's west and north coasts. Two color morphs occur in the state: white-morph foxes are white in the winter and brown in the summer, while blue-morph foxes are charcoal-colored in summer and a somewhat lighter gray in winter. During the summer, Arctic foxes feed mainly on small animals, but during the winter foxes often venture onto sea ice to eat seal carcasses left by polar bears. Arctic foxes are sometimes trapped for fur; the fur trade is important to many coastal Native villages, though demand for Arctic fox fur has decreased in recent years.	No
Coyote	*Canis latrans*	Canid	Coyotes have only been seen in Alaska since the early 20th century; they were originally reported in Southeast Alaska, but since have expanded across the state. The state's coyote population peaked in the 1940s and has declined in many areas since. Coyotes are most common in the Kenai Peninsula, the Mat-Su Valley, and the Copper River Valley and are rare north of the Yukon River. In Alaska, coyotes' diets consist primarily of snowshoe hares, rodents, and carrion; predators of the young include great horned owls, bald eagles, and golden eagles; adults are preyed upon by wolves, bears and cougars. The state offered bounties for killing coyotes in the early 20th century (as did other states); the bounty program ended in 1969, and today a small number of coyotes are trapped in Alaska each year. Because coyotes are very secretive, they are rarely seen by Alaska residents	Yes

Common Name	Scientific Name	Species Group	Additional Information	Anticipated to Occur
Grey Wolf	*Canis lupus*	Canid	There are two subspecies of wolves in Alaska; the Mackenzie Valley wolf and Arctic Wolf. Wolves in the southeast are darker and smaller than those in northern regions. Wolves are found on the mainland of Alaska, Unimak Island, and on most major islands in the southeast. There is approximately one wolf per 25 square miles (65 km^2) in Alaska. In recent years, efforts to control wolf population through aerial hunting have been a source of controversy in the state	Yes
Red Fox	*Vulpes vulpes*	Canid	Red foxes are found throughout Alaska, except for the Western Aleutians, some islands in Southeast Alaska, and Prince William Sound. It is an introduced animal on many of the state's islands due to turn of the 20th century fox farming. Red foxes, which are most common south of the Arctic tundra, prefer low marshes, hilly areas, and broken country. Where the red fox's range overlaps with that of the Arctic fox, the red fox dominates. In Alaska, most red foxes are of the characteristic red color phase, but other color phases—which comprise up to 2% of foxes in certain northern areas—include "cross", silver, and black. Predators of red foxes include wolves, lynx, coyotes, wolverines, men (primarily as trappers), and perhaps bears	Yes
Caribou	*Rangifer tarandus granti*	Cervid	Alaska is home to the *Rangifer tarandus granti* subspecies of caribou. Caribou in Alaska generally are found in tundra and mountain regions, where there are few trees. However, many herds spend the winter months in the boreal forest areas. Caribou in Alaska are abundant; currently there are an estimated 950,000 in the state. The populations of caribou are controlled by predators and hunters (who shoot about 22,000 caribou a year).	No
Elk	*Cervus elaphus roosevelti*	Cervid	Introduced, subspecies: Roosevelt Elk. Found in the southern tip of Alaska	No
Moose	*Alces alces*	Cervid	The Alaska subspecies of moose (*Alces alces gigas*) is the largest in the world; adult males weigh 1,200 to 1,600 pounds (542–725 kg), and adult females weigh 800 to 1,300 pounds (364–591 kg) Alaska's substantial moose population is controlled by predators such as bears and wolves, which prey mainly on vulnerable calves, as well as by hunters. Moose are often hunted for subsistence and recreation.	Yes
Sitka Black-tailed deer	*Odocoileus hemionus sitkensis*	Cervid	NA	Yes
Lynx	*Lynx Canadensis*	Felid	Lynx live in a wide range in Alaska, but due to being mostly nocturnal and instinctively secretive predators they are rarely seen by humans. They share a "boom and bust" symbiotic life cycle with the snowshoe hare, the main animal they prey on. In times of booming hare population lynx are spotted more frequently as their numbers rise as well. After the lynx and other predators have decimated the hare population their numbers go down in the following years.	Yes
Mountain Lion	*Puma concolor*	Felid	It is unlikely that there is a breeding population of mountain lions in Alaska, but periodic sightings indicate that some mountain lions venture into the state. Generally the state receives two or three reports of mountain lion sightings per year. Reports have come from as far northwest as Homer, but the most credible reports come from the Southeast, which is relatively near an established population of mountain lions in British Columbia. Populations of mountain lions have been increasing in the American West and in Canada, and biologists have speculated that within fifty years Alaska could have a breeding population of its own	Unlikely
American Marten	*Martes americana*	Mustelid	Common	Yes
American Mink	*Neovison vison*	Mustelid	Mink are found in every region of Alaska except Kodiak Island, the Aleutian Islands, Bering Sea offshore islands, and most of the North Slope. Mink are opportunistic hunters, eating almost anything that they can kill; important food sources include fish, birds, bird eggs, insects, crabs, clams, and small mammals. Wolves, foxes, hawks, owls, lynx, and river otters occasionally prey on mink, but the effects of predation on mink population have been studied relatively little. In Alaska, Mink are sometimes trapped for their fur	Yes
Ermine (Short-tailed Weasel)	*Mustela erminea*	Mustelid	Common	Yes
Fisher	*Martes Pennanti*	Mustelid	Uncommon, associated with Cottonwood habitat	Yes
Least Weasel	*Mustela nivalis*	Mustelid	Common	Yes
Pacific Marten	*Martes caurina*	Mustelid	Marten are found from Southeast Alaska to the start of treeless tundra in Alaska's north and west. Marten are abundant in Alaska, being most common in the bogs and black spruce forests of Interior Alaska. In much of their range, especially in less optimal habitat, meadow voles and red-backed voles are marten's primary food source. Other important food sources include berries, small birds, eggs, plants, and carrion. Red squirrels, which are a major food source for martens in other areas, are not generally eaten by martens in Alaska. Marten are Alaska's most trapped animal, and as of 1994 generated $1–2 million in income in the state. In most areas, overtrapping is not a management problem	Yes
River Otter	*Lutra canadensis*	Mustelid	River otters are found throughout Alaska except the Aleutian Islands, Bering Sea offshore islands, and the Arctic coast east of Point Lay	Yes
Wolverine	*Gulo gulo*	Mustelid	Wolverines are found primarily in the more remote areas of mainland Alaska and on some islands in Southeast Alaska. Because wolverines require large amounts of wilderness (the home range of a male may be up to 240 sq. mi.), they are sparsely distributed throughout their range. Wolverines are solitary, except during the May–August breeding season. Wolverines are better adapted for scavenging than for hunting and are opportunistic eaters. During winter, they primarily eat the carcasses of animals that have died of natural causes and the carcasses of moose and caribou left by wolves and hunters. The rest of the year their diet consists of smaller animals, such as voles, squirrels, snowshoe hares, and birds. On rare occasions, wolverines may kill moose or caribou.	Yes
Collared Pika	*Ochotona collaris*	Pikas, hares and rabbits	Commonly heard, and seen, in close associated with talus features. Listen for nasal 'yank' call.	Unlikely

Common Name	Scientific Name	Species Group	Additional Information	Anticipated to Occur
Snowshoe Hare	*Lepus americanus*	Pikas, hares and rabbits	The snowshoe hare is the most common and widespread hare in Alaska, found everywhere in the state except the lower Kuskokwim Delta, the Alaska Peninsula, and the area north of the Brooks Range. They generally live in brush, mixed spruce forests, and wooded swamps. Snowshoe hare populations are dramatically cyclical, and in peak years there may be up to 600 snowshoe hares per square mi (230/km²) of the animals' range. The hares are a key food source for Alaska's furbearers, especially lynx, and are also important for human subsistence and recreational hunting.	Yes
Tundra Hare	*Lepus othus*	Pikas, hares and rabbits	The tundra hare is most often found on the western coast of Alaska, including the Alaska Peninsula, and can occasionally be seen on the Arctic coast and the north slope of the Brooks Range. It generally lives on rocky slopes and upland tundra, avoiding lowlands and forests. They are important for subsistence and recreational hunting and for fur trapping	No
Raccoon	*Procyon lotor*	Raccoon	The raccoon was introduced into Alaska in the 1930s for the fur trade. Very small but stable populations thrive in Southwestern parts of Alaska.	No
American Beaver	*Castor canadensis*	Rodent	Largest rodent in North America. Common	Yes
Brown Lemming	*Lemmus trimucronatus*	Rodent	NA	Yes
Brown Rat	*Rattus norvegicus*	Rodent	Introduced.	No
Bushy-tailed woodrat	*Neotoma cinerea*	Rodent	Associated with talus.	Yes
House Mouse	*Mus musculus*	Rodent	Introduced.	No
Insular Vole	Microtus abbreviatus	Rodent	NA	No
Keen's (Forest) Deer Mouse	*Peromyscus keeni*	Rodent	NA	Yes
Long-tailed Vole	*Microtus longicuadus*	Rodent	Long-tailed voles may be found throughout Southeast Alaska, the Yakutat forelands, and the far eastern Interior	Yes
Meadow Jumping Mouse	*Zapus hudsonius*	Rodent	NA	Yes
Meadow Vole	*Microtus pennsylvanicus*	Rodent	NA	Yes
Muskrat	*Ondatra zibethicus*	Rodent	Associated with water, smaller than a beaver. Tail not flattened. Lodges build from reeds	Yes
North American Deer Mouse	*Peromysucs maniculatus*	Rodent	Introduced.	Yes
Northern Bog Lemming	*Synaptomys borealis*	Rodent	NA	Yes
Northern Collared Lemming	*Dicrostonyx groenlandicus*	Rodent	NA	No
Northern Red-backed Vole	*Clethrionomys rutilus*	Rodent	Northern red-backed voles are found throughout mainland Alaska. It is also found on Unimak Island and St. Lawrence Island, but not Southeast Alaska, Kodiak, or Nunivak Island	No
Porcupine	*Erithizon dorsatum*	Rodent	Weighing approximately 15 pounds, porcupines are the largest of Alaska's rodents except for beavers. Porcupines are found everywhere in Alaska except the Alaska Peninsula and Kodiak, Nunivak, and St. Lawrence islands. In winter, porcupines primarily eat trees' inner bark; in summer, they eat trees' buds and young leaves. Porcupines can cause forest management problems when they eat terminal buds or eating bark all the way around trees, though in most parts of Alaska there are not enough porcupines to cause significant damage. Though porcupine's quills discourage most predators, fishers, lynx, wolves, coyotes, and wolverines have developed methods of killing porcupines safely. Porcupines are also easily killed by hunters because of their plodding gate, but they are generally unpopular among hunters because of their meat's strong taste. The porcupine didn't reached Alaska until the last ice age.	Yes
Red-Backed Vole	*Myodes rutilus*	Rodent	NA	Yes
Roof Rat	*Rattus rattus*	Rodent	introduced	No
Singing Vole	*Microtus miurus*	Rodent	The distribution of the singing vole has not yet been well characterized. Specimens have been found on the North Slope, Seward Peninsula, Brooks Range, Alaska Range, south to the Kenai Peninsula and Cook Inlet, and west to Cape Newenham. There appear to be no singing voles in the Interior and Southeast.	Yes
Southern Red-backed Vole	*Clethrionomys gapperi*	Rodent	NA	Unlikely
Tundra (Root) Vole	*Microtus oeconomus*	Rodent	NA	Yes
Tundra Hare	*Lepus othus*	Rodent	The tundra hare is most often found on the western coast of Alaska, including the Alaska Peninsula, and can occasionally be seen on the Arctic coast and the north slope of the Brooks Range.[24] It generally lives on rocky slopes and upland tundra, avoiding lowlands and forests.[24] They are important for subsistence and recreational hunting and for fur trapping	No
Western Heather Vole	*Phenacomys intermedius*	Rodent	The first western heather vole specimen in Alaska was identified in 1999 near Hyder, Alaska	Yes
Western Jumping Mouse	*Zapus princeps*	Rodent	NA	No
Yellow-cheeked (Taiga) Vole	*Microtus xanthognathus*	Rodent	NA	No

Common Name	Scientific Name	Species Group	Additional Information	Anticipated to Occur
American Water Shrew	*Sorex pulastris*	Shrew	The water shrew is found from Southcentral and Southeast Alaska to the Alaska Range in the north	Yes
Barren Ground Shrew	*Sorex ugyunak*	Shrew	Barrenground shrews are found on the North Slope	No
Cinereous (Common) Shrew	*Sorex cinereus*	Shrew	The common shrew is one of the two most widespread species of shrew in Alaska (the other being the dusky shrew). It is found from the Brooks Range to Southeast Alaska	Yes
Dusky Shrew	*Sorex monticolus*	Shrew	The dusky shrew is one of the two most widespread species of shrew in Alaska (the other being the common shrew). It is found from the Brooks Range to Southeast Alaska	Yes
Glacier Bay Water Shrew	*Sorex alaskanus*	Shrew	Glacier Bay water shrews are known from Glacier Bay National Park and Preserve in southeast Alaska	No
Pribolof Island Shrew	*Sorex hydrodromus*	Shrew	The Pribilof Island shrew is found only on the Pribilof Islands	No
Pygmy Shrew	*Sorex hoyi*	Shrew	The pygmy shrew is found throughout most of the state except the North Slope and the southeast	No
St. Lawrence Island Shrew	*Sorex jacksoni*	Shrew	The St. Lawrence Island shrew is found only on St. Lawrence Island	No
Tiny Shrew	*Sorex yukonicus*	Shrew	The tiny shrew appears to be widespread but uncommon in Alaska	Yes
Tundra Shrew	*Sorex tunrensis*	Shrew	Tundra shrews are found throughout most of the state except the southeast	No
Alaska Marmot	*Marmota broweri*	Squirrel Family	The Alaska marmot is found in the scree slopes of the Brooks Range, which provide protection from predators. They eat grass, flowering plants, berries, roots, moss, and lichen. Alaska marmots have special winter dens with a single entrance that is plugged during the entire winter hibernation period. They are built on exposed ridges that thaw earlier than other areas, and the entire colony stays within the den from September until the plug melts in early May. Most marmots mate before emerging from the winter den. In areas where marmots are hunted, marmots remain quiet when approached by humans; Alaska Natives have traditionally eaten marmot meat and used marmot fur in clothing.	No
Arctic Ground Squirrel	*Spermophilus parryii*	Squirrel Family	NA	Yes
Hoary Marmot	*Marmota caligata*	Squirrel Family	Common and associated with rock features.	Yes
Northern Flying Squirrel	*Glaucomys sabrinus yukonensis*	Squirrel Family	Nocturnal, forested areas.	Yes
Red Squirrel	*Tamiasciurus hudsonicus*	Squirrel Family	Common	Yes
Woodchuck	*Marmota monax*	Squirrel Family	NA	No

BIRDS

Common Name	Scientific Name	Family	Species Group	Anticipated to Occur	Status
Taiga Bean Goose	*Anser fabalis*	Ducks, Geese, and Swans	Waterfowl	No	Casual
Tundra Bean Goose	*Anser serrirostris*	Ducks, Geese, and Swans	Waterfowl	No	Casual
Greater White fronted Goose	*Anser albifrons*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Lesser White fronted Goose	*Anser erythropus*	Ducks, Geese, and Swans	Waterfowl	No	Accidental
Emperor Goose	*Chen canagica*	Ducks, Geese, and Swans	Waterfowl	No	Common
Snow Goose	*Chen caerulescens*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Ross's Goose	*Chen rossii*	Ducks, Geese, and Swans	Waterfowl	No	Casual
Brant	*Branta bernicla*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Cackling Goose	*Branta hutchinsii*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Canada Goose	*Branta canadensis*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Trumpeter Swan	*Cygnus buccinator*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Tundra Swan	*Cygnus columbianus*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Whooper Swan	*Cygnus cygnus*	Ducks, Geese, and Swans	Waterfowl	No	Rare
Wood Duck	*Aix sponsa*	Ducks, Geese, and Swans	Waterfowl	No	Rare
Gadwall	*Anas strepera*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Falcated Duck	*Anas falcata*	Ducks, Geese, and Swans	Waterfowl	No	Casual
Eurasian Wigeon	*Anas penelope*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
American Wigeon	*Anas americana*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
American Black Duck	*Anas rubripes*	Ducks, Geese, and Swans	Waterfowl	No	Casual
Mallard	*Anas platyrhynchos*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Eastern Spot billed Duck	*Anas zonorhyncha*	Ducks, Geese, and Swans	Waterfowl	No	Casual
Blue winged Teal	*Anas discors*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Cinnamon Teal	*Anas cyanoptera*	Ducks, Geese, and Swans	Waterfowl	No	Rare
Northern Shoveler	*Anas clypeata*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Northern Pintail	*Anas acuta*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Garganey	*Anas querquedula*	Ducks, Geese, and Swans	Waterfowl	No	Casual
Baikal Teal	*Anas formosa*	Ducks, Geese, and Swans	Waterfowl	No	Casual
Green winged Teal	*Anas crecca*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Canvasback	*Aythya valisineria*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Redhead	*Aythya americana*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Common Pochard	*Aythya ferina*	Ducks, Geese, and Swans	Waterfowl	No	Casual
Ring necked Duck	*Aythya collaris*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Tufted Duck	*Aythya fuligula*	Ducks, Geese, and Swans	Waterfowl	No	Rare
Greater Scaup	*Aythya marila*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Lesser Scaup	*Aythya affinis*	Ducks, Geese, and Swans	Waterfowl	Yes	Common

Common Name	Scientific Name	Family	Species Group	Anticipated to Occur	Status
Steller's Eider	*Polysticta stelleri*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Spectacled Eider	*Somateria fischeri*	Ducks, Geese, and Swans	Waterfowl	No	Common
King Eider	*Somateria spectabilis*	Ducks, Geese, and Swans	Waterfowl	No	Common
Common Eider	*Somateria mollissima*	Ducks, Geese, and Swans	Waterfowl	No	Common
Harlequin Duck	*Histrionicus histrionicus*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Surf Scoter	*Melanitta perspicillata*	Ducks, Geese, and Swans	Waterfowl	No	Common
White winged Scoter	*Melanitta fusca*	Ducks, Geese, and Swans	Waterfowl	No	Common
Black Scoter	*Melanitta americana*	Ducks, Geese, and Swans	Waterfowl	No	Common
Long tailed Duck	*Clangula hyemalis*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Bufflehead	*Bucephala albeola*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Common Goldeneye	*Bucephala clangula*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Barrow's Goldeneye	*Bucephala islandica*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Smew	*Mergellus albellus*	Ducks, Geese, and Swans	Waterfowl	No	Rare
Hooded Merganser	*Lophodytes cucullatus*	Ducks, Geese, and Swans	Waterfowl	No	Common
Common Merganser	*Mergus merganser*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Red breasted Merganser	*Mergus serrator*	Ducks, Geese, and Swans	Waterfowl	Yes	Common
Ruddy Duck	*Oxyura jamaicensis*	Ducks, Geese, and Swans	Waterfowl	No	Rare
Ruffed Grouse	*Bonasa umbellus*	Grouse	Grouse	Yes	Common
Spruce Grouse	*Falcipennis canadensis*	Grouse	Grouse	Yes	Common
Willow Ptarmigan	*Lagopus lagopus*	Grouse	Grouse	Yes	Common
Rock Ptarmigan	*Lagopus muta*	Grouse	Grouse	Yes	Common
White tailed Ptarmigan	*Lagopus leucura*	Grouse	Grouse	Yes	Common
Sooty Grouse	*Dendragapus fuliginosus*	Grouse	Grouse	Yes	Common
Sharp tailed Grouse	*Tympanuchus phasianellus*	Grouse	Grouse	No	Common
Red throated Loon	*Gavia stellata*	Loons	Waterfowl	No	Common
Arctic Loon	*Gavia arctica*	Loons	Waterfowl	No	Rare
Pacific Loon	*Gavia pacifica*	Loons	Waterfowl	Yes	Common
Common Loon	*Gavia immer*	Loons	Waterfowl	Yes	Common
Yellow billed Loon	*Gavia adamsii*	Loons	Waterfowl	No	Common
Pied billed Grebe	*Podilymbus podiceps*	Grebes	Waterfowl	No	Rare
Horned Grebe	*Podiceps auritus*	Grebes	Waterfowl	Yes	Common
Red necked Grebe	*Podiceps grisegena*	Grebes	Waterfowl	Yes	Common
Eared Grebe	*Podiceps nigricollis*	Grebes	Waterfowl	No	Casual
Western Grebe	*Aechmophorus occidentalis*	Grebes	Waterfowl	Yes	Common
Shy Albatross	*Thalassarche cauta*	Albatrosses	Pelagic (Marine)	No	Accidental
Laysan Albatross	*Phoebastria immutabilis*	Albatrosses	Pelagic (Marine)	No	Common
Black footed Albatross	*Phoebastria nigripes*	Albatrosses	Pelagic (Marine)	No	Common

Common Name	Scientific Name	Family	Species Group	Anticipated to Occur	Status
Short tailed Albatross	*Phoebastria albatrus*	Albatrosses	Pelagic (Marine)	No	Rare
Northern Fulmar	*Fulmarus glacialis*	Shearwaters and Petrels	Pelagic (Marine)	No	Common
Providence Petrel	*Pterodroma solandri*	Shearwaters and Petrels	Pelagic (Marine)	No	Accidental
Mottled Petrel	*Pterodroma inexpectata*	Shearwaters and Petrels	Pelagic (Marine)	No	Common
Cook's Petrel	*Pterodroma cookii*	Shearwaters and Petrels	Pelagic (Marine)	No	Accidental
Pink footed Shearwater	*Puffinus creatopus*	Shearwaters and Petrels	Pelagic (Marine)	No	Rare
Flesh footed Shearwater	*Puffinus carneipes*	Shearwaters and Petrels	Pelagic (Marine)	No	Casual
Great Shearwater	*Puffinus gravis*	Shearwaters and Petrels	Pelagic (Marine)	No	Casual
Buller's Shearwater	*Puffinus bulleri*	Shearwaters and Petrels	Pelagic (Marine)	No	Common
Sooty Shearwater	*Puffinus griseus*	Shearwaters and Petrels	Pelagic (Marine)	No	Common
Short tailed Shearwater	*Puffinus tenuirostris*	Shearwaters and Petrels	Pelagic (Marine)	No	Common
Manx Shearwater	*Puffinus puffinus*	Shearwaters and Petrels	Pelagic (Marine)	No	Casual
Fork tailed Storm Petrel	*Oceanodroma furcata*	Storm-Petrels	Pelagic (Marine)	No	Common
Leach's Storm Petrel	*Oceanodroma leucorhoa*	Storm-Petrels	Pelagic (Marine)	No	Common
Magnificent Frigatebird	*Fregata magnificens*	Frigatebirds	Pelagic (Marine)	No	Accidental
Brandt's Cormorant	*Phalacrocorax penicillatus*	Cormorants	Pelagic (Marine)	No	Rare
Double crested Cormorant	*Phalacrocorax auritus*	Cormorants	Pelagic (Marine)	No	Common
Red faced Cormorant	*Phalacrocorax urile*	Cormorants	Pelagic (Marine)	No	Common
Pelagic Cormorant	*Phalacrocorax pelagicus*	Cormorants	Pelagic (Marine)	No	Common
American White Pelican	*Pelecanus erythrorhynchos*	Pelicans	Waterfowl	No	Accidental
Brown Pelican	*Pelecanus occidentalis*	Pelicans	Waterfowl	No	Casual
American Bittern	*Botaurus lentiginosus*	Herons, Bitterns, and Allies	Herons, Bitterns and Cranes	No	Casual
Yellow Bittern	*Ixobrychus sinensis*	Herons, Bitterns, and Allies	Herons, Bitterns and Cranes	No	Accidental
Great Blue Heron	*Ardea herodias*	Herons, Bitterns, and Allies	Herons, Bitterns and Cranes	Yes	Common
Gray Heron	*Ardea cinerea*	Herons, Bitterns, and Allies	Herons, Bitterns and Cranes	No	Casual
Great Egret	*Ardea alba*	Herons, Bitterns, and Allies	Herons, Bitterns and Cranes	No	Casual
Intermediate Egret	*Mesophoyx intermedia*	Herons, Bitterns, and Allies	Herons, Bitterns and Cranes	No	Accidental
Chinese Egret	*Egretta eulophotes*	Herons, Bitterns, and Allies	Herons, Bitterns and Cranes	No	Accidental
Little Egret	*Egretta garzetta*	Herons, Bitterns, and Allies	Herons, Bitterns and Cranes	No	Accidental
Tricolored Heron	*Egretta tricolor*	Herons, Bitterns, and Allies	Herons, Bitterns and Cranes	No	Accidental
Cattle Egret	*Bubulcus ibis*	Herons, Bitterns, and Allies	Herons, Bitterns and Cranes	No	Casual
Chinese Pond Heron	*Ardeola bacchus*	Herons, Bitterns, and Allies	Herons, Bitterns and Cranes	No	Casual
Green Heron	*Butorides virescens*	Herons, Bitterns, and Allies	Herons, Bitterns and Cranes	No	Accidental
Black crowned Night Heron	*Nycticorax nycticorax*	Herons, Bitterns, and Allies	Herons, Bitterns and Cranes	No	Casual
Turkey Vulture	*Cathartes aura*	New World Vultures	Raptors	No	Casual
Osprey	*Pandion haliaetus*	Ospreys	Raptors	Yes	Common
Bald Eagle	*Haliaeetus leucocephalus*	Hawks, Eagles, and Allies	Raptors	Yes	Common

Common Name	Scientific Name	Family	Species Group	Anticipated to Occur	Status
White tailed Eagle	*Haliaeetus albicilla*	Hawks, Eagles, and Allies	Raptors	No	Casual
Steller's Sea Eagle	*Haliaeetus pelagicus*	Hawks, Eagles, and Allies	Raptors	No	Casual
Northern Harrier	*Circus cyaneus*	Hawks, Eagles, and Allies	Raptors	Yes	Common
Sharp shinned Hawk	*Accipiter striatus*	Hawks, Eagles, and Allies	Raptors	Yes	Common
Northern Goshawk	*Accipiter gentilis*	Hawks, Eagles, and Allies	Raptors	Yes	Common
Swainson's Hawk	*Buteo swainsoni*	Hawks, Eagles, and Allies	Raptors	No	Rare
Red tailed Hawk	*Buteo jamaicensis*	Hawks, Eagles, and Allies	Raptors	Yes	Common
Rough legged Hawk	*Buteo lagopus*	Hawks, Eagles, and Allies	Raptors	Yes	Common
Golden Eagle	*Aquila chrysaetos*	Hawks, Eagles, and Allies	Raptors	Yes	Common
Virginia Rail	*Rallus limicola*	Rails and Coots	Waterfowl	No	Casual
Sora	*Porzana carolina*	Rails and Coots	Waterfowl	No	Rare
Common Moorhen	*Gallinula chloropus*	Rails and Coots	Waterfowl	No	Accidental
Eurasian Coot	*Fulica atra*	Rails and Coots	Waterfowl	No	Accidental
American Coot	*Fulica americana*	Rails and Coots	Waterfowl	No	Rare
Sandhill Crane	*Grus canadensis*	Cranes	Herons, Bitterns and Cranes	Yes	Common
Common Crane	*Grus grus*	Cranes	Herons, Bitterns and Cranes	No	Accidental
Black-winged Stilt	*Himantopus himantopus*	Stilts and Avocets	Shorebirds	No	Casual
American Avocet	*Recurvirostra americana*	Stilts and Avocets	Shorebirds	No	Casual
Eurasian Oystercatcher	*Haematopus ostralegus*	Oystercatchers	Pelagic (Marine)	No	Accidental
Black Oystercatcher	*Haematopus bachmani*	Oystercatchers	Pelagic (Marine)	No	Common
Northern Lapwing	*Vanellus vanellus*	Lapwings and Plovers	Shorebirds	No	Accidental
Black-bellied Plover	*Pluvialis squatarola*	Lapwings and Plovers	Shorebirds	Yes	Common
European Golden-Plover	*Pluvialis apricaria*	Lapwings and Plovers	Shorebirds	No	Accidental
American Golden-Plover	*Pluvialis dominica*	Lapwings and Plovers	Shorebirds	Yes	Common
Pacific Golden-Plover	*Pluvialis fulva*	Lapwings and Plovers	Shorebirds	Yes	Common
Lesses Sand-Plover	*Charadrius mongolus*	Lapwings and Plovers	Shorebirds	No	Rare
Common Ringed Plover	*Charadrius hiaticula*	Lapwings and Plovers	Shorebirds	No	Rare
Semipalmated Plover	*Charadrius semipalmatus*	Lapwings and Plovers	Shorebirds	Yes	Common
Little Ringed Plover	*Charadrius dubius*	Lapwings and Plovers	Shorebirds	No	Casual
Killdeer	*Charadrius vociferus*	Lapwings and Plovers	Shorebirds	Yes	Common
Eurasian Dotterel	*Charadrius morinellus*	Lapwings and Plovers	Shorebirds	No	Casual
Terek Sandpiper	*Xenus cinereus*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Casual
Common Sandpiper	*Actitis hypoleucos*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Rare
Spotted Sandpiper	*Actitis macularius*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Green Sandpiper	*Tringa ochropus*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Casual
Solitary Sandpiper	*Tringa solitaria*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Gray-tailed Tattler	*Tringa brevipes*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common

Common Name	Scientific Name	Family	Species Group	Anticipated to Occur	Status
Wantering Tattler	*Tringa incana*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Spotted Redshank	*Tringa erythropus*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Casual
Greater Yellowlegs	*Tringa melanoleuca*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Common Greenshank	*Tringa nebularia*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Rare
Willet	*Tringa semipalmata*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Casual
Lesser Yellowlegs	*Tringa flavipes*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Marsh Sandpiper	*Tringa stagnatilis*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Casual
Wood Sandpiper	*Tringa glareola*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Upland Sandpiper	*Bartramia longicauda*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Little Curlew	*Numenius minutus*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Accidental
Eskimo Curlew	*Numenius borealis*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Accidental
Whimbrel	*Numenius phaeopus*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Bristle-thighed Curlew	*Numenius tahitiensis*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Far Eastern Curlew	*Numenius madagascariensis*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Casual
Black-tailed Godwit	*Limosa limosa*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Casual
Hudsonian Godwit	*Limosa haemastica*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Bar-tailed Godwit	*Limosa lapponica*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Marbled Godwit	*Limosa fedoa*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Ruddy Turnstone	*Arenaria interpres*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Black Turnstone	*Arenaria melanocephala*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Great Knot	*Calidris tenuirostris*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Casual
Red Knot	*Calidris canutus*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Surfbird	*Calidris virgata*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Ruff	*Calidris pugnax*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Rare
Broad-billed Sanpiper	*Calidris falcinellus*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Casual
Sharp-tailed Sandpiper	*Calidris acuminata*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Stilt Sandpiper	*Calidris himantopus*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Curlew Sandpiper	*Calidris ferruginea*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Casual
Temminck's Stint	*Calidris temminckii*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Casual
Long-toed Stint	*Calidris subminuta*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Rare
Spoon-billed Sandpiper	*Calidris pygmea*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Casual
Red-necked Stint	*Calidris ruficollis*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Sanderling	*Calidris alba*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Dunlin	*Calidris alpina*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Rock Sandpiper	*Calidris ptilocnemis*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Purple Sandpiper	*Calidris maritima*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Accidental
Baird's Sandpiper	*Calidris bairdii*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common

Common Name	Scientific Name	Family	Species Group	Anticipated to Occur	Status
Little Stint	*Calidris minuta*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Casual
Least Sandpiper	*Calidris minutilla*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
White-rumped Sandpiper	*Calidris fuscicollis*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Rare
Buff-breasted Sandpiper	*Calidris subruficollis*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Pectoral Sandpiper	*Calidris melanotos*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Semipalmated Sandpiper	*Calidris pusilla*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Western Sandpiper	*Calidris mauri*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Short-billed Dowitcher	*Limnodromus griseus*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Long-billed Dowitcher	*Limnodromus scolopaceus*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Jack Snipe	*Lymnocryptes minimus*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Casual
Wilson's Snipe	*Gallinago delicata*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Common Snipe	*Gallinago gallinago*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Pin-tailed Snipe	*Gallinago stenura*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Casual
Solitary Snipe	*Gallinago solitaria*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Accidental
Wilson's Phalarope	*Phalaropus tricolor*	Sandpipers, Phalaropes, and Allies	Shorebirds	No	Rare
Red-necked Phalarope	*Phalaropus lobatus*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Red Phalarope	*Phalaropus fulicarius*	Sandpipers, Phalaropes, and Allies	Shorebirds	Yes	Common
Oriental Pratincole	*Glareola maldivarum*	Pratincoles	Pratincoles	No	Accidental
South Polar Skua	*Stercorarius maccormicki*	Jaegers	Skuas	No	Casual
Pomarine Jaeger	*Stercorarius pomarinus*	Jaegers	Gulls, Terns, Jaegars	No	Common
Parasitic Jaeger	*Stercorarius parasiticus*	Jaegers	Gulls, Terns, Jaegars	Yes	Common
Long-tailed Jaeger	*Stercorarius longicaudus*	Jaegers	Gulls, Terns, Jaegars	Yes	Common
Dovekie	*Alle alle*	Auks, Murres, and Puffins	Pelagic (Marine)	No	Rare
Common Murre	*Uria aalge*	Auks, Murres, and Puffins	Pelagic (Marine)	No	Common
Thick-billed Murre	*Uria lomvia*	Auks, Murres, and Puffins	Pelagic (Marine)	No	Common
Black Guillemot	*Cepphus grylle*	Auks, Murres, and Puffins	Pelagic (Marine)	No	Common
Pigeon Guillemot	*Cepphus columba*	Auks, Murres, and Puffins	Pelagic (Marine)	No	Common
Long-billed Murrelet	*Brachyramphus perdix*	Auks, Murres, and Puffins	Pelagic (Marine)	No	Casual
Marbled Murrelet	*Brachyramphus marmoratus*	Auks, Murres, and Puffins	Pelagic (Marine)	No	Common
Kittlitz's Murrelet	*Brachyramphus brevirostris*	Auks, Murres, and Puffins	Pelagic (Marine)	No	Common
Ancient Murrelet	*Synthliboramphus antiquus*	Auks, Murres, and Puffins	Pelagic (Marine)	No	Common
Cassin's Auklet	*Ptychoramphus aleuticus*	Auks, Murres, and Puffins	Pelagic (Marine)	No	Common
Parakeet Auklet	*Aethia psittacula*	Auks, Murres, and Puffins	Pelagic (Marine)	No	Common
Least Auklet	*Aethia pusilla*	Auks, Murres, and Puffins	Pelagic (Marine)	No	Common
Whiskerred Auklet	*Aethia pygmaea*	Auks, Murres, and Puffins	Pelagic (Marine)	No	Common
Crested Auklet	*Aethia cristatella*	Auks, Murres, and Puffins	Pelagic (Marine)	No	Common
Rhinoceros Auklet	*Cerorhinca monocerata*	Auks, Murres, and Puffins	Pelagic (Marine)	No	Common

Common Name	Scientific Name	Family	Species Group	Anticipated to Occur	Status
Horned Puffin	*Fratercula corniculata*	Auks, Murres, and Puffins	Pelagic (Marine)	No	Common
Tufted Puffin	*Fratercula cirrhata*	Auks, Murres, and Puffins	Pelagic (Marine)	No	Common
Black-legged Kittiwake	*Rissa tridactyla*	Gulls and Terns	Gulls, Terns, Jaegars	No	Common
Red-legged Kittiwake	*Rissa brevirostris*	Gulls and Terns	Gulls, Terns, Jaegars	No	Common
Ivory Gull	*Pagophila eburnea*	Gulls and Terns	Gulls, Terns, Jaegars	No	Common
Sabine's Gull	*Xema sabini*	Gulls and Terns	Gulls, Terns, Jaegars	No	Common
Bonaparte's Gull	*Chroicocephalus philadelphia*	Gulls and Terns	Gulls, Terns, Jaegars	Yes	Common
Black-headed Gull	*Chroicocephalus ridibundus*	Gulls and Terns	Gulls, Terns, Jaegars	No	Rare
Little Gull	*Hydrocoloeus minutus*	Gulls and Terns	Gulls, Terns, Jaegars	No	Casual
Ross's Gull	*Rhodostethia rosea*	Gulls and Terns	Gulls, Terns, Jaegars	No	Common
Laughing Gull	*Leucophaeus atricilla*	Gulls and Terns	Gulls, Terns, Jaegars	No	Casual
Franklin's Gull	*Leucophaeus pipixcan*	Gulls and Terns	Gulls, Terns, Jaegars	No	Rare
Black-tailed Gull	*Larus crassirostris*	Gulls and Terns	Gulls, Terns, Jaegars	No	Casual
Heermann's Gull	*Larus heermanni*	Gulls and Terns	Gulls, Terns, Jaegars	No	Casual
Mew Gull	*Larus canus*	Gulls and Terns	Gulls, Terns, Jaegars	Yes	Common
Ring-billed Gull	*Larus delawarensis*	Gulls and Terns	Gulls, Terns, Jaegars	No	Rare
Western Gull	*Larus occidentalis*	Gulls and Terns	Gulls, Terns, Jaegars	No	Casual
California Gull	*Larus californicus*	Gulls and Terns	Gulls, Terns, Jaegars	Yes	Common
Herring Gull	*Larus argentatus*	Gulls and Terns	Gulls, Terns, Jaegars	Yes	Common
Iceland Gull	*Larus glaucoides*	Gulls and Terns	Gulls, Terns, Jaegars	No	Common
Lesser Black-backed Gull	*Larus fuscus*	Gulls and Terns	Gulls, Terns, Jaegars	No	Casual
Slaty-backed Gull	*Larus schistisagus*	Gulls and Terns	Gulls, Terns, Jaegars	Yes	Common
Glaucous-winged Gull	*Larus glaucescens*	Gulls and Terns	Gulls, Terns, Jaegars	Yes	Common
Glaucous Gull	*Larus hyperboreus*	Gulls and Terns	Gulls, Terns, Jaegars	Yes	Common
Great Black-backed Gull	*Larus marinus*	Gulls and Terns	Gulls, Terns, Jaegars	No	Casual
Sooty Tern	*Onychoprion fuscatus*	Gulls and Terns	Gulls, Terns, Jaegars	No	Accidental
Aleutian Tern	*Onychoprion aleuticus*	Gulls and Terns	Gulls, Terns, Jaegars	Yes	Common
Caspian Tern	*Hydroprogne caspia*	Gulls and Terns	Gulls, Terns, Jaegars	Yes	Common
Black Tern	*Chlidonias niger*	Gulls and Terns	Gulls, Terns, Jaegars	No	Casual
White-winged Tern	*Chlidonias leucopterus*	Gulls and Terns	Gulls, Terns, Jaegars	No	Casual
Common Tern	*Sterna hirundo*	Gulls and Terns	Gulls, Terns, Jaegars	No	Casual
Arctic Tern	*Sterna paradisaea*	Gulls and Terns	Gulls, Terns, Jaegars	Yes	Common
Band tailed Pigeon	*Patagioenas fasciata*	Pigeons and Doves	Pigeons and Doves	No	Rare
Oriental Turtle Dove	*Streptopelia orientalis*	Pigeons and Doves	Pigeons and Doves	No	Casual
Eurasian Collared Dove	*Streptopelia decaocto*	Pigeons and Doves	Pigeons and Doves	Yes	Common
White winged Dove	*Zenaida asiatica*	Pigeons and Doves	Pigeons and Doves	No	Accidental
Mourning Dove	*Zenaida macroura*	Pigeons and Doves	Pigeons and Doves	No	Rare

Common Name	Scientific Name	Family	Species Group	Anticipated to Occur	Status
Common Cuckoo	*Cuculus canorus*	Cuckoos	Cuckoos	No	Casual
Oriental Cuckoo	*Cuculus optatus*	Cuckoos	Cuckoos	No	Casual
Yellow billed Cuckoo	*Coccyzus americanus*	Cuckoos	Cuckoos	No	Casual
Oriental Scops Owl	*Otus sunia*	Typical Owls	Owls	No	Accidental
Western Screech Owl	*Megascops kennicottii*	Typical Owls	Owls	No	Rare
Great Horned Owl	*Bubo virginianus*	Typical Owls	Owls	Yes	Common
Snowy Owl	*Bubo scandiacus*	Typical Owls	Owls	No	Common
Northern Hawk Owl	*Surnia ulula*	Typical Owls	Owls	Yes	Common
Northern Pygmy Owl	*Glaucidium gnoma*	Typical Owls	Owls	No	Rare
Barred Owl	*Strix varia*	Typical Owls	Owls	Yes	Common
Great Gray Owl	*Strix nebulosa*	Typical Owls	Owls	Yes	Common
Long eared Owl	*Asio otus*	Typical Owls	Owls	No	Casual
Short eared Owl	*Asio flammeus*	Typical Owls	Owls	Yes	Common
Boreal Owl	*Aegolius funereus*	Typical Owls	Owls	Yes	Common
Northern Saw whet Owl	*Aegolius acadicus*	Typical Owls	Owls	Yes	Common
Brown Hawk Owl	*Ninox scutulata*	Typical Owls	Owls	No	Accidental
Lesser Nighthawk	*Chordeiles acutipennis*	Goatsuckers	Nighthawks and Poorwills	No	Accidental
Common Nighthawk	*Chordeiles minor*	Goatsuckers	Nighthawks and Poorwills	No	Rare
Eastern Whip poor will	*Antrostomus vociferus*	Goatsuckers	Nighthawks and Poorwills	No	Accidental
Gray Nightjar	*Caprimulgus indicus*	Goatsuckers	Nighthawks and Poorwills	No	Accidental
Black Swift	*Cypseloides niger*	Swifts	Swifts	Yes	Common
Chimney Swift	*Chaetura pelagica*	Swifts	Swifts	No	Accidental
Vaux's Swift	*Chaetura vauxi*	Swifts	Swifts	Yes	Common
White throated Needletail	*Hirundapus caudacutus*	Swifts	Swifts	No	Casual
Common Swift	*Apus apus*	Swifts	Swifts	No	Accidental
Fork tailed Swift	*Apus pacificus*	Swifts	Swifts	No	Casual
Ruby throated Hummingbird	*Archilochus colubris*	Hummingbirds	Hummingbirds	No	Casual
Anna's Hummingbird	*Calypte anna*	Hummingbirds	Hummingbirds	No	Rare
Costa's Hummingbird	*Calypte costae*	Hummingbirds	Hummingbirds	No	Casual
Rufous Hummingbird	*Selasphorus rufus*	Hummingbirds	Hummingbirds	Yes	Common
Eurasian Hoopoe	*Upupa epops*	Hoopoes	Hoopoes	No	Accidental
Belted Kingfisher	*Megaceryle alcyon*	Kingfishers	Kingfisher	Yes	Common
Eurasian Wryneck	*Jynx torquilla*	Woodpeckers	Woodpeckers	No	Accidental
Yellow bellied Sapsucker	*Sphyrapicus varius*	Woodpeckers	Woodpeckers	No	Casual
Red breasted Sapsucker	*Sphyrapicus ruber*	Woodpeckers	Woodpeckers	Yes	Common
Great Spotted Woodpecker	*Dendrocopos major*	Woodpeckers	Woodpeckers	No	Casual
Downy Woodpecker	*Picoides pubescens*	Woodpeckers	Woodpeckers	Yes	Common

Common Name	Scientific Name	Family	Species Group	Anticipated to Occur	Status
Hairy Woodpecker	*Picoides villosus*	Woodpeckers	Woodpeckers	Yes	Common
American Three toed Woodpecker	*Picoides dorsalis*	Woodpeckers	Woodpeckers	Yes	Common
Black backed Woodpecker	*Picoides arcticus*	Woodpeckers	Woodpeckers	Yes	Common
Northern Flicker	*Colaptes auratus*	Woodpeckers	Woodpeckers	Yes	Common
Eurasian Kestrel	*Falco tinnunculus*	Falcons	Raptors	No	Casual
American Kestrel	*Falco sparverius*	Falcons	Raptors	Yes	Common
Merlin	*Falco columbarius*	Falcons	Raptors	Yes	Common
Eurasian Hobby	*Falco subbuteo*	Falcons	Raptors	No	Casual
Gyrfalcon	*Falco rusticolus*	Falcons	Raptors	Yes	Common
Peregrine Falcon	*Falco peregrinus*	Falcons	Raptors	Yes	Common
Olive sided Flycatcher	*Contopus cooperi*	Tyrant Flycatchers	Perching Birds	Yes	Common
Western Wood Pewee	*Contopus sordidulus*	Tyrant Flycatchers	Perching Birds	Yes	Common
Yellow bellied Flycatcher	*Empidonax flaviventris*	Tyrant Flycatchers	Perching Birds	No	Rare
Alder Flycatcher	*Empidonax alnorum*	Tyrant Flycatchers	Perching Birds	Yes	Common
Willow Flycatcher	*Empidonax traillii*	Tyrant Flycatchers	Perching Birds	No	Casual
Least Flycatcher	*Empidonax minimus*	Tyrant Flycatchers	Perching Birds	No	Casual
Hammond's Flycatcher	*Empidonax hammondii*	Tyrant Flycatchers	Perching Birds	Yes	Common
Dusky Flycatcher	*Empidonax oberholseri*	Tyrant Flycatchers	Perching Birds	No	Casual
Pacific slope Flycatcher	*Empidonax difficilis*	Tyrant Flycatchers	Perching Birds	Yes	Common
Black Phoebe	*Sayornis nigricans*	Tyrant Flycatchers	Perching Birds	No	Accidental
Eastern Phoebe	*Sayornis phoebe*	Tyrant Flycatchers	Perching Birds	No	Casual
Say's Phoebe	*Sayornis saya*	Tyrant Flycatchers	Perching Birds	Yes	Common
Ash throated Flycatcher	*Myiarchus cinerascens*	Tyrant Flycatchers	Perching Birds	No	Accidental
Great Crested Flycatcher	*Myiarchus crinitus*	Tyrant Flycatchers	Perching Birds	No	Casual
Tropical Kingbird	*Tyrannus melancholicus*	Tyrant Flycatchers	Perching Birds	No	Casual
Western Kingbird	*Tyrannus verticalis*	Tyrant Flycatchers	Perching Birds	No	Casual
Eastern Kingbird	*Tyrannus tyrannus*	Tyrant Flycatchers	Perching Birds	No	Casual
Scissor tailed Flycatcher	*Tyrannus forficatus*	Tyrant Flycatchers	Perching Birds	No	Casual
Brown Shrike	*Lanius cristatus*	Shrikes	Perching Birds	No	Casual
Northern Shrike	*Lanius excubitor*	Shrikes	Perching Birds	Yes	Common
Cassin's Vireo	*Vireo cassinii*	Vireos	Perching Birds	No	Rare
Blue headed Vireo	*Vireo solitarius*	Vireos	Perching Birds	No	Accidental
Warbling Vireo	*Vireo gilvus*	Vireos	Perching Birds	Yes	Common
Philadelphia Vireo	*Vireo philadelphicus*	Vireos	Perching Birds	No	Casual
Red eyed Vireo	*Vireo olivaceus*	Vireos	Perching Birds	No	Casual
Gray Jay	*Perisoreus canadensis*	Crows and Jays	Corvids	Yes	Common
Steller's Jay	*Cyanocitta stelleri*	Crows and Jays	Corvids	Yes	Common

Common Name	Scientific Name	Family	Species Group	Anticipated to Occur	Status
Clark's Nutcracker	*Nucifraga columbiana*	Crows and Jays	Corvids	No	Casual
Black billed Magpie	*Pica hudsonia*	Crows and Jays	Corvids	Yes	Common
American Crow	*Corvus brachyrhynchos*	Crows and Jays	Corvids	No	Rare
Northwestern Crow	*Corvus caurinus*	Crows and Jays	Corvids	Yes	Common
Common Raven	*Corvus corax*	Crows and Jays	Corvids	Yes	Common
Sky Lark	*Alauda arvensis*	Larks	Perching Birds	No	Rare
Horned Lark	*Eremophila alpestris*	Larks	Perching Birds	Yes	Common
Purple Martin	*Progne subis*	Swallows	Perching Birds	No	Casual
Tree Swallow	*Tachycineta bicolor*	Swallows	Perching Birds	Yes	Common
Violet green Swallow	*Tachycineta thalassina*	Swallows	Perching Birds	Yes	Common
Northern Rough winged Swallow	*Stelgidopteryx serripennis*	Swallows	Perching Birds	No	Rare
Bank Swallow	*Riparia riparia*	Swallows	Perching Birds	Yes	Common
Cliff Swallow	*Petrochelidon pyrrhonota*	Swallows	Perching Birds	Yes	Common
Barn Swallow	*Hirundo rustica*	Swallows	Perching Birds	Yes	Common
Common House Martin	*Delichon urbicum*	Swallows	Perching Birds	No	Casual
Black capped Chickadee	*Poecile atricapillus*	Chickadees	Perching Birds	Yes	Common
Mountain Chickadee	*Poecile gambeli*	Chickadees	Perching Birds	No	Casual
Chestnut backed Chickadee	*Poecile rufescens*	Chickadees	Perching Birds	Yes	Common
Boreal Chickadee	*Poecile hudsonicus*	Chickadees	Perching Birds	Yes	Common
Gray headed Chickadee	*Poecile cinctus*	Chickadees	Perching Birds	No	Rare
Red breasted Nuthatch	*Sitta canadensis*	Nuthatches	Perching Birds	Yes	Common
Brown Creeper	*Certhia americana*	Creepers	Perching Birds	Yes	Common
Pacific Wren	*Troglodytes pacificus*	Wrens	Perching Birds	Yes	Common
Marsh Wren	*Cistothorus palustris*	Wrens	Perching Birds	No	Accidental
American Dipper	*Cinclus mexicanus*	Dippers	Perching Birds	Yes	Common
Golden crowned Kinglet	*Regulus satrapa*	Kinglets	Perching Birds	Yes	Common
Ruby crowned Kinglet	*Regulus calendula*	Kinglets	Perching Birds	Yes	Common
Willow Warbler	*Phylloscopus trochilus*	Leaf Warblers	Perching Birds	No	Casual
Common Chiffchaff	*Phylloscopus collybita*	Leaf Warblers	Perching Birds	No	Accidental
Wood Warbler	*Phylloscopus sibilatrix*	Leaf Warblers	Perching Birds	No	Casual
Dusky Warbler	*Phylloscopus fuscatus*	Leaf Warblers	Perching Birds	No	Rare
Pallas's Leaf Warbler	*Phylloscopus proregulus*	Leaf Warblers	Perching Birds	No	Accidental
Yellow browed Warbler	*Phylloscopus inornatus*	Leaf Warblers	Perching Birds	No	Casual
Arctic Warbler	*Phylloscopus borealis*	Leaf Warblers	Perching Birds	Yes	Common
Lesser Whitethroat	*Sylvia curruca*	Sylviid Warblers	Perching Birds	No	Accidental
Sedge Warbler	*Acrocephalus schoenobaenus*	Reed Warblers	Perching Birds	No	Accidental
Middendorff's Grasshopper Warbler	*Locustella ochotensis*	Grassbirds	Perching Birds	No	Casual

Common Name	Scientific Name	Family	Species Group	Anticipated to Occur	Status
Lanceolated Warbler Locustella	*lanceolata «*	Grassbirds	Perching Birds	No	Common
Gray streaked Flycatcher	*Muscicapa griseisticta*	Old World Flycatchers and Allies	Perching Birds	No	Casual
Asian Brown Flycatcher	*Muscicapa dauurica*	Old World Flycatchers and Allies	Perching Birds	No	Casual
Spotted Flycatcher	*Muscicapa striata*	Old World Flycatchers and Allies	Perching Birds	No	Accidental
Dark sided Flycatcher	*Muscicapa sibirica*	Old World Flycatchers and Allies	Perching Birds	No	Casual
Rufous tailed Robin	*Luscinia sibilans*	Old World Flycatchers and Allies	Perching Birds	No	Casual
Siberian Rubythroat	*Luscinia calliope*	Old World Flycatchers and Allies	Perching Birds	No	Rare
Bluethroat	*Luscinia svecica*	Old World Flycatchers and Allies	Perching Birds	No	Common
Siberian Blue Robin	*Luscinia cyane*	Old World Flycatchers and Allies	Perching Birds	No	Accidental
Red flanked Bluetail	*Tarsiger cyanurus*	Old World Flycatchers and Allies	Perching Birds	No	Casual
Narcissus Flycatcher	*Ficedula narcissina*	Old World Flycatchers and Allies	Perching Birds	No	Accidental
Taiga Flycatcher	*Ficedula albicilla*	Old World Flycatchers and Allies	Perching Birds	No	Casual
Northern Wheatear	*Oenanthe oenanthe*	Old World Flycatchers and Allies	Perching Birds	Yes	Common
Stonechat	*Saxicola torquatus*	Old World Flycatchers and Allies	Perching Birds	No	Casual
Common Redstart	*Phoenicurus phoenicurus*	Old World Flycatchers and Allies	Perching Birds	No	Accidental
Mountain Bluebird	*Sialia currucoides*	Thrushes	Perching Birds	No	Rare
Townsend's Solitaire	*Myadestes townsendi*	Thrushes	Perching Birds	Yes	Common
Veery	*Catharus fuscescens*	Thrushes	Perching Birds	No	Accidental
Gray cheeked Thrush	*Catharus minimus*	Thrushes	Perching Birds	Yes	Common
Swainson's Thrush	*Catharus ustulatus*	Thrushes	Perching Birds	Yes	Common
Hermit Thrush	*Catharus guttatus*	Thrushes	Perching Birds	Yes	Common
Eyebrowed Thrush	*Turdus obscurus*	Thrushes	Perching Birds	No	Rare
Dusky Thrush	*Turdus naumanni*	Thrushes	Perching Birds	No	Casual
Fieldfare	*Turdus pilaris*	Thrushes	Perching Birds	No	Casual
Redwing	*Turdus iliacus*	Thrushes	Perching Birds	No	Accidental
American Robin	*Turdus migratorius*	Thrushes	Perching Birds	Yes	Common
Varied Thrush	*Ixoreus naevius*	Thrushes	Perching Birds	Yes	Common
Gray Catbird	*Dumetella carolinensis*	Mockingbirds and Thrashers	Perching Birds	No	Casual
Brown Thrasher	*Toxostoma rufum*	Mockingbirds and Thrashers	Perching Birds	No	Casual
Northern Mockingbird	*Mimus polyglottos*	Mockingbirds and Thrashers	Perching Birds	No	Casual
European Starling	*Sturnus vulgaris*	Starlings	Perching Birds	Yes	Common
Siberian Accentor	*Prunella montanella*	Accentors	Perching Birds	No	Casual
Eastern Yellow Wagtail	*Motacilla tschutschensis*	Wagtails and Pipits	Perching Birds	No	Common
Gray Wagtail	*Motacilla cinerea*	Wagtails and Pipits	Perching Birds	No	Casual
White Wagtail	*Motacilla alba*	Wagtails and Pipits	Perching Birds	No	Rare
Tree Pipit	*Anthus trivialis*	Wagtails and Pipits	Perching Birds	No	Casual
Olive backed Pipit	*Anthus hodgsoni*	Wagtails and Pipits	Perching Birds	No	Casual

Common Name	Scientific Name	Family	Species Group	Anticipated to Occur	Status
Pechora Pipit	*Anthus gustavi*	Wagtails and Pipits	Perching Birds	No	Casual
Red throated Pipit	*Anthus cervinus*	Wagtails and Pipits	Perching Birds	No	Common
American Pipit	*Anthus rubescens*	Wagtails and Pipits	Perching Birds	Yes	Common
Bohemian Waxwing	*Bombycilla garrulus*	Waxwings	Perching Birds	Yes	Common
Cedar Waxwing	*Bombycilla cedrorum*	Waxwings	Perching Birds	Yes	Common
Lapland Longspur	*Calcarius lapponicus*	Longspurs and Snow Buntings	Perching Birds	Yes	Common
Smith's Longspur	*Calcarius pictus*	Longspurs and Snow Buntings	Perching Birds	Yes	Common
Snow Bunting	*Plectrophenax nivalis*	Longspurs and Snow Buntings	Perching Birds	Yes	Common
McKay's Bunting	*Plectrophenax hyperboreus*	Longspurs and Snow Buntings	Perching Birds	No	Common
Ovenbird	*Seiurus aurocapilla*	Wood-Warblers	Perching Birds	No	Casual
Northern Waterthrush	*Parkesia noveboracensis*	Wood-Warblers	Perching Birds	Yes	Common
Black and white Warbler	*Mniotilta varia*	Wood-Warblers	Perching Birds	No	Casual
Tennessee Warbler	*Oreothlypis peregrina*	Wood-Warblers	Perching Birds	No	Rare
Orange crowned Warbler	*Oreothlypis celata*	Wood-Warblers	Perching Birds	Yes	Common
Nashville Warbler	*Oreothlypis ruficapilla*	Wood-Warblers	Perching Birds	No	Casual
MacGillivray's Warbler	*Geothlypis tolmiei*	Wood-Warblers	Perching Birds	Yes	Common
Mourning Warbler	*Geothlypis philadelphia*	Wood-Warblers	Perching Birds	No	Casual
Common Yellowthroat	*Geothlypis trichas*	Wood-Warblers	Perching Birds	Yes	Common
American Redstart	*Setophaga ruticilla*	Wood-Warblers	Perching Birds	Yes	Common
Cape May Warbler	*Setophaga tigrina*	Wood-Warblers	Perching Birds	No	Casual
Magnolia Warbler	*Setophaga magnolia*	Wood-Warblers	Perching Birds	No	Casual
Yellow Warbler	*Setophaga petechia*	Wood-Warblers	Perching Birds	Yes	Common
Chestnut sided Warbler	*Setophaga pensylvanica*	Wood-Warblers	Perching Birds	No	Casual
Blackpoll Warbler	*Setophaga striata*	Wood-Warblers	Perching Birds	Yes	Common
Black throated Blue Warbler	*Setophaga caerulescens*	Wood-Warblers	Perching Birds	No	Accidental
Palm Warbler	*Setophaga palmarum*	Wood-Warblers	Perching Birds	No	Casual
Yellow rumped Warbler	*Setophaga coronata*	Wood-Warblers	Perching Birds	Yes	Common
Prairie Warbler	*Setophaga discolor*	Wood-Warblers	Perching Birds	No	Accidental
Townsend's Warbler	*Setophaga townsendi*	Wood-Warblers	Perching Birds	Yes	Common
Black throated Green Warbler	*Setophaga virens*	Wood-Warblers	Perching Birds	No	Accidental
Canada Warbler	*Cardellina canadensis*	Wood-Warblers	Perching Birds	No	Accidental
Wilson's Warbler	*Cardellina pusilla*	Wood-Warblers	Perching Birds	Yes	Common
Spotted Towhee	*Pipilo maculatus*	Emberizids	Perching Birds	No	Casual
American Tree Sparrow	*Spizella arborea*	Emberizids	Perching Birds	Yes	Common
Chipping Sparrow	*Spizella passerina*	Emberizids	Perching Birds	Yes	Common
Clay colored Sparrow	*Spizella pallida*	Emberizids	Perching Birds	No	Casual
Brewer's Sparrow	*Spizella breweri*	Emberizids	Perching Birds	No	Rare

Common Name	Scientific Name	Family	Species Group	Anticipated to Occur	Status
Vesper Sparrow	*Pooecetes gramineus*	Emberizids	Perching Birds	No	Accidental
Lark Sparrow	*Chondestes grammacus*	Emberizids	Perching Birds	No	Casual
Savannah Sparrow	*Passerculus sandwichensis*	Emberizids	Perching Birds	Yes	Common
Fox Sparrow	*Passerella iliaca*	Emberizids	Perching Birds	Yes	Common
Song Sparrow	*Melospiza melodia*	Emberizids	Perching Birds	Yes	Common
Lincoln's Sparrow	*Melospiza lincolnii*	Emberizids	Perching Birds	Yes	Common
Swamp Sparrow	*Melospiza georgiana*	Emberizids	Perching Birds	No	Rare
White throated Sparrow	*Zonotrichia albicollis*	Emberizids	Perching Birds	No	Rare
Harris's Sparrow	*Zonotrichia querula*	Emberizids	Perching Birds	No	Casual
White crowned Sparrow	*Zonotrichia leucophrys*	Emberizids	Perching Birds	Yes	Common
Golden crowned Sparrow	*Zonotrichia atricapilla*	Emberizids	Perching Birds	Yes	Common
Dark eyed Junco	*Junco hyemalis*	Emberizids	Perching Birds	Yes	Common
Pine Bunting	*Emberiza leucocephalos*	Emberizids	Perching Birds	No	Casual
Yellow browed Bunting	*Emberiza chrysophrys*	Emberizids	Perching Birds	No	Accidental
Little Bunting	*Emberiza pusilla*	Emberizids	Perching Birds	No	Casual
Rustic Bunting	*Emberiza rustica*	Emberizids	Perching Birds	No	Rare
Yellow throated Bunting	*Emberiza elegans*	Emberizids	Perching Birds	No	Accidental
Yellow breasted Bunting	*Emberiza aureola*	Emberizids	Perching Birds	No	Casual
Gray Bunting	*Emberiza variabilis*	Emberizids	Perching Birds	No	Casual
Pallas's Bunting	*Emberiza pallasi*	Emberizids	Perching Birds	No	Casual
Reed Bunting	*Emberiza schoeniclus*	Emberizids	Perching Birds	No	Casual
Scarlet Tanager	*Piranga olivacea*	Cardinals and Allies	Perching Birds	No	Accidental
Western Tanager	*Piranga ludoviciana*	Cardinals and Allies	Perching Birds	Yes	Common
Rose breasted Grosbeak	*Pheucticus ludovicianus*	Cardinals and Allies	Perching Birds	No	Casual
Black headed Grosbeak	*Pheucticus melanocephalus*	Cardinals and Allies	Perching Birds	No	Rare
Blue Grosbeak	*Passerina caerulea*	Cardinals and Allies	Perching Birds	No	Accidental
Lazuli Bunting	*Passerina amoena*	Cardinals and Allies	Perching Birds	No	Casual
Indigo Bunting	*Passerina cyanea*	Cardinals and Allies	Perching Birds	No	Casual
Dickcissel	*Spiza americana*	Cardinals and Allies	Perching Birds	No	Accidental
Bobolink	*Dolichonyx oryzivorus*	Blackbirds	Perching Birds	No	Casual
Red winged Blackbird	*Agelaius phoeniceus*	Blackbirds	Perching Birds	Yes	Common
Western Meadowlark	*Sturnella neglecta*	Blackbirds	Perching Birds	No	Casual
Yellow headed Blackbird	*Xanthocephalus xanthocephalus*	Blackbirds	Perching Birds	No	Casual
Rusty Blackbird	*Euphagus carolinus*	Blackbirds	Perching Birds	Yes	Common
Brewer's Blackbird	*Euphagus cyanocephalus*	Blackbirds	Perching Birds	No	Casual
Common Grackle	*Quiscalus quiscula*	Blackbirds	Perching Birds	No	Casual
Brown headed Cowbird	*Molothrus ater*	Blackbirds	Perching Birds	No	Rare

Common Name	Scientific Name	Family	Species Group	Anticipated to Occur	Status
Orchard Oriole	*Icterus spurius*	Blackbirds	Perching Birds	No	Accidental
Bullock's Oriole	*Icterus bullockii*	Blackbirds	Perching Birds	No	Casual
Brambling	*Fringilla montifringilla*	Fringilline and Cardueline Finches	Perching Birds	No	Common
Asian Rosy Finch	*Leucosticte arctoa*	Fringilline and Cardueline Finches	Perching Birds	No	Accidental
Gray crowned Rosy Finch	*Leucosticte tephrocotis*	Fringilline and Cardueline Finches	Perching Birds	Yes	Common
Pine Grosbeak	*Pinicola enucleator*	Fringilline and Cardueline Finches	Perching Birds	Yes	Common
Eurasian Bullfinch	*Pyrrhula pyrrhula*	Fringilline and Cardueline Finches	Perching Birds	No	Casual
Common Rosefinch	*Carpodacus erythrinus*	Fringilline and Cardueline Finches	Perching Birds	No	Casual
House Finch	*Haemorhous mexicanus*	Fringilline and Cardueline Finches	Perching Birds	No	Casual
Purple Finch	*Haemorhous purpureus*	Fringilline and Cardueline Finches	Perching Birds	No	Rare
Cassin's Finch	*Haemorhous cassinii*	Fringilline and Cardueline Finches	Perching Birds	No	Casual
Red Crossbill	*Loxia curvirostra*	Fringilline and Cardueline Finches	Perching Birds	Yes	Common
White winged Crossbill	*Loxia leucoptera*	Fringilline and Cardueline Finches	Perching Birds	Yes	Common
Common Redpoll	*Acanthis flammea*	Fringilline and Cardueline Finches	Perching Birds	Yes	Common
Hoary Redpoll	*Acanthis hornemanni*	Fringilline and Cardueline Finches	Perching Birds	Yes	Common
Eurasian Siskin	*Spinus spinus*	Fringilline and Cardueline Finches	Perching Birds	No	Accidental
Pine Siskin	*Spinus pinus*	Fringilline and Cardueline Finches	Perching Birds	Yes	Common
American Goldfinch	*Spinus tristis*	Fringilline and Cardueline Finches	Perching Birds	No	Casual
Oriental Greenfinch	*Chloris sinica*	Fringilline and Cardueline Finches	Perching Birds	No	Casual
Evening Grosbeak	*Coccothraustes vespertinus*	Fringilline and Cardueline Finches	Perching Birds	No	Casual
Hawfinch	*Coccothraustes coccothraustes*	Fringilline and Cardueline Finches	Perching Birds	No	Casual
House Sparrow	*Passer domesticus*	Old World Sparrows	Perching Birds	No	Rare

AMPHIBIANS

Common Name	Scientific Name	Clade	Anticipated to Occur
Columbia Spotted Frog	*Rana luteiventris*	Anuran	Yes
Wood Frog	*Rana sylvatica*	Anuran	Yes
Roughskin Newt	*Taricha granulosa*	Salamanders and Newts	Yes
Long-toed Salamander	*Ambystoma macrodactylum*	Salamanders and Newts	Yes
Northwestern Salamander	*Ambystoma gracile*	Salamanders and Newts	Yes
Western Toad	*Bufo boreas*	Toad	Yes

MARINE MAMMALS

Common Name	Scientific Name	Clade	Anticipated to Occur	Strata Type Association
Baird's Beaked Whale	*Berardius bairdii*	Cetacea-whales	No	Marine
Beluga Whale	*Delphinapterus leucas*	Cetacea-whales	No	Marine
Blue Whale	*Balaenoptera musculus*	Cetacea-whales	No	Marine
Bowhead Whale	*Balaena mysticetus*	Cetacea-whales	No	Marine
Common Minke Whale	*Balaenoptera acutorostrata*	Cetacea-whales	No	Marine
Cuvier's Beaked Whale	*Ziphius cavirostris*	Cetacea-whales	No	Marine
Dall's Porpoise	*Phocoenoides dalli*	Cetacea-whales	No	Marine
False Killer Whale	*Pseudorca crassidens*	Cetacea-whales	No	Marine
Fin Whale	*Balaenoptera physalus*	Cetacea-whales	No	Marine
Gray Whale	*Eschrichtius robustus*	Cetacea-whales	No	Marine
Humpback Whale	*Megaptera novaeangliae*	Cetacea-whales	No	Marine
Killer Whale	*Orcinus orca*	Cetacea-whales	No	Marine
Narwhal	*Monodon monocerus*	Cetacea-whales	No	Marine
North Pacific Right Whale	*Eubalaena japonica*	Cetacea-whales	No	Marine
Northern Right-whale dolphin	Lissodelphis borealis	Cetacea-whales	No	Marine

Common Name	Scientific Name	Clade	Anticipated to Occur	Strata Type Association
Pacific white-sided dolphin	*Lagenorhynchus obliquidens*	Cetacea-whales	No	Marine
Pantropical spotted dolphin	*Stenella attenuata*	Cetacea-whales	No	Marine
Pygmy Sperm Whale	*Kogia breviceps*	Cetacea-whales	No	Marine
Risso's Dolphin	Grampus griseaus	Cetacea-whales	No	Marine
Sei Whale	*Balaenoptera borealis*	Cetacea-whales	No	Marine
Short-finned Pilot Whale	Globicephala macrorhynchus	Cetacea-whales	No	Marine
Sperm Whale	*Physeter macrocephalus*	Cetacea-whales	No	Marine
Stejneger's Beaked Whale	*Mesoplodon stejnegeri*	Cetacea-whales	No	Marine
Striped Dolphin	Stenella coeruleoalba	Cetacea-whales	No	Marine
Northern Sea Otter	*Enhydra lutris kenyoni*	Mustelid	No	Marine
California Sea Lion	*Zalophus californianus*	Otariidea-Sea Lions	No	Marine
Northern Fur Seal	*Callorhinus ursinus*	Otariidea-Sea Lions	No	Marine
Steller Sea Lion	*Eumetopias jubatus*	Otariidea-Sea Lions	No	Marine
Bearded Seal	*Erignathus barbatus*	Phocidea-Seals	No	Marine
Northern Elephant Seal	*Mirounga angustirostris*	Phocidea-Seals	No	Marine
Harbor Porpoise	*Phocoena phocoena*	Phocidea-Seals	No	Marine
Harbor Seal	*Phoca vitulina*	Phocidea-Seals	No	Marine
Harp Seal	*Phoca groenlandica*	Phocidea-Seals	No	Marine
Hooded Seal	*Cystophora cristata*	Phocidea-Seals	No	Marine
Pacific Walrus	*Odobenus rosmarus divergens*	Phocidea-Seals	No	Marine
Ribbon Seal	*Phoca fasciata*	Phocidea-Seals	No	Marine
Ringed Seal	*Phoca hispida*	Phocidea-Seals	No	Marine
Spotted Seal	*Phoca largha*	Phocidea-Seals	No	Marine
Stellars Sea Cow	*Hydrodamalis gigas*	Sirens	No	Marine

UNCONFIRMED BIRDS

Common Name	Scientific Name	Family	Species Group	Anticipated to Occur	Status
Clark's Grebe	*Aechmophorus clarkii*	NA	NA	No	Not confirmed
Little Shearwater	*Puffinus assimilis*	NA	NA	No	Not confirmed
Swinhoe's Storm Petrel	*Oceanodroma monorhis*	NA	NA	No	Not confirmed
Northern Gannet	*Morus bassanus*	NA	NA	No	Not confirmed
Eurasian Bittern	*Botaurus stellaris*	NA	NA	No	Not confirmed
Snowy Egret	*Egretta thula*	NA	NA	No	Not confirmed
Chinese Sparrowhawk	*Accipiter soloensis*	NA	NA	No	Not confirmed
Cooper's Hawk	*Accipiter cooperii*	NA	NA	No	Not confirmed
Common Buzzard	*Buteo buteo*	NA	NA	No	Not confirmed
Yellow Rail	*Coturnicops noveboracensis*	NA	NA	No	Not confirmed
Baillon's Crake	*Porzana pusilla*	NA	NA	No	Not confirmed
Kentish/Snowy Plover	*Charadrius alexandrinus/nivosus*	NA	NA	No	Not confirmed
Long billed Curlew	*Numenius americanus*	NA	NA	No	Not confirmed
Little/Least Tern	*Sternula albifrons/antillarum*	NA	NA	No	Not confirmed
Calliope Hummingbird	*Selasphorus calliope*	NA	NA	No	Not confirmed
Pileated Woodpecker	*Dryocopus pileatus*	NA	NA	No	Not confirmed
Great Tit	*Parus major*	NA	NA	No	Not confirmed
Blyth's Reed Warbler	*Acrocephalus dumetorum*	NA	NA	No	Not confirmed
Mugimaki Flycatcher	*Ficedula mugimaki*	NA	NA	No	Not confirmed
Chestnut collared Longspur	*Calcarius ornatus*	NA	NA	No	Not confirmed
Kentucky Warbler	*Geothlypis formosa*	NA	NA	No	Not confirmed
Northern Parula	*Setophaga americana*	NA	NA	No	Not confirmed
Bay breasted Warbler	*Setophaga castanea*	NA	NA	No	Not confirmed
Black throated Gray Warbler	*Setophaga nigrescens*	NA	NA	No	Not confirmed
Hermit Warbler	*Setophaga occidentalis*	NA	NA	No	Not confirmed

APPENDIX 2

AWAP Species listed by the State of Alaska and/or the BLM

Species	Clade	SoA Status	BLM Status	Known Occurrence	Potential to Occur	Potential Occurrence Comment	Potential to Interact
Red-legged frog	Amphibians	Not listed	Not listed	None in Alaska	Low	suitable habitat on site but not documented to occur in state	High
Long-toed salamander	Amphibians	Not listed	Not listed	in Tongass, near Juneau-SA at edge of range map	High	suitable habitat on site	High
Northwestern salamander	Amphibians	Not listed	Not listed	in Tongass,close to known range	Moderate	suitable habitat on site	High
Rough-skinned newt	Amphibians	Not listed	Not listed	in Tongass, near Juneau-SA at edge of range map	High	suitable habitat on site	High
Western toad	Amphibians	Not listed	Not listed	Yes, just south of study area	High	suitable habitat on site	High
Wood frog	Amphibians	Not listed	Not listed	Most common amphib in alaska	High	suitable habitat on site	High
Short-tailed albatross	Birds	Endangered	Not listed	Aleutians	Nil	not in range	Nil
Red-throated loon	Birds	Not listed	Sensitive	Aleutians	Nil	not in range	Nil
Yellow-billed loon	Birds	Not listed	Sensitive	Northern Alaska	Nil	not in range	Nil
Aleutian Canada goose	Birds	SSOC	Not listed	Species not in database	Nil	not in range	Nil
Steller's eider	Birds	SSOC	Not listed	Northern Alaska	Nil	not in range	Nil
Spectacled eider	Birds	SSOC	Not listed	Northern Alaska	Nil	not in range	Nil
Queen Charlotte northern goshawk	Birds	SSOC	Sensitive	None mapped	High	good habitat, in known range	Moderate
Peale's peregrine falcon	Birds	Not listed	Sensitive	in known range	Moderate	good habitat, in known range	Moderate
Arctic peregrine falcon	Birds	SSOC	Sensitive	Northern Alaska	Nil	not in range	Nil
Eskimo curlew	Birds	Endangered	Not listed	Northern Alaska	Nil	not in range	Nil
Bristle-thighed curlew	Birds	Not listed	Sensitive	North-western Alaska	Nil	not in range	Nil
Black-tailed godwit	Birds	Not listed	Sensitive	Aleutians	Nil	not in range	Nil
Hudsonian godwit	Birds	Not listed	Sensitive	North-western Alaska	Nil	not in range	Nil
Marbled godwit	Birds	Not listed	Sensitive	North-western Alaska	Nil	not in range	Nil
Surfbird	Birds	Not listed	Sensitive	3 records at Juneau and elsewhere well outside project area	Nil	no habitat	Nil
Red knot	Birds	Not listed	Sensitive	North-western Alaska	Nil	not in range	Nil
Buff-breasted sandpiper	Birds	Not listed	Sensitive	Northern Alaska	Nil	not in range	Nil
Dovekie	Birds	Not listed	Sensitive	Bering sea islands	Nil	not in range	Nil
Black guillemot	Birds	Not listed	Sensitive	Northern Alaska	Nil	not in range	Nil
Marbled murrelet	Birds	Not listed	Sensitive	south of Juneau	Moderate	good habitat, in known range	High
Kittlitz's murrelet	Birds	Not listed	Sensitive	North-western Alaska	Nil	not in range	Nil
Olive-sided flycatcher	Birds	SSOC	Sensitive	study area in buffer of mapped occurrence	High	good habitat, in known range	Moderate
Gray-cheeked thrush	Birds	SSOC	Sensitive	south of Juneau	High	good habitat, in known range	High
Blackpoll warbler	Birds	SSOC	Sensitive	Central Alaska	Nil	not in range	Nil
Townsend's warbler	Birds	SSOC	Sensitive	None documented	High	good habitat, in known range	Low
McKay's bunting	Birds	Not listed	Sensitive	North-western Alaska	Nil	not in range	Nil
Rock ptarmigan	Birds	Not listed	Not listed	Confirmed in Project Area	High	Confirmed	HIgh
Golden eagle	Birds	Not listed	Not listed	Confirmed in Project Area	High	Confirmed	HIgh
Western screech-owl	Birds	Not listed	Not listed	Suspected to occur	High	Suspected	High
Sea otter	Mammals	SSOC	Not listed	Alaska coastline	Nil	not in range	Nil
Pacific harbor seal	Mammals	SSOC	Sensitive	Alaska coastline	Nil	not in range	Nil

Species	Clade	SoA Status	BLM Status	Known Occurrence	Potential to Occur	Potential Occurrence Comment	Potential to Interact
Stellar's sea lion	Mammals	SSOC	Not listed	Alaska coastline	Nil	not in range	Nil
Brown bear, Kenai pop.	Mammals	SSOC	Not listed	Kenai	Nil	not in range	Nil
Beluga whale	Mammals	SSOC	Not listed	Alaska coastline	Nil	not in range	Nil
Blue whale	Mammals	Endangered	Not listed	Alaska coastline	Nil	not in range	Nil
Bowhead whale	Mammals	SSOC	Not listed	Alaska coastline	Nil	not in range	Nil
Humpback whale	Mammals	SSOC	Not listed	Alaska coastline	Nil	not in range	Nil
Northern right whale	Mammals	Endangered	Not listed	Alaska coastline	Nil	not in range	Nil
Brown bear	Mammals	Not listed	Not listed	Confirmed in Project Area	High	Confirmed	HIgh
Mountain goat	Mammals	Not listed	Not listed	Confirmed in Project Area	High	Confirmed	HIgh
Moose	Mammals	Not listed	Not listed	Confirmed in Project Area	High	Confirmed	HIgh
Wolverine	Mammals	Not listed	Not listed	Suspected to occur	High	Suspected	High

APPENDIX 3

Wildlife Observations for the Palmer Project Area

Appendix 3

Record ID	Species	Date	Time	TT	Observer	Species Group Observed	# of Individuals	Obs. Latitude	Obs. Longitude	Zone	Obs. Easting	Obs. Northing	Projection	Wildlife Lat	Wildlife Long	W.Zone
1	Unidentified to species	08/05/2014	10:55:45	AM	Tighe-Pilot	Unidentified Frog	1	59.41687	-136.23089	8	430139	6586910	NAD27	59.41687	-136.23089	8
2	Red tailed Hawk	09/03/2014	8:02:47	AM	Darwin Green	Raptors	1	59.40754	-136.32053	8	425031	6585969	NAD27	59.40754	-136.32053	8
3	Unidentified to species	09/03/2014	7:52:24	AM	Darwin Green	Owls	3	59.3896	-136.30675	8	425774	6583956	NAD27	59.3896	-136.30675	8
4	Golden Eagle	09/01/2014	7:58:28	AM	Dan Wakerman	Raptors	0	59.38864	-136.39702	8	420645	6583953	NAD27	59.38864	-136.39702	8
5	Rock Ptarmigan	08/31/2014	7:20:35	PM	HeliPilot - Other	Grouse	5	59.39598	-136.44511	8	417931	6584829	NAD27	59.39598	-136.44511	8
6	Bald Eagle	08/20/2014	11:59:03	AM	Shayne Price	Raptors	2	59.39601	-136.39078	8	421017	6584767	NAD27	59.39601	-136.39078	8
7	Golden Eagle	08/19/2014	3:45:05	PM	Tighe-Pilot	Raptors	1	59.39243	-136.37568	8	421866	6584350	NAD27	Same,		8
8	Great Blue Heron	08/12/2014	8:19:50	PM	Darwin Green	Herons, Bitterns & Cranes	1	59.42236	-136.26615	8	428150	6587559	NAD27	59.42236	-136.26615	8
9	Golden Eagle	08/01/2014	9:03:38	AM	Dan Wakerman	Raptors	3	59.39858	-136.38582	8	421304	6585047	NAD27	59.39858	-136.38582	8
10	Golden Eagle	07/30/2014	7:35:12	AM	Dan Wakerman	Raptors	1	59.38993	-136.38906	8	421100	6584088	NAD27	59.38993	-136.38906	8
11	American Three toed Woodpecker	07/23/2014	3:39:48	PM	Dan Wakerman	Woodpeckers	1	59.417386	-136.303866	8	425999	6587047	NAD27	1st tributary crossing on road from Glacier creek washed out bridge. ~500meters up stream.		8
12	Belted Kingfisher	07/21/2014	3:57:44	PM	Darsie Culbeck	Kingfisher	1	59.417814	-136.229826	8	430201	6587014	NAD27	Core shack,		8
13	Golden Eagle	07/06/2014	3:50:06	PM	Tighe-Pilot	Raptors	1	59.39795	-136.38263	8	421484	6584973	NAD27	59.39795	-136.38263	8
14	Rufous Hummingbird	07/05/2014	5:08:54	PM	Tighe-Pilot	Hummingbirds	1	59.393895	-136.388357	8	421149	6584528	NAD27	Same,		8
15	Golden Eagle	07/05/2014	4:41:51	PM	Tighe-Pilot	Raptors	1	59.40376	-136.27811	8	427431	6585501	NAD27	59.40376	-136.27811	8
16	Mountain Goat	09/27/2014	11:01:38	AM	Shayne Price	Bovid	6	59.41736	-136.42119	8	419341	6587180	NAD27	59.41736	-136.42119	8
17	Unidentified to species	09/23/2014	4:36:05	PM	Shayne Price	Bear	1	59.40502	-136.37793	8	421767	6585755	NAD27	59.40502	-136.37793	8
18	Brown Bear	09/09/2014	11:45:03	AM	Shayne Price	Bear	2	59.41312	-136.36731	8	422388	6586644	NAD27	59.41312	-136.36731	8
19	Brown Bear	09/08/2014	4:10:49	PM	Dan Wackerman	Bear	2	59.40317	-136.3765	8	421844	6585547	NAD27	59.40317	-136.3765	8
20	Mountain Goat	09/08/2014	9:28:59	AM	Dan Wackerman	Bovid	2	59.39743	-136.39461	8	420802	6584929	NAD27	59.39743	-136.39461	8
21	Black Bear	09/03/2014	5:06:42	PM	Other-Pilot	Bear	4	59.39968	-136.32353	8	424844	6585097	NAD27	59.39968	-136.32353	8
22	Moose	09/03/2014	5:04:54	PM	Other-Pilot	Cervid	2	59.39968	-136.32353	8	424844	6585097	NAD27	59.39968	-136.32353	8
23	Black Bear	09/03/2014	7:58:24	AM	Darsie Culbeck	Bear	1	59.41713	-136.23034	8	430171	6586939	NAD27	59.41713	-136.23034	8
24	Black Bear	09/01/2014	6:04:15	PM	Jesse Reis	Bear	1	59.41093	-136.3944	8	420846	6586432	NAD27	59.41093	-136.3944	8
25	Brown Bear	08/31/2014	7:14:59	PM	HeliPilot - Other	Bear	2	59.39978	-136.37678	8	421820	6585170	NAD27	59.39978	-136.37678	8
26	Mountain Goat	08/31/2014	7:11:54	PM	HeliPilot - Other	Bovid	1	59.39162	-136.3872	8	421210	6584274	NAD27	59.39162	-136.3872	8
27	Mountain Goat	08/29/2014	6:27:52	PM	Roy Greig	Bovid	5	59.41732	-136.4261	8	419062	6587182	NAD27	59.41732	-136.4261	8
28	Mountain Goat	08/29/2014	6:25:49	PM	Roy Greig	Bovid	5	59.41866	-136.42121	8	419342	6587325	NAD27	59.41866	-136.42121	8
29	Brown Bear	08/23/2014	7:35:40	AM	Dan Wackerman	Bear	1	59.40043	-136.37337	8	422015	6585238	NAD27	59.40043	-136.37337	8
30	Brown Bear	08/22/2014	5:40:03	PM	Shayne Price	Bear	1	59.39601	-136.39078	8	421017	6584767	NAD27	59.39601	-136.39078	8
31	Arctic Ground Squirrel	08/19/2014	5:36:12	PM	Darsie Culbeck	Squirrel Family	1	59.390898	-136.393581	8	420846	6584201	NAD27	Green pad,		8
32	Mountain Goat	08/19/2014	12:47:58	PM	Tighe-Pilot	Bovid	2	59.39368	-136.40185	8	420383	6584520	NAD27	59.39368	-136.40185	8
33	Mountain Goat	08/12/2014	8:23:04	PM	Tighe-Pilot	Bovid	2	59.38734	-136.38944	8	421073	6583800	NAD27	59.38734	-136.38944	8
34	Moose	08/05/2014	11:01:19	AM	Tighe-Pilot	Cervid	1	59.40693	-136.27867	8	427406	6585855	NAD27	59.40693	-136.27867	8
35	Hoary Marmot	08/01/2014	9:02:23	AM	Dan Wakerman	Squirrel Family	8	59.39858	-136.38582	8	421304	6585047	NAD27	59.39858	-136.38582	8
36	Black Bear	07/30/2014	6:28:36	PM	Dan Wakerman	Bear	1	59.40911	-136.38344	8	421464	6586216	NAD27	59.40911	-136.38344	8
37	Black Bear	07/30/2014	6:19:30	PM	Shayne Price	Bear	1	59.40891	-136.38256	8	421513	6586193	NAD27	59.40891	-136.38256	8
38	Hoary Marmot	07/30/2014	7:39:39	AM	Dan Wakerman	Squirrel Family	2	59.39328	-136.39141	8	420974	6584463	NAD27	59.39328	-136.39141	8

Record ID	Species	Date	Time	TT	Observer	Species Group Observed	# of Individuals	Obs. Latitude	Obs. Longitude	Zone	Obs. Easting	Obs. Northing	Projection	Wildlife Lat	Wildlife Long	W.Z one
39	Brown Bear	07/30/2014	7:31:22	AM	Dan Wakerman	Bear	2	59.41163	-136.4003	8	420513	6586517	NAD27	59.41163	-136.4003	8
40	Unidentified to species	07/26/2014	7:59:45	AM	Jesse Reis	Rodent	1	59.40285	-136.40097	8	420454	6585540	NAD27	59.40285	-136.40097	8
41	Brown Bear	07/21/2014	10:17:05	AM	Austin Badger	Bear	1	59.419084	-136.226796	8	430376	6587153	NAD27	Near camp,		8
42	Brown Bear	07/18/2014	7:44:38	PM	Tighe-Pilot	Bear	3	59.39108	-136.38764	8	421183	6584214	NAD27	59.39108	-136.38764	8
43	Unidentified to species	07/17/2014	10:11:54	AM	Tighe-Pilot	Bear	1	59.380202	-136.386837	8	421204	6583002	NAD27	On east toe of saksie glacier where ice gives way to exposed rock. next to water fall,		8
44	Unidentified to species	07/16/2014	12:00:35	PM	Tighe-Pilot	Bear	3	59.42195	-136.22757	8	430338	6587473	NAD27	59.42195	-136.22757	8
45	Unidentified to species	07/16/2014	11:57:07	AM	Tighe-Pilot	Bear	3	59.42468	-136.22535	8	430470	6587774	NAD27	59.42468	-136.22535	8
46	Unidentified to species	07/12/2014	8:34:46	AM	Tim Thomas	Bear	2	59.41159	-136.38507	8	421377	6586495	NAD27	59.41159	-136.38507	8
47	Black Bear	07/12/2014	8:24:56	AM	Tighe-Pilot	Bear	1	59.41159	-136.38507	8	421377	6586495	NAD27	59.41159	-136.38507	8
48	Hoary Marmot	07/10/2014	4:49:57	PM	Logan Miller	Squirrel Family	1	59.40579	-136.40734	8	420099	6585875	NAD27	59.40579	-136.40734	8
49	Red Squirrel	07/10/2014	12:53:52	PM	Tighe-Pilot	Squirrel Family	1	59.41687	-136.23089	8	430139	6586910	NAD27	59.41687	-136.23089	8
50	Unidentified to species	07/06/2014	9:13:33	AM	Tighe-Pilot	Bear	1	59.42158	-136.23281	8	430040	6587437	NAD27	59.42158	-136.23281	8
51	Hoary Marmot	07/05/2014	4:34:06	PM	Tighe-Pilot	Squirrel Family	1	59.39431	-136.38655	8	421253	6584572	NAD27	59.39431	-136.38655	8
52	Brown Bear	07/05/2014	1:54:32	PM	Tighe-Pilot	Bear	3	59.39444	-136.32275	8	424876	6584513	NAD27	59.39444	-136.32275	8

Appendix 3

Record ID	Species	W.Easting	W.Northing	Observer Activity	Species Identification: Comments	Habitat Description	Obs Type	Observer/ID Confidence
1	Unidentified to species	430139	6586910	On Foot	Small frog in rock pile next to heli pad	Ephemeral	Visual	High (75-99%)
2	Red tailed Hawk	425031	6585969	On Foot	Random hike	Coniferous forest	Visual	Medium (50-74%)
3	Unidentified to species	425774	6583956	On Foot	Large, pale coloured under side of wings, agile - hunting small rodents at dusk	Open alpine meadow (flower ridge)	Visual	Absolute (100%)
4	Golden Eagle	420645	6583953	In Helicopter	-	Nest on cliff. Lotsa poo all around under nest.	Visual	Medium (50-74%)
5	Rock Ptarmigan	417931	6584829	In Helicopter	-	-	Visual	Absolute (100%)
6	Bald Eagle	421017	6584767	On Foot	Bald head on adult	-	Visual	Absolute (100%)
7	Golden Eagle	421866	6584350	In Helicopter	Flying above south wall near pump pass at ridge elevation	-	Visual	High (75-99%)
8	Great Blue Heron	428150	6587559	In Motor Vehicle	-	In clear cut along road	Visual	High (75-99%)
9	Golden Eagle	421304	6585047	On Foot	-	-	Visual	Absolute (100%)
10	Golden Eagle	421100	6584088	At Drill Site	Short neck huge wings dark brown	Robust small thermals	Visual	High (75-99%)
11	American Three toed Woodpecker	425999	6587047	On Foot	Seemed light coloured and puffy. Juvenile?	On trees above a Devils club filled creek bed.	Visual	Medium (50-74%)
12	Belted Kingfisher	430201	6587014	On Foot	Near river	Riparian	Visual	Absolute (100%)
13	Golden Eagle	421484	6584973	In Helicopter	-	Flying along south wall below pump pass at about 3500 msl	Visual	Absolute (100%)
14	Rufous Hummingbird	421149	6584528	At Drill Site	-	At long pad heli pad	Visual	High (75-99%)
15	Golden Eagle	427431	6585501	In Helicopter	-	In flight over lower flower ridge	Visual	Medium (50-74%)
16	Mountain Goat	419341	6587180	On Foot	-	-	Visual	Absolute (100%)
17	Unidentified to species	421767	6585755	On Foot	-	-	Visual	Low (25-49%)
18	Brown Bear	422388	6586644	In Helicopter	-	-	Visual	Medium (50-74%)
19	Brown Bear	421844	6585547	In Helicopter	Healthy brown mama with blonde highlights	-	Visual	Absolute (100%)
20	Mountain Goat	420802	6584929	On Foot	-	-	Visual	Absolute (100%)
21	Black Bear	424844	6585097	In Helicopter	-	-	Visual	Absolute (100%)
22	Moose	424844	6585097	In Helicopter	3 spikes on rack on one of them	Above treeline upland shrubland?	Visual	Absolute (100%)
23	Black Bear	430171	6586939	On Foot	Big black ice	Forest clearing	Visual	High (75-99%)
24	Black Bear	420846	6586432	On Foot	Black, healthy, fuzzy	Foraging	Visual	Absolute (100%)
25	Brown Bear	421820	6585170	In Helicopter	-	-	Visual	Absolute (100%)
26	Mountain Goat	421210	6584274	In Helicopter	-	-	Visual	Absolute (100%)
27	Mountain Goat	419062	6587182	In Helicopter	-	-	Visual	Absolute (100%)
28	Mountain Goat	419342	6587325	In Helicopter	-	-	Visual	Absolute (100%)
29	Brown Bear	422015	6585238	On Foot	-	-	Visual	Absolute (100%)
30	Brown Bear	421017	6584767	In Helicopter	-	-	Visual	Medium (50-74%)
31	Arctic Ground Squirrel	420846	6584201	On Foot	Squirrel seems habituated to the drill	Alpine	Visual	Absolute (100%)
32	Mountain Goat	420383	6584520	At Drill Site	-	Two mountain goats walking across paddys pocket	Visual	Absolute (100%)
33	Mountain Goat	421073	6583800	In Helicopter	Annie with kid	On rocky slope above glacier	Visual	Absolute (100%)
34	Moose	427406	6585855	In Helicopter	Bull moose 30-40 inch antler spread	In moose meadows	Visual	Absolute (100%)
35	Hoary Marmot	421304	6585047	On Foot	6-adults and 2-young	SE aspect ~4000ft	Visual	Absolute (100%)
36	Black Bear	421464	6586216	In Helicopter	Healthy young adult	High alpine heather and flowers	Visual	Absolute (100%)
37	Black Bear	421513	6586193	In Helicopter	-	-	Visual	High (75-99%)
38	Hoary Marmot	420974	6584463	In Helicopter	-	Steep flowery slope	Visual	Absolute (100%)

Record ID	Species	W.Easting	W.Northing	Observer Activity	Species Identification: Comments	Habitat Description	Obs Type	Observer/ID Confidence
39	Brown Bear	420513	6586517	On Foot	Healthy and comfy	Steep heathery slope	Visual	Absolute (100%)
40	Unidentified to species	420454	6585540	On Foot	Marmot	-	Visual	Absolute (100%)
41	Brown Bear	430376	6587153	In Motor Vehicle	Big brownie	Road near camp entrance	Visual	Absolute (100%)
42	Brown Bear	421183	6584214	In Helicopter	One sow with first year cub one single bear 5-6 years old within 100yds appeared to be traveling together	On open grassy slope below green pad	Visual	Absolute (100%)
43	Unidentified to species	421204	6583002	On Foot	Single set of tracks. 4.5inches across right front foot pad	Tracks come from forested area to east and traverse from east to west along toe of glacier	Sign	High (75-99%)
44	Unidentified to species	430338	6587473	In Helicopter	Sow with 2 cubs	On main road leading into porcupine town site	Visual	Medium (50-74%)
45	Unidentified to species	430470	6587774	In Helicopter	Sow with two cubs	On old road north of porcupine town site	Visual	Medium (50-74%)
46	Unidentified to species	421377	6586495	On Foot	Two small bear cubs dark in color. First year cubs possibly	In alder brush next to road	Visual	Medium (50-74%)
47	Black Bear	421377	6586495	On Foot	Large black bear not sure of sex	Foraging up hill along exposed rock bands to the north of lower pur	Visual	High (75-99%)
48	Hoary Marmot	420099	6585875	On Foot	Sitting on rock	-	Visual	Absolute (100%)
49	Red Squirrel	430139	6586910	On Foot	-	In small group of trees above heli pad in camp	Visual	High (75-99%)
50	Unidentified to species	430040	6587437	In Helicopter	Unable to determine if it was a brown or black bear because of its proximity to other camp. Didn't want to fly to close	Was in clearing of old porcupine town site	Visual	Medium (50-74%)
51	Hoary Marmot	421253	6584572	At Drill Site	Single marmot underneath long pad drill pad	Under drill pad	Visual	High (75-99%)
52	Brown Bear	424876	6584513	In Helicopter	-	-	Visual	Absolute (100%)

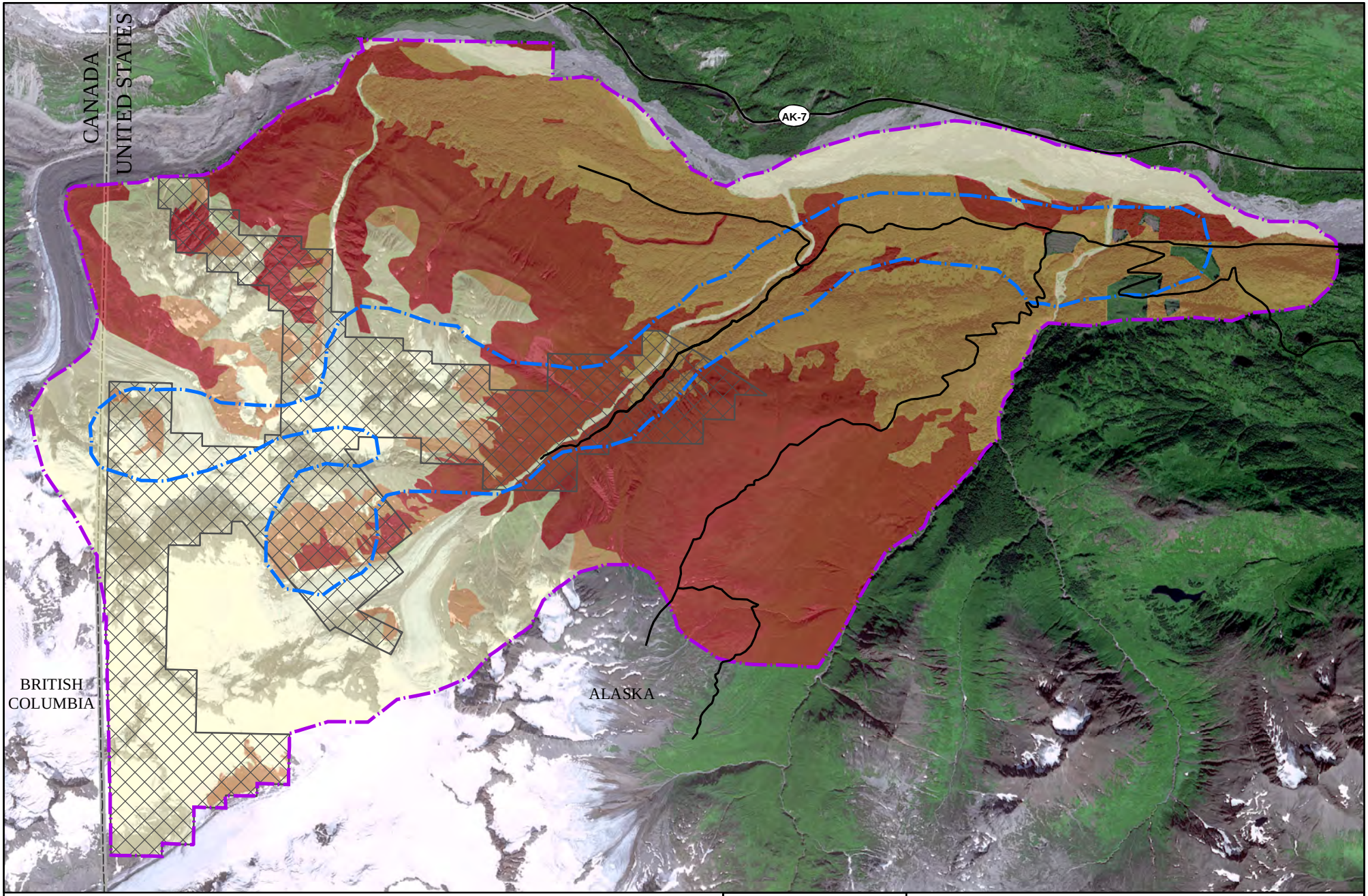
Appendix 3

Record ID	Species	Animal Behaviour	Animal Behaviour: Comments	Life Stage	Additional Comments
1	Unidentified to species	Escape	-	Adult	-
2	Red tailed Hawk	Flight	-	Adult	-
3	Unidentified to species	Foraging	-	Adult	Several birds together
4	Golden Eagle	Nesting	-	NA	Only nest sighted today. Adults have been seen all season soaring above this site.
5	Rock Ptarmigan	Flight	-	Adult	5+ individuals. A flock. Not sure what kind of ptarmigan.
6	Bald Eagle	Flight	-	Adult	One adult one juvenile
7	Golden Eagle	Flight	-	Adult	-
8	Great Blue Heron	Vigilant	-	Adult	-
9	Golden Eagle	Flight	Soaring in thermals	Adult	Observer was at Stryker
10	Golden Eagle	Flight	Looking around soaring	Adult	-
11	American Three toed Woodpecker	Foraging, Flight, Vigilant	-	Adult	With Kai and Jerry.
12	Belted Kingfisher	Flight	Flew across river to placer claim	Adult	-
13	Golden Eagle	Flight	-	Adult	-
14	Rufous Hummingbird	Foraging, Flight	While shut down on long pad heli pad the humming bird flew into the helicopter via open door. It hovered around next to copilot seat and began pecking at red seat cusion. After several pecks it flew back out open door and left area	Adult	Possibly a female but not sure
15	Golden Eagle	Flight	-	Adult	Thought to be golden eagle but not 100% certain do to light and fast movement. Bird was flying at 2500 feet msl
16	Mountain Goat	Resting	-	Adult	Life stages unsure. Did not take a close look.
17	Unidentified to species	Foraging	Saw from a distance looks like brown bear	Adult	-
18	Brown Bear	Escape	Momma and cub, momma had blonde back, cub all black	Adult & Juvenile	-
19	Brown Bear	Vigilant	Foraging	Adult & Juvenile	Mom and cub
20	Mountain Goat	Vigilant/Resting	-	Adult & Juvenile	-
21	Black Bear	Unknown	-	Adult & Juvenile	Black bear and 3 cubs
22	Moose	Vigilant, Foraging	Look like a bro-mance	Adult/Sub-Adult	Thought was going to fight but bromance instead
23	Black Bear	Other	Wandering	Sub-Adult	-
24	Black Bear	Vigilant, Foraging	-	Adult	-
25	Brown Bear	Escape	-	Adult & Juvenile	-
26	Mountain Goat	Resting	-	Adult	-
27	Mountain Goat	Vigilant/Resting	-	Adult & Juvenile	-
28	Mountain Goat	Vigilant/Other	Chillin	Adult & Juvenile	-
29	Brown Bear	Foraging	-	Adult	-
30	Brown Bear	Foraging	-	Adult	Seen from a distance
31	Arctic Ground Squirrel	Foraging	-	Adult	-
32	Mountain Goat	Vigilant, Escape	-	Adult & Juvenile	-
33	Mountain Goat	Vigilant, Foraging, Resting	-	Adult & Juvenile	-
34	Moose	Vigilant, Foraging	-	Adult	Seen while bringing mountain crew off of hill
35	Hoary Marmot	Vigilant, Foraging	Spread out along a flowery heather covered slope. About 1per 30meters.	Adult Sub-Adult	Resident.
36	Black Bear	Foraging	No reaction to helicopter flight overhead.	Adult/Sub-Adult	-
37	Black Bear	Vigilant, Escape	-	Sub-Adult	-
38	Hoary Marmot	Vigilant, Escape	Resident. Healthy and happy	Adult	-

Appendix 3

Record ID	Species	Animal Behaviour	Animal Behaviour: Comments	Life Stage	Additional Comments
39	Brown Bear	Foraging	Walking	Adult & Juvenile	-
40	Unidentified to species	Escape	-	Adult/Sub-Adult/ Juvenile (typically with adult)	-
41	Brown Bear	Escape	Running across road	Adult	-
42	Brown Bear	Vigilant, Foraging	-	Adult Sub-Adult Juvenile (typically with adult)	Was seen during crew change by Lloyd
43	Unidentified to species	Unknown	-	Sub-Adult	-
44	Unidentified to species	Vigilant, Resting	-	Adult & Juvenile	Seen during morning crew change
45	Unidentified to species	Vigilant, Escape, Foraging	Animals were walking down road the fled into bushes	Adult & Juvenile	Was seen during morning crew change
46	Unidentified to species	Vigilant	Cubs came to edge of brush to see tim	Adult & Juvenile	While parked at the overlook Tim heard a noise in the brush. As he approached the side of the road two small bear cubs poked their heads out to observe Tim. Tim got back on his dirt bike and left the area
47	Black Bear	Vigilant, Foraging	Was foraging until helicopter was started. As we lifted and departed area bear sat down and watched us.	Adult	Was seen with Tim Tom, Dan , Jesse
48	Hoary Marmot	Vigilant	-	Adult	-
49	Red Squirrel	Escape, Foraging	Was foraging along ground then fled up nearest tree.	Adult	-
50	Unidentified to species	Vigilant, Escape, Foraging	Was foraging until it heard helicopter then ran to brush	Sub-Adult	Dark color smaller in size
51	Hoary Marmot	Escape, Foraging,Other	Not afraid of people or equipment with several feet. Will go under rocks if approached to fast	Adult	-
52	Brown Bear	Vigilant, Foraging, Resting	-	Adult & Juvenile	Sow with two cubs

APPENDIX 4
SOI Suitability Mapping



Legend

Brown Bear Habitat Suitability

- High
- Moderate
- Low

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

N

1:75,000

0 1 2

Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

CLIENT: CONSTANTINE metal resources ltd.

Terrestrial Wildlife and Habitat Assessment
Constantine Metal Resources
Palmer Project Site

HABITAT SUITABILITY FOR BROWN BEAR

PROJECT No.		
1679-001.01	January 2015	FIGURE 1

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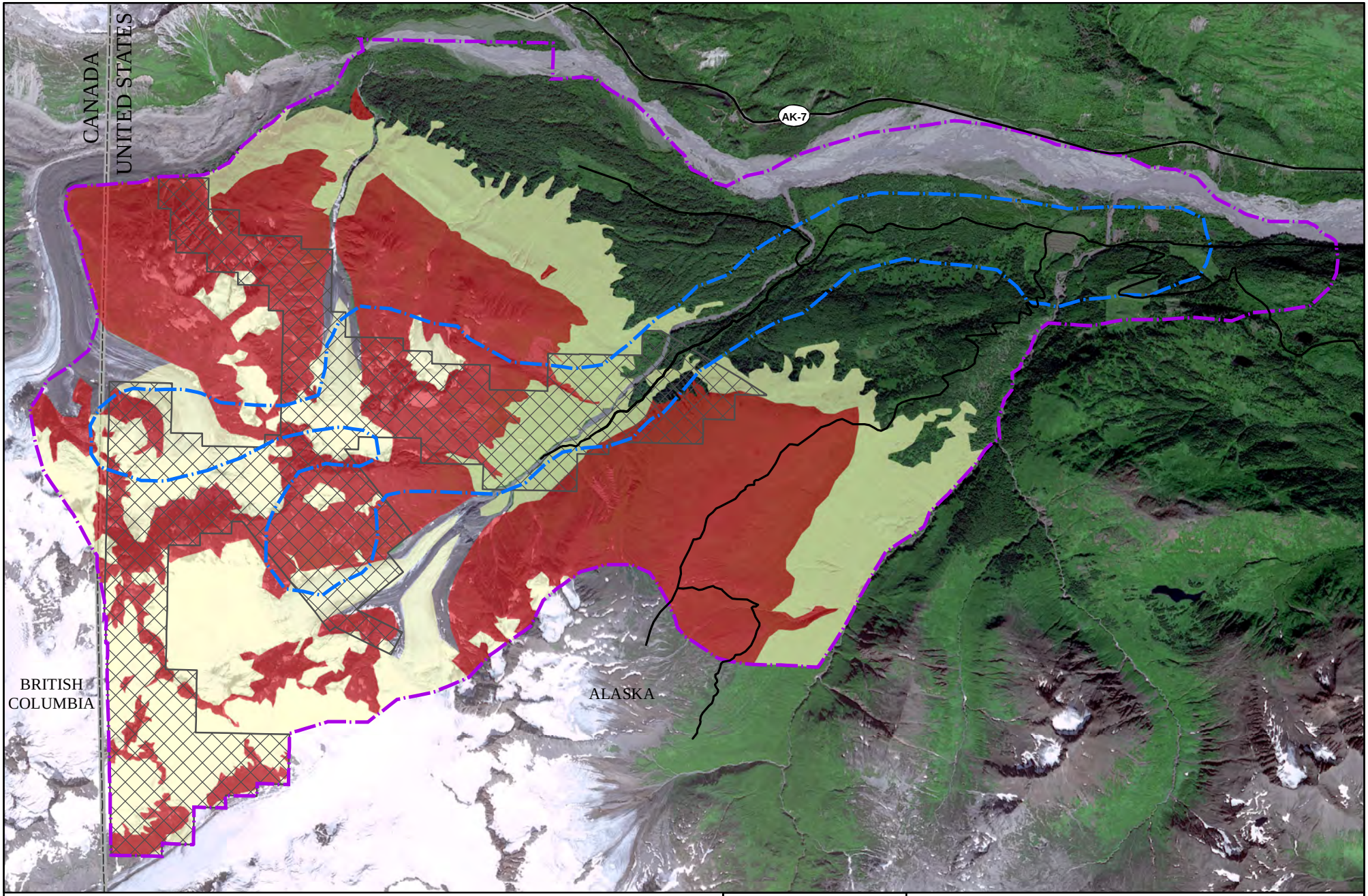

Legend

Mountain Goat Habitat Suitability

- High
- Moderate
- Low

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

N

1:75,000

0 1 2

Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

CLIENT: CONSTANTINE metal resources ltd.

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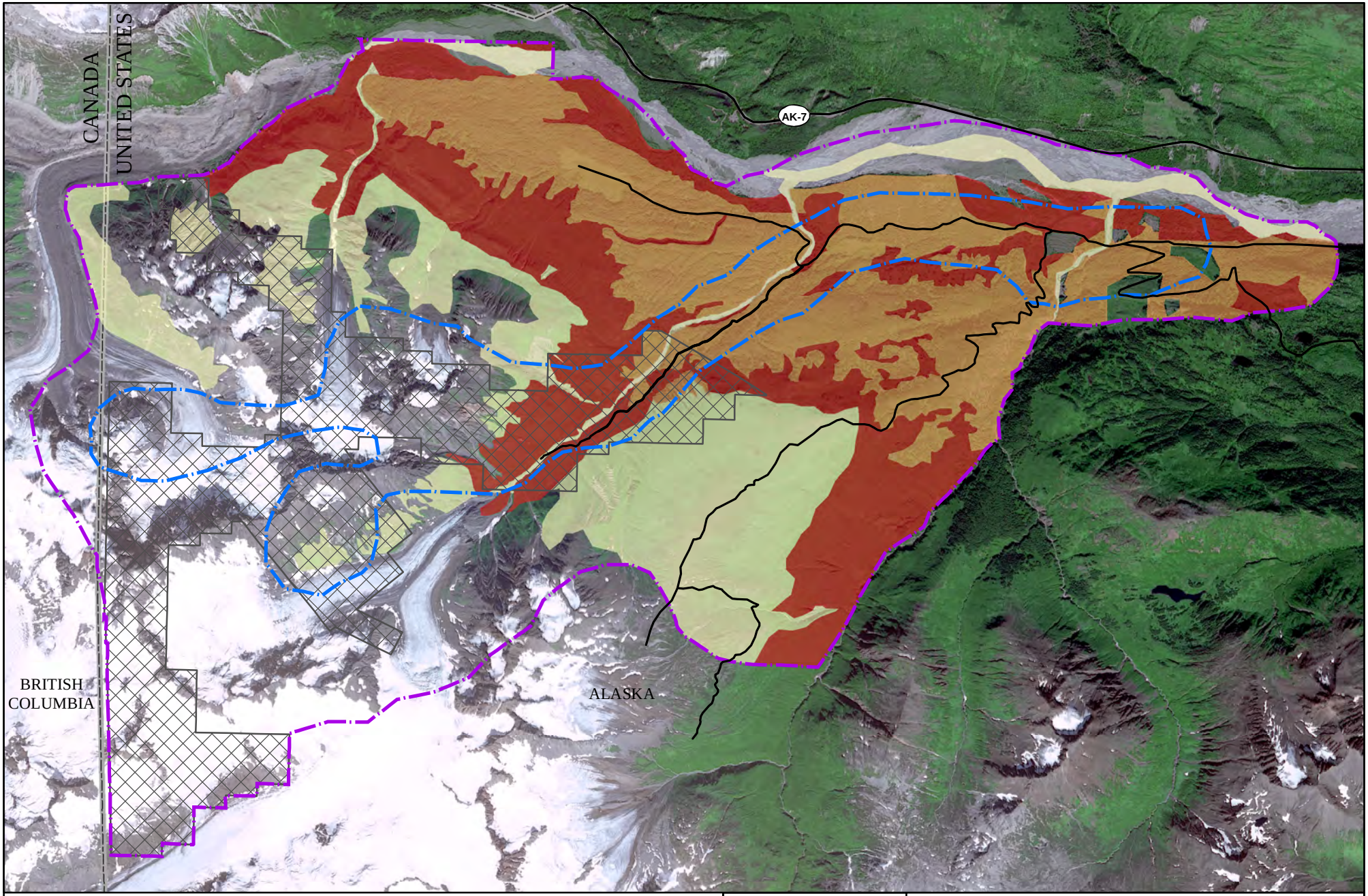
Constantine Metal Resources
Palmer Project Site

HABITAT SUITABILITY FOR MOUNTAIN GOAT

PROJECT No.		
1679-001.01	January 2015	FIGURE 2

Path: O:\1\600\1679\mxd\Fig\A2_1679_001_01_ORAM_150112.mxd



Legend

Moose Habitat Suitability

- High
- Moderate
- Low

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

N

1:75,000

0 1 2

Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

CLIENT: CONSTANTINE metal resources ltd.

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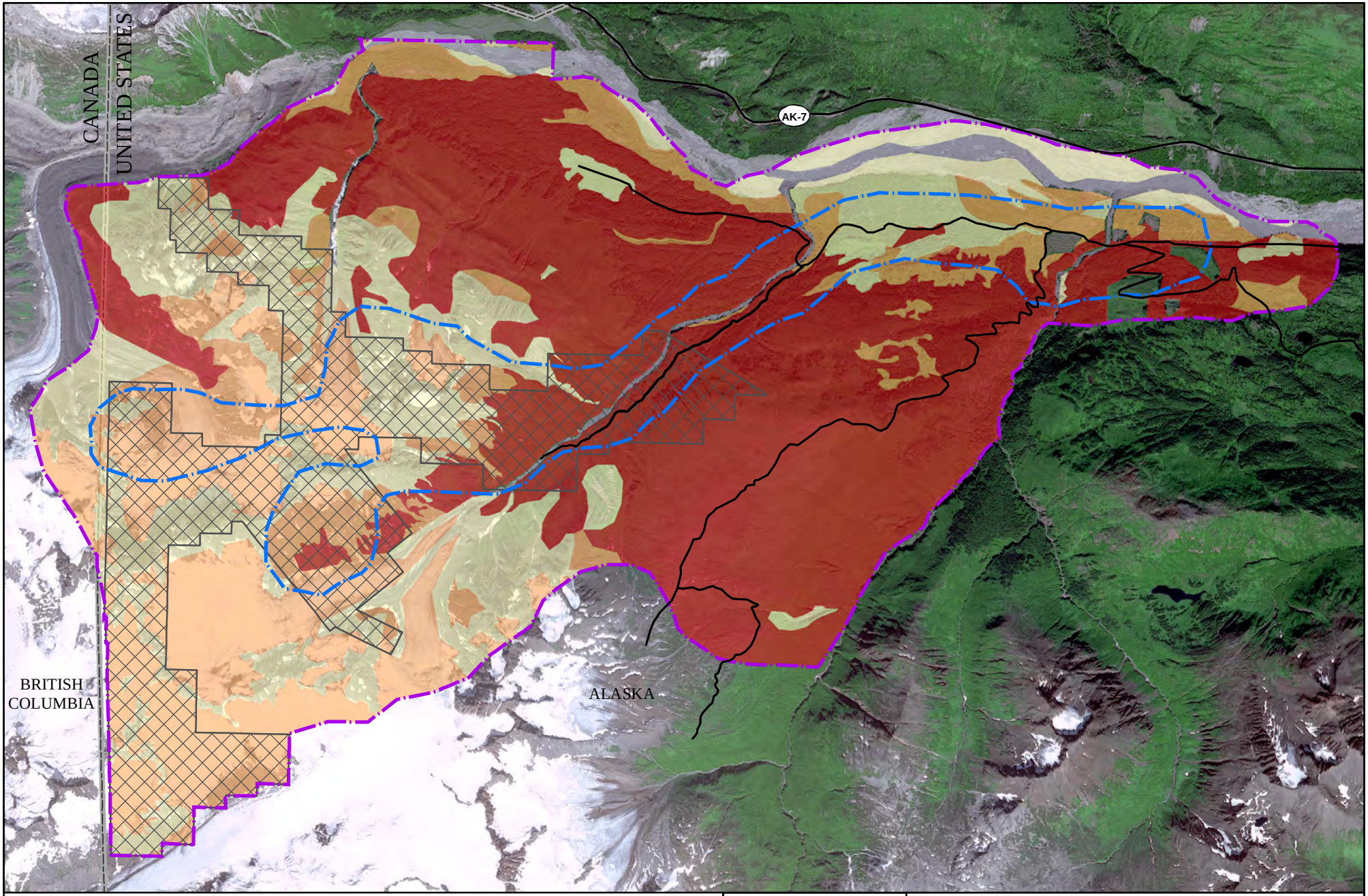
Constantine Metal Resources
Palmer Project Site

HABITAT SUITABILITY FOR MOOSE

PROJECT No.		
1679-001.01	January 2015	FIGURE 3

Path: O:\1600\1679\mxd\Fig\A3_1679_001_01_ALAL_150112.mxd



Legend

Wolverine Habitat Suitability

- High
- Moderate
- Low

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

N

1:75,000

0 1 2

Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

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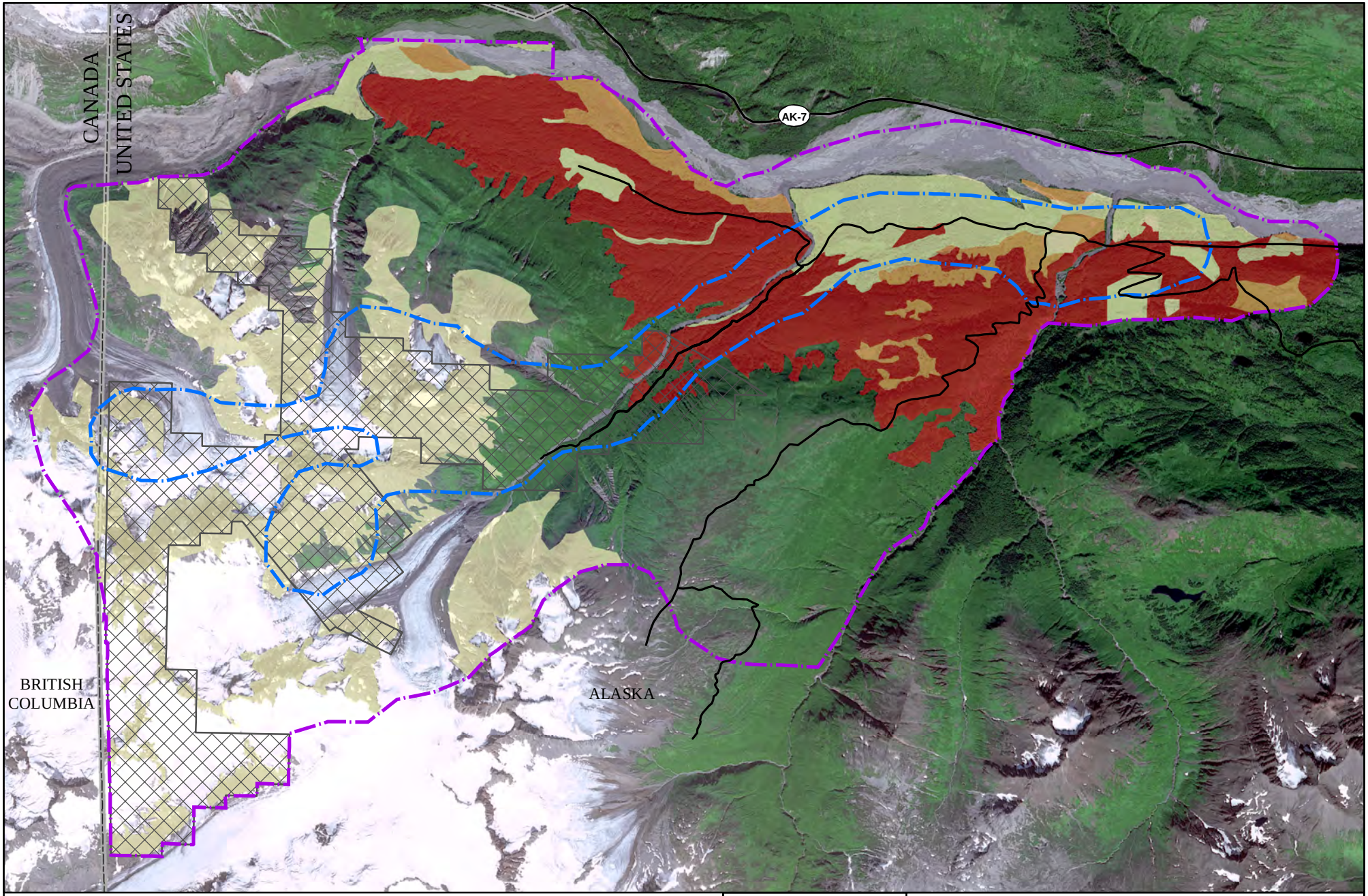
Constantine Metal Resources
Palmer Project Site

HABITAT SUITABILITY FOR WOLVERINE

PROJECT No.		
1679-001.01	January 2015	FIGURE 4

Path: O:\1\1600\1679\mxd\Fig04_1679_001_01_GUGU_150112.mxd



Legend

Queen Charlotte Northern Goshawk Habitat Suitability

- High
- Moderate
- Low

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

N

1:75,000

0 1 2

Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

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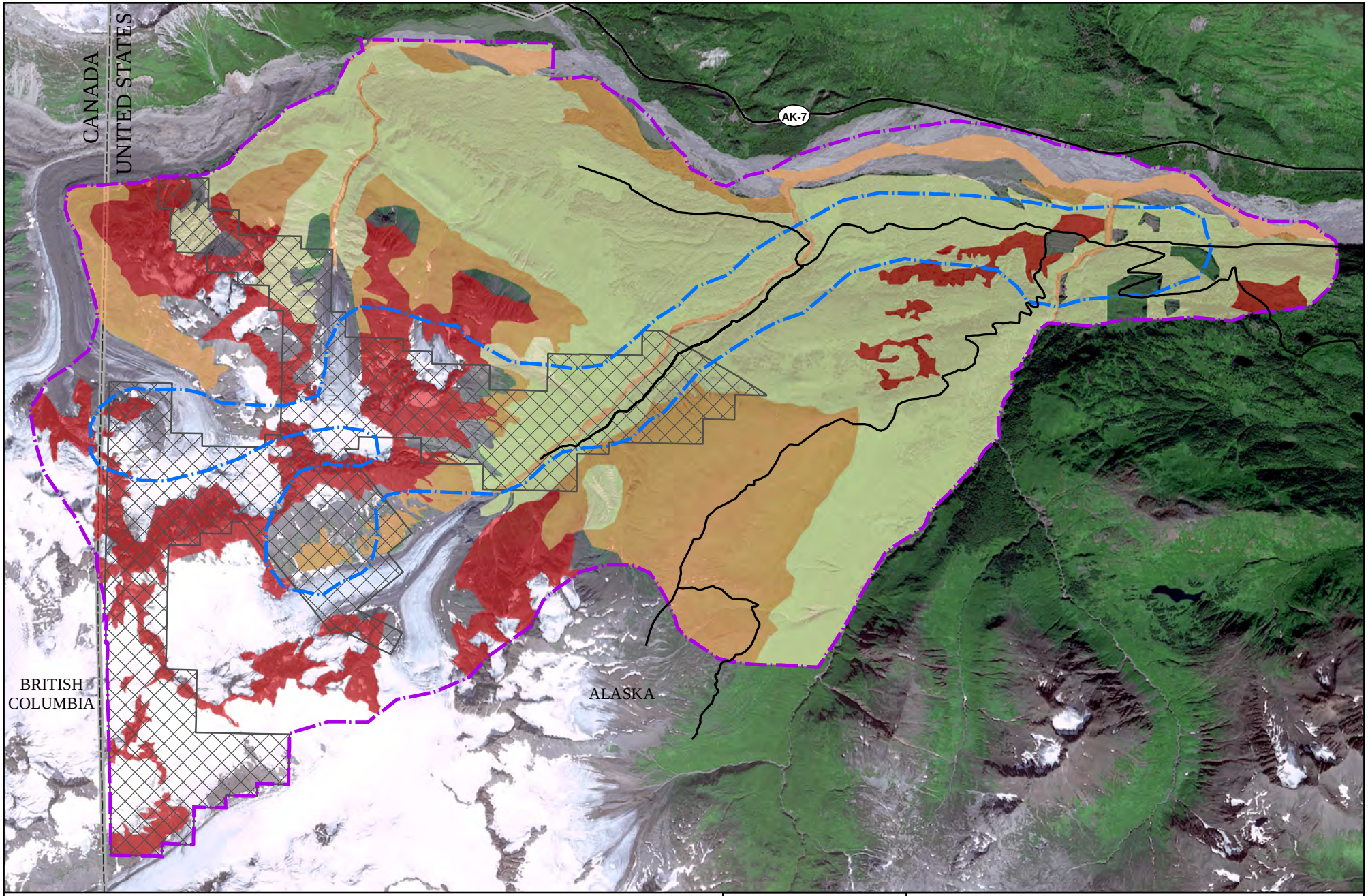
HABITAT SUITABILITY FOR QUEEN CHARLOTTE NORTHERN GOSHAWK

PROJECT No.		
1679-001.01	January 2015	FIGURE 5

Path: O:\1\1600\1679\mxd\FigA5_1679_001_01_NOGO_150112.mxd



Legend

Peale's Peregrine Falcon Habitat Suitability

- High
- Moderate
- Low

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

N

1:75,000

0 1 2

Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

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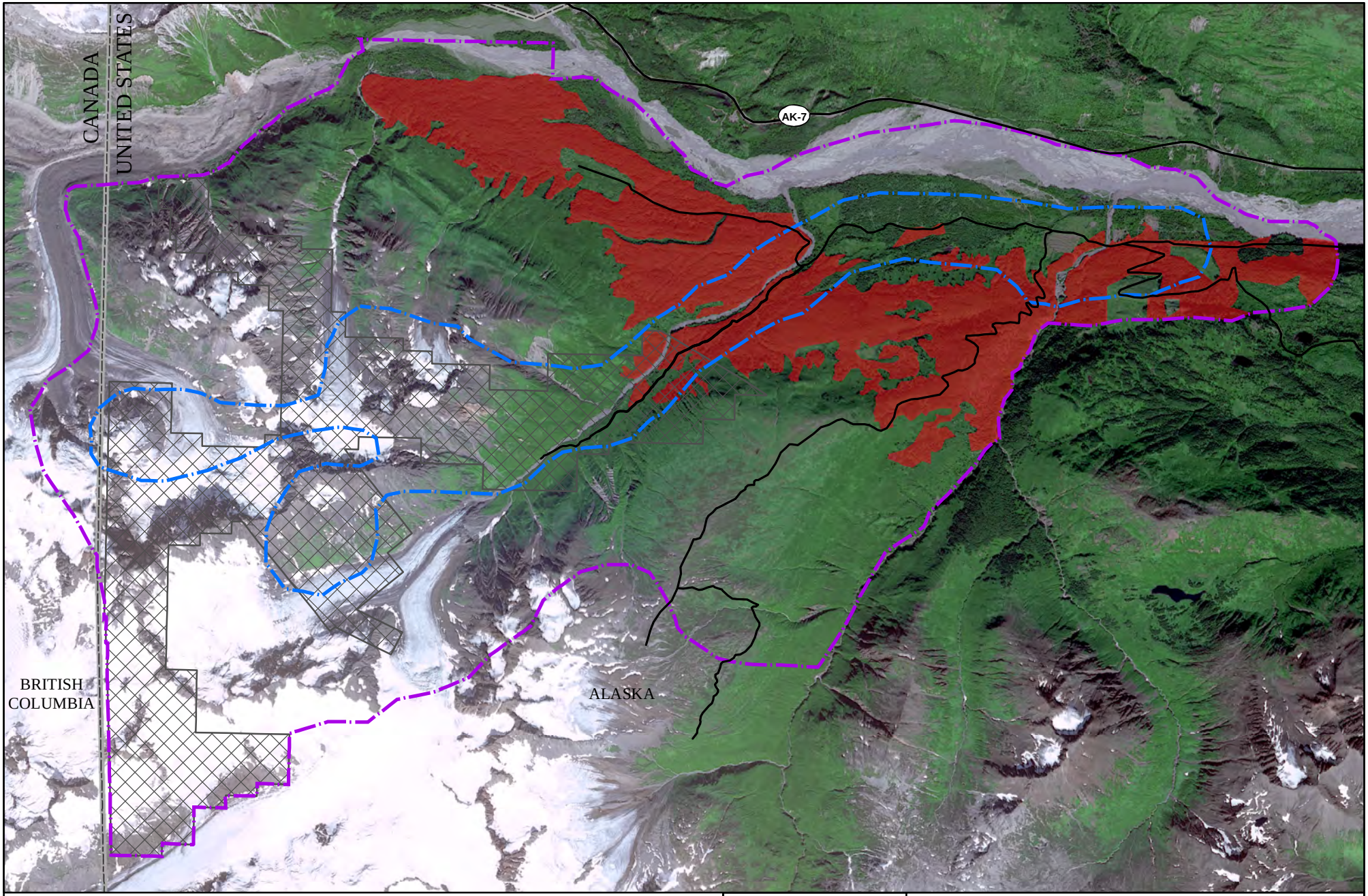
HABITAT SUITABILITY FOR PEALE'S PEREGRINE FALCON

PROJECT No.		
1679-001.01	January 2015	FIGURE 6

Path: O:\1\1600\1679\mxd\Fig\A6_1679_001_01_PEFA_150112.mxd



Legend

Marbled Murrelet Habitat Suitability

- High
- Moderate
- Low

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

N

1:75,000

0 1 2

Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

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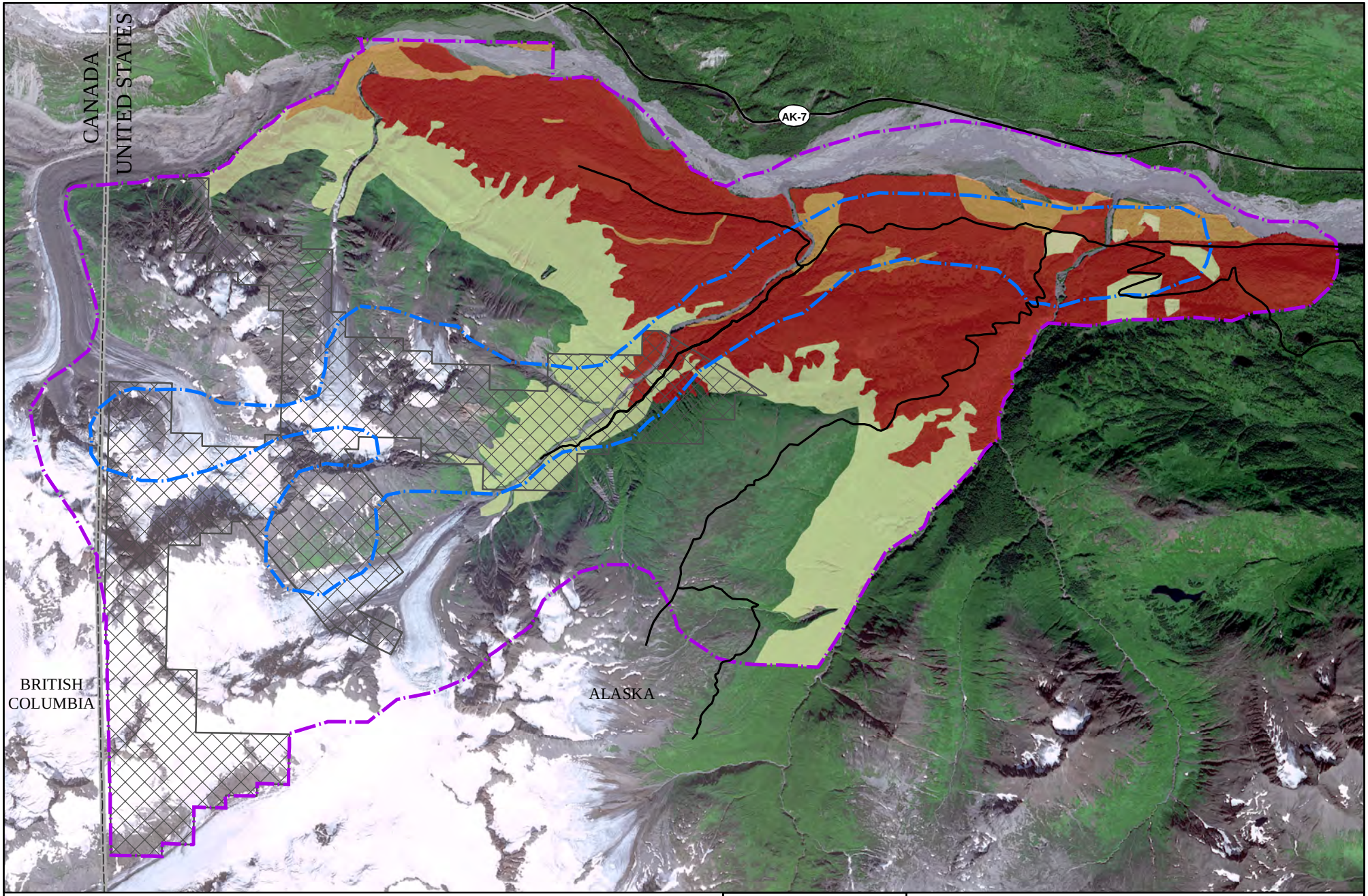
HABITAT SUITABILITY FOR MARBLED MURRELET

PROJECT No.		
1679-001.01	January 2015	FIGURE 7

Path: O:\1\1600\1679\mxd\FigA7_1679_001_01_MAMU_150112.mxd



Legend

Olive-sided Flycatcher Habitat Suitability

- High
- Moderate
- Low

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

N

1:75,000

0 1 2

Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

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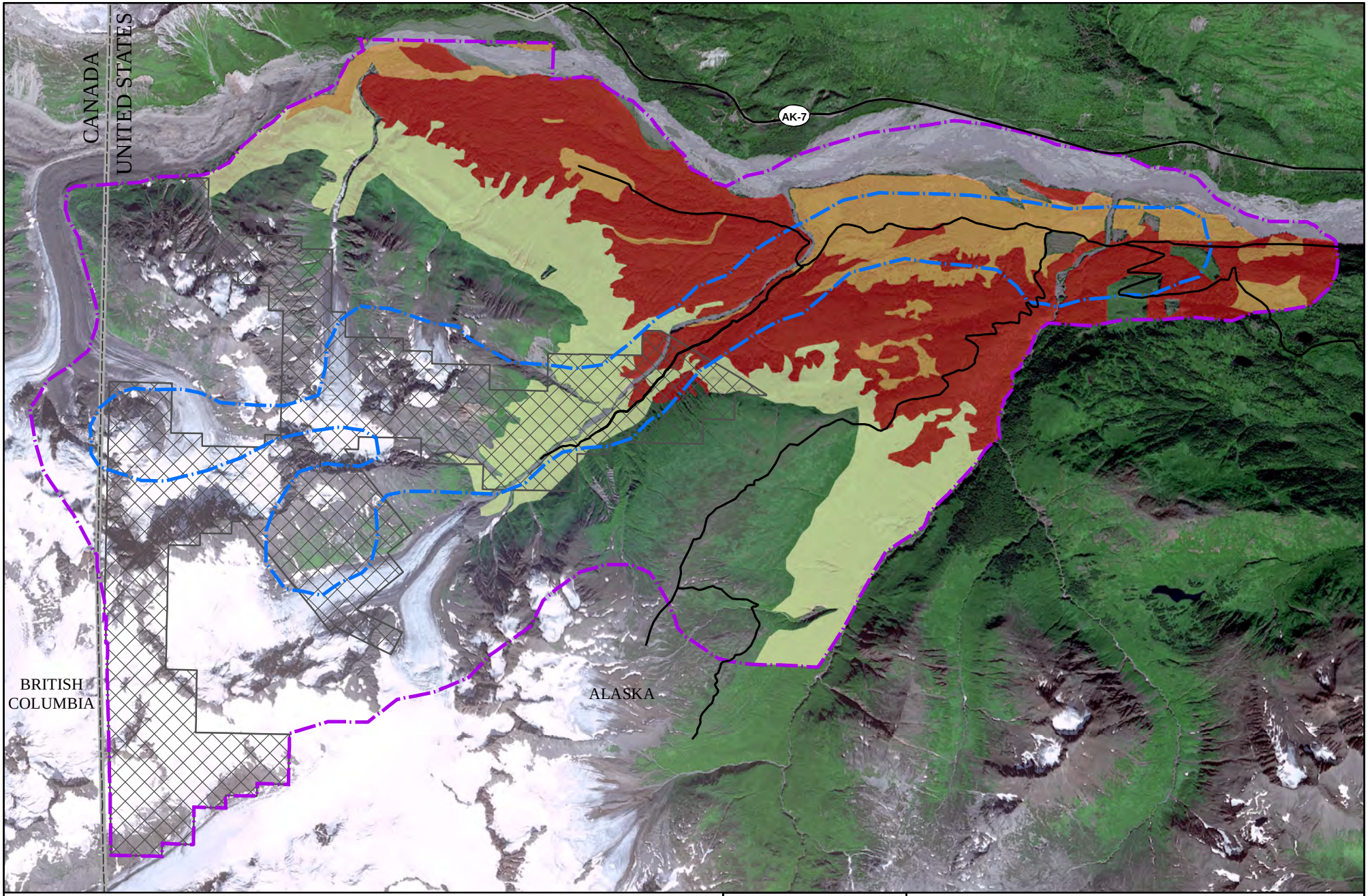
HABITAT SUITABILITY FOR OLIVE-SIDED FLYCATCHER

PROJECT No.		
1679-001.01	January 2015	FIGURE 8

Path: O:\1600\1679\mxd\Fig\A8_1679_001_01_OSFL_150112.mxd



Legend

Gray-cheeked Thrush

Habitat Suitability

- High
- Moderate
- Low

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

N

1:75,000

0 1 2

Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

CLIENT: CONSTANTINE metal resources ltd.

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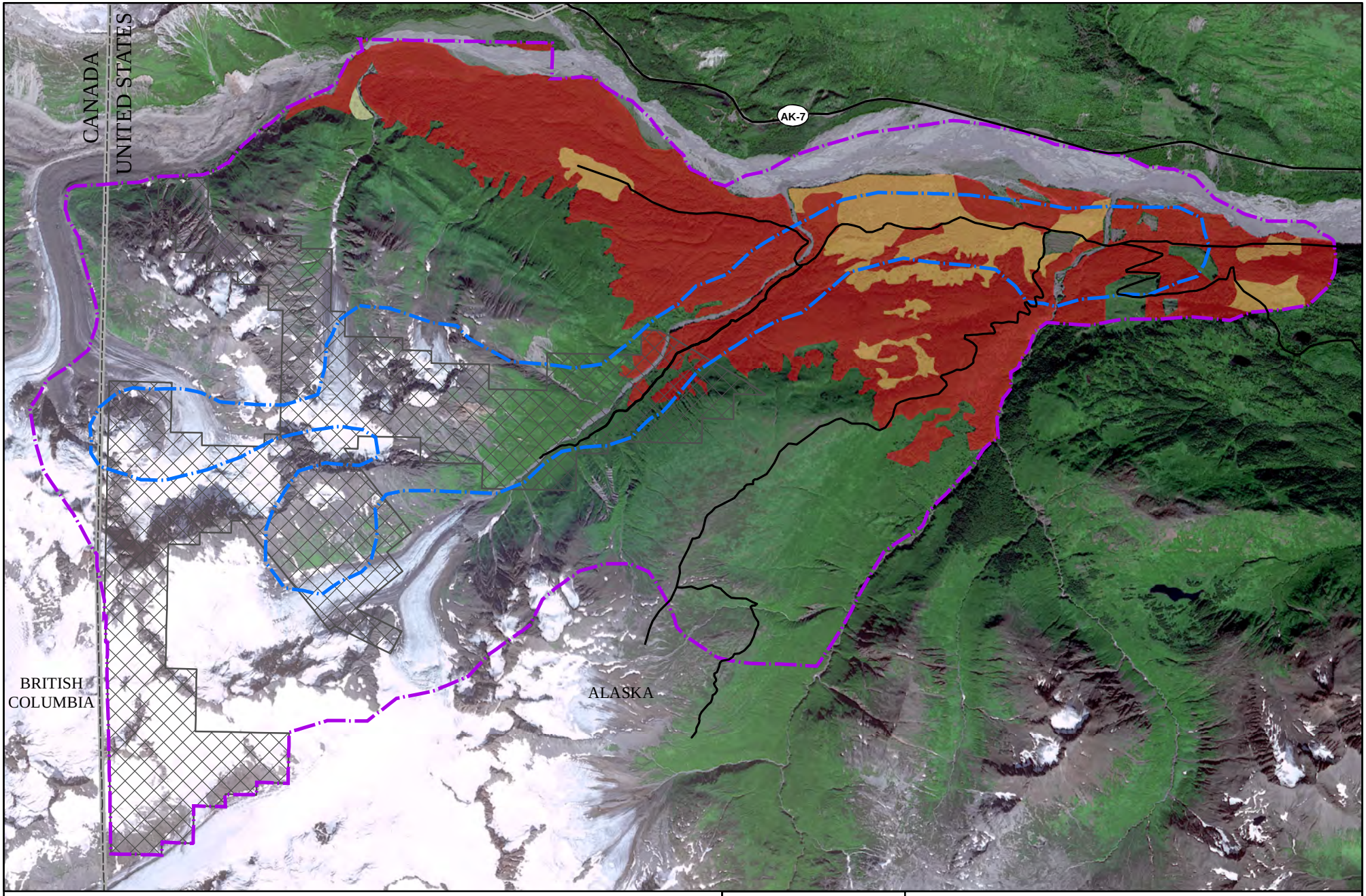
Constantine Metal Resources
Palmer Project Site

HABITAT SUITABILITY FOR GRAY-CHEEKED THRUSH

PROJECT No.		
1679-001.01	January 2015	FIGURE 9

Path: O:\1600\1679\mxd\Fig\A9_1679_001_01_GCTH_150112.mxd



Legend

Townsend's Warbler

Habitat Suitability

- High
- Moderate
- Low

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

N

1:75,000

0 1 2

Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

CLIENT: CONSTANTINE metal resources ltd.

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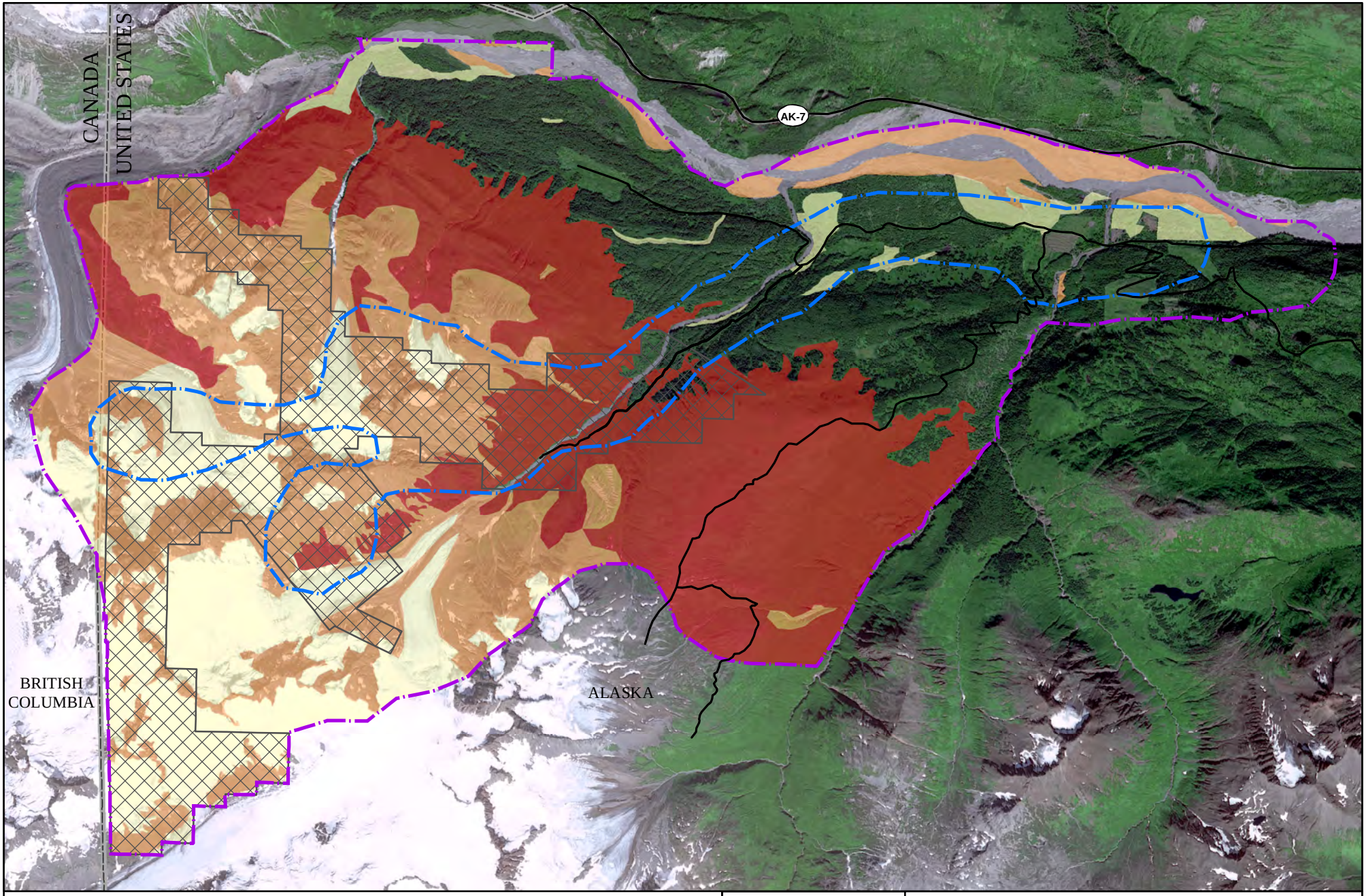
Constantine Metal Resources
Palmer Project Site

HABITAT SUITABILITY FOR TOWNSEND'S WARBLER

PROJECT No.		
1679-001.01	January 2015	FIGURE 10

Path: O:\1600\1679\mxd\Fig\A10_1679_001_01_TOWA_150112.mxd



Legend

Rock Ptarmigan Habitat Suitability

- High
- Moderate
- Low

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

N

1:75,000

0 1 2

Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

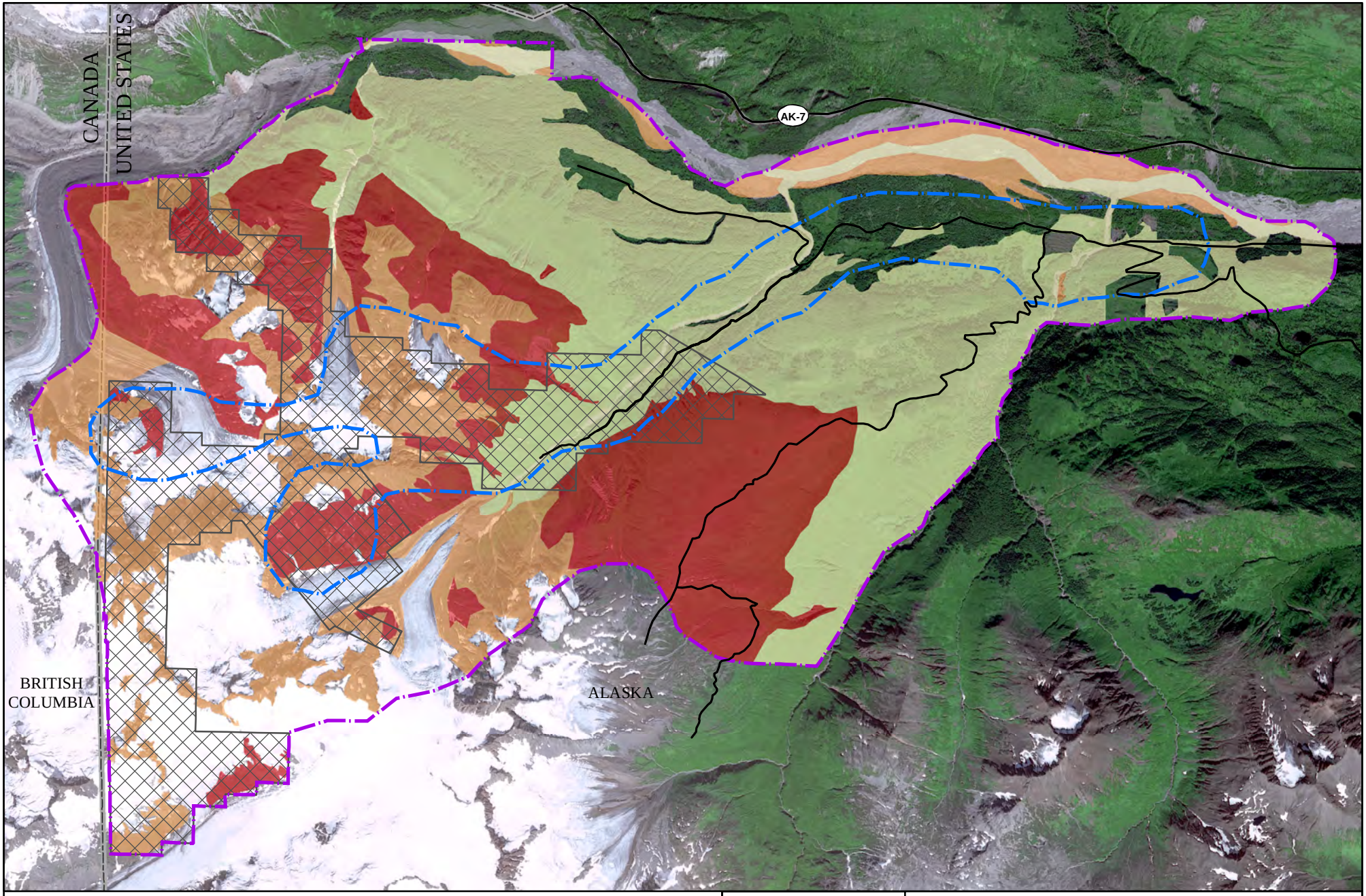
CLIENT: CONSTANTINE metal resources ltd.

Terrestrial Wildlife and Habitat Assessment
Constantine Metal Resources
Palmer Project Site

HABITAT SUITABILITY FOR ROCK PTARMIGAN

PROJECT No.		
1679-001.01	January 2015	FIGURE 11

Path: O:\1600\1679\mxd\Fig\A11_1679_001_01_ROPT_150112.mxd



Legend

Golden Eagle Habitat Suitability

- High
- Moderate
- Low

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

N

1:75,000

0 1 2

Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

CLIENT: CONSTANTINE metal resources ltd.

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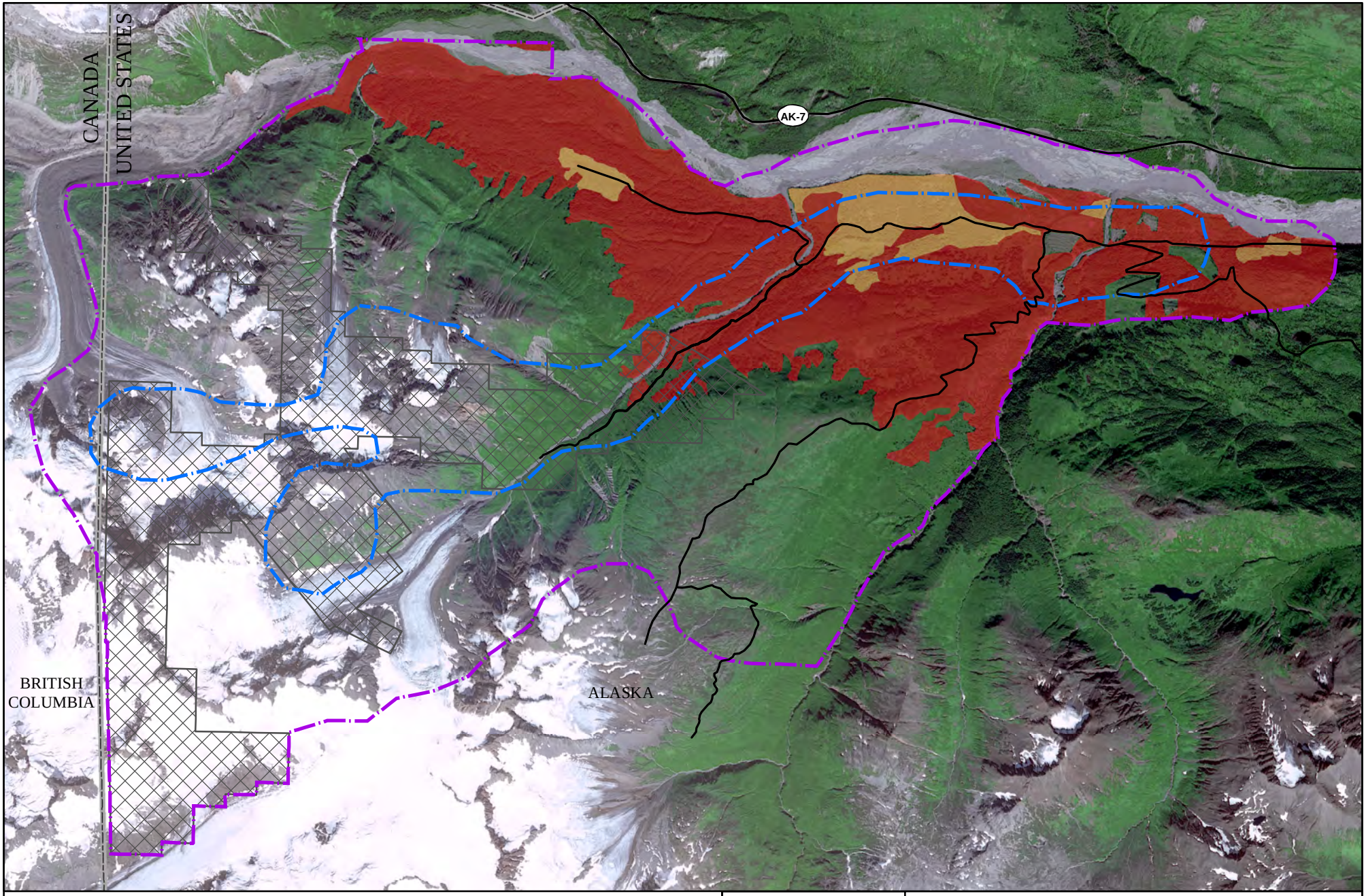
Constantine Metal Resources
Palmer Project Site

HABITAT SUITABILITY FOR GOLDEN EAGLE

PROJECT No.		
1679-001.01	January 2015	FIGURE 12

Path: O:\1600\1679\mxd\Fig\A12_1679_001_01_GOEA_150112.mxd



Legend

Western screech-owl

Habitat Suitability

- High
- Moderate
- Low

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

N

1:75,000

0 1 2

Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

CLIENT: CONSTANTINE metal resources ltd.

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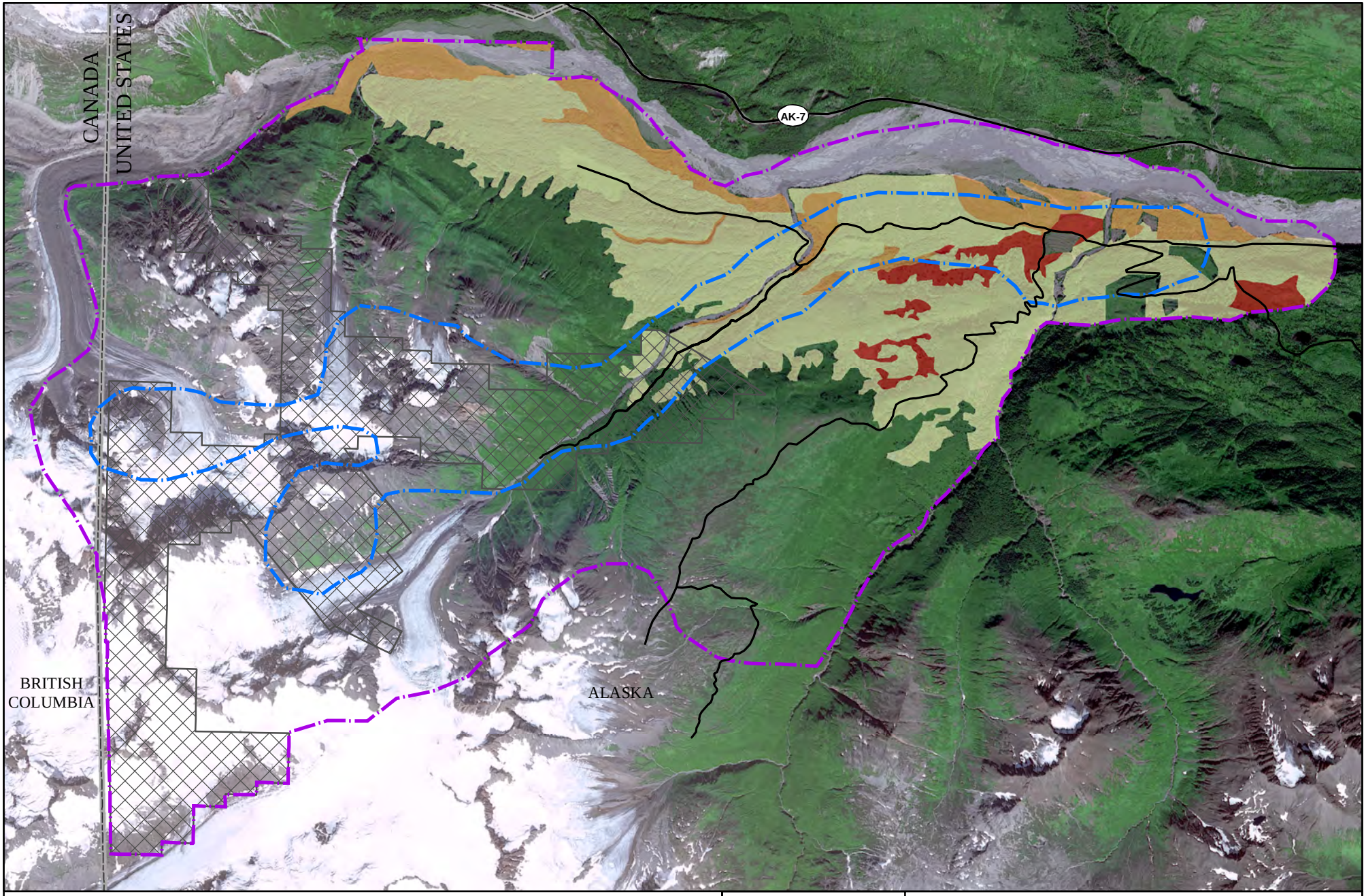
Palmer Project Site

HABITAT SUITABILITY FOR WESTERN SCREECH-OWL

PROJECT No.		
1679-001.01	January 2015	FIGURE 13

Path: O:\1600\1679\mxd\Fig\A13_1679_001_01_WSOW_150112.mxd



Legend

Red-legged Frog

Habitat Suitability

- High
- Moderate
- Low

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

N

1:75,000

0 1 2

Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

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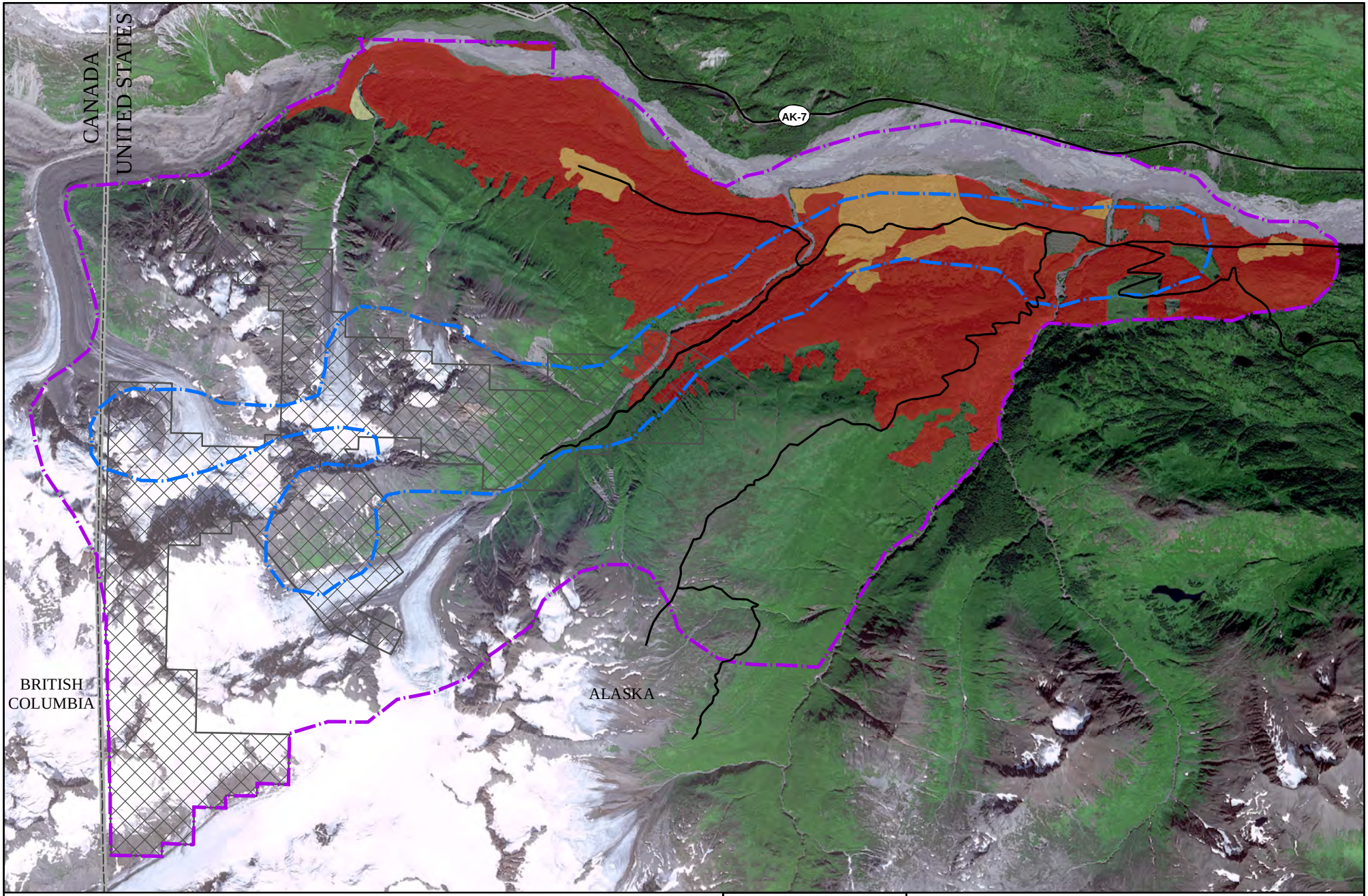
HABITAT SUITABILITY FOR RED-LEGGED FROG

PROJECT No.		
1679-001.01	January 2015	FIGURE 14

Path: O:\1600\1679\mxd\Fig\A14_1679_001_01_RAAU_150112.mxd



Legend

Long-toed Salamander

Habitat Suitability

- High
- Moderate
- Low

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

N

1:75,000

0 1 2

Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

CLIENT: CONSTANTINE metal resources ltd.

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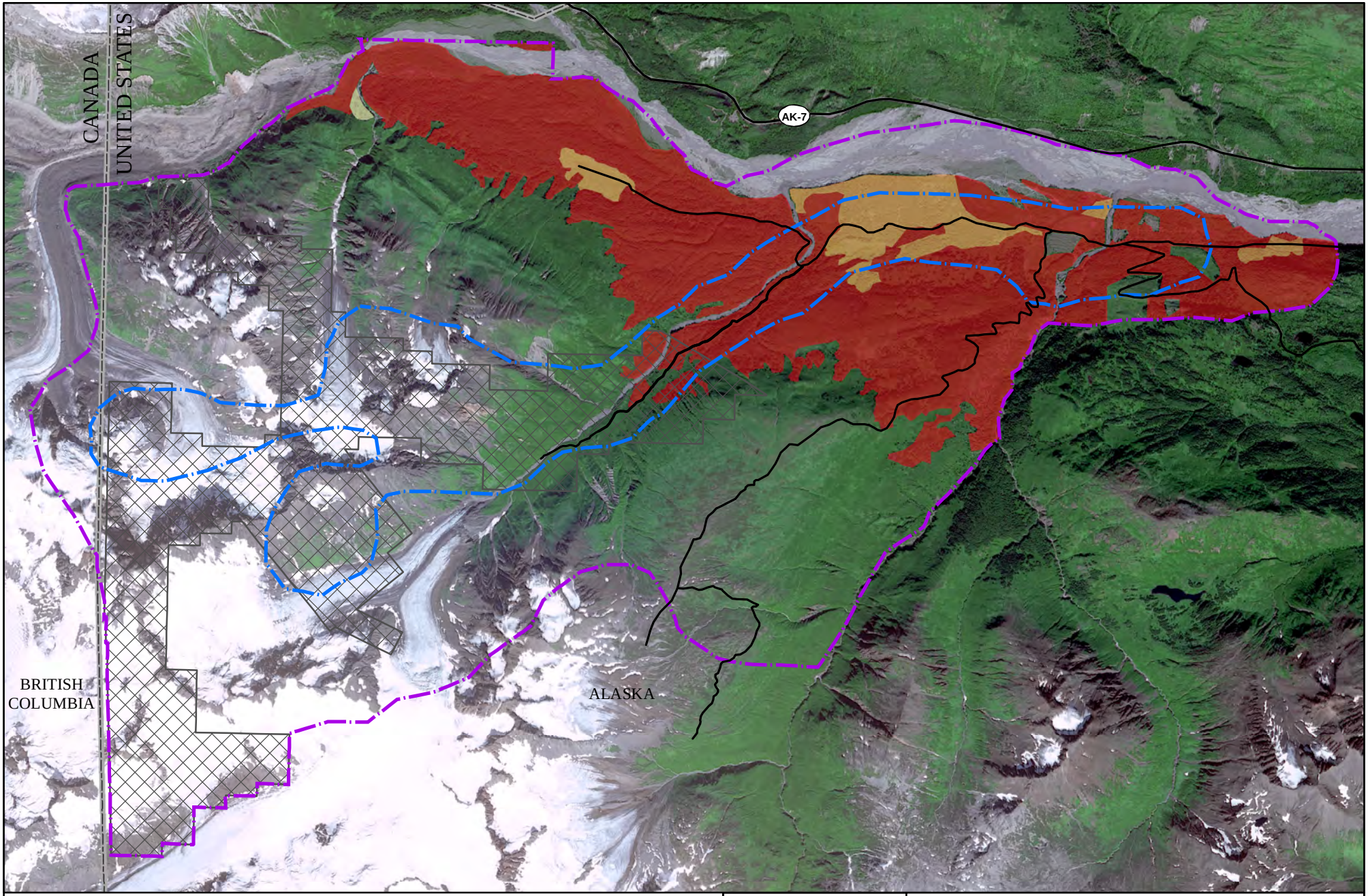
Palmer Project Site

HABITAT SUITABILITY FOR LONG-TOED SALAMANDER

PROJECT No.		
1679-001.01	January 2015	FIGURE 15

Path: O:\1600\1679\mxd\Fig\A15_1679_001_01_AMMA_150112.mxd



Legend

Northwestern Salamander Habitat Suitability

- High
- Moderate
- Low

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

N

1:75,000

0 1 2

Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

CLIENT: CONSTANTINE metal resources ltd.

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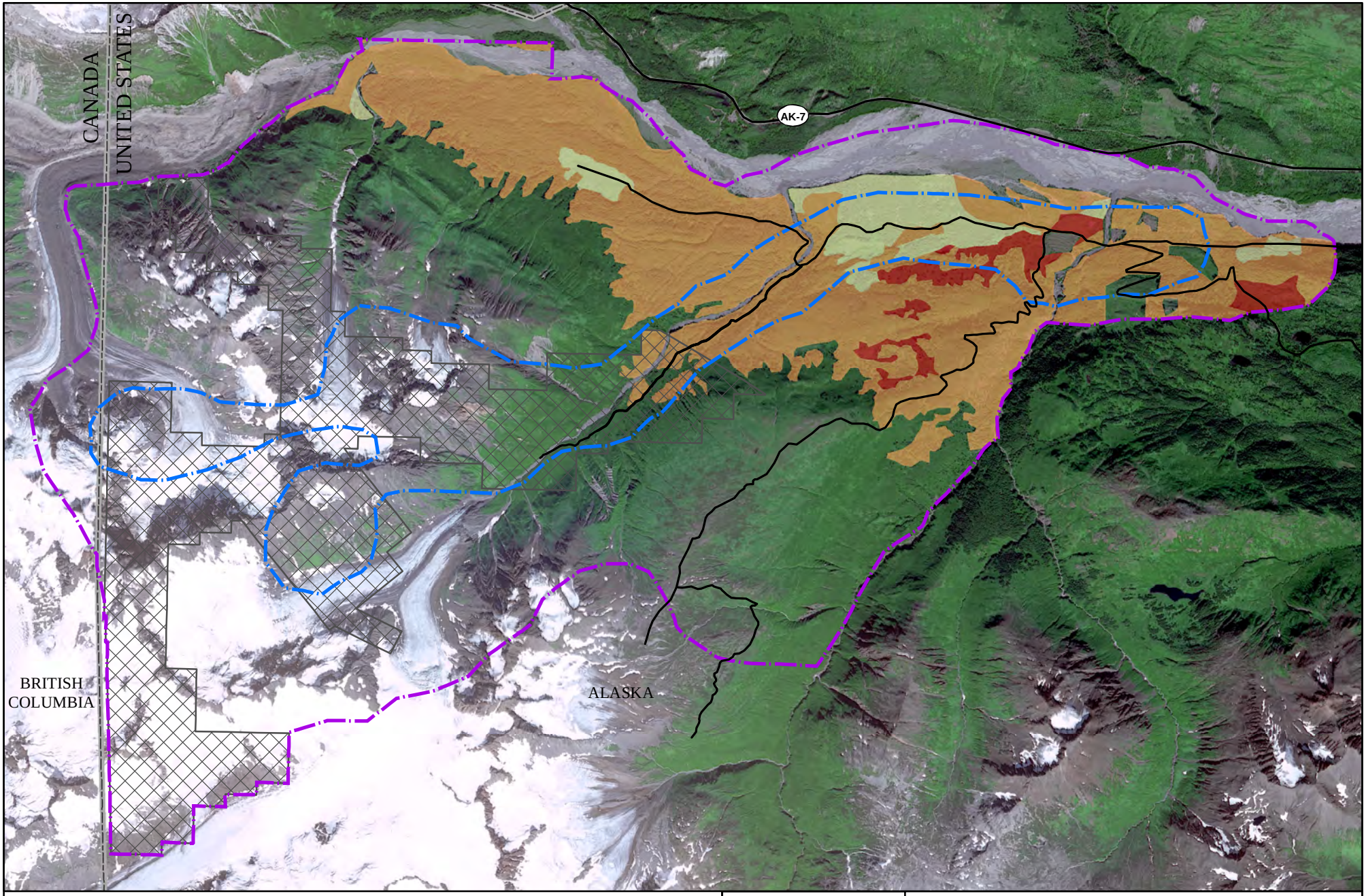
Palmer Project Site

HABITAT SUITABILITY FOR NORTHWESTERN SALAMANDER

PROJECT No.		
1679-001.01	January 2015	FIGURE 16

Path: O:\1600\1679\mxd\Fig\A16_1679_001_01_AMGR_150112.mxd



Legend

Rough-skinned Newt

Habitat Suitability

- High
- Moderate
- Low

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

N

1:75,000

0 1 2

Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

CLIENT: CONSTANTINE metal resources ltd.

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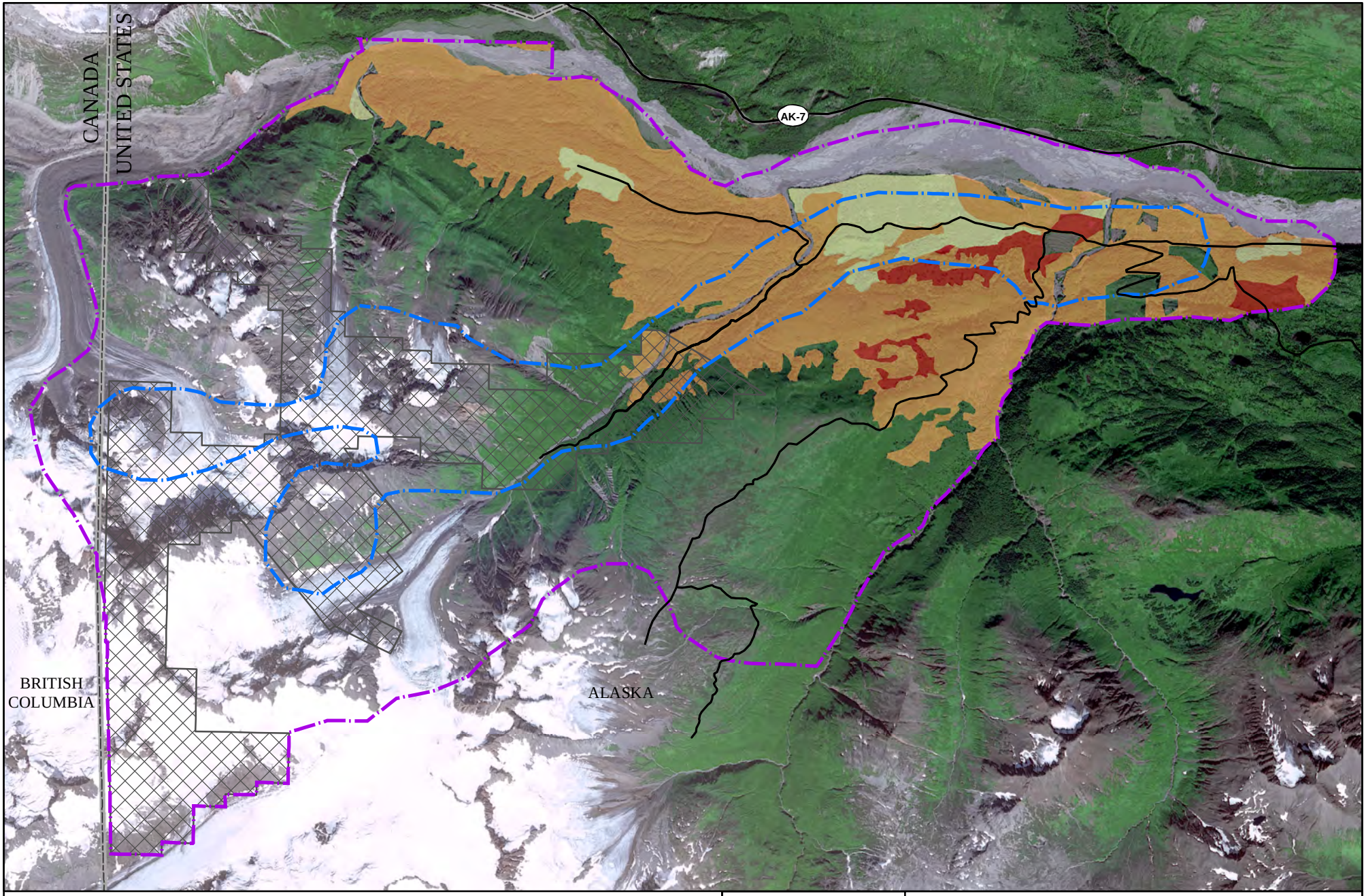
Palmer Project Site

HABITAT SUITABILITY FOR ROUGH-SKINNED NEWT

PROJECT No.		
1679-001.01	January 2015	FIGURE 17

Path: O:\1600\1679\mxd\FigA17_1679_001_01_TAGR_150112.mxd



Legend

Western Toad Habitat Suitability

- High
- Moderate
- Low

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

N

1:75,000

0 1 2

Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

CLIENT: CONSTANTINE metal resources ltd.

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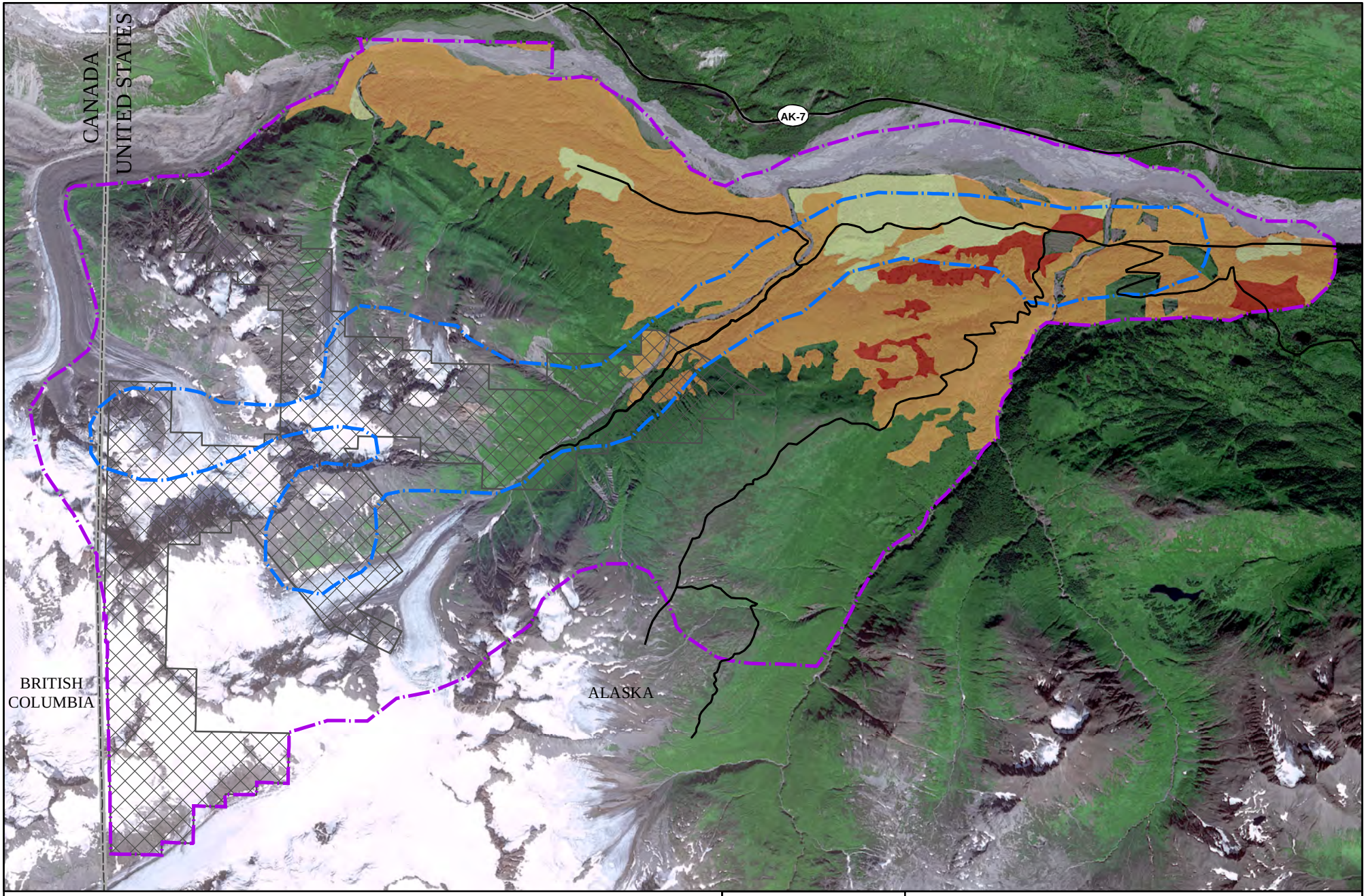
Constantine Metal Resources
Palmer Project Site

HABITAT SUITABILITY FOR WESTERN TOAD

PROJECT No.		
1679-001.01	January 2015	FIGURE 18

Path: O:\1600\1679\mxd\Fig\A18_1679_001_01_ANBO_150112.mxd



Legend

Wood Frog Habitat Suitability

- High
- Moderate
- Low

- WHA Buffer
- WHA Core
- 2009 Claim Boundary
- International Boundary
- Road

N

1:75,000

0 1 2

Kilometres

Aerial Image: SPOT 5 m Colour

HEMMERA

CLIENT: CONSTANTINE metal resources ltd.

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HABITAT SUITABILITY FOR WOOD FROG

PROJECT No.		
1679-001.01	January 2015	FIGURE 19

Path: O:\1600\1679\mxd\FigA19_1679_001_01_USY_150112.mxd