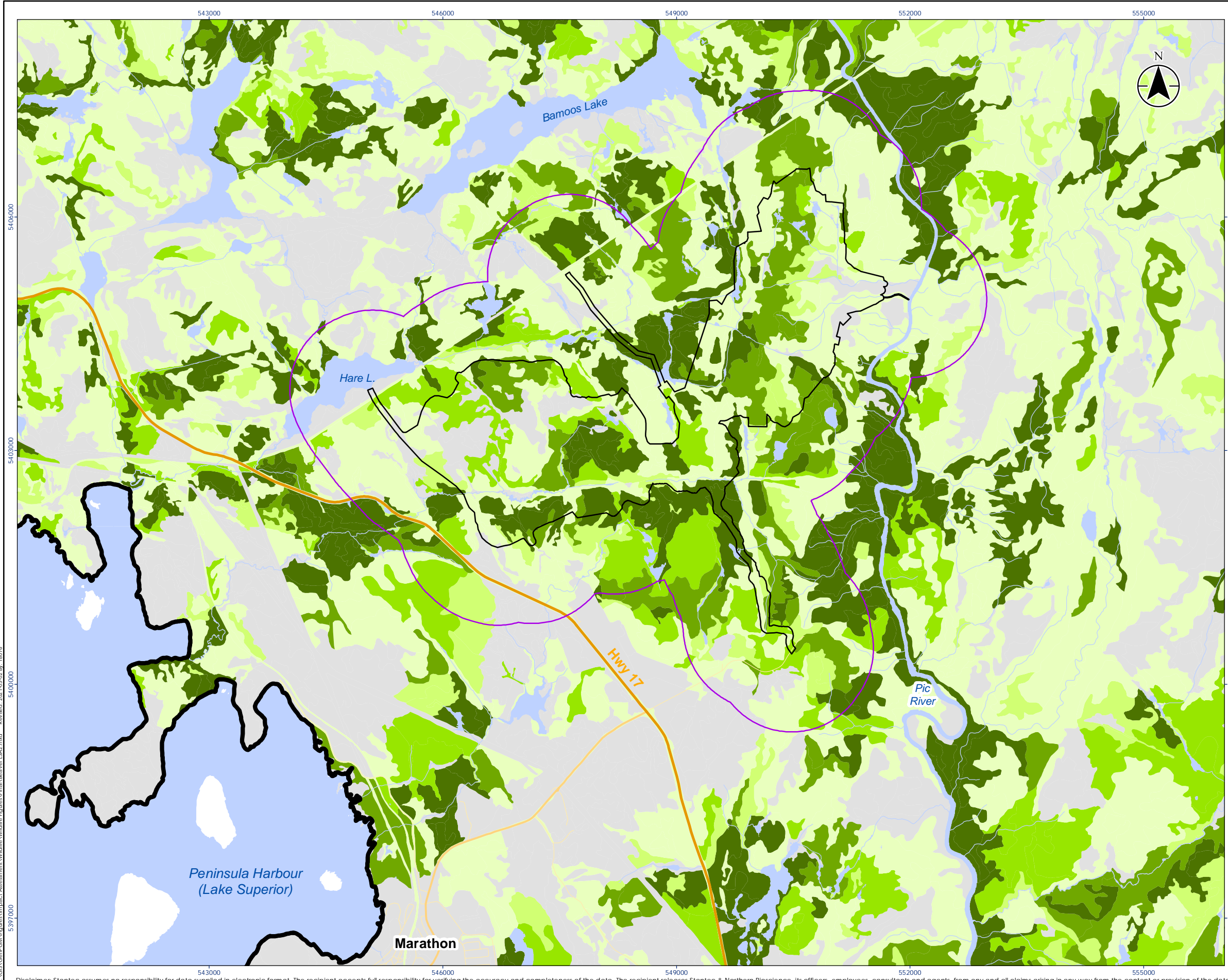


*D8 WILDLIFE SUPPORTING
INFORMATION*

D8.1 BEAVER HABITAT MAPPING



Legend

Beaver Habitat

- 0%
- 1 - 20%
- 21 - 40%
- 41 - 60%
- 61 - 80%
- 81-100%
- Site Study
- Local Study
- Regional Study
- Highway
- Major Road
- Minor Road
- Waterbody (LIO)
- Watercourse



Notes

1. Coordinate System: NAD 1983 UTM Zone 16N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.



Project Location
Marathon

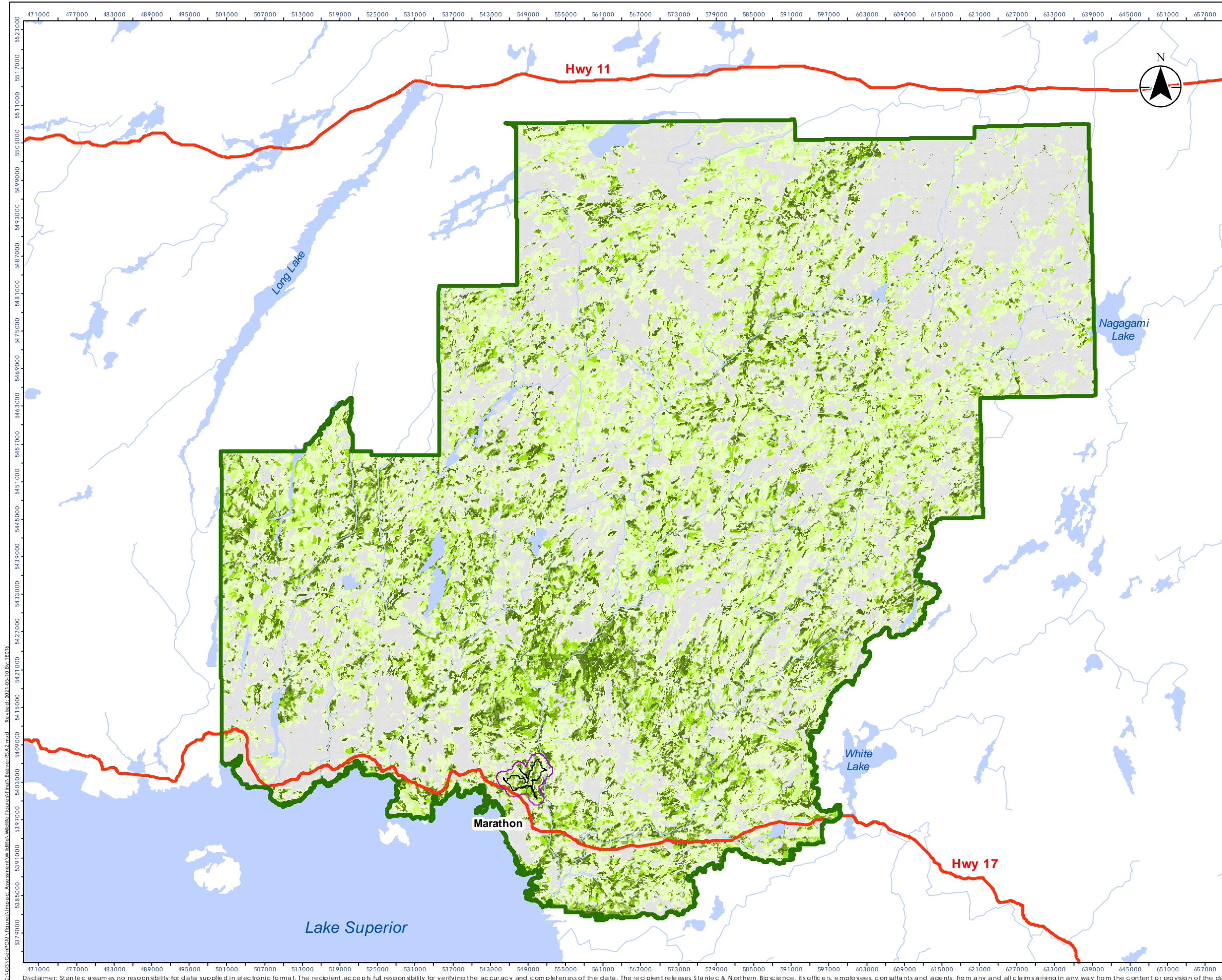
Prepared by R. Foster on 2021-03-02

Client/Project
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MARATHON PALLADIUM PROJECT

Figure No.
Appendix D8.1-1

Title
Beaver Habitat in the LSA

C:\GIS\Geoprocessing\Impact Assessment\Wildlife\Fish\Beaver\LSA2.mxd Revised: 2021-03-02 By: 18076

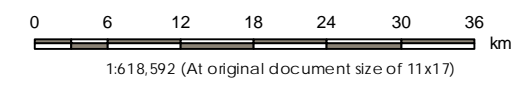


Legend

Beaver Habitat

BVR_1

- 0%
- 1 - 20%
- 21 - 40%
- 41 - 60%
- 61 - 80%
- 81-100%
- Site Study Area
- Local Study Area
- Regional Study Area
- Expressway / Highway
- Waterbody (LIO 1:2M)
- Watercourse (LIO 1:5M)



Notes
 1. Coordinate System: NAD 1983 UTM Zone 16N
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Project Location: Marathon
 Prepared by R. Foster on 2021-03-10

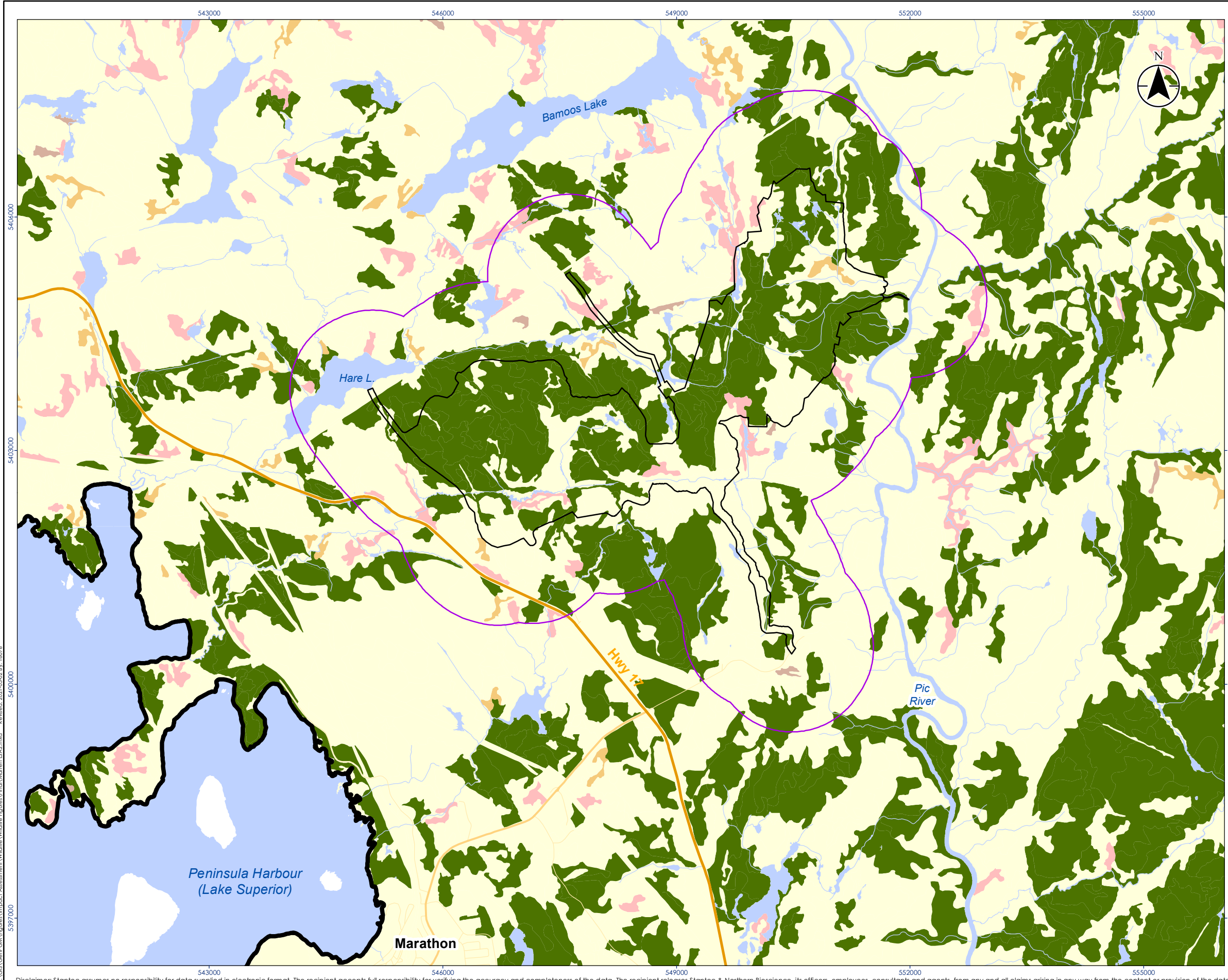
Client/Project:
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Figure No.: Appendix D8.1-2
 Title: Beaver Habitat in the Regional Study Area

C:\GIS\Geoprocessing\Assessments\Wildlife\Figures\Fresh\Beaver\Fig2.mxd - Revised: 2021.03.10 by I.18076

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D8.2 MARTEN HABITAT MAPPING



- Legend
- Marten Habitat**
- 1-20%
 - 21-40%
 - 41-60%
 - 61-75%
 - >75%
- Site Study
 - Local Study
 - Regional Study
 - Highway
 - Major Road
 - Minor Road
 - Waterbody (LIO)
 - Watercourse



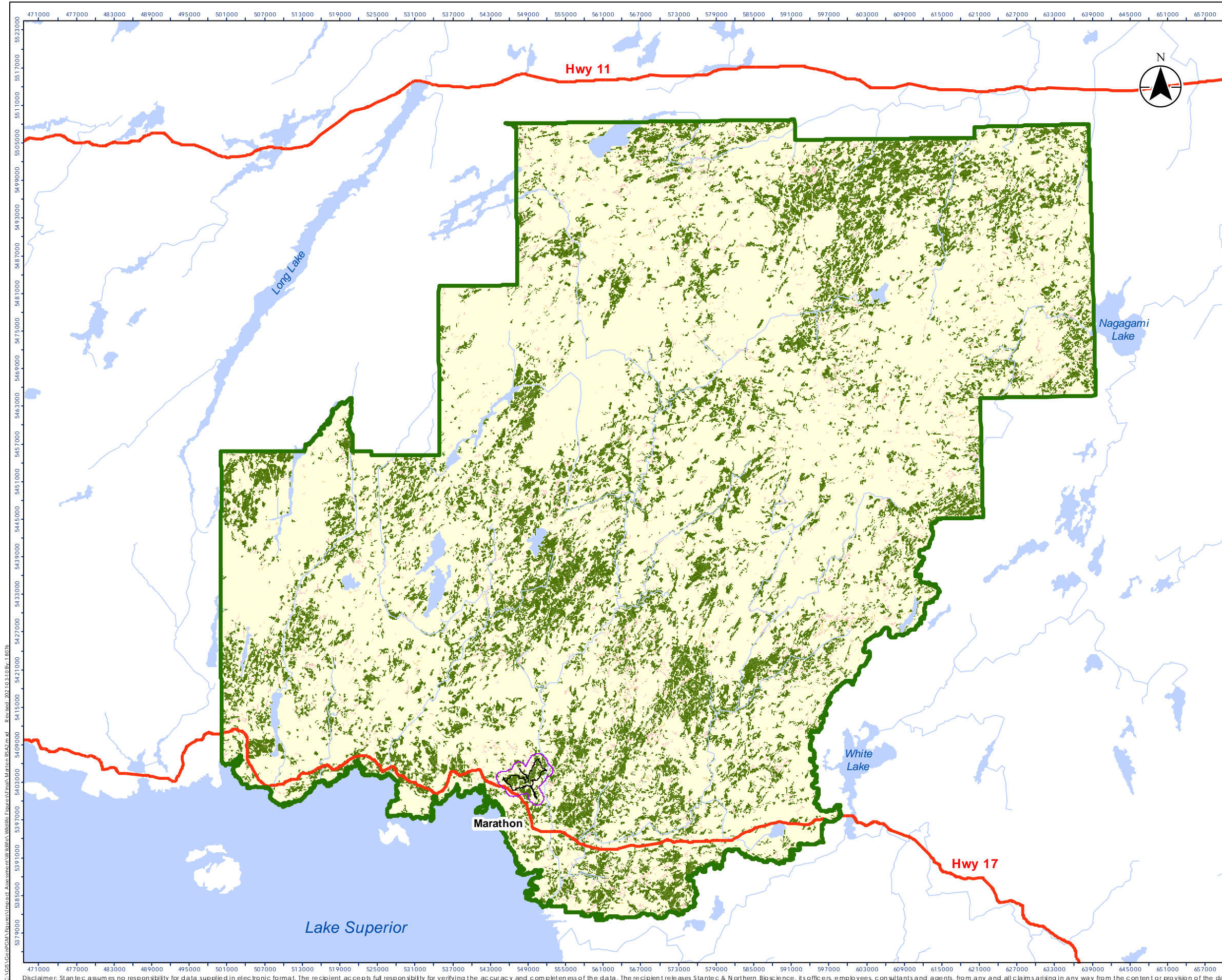
- Notes
1. Coordinate System: NAD 1983 UTM Zone 16N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.



Project Location: Marathon
 Prepared by R. Foster on 2021-03-02

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Figure No.
Appendix D8.2-1
 Title
Marten Habitat in the LSA

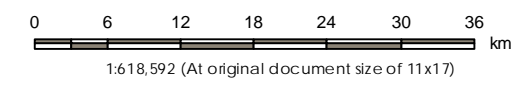


Legend

Marten Habitat

- 1-20%
- 21-40%
- 41-60%
- 61-75%
- >75%

- Site Study Area
- Local Study Area
- Regional Study Area
- Expressway / Highway
- Waterbody (LIO 1:2M)
- Watercourse (LIO 1:5M)



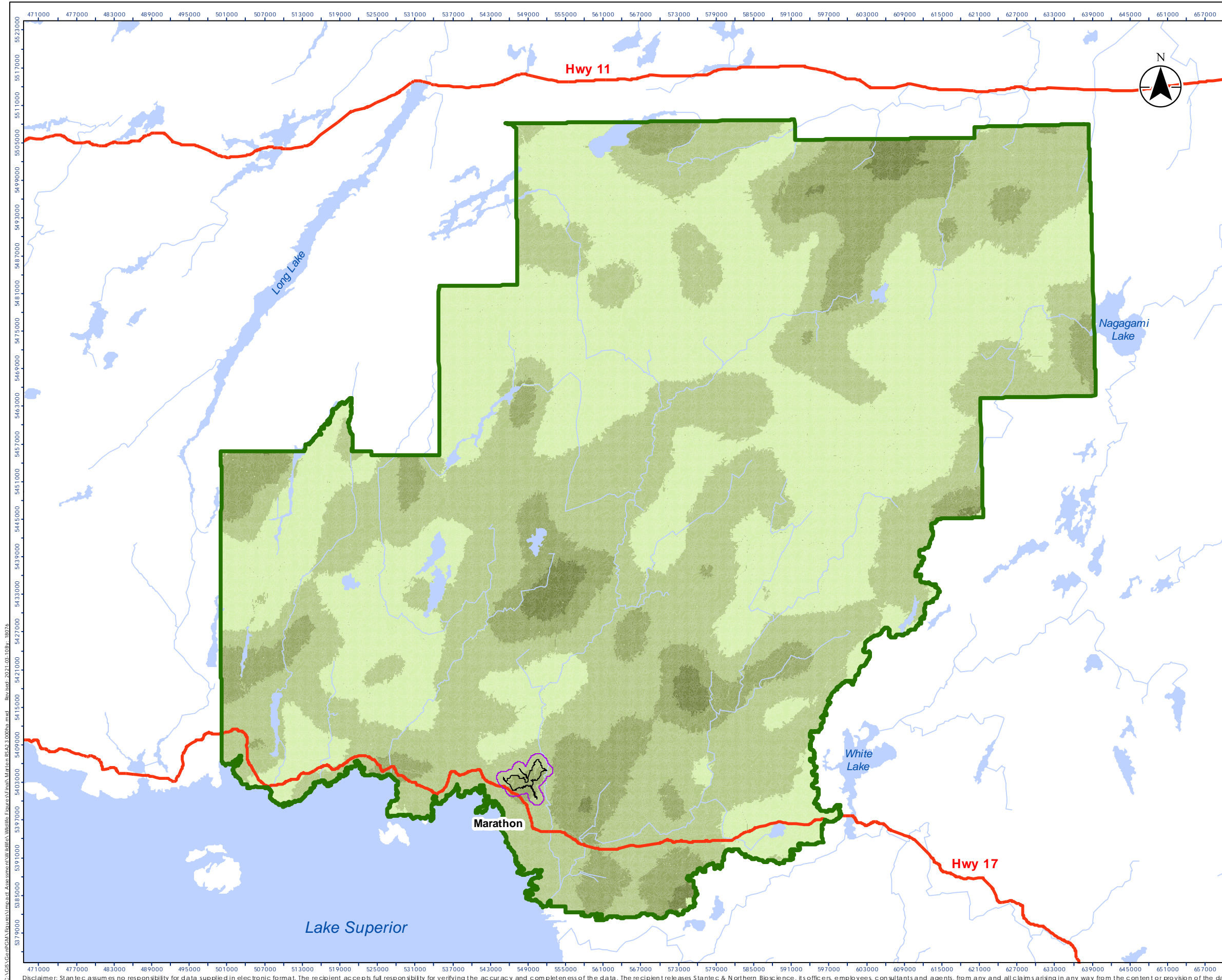
Notes
 1. Coordinate System: NAD 1983 UTM Zone 16N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.



Project Location: Marathon
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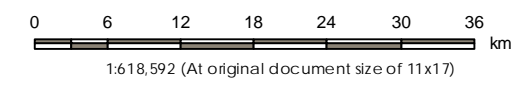
Figure No.: Appendix D8.2-2
 Title: Marten Habitat in the Regional Study Area



Legend

Marten Habitat (3000 ha)

- 1-20%
- 21-40%
- 41-60%
- 60-75%
- >75%
- Site Study Area
- Local Study Area
- Regional Study Area
- Expressway / Highway
- Waterbody (LIO 1:2M)
- Watercourse (LIO 1:5M)



Notes
 1. Coordinate System: NAD 1983 UTM Zone 16N
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Figure No.:
 Appendix D8.2-3

Title:
 Marten Habitat in the Regional Study Area
 (3000 ha)

C:\GIS\Geoprocessing\Assessments\Wildlife\Figures\Fresh\Marten\RAZ\3000ha.mxd. Rev: Iss: 2021-03-10 by: 18076

D8.3 BLACK BEAR HABITAT MAPPING

MARATHON PALLADIUM PROJECT ENVIRONMENTAL IMPACT STATEMENT ADDENDUM

Appendix D8.3 Bear Habitat Modelling

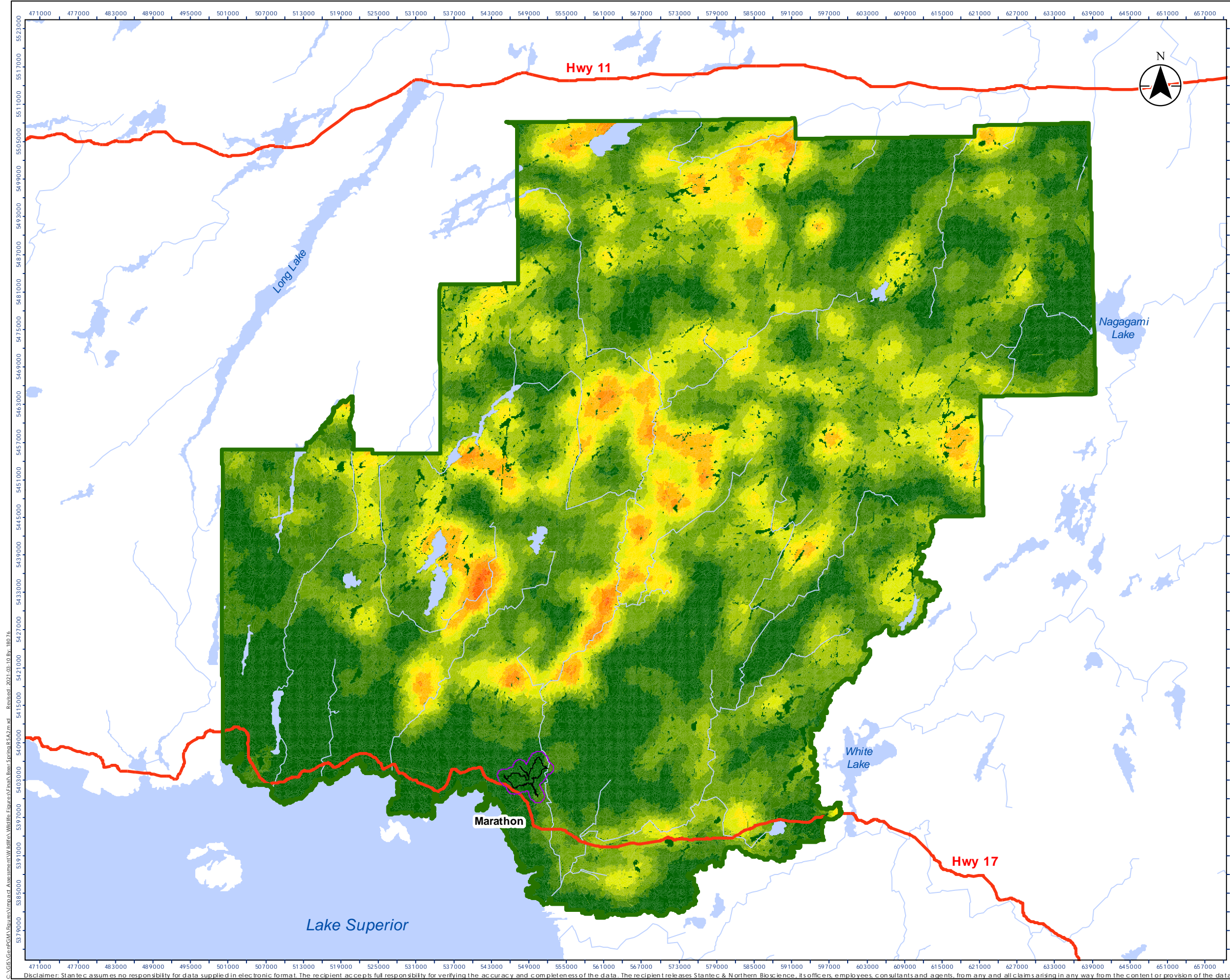
Bear habitat suitability is a relative index of spring, summer, or den suitability. See Naylor et al. (1999) and Pond et al. (2009) for details.

The following figures identify bear habitat suitability within the study area.

Reference

Naylor, B, D. Kaminski, S. Bridge, P. Elkie, D. Ferguson, G. Lucking, and B. Watt. 1999. User's guide for OWHAM and OWHAMTool. Ontario Ministry of Natural Resources and Forestry, South Central Science Section. Tech. Rpt. No. 54.

Pond, B., M. bbard, and P. Elkie 2009. American Black Bear: Evaluative indicators for the Forest Management Landscape Book. Great Lakes St. Lawrence forest Regional, Ontario. Unpublished report. Ontario Ministry of Natural Resources and Forestry . 24 pp.

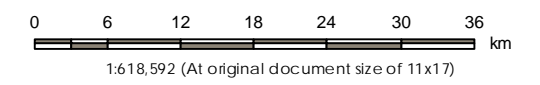


Legend

Bear Spring Habitat Suitability

- 0.000 - 0.010
- 0.011 - 0.020
- 0.021 - 0.030
- 0.031 - 0.040
- 0.041 - 0.050
- 0.051 - 0.060
- 0.061 - 0.070
- 0.071 - 0.080
- 0.081 - 0.090
- 0.091 - 1.000

- Site Study Area
- Local Study Area
- Regional Study Area
- Expressway / Highway
- Waterbody (LIO 1:2M)
- Watercourse (LIO 1:5M)



Notes
 1. Coordinate System: NAD 1983 UTM Zone 16N
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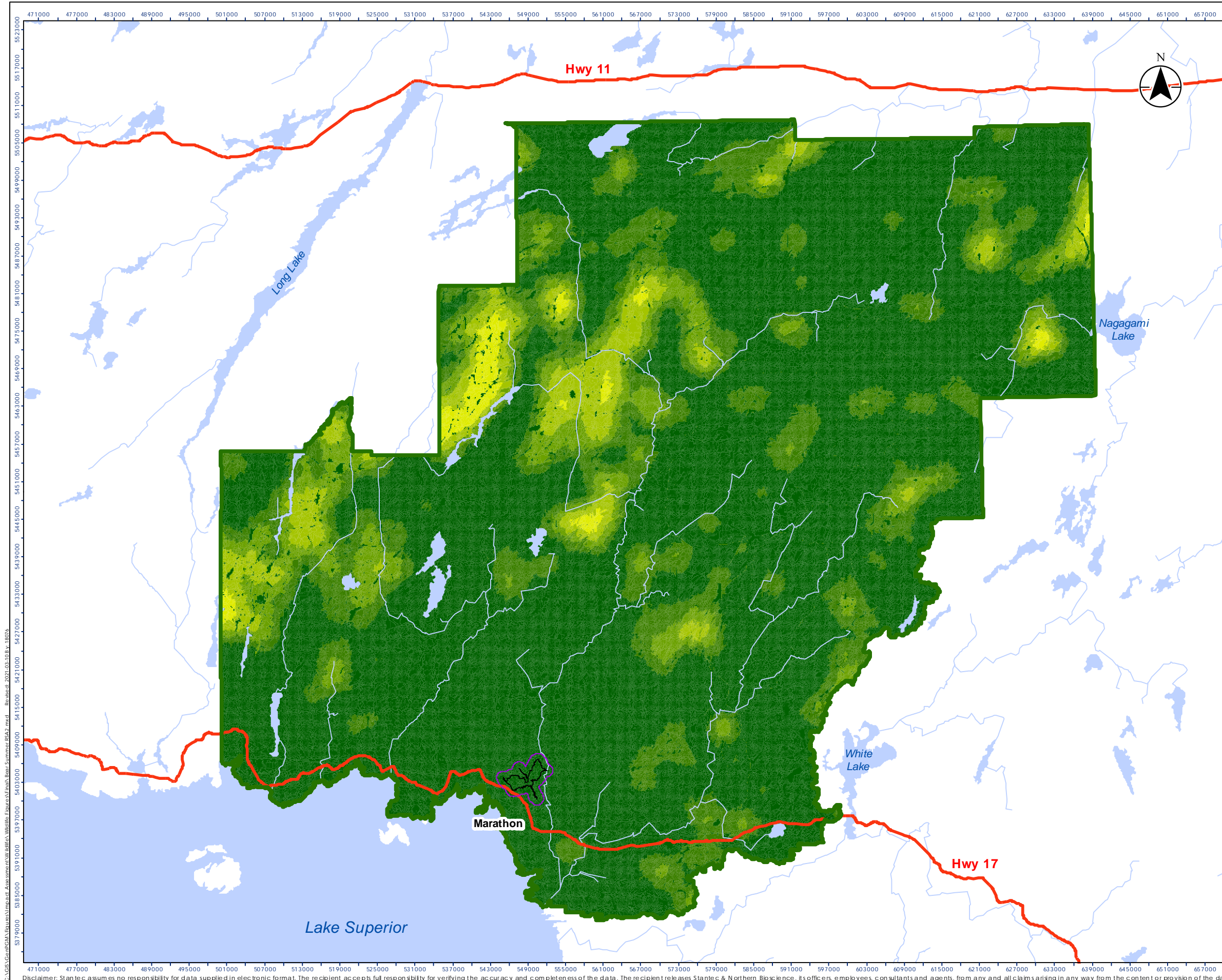
Project Location: Marathon
 Prepared by R. Foster on 2021-03-10

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Figure No.
 Appendix D8.3-1
 Title
 Bear Spring Habitat Suitability

C:\GIS\Geoprocessing\Assessments\Wildlife\Figures\Bear Spring\ESA2.mxd, Revised: 2021-03-10 By: 18076

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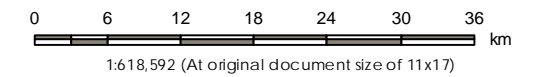


Legend

Bear Summer Habitat Suitability

- 0.000 - 0.010
- 0.011 - 0.020
- 0.021 - 0.030
- 0.031 - 0.040
- 0.041 - 0.050
- 0.051 - 0.060
- 0.061 - 0.070
- 0.071 - 0.080
- 0.081 - 0.090
- 0.091 - 1.000

- Site Study Area
- Local Study Area
- Regional Study Area
- Expressway / Highway
- Waterbody (LIO 1:2M)
- Watercourse (LIO 1:5M)



Notes
 1. Coordinate System: NAD 1983 UTM Zone 16N
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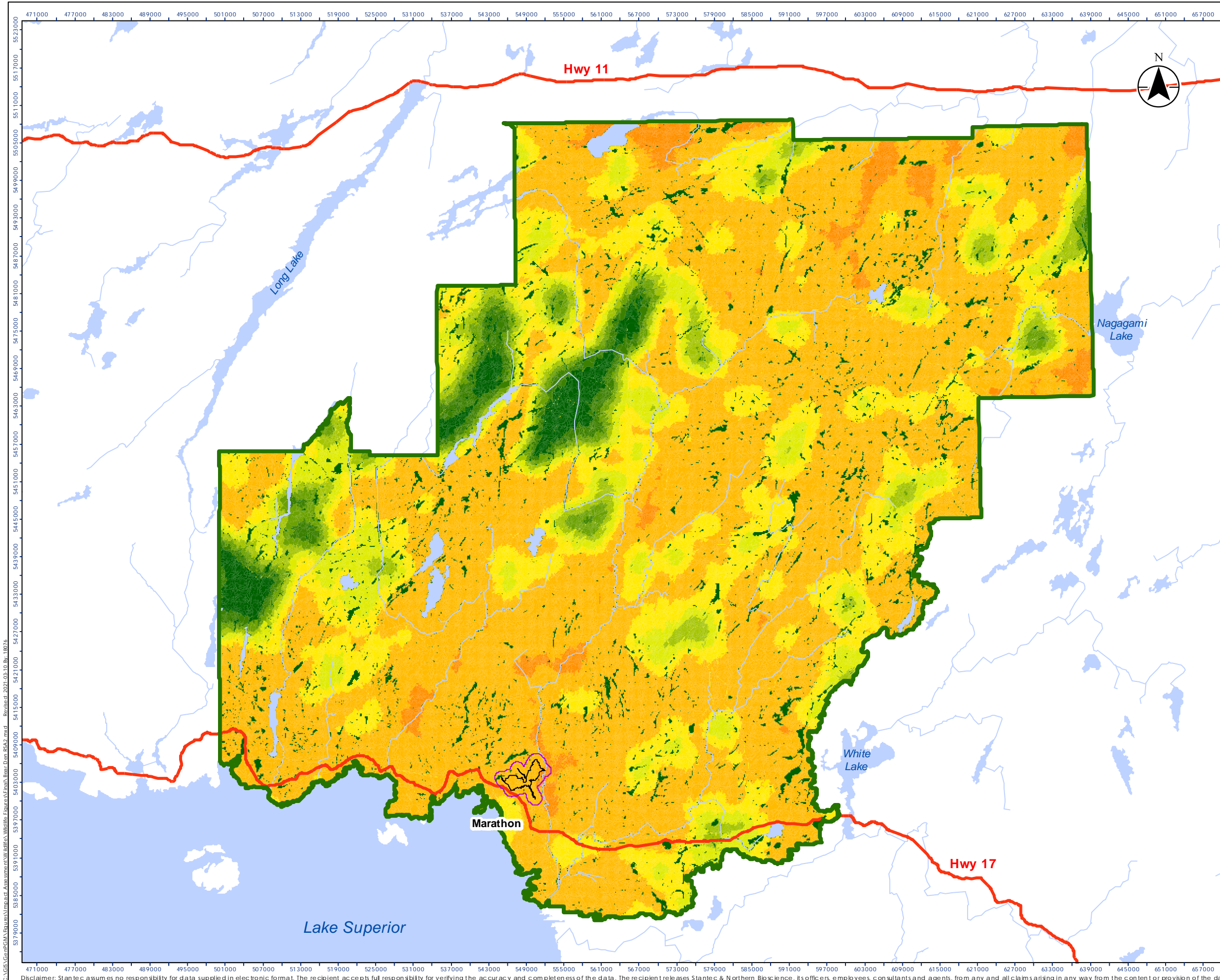
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 Prepared by R. Foster on 2021-03-10

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Figure No.: Appendix D8.3-2
 Title: Bear Summer Habitat Suitability

C:\GIS\Geoprocessing\Assessments\Wildlife\Figures\Fresh\Bear_Summer_RSA2.mxd..._Revise.d_2021.03.10.8.k.18076

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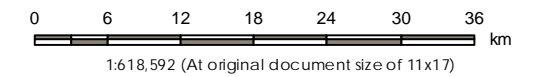


Legend

Bear Den Habitat Suitability

- 0.000 - 0.010
- 0.011 - 0.020
- 0.021 - 0.030
- 0.031 - 0.040
- 0.041 - 0.050
- 0.051 - 0.060
- 0.061 - 0.070
- 0.071 - 0.080
- 0.081 - 0.090
- 0.091 - 1.000

- Site Study Area
- Local Study Area
- Regional Study Area
- Expressway / Highway
- Waterbody (LIO 1:2M)
- Watercourse (LIO 1:5M)



Notes
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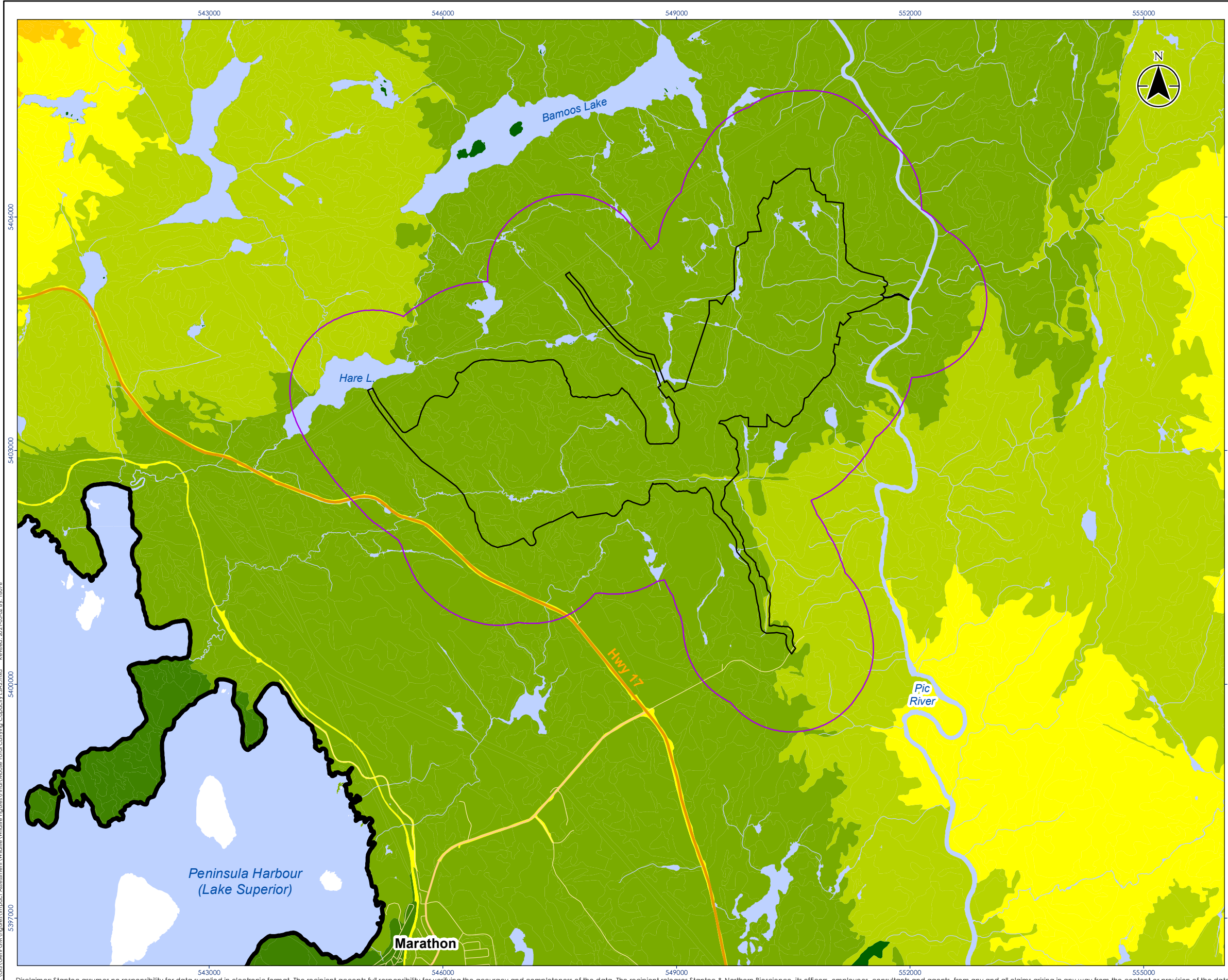
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Figure No.
 Appendix D8.3-3

Title
 Bear Den Habitat Suitability

C:\GIS\Geoprocessing\Assessments\Wildlife\Figures\Fresh\Bear Den\ESA2.mxd - Revised: 2021-03-10 By: LB74

D8.4 MOOSE HABITAT MAPPING



Legend

Moose Total Carrying Capacity (moose/km²)

- <math>< 0.05</math>
- 0.06 - 0.10
- 0.11 - 0.15
- 0.16 - 0.20
- 0.21 - 0.25
- 0.26 - 0.30
- 0.31 - 0.40
- 0.41 - 0.50
- >0.05

- Site Study
- Local Study
- Regional Study
- Highway
- Major Road
- Minor Road
- Waterbody (LIO)
- Watercourse



Notes

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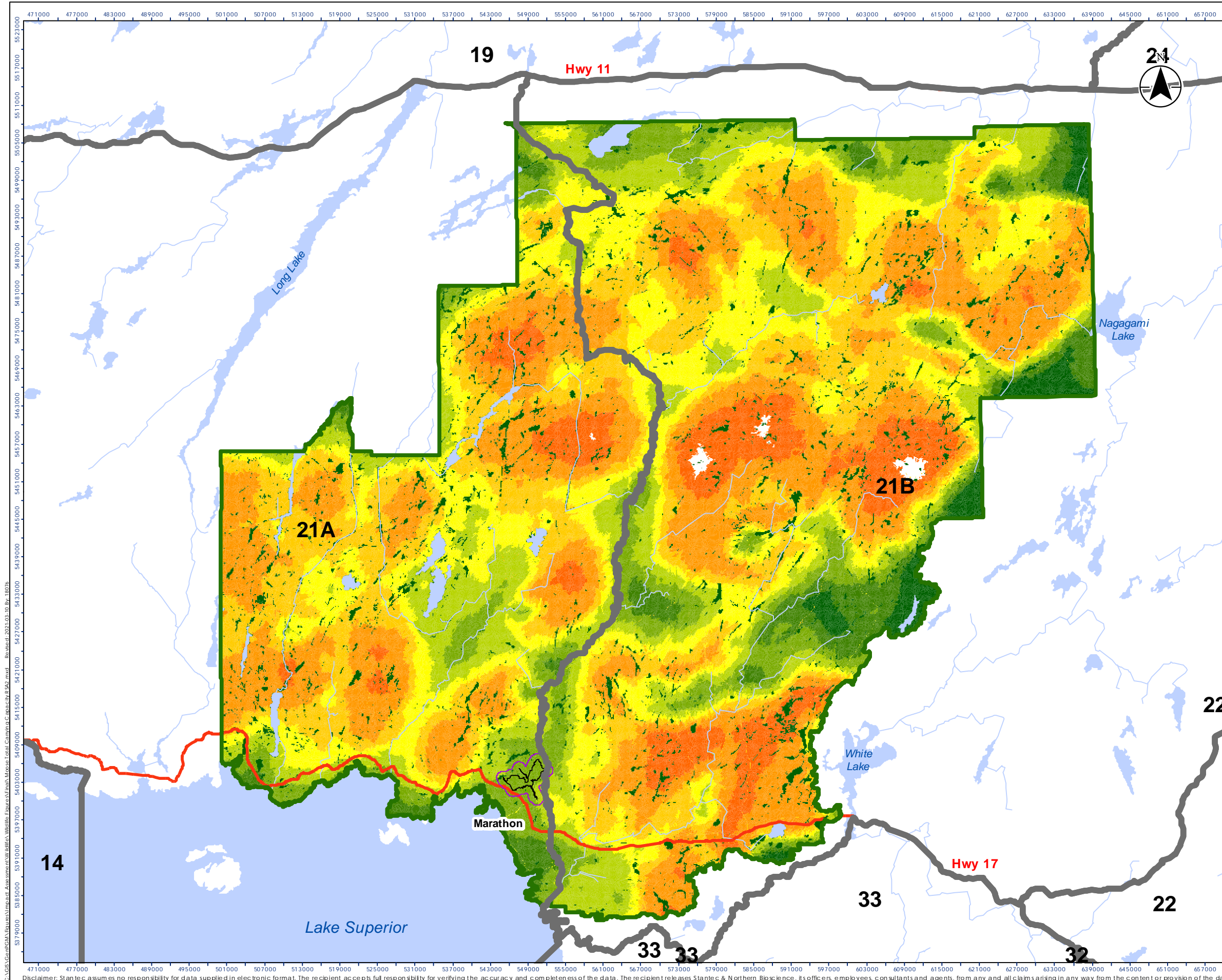
Project Location: Marathon
Prepared by R. Foster on 2021-03-02

Client/Project
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MARATHON PALLADIUM PROJECT

Figure No.
Appendix D8.4-1
Title
Moose Total Carrying Capacity in the Local Study Area

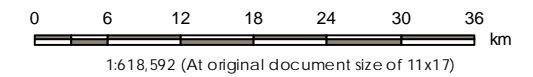
C:\GIS\GenPGM\Egures\Impact Assessment\Wildlife\Wildlife Egures\Final\Moose Total Carrying Capacity_LSA2.mxd Revised: 2021-03-02 By: 18074

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Legend

- Wildlife Management Unit
- Moose Total Carrying Capacity (moose/km²)**
- < 0.05
- 0.06 - 0.10
- 0.11 - 0.15
- 0.16 - 0.20
- 0.21 - 0.25
- 0.26 - 0.30
- 0.31 - 0.40
- 0.41 - 0.50
- >0.05
- Site Study Area
- Local Study Area
- Regional Study Area
- Expressway / Highway
- Waterbody (LIO 1:2M)
- Watercourse (LIO 1:5M)



Notes
 1. Coordinate System: NAD 1983 UTM Zone 16N
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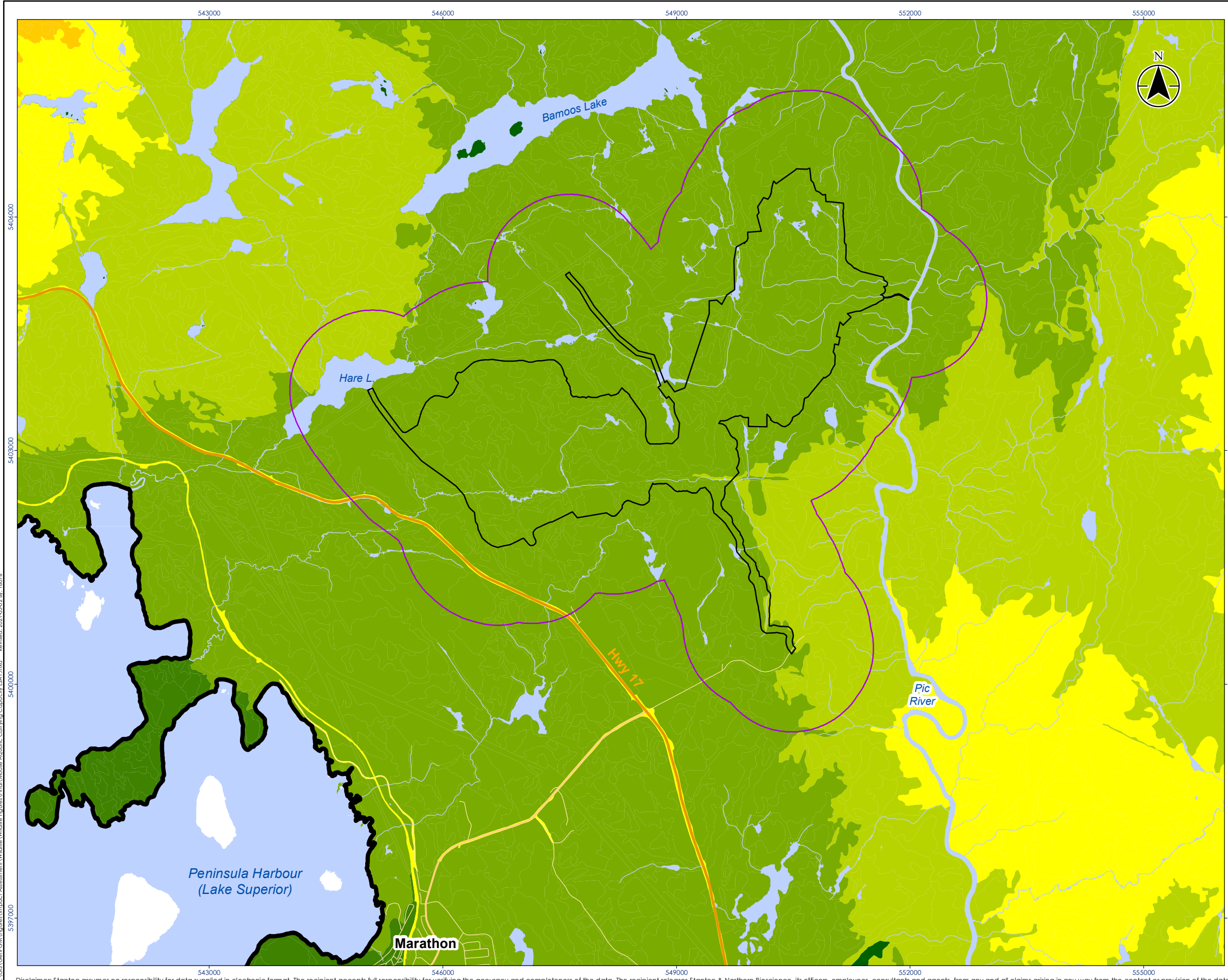
Project Location: Marathon
 Prepared by R. Foster on 2021-03-10

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Figure No.
 Appendix D8.4-2

Title
 Moose Total Carrying Capacity in the
 Regional Study Area

C:\GIS\Geoprocessing\Assessments\Wildlife\Figures\Fresh\Moose_Totals_Carrying_Capacity_85x2.mxd, Revised: 2021-03-10 By: 18076



Legend

Moose Aquatic Carrying Capacity (moose/km²)

- < 0.05
- 0.06 - 0.10
- 0.10 - 0.15
- 0.16 - 0.20
- 0.21 - 0.25
- 0.60 - 0.30
- 0.31 - 0.40
- 0.41 - 0.50
- > 0.50

- Site Study Area
- Local Study Area
- Regional Study Area
- Highway
- Major Road
- Minor Road
- Waterbody (LIO)
- Watercourse



Notes

1. Coordinate System: NAD 1983 UTM Zone 16N
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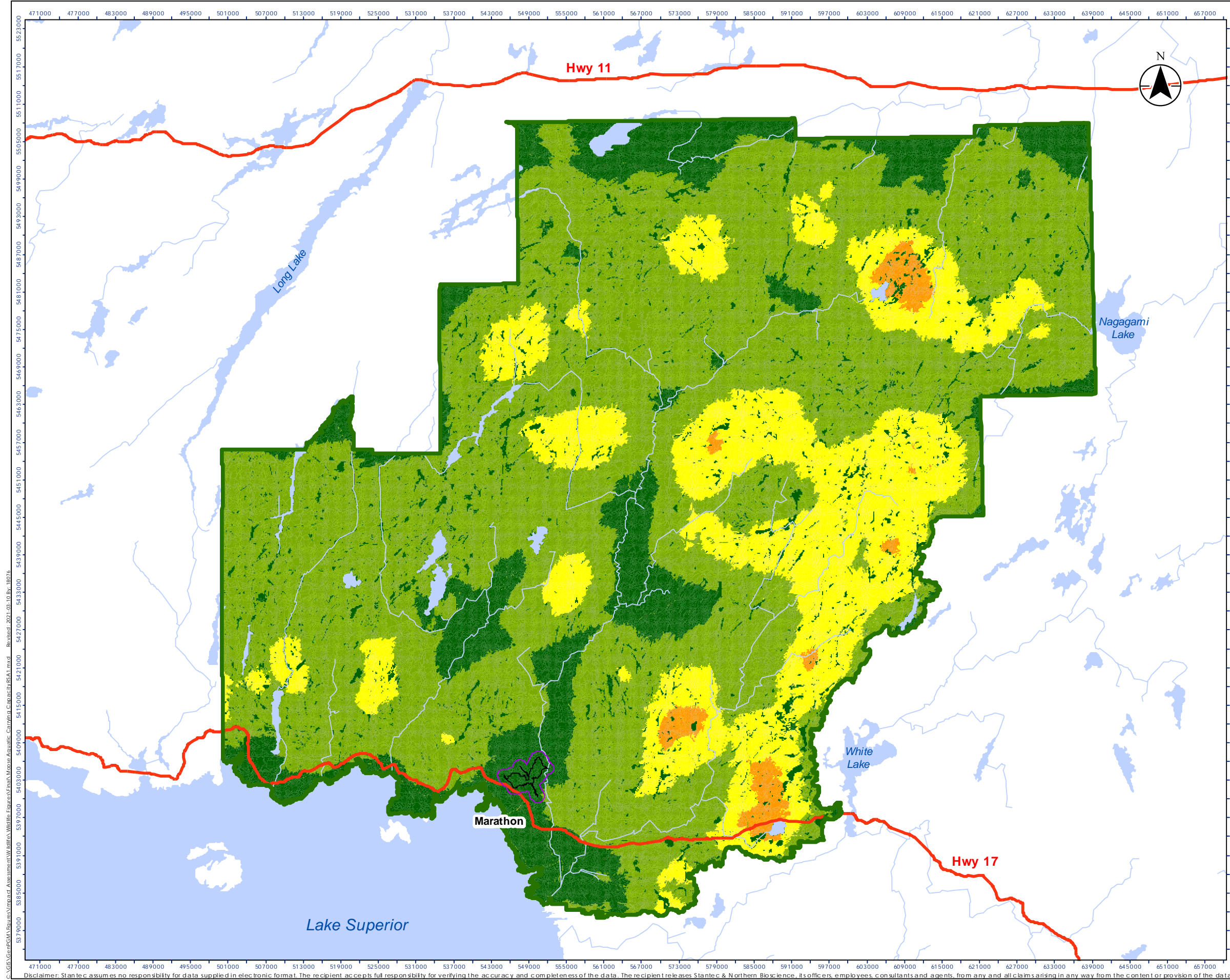


Project Location: Marathon
Prepared by R. Foster on 2021-03-02

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Figure No.: **Appendix D8.4-3**
Title: **Moose Aquatic Carrying Capacity in the Local Study Area**

C:\GIS\GenPGM\Egures\Impact Assessment\Wildlife\Wildlife Egures\Final\Moose Aquatic Carrying Capacity\LSA1.mxd Revised: 2021-03-02 By: 18074

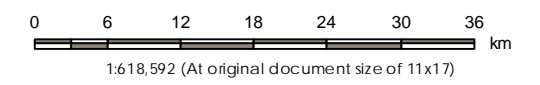


Legend

Moose Aquatic Habitat

- 1 - 20%
- 21 - 40%
- 41 - 60%
- 61 - 80%
- >80%

- Site Study Area
- Local Study Area
- Regional Study Area
- Expressway / Highway
- Waterbody (LIO 1:2M)
- Watercourse (LIO 1:5M)



- Notes
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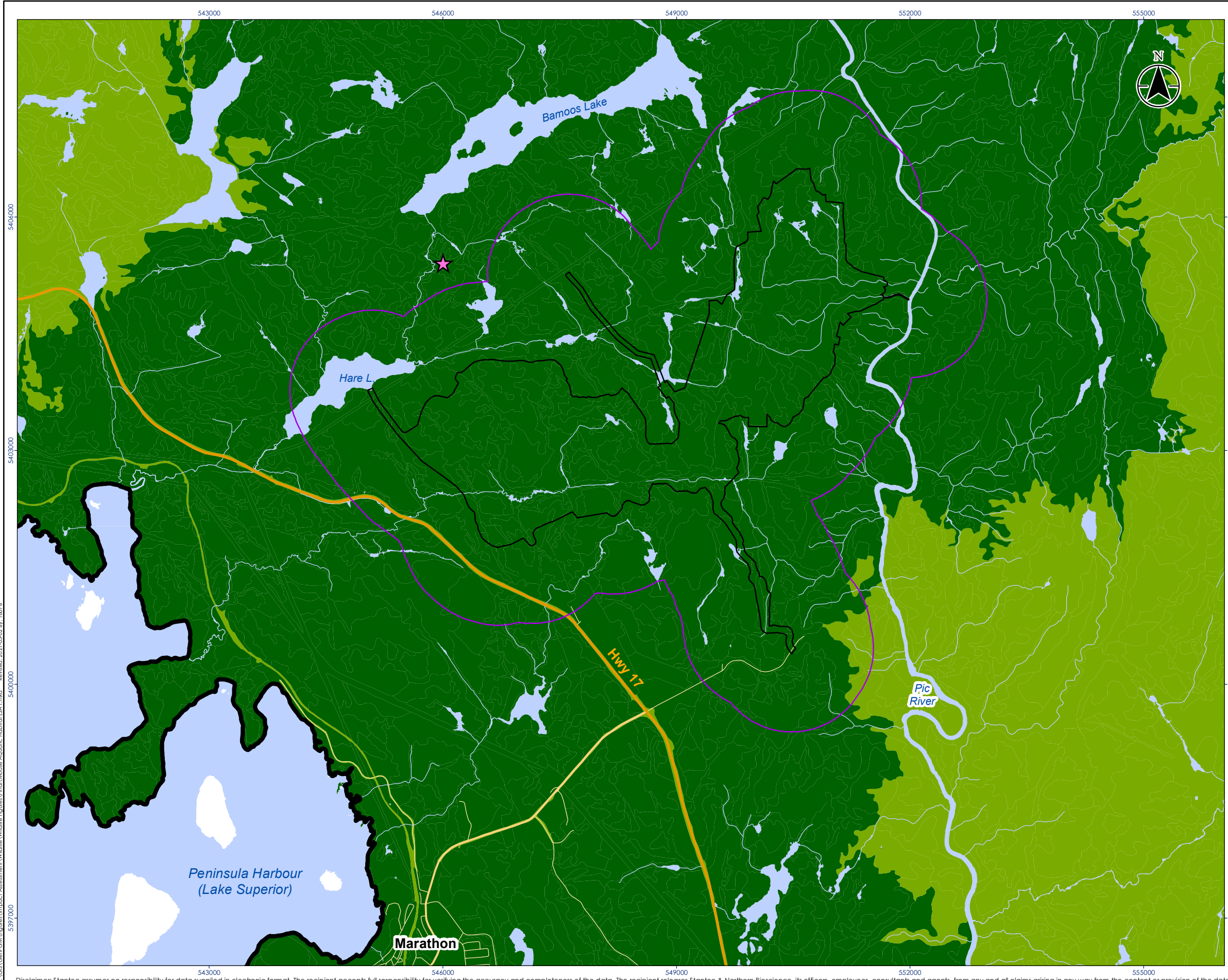
Project Location: Marathon
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Figure No.
Appendix D8.4-4
Title
Moose Aquatic Carrying Capacity in the Regional Study Area

C:\GIS\Geoprocessing\Assessments\Wildlife\Figures\Fresh\MooseAquatic_CarryingCapacity_SAL.mxd - Revised: 2021-03-10 By: L8076

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Legend

★ Moose Aquatic Feeding Area (Pic FMU)

Moose Aquatic Habitat

- 1 - 20%
- 21 - 40%
- 41 - 60%
- 61 - 80%
- >80%

- Site Study Area
- Local Study Area
- Regional Study Area

- Highway
- Major Road
- Minor Road
- Waterbody (LIO)
- Watercourse



Notes

1. Coordinate System: NAD 1983 UTM Zone 16N
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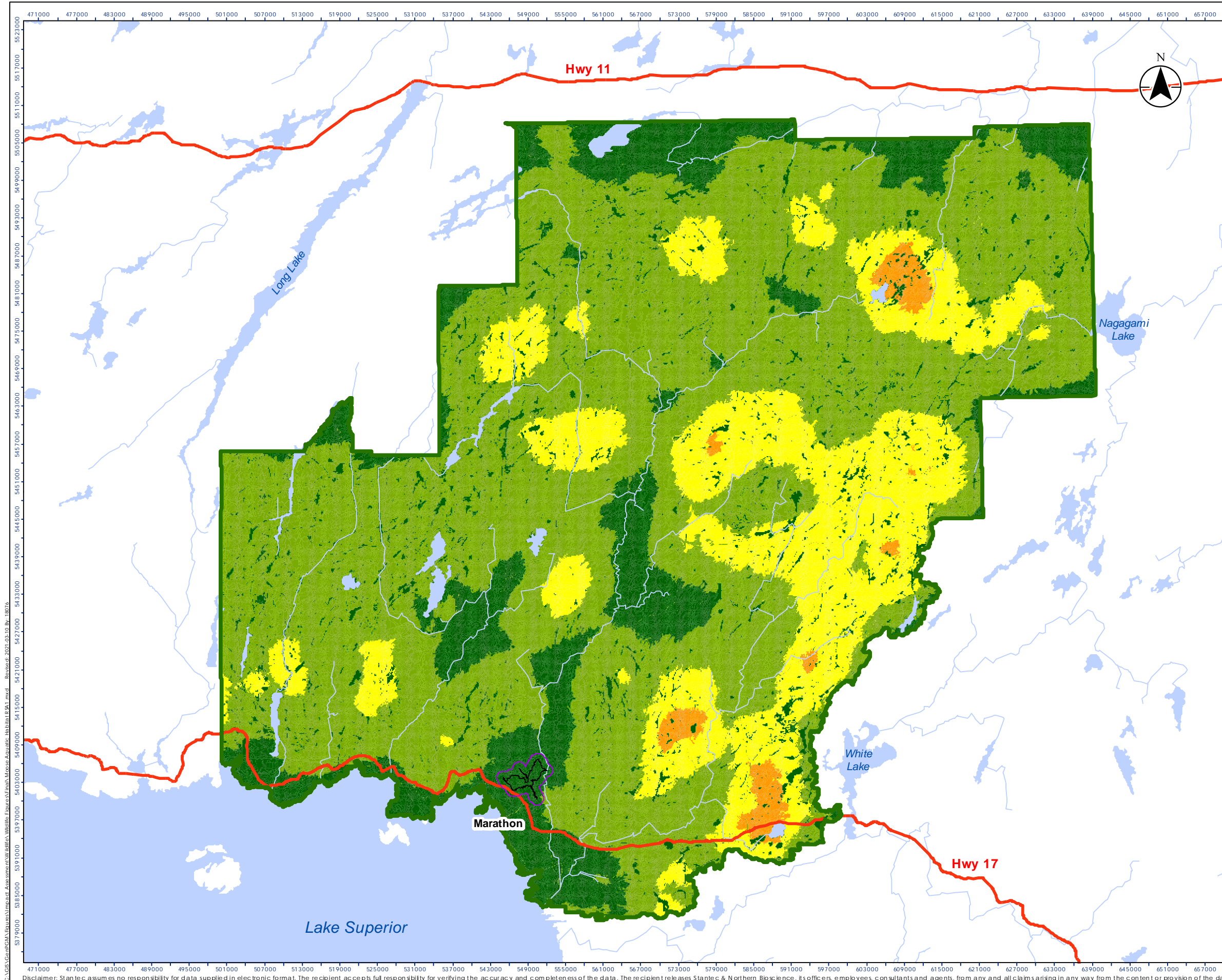
Project Location: Marathon
Prepared by R. Foster on 2021-03-02

Client/Project: GENERATION MINING LTD. MARATHON PALLADIUM PROJECT

Figure No. **Appendix D8.4-5**
Title **Moose Aquatic Habitat in the Local Study Area**

C:\GIS\GenPGM\Egures\Impact Assessment\Wildlife\Wildlife Egures\Final\Moose Aquatic Habitat LSA.Lrmd Revised: 2021-03-02 By: 1807.6

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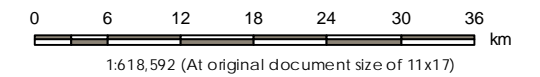


Legend

Moose Aquatic Habitat

- 1 - 20%
- 21 - 40%
- 41 - 60%
- 61 - 80%
- >80%

- Site Study Area
- Local Study Area
- Regional Study Area
- Expressway / Highway
- Waterbody (LIO 1:2M)
- Watercourse (LIO 1:5M)



- Notes
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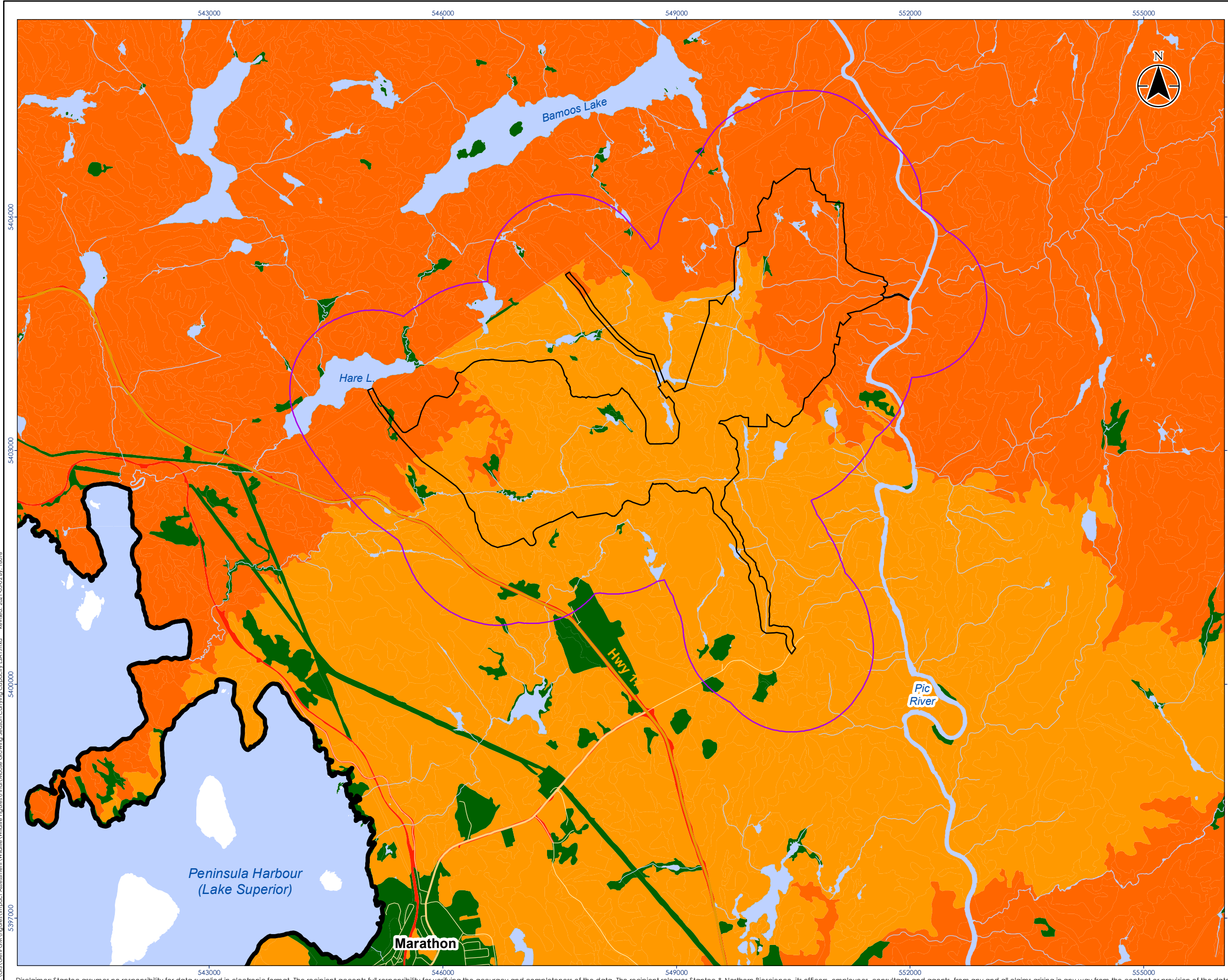
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MARATHON PALLADIUM PROJECT

Figure No.
Appendix D8.4-6

Title
Moose Aquatic Habitat in the Regional Study Area

C:\GIS\Geoprocessing\Assessments\Watershed\Watershed\MooseAquatic_Habitat\RA1.mxd - Revised: 2021-03-10 By: J.18076

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Legend

Moose Growing Season Carrying Capacity (moose/km2)

- < 0.05
- 0.06 - 0.10
- 0.11 - 0.15
- 0.16 - 0.20
- 0.21 - 0.25
- 0.26 - 0.30
- 0.31 - 0.40
- 0.41 - 0.50
- > 0.50

- Site Study Area
- Local Study Area
- Regional Study Area

- Highway
- Major Road
- Minor Road
- Waterbody (LIO)
- Watercourse



Notes

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Project Location: Marathon
Prepared by R. Foster on 2021-03-02

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Figure No.

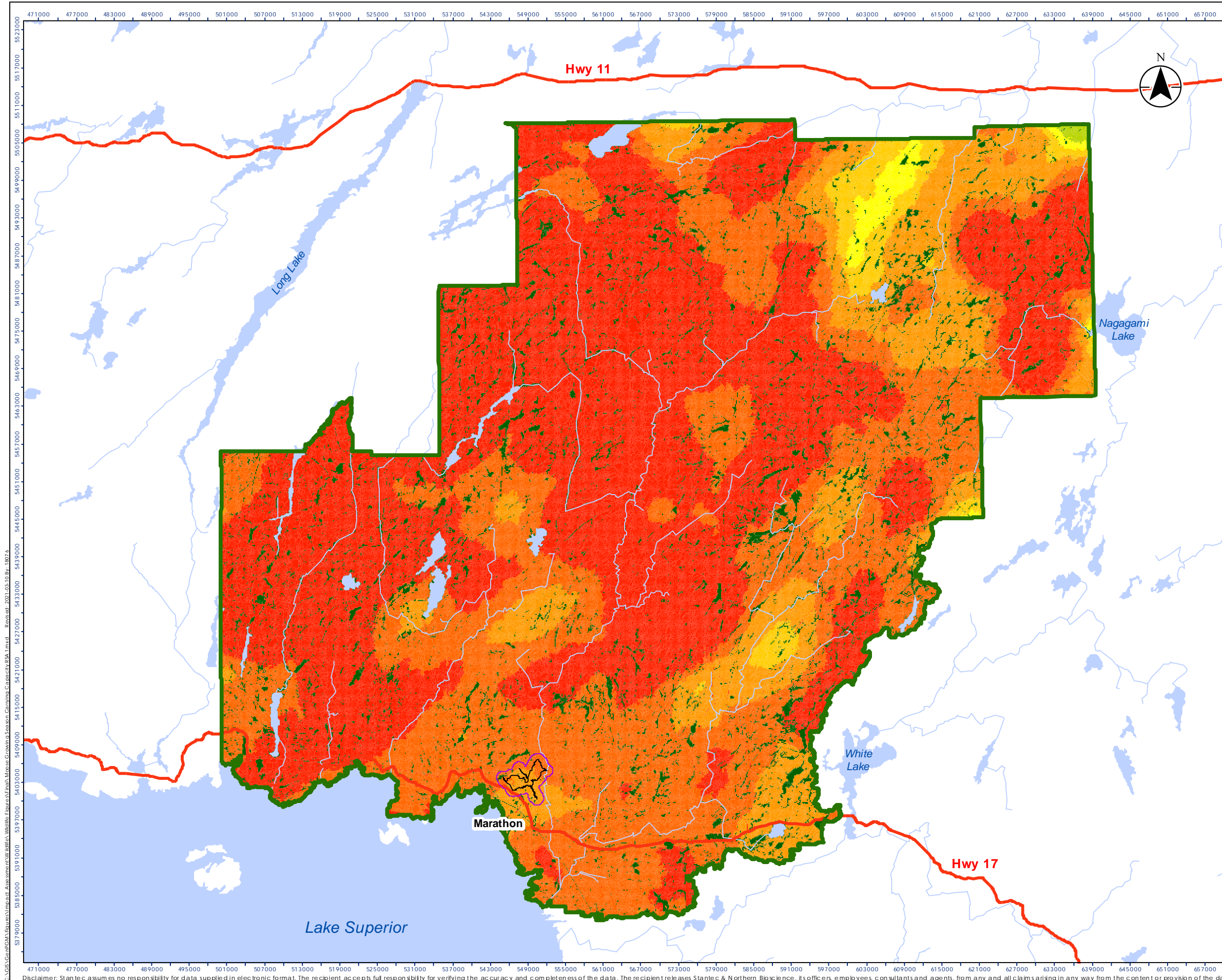
Appendix D8.4-7

Title

Moose Growing Season Carrying Capacity in the Local Study Area

C:\GIS\GenPGM\Egures\Impact Assessment\Wildlife\Wildlife Egures\Final\Moose Growing Season Carrying Capacity LSA1.mxd Revised: 2021-03-02 By: 18076

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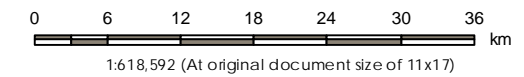


Legend

Moose Growing Season Carrying Capacity (moose/km2)

- < 0.05
- 0.06 - 0.10
- 0.11 - 0.15
- 0.16 - 0.20
- 0.21 - 0.25
- 0.26 - 0.30
- 0.31 - 0.40
- 0.41 - 0.50
- > 0.50

- Site Study Area
- Local Study Area
- Regional Study Area
- Expressway / Highway
- Waterbody (LIO 1:2M)
- Watercourse (LIO 1:5M)



Notes

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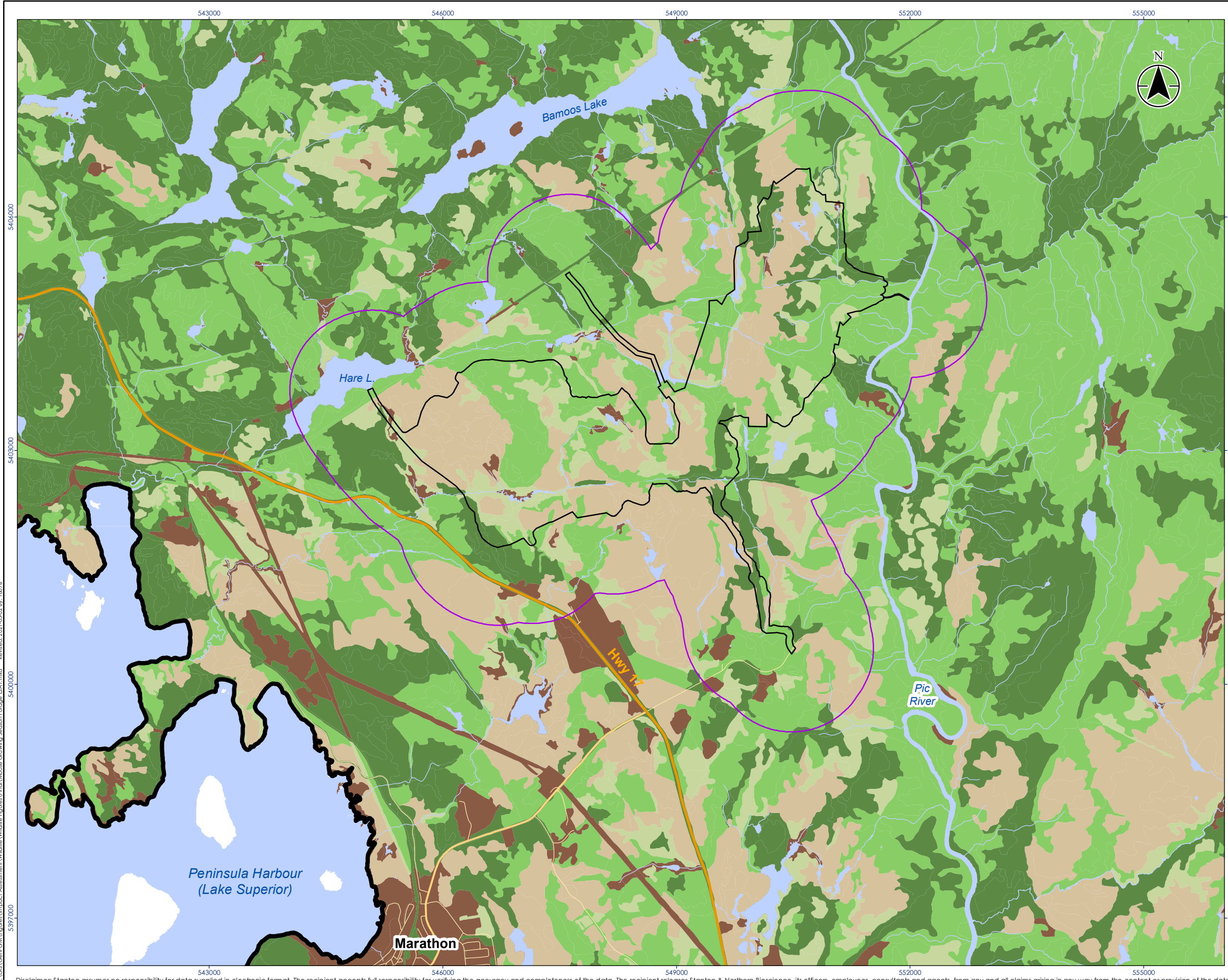
Client/Project:
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MARATHON PALLADIUM PROJECT

Figure No.
Appendix D8.4-8

Title
Moose Growing Season Carrying Capacity

C:\GIS\GeopGM\Figures\Map\Map\Wildlife\Figures\Map\Moose Growing Season Carrying Capacity ESA.mxd - Revised: 2021.03.10 by: 1807.6

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Legend

Moose Growing Season Forage (kg/ha)

- < 1
- 1 - 10
- 11 - 20
- 21 - 30
- > 30

- Site Study Area
- Local Study Area
- Regional Study Area
- Highway
- Major Road
- Minor Road
- Waterbody (LIO)
- Watercourse



Notes

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Project Location
Marathon

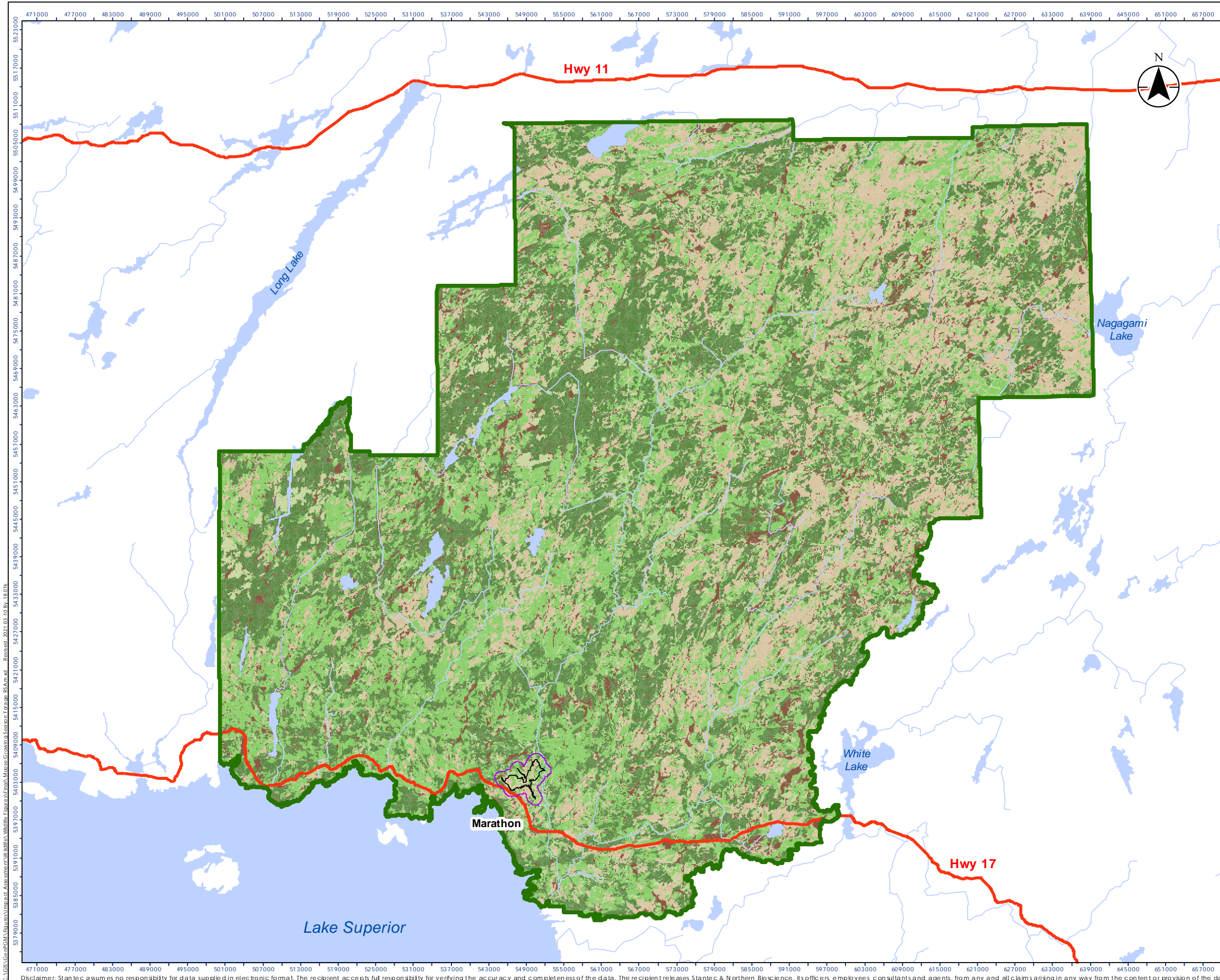
Prepared by R. Foster on 2021-03-02

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Figure No.
Appendix A: OWHAM Habitat Models

Title
Moose Growing Season Forage in the Local Study Area

C:\GIS\GenPGM\Egures\Impact Assessment\Wildlife\Wildlife Egures\Final\Moose Growing Season Forage_LSA.mxd Revised: 2021-03-02 By: 18074

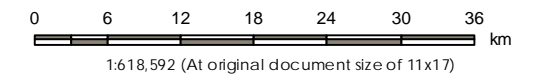


Legend

Moose Growing Season Forage (kg/ha)

- < 1
- 1 - 10
- 11 - 20
- 21 - 30
- > 30

- Site Study Area
- Local Study Area
- Regional Study Area
- Expressway / Highway
- Waterbody (LIO 1:2M)
- Watercourse (LIO 1:5M)



- Notes
1. Coordinate System: NAD 1983 UTM Zone 16N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.



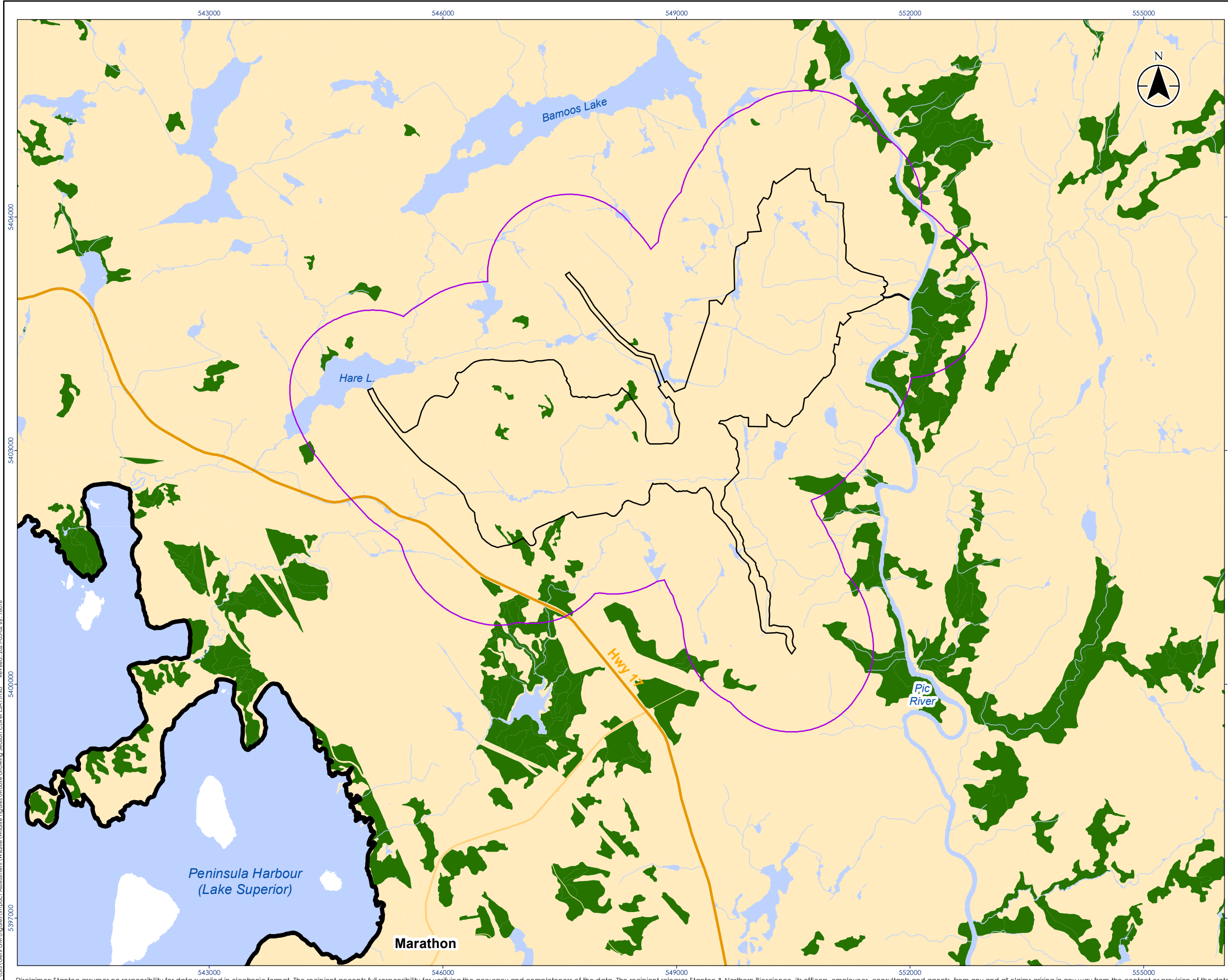
Project Location: Marathon
Prepared by R. Foster on 2021-03-10

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Figure No.
Appendix D8.4-10

Title
Moose Growing Season Forage in the
Regional Study Area

C:\GIS\Geoprocessing\Assessments\Wildlife\Figures\Fresh\Moose_Growing_Season_Forage_RS_Area.mxd - Revised: 2021.03.10 By: 18.076



Legend

Moose Growing Season Cover

- No Cover
- Thermal Cover
- Site Study Area
- Local Study Area
- Regional Study Area
- Highway
- Major Road
- Minor Road
- Waterbody (LIO)
- Watercourse



Notes

1. Coordinate System: NAD 1983 UTM Zone 16N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.



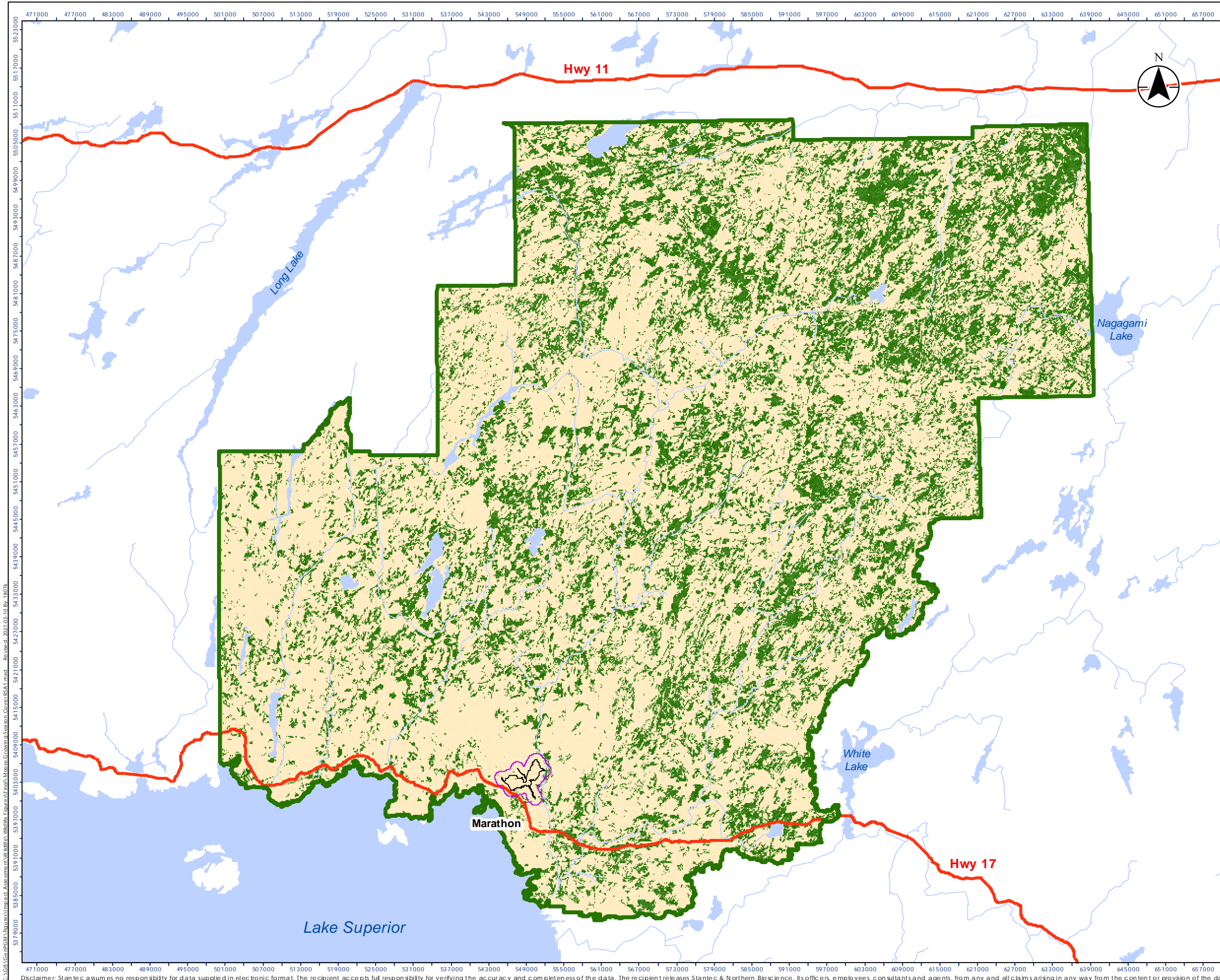
Project Location: Marathon
Prepared by R. Foster on 2021-03-02

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Figure No.
Appendix D8.4-11

Title
Moose Growing Season Cover in the Local Study Area

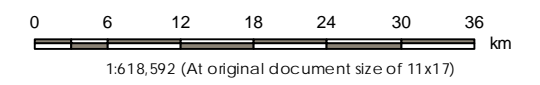
C:\GIS\GenPGM\Egures\Impact Assessment\Wildlife\Egures\Moose Growing Season Cover LSA1.mxd - Revised: 2021-03-02 By: 18076



Legend

Moose Growing Season Cover

- No Cover
- Thermal Cover
- Site Study Area
- Local Study Area
- Regional Study Area
- Expressway / Highway
- Waterbody (LIO 1:2M)
- Watercourse (LIO 1:5M)



- Notes
1. Coordinate System: NAD 1983 UTM Zone 16N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.

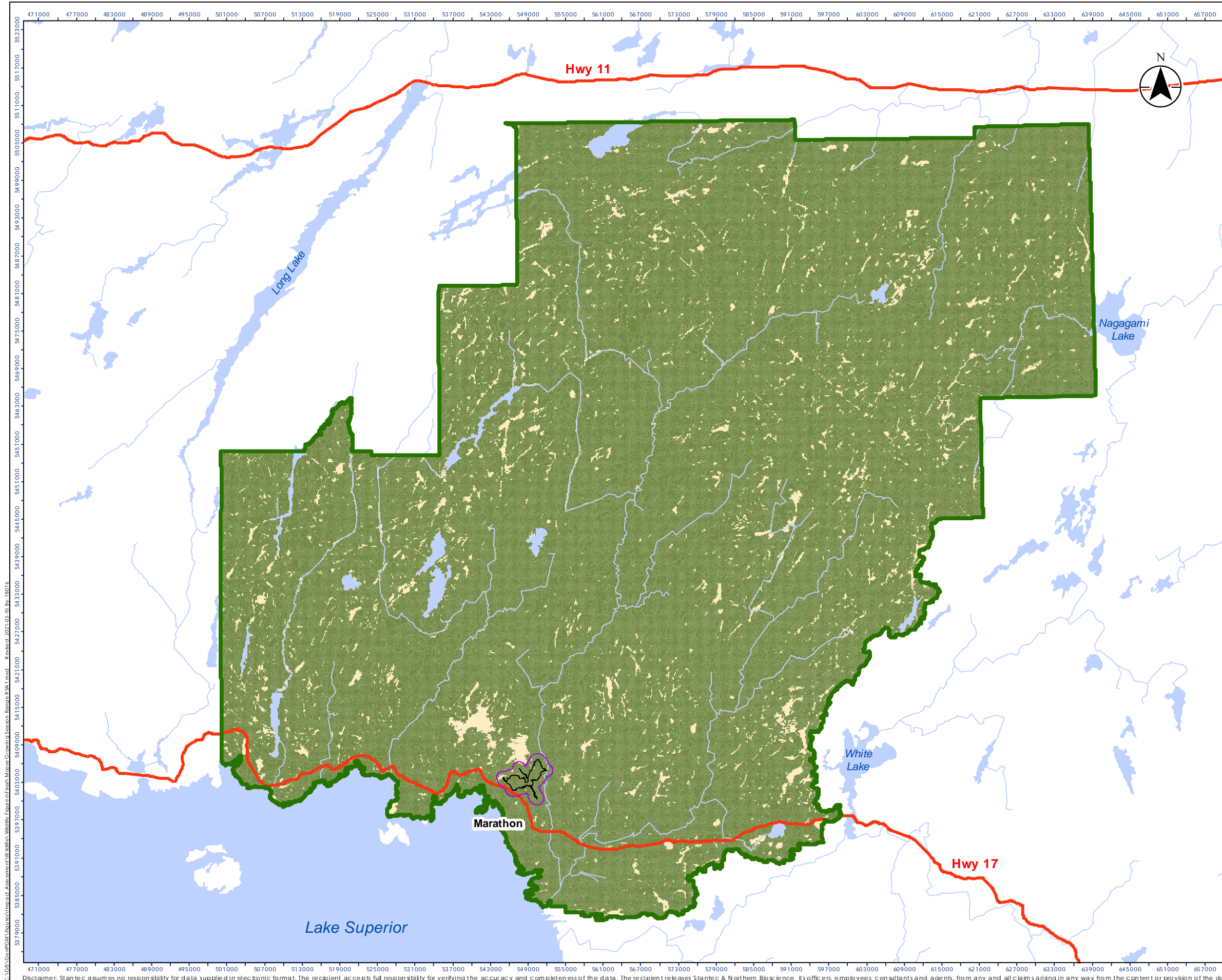


Project Location: Marathon
Prepared by R. Foster on 2021-03-10

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Figure No.
Appendix D8.4-12
Title
Moose Growing Season Cover in the
Regional Study Area

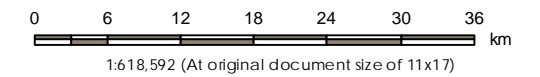
C:\GIS\Geoprocessing\Assessments\Wildlife\Figures\Marsh\Moose Growing Season Cover ESA1.mxd - Revised: 2021-03-10 By: 18076



Legend

Moose Growing Season Range

- Not Range
- Range
- Site Study Area
- Local Study Area
- Regional Study Area
- Expressway / Highway
- Waterbody (LIO 1:2M)
- Watercourse (LIO 1:5M)



- Notes
1. Coordinate System: NAD 1983 UTM Zone 16N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.

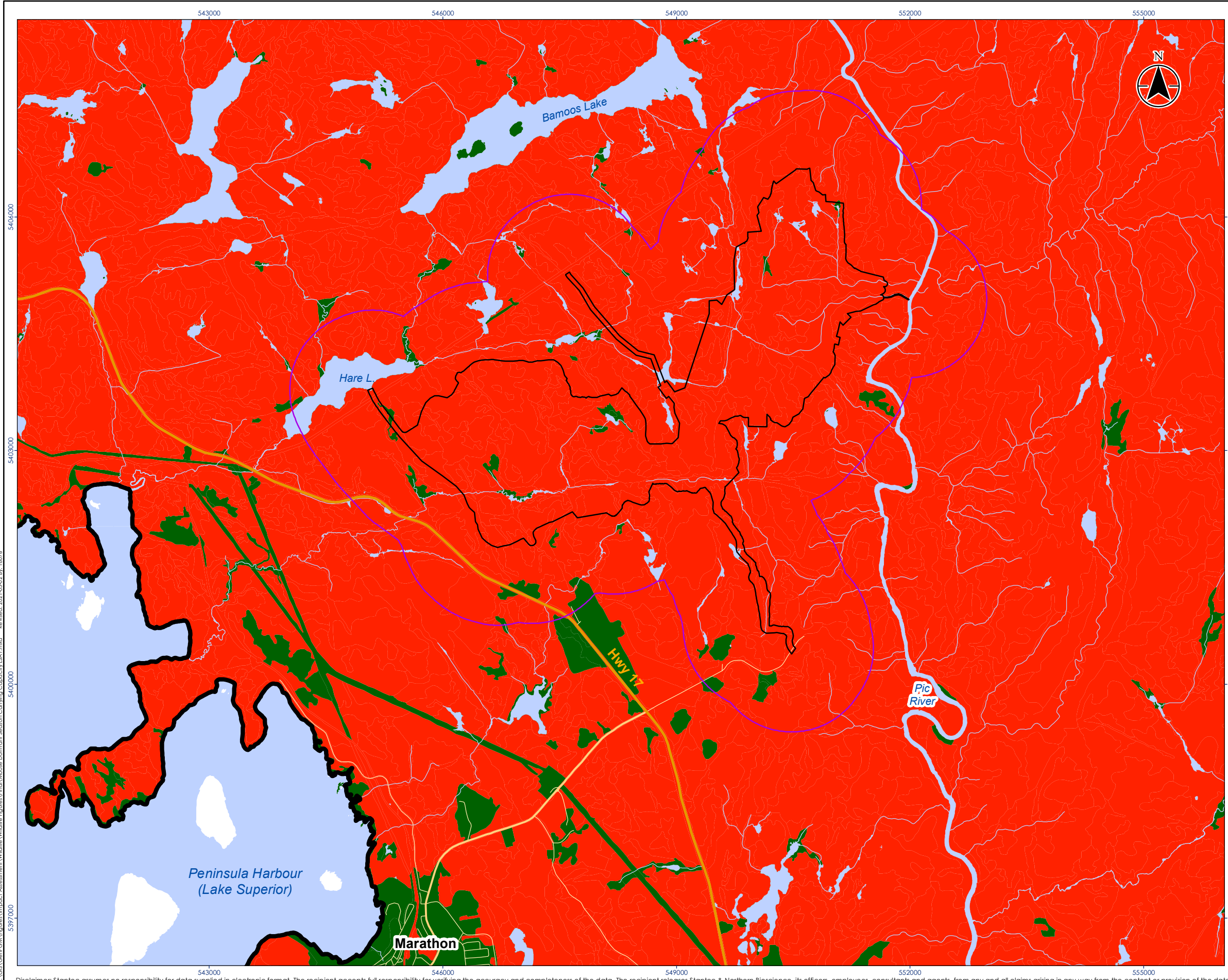


Project Location: Marathon
Prepared by R. Foster on 2021-03-10

Client/Project
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MARATHON PALLADIUM PROJECT

Figure No.
Appendix D8.4-13
Title
Moose Growing Season Range

C:\GIS\Geoprocessing\Assessments\Wildlife\Figures\Moose Growing Season Range\FSA1.mxd - Revised: 2021-03-10 - Bv118076



Legend

Moose Dormant Season Carrying Capacity (moose/km2)

- < 0.05
- 0.06 - 0.10
- 0.11 - 0.15
- 0.16 - 0.20
- 0.21 - 0.25
- 0.26 - 0.30
- 0.31 - 0.40
- 0.41 - 0.50
- > 0.50

- Site Study Area
- Local Study Area
- Regional Study Area

- Highway
- Major Road
- Minor Road
- Waterbody (LIO)
- Watercourse



Notes

1. Coordinate System: NAD 1983 UTM Zone 16N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.



Project Location: Marathon
Prepared by R. Foster on 2021-03-02

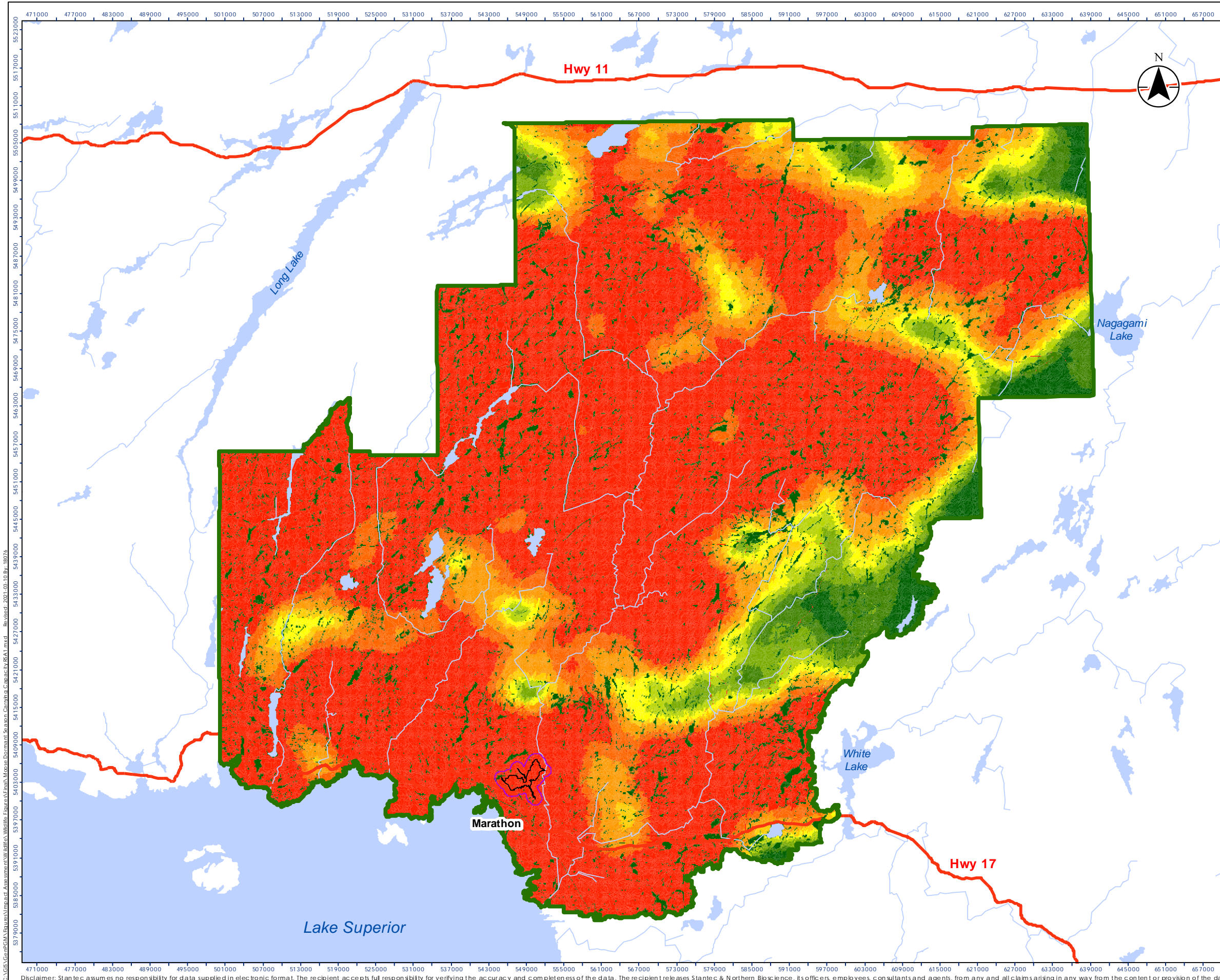
Client/Project:
GENERATION MINING LTD.
MARATHON PALLADIUM PROJECT

Figure No.
Appendix D8.4-14

Title
Moose Dormant Season Carrying Capacity in the Local Study Area

C:\GIS\GenPGM\Egures\Impact Assessment\Wildlife\Wildlife Egures\Final\Moose Dormant Season Carrying Capacity_LSA1.mxd Revised: 2021-03-02 By: 18076

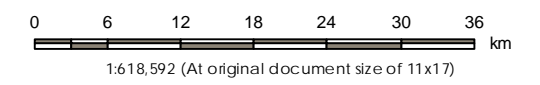
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Legend
Moose Dormant Season Carrying Capacity (moose/km2)

- < 0.05
- 0.06 - 0.10
- 0.11 - 0.15
- 0.16 - 0.20
- 0.21 - 0.25
- 0.26 - 0.30
- 0.31 - 0.40
- 0.41 - 0.50
- > 0.50

- Site Study Area
- Local Study Area
- Regional Study Area
- Expressway / Highway
- Waterbody (LIO 1:2M)
- Watercourse (LIO 1:5M)



Notes
 1. Coordinate System: NAD 1983 UTM Zone 16N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.



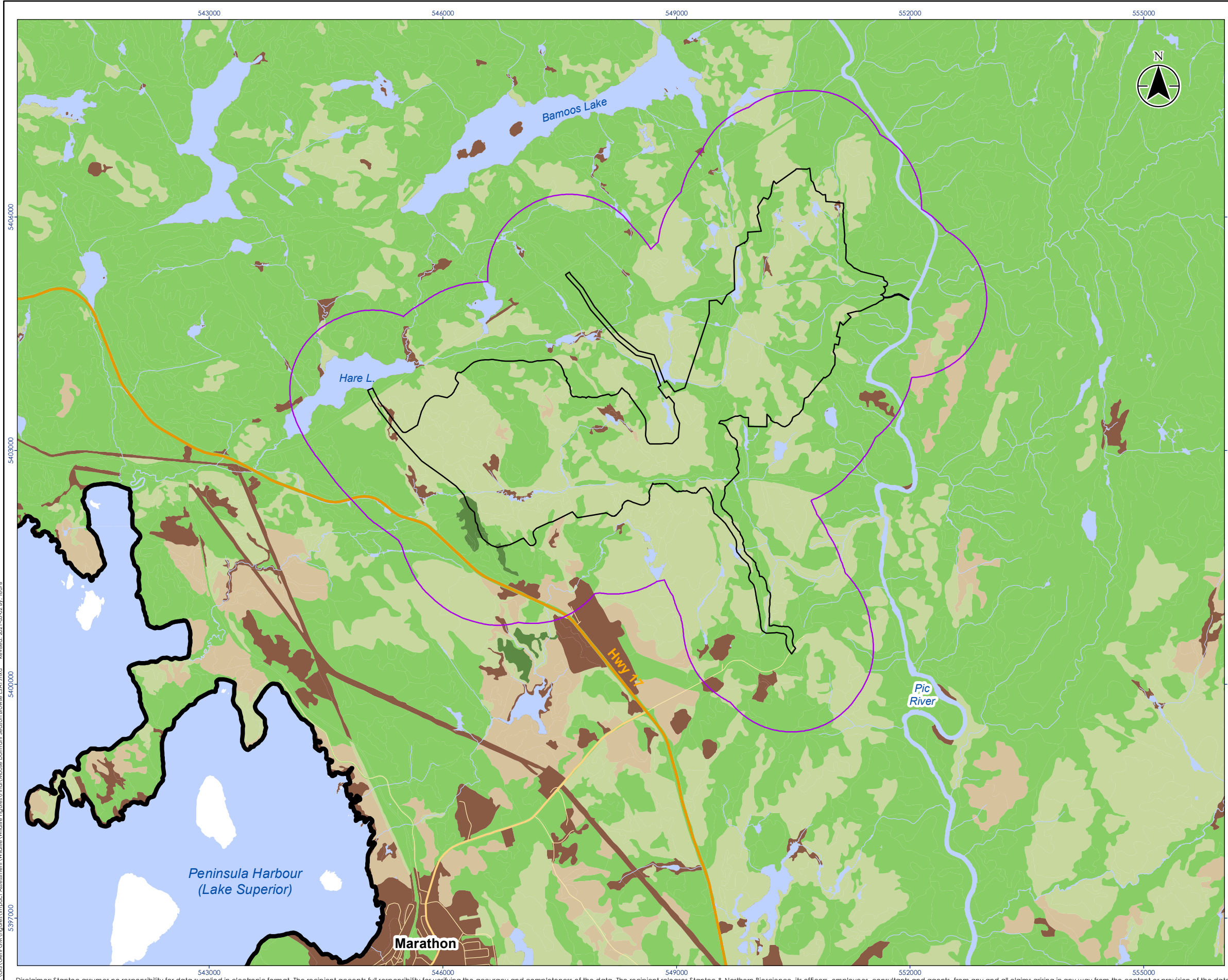
Project Location: Marathon
 Prepared by R. Foster on 2021-03-10

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Figure No.: Appendix D8.4-15
 Title: Moose Dormant Season Carrying Capacity in the Regional Study Area

C:\GIS\Geoprocessing\Assessments\Wildlife\Figures\Moose Dormant Season Carrying Capacity\KSA1.mxd - Revised: 2021-03-10 By: 18076

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- Legend
- Moose Dormant Season Browse (kg/ha)**
- <math>< 1</math>
 - 1 - 10
 - 11 - 20
 - 21 - 30
 - > 30
- Site Study Area
 - Local Study Area
 - Regional Study Area
 - Highway
 - Major Road
 - Minor Road
 - Waterbody (LIO)
 - Watercourse



- Notes**
1. Coordinate System: NAD 1983 UTM Zone 16N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.



Project Location
Marathon

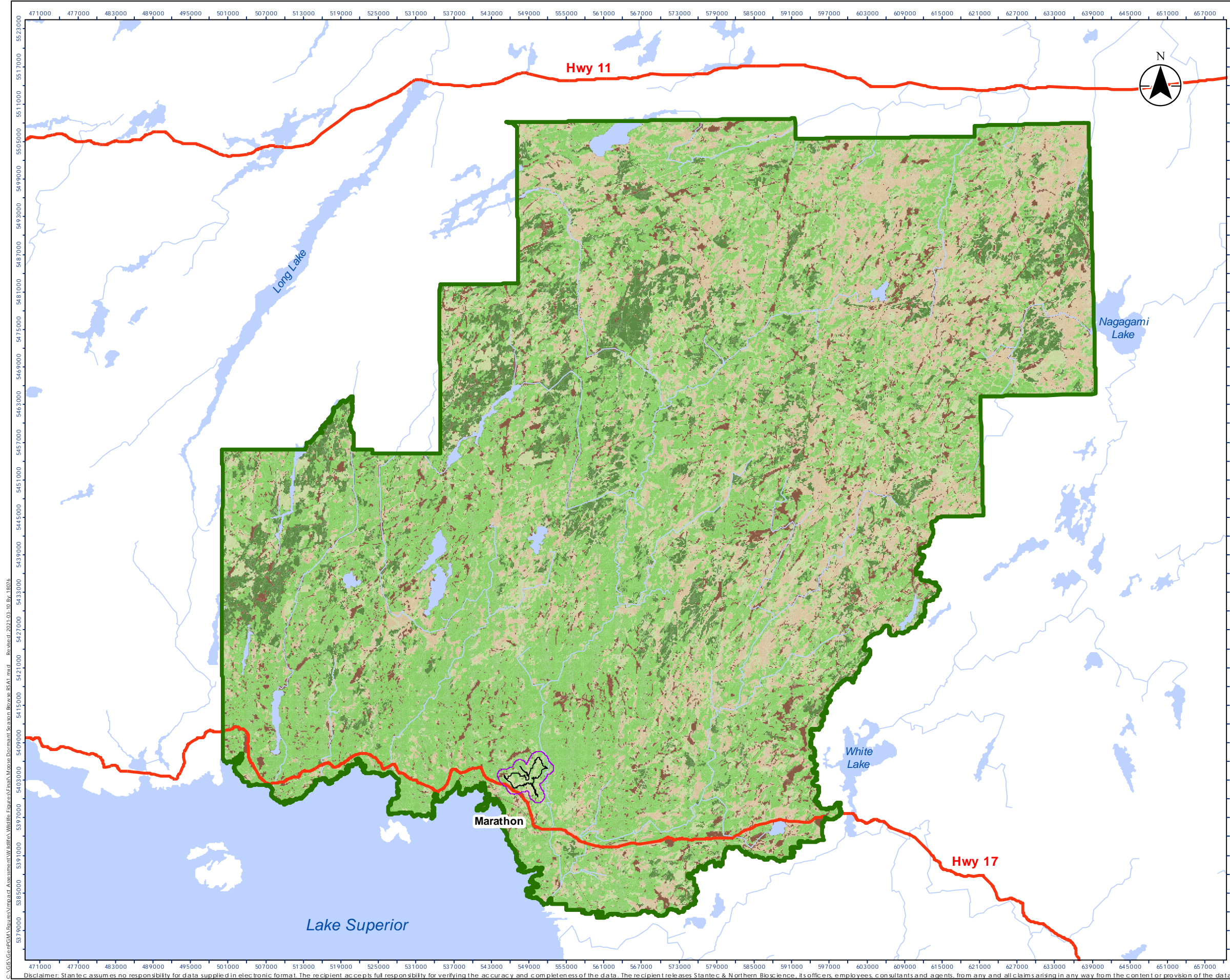
Prepared by R. Foster on 2021-03-02

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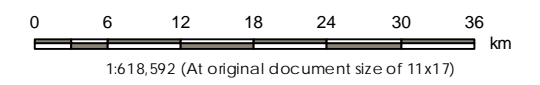
Figure No.
Appendix D8.4-16

Title
Moose Dormant Season Browse in the Local Study Area

C:\GIS\GenPGM\Egures\Impact Assessment\Wildlife\Wildlife Egures\Final\Moose Dormant Season Browse LSA.mxd Reviewed: 2021-03-02 By: 18074



- Legend
- Moose Dormant Season Browse (kg/ha)**
- < 1
 - 1 - 10
 - 11 - 20
 - 21 - 30
 - > 30
- Site Study Area
 - Local Study Area
 - Regional Study Area
 - Expressway / Highway
 - Waterbody (LIO 1:2M)
 - Watercourse (LIO 1:5M)



- Notes
1. Coordinate System: NAD 1983 UTM Zone 16N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.



Project Location: Marathon
 Prepared by R. Foster on 2021-03-10

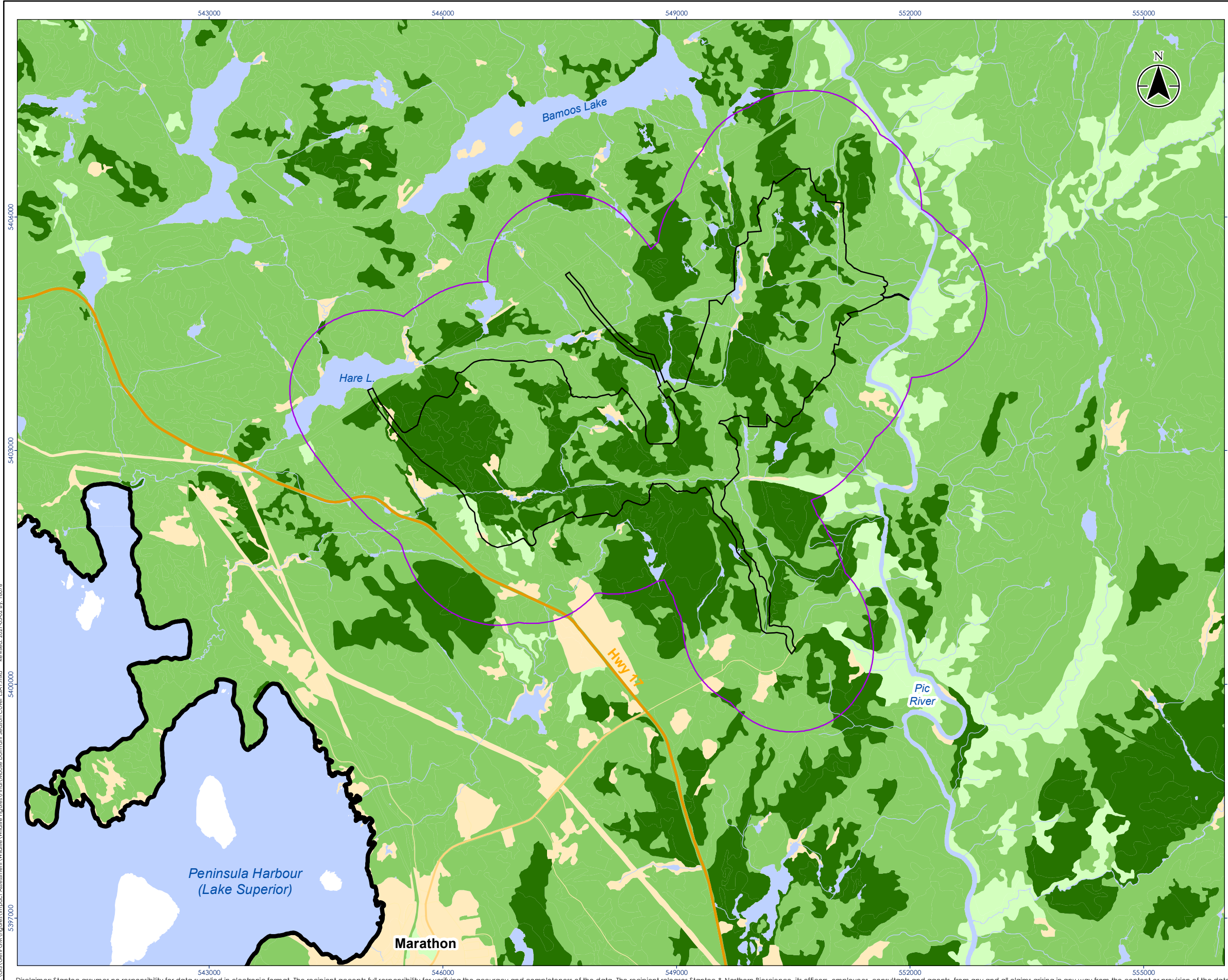
Client/Project
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Figure No.
 Appendix D8.4-17

Title
 Moose Dormant Season Browse in the
 Regional Study Area

C:\GIS\Geoprocessing\Assessments\Wildlife\Figures\Moose Dormant Season Browse\RSAL.mxd - Revised: 2021-03-10 By: L. 18076

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Legend

- Moose Dormant Season Cover**
- No Cover
 - Lateral Cover Only
 - Winter Cover
 - Winter Cover and Conifer Cover
 - Site Study Area
 - Local Study Area
 - Regional Study Area
 - Highway
 - Major Road
 - Minor Road
 - Waterbody (LIO)
 - Watercourse



Notes

1. Coordinate System: NAD 1983 UTM Zone 16N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.



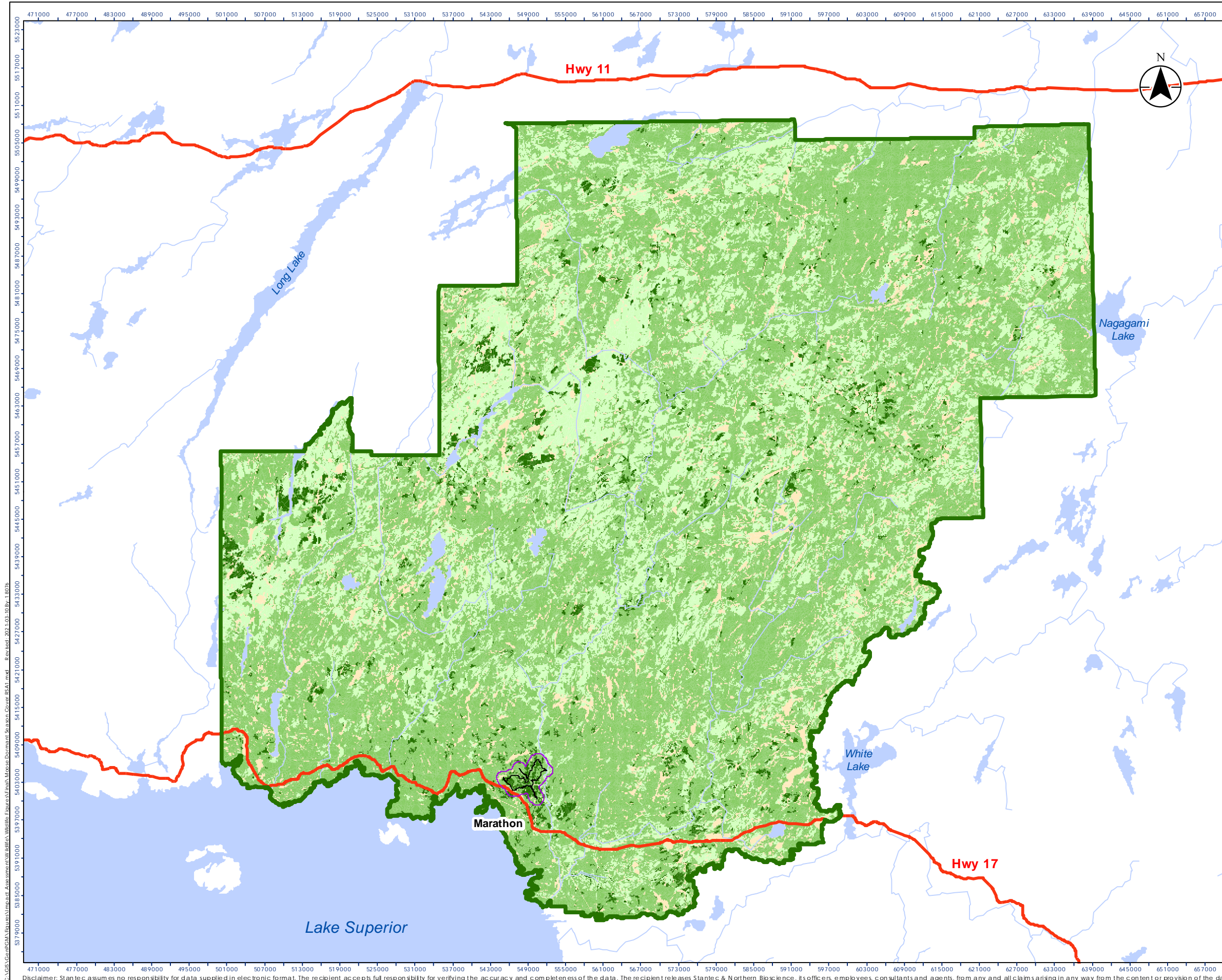
Project Location: Marathon
Prepared by R. Foster on 2021-03-02

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GENERATION MINING LTD.
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Figure No.
Appendix D8.4-17

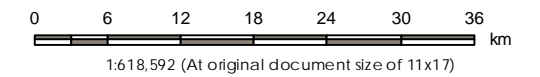
Title:
Moose Dormant Season Cover in the Local Study Area

C:\GIS\GenPGM\Egures\Impact Assessment\Wildlife\Wildlife Egures\Final\Moose Dormant Season Cover LSA1.mxd Revised: 2021-03-02 By: 18076



Legend

- Moose Dormant Season Cover**
- No Cover
 - Lateral Cover Only
 - Winter Cover
 - Winter Cover and Conifer Cover
 - Site Study Area
 - Local Study Area
 - Regional Study Area
 - Expressway / Highway
 - Waterbody (LIO 1:2M)
 - Watercourse (LIO 1:5M)



Notes
 1. Coordinate System: NAD 1983 UTM Zone 16N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.



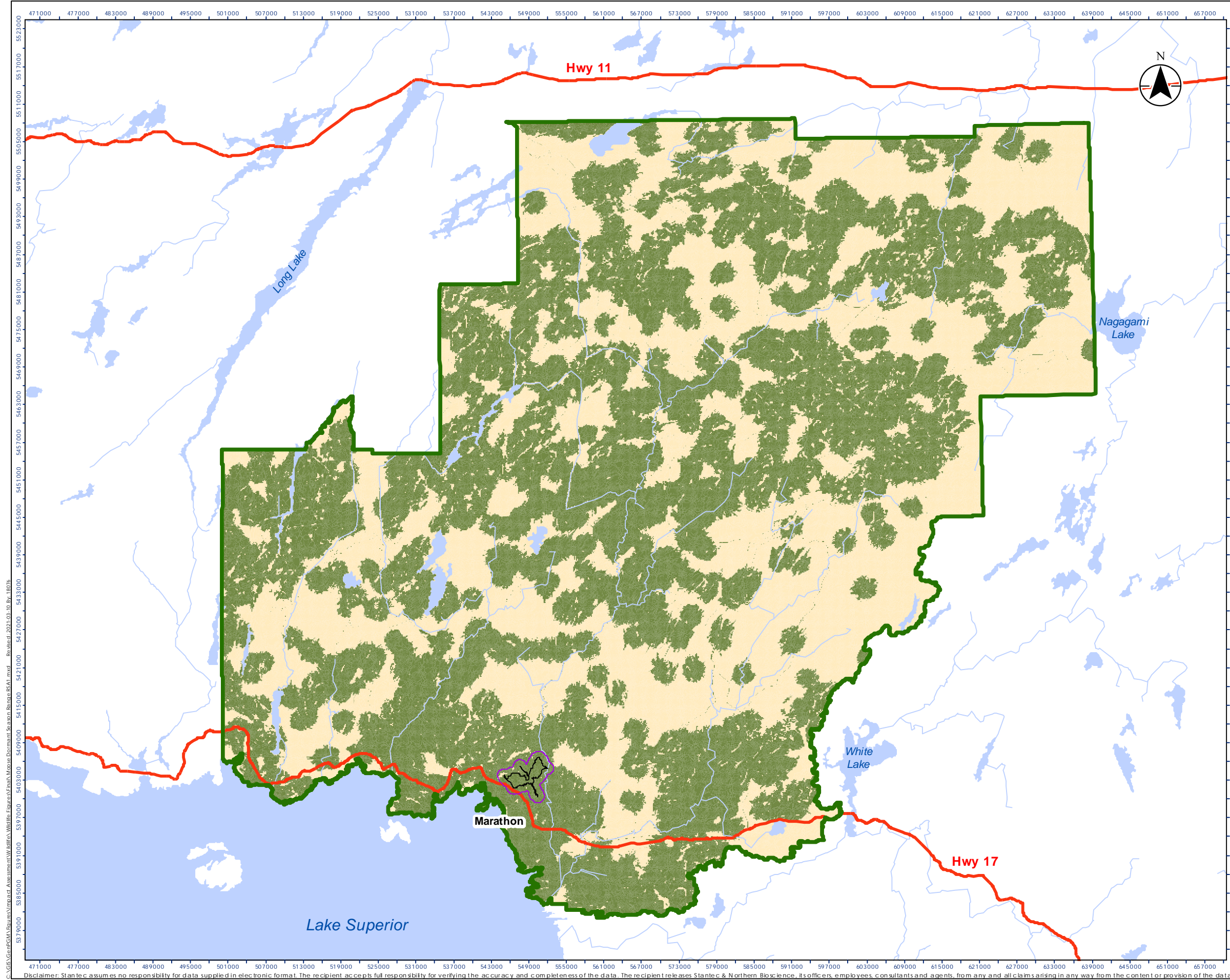
Project Location: Marathon
 Prepared by R. Foster on 2021-03-10

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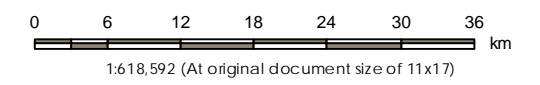
Figure No.
 Appendix D8.4-19

Title
 Moose Dormant Season Cover in the
 Regional Study Area

C:\GIS\Geoprocessing\Assessments\Wildlife\Fresh\Moose Dormant Season Cover.RSAL.mxd - Revised: 2021-03-10 by: R.Foster



- Legend
- Moose Dormant Season Range**
 - Not Range
 - Range
 - Site Study Area
 - Local Study Area
 - Regional Study Area
 - Expressway / Highway
 - Waterbody (LIO 1:2M)
 - Watercourse (LIO 1:5M)



Notes
 1. Coordinate System: NAD 1983 UTM Zone 16N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.



Project Location: Marathon
 Prepared by R. Foster on 2021-03-10

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Figure No.
 Appendix D8.4-20
 Title
 Moose Dormant Season Range

C:\GIS\GeopGM\Figures\Map\Wildlife\Figures\Marsh\MooseDormantSeason_Range_BSA1.mxd, Revision: 2021.03.10, By: 18076

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D8.5 MIGRATORY BIRD HABITAT
MODELS

MARATHON PALLADIUM PROJECT ENVIRONMENTAL IMPACT STATEMENT ADDENDUM

APPENDIX D8.5: MIGRATORY BIRD HABITAT MODELS

Common Name	PIF Priority Species BCR 8*	Area-Sensitive Species**	Total # Ind. (All PCs)	Detection Distance (DD) Category (m)	Pair Adjust Category (P)	Time Adjust Mean (T)	Effective Plot Size (ha)	Total Area Sampled (ha)	Adjusted n	Density (n/ha)	Total # Birds in SSA
Ruffed Grouse	Y		10	200	2	1.40236	12.57	2136.28	28.0	0.01313	14.7
Spruce Grouse			4	50	2	1.67582	0.79	133.52	13.4	0.10041	112.1
Broad-winged Hawk			1	125	2	2.51891	4.91	834.48	5.0	0.00604	6.7
Red-tailed Hawk			1	300	1.25	1.54822	28.27	4806.63	1.9	0.00040	0.4
Belted Kingfisher			3	200	2	1.33694	12.57	2136.28	8.0	0.00375	4.2
Yellow-bellied Sapsucker	Y		6	125	1.5	1.65765	4.91	834.48	14.9	0.01788	20.0
Black-backed Woodpecker			1	125	1.5	1.53302	4.91	834.48	2.3	0.00276	3.1
Downy Woodpecker			5	125	2	1.34687	4.91	834.48	13.5	0.01614	18.0
Hairy Woodpecker		Y	11	125	2	1.28315	4.91	834.48	28.2	0.03383	37.8
Northern Flicker	Y		15	200	1.25	1.30096	12.57	2136.28	24.4	0.01142	12.7
Pileated Woodpecker		Y	2	300	2	1.70075	28.27	4806.63	6.8	0.00142	1.6
Eastern Wood-Pewee			1	200	2	1.11659	12.57	2136.28	2.2	0.00105	1.2
Yellow-bellied Flycatcher	Y		18	125	2	1.19799	4.91	834.48	43.1	0.05168	57.7
Alder Flycatcher	Y		17	125	2	1.32223	4.91	834.48	45.0	0.05387	60.1
Least Flycatcher		Y	62	125	2	1.09100	4.91	834.48	135.3	0.16212	180.9
Eastern Phoebe			1	125	2	2.45506	4.91	834.48	4.9	0.00588	6.6
Blue-headed Vireo	Y	Y	16	125	2	1.21135	4.91	834.48	38.8	0.04645	51.8
Philadelphia Vireo	Y		10	125	2	1.19606	4.91	834.48	23.9	0.02867	32.0
Red-eyed Vireo			94	125	2	1.28468	4.91	834.48	241.5	0.28942	323.0
Canada Jay			11	125	1	1.22885	4.91	834.48	13.5	0.01620	18.1
Blue Jay			12	200	1.25	1.21678	12.57	2136.28	18.3	0.00854	9.5
American Crow			16	400	1.75	1.66433	50.27	8545.12	46.6	0.00545	6.1
Common Raven			57	400	1	1.38112	50.27	8545.12	78.7	0.00921	10.3
Black-capped Chickadee			18	125	2	1.46025	4.91	834.48	52.6	0.06300	70.3
Boreal Chickadee			9	80	1.25	1.13157	2.01	341.80	12.7	0.03724	41.6
Red-breasted Nuthatch		Y	70	125	1.75	1.24411	4.91	834.48	152.4	0.18263	203.8
Brown Creeper		Y	4	80	2	1.38789	2.01	341.80	11.1	0.03248	36.3
Winter Wren	Y	Y	159	200	1.75	1.56925	12.57	2136.28	436.6	0.20439	228.1
Golden-crowned Kinglet			30	50	2	1.22100	0.79	133.52	73.3	0.54869	612.3
Ruby-crowned Kinglet	Y		60	125	2	1.14550	4.91	834.48	137.5	0.16472	183.8

MARATHON PALLADIUM PROJECT ENVIRONMENTAL IMPACT STATEMENT ADDENDUM

APPENDIX D8.5: MIGRATORY BIRD HABITAT MODELS

Common Name	PIF Priority Species BCR 8*	Area-Sensitive Species**	Total # Ind. (All PCs)	Detection Distance (DD) Category (m)	Pair Adjust Category (P)	Time Adjust Mean (T)	Effective Plot Size (ha)	Total Area Sampled (ha)	Adjusted n	Density (n/ha)	Total # Birds in SSA
Veery		Y	7	200	2	1.62199	12.57	2136.28	22.7	0.01063	11.9
Swainson's Thrush			177	200	2	1.67607	12.57	2136.28	593.3	0.27774	310.0
Hermit Thrush		Y	128	200	2	1.41750	12.57	2136.28	362.9	0.16987	189.6
American Robin			89	200	2	2.26329	12.57	2136.28	402.9	0.18858	210.5
European Starling			2	200	1	1.57719	12.57	2136.28	3.2	0.00148	1.6
Cedar Waxwing			30	100	1.75	1.28580	3.14	534.07	67.5	0.12640	141.1
Evening Grosbeak	Y		2	125	1.75	1.28694	4.91	834.48	4.5	0.00540	6.0
Pine Grosbeak	Y		2	125	2	1.21476	4.91	834.48	4.9	0.00582	6.5
Purple Finch	Y		5	125	2	1.23181	4.91	834.48	12.3	0.01476	16.5
White-winged Crossbill			18	125	1.25	1.37162	4.91	834.48	30.9	0.03698	41.3
Pine Siskin			416	100	1.5	1.37783	3.14	534.07	859.8	1.60983	1796.6
American Goldfinch			2	125	1.25	1.36521	4.91	834.48	3.4	0.00409	4.6
Chipping Sparrow			17	125	2	2.00426	4.91	834.48	68.1	0.08166	91.1
Fox Sparrow			5	200	2	1.09285	12.57	2136.28	10.9	0.00512	5.7
Dark-eyed Junco			27	125	2	1.71879	4.91	834.48	92.8	0.11122	124.1
White-crowned Sparrow			2	200	2	2.08721	12.57	2136.28	8.3	0.00391	4.4
White-throated Sparrow	Y		310	200	2	2.24834	12.57	2136.28	1394.0	0.65252	728.2
Song Sparrow			3	125	2	1.45917	4.91	834.48	8.8	0.01049	11.7
Lincoln's Sparrow			3	125	2	1.91718	4.91	834.48	11.5	0.01378	15.4
Swamp Sparrow	Y		5	125	2	1.65774	4.91	834.48	16.6	0.01987	22.2
Brown-headed Cowbird			1	125	1.75	1.21696	4.91	834.48	2.1	0.00255	2.8
Ovenbird	Y	Y	37	200	2	1.23908	12.57	2136.28	91.7	0.04292	47.9
Northern Waterthrush			16	200	2	1.11512	12.57	2136.28	35.7	0.01670	18.6
Black-and-white Warbler	Y	Y	20	100	2	1.16512	3.14	534.07	46.6	0.08726	97.4
Tennessee Warbler	Y		10	125	2	1.21888	4.91	834.48	24.4	0.02921	32.6
Nashville Warbler	Y		90	125	2	1.23809	4.91	834.48	222.9	0.26706	298.0
Mourning Warbler	Y		39	125	2	1.29688	4.91	834.48	101.2	0.12122	135.3
American Redstart		Y	107	100	2	1.08455	3.14	534.07	232.1	0.43458	485.0
Cape May Warbler	Y		1	80	2	1.38513	2.01	341.80	2.8	0.00810	9.0
Northern Parula		Y	15	100	2	1.18016	3.14	534.07	35.4	0.06629	74.0

MARATHON PALLADIUM PROJECT ENVIRONMENTAL IMPACT STATEMENT ADDENDUM

APPENDIX D8.5: MIGRATORY BIRD HABITAT MODELS

Common Name	PIF Priority Species BCR 8*	Area-Sensitive Species**	Total # Ind. (All PCs)	Detection Distance (DD) Category (m)	Pair Adjust Category (P)	Time Adjust Mean (T)	Effective Plot Size (ha)	Total Area Sampled (ha)	Adjusted n	Density (n/ha)	Total # Birds in SSA
Magnolia Warbler	Y	Y	59	125	2	1.13681	4.91	834.48	134.1	0.16075	179.4
Bay-breasted Warbler	Y		40	80	2	1.16609	2.01	341.80	93.3	0.27293	304.6
Blackburnian Warbler	Y	Y	7	80	2	1.21099	2.01	341.80	17.0	0.04960	55.4
Yellow Warbler			2	125	2	1.10609	4.91	834.48	4.4	0.00530	5.9
Chestnut-sided Warbler	Y		18	125	2	1.23110	4.91	834.48	44.3	0.05311	59.3
Black-throated Blue Warbler		Y	3	125	2	1.13171	4.91	834.48	6.8	0.00814	9.1
Palm Warbler			1	125	2	1.30411	4.91	834.48	2.6	0.00313	3.5
Yellow-rumped Warbler			60	125	2	1.29712	4.91	834.48	155.7	0.18653	208.2
Black-throated Green Warbler	Y	Y	165	125	2	1.13092	4.91	834.48	373.2	0.44723	499.1
Canada Warbler	Y	Y	19	100	2	1.15546	3.14	534.07	43.9	0.08221	91.7
Wilson's Warbler			2	100	2	1.16268	3.14	534.07	4.7	0.00871	9.7
Rose-breasted Grosbeak			2	200	2	1.16425	12.57	2136.28	4.7	0.00218	2.4

* Environment Canada (2004)

** OMNR (2000); additional species not adequately surveyed by point counts (and for which no densities were calculated) are also considered area-sensitive.

D8.6 PATCH SIZE ANALYSIS OUTPUTS

MARATHON PALLADIUM PROJECT ENVIRONMENTAL IMPACT STATEMENT ADDENDUM

APPENDIX D8.6: PATCH SIZE ANALYSIS OUTPUTS

The following includes texture results of mature and old forest from Ontario’s Landscape Tool (OLT) i.e., classifications used in the OMNRF’s Northwest Region in forest management planning (the Project straddles the boundary between OMNRF Northwest and Northeast regions).

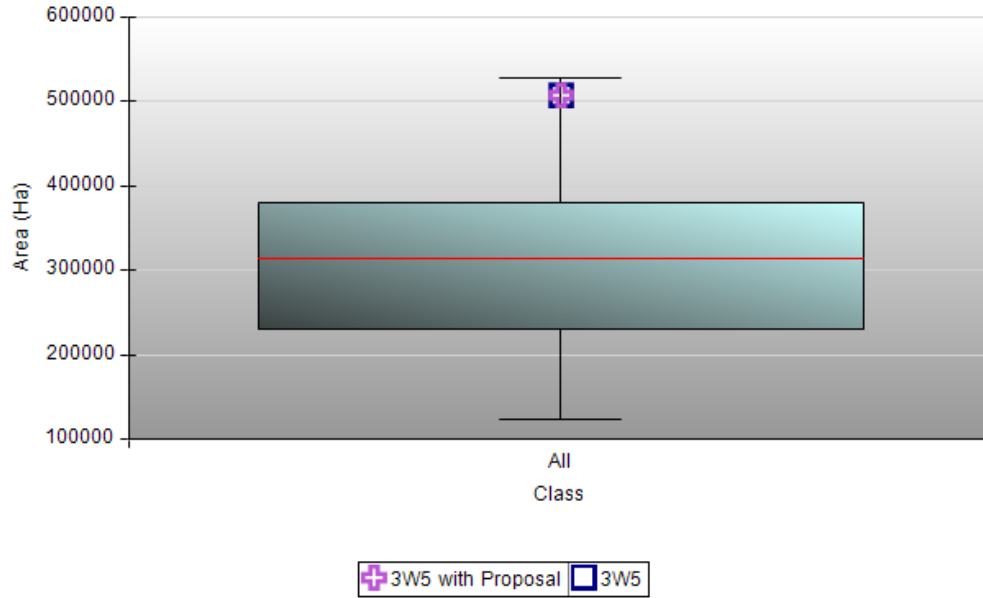
This appendix also presents young forest patch size results from OLT. Young forest is defined as forest less than 36 years.

The following table shows forest units and the onset age for each development stage. Mature and old includes everything from the mature onset age and older – note differences among forest units.

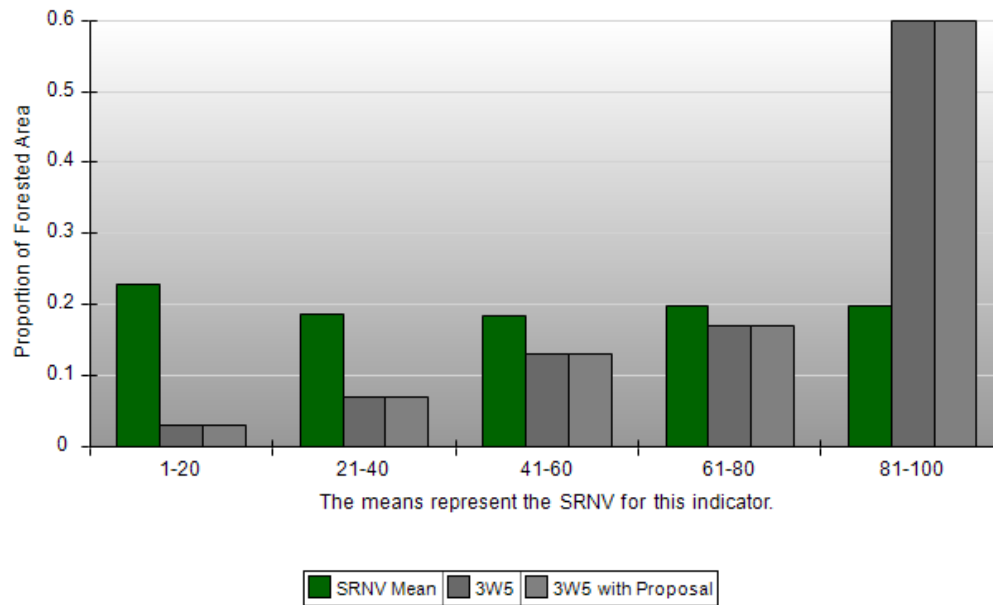
NWR Forest Unit	Development Stage				
	Presapling	Sapling	Immature	Mature	Late
BfDom	0	5	10	60	80
BwDom	0	5	10	50	110
ConMx	0	10	30	70	110
HrdMw	0	5	10	60	110
HrDom	0	5	10	60	100
OcLow	0	10	30	70	120
OthHd	0	5	10	60	100
PjDom	0	10	30	70	100
PjMx1	0	10	30	70	100
PoDom	0	5	10	60	100
PrwMx	0	10	20	80	140
SbDom	0	10	30	70	120
SbLow	0	10	30	70	160
SbMx1	0	10	30	70	110

ECO-District 3W Results Mature and Old Forest

**Simulation (Box & Whisker) Area: Ecodistrict 3W-5
 Indicator: Mature and Old**

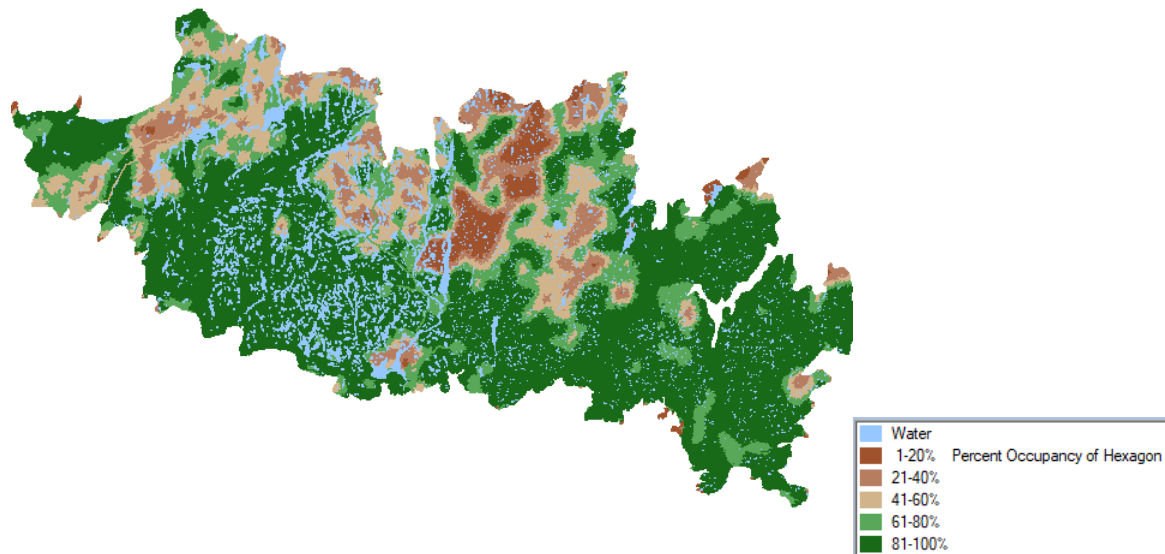


**Simulation Area: Ecodistrict 3W-5
 Indicator: Mature and Old**

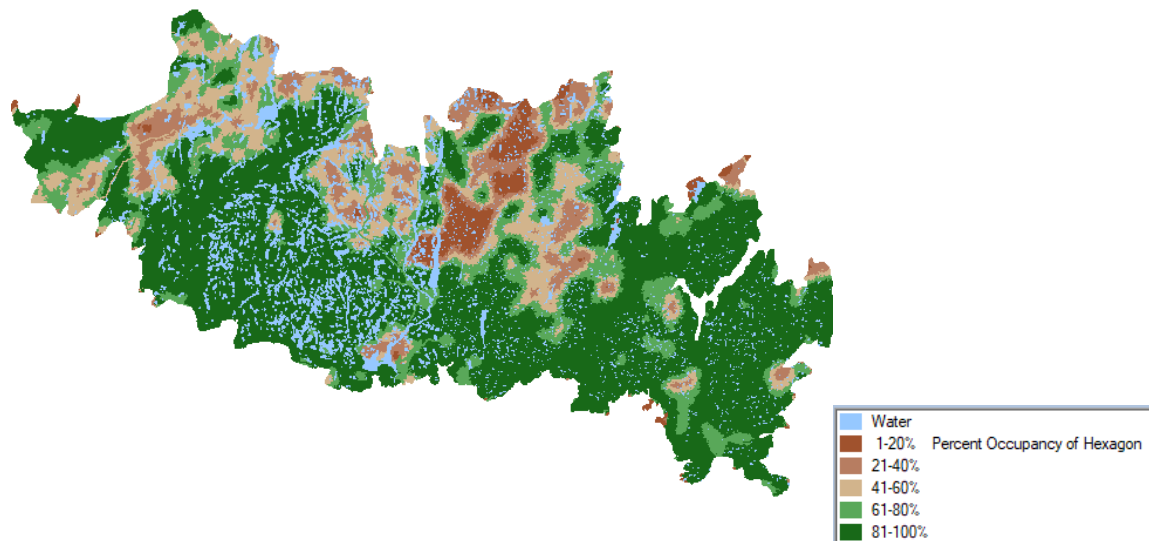


500-hectare hexagon scale texture

MARATHON PALLADIUM PROJECT ENVIRONMENTAL IMPACT STATEMENT ADDENDUM
APPENDIX D8.6: PATCH SIZE ANALYSIS OUTPUTS



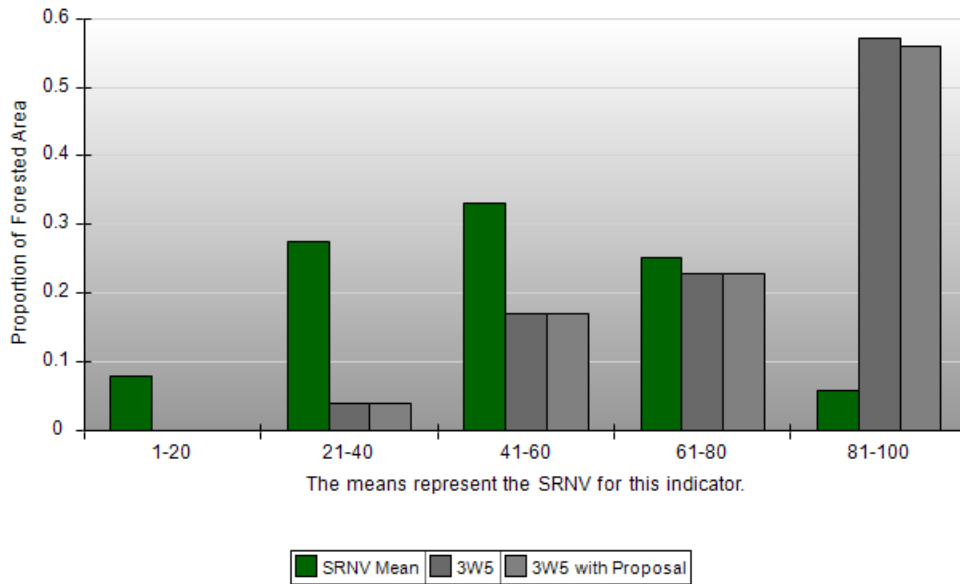
Mature and old forest at the 500-ha hexagon size in 3W-5 without Project (current conditions).



Mature and old forest at the 500-ha hexagon size in 3W-5 with Project.

MARATHON PALLADIUM PROJECT ENVIRONMENTAL IMPACT STATEMENT ADDENDUM
APPENDIX D8.6: PATCH SIZE ANALYSIS OUTPUTS

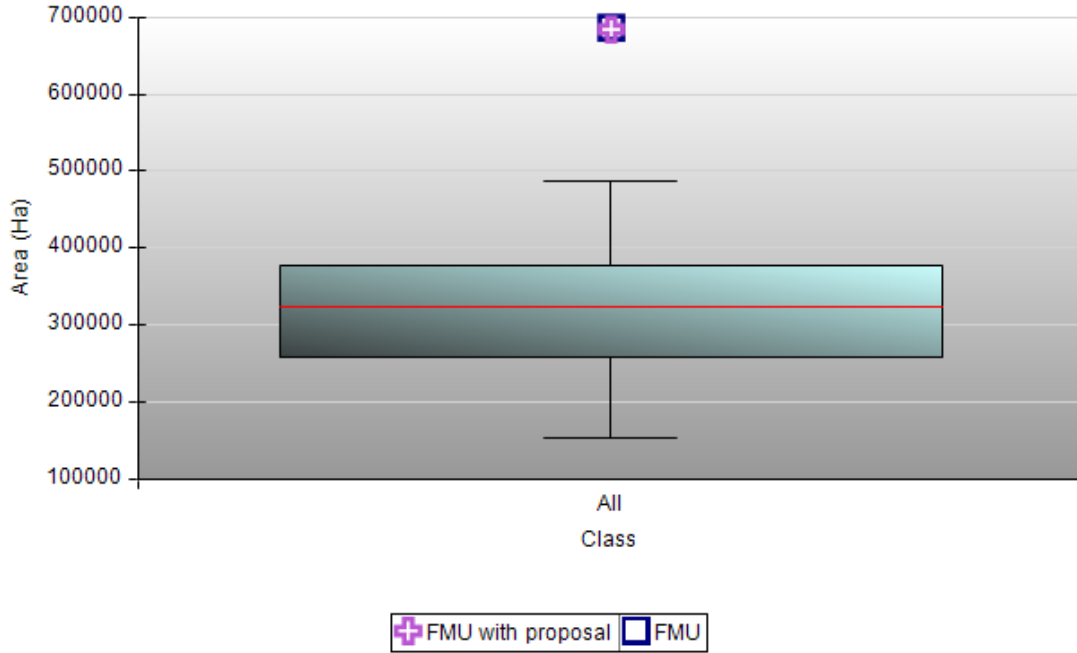
Simulation Area: Ecodistrict 3W-5
Indicator: Mature and Old



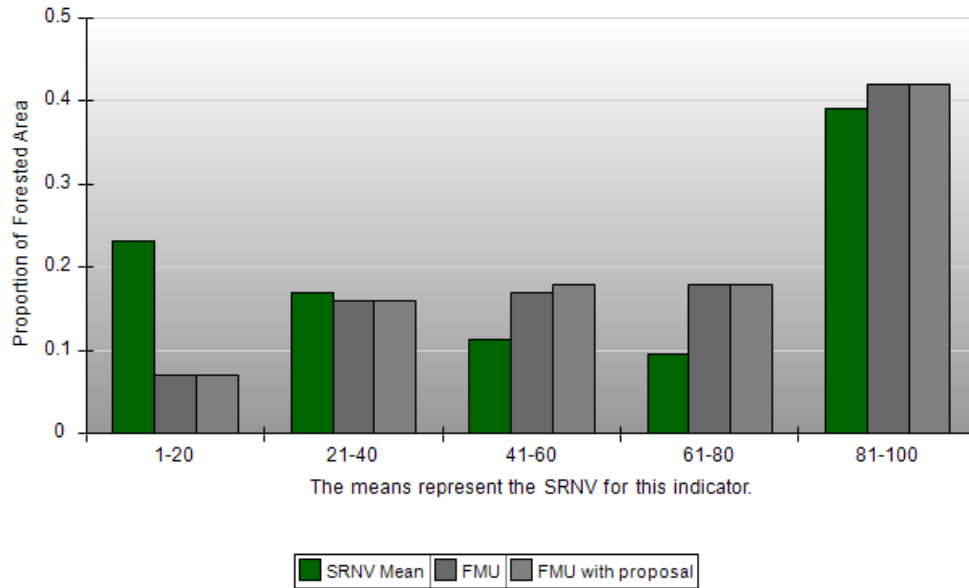
5000-hectare hexagon scale texture

Forest Management Unit (FMU) Results Mature and Old Forest

**Simulation (Box & Whisker) Area: Big Pic Forest
Indicator: Mature and Old**

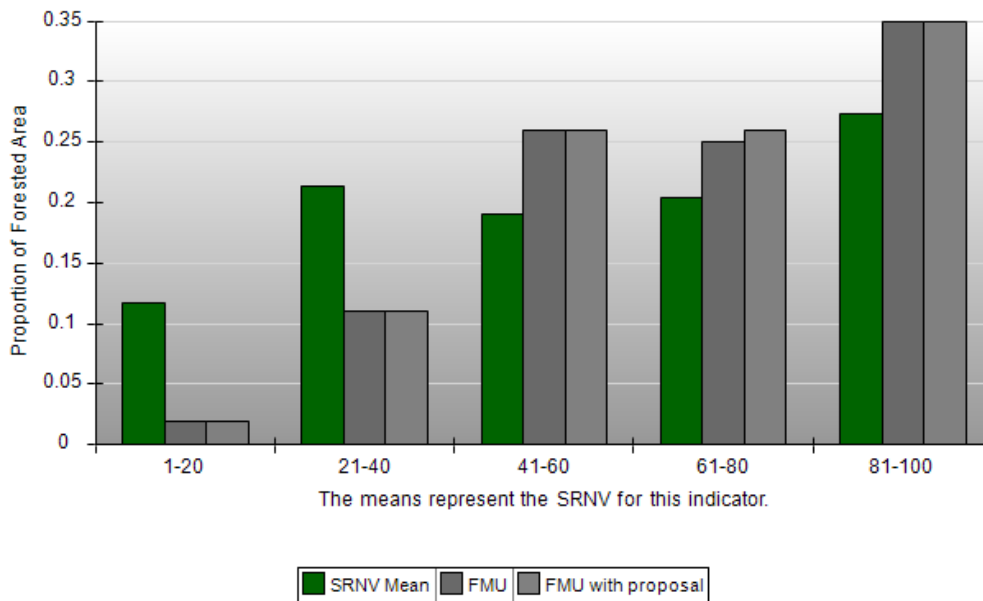


Simulation Area: Big Pic Forest
Indicator: Mature and Old



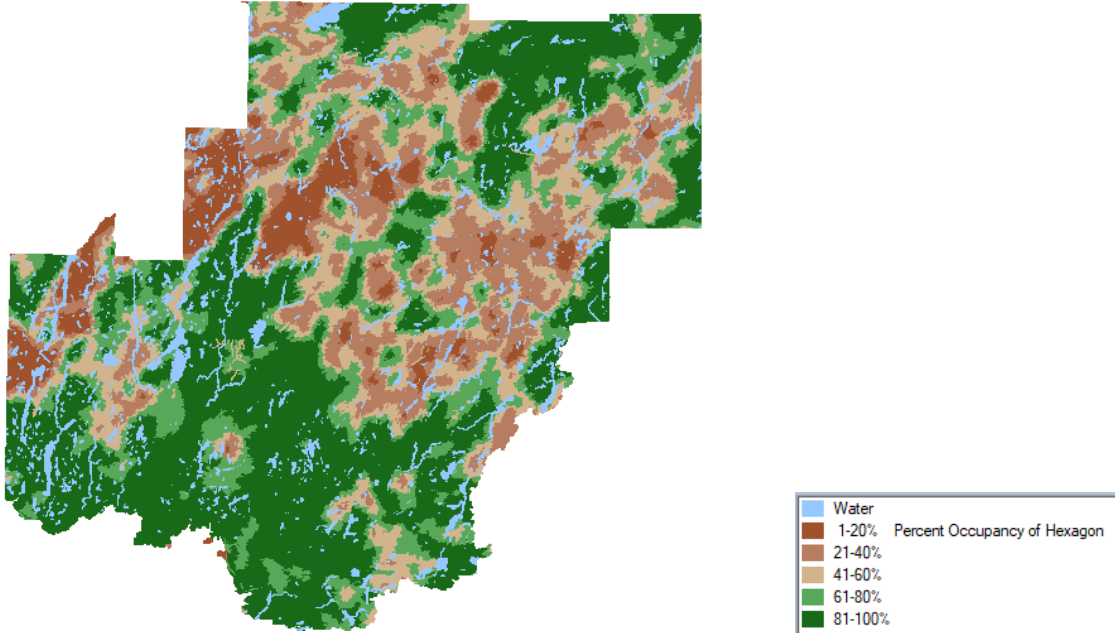
500-hectare hexagon scale texture

Simulation Area: Big Pic Forest
Indicator: Mature and Old

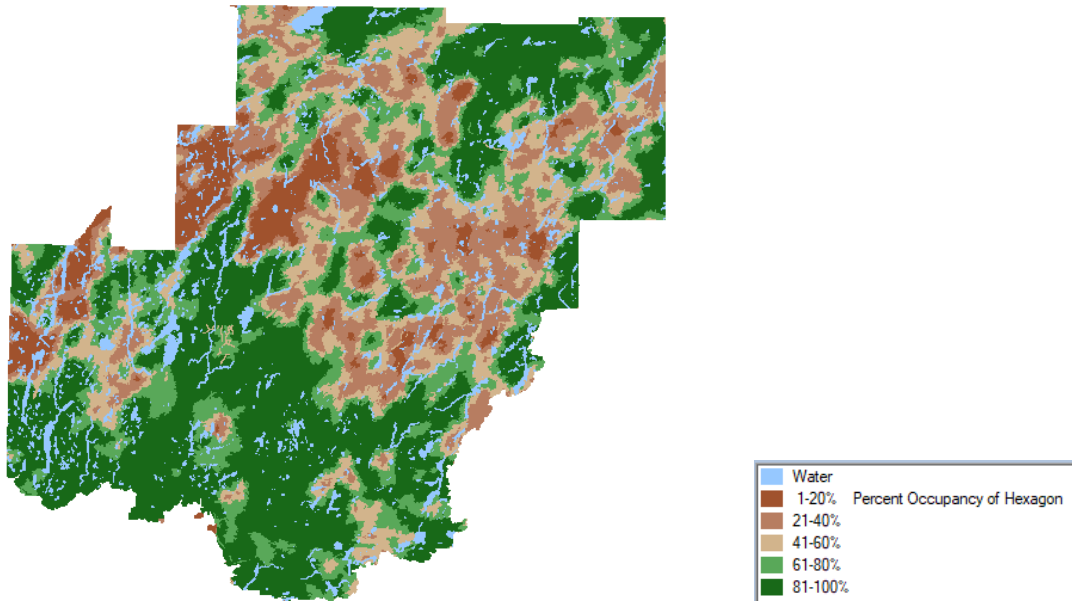


5000-hectare hexagon scale texture

MARATHON PALLADIUM PROJECT ENVIRONMENTAL IMPACT STATEMENT ADDENDUM
APPENDIX D8.6: PATCH SIZE ANALYSIS OUTPUTS



Mature and old forest at the 500-ha hexagon size in 3W-5 without Project (current conditions).

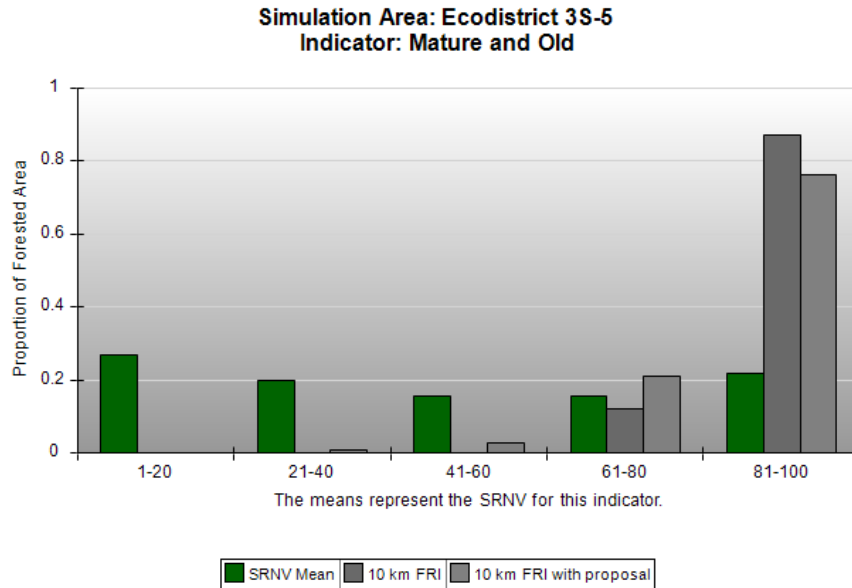


Mature and old forest at the 500-ha hexagon size in 3W-5 with Project.

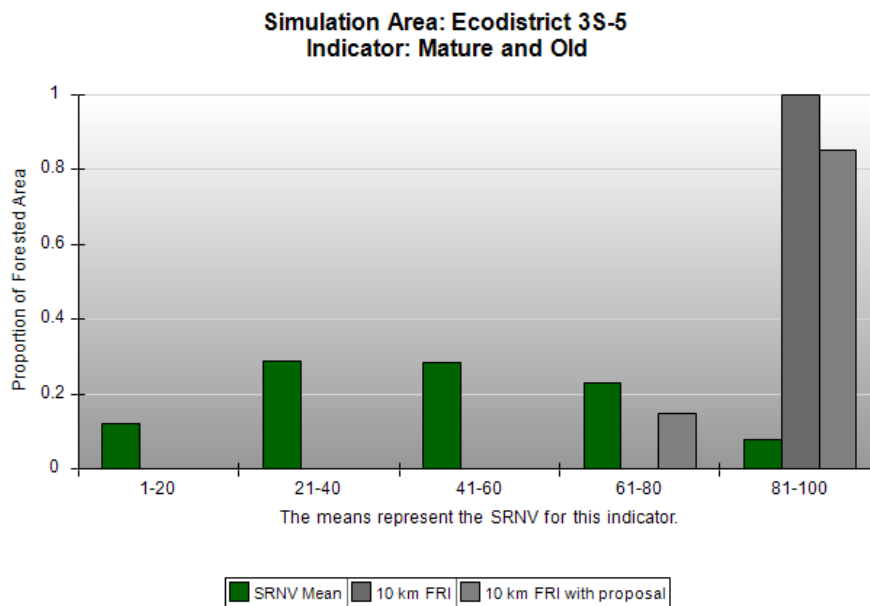
Project SSA + 10 km buffer Results Mature and Old Forest

MARATHON PALLADIUM PROJECT ENVIRONMENTAL IMPACT STATEMENT ADDENDUM
APPENDIX D8.6: PATCH SIZE ANALYSIS OUTPUTS

Note: There is 38,538 ha of mature old forest currently in the area and 36,999 ha when the Project SSA is overlaid. There is no mature and old SRNV for the 10 km buffered area. In the texture graph below the SRNV (green) is for the entire ecodistrict.

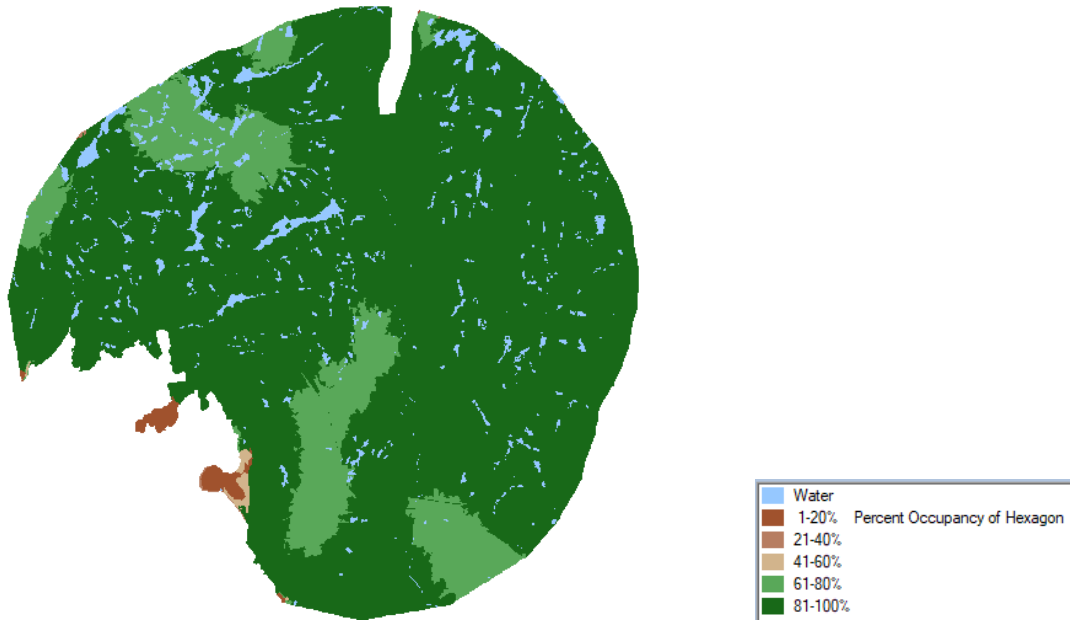


500-hectare hexagon scale texture.

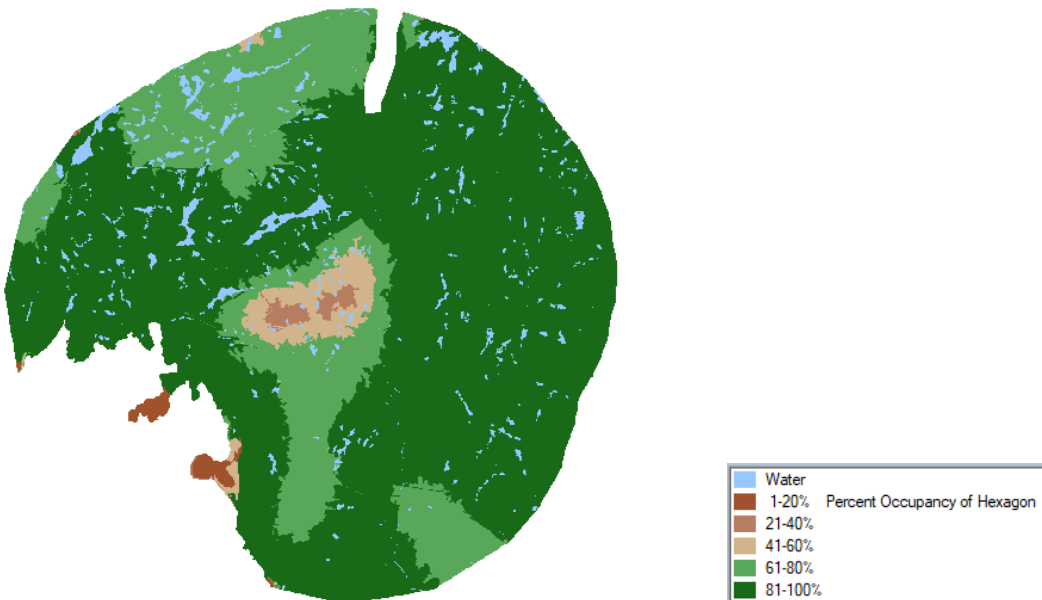


5,000-hectare hexagon scale texture.

MARATHON PALLADIUM PROJECT ENVIRONMENTAL IMPACT STATEMENT ADDENDUM
APPENDIX D8.6: PATCH SIZE ANALYSIS OUTPUTS



Mature and old forest at the 500-ha hexagon size in 3W-5 without Project (current conditions).



Mature and old forest at the 500-ha hexagon size in 3W-5 with Project.

Mature and Old Chart Data 500-hectare hexagon size.

Note SRNV data is for Ecodistrict 3w5.

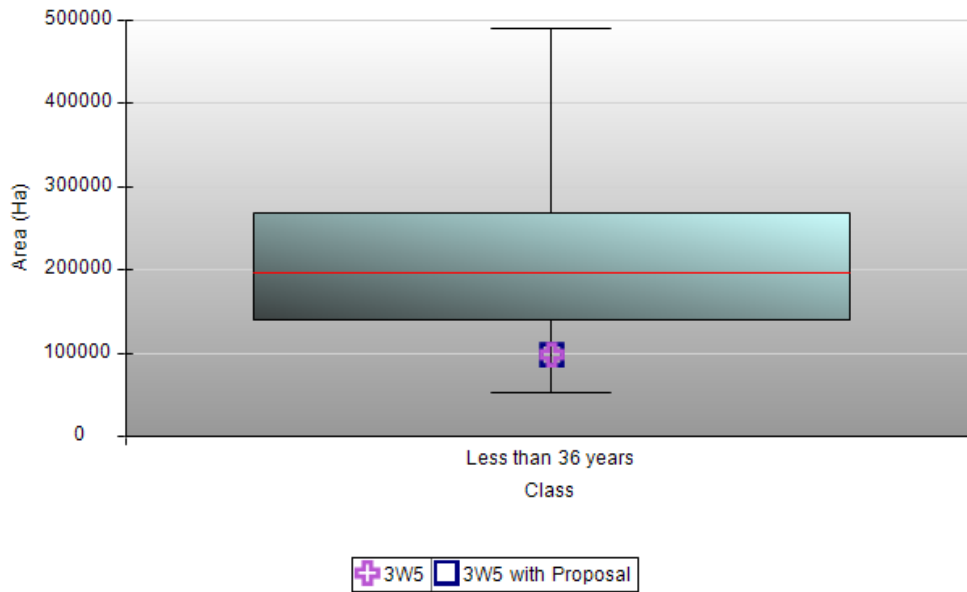
Value	1-20	21-40	41-60	61-80	81-100
Lower Range	0.00	0.00	0.00	0.00	0.00
Mean	0.13	0.17	0.29	0.31	0.10
Upper Range	0.00	0.00	0.00	0.00	0.00
3w5	0.03	0.07	0.13	0.17	0.60
3w5 with Proposal	0.03	0.07	0.13	0.17	0.60
FMU	0.07	0.16	0.17	0.18	0.42
FMU with proposal	0.07	0.16	0.18	0.18	0.42
10 km FRI with proposal	0.00	0.01	0.03	0.21	0.76
10 km FRI	0.00	0.00	0.00	0.12	0.87

Mature and Old Chart Data 500o-hectare hexagon size.

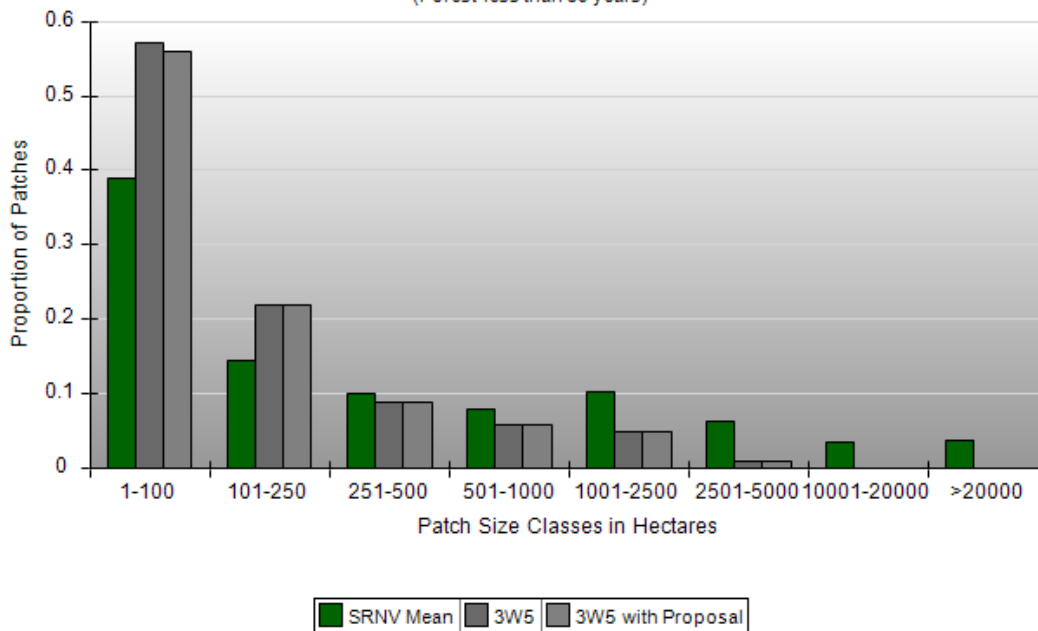
Value	81-100	1-20	21-40	41-60	61-80
Lower Range	0.00	0.00	0.00	0.00	0.00
Mean	0.03	0.10	0.19	0.40	0.29
Upper Range	0.00	0.00	0.00	0.00	0.00
3w5	0.00	0.04	0.17	0.23	0.57
3w5 with Proposal	0.00	0.04	0.17	0.23	0.56
FMU	0.02	0.11	0.26	0.25	0.35
FMU with proposal	0.02	0.11	0.26	0.26	0.35
10 km FRI with proposal	0.00	0.00	0.00	0.15	0.85
10 km FRI	0.00	0.00	0.00	0.00	1.00

ECO-District 3W Results Young Forest

**Simulation (Box & Whisker) Area: Ecodistrict 3W-5
 Indicator: Young**

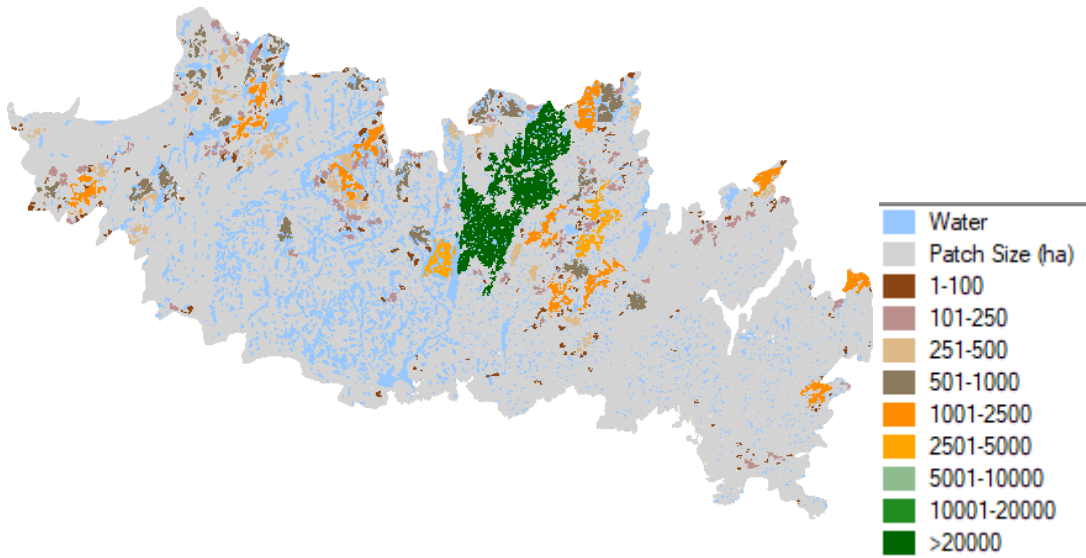


**Simulation Area: Ecodistrict 3W-5
 Indicator: Young
 (Forest less than 36 years)**

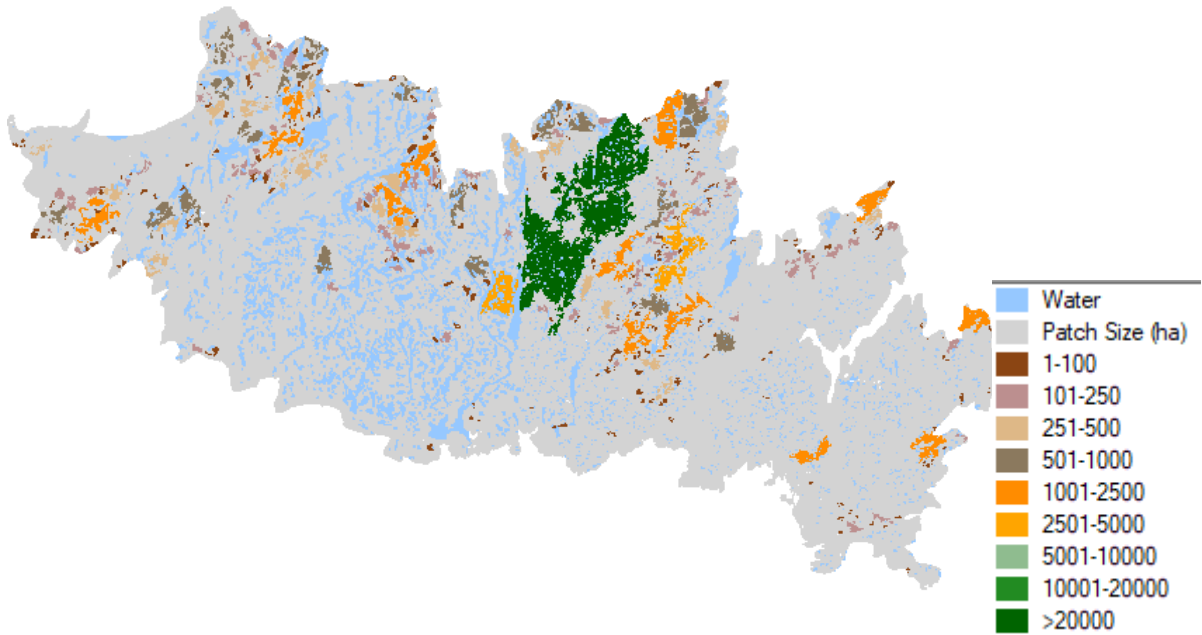


Young forest patch size frequency current and with Project at Eco-district 3W-5 level.

MARATHON PALLADIUM PROJECT ENVIRONMENTAL IMPACT STATEMENT ADDENDUM
APPENDIX D8.6: PATCH SIZE ANALYSIS OUTPUTS



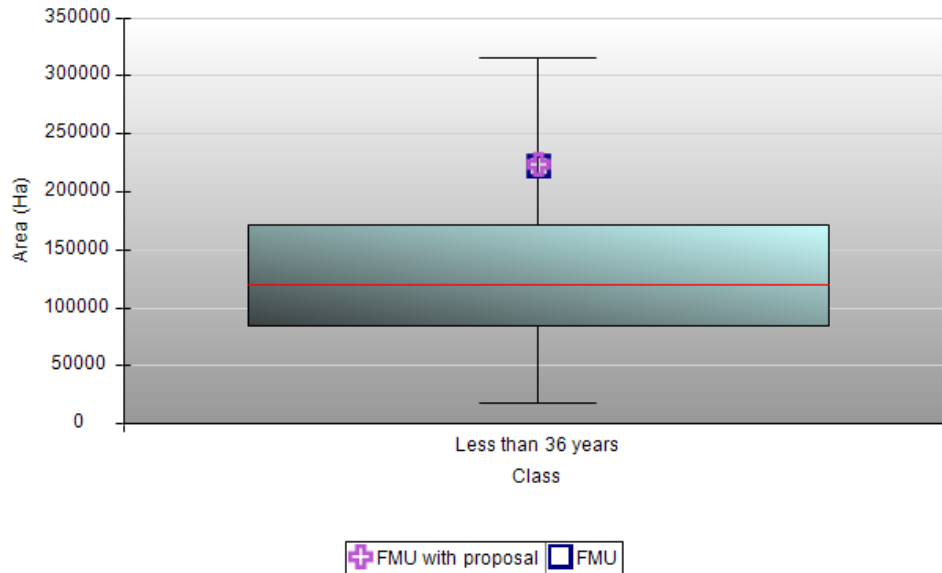
Young forest patches current without Project



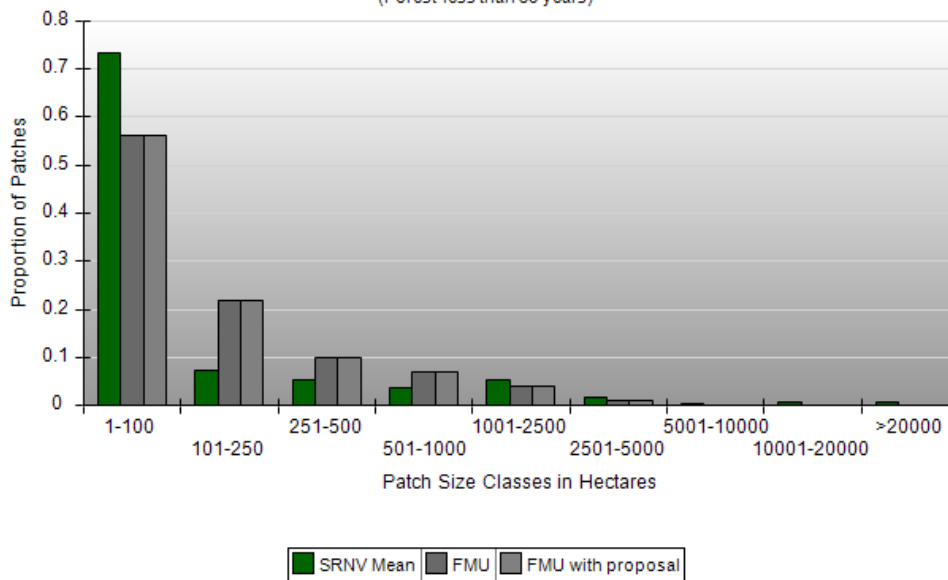
Young forest patches current with Project

Forest Management Unit Results Young Forest

**Simulation (Box & Whisker) Area: Big Pic Forest
 Indicator: Young**

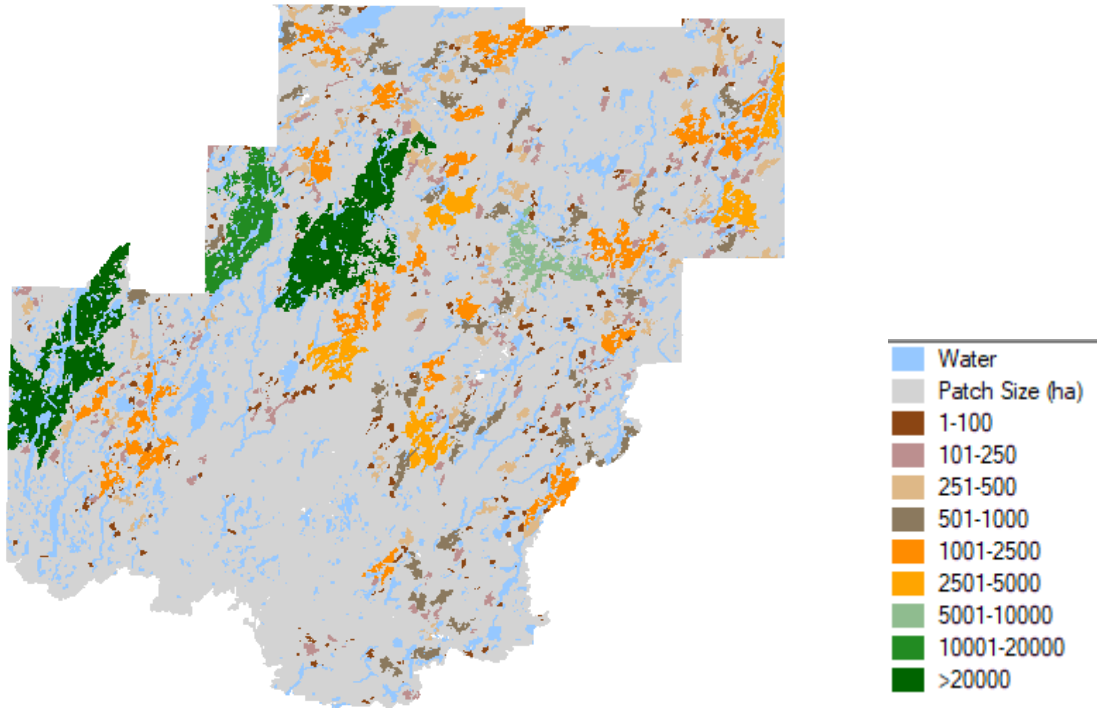


**Simulation Area: Big Pic Forest
 Indicator: Young
 (Forest less than 36 years)**

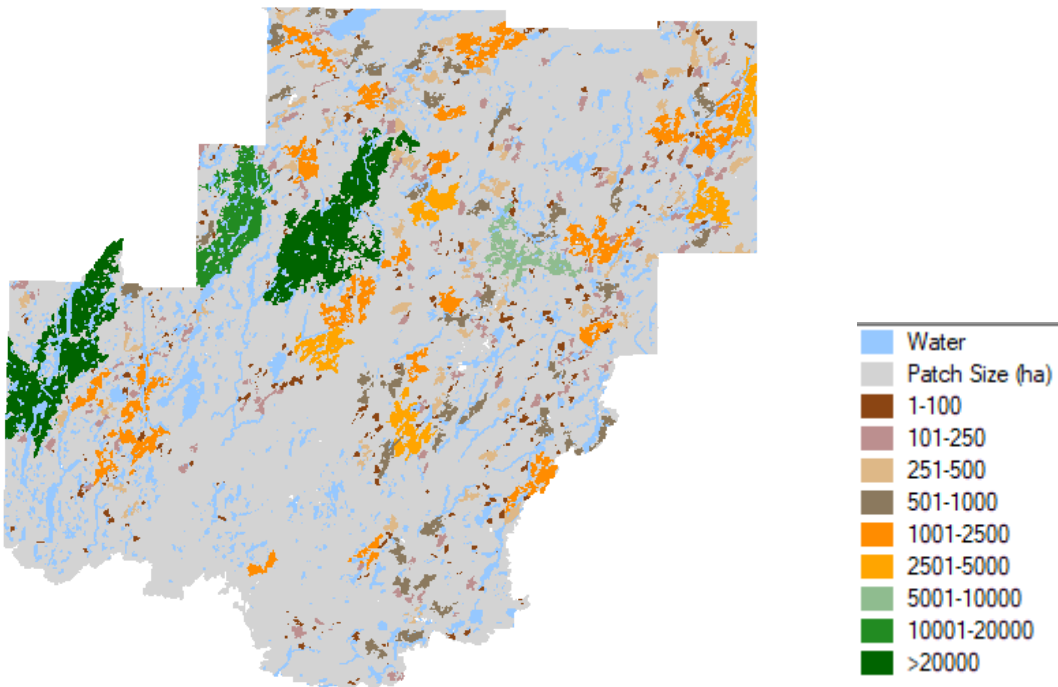


Young forest patch size frequency current and with Project at FMU level.

MARATHON PALLADIUM PROJECT ENVIRONMENTAL IMPACT STATEMENT ADDENDUM
APPENDIX D8.6: PATCH SIZE ANALYSIS OUTPUTS



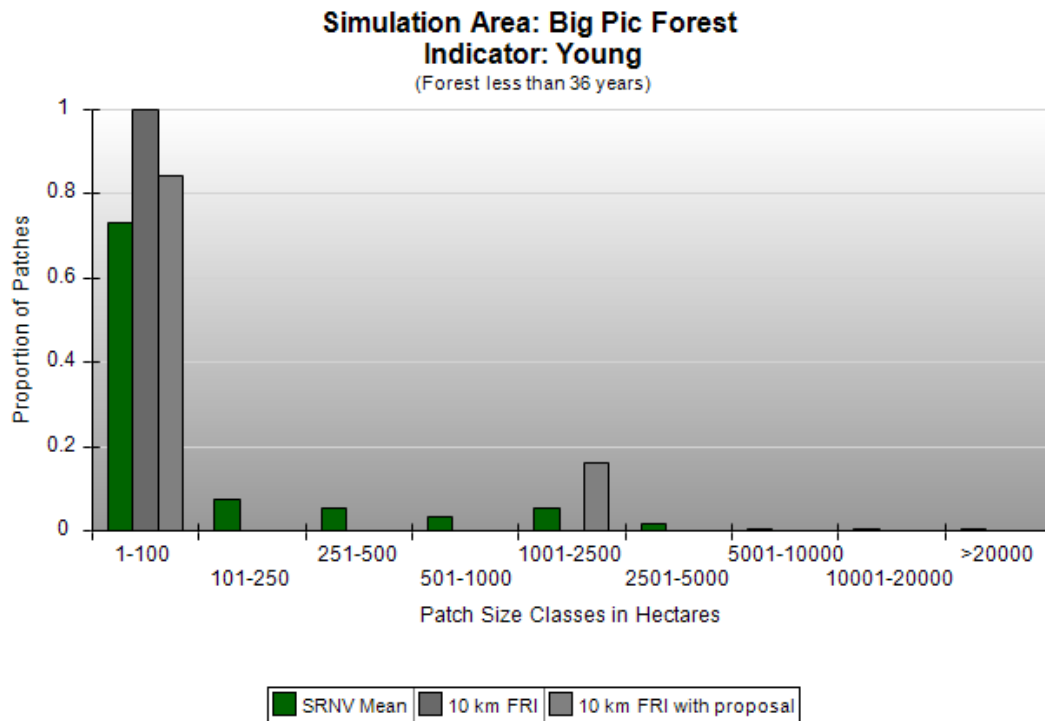
Young forest patches without Project



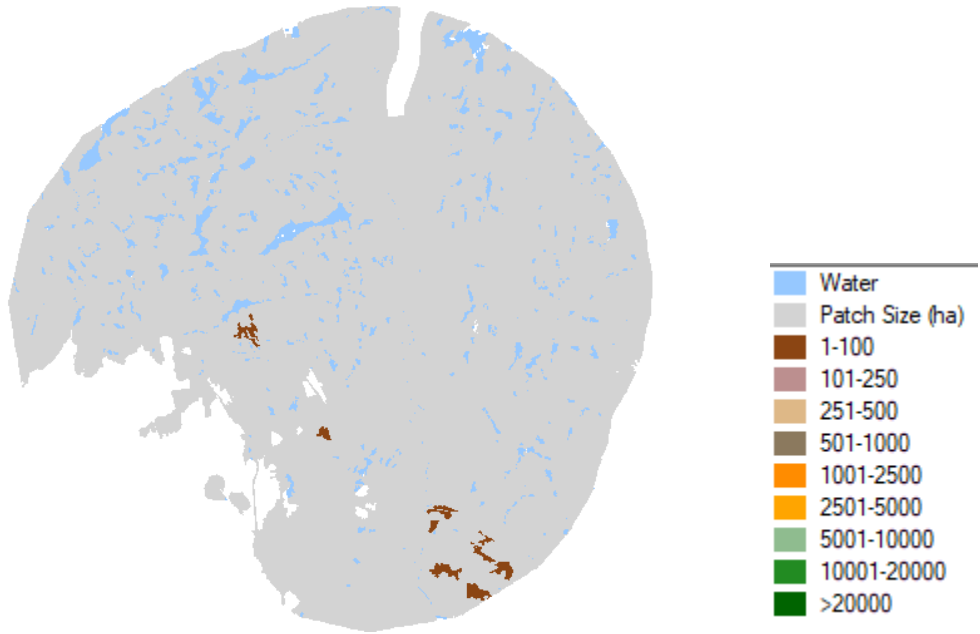
Young forest patches with Project
Project SSA + 10 km buffer Results Young Forest

MARATHON PALLADIUM PROJECT ENVIRONMENTAL IMPACT STATEMENT ADDENDUM
APPENDIX D8.6: PATCH SIZE ANALYSIS OUTPUTS

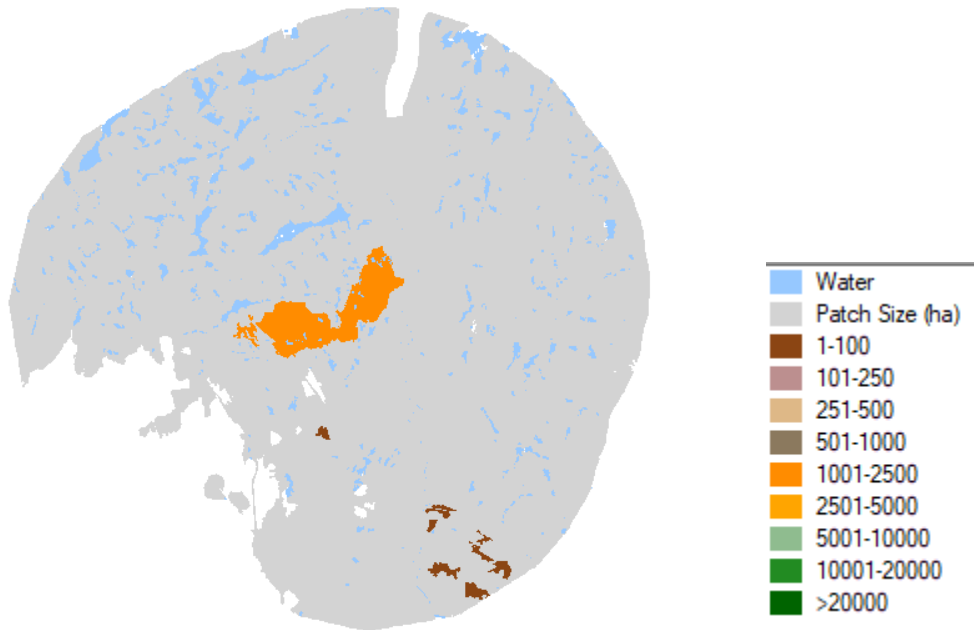
Note: SRNV for young forest in the 10 km buffer does not exist. Currently there is 634.6 ha of young forest and after the Project there is 1699.2 ha.



MARATHON PALLADIUM PROJECT ENVIRONMENTAL IMPACT STATEMENT ADDENDUM
APPENDIX D8.6: PATCH SIZE ANALYSIS OUTPUTS



Young forest patches without Project



Young forest patches with Project

MARATHON PALLADIUM PROJECT ENVIRONMENTAL IMPACT STATEMENT ADDENDUM
APPENDIX D8.6: PATCH SIZE ANALYSIS OUTPUTS

Young forest patch size graph data

Ecodistrict 3W-5

Value	1-100	101-250	251-500	501-1000	1001-2500	2501-5000	10001-20000	>20000
Lower Range	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mean	0.39	0.14	0.10	0.08	0.10	0.06	0.04	0.04
Upper Range	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3W5 with Proposal	0.56	0.22	0.09	0.06	0.05	0.01	0.00	0.00
3W5	0.57	0.22	0.09	0.06	0.05	0.01	0.00	0.00

FMU

Value	1-100	101-250	251-500	501-1000	1001-2500	2501-5000	5001-10000	10001-20000	>20000
Lower Range	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mean	0.73	0.07	0.06	0.04	0.06	0.02	0.01	0.01	0.01
Upper Range	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FMU	0.56	0.22	0.10	0.07	0.04	0.01	0.00	0.00	0.00
FMU with proposal	0.56	0.22	0.10	0.07	0.04	0.01	0.00	0.00	0.00

10 km buffer

Value	1-100	101-250	251-500	501-1000	1001-2500	2501-5000	5001-10000	10001-20000	>20000
Lower Range	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mean	0.73	0.07	0.06	0.04	0.06	0.02	0.01	0.01	0.01
Upper Range	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10 km FRI	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00