

**DATE** September 8, 2017**PROJECT No.** 1665943**TO** Michael Conway, Regional Superintendent  
Department of Infrastructure, GNWT**CC****FROM** Dan Coulton**EMAIL** dcoulton@golder.com**CONSIDERATION OF ENVIRONMENT AND CLIMATE CHANGE CANADA BIRD DATA FOR THE ENVIRONMENTAL ASSESSMENT OF THE TŁIČHQ ALL-SEASON ROAD**

Environment and Climate Change Canada (ECCC) submitted an Information Request (ECCC IR#9) regarding a recent landbird data collected along Highway 3, which they requested be considered for Adequacy Statement Response (ASR) for the environmental assessment of the Tłı̄chq All-Season Road Project by the Mackenzie Valley Environmental Impact Review Board (EA-1617-01). According to the interim report provided with the data (Hache et al. 2016), the study was designed to examine the relationships between forest fire intensity and bird abundance and changes as burned forest regenerates. The species abundance data were collected using autonomous recording units (ARU), which record vocalizations of signing individuals.

In 2015, 25 ARUs were spaced approximately every 600 m in a grid array at 16 sites, including an additional 12 ARUs deployed at two sites. In 2016, 12 sites were added to the study to test for the effects of time since last fire on bird communities and ARUs were also spaced 600 m apart at these new sites but only 16 ARUs were deployed at each site.

The data were collected from June 3 to July 4, in 2015 (16 sites, 362 sampling stations) and from May 31 to July 12, 2016 (28 sites, 439 total ARUs [including 230 ARUs that were also sampled in 2015]) adjacent to Highway 3 (Figures 1, 2). To consider these data relative to the ASR (PR#110), ARU location coordinates were intersected with land cover data used in the ASR including forest fire data. Additional description of the sampling design and results relative to the regional study area (RSA) for birds, bats and bees is provided below.

Six of sixteen sites (2-07, 2-08, 2-09, 2-10, 2-18 and 2-30; 38%) monitored in 2015 were not burned by 2014 wildfire (Figure 1). Three of the unburned sites in 2015 (2-08, 2-09 and 2-10) were burned greater than 66% (range: 66% to 100%) by wildfire before the 2016 sampling (Figure 2). Only two (4-73 and 4-76) of 12 sites added in 2016 had not been burned in the last eight years (since 2008; Figure 2). In summary, approximately 29% of site-years included habitats that had not been burned in the last eight years (71% had been burned) and 46% were burned within the last two years. Of the five sites overlapping with the RSA (3-13, 3-14, 3-15, 2-28 and 4-73), three of these sites were completely burned in 2014 and another was 94% burned from wildfire in 2008. Across sites and years, unburned sites included 10 of 16 land covers represented in the RSA but the number at individual sites ranged from three to seven land cover types.

A total of 91 bird species were recorded by ARUs (Table 1). In 2015, a total of 75 bird species were recorded, versus in 2016, a total of 74 bird species were recorded. Bird species considered valued components (VCs) in the ASR (PR#110) were noted on 169 (2%) of the 8,664 ARU recordings. The VCs recorded included bank swallow, common nighthawk, olive-sided flycatcher, rusty blackbird, and yellow rail (Table 2).



**Table 1: Bird Species Recorded by Autonomous Recording Units, 2015 to 2016**

Species	Total Number Recorded
Alder flycatcher	226
American bittern	1
American coot	5
American crow	1
American kestrel	1
American robin	1028
American tree sparrow	1
American wigeon	6
Bank swallow	1
Bay-breasted warbler	1
Black-backed woodpecker	9
Black-capped chickadee	1
Blackpoll warbler	5
Blue-headed vireo	13
Bohemian waxwing	1
Bonaparte's gull	18
Boreal chickadee	5
Canada goose	52
Chipping sparrow	1167
Clay-colored sparrow	31
Common loon	15
Common nighthawk	63
Common raven	3
Common redpoll	4
Common yellowthroat	23
Dark-eyed junco	1139
Downy woodpecker	2
Eastern phoebe	2
Fox sparrow	7
Franklin's gull	1
Gadwall	1
Gray jay	88
Gray-cheeked thrush	4
Great gray owl	3
Greater yellowlegs	8
Green-winged teal	8
Hairy woodpecker	3
Hermit thrush	1952
Killdeer	2
Le Conte's sparrow	80
Least flycatcher	23
Lesser yellowlegs	162
Lincoln's sparrow	870
Magnolia warbler	2
Mallard	8
Mew gull	2

Species	Total Number Recorded
Mountain bluebird	6
Mourning warbler	2
Northern flicker	18
Northern hawk owl	2
Northern shoveler	13
Northern waterthrush	4
Olive-sided flycatcher	111
Orange-crowned warbler	288
Ovenbird	9
Pacific loon	83
Palm warbler	250
Pied-billed grebe	2
Pileated woodpecker	4
Pine siskin	11
Red crossbill	14
Red-necked grebe	23
Red-winged blackbird	17
Ring-necked duck	3
Ruby-crowned kinglet	88
Ruffed grouse	51
Rusty blackbird	4
Sandhill crane	160
Savannah sparrow	8
Sedge wren	1
Solitary sandpiper	58
Sora	237
Spotted sandpiper	9
Swainson's thrush	1004
Swamp sparrow	148
Tennessee warbler	178
Townsend's solitaire	4
Tree swallow	57
Warbling vireo	2
Western tanager	5
Western wood-pewee	21
White-crowned sparrow	276
White-throated sparrow	1274
White-winged crossbill	17
Wilson's warbler	5
Winter wren	2
Yellow rail	1
Yellow warbler	13
Yellow-bellied flycatcher	6
Yellow-bellied sapsucker	14
Yellow-rumped warbler	456

**Table 2: Migratory Bird Species at Risk Valued Components Detected at Landbird Monitoring Sites, 2015 and 2016**

Species	2015 Sites	2016 Sites
Bank swallow	02-07	None
Common nighthawk	01-06, 02-09, 02-10, 03-11, 03-14	01-05, 02-07, 02-30, 03-11, 03-15, 03-28, 04-72, 04-74, 04-79
Olive-sided flycatcher	01-02, 01-04, 01-05, 01-06, 02-30, 03-13, 03-14, 03-16	01-04, 01-05, 02-07, 02-09, 02-23, 02-30, 03-11, 03-15, 04-74, 04-76, 04-79
Rusty blackbird	01-05	None
Yellow rail	04-76	None

Relative to the RSA, two sites (3-13, 3-28) are entirely and three sites partially (3-14, 3-15 and 4-73) located within the RSA and these sites occurred near the junction between the Project and Highway 3 (Figures 1, 2). The remainder of sites were located from 0.1 km to 109 km outside of the RSA and all were within 2.5 km of Highway 3.

At the five sites intersecting with the RSA, common nighthawk and olive-sided flycatcher were the only bird VCs detected. No new bird species at risk were detected beyond those already included in the ASR.

A typical baseline study design for an environmental assessment would have included sampling habitat at the patch-level in accordance with habitat distribution to produce data representative of the RSA and capture natural variability. The distribution of sampling would have included maintaining observation independence and replication. In contrast, the landbird sampling was designed to measure abundance at a larger site scale (with varying and multiple patches within a site) with an emphasis on burned habitat. Because individual ARU results are correlated by site, they cannot be assumed to provide independent observations of patches but reflect suitability at the larger site scale. For example, 44 of 126 (34.9%) common nighthawk recordings came from one site (02-09) in 2015. This site had 11 of 25 (44%) ARUs located in three land covers described as moderate to highly suitable habitat in the ASR. Other less suitable habitats (four types at this site) with ARUs at this same site also recorded common nighthawk likely because they are in an area of higher quality habitat, which is more attractive to common nighthawk. There are only six unburned sites, which is a low number of replicates and too few to confidently evaluate the assessment Habitat Suitability Indices. These unburned sites also collectively underrepresent habitat diversity than the RSA. The unburned sites are also clustered spatially (Figures 1, 2) so there is uncertainty about how well they represent the RSA. While the sampling design of the landbird study may be adequate to meet the objective of characterizing relationships between bird abundance and diversity following wildfire that it was designed to do, it does not align well with the study area nor the distribution of unburned habitats in the RSA. Therefore, these data do not lend themselves well to verifying the VC habitat suitability indices included in the ASR, which are based on species preferences noted in the scientific literature. However, these data did confirm the presence of common nighthawk and olive-sided flycatcher in the RSA and that other bird species at risk VCs are present but rare at the landscape scale as indicated in the ASR. Consideration of the landbird study data does not change the ASR conclusions regarding impacts to bird VCs.

It is important to note that an environmental assessment can be completed in the absence of baseline data and still provide confidence in assessment conclusions. This is accomplished by applying conservatism so that effects have not been underestimated. The assessment method in the ASR assumes that all species at risk VCs whose ranges overlap the Project are present in the RSA, and that all suitable habitat is necessary to meet a VC's life-history requirements. Therefore, all suitable habitats are important to the population under examination regardless of whether a suitable patch is occupied or not, as would be determined during a baseline study. As part of the

assessment, the suitable habitats were mapped using available information on habitat selection and use relationships described in previously completed scientific and monitoring studies on wildlife criterion (ASR Section 4.2.2), and the resulting maps were used to quantify the effects of direct habitat loss on bird VCs using disturbance layers in a GIS.

Importantly, the effects of previous and existing developments, the Project and foreseeable future developments were maximized by exaggerating the size of footprints by use of buffers to overestimate footprints. This provides confidence that incremental and cumulative effects have not been underestimated, and confidence in the ASR conclusion that the Project will not lead to significant environmental impacts to bird VC populations.

## References

Hache, S., R. Pankraz and M. Knaggs. 2016. Summary of the Post-Fire Landbird Monitoring Project. Unpublished report. December 6, 2016.

PR#110. Adequacy Statement Responses for the Tłı̄ch̄o All-Season Road Project. Mackenzie Valley Environmental Impact Review Board EA-1617-01. Prepared by Golder Associates Ltd. for the Government of the Northwest Territories. April 2017

## Closure

We hope this technical memorandum meets your needs. If you have any questions, please don't hesitate to contact Damian Panayi at 873.6319.



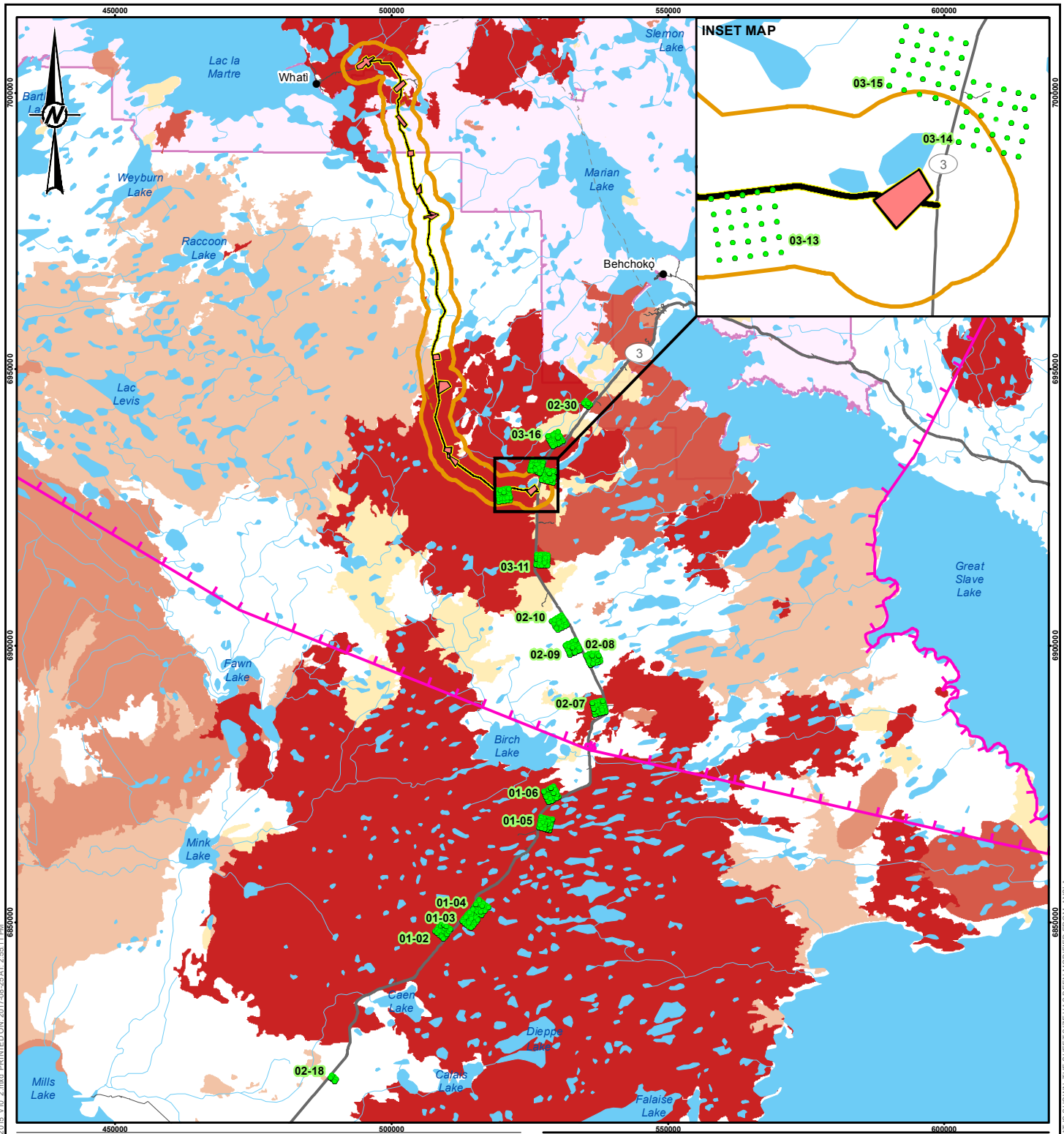
Dan Coulton, PhD  
Wildlife Biologist



Damian Panayi, BSc  
Associate, Wildlife Biologist

## Attachment: Figure 1 and Figure 2

[https://capws.golder.com/sites/1665943tlichoroadea/eccc\\_bird\\_data/final\\_gnwt\\_edits/eccc\\_ir9\\_bird\\_data\\_review\\_golder\\_memo\\_final.docx](https://capws.golder.com/sites/1665943tlichoroadea/eccc_bird_data/final_gnwt_edits/eccc_ir9_bird_data_review_golder_memo_final.docx)



**LEGEND**

- POPULATED PLACE
  - ALL-SEASON ROAD
  - LOCAL ROAD
  - - - WINTER ROAD
  - - - OLD AIRPORT ROAD
  - WATERCOURSE
  - Tłı̨chǫ LAND
  - WATER BODY
  - WEK'ĒEZHI RESOURCE MANAGEMENT AREA
  - PROJECT FOOTPRINT - BORROW SOURCE
  - PROJECT FOOTPRINT - ROAD
  - AUTOMATED RECORDING UNIT
  - BUMBLE BEE, BIRD, AND BAT RSA
- FIRE HISTORY**
- 0 - 5 YEARS (2010 - 2014)
  - 6 - 10 YEARS (2005 - 2009)
  - 11 - 20 YEARS (1995 - 2004)
  - 21 - 40 YEARS (1975 - 1994)
  - > 40 YEARS (1946 - 1974)



**REFERENCE(S)**

1. ARU DATA OBTAINED FROM ENVIRONMENT CANADA, 2017.
  2. FIRE HISTORY OBTAINED FROM GOVERNMENT OF NWT WITH PERM ISSION.
  3. BASE DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
- PROJECTION: UTM ZONE 11 DATUM: NAD83

CLIENT  
GOVERNMENT OF NORTHWEST TERRITORIES

PROJECT  
Tłı̨chǫ ALL-SEASON ROAD

TITLE  
**SITE LOCATIONS OF 2015 LANDBIRD AUTOMATED RECORDING UNITS**

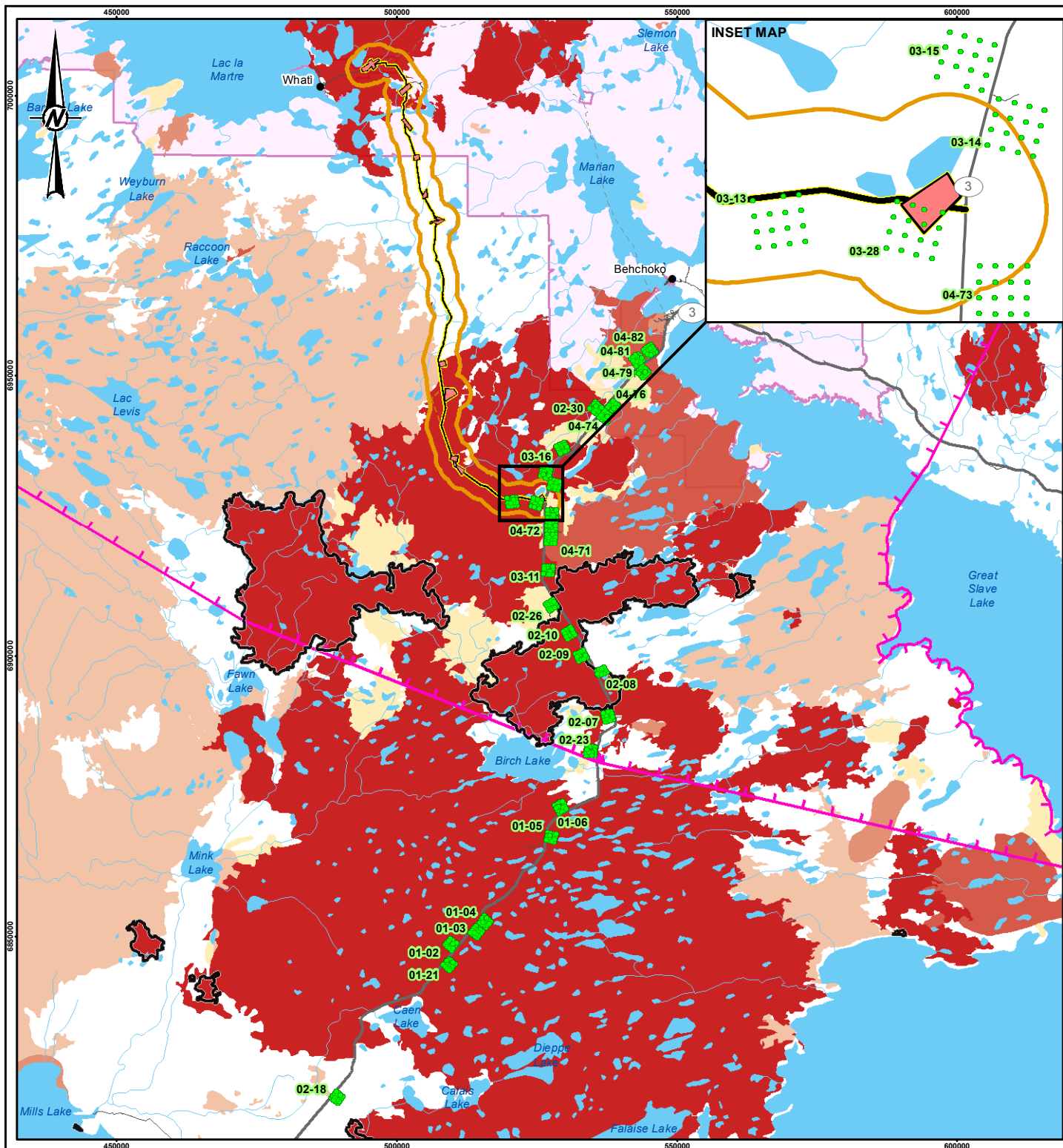
CONSULTANT	YYYY-MM-DD	2017-08-25
DESIGNED	DC	
PREPARED	LMS	
REVIEWED	DC	
APPROVED	DP	



PROJECT NO.  
1665943

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**LEGEND**

- POPULATED PLACE
  - ALL-SEASON ROAD
  - LOCAL ROAD
  - - - WINTER ROAD
  - - - OLD AIRPORT ROAD
  - WATERCOURSE
  - TŁJCHQ LAND
  - WATER BODY
  - WEK'ĒEZHI RESOURCE MANAGEMENT AREA
  - PROJECT FOOTPRINT - BORROW SOURCE
  - PROJECT FOOTPRINT - ROAD
  - AUTOMATED RECORDING UNIT
  - BUMBLE BEE, BIRD, AND BAT RSA
  - 2015 FIRE BOUNDARY
- FIRE HISTORY**
- 0 - 5 YEARS (2011 - 2015)
  - 6 - 10 YEARS (2006 - 2010)
  - 11 - 20 YEARS (1996 - 2005)
  - 21 - 40 YEARS (1976 - 1995)
  - > 40 YEARS (1946 - 1975)
- 0 20 40  
1:1,000,000 KILOMETRES

**REFERENCE(S)**

1. ARU DATA OBTAINED FROM ENVIRONMENT CANADA, 2017.
  2. FIRE HISTORY OBTAINED FROM GOVERNMENT OF NWT WITH PERM ISSION.
  3. BASE DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
- PROJECTION: UTM ZONE 11 DATUM: NAD83

CLIENT  
GOVERNMENT OF NORTHWEST TERRITORIES

PROJECT  
TŁJCHQ ALL-SEASON ROAD

TITLE  
**SITE LOCATIONS OF 2016 LANDBIRD AUTOMATED RECORDING UNITS**

CONSULTANT	YYYY-MM-DD	2017-09-07
DESIGNED	DC	
PREPARED	LMS	
REVIEWED	DC	
APPROVED	DP	



PROJECT NO. 1665943      REV. 0      FIGURE 2

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A 25mm