



**GENERIC ENVIRONMENTAL MANAGEMENT PROGRAMME  
(EMPR) FOR THE DEVELOPMENT AND EXPANSION OF  
SUBSTATION INFRASTRUCTURE FOR THE TRANSMISSION  
AND DISTRIBUTION OF ELECTRICITY**

**PROPOSED NGXWABANGU WIND ENERGY FACILITY AND  
ASSOCIATED INFRASTRUCTURE, EASTERN CAPE PROVINCE**

*(DEFF REFERENCE NUMBER: PENDING)*

*CONSTRUCTION OF ONSITE SUBSTATIONS*

**MAY 2023**

**APPENDIX 2**  
**GENERIC ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) FOR THE  
DEVELOPMENT AND EXPANSION OF SUBSTATION INFRASTRUCTURE FOR THE  
TRANSMISSION AND DISTRIBUTION OF ELECTRICITY**

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**environmental affairs**

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA

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## **INTRODUCTION**

### **1. Background**

The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) requires that an environmental management programme (EMPr) be submitted where an environmental impact assessment (EIA) has been identified as the environmental instrument to be utilised as the basis for a decision on an application for environmental authorisation (EA). The content of an EMPr must either contain the information set out in Appendix 4 of the Environmental Impact Assessment Regulations, 2014, as amended (EIA Regulations) or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. Once the Minister has identified, through a government notice that a generic EMPr is relevant to an application for EA, that generic EMPr must be applied by all parties involved in the EA process, including but not limited to the applicant and the competent authority (CA).

### **2. Purpose**

This document constitutes a generic EMPr relevant to applications for the development or expansion of substation infrastructure for the transmission and distribution of electricity, and all listed and specified activities necessary for the realisation of such infrastructure.

### **3. Objective**

The objective of this generic EMPr is to prescribe and pre-approve generally accepted impact management outcomes and impact management actions, which can commonly and repeatedly be used for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of substation infrastructure for the transmission and distribution of electricity. The use of a generic EMPr is intended to reduce the need to prepare and review individual EMPrs for applications of a similar nature.

### **4. Scope**

The scope of this generic EMPr applies to the development or expansion of substation infrastructure for the transmission and distribution of electricity requiring EA in terms of NEMA. This generic EMPr applies to activities requiring EA, mainly activity 11 and 47 of the Environmental Impact Assessment Regulations Listing Notice 1 of 2014, as amended, and activity 9 of the Environmental Impact Assessment Regulations Listing Notice 2 of 2014, as amended, and all associated listed or specified activities necessary for the realization of such infrastructure.

## 5. Structure of this document

This document is structured in three parts with an Appendix as indicated in the table below:

Part	Section	Heading	Content
A		Provides general guidance and information and is <b>not legally binding</b>	Definitions, acronyms, roles & responsibilities and documentation and reporting.
B	1	Pre-approved generic EMPr template	<p>Contains generally accepted impact management outcomes and impact management actions required for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of substation infrastructure for the transmission and distribution of electricity, which are presented in the form of a template that has been pre-approved.</p> <p>The template in this section is to be completed by the contractor, with each completed page signed and dated by the holder of the EA prior to commencement of the activity.</p> <p>Where an impact management outcome is not relevant, the words “not applicable” can be inserted in the template under the “responsible persons” column.</p> <p>Once completed and signed, the template represents the EMPr for the activity approved by the CA and is legally binding. The template <b>is not required</b> to be submitted to the CA as once the generic EMPr is gazetted for implementation, it has been approved by the CA.</p> <p>To allow interested and affected parties access to the pre-approved EMPr template for consideration through the decision-making process, the EAP on behalf of the applicant /proponent must make the hard copy of this EMPr available at a public location and where the applicant has a website, the EMPr should also be made available on such publicly accessible website.</p>
	2	Site specific information	Contains preliminary infrastructure layout and a declaration that the applicant/holder of the EA will comply with the pre-approved generic EMPr template contained in <u>Part B: Section 1</u> , and understands that the impact management outcomes and impact management actions are <b>legally binding</b> . The preliminary infrastructure layout must be finalized to inform the final EMPr that is to be submitted with the basic assessment report (BAR) or environmental impact

Part	Section	Heading	Content
			<p>assessment report (EIAR), ensuring that all impact management outcomes and impact management actions have been either pre-approved or approved in terms of <u>Part C</u>.</p> <p>This section <b>must be</b> submitted to the CA together with the final BAR or EIAR. The information submitted to the CA will be considered to be incomplete should a signed copy of <u>Part B: section 2</u> not be submitted. Once approved, this Section forms part of the EMPr for the development and is legally binding.</p>
C		Site specific sensitivities/ attributes	<p>If any specific environmental sensitivities/ attributes are present on the site which require site specific impact management outcomes and impact management actions, not included in the pre-approved generic EMPr, to manage impacts, these specific impact management outcomes and impact management actions must be included in this section. These specific environmental attributes must be referenced spatially and impact management outcomes and impact management actions must be provided. These specific impact management outcomes and impact management actions must be presented in the format of the pre-approved EMPr template (<u>Part B: section 1</u>)</p> <p>This section will not be required should the site contain no specific environmental sensitivities or attributes. However, if <u>Part C</u> is applicable to the site, it <b>is required</b> to be submitted together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP and must contain his/her name and expertise including a curriculum vitae. Once approved, Part C forms part of the EMPr for the site and is legally binding.</p> <p>This section applies only <b>to additional</b> impact management outcomes and impact management actions that are necessary for the avoidance, management and mitigation of impacts and risks associated with the specific development or expansion and which are not already included in <u>Part B: section 1</u>.</p>
Appendix 1			Contains the method statements to be prepared prior to commencement of the activity. The method statements are <b>not required</b> to be submitted to the competent authority.



## 6. Completion of part B: section 1: the pre-approved generic EMPr template

The template is to be completed prior to commencement of the activity, by providing the following information for each environmental impact management action:

- For implementation
  - a 'responsible person',
  - a method for implementation,
  - a timeframe for implementation
- For monitoring
  - a responsible person
  - frequency
  - evidence of compliance.

The completed template must be signed and dated by the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must be signed and dated on each page by the holder of the EA. This template once signed and dated is legally binding. The holder of the EA will remain responsible for its implementation.

## 7. Amendments of the impact management outcomes and impact management actions

Once the activity has commenced, a holder of an EA may make amendments to the impact management outcomes and impact management actions in the following manner:

- Amendment of the impact management outcomes: in line with the process contemplated in Regulation 37 of the EIA Regulations; and
- Amendment of the impact management actions: in line with the process contemplated in Regulation 36 of the EIA Regulations.

## 8. Documents to be submitted as part of part B: section 2 site specific information and declaration

Part B: Section 2 has three distinct sub-sections. The first and third sub-sections are in a template format. Sub-section two requires a map to be produced.

Sub-section 1 contains the project name, the applicant's name and contact details, the site information, which includes coordinates of the property or farm in which the proposed substation infrastructure is proposed as well as the 21-digit Surveyor General code of each cadastral land parcel and, where available, the farm name.

Sub-section 2 is to be prepared by an EAP and must contain his/her name and expertise including a curriculum vitae. This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout using the national web based environmental screening tool, when available for compulsory use at: <https://screening.environment.gov.za/screeningtool>. The sensitivity map shall identify the nature of each sensitive feature e.g. threatened plant species, archaeological site, etc. Sensitivity maps shall identify features both within the planned working area and any known sensitive features and within 50 m from the development footprint.

Sub-section 3 is the declaration that the applicant (s)/proponent (s) or holder of the EA in the case of a change of ownership must complete which confirms that the applicant/EA holder will comply with the pre-approved

'generic EMPr' template in Section 1 and understands that the impact management outcomes and impact management actions are legally binding.

**(a) Amendments to Part B: Section 2 – site specific information and declaration**

Should the EA be transferred, Part B: Section 2 must be completed by the new applicant/proponent and submitted with the application for an amendment of the EA in terms of regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted as part of such an application for an amendment to an EA will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMPr for the development and the EMPr becomes legally binding to the new EA holder.

## **PART A – GENERAL INFORMATION**

### **1. DEFINITIONS**

In this EMPr any word or expression to which a meaning has been assigned in the NEMA or EIA Regulations has that meaning, and unless the context requires otherwise –

**“clearing”** means the clearing and removal of vegetation, whether partially or in whole, including trees and shrubs, as specified;

**“construction camp”** is the area designated for key construction infrastructure and services, including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;

**“contractor”** - The Contractor has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract, are in line with the Environmental Management Programme and that Method Statements are implemented as described.

**“hazardous substance”** is a substance governed by the Hazardous Substances Act, 1973 (Act No. 15 of 1973) as well as the Hazardous Chemical and Substances Regulations, 1995;

**“method statement”** means a written submission by the Contractor to the Project Manager in response to this EMPr or a request by the Project Manager and ECO. The method statement must set out the equipment, materials, labour and method(s) the Contractor proposes using to carry out an activity identified by the Project Manager when requesting the Method Statement. This must be done in such detail that the Project Manager and ECO is able to assess whether the Contractor's proposal is in accordance with this specification and/or will produce results in accordance with this specification;

The method statement must cover as a minimum applicable details with regard to:

- (i) Construction procedures;
- (ii) Plant, materials and equipment to be used;
- (iii) Transporting the equipment to and from site;
- (iv) How the plant/ material/ equipment will be moved while on site;
- (v) How and where the plant/ material/ equipment will be stored;
- (vi) The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- (vii) Timing and location of activities;
- (viii) Compliance/ non-compliance; and
- (ix) Any other information deemed necessary by the Project Manager.

**“slope”** means the inclination of a surface expressed as one unit of rise or fall for so many horizontal units;

“**solid waste**” means all solid waste, including construction debris, hazardous waste, excess cement/ concrete, wrapping materials, timber, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers);

“**spoil**” means excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works;

“**topsoil**” means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility, appearance, structure, agricultural potential, fertility and composition of the soil;

“**works**” means the works to be executed in terms of the Contract

## 2. ACRONYMS and ABBREVIATIONS

<b>BA</b>	Basic Assessment
<b>BAR</b>	Basic Assessment Report
<b>BESS</b>	Battery Energy Storage System
<b>CA</b>	Competent Authority
<b>CC</b>	Construction Compound
<b>cEO</b>	Contractors Environmental Officer
<b>CTMF</b>	Concrete Tower Manufacturing Facility
<b>dEO</b>	Developer Environmental Officer
<b>DPM</b>	Developer Project Manager
<b>DSS</b>	Developer Site Supervisor
<b>EAR</b>	Environmental Audit Report
<b>ECA</b>	Environmental Conservation Act No. 73 of 1989
<b>ECO</b>	Environmental Control Officer
<b>EA</b>	Environmental Authorisation
<b>EIA</b>	Environmental Impact Assessment
<b>ERAP</b>	Emergency Response Action Plan
<b>EMPr</b>	Environmental Management Programme Report
<b>EAP</b>	Environmental Assessment Practitioner
<b>FPA</b>	Fire Protection Agency
<b>HCS</b>	Hazardous chemical Substance
<b>kV</b>	Kilovolts
<b>NEMA</b>	National Environmental Management Act, 1998 (Act No. 107 of 1998)
<b>NEMBA</b>	National Environmental Management: Biodiversity Act ,2004 (Act No. 10 of 2004)
<b>NEMWA</b>	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
<b>MSDS</b>	Material Safety Data Sheet
<b>MW</b>	Megawatts
<b>OHL</b>	Overhead Line
<b>REDZ</b>	Renewable Energy Development Zone
<b>RI&amp;AP's</b>	Registered Interested and affected parties
<b>WEF</b>	Wind Energy Facility

### 3. ROLES AND RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) IMPLEMENTATION

The effective implementation of this generic EMPr is dependent on established and clear roles, responsibilities and reporting lines within an institutional framework. This section of the EMPr gives guidance to the various environmental roles and reporting lines, however, project specific requirements will ultimately determine the need for the appointment of specific person(s) to undertake specific roles and or responsibilities. As such, it must be noted that in the event that no specific person, for example, an environmental control officer (ECO) is appointed, the holder of the EA remains responsible for ensuring that the duties indicated in this document for action by the ECO are undertaken.

**Table 1: Guide to roles and responsibilities for implementation of an EMPr**

Responsible Person(s)	Role and Responsibilities
Developer's Project Manager (DPM)	<p><u>Role</u></p> <p>The Project Developer is accountable for ensuring compliance with the EMPr and any conditions of approval from the competent authority (CA). Where required, an environmental control officer (ECO) must be contracted by the Project Developer to objectively monitor the implementation of the EMPr according to relevant environmental legislation, and the conditions of the environmental authorisation (EA). The Project Developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- Be fully conversant with the conditions of the EA;</li> <li>- Ensure that all stipulations within the EMPr are communicated and adhered to by the Developer and its Contractor(s);</li> <li>- Issuing of site instructions to the Contractor for corrective actions required;</li> <li>- Monitor the implementation of the EMPr throughout the project by means of site inspections and meetings. Overall management of the project and EMPr implementation; and</li> <li>- Ensure that periodic environmental performance audits are undertaken on the project implementation.</li> </ul>
Developer Site Supervisor (DSS)	<p><u>Role</u></p> <p>The DSS reports directly to the DPM, oversees site works, liaises with the contractor(s) and the ECO. The DSS is responsible for the day to day implementation of the EMPr and for ensuring the compliance of all contractors with the conditions and requirements stipulated in the EMPr.</p> <p><u>Responsibilities</u></p>

Responsible Person(s)	Role and Responsibilities
	<ul style="list-style-type: none"> <li>- Ensure that all contractors identify a contractor’s Environmental Officer (cEO);</li> <li>- Must be fully conversant with the conditions of the EA. Oversees site works, liaison with Contractor, DPM and ECO;</li> <li>- Must ensure that all landowners have the relevant contact details of the site staff, ECO and cEO;</li> <li>- Issuing of site instructions to the Contractor for corrective actions required;</li> <li>- Will issue all non-compliances to contractors; and</li> <li>- Ratify the Monthly Environmental Report.</li> </ul>
Environmental Control Officer (ECO)	<p><u>Role</u></p> <p>The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise. The ECO is also required to conduct compliance audits, verifying the monitoring reports submitted by the cEO. The ECO provides feedback to the DSS and Project Manager regarding all environmental matters. The Contractor, cEO and dEO are answerable to the Environmental Control Officer for non-compliance with the Performance Specifications as set out in the EA and EMPr.</p> <p>The ECO provides feedback to the DSS and Project Manager, who in turn reports back to the Contractor and potential and Registered Interested &amp; Affected Parties’ (RI&amp;AP’s), as required. Issues of non-compliance raised by the ECO must be taken up by the Project Manager, and resolved with the Contractor as per the conditions of his contract. Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation, not allowed for in the Performance Specification) must be endorsed by the Project Manager. The ECO must also, as specified by the EA, report to the relevant CA as and when required.</p> <p><u>Responsibilities</u></p> <p>The responsibilities of the ECO will include the following:</p> <ul style="list-style-type: none"> <li>- Be aware of the findings and conclusions of all EA related to the development;</li> <li>- Be familiar with the recommendations and mitigation measures of this EMPr;</li> <li>- Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them;</li> <li>- Undertake regular and comprehensive site inspections / audits of the construction site according to the generic EMPr and applicable licenses in order to monitor compliance as required;</li> </ul>

Responsible Person(s)	Role and Responsibilities
	<ul style="list-style-type: none"> <li>- Educate the construction team about the management measures contained in the EMPr and environmental licenses;</li> <li>- Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective;</li> <li>- Monitoring the performance of the Contractors and ensuring compliance with the EMPr and associated Method Statements;</li> <li>- In consultation with the Developer Site Supervisor order the removal of person(s) and/or equipment which are in contravention of the specifications of the EMPr and/or environmental licenses;</li> <li>- Liaison between the DPM, Contractors, authorities and other lead stakeholders on all environmental concerns;</li> <li>- Compile a regular environmental audit report highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr;</li> <li>- Validating the regular site inspection reports, which are to be prepared by the contractor Environmental Officer (cEO);</li> <li>- Checking the cEO's record of environmental incidents (spills, impacts, legal transgressions etc.) as well as corrective and preventive actions taken;</li> <li>- Checking the cEO's public complaints register in which all complaints are recorded, as well as action taken;</li> <li>- Assisting in the resolution of conflicts;</li> <li>- Facilitate training for all personnel on the site – this may range from carrying out the training, to reviewing the training programmes of the Contractor;</li> <li>- In case of non-compliances, the ECO must first communicate this to the Senior Site Supervisor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the authorities as non-compliance;</li> <li>- Maintenance, update and review of the EMPr;</li> <li>- Communication of all modifications to the EMPr to the relevant stakeholders.</li> </ul>
<p>developer Environmental Officer (dEO)</p>	<p><u>Role</u></p> <p>The dEOs will report to the Project Manager and are responsible for implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- Be fully conversant with the EMPr;</li> </ul>

Responsible Person(s)	Role and Responsibilities
	<ul style="list-style-type: none"> <li>- Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures;</li> <li>- Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s) ;</li> <li>- Confine the development site to the demarcated area;</li> <li>- Conduct environmental internal audits with regards to EMPr and authorisation compliance (on cEO);</li> <li>- Assist the contractors in addressing environmental challenges on site;</li> <li>- Assist in incident management:</li> <li>- Reporting environmental incidents to developer and ensuring that corrective action is taken, and lessons learnt shared;</li> <li>- Assist the contractor in investigating environmental incidents and compile investigation reports;</li> <li>- Follow-up on pre-warnings, defects, non-conformance reports;</li> <li>- Measure and communicate environmental performance to the Contractor;</li> <li>- Conduct environmental awareness training on site together with ECO and cEO;</li> <li>- Ensure that the necessary legal permits and / or licenses are in place and up to date;</li> <li>- Acting as Developer’s Environmental Representative on site and work together with the ECO and contractor;</li> </ul>
Contractor	<p><u>Role</u></p> <p>The Contractor appoints the cEO and has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented as described. External contractors must ensure compliance with this EMPr while performing the onsite activities as per their contract with the Project Developer. The contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion of substation infrastructure for the transmission and distribution of electricity activities.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- project delivery and quality control for the development services as per appointment;</li> <li>- employ a suitably qualified person to monitor and report to the Project Developer’s appointed person on the daily activities on-site during the construction period;</li> <li>- ensure that safe, environmentally acceptable working methods and practices are implemented and that equipment is properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely;</li> <li>- attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones;</li> <li>- ensure that contractors’ staff repair, at their own cost, any environmental damage as a result of a contravention of the</li> </ul>



Responsible Person(s)	Role and Responsibilities
contractor Environmental Officer (cEO)	<p style="text-align: center;">specifications contained in EMPr, to the satisfaction of the ECO.</p> <p><u>Role</u>  Each Contractor affected by the EMPr should appoint a cEO, who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor’s representative can be the site agent; site engineer; a dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor’s Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public. As a minimum the cEO shall meet the following criteria:</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- Be on site throughout the duration of the project and be dedicated to the project;</li> <li>- Ensure all their staff are aware of the environmental requirements, conditions and constraints with respect to all of their activities on site;</li> <li>- Implementing the environmental conditions, guidelines and requirements as stipulated within the EA, EMPr and Method Statements;</li> <li>- Attend the Environmental Site Meeting;</li> <li>- Undertaking corrective actions where non-compliances are registered within the stipulated timeframes;</li> <li>- Report back formally on the completion of corrective actions;</li> <li>- Assist the ECO in maintaining all the site documentation;</li> <li>- Prepare the site inspection reports and corrective action reports for submission to the ECO;</li> <li>- Assist the ECO with the preparing of the monthly report; and</li> <li>- Where more than one Contractor is undertaking work on site, each company appointed as a Contractor will appoint a cEO representing that company.</li> </ul>

#### 4. ENVIRONMENTAL DOCUMENTATION REPORTING AND COMPLIANCE

To ensure accountable and demonstrated implementation of the EMPr, a number of reporting systems, documentation controls and compliance mechanisms must be in place for all substation infrastructure projects as a minimum requirement.

##### 4.1 Document control/Filing system

The holder of the EA is solely responsible for the upkeep and management of the EMPr file. As a minimum, all documentation detailed below will be stored in the EMPr file. A hard copy of all documentation shall be filed, while an electronic copy may be kept where relevant. A duplicate file will be maintained in the office of the DSS (where applicable). This duplicate file must remain current and up-to-date. The filing system must be updated and relevant documents added as required. The EMPr file must be made available at all times on request by the CA or other relevant authorities. The EMPr file will form part of any environmental audits undertaken as prescribed in the EIA Regulations.

##### 4.2 Documentation to be available

At the outset of the project the following preliminary list of documents shall be placed in the filing system and be accessible at all times:

- Full copy of the signed EA from the CA in terms of NEMA, granting approval for the development or expansion;
- Copy of the generic and site specific EMPr as well as any amendments thereof;
- Copy of declaration of implementing generic EMPr and subsequent approval of site specific EMPr and amendments thereof;
- All method statements;
- Completed environmental checklists;
- Minutes and attendance register of environmental site meetings;
- An up-to-date environmental incident log;
- A copy of all instructions or directives issued;
- A copy of all corrective actions signed off. The corrective actions must be filed in such a way that a clear reference is made to the non-compliance record;
- Complaints register.

##### 4.3 Weekly Environmental Checklist

The ECOs are required to complete a Weekly Environmental Checklist, the format of which is to be agreed prior to commencement of the activity. The ECOs are required to sign and date the checklist, retain a copy in the EMPr file and submit a copy of the completed checklist to the DSS on a weekly basis.

The checklists will form the basis for the Monthly Environmental Reports. Copies of all completed checklists will be attached as Annexures to the Environmental Audit Report as required in terms of the EIA Regulations.

##### 4.4 Environmental site meetings

Minutes of the environmental site meetings shall be kept. The minutes must include an attendance register and will be attached to the Monthly Report that is distributed to attendees. Each set of minutes must clearly record "Matters for Attention" that will be reviewed at the next meeting.

#### 4.5 Required Method Statements

The method statement will be done in such detail that the ECOs are enabled to assess whether the contractor's proposal is in accordance with the EMPr.

The method statement must cover applicable details with regard to:

- development procedures;
- materials and equipment to be used;
- getting the equipment to and from site;
- how the equipment/ material will be moved while on site;
- how and where material will be stored;
- the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- timing and location of activities;
- compliance/ non-compliance with the EMPr; and
- any other information deemed necessary by the ECOs.

Unless indicated otherwise by the Project Manager, the Contractor shall provide the following method statements to the Project Manager no less than 14 days prior to the commencement date of the activity:

- Site establishment – Camps, Lay-down or storage areas, satellite camps, infrastructure;
- Batch plants;
- Workshop or plant servicing;
- Handling, transport and storage of Hazardous Chemical Substance's;
- Vegetation management – Protected, clearing, aliens, felling;
- Access management – Roads, gates, crossings etc.;
- Fire plan;
- Waste management – transport, storage, segregation, classification, disposal (all waste streams);
- Social interaction – complaints management, compensation claims, access to properties etc.;
- Water – use (source, abstraction and disposal), access and all related information, crossings and mitigation;
- Emergency preparedness – Spills, training, other environmental emergencies;
- Dust and noise management methodologies;
- Fauna interaction and risk management – only if the risk was identified – wildlife interaction especially on game farms; and
- Heritage and palaeontology management.

The ECOs shall monitor and ensure that the contractors perform in accordance with these method statements. Completed and agreed method statements between the holder of the EA and the contractor shall be captured in Appendix 1.

#### 4.6 Environmental Incident Log (Diary)

The ECOs are required to maintain an up-to-date and current Environmental Incident Log (environmental diary). The Environmental Incident Log is a means to record all environmental incidents and/or all non-compliance notice would not be issued. An environmental incident is defined as:

- Any deviation from the listed impact management actions (listed in this EMPr) that may be addressed immediately by the ECOs. (For example a contractor's staff member littering or a drip tray that has not been emptied);
- Any environmental impact resulting from an action or activity by a contractor in contravention of the environmental stipulations and guidelines listed in the EMPr which as a single event would have a minor impact but which if cumulative and continuous would have a significant effect (for example no toilet paper available in the ablutions for an afternoon); and
- General environmental information such as road kills or injured wildlife.

The ECOs are to record all environmental incidents in the Environmental Incident Log. All incidents regardless of severity must be reported to the Developer. The Log is to be kept in the EMPr file and at a minimum the following will be recorded for each environmental incident:

- The date and time of the incident;
- Description of the incident;
- The name of the Contractor responsible;
- The incident must be listed as significant or minor;
- If the incident is listed as significant, a non-compliance notice must be issued, and recorded in the log;
- Remedial or corrective action taken to mitigate the incident; and
- Record of repeat minor offences by the same contractor or staff member.

The Environmental Incident Log will be captured in the EAR.

#### 4.7 Non-compliance

A non-compliance notice will be issued to the responsible contractor by the ECOs via the DSS or Project Manager. The non-compliance notice will be issued in writing; a copy filed in the EMPr file and will at a minimum include the following:

- Time and date of the non-compliance;
- Name of the contractor responsible;
- Nature and description of the non-compliance;
- Recommended / required corrective action; and
- Date by which the corrective action to be completed.
- The contractors shall act immediately when a notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the development site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. The ECO should be made aware of any complaints. Any non-compliance with the agreed procedures of the EMPr is a transgression of the various statutes and laws that define the manner by which the environment is managed. Failure to redress the cause shall be reported to the relevant CA for them to deal with the transgression, as it deems fit. The contractor is deemed not to have complied with the EMPr if, inter alia, There is a deviation from the environmental conditions, impact management outcomes and impact management actions activities, as approved in generic and site specific EMPr as relevant as set out in the EMPr, which deviation has, or may cause, an environmental impact.

#### 4.8 Corrective action records

For each non-compliance notice issued, a documented corrective action must be recorded. On receiving a non-compliance notice from the DSS, the contractor's cEO will ensure that the corrective actions required take place within the stipulated timeframe. On completion of the corrective action the cEO is to issue a Corrective Action Report in writing to the ECOs. If satisfied that the corrective action has been completed, the ECOs are to sign-off on the Corrective Action Report, and attach the report to the non-compliance notice in the EMPr file. A corrective action is considered complete once the report has signed off by the ECOs.

#### 4.9 Photographic record

A digital photographic record will be kept. The photographic record will be used to show before, during and post rehabilitation evidence of the project as well used in cases of damages claims if they arise. Each image must be dated, and a brief description note attached.

The Contractor shall:

1. Allow the ECOs access to take photographs of all areas, activities and actions.

The ECOs shall keep an electronic database of photographic records which will include:

1. Pictures of all areas designated as work areas, camp areas, development sites and storage areas taken before these areas are set up;
2. All bunding and fencing;
3. Road conditions and road verges;
4. Condition of all farm fences;
5. Topsoil storage areas;
6. All areas to be cordoned off during construction;
7. Waste management sites;
8. Ablution facilities (inside and out);
9. Any non-conformances deemed to be "significant";
10. All completed corrective actions for non-compliances;
11. All required signage;
12. Photographic recordings of incidents;
13. All areas before, during and post rehabilitation; and
14. Include relevant photographs in the Final Environmental Audit Report.

#### 4.10 Complaints register

The ECOs shall keep a current and up-to-date complaints register. The complaints register is to be a record of all complaints received from communities, stakeholders and individuals. The Complaints Record shall:

1. Record the name and contact details of the complainant;
2. Record the time and date of the complaint;
3. Contain a detailed description of the complaint;
4. Where relevant and appropriate, contain photographic evidence of the complaint or damage (ECOs to take relevant photographs); and
5. Contain a copy of the ECOs written response to each complaint received and keep a record of any further correspondence with the complainant. The ECO's written response will include a description

of any corrective action to be taken and must be signed by the Contractor, ECO and affected party. Where a damage claim is issued by the complainant, the ECOs shall respond as described in (**section 4.11**) below.

#### 4.11 Claims for damages

In the event that a Claim for Damages is submitted by a community, landowner or individual, the ECOs shall:

1. Record the full detail of the complaint as described in (**section 4.10**) above;
2. The DPM will evaluate the claim and associated damage and submit the evaluation to the Senior Site Representative for approval;
3. Following consideration by the DPM, the claim is to be resolved and settled immediately, or the reason for not accepting the claim communicated in writing to the claimant. Should the claimant not accept this, the ECO shall, in writing report the incident to the Developer's negotiator and legal department; and
4. A formal record of the response by the ECOs to the claimant as well as the rectification of the method of making payments not amount will be recorded in the EMPr file.

#### 4.12 Interactions with affected parties

Open, transparent and good relations with affected landowners, communities and regional staff are an essential aspect to the successful management and mitigation of environmental impacts.

The ECOs shall:

1. Ensure that all queries, complaints and claims are dealt within an agreed timeframe;
2. Ensure that any or all agreements are documented, signed by all parties and a record of the agreement kept in the EMPr file;
3. Ensure that a complaints telephone numbers are made available to all landowners and affected parties; and
4. Ensure that contact with affected parties is courteous at all times;

#### 4.13 Environmental audits

Internal environmental audits of the activity and implementation of the EMPr must be undertaken. The findings and outcomes included in the EMPr file and submitted to the CA at intervals as indicated in the EA.

The ECOs must prepare a monthly EAR. The report will be tabled as the key point on the agenda of the Environmental Site Meeting. The Report is submitted for acceptance at the meeting and the final report will be circulated to the Project Manager and filed in the EMPr file. At a frequency determined by the EA, the ECOs shall submit the monthly reports to the CA. At a minimum the monthly report is to cover the following:

- Weekly Environmental Checklists;
- Deviations and non-compliances with the checklists;
- Non-compliances issued;
- Completed and reported corrective actions;
- Environmental Monitoring;
- General environmental findings and actions; and
- Minutes of the Bi-monthly Environmental Site Meetings.

#### 4.14 Final environmental audits

On final completion of the rehabilitation and/or requirements of the EA a final EAR is to be prepared and submitted to the CA. The EAR must comply with Appendix 7 of the EIA Regulations.

## **PART B: SECTION 1: Pre-approved generic EMPr template**

### **5. IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS**

This section provides a pre-approved generic EMPr template with aspects that are common to the development of substation infrastructure for the transmission and distribution of electricity. There is a list of aspects identified for the development or expansion of substation infrastructure for the transmission and distribution of electricity, and for each aspect a set of prescribed impact management outcomes and associated impact management actions have been identified. Holders of EAs are responsible to ensure the implementation of these outcomes and actions for all projects as a minimum requirement, in order to mitigate the impact of such aspects identified for the development or expansion of substation infrastructure for the transmission and distribution of electricity.

The template provided below is to be completed by providing the information under each heading for each environmental impact management action.

The completed template must be signed and dated on each page by both the contractor and the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must also be duly signed and dated on each page by the contractor and the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.



**5.1 Environmental awareness training**

<b>Impact management outcome:</b> All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.						
<b>Impact Management Actions</b>	<b>Implementation</b>			<b>Monitoring</b>		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– All staff must receive environmental awareness training prior to commencement of the activities;</li> <li>– The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course;</li> <li>– Refresher environmental awareness training is available as and when required;</li> <li>– All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr;</li> <li>– The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum:               <ul style="list-style-type: none"> <li>a) Safety notifications; and</li> <li>b) No littering.</li> </ul> </li> <li>– Environmental awareness training must include as a minimum the following:               <ul style="list-style-type: none"> <li>a) Description of significant environmental impacts, actual or potential, related to their work activities;</li> <li>b) Mitigation measures to be implemented when carrying out specific activities;</li> <li>c) Emergency preparedness and response procedures;</li> <li>d) Emergency procedures;</li> <li>e) Procedures to be followed when working near or within sensitive areas;</li> <li>f) Wastewater management procedures;</li> <li>g) Water usage and conservation;</li> <li>h) Solid waste management procedures;</li> <li>i) Sanitation procedures;</li> </ul> </li> </ul>	<p><b>The Contractor and the contractor Environmental Officer (cEO)/Environmental Site Officer (ESO).</b></p>	<ul style="list-style-type: none"> <li>• <b>Compulsory Environmental Awareness Training Sessions.</b></li> <li>• <b>Information Posters in accessible locations.</b></li> </ul>	<p><b>Pre-construction Phase.</b></p>	<p><b>The appointed Environmental Control Officer (ECO).</b></p>	<p><b>Monthly.</b></p>	<p><b>An Environmental Site File should be compiled and maintained by the cEO/ESO for the duration of the construction phase. This file should include proof of training, attendance registers, etc., and a copy of this file should be provided to the ECO, to append to the monthly audit reports.</b></p>

<ul style="list-style-type: none"> <li>j) Fire prevention; and</li> <li>k) Disease prevention.</li> </ul> <ul style="list-style-type: none"> <li>– A record of all environmental awareness training courses undertaken as part of the EMPr must be available;</li> <li>– Educate workers on the dangers of open and/or unattended fires;</li> <li>– A staff attendance register of all staff to have received environmental awareness training must be available.</li> <li>– Course material must be available and presented in appropriate languages that all staff can understand.</li> </ul>						
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**5.2 Site Establishment development**

<b>Impact management outcome:</b> Impacts on the environment are minimised during site establishment and the development footprint are kept to demarcated development area.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– A method statement must be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;</li> <li>– Location of camps must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through;</li> <li>– Sites must be located where possible on previously disturbed areas;</li> <li>– The camp must be fenced in accordance with <b>Section 5.5: Fencing and gate installation</b>; and</li> <li>– The use of existing accommodation for contractor staff, where possible, is encouraged.</li> </ul>	<b>The Contractor.</b>	<b>Submission of relevant Method Statement(s) for approval.</b>	<b>Pre-construction Phase.</b>	<b>The appointed ECO.</b>	<b>As Method Statements are submitted, and monthly monitoring.</b>	<b>Evidence of compliance and copies of all approved Method Statements must be appended to the pre-construction audit report.</b>

### 5.3 Access restricted areas

Impact management outcome: Access to restricted areas prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Identification of access restricted areas is to be informed by the environmental assessment, site walk through, and any additional areas identified during development;</li> <li>– Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate; and</li> <li>– Unauthorised access and development related activity inside access restricted areas is prohibited.</li> </ul>	<b>The Contractor and the ECO.</b>	<b>Demarcation and the placement of relevant signage.</b>	<b>Pre-construction Phase.</b>	<b>The ECO.</b>	<b>Monthly.</b>	<b>The ECO must monitor the site to ensure that all restricted areas have been demarcated (photographic evidence) and that construction is not taking place within these areas.</b>

### 5.4 Access roads

Impact management outcome: Minimise impact to the environment through the planned and restricted movement of vehicles on site.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with the activities;</li> <li>– All private roads used for access to the servitude must be maintained and upon completion of the works, be left in at least the original condition</li> <li>– All contractors must be made aware of all these access routes.</li> <li>– Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense;</li> <li>– Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the development of new roads;</li> <li>– In circumstances where private roads must be used, the condition of the</li> </ul>	<b>The Developer Site Supervisor (DSS), the Contractor and the affected Landowners.</b>	<b>Formal access agreement.</b>	<b>Construction Phase.</b>	<b>The ECO.</b>	<b>Once-off, and monthly reporting.</b>	<b>The Contractor must provide the ECO with a copy of the access agreement, as well as any specific (agreed-upon) conditions.</b>

<p>said roads must be recorded in accordance with <b>section 4.9: photographic record</b>; prior to use and the condition thereof agreed by the landowner, the DPM, and the contractor;</p> <ul style="list-style-type: none"> <li>– Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or croplands</li> <li>– Access roads must only be developed on pre-planned and approved roads.</li> </ul>						
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### 5.5 Fencing and Gate installation

Impact management outcome: Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Use existing gates provided to gain access to all parts of the area authorised for development, where possible;</li> <li>– Existing and new gates to be recorded and documented in accordance with <b>section 4.9: photographic record</b>;</li> <li>– All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner;</li> <li>– At points where the line crosses a fence in which there is no suitable gate within the extent of the line servitude, on the instruction of the DPM, a gate must be installed at the approval of the landowner;</li> <li>– Care must be taken that the gates must be so erected that there is a gap of no more than 100 mm between the bottom of the gate and the ground;</li> <li>– Where gates are installed in jackal proof fencing, a suitable reinforced concrete sill must be provided beneath the gate;</li> <li>– Original tension must be maintained in the fence wires;</li> <li>– All gates installed in electrified fencing must be re-electrified;</li> <li>– All demarcation fencing and barriers must be maintained in good working order for the duration of the development activities;</li> <li>– Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where applicable;</li> <li>– Any temporary fencing to restrict the movement of life-stock must only be erected with the permission of the landowner.</li> <li>– All fencing must be developed of high-quality material bearing the SABS mark;</li> </ul>	<b>The Contractor.</b>	<b>Supervision.</b>	<b>Construction Phase and prior to the commencement of the Operational Phase.</b>	<b>The ECO.</b>	<b>As required and reporting monthly.</b>	<b>Photographic evidence should be included in the monthly audit reports.</b>

<ul style="list-style-type: none"> <li>– The use of razor wire as fencing must be avoided;</li> <li>– Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff is away from site. Site security will be required at all times;</li> <li>– On completion of the development phase all temporary fences are to be removed;</li> <li>– The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely.</li> </ul>						
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### 5.6 Water Supply Management

<b>Impact management outcome:</b> Undertake responsible water usage.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– All abstraction points or bore holes must be registered with the DWS and suitable water meters installed to ensure that the abstracted volumes are measured on a daily basis;</li> <li>– The Contractor must ensure the following: <ul style="list-style-type: none"> <li>a. The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river;</li> <li>b. No damage occurs to the riverbed or banks and that the abstraction of water does not entail stream diversion activities; and</li> <li>c. All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented.</li> </ul> </li> <li>– Ensure water conservation is being practiced by: <ul style="list-style-type: none"> <li>a. Minimising water use during cleaning of equipment;</li> <li>b. Undertaking regular audits of water systems; and</li> <li>c. Including a discussion on water usage and conservation during environmental awareness training.</li> <li>d. The use of grey water is encouraged.</li> </ul> </li> </ul>	<b>The Contractor.</b>	<ul style="list-style-type: none"> <li>• <b>Environmental Awareness Training.</b></li> <li>• <b>Monitoring and supervision.</b></li> </ul>	<b>Construction Phase.</b>	<b>The cEO/ESO and the ECO.</b>	<b>Daily (cEO/ESO) and monthly (ECO).</b>	<b>The cEO/ESO should report to the ECO and photographic evidence should be included in the monthly audit reports.</b>

### 5.7 Storm and wastewater management

Impact management outcome: Impacts to the environment caused by storm water and wastewater discharges during construction are avoided.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Runoff from the cement/ concrete batching areas must be strictly controlled, and contaminated water must be collected, stored and either treated or disposed of off-site, at a location approved by the project manager;</li> <li>– All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility;</li> <li>– Natural storm water runoff not contaminated during the development and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager’s approval and support by the ECO;</li> <li>– Water that has been contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have been removed from the water by settling out these solids in settlement ponds. The release of settled water back into the environment must be subject to the Project Manager’s approval and support by the ECO.</li> </ul>	<b>The Contractor.</b>	<b>The implementation of the Stormwater Management Plan.</b>	<b>Construction Phase.</b>	<b>The cEO/ESO and the ECO.</b>	<b>Monthly.</b>	<b>Photographic evidence should be included in the monthly audit reports. The ECO should monitor the Contractor’s compliance with the Stormwater Management Plan.</b>

### 5.8 Solid and hazardous waste management

Impact management outcome: Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– All measures regarding waste management must be undertaken using an integrated waste management approach;</li> <li>– Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided;</li> </ul>	<b>The Contractor.</b>	<b>The implementation of the Waste Management Plan.</b>	<b>Construction Phase.</b>	<b>The ECO.</b>	<b>Monthly.</b>	<b>Copies of the waste disposal certificates must be submitted to</b>

<ul style="list-style-type: none"> <li>– A suitably positioned and clearly demarcated waste collection site must be identified and provided;</li> <li>– The waste collection site must be maintained in a clean and orderly manner;</li> <li>– Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal;</li> <li>– Staff must be trained in waste segregation;</li> <li>– Bins must be emptied regularly;</li> <li>– General waste produced onsite must be disposed of at registered waste disposal sites/ recycling company;</li> <li>– Hazardous waste must be disposed of at a registered waste disposal site;</li> <li>– Certificates of safe disposal for general, hazardous and recycled waste must be maintained.</li> </ul>					<p>the ECO for inclusion in the audit reports. The ECO should monitor the Contractor's compliance with the Waste Management Plan.</p>
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**5.9 Protection of watercourses and estuaries**

<p><b>Impact management outcome:</b> Pollution and contamination of the watercourse environment and or estuary erosion are prevented.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– All watercourses must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities;</li> <li>– In the event of a spill, prompt action must be taken to clear the polluted or affected areas;</li> <li>– Where possible, no development equipment must traverse any seasonal or permanent wetland</li> <li>– No return flow into the estuaries must be allowed and no disturbance of the Estuarine functional Zone should occur;</li> <li>– Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available;</li> <li>– There must not be any impact on the long-term morphological dynamics of watercourses or estuaries;</li> <li>– Existing crossing points must be favored over the creation of new crossings</li> </ul>	<p><b>The Contractor.</b></p>	<p><b>Adherence to the conditions of all General Authorisations and/or Water Use Licenses.</b></p>	<p><b>Construction Phase.</b></p>	<p><b>The ECO.</b></p>	<p><b>Monthly.</b></p>	<p><b>All conditions of the General Authorisations and/or Water Use Licenses must be included in the ECO's audit checklist. Photographic evidence should be included in the monthly audit reports.</b></p>

<p>(including temporary access)</p> <ul style="list-style-type: none"> <li>- When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken:           <ul style="list-style-type: none"> <li>a) Water levels during the period of construction;</li> </ul> </li> </ul> <p>No altering of the bed, banks, course or characteristics of a watercourse</p> <ul style="list-style-type: none"> <li>b) During the execution of the works, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g. including ensuring that construction equipment is well maintained;</li> <li>c) Where earthwork is being undertaken in close proximity to any watercourse, slopes must be stabilised using suitable materials, i.e. sandbags or geotextile fabric, to prevent sand and rock from entering the channel; and</li> <li>d) Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows.</li> </ul>					
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### 5.10 Vegetation clearing

<p><b>Impact management outcome:</b> Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<p><b>General:</b></p> <ul style="list-style-type: none"> <li>- Indigenous vegetation which does not interfere with the development must be left undisturbed;</li> <li>- Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species;</li> <li>- Search, rescue and replanting of all protected and endangered species likely to be damaged during project development must be identified by the relevant specialist and completed prior to any development or clearing;</li> <li>- Permits for removal must be obtained from the relevant CA prior to the cutting or clearing of the affected species, and they must be filed;</li> </ul>	<p><b>The Contractor and a Botanical Specialist (appointed to undertake Floral Search and Rescue).</b></p>	<ul style="list-style-type: none"> <li>• Applications for all necessary permits.</li> <li>• Implementation of the Alien Invasive Vegetation Management Plan.</li> <li>• Thorough Floral Search and Rescue by a suitably qualified</li> </ul>	<p><b>Pre-Construction and Construction Phases.</b></p>	<p><b>The ECO.</b></p>	<p><b>Monthly.</b></p>	<p><b>Copies of all relevant permits must be included in the pre-construction audit report, compliance with the Alien Invasive Vegetation Management Plan must be monitored, and photographic evidence of replanting of Search and Rescue vegetation must be included in the audit</b></p>



<ul style="list-style-type: none"> <li>– The Environmental Audit Report must confirm that all identified species have been rescued and replanted and that the location of replanting is compliant with conditions of approvals;</li> <li>– Trees felled due to construction must be documented and form part of the Environmental Audit Report;</li> <li>– Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris;</li> <li>– Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained;</li> <li>– A daily register must be kept of all relevant details of herbicide usage;</li> <li>– No herbicides must be used in estuaries;</li> <li>– All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off in accordance to <b>Section 5.3: Access restricted areas</b>.</li> <li>– Alien invasive vegetation must be removed and disposed of at a licensed waste management facility.</li> </ul>		<p>specialist.</p> <ul style="list-style-type: none"> <li>• <b>Compilation of a list of all species which require rescue and replanting, including the identification of a suitable location for replanting.</b></li> <li>• <b>Monitoring.</b></li> </ul>			<p>reports. The ECO should provide photographic evidence of all species which have been rescued and replanted. The ECO must document all herbicide usage and ensure that a suitably qualified individual applies such herbicides (if required).</p>
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### 5.11 Protection of fauna

<b>Impact management outcome:</b> Disturbance to fauna is minimised.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– No interference with livestock must occur without the landowner’s written consent and with the landowner or a person representing the landowner being present;</li> <li>– The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the development programme;</li> <li>– Breeding sites must be kept intact and disturbance to breeding</li> </ul>	<b>The Contractor.</b>	<ul style="list-style-type: none"> <li>• <b>Implementation of the mitigation measures stipulated in the Ecological Assessment Report.</b></li> <li>• <b>Relevant Faunal Permits.</b></li> </ul>	<b>Pre-construction and Construction Phases.</b>	<b>The ECO.</b>	<b>Monthly.</b>	<b>The compliance with the conditions and mitigation measures must be audited by the ECO. Copies of any permits must be included in the audit reports. The ECO must ensure that any</b>

<p>birds must be avoided. Special care must be taken where nestlings or fledglings are present;</p> <ul style="list-style-type: none"> <li>– Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds;</li> <li>– No poaching must be tolerated under any circumstances. All animal dens in close proximity to the works areas must be marked as Access restricted areas;</li> <li>– No deliberate or intentional killing of fauna is allowed;</li> <li>– In areas where snakes are abundant, snake deterrents to be deployed on the pylons to prevent snakes climbing up, being electrocuted and causing power outages; and</li> <li>– No Threatened or Protected species (ToPs) and/or protected fauna as listed according NEMBA (Act No. 10 of 2004) and relevant provincial ordinances may be removed and/or relocated without appropriate authorisations/permits.</li> </ul>		<ul style="list-style-type: none"> <li>• Faunal Search and Rescue by a suitably qualified specialist.</li> <li>• Snakes which occur within the development footprints should be removed and relocated by an experienced snake handler. Snake deterrents should be installed, where necessary.</li> <li>• Installation of bird guards and diverters, where necessary.</li> </ul>				<p>snakes, found within the development footprint, are removed by a suitably experienced snake handler. The ECO should include the type of snake(s) found in the audit reports and provide details of the removal as well as the area of relocation. Contact details of a suitably experienced snake handler must be available on site.</p>
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### 5.12 Protection of heritage resources

<p><b>Impact management outcome:</b> Impact to heritage resources is minimised.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Identify, demarcate and prevent impact to all known sensitive heritage features on site in accordance with the No-Go procedure in <b>Section 5.3: Access restricted areas</b>;</li> <li>– Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance;</li> <li>– All work must cease immediately, if any human remains and/or other archaeological, palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/ palaeontologist (or the South African Police Services), so that a systematic and professional</li> </ul>	<p><b>The Contractor.</b></p>	<ul style="list-style-type: none"> <li>• Demarcation of identified sensitive heritage resources.</li> <li>• Compliance with the mitigation measures and monitoring</li> </ul>	<p>Pre-Construction and Construction Phases.</p>	<p>The ECO and a suitably qualified Archaeological and/or Palaeontological Specialist (if or when required).</p>	<p>Monthly (ECO) and when required (the Specialists).</p>	<p>The ECO should include photographic evidence of the demarcated site(s) in the monthly audit reports. Copies of all permits must be included in the audit reports. The ECO should advise the Contractor on the correct course of</p>

investigation can be undertaken. Sufficient time must be allowed to remove/collect such material before development recommences.		<p><b>recommended in the Heritage Assessment Report.</b></p> <ul style="list-style-type: none"> <li>• Education in the identification of sensitive archaeological and palaeontological resources.</li> <li>• Relevant permits.</li> </ul>				action should potentially sensitive archaeological and/or palaeontological resources be discovered within the site.
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### 5.13 Safety of the public

<b>Impact management outcome:</b> All precautions are taken to minimise the risk of injury, harm or complaints.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. large brush stockpiles, fuels etc.;</li> <li>– All unattended open excavations must be adequately fenced or demarcated;</li> <li>– Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding;</li> <li>– Ensure structures vulnerable to high winds are secured;</li> <li>– Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged.</li> </ul>	<b>The Contractor.</b>	<b>Monitoring.</b>	<b>Construction Phase.</b>	<b>The cEO/ESO and the ECO.</b>	<b>As required (cEO/ESO) and monthly (ECO).</b>	<b>The cEO/ESO should compile and maintain an incident and complaints register. All incidents and complaints must be reported to the ECO and the Developer’s Project Manager (DPM). The incident and complaints register must be submitted to the ECO monthly for inclusion in the audit reports.</b>

#### 5.14 Sanitation

Impact management outcome: Clean and well-maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Mobile chemical toilets are installed onsite if no other ablution facilities are available;</li> <li>– The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for the purposes of ablutions must be permitted under any circumstances;</li> <li>– Where mobile chemical toilets are required, the following must be ensured:               <ul style="list-style-type: none"> <li>a) Toilets are located no closer than 100 m to any watercourse or water body;</li> <li>b) Toilets are secured to the ground to prevent them from toppling due to wind or any other cause;</li> <li>c) No spillage occurs when the toilets are cleaned or emptied, and the contents are managed in accordance with the EMP; </li> <li>d) Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out;</li> <li>e) Toilets are emptied before long weekends and workers holidays, and must be locked after working hours;</li> <li>f) Toilets are serviced regularly, and the ECO must inspect toilets to ensure compliance to health standards;</li> </ul> </li> <li>– A copy of the waste disposal certificates must be maintained.</li> </ul>	<b>The Contractor.</b>	<b>The implementation of the Waste Management Plan.</b>	<b>Construction Phase.</b>	<b>The ECO.</b>	<b>As required and monthly.</b>	<b>Copies of the waste disposal certificates must be submitted to the ECO for inclusion in the audit reports. The ECO should monitor the Contractor's compliance with the Waste Management Plan as well as the general levels of sanitation on the site.</b>

#### 5.15 Prevention of disease

Impact Management outcome: All necessary precautions linked to the spread of disease are taken.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Undertake environmentally friendly pest control in the camp area;</li> </ul>	<b>The</b>	<b>• Information</b>	<b>Construction</b>	<b>The ECO.</b>	<b>Monthly.</b>	<b>The ECO should</b>

<ul style="list-style-type: none"> <li>– Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS;</li> <li>– The Contractor must ensure that information posters on AIDS are displayed in the Contractor Camp area;</li> <li>– Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community, where applicable;</li> <li>– Free condoms must be made available to all staff on site at central points;</li> <li>– Medical support must be made available;</li> <li>– Provide access to Voluntary HIV Testing and Counselling Services.</li> </ul>	<b>Contractor.</b>	<b>posters, including contact details of suitable support.</b> <ul style="list-style-type: none"> <li>• <b>Provision of medical guidance and support, where necessary.</b></li> </ul>	<b>Phase.</b>			<b>monitor the compliance with these management actions through verbal discussions with the Contractor and photographic evidence of information posters.</b>
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### 5.16 Emergency procedures

<b>Impact management outcome:</b> Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.						
<b>Impact Management Actions</b>	<b>Implementation</b>			<b>Monitoring</b>		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project;</li> <li>– The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation;</li> <li>– All staff must be made aware of emergency procedures as part of environmental awareness training;</li> <li>– The relevant local authority must be made aware of a fire as soon as it starts;</li> <li>– In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see <i>Hazardous Substances section 5.17</i>).</li> </ul>	<b>The Contractor.</b>	<ul style="list-style-type: none"> <li>• <b>Implementation of the Emergency Response Action Plan.</b></li> <li>• <b>Implementation of the Fire Management Plan.</b></li> </ul>	<b>All phases of development.</b>	<b>The ECO.</b>	<b>Monthly.</b>	<b>The ECO should ensure that the Contractor has compiled an Emergency Response Action Plan, Fire Management Plan and that emergency contact details are available at suitable locations within the construction site. Photographic evidence of the emergency contact details must be included in the audit reports.</b>

5.17 Hazardous substances

Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible;</li> <li>– All hazardous substances must be stored in suitable containers as defined in the Method Statement;</li> <li>– Containers must be clearly marked to indicate contents, quantities and safety requirements;</li> <li>– All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored containers;</li> <li>– Bunded areas to be suitably lined with a SABS approved liner;</li> <li>– An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis;</li> <li>– All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS);</li> <li>– All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet;</li> <li>– Employees handling hazardous substances / materials must be aware of the potential impacts and follow appropriate safety measures. Appropriate personal protective equipment must be made available;</li> <li>– The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers;</li> <li>– The tanks/ bowsers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the storage tanks/ bowsers (110% statutory requirement plus an allowance for rainfall);</li> <li>– The floor of the bund must be sloped, draining to an oil separator;</li> <li>– Provision must be made for refueling at the storage area by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained;</li> </ul>	<p><b>The Contractor.</b></p>	<ul style="list-style-type: none"> <li>• <b>Method Statement(s).</b></li> <li>• <b>Implementation of the Stormwater Management Plan.</b></li> <li>• <b>Implementation of the Waste Management Plan.</b></li> <li>• <b>Implementation of the Emergency Response Action Plan.</b></li> </ul>	<p><b>Construction Phase.</b></p>	<p><b>The cEO/ESO and the ECO.</b></p>	<p><b>Daily (cEO/ESO) and monthly (ECO).</b></p>	<p><b>The cEO/ESO and the ECO must monitor the Contractor's compliance with all relevant Method Statements, the Stormwater Management Plan, the Waste Management Plan, and the Emergency Response Action Plan (if/when required). In addition, the ECO should monitor the availability and use of spill kits and drip trays within the</b></p>

<ul style="list-style-type: none"> <li>– All empty externally dirty drums must be stored on a drip tray or within a bunded area;</li> <li>– No unauthorised access into the hazardous substances’ storage areas must be permitted;</li> <li>– No smoking must be allowed within the vicinity of the hazardous storage areas;</li> <li>– Adequate fire-fighting equipment must be made available at all hazardous storage areas;</li> <li>– Where refueling away from the dedicated refueling station is required, a mobile refueling unit must be used. Appropriate ground protection such as drip trays must be used;</li> <li>– An appropriately sized spill kit kept onsite relevant to the scale of the activity/s involving the use of hazardous substance must be available at all times;</li> <li>– The responsible operator must have the required training to make use of the spill kit in emergency situations;</li> <li>– An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken;</li> <li>– In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to <b>Section 5.7</b> for procedures concerning <b>storm- and wastewater management</b> and <b>5.8</b> for <b>solid and hazardous waste management</b>.</li> </ul>					<p>site. Copies of the HCS control sheet and the MSDS must be included in the audit reports.</p>
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**5.18 Workshop, equipment maintenance and storage**

<p><b>Impact management outcome:</b> Soil, surface water and groundwater contamination is minimised.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area;</li> <li>– During servicing of vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts;</li> </ul>	<p><b>The Contractor.</b></p>	<ul style="list-style-type: none"> <li>• <b>Method Statement(s).</b></li> <li>• <b>Implementation of the Stormwater Management</b></li> </ul>	<p><b>Construction Phase.</b></p>	<p><b>The cEO/ESO and the ECO.</b></p>	<p><b>Daily (cEO/ESO) and monthly (ECO).</b></p>	<p><b>The cEO/ESO and the ECO must monitor the Contractor’s compliance with all relevant Method Statements, the</b></p>

<ul style="list-style-type: none"> <li>– Leaking equipment must be repaired immediately or be removed from site to facilitate repair;</li> <li>– Workshop areas must be monitored for oil and fuel spills;</li> <li>– Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available;</li> <li>– The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil / water separator where maintenance work on vehicles and equipment can be performed;</li> <li>– Water drainage from the workshop must be contained and managed in accordance Section <b>5.7: Storm- and wastewater management.</b></li> </ul>		<p><b>Plan.</b></p> <ul style="list-style-type: none"> <li>• <b>Implementation of the Waste Management Plan.</b></li> </ul>				<p><b>Stormwater Management Plan, and the Waste Management. In addition, the ECO should monitor the availability and use of spill kits and drip trays within the site.</b></p>
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### 5.19 Batching plants

Impact management outcome: Minimise spillages and contamination of soil, surface water and groundwater.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Concrete mixing must be carried out on an impermeable surface;</li> <li>– Batching plants areas must be fitted with a containment facility for the collection of cement laden water.</li> <li>– Dirty water from the batching plant must be contained to prevent soil and groundwater contamination</li> <li>– Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains;</li> <li>– A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted;</li> <li>– Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility;</li> <li>– Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site;</li> <li>– Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to <b>Section 5.20: Dust</b></li> </ul>	<p><b>The Contractor.</b></p>	<ul style="list-style-type: none"> <li>• <b>Erect temporary fencing around the batching plant(s).</b></li> <li>• <b>Method Statement(s).</b></li> <li>• <b>Implementation of the Stormwater Management Plan.</b></li> <li>• <b>Implementation of the Waste Management Plan.</b></li> </ul>	<p><b>Construction Phase.</b></p>	<p><b>The ECO.</b></p>	<p><b>Monthly.</b></p>	<p><b>The ECO must monitor the Contractor’s compliance with the Stormwater Management Plan and the Waste Management Plan. The ECO should provide photographic evidence of the necessary temporary fencing, which is erected around batching plants. In addition, the ECO should obtain proof that excess materials have been disposed of at a registered disposal facility. Copies of any Method Statements</b></p>



<p><b>emissions)</b></p> <ul style="list-style-type: none"> <li>– Any excess sand, stone and cement must be removed or reused from site on completion of construction period and disposed at a registered disposal facility;</li> <li>– Temporary fencing must be erected around batching plants in accordance with Section <b>5.5: Fencing and gate installation</b>.</li> </ul>						<p>relating to the batching plant(s) and proof of waste disposal must be included in the audit reports.</p>
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### 5.20 Dust emissions

<b>Impact management outcome:</b> Dust prevention measures are applied to minimise the generation of dust.						
<b>Impact Management Actions</b>	<b>Implementation</b>			<b>Monitoring</b>		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO;</li> <li>– Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re-vegetated or stabilised as soon as is practically possible;</li> <li>– Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present;</li> <li>– During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust-damping measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level;</li> <li>– Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind;</li> <li>– Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO;</li> <li>– Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas;</li> <li>– Straw stabilisation must be applied at a rate of one bale/10 m<sup>2</sup> and harrowed into the top 100 mm of top material, for all completed earthworks;</li> </ul>	<b>The Contractor.</b>	<b>Implementation of impact management actions (this report) and relevant mitigation measures (Basic Assessment Report).</b>	<b>Construction Phase.</b>	<b>The cEO/ESO and ECO.</b>	<b>Daily (cEO/ESO) and monthly (ECO).</b>	<b>The compliance with these management actions, as well as the mitigation measures stipulated in the Basic Assessment Report, must be indicated in the monthly audit reports. The cEO/ESO and ECO should ensure that any complaints relating to dust are recorded in the incident and complaints register.</b>

– For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust.						
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### 5.21 Blasting

<b>Impact management outcome:</b> Impact to the environment is minimised through a safe blasting practice.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Any blasting activity must be conducted by a suitably licensed blasting contractor; and</li> <li>Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site.</li> </ul>	<b>The Contractor.</b>	<ul style="list-style-type: none"> <li><b>Notification of the landowners and surrounding landowners.</b></li> <li><b>Blasting activities must only occur within the authorised (EA) times.</b></li> </ul>	<b>Construction Phase.</b>	<b>The ECO.</b>	<b>Limited to the specific blasting times (if any blasting is required).</b>	<b>The ECO must audit the blasting activities to ensure that blasting is undertaken in accordance with all relevant legislation, guidelines, and by-laws. Proof of landowner notification must be included in the audit reports. The ECO should ensure that any complaints relating to blasting are recorded in the incident and complaints register.</b>

### 5.22 Noise

<b>Impact Management outcome:</b> Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>The Contractor must keep noise level within acceptable limits, Restrict the use of sound amplification equipment for communication and emergency only;</li> <li>All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained;</li> <li>Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or</li> </ul>	<b>The Contractor.</b>	<ul style="list-style-type: none"> <li><b>Monitor the construction workers' adherence to the Code of Conduct.</b></li> <li><b>No construction activities may take</b></li> </ul>	<b>Construction Phase.</b>	<b>The cEO/ESO and ECO.</b>	<b>Daily (cEO/ESO) and monthly (ECO).</b>	<b>The noise levels must be monitored daily by the cEO/ESO, and the cEO/ESO must report on these levels to the ECO for inclusion in the monthly audit reports. The ECO</b>

<p>applicable, provide transport to and from the site on a daily basis for construction workers;</p> <ul style="list-style-type: none"> <li>– Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff. Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet the impact management outcome related to noise management.</li> </ul>		<p><b>place outside of the authorised (EA) times.</b></p> <ul style="list-style-type: none"> <li>• <b>Ensure that vehicles and machinery are serviced and maintained regularly to reduce noise.</b></li> <li>• <b>Compliance with the Noise Assessment Report recommendations and mitigation measures.</b></li> </ul>			<p><b>must monitor the adherence of construction workers to the Code of Conduct and the recommendations and mitigation measures in the Noise Assessment Report. The ECO should ensure that any complaints relating to noise are recorded in the incident and complaints register.</b></p>
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### 5.23 Fire prevention

Impact management outcome: Prevention of uncontrollable fires.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Designate smoking areas where the fire hazard could be regarded as insignificant;</li> <li>– Firefighting equipment must be available on all vehicles located on site;</li> <li>– The local Fire Protection Agency (FPA) must be informed of construction activities;</li> <li>– Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site;</li> <li>– Two-way swop of contact details between ECO and FPA.</li> </ul>	<p><b>The Contractor and the cEO/ESO.</b></p>	<ul style="list-style-type: none"> <li>• <b>Establishment of designated smoking areas.</b></li> <li>• <b>Availability of fire-fighting equipment at the site camp.</b></li> <li>• <b>Posters containing emergency contact details.</b></li> <li>• <b>Implementation of the Emergency Response Action</b></li> </ul>	<p><b>Construction Phase.</b></p>	<p><b>The ECO.</b></p>	<p><b>Monthly.</b></p>	<p><b>The ECO should inspect the site and liaise with the cEO/ESO and the Contractor regarding fire prevention precautions which are in place within site. The ECO should review the Emergency Response Action Plan and the Fire Management Plan, and provide photographic evidence of the designated smoking areas, posters which contain emergency contact details and the available fire-fighting equipment. The ECO should ensure that any incidents</b></p>

		<b>Plan.</b> • <b>Implementation of the Fire Management Plan.</b>				relating to fire are recorded in the incident and complaints register and reported to the DPM.
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#### 5.24 Stockpiling and stockpile areas

<b>Impact management outcome:</b> Reduce erosion and sedimentation as a result of stockpiling.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored appropriately on site in order to minimise impacts to watercourses, watercourses and water bodies;</li> <li>– All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods;</li> <li>– Topsoil stockpiles must not exceed 2 m in height;</li> <li>– During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.);</li> <li>– Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material.</li> </ul>	<b>The Contractor.</b>	<b>Supervision of the implementation of the management actions and the mitigation measures.</b>	<b>Construction Phase.</b>	<b>The cEO/ESO and the ECO.</b>	<b>Daily (cEO/ESO) and monthly (ECO).</b>	<b>The cEO/ESO and ECO should monitor the stockpiling of materials. The ECO should include photographic evidence of the material stockpiles and stockpile areas in the audit reports. The cEO/ESO should report any growth of alien vegetation on the stockpiles to the ECO, as well as any signs of erosion or sedimentation which occur as a result of the material stockpiles. The ECO should report on the condition of the material stockpiles in the audit reports and recommend additional mitigation measures and/or remedial actions should these be required.</b>

#### 5.25 Civil works

<b>Impact management outcome:</b> Impact to the environment minimised during civil works to create the substation terrace.		
Impact Management Actions	Implementation	Monitoring

	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Where terracing is required, topsoil must be collected and retained for the purpose of re-use later to rehabilitate disturbed areas not covered by yard stone;</li> <li>– Areas to be rehabilitated include terrace embankments and areas outside the high voltage yards;</li> <li>– Where required, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled;</li> <li>– These areas can be stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly;</li> <li>– Rehabilitation of the disturbed areas must be managed in accordance with <b>Section 5.35: Landscaping and rehabilitation</b>;</li> <li>– All excess spoil generated during terracing activities must be disposed of in an appropriate manner and at a recognised landfill site; and</li> <li>– Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes.</li> </ul>	<b>The Contractor.</b>	<ul style="list-style-type: none"> <li>• Compliance with the conditions of the EA and EMPs.</li> <li>• Implementation of the Erosion Management Plan.</li> <li>• Implementation of the Stormwater Management Plan.</li> <li>• Implementation of the Alien Vegetation Management Plan.</li> <li>• Implementation of the Waste Management Plan.</li> </ul>	<b>Construction, Post-construction, and Operational Phases.</b>	<b>The cEO/ESO and the ECO.</b>	<b>Daily (cEO/ESO) and monthly (ECO).</b>	<b>The cEO/ESO and ECO should monitor the site landscaping and rehabilitation against all required conditions. Photographic evidence should be provided in the audit reports as well as the recommendation of additional mitigation measures, where necessary.</b>

### 5.26 Excavation of foundation, cable trenching and drainage systems

<b>Impact management outcome:</b> No environmental degradation occurs as a result of excavation of foundation, cable trenching and drainage systems.						
<b>Impact Management Actions</b>	<b>Implementation</b>			<b>Monitoring</b>		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– All excess spoil generated during foundation excavation must be disposed of in an appropriate manner and at a licensed landfill site, if not used for backfilling purposes;</li> <li>– Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes;</li> <li>– Management of equipment for excavation purposes must be undertaken in accordance with <b>Section 5.18: Workshop,</b></li> </ul>	<b>The Contractor.</b>	<ul style="list-style-type: none"> <li>• Method Statement(s).</li> <li>• Compliance with the conditions of the EA and EMPs.</li> <li>• Implementation of the Erosion Management Plan.</li> <li>• Implementation of the</li> </ul>	<b>Construction Phase.</b>	<b>The cEO/ESO and the ECO.</b>	<b>Daily (cEO/ESO) and monthly (ECO).</b>	<b>Copies of the waste disposal certificates must be submitted to the ECO for inclusion in the audit reports. The ECO should monitor the Contractor's compliance with the relevant</b>

<p><i>equipment maintenance and storage</i>; and</p> <ul style="list-style-type: none"> <li>– Hazardous substances spills from equipment must be managed in accordance with <b>Section 5.17: Hazardous substances</b>.</li> </ul>		<p><b>Stormwater Management Plan.</b></p> <ul style="list-style-type: none"> <li>• Implementation of the Waste Management Plan.</li> </ul>				<p><b>conditions and Management Plans.</b></p>
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**5.27 Installation of foundations, cable trenching and drainage systems**

<p><b>Impact management outcome:</b> No environmental degradation occurs during the installation of foundation, cable trenching and drainage system.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Batching of cement to be undertaken in accordance with <b>Section 5.19: Batching plants</b>; and</li> <li>– Residual solid waste must be disposed of in accordance with <b>Section 5.8: Solid waste and hazardous management</b>.</li> </ul>	<p><b>The Contractor.</b></p>	<ul style="list-style-type: none"> <li>• Method Statement(s).</li> <li>• Implementation of the Waste Management Plan.</li> <li>• Implementation of the Erosion Management Plan.</li> <li>• Implementation of the Stormwater Management Plan.</li> </ul>	<p><b>Construction Phase</b></p>	<p><b>The cEO/ESO and the ECO.</b></p>	<p><b>Daily.</b></p>	<p>Either the cEO/ESO or the ECO should be present during the installation of foundations and cable trenching to ensure that the management actions are implemented and to provide photographic evidence for inclusion in the audit reports.</p>

**5.28 Installation of equipment (circuit breakers, current Transformers, Isolators, Insulators, surge arresters, voltage transformers, earth switches)**

<p><b>Impact management outcome:</b> No environmental degradation occurs as a result of installation of equipment.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Management of dust must be conducted in accordance with <b>Section 5. 20: Dust emissions</b>;</li> <li>– Management of equipment used for installation must be conducted in accordance with <b>Section 5.18: Workshop</b>,</li> </ul>	<p><b>The Contractor.</b></p>	<ul style="list-style-type: none"> <li>• Method Statement(s).</li> <li>• Implementation of the Waste Management Plan.</li> <li>• Implementation of the</li> </ul>	<p><b>Construction Phase</b></p>	<p><b>The cEO/ESO and the ECO.</b></p>	<p><b>Daily (cEO/ESO) and monthly (ECO).</b></p>	<p>Either the cEO/ESO or the ECO should be present during the installation of equipment to ensure</p>

<p><b>equipment maintenance and storage;</b></p> <ul style="list-style-type: none"> <li>– Management hazardous substances and any associated spills must be conducted in accordance with <b>Section 5.17: Hazardous substances;</b> and</li> <li>– Residual solid waste must be recycled or disposed of in accordance with <b>Section 5.8: Solid waste and hazardous management.</b></li> </ul>		<p><b>Erosion Management Plan.</b></p> <ul style="list-style-type: none"> <li>• <b>Implementation of the Stormwater Management Plan.</b></li> </ul>				<p>that the management actions are implemented and to provide photographic evidence for inclusion in the audit reports.</p>
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**5.29 Steelwork Assembly and Erection**

<p><b>Impact management outcome:</b> No environmental degradation occurs as a result of steelwork assembly and erection.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– During assembly, care must be taken to ensure that no wasted/unused materials are left on site e.g. bolts and nuts</li> <li>– Emergency repairs due to breakages of equipment must be managed in accordance with <b>Section 5. 18: Workshop, equipment maintenance and storage</b> and <b>Section 5.16: Emergency procedures.</b></li> </ul>	<p><b>The Contractor.</b></p>	<ul style="list-style-type: none"> <li>• <b>Supervision.</b></li> <li>• <b>Method Statement(s).</b></li> <li>• <b>Implementation of the Waste Management Plan.</b></li> <li>• <b>Implementation of the Emergency Response Action Plan.</b></li> </ul>	<p><b>Construction Phase</b></p>	<p><b>The cEO/ESO and the ECO.</b></p>	<p><b>Daily (cEO/ESO) and monthly (ECO).</b></p>	<p>Either the cEO/ESO or the ECO should be present during the steelwork assembly and erection to ensure that the management actions are implemented and to provide photographic evidence for inclusion in the audit reports.</p>

**5.30 Cabling and Stringing**

<p><b>Impact management outcome:</b> No environmental degradation occurs as a result of stringing.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Residual solid waste (off cuts etc.) shall be recycled or disposed of in accordance with <b>Section 6.8: Solid waste and hazardous Management;</b></li> </ul>	<p><b>The Contractor and the</b></p>	<ul style="list-style-type: none"> <li>• <b>Supervision.</b></li> <li>• <b>Method Statement(s).</b></li> <li>• <b>Implementation of the</b></li> </ul>	<p><b>Construction Phase.</b></p>	<p><b>The cEO/ESO and the</b></p>	<p><b>Daily (cEO/ESO) and once-</b></p>	<p><b>The cEO/ESO should monitor all cabling and stringing and provide</b></p>

<ul style="list-style-type: none"> <li>– Management of equipment used for installation shall be conducted in accordance with <b>Section 5.18: Workshop, equipment maintenance and storage</b>;</li> <li>– Management hazardous substances and any associated spills shall be conducted in accordance with <b>Section 5.17: Hazardous substances</b>.</li> </ul>	cEO/ESO.	<b>Waste Management Plan.</b> <ul style="list-style-type: none"> <li>• Implementation of the Emergency Response Action Plan.</li> </ul>		ECO.	off (ECO).	feedback on the compliance with the management actions and the conditions to the ECO for inclusion in the audit reports.
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### 5.31 Testing and Commissioning (all equipment testing, earthing system, system integration)

<b>Impact management outcome:</b> No environmental degradation occurs as a result of Testing and Commissioning.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Residual solid waste must be recycled or disposed of in accordance with <b>Section 5.8: Solid waste and hazardous management</b>.</li> </ul>	The Contractor.	Implementation of the Waste Management Plan.	Construction Phase.	The ECO.	Once-off.	The ECO should inspect the site during testing and commissioning and provide feedback on the compliance with the management actions and the conditions in the audit reports. Photographs should be taken of the equipment and the condition of the site and immediate surrounds.

### 5.32 Socio-economic

<b>Impact management outcome:</b> enhanced socio-economic development.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Develop and implement communication strategies to facilitate public participation;</li> <li>– Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process;</li> <li>– Sustain continuous communication and liaison with neighboring owners and residents</li> </ul>	The Contractor and the DSS.	<ul style="list-style-type: none"> <li>• Communication and management.</li> <li>• Implementation of the recommendation and mitigation</li> </ul>	All phases of development.	The cEO/ESO and the ECO.	Daily (cEO/ESO) and monthly (ECO).	The cEO/ESO should compile and maintain an incident and complaints register. This register should be submitted to the ECO on a monthly basis. The ECO should audit compliance



<ul style="list-style-type: none"> <li>– Create work and training opportunities for local stakeholders; and</li> <li>– Where feasible, no workers, with the exception of security personnel, must be permitted to stay over-night on the site. This would reduce the risk to local farmers.</li> </ul>		<b>measures in the Socio-Economic Assessment Report.</b>				<b>with the conditions in the Socio-Economic Assessment Report. Incidents and complaints should be reported to the ECO within 48 hours and the ECO should report all incidents to the DSS.</b>
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### 5.33 Temporary closure of site

<b>Impact management outcome:</b> Minimise the risk of environmental impact during periods of site closure greater than five days.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in <b>sections 5.17: Hazardous substances and 5.18: Workshop, equipment maintenance and storage;</b></li> <li>– Hazardous storage areas must be well ventilated;</li> <li>– Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service;</li> <li>– Emergency and contact details displayed must be displayed;</li> <li>– Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel;</li> <li>– Night hazards such as reflectors, lighting, traffic signage etc. must have been checked;</li> <li>– Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.;</li> <li>– Structures vulnerable to high winds must be secured;</li> <li>– Wind and dust mitigation must be implemented;</li> <li>– Cement and materials stores must have been secured;</li> <li>– Toilets must have been emptied and secured;</li> <li>– Refuse bins must have been emptied and secured;</li> <li>– Drip trays must have been emptied and secured.</li> </ul>	<b>The Contractor and the DSS.</b>	<ul style="list-style-type: none"> <li>• <b>Supervision and management.</b></li> <li>• <b>The implementation of the conditions of this EMPr and all relevant EMPrs.</b></li> </ul>	<b>All phases of development.</b>	<b>The ECO and the DPM.</b>	<b>Whenever temporary site closure occurs.</b>	<b>The ECO should undertake a site inspection prior to the temporary closure of the site. The ECO should include the temporary site closure dates as well as photographic evidence of the condition of the site in the audit reports.</b>

### 5.34 Dismantling of old equipment

Impact management outcome: Impact to the environment to be minimised during the dismantling, storage and disposal of old equipment commissioning.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– All old equipment removed during the project must be stored in such a way as to prevent pollution of the environment;</li> <li>– Oil containing equipment must be stored to prevent leaking or be stored on drip trays;</li> <li>– All scrap steel must be stacked neatly, and any disused and broken insulators must be stored in containers;</li> <li>– Once material has been scrapped and the contract has been placed for removal, the disposal Contractor must ensure that any equipment containing pollution causing substances is dismantled and transported in such a way as to prevent spillage and pollution of the environment;</li> <li>– The Contractor must also be equipped to contain and clean up any pollution causing spills; and</li> <li>– Disposal of unusable material must be at a licensed waste disposal site.</li> </ul>	<b>The Contractor.</b>	<b>The implementation of the Waste Management Plan.</b>	<b>Construction Phase.</b>	<b>The ECO.</b>	<b>Monthly.</b>	<b>Copies of the waste disposal certificates must be submitted to the ECO for inclusion in the audit reports. The ECO should monitor the Contractor's compliance with the Waste Management Plan.</b>

### 5.35 Landscaping and rehabilitation

Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must be disposed of to a registered waste site;</li> <li>– All slopes must be assessed for contouring, and to contour only when the</li> </ul>	<b>The Contractor, a suitably qualified</b>	<ul style="list-style-type: none"> <li>• <b>Compliance with the conditions of the EA and EMPrs.</b></li> <li>• <b>Implementation of</b></li> </ul>	<b>Construction, Post-construction, and</b>	<b>The cEO/ESO and the ECO.</b>	<b>Daily (cEO/ESO) and monthly</b>	<b>The cEO/ESO and ECO should monitor the site landscaping and</b>

<p>need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983</p> <ul style="list-style-type: none"> <li>– All slopes must be assessed for terracing, and to terrace only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983;</li> <li>– Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses that approximates the original condition;</li> <li>– Where new access roads have crossed cultivated farmlands, that lands must be rehabilitated by ripping which must be agreed to by the holder of the EA and the landowners;</li> <li>– Rehabilitation of access roads outside of farmland;</li> <li>– Indigenous species must be used for with species and/grasses to where it compliments or approximates the original condition;</li> <li>– Stockpiled topsoil must be used for rehabilitation (refer to <b>Section 5.24: Stockpiling and stockpiled areas</b>);</li> <li>– Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion;</li> <li>– Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed;</li> <li>– Subsoil must be ripped before topsoil is placed;</li> <li>– The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment;</li> <li>– Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled;</li> <li>– Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly;</li> <li>– Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil.</li> <li>– Where required, re-vegetation including hydro-seeding can be enhanced using a vegetation seed mixture as described below. A mixture of seed can be used provided the mixture is carefully selected to ensure the following: <ul style="list-style-type: none"> <li>a) Annual and perennial plants are chosen;</li> <li>b) Pioneer species are included;</li> </ul> </li> </ul>	<p><b>Botanical Specialist, and the DSS.</b></p>	<p><b>the Erosion Management Plan.</b></p> <ul style="list-style-type: none"> <li>• <b>Implementation of the Stormwater Management Plan.</b></li> <li>• <b>Implementation of the Alien Invasive Vegetation Management Plan.</b></li> <li>• <b>Implementation of the Waste Management Plan.</b></li> <li>• <b>Implementation of the Aquatic Rehabilitation and Monitoring Plan.</b></li> </ul>	<p><b>Operational Phases.</b></p>		<p><b>(ECO).</b></p>	<p><b>rehabilitation against all required conditions. Photographic evidence should be provided in the audit reports as well as the recommendation of additional mitigation measures, where necessary.</b></p>
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c) Species chosen must be indigenous to the area with the seeds used coming from the area; d) Root systems must have a binding effect on the soil; e) The final product must not cause an ecological imbalance in the area						
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**6 ACCESS TO THE GENERIC EMPr**

Once completed and signed, to allow the public access to the generic EMPr, the holder of the EA must make the EMPr available to the public in accordance with the requirements of Regulation 26(h) of the EIA Regulations.

## PART B: SECTION 2

### 7 SITE SPECIFIC INFORMATION AND DECLARATION

#### 7.1 Sub-section 1: contact details and description of the project

##### 7.1.1 Details of the applicant:

Name of applicant: **Ngxwabangu Wind Power (Pty) Ltd.**

Tel No: **+27 (0)41 506 4900**

Fax No: **N/A**

Postal Address: **Same as physical address.**

Physical Address: **Waterfront Business Park, Building 4 – First Floor, 1204 Humerail Road,  
Humerail, Gqeberha, 6001**

##### 7.1.2 Details and expertise of the EAP:

Name of environmental consultancy: **Coastal and Environmental Services (Pty) Ltd. (t/a “CES”)**

Name of EAP: **Dr Alan Carter**

Assisting EAP: **Mrs Caroline Beer (née Evans)**

Tel No: **+27 (0)43 726 7809**

Fax No: **+27 (0)86 410 7822**

E-mail address: [a.carter@cesnet.co.za](mailto:a.carter@cesnet.co.za) | [c.evans@cesnet.co.za](mailto:c.evans@cesnet.co.za)

Expertise of the EAP (Curriculum Vitae included): **Yes, please see Appendix 2.**

##### 7.1.3 Project name: **Proposed Ngxwabangu Wind Energy Facility and Associated Infrastructure, Eastern Cape Province (DFFE Reference Number: Pending).**

##### 7.1.4 Description of the project:

Ngxwabangu Wind Power (Pty) Ltd., a subsidiary of EDF Renewables South Africa (Pty) Ltd. plans to develop, construct and operate a Wind Energy Facility (WEF) approximately 15 km North of Cofimvaba in the Eastern Cape Province. The project site is situated in the Intsika Yethu Local Municipality (LM) which forms part of the Chris Hani District Municipality (DM). The proposed Ngxwabangu WEF is situated within the Stormberg Renewable Energy Development Zone (REDZ4) which was promulgated in GN R. 840 for large scale wind and solar photovoltaic energy facilities.

The proposed Ngxwabangu WEF will consist of up to 36 turbines, with a total facility output of up to 260MW. The WEF will also include up to four (4) 33kV medium voltage internal collector substations (SS), two (2) 33kV medium voltage underground powerlines of up to 6km and 9km in length (two alternatives), a 33 kV medium voltage Overhead Line (OHL) of approximately 12km to connect the northern section to the southern section of the site, an IPP SS (two alternatives) which will include a 33kV/132kV Switching Station area in order to connect the WEF to the existing Eskom Substation via a 132kV OHL (two alternatives). The WEF will also include a Battery Energy Storage System (BESS) (two alternatives), temporary and permanent laydown areas, a Concrete Tower Manufacturing Facility (CTMF), a Construction Compound (CC), and access roads. The

construction footprint of the proposed WEF will be up to 209 ha (inclusive of roads), rehabilitated to an operational footprint of up to 118 ha (inclusive of roads). Please see Figure 1 for the layout map.

In summary, the proposed Ngxwabangu WEF will include:

- Up to 36 turbines with a maximum nominal power output of up to 260MW.
- The proposed WEF will include turbines with a hub height of up to 130m, a rotor diameter of up to 170m, blade length of up to 85m, and a maximum tip height of up to 215m and a lower tip height of 30m.
- Permanent laydown areas adjacent to each wind turbine (up to 4 000 m<sup>2</sup>).
- Temporary laydown areas adjacent to each wind turbine (up to 3 150 m<sup>2</sup>).
- Foundations (up to 900 m<sup>2</sup>) for each wind turbine.
- An IPP Substation of up to 4ha (inclusive of a 33/132kV Eskom Substation, offices and parking and a permanent Substation laydown area). Two alternatives are proposed:
  - IPP Substation Alternative 1: situated in southern area.
  - IPP Substation Alternative 2: situated in the northern area. This is the preferred alternative.
- Four (4) Collector Substations of up 3ha each (33kV). Two (2) of the Collector Substations are situated within the western cluster of turbines and two (2) of the Collector Substations are situated within the eastern cluster of turbines.
- Temporary Laydown Area, Temporary Buffer Yard, Temporary Batching Plant, Temporary CTMF and Temporary Site Camp (Construction Compound) of up to 9ha.
- BESS of up to 3ha. Two alternatives are proposed:
  - BESS Alternative 1: Situated adjacent to the southern IPP Substation (Alternative 1).
  - BESS Alternative 2: Situated adjacent to the northern IPP Substation (Alternative 2). This is the preferred alternative.
- Two (2) medium voltage underground powerlines (up to 33kV) between the Collector Substation and the IPP Substation of up to 6km and 9km in length. Two alternatives are proposed:
  - 33kV Powerline Alternative 1: Connecting the Northern and Eastern Collector Substations to the southern IPP Substation (Alternative 1).
  - 33kV Powerline Alternative 2: Connecting the Northern and Eastern Collector Substations to the northern IPP Substation (Alternative 2). This is the preferred alternative.
- A 33kV medium voltage OHL of approximately 12km to connect the northern section to the southern section of the site.
- Ngxwabangu WEF will require Grid Infrastructure in order to connect to the existing Eskom Grid network. This is proposed via a 132kV OHL from the proposed onsite IPP Substation (33/132kV) to the existing Qolweni Substation. The proposed OHL will be strung with a single circuit tern conductor, up to 22km in length. Four alternatives are being considered.
  - Alternative 1a is proposed from the southern IPP Substation (Alternative 1). This OHL is 132kV and is up to 20km in length.
  - Alternative 1b is proposed from the southern IPP Substation (Alternative 1). This OHL is 132kV and is up to 20km in length.
  - Alternative 2a is proposed from the northern IPP Substation (Alternative 2). This OHL is 132kV and is up to 20km in length. This is the preferred alternative (2a)
  - Alternative 2b is proposed from the northern IPP Substation (Alternative 2). This OHL is 132kV and is up to 20km in length.
- Medium voltage cabling (up to 33kV) between turbines and the collector substations, to be laid underground and along roads, where technically feasible.
- Internal access roads of up 101km constructed at up to 15m wide (construction phase), rehabilitated to 8m wide (operational phase). Existing roads will be used as far as possible. However, where required, internal access roads will be constructed between the turbines.

CES has been appointed by Ngxwabangu Wind Power as the Environmental Assessment Practitioner (EAP) to conduct the necessary BA Process for the project in terms of the National Environmental Management Act (NEMA) (Act No. 107 of 1998, and subsequent amendments) EIA Regulations (2014, as amended).

NGXWABANGU WEF DESIGN SPECIFICATIONS	
Number of turbines	Up to 36
Power output per turbine	Unspecified
Facility output	Up to 260 MW
Turbine hub height	Up to 130 m
Turbine rotor diameter	Up to 170 m
Turbine blade length	Up to 85 m
Turbine upper tip height	Up to 215 m
Turbine lower tip height	30 m
IPP Substations (SS)	33kV
Collector Substations (SS)	33kV
Eskom Substation (SS)	33/132kV
Connecting Overhead Line (OHL)	Up to 132kV
Length of Connecting OHL	Up to 22 km
Conductor Type of OHL	Tern Conductor
Tower Type of OHL	Monopole and/or Lattice Structures
Connecting Cabling	33kV (underground, where technically feasible)
Access Roads	Two Access Points
Main Facility Roads	15 m (construction phase), to be rehabilitated to 8m (operational phase)
OHL Service Road	Up to 3 m jeep track
BESS Technology	Solid State (Li-Ion) or REDOX-Flow
REDZ	Stormberg

FACILITY COMPONENT	CONSTRUCTION FOOTPRINT (PRE-MITIGATION)	OPERATIONAL FOOTPRINT (POST-MITIGATION)
Permanent Turbine Laydown Area	<u>TOTAL</u> 4 000 m <sup>2</sup> x 36 turbines = 144 000 m <sup>2</sup> which equates to <b>14.400 ha</b>	<u>TOTAL</u> 4 000 m <sup>2</sup> x 36 turbines = 144 000 m <sup>2</sup> which equates to <b>14.400 ha</b>
Permanent Turbine Foundation Area	<u>TOTAL</u> Up to 900m <sup>2</sup> x 36 turbines = 32 400 m <sup>2</sup> which equates to <b>3.240 ha</b>	<u>TOTAL</u> Up to 900m <sup>2</sup> x 36 turbines = 32 400 m <sup>2</sup> which equates to <b>3.240 ha</b>
Permanent Turbine Transformer Area	<u>TOTAL</u> Up to 25m <sup>2</sup> x 36 turbines = 900 m <sup>2</sup> which equates to <b>0.090 ha</b>	<u>TOTAL</u> Up to 25m <sup>2</sup> x 36 turbines = 900 m <sup>2</sup> which equates to <b>0.090 ha</b>
Permanent BESS Area	<u>TOTAL</u> Up to 30 000m <sup>2</sup> which equates to <b>3.000 ha</b>	<u>TOTAL</u> Up to 30 000m <sup>2</sup> which equates to <b>3.000 ha</b>
Permanent IPP Substation (including a 33/132kV Switching Station)	<u>TOTAL</u> Up to 40 000m <sup>2</sup> = 40 000 m <sup>2</sup> which equates to <b>4.000 ha</b>	<u>TOTAL</u> Up to 40 000m <sup>2</sup> = 40 000 m <sup>2</sup> which equates to <b>4.000 ha</b>
Permanent Collector Substations (33kV)	<u>TOTAL</u> Up to 30 000m <sup>2</sup> x 4 = 120 000 m <sup>2</sup> which equates to <b>12.000 ha</b>	<u>TOTAL</u> Up to 30 000m <sup>2</sup> x 4 = 120 000 m <sup>2</sup> which equates to <b>12.000 ha</b>
Permanent WEF Gatehouse	<u>TOTAL</u> Up to 40m <sup>2</sup> which equates to <b>0.004 ha</b>	<u>TOTAL</u> Up to 40m <sup>2</sup> which equates to <b>0.004 ha</b>
Temporary Turbine Laydown	<u>TOTAL</u>	<u>TOTAL</u>

FACILITY COMPONENT	CONSTRUCTION FOOTPRINT (PRE-MITIGATION)	OPERATIONAL FOOTPRINT (POST-MITIGATION)
Area	3 150 m <sup>2</sup> x 36 turbines = 113 400 m <sup>2</sup> which equates to <b>11.340 ha</b>	0 m <sup>2</sup> x 36 turbines = 0m <sup>2</sup> which equates to <b>0.000 ha</b>
Temporary WEF Site Camp	<b>TOTAL</b> Up to 90 000m <sup>2</sup> which equates to <b>9.000 ha</b>	<b>TOTAL</b> Up to 0m <sup>2</sup> which equates to <b>0.000 ha</b>
Temporary WEF Laydown Area		
Temporary WEF CTMF Area		
Temporary Buffer Yard		
Temporary WEF Batching Plant		
New Internal Access Roads (15 m construction, rehabilitated to 8 m during operation)	<b>TOTAL</b> Up to 57 000 m x 15m = 855 000 m <sup>2</sup> which equates to <b>85.500 ha</b>	<b>TOTAL</b> Up to 57 000 m x 8m = 456 000 m <sup>2</sup> which equates to <b>45.600 ha</b>
Upgraded Existing Internal Access Roads (15 m construction, rehabilitated to 8 m during operation)	<b>TOTAL</b> Up to 44 000 m x 15m = 660 000 m <sup>2</sup> which equates to <b>66.000 ha</b>	<b>TOTAL</b> Up to 44 000 m x 8m = 352 000 m <sup>2</sup> which equates to <b>35.200 ha</b>
<b>TOTAL FOOTPRINT:</b>	Up to 57.074 ha of clearing needed for the <b>construction phase</b> of the development of the proposed WEF (excluding roads) Up to 208.574 ha of clearing needed for the <b>construction phase</b> of the development of the proposed WEF (including roads)	Up to 36.734 ha of clearing remaining during the post-construction <b>operational phase</b> (after rehabilitation) of the proposed WEF (excluding roads) Up to 117.534 ha of clearing remaining during the post-construction <b>operational phase</b> (after rehabilitation) of the proposed WEF (including roads)

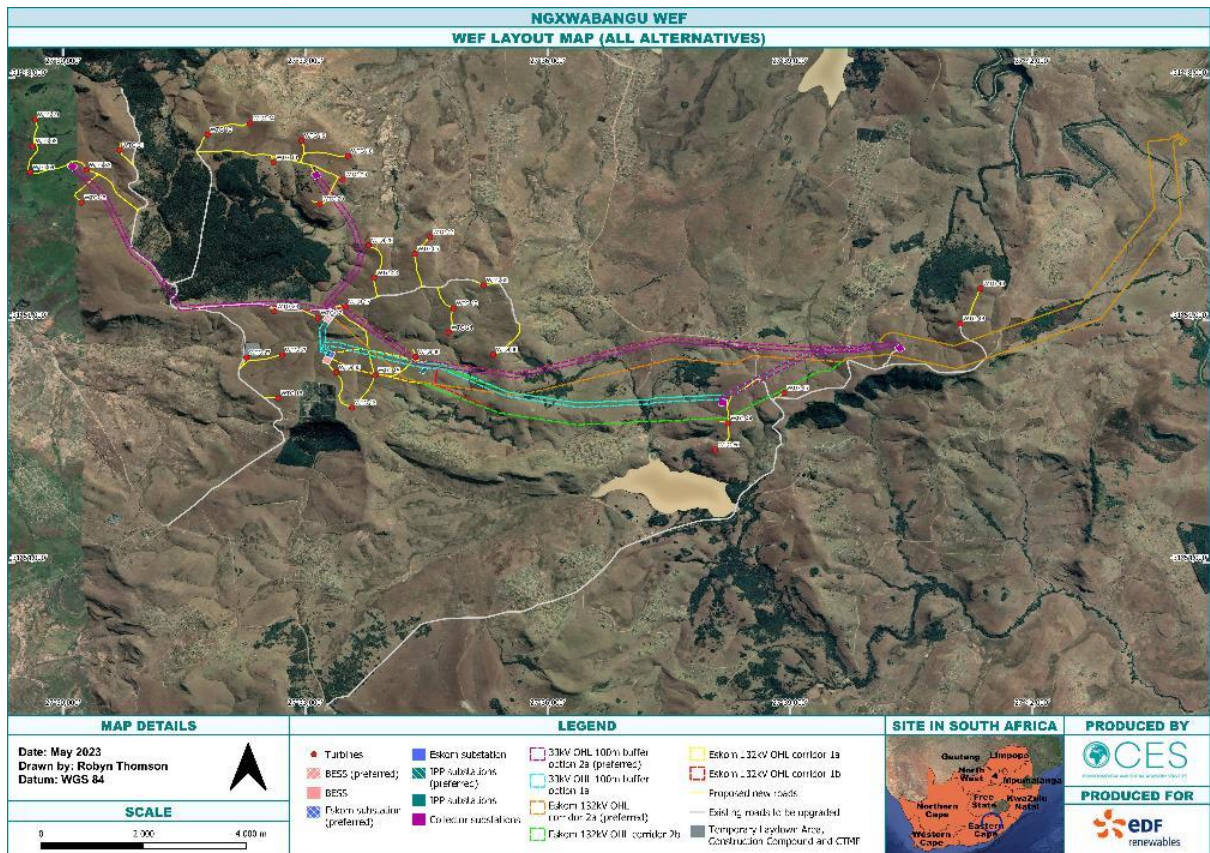


Figure 1: Layout Map of the Proposed Ngxwabangu WEF Development.



7.1.5 Project location:

Table 2: Details of Affected Properties.

NGXWABANGU WIND ENERGY FACILITY			
FARM NAME	SG DIGIT NUMBER	FARM NUMBER/PORTION	AREA (HA)
Nququ Plantation	C1060000000006600000	Portion 0 of Farm 66	1 390
Lower Nququ	C1060000000009500000	Portion 0 of Farm 95	4 605
Farm 98	C1060000000009800000	Portion 0 of Farm 98	2 589
Mcambalala	C10600000000010100000	Portion 0 of Farm 101	3 048
Farm 123	C10600000000012300000	Portion 0 of Farm 123	885
Ngxwabangu	C10600000000017000000	Portion 0 of Farm 170	3 110
Ngcagca	C10600000000018100000	Portion 0 of Farm 181	1450
Upper Ncuncuzo	C10600000000018400000	Portion 0 of Farm 184	2 284
Ncuncuzo	C10600000000018300000	Portion 0 of Farm 183	5 674
Mtshanyana	C10600000000018800000	Portion 0 of Farm 188	3 723
<b>TOTAL</b>			<b>28 758</b>

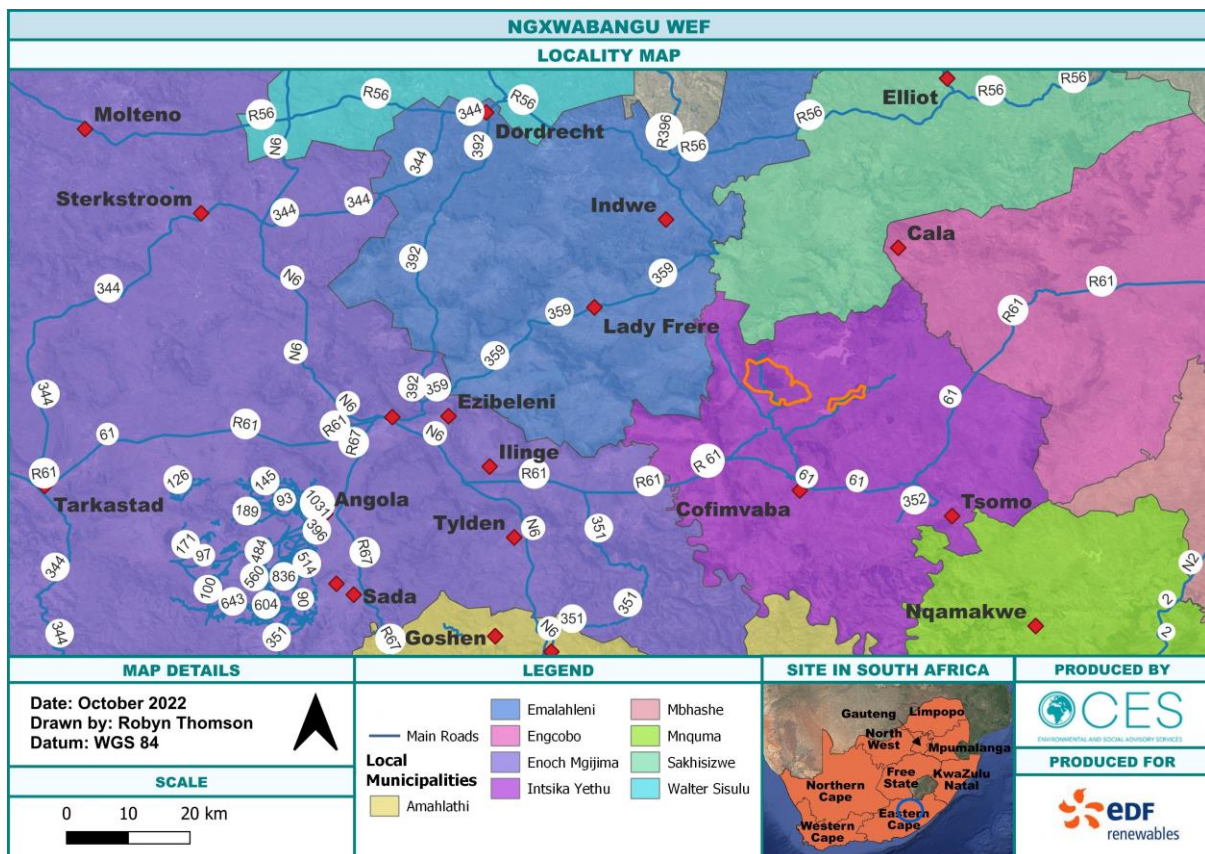


Figure 2: Locality Map of the Proposed Ngxwabangu WEF.

7.2 Sub-section 2: Development footprint site map

This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout. The sensitivity map must be prepared from the national web based environmental screening tool, when

available for compulsory use at: <https://screening.environment.gov.za/screeningtool>. The sensitivity map shall identify the nature of each sensitive feature e.g. threatened plant species, archaeological site, etc. Sensitivity maps shall identify features both within the planned working area and any known sensitive features within 50 m from the development footprint.

**Please see Appendix 3 for the National Screening Tool Report Maps of the proposed WEF, including substations and the various alternatives.**

### 7.3 Sub-section 3: Declaration

The proponent/applicant or holder of the EA affirms that he/she will abide and comply with the prescribed impact management outcomes and impact management actions as stipulated in part B: section 1 of the generic EMPr and have the understanding that the impact management outcomes and impact management actions are legally binding. The proponent/applicant or holder of the EA affirms that he/she will provide written notice to the CA 14 day prior to the date on which the activity will commence of commencement of construction to facilitate compliance inspections.

Signature Proponent/applicant/ holder of EA



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Date: 19 May 2023

### 7.4 Sub-section 4: amendments to site specific information (Part B; section 2)

Should the EA be transferred to a new holder, Part B: Section 2 must be completed by the new holder and submitted with the application for an amendment of the EA in terms of Regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted for an amendment to an environmental authorisation will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMPr for the development and the EMPr becomes legally binding to the new EA holder.

## PART C

### 8 SITE SPECIFIC ENVIRONMENTAL ATTRIBUTES

If any specific environmental sensitivities/attributes are present on the site which require more specific impact management outcomes and actions, not included in the pre-approved generic EMPr template, to manage impacts, those impact management outcomes and impact management actions must be included in this section. These specific management controls must be referenced spatially, and must include impact management outcomes and impact management actions. The management controls including impact management outcomes and impact management actions must be presented in the format of the pre-approved generic EMPr template. This applies only to additional impact management outcomes and impact management actions that are necessary.

If Part C is applicable to the development as authorised in the EA, it is required to be submitted to the CA together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP and the name and expertise of the EAP, including the curriculum vitae are to be included. Once approved, Part C forms part of the EMPr for the site and is legally binding.

This section will **not be required** should the site contain no specific environmental sensitivities or attributes.

### Recommendations of the EAP

The following recommendations are stressed as per the BAR and associated specialist reports:

- ✦ The Biodiversity Offset Strategy must be implemented by the developer (as per the Biodiversity Offset Strategy);
- ✦ Social enhancement recommendations must be considered and financially catered for by the developer (as per the SEIA)
- ✦ All no-go areas must be avoided (as per the current preferred layout, all no-go areas have been avoided with the exception of a section of new road in the Rudd's Lark/Yellow-breasted Pipit area. This will require ground truthing prior to road layout finalisation); and
- ✦ The layout and EMPr are subject to a final walk through by an Avifaunal, Heritage and Botanical specialist prior to approval. This process must include PPP in accordance with the NEMA EIA Regulation (2014, as amended).

The sections below include a comprehensive list of further recommendations, as per the BAR and associated specialist reports, for the various phases of the project.

### Planning and Design Recommendations

The following general planning and design phase mitigation actions are recommended:

- ✦ Reduce the size of the facility and factor in the additional bat sensitivity recommendations to ensure that turbines avoid all sensitive areas.
- ✦ Project planning must include a plan for traffic control that will be implemented, especially during the construction phase of the development. Consultation with the local Road Traffic Unit in this regard must be done early in the planning phase. The necessary road traffic permits must be obtained for transporting parts, containers, materials and construction equipment to the site.

- ✦ Careful planning of the routes taken by heavy vehicles must highlight areas of road that may need to be upgraded in order to accommodate these vehicles. Once identified, these areas must be upgraded if necessary.
- ✦ All hazardous substances such as paints, diesel and cement must be stored in a bunded area with an impermeable surface beneath them.
- ✦ Cement mixing must be conducted at a single location which must be centrally located, where practical. This mixing must take place on an impermeable surface, and dried waste cement must be disposed of with building rubble.
- ✦ Ensure that all relevant legislation and policy is consulted and further ensure that the project is compliant with such legislation and policy. These must include (but not restricted to):
  - Local and District Spatial Development Frameworks
  - Local Municipal bylaws
- ✦ In addition, planning for the construction and operation of the proposed energy facility must consider available best practice guidelines.
- ✦ Turbine and ancillary infrastructure (except roads) must be located at least 32m away from identified drainage lines.
- ✦ A Stormwater Management Plan must be designed and implemented to ensure maximum water seepage at the source of water flow. The plan must also include management mitigation measures for water pollution, wastewater management and the management of surface erosion e.g. by considering the applicability of contouring, etc.
- ✦ Develop and implement a Waste Management Plan for handling on site waste.
- ✦ Designate an appropriate area where waste can be stored before disposal.
- ✦ General Waste must be disposed of at a registered landfill site.
- ✦ Wherever possible, construction activities must be undertaken during the driest part of the year to minimize downstream sedimentation due to excavation, etc.
- ✦ When not possible, suitable stream diversions structures must be used to ensure that rivers/streams are not negatively impacted by construction activity.
- ✦ Aquatic: The final design must avoid the indicated No-Go areas.
- ✦ Aquatic: A pre-construction walkthrough with an aquatic specialist is recommended and they can assist with the development of the stormwater management plan and Aquatic Rehabilitation and Monitoring plan, coupled to micro-siting of the final layout.
- ✦ Aquatic: A Stormwater Management Plan must be developed in the preconstruction phase, detailing the stormwater structures and management interventions that must be installed to manage the increase of surface water flows directly into any natural systems. The stormwater management infrastructure must be designed to ensure the runoff from the development is not highly concentrated before entering the buffer area.
- ✦ Avifauna: If more than five years elapses between this study and construction, there may be a need to conduct further monitoring on site to determine whether any significant avifaunal features have changed in the interim.
- ✦ Avifauna: A pre-construction avifaunal walk down should be conducted to confirm final layout and identify any sensitivities that may arise between the conclusion of the BA process and the construction phase. This should be done between October and March, and ideally not more than 3 months before the start of construction.
- ✦ Avifauna: A Biodiversity Management Plan (BMP) must be designed by an ornithologist for the site prior to the Commercial Operation Date (COD). This BMP should include a bird fatality threshold and adaptive management policy, which identifies the number of bird fatalities of priority species which will trigger a management response, appropriate responses, and timelines for such responses. Fatalities of priority bird species are usually rare events (but with very high consequence) and it is difficult to analyse trends or statistics related to these fatalities as they occur. It is therefore important to have a threshold policy in place proactively to assist adaptive management. The BMP should form an annexure of the operational EMP for the facility.
- ✦ A 'Cape Vulture Food Management Programme' must be implemented on site to ensure all dead livestock/wildlife on site are removed as soon as possible and made unavailable to vultures for feeding. This programme will reduce the amount of available vulture food on site and reduce vulture-turbine collision risk. This programme will require the deployment of a dedicated (i.e. no other tasks) and adequately resourced (transport, binoculars, GPS, cameras, training) team of staff to patrol the full site during all daylight hours. This team will need to have a vehicle and the appropriate equipment to be able

to dispose of large dead animals off site. This programme must be operational by the time the first turbine blades are turning on site and should not wait for COD. A full detailed protocol for this programme is included as Appendix 10 and must be updated and included in the BMP/EMPr. This programme should if possible be combined with the initiation of a 'vulture restaurant' a suitable distance off site – where vultures are fed (and the above mentioned carcasses are disposed of) in order to provide an attraction for vultures away from the turbines.

## Construction Recommendations

**The following general Construction Phase mitigation actions are recommended:**

- ✦ Fugitive/nuisance dust must be reduced by implementing one of or a combination of the following:
  - Damping down of un-surfaced and un-vegetated areas;
  - Retention of vegetation where possible;
  - Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas; and/or
  - A speed limit of 40km/h must not be exceeded onsite dirt roads.
- ✦ Any complaints or claims emanating from the lack of dust control must be attended to immediately by the Contractor.
- ✦ There must be no burning of construction waste or debris onsite.
- ✦ Burning of vegetation is not permitted on site.
- ✦ Smoking on site must be confined to a designated area in the vicinity of the site office which must be equipped with the necessary fire extinguishers.
- ✦ The recommendations of the stormwater management plan must be implemented to avoid soil erosion and siltation of drainage line.
- ✦ There must be no earthworks within 32m of the drainage lines to avoid contamination of water sources (except for road construction, where approved).
- ✦ A Waste Management Plan incorporating recycling and waste minimisation must be implemented. The Waste Management Plan must be explained to all employees as part of the environmental induction training.
- ✦ The storage of fuels and hazardous materials must be located away from sensitive water resources.
- ✦ All hazardous substances (e.g. diesel, oil drums, etc.) must be stored in a bunded area.
- ✦ The recommendations of the Stormwater Management Plan must be implemented during construction.
- ✦ All construction materials must be stored in a central and secure location with controlled access with an appropriate impermeable surface.
- ✦ Materials used for infilling must be suitably stabilized to ensure that scour and erosion of the existing bed/banks is exacerbated.

**The following aquatic Construction Phase mitigation actions are recommended:**

- ✦ Where large cut and fill areas are required, these must be stabilised and rehabilitated during the construction process, to minimise erosion and sedimentation.
- ✦ Suitable stormwater management systems must be installed along roads and other areas and monitored during the first few months of use. Any erosion / sedimentation must be resolved through whatever additional interventions maybe necessary (i.e., extension, energy dissipaters, spreaders, etc).
- ✦ Use existing roads or upgrade existing tracks to cross wetlands rather than constructing entirely new roads wherever possible.
- ✦ Use the smallest possible working corridor. Outside the working corridor, all watercourses are to be considered no go areas. Any unnecessary intrusion into these areas is prohibited. Where intrusion is required, the working corridor must be kept to a minimum and demarcated clearly, before any construction commences.
- ✦ Removal of vegetation must only be when essential for the continuation of the project. Do not allow any disturbance to the adjoining natural vegetation cover or soils.

- ✦ All pipe culverts must be removed and replaced with suitable sized box culverts, where road levels are raised. Crossings that are installed below the natural ground level are to be constructed with an appropriate drop inlet structure on the upstream side to ensure that headcut erosion does not develop as a result of the gradient change from the natural ground level to the invert level of the culvert.
- ✦ The channel profile, regardless of the current state of the river / water course, will be reinstated thus preventing any impoundments from being formed. The related designs must be assessed by an aquatic specialist during a pre-construction walkdown.
- ✦ Water diversions must be temporary in nature and no permanent walls, berms or dams may be installed within a watercourse. Sandbags used in any diversion or for any other activity within a watercourse must be in a good condition, so that they do not burst and empty sediment into the watercourse. Upon completion of the construction at the site, the diversions shall be removed to restore natural flow patterns. Under no circumstance shall a new channel or drainage canals be excavated to divert water away from construction activities.
- ✦ Any fauna (frogs, snakes, etc.) that are found within the construction area must be moved to the closest point of similar habitat type outside of the areas to be impacted.
- ✦ All disturbed areas beyond the construction site that are intentionally or accidentally disturbed during the construction phase must be rehabilitated.
- ✦ It is the contractor's responsibility to continuously monitor the area for newly established alien species during the contract and establishment period, which if present must be removed. Removal of these species shall be undertaken in a way which prevents any damage to the remaining indigenous species and inhibits the re-infestation of the cleaned areas.
- ✦ The buffer area must be considered as a No-Go area for development and large infrastructure.
- ✦ The volume and velocity of water must be reduced through discharging the surface flow at multiple locations surrounding the development, preventing erosion.
- ✦ Effective stormwater management must include effective stabilisation (gabions and Reno mattresses) of exposed soil. Contingency plans must be in place for high rainfall events which may occur during construction.
- ✦ Monitoring of the project activities is essential to ensure the mitigation measures are implemented. Compliance with the mitigation recommendations must be audited by a suitably qualified independent Environmental Control Officer with an appropriately timed (monthly) audit report.
- ✦ Sedimentation must be minimised with appropriate measures. Any construction, within or directly upslope of a watercourse, causing bare slopes and surfaces to be exposed to the elements must include measures to protect against erosion using rows of silt fences, sandbags, hay bales and/or earthen berms spaced along contours at regular intervals. Construction must have contingency plans for high rainfall events during construction.
- ✦ Energy dissipaters should be installed to prevent scour at any culvert outlet. This can be constructed of appropriately sized rock armour. Coarse bedding material or geotextile wrapped dump rock must be considered for use wherever the roads crosses wetland characterized by diffuse subsurface flows such as the seeps.
- ✦ Stormwater infrastructure must be inspected at least once every year (before the onset of rains) to ensure that it is working efficiently. Any evidence of erosion from this stormwater system must be rehabilitated and the volume/velocity of the water reduced through further structures and/or energy dissipaters.
- ✦ All liquid chemicals including fuels and oil, including for the BESS, must be stored in with secondary containment (bunds or containers or berms) that can contain a leak or spill. Such facilities must be inspected routinely and must have the suitable PPE and spill kits needed to contain likely worst-case scenario leak or spill in that facility, safely.
- ✦ Washing and cleaning of equipment must be done in designated wash bays, where rinse water is contained in evaporation/sedimentation ponds (to capture oils, grease cement and sediment).
- ✦ Mechanical plant and bowsers must not be refuelled or serviced within 100m of a river channel.
- ✦ All construction camps, lay down areas, wash bays, batching plants or areas and any stores should be more than 50 m from any demarcated water courses.
- ✦ Littering and contamination associated with construction activity must be avoided through effective construction camp management.
- ✦ No stockpiling should take place within or near a water course.
- ✦ All stockpiles must be protected and located in flat areas where run-off will be minimised and sediment recoverable.

- ✦ ESO monitors the site on a daily basis to ensure plant is in working order (minimise leaks), spills are prevented and if they do occur, are quickly rectified.

**The following avifaunal Construction Phase mitigation actions are recommended:**

- ✦ The No-Go areas identified by this study (which build on those identified in the screening phase) should be adhered to.
- ✦ No internal medium voltage power lines (33kV) should be overhead.
- ✦ All construction activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.
- ✦ A post construction inspection must be conducted by an avifaunal specialist to confirm that all aspects have been appropriately handled and in particular that road and hard stand verges do not provide additional substrate for raptor prey species. It is essential that the new wind farm does not create favourable conditions for such mammals in high risk areas. We therefore recommend that within the first year of operations a full assessment of this aspect be made by the ornithologist contracted for post construction monitoring. If such conditions have been created case specific solutions will need to be developed and implemented by the wind farm.
- ✦ A Biodiversity Management Plan (BMP) must be designed by an ornithologist for the site prior to the Commercial Operation Date (COD). This BMP should include a bird fatality threshold and adaptive management policy, which identifies the number of bird fatalities of priority species which will trigger a management response, appropriate responses, and timelines for such responses. Fatalities of priority bird species are usually rare events (but with very high consequence) and it is difficult to analyse trends or statistics related to these fatalities as they occur. It is therefore important to have a threshold policy in place proactively to assist adaptive management. The BMP should form an annexure of the operational EMPr for the facility.
- ✦ A 'Cape Vulture Food Management Programme' must be implemented on site to ensure all dead livestock/wildlife on site are removed as soon as possible and made unavailable to vultures for feeding. This programme will reduce the amount of available vulture food on site and reduce vulture-turbine collision risk. This programme will require the deployment of a dedicated (i.e. no other tasks) and adequately resourced (transport, binoculars, GPS, cameras, training) team of staff to patrol the full site during all daylight hours. This team will need to have a vehicle and the appropriate equipment to be able to dispose of large dead animals off site. This programme must be operational by the time the first turbine blades are turning on site and should not wait for COD. A full detailed protocol for this programme is included as Appendix 10 and must be updated and included in the BMP/EMPr. This programme should if possible be combined with the initiation of a 'vulture restaurant' a suitable distance off site – where vultures are fed (and the above mentioned carcasses are disposed of) in order to provide an attraction for vultures away from the turbines.

**The following bat Construction Phase mitigation actions are recommended:**

- ✦ Avoid High sensitive areas. Currently, no proposed turbines (including their full rotor swept areas) encroach on High sensitive areas. Ensure that any new buildings, substation, BESS, construction camp, laydown areas, and possible quarry/ies avoid all High sensitive areas and instead, are positioned ideally in Medium sensitive areas.
- ✦ Minimize disturbance of Medium-High sensitive areas. Currently, no proposed turbines (including their full rotor swept areas) encroach on Medium-High sensitive areas.
- ✦ Implement curtailment of turbines in Medium sensitive areas, as soon as the first turbine is operational, below an initial cut-in speed of 5 m/s during temperatures of 12 °C or warmer for four hours after sunset from 1 June to 31 October, and from sunset to sunrise from 1 November to 31 May. The 5 m/s turbine cut-in wind speed represents the wind speed associated with approximately 50% of all bat activity recorded at 73-110 m above ground level in 2021/2022 by IWS.
- ✦ Minimize road impacts. Minimize the length and breadth of proposed roads, and thus minimize the clearing and disturbance of natural areas (including potential bat roosting habitat).
- ✦ Avoid blasting within 2 km of a confirmed roost.



- ✦ Minimize degradation of terrestrial habitat (potential bat foraging and roosting habitat). Implement and maintain effective invasive alien plant, stormwater, erosion, sediment, and dust control measures.
- ✦ Ensure that turbines can be fitted with bat detectors and deterrent devices. Turbine engineers must consult with bat specialists to incorporate the necessary turbine adaptations for this during the design phase, so there are no unexpected surprises or concerns after the turbines are built.
- ✦ Minimize artificial lighting on site. Apart from compulsory civil aviation lighting, minimize artificial lighting - especially high-intensity, steady-burning, sodium vapour, quartz, halogen, and other bright lights at substations, offices, and turbines. All non-aviation lights should be hooded downward and directed to minimise horizontal and skyward illumination. Where possible, solar-powered motion-sensitive lights should be used.
- ✦ Commence again with acoustic bat monitoring. A detector(s) should be installed on the meteorological mast just before construction commences, and monitoring should occur throughout construction, during the first and second years of operation, and again during the fifth year of operation, and every fifth year thereafter.
- ✦ Perform operational bat monitoring as soon as the first turbine is operational - as per the latest SABAA guideline for this (Aronson et al. 2020 or later). The quality of the operational monitoring and data analysis are to be conducted to a high standard so that there is confidence in the data and the fatality estimate results.
- ✦ Adaptively manage bat fatalities by consulting the latest SABAA guideline for this (Aronson et al. 2020 or later), and the best available relevant scientific information. The specialist conducting the Year 1 and Year 2 operational monitoring should provide recommendations for adaptive management of the above strategy after the second year of operational monitoring. Allowance should be made in the financial provision for adaptive management and mitigation of bat fatalities.
- ✦ If the operational bat monitoring and data analysis are not conducted properly as per Aronson et al. 2020 (or later), and/or if the bat fatality threshold is exceeded (determined as per MacEwan et al. 2018 or later), improved bat fatality mitigation must be promptly implemented. Unless the WEF's operational bat monitoring data suggest otherwise, and/or unless there are other measures that have been proven to effectively mitigate bat fatalities at WEFs, turbine curtailment should be implemented below an initial cut-in speed of 7 m/s during temperatures of 12 °C or warmer for four hours after sunset from 1 June to 31 October, and from sunset to sunrise from 1 November to 31 May. The 7m/s turbine cut-in wind speed represents the wind speed associated with approximately 80% of all bat activity recorded at 73-110 m above ground level in 2021/2022 by IWS.
- ✦ Submit quarterly and annual bat fatality monitoring reports to SABAAP (the South African Bat Assessment Association Panel), EWT (the Endangered Wildlife Trust), and the DEFF (the national Department of Environment, Forestry and Fisheries).
- ✦ Forward all (live and fatality) bat monitoring data to the database recommended by SABAA to expand the scientific knowledge base for more informed decision making and mitigation.
- ✦ Rehabilitate disturbed terrestrial habitat and water resources (bat foraging habitat). Implement effective rehabilitation of disturbed terrestrial habitat and water resources based on consultation with an appropriate experienced specialist(s). Carefully manage alien vegetation, livestock grazing, and water points.

**The following ecological Construction Phase mitigation actions are recommended:**

- ✦ An Erosion Management Plan / Method Statement should be compiled and implemented during the Construction Phase.
- ✦ Vegetation clearance must be kept to a minimum and retained where possible to avoid soil erosion.
- ✦ Disturbed areas must be rehabilitated as soon as possible after construction.
- ✦ The site must be monitored regularly for signs of erosion. Remedial action must be taken at the first signs of erosion.
- ✦ Vegetation clearance must be strictly limited to that which is necessary for the construction of the proposed Ngxwabangu WEF. Blanket and strip clearing should be avoided where possible.
- ✦ Maintain basal cover where possible and reduce/control soil erosion. These important management actions for restoring and maintaining healthy grasslands.
- ✦ Where excavation is required, topsoil should be removed and managed for use during rehabilitation. Topsoil often contains a large seedbank which can aid in the restoration of impact areas.

- ✦ Impacted areas that do not form part of the development footprint, and which are not required during the operational phase, must be rehabilitated as soon as possible after construction. Impacted areas should be spread with topsoil and planted species indigenous to the natural vegetation type of the project area.
- ✦ Where possible, lay down areas should be located within previously disturbed areas. Laydown areas cannot be located within sensitive areas such as wetlands/ forest patches.
- ✦ Employees must be prohibited from making open fires during the construction phase.
- ✦ Existing roads must be utilised as far as practically and feasibly possible.
- ✦ An Alien Invasive Management Plan must be compiled and implemented during all phases of the proposed development.
- ✦ The footprint of the proposed development must be micro-sited prior to construction. Should populations of threatened SCC be identified during micro-siting, the design and placement of the turbine hardstands and associated infrastructure components should be amended to avoid these populations. If this is not possible, permits for the removal and translocation of these populations must be obtained. Should translocation of threatened SCC be required, threatened SCC must be translocated to the same habitat type by a qualified botanist/horticulturalist.
- ✦ Do not use herbicides or hoeing in the creation of firebreaks.
- ✦ A Fire Management Plan must be drafted by a suitably qualified specialist and implemented during the operation of the proposed Ngxwabangu WEF
- ✦ Permits must be obtained for the removal/translocation of SCC protected in terms of the PNCO.
- ✦ All forest patches must be delineated and declared as no-go areas.
- ✦ A 50 m no-go buffer must be established and delineated around all forest patches within the project area.
- ✦ No construction activities must be permitted within no-go areas.
- ✦ The footprint of turbine hardstands, roads, and other project related infrastructure must be micro-sited prior to construction. Should populations of threatened SCC be identified during micro-siting, the design and placement of the project components should be amended to avoid these populations. If this is not possible, permits for the removal and translocation of these populations must be obtained. Should translocation of threatened SCC be required, threatened SCC must be translocated to the same habitat type by a qualified botanist/horticulturalist.
- ✦ Permits for the removal of plant species protected in terms of the Nature and Environmental Conservation Ordinance 19 of 1974, TOPS and List of Protected Trees must be obtained prior to vegetation clearance/translocation.
- ✦ Construction vehicles and machinery must not encroach into identified 'no-go' areas or areas outside the project footprint.
- ✦ Any impacted areas outside of the development footprint must be rehabilitated using indigenous plant species commonly occurring within the vegetation types of the project area.
- ✦ Identify and maintain ecological corridors within the broader landscape to ensure the maintenance of ecosystem processes.
- ✦ The site must be checked regularly for the presence of alien invasive species.
- ✦ All alien invasive species that establish as a result of the project must be removed and disposed of as per the Working for Water Guidelines.
- ✦ An Alien Invasive Management Plan must be compiled and implemented from the proposed Ngxwabangu WEF, BESS and Grid Connection.
- ✦ The relevant permit must be acquired for any removal of amphibians and reptiles within the study area that are listed as either Schedule I or II on the PNCO.
- ✦ All construction staff must be educated with regards to wildlife conservation, and all staff employed by the developer must ensure that any amphibians or reptiles encountered during construction of the proposed development are not harmed or killed.
- ✦ Amphibians and reptiles encountered must be allowed to move away from the construction area. In the event they need to be translocated, amphibians must be released in the same catchment areas while reptiles must be relocated to directly adjacent areas of the proposed development. No amphibian or reptile species may be removed off site without proper authorisation from the relevant authority.
- ✦ A rescue plan must be developed to protect reptiles which could fall into construction pits.
- ✦ The appointed ESO should be trained in snake handling and removal techniques.
- ✦ Any amphibian or reptile species that may die due to construction activities associated with the proposed development must be recorded (e.g., photographed and GPS coordinates taken) and reported to the appointed ECO and relevant authorities (i.e., EWT). Where needed, the carcass should be donated to SANBI.

- ✦ All individuals, including construction workers, must sign a register prior to accessing the construction site.
- ✦ Construction workers must not be housed on site.
- ✦ Speed restrictions (40 km per hour is recommended) must be implemented to reduce the chance of road kills, as well as to reduce the amount of dust caused by vehicle movement along the roads.
- ✦ The construction of turbine handstands or project related infrastructure on rocky outcrops and/or permanent waterbodies must be avoided. Moreover, some amphibian species breed in temporary waterbodies, therefore it is recommended that where possible construction activities should take place outside of the wet and rainy season.
- ✦ All reasonable and feasible measures should be implemented to reduce noise in ecologically sensitive areas.
- ✦ The relevant permit must be acquired for the removal of any mammals within the study area that are listed as either Schedule I or II on the PNCO.
- ✦ Any mammals encountered must be allowed to move away from the construction area. No mammal may be removed off site without proper authorisation from the relevant authority.
- ✦ Any mammal species that may die due to construction activities associated with the proposed development must be recorded (e.g., photographed and GPS coordinates taken) and reported to the appointed ECO and relevant authorities (i.e., EWT). Where needed, the carcass should be donated to SANBI.
- ✦ A Search and Rescue Operation must be undertaken for protected amphibian and reptile species.
- ✦ The relevant permit must be acquired for the removal of any amphibians and reptiles within the study area that are listed as either Schedule I or II on the PNCO.
- ✦ Not all areas can be avoided, but it is recommended that construction staff must be educated with regards to wildlife conservation and that all staff employed by the developer ensure that any amphibians or reptiles encountered are not harmed or killed.
- ✦ Amphibians or reptiles encountered must be allowed to move away from the construction area. In the event they need to be translocated, amphibians must be released in the same catchment area while reptiles must be relocated to directly adjacent areas of the proposed development. No amphibians or reptiles may be removed off site without proper authorisation from the relevant authority.
- ✦ Where possible, amphibian or reptile SCC observed on site must be recorded (photographed, GPS coordinates taken) and loaded onto iNaturalist by the appointed ESO.
- ✦ The hunting, baiting, or trapping of mammals by construction staff must be strictly prohibited.
- ✦ The appointed ESO should inquire and undertake an overview inspection of the site for the evidence of snares during the construction phase.

**The following heritage Construction Phase mitigation actions are recommended:**

- ✦ Site Monitoring: Regular examination of trenches and excavations.
- ✦ Monitor as frequently as practically possible. Preferred Mitigation Procedure: Avoidance: Implement a heritage conservation buffer of at least 100m around the heritage resource, redesign infrastructure to avoid the heritage resource and the proposed conservation buffer.
- ✦ Alternative Mitigation Procedure (if preferred mitigation procedure is not feasible): Documentation of sites if features are to be impacted on by development (mapping, desktop study Phase 2 site sampling). Permitting if and when required.
- ✦ Social Consultation: It is suggested that local communities be consulted with regards to the religious and social meaning of the site and possible impacts / management of the site.
- ✦ Avoidance: Implement a heritage conservation buffer of at least 50m from all burials / graves. Where digging / construction encroaches on this buffer, erect a temporary construction barricade around burials to clearly indicate the location of burials. Implement a site management plan detailing strict site management conservation measures.
- ✦ Grave Relocation: Relocation of burials and documentation of site, full social consultation with affected parties, possible conservation management and protection measures. Subject to authorisations and relevant permitting from heritage authorities and affected parties.

**The following noise Construction Phase mitigation actions are recommended:**

- ✦ It is recommended that the applicant plan that access roads are not constructed at night.
- ✦ Plan construction schedule that such simultaneous activities are only required at one WTG location (located within 1,000m from an NSR). Other simultaneous construction activities can continue, but should take place further than 1,000m from NSR; and
- ✦ Minimise active equipment at night, planning the completion of noisiest activities (though unlikely, could include activities such as pile driving, rock breaking and excavation) during the daytime period.

**The following palaeontology Construction Phase mitigation actions are recommended:**

- ✦ A Chance Find Palaeontology Management Plan must be implemented during the construction phase.

**The following socio-economic Construction Phase mitigation actions are recommended:**

- ✦ The wind energy facility developer, EDF Renewables, should prescribe that the EPC contractor prioritises local procurement of goods and services where possible from nearby sourcing hubs being Komani and Mthatha. This will be limited to more general construction related goods and services as well as generic machinery.
- ✦ The EPC should also be encouraged to raise awareness amongst local businesses as well as aspiring entrepreneurs within the study area prior to the construction taking place. Awareness should extend to catering companies as well as accommodation businesses in the nearby towns and generic construction businesses as mentioned above.
- ✦ Sub-contract to local construction and transport companies particularly MSME's, B-BBEE compliant and women-owned enterprises where possible.
- ✦ Use local suppliers where feasible and arrange with the local MSME's to provide transport, catering and other services to the construction crews.
- ✦ Co-ordinate and arrange local community meetings through the Instika Yethu local municipality, labour unions and local traditional councils to advise the local labour force about the proposed project and the jobs that can potentially be applied for.
- ✦ Establish numerous local skills desks to determine the potential skills that could be sourced from the area. Skills desks could be located at the stone quarry and the Lubisi conference centre found in the Mcambalala traditional council as well as the local clinic found within the proposed study area as well as in nearby towns such as Cofimvaba and Komani.
- ✦ Recruit local labour as far as feasible.
- ✦ Provide the local labour force with necessary training prior to the construction phase.
- ✦ Employment of labour-intensive methods in construction where feasible.
- ✦ Facilitate knowledge and skills transfer between highly specialised technical experts and South African professionals during the pre-establishment and construction phases.
- ✦ Provide basic construction training to recruited local members before the construction phase takes place.
- ✦ Set up apprenticeship programmes to build onto existing skill levels or develop new skills amongst construction workers especially those from the local communities.
- ✦ Improved labour productivity and employability of construction workers for similar projects proposed in the province.
- ✦ Possible development of provincial skills and expertise in R&D and manufacturing, specialist services and construction industries related to the wind energy industry through partnerships with Nelson Mandela University, Rhodes University, Walter Sisulu University and the University of Fort Hare.
- ✦ Recruit local labour as far as feasible to increase the benefits to the local households.
- ✦ Employ labour intensive methods in construction where feasible.
- ✦ Sub-contract to generic local construction companies where possible.
- ✦ Use local suppliers where feasible and arrange with local MSME's and B-BBEE compliant enterprises to provide transport, catering and other services to the construction crews.
- ✦ Set up a recruitment office in the nearby towns (such as Cofimvaba and Komani) and adhere to strict labour recruitment practices that would reduce the desire of potential job seekers to loiter around the area in the hope of finding temporary employment.

- ✦ Control the movement of workers between the site and areas of temporary residence to minimise loitering around the site. This should be achieved through the provision of scheduled transportation services between the construction site and area of residence.
- ✦ Involve the traditional leaders from the four administrative areas of the study area to inform the EPC contractor and the proposed development team at large about the cultural and religious land practices that are followed in the study area.
- ✦ The traditional leaders should be encouraged to assign a reliable person in their respective administration area to deal with complaints of their community members.
- ✦ Employ locals as far as feasible through the creation of a local skills database.
- ✦ Establish a management forum comprising of key stakeholders to monitor and identify potential problems that may arise due to the influx of job seekers to the area.
- ✦ Ensure that any damages or losses to nearby buildings that can be linked to the conduct of construction workers are adequately reimbursed.
- ✦ Assign a dedicated person to deal with complaints and concerns of affected parties.
- ✦ Provide adequate signage along relevant road networks to warn the motorists of the construction activities taking place on the site.
- ✦ Engage with local authorities and inform them of the development as well as discuss with them their ability to meet the additional demands on social and basic services created by the in migration of workers.
- ✦ Where feasible, assist the municipality in ensuring that the quality of the local social and economic infrastructure does not deteriorate through the use of social responsibility allocations.
- ✦ The developer and EPC contractor should ensure prior to the construction phase that they make use of their own mobile social services and economic infrastructure as far as possible, i.e., the use of a mobile clinic on site for the construction team as well as a generator for their own electricity supply as well as water tanks and boreholes as suitable water sources.
- ✦ The mitigation measures proposed by the visual and noise specialists should be adhered to.
- ✦ Natural environments that are not affected and needed by the proposed development should remain untouched. Regulations of boundaries of such areas need to be made transparent between the local community's leaders, the developer and EPC contractor prior to the development's construction phase.
- ✦ Efforts should also be made to avoid disturbing such sites during construction.

**The following visual Construction Phase mitigation actions are recommended:**

- ✦ Ensure that vegetation is not unnecessarily removed during the construction period.
- ✦ Reduce the construction period through careful logistical planning and productive implementation of resources.
- ✦ Plan the placement of lay-down areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e., in already disturbed areas) wherever possible.
- ✦ Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.
- ✦ Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.
- ✦ Reduce and control construction dust using approved dust suppression techniques as and when required (i.e., whenever dust becomes apparent).
- ✦ Where possible, restrict construction activities to daylight hours in order to reduce lighting impacts as much as possible.
- ✦ Rehabilitate all disturbed areas immediately after the completion of construction works.
- ✦ Reduce the construction period through careful logistical planning and productive implementation of resources.
- ✦ Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.

## **Operational Recommendations**

**The following general Operational Phase mitigation actions are recommended:**

- ✦ All project structures and buildings must be maintained.
- ✦ All hazardous substances must be stored in appropriately bunded locations.
- ✦ Recommendations of the Stormwater Management Plan must be implemented and monitored.
- ✦ A Waste Management Plan incorporating recycling and waste minimisation must be implemented. The Waste Management Plan must be explained to all employees as part of the environmental induction training.

**The following avifaunal Operational Phase mitigation actions are recommended:**

- ✦ An observer or technology led turbine Shutdown on Demand (SDOD) programme must be implemented on site from COD. In South Africa, observer led Shutdown on Demand has recently shown promise at an operational wind farm in the Western Cape. It is likely that by the time of construction of the proposed project more experience on this mitigation will be available in country. This is required in order to mitigate the risk of turbine collision for Cape Vulture in particular, but will also address risk to other species. If an observer led programme is used, this programme must consist of a suitably qualified, trained and resourced team of observers present on site for all daylight hours 365 days of the year. This team must be stationed at vantage points with full visible coverage of all turbine locations. The observers must detect incoming priority bird species, track their flights, judge when they enter a turbine proximity threshold, and alert the control room to shut down the relevant turbine until the risk has reduced. A full detailed protocol is included in Appendix 11 and must be updated and included in the BMP/EMPr. If a technology led option is used, preference should be given to a system that has been independently reviewed for efficacy. We crudely estimated how many shutdowns could be expected based on pre-construction monitoring data. When Cape Vulture flight paths are clipped to a 500m proximity to the current turbine layout, 26 records were made in 360 hours of observation. This translates into a passage rate of 0.072birds/hr. Converting this to a year results in approximately 315 shutdown events per year. At an assumed 10 minutes shutdown at 1 turbine per event, this means 3 150 minutes of turbine downtime in a year. The facility of 36 turbines will operate for a total of 18 921 600 minutes per year (24hrs x 60 minutes x 365days x 36 turbines) this equates to 0.01% lost operating time. Even if the estimate is wrong and the real loss is ten times higher, it would be 0.1%. EDFR has confirmed that this is acceptable to them.
- ✦ One turbine blade must be painted according to a protocol currently under development by the South African Wind Energy Association (SAWEA) from the outset. Provision must be made by the developer for the resolution of any technical, warranty, supplier challenges that this may present.
- ✦ Any residual impacts after all possible mitigation measures have been implemented will need to be mitigated off site. The facility will need to address other sources of mortality of priority species in a measurable way (according to best practice) so as to compensate for residual effects on the facility itself. An example of such off-site mitigation could be the retrofitting of insulation onto existing Eskom power lines in the project vicinity which pose an electrocution risk to vultures. This is a measurable impact which is not currently mitigated adequately by Eskom due to the cost. The project could contribute to the cost of such mitigation. Please see Biodiversity Offset Strategy in Appendix E of this report.

**The following bat Operational Phase mitigation actions are recommended:**

- ✦ Implement curtailment of turbines in Medium sensitive areas, as soon as the first turbine is operational, below an initial cut-in speed of 5 m/s during temperatures of 12 °C or warmer for four hours after sunset from 1 June to 31 October, and from sunset to sunrise from 1 November to 31 May. The 5 m/s turbine cut-in wind speed represents the wind speed associated with approximately 50% of all bat activity recorded at 73-110 m above ground level in 2021/2022 by IWS.
- ✦ Ensure that turbines can be fitted with bat detectors and deterrent devices. Turbine engineers must consult with bat specialists to incorporate the necessary turbine adaptations for this during the design phase, so there are no unexpected surprises or concerns after the turbines are built.
- ✦ Minimize artificial lighting on site. Apart from compulsory civil aviation lighting, minimize artificial lighting - especially high-intensity, steady-burning, sodium vapour, quartz, halogen, and other bright lights at substations, offices, and turbines. All non-aviation lights should be hooded downward and directed to minimise horizontal and skyward illumination. Where possible, solar-powered motion-sensitive lights should be used. This must be done in accordance with relevant H&S Regulations.

- ✦ Commence again with acoustic bat monitoring. A detector(s) should be installed on the meteorological mast just before construction commences, and monitoring should occur throughout construction, during the first and second years of operation, and again during the fifth year of operation, and every fifth year thereafter.
- ✦ Perform operational bat monitoring as soon as the first turbine is operational - as per the latest SABAA guideline for this (Aronson et al. 2020 or later). The quality of the operational monitoring and data analysis are to be conducted to a high standard so that there is confidence in the data and the fatality estimate results. If the operational monitoring and data analysis are not conducted properly as per Aronson et al. 2020 (or later), the prescribed curtailment Regime 1 should be implemented at all turbines at the WEF.
- ✦ Adaptively manage bat fatalities by consulting the latest SABAA guideline for this (Aronson et al. 2020 or later), and the best available relevant scientific information. The specialist conducting the Year 1 and Year 2 operational monitoring should provide recommendations for adaptive management of the above strategy after the second year of operational monitoring. Allowance should be made in the financial provision for adaptive management and mitigation of bat fatalities. If the bat fatality threshold is exceeded (determined as per MacEwan et al. 2018 or later), further adaptive management and mitigation (possibly including greater curtailment) must be implemented (refer to Aronson et al. 2020 or later).
- ✦ Submit quarterly and annual bat fatality monitoring reports to SABAAP (the South African Bat Assessment Association Panel), EWT (the Endangered Wildlife Trust), and the DEFF (the national Department of Environment, Forestry and Fisheries).
- ✦ Forward all (live and fatality) bat monitoring data to the database recommended by SABAA to expand the scientific knowledge base for more informed decision making and mitigation.
- ✦ Rehabilitate disturbed terrestrial habitat and water resources (bat foraging habitat). Implement effective rehabilitation of disturbed terrestrial habitat and water resources based on consultation with an appropriate experienced specialist(s). Carefully manage alien vegetation, livestock grazing, and water points.

**The following ecological Operational Phase mitigation actions are recommended:**

- ✦ Regular maintenance and checks of the infrastructure must be undertaken.
- ✦ External lighting should be avoided where possible. However, if required, lighting should be down lighting and low wattage.
- ✦ Access to the site should be minimised.
- ✦ All individuals must sign a register prior to accessing the proposed development site.
- ✦ Speed restrictions (40 km per hour is recommended) must be implemented to reduce the chance of road kills, as well as to reduce the amount of dust caused by vehicle movement along the roads.
- ✦ All areas disturbed during construction that do not form part of the proposed development must be rehabilitated. Topsoil from nearby areas of the same vegetation type must be spread over impacted area and planted with indigenous plant species.
- ✦ A Fire Management Plan must be drafted by a suitably qualified specialist and implemented during the operation of the proposed Ngxwabangu WEF.
- ✦ The site must be checked regularly for the presence of alien invasive species. When alien invasive species are found, immediate action must be taken to remove them.
- ✦ The ECO must create a list with accompanying photographs of possible alien invasive species that could occur on site prior to construction. This photo guide must be used to determine if any alien invasive species are present.
- ✦ An Alien Invasive Management Plan must be compiled and implemented during the Construction and Operational Phase of the proposed Ngxwabangu WEF.

**The following noise Operational Phase mitigation actions are recommended:**

- ✦ The applicant must confirm the status of structures located in areas where noise levels exceed 45 dBA, confirming that it is not used for residential purposes. If these structures are used for residential purposes the applicant must implement appropriate mitigation measures (see Section 11.2 of the Noise Impact Assessment) to ensure that noise levels due to operating WTG are less than 45 dBA.

- ✦ The applicant must confirm the status of structures located in areas where noise levels exceed 45 dBA, confirming whether it is not used for residential purposes. If these structures are used for residential purposes the applicant must implement appropriate mitigation measures (see Section 11.2 of the Noise Impact Assessment) to ensure that noise levels due to operating WTG are less than 45 dBA.

**The following socio-economic Operational Phase mitigation actions are recommended:**

- ✦ The operator of the wind energy facility and its related infrastructure should be encouraged to, as far as possible, procure materials, goods and products required for the operation and maintenance of the facility from local suppliers to increase the positive impact in the local economy.
- ✦ Aspiring entrepreneurs from the local communities should be encouraged to formally register their MSMEs in order to do business with the IPP- this would specifically apply to MSMEs within the security and cleaning/cleansing sub-industries.
- ✦ Sufficient economies of scale could be created to establish new businesses in the provincial economy. These businesses could then supply the goods and services required for the operation and maintenance of the facility that cannot currently be procured in the area. This would contribute to the local economies' growth and development. Given that this project would be the first of its kind within the region, these cumulative impacts will only materialise over time.
- ✦ Where possible, local labour should be considered for employment to increase the positive impact on the local economy.
- ✦ Only source Cape Vulture and other live birds and animal spotters from the immediate study area.
- ✦ As far as possible, local small and medium enterprises should be approached to investigate the opportunities for supply inputs required for the maintenance and operation of the wind energy facility and related infrastructure.
- ✦ The developer should consider establishing vocational training programmes for the local labour force to promote the development of skills required by the wind energy facility and their related infrastructure and thus provide for the opportunities for these people to be employed in other similar facilities elsewhere.
- ✦ Where possible, the local labour supply should be considered for employment opportunities to increase the positive impact on the area's economy.
- ✦ As far as feasible, local small and medium enterprises should be approached to investigate the opportunities for supply inputs required for the maintenance and operation of the wind energy facility and their related infrastructure.
- ✦ An innovative and site-specific ED and SED programme should be devised by the developer and regularly updated throughout the project's lifespan.
- ✦ Recommend and advertise accommodation at the Lubisi Lodge and Conference centre for overnight stays and hosting meetings and conferences related to the proposed development or for other business ventures and educational tourism expeditions.
- ✦ The developer should encourage the operational manager and team to be open to hosting safe site visits for local schools and colleges for educational purposes.
- ✦ The plan should be developed in consultation with local authorities and local communities to identify community projects that would result in the greatest social benefits.
- ✦ These plans should be reviewed on an annual basis and, where necessary, updated.
- ✦ When identifying enterprise development initiatives, the focus should be on creating sustainable and self-sufficient enterprises.
- ✦ In devising the programmes to be implemented, the developer should take into account the priorities set out in the local IDP.
- ✦ The mitigation measures proposed by the visual and noise specialists should be adhered to.

**The following visual Operational Phase mitigation actions are recommended:**

- ✦ Maintain the general appearance of the site as a whole.
- ✦ Lighting should be kept to a minimum wherever possible.
- ✦ Aviation standards and CAA Regulations for turbine lighting must be followed.
- ✦ The possibility of limiting aircraft warning lights to the turbines on the perimeter according to CAA requirements, thereby reducing the overall impact, must be investigated.



- ✧ Install aircraft warning lights that only activate when the presence of an aircraft is detected, if permitted by CAA.

## Decommissioning Recommendations

The following mitigation measures must be implemented during the operational phase:

- ✧ This section of mitigation measures must be reassessed by a suitably qualified EAP and specialists prior to decommissioning.
- ✧ Littering must be avoided, and litter bins must be made available at various strategic points on site. Refuse from the construction site must be collected on a regular basis and deposited at an appropriate landfill.
- ✧ Fugitive/nuisance dust must be reduced by implementing one of or a combination of the following:
  - Damping down of un-surfaced and un-vegetated areas;
  - Retention of vegetation where possible;
  - Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas; and/or
  - A speed limit of 40km/h must not be exceeded on dirt roads.
- ✧ Any complaints or claims emanating from the lack of dust control must be attended to immediately by the Contractor.
- ✧ Construction vehicles and machinery must make use of existing infrastructure such as roads as far as possible to minimise disturbance on the receiving environment.
- ✧ After the removal of all wind turbine-related structures, the disturbed soils must be re-vegetated to avoid unnecessary soil erosion.

Based on current available information the turbines will be removed as per the above specifications. It is recommended that a new and up-to-date impact assessment is undertaken prior to this process to ensure that the latest relevant guidelines and policy on wind farm decommissioning are factored into the process. Should new technology be available to replace the structures then, depending on the legislation relevant at the time, the EAP recommends a new impact assessment process prior to being able to do so. The DFFE would be required to approve any decommissioning or replacement process.

## Monitoring Recommendations

- ✧ Avifaunal Monitoring:
  - The duration and scope of post-construction monitoring must be informed by the outcomes of the previous year's monitoring and must be reviewed annually. Post-construction monitoring of bird abundance and movements should span a minimum of one year and monitoring for fatalities should take place over a minimum of two to three years and repeated at year five and every five years thereafter. The duration of monitoring must be increased should significant impacts be observed.
  - A contingency mitigation budget must be planned for in the operational phase to allow adaptive management of impacts that arise. If such a situation arises possible necessary mitigation measures could include: further research into the problem (including possibly bird tracking studies); human based turbine shutdown on demand; habitat alteration; bird deterrence from site; and any others identified as feasible at the time.
- ✧ Bat Monitoring
  - Post-construction/ operational bat monitoring must be performed according to the South African Good Practise Guidelines for Operational Monitoring for Bats at Wind Energy Facilities (Aronson et al 2014) or later version valid at the time of monitoring. IWS recommends the initial 2 years and then every third year for the remainder of the project.
  - Should operational monitoring show that adjusted annual bat fatalities (adjusted for biases such as searcher efficiency and carcass persistence) ever equal or exceed the threshold level of fatalities guided by SABAAP:
    - 60 bats per annum based on the thresholds provided for Drakensberg Montane Grasslands, Woodlands and Forest ecoregion in MacEwan et al. (2017).

- 39 bats per annum based on site specific thresholds calculated according to the methods provided in MacEwan et al. (2017).
- Both methods use the entire 6500ha project boundary area and both threshold levels apply to fatalities of single species, i.e. if two species were among the fatalities estimated for a site, the threshold would apply to each, not to the grouped number of all species combined.
- Then mitigation actions will only be required at specific turbines that have killed 2 or more bats of the particular bat species that has exceeded the fatality threshold for the previous year of monitoring.
- Such actions at the individual turbines include increasing the cut-in wind speed to 6m/s (only exposing 40% of bat activity to spinning blades).
- When dealing with living animals that can respond in different and unpredictable ways to changing environmental, climatic and developmental parameters, it is very difficult to make guaranteed predictions. Lintott et al. (2016) state that the nightly and seasonal activity data collected during pre-construction surveys may provide an indication of the extent of curtailment that is required and therefore the economic viability of the project, however, they highlight the need for a feedback mechanism for practitioners to share the success or failure of mitigation strategies, i.e. adaptive mitigation. The bat specialist conducting the operational monitoring has the right to make further recommendations should they see fit.
- Given the magnitude and extent of wind-turbine related bat fatalities worldwide, the conservation implications are critically important and bat fatalities must be avoided, minimised or mitigated proactively.

## Management Recommendations

The following site-specific management plans must be included in the final Appendix 4 EMPr.

- Alien Invasive Management Plan (High-level plan provided in Section 9.1 of the Appendix 4 EMPr);
- Plant Rescue and Protection Plan (High-level plan provided in Section 9.1 of the Appendix 4 EMPr);
- Avifauna Monitoring and Management Plan (High-level plan provided in Section 9.3 of the Appendix 4 EMPr);
- Re-vegetation and Habitat Rehabilitation Plan (High-level plan provided in Section 9.1 of the Appendix 4 EMPr);
- Open Space Management Plan (High-level plan provided in Section 9.2 of the Appendix 4 EMPr);
- Traffic Management Plan (High-level plan provided in Section 9.4 of the Appendix 4 EMPr);
- Transportation Plan (High-level plan provided in Section 9.4 of the Appendix 4 EMPr);
- Stormwater Management Plan (High-level plan provided in Section 9.5 of the Appendix 4 EMPr);
- Fire Management Plan (High-level plan provided in Section 9.7 of the Appendix 4 EMPr);
- Erosion Management Plan (High-level plan provided in Section 9.5 of the Appendix 4 EMPr);
- Monitoring System to detect any leakage or spillage of all hazardous substances (High-level plan provided in Section 9.6 of the Appendix 4 EMPr);
- Measures to protect hydrological features (High-level plan provided in Section 9.2 and 9.5 of the Appendix 4 EMPr);
- Biodiversity Management Plan (to be prepared);
- Cape Vulture Food Management Programme (to be prepared);
- Chance Fossil Finds Protocol (to be prepared);
- Aquatic Rehabilitation and Monitoring Plan (to be prepared);
- Emergency Response Action Plan (as per the Generic EMPr, to be prepared).

## APPENDIX 1: METHOD STATEMENTS

To be prepared by the contractor prior to commencement of the activity. The method statements are **not required** to be submitted to the CA.

## APPENDIX 2: CURRICULUM VITAE OF THE EAP AND ENVIRONMENTAL TEAM

- Dr Alan Carter (CES, Executive Consultant) – *EAP, Project Leader and Author*
- Ms Caroline Evans (CES, Principal Consultant) – *Project Manager and Co-Author*

**EMPLOYMENT  
EXPERIENCE**

- January 2001 – Present: Executive Director (Coastal & Environmental Services, East London, South Africa)
- January 1999 – December 2001: Manager (Arthur Andersen LLP, Public Accounting Firm, Chicago, Illinois USA)
- December 1996 – December 1998: Senior Accountant/Auditor (Ernst & Young LLP, Public Accounting Firm, Austin, Texas, USA.)
- January 1994 – December 1996: Senior Accountant/Auditor (Ernst & Young, Charteris & Barnes, Chartered Accountants, East London, South Africa)
- July 1991 – December 1994: Associate Consultant (Coastal & Environmental Services, East London, South Africa)
- March 1989 – June 1990: Data Investigator (London Stock Exchange, London, England, United Kingdom)

**ACADEMIC  
QUALIFICATIONS**

- Ph.D. Plant Science (Marine) - Rhodes University 1987
- B. Compt. Hons. Accounting Science - University of South Africa 1997
- B. Com. Financial Accounting - Rhodes University 1995
- B.Sc. Hons. Plant Science - Rhodes University 1983
- B.Sc. Plant Science & Zoology - Rhodes University 1982

**COURSES**

- Environmental Management Systems Lead Auditor Training Course - American National Standards Institute and British Standards Institute (2000)
- ISO 14001:2015 Implementing Changes - British Standards Institute (2015)
- Numerous other workshops and training courses.

**CONSULTING  
EXPERIENCE**

**Environmental Impact Assessment**

- Managed numerous environmental impact assessment (EIA) projects (estimated at over 200 EIAs) and prepared EIA reports in terms of relevant EIA legislation and regulations (including World Bank and IFC Standards) for development proposals including: bulk water and waste water, roads, electrical, mining, ports, aquaculture, renewable energy (over 20 solar facilities and over 20 wind farms), industrial processes, housing developments, golf estates and resorts, etc. (2002 – present).
- Projects have also included preparation of applications in terms of other statutory requirements, such as water-use and mining licence /permit applications.
- Assisted City of Johannesburg in the process to proclaim four nature reserves in terms of relevant legislation (2015-2016).

**Feasibility and Pre-feasibility Assessments**

- Managed projects to develop pre-feasibility and feasibility assessments for various projects, including various tourism developments, aquaculture, infrastructure projects, etc.
- Managed project for the East London Industrial Development Zone (ELIDZ) to develop a Conceptual Framework for a Mariculture Zone within the ELIDZ (2009).
- Managed the following aquaculture feasibility studies:
  - Mariculture Zone at Qoloha on the South African Wild Coast (2013).
  - Mariculture Zone within the Coega Industrial Development Zone (2014).
  - Aquaponics Zone within the Coega Industrial Development Zone (2017).
  - Finfish cage farming within the Port of Richards Bay (2019).

- Multispecies aquaculture hatchery and demonstration facility in the Eastern Cape Province (2019).
- Managed project to determine the financial feasibility of various proposed tourism developments for the Kouga Development Agency in the Eastern Cape Province (2006)
- Contributed significantly to a study to determine the financial and environmental feasibility of three proposed tourism development projects at Coffee Bay on the Wild Coast (2004).

**Strategic Environmental Assessment**

- Managed Strategic Environmental Assessment (SEA) project toward the development of a Biofuel Industry in the Eastern Cape Province of South Africa (2014-2016)
- Managed Strategic Environmental Assessment (SEA) projects for two South African ports (2006 – 2007).
- Managed Strategic Environmental Assessment (SEA) projects for five (5) local municipalities in the Eastern Cape as part of the municipal Spatial Development Framework plans (2004 – 2005).
- Involved in the financial assessment of various land-use options and carbon credit potential as part of a larger Strategic Environmental Assessment (SEA) for assessing forestry potential in Water Catchment Area 12 in the Eastern Cape of South Africa (2006).

**Climate change, emissions trading and renewable energy**

- Provided specialist peer review services for National Department of Environmental Affairs relating to climate change impact assessments for large infrastructure projects (2017-2018).
- Conducted climate change impact assessment for a proposed coal-fired power station in Africa (2017-2018).
- Participated in the development of a web-based Monitoring & Evaluation (M&E) system for climate change Mitigation and Adaptation in South Africa for National Department of Environmental Affairs (DEA) (2015-2016).
- Managed project to develop a Climate Change Strategy for Buffalo City Metro Municipality (2013).
- Managed projects to develop climate change strategies for two district municipalities in the Eastern Cape Province (2011).
- Conducted specialist carbon stock and greenhouse gas emissions impact and life cycle assessment as part of the Environmental, Social and Health Impact Assessment for a proposed sugarcane to ethanol project in Sierra Leone (2009 - 2010) and a proposed Jatropha bio-diesel project in Mozambique (2009 - 2010).
- Managed project to develop the Eastern Cape Province Climate Change Strategy (2010).
- Managed project to develop a Transnet National Ports Authority Climate Change Risk Strategy (2009).
- Participated in a project to develop a Renewable Energy roadmap for the East London Industrial Development Zone (ELIDZ) (2013).
- Participated in a project for the East London Industrial Development Zone (ELIDZ) and Eastern Cape Government to prepare a Renewable Energy Strategy (2009).
- Contributed to the development of Arthur Andersen LLP's International Climate Change and Emissions Trading Services (2001).
- Conducted carbon credit (Clean Development Mechanism - CDM) feasibility assessment for a variety of renewable energy projects ranging from biogas to solar PV.

- Participated in the preparation of CDM applications for two solar PV projects in the Eastern Cape.

**Waste Management**

- Managed project to develop Integrated Waste Management Plans for six local municipalities on behalf of the Sarah Baartman District Municipality in the Eastern Cape Province (2016).
- Managed project to develop Integrated Waste Management Plans for four local municipalities on behalf of Alfred Nzo District Municipality in the Eastern Cape Province (2015).
- Managed project to develop Integrated Waste Management Plans for eight local municipalities on behalf of Chris Hanu District Municipality in the Eastern Cape Province (2011).
- Managed a project to develop a zero-waste strategy for a community development in the Eastern Cape Province (2010).
- Managed waste management status quo analysis for a District Municipality in the Eastern Cape Province (2003).
- For three consecutive years, managed elements of the evaluation of the environmental financial reserves of the three largest solid waste companies (Waste Management, Inc., Republic Services, Inc., Allied Waste, Inc.) and number of smaller waste companies in the USA as part of the annual financial audit process for SEC reporting purposes. Ensured compliance with RCRA and CERCLA environmental regulations.
- Managed elements of the evaluation of the environmental financial reserves of the largest hazardous waste company in the USA (Safety-Kleen, Inc.), as part of the audit process for SEC reporting purposes. Ensured compliance with RCRA and CERCLA environmental regulations.

**Environmental auditing and compliance**

- Conducted environmental legal compliance audit for various large Transnet Freight Rail facilities (2018).
- Lead auditor for numerous Environmental Control Officer (ECO) projects, including construction of wind and solar farms, road infrastructure, bulk water and sewage infrastructure, port infrastructure, cemeteries, etc.
- Participated in numerous ISO14001 Environmental Management System (EMS) audits for large South African corporations including SAPPI, BHP Billiton, SAB Miller, Western Platinum Refinery, Dorbyl Group and others (2002 – present).
- Reviewed the SHE data reporting system of International Paper, Inc. (IP) for three successive years as part of the verification of the IP SHE Annual Report, which included environmental assessments of 12 IP pulp and paper mills located throughout the USA.

**Environmental Due Diligence and Business Risk**

- Participated in project on behalf of the CDC Group (UK) to conduct a due diligence on the ESG systems and mechanisms in place for an agro-industry investment entity with considerable agricultural investments throughout Africa (2021).
- Conducted environmental due diligence projects on behalf of the German Development Bank for a forestry pulp and paper operation in Swaziland (2010) and for a large diversified South African agricultural/agro-processing company (2011).
- Managed project for the Transnet National Ports Authority to identify the environmental risks and liabilities associated with the operations of the Port of Durban

as part of a broader National initiative to assess business and financial risks relating to environmental management (2006).

- Conducted sustainability and cost/benefit analysis of various waste water treatment options (including a marine pipeline at Hood Point) for the West Bank of East London (2004).
- Conducted analysis of permit fees and application processing costs for off-road vehicle use on the South African coastline for the Department of Environmental Affairs and Tourism, Marine & Coastal Management (2003).
- Involved in the determination of the historical cost element of environmental remediation insurance claims for a number of multinational companies, including Dow Chemicals, Inc. and International Paper, Inc.
- Evaluated the environmental budgeting process of the US Army and provided best practice guidance for improving the process.

#### **Policy and Guidelines**

- Managed project to develop an Estuarine Management Plan for the Quinera Estuary for the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (2021).
- Development of Administration / Application Fee Structure for the Reclamation of Land, Coastal Use Permits, Coastal Waters Discharge Permits, Dumping of Waste at Sea, Off-Road Vehicle Regulations Promulgated in Terms of the National Environmental Management Act: Integrated Coastal Management Act (Act No. 24 Of 2008) (2017).
- Managed project to develop an Estuarine Management Plan for the Buffalo River Estuary for the National Department of Environmental Affairs (2017).
- Managed project to develop a Coastal Management Programme for Amathole District Municipality, Eastern Cape (2015 – 2016).
- Managed project to develop a sustainability diagnostic report as part of the development of the Eastern Cape Development Plan and Vision 2030 (2013).
- Managed project for the Department of Environmental Affairs and Tourism, Marine & Coastal Management to determine the cost implications associated with the implementation of the Integrated Coastal Management Act (2007).
- Managed project to develop a Conservation Plan and Municipal Open Space System (MOSS) for Buffalo City Municipality (2007)
- Managed project to develop a Sanitation Policy and Strategy for Buffalo City Municipality, Eastern Cape (2004 – 2006).
- Managed project to develop an Integrated Environmental Management Plan and Integrated Coastal Zone Management Plan for Buffalo City Municipality, Eastern Cape (2004 – 2005).
- Managed projects to develop and implement an Environmental Management System (EMS) for the Chris Hani and Joe Gqabi (formerly Ukhahlamba) District Municipalities in the Eastern Cape generally in line with ISO14001 EMS standards (2004 – 2005).
- Managed project to develop a State of the Environment Report and Environmental Implementation Plans for Amathole, Chris Hani, OR Tambo and Joe Gqabi District Municipalities in the Eastern Cape Province (2005 – 20010).
- Conducted analysis of permit fees and application processing costs for off-road vehicle use on the South African coastline for the Department of Environmental Affairs and Tourism, Marine & Coastal Management (2003).

#### **Environmental & Social Management Systems**



**PUBLICATIONS**

- Managed project to develop Environmental & Social Management Systems (ESMS) in line with IFC Performance Standards for an agricultural equipment supplier in Malawi on behalf of Norfund (2021).
- Managed projects to develop Environmental Management Systems (EMS) in line with ISO14001 EMS Standard for a South African water utility (2019).
- Managed projects to develop Environmental & Social Management Systems (ESMS) in line with IFC Performance Standards for four (4) wind farms in South Africa (2015-2018).
- Managed project to develop an Environmental & Social Management System (ESMS) in line with IFC Performance Standards for a telecoms company in Zimbabwe on behalf of the German Development Bank (2013).
- Conducted Environmental Management System (EMS) reviews for a number of large US corporations, including Gulfstream Aerospace Corporation.

**Public financial accounting**

- While with Ernst & Young LLP, (USA), functioned as lead financial auditor for various public and private companies, mostly in the technology business segment of up to \$200 million in annual sales. Client experience included assistance in a \$100 million debt offering, a \$100 million IPO and SEC annual and quarterly reporting requirements.
- Completed three years of articles (training contract) in fulfilment of the certification requirements of the South African Institute of Chartered Accountants which included auditing, accounting and preparation of tax returns for many small to medium sized commercial entities.

**Refereed Publications**

- Carter, A.R. 1985. Reproductive morphology and phenology, and culture studies of *Gelidium pristoides* (Rhodophyta) from Port Alfred in South Africa. *Botanica Marina* 28: 303-311.
- Carter, A.R. 1993. Chromosome observations relating to bispore production in *Gelidium pristoides* (Gelidiales, Rhodophyta). *Botanica Marina* 36: 253-256.
- Carter, A.R. and R.J. Anderson. 1985. Regrowth after experimental harvesting of the agarophyte *Gelidium pristoides* (Gelidiales: Rhodophyta) in the eastern Cape Province. *South African Journal of Marine Science* 3: 111-118.
- Carter, A.R. and R.J. Anderson. 1986. Seasonal growth and agar contents in *Gelidium pristoides* (Gelidiales, Rhodophyta) from Port Alfred, South Africa. *Botanica Marina* 29: 117-123.
- Carter, A.R. and R.H. Simons. 1987. Regrowth and production capacity of *Gelidium pristoides* (Gelidiales, Rhodophyta) under various harvesting regimes at Port Alfred, South Africa. *Botanica Marina* 30: 227-231.
- Carter, A.R. and R.J. Anderson. 1991. Biological and physical factors controlling the spatial distribution of the intertidal alga *Gelidium pristoides* in the eastern Cape Province, South Africa. *Journal of the Marine Biological Association of the United Kingdom* 71: 555-568.

**Published reports**

- Water Research Commission. 2006. Profiling Estuary Management in Integrated Development Planning in South Africa with Particular Reference to the Eastern Cape. Project No. K5/1485.
- Turpie J., N. Sihlophe, A. Carter, T. Maswime and S. Hosking. 2006. Maximising the socio-economic benefits of estuaries through integrated planning and management: A


rationale and protocol for incorporating and enhancing estuary values in planning and management. Un-published Water Research Commission Report No. K5/1485

**Conference Proceedings**

- Carter, A.R. 2002. Climate change and emission inventories in South Africa. Invited plenary paper at the 5th International System Auditors Convention, Pretoria. Held under the auspices of the South African Auditor & Training Certification Association Conference (SAATCA).
- Carter, A.R. 2003. Accounting for environmental closure costs and remediation liabilities in the South African mining industry. Proceedings of the Mining and Sustainable Development Conference. Chamber of Mines of South Africa, Vol. 2: 6B1-5
- Carter, A.R. and S. Fergus. 2004. Sustainability analysis of wastewater treatment options on the West Bank of East London, Buffalo City. Proceedings of the Annual National Conference of the International Association for Impact Assessment, South African Affiliate: Pages 295-301.
- Carter, A., L. Greyling, M. Parramon and K. Whittington-Jones. 2007. A methodology for assessing the risk of incurring environmental costs associated with port activities. Proceedings of the 1st Global Conference of the Environmental Management Accounting Network.
- Hawley, GL, AR McMaster and AR Carter. 2009. Carbon, carbon stock and life-cycle assessment in assessing cumulative climate change impacts in the environmental impact process. Proceedings of the Annual National Conference of the International Association for Impact Assessment, South African Affiliate.
- Hawley, GL, AR McMaster and AR Carter. 2010. The Environmental and Social Impact Assessment and associated issues and challenges. African, Caribbean and Pacific Group of States (ACP), Science and Technology Programme, Sustainable Crop Biofuels in Africa.
- Carter, AR. 2011. A case study in the use of Life Cycle Assessment (LCA) in the assessment of greenhouse gas impacts and emissions in biofuel projects. 2nd Environmental Management Accounting Network- Africa Conference on Sustainability Accounting for Emerging Economies. Abstracts: Pages 69-70.

**CERTIFICATION**

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.



**ALAN ROBERT CARTER**

Date: 28 January 2022

## CONTACT DETAILS

<b>Name of Company</b>	<b>CES – Environmental and Social Advisory Services</b>
<b>Designation</b>	Grahamstown Branch
<b>Profession</b>	Principal Environmental Consultant Consulting Manager
<b>Years with firm</b>	9 Years
<b>E-mail</b>	<a href="mailto:c.evans@cesnet.co.za">c.evans@cesnet.co.za</a>
<b>Office number</b>	+27 (0)46 622 2364
<b>Nationality</b>	South African
<b>Professional Body</b>	SACNASP, South African Council for Natural Scientific Profession, Professional (pending) IAIA
<b>Key areas of expertise</b>	<ul style="list-style-type: none"><li>➤ Project Management</li><li>➤ Renewable Energy</li><li>➤ Agriculture</li></ul>

## PROFILE

### Ms Caroline Evans

Ms Caroline Evans is a Principal Environmental Consultant based in the Grahamstown branch. She holds a BSc degree in Zoology and Environmental Science (with distinction) and a BSc Honours degree in Environmental Science (with distinction), both from Rhodes University. Caroline has completed accredited courses in environmental impact assessments and wetland assessments.

Caroline's primary focuses include Project Management and the general Environmental Impact Assessment Process, particularly in the Renewable Energy and Agricultural fields. Examples of fields in which Caroline was the project manager and lead report writer include Wind Energy Facilities (WEFs) and the associated infrastructure (BESS, OHL and other ancillary infrastructure), Solar PV and Agricultural Developments. Her experience with wind energy facilities and associated infrastructure includes the project management and report writing for the Umsobomvu WEF, Coleskop WEF, Dassiesridge WEF, Scarlet Ibis WEF, Albany WEF, Haga Haga WEF, Grahamstown WEF, Kleinsee WEF, Waaihoek WEF and the Great Kei WEF.

Caroline is well versed in South African policy and legislation relating to development, particularly in the Eastern Cape Province. In addition, Caroline's project management experience has helped her gain knowledge and experience in the technical and financial management and coordination of large specialist teams, competent authority and stakeholder engagement, and client liaison. Caroline has a strong focus on renewable energy and South African policy and legislation related to development.

<b>EMPLOYMENT EXPERIENCE</b>	<p><b>Coastal and Environmental Services</b>, Principal Environmental Consultant <i>August 2020 – present</i></p> <ul style="list-style-type: none"><li>• Project Management</li><li>• Renewable Energy Consultant</li><li>• Agricultural Consultant</li></ul> <p><b>EOH Coastal and Environmental Services</b>, Senior Environmental Consultant <i>August 2016 – July 2020</i></p> <ul style="list-style-type: none"><li>• Project Management</li><li>• Renewable Energy Consultant</li><li>• Wetland Specialist</li></ul> <p><b>EOH Coastal and Environmental Services</b>, Environmental Consultant <i>November 2013 – July 2016</i></p> <p><b>Rhodes University, Department of Environmental Science</b>, Graduate Assistant <i>January 2010 – January 2012</i></p>
<b>ACADEMIC QUALIFICATIONS</b>	<p><b>Rhodes University</b>, Eastern Cape, South Africa B.Sc. Honours Environmental Science (with distinction) 2011</p> <p><b>Rhodes University</b>, Eastern Cape, South Africa B.Sc. Zoology &amp; Environmental Science (with distinction) 2007-2010</p>
<b>COURSES</b>	<ul style="list-style-type: none"><li>➤ Rhodes University, Eastern Cape “Tools for Wetland Assessment” 2010 (with distinction)</li><li>➤ Rhodes University, Eastern Cape “Urban Ecology” 2010 (with distinction)</li><li>➤ Rhodes University, Eastern Cape “Post Graduate Statistics” 2010 (with distinction)</li><li>➤ Rhodes University, Eastern Cape “Environmental Impact Assessment” 2013 (with distinction)</li><li>➤ Gordon Institute of Business Science, University of Pretoria “Business and Management Development” 2021 (with distinction)</li></ul>
<b>CONSULTING EXPERIENCE</b>	<p><b>ENVIRONMENTAL IMPACT ASSESSMENTS:</b></p> <ul style="list-style-type: none"><li>➤ Project: Albany Wind Energy Facility (Grahamstown, EC) Role: Project Manager and Report Production</li><li>➤ Project: Umsobomvu Wind Energy Facility (Middelburg, EC / Noupoort, NC) Role: Project Manager and Report Production</li></ul>

- Project: Waainek Wind Energy Facility Post-Construction Bird and Bat Monitoring (Grahamstown, EC)  
Role: Project Manager and Report Production
- Project: Dassiesridge Wind Energy Facility (Uitenhage, EC)  
Role: Project Manager and Report Production
- Project: Waaihoek Wind Energy Facility (Utrecht, KZN)  
Role: Project Manager and Report Production
- Project: Waaihoek Wind Energy Facility (Utrecht, KZN)  
Role: Project Manager and Report Production
- Project: Great Kei Wind Energy Facility (Komga, EC)  
Role: Assistant Project Manager and Report Production
- Project: Doorndraai Citrus Plantation (Cookhouse, EC)  
Role: Project Manager and Report Production
- Project: Fishwater Flats WWTW Biogas (Port Elizabeth, EC)  
Role: Report Production
- Project: Olivewood Golf and Residential Estate (Chintsa, EC)  
Role: Report Production

**BASIC ASSESSMENTS:**

- Project: Albany Powerline (Grahamstown, EC)  
Role: Project Manager and Report Production
- Project: Scarlet Ibis Wind Energy Facility (NMBM, EC)  
Role: Project Manager and Report Production
- Project: Grey Jade Waterfall Feedlot Biogas (Berlin, EC)  
Role: Project Manager and Report Production
- Project: Black Lite Solar 5MW PV (Berlin, EC)  
Role: Project Manager and Report Production
- Project: Sitrusrand Kirkwood Citrus (Kirkwood, EC)  
Role: Project Manager
- Project: Kareekrans Middleton Pivot (Middleton, EC)  
Role: Project Manager
- Project: Uitsig Boerdery Kirkwood Citrus (Kirkwood, EC)  
Role: Project Manager

**OTHER REPORTS:**

- Project: Eastern Cape Biofuels Strategic Environmental Assessment (EC)

Role: Report Production

- Project: Coega Industrial Development Zone (EC)  
Role: Report Production
- Project: Umsobomvu WEF EA Amendments (EC & NC)  
Role: Project Manager and Report Production
- Project: Dassiesridge WEF EA Amendments (EC)  
Role: Project Manager and Report Production
- Project: Great Kei WEF EA Amendments (EC)  
Role: Project Manager and Report Production
- Project: Ukomeleza WEF EA Amendments (EC)  
Role: Project Manager and Report Production
- Project: Motherwell WEF EA Amendments (EC)  
Role: Project Manager and Report Production
- Project: Golden Valley II WEF EA Amendments (EC)  
Role: Project Manager and Report Production
- Project: Peddie WEF and PV EA Amendments (EC)  
Role: Project Manager and Report Production
- Project: Nqamakwe WEF and PV EA Amendments (EC)  
Role: Project Manager and Report Production
- Project: Thomas River Renewable Energy Facility EA Amendments (EC)  
Role: Project Manager and Report Production
- Project: Qunu WEF and PV EA Amendments (EC)  
Role: Project Manager and Report Production

## **CERTIFICATION**

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.

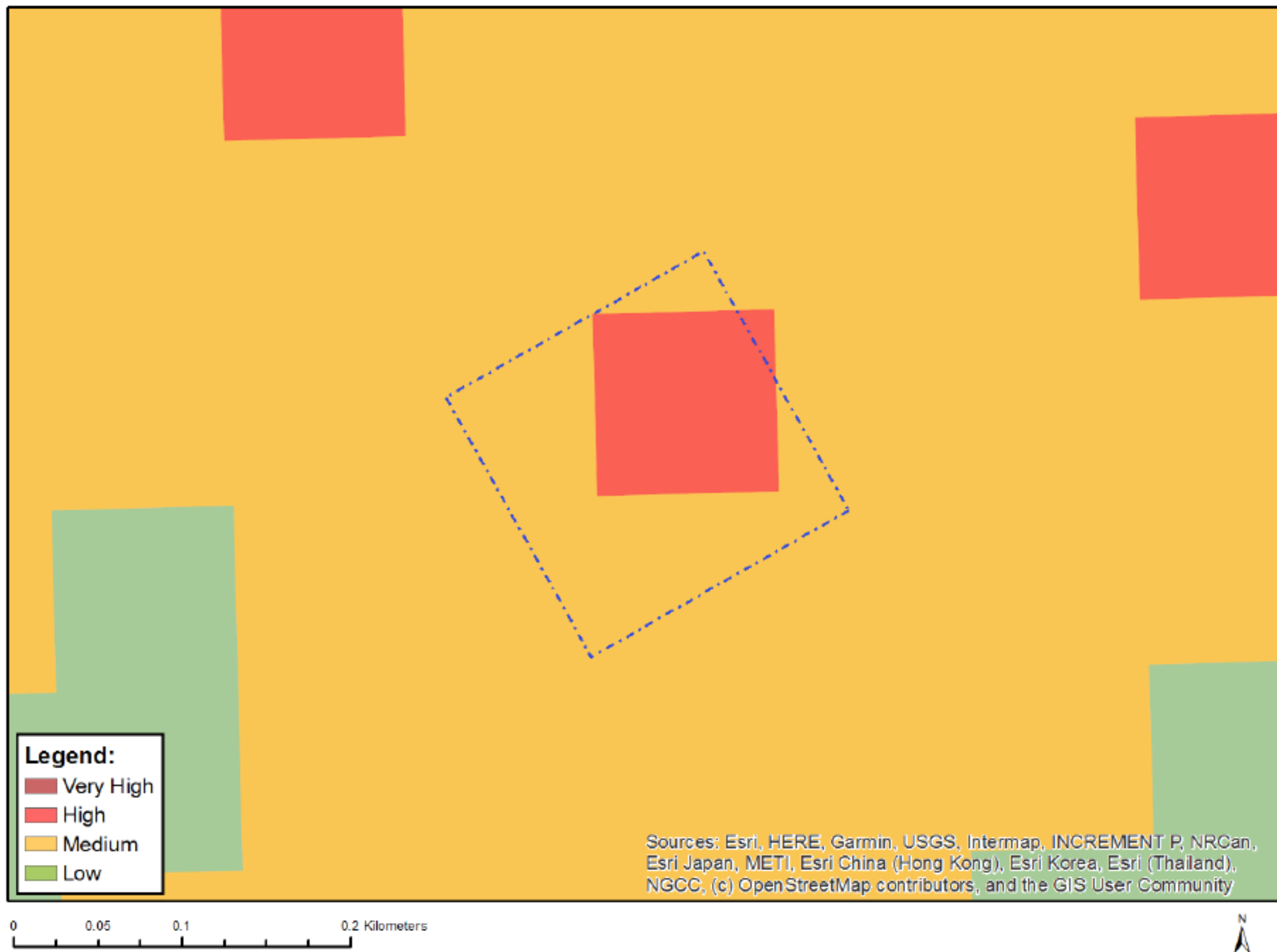


**CAROLINE ANN EVANS**

Date: 13<sup>th</sup> of July 2022

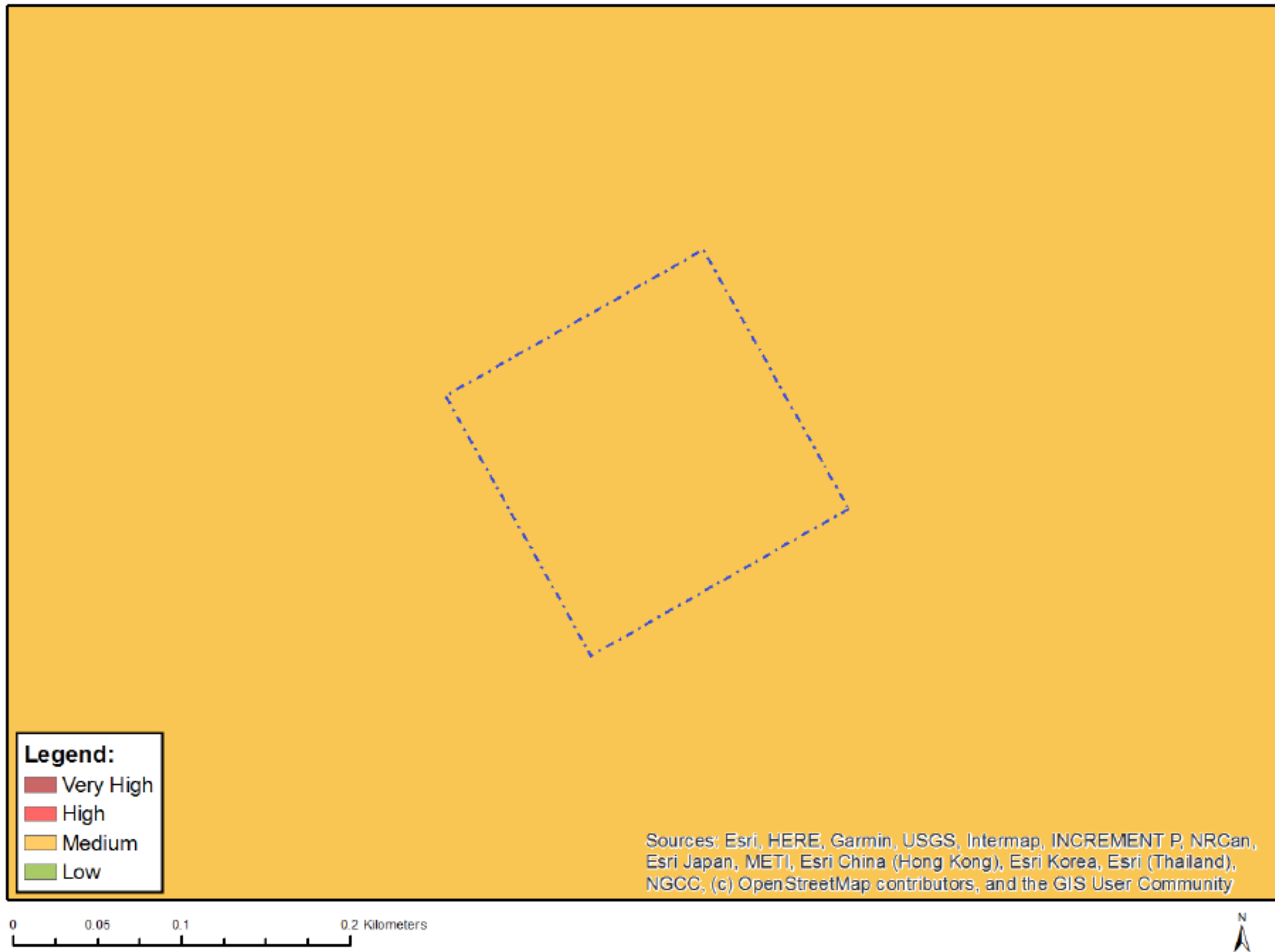
COLLECTOR SUBSTATION 1 <i>REQUIRED</i>					
THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVITY	SENSITIVITY FEATURES
AGRICULTURE THEME		X			High: Land capability
ANIMAL SPECIES THEME			X		Medium: Mammalia- <i>Dendrohyrax arboreus</i>
AQUATIC BIODIVERSITY THEME	X				Very High: ESA 1; Very High: SWSA (SW) _ Eastern Cape Drakensberg
ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME				X	Low: Low sensitivity
CIVIL AVIATION THEME				X	Low: Low sensitivity
DEFENCE THEME				X	Low: Low Sensitivity
PALAEONTOLOGY THEME	X				Very High: Features with a Very High paleontological sensitivity
PLANT SPECIES THEME			X		Medium: Sensitive species 535; Medium: Sensitive species 441; Medium: Sensitive species 451; Medium: Sensitive species 1248
TERRESTRIAL BIODIVERSITY THEME	X				Very High: Strategic Water Source Areas

## MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY

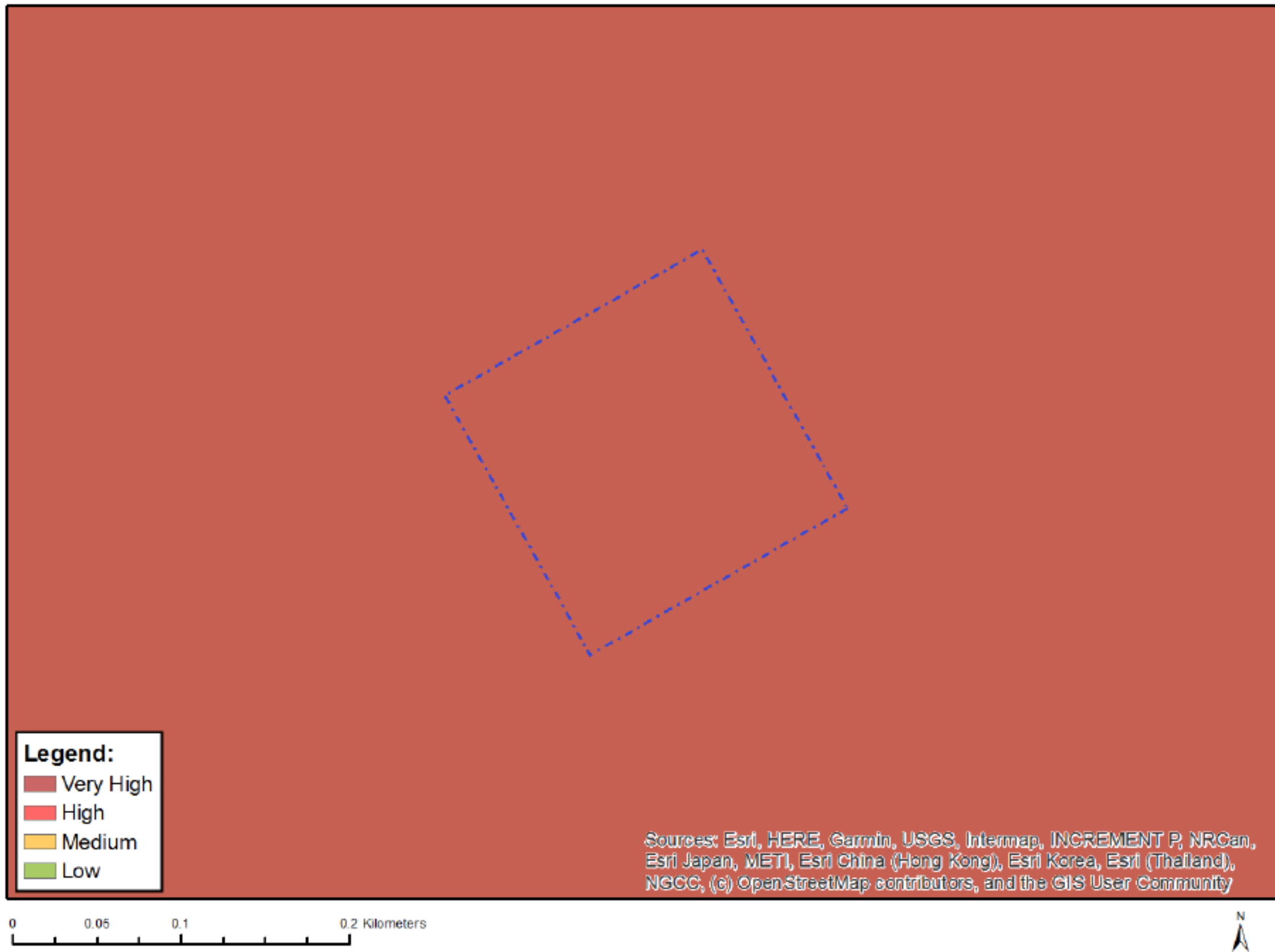




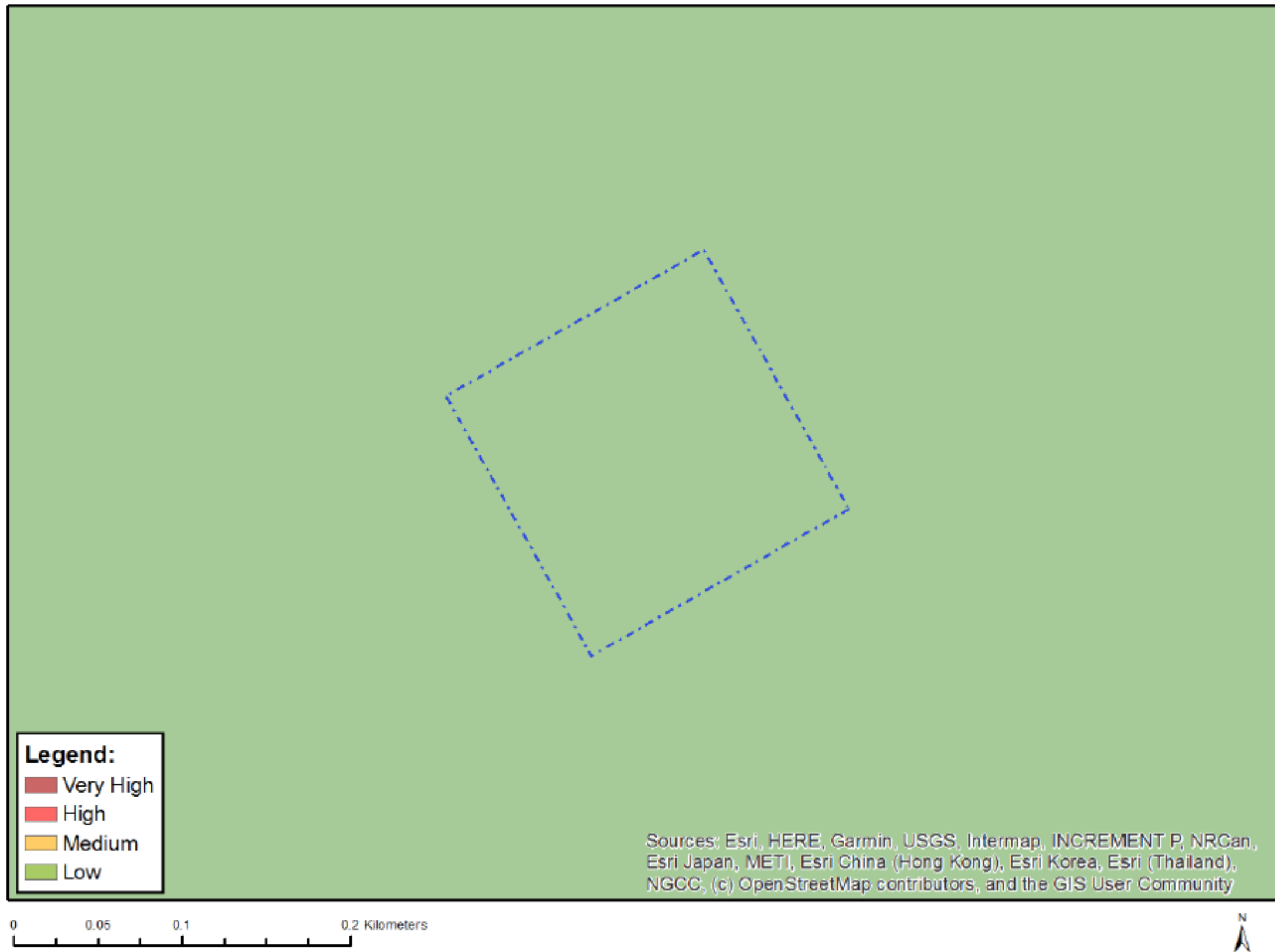
# MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



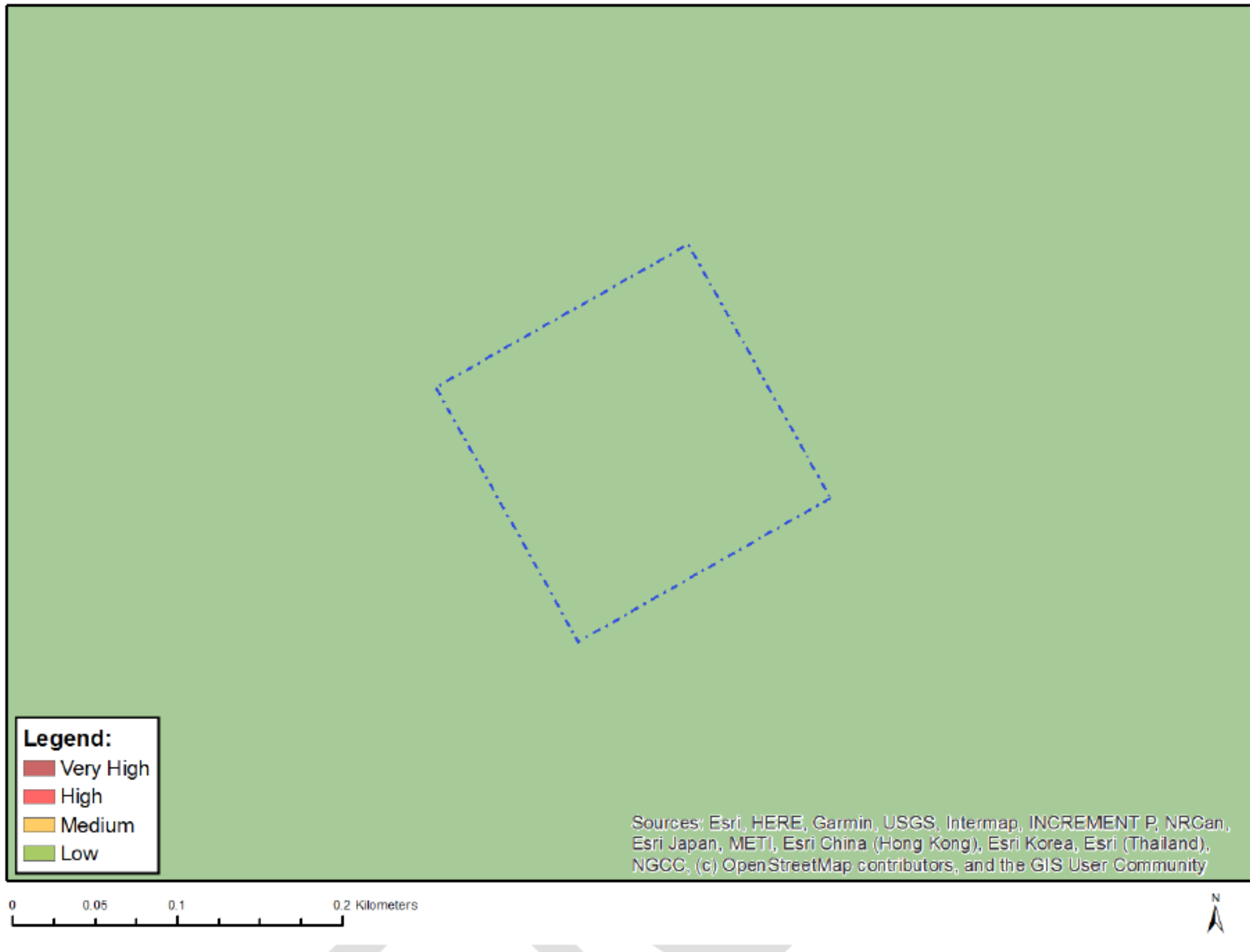
# MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



# MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY



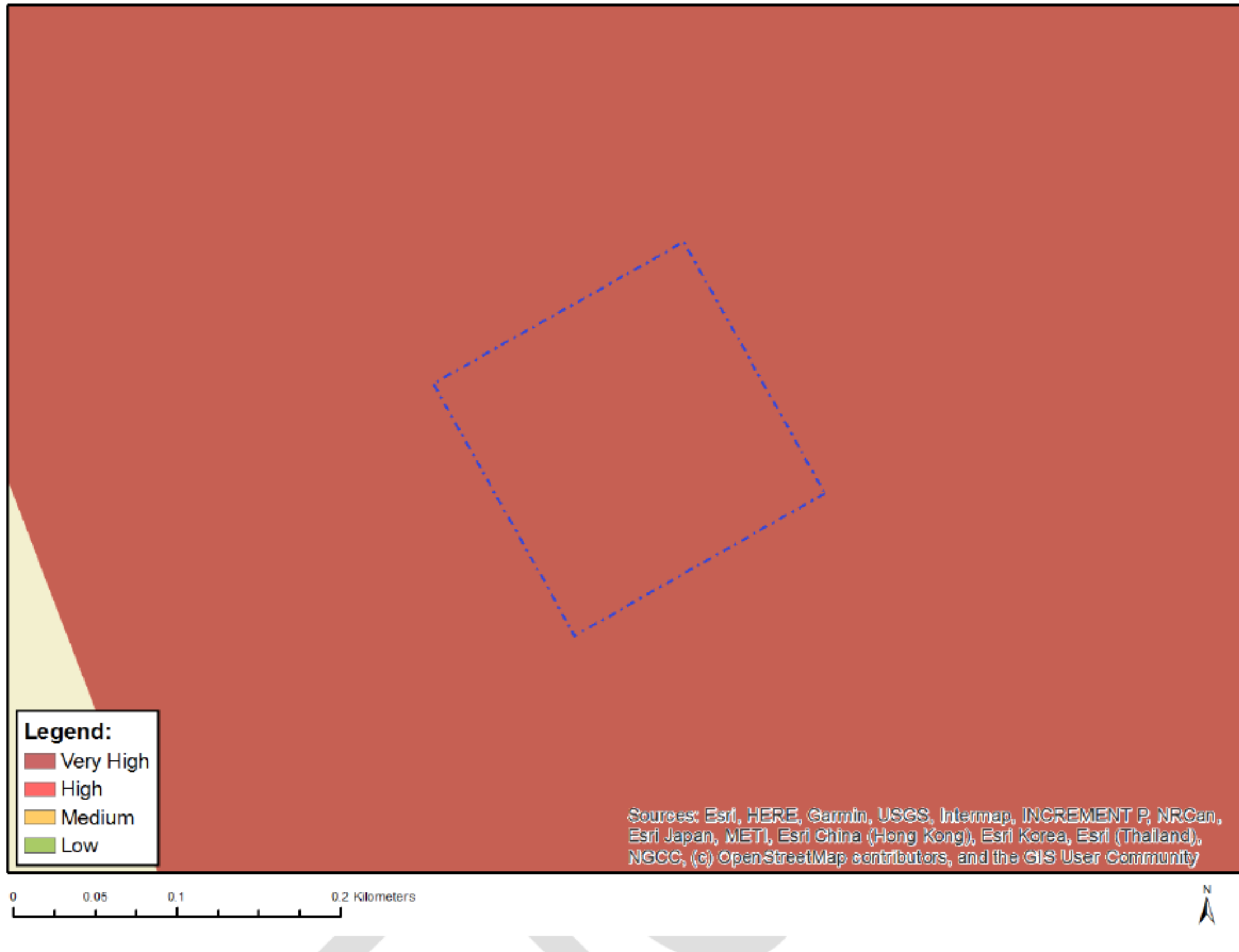
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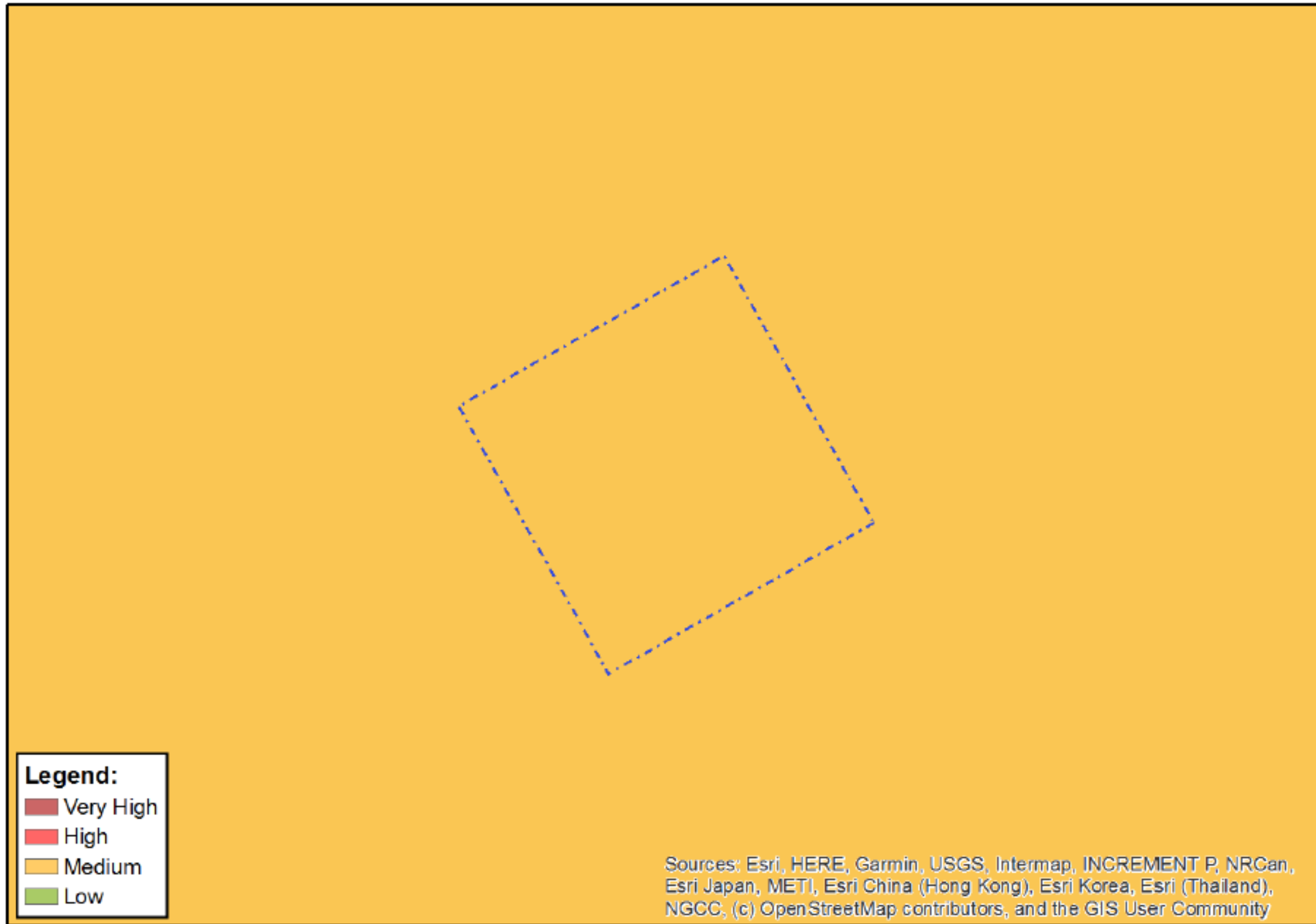
# MAP OF RELATIVE DEFENCE THEME SENSITIVITY



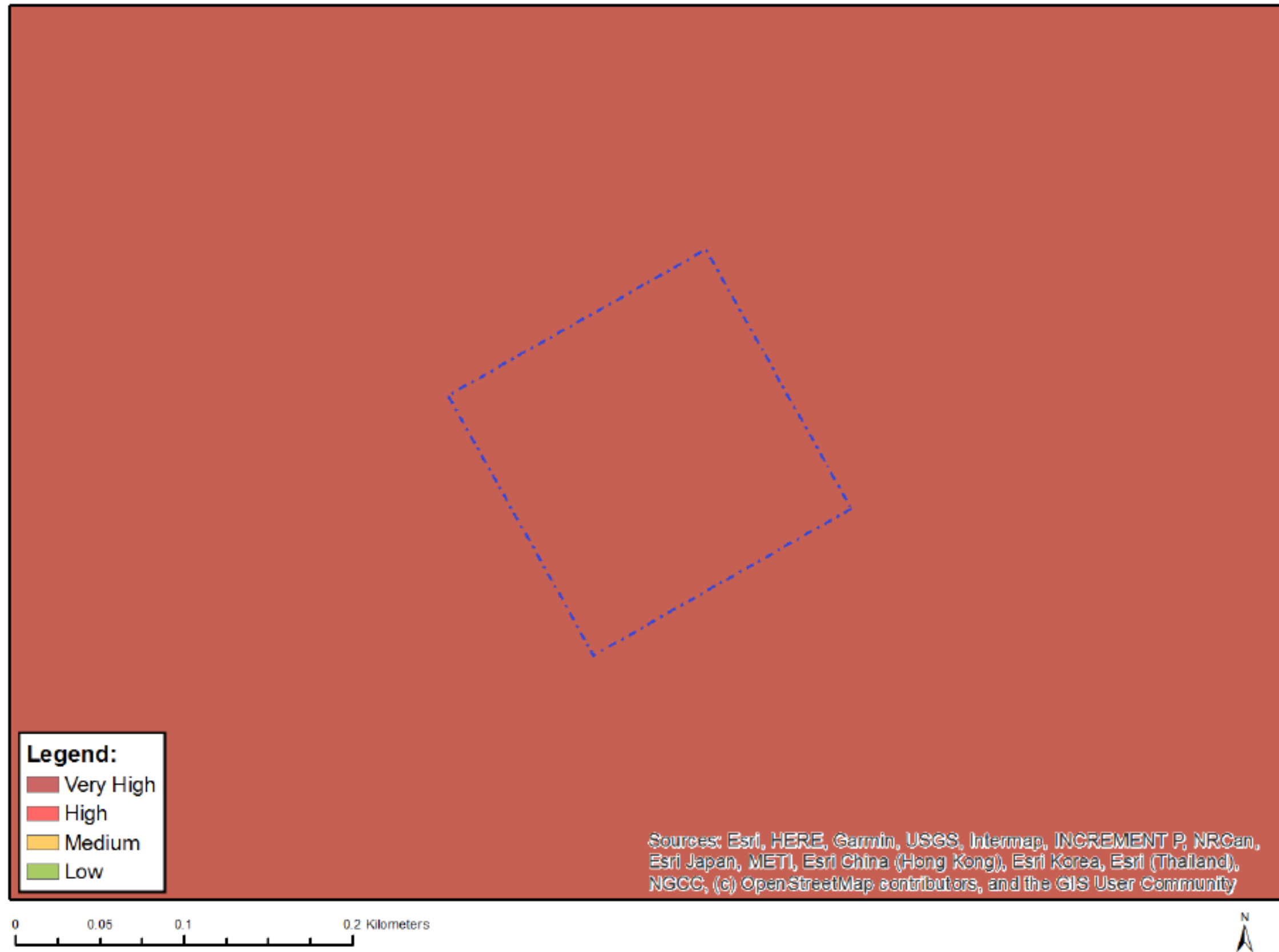
# MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



# MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



# MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY

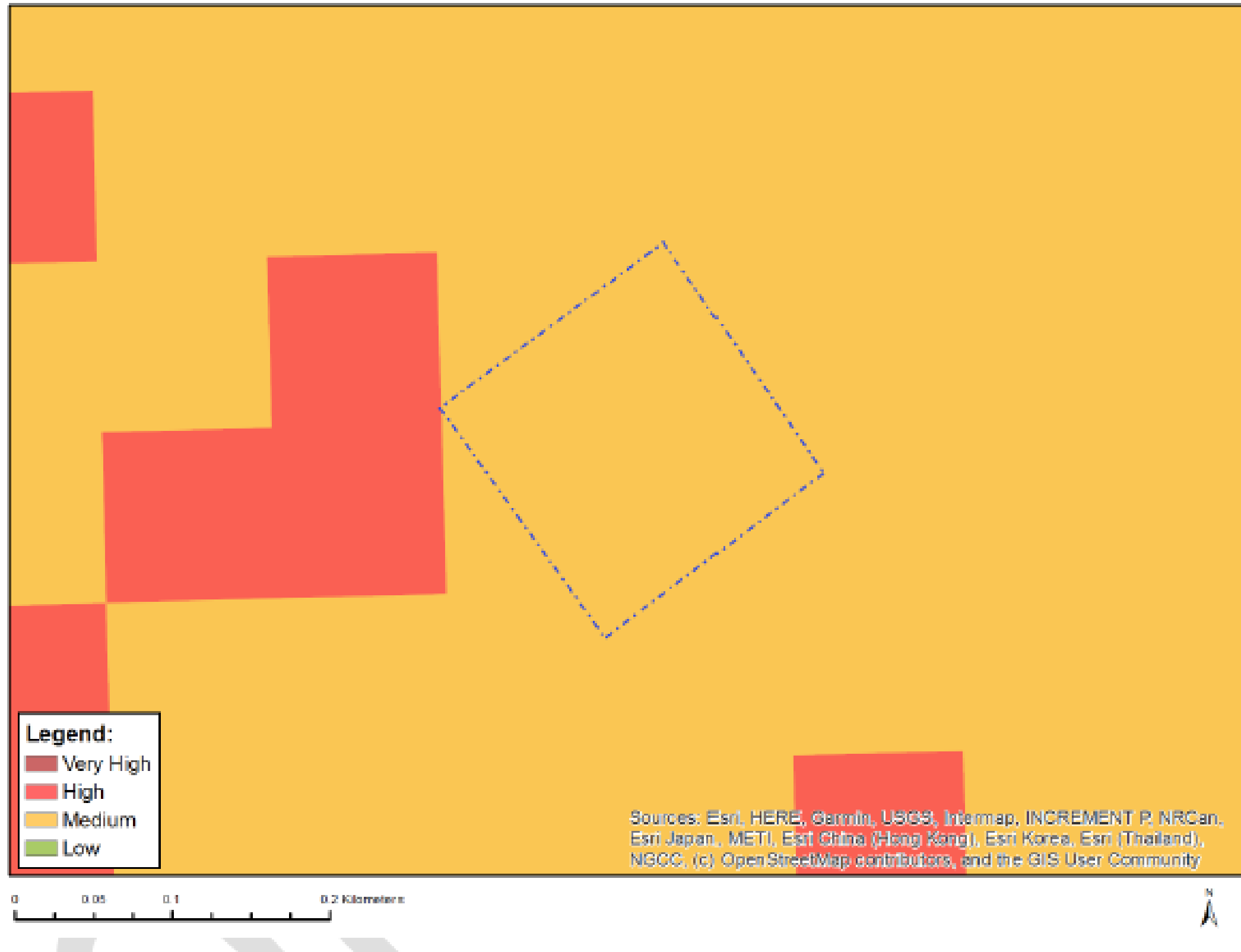




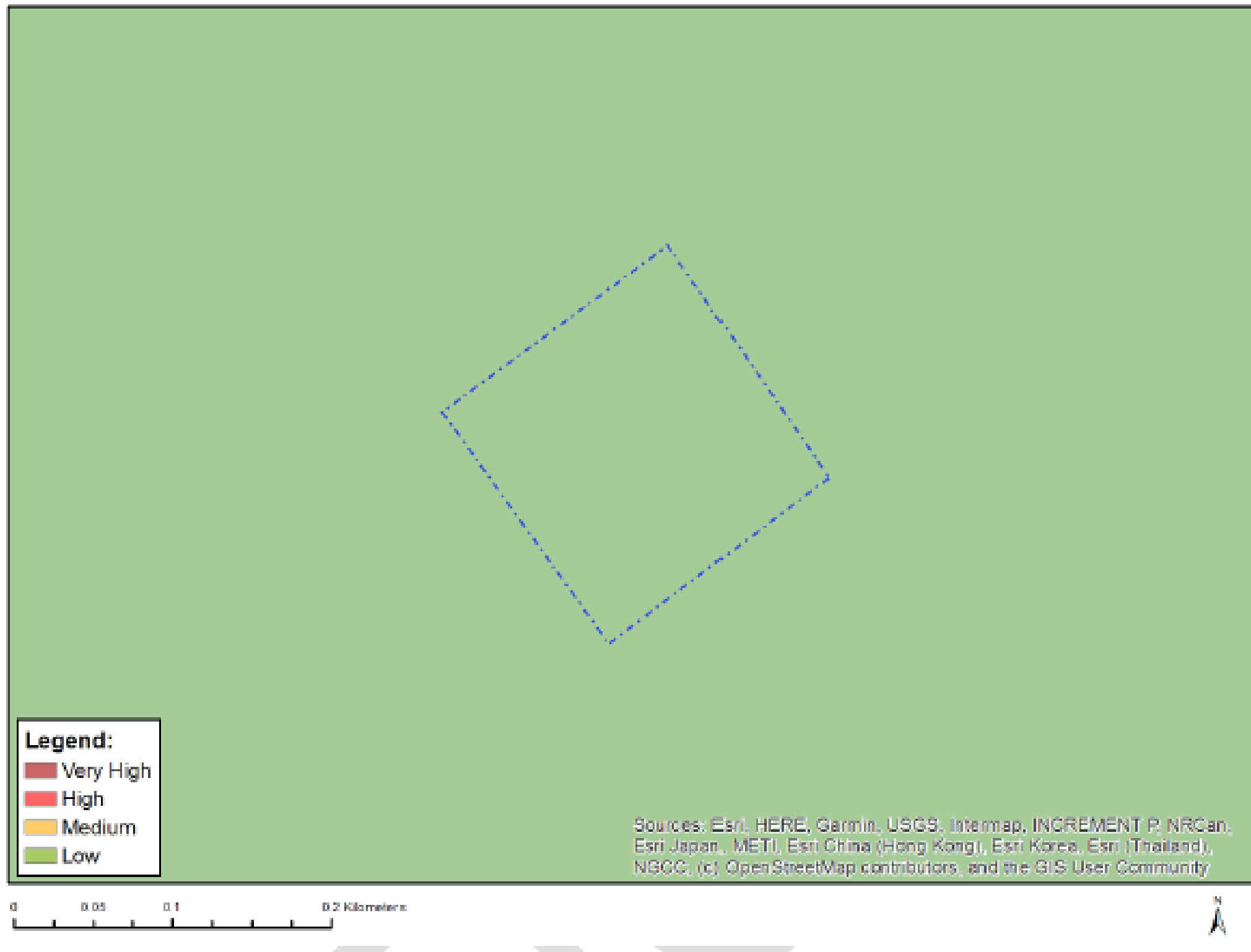
**COLLECTOR SUBSTATION 2 REQUIRED**

THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVITY	SENSITIVITY FEATURES
AGRICULTURE THEME					High: Land capability
ANIMAL SPECIES THEME					Low: Low sensitivity
AQUATIC BIODIVERSITY THEME					Very High: ESA 1; Very High: SWSA (SW) _ Eastern Cape Drakensberg
ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME					Low: Low sensitivity
CIVIL AVIATION THEME					Low: Low sensitivity
DEFENCE THEME					Low: Low Sensitivity
PALAEONTOLOGY THEME					Very High: Features with a Very High paleontological sensitivity
PLANT SPECIES THEME					Medium: Sensitive species 535; Medium: Sensitive species 441; Medium: Sensitive species 451; Medium: Sensitive species 1248
TERRESTRIAL BIODIVERSITY THEME					Very High: Strategic Water Source Areas

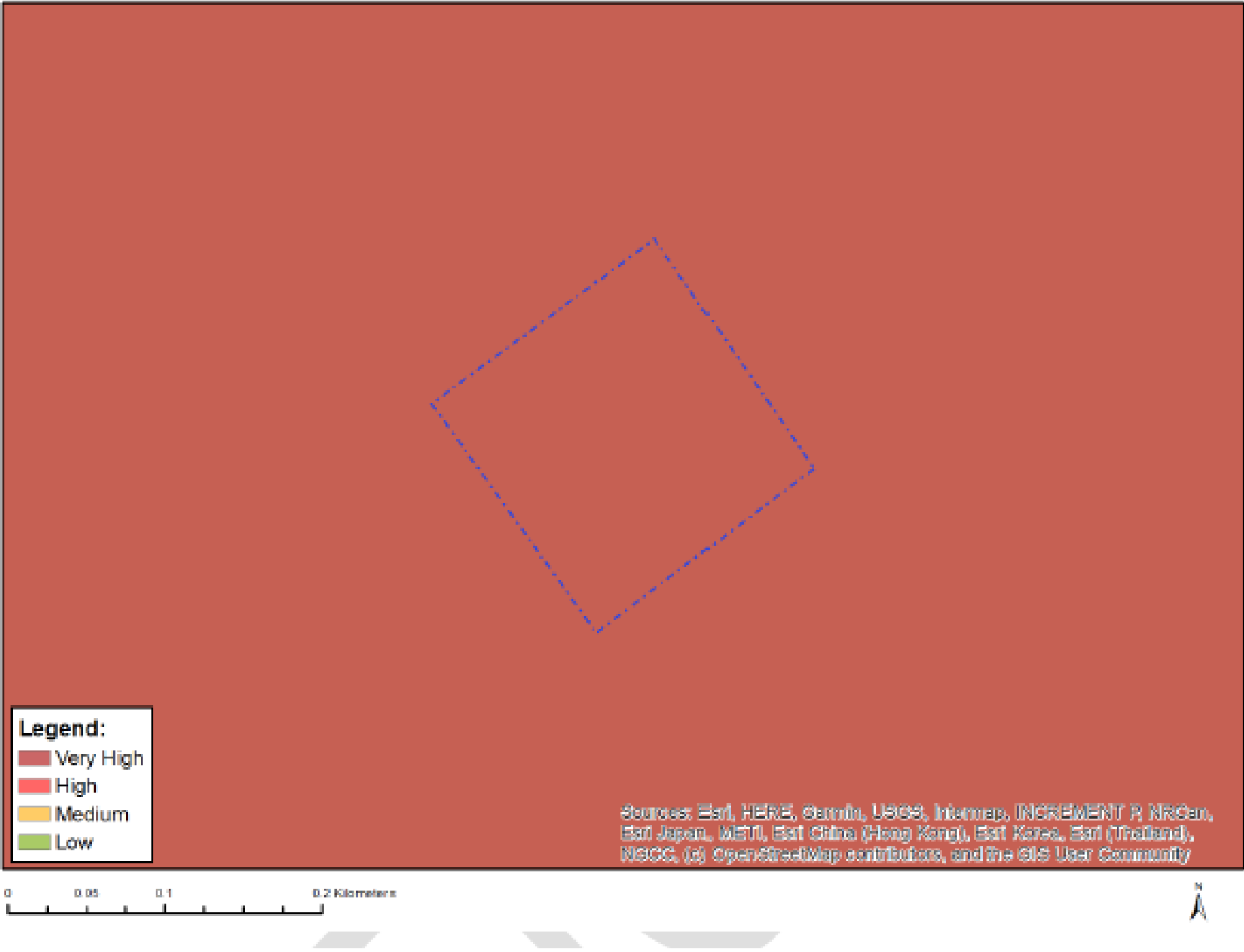
## MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY



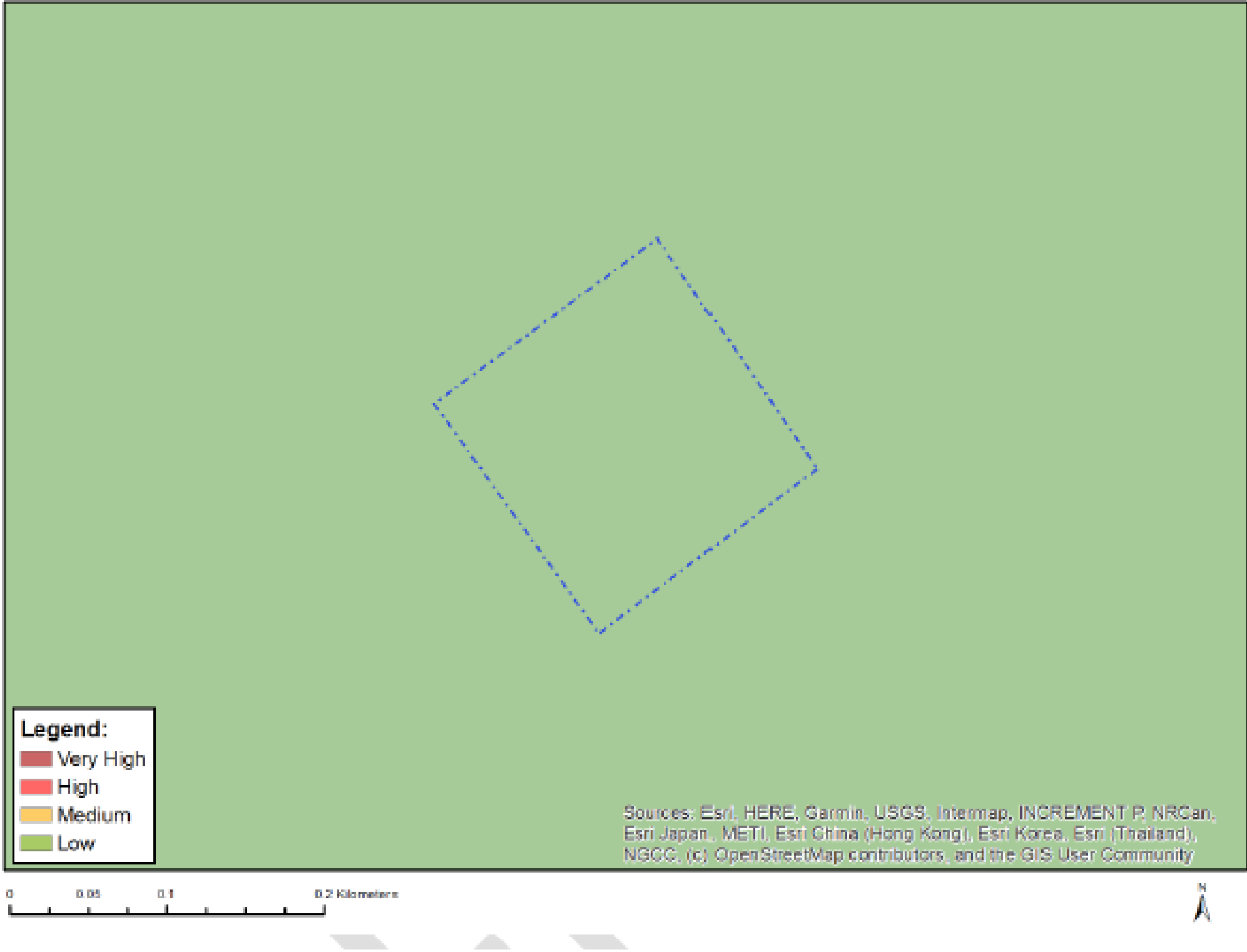
## MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



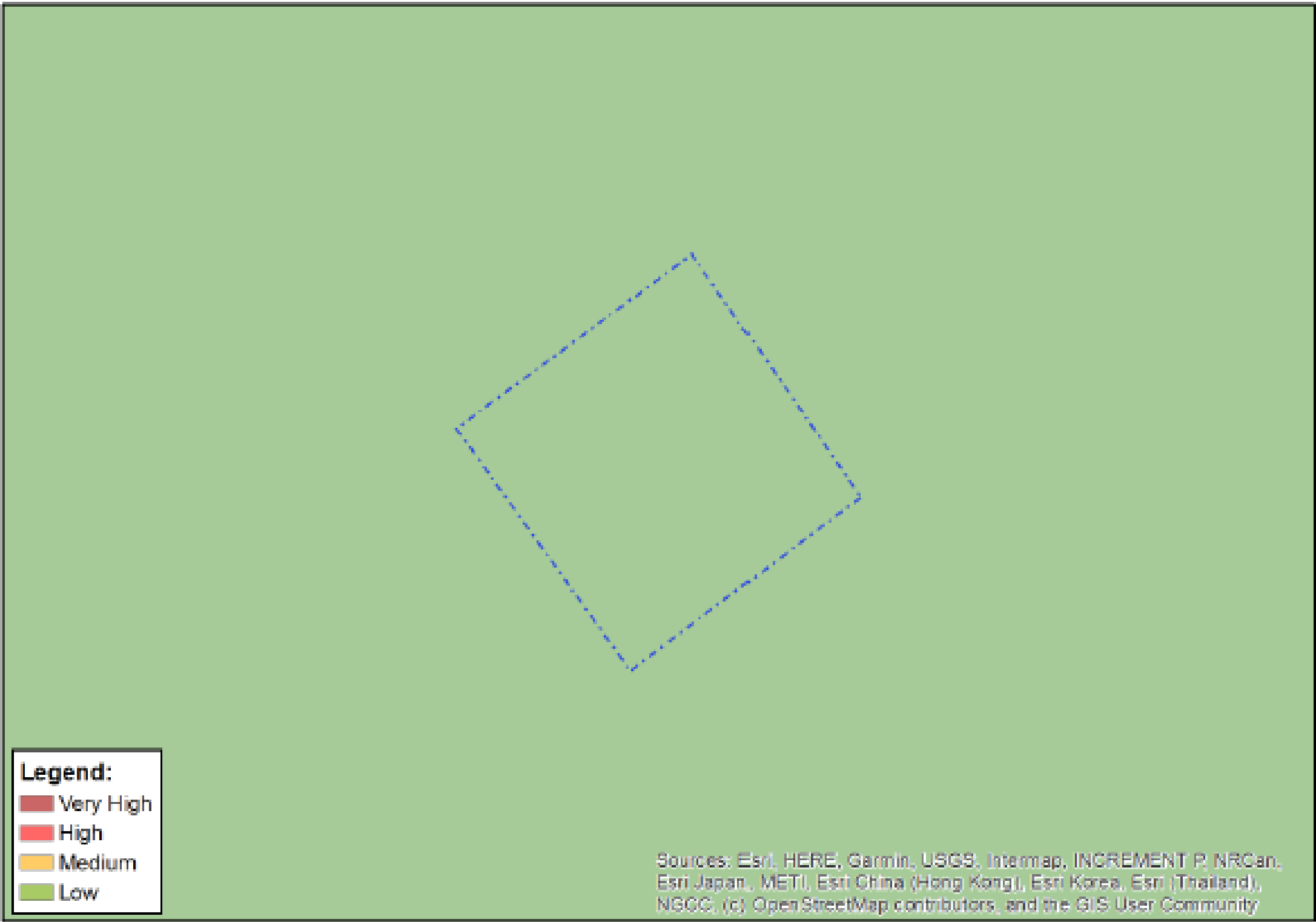
# MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



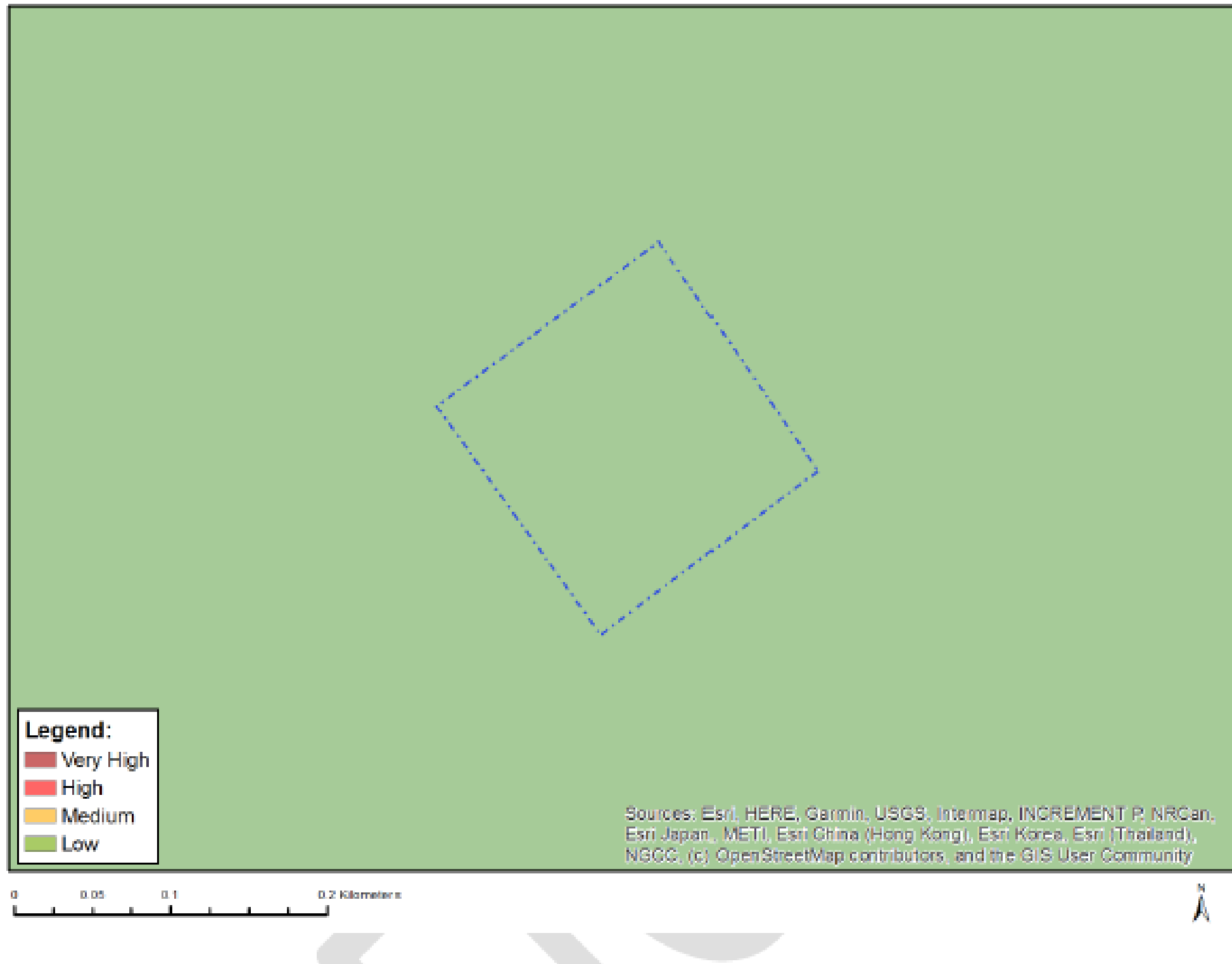
# MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY



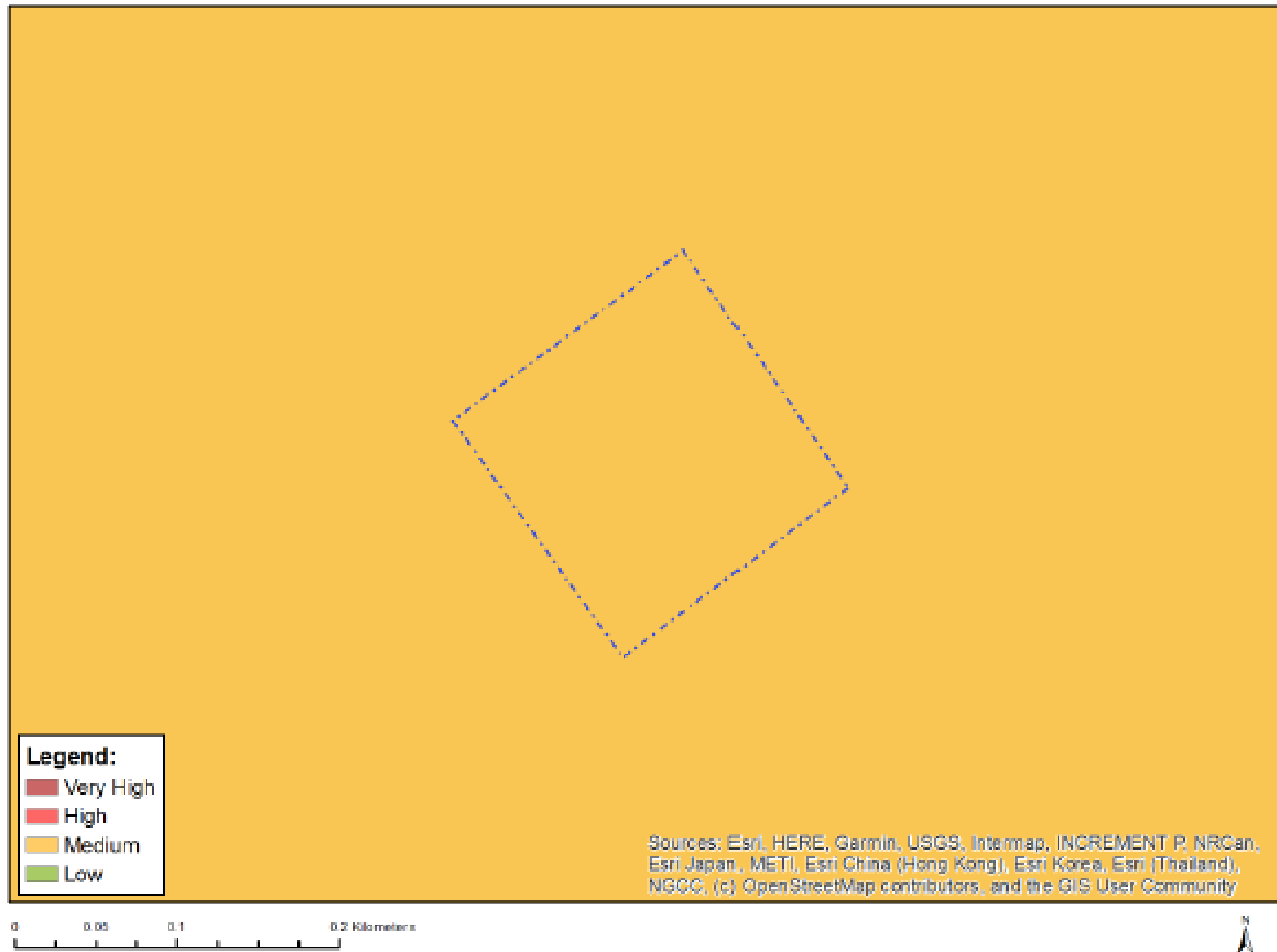
# MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY



## MAP OF RELATIVE DEFENCE THEME SENSITIVITY

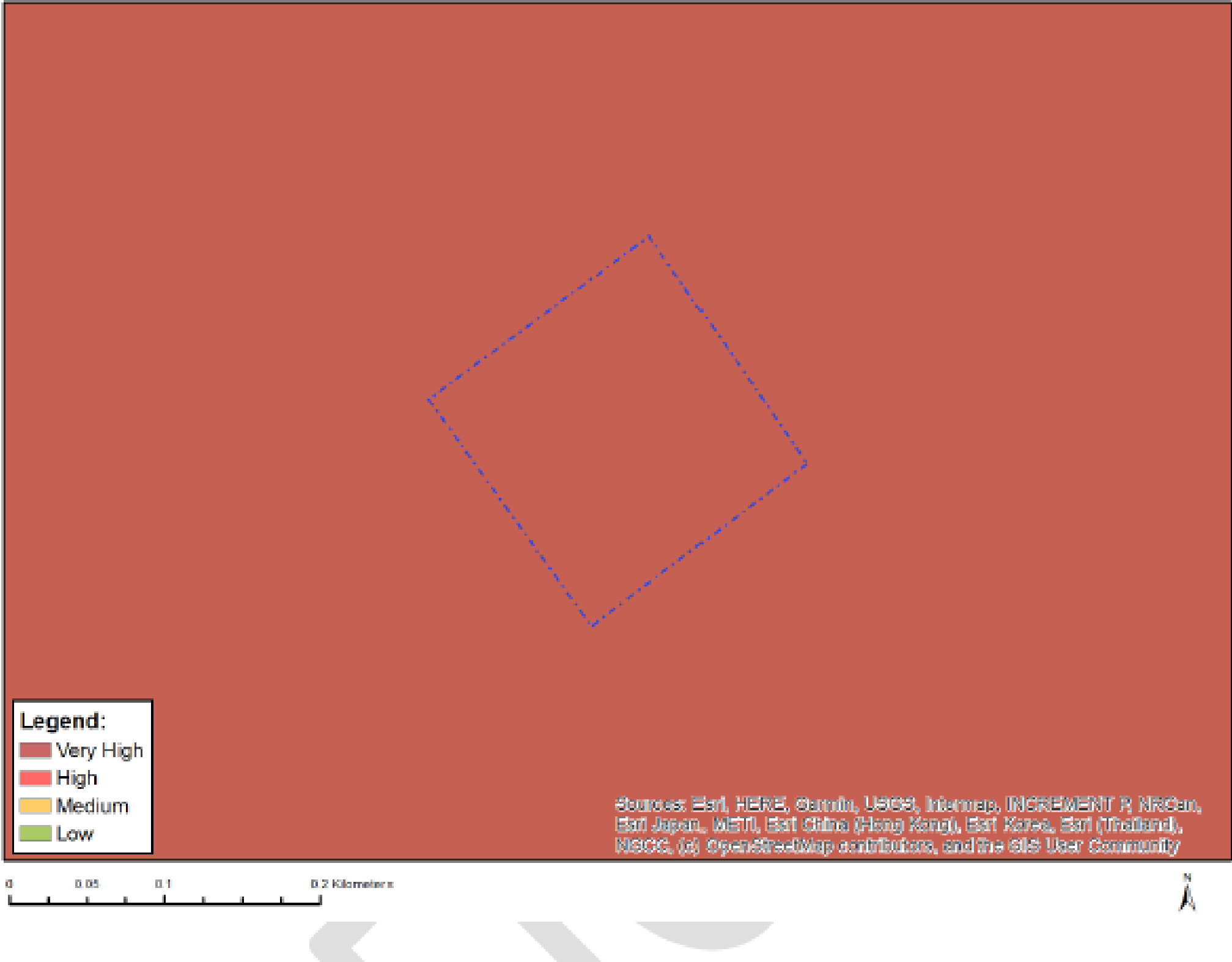


## MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY





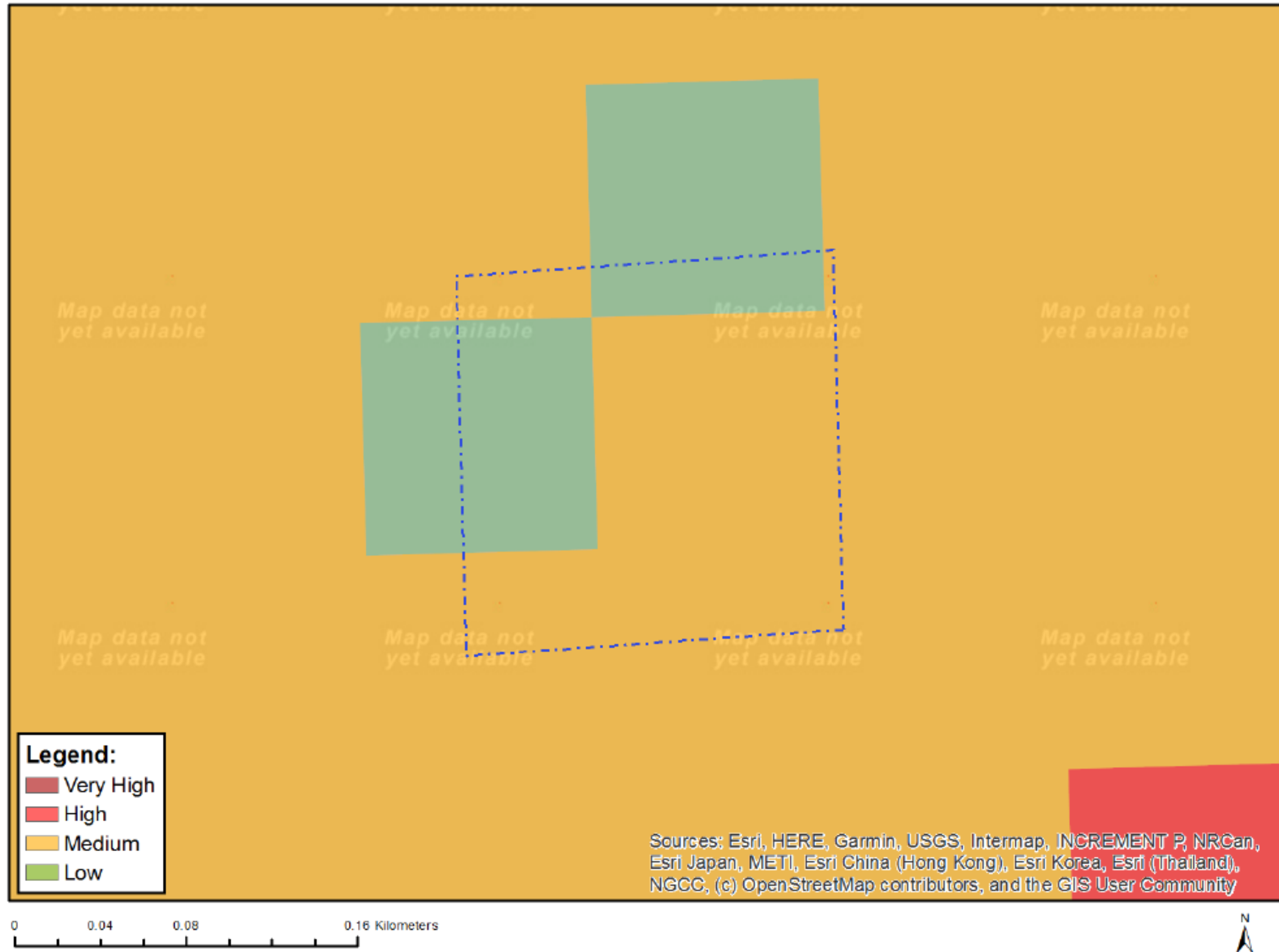
# MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



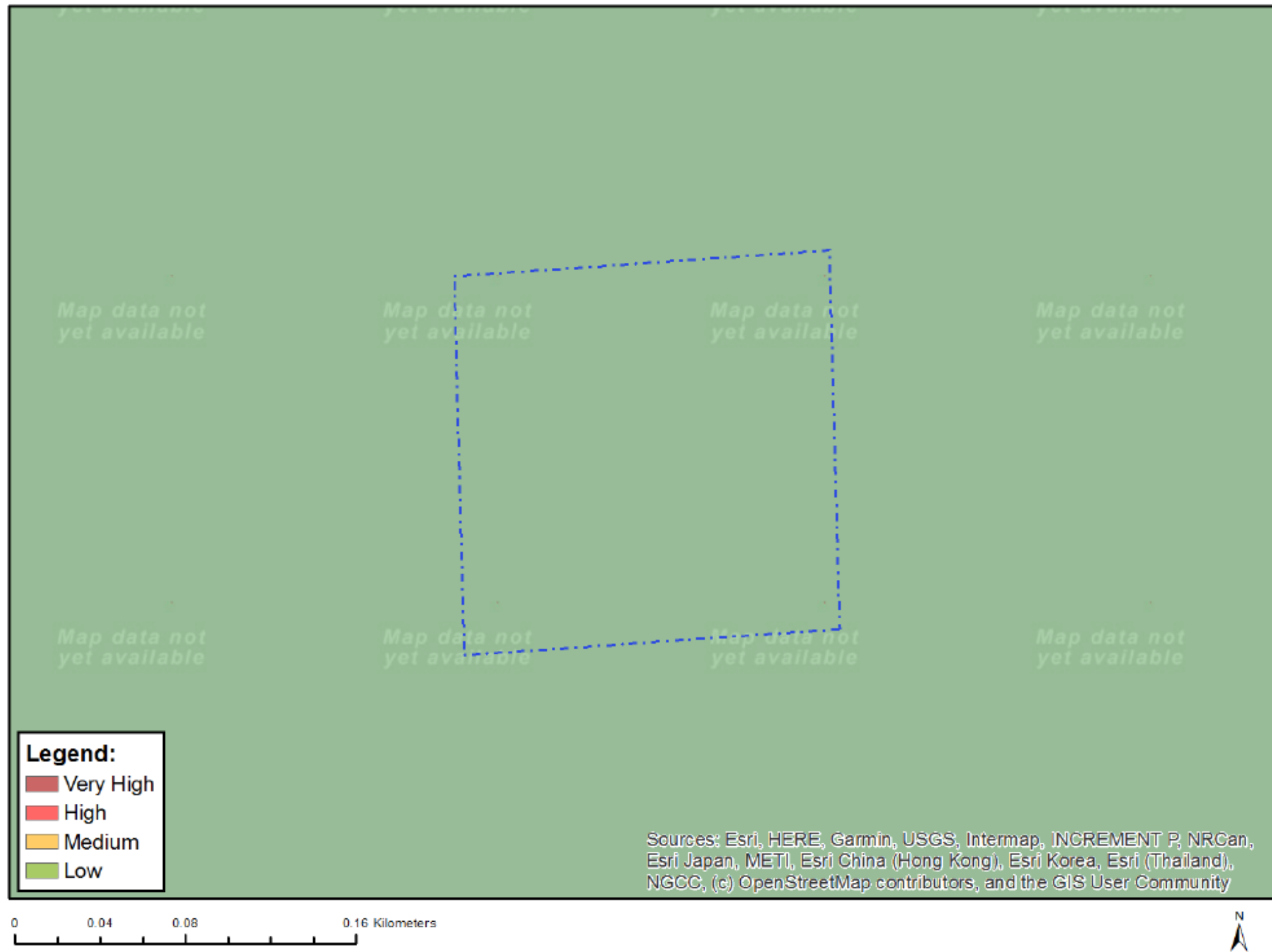
**COLLECTOR SUBSTATION 3 REQUIRED**

THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVITY	SENSITIVITY FEATURES
AGRICULTURE THEME			X		Medium: Land capability
ANIMAL SPECIES THEME				X	Low: Low sensitivity
AQUATIC BIODIVERSITY THEME				X	Low: Low sensitivity
ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME	X				Very High: Within 100m of an Ungraded Heritage site
CIVIL AVIATION THEME				X	Low: Low sensitivity
DEFENCE THEME				X	Low: Low Sensitivity
PALAEONTOLOGY THEME	X				Very High: Features with a Very High paleontological sensitivity
PLANT SPECIES THEME			X		Medium: Sensitive species 535; Medium: Sensitive species 441; Medium: Sensitive species 451; Medium: Sensitive species 1248
TERRESTRIAL BIODIVERSITY THEME	X				Very High: Strategic Water Source Areas

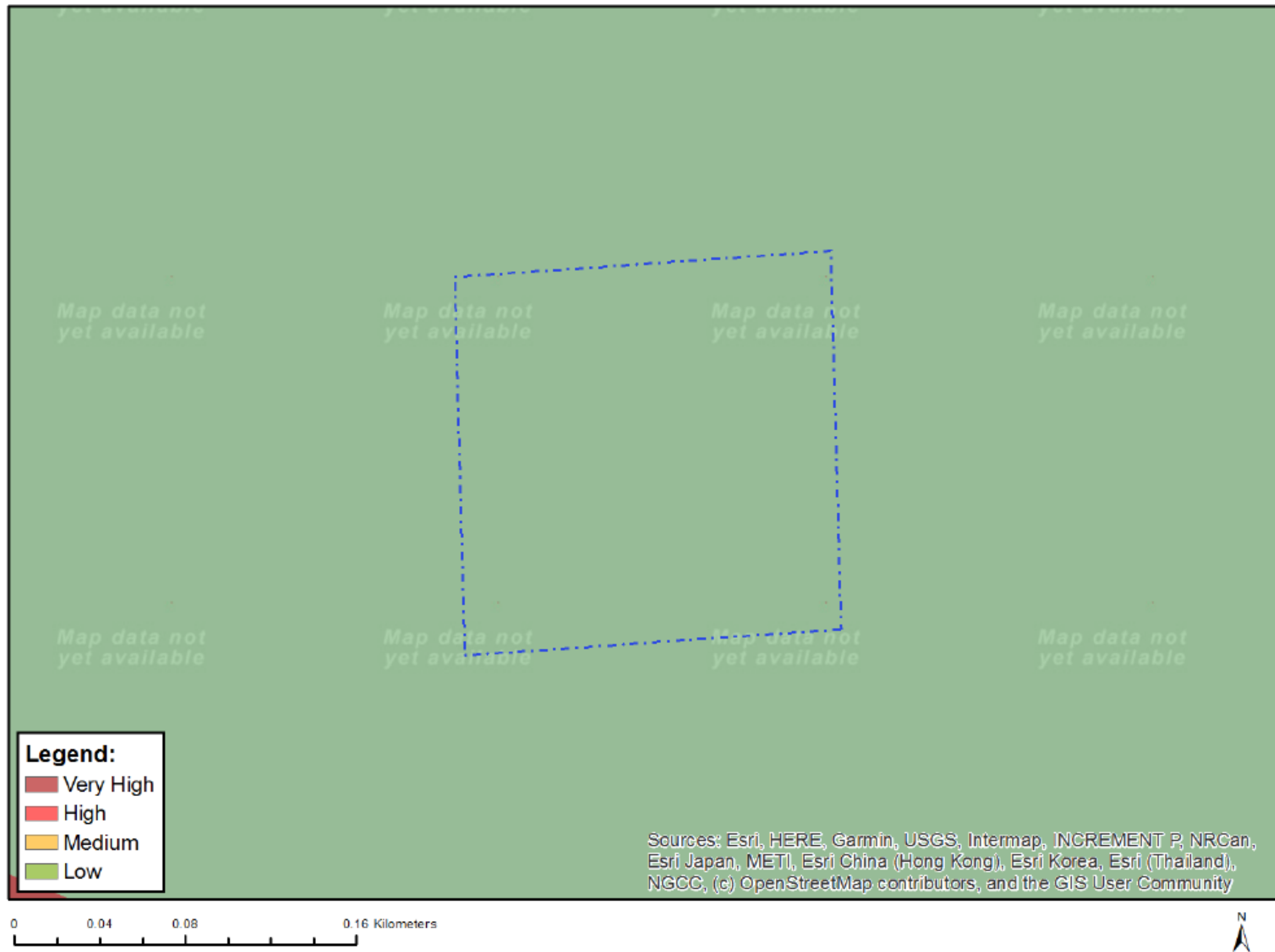
# MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY



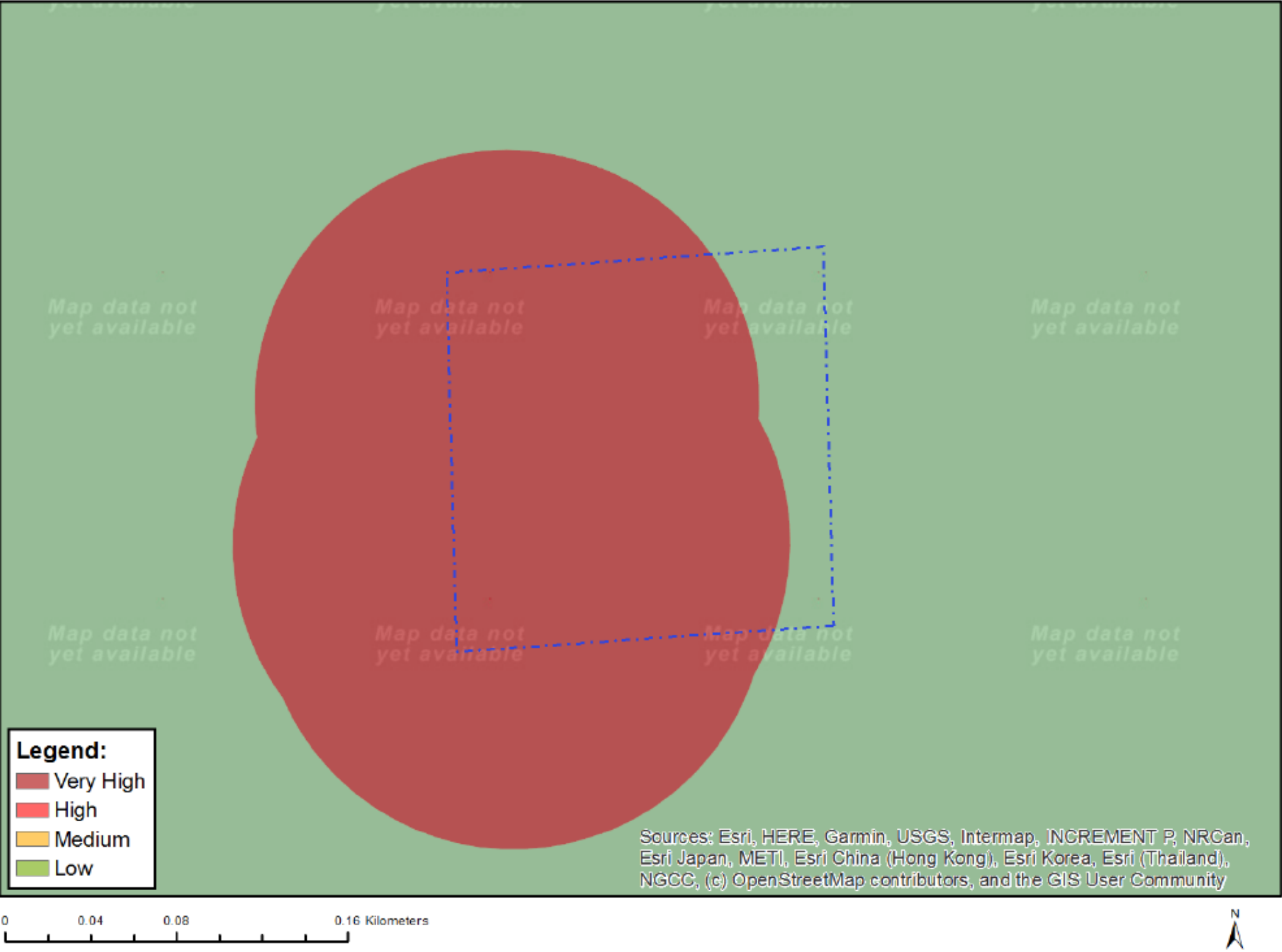
# MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



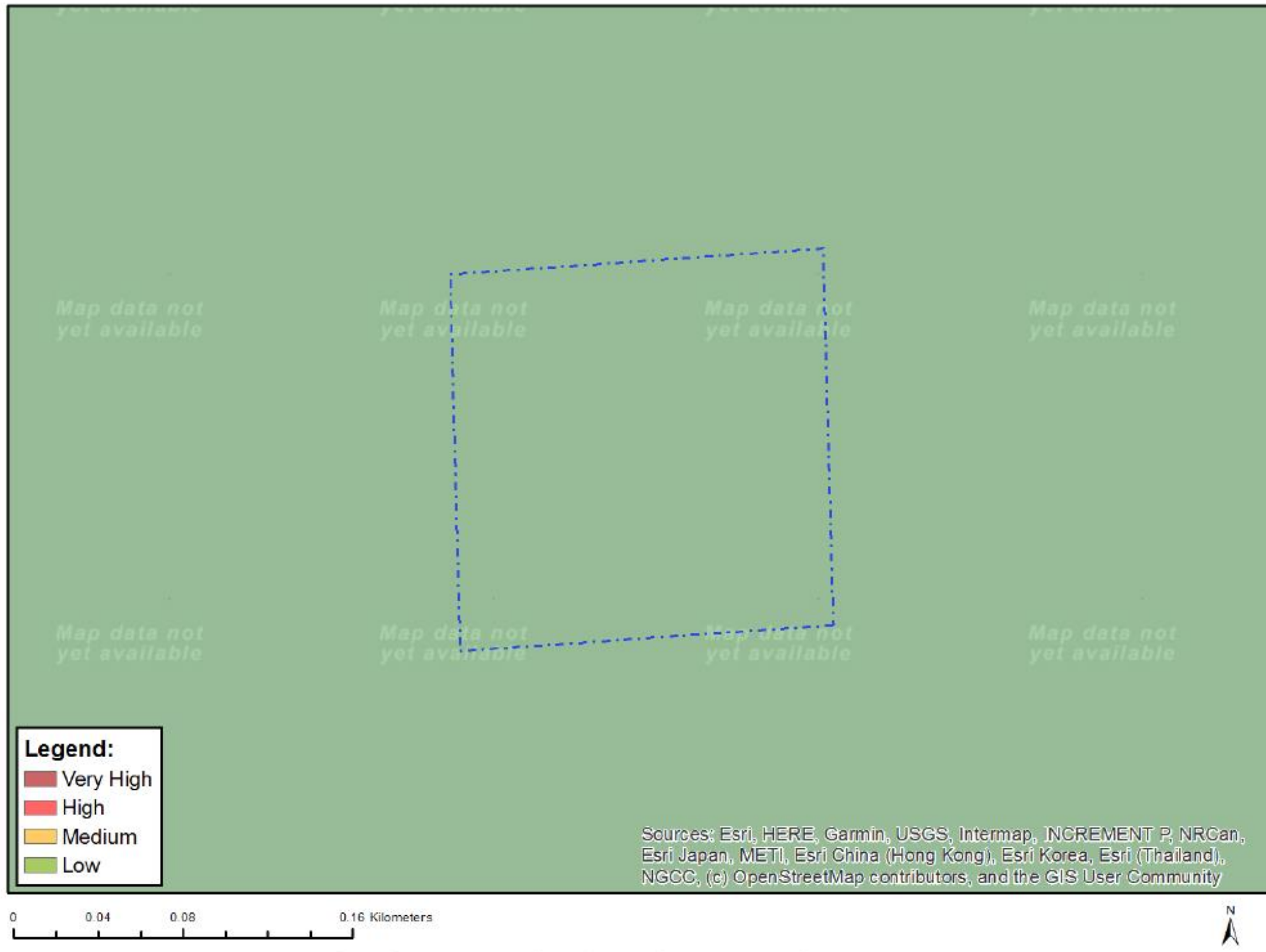
# MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



# MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY



# MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY



# MAP OF RELATIVE DEFENCE THEME SENSITIVITY

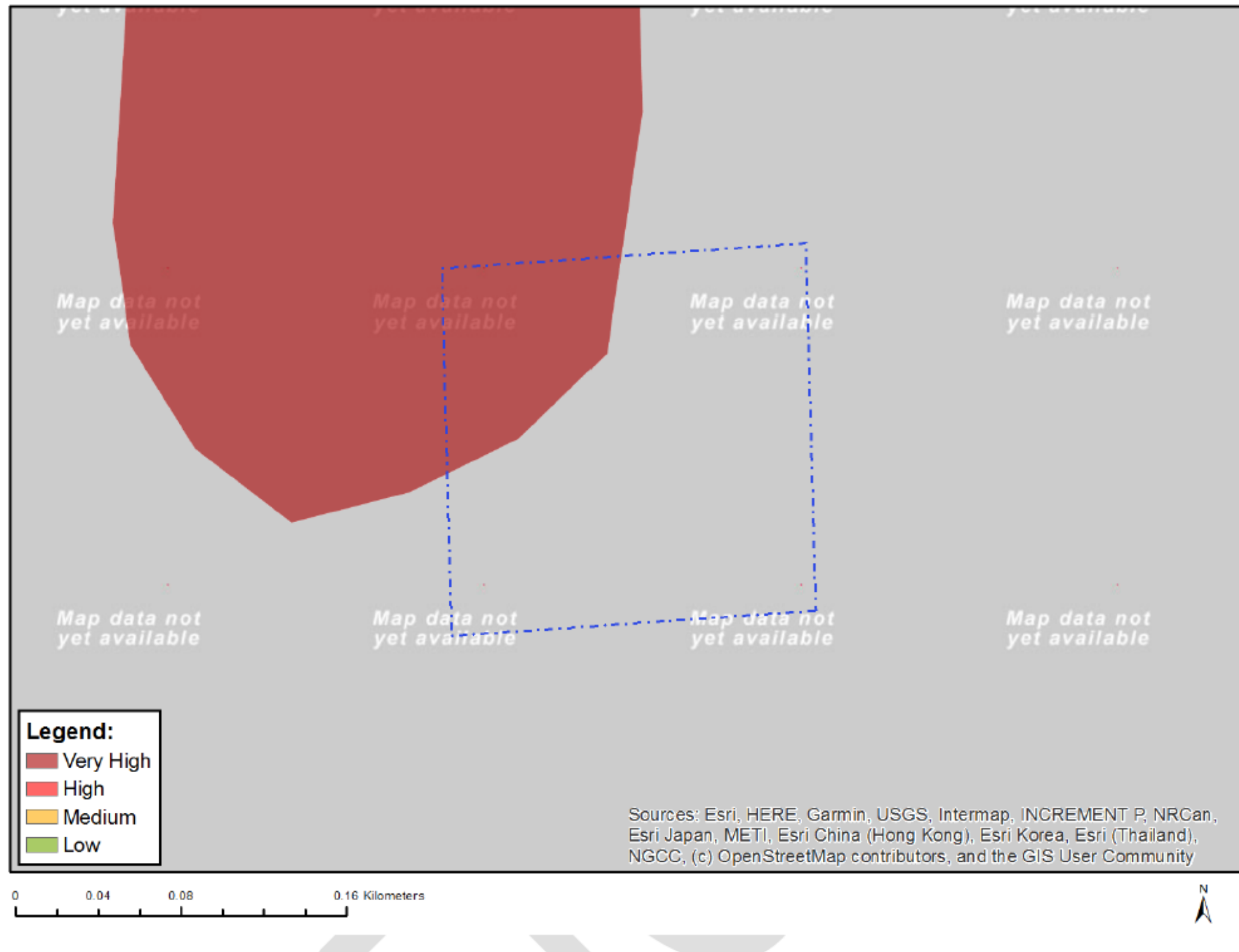


0 0.04 0.08 0.16 Kilometers

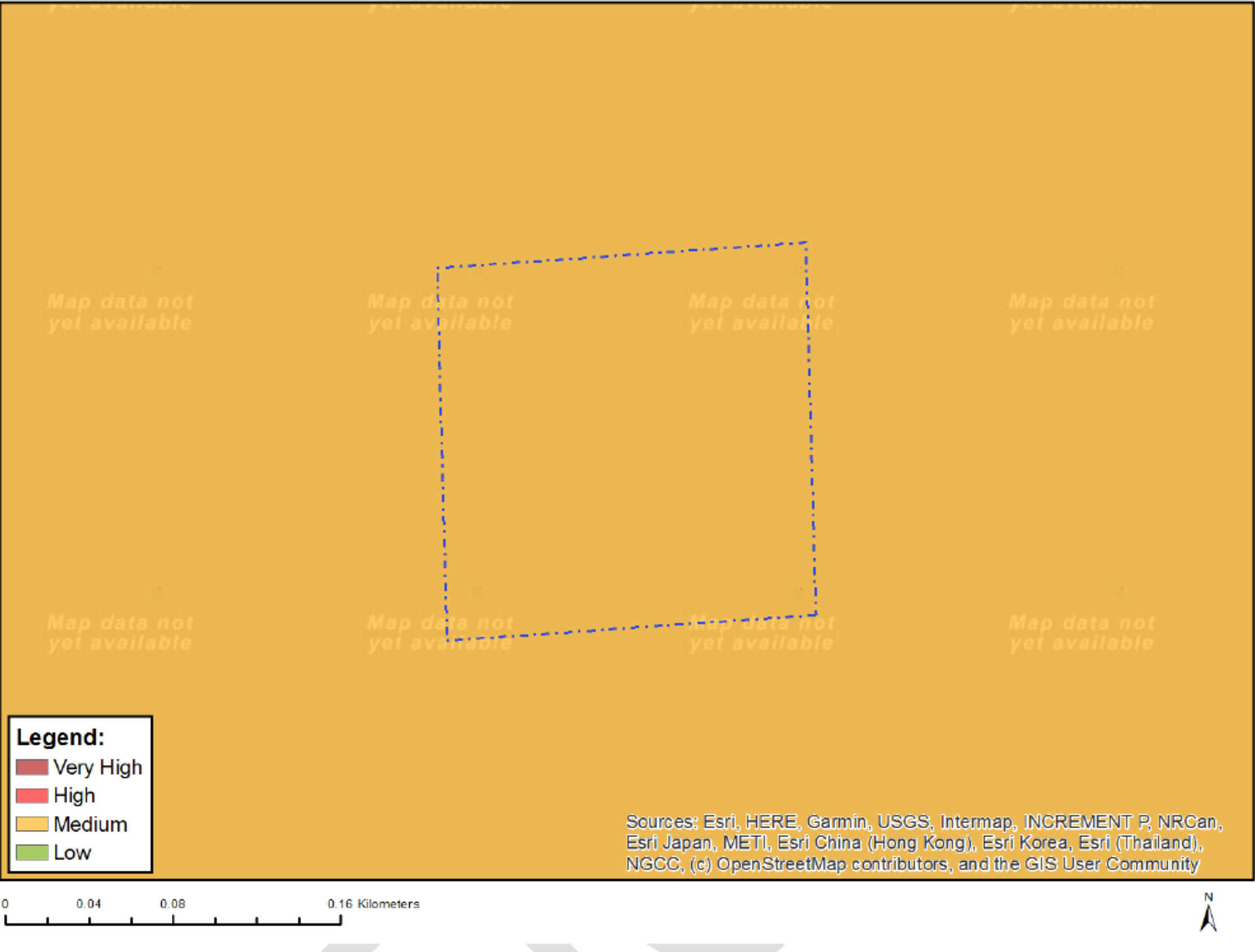




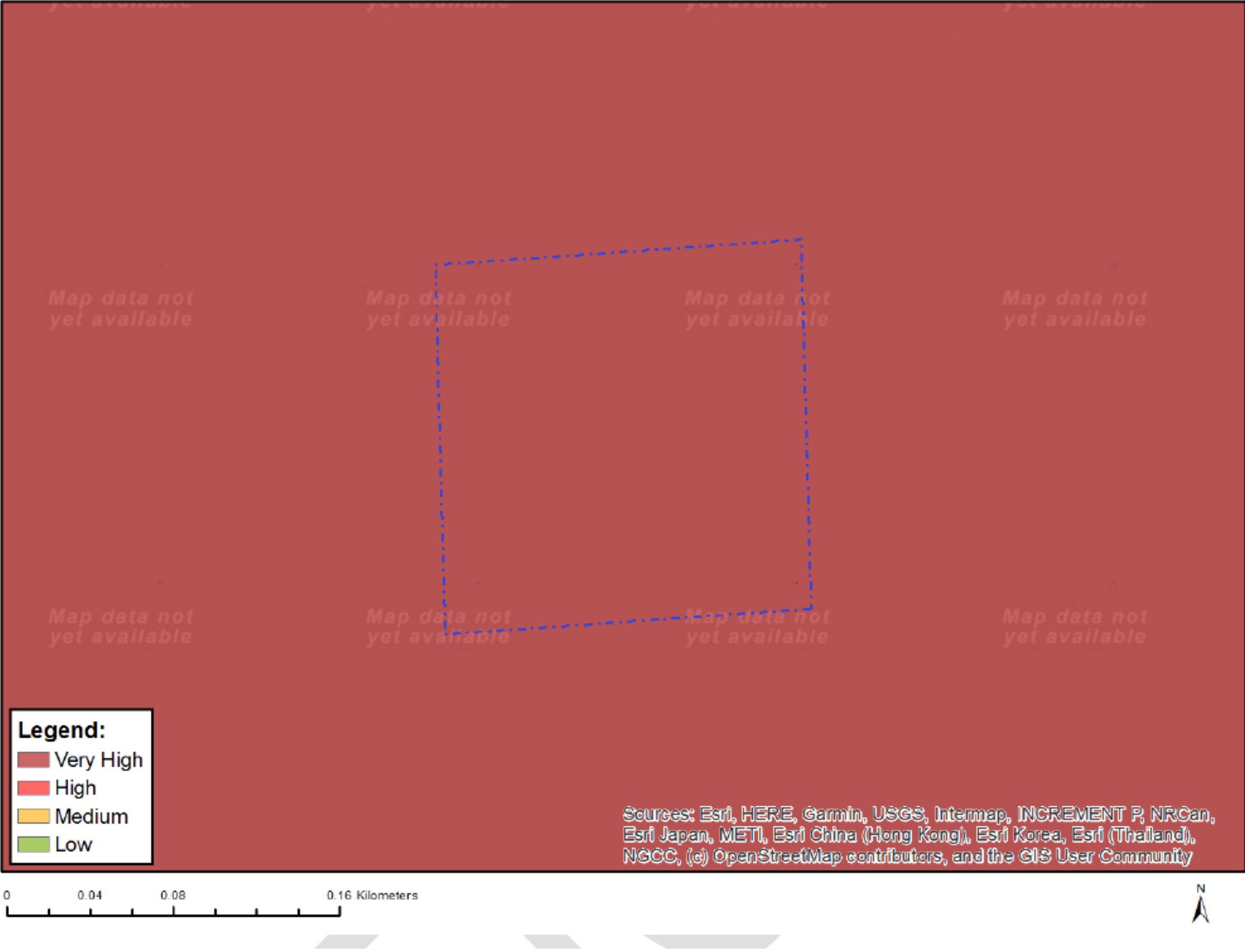
# MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



# MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



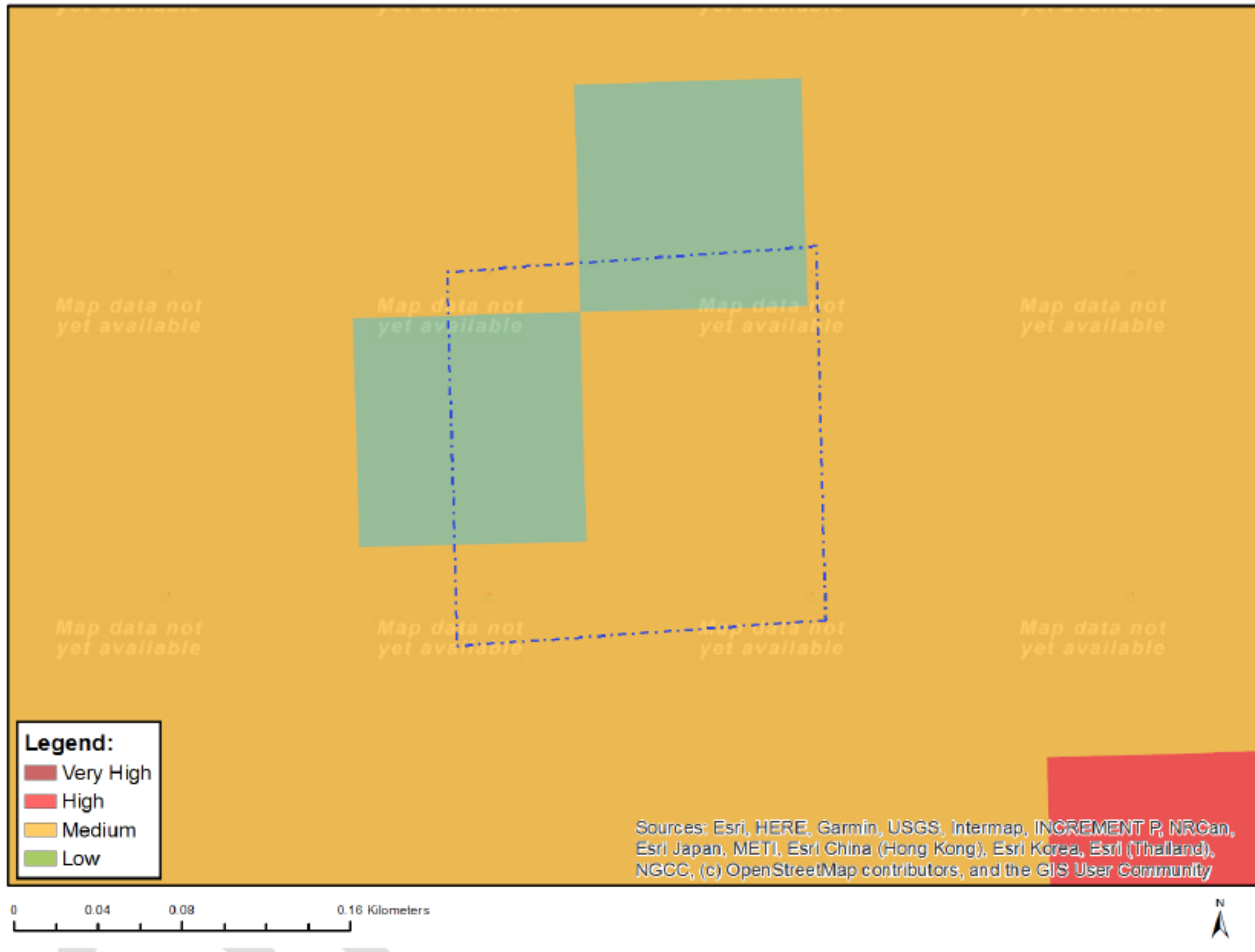
# MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



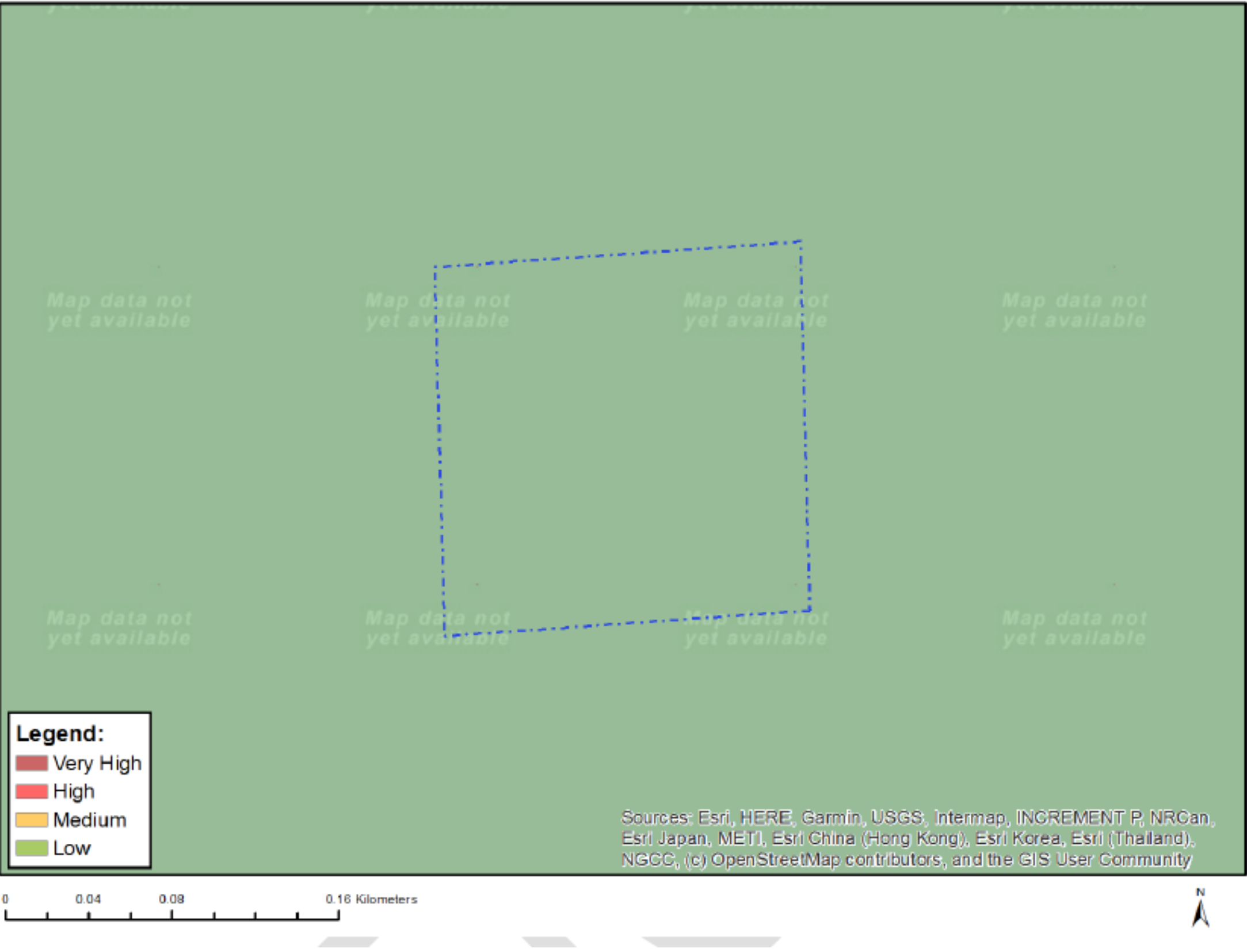
**COLLECTOR SUBSTATION 4 REQUIRED**

THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVITY	SENSITIVITY FEATURES
AGRICULTURE THEME					Medium: Land capability
ANIMAL SPECIES THEME					Low: Low sensitivity
AQUATIC BIODIVERSITY THEME					Very High: ESA 1; Very High: SWSA (SW) _ Eastern Cape Drakensberg
ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME					Very High: Within 100m of an Ungraded Heritage site
CIVIL AVIATION THEME					Low: Low sensitivity
DEFENCE THEME					Low: Low Sensitivity
PALAEONTOLOGY THEME					Very High: Features with a Very High paleontological sensitivity
PLANT SPECIES THEME					Medium: Sensitive species 535; Medium: Sensitive species 441; Medium: Sensitive species 451; Medium: Sensitive species 1248
TERRESTRIAL BIODIVERSITY THEME					Very High: CBA 2

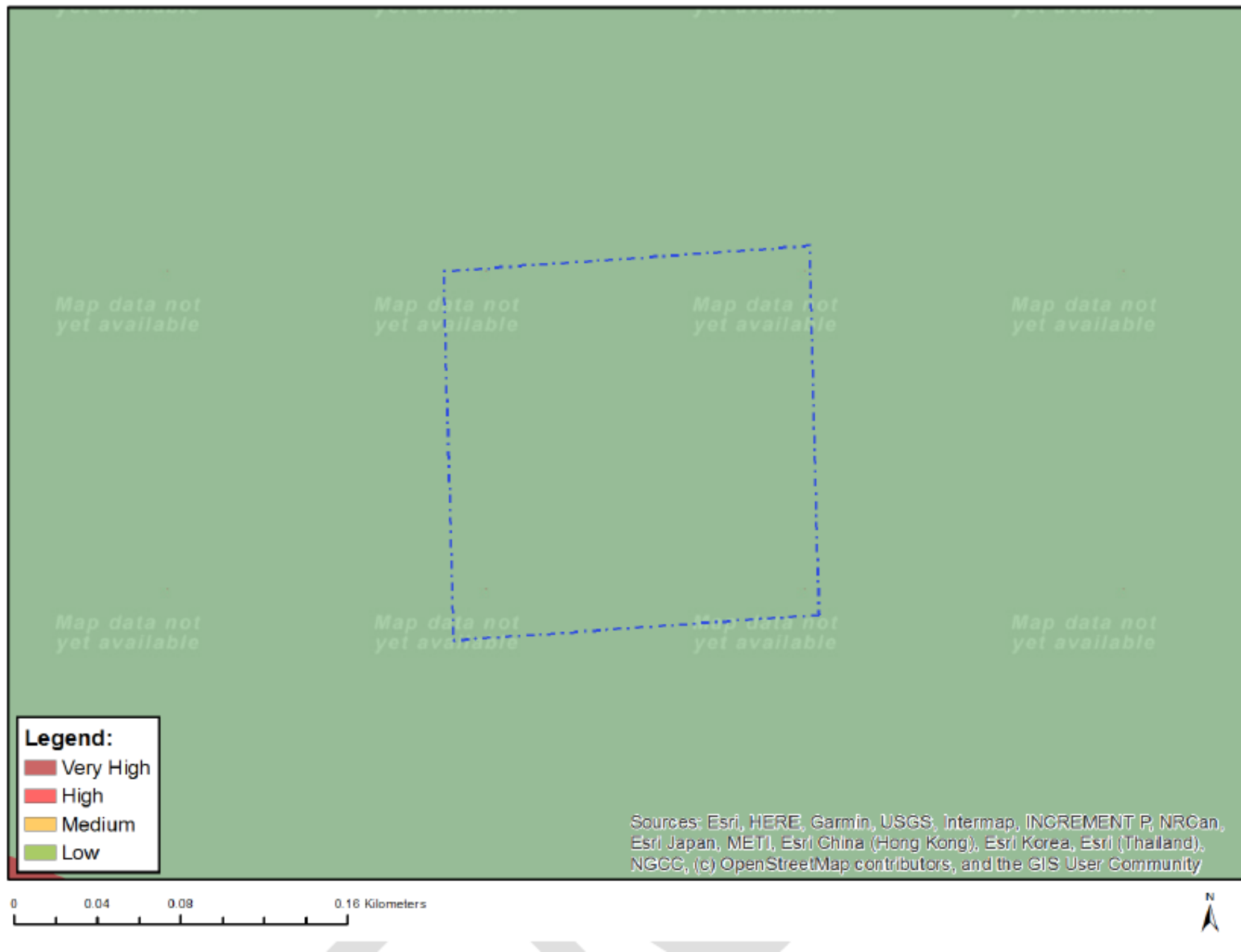
# MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY



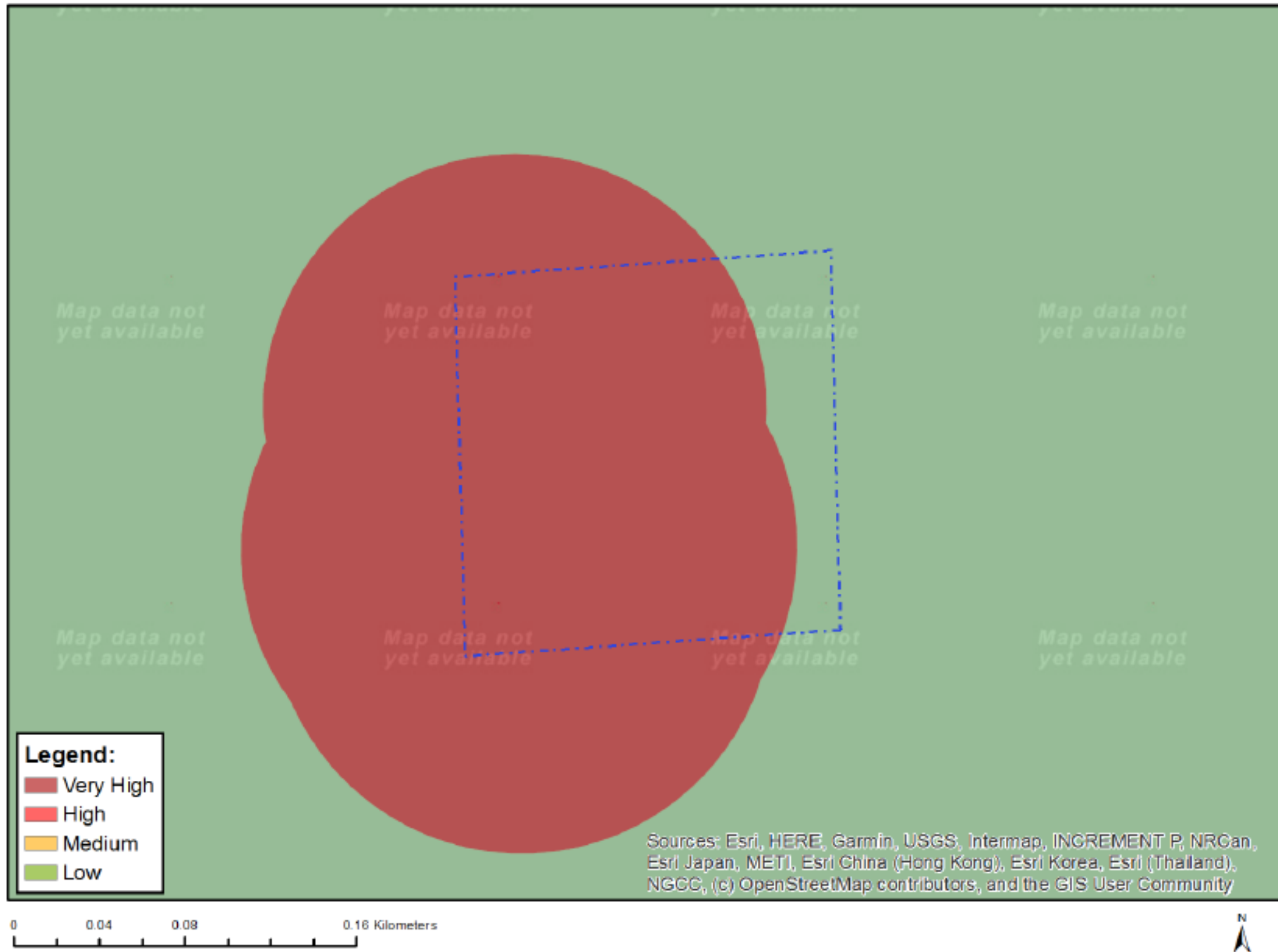
# MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



# MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY

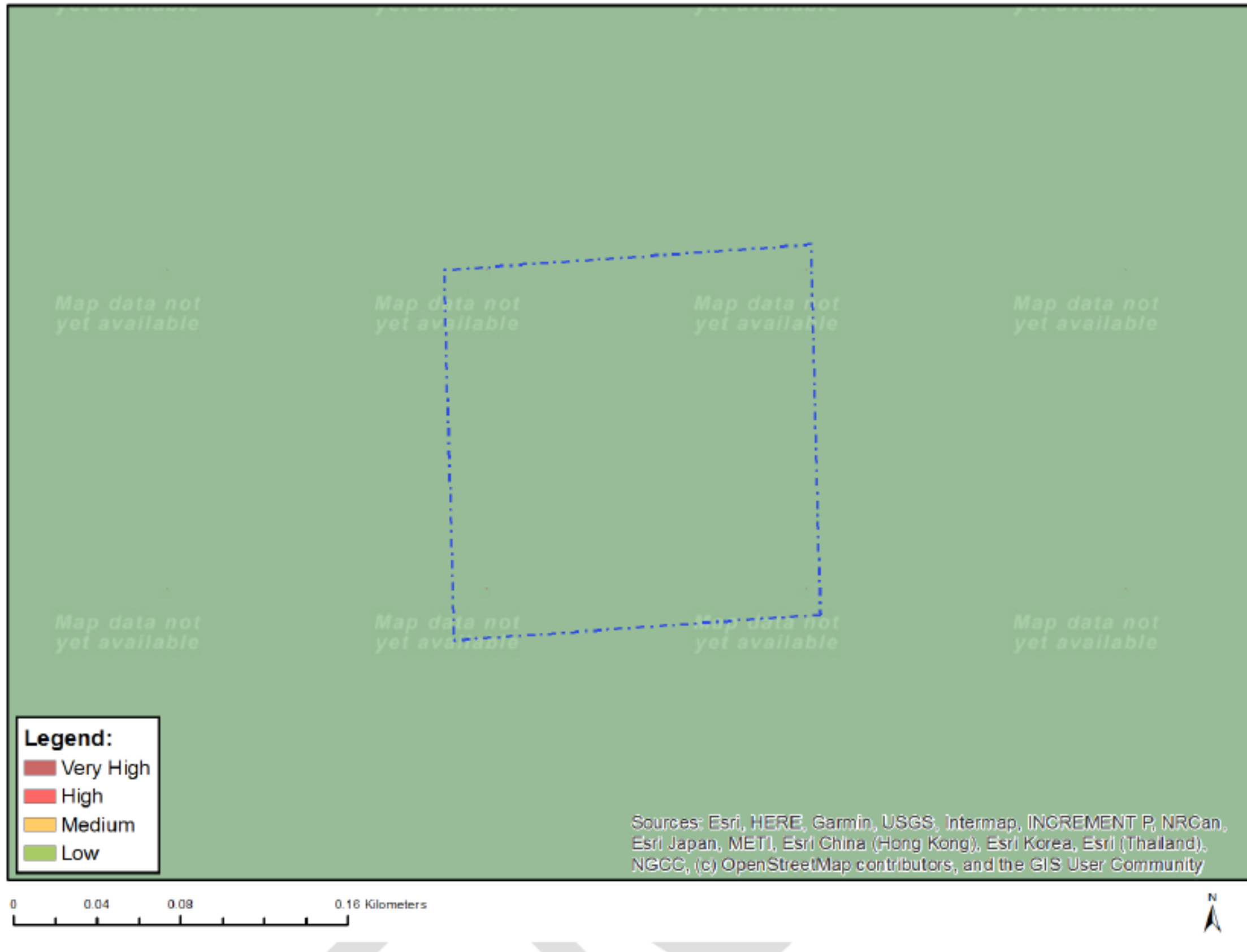


# MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY

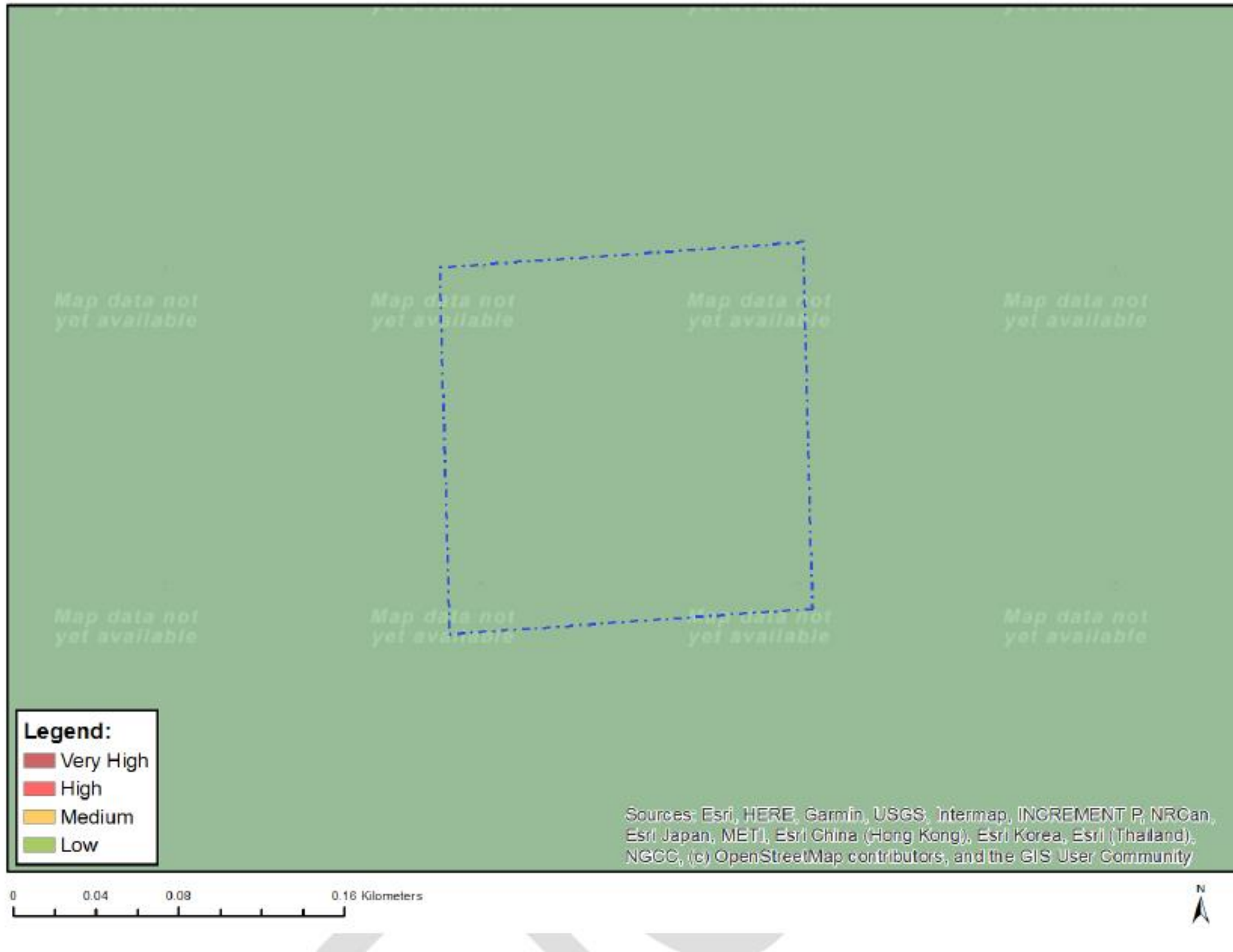




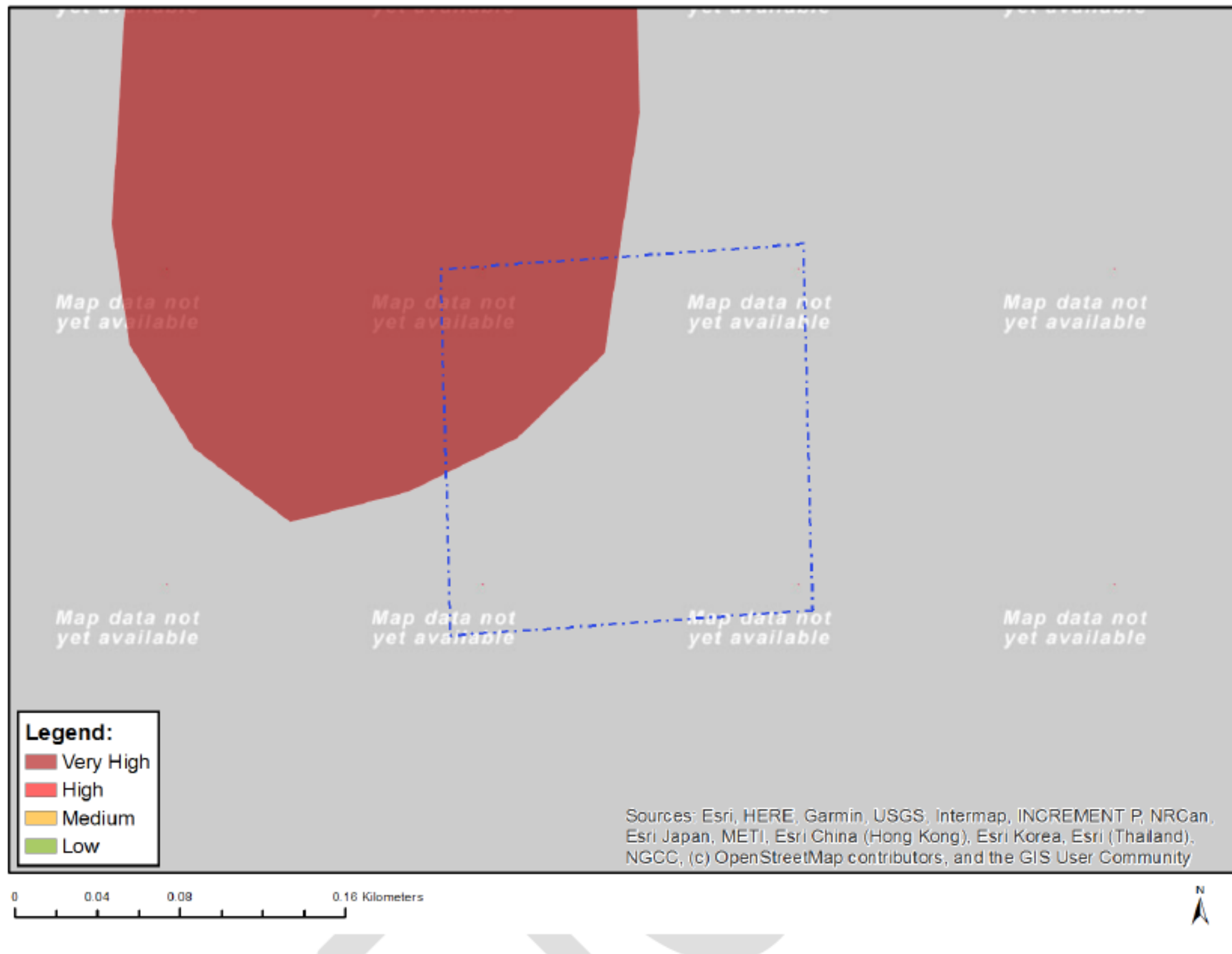
# MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY



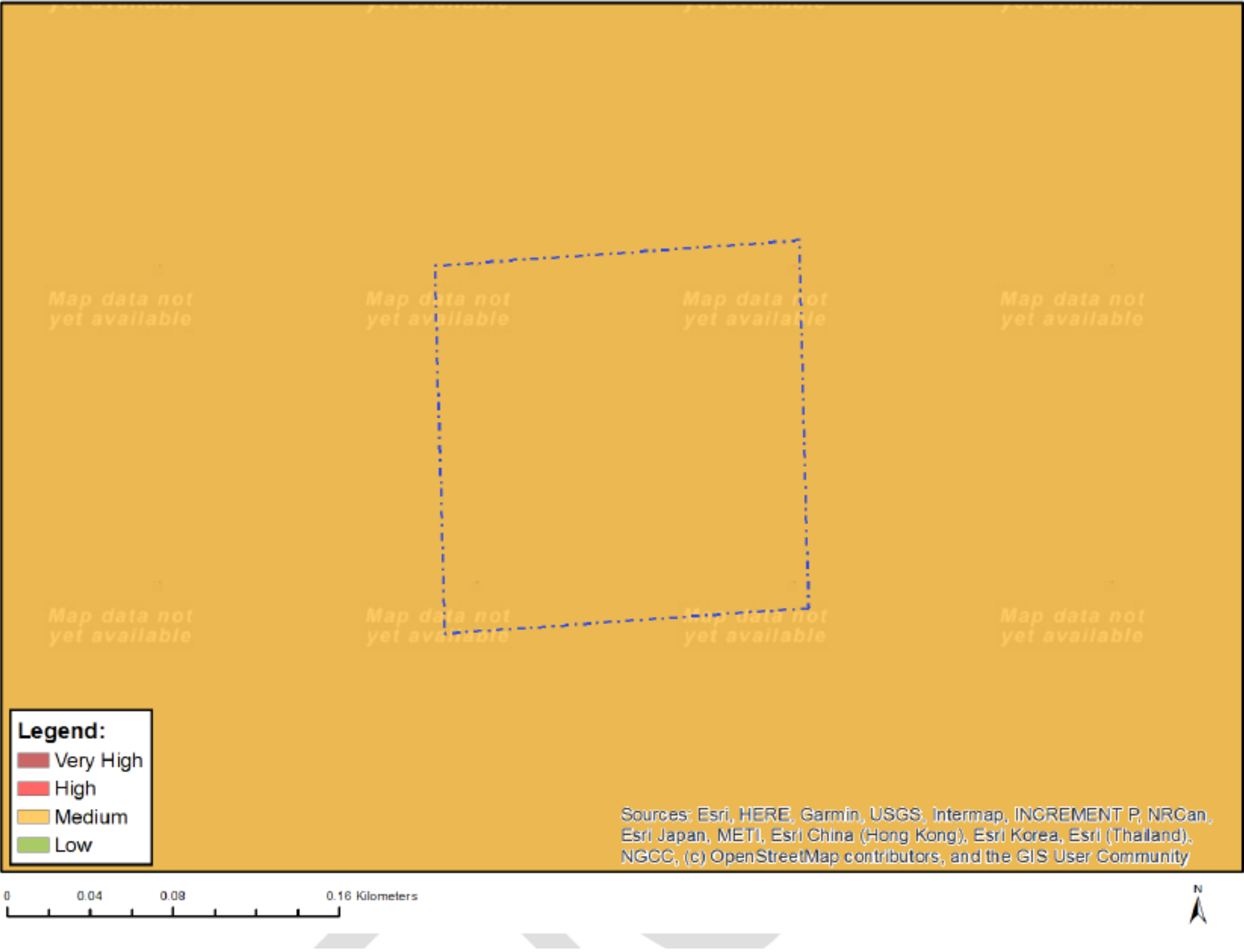
# MAP OF RELATIVE DEFENCE THEME SENSITIVITY



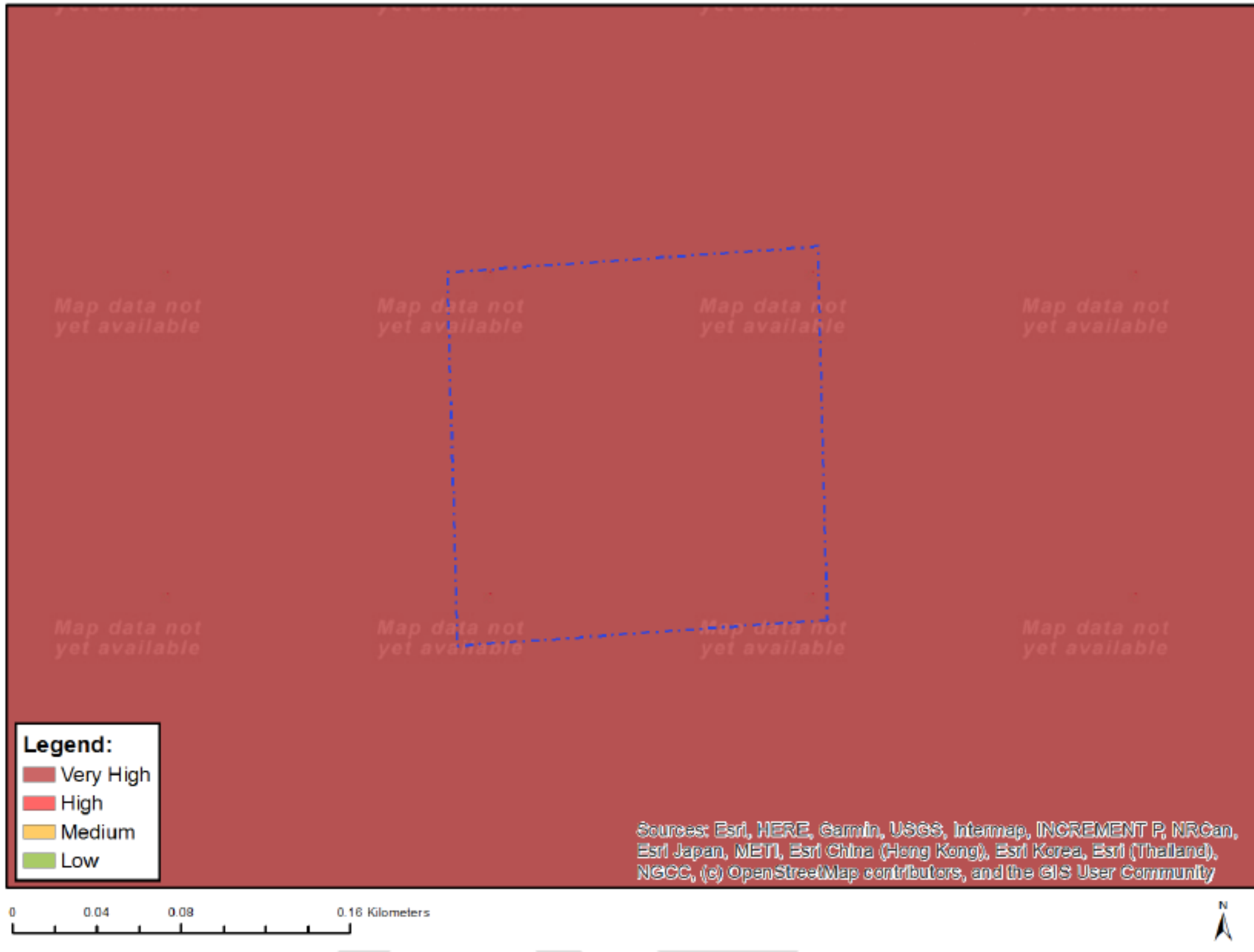
# MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



# MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



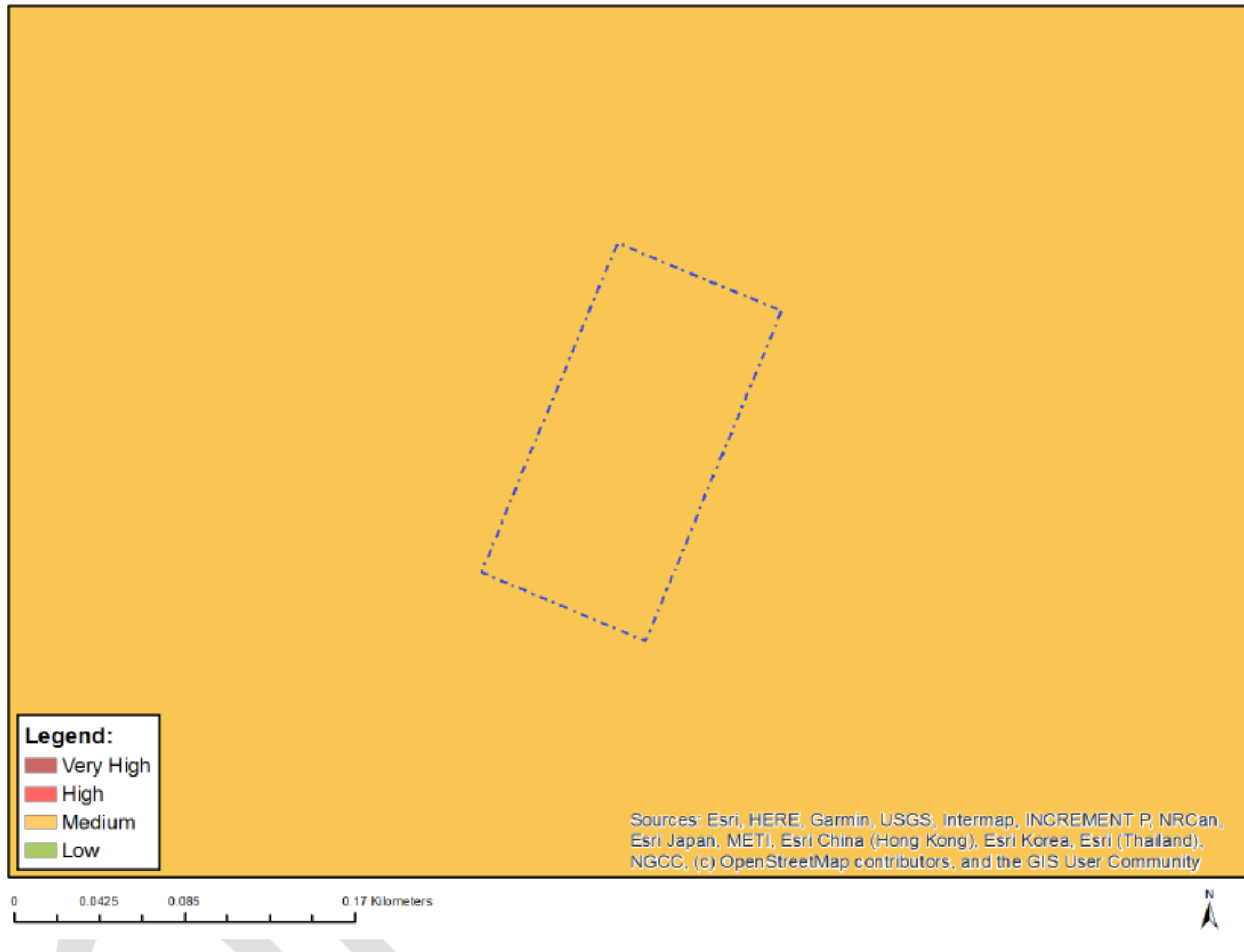
# MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



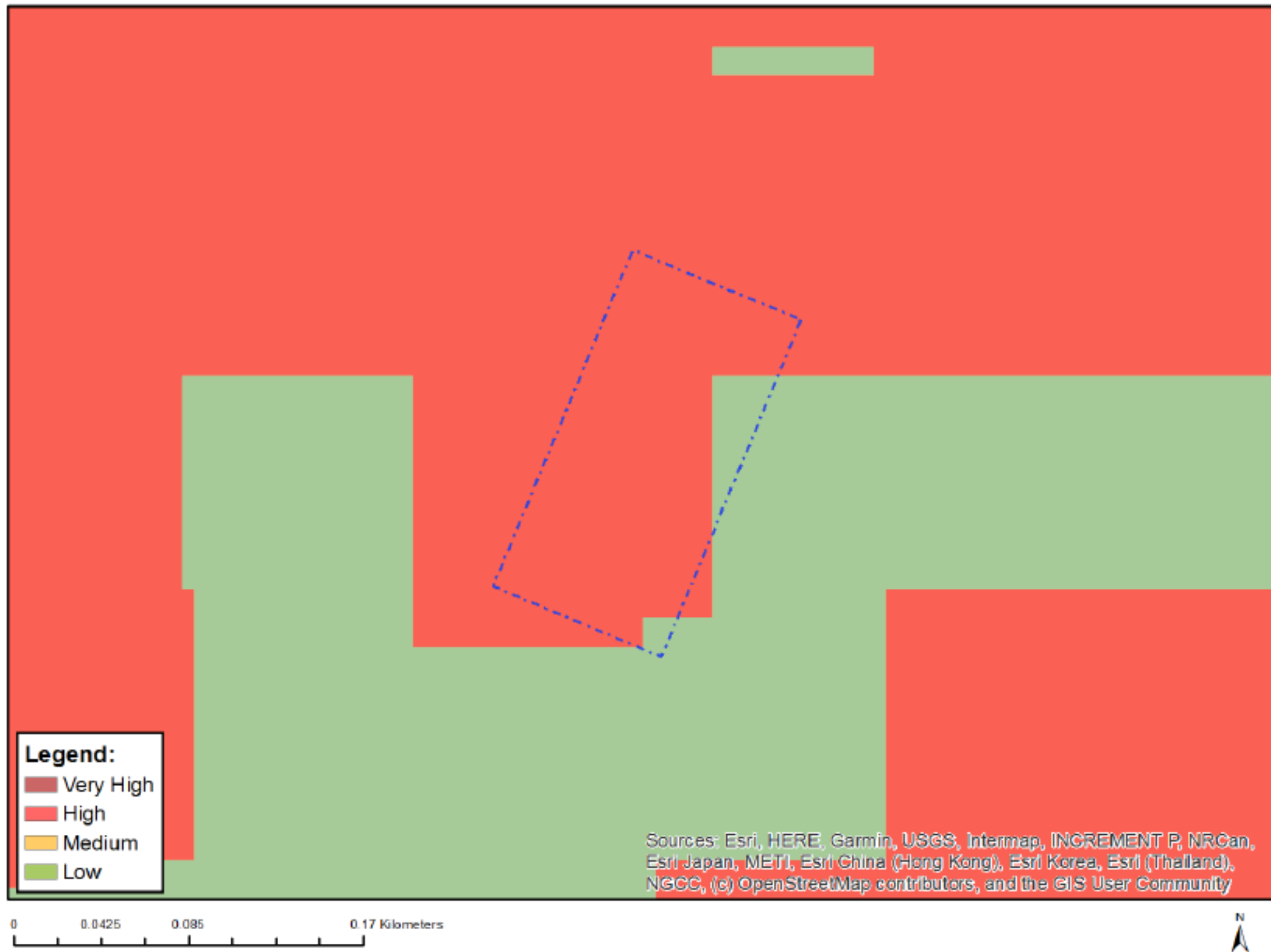
**ESKOM SUBSTATION ALTERNATIVE 1**

THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVITY	SENSITIVITY FEATURES
AGRICULTURE THEME			X		Medium: Land capability
ANIMAL SPECIES THEME		X			High: <i>Aves-Circus maurus</i> ; High: <i>Aves-Neotis denhami</i>
AQUATIC BIODIVERSITY THEME	X				Very High: ESA 1; Very High: SWSA (SW) _ Eastern Cape Drakensberg
ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME				X	Low: Low sensitivity
CIVIL AVIATION THEME				X	Low: Low sensitivity
DEFENCE THEME				X	Low: Low Sensitivity
PALAEONTOLOGY THEME	X				Very High: Features with a Very High paleontological sensitivity
PLANT SPECIES THEME			X		Medium: Sensitive species 535; Medium: Sensitive species 441; Medium: Sensitive species 451; Medium: Sensitive species 1248
TERRESTRIAL BIODIVERSITY THEME	X				Very High: Strategic Water Source Areas

# MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY



## MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY

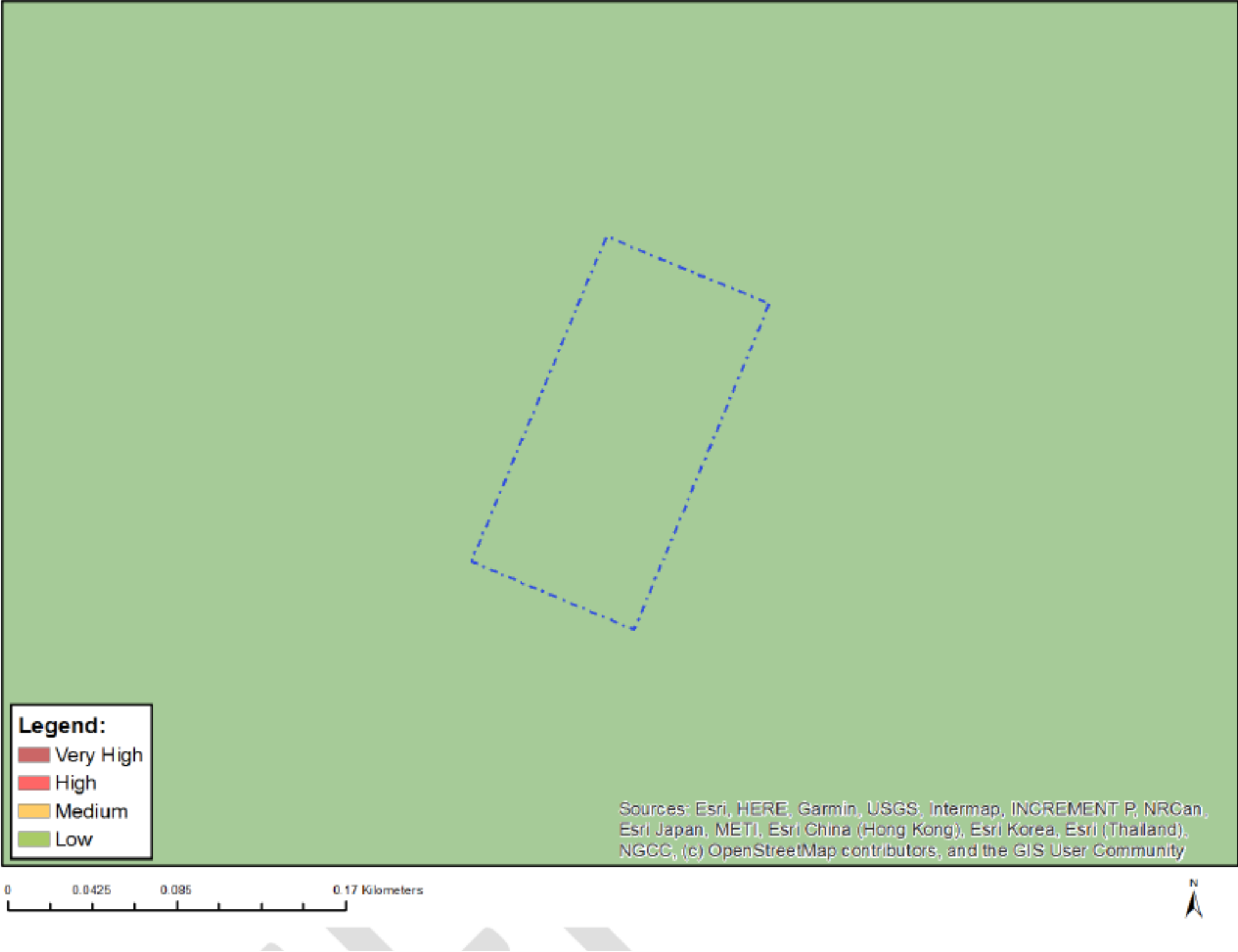




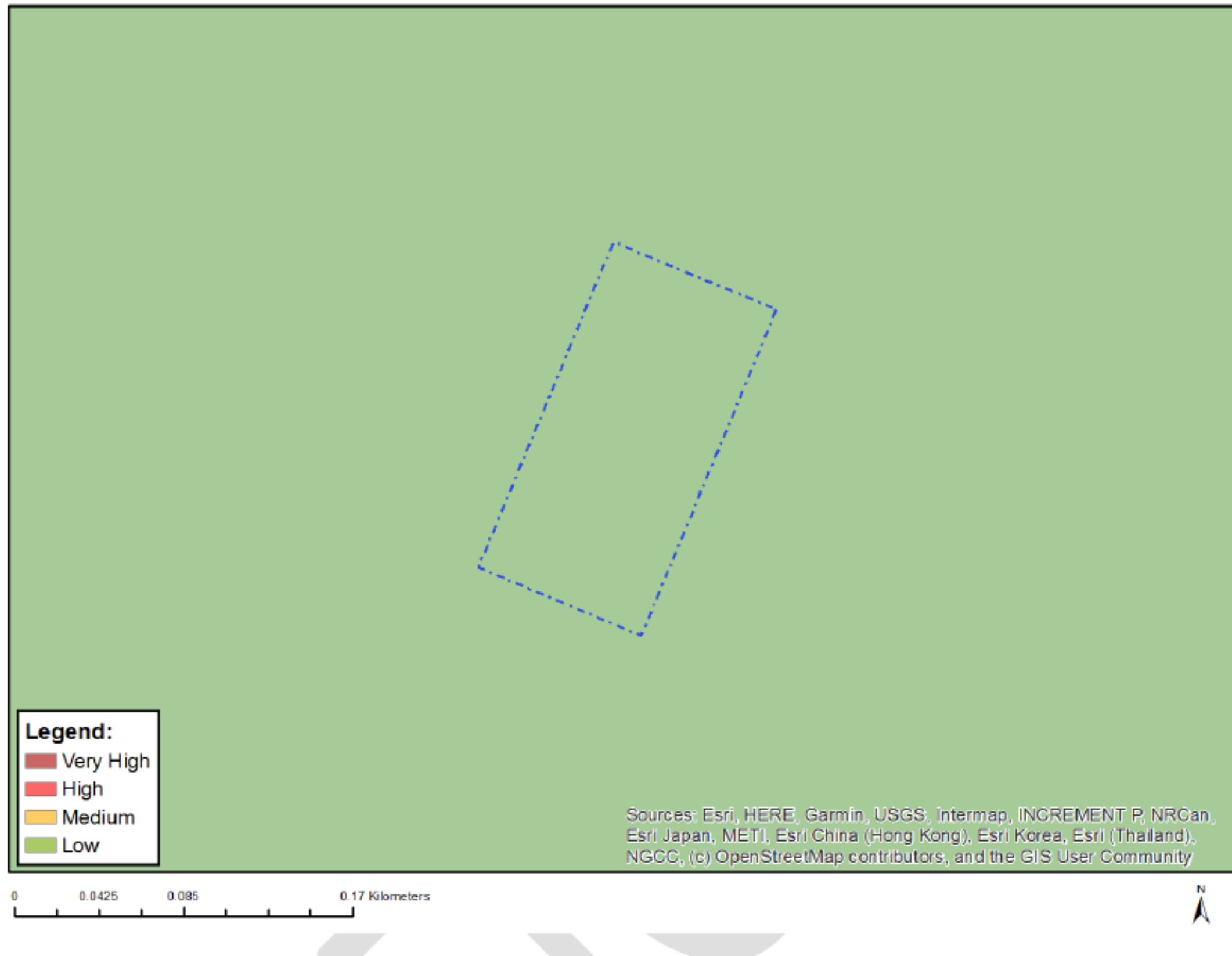
# MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



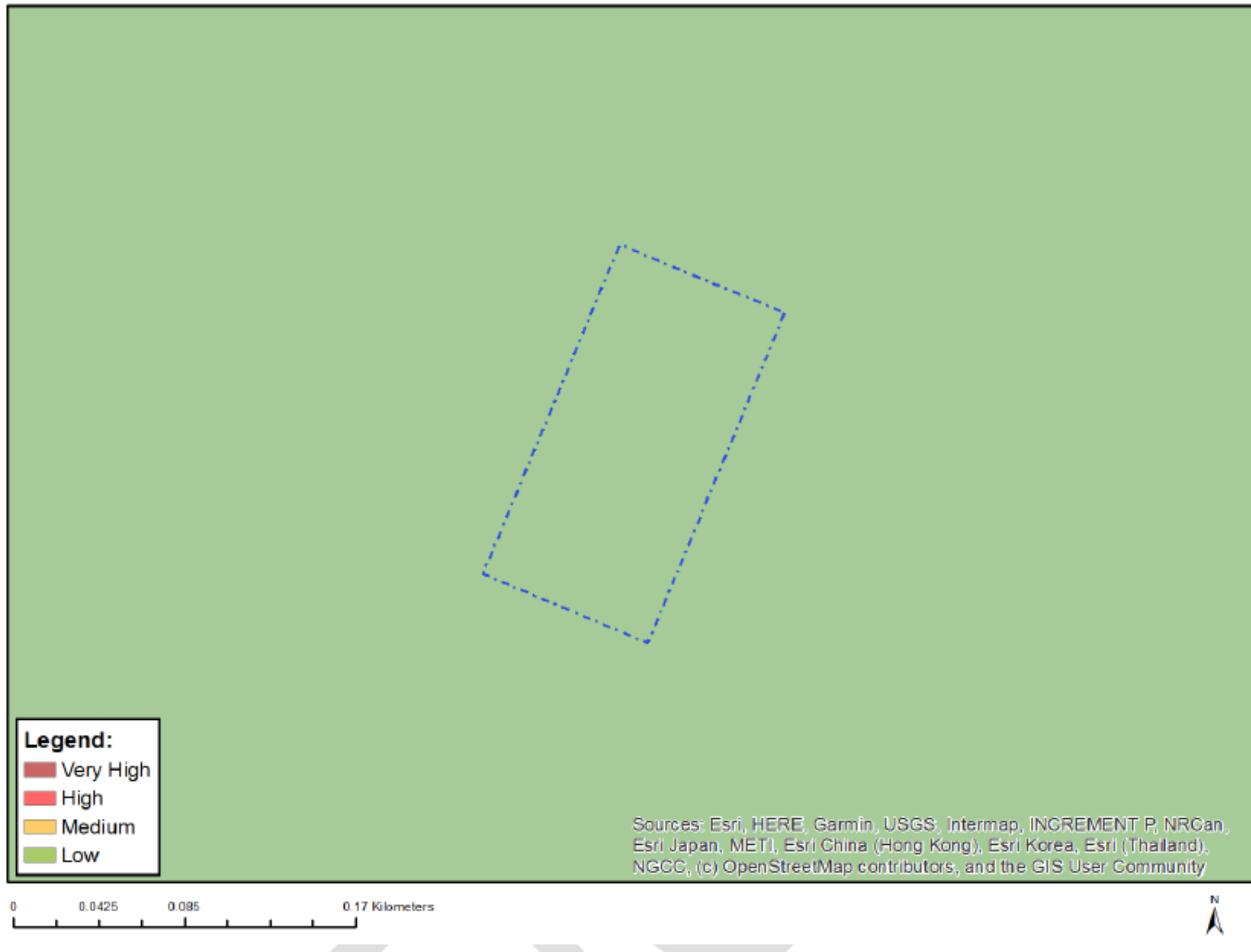
# MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY



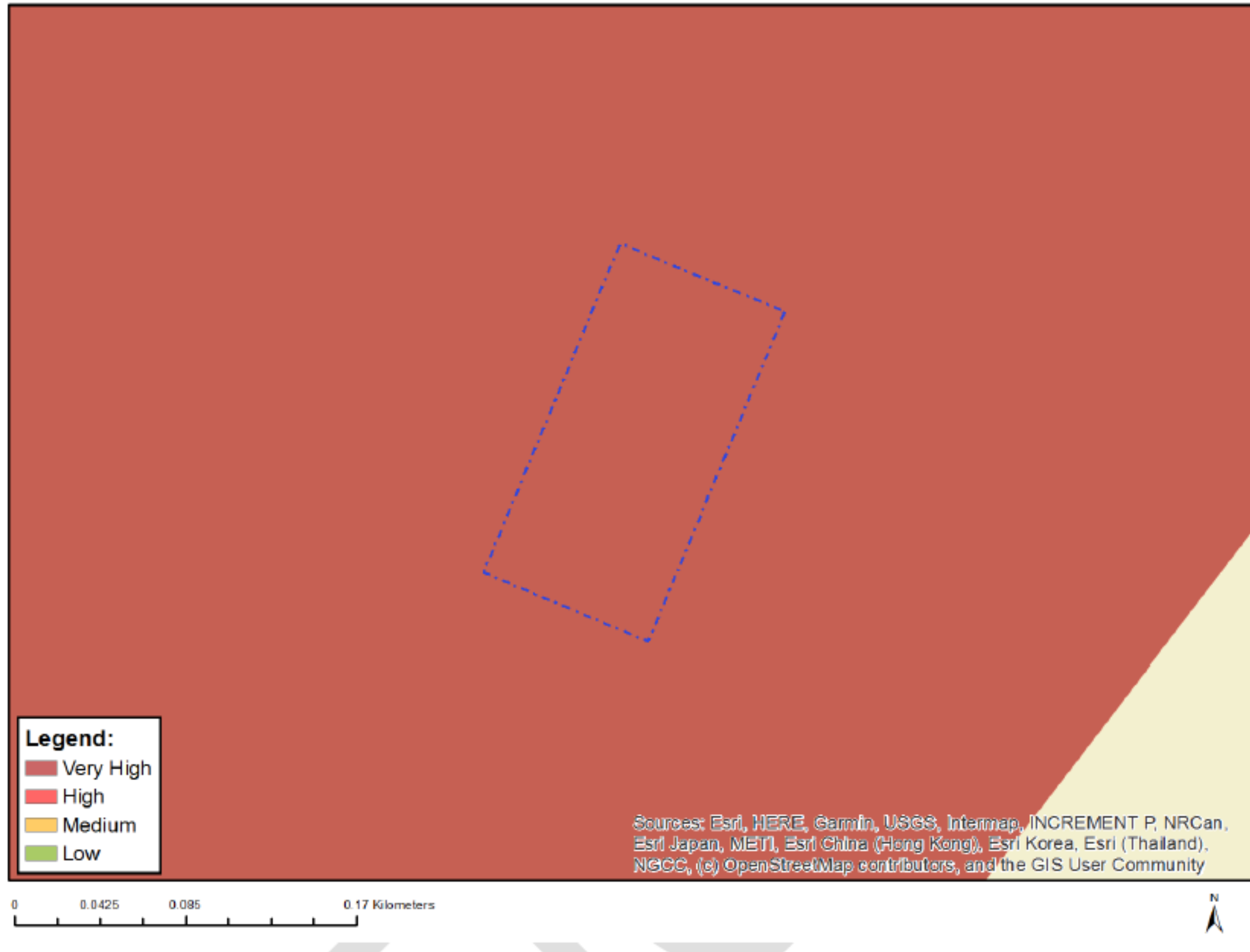
## MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY



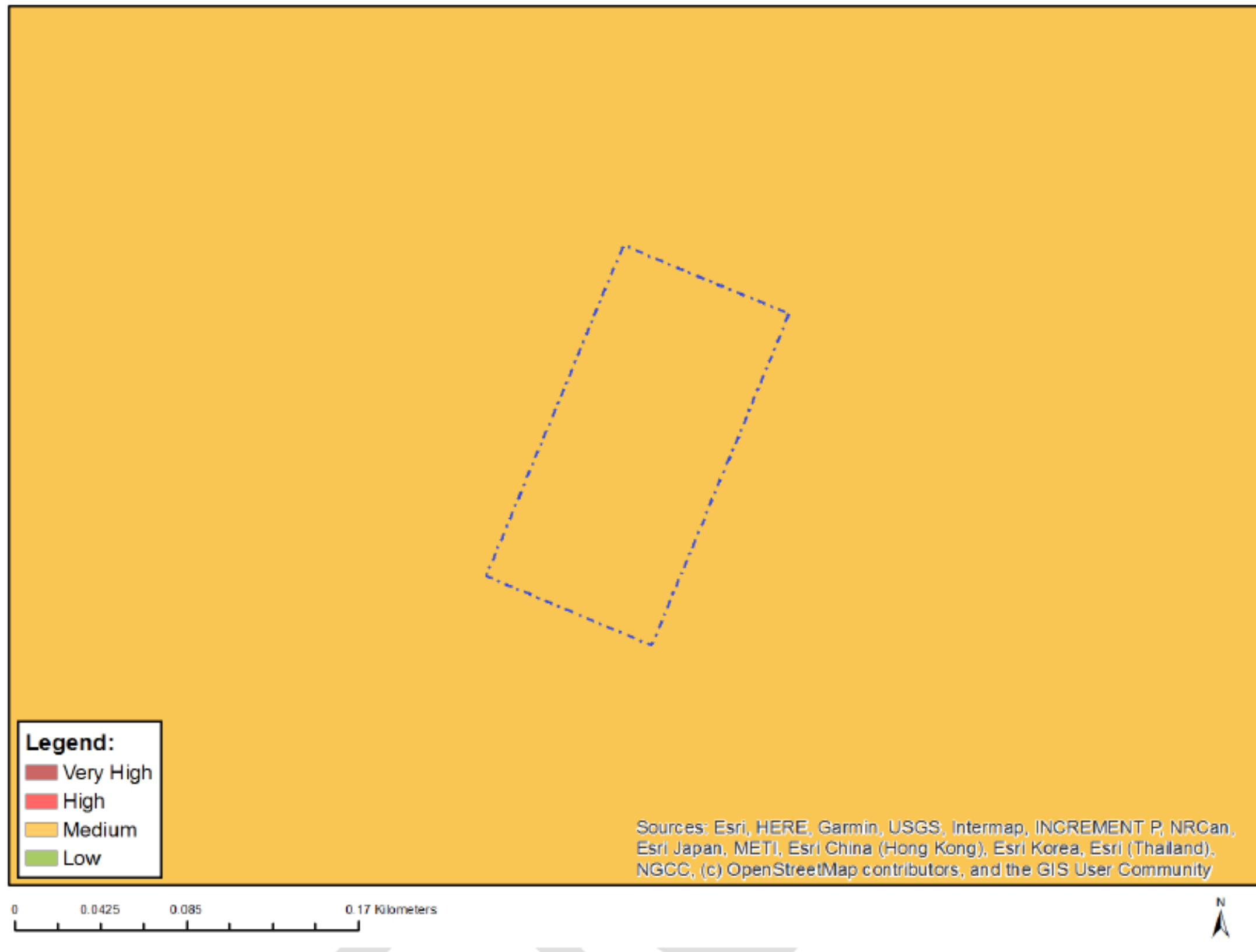
# MAP OF RELATIVE DEFENCE THEME SENSITIVITY



# MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



# MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



# MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



**ESKOM SUBSTATION ALTERNATIVE 2 (PREFERRED)**

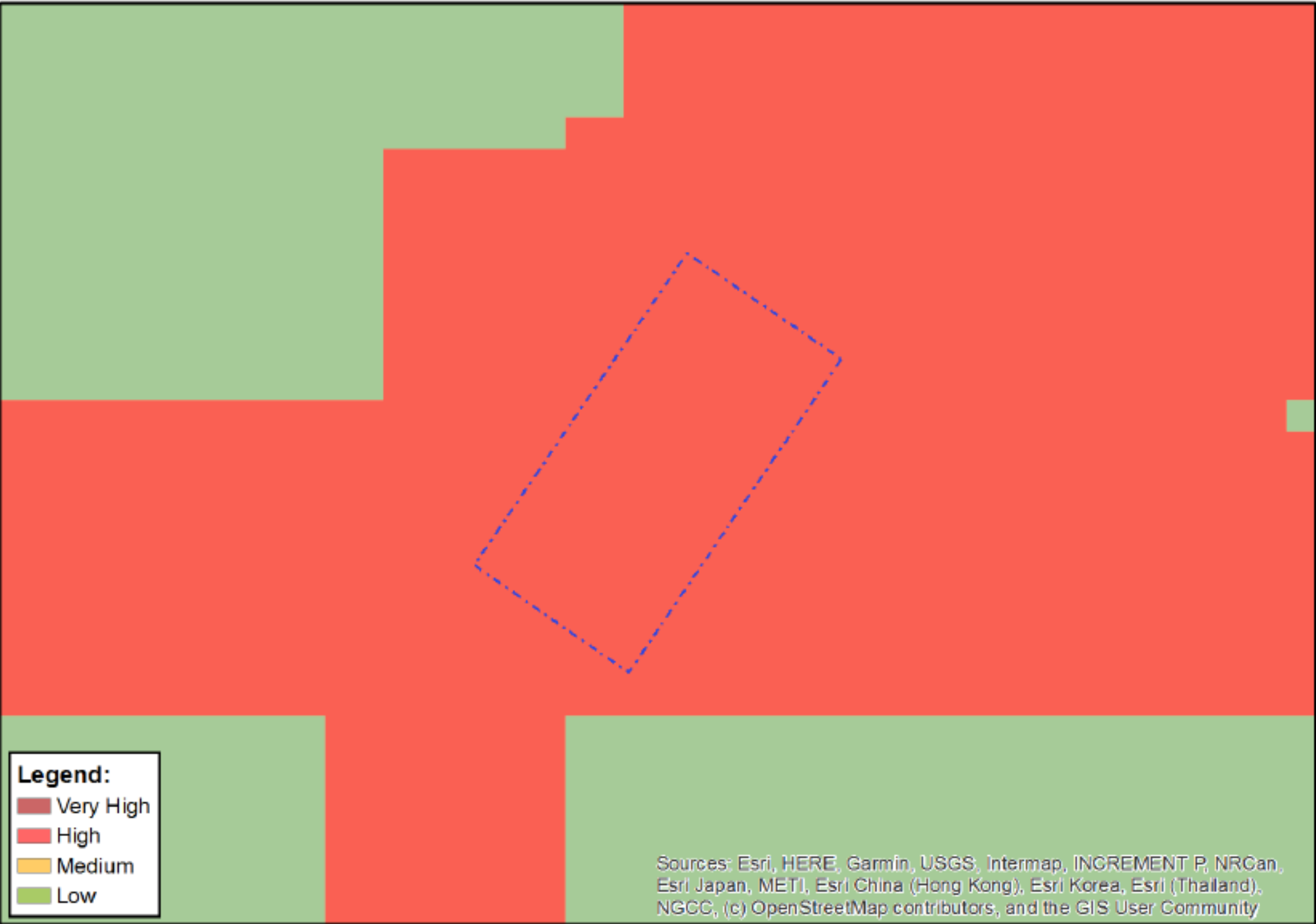
THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVITY	SENSITIVITY FEATURES
AGRICULTURE THEME			X		Medium: Land capability
ANIMAL SPECIES THEME		X			High: <i>Aves-Circus maurus</i> ; High: <i>Aves-Neotis denhami</i>
AQUATIC BIODIVERSITY THEME	X				Very High: ESA 1; Very High: SWSA (SW) _ Eastern Cape Drakensberg
ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME				X	Low: Low sensitivity
CIVIL AVIATION THEME				X	Low: Low sensitivity
DEFENCE THEME				X	Low: Low Sensitivity
PALAEONTOLOGY THEME	X				Very High: Features with a Very High paleontological sensitivity
PLANT SPECIES THEME			X		Medium: Sensitive species 535; Medium: Sensitive species 441; Medium: Sensitive species 451; Medium: Sensitive species 1248
TERRESTRIAL BIODIVERSITY THEME	X				Very High: Strategic Water Source Areas



# MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY



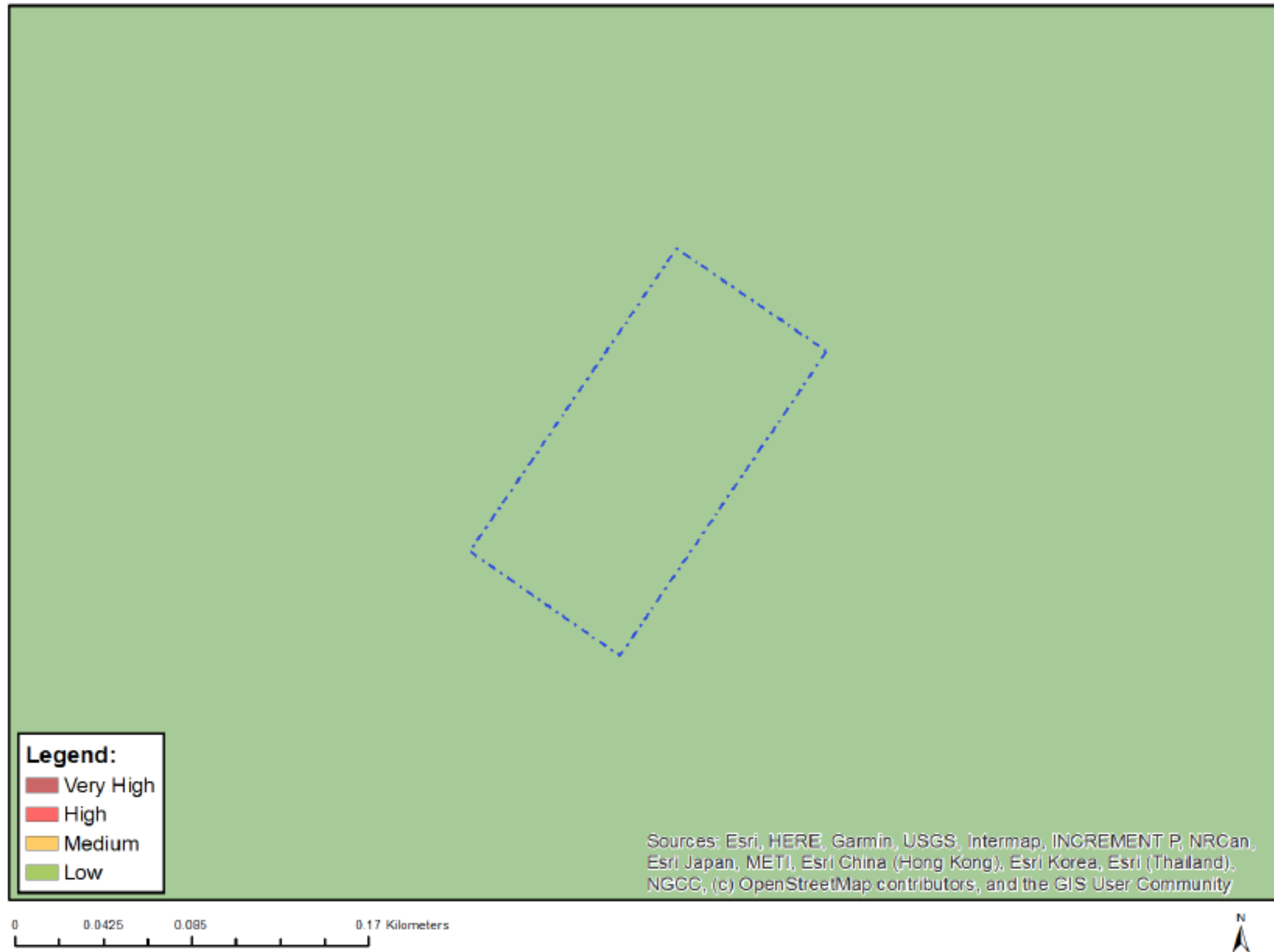
# MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



# MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



# MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY



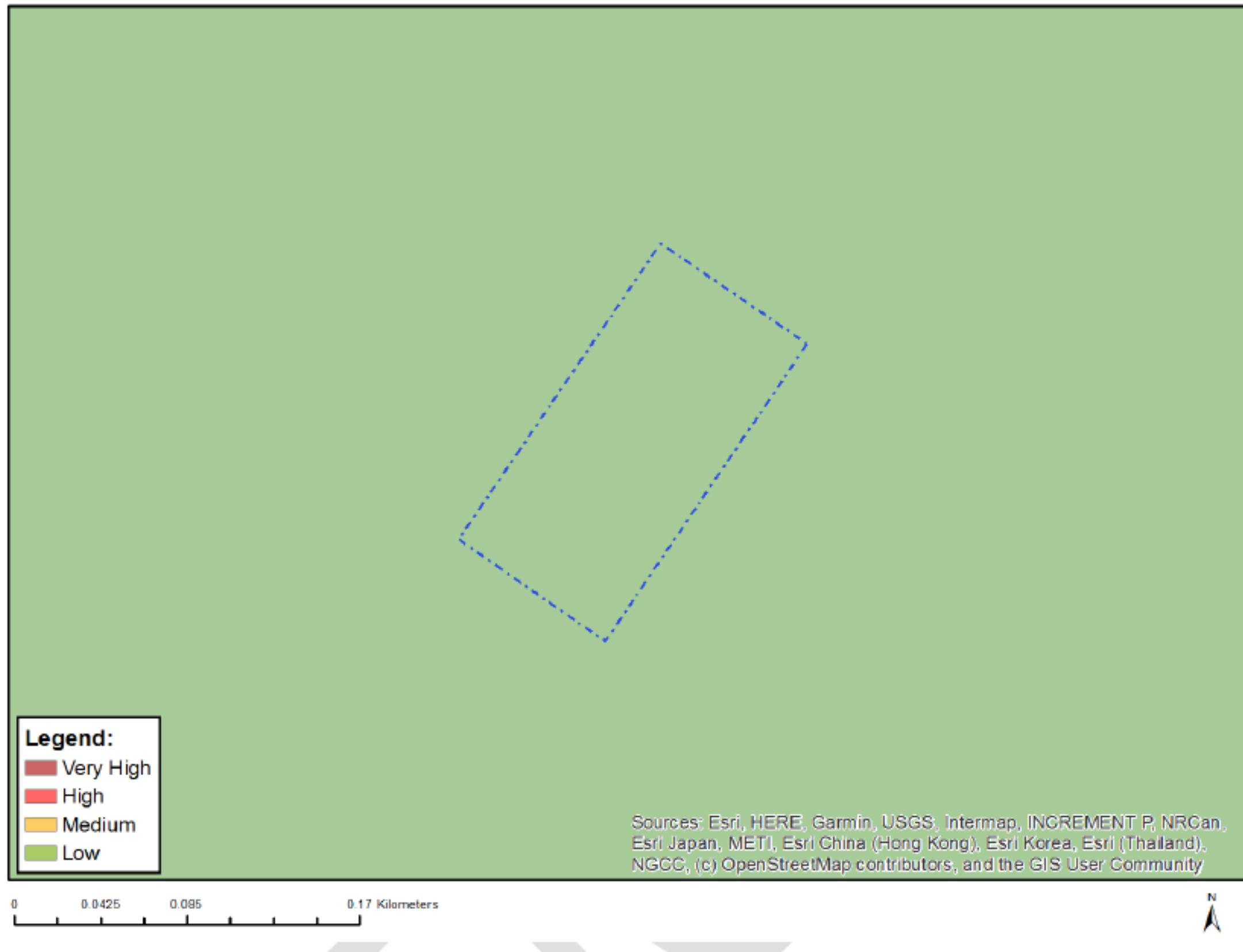
# MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY



0 0.0425 0.085 0.17 Kilometers



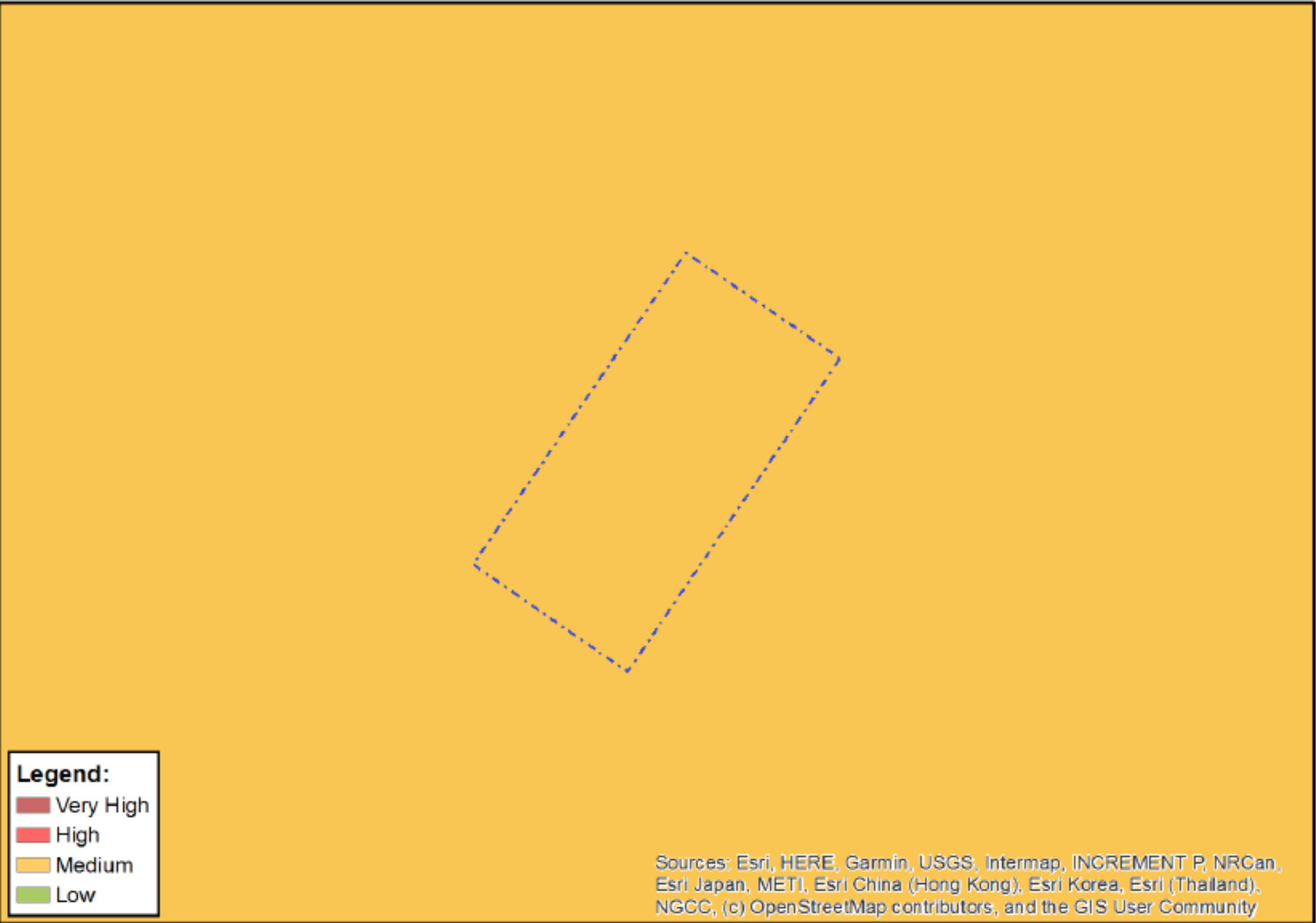
## MAP OF RELATIVE DEFENCE THEME SENSITIVITY



## MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



# MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY

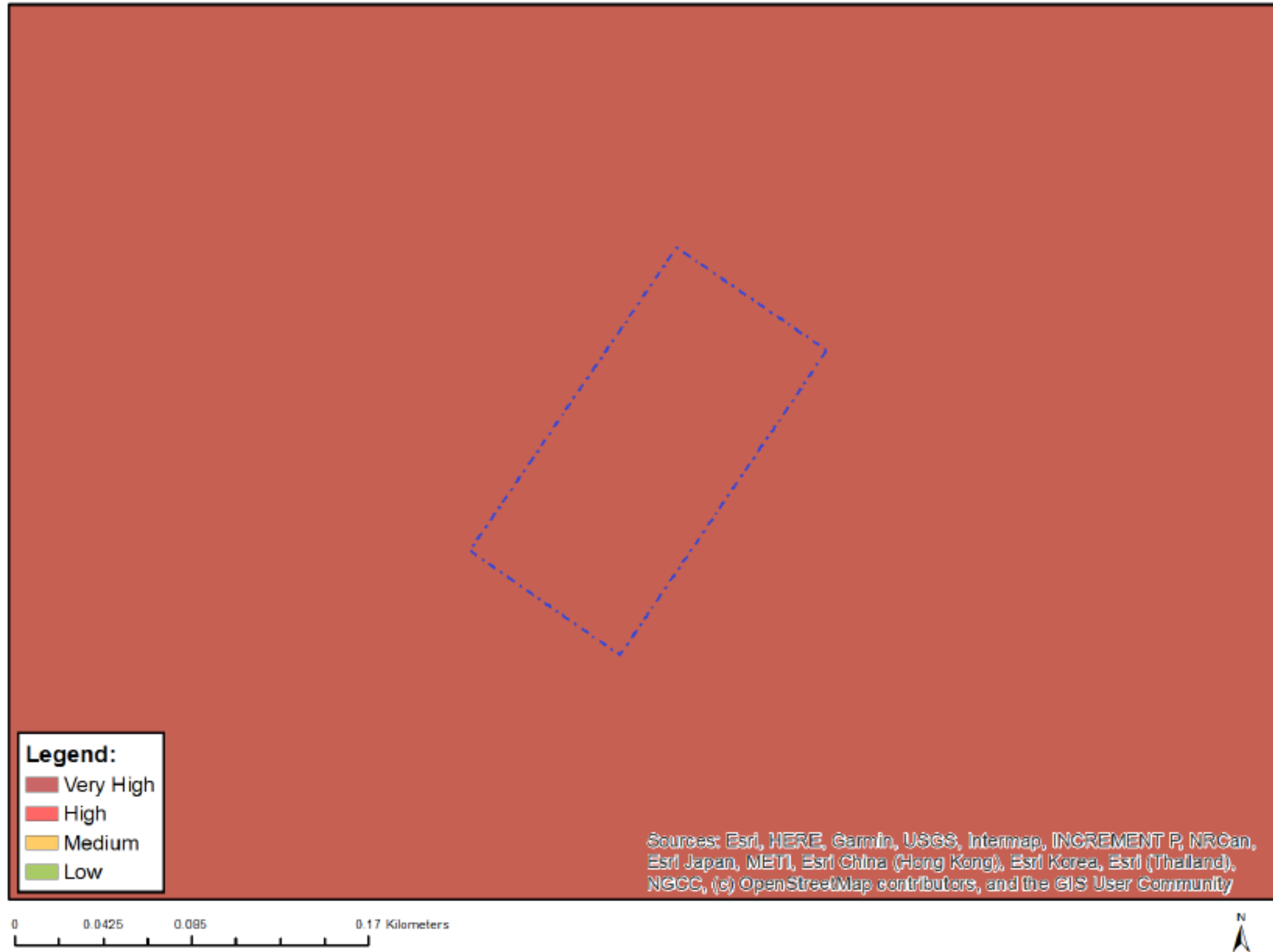


0 0.0425 0.085 0.17 Kilometers





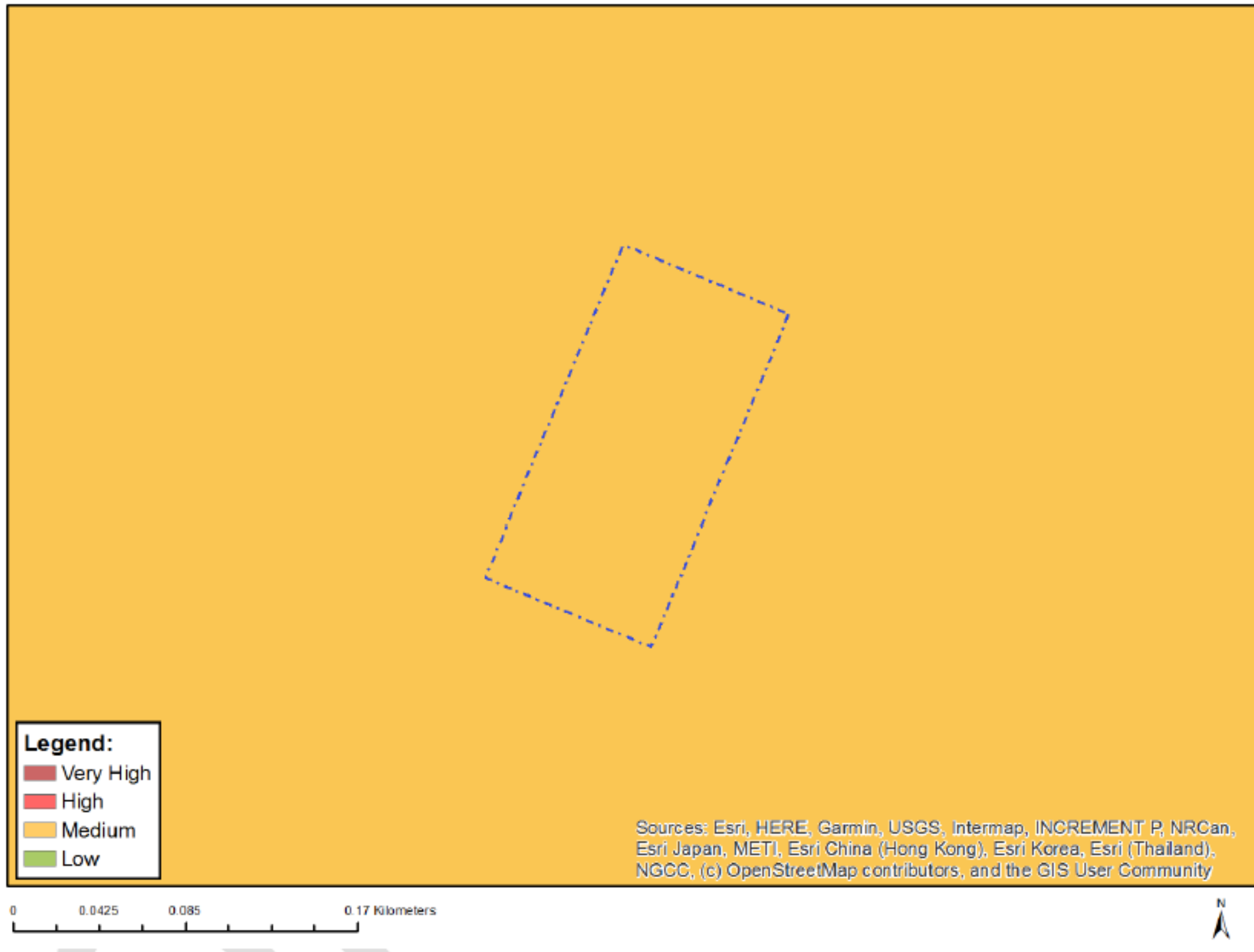
# MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



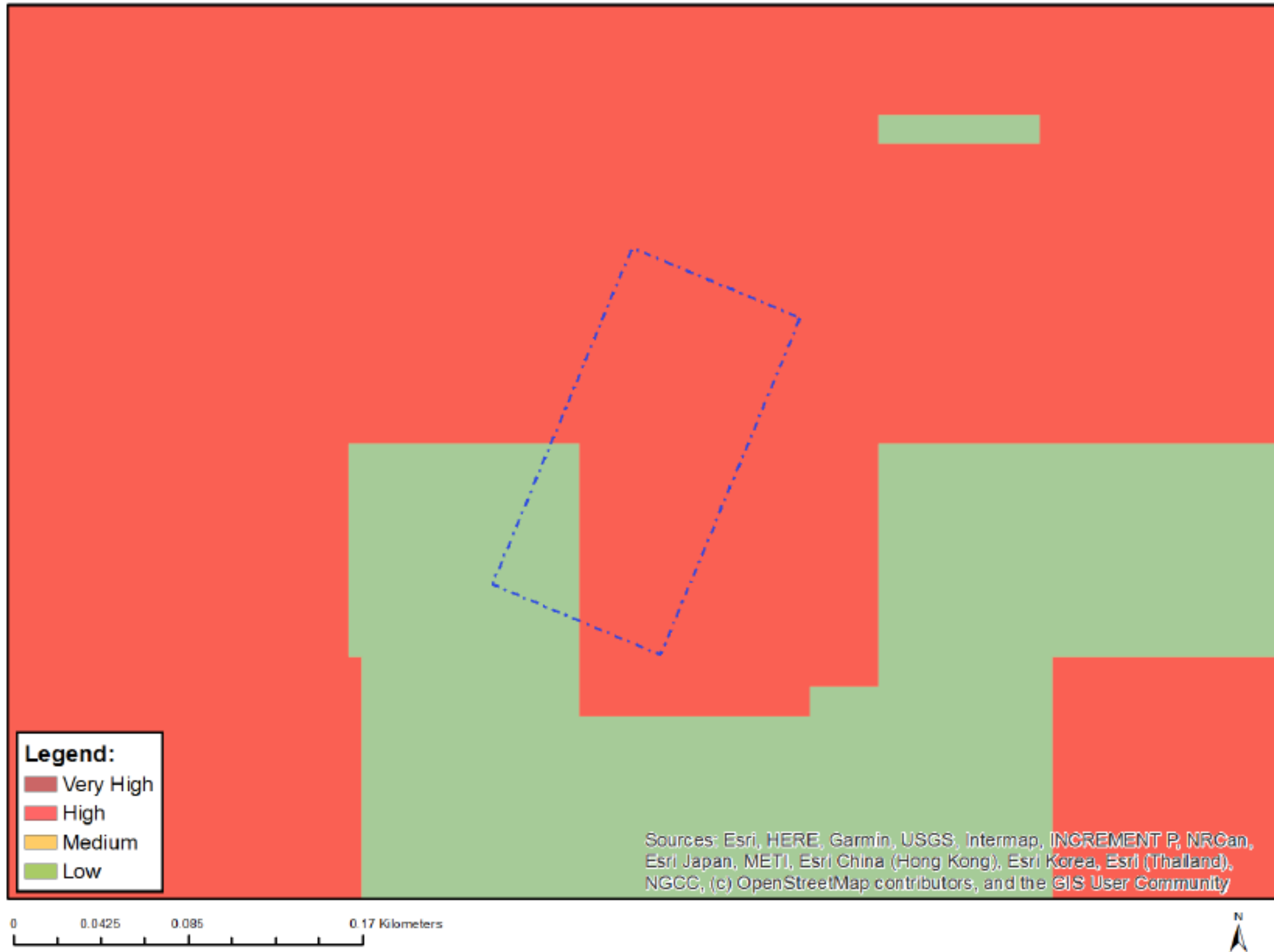
**IPP SUBSTATION ALTERNATIVE 1**

THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVITY	SENSITIVITY FEATURES
AGRICULTURE THEME			X		Medium: Land capability
ANIMAL SPECIES THEME		X			High: <i>Aves-Circus maurus</i> ; High: <i>Aves-Neotis denhami</i>
AQUATIC BIODIVERSITY THEME	X				Very High: ESA 1; Very High: SWSA (SW) _ Eastern Cape Drakensberg
ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME				X	Low: Low sensitivity
CIVIL AVIATION THEME				X	Low: Low sensitivity
DEFENCE THEME				X	Low: Low Sensitivity
PALAEONTOLOGY THEME	X				Very High: Features with a Very High paleontological sensitivity
PLANT SPECIES THEME			X		Medium: Sensitive species 535; Medium: Sensitive species 441; Medium: Sensitive species 451; Medium: Sensitive species 1248
TERRESTRIAL BIODIVERSITY THEME	X				Very High: Strategic Water Source Areas

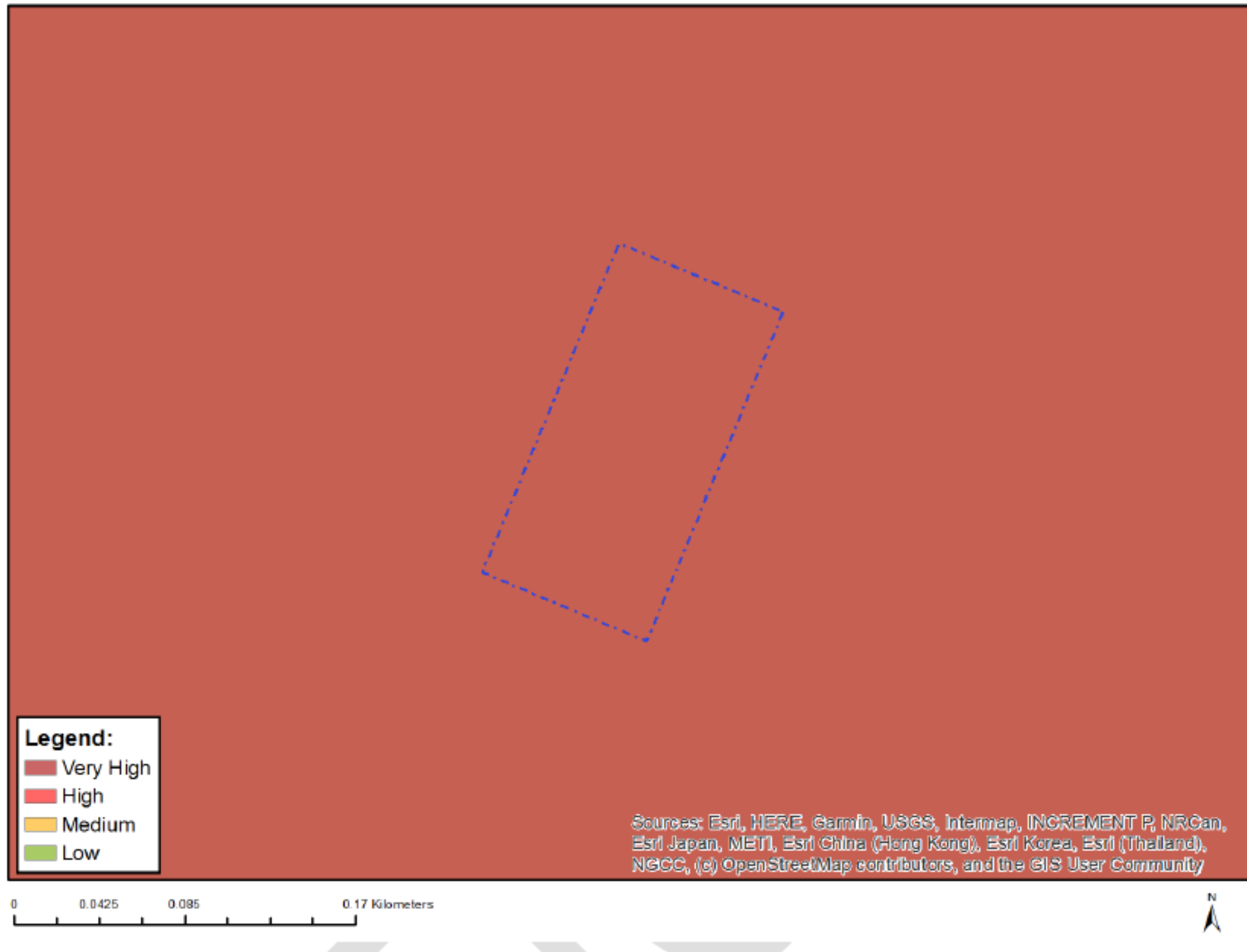
# MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY



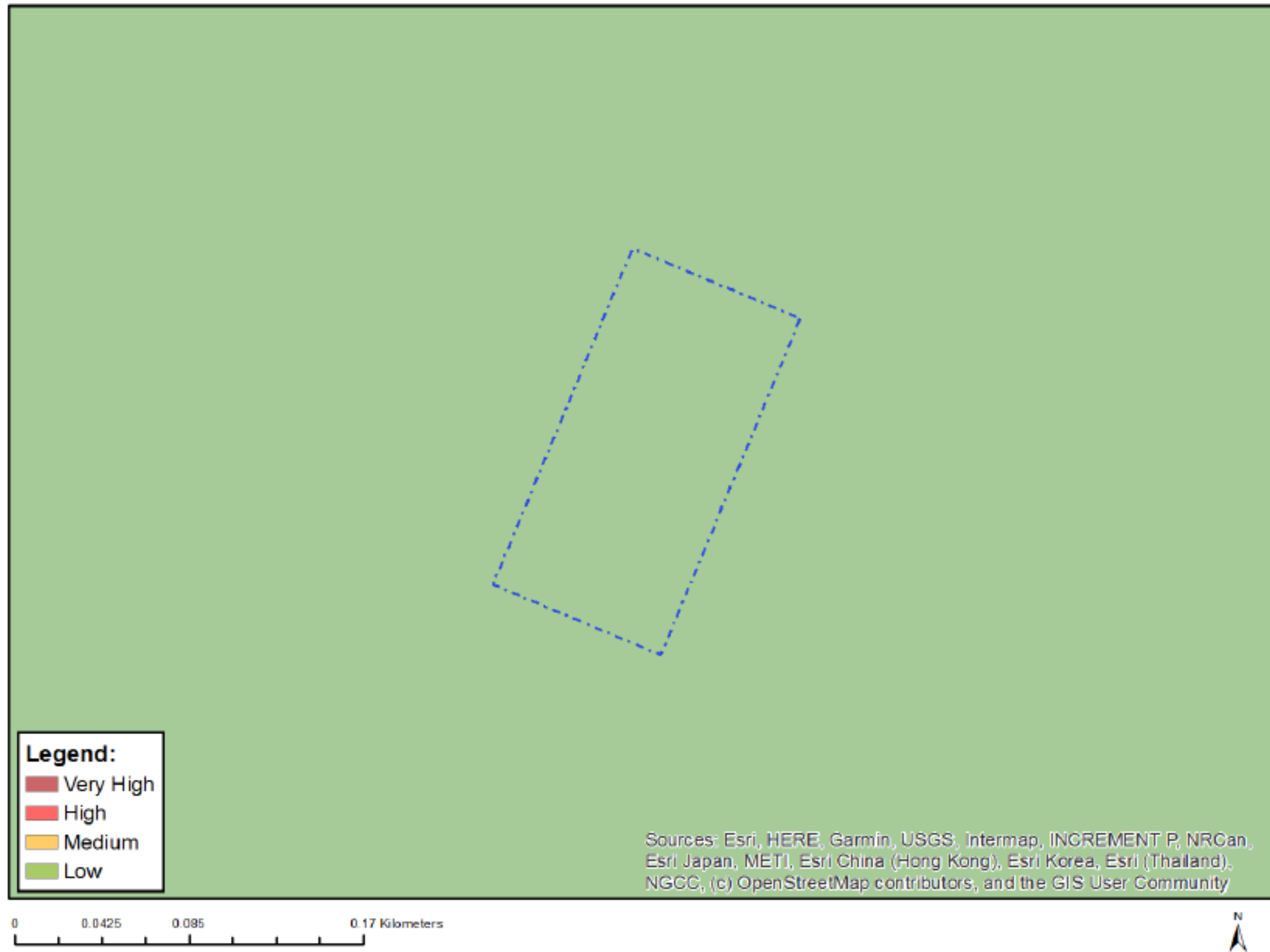
# MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



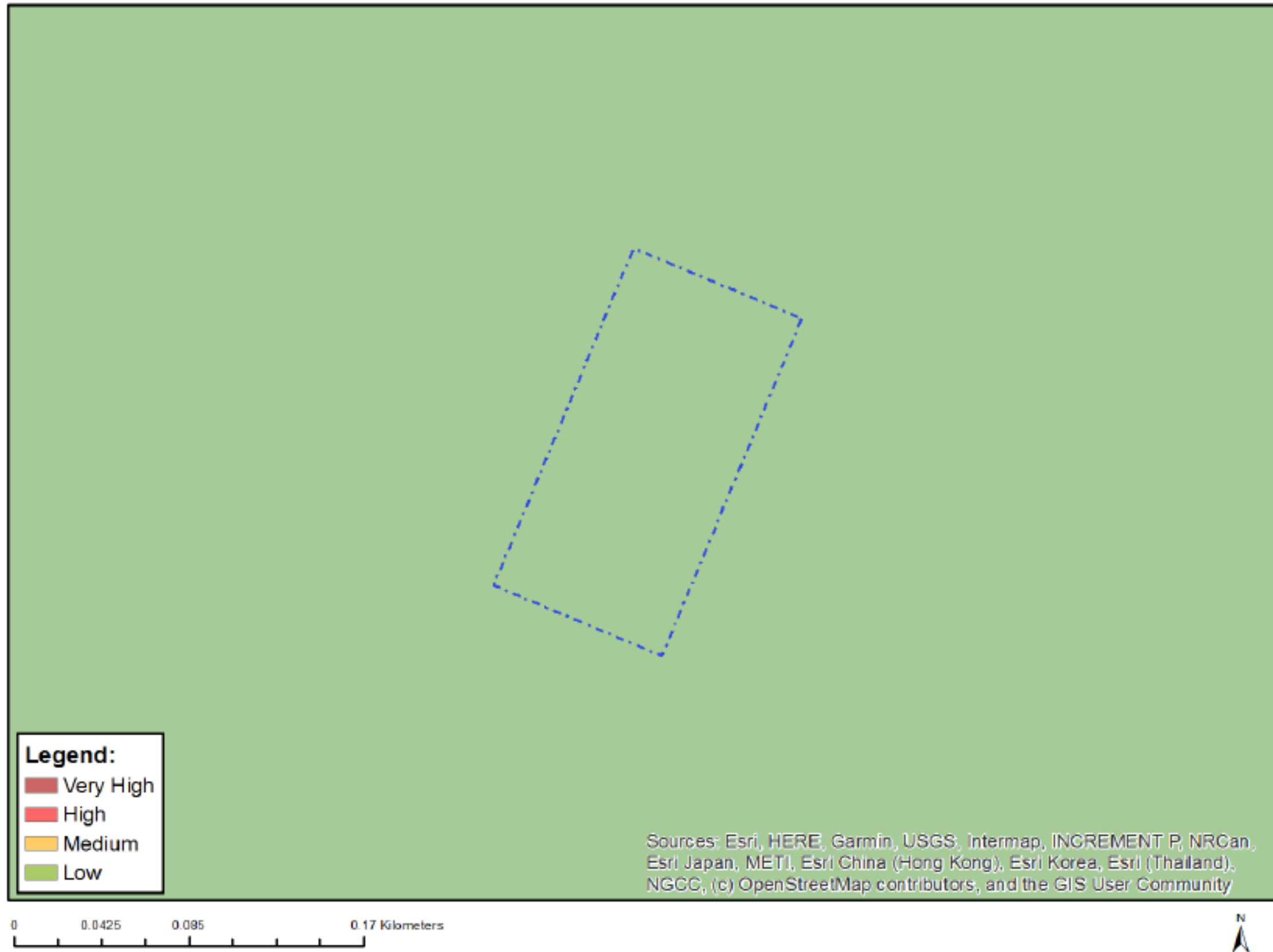
# MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



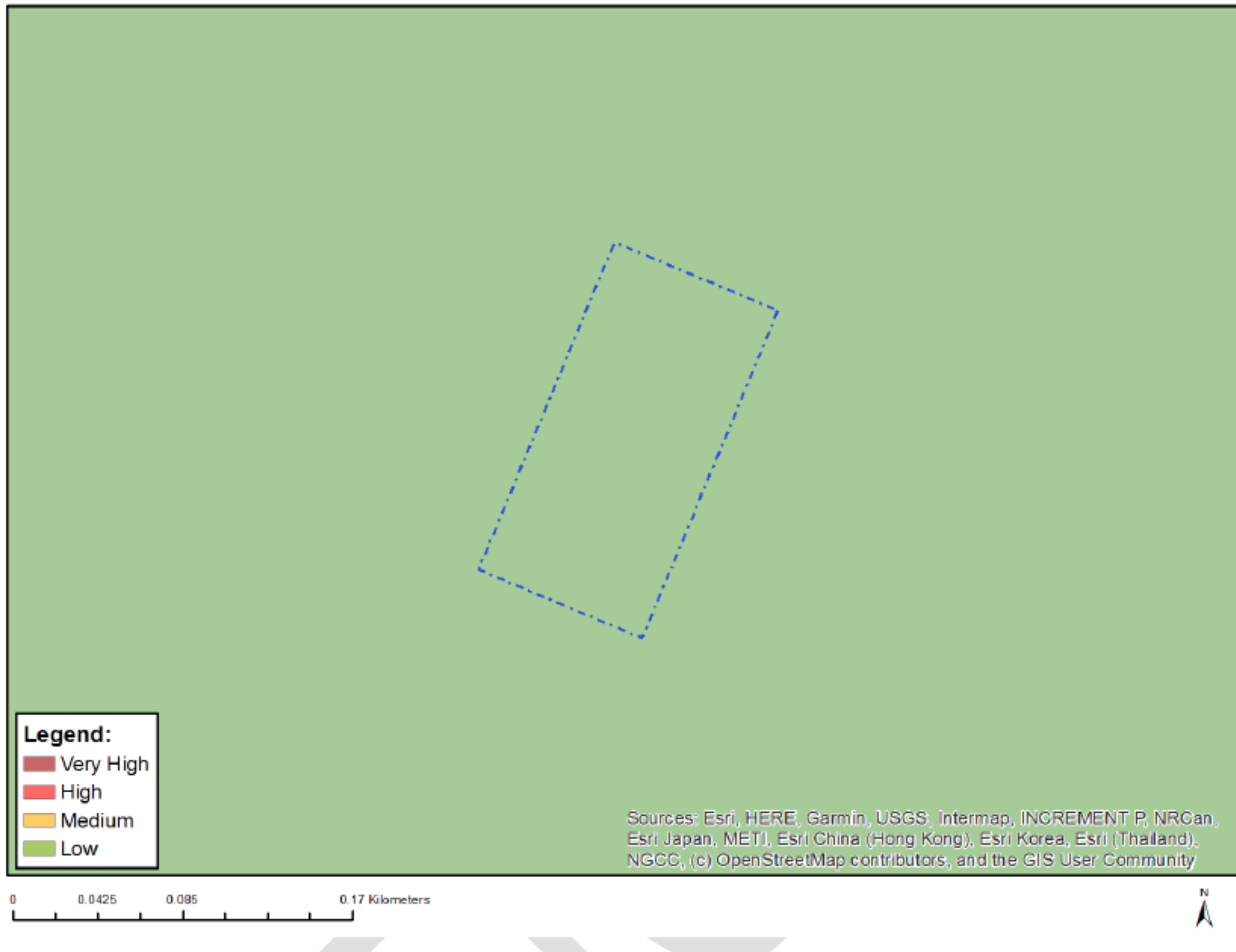
# MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY



# MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY

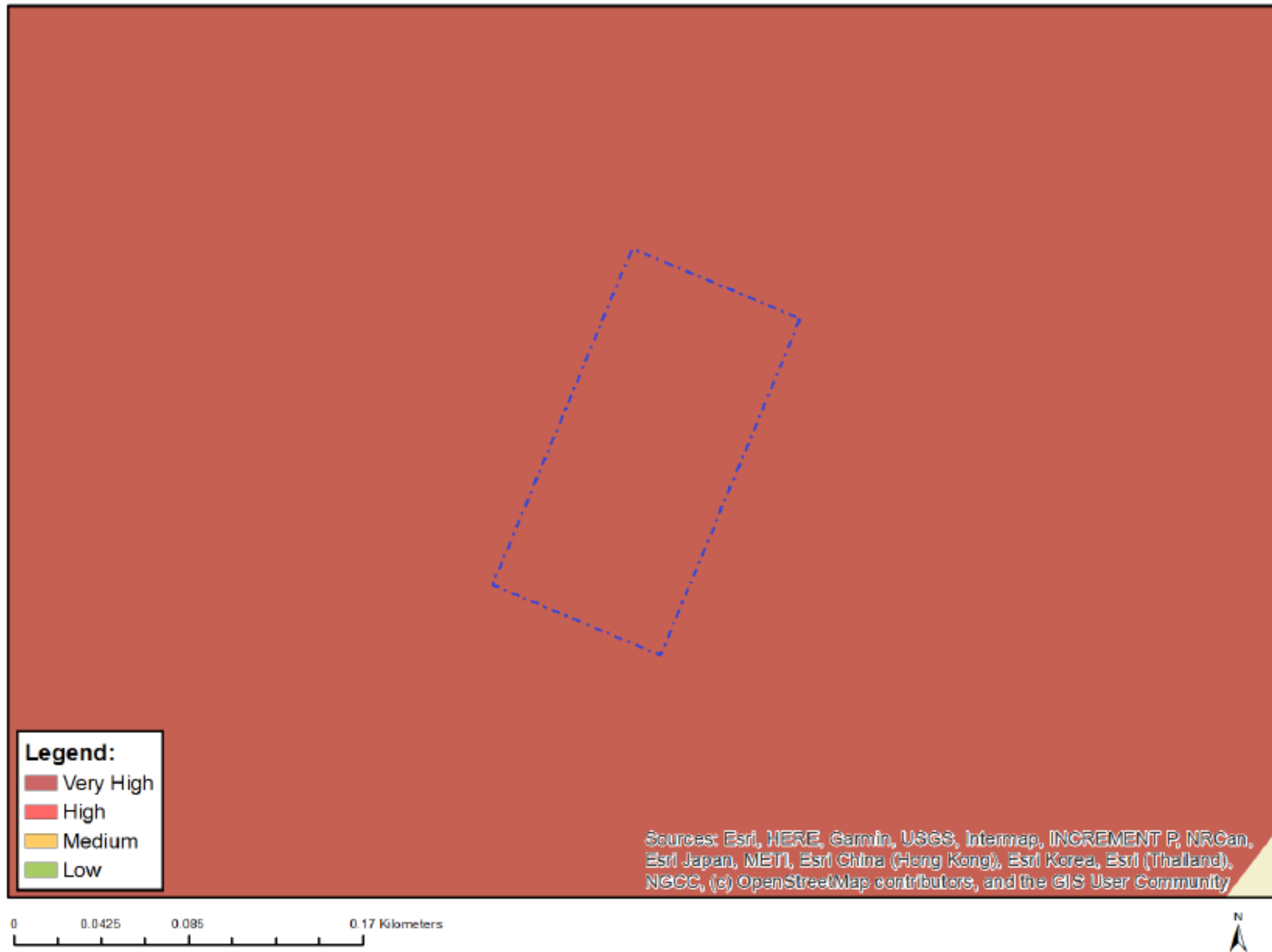


# MAP OF RELATIVE DEFENCE THEME SENSITIVITY





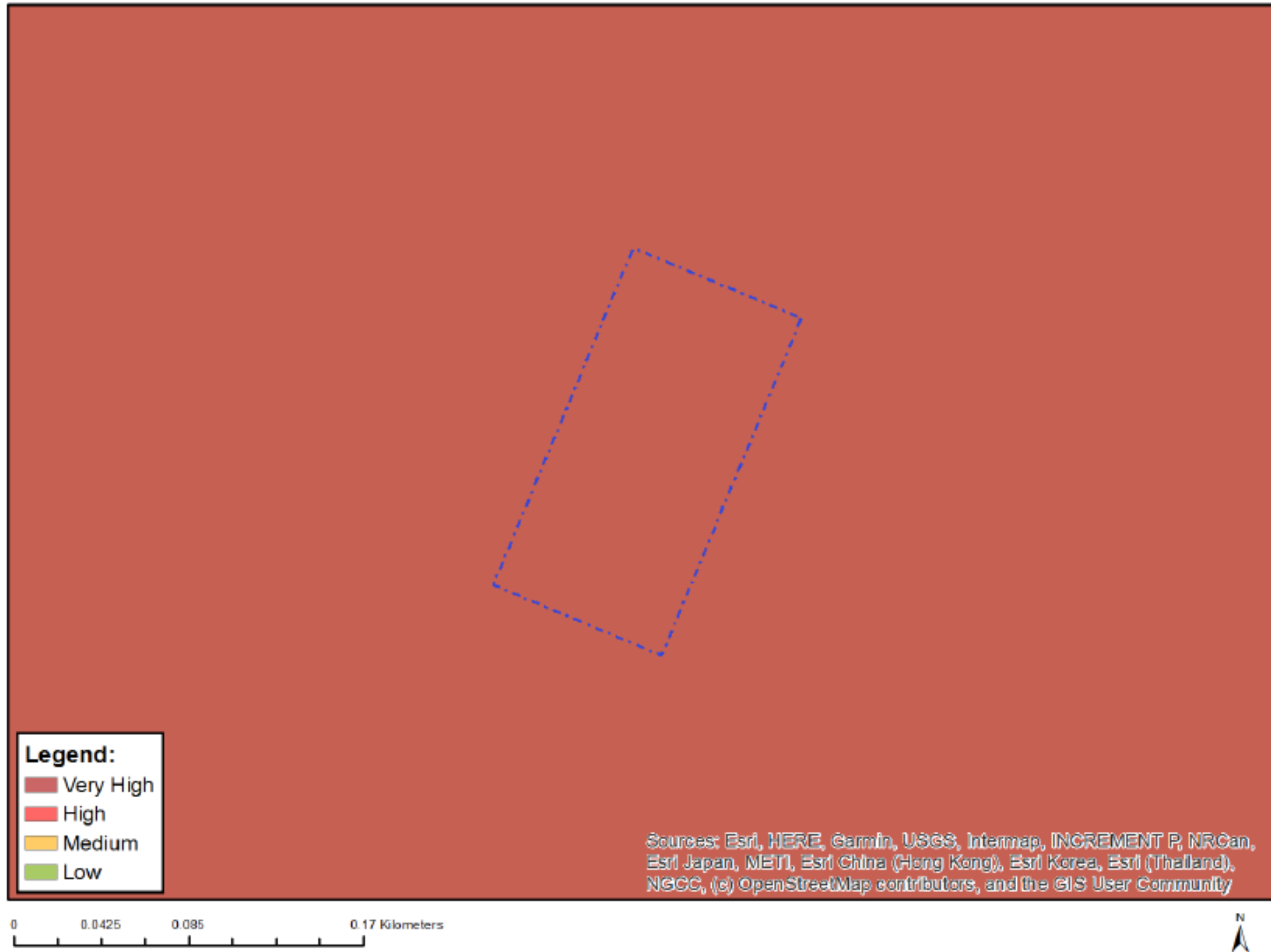
# MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



# MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



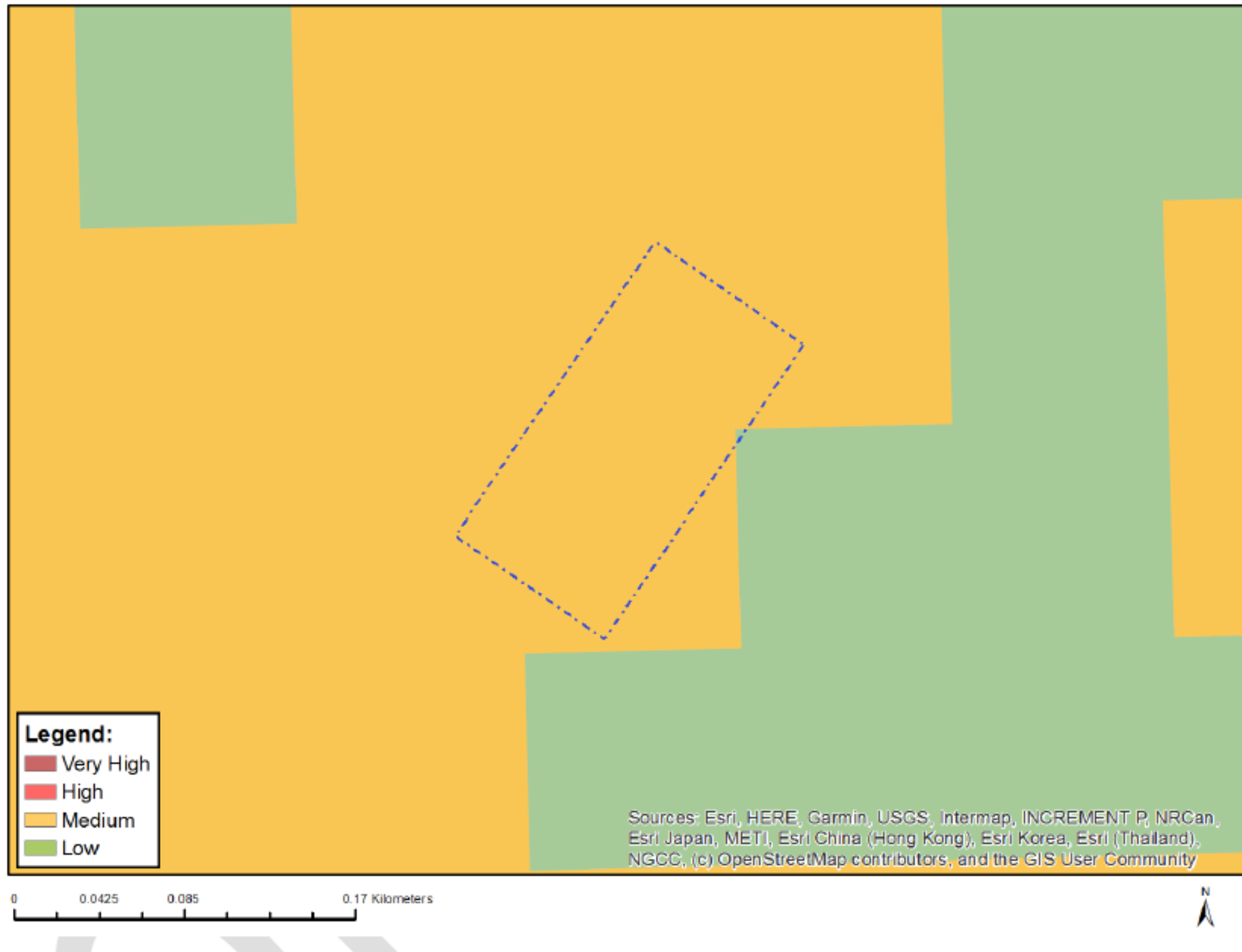
# MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



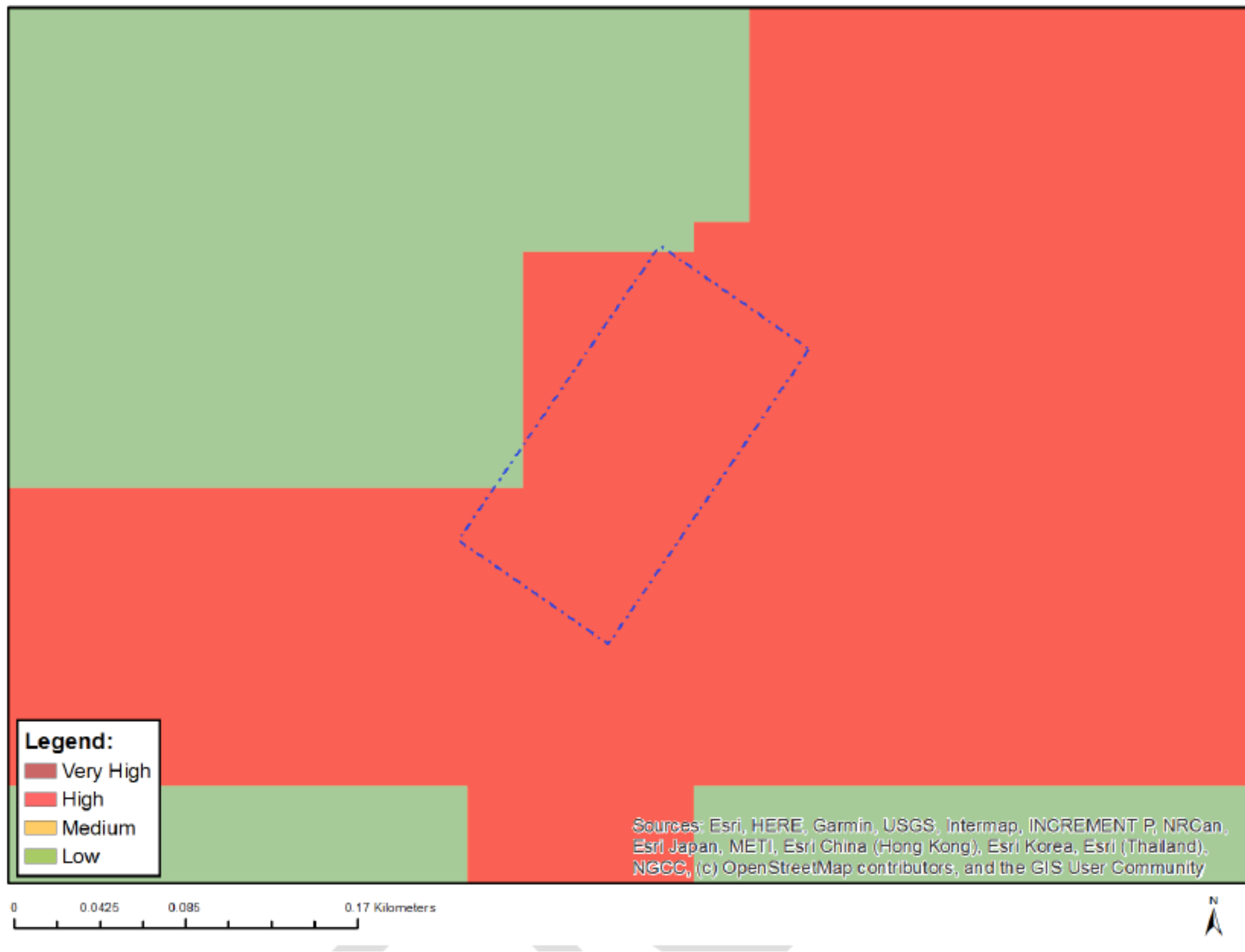
**IPP SUBSTATION ALTERNATIVE 2 (PREFERRED)**

THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVITY	SENSITIVITY FEATURES
AGRICULTURE THEME			X		Medium: Land capability
ANIMAL SPECIES THEME		X			High: <i>Aves-Circus maurus</i> ; High: <i>Aves-Neotis denhami</i>
AQUATIC BIODIVERSITY THEME	X				Very High: ESA 1; Very High: SWSA (SW) _ Eastern Cape Drakensberg
ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME				X	Low: Low sensitivity
CIVIL AVIATION THEME				X	Low: Low sensitivity
DEFENCE THEME				X	Low: Low Sensitivity
PALAEONTOLOGY THEME	X				Very High: Features with a Very High paleontological sensitivity
PLANT SPECIES THEME			X		Medium: Sensitive species 535; Medium: Sensitive species 441; Medium: Sensitive species 451; Medium: Sensitive species 1248
TERRESTRIAL BIODIVERSITY THEME	X				Very High: Strategic Water Source Areas

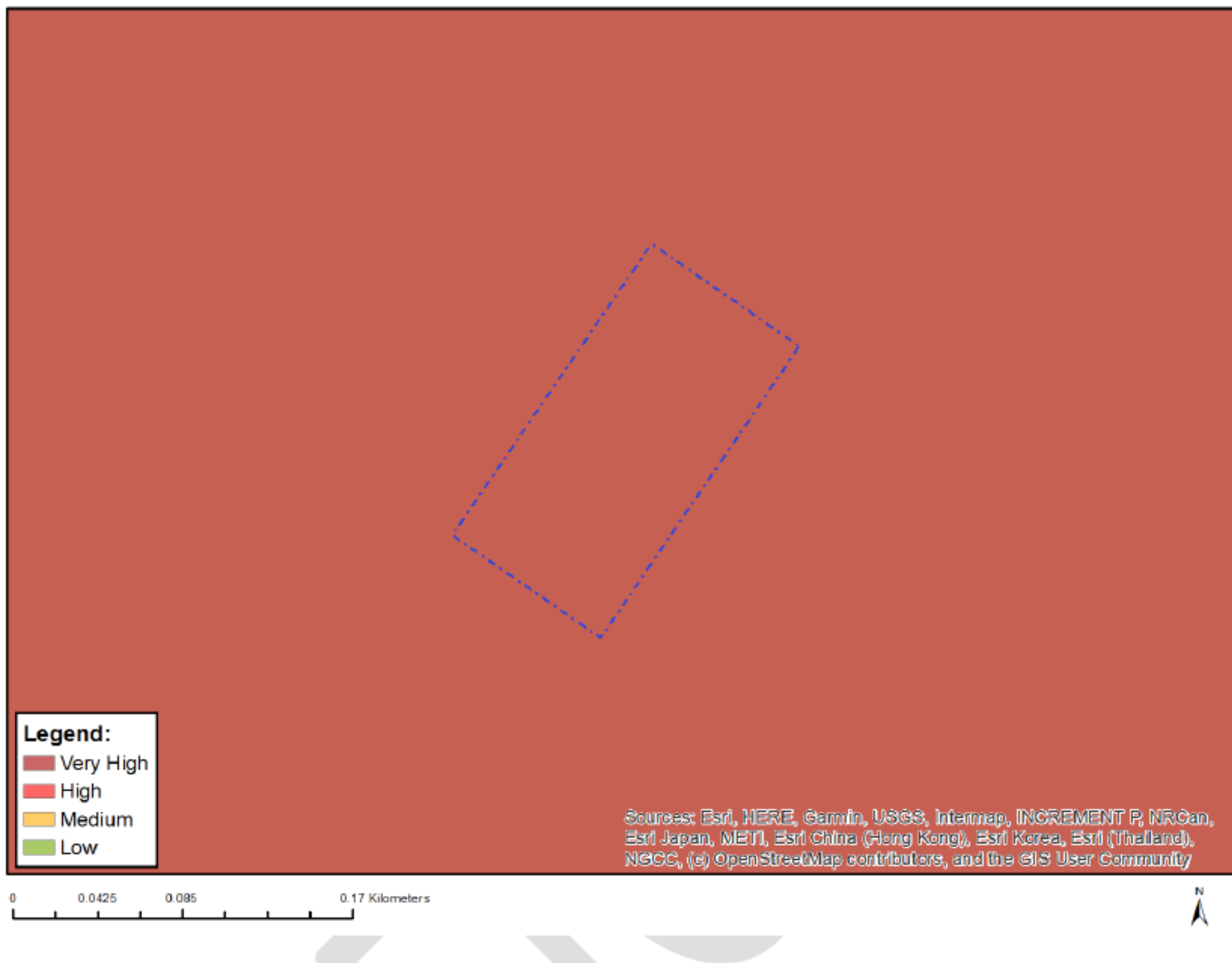
# MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY



# MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



# MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY

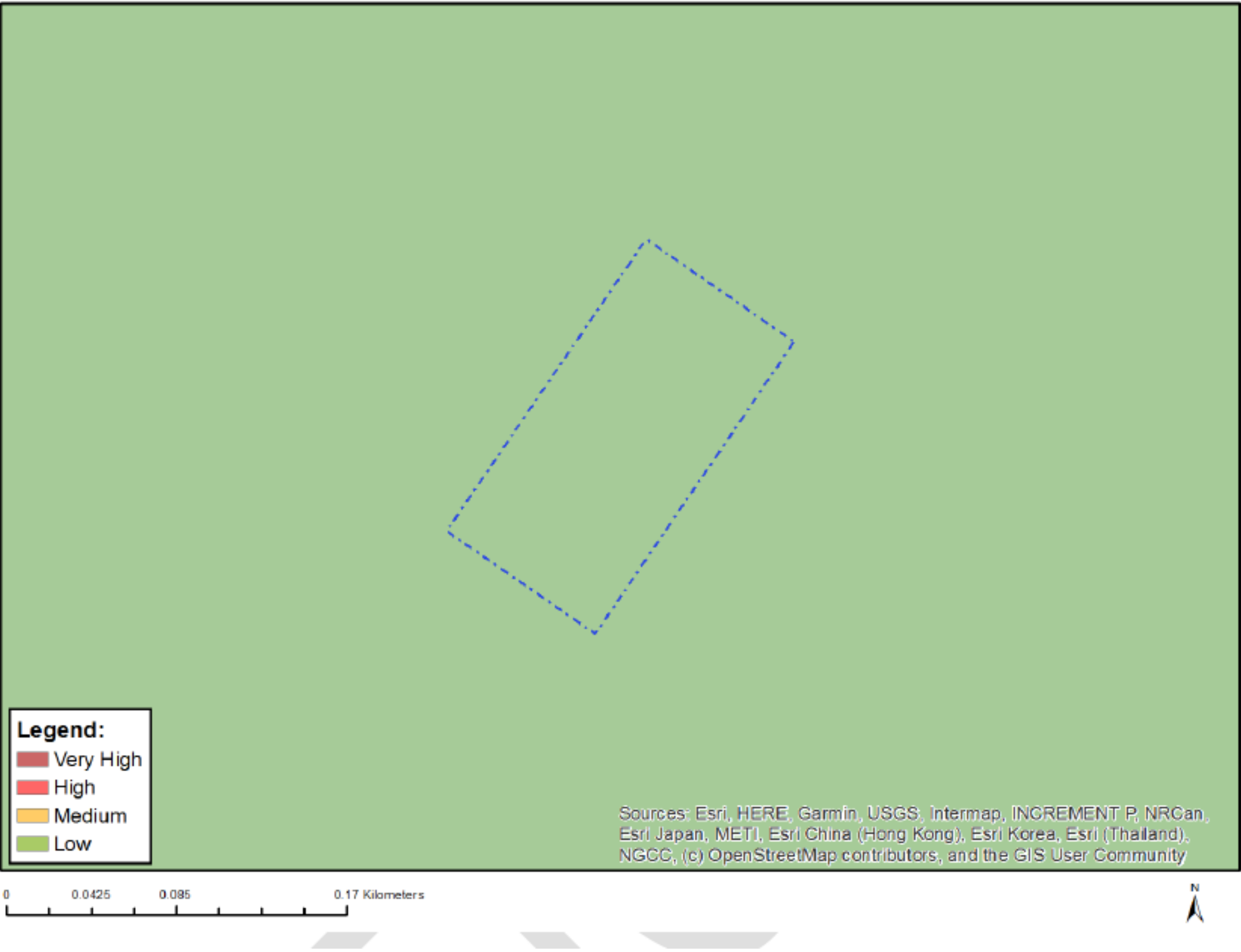


# MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY

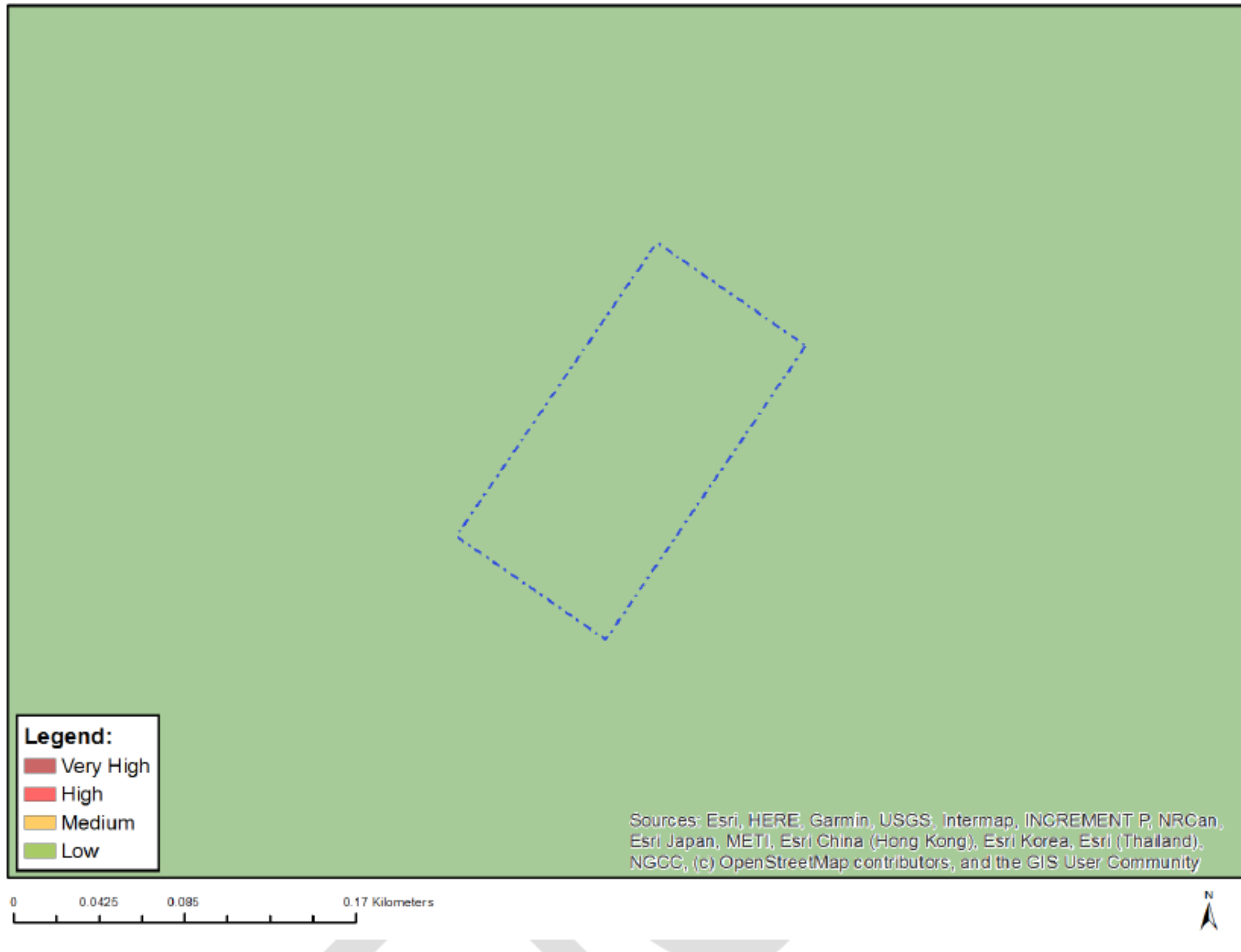




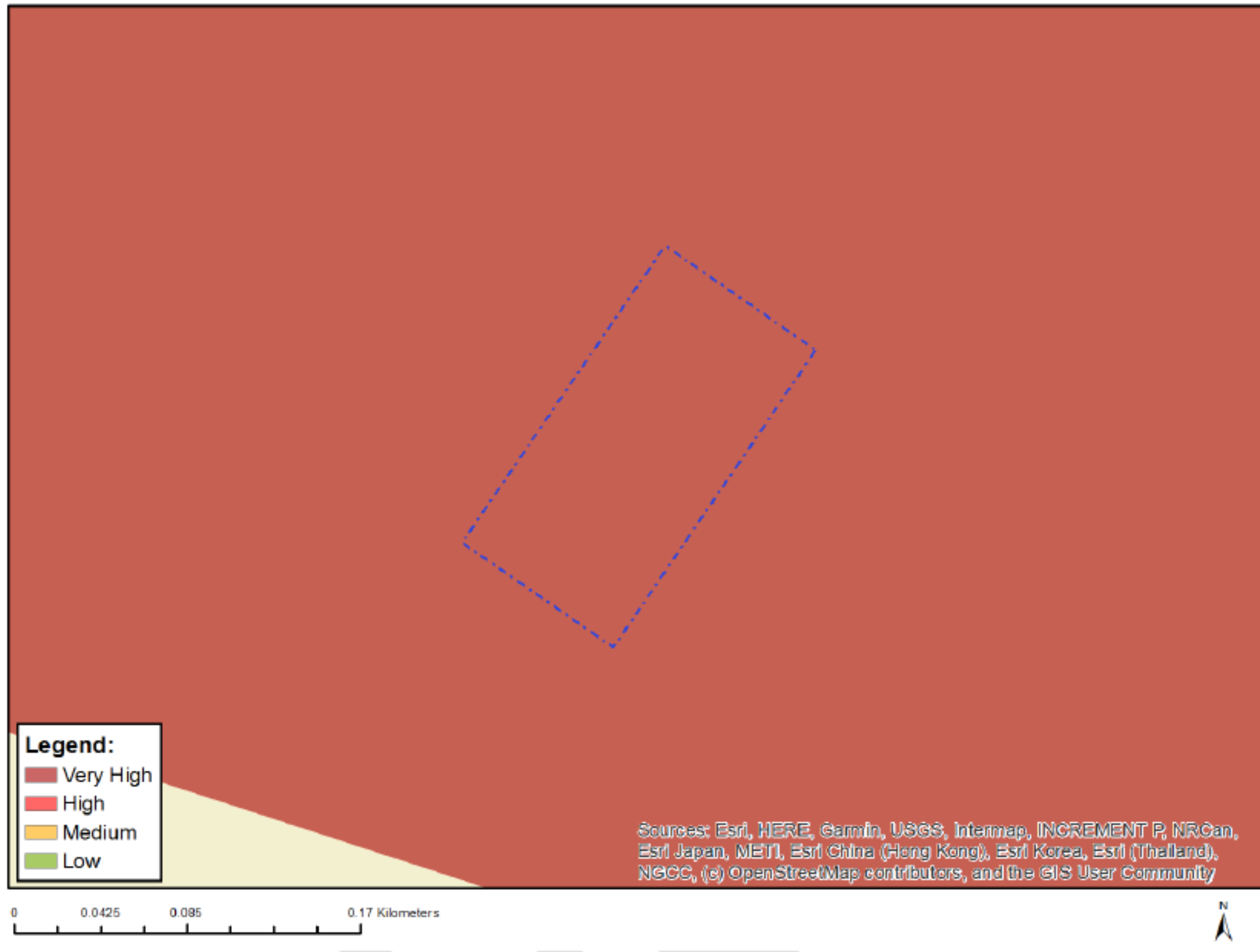
# MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY



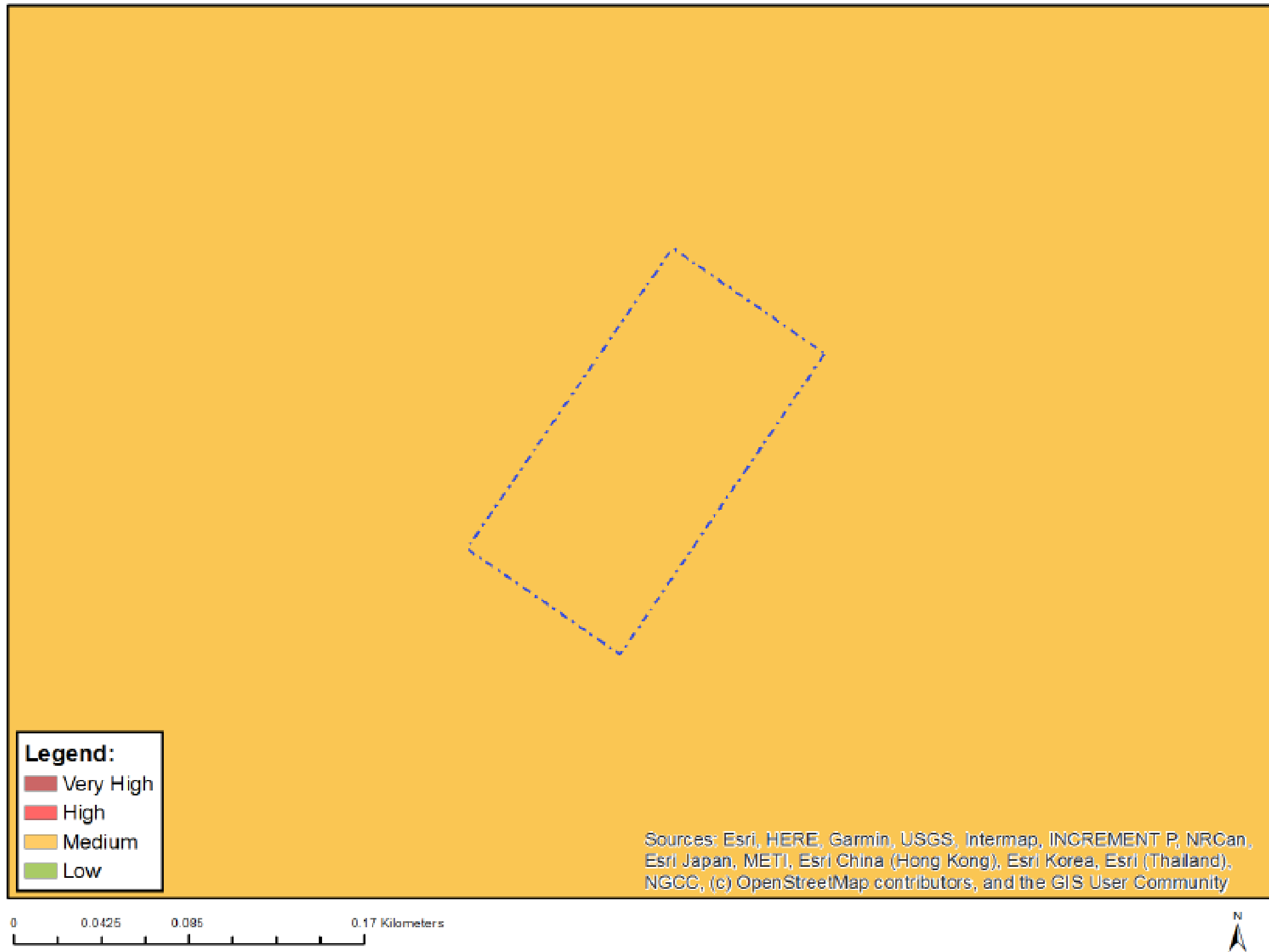
# MAP OF RELATIVE DEFENCE THEME SENSITIVITY



# MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



# MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



# MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY

