



PROPOSED GENEX KIDSTON CONNECTION PROJECT

Corridor Selection Report

PREPARED BY

QUEENSLAND ELECTRICITY TRANSMISSION CORPORATION LIMITED

(ACN 078 849 233) trading as "POWERLINK"

3 ECOLOGICAL CONSTRAINTS

3.1 Matters of State Environmental Significance

The following MSES have been assessed in the following sections:

- NC Act threatened flora and fauna species
- regulated vegetation, including:
 - DNRM's regulated vegetation mapping
 - DNRM's regional ecosystem mapping
 - Virtual GIS's remote sensing analysis and mapping of woody vegetation
 - regulated remnant watercourse vegetation
 - regulated remnant wetland vegetation
- protected areas (e.g. National Parks and State reserves)
- wildlife habitats
- strategic environmental areas
- high ecological significance (HES) wetlands
- high ecological value (HEV) waters (wetland)
- high ecological value (HEV) waters (watercourses)
- environmental offsets
- connectivity.

3.1.1 NC Act threatened species

3.1.1.1 Wildlife Online results

The Wildlife Online database search results revealed that 26 threatened species listed under the NC Act and/or EPBC Act have been previously recorded within the search area that was applied to all three corridor options, including 11 birds, six mammals and nine plants.

The results of the Wildlife Online database search is presented in Table 3.1. The complete Wildlife Online database searches are presented in Appendix C.

Threatened species listed as endangered, vulnerable and special least concern under the NC Act are recognised as MSES under the *Environmental Offset Act 2014*. Near threatened species do not need to be assessed in terms of significant residual impacts under the *Environmental Offset Act 2014*, but have been included, just in case of any future changes in legislation that may occur during the approval pathway of the Project.

Table 3.1 Wildlife Online database search results for threatened flora and fauna species previously recorded within the search area

SCIENTIFIC NAME	COMMON NAME	NC ACT	EPBC ACT
Birds			
<i>Calidris ruficollis</i>	Red-necked Stint	SL	M
<i>Calyptorhynchus lathami erebus</i>	Glossy Black-cockatoo (northern)	V	–
<i>Casuarius casuarius johnsonii</i> (southern population)	Southern Cassowary (southern population)	E	E
<i>Cuculus optatus</i>	Oriental Cuckoo	SL	M
<i>Erythrura gouldiae</i>	Gouldian Finch	E	E
<i>Hirundapus caudacutus</i>	White-throated Needletail	SL	M

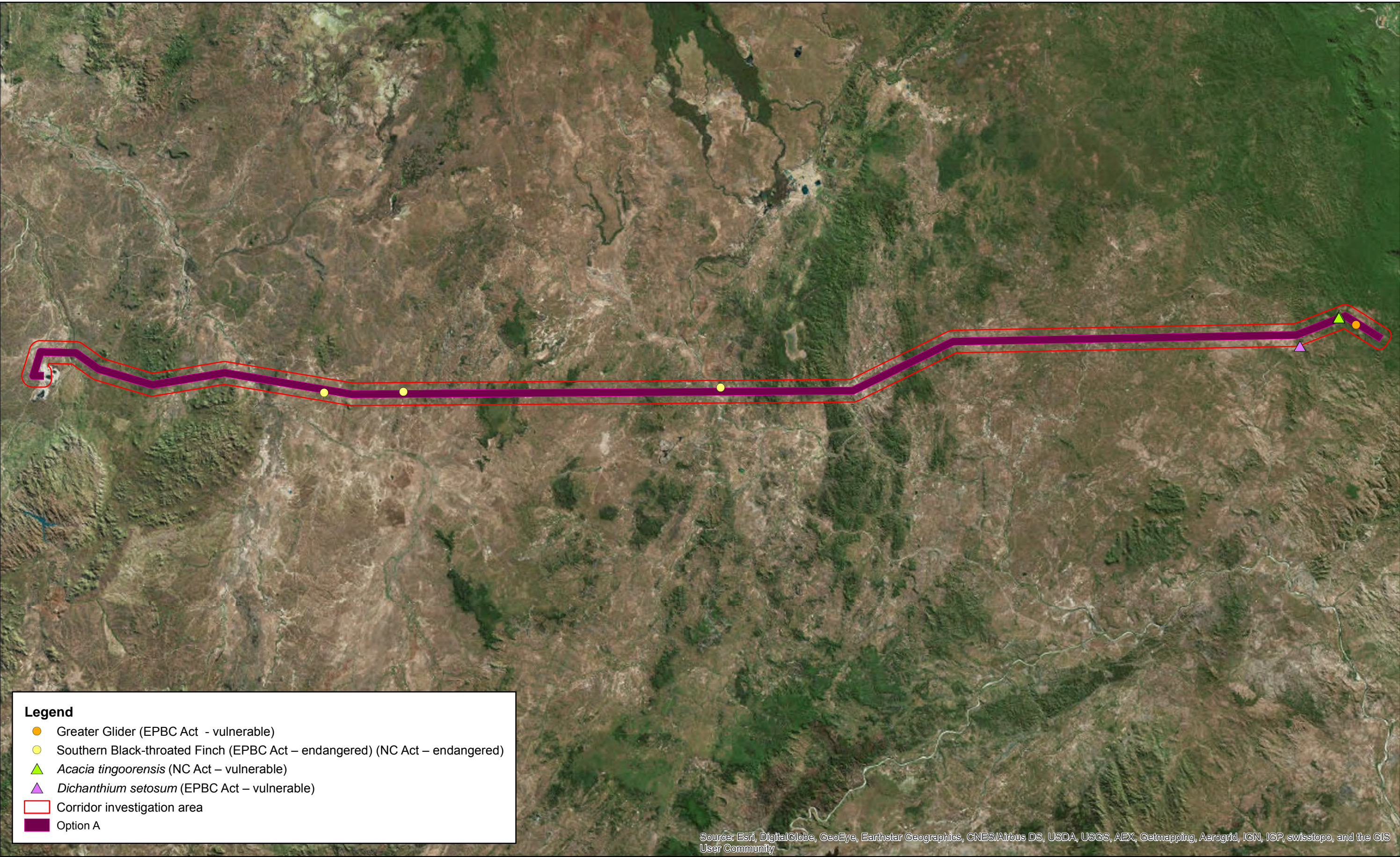
SCIENTIFIC NAME	COMMON NAME	NC ACT	EPBC ACT
<i>Hydroprogne caspia</i>	Caspian Tern	SL	M
<i>Monarcha melanopsis</i>	Black-faced Monarch	SL	M
<i>Poephila cincta cincta</i>	Black-throated Finch (white-rumped subspecies)	E	E
<i>Rhipidura rufifrons</i>	Rufous Fantail	SL	M
<i>Symposiachrus trivirgatus</i>	Spectacled Monarch	SL	M
Mammals			
<i>Mesembriomys gouldii</i>	Black-footed Tree-rat	–	V
<i>Petauroides volans minor</i>	Northern Greater Glider	–	V
<i>Petaurus gracilis</i>	Mahogany Glider	E	E
<i>Petrogale sharmani</i>	Sharman's Rock-wallaby	V	V
<i>Phascolarctos cinereus</i>	Koala	V	V
<i>Tachyglossus aculeatus</i>	Short-beaked Echidna	SL	–
Plants			
<i>Acacia tingoorensis</i>	–	V	–
<i>Arytera dictyoneura</i>	–	NT	–
<i>Cycas cairnsiana</i>	–	V	V
<i>Corybas cerasinus</i>	–	NT	–
<i>Corymbia leptoloma</i>	–	V	V
<i>Glossocardia orthochaeta</i>	Yellow jacket	E	–
<i>Leptospermum pallidum</i>	–	NT	–
<i>Lepturus minutus</i>	–	V	–
<i>Oenanthe javanica</i>	–	NT	–

Key: E = endangered, V = vulnerable, NT = near threatened, SL = special least concern, M = migratory

3.1.1.2 Threatened species records

The NC Act threatened species records, obtained from DSITI's species profile search and Atlas of Living Australia that are of relevance to each corridor option have been quantified and mapped using GIS. The number of threatened species listed under the NC Act that have been previously recorded within each corridor investigation area is presented in Table 3.2 and mapped on Figure 3.1–Figure 3.3.

The spreadsheet that contains the analysis of threatened species records is presented in Appendix F.



Legend

Greater Glider (EPBC Act - vulnerable)



Southern Black-throated Finch (EPBC Act – endangered) (NC Act – endangered)

Acacia tingoorensis (NC Act – vulnerable)

Dichanthium setosum (EPBC Act – vulnerable)

Corridor investigation area

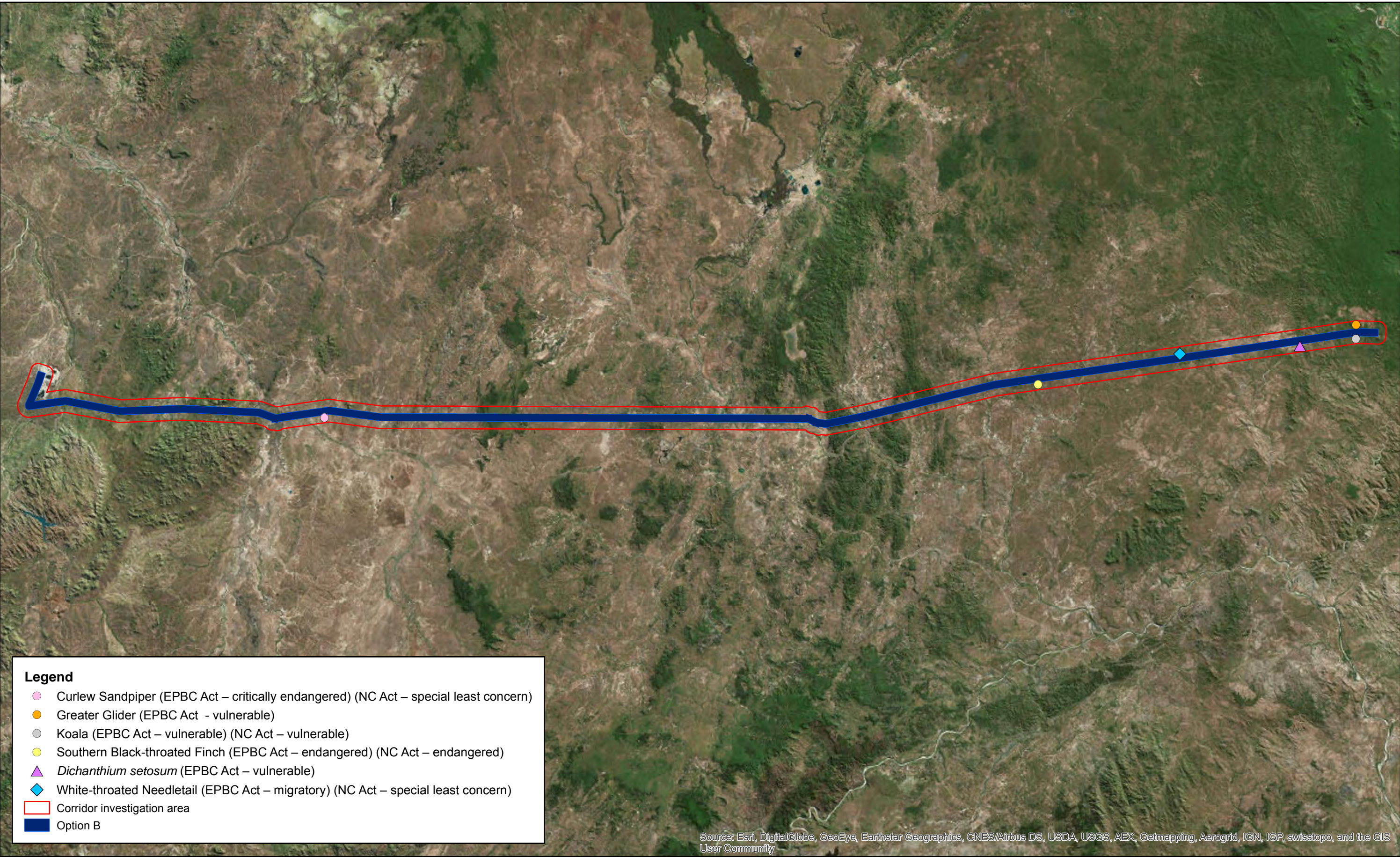
Option A

Map: 2270434A_GIS_E003_A3a	Author: VD		 1:470,000
Date: 12/12/2016	Approved by: RH		
Data source: Species records from DSITI © The State of Queensland (2016) and Atlas of Living Australia (2016)			

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Kidston Power Transmission Line
Figure 3.1
Threatened species records
Option A



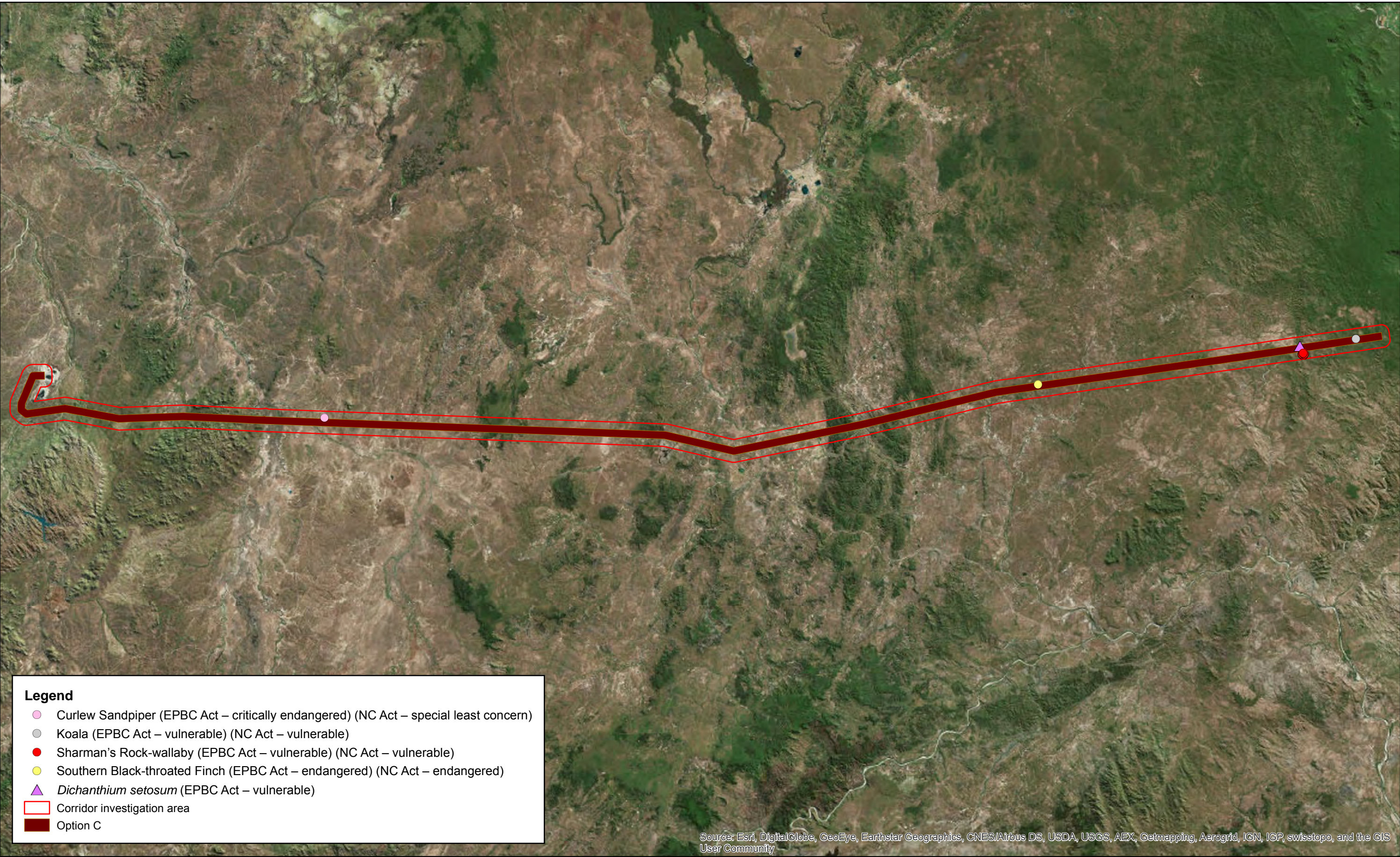
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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Data source: Species records from DSITI © The State of Queensland (2016) and Atlas of Living Australia (2016)			Coordinate system: GDA 1994 MGA Zone 55 Scale ratio correct when printed at A3

Kidston Power Transmission Line
Figure 3.2
Threatened species records
Option B

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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Data source: Species records from DSITI © The State of Queensland (2016) and Atlas of Living Australia (2016)		Coordinate system: GDA 1994 MGA Zone 55 Scale ratio correct when printed at A3	

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Kidston Power Transmission Line
Figure 3.3
Threatened species records
Option C

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Table 3.2 The number of NC Act listed species that have been previously recorded within each corridor investigation area

NC ACT STATUS	OPTION A	OPTION B	OPTION C
Threatened flora species			
Endangered	-	-	-
Vulnerable	1	-	-
Near threatened	-	-	-
Threatened fauna species			
Endangered	1	1	1
Vulnerable	-	1	3
Near threatened	-	-	-
Special least concern	-	2	1
Total records	2	4	5

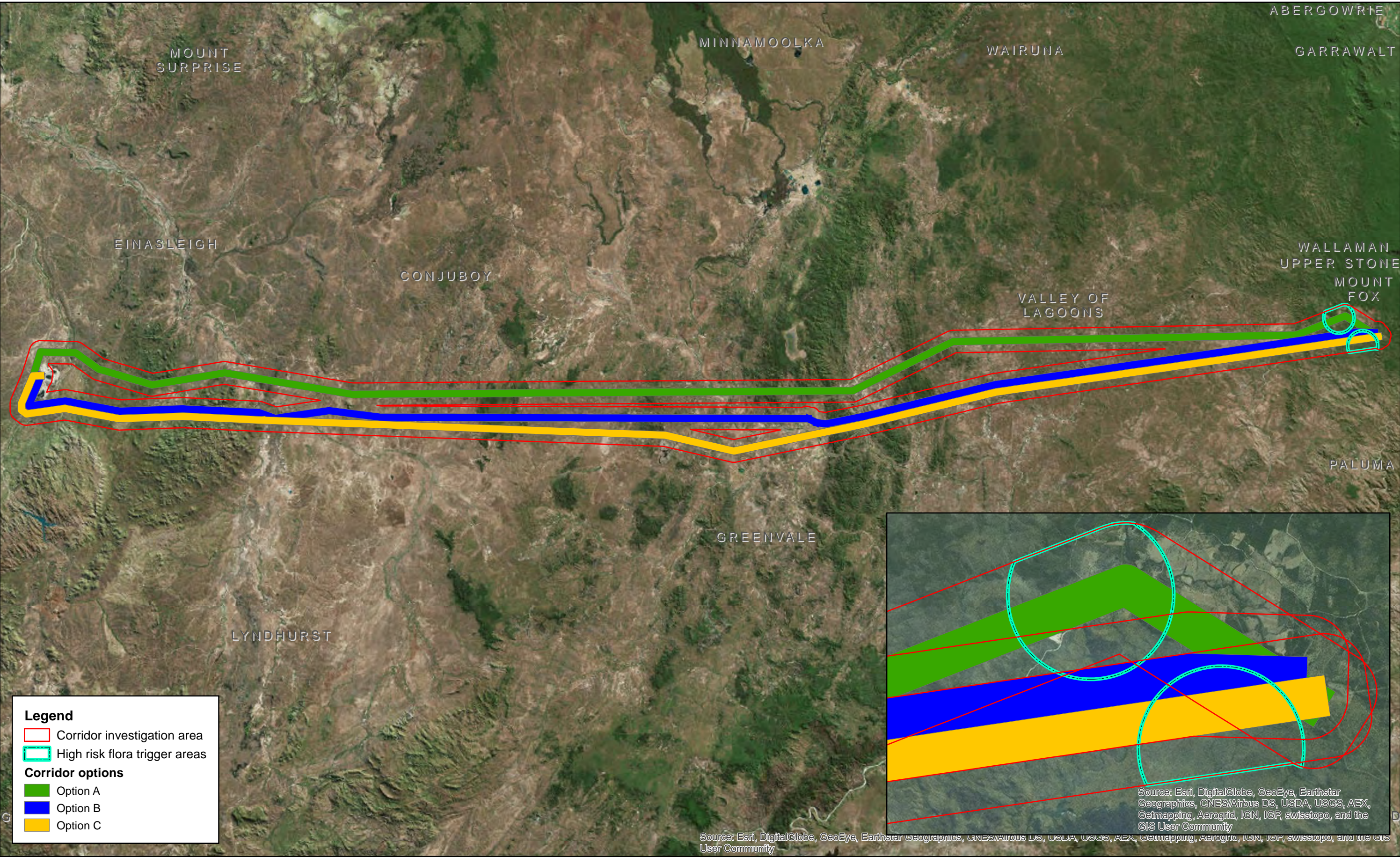
In reference to Table 3.2, Option A has the least number of NC Act threatened species records and is therefore the least constrained.

It is important to note that the number of threatened species records are representative of the number of flora and fauna surveys that are undertaken in specific areas for developments or in association with protected areas. In respect to the remoteness of the corridor investigation areas, it is possible that flora and fauna surveys for the Project may identify threatened species that may have not yet been recorded within the corridor investigation areas, and as such formerly captured on the DSITI and ALA species records databases.

3.1.1.3 Protected plants flora survey trigger map high risk areas

The 'high risk areas' for endangered, vulnerable and near threatened plants (EVNT plants) listed under NC Act on the 'protected plants flora survey trigger map' within each corridor investigation area is presented on Figure 3.4. This indicates the presence of threatened flora species within the high risk areas and indicates a potential ecological constraint to all three corridor options. The high risk areas have been mapped for confirmed records of *Acacia tingoorensis*.

Once a final project footprint is obtained a protected plants flora survey in accordance with the *Flora Survey Guidelines – Protected Plants Nature Conservation Act 1992* (DEHP, 2014), would need to be conducted within the high risk areas that intersect the project footprint. This survey would need to be conducted within 12 months of construction within the high risk areas.



Legend

Corridor investigation area

High risk flora trigger areas

Corridor options

Option A

Option B

Option C

Map: 2270434A_GIS_E001_A3	Author: VD		 1:470,000
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Kidston Power Transmission Line
Figure 3.4
High risk flora trigger areas

3.1.2 Mapped regulated vegetation

The extent of DNRM's mapped regulated vegetation that is of potential of relevance to each corridor investigation area, is presented on Figure 3.5–Figure 3.19.

The area of mapped regulated vegetation that is of potential relevance to each corridor option has been further calculated using GIS, and is listed in Table 3.3.

The area (ha) of mapped regulated vegetation associated with dominant and sub-dominant of concern regional ecosystems that is of potential relevance to each corridor investigation area is presented in Table 3.3. The analysis of regulated vegetation for each corridor option is presented in Appendix G.

Based on the results of this assessment, Option C is the least constrained in terms of potential impacts upon mapped regulated vegetation, as presented in Table 3.3.

Table 3.3 Extent of regulated vegetation of relevance to each corridor option

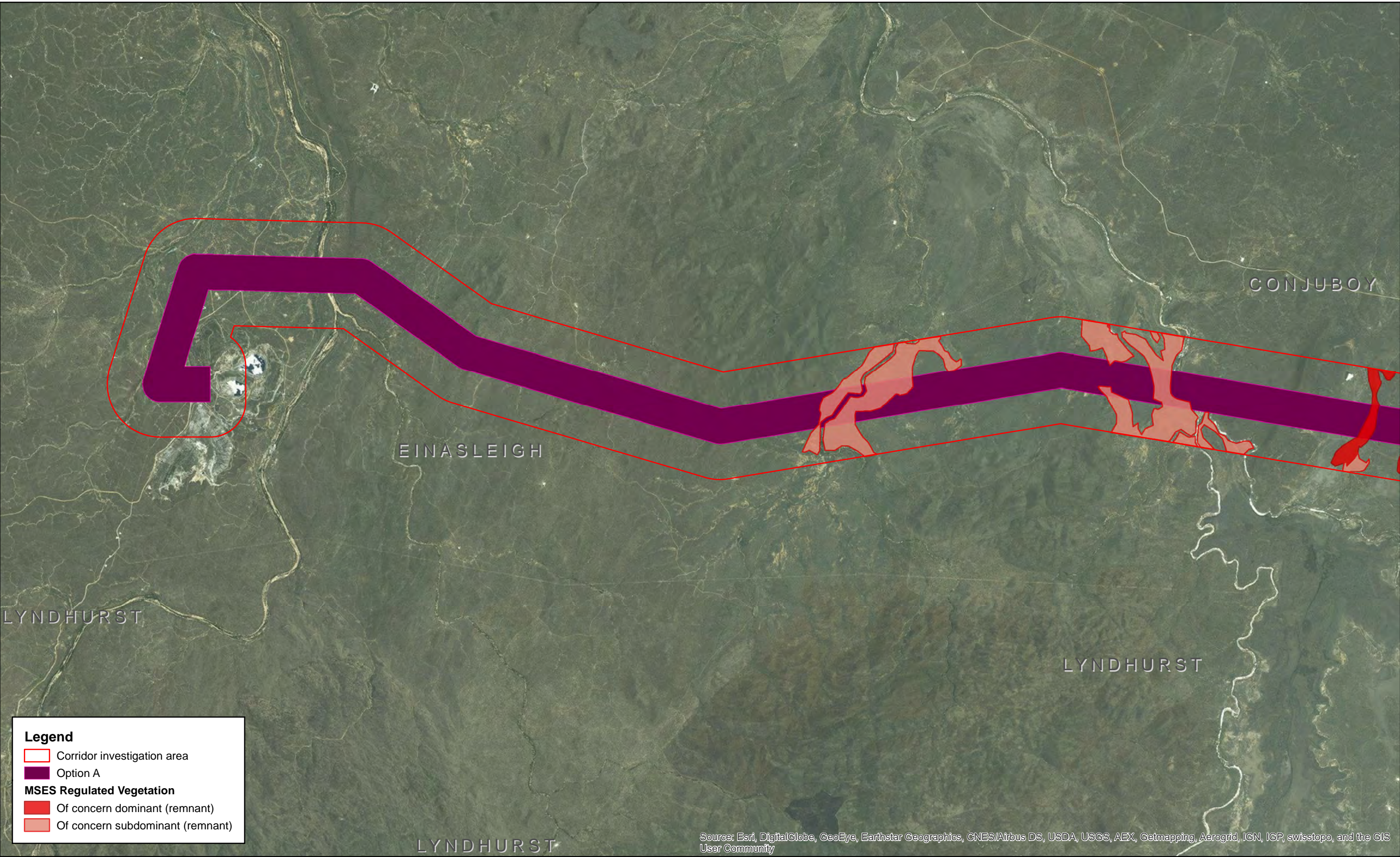
CORRIDOR	MAPPED REGULATED VEGETATION (HA)			
	OF CONCERN DOMINANT	OF CONCERN SUB-DOMINANT	OF CONCERN HVR	CATEGORY R REGROWTH
Option A	2,059	1,008	3.6	422
Option B	1,819	442	2.4	296
Option C	1,519	334	2.4	257

3.1.2.1 Category R vegetation

The DNRM's mapped *Category R regrowth vegetation: A self-assessable vegetation clearing code* (DNRM, 2013), specifies that Category R regrowth vegetation is native woody vegetation on freehold land, Indigenous land or leasehold land granted for agriculture or grazing purposes, located within 50 metres of a watercourse in the Burdekin, Mackay, Whitsunday and Wet Tropics Great Barrier Reef catchments (DNRM, 2013).

The need to consider Category R regrowth vegetation will be dependent upon the approval pathway for the Project. Assessment of the approvals pathway for the Project is excluded from the scope of this report, however a review of Community Infrastructure Designations (CIDs) database (Department of Infrastructure, Local Government and Planning, 2015) indicates that most Powerlink transmission lines are assessed and approved by the State under a CID under Chapter 5 of the *Sustainable Planning Act 2009*. Schedule 24 of the Sustainable Planning Regulation 2009 (SP Regulation) enables clearing of vegetation for community infrastructure mentioned in schedule 2 (of the SP Regulation), if the clearing is carried out on designated land.

Given the likelihood that approval for the transmission line is required by the State under the CID process, it is relevant to consider the potential ecological constraints associated with Category R regrowth vegetation until the approval pathway has been determined. In reference to Table 3.3, Option C is of least constraint in terms of potential impacts upon Category R regrowth vegetation.



Legend

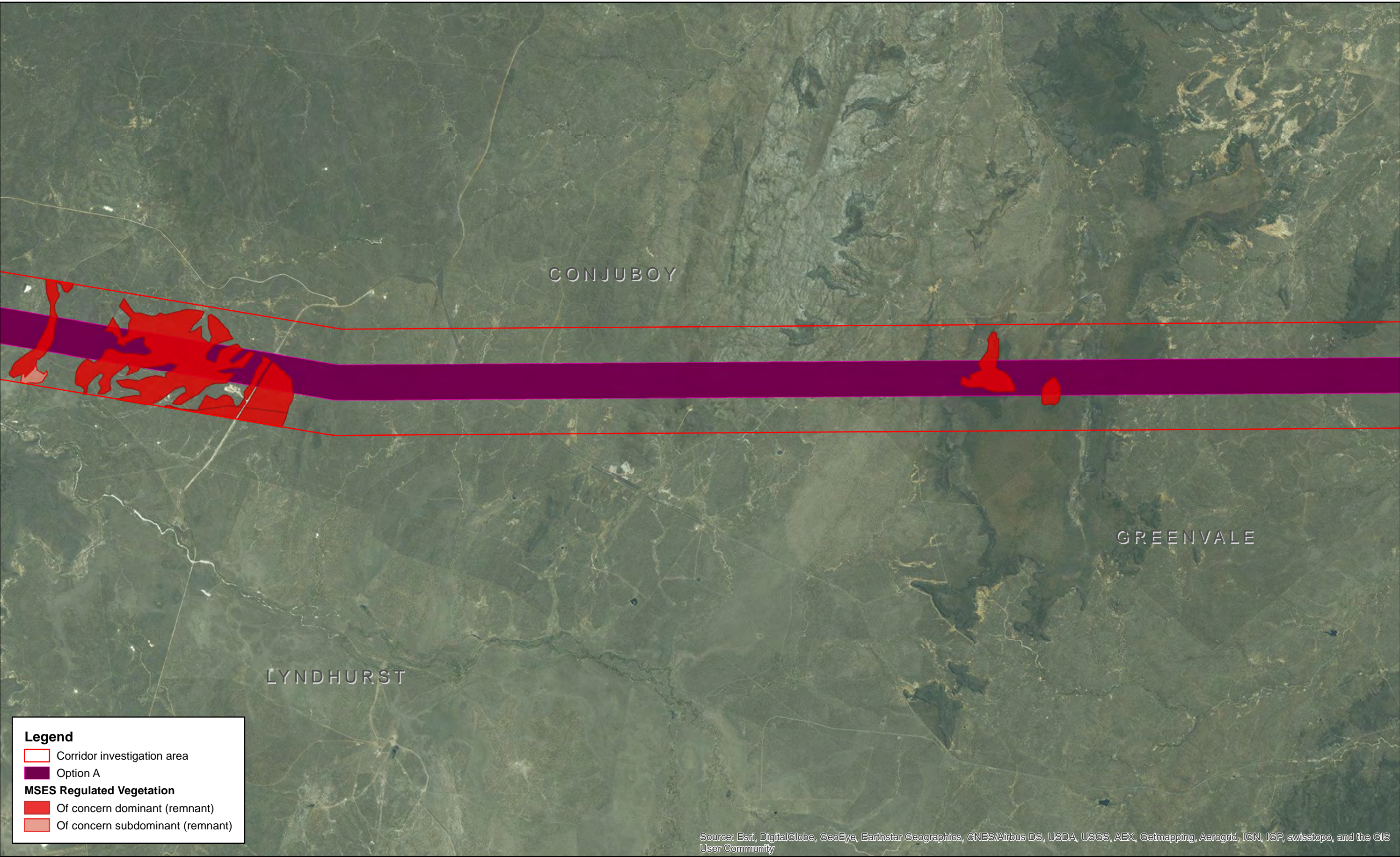
Corridor investigation area

Option A

MSES Regulated Vegetation

Of concern dominant (remnant)

Of concern subdominant (remnant)



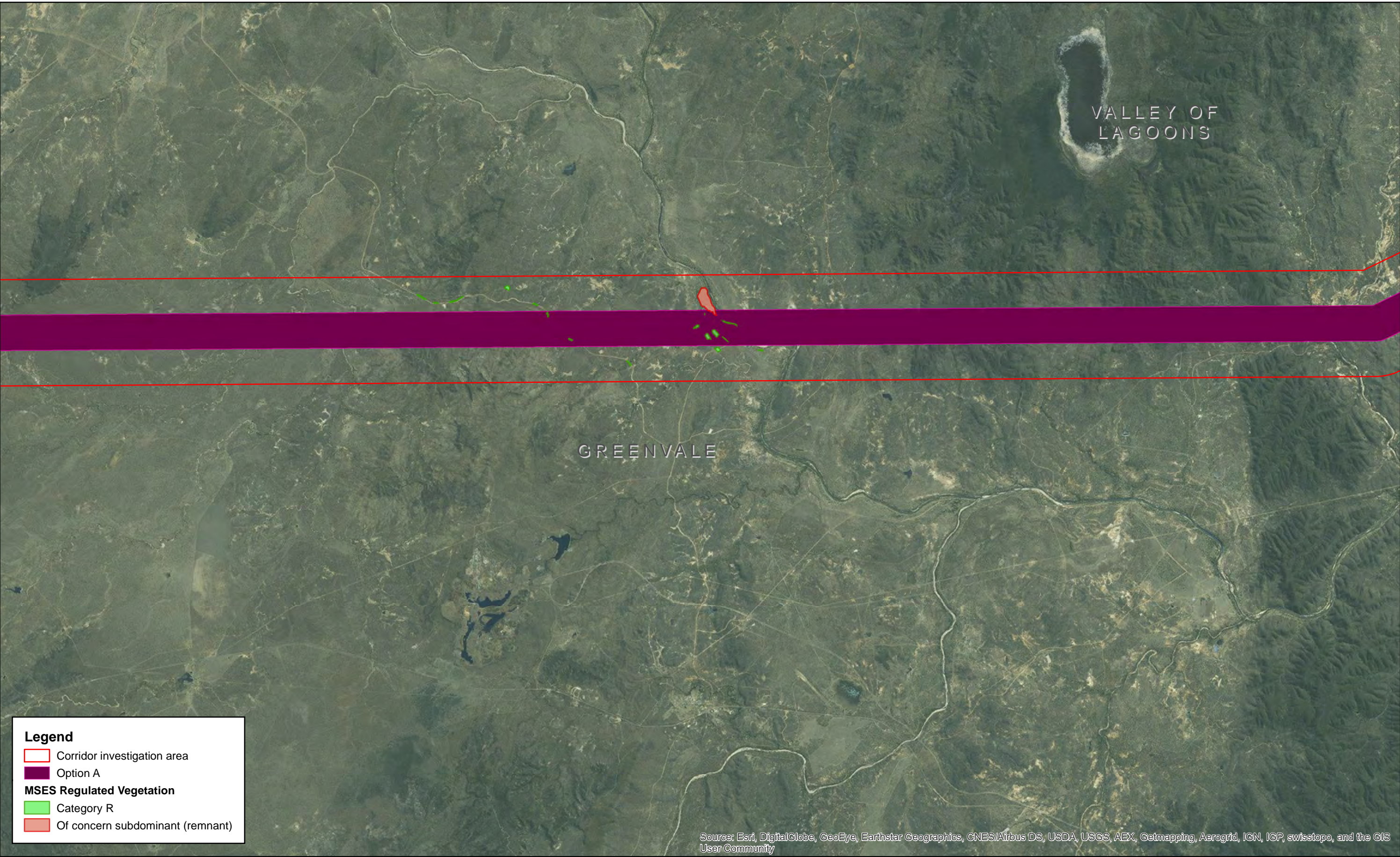
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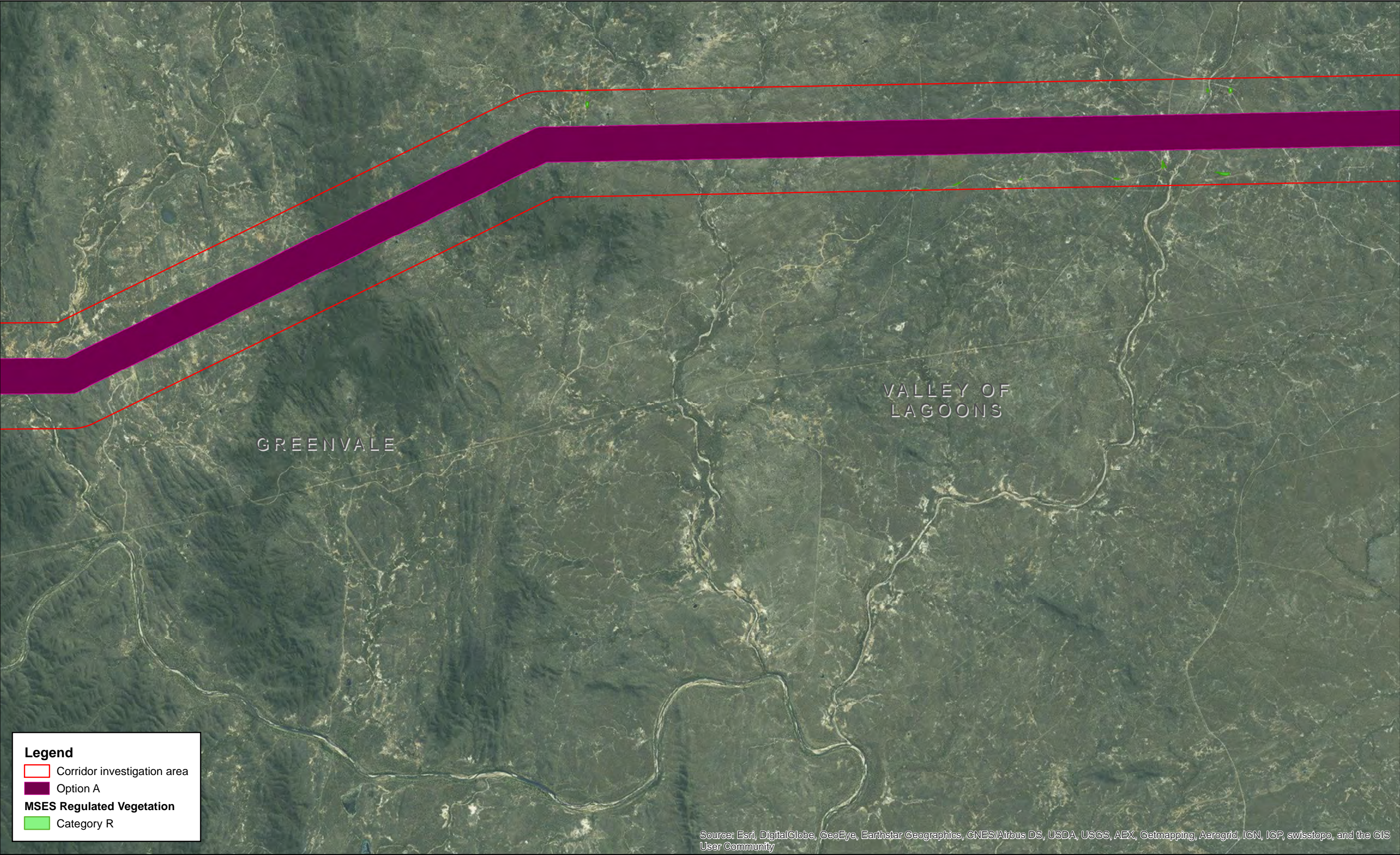
Kidston Power Transmission Line
Figure 3.6
MSES Regulated Vegetation
Option A

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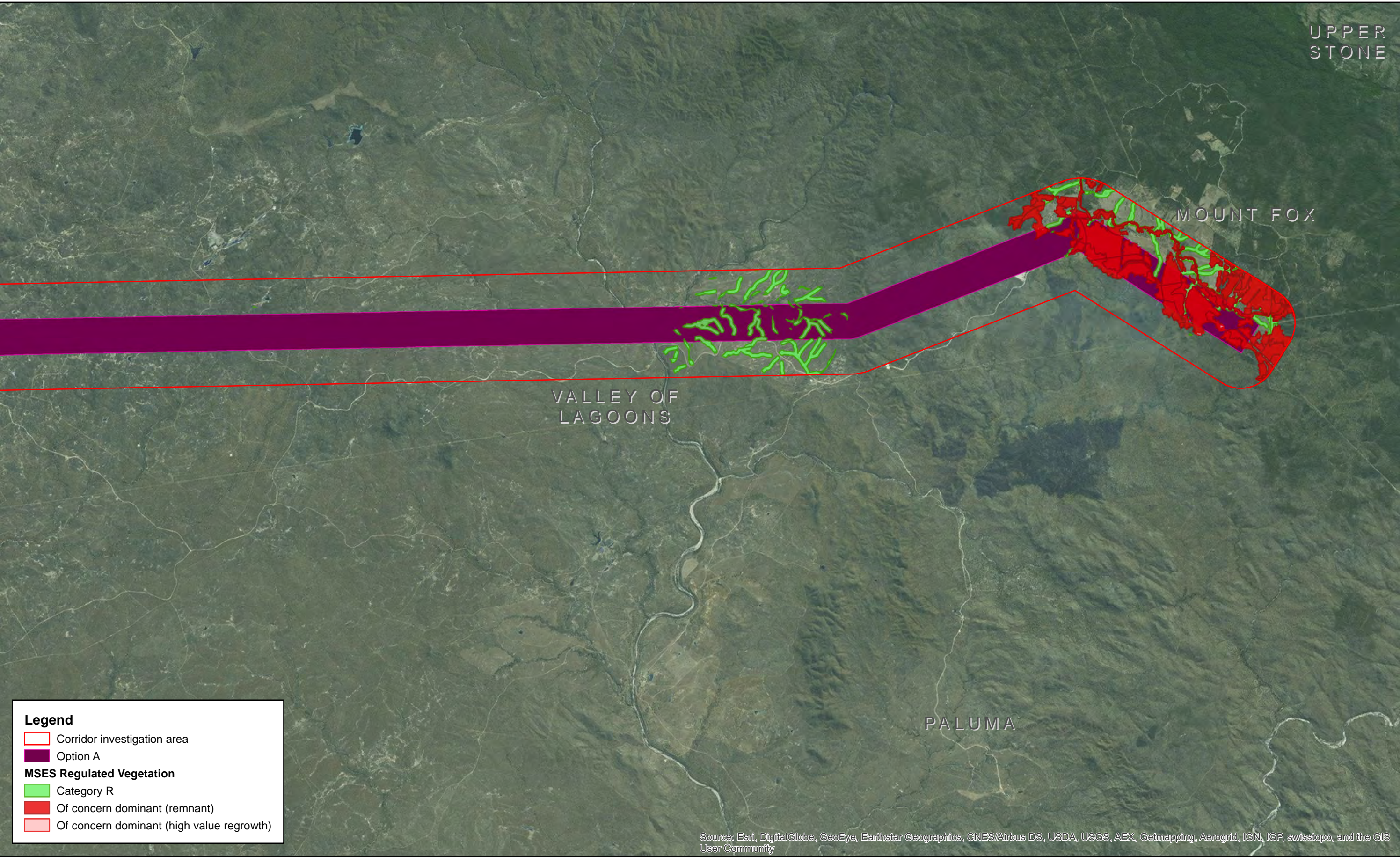
Kidston Power Transmission Line
Figure 3.7
MSES Regulated Vegetation
Option A



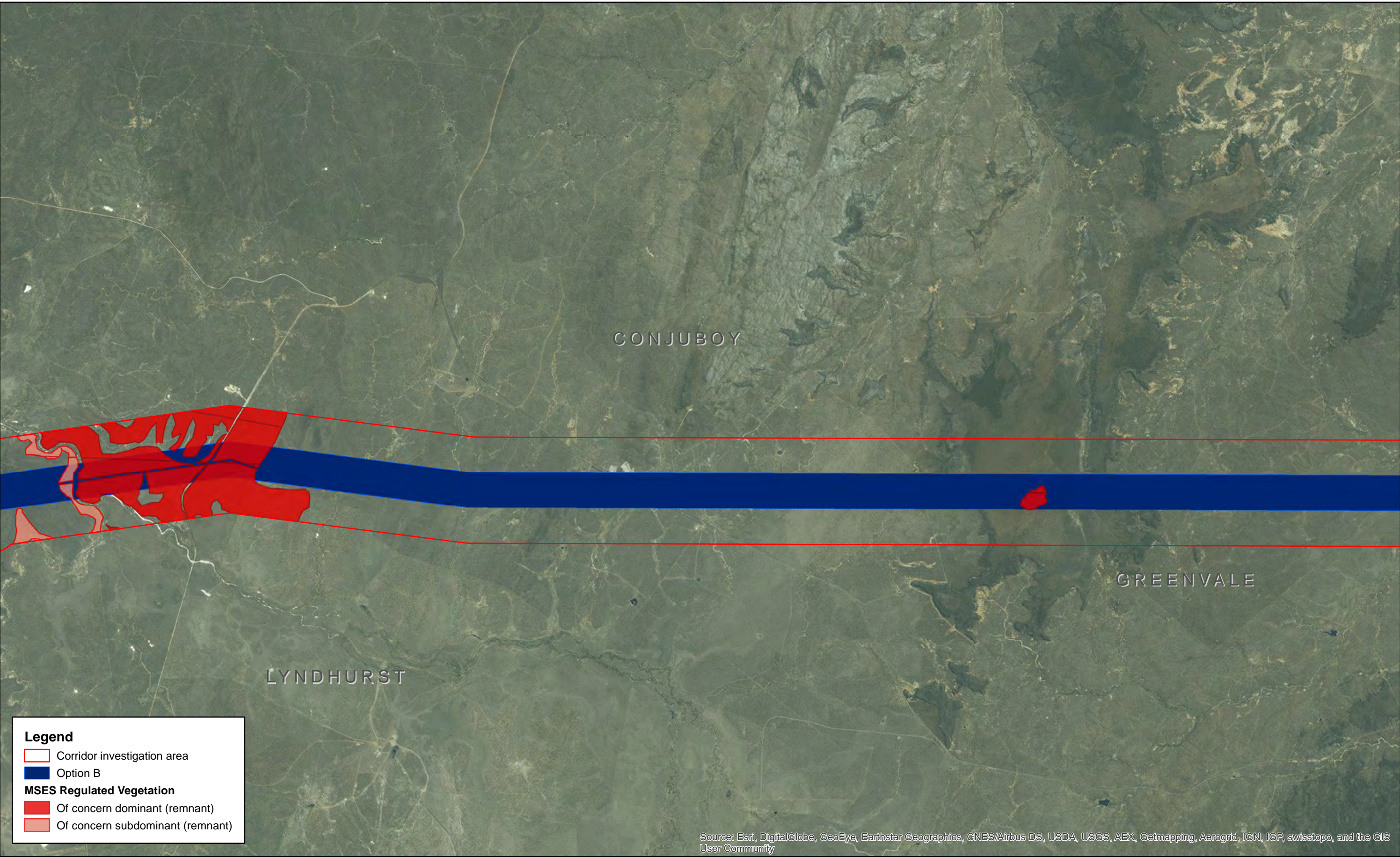
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Kidston Power Transmission Line
Figure 3.8
MSES Regulated Vegetation
Option A

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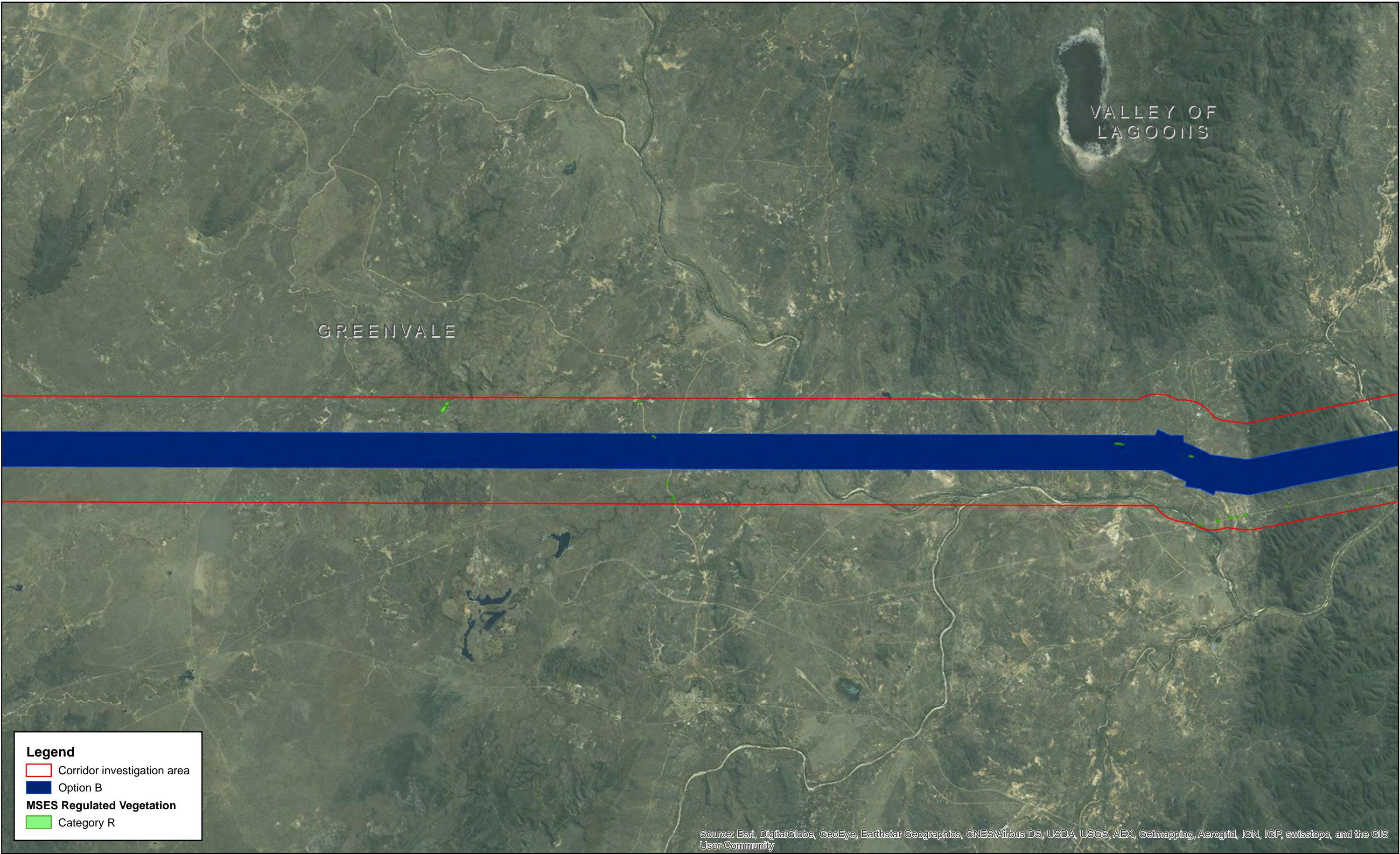


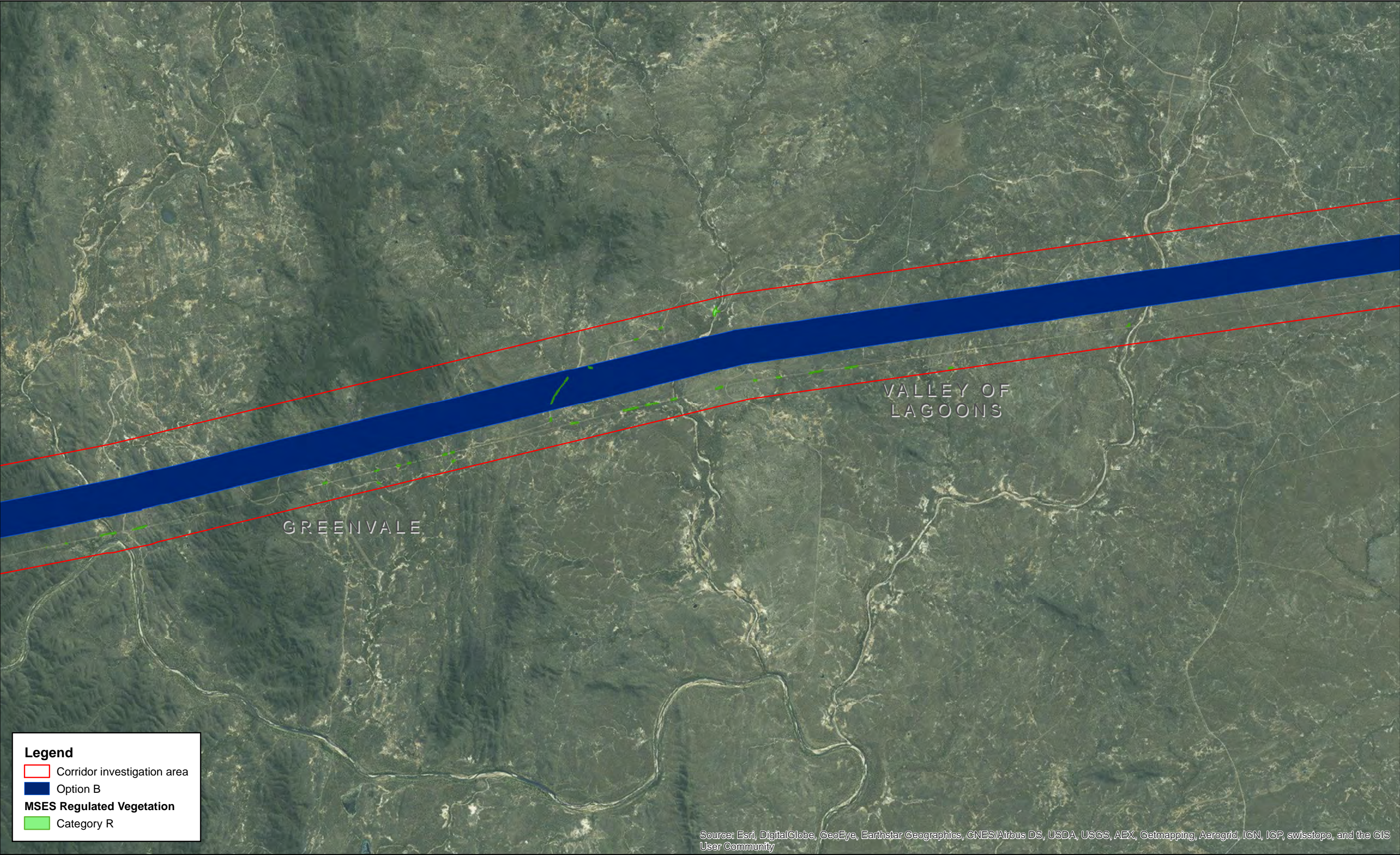
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Kidston Power Transmission Line
Figure 3.11
MSES Regulated Vegetation
Option B

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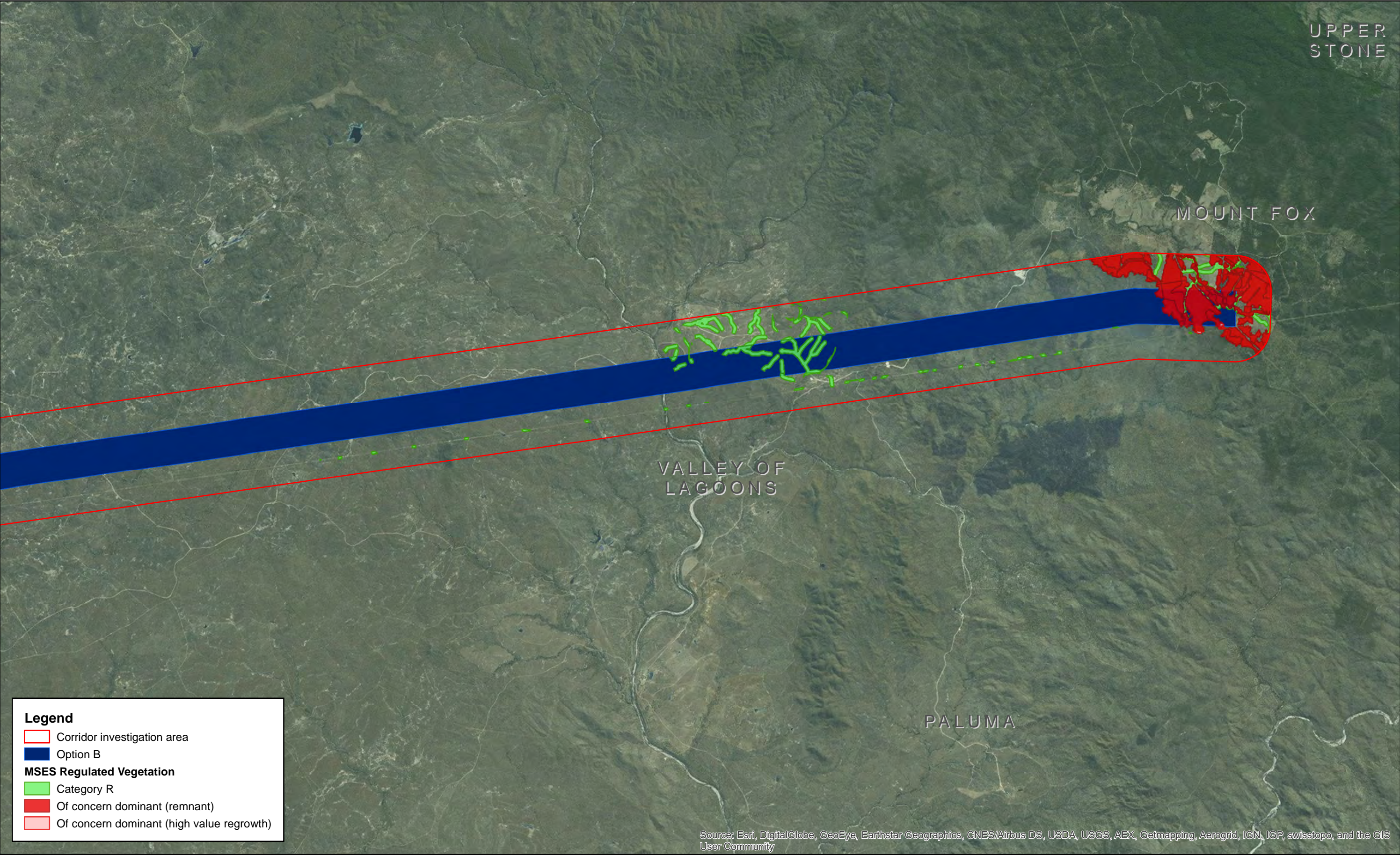


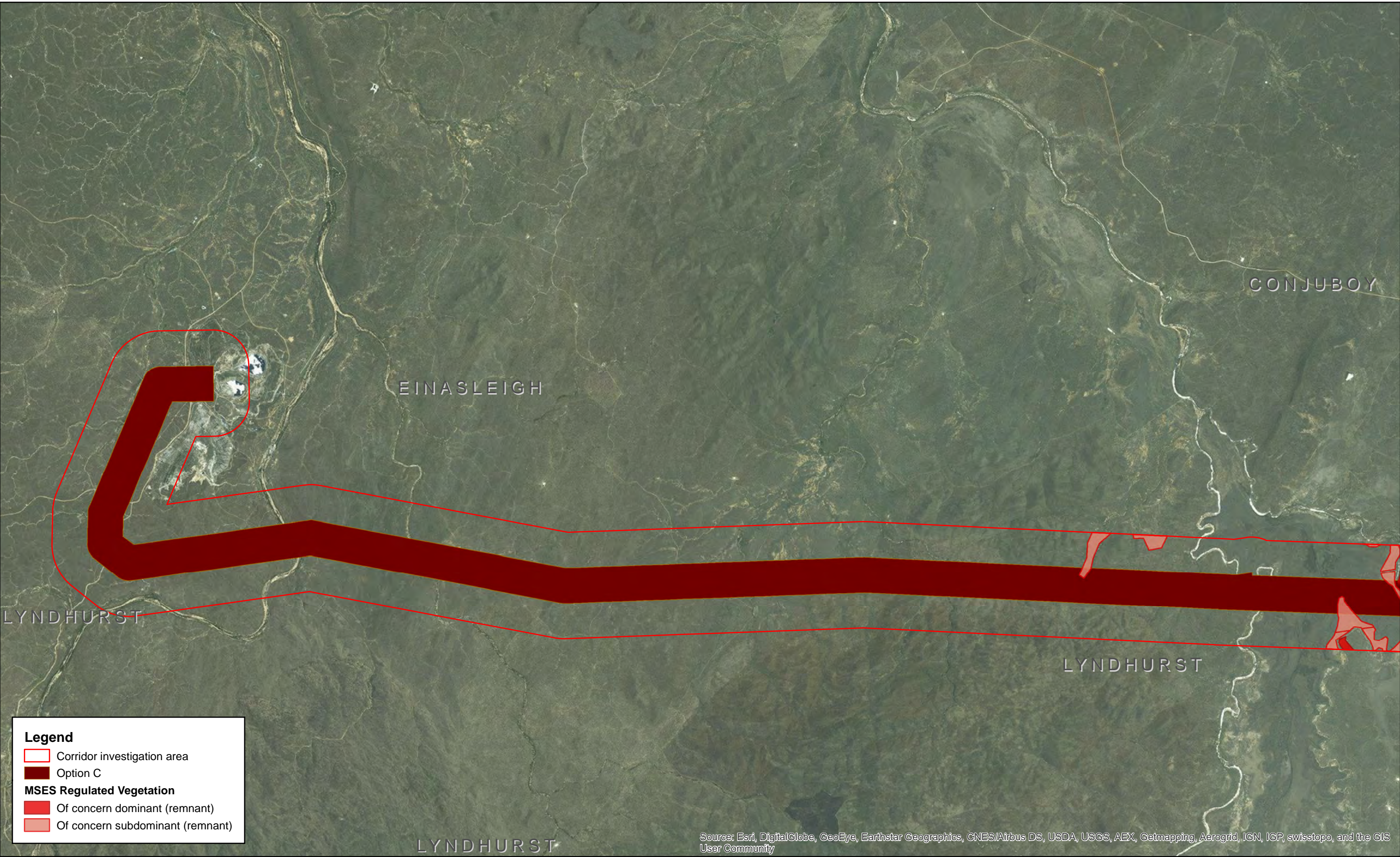


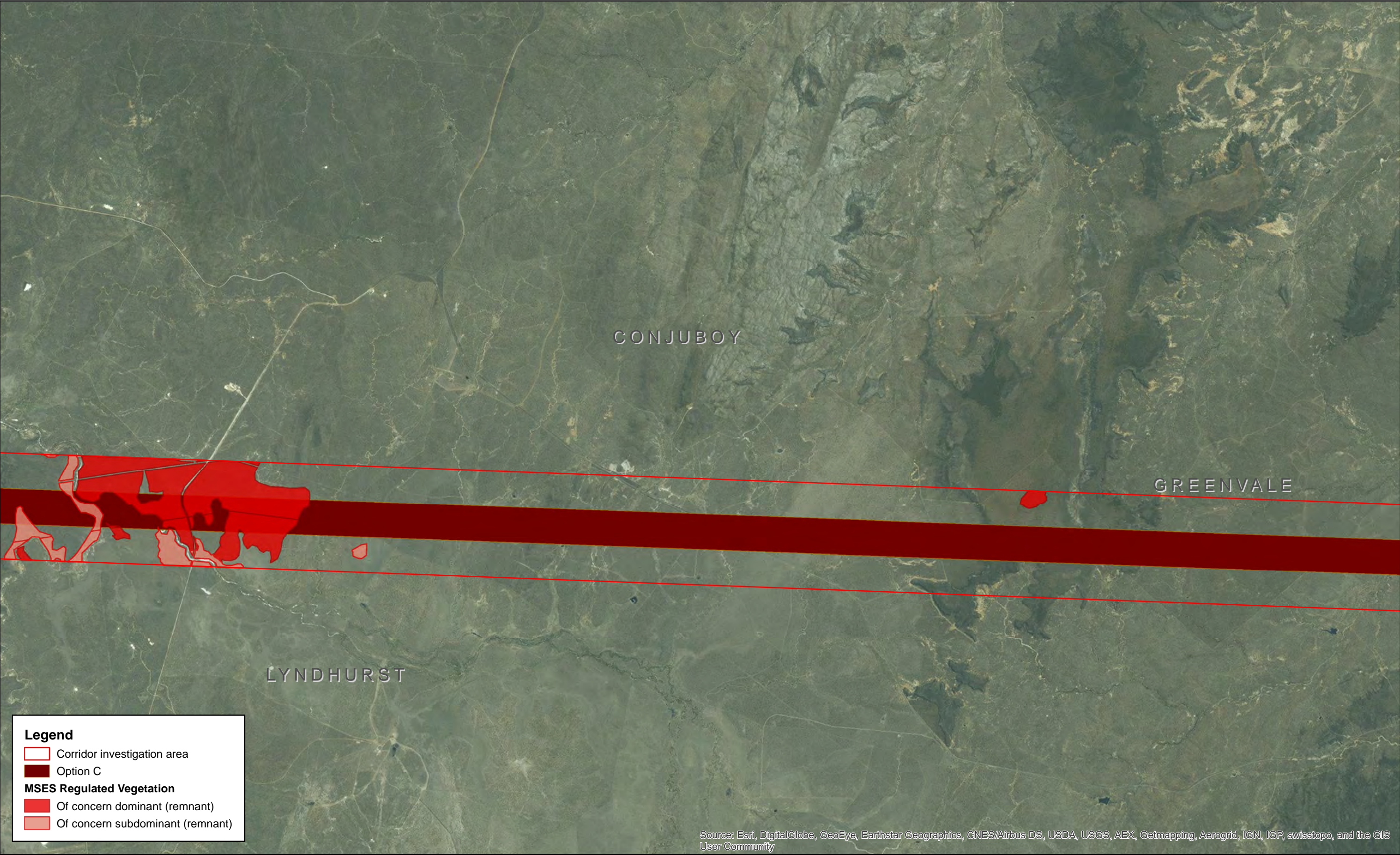
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Kidston Power Transmission Line
Figure 3.13
MSES Regulated Vegetation
Option B

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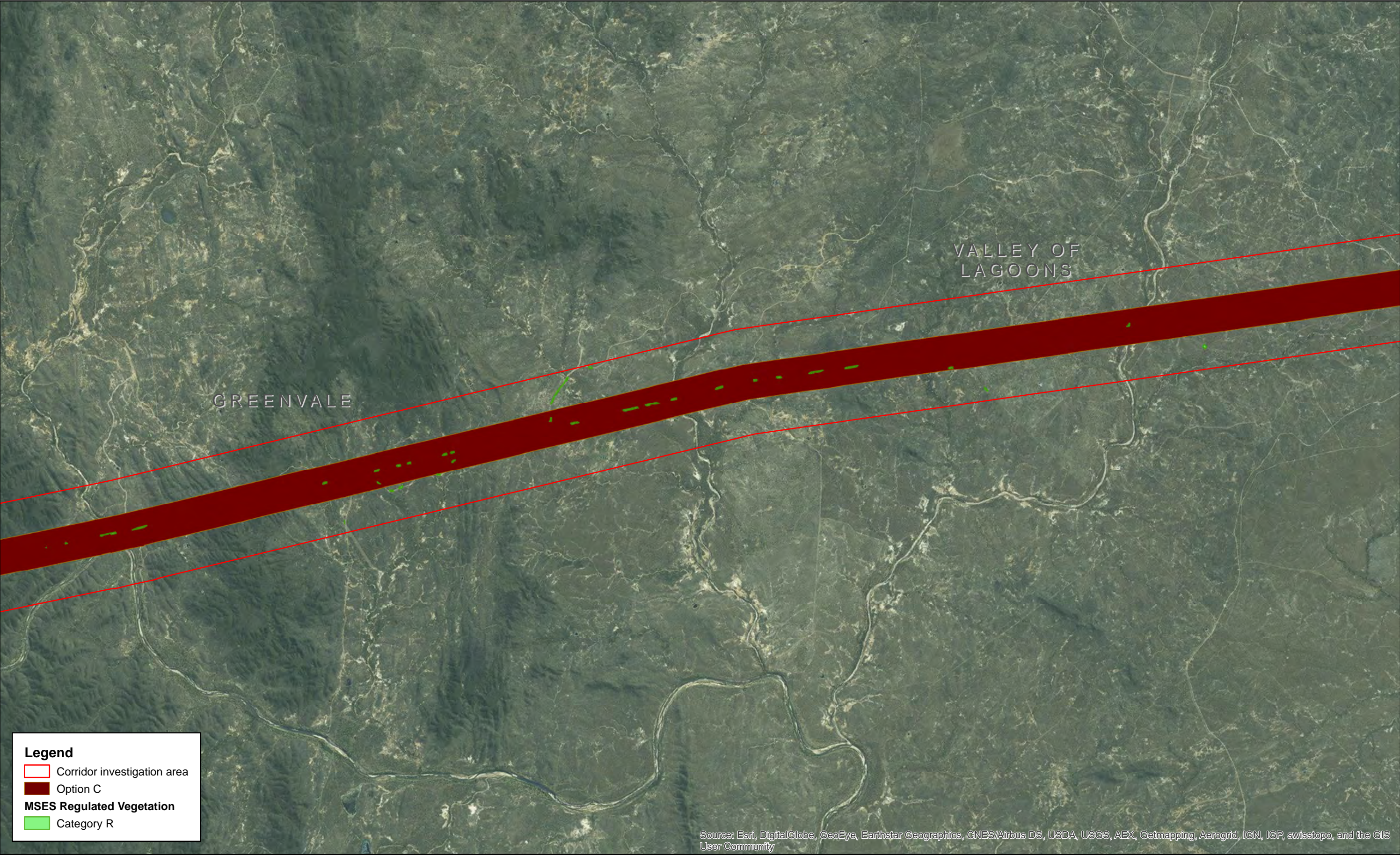


Kidston Power Transmission Line
Figure 3.16
MSES Regulated Vegetation
Option C

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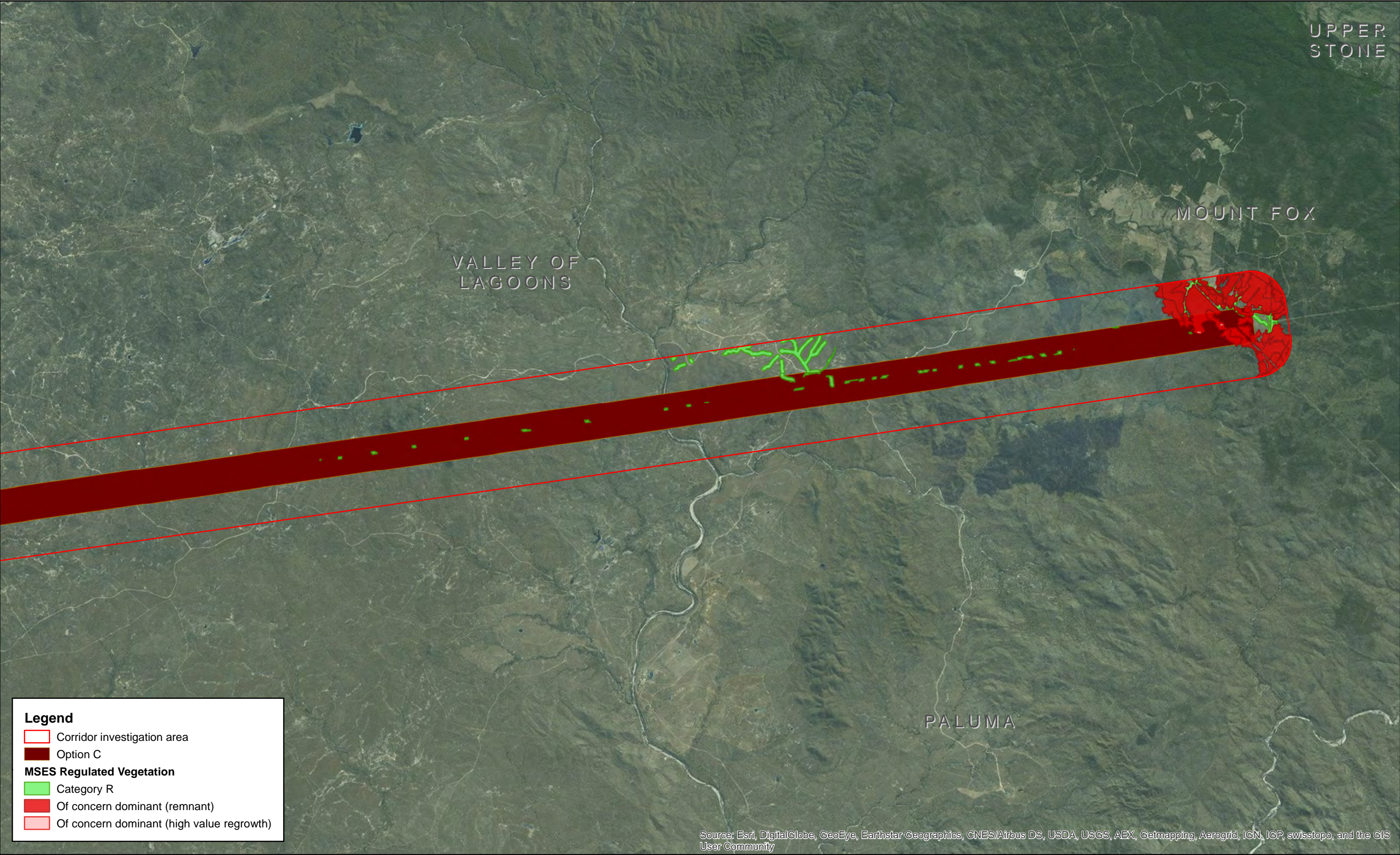


Kidston Power Transmission Line
Figure 3.18
MSES Regulated Vegetation
Option C

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3.1.3 DNRN regional ecosystem mapping

The results of the GIS analysis of DNRN's regional ecosystems mapping determined the extent of mapped of concern dominant and sub-dominant, and least concern regional ecosystems that is of potential relevance to each corridor option.

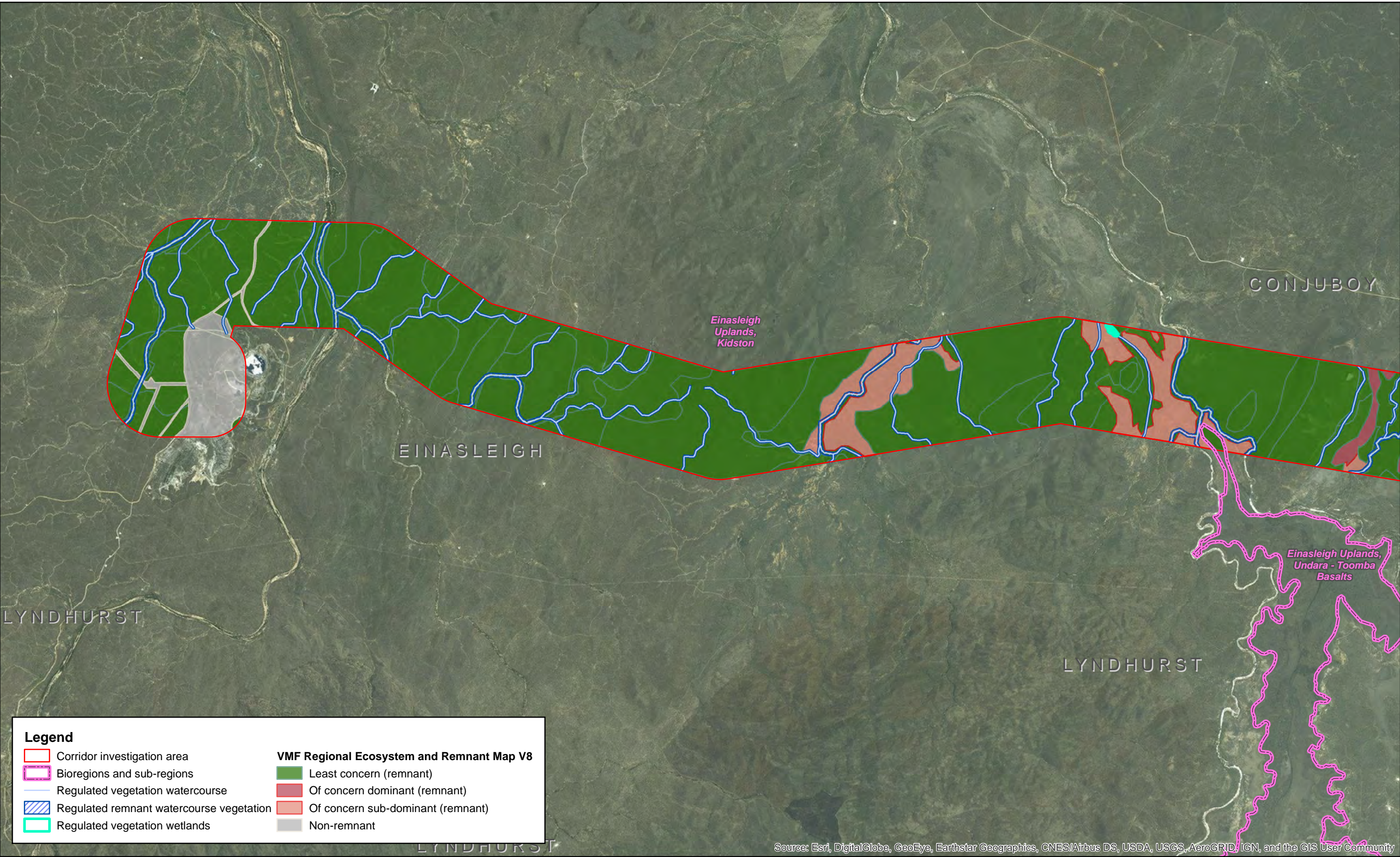
The extent of DNRN's mapped regional ecosystems that is of potential of relevance to each corridor investigation area, is presented on Figure 3.20–Figure 3.34.

The area (ha) of dominant and sub-dominant of concern, and least concern regional ecosystems that is of potential relevance to each corridor investigation area is presented in Table 3.4. The analysis of regional ecosystems for each corridor option is presented in Appendix G.



Option C is of least constraint in terms of potential impacts upon of concern dominant and sub-dominant regional ecosystems (refer Table 3.4).

Table 3.4 Extent of mapped regional ecosystems of relevance to each corridor option

CORRIDOR	REMNANT VEGETATION (HA)			REGROWTH VEGETATION (HVR) (HA)		NON-REMNANT (HA)	
	OF CONCERN DOMINANT	OF CONCERN SUB- DOMINANT	LEAST CONCERN	OF CONCERN DOMINANT	LEAST CONCERN	VEGETATION	WATER
Option A	2,059	1,008	50,675	3.6	62	2,675	20
Option B	1,891	442	51,121	2.4	202	2,379	117
Option C	1,519	334	52,609	2.4	266	2,458	29



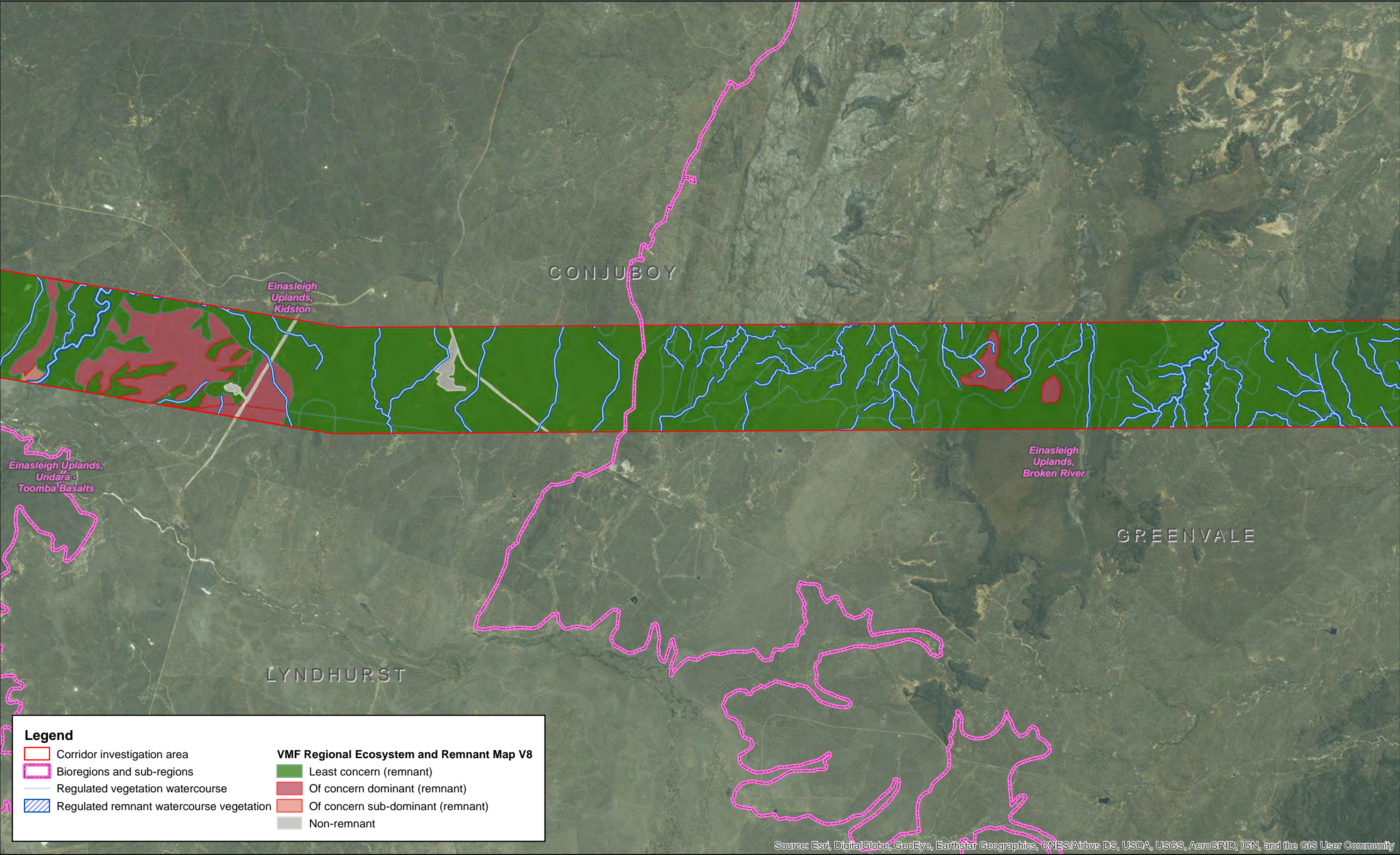
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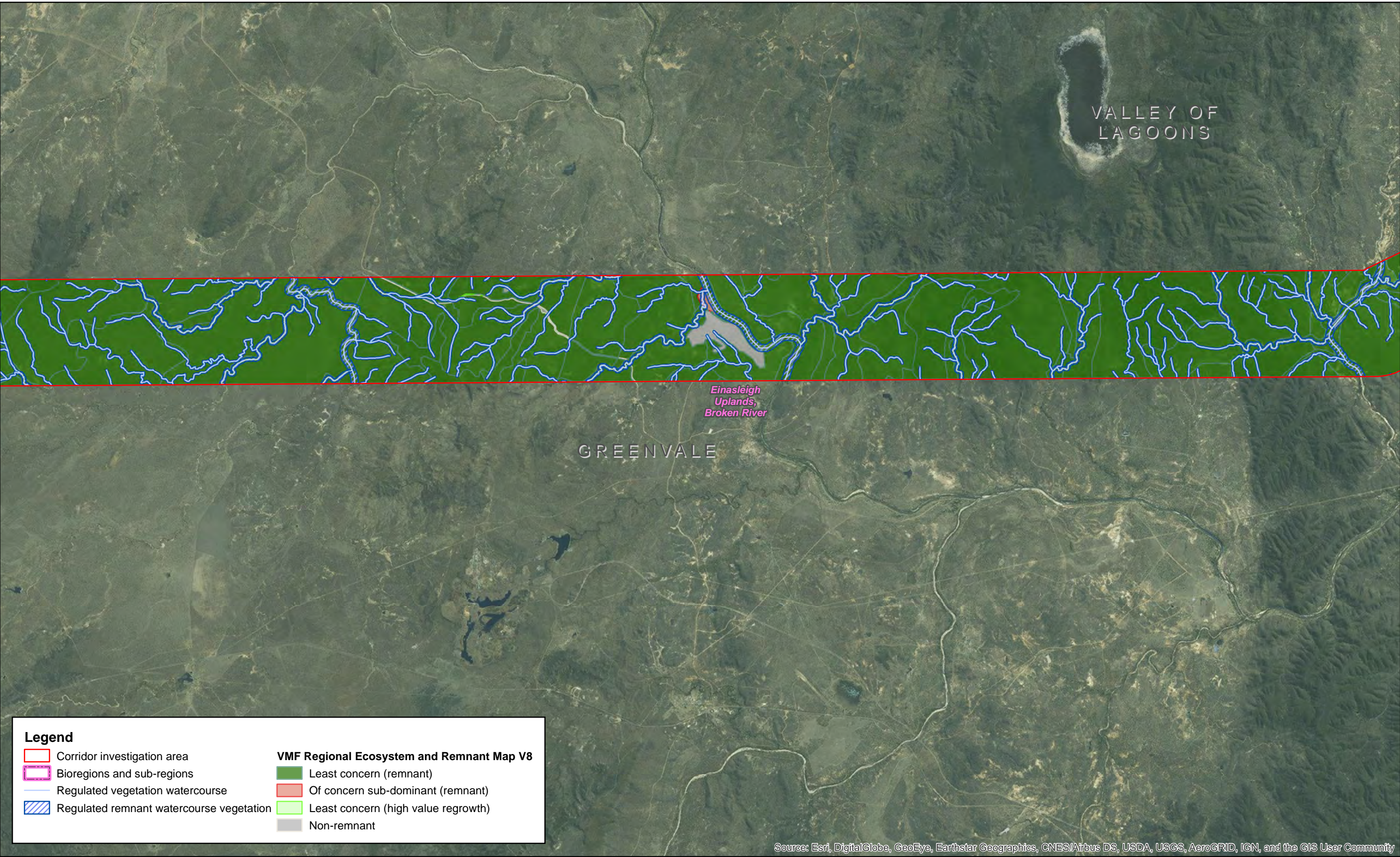
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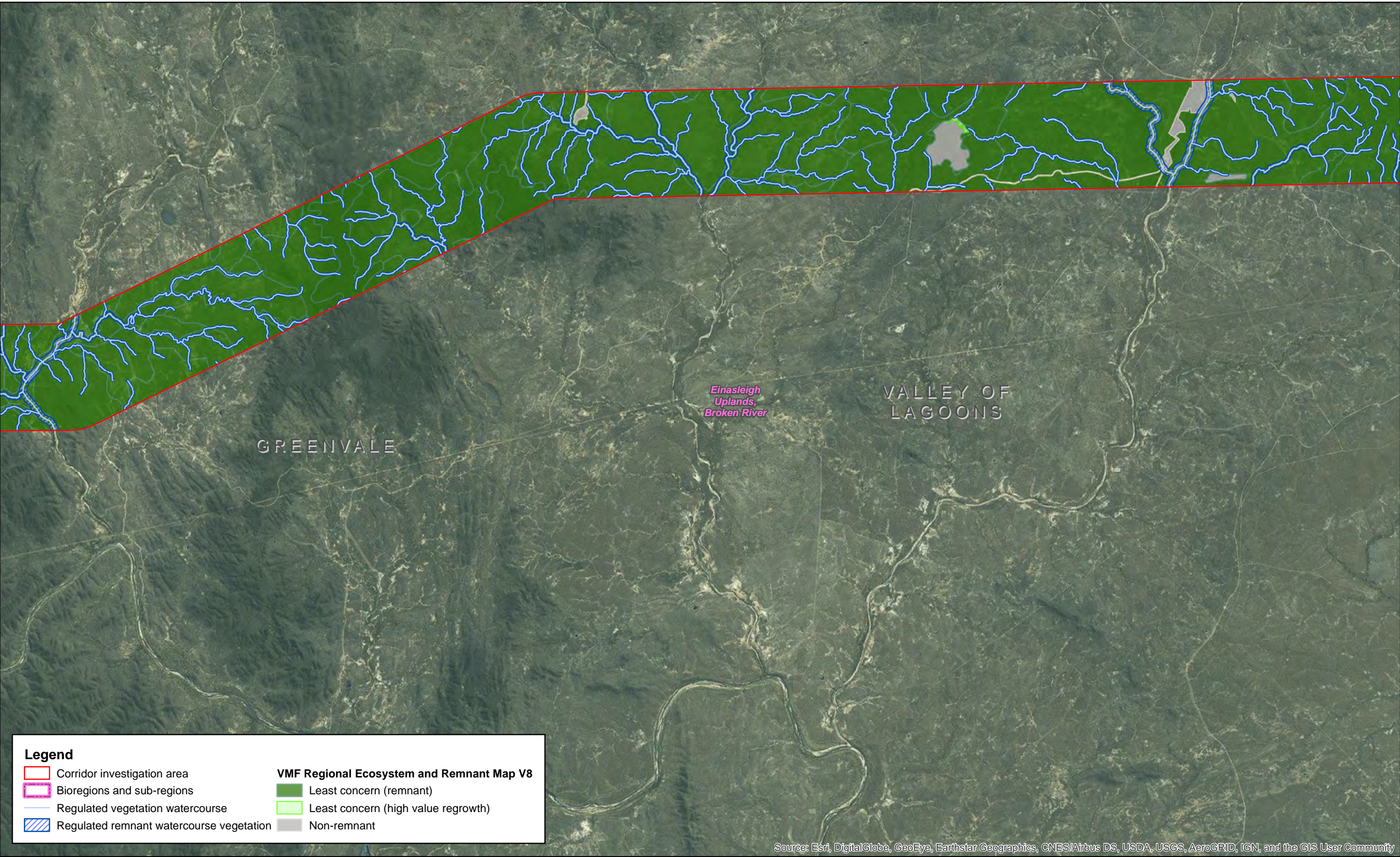


Kidston Power Transmission Line
Figure 3.20
Regional ecosystems and regulated remnant water course vegetation
Option A



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





Legend

Corridor investigation area

Bioregions and sub-regions

Regulated vegetation watercourse



Regulated remnant watercourse vegetation

VMF Regional Ecosystem and Remnant Map V8

Least concern (remnant)

Least concern (high value regrowth)

Non-remnant

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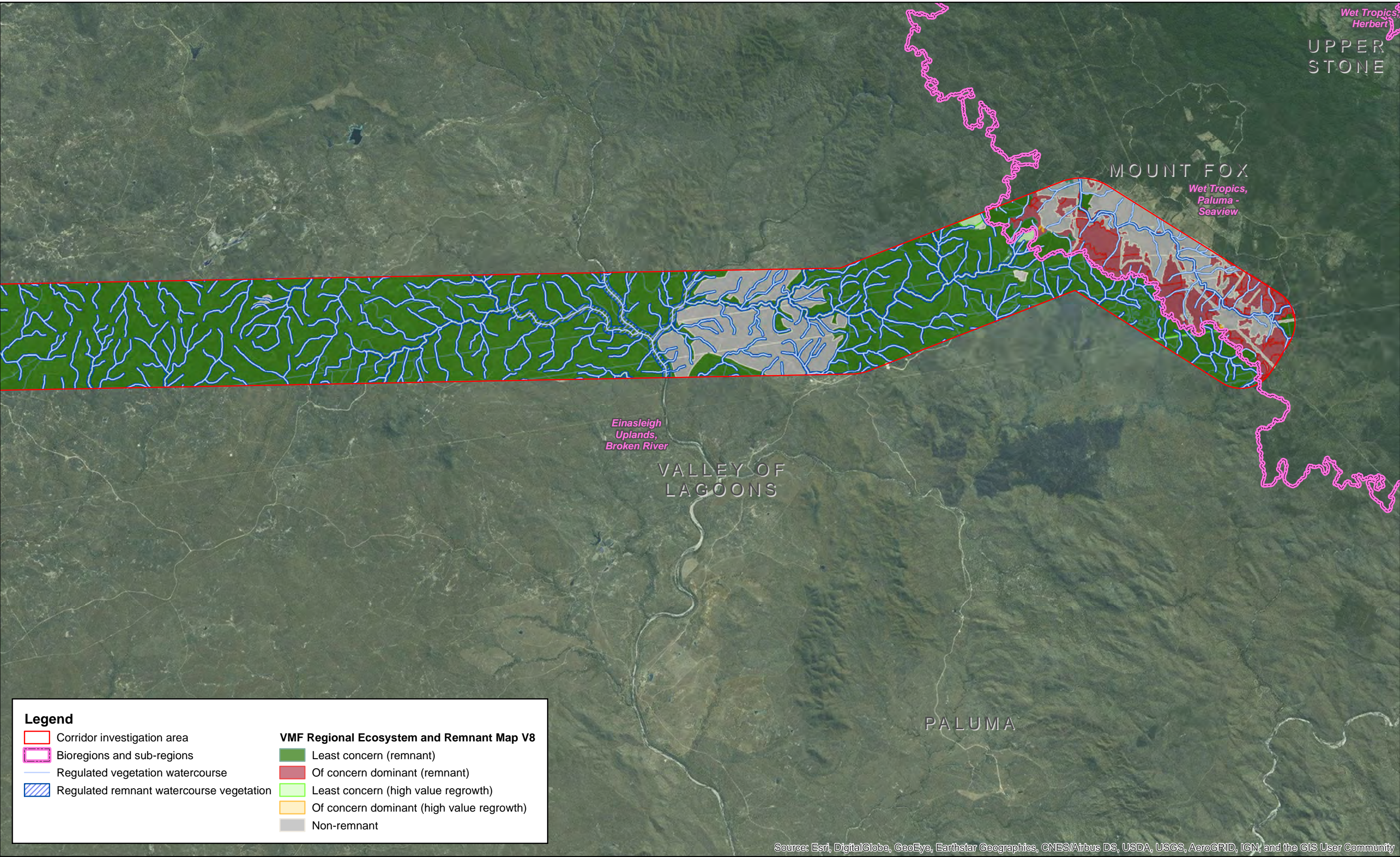


Kidston Power Transmission Line

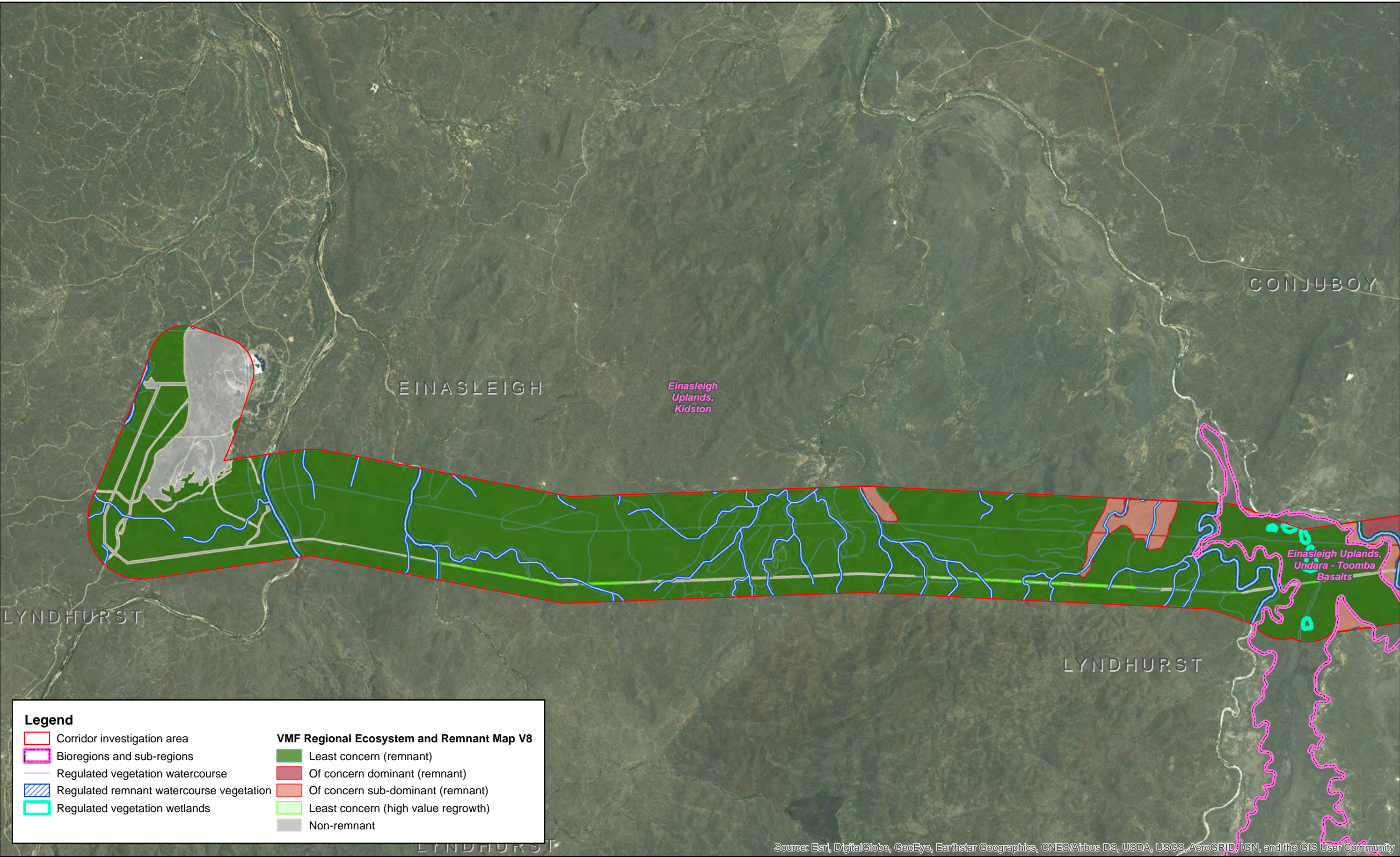
Figure 3.23

Regional ecosystems and regulated remnant water course vegetation

Option A



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

- Corridor investigation area
- Bioregions and sub-regions
- Regulated vegetation watercourse
- Regulated remnant watercourse vegetation
- Regulated vegetation wetlands

VMF Regional Ecosystem and Remnant Map V8

- Least concern (remnant)
- Of concern dominant (remnant)
- Of concern sub-dominant (remnant)
- Least concern (high value regrowth)
- Non-remnant

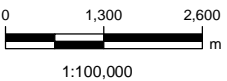
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Map: 2270434A_GIS_E009_A2b

Author: VD

Date: 12/12/2016

Approved by: RH



1:100,000

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

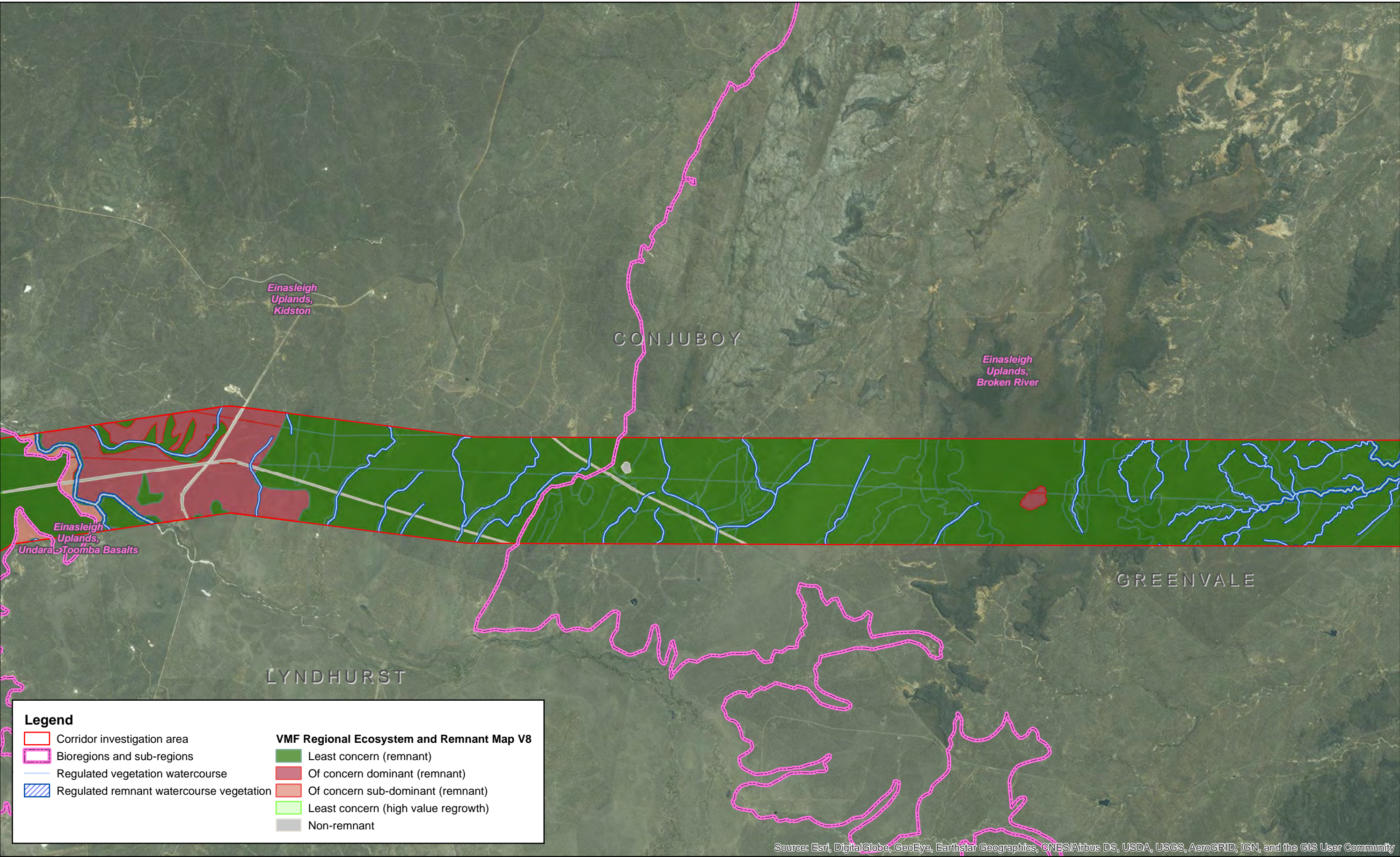
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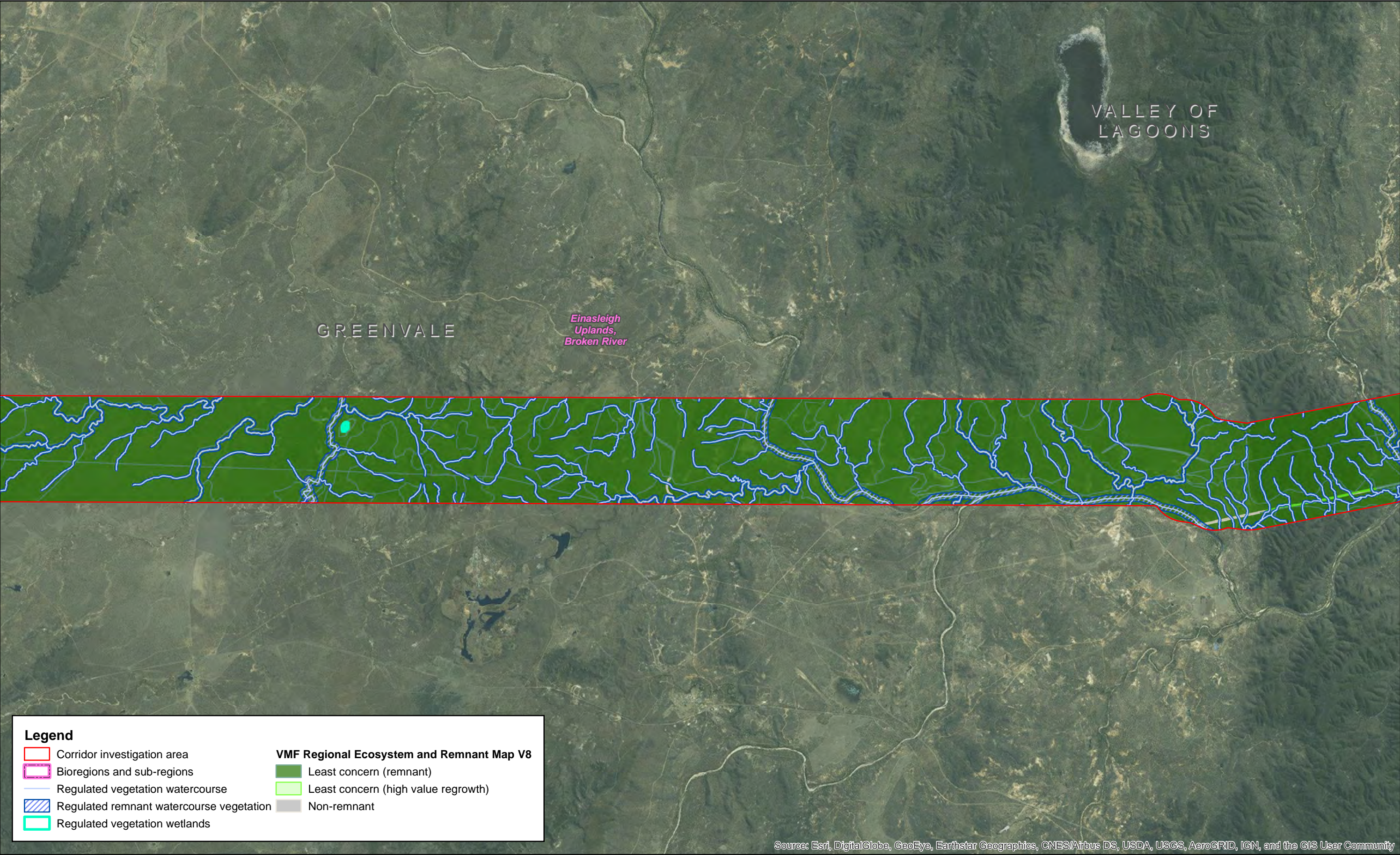
Kidston Power Transmission Line

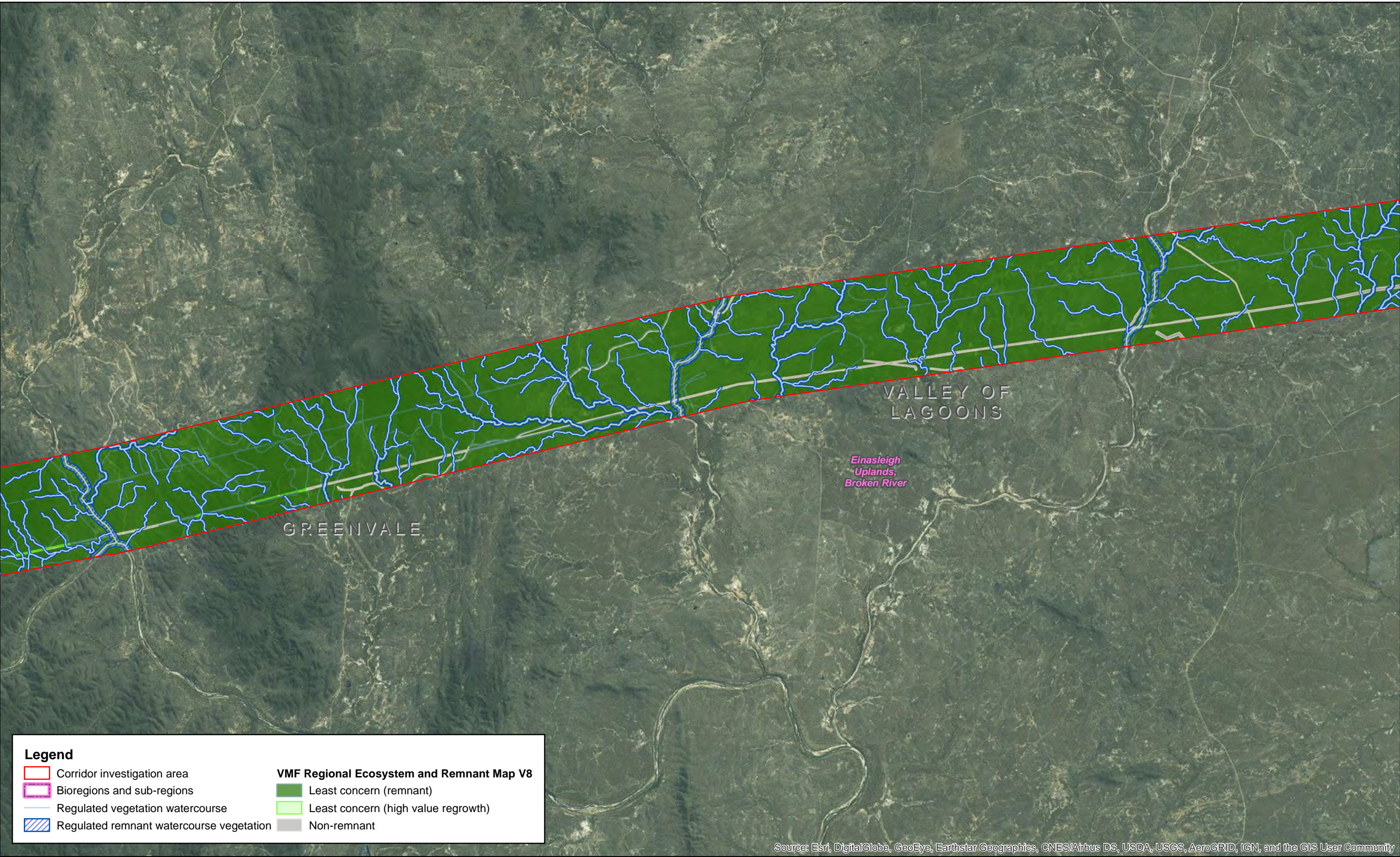
Figure 3.25

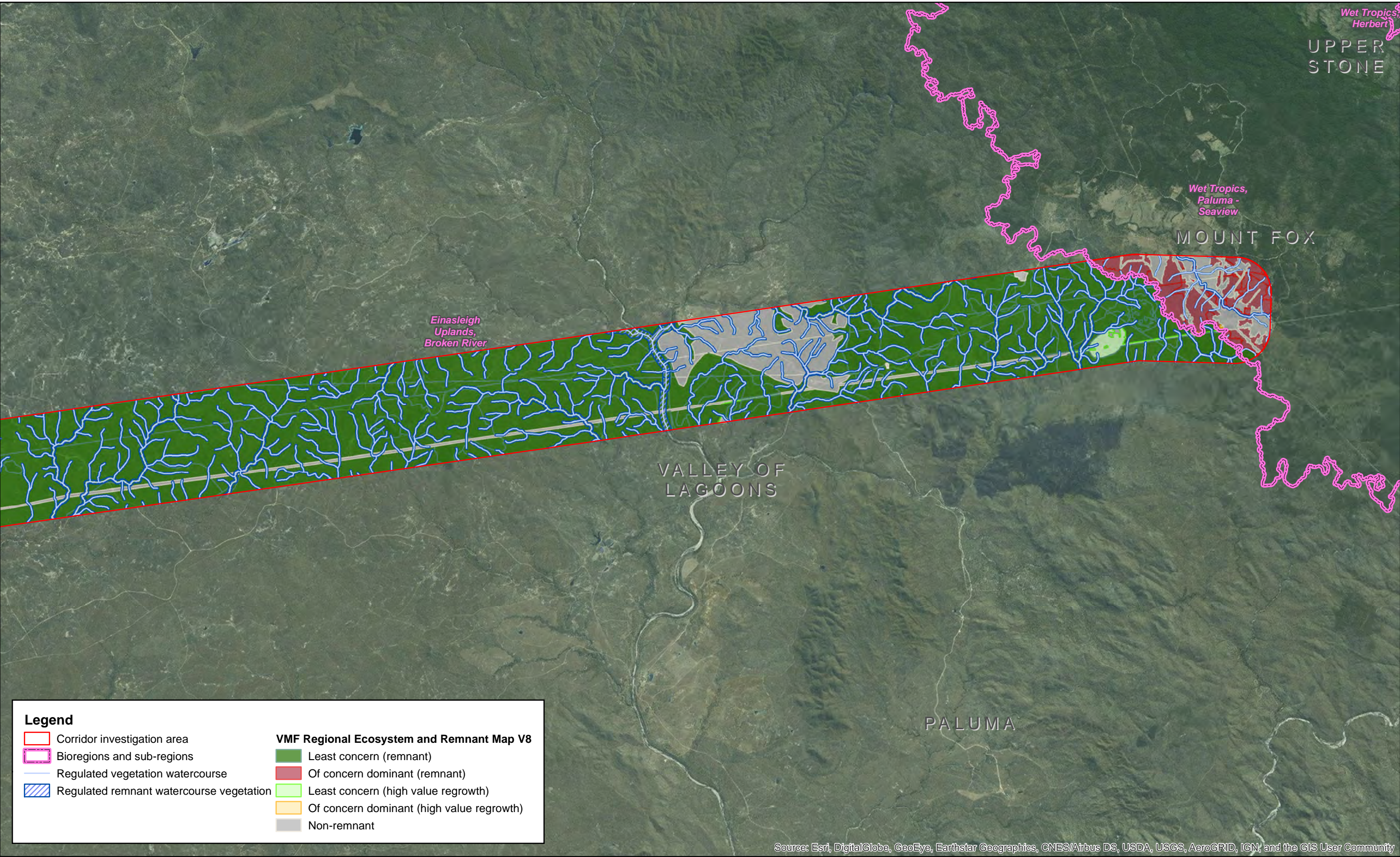
Regional ecosystems and regulated remnant water course vegetation
Option B



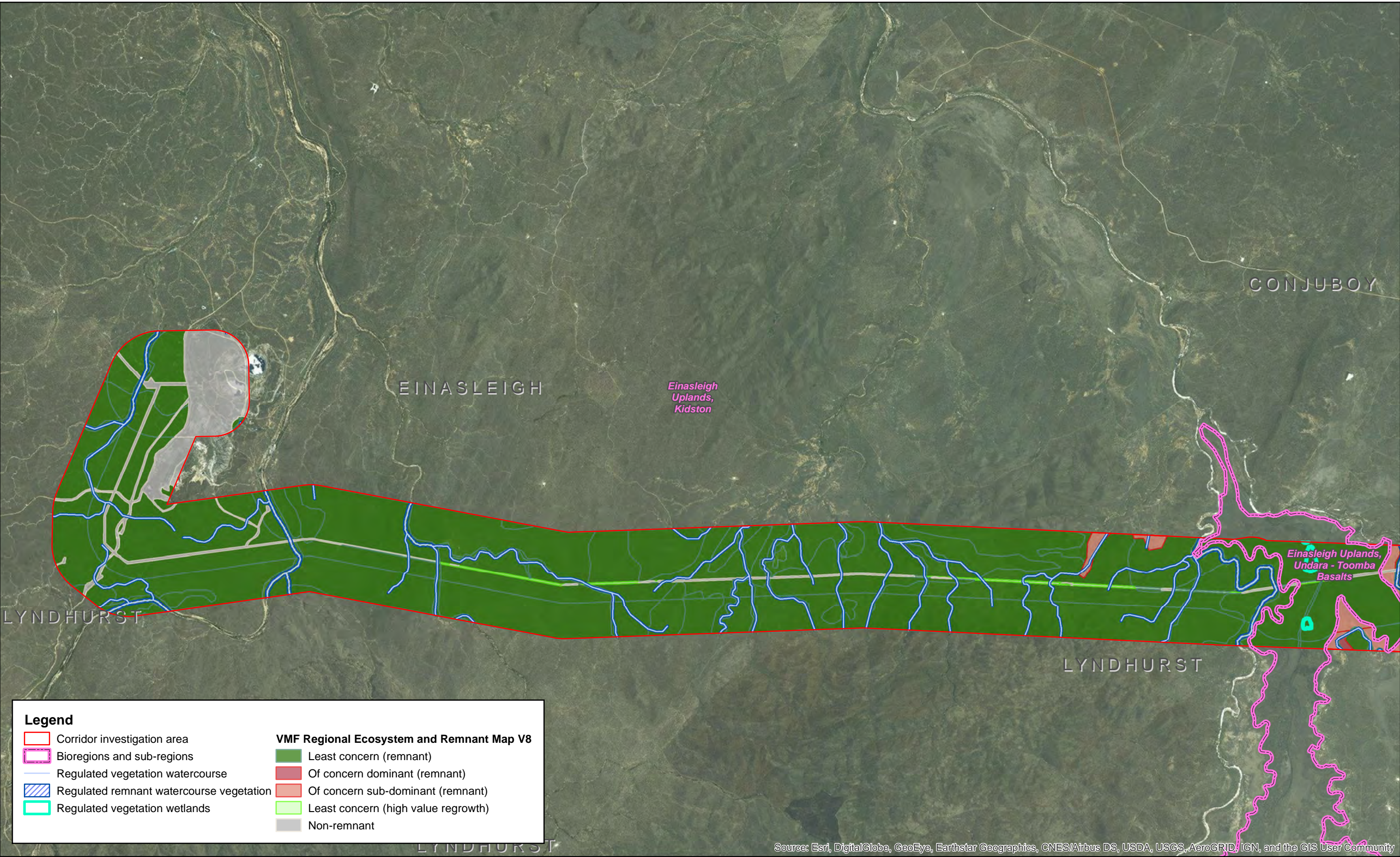
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community









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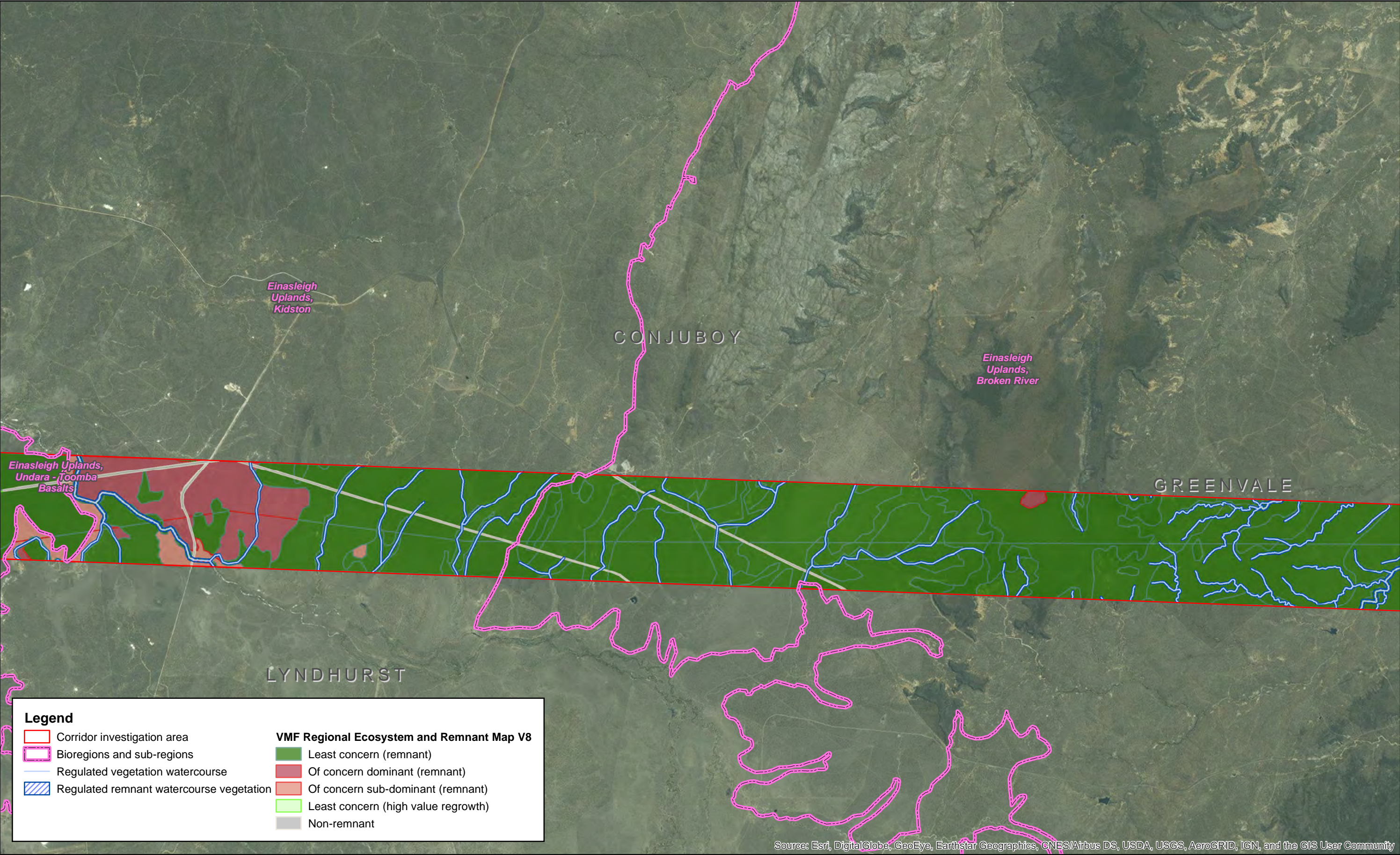
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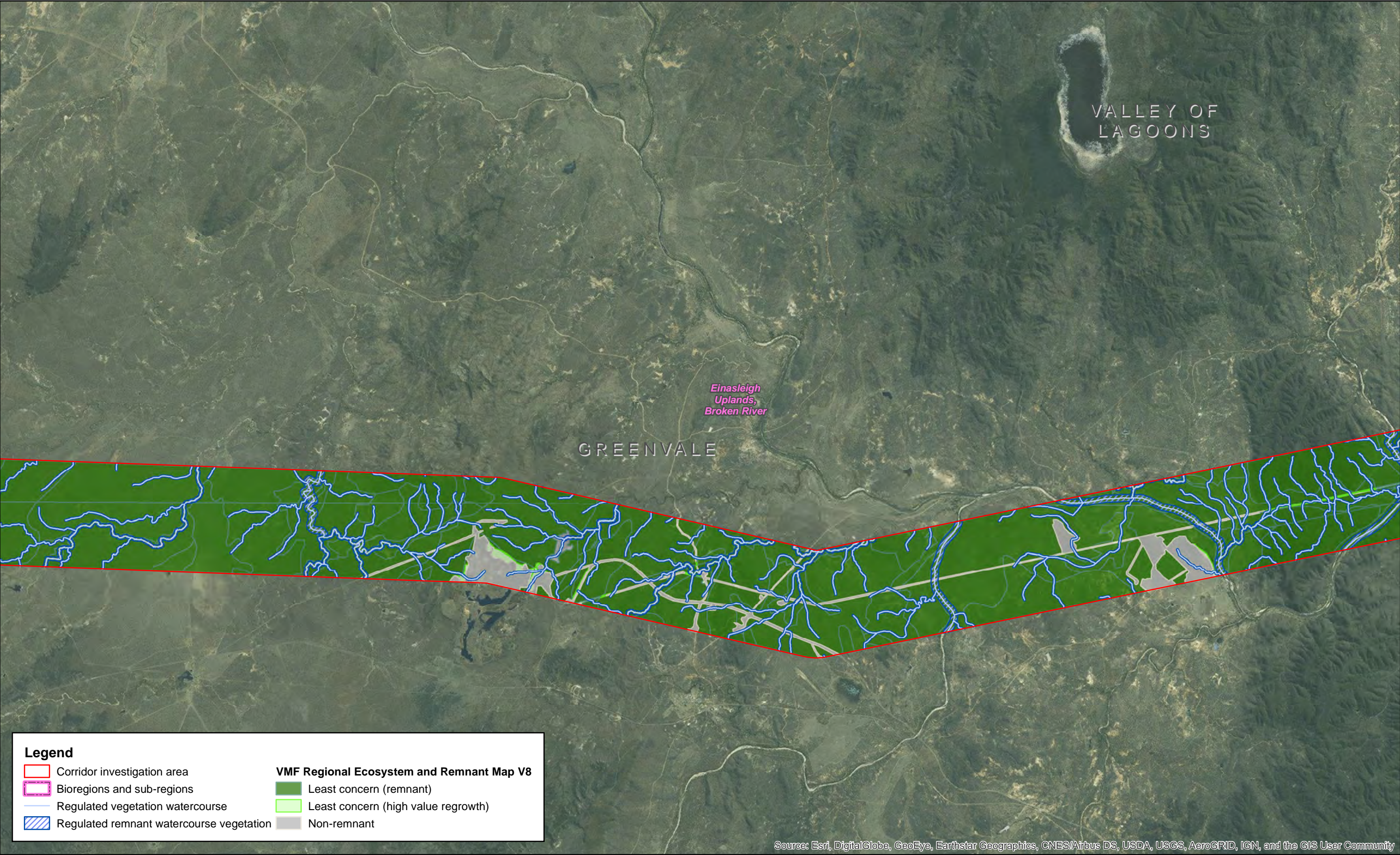
Map: 2270434A_GIS_E009_A2c	Author: VD		 1:100,000
Date: 12/12/2016	Approved by: RH		
Data source: Department of Environment and Heritage Protection (2016)			

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Kidston Power Transmission Line
Figure 3.30
Regional ecosystems and regulated remnant water course vegetation
Option C





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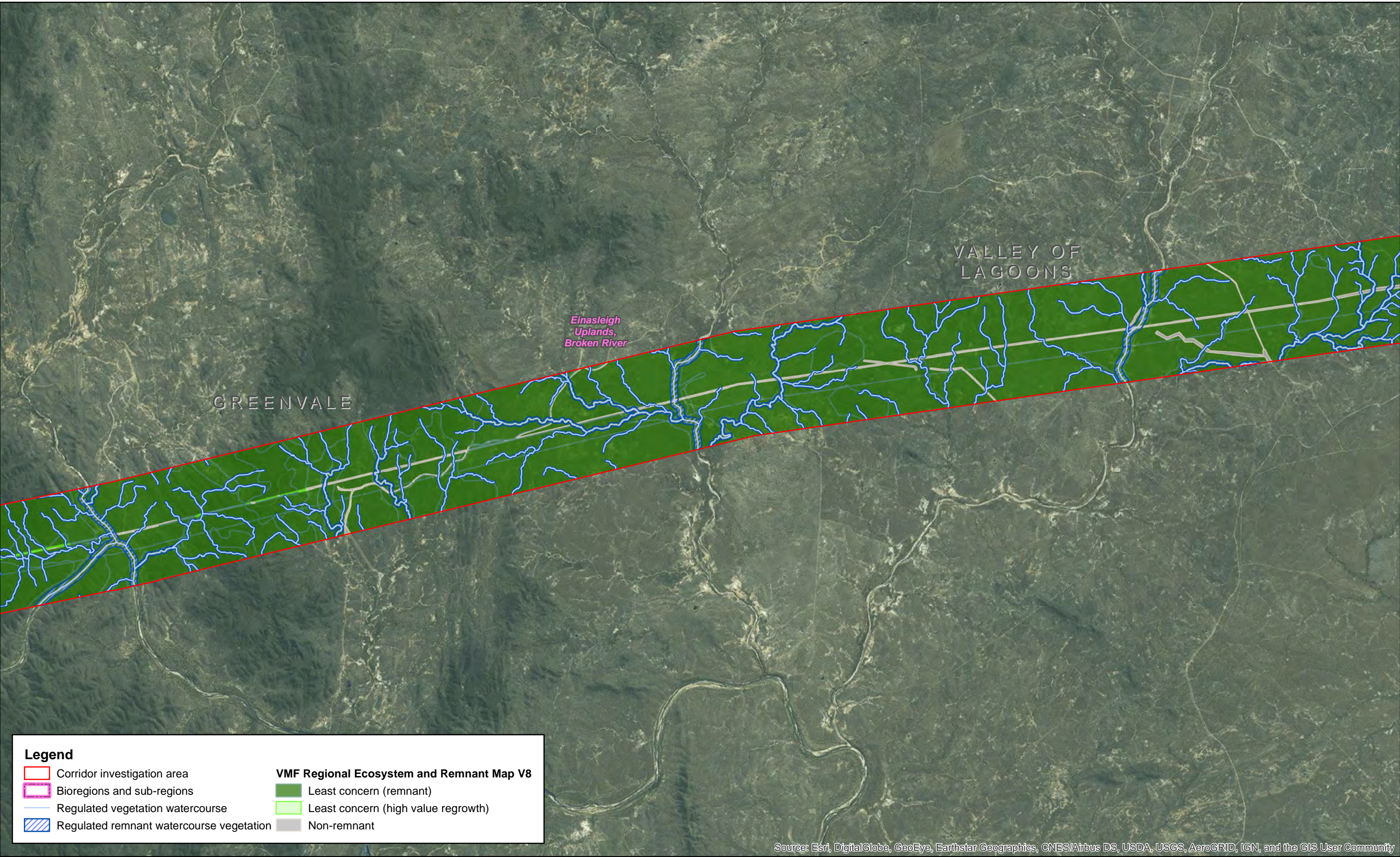
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Date: 12/12/2016	Approved by: RH		
Data source: Department of Environment and Heritage Protection (2016)		Coordinate system: GDA 1994 MGA Zone 55 Scale ratio correct when printed at A3	

Kidston Power Transmission Line
Figure 3.32
Regional ecosystems and regulated remnant water course vegetation
Option C

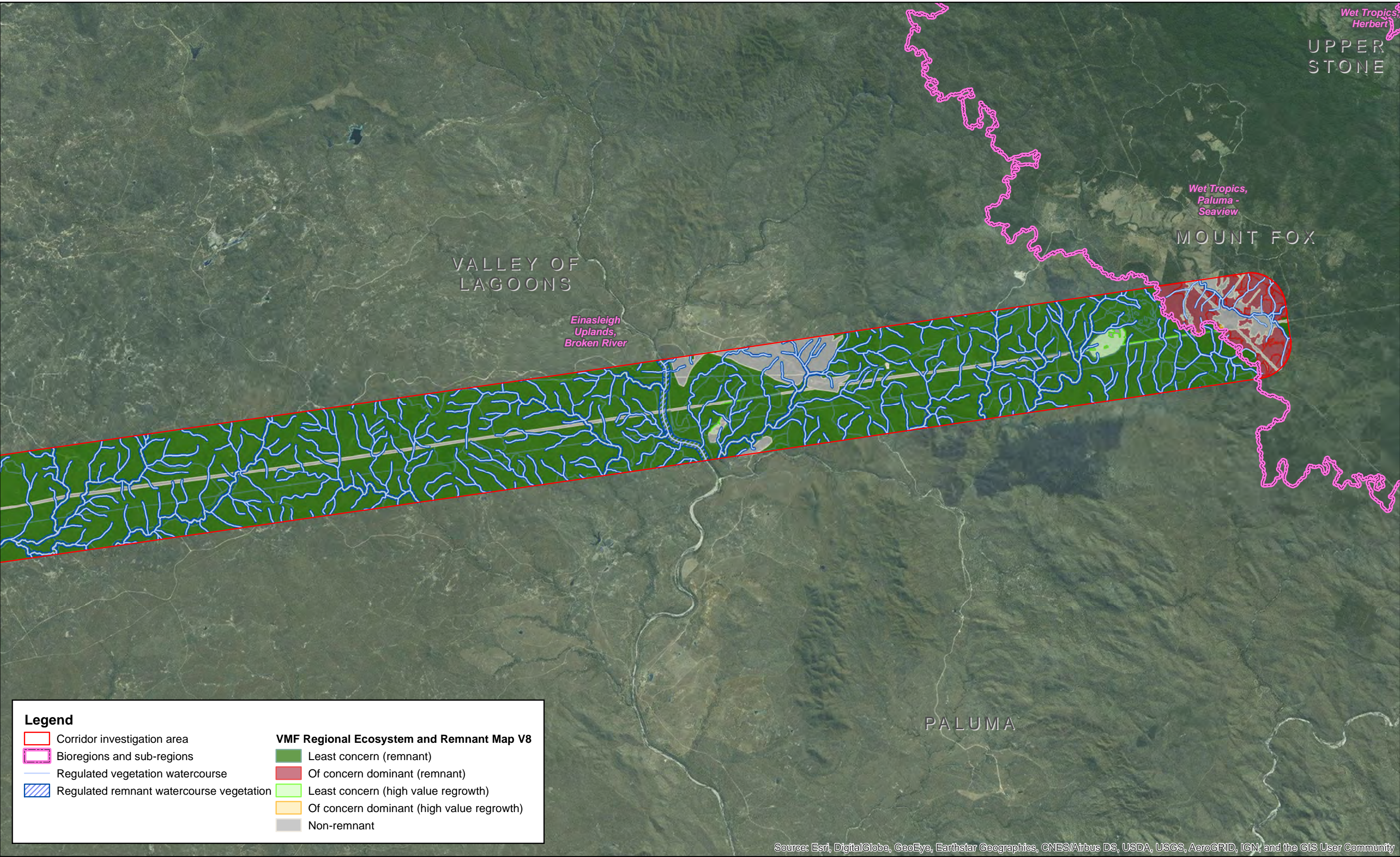
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Map: 2270434A_GIS_E009_A2c	Author: VD		 1:100,000	Coordinate system: GDA 1994 MGA Zone 55 Scale ratio correct when printed at A3
Date: 12/12/2016	Approved by: RH			
Data source: Department of Environment and Heritage Protection (2016)				
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Kidston Power Transmission Line
Figure 3.34
Regional ecosystems and regulated remnant water course vegetation
Option C

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