

Submitted to:

Energía del Pacífico

Energía del Pacífico

Ahuachapán to Acajutla Transmission Line

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Environmental Resources Management (ERM)

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Acronyms and Abbreviations

AM	Amenazado (Threatened)
BAP	Biodiversity Action Plan
CR	Critically Endangered
DMU	Discrete Management Unit
EBA	Endemic Bird Area
EDP	Energía del Pacífico Ltda. de C.V.
ERM	Environmental Resources Management
EN	Endangered
ESIA	Environmental and Social Impact Assessment
GN	Guidance Note
IBA	Important Bird Area
IFC	International Finance Corporation
IUCN	International Union for the Conservation of Nature
MAG	Ministerio de Agricultura
MARN	Ministerio de Ambiente y Recursos Naturales
PS 6	Performance Standard 6
SE	Substation
TL	Transmission Line
VU	Vulnerable

1. INTRODUCTION

1.1. Background

The Ahuachapán to Acajutla 230 kV Transmission Line (TL) will transport electricity to the Ahuachapán Substation that connects with the *Sistema de Interconexión de los Países de América Central* (SIEPAC). The Project also includes necessary modifications and expansions to existing substations in Acajutla and Ahuachapán as well as the interconnection at 115 kV with the Substation of Acajutla in order to provide additional flexibility to the electrical distribution system within El Salvador.

1.2. Project Description

The Project includes the construction of a 230 kilovolts (kV) double circuit Transmission Line that is approximately 44 kilometers (km) in length. The TL forms part of the *Energía del Pacífico* “LNG to Power” that consists of the following components: i) construction of a Power Generation Plant with a capacity of 378 megawatts (MW) that uses natural gas, located in the Municipality of Acajutla, Sonsonate Department (Natural Gas comes from a new regasification facility or FSRU, associated to the EDP); ii) the enlargement and continued development of existing substations located at Ahuachapán (230 kV) and Acajutla (115 kV); and iii) the construction of a new electrical switchyard in Acajutla (230 kV) within the area of the central power plant (EDP switchyard).

The TL begins in SE Ahuachapán, located near the Geothermal Plant Los Ausoles; it then passes through the municipalities of Ahuachapán, Apaneca, San Pedro Puxtla, Santo Domingo de Guzmán, Sonsonate and Acajutla; arriving at the location where the EDP switchyard will be built. The EDP switchyard Acajutla will have two voltage levels: 230 kV in order to interconnect with the Ahuachapán substation and the SIEPAC and 115 kV for the interconnection with the Acajutla substation.

Therefore, the TL project includes the implementation of the following components that serve to connect the central power plant with the inter-connected electrical system of El Salvador.

- Enlargement of the existing substations of Ahuachapán (230 kV) and Acajutla (115 kV);
- Construction of a new switchyard in Acajutla (230/115 kV) within the area of the EDP power plant;
- Construction of an underground 115kV Transmission Line between the EDP power plant and the Acajutla SE of 115 kV; and,
- Construction of an overhead 230 kV TL between the Ahuachapán substation and Acajutla switchyard, which will have an 1.8 kilometers underground segment at the *Ruta Las Flores*.

The network access roads needed for the construction of Project components are comprised of:

- Principal access roads built off of the public road system

- Internal access roads between the various construction sites and Project services.

It is estimated that it will take approximately 22 months for the installation of the 230 kV Ahuachapán-Acajutla TL to be completed.

2. DETERMINATION OF MODIFIED AND NATURAL HABITAT

According to p11, PS 6, modified habitats are those that “*contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area’s primary ecological functions and species composition. 5 Modified habitats may include areas managed for agriculture, forest plantations, reclaimed coastal zones, and reclaimed wetlands*”. The Performance Standard 6 applies to areas of modified habitat with significant biodiversity value as well as natural habitats.

Natural habitats are defined as “*areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area’s primary ecological functions and species composition.*”

Vegetation cover for the Project area of influence was determined using Landsat satellite imagery using forest cover data from 2014. Landsat imagery indicates that the majority of the area has less than 50% woody vegetation cover, with some areas having 50-79% woody vegetation cover. Upland volcanic areas have 80-100% woody vegetation cover; however, the vast majority of this woody vegetation cover corresponds to the extensive agroforestry plantations that grow coffee; however, differentiating between coffee plantations and natural forest cover is not feasible with Landsat imagery. Estimates using Google Earth Pro in 2017 indicate that the area of natural forest (not in coffee production) within the Transmission line right of way is less than 18 ha (ESIA 2017). This estimate includes tree-fences, riparian forest, and small tree-patches in pastures and cultivated areas. For this assessment, we considered modified habitats are those that contain less than 50% woody vegetation cover.

Habitats considered as modified in this analysis include.

- Historically converted forested lands now under various types of herbaceous cover (e.g. , grass or pastures) with varying degrees of colonization of woody species;
- Planted tree lines or living fences; and
- Actively cultivated areas and fallow areas

Habitats with areas having 50-100% woody vegetation cover were categorized as Natural. Because agro-forestry plantations provision ecosystem services, serve as wildlife corridors, and house important biodiversity values, coffee plantations are considered natural habitat. Habitats designated as Natural include the following:

- Remnant riparian/gallery forests
- Agroforestry plantations dedicated to coffee cultivation

Table 1 summarizes the area of natural and modified habitat affected by the project (AppendixA presents the detailed areas by access roads, substations, temporary laydown areas and tower

construction and Appendix B presents a map of critical and natural habitat as well as project components).

TABLE 2-1: SUMMARY OF IMPACTS TO NATURAL AND MODIFIED HABITATS DUE TO PROJECT CONSTRUCTION ACTIVITY (HECTARES).

Impact	Natural	Modified	Total
Access roads, laydown areas, substation	18.38	29.78	48.17
Towers	9.37	7.78	17.15
	27.75	37.56	65.32

3. CRITICAL HABITAT DEFINITION

This report provides an assessment of critical habitats applicable to the transmission line component of the LNG-to-Power Project of the Ahuachapán to Acajutla Transmission Line – Energía del Pacífico (Project) in accordance with the International Finance Corporation’s (IFC) Performance Standard 6 (PS6) *Biodiversity Conservation and Sustainable Management of Living Natural Resources* (IFC 2012a) and its related Guidance Note 6 (GN6).

The assessment is based on a review of the biological baseline information provided within the Environmental and Social Impact Assessment of the TL component, and a post-EIA supplemental report, *Estudio de avifauna en el Proyecto de línea de transmisión de energías del Pacífico S.A. de C.V. en Trayecto Acajutla-Ahuachapán, El Salvador* (February, 2018). In addition, desktop analysis of relevant publicly available information on species and habitats occurring within the Project area was utilized to assess and describe additional characteristics of the landscape and species of flora and fauna.

IFC PS6 (IFC 2012) defines critical habitat as areas with high biodiversity value that meet one or more of the following criteria:

- Criterion 1: Critically Endangered (CR) and/or Endangered (EN) species
- Criterion 2: Endemic and/or restricted range species
- Criterion 3: Migratory and/or congregatory species
- Criterion 4: Highly threatened and/or unique ecosystems and
- Criterion 5: Key evolutionary processes

Other areas of high biodiversity value that do not fall within the five criteria can be classified as critical habitat under PS6. For example, certain protected areas can trigger a critical habitat designation under PS6 including but not limited to:

- IUCN Category 1 and 2 Protected Areas;

- Areas required for the reintroduction of CR and EN species and/or sites required by species during periods of stress such as flood, drought, or fire;
- Ramsar sites meeting Criteria 1 (Critically Endangered species only), Criteria 5 (regularly supports 20,000 or more waterbirds), and Criteria 6 (regularly supports 1 percent of the individuals of a population of one species or subspecies of waterbird);
- Key Biodiversity Areas designated for Critically Endangered species, endemic and restricted range species, and migratory species or species that form congregations;
- Important Bird Areas (IBAs) meeting Criteria A1 (Critically Endangered species only), A2 (restricted range species), and A4 (congregations);
- Ecosystems of known special significance to EN or CR species for climate adaptation purposes;
- Concentrations of Vulnerable (VU) species where there may be uncertainty regarding listing;
- Areas with high levels of species diversity (see GN56); and
- World Heritage Sites.

PS6 establishes a tier system for Criteria 1 through 3. No tiers have been established for Criteria 4 and 5. The tiers further characterize the critical habitat based on relative vulnerability (degree of threat) and irreplaceability (rarity or uniqueness), with Tier 1 having the highest degree of vulnerability and irreplaceability. Table 3 summarizes the defining attributes of each Criterion and related tiers for Criteria 1 through 3.

TABLE 3-1: SUMMARY OF IFC PS6 CRITERIA AND DEFINING ATTRIBUTES

Criteria	Defining Attributes
Criterion 1: Habitat of significant importance to Critically Endangered and or Endangered species ¹	Habitat of significant importance to CR and or EN species. Also includes “refuge” sites, reintroduction sites, and sites with high scientific value. <u>Tier 1:</u> Habitat required to sustain ≥ 10 percent of the global population of a CR or EN species/subspecies where there are known, regular occurrences of the species and where that habitat could be considered a discrete management unit for that species. Habitat with known, regular occurrences of CR or EN species where that habitat is one of 10 or fewer discrete management sites globally for that species. <u>Tier 2:</u> Habitat that supports the regular occurrence of a single individual of a CR species and/or habitat containing regionally - important concentrations of a red-listed EN species where that habitat could be considered a discrete management unit for that species/ subspecies. Habitat of significant importance to CR or EN species that are wide-ranging and/or whose population distribution is not well understood and where the loss of such a habitat could potentially impact the long-term survivability of the species. As appropriate, habitat containing nationally/regionally important concentrations of an EN, CR, or equivalent national/regional listing.

Criteria	Defining Attributes
<p>Criterion 2: Habitat of significant importance to endemic and/or restricted-range species²</p>	<p>Habitat of significant importance to endemic and/or restricted-range species.</p> <p><u>Tier 1:</u> Habitat known to sustain ≥ 95 percent of the global population of an endemic or restricted-range species where that habitat could be considered a discrete management unit for that species (e.g., a single-site endemic).</p> <p><u>Tier 2:</u> Habitat known to sustain ≥ 1 percent but < 95 percent of the global population of an endemic or restricted-range species where that habitat could be considered a discrete management unit for that species, where data are available, and/or based on expert judgment.</p>
<p>Criterion 3: Habitat supporting globally significant concentrations of migratory species and/or congregatory species</p>	<p>Habitat supporting globally significant concentrations of migratory species and/or congregatory species. Migratory species are defined as species “of which a significant portion of its members cyclically and predictably move from one geographical area to another.”</p> <p>Congregatory species form colonies for breeding or other purposes, move through “bottlenecks” where individuals become concentrated, may become largely concentrated in a single or few sites, or have “source populations” that contribute inordinately to recruitment elsewhere.</p> <p><u>Tier 1:</u> Habitat known to sustain, on a cyclical or otherwise regular basis, ≥ 95 percent of the global population of a migratory or congregatory species at any point of the species’ lifecycle where that habitat could be considered a discrete management unit for that species.</p> <p><u>Tier 2:</u> Habitat known to sustain, on a cyclical or otherwise regular basis, ≥ 1 percent but < 95 percent of the global population of a migratory or congregatory species at any point of the species’ lifecycle and where that habitat could be considered a discrete management unit for that species, where adequate data are available and/or based on expert judgment.</p> <p>For birds, habitat that meets BirdLife International’s Criterion A4³ for congregations and/or Ramsar Criteria 5 or 6 for Identifying Wetlands of International Importance.⁴</p> <p>For species with large but clumped distributions, a provisional threshold is set at ≥ 5 percent of the global population for both terrestrial and marine species. Source sites that contribute ≥ 1 percent of the global population of recruits.</p>
<p>Criterion 4: Highly threatened and/or unique ecosystems</p>	<p>Highly threatened and/or unique ecosystems are defined in GN6, subnote GN90 as those (i) that are at risk of significantly decreasing in area or quality; (ii) with a small spatial extent; and/or (iii) containing unique assemblages of species including assemblages or concentrations of biome-restricted species. To be prioritized using factors similar to those used by the IUCN Red List of Threatened Species, such as long-term trend, rarity, ecological condition, and threat. Specifies that ecosystems must be “highly” threatened to be designated as critical habitat solely on the basis of ecological threat.</p>

Critería	Defining Attributes
Criterion 5: Areas associated with key evolutionary processes	<p>Areas associated with key evolutionary processes are defined in GN6 subnote GN95, criterion is defined by: (i) the physical features of a landscape that might be associated with particular evolutionary processes; and/or (ii) subpopulations of species that are phylogenetically or morphogenetically distinct and may be of special conservation concern given their distinct evolutionary history. The latter includes evolutionarily significant units (ESUs) and Evolutionarily Distinct and Globally Endangered (EDGE) species.</p> <p>Criteria now focuses instead solely on key evolutionary processes. Provides expanded but qualitative guidance on the specific habitat characteristics that contribute to evolutionary processes. Analytical protocol remains qualitative and focused on professional expertise and expert judgment.</p>

CR = Critically Endangered; EN = Endangered

¹ As classified on the IUCN Red List (IUCN 2014a) or lists designated by the host government.

² For purposes of IFC Critical Habitat assessment, an endemic species is defined as one that has ≥ 95 percent of its global range inside the country or region of analysis. Range-restricted species are defined differently according to the type of organism and ecosystem in which it is found and are defined in the guidance as:

- Terrestrial vertebrates - those species that have an extent of occurrence of 50,000 km² or less.
- Marine systems (provisionally) - those with an extent of occurrence of 100,000 km² or less.
- Freshwater systems - not yet standardized, however, approximate guidance from IUCN study is 20,000 km² for crabs, fish, and mollusks and 50,000 km² for odonates (dragonflies and damselflies).
- Plants - may be listed as part of national legislation.

^{3 A4.} Congregations Criteria: A site may qualify on any one or more of the four criteria listed below:

- Site known or thought to hold, on a regular basis, >1% of a biogeographic population of a congregatory waterbird species.
- Site known or thought to hold, on a regular basis, >1% of the global population of a congregatory seabird or terrestrial species.
- Site known or thought to hold, on a regular basis, > 20,000 waterbirds or >10,000 pairs of seabirds of one or more species.
- Site known or thought to exceed thresholds set for migratory species at bottleneck sites.

⁴ Ramsar Criterion 5: A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds. Ramsar Criterion 6: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.

4. CRITICAL HABITAT ASSESSMENT

4.1. Discrete Management Unit for the Assessment (DMU)

The scale at which a critical habitat determination occurs depends on the ecological processes occurring within the habitat under analysis and is therefore not limited to the direct footprint of the Project. GN65 states that for Criteria 1-3 the determination of critical habitat should be based on a “*Discrete Management Unit*” (DMU). A DMU has a boundary, either ecological or political, within which biological communities have more in common with each other than they do with communities outside the boundary.

The TL and associated structures occur within the Dry Forest Ecoregion (0-700 masl), the Humid Forest ecoregion (700-1900 masl) and the Cloud Forest Ecoregion (above 1900 masl). These ecoregions occur within three of El Salvador’s eleven major watersheds (MAG, 2012); The three watershed regions are: 1) Paz (Region B), 2) Cara Sucia (Region C) and 3) Grande de Sonsonate-Banderas (Region D). These watersheds comprise the DMU for this assessment (refer to Fig 1).

FIGURE 4-1: AREA OF TRANSMISSION LINE AND THE PAZ, CARA SUCIA AND GRANDE DE SONSONATE-BANDERAS WATERSHEDS.



The La Paz watershed occurs in both El Salvador and Guatemala; however, for the critical habitat determination, only the area within El Salvador is considered. In El Salvador, the La Paz watershed has an area of 919 km². Threats to this watershed include deforestation, unsustainable utilization of flora and fauna, changes in wildlife corridors, water pollution (MARN 2013). Maximum elevation within this watershed is 2,365 masl, and annual precipitation ranges from 1400-2400 mm. The Cara Sucia watershed has an area of 768 km², a maximum elevation of 1,436.8 masl and an annual precipitation of 1400-2400 mm. The Sonsonate Banderas watershed has an area of 778.43 km² and annual precipitation ranging from 1400-2400 mm.

4.2. Landscape and Habitats within the DMU

El Salvador is located in the Neotropical region that comprises the American tropics from the north of Mexico to the center of Argentina. The Project area includes the Santa Ana volcanic complex, of which the Santa Ana Volcano or Ilimatepec forms the nucleus. This volcano originated in the Pleistocene (between 1 to 2 million years ago) before the explosion of the Coatepeque crater (its last eruption was in 2005). The nearby volcanos of Izalco, Cerro Verde, San Marcelino and others are “parasites” of the mother volcano (UNESCO, 2007b).

The project is located within 13° 35' 1.81" (SE Acajutla) y 13° 55' 21.39" (SE Ahuachapán) north latitude and 89° 49' 39.67" (SE Acajutla) to 79° 49' 2.65" (SE Ahuachapán) longitude.

The area of the Project crosses three watersheds; Paz, Cara Sucia San Pedro and Grande de Sonsonate-Banderas. The main rivers and streams in the Project area are the Rio Grande de Sonsona, the Cashalate River, the Quebrada de Invierno, the Camalote river and the El Venado River; the climate is Tropical warm savannah (MARN 2012, ESIA 2017).

The Project crosses a portion of the Apaneca Ilamatepec Biosphere Reserve, which includes three ecoregions:

- i. the Central American Montane forest, classified as Vulnerable;
- ii. the Central American Dry Forest, which is classified as Critical/EN and
- iii. Pine-Oak forest classified as VU (Comision Centroamericana de Ambiente y Desarrollo CCAD, 2000) and Critical/EN, (WWF , 2018).

According to the Holdridge (1971, 1978), the Project crosses 7 life zones. These are:

- Subtropical warm moist forest bh-S
- SubTropical moist forest transitioning to tropical
- Tropical moist forest
- Tropical moist forest transitioning to subtropical
- Subtropical very moist forest transitioning to moist –S
- Subtropical very moist lowland montane forest-MBS
- Subtropical very moist forest bmh-S

Most of El Salvador is within the warm savannah tropical climate, that includes coastal plains up to 200m and interior valleys up to 800-900m. Average temperatures of the coldest month are 18° C and average temperatures of the warmest month are above 22°. In mountains and valleys between 800 and 1,200 m, the warm savannah tropical climate predominates; above 1,200m high altitude tropical climate average monthly temperatures below 18° predominates.

Because of the unique conditions caused by the presence of the ocean and its thermal regulating properties, the coastal zone (up to 200 m) can be considered its own climate unite that is differentiated by attenuated temperature regimen in comparison with the interior valleys.

The TL traverses three altitudinal zones and ecoregions. The low-lying areas from 0-700 masl, are in the Dry Forest Ecoregion; while areas from 700-1900 masl are located within the Humid Forest ecoregion. The highest peaks correspond to the Cloud forest ecoregion. Coffee is grown from approximately 400 masl to 1700 masl, and coffee plantations occur over 90% of the area.

Three-fourths of the El Salvador's territory is occupied by agro-ecosystems (Estrategia Nacional de Biodiversidad, 2013). The following habitats as occurring within the Project area of influence: coffee plantations, natural forest, pasture, and urban areas. The TL crosses agro-ecosystems comprised of coffee plantations in addition to mixed annual and permanent cultivars, pastures, sugarcane and a discontinuous urban mosaic.

4.2.1. Coffee Plantations

The Apaneca-Illamatepec cordillera, which passes through the departments of Ahuachapán and Sonsonate, is one of the principal coffee growing regions in the country. Within the Project area of influence, coffee agro-forestry plantations are common with both poly- and mono-cultures occurring. Coffee plantations with polycultures have trees that are approximately 8-10m in height with a diversity of species that include relatively young fruit and wood producing trees that give shade to coffee. Species utilized to shade coffee may be non-native and introduced. Mono-cultures generally have one, or sometimes two species that shade coffee. Monoculture plantations have trees with an average height of 4.8 m, and a canopy cover of approximately 65%. Trees can average 2016 per hectare, while coffee plants can attain a density of 4,300 individuals per hectare (ESIA 2017).

4.2.2. Aquatic Habitats

The slopes of the volcanic mountains on the western Pacific coast of Central American form generally small watersheds that have rivers and streams of a generally short length. With regards to fish diversity, it is known as the Chiapaneca-Nicaraguan Province and is characterized by having a relatively low number of species as well as a low level of endemism (Bussing, 1998; Chicas Batres & Gonzalvez Leiva, 2009)

Critical and/or Endangered species associated with aquatic habitats were not recorded during field surveys conducted during the ESIA (2017) and are not recorded within the DMU; impacts to aquatic biodiversity due to Project operations are not anticipated.

4.2.3. Plantations, Cropland, Pastures

These areas are dominated by herbaceous vegetation from the following families: Poaceae, Euporbiaceae, Asteraceae, and some arboreal species. Native trees can be found in these habitats, primarily as live fences.

5. CRITICAL HABITAT DETERMINATION

Appendix C summarizes the results of the critical habitat determination for the Project based on available information reviewed for this analysis. Of the species evaluated, the DMU meets critical habitat criteria defined in PS6 for *Eugenia salamensis* and *Junglans olanchana*. Of the sites evaluated, the IBA Los Cobanos, IBA Volcans and San Marcelino IBA and El Imposible National Park meet critical habitat criteria as defined in PS6 (see below for summaries by sites and species).

5.1. Criterion 1: Critically Endangered and/or Endangered Species

According to the IUCN Red list of Threatened Species, no critically endangered species are found within the Project area of influence and DMU. Some species do occur within the areas surveyed that have been categorized as Endangered by either the IUCN or *Ministerio de*

Ambiente y Recursos Naturales (MARN) for El Salvador. MARN (2015) defines threat categories as follows:

- *En Peligro de Extinción* (Endangered): Populations that have been reduced to a critical level or whose habitat has been reduced so drastically that it is considered to be in immediate danger of disappearing or being extermination on national territory and therefore requires strict measures of protection or restoration.”
- *Amenzada de extinción* (Threatened with extinction): Species that are not in short- term danger of extinction, but where a notable decrease in population size and range is observed due to over-exploitation, habitat destruction or other drastic environmental modifications”

Guidance note 72 for Criterion 1 states that “species listed nationally/regionally as CR or EN in countries that have adhered to IUCN guidance, shall be determined on a project-by-project basis. The same is true in instances where nationally or regionally-listed species categories do not correspond well to those of the IUCN...., although in these cases an assessment might be conducted on the rationale and purpose of the listing”.

The threatened species list for El Salvador does not contain details on the methods used to assess threat status of species and threat categories differ between MARN and IUCN classifications, so it is assumed that threat status categorization for El Salvador does not follow IUCN criteria. It is also assumed that El Salvador threat status is based on national scientific expertise, knowledge and assessment.

Below, species found to be endangered, species of conservation concern that warrant additional attention are highlighted, known information about these is summarized and critical habitat designation is proposed.

5.1.1. *Eugenia salamensis* (EN IUCN, AM MARN)

Eugenia salamensis (fruta de pava; Myrtaceae) is native to Costa Rica, El Salvador, Honduras, Mexico, and Nicaragua. It occurs in moist wooded ravines, rocky hills and dense wet-mixed forest at medium to high altitudes. It is classified as Endangered by the IUCN (Nelson 1998) and AM by MARN (2015) but is not considered to be an endemic species. Enquist & Sullivan (2001) describe it as a “small to medium sized tree” with yellow-orange to purple orange fleshy fruits up to 30 mm in size. They note that it occurs in the Area de Conservación Guanacaste in northwestern Costa Rica. Merlos et al. (2005) recorded its occurrence during a survey of the dry forest in Nicaragua. They note that even though the landscapes where it occurred were “very degraded”, the trees provided biodiversity value for the landscape. Mendez and Bacon (2005) state that *E. salamensis* is an important shade tree often found in coffee plantations. No published record exists regarding its population status in El Salvador, *E. salamensis* trees were not identified as being within the direct project footprint, so negative impacts to this species are not anticipated.

Because it is categorized as EN both globally and threatened (AM) nationally, the project DMU is considered a tier 2 critical habitat for this species.

5.1.2. *Juglans olanchana* (EN IUCN, EN MARN)

Juglans olanchana (Juglandaceae), the Central American Walnut or *cedro negro*, is native to Guatemala, Honduras, México, Nicaragua and El Salvador (Nelson 1998). It is a species of the Atlantic lowlands and is EN according to the IUCN (2018) and EN in El Salvador according to MARN (2015). Mendez et al. (2006) recorded this species in coffee cooperatives in El Salvador. Hagggar et al (2015) found it to be among the most common tree occurring in farms in Nicaragua. Stone et al. (2009) found that it was frequently associated with coffee plantations and state that *J. olanchana* “may still be found in native plant communities as a canopy tree, although it is more common to observe populations in cleared areas where the trees were retained as shade for coffee”. They suggest that *J. olanchana* may be useful for agroforestry efforts for rehabilitation of degraded sites. *J. olanchana* trees were not identified as being within the direct project footprint, so negative impacts to this species due to construction activities are not anticipated.

Because of its EN status globally and EN status nationally, the project DMU is considered to be a tier 2 critical habitat for this species.

5.1.3. *Swietenia humilis* (IUCN VU, EN MARN)

Swietenia humilis (Meliaceae), the Pacific coast mahogany, is currently listed as VU by the IUCN (2018) and EN by MARN (2015). It is a species of dry deciduous forest, savanna, rough scrub, rocky hillsides and cultivated fields recorded as occurring in Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama (World Conservation Monitoring Center, 1998). Trees are usually seen as scattered and isolated individuals, often preserved in cultivated land and pastures. Genetic data indicates that this species is exhibiting signs of habitat fragmentation. White et al. (1999) found that initial effects of fragmentation were shown through loss of low- frequency alleles for trees in fragments as compared to trees located in continuous control size while allelic richness of seeds was found to be lower in isolated populations (Rosas et al. 2011). Boshier et al. (2004) noted that it was a species commonly found on farms in Honduras and note that this common on-farm occurrence was not explained by farmer preference. They state that “*S. humilis*...undoubtedly thrives in regimes of heavy disturbance as provided by traditional agriculture in southern Honduras. “. They also note that this species can likely survive “for decades in the closed forests that form when fallows are abandoned.”

This species is not considered endemic or range restricted. *S. humilis* trees were not identified as being within the direct project footprint, so negative impacts to this species due to construction activities are not anticipated.

Based on the IUCN threat categorization and a literature review of its occurrence throughout its range, the project DMU is not considered critical habitat for this species.

5.1.4. *Quercus skinneri* (IUCN VU, AM MARN)

Quercus skinneri (Fagaceae), known as *encino*, is native to El Salvador, Guatemala, Honduras and Mexico. It is categorized as VU by the IUCN (2018) and as Threatened by MARN (2015).

Deforestation is thought to have caused significant population declines over its range (Nixon et al. 1998). Mendez et al (2007) recorded as occurring within coffee cooperatives in El Salvador; it is occurring in El Imposible National Park. No published information exists on the status of populations in El Salvador. No individuals belonging to this species have been identified as occurring within the project footprint; therefore, no negative impacts are anticipated due to implementation of the Project.

Based on the IUCN and MARN threat categorization the project DMU is not considered critical habitat for this species.

5.1.5. *Cedrela odorata* (IUCN VU, AM (Threatened) MARN)

Cedrela odorata, known as the Spanish cedar, is widely cultivated as a timber crop throughout the neotropics; and is categorized as VU by the IUCN (2018) and threatened by MARN (2015). It is found from Mexico south to Central America and northern Argentina up to 800 m altitude. Its range has decreased by 28.8% in the last 100 years (Mark & Rives 2017). It occurs in humid or dry lowland forest. In El Salvador, it has been recorded in coffee plantations (Mendez et al. 2008). No published detailed information exists on populations in El Salvador, but its wood is utilized traditionally for furniture, frames, jewelry boxes, chess sets.

<http://www.fundesyram.info/biblioteca.php?id=2374>

Based on IUCN and MARN threat categorization the project DMU is not considered critical habitat for this species.

5.1.6. *Lonchocarpus rugosus* ssp. *apricus* (IUCN LC, EN MARN)

Lonchocarpus rugosus is classified as being of Least Concern by the IUCN. *Lonchocarpus rugosus* ssp. *apricus* has not been assessed by the IUCN (2018) at the level of subspecies but the subspecies is currently categorized as EN by MARN (2015). *L. rugosus* is widespread in Central America and is known to occur within a number of protected areas. The taxon is described as common and known to occur in a range of habitat types. Habitat types include lowland oak forest, tropical woodland with *Enterolobium* subdeciduous forest with *Brosimum* as well as hillsides and ravines. It is not considered to be threatened or in decline (Groom, A. 2012).

Sousa (2008) describes several subspecies of *L. rugosus*, including ssp. *apricus* (known as *chapulaltalpa*). He states that this subspecies has the most boreal distribution of the species and is frequent in mixed pine and oak forests, although it also occurs in tropical forest at altitudes ranging from 100 to 1200 masl. Sousa (2009) recommends that this subspecies be categorized as Least Concern as per IUCN criteria because of its distribution and broad range of habitat types where it occurs; however, there is no published information on detailed population status of this subspecies within El Salvador.

Data from the ESIA (ERM 2016) indicate that individuals of *L. rugosus* will be impacted through tower construction. While the subspecies of this tree has not been identified, based on distribution and habitat it is likely that these individuals belong to *L. r. ssp apricus*. According to the ESIA, impacts will be from construction of access roads and towers. A total of 23 trees will

be removed at the following locations; Near tower 12: 8 individuals; tower 44: 3 individuals, tower 47: 3 individuals; tower 53: 2 individuals.

Guidance note 76 for PS 6 states that “*In special circumstances, and through consultation with a recognized species specialist, the guidance provided for Criterion 1 may be extended to some subspecies. This determination would be made on a case-by-case basis and require rigorous consensus-based justification and not simply the opinion of a single taxonomist. This statement applies to Criteria 1 through 3*”. A literature review of regarding the subspecies found only one published description of the subspecies; moreover, this subspecies occurs in more than one habitat. The author who described the subspecies recommended that it be categorized as LC (Sousa 2008, 2009).

Based on the IUCN threat categorization for the project the DMU is not considered to be critical habitat for this species.

5.1.7. *Habromys lophorus* (NT IUCN, EN MARN)

Habromys lophorus (Rodentia: Cricetidae) the crested-tail deer mouse, is listed as NT by the IUCN (2018) and as EN by MARN (2015). It is known from Chiapas, Mexico to central Guatemala and northwestern El Salvador (Musser and Carleton 2005). It occurs from 1,950 to 3,110 m. The species is not endemic and its range is somewhat greater than 20,000 km² (Reid et al. 2008). The species has a patchy distribution and appears to be restricted to humid montane forests, such as cloud and humid pine-oak forest between 1800 and 3150 m of elevation (Panigaua et al 2007; Carleton et al. 2002). It has not been recorded as occurring in El Salvador since the 1960's and no published information on this species exists.

Based on the IUCN threat categorization, wide and patchy distribution, this DMU is not considered critical habitat for this species.

5.1.8. *Accipiter striatus chionogaster* (IUCN LC, EN MARN)

Accipiter striatus chionogaster (Accipitridae), the sharp-shinned hawk, has not been assessed to the level of subspecies by the IUCN; the species is currently listed as being of LC (IUCN 2018). The subspecies *chionogaster* is currently listed as EN by MARN (2015). Taxonomy and phylogenetic relationships within the genus *Accipiter* are as yet unclear (Bremen et al. 2013). The species occurs from Alaska in the USA through Canada south to Panama and south to northern Argentina (Bird Life International 2016). It was previously recorded in El Imposible National Park (Perez Leon 2002); density of individuals in the national park was estimated to be 1.75 individuals/ha and it was categorized as being a rare species. Little published information is available on the population status of this species within El Salvador. Rojas-Soto et al. 2010 include it in their list of under protected phylogenetic species referring to *A. striatus chionogaster* as one species of “*an interesting set of forms that exist in isolation in mountain ranges or islands*”. *Accipiter striatus* is considered a long-distance, altitudinal and partial migrant (Bildstein, 2004). Komar (1998) lists *A.s. chionogaster* as a subspecies endemic to northern Central America, found mainly in highland habitats; the author categorizes the subspecies as threatened in El Salvador. Jenner (2008) noted that this species has been

recorded in pine forests on the border with Honduras in the Montecristo National Park; outside of the DMU; the author considers this subspecies as primarily sedentary and notes that it is often found nesting near houses and seems to adapt to human activity. Three individuals were recorded within the Project Area of influence in February 2018 (Post-ESIA bird survey).

Based on the IUCN threat categorization, current taxonomic uncertainty regarding subspecies assignments, and occurrence of *A.s. chionogaster* in the Montecristo National Park, the DMU is not considered not considered critical habitat for *A. striatus* or *A. striatus chionogaster*.

5.1.9. *Spizaetus tyrannus* (IUCN LC, EN MARN)

Spizaetus tyrannus (Accipitridae), the black hawk eagle or *aguila tirana*, is categorized as LC by the IUCN (2018) and as being EN by MARN (2015). The species has a large range and occurs from Central America south to Argentina (BirdLife International 2016). It is recorded as occurring in the Imposible National Park (Komar 2002), but not in any additional protected areas within El Salvador. Perez-Leon (2002) recorded 27 individuals and estimated its density within the park as being 5.25 ind./ha; the author categorized this species as being “common” within the park. Two individuals were recorded in patches of natural forest near the proposed transmission line in February 2018.

Based on the IUCN threat categorization of LC, and published accounts of occurrences in protected areas and abundance, the DMU is not considered critical habitat for *S. tyrannus*.

5.1.10. *Tilmatura dupontii* (LC IUCN, EN MARN)

Tilmatura dupontii (Trochilidae), the sparkling-tailed woodstar, is categorized as LC by the IUCN (2016) and as EN by MARN (2015). It occurs from Mexico and Central America. It is recorded as occurring in the Monte Cristo National Park (Komar, 2002b)

Komar (2002a) reported this species as occurring in three protected areas within El Salvador: El Imposible, Monte Cristo, and Cerro Cachuatique; thus, the species is recorded in protected areas outside of the DMU. One individual was recorded in natural forest patches near the proposed transmission line in February 2018.

Based on the IUCN threat categorization of LC, and its occurrence in three national protected areas within El Salvador, which also occur outside of the DMU, the DMU is not considered critical habitat for this species.

5.1.11. *Neotoma ferrugineae* (Synonym is *N. mexicana* IUCN LC, EN MARN)

Neotoma ferruginea, (Rodentia; Cricetidae) a species of woodrat, is considered EN by MARN (2015) but is not assessed as such by the IUCN. The IUCN has not yet assessed *N. ferruginea* because it is considered synonymous with *Neotoma mexicana*, the Mexican woodrat. *N. mexicana* is categorized LC by the IUCN (2018). Edward and Bradley (2002) suggested assigning Mexican wood rats south of the Isthmus of Tehuantepec to the same species and those occurring along the Sierra Madre in southwestern Mexico to a second species. They state “we have not examined samples from Guatemala, El Salvador, Honduras, and Nicaragua; if

these samples are conspecific with *N. isthmica* then the name *N. ferruginea* (Tomes 1862) would have priority and would refer to all samples from southeastern Oaxaca and those south of the Isthmus of Tehuantepec". Owen and Giron (2012) list *N. ferruginea* as occurring in El Salvador, but no published accounts are cited. Because at present the IUCN considers *N. mexicana* synonymous with *N. ferruginea*, information on *Neotoma mexicana* is summarized here. *N. mexicana* occurs in rock outcrops, cliffs, and rocky slopes; however, this species is poorly known in Central America. It is found in highland pine-oak forest and open woodland and favors dry rocky areas in coniferous forest but can occur in cool, evergreen forest (Linzey et al. 2016).

This species has not been recorded within the project area of influence and based on published habitat preferences, this species is unlikely to occur in the Project Area of Influence, and so negative impacts are not anticipated. The Left Tool habitat occupancy modeling did not predict species occurrence within the area of the project.

Based on the current IUCN threat categorization for *N. mexicana*, and status as being synonymous *N. ferruginea*, the DMU is not considered critical habitat for this species *at this time*. However, if taxonomic status of this species is modified, ERM recommends reassessing critical habitat status.

5.1.12. *Chrotopterus auritus* (IUCN LC, EN MARN)

Chrotopterus auritus (Chiroptera: Phyllostomidae), the woolly false vampire bat, is categorized as LC by the IUCN (2018) and EN by MARN (2015). This species occurs from Mexico to north Argentina. It is considered common throughout its range, yet uncommon in Central America. It is a carnivore of dense forest and tends to live near streams and other moist areas in forested lowlands, tropical rainforests, tropical deciduous forests, and cloud forests and it roosts in hollow trees and caves (Barques et al. 2015). This species has a low reproductive rate and one offspring per litter. It is carnivorous but can eat insects and fruit. Published information on populations of this species for El Salvador are not available. There are no records of this species in El Salvador found in GBIF (Global Biodiversity Information Facility database). The Left Ecological Footprint tool, which uses a habitat model to predict species occurrence (Oxford 2018), did not register this species as occurring within the DMU. Surveys conducted for the ESIA did not record presence of this species, so the project area and DMU are considered potential habitats.

Based on the IUCN threat assessment, habitat occupancy models, the current DMU is not considered critical habitat for this species.

5.1.13. *Macrophyllum macrophyllum* (IUCN LC, EN MARN)

Macrophyllum macrophyllum (Chiroptera: Phyllostomidae), the long-legged bat is categorized as LC by the IUCN (2018) and EN by MARN (2015). It is considered to be LC because of its wide distribution and presumed large populations (Rodriguez et al. 2015). *M. macrophyllum* tolerates habitat modification and occurs in protected areas. It lives in colonies up to 70 individuals and is water dependent. Owen et al (1991) includes this species as occurring in El

Salvador. Harrison & Pendleton (1974) record *M. macrophyllum* for a location north of Acajutla. No recent publications or records exist for El Salvador, and population data for El Salvador is unknown. These bats were not recorded within the project area of influence during field surveys conducted for the ESIA.

Based on the IUCN threat assessment, occurrence in protected areas throughout its range, tolerance to habitat modification, and lack of published information on population status within El Salvador, the current DMU is not considered critical habitat for this species. However, while there are no records of this species occurring since 1974, it is possible that it does occur within the DMU.

5.2. Species categorized as Vulnerable by the IUCN or Threatened by MARN and recorded within the project area of influence

5.2.1. *Brotogeris jugularis* (IUCN LC, AM MARN)

Brotogeris jugularis (Psittacidae) the orange chinned parakeet is listed as least concern by the IUCN (2018) and Threatened by MARN (2015). This species has a large range and the population appears stable (Bird Life International 2016). In Mexico *B. jugularis* was shown to have a high proportion of modified lands within their current distributions (Marin Togo et al 2012)*.

Based on the IUCN and MARN threat assessments the current DMU is not considered critical habitat for this species.

5.2.2. *Eupsittula canicularis* (IUCN LC, AM MARN)

Eupsittula canicularis (Psittacidae; the orange fronted parakeet) is categorized as LC by the IUCN (2018) and Threatened by MARN (2015). The IUCN considers populations to be wide ranging and apparently stable. No published information is available regarding population status of this species in El Salvador.

Based on the IUCN and MARN threat assessments the current DMU is not considered critical habitat for this species

5.2.3. *Aulacorhynchus prasinus* (IUCN LC, AM MARN)

Aulacorhynchus prasinus (Ramphastidae; *Tucaneta verde*) is categorized as being of LC by the IUCN (2018) and Threatened by MARN (2015). It occurs in Mexico and Central America (Bird Life International 2016). Three individuals were observed as occurring in natural forest in the project area of influence and none was observed in the coffee plantations (ESIA 2017). Sixteen individuals were recorded in natural forest patches near the proposed transmission line in February 2018. No published information exists on the population status of this species within El Salvador.

Based on the IUCN and MARN threat assessments the current DMU is not considered critical habitat for this species

5.2.4. *Chiroxiphia linearis* (IUCN LC, AM MARN)

Chiroxiphia linearis (Piperidae), saltarin colilargo, *toledo* or long-tailed manakin, is categorized as being of LC by the IUCN (2018) and Threatened by MARN (2015). The species has a large range and is native to Costa Rica, El Salvador, Guatemala, Honduras, Mexico and Nicaragua; throughout its range, the population is considered stable (Bird Life International 2016). Komar (1999) categorizes this species as threatened and records it as a lowland forest specialist. Two individuals were recorded occurring in shade-coffee/natural forest areas near the proposed transmission line in February 2018.

Based on the IUCN and MARN threat assessments the current DMU is not considered critical habitat for this species

5.2.5. *Psittacara holochlorus* synonym *Psittacara strenuus* (IUCN LC, AM MARN)

Psittacara holochlorus (syn. *strenuus* family Psittacidae), the pacific parakeet or perico is IUCN (2018) LC and Threatened (MARN 2015) and is found from southern Texas through Central America (Bird Life International 2016). It occurs in wooded habitats but is also found in modified habitats. "This species was formerly placed in the genus *Aratinga* as *A. holochlora*, and divided into various subspecies *A. h. holochlora*, *A. h. brevipes*, *A. h. brewsteri*, *A. h. strenua*, and *A. h. rubritorquis*. Later, it was split into three species as green conure (*A. holochlora*), pacific conure (*A. strenua*), and Socorro conure (*A. brevipes*). It is currently recognized as single species with a highly threatened subspecies (*Psittacara holochlorus brevipes*) endemic to Socorro in the Revillagigedo Islands, Mexico.

Based on the IUCN and MARN threat assessments the current DMU is not considered critical habitat for this species

5.2.6. *Ctenosaura similis* (IUCN LC, AM MARN)

Ctenosaura similis, the *garrobo* or black iguana is listed as LC by the IUCN (2018) and Threatened by MARN (2015). It is often common in disturbed habitats but may be threatened due to hunting pressure for food. Harvesting for human consumption does not seem to be having a negative effect on the population size (Pasachnik 2015). Greenbaum and Komar (2015) reviewed this species according to IUCN criteria within El Salvador and they found 37 collection localities nationally, and estimated a range greater than 20,000 km². They also categorized this species as being LC as per IUCN criteria.

It is not expected that the Project will negatively affect populations of this species.

Based on the IUCN and MARN threat assessments the current DMU is not considered critical habitat for this species

5.2.7. *Passerina ciris* (IUCN NT, AM MARN)

This species is categorized LC by the IUCN (2018) and Threatened (AM) by MARN (2015). It is native to Central America and the USA, and can occur as a vagrant in the Caribbean.

Populations have undergone a decline in North America and in Mexico, likely due to loss of habitat and capture for the cage bird trade. In addition, declines may have occurred due to brood parasitism by the Brown-headed Cowbird (BirdLife International 2016). While little published information exists on its population status in El Salvador, it has been recorded in nine protected areas within El Salvador. Five individuals were recorded in shade-coffee/natural forest habitat near the proposed Transmission Line in February 2018.

Based on the IUCN and MARN threat assessments the current DMU is not considered critical habitat for this species

5.2.8. *Agalychnis moreletti* (LC IUCN)

Agalychnis moreletti (Phyllomedusidae), the black-eyed leaf frog, is currently considered to be of Least Concern according to the IUCN (2018). It is not listed as threatened species by MARN (2015). Until recently, this species was listed as CR by the IUCN because of a predicted future decline of its population. Because of its large range and abundant populations, it has been relisted as being of Least Concern by the IUCN in 2017. This species occurs discontinuously in Mexico from northeastern Puebla state and south-central Veracruz state, and from south-central Guerrero state (new records since last assessment) to north and south-central Oaxaca state and occurs also in northwestern Honduras and central Belize; and from central-western El Salvador and throughout Guatemala. The extent of occurrence (EOO) of its current known range is 528,014 km² (IUCN SSG Amphibian Specialist Group 2017). Despite this species recent re-categorization of threat status by the IUCN, there is little published information on the status of populations in El Salvador. However, chytridiomycosis (infection by *Batrachochytrium dendrobatidis*) has been recorded as infecting individuals of *A. moreletti* within El Salvador (Felgler et al. 2011). Lawson et al (2011) found that in El Salvador, two of thirteen sites sampled had high (89%) estimated prevalence of *Batrachochytrium dendrobatidis*, while little or no Bd was detected at remaining sites. The authors suggest that this tree frog currently might not be experiencing rapid population declines due to chytridiomycosis. Nevertheless, they caution, “it remains possible that more subtle, localized declines might be occurring due to reduced survival of Bd-infected adults, larvae, or metamorphs. Furthermore, endemic Bd might increase susceptibility to decline due to synergistic interactions with other threats, such as pollution, habitat modification, or climate change, as well as demographic vulnerabilities”. They highlight the importance of implementing monitoring programs for this species.

Greenbaum and Kumar (2005) published a list of threatened herpetofauna in El Salvador that they assessed for threat status using museum records and IUCN criteria. According to their analysis, *A. moreletti* is listed as EN, however they note that the species is Data Deficient (DD) regarding assessment of population criteria. For example, limits set by Criteria B1a or B2a set limits of <10 locations for VU species and less than 5 for EN species; according to these limits, *A. moreletti* could be considered as VU. Their review found nine localities for *A. moreletti* in El Salvador with an extent of occurrence based on these being approximately 90 km² nationally. It is recorded as occurring in six departments within El Salvador, one of them being Ahuachapán. The authors also note the importance of Ahuachapán for the conservation of herpetofauna, due in large part to the existence of the El Imposible National Park.

Because of the above, and its status as IUCN LC, the DMU is not considered critical habitat for this species.

5.3. Endemic and Restricted Range Species

No endemic or range restricted species occur within the DMU except for those species that trigger the A2 criteria for the Volcans and San Marcelino IBA, located outside of the project area of influence. These species are classified as being of LC (IUCN). Species that trigger A2 criteria are *Cyanocorax melanocyaneus* blue crested jay; rufous browed wren *Togodytes rufocillatus*, blue and white mockingbird *Melanotis hypoleucus*, rufous collared thrush *Turdus rufitorques*, bar winged oriole *Icterus maculialatus*; *Melmzone leucotis*, the white eared ground sparrow. These species were not recorded during the ESIA and post-ESIA field surveys.

The Volcans and San Marcelino IBA are not within the project area of influence; however, it is located within the DMU. Because it is an IBA and EBA (A3 and A2 criteria triggered), this IBA is a critical habitat trigger.

5.4. Migratory and/or Congregatory Species

The Barra el Santiago, located 22 km from the Project, is a RAMSAR site that exists within the DMU. Migratory bird species were observed as occurring within the DMU and recorded in the ESIA (2017) and post EIA field surveys (2018). However, IBA's within the DMU do not meet the criteria for being important sites for congregatory species; criteria A4 states that "*the site is known or thought to hold congregations of $\geq 1\%$ of the global population of one or more species on a regular or predictable basis.*"

Based on the above, ERM does not consider the DMU to qualify as critical habitat for migratory and/or congregatory species.

5.5. Highly Threatened and/or Unique Ecosystems

5.5.1. Central American Dry Forest

Central American dry forest is considered CR or EN by the World Wildlife Fund (<https://www.worldwildlife.org/ecoregions/nt0209>) 68,00 km². This ecoregion was once continuous from southwestern, Pacific Coast Mexico, through El Salvador, Honduras, Nicaragua, to Costa Rica. This ecoregion occurs within the North Central American Pacific slope Endemic Bird Area, containing four restricted range species (Stratensfield 1998). In El Salvador, it is estimated that three, 291 km² of tropical dry forest existed as of 2010 (Portillo-Quintero et al. 2010); and according to satellite data, only nine km² of tropical dry forest in El Salvador is protected. Most dry forest, however, (approximately 80%), is in fragments that are larger than 10 km², which can provide opportunities for conservation within larger landscapes. Los Cobanos IBA contains small patches of flora corresponding to Tropical Dry Forest (Bird life international-Los Cobanos fact sheet)

Because of the CR-EN status of this ecosystem, and the small amount currently protected within El Salvador natural forest fragments (Portillo-Quintero et al. 2010) this ecosystem is considered a critical habitat trigger within the DMU.

5.5.2. Central American Pine-oak Forests

Central American Pine-oak forests occur in Mexico, Guatemala, Honduras, El Salvador and some areas of wet central Nicaragua. They are categorized as being CR or EN by the World Wildlife Fund (<https://www.worldwildlife.org/ecoregions/nt0303>). These forests are found from 600-1,800 masl. Dominant species of these forests can include *Pinus spp.*, *Quercus spp.*, *Ostrya spp.* and *Alnus spp.* In El Salvador, pine-oak forests have almost been totally cleared. Pine and/or pine-oak forests cover 16% or 38,433 ha of El Salvador's territory (MARN 2013) and human populations are concentrated in this eco-region. According to MARN (2013) pine-oak forests are threatened by extractive activities; Montecristo National Park reportedly contains the last remaining intact pine-oak forest in El Salvador. No intact pine-oak forests were recorded during field surveys conducted for the ESIA (2017).

While Pine-oak forests may have historically occurred within the DMU, currently no regionally or globally important remnants remain. Pine-oak remnants occurring within the Montecristo National Park are outside of the DMU (s) for the project; therefore, this ecosystem is not considered a critical habitat trigger.

5.6. Key Evolutionary Processes

The Meso-American corridor is a transboundary system of protected areas and connecting corridors; it currently incorporates sustainable development that include goals of biodiversity conservation with sustainable development initiatives of local peoples; all protected areas in Central America form part of the corridor, which serves as way to promote habitat connectivity and (TBPA 2018).

According to PS6 GN 96 “connectivity between habitats ensures species migration and gene flow which is especially important in fragmented habitats and for the conservation of meta-populations”.

Because the DMU is part of the Meso-American corridor and protected areas within the DMU are essential for maintaining connectivity in fragmented habitats within El Salvador, critical habitat is triggered for this DMU.

5.7. Legally Protected and Internationally Recognized Areas

5.7.1. Reserva de la Biosfera Apaneca-Ilamtepec

The Apaneca-Ilamtepec Biosphere reserve is part of the Man and the Biosphere Program, whose aim is to “develop the basis within the natural and social sciences for the rational and sustainable use and conservation of resources and improvement of overall relationship between people and their environment (UNESCO, 2017) (<http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/man-and-biosphere-programme/about-mab/>). It is one of three biosphere reserves within El Salvador (refer to Figure 2 for protected and internationally recognized areas). The reserve was declared in 2007 (UNESCO 2007), and contains paramo montane forests, cloud forests and conifer forests. It covers 2.3% of El Salvador's territory and approximately 10,000 people make their living within the reserve.

Approximately 4,000 ha are allocated for conservation as natural protected areas. The reserve is comprised of seven nuclear zones, a buffer zone, and a transition zone. The core zones contain natural forest and include: 1) *Los Volcanes* National Park (also known as Cerro Verde national park and Complejo los Volcanes), at 2,184.7 ha is the largest protected area within El Salvador. It has an approved management plan (MARN-AECI 2003). 2) San Marcelino Complex at 1,577 ha, 3) Laguna las Ninfas, 125 ha 4) Laguna Verde, 115 ha 5) Buenos Aires 6) San Francisco 7) El triunfo, San Rafael, Los Naranjos. The small nuclear zones are comprised in large part, of natural forest areas.

The buffer zone is the largest component of the reserve. Shade-coffee plantations make-up 92% of habitats within the buffer zone on the east side; on the west side, 65% of habitat is coffee plantations. Aquatic habitats make up 9% of the buffer zone while natural forest habitats comprise 10%. Coffee agro-forestry plantations, therefore, provide vegetation cover and forest structure that decreases the edge effect on the nuclear areas within the Reserve; the agro-forestry plantations also provide connectivity among natural forest habitats (UNESCO 2007). The area is a part of the Mesoamerican Biological Corridor. Objectives within the buffer zone include promotion of organic coffee growing, use of native species, and development of sustainable tourism (citation).

The transition area of the reserve is 29, 226 Ha, and is mostly comprised of shade coffee plantations that cover 68% of this area. Few areas of natural forests exist in this area, except for a few patches of fragment gallery forest. Almost 12% of this area is used to cultivate grains and subsequently are the areas that contain population centers.

The Transmission Line crosses the Biosphere Reserve at two sectors. In the northernmost sector, the transmission line crosses the buffer zone for towers 28 and 39 and the transition zone for towers 56a and 59. In a southern sector, the transmission line crosses the transition zone from towers 28 through 39.

Biosphere reserves are IUCN category 5 protected areas; category 5 applies to areas where landscapes have been transformed because of long-term interactions with humans and do not trigger critical habitat status. Therefore, the Biosphere Reserve itself does not trigger critical habitat, although IBA's (Los Cobanos and species that occur within it may be critical habitat triggers.

Slope Biome). This category applies to groups of species with shared distributions which occur mostly or wholly within all or part of a biome and are therefore of global importance. This area does not hold congregations of >1% of global population of one or more species on a regular or predictable basis. However, the IBA does contain small remnants of the CR-EN ecosystem: The Central American Dry Forest.

The transmission line crosses the northwest sector of the IBA Los Cobanos from towers 136 to 145 + 100 m for a linear distance of approximately 2,890 m.

Based on the above, the IBA Los Cobanos is considered a critical habitat due to the presence of tropical dry forest remnants and Pacific Slope Biome species.

5.7.3. El Imposible National Park

This National Park is located approximately 7 km from the Project Transmission Lines. AT 2, 985.98 ha in size, it is the largest national park in El Salvador, located in Ahuachapán between the municipalities of San Francisco Menendez and Takuba, southwest of the Ruta de las Flores. It is made up of the following portions: San Benito I (1,142 ha); San Benito II (1,142 ha); Las Colinas (35 ha), El Salto (39 ha); Hacienda El Imposible (396 ha); Los Laureles (59 ha). As of 2004 when the management plan was published, four additional parcels were being considered as additions to the park (Los Laureles, El cortijo, Monte Hermoso, and El Balsamero). In addition, SalvaNatura owned nine additional parcels with an approximate area of 426 ha. The total of consolidated and proposed areas for the park is 3,520 ha. A large part of it overlaps with the El Imposible Forest IBA (see below). In 1991 a co-management agreement was reached with the NGO SalvaNatura, and in 2004 the management plan for the park was published (MARN 2004). The park is part of the *Sistema de Areas Naturales Protegidas* (SANP). Habitats include abandoned coffee plantations, secondary forest, and tropical dry forest and dry tropical premontane forest (MARN, 2018; Komar 2002).

Thirteen species of fish, fourteen species of amphibians have been recorded within the park, including *Agalychnis moreletti*; 43 species of herpetofauna, 140 species of birds (Komar & Herrera 1994), and approximately 104 species of mammals. Mammals are the least studied taxonomic group within the park, and many of the 104 species listed are based on possible occurrence and are not based documented records (MARN 2004). Komar (2002) ranks this protected area as second in importance for the conservation of bird biodiversity within El Salvador. Despite its importance for the conservation of biodiversity within El Salvador, none of the terrestrial species within the park are considered to be endangered globally.

The Transmission line does not cross El Imposible National Park, but the park occurs within the DMU of the project.

Because of its status as a National Park and Category 2 status as a protected area, El Imposible National Park is designated as critical habitat within the DMU.

5.7.4. *El Imposible Important Bird Area*

This IBA is located approximately 4 km from the transmission line. It is 9,800 ha in size; 4,000 ha of this IBA overlaps with the Imposible National Park. Habitats include 5,800 ha of dry and montane forest. This IBA has the only population of the great currasow, *Crax rubra*, in El Salvador, which is categorized as NT by MARN (2015). The area contains 290 species of birds, including a community of birds that characterize the Pacific Arid Slope. All are resident species and IUCN LC. No IUCN EN species are found occurring within this IBA. The Criteria triggered for this IBA is A3, biome restricted species. This category applies to groups of species with shared distributions which occur mostly or wholly within all or part of a biome and are therefore of global importance. This area does not hold congregations of >1% of global population of one or more species on a regular or predictable basis. (IBA citation here)

The Transmission line does not cross this protected area, but it occurs within the DMU of the project.

5.7.5. *Complejo Los Volcanes National Park*

This protected area is located between the Sonsonate and Santa Ana departments and is located within the Apaneca-Illamatepec Biosphere Reserve. It overlaps with the Volcans and San Marcelino IBA, and contains cloud forest and tropical montane scrub habitats (Komar 2002). This national park does not yet have a management plan.

The Transmission line does not cross this protected area, but it occurs within the DMU of the project.

5.7.6. *The Volcans and San Marcelino IBA and Endemic Bird Area (EBA)*

This IBA is approximately 16,100 ha, and includes 1,700 ha of cloud and dry forest, and 10,000 ha of shade coffee plantations. It is within the Apaneca-Illamatepec Biosphere Reserve. It contains 9 species or 53% of birds endemic to highlands of Central America an Endemic Bird Area (North Central American Highlands EBA 018; Bird Life International 2018, as well as 40% of 45 species of Middle American Highlands (MAH). Dry forests contain Pacific Arid Slope species (PAS), with 70% of species for this biome in El Salvador. The criteria triggered for this IBA are A2; endemic and range-restricted bird species and A3 biome-restricted species. Species that trigger the A2 criteria are *Cyanocorax melanocyaneus* blue crested jay; rufous browed wren *Togodytes rufociliatus*, blue and white mockingbird *Melanotis hypoleucus*, rufous collared thrush *Turdus rufitorques*, bar winged oriole *Icterus maculialatus*; *Melozona leucotis*, the white eared ground sparrow. All species in this IBA are categorized as LC by the IUCN (2018; Bird Life International 2018). None of the IBA A2 trigger species were recorded during the ESIA field surveys (ESIA 2018) or the post-ESIA field survey (2018)

The Transmission line does not cross this important bird area, but it occurs within the DMU of the project.

5.7.7. Barra de Santiago IBA

The Barra de Santiago IBA is located approximately 22 km from the Project. It consists of 2000 ha of mangroves along the west coast of El Salvador. It contains habitat for coastal birds and serves as a nesting site. It has the only population of the gray necked wood (*Aramides cajanea*) in El Salvador. The criteria triggered for this IBA is A3, for biome-restricted species. Species within this IBA are categorized as being of LC by the IUCN. Bird life international (2018) has flagged this IBA as being in danger and having a high threat level. This site is also a RAMSAR site (RAMSAR sites information service 2018)

The Transmission line does not cross this important bird area, but it occurs within the DMU of the project.

Because criterion A3 does not trigger critical habitat status, there are no CR/EN species within this IBA and CR/EN ecosystems are not recorded as occurring within this IBA

The IBA Barra de Santiago does not trigger critical habitat.

6. CONCLUSIONS AND RECOMMENDATIONS

The intention of delineating critical habitat is to define areas in which development would be of a particularly sensitive nature and require special attention were it to be implemented. IFC's requirements for projects occurring within or having the potential to adversely impact designated critical habitat include (GN6 sub note GN97, Paragraph 17):

- The project must demonstrate that no other viable alternatives within the region exist for development of the project on modified or natural habitats that are not critical. Section 6.1.2 (see below) provides a summary of measures proposed in the ESIA to analyzed alternatives in compliance with this requirement.
- The project does not lead to measurable adverse impacts on those biodiversity values for which the critical habitat was designated and on the ecological processes supporting those biodiversity values; the Project includes avoidance, minimization and mitigation measures on important biodiversity values identified in this report. Through the implementation of compensation measures and additional conservation actions described in the Environmental Management Plan (Plan de Manejo Ambiental y Social, see section 6.4.1, this report) the Project can have a net benefit for biodiversity conservation.
- The project does not lead to a net reduction in the global and/or national/regional population of any Critically Endangered or Endangered species over a reasonable period of time. Avoidance, minimization and mitigation measures described in the Environmental Management Plan (PMAS 2017, see section 6.4.1 this report) will prevent reductions in global and national/regional populations.

- The project demonstrates strict adherence to the mitigation hierarchy¹. The ESIA (2017) and PMAS (2017) both describe avoidance, minimization, mitigation/restoration measures as well as additional conservation measures and compensation activities.
- A robust, appropriately designed, and long-term biodiversity monitoring and evaluation program is integrated into the project's management program. The PMAS (2017) includes monitoring indicators and activities for biodiversity indicators (see section 6.4.1 below)
- The project designs and implements a mitigation strategy that achieves net gains of those biodiversity values for which the critical habitat was designated (GN6 sub note GN97, Paragraph 17). The Project currently includes measures to compensate for biodiversity impacts as well as incorporate additional conservation actions (see section 6.4.1 below)

6.1. Determination of Modified vs. Natural Habitat Requirements

6.1.1. Habitat Categorization

Based on this assessment, ERM recommends that the following land covers and vegetation types be considered modified habitats (less than <50% forest cover):

- Historically converted forested lands now under various types of herbaceous cover (e.g., grass or pastures) with varying degrees of colonization of woody species;
- Planted tree lines or living fences; and
- Actively cultivated areas and fallow areas

Habitats designated as natural include the following:

- Remnant riparian/gallery forests
- Agroforestry plantations dedicated to coffee cultivation

ERM considers the landscape to be a mix of modified and natural habitats. Modified habitats can have high biodiversity value and qualify as critical habitats if critical habitat triggering biodiversity values are present.

6.1.2. Analysis of Alternatives

EDP assessed alternatives for the Transmission Line and associated Project Components. The ESIA (2017, section 2.5) describes the site selection process for substations, and the transmission line. In the case of the SE Acajutla, the construction area is within an industrial site near the Central Power station. EDP evaluated the positioning of the SE in order to minimize vegetation removal.

Four possible route alternatives were selected for the TL. Criteria analyzed included technical, topographic, environmental, and social aspects. The ESIA (2017, section 2.5.2) and associated appendices detail the route alternatives.

¹ The mitigation hierarchy has the following steps: avoid, minimize, rehabilitate, and offset.

6.1.3. Consultation

As part of a stakeholder engagement plan during the ESIA, EDP consulted with stakeholders regarding the affectation of natural habitats. EDP will continue communication with the community regarding biodiversity as part of the Project's social plans.

6.1.4. No net loss where feasible

EDP has applied the mitigation hierarchy and avoided conversion of the natural habitats, where possible. Impacts to area of natural habitats that cannot be avoided will be minimized and restored when possible, as described in the PMAS and below.

6.1.5. Potential for compliance with Critical Habitat Requirements

ERM's assessment is that with the design and implementation of appropriate mitigation measures and additional conservation actions designed on the outcomes of an assessment of residual impacts to critical habitat qualifying biodiversity features, EDP will comply with the requirements of Paragraph 17 of PS6 for projects in critical habitat.

- EDP's process for identifying and evaluating the project location did not identify other viable alternatives within the region for the development of the project on lower-biodiversity value habitats or habitats that are not critical.
- With the mitigation actions as recommended in the Environmental Management Plan (PMAS, 2017) and for the Biodiversity Action Plan, EDP's activities are unlikely to lead to measurable negative impacts on *Eugenia salamensis* or *Junglans olanchana* populations or on the ecological processes supporting those species.
- With appropriate mitigation and additional mitigation actions as recommended within the PMAS (2017) and recommended for Biodiversity Action Plan, EDP's activities are unlikely to lead to net reduction in the global and/or regional populations of any Endangered or Critically Endangered species over a reasonable period of time.

6.2. Compliance with requirements for legally protected and internationally recognized areas

The Project area of influence does not intersect any National Parks (category 1 or 2). It currently intersects the Los Cobanos IBA, which does not have legal status. The project also intersects portions of the transition and buffer zones of the Reserva de la Biósfera Apaneca-Illamatepec.

EDP demonstrated that it is in compliance with requirements for all legally national protected recognized areas within the project area of influence, as stated on the approval issued by MARN. In addition, in the future EDP will continue demonstrating this project will be in compliance with any international recognized areas. The environmental license was officially issued on February 21, 2018 and received by EDP on March 8, 2018.

6.3. Recommendations for a Biodiversity Action Plan

When a borrower is able to meet the requirements for a project in critical habitat, Paragraph 18 of PS6 require that the project's mitigation strategy be described in a Biodiversity Action Plan (BAP) designed to achieve net gains for those biodiversity values for which critical habitat was designated. This may not be required in cases where the project has no potential impact on the biodiversity features of interest.

The Project's BAP will focus on obtaining net gain biodiversity indicators for those values assessed and identified in the Critical Habitat Assessment. Species identified that fall under criterion one is: 1) *Eugenia salamensis*; 2) *Juglans olanchana*; endangered ecosystems identified via criterion 4 are dry forest and pine-oak forest and important evolutionary processes identified under criterion five are the maintenance of habitat connectivity and gene flow within the Mesoamerican corridor.

6.3.1. Summary of identified impacts and mitigation measures already included in MARN's environmental license

The Project ESIA (2107) identified impacts to biodiversity due to Project implementation, while the Ecological Management Plan, or Plan de Manejo Ambiental y Social (PMAS, 2017) summarized main impacts to biodiversity during each phase of the project (construction and operation). The PMAS also outlines measures to mitigate these via the mitigation hierarchy framework. The major objectives (section 6.2) of the PMAS are to:

- Summarize applicable legislation and priority biodiversity values
- Summarize measures to avoid and minimize negative impacts and potentiate positive impacts on biodiversity
- Monitor effectiveness of actions taken to avoid and minimize negative impacts as well as actions (such as restoration) taken to benefit biodiversity in the area of the Project.

Major impacts identified in the ESIA and the PMAS for terrestrial habitats are the following (PMAS, section 6.5):

- Vegetation loss due to construction of Transmission line
- Negative impacts to individuals of flora and fauna of conservation concern (EN)
- Loss of habitat for *Agalychnis moreletti*
- Collision of birds with TL cables
- Impacts to the Apaneca-Ilamatepec Biosphere Reserve
- Impact to the IBA "Los Cobanos"

The Plan de Manejo Ambiental y Social (PMAS) describes the application of the mitigation hierarchy framework as a best practice approach to reduce and mitigate environmental impacts identified (section 6.6). Section 6.7, *medidas específicas para valores de biodiversidad* (specific measures for biodiversity values) outlines recommended measures to address potential impacts identified. These measures are:

Installation of bird diverters

Spiral bird diverters will be installed on cables; separation between these will be a maximum of 15 m; they will be installed alternately on each cable (with 30 m distance between each diverter per/cable). For example, in a 300 m segment, 20 diverters will be installed, 10 per cable alternately to obtain a diverter every 15 m (according to guidelines of the Avian Power Line Interaction Committee, 2012). The table below (Table 3), included in section 6.7 of the PMAS, summarizes the recommended number of spiral diverters and their approximate locations:

TABLE 6-1: PROPOSED BIRD DIVERTERS

Towers	Distance	Number of spiral diverters	Habitat/Area
TP136-TP145	2,890	192	Los Cobanos IBA
TP 124 TP 127	395	26	River
TP 95 TP 96	310	20	River
TP 78 TP 79	510	34	River
TP 72 –TP 74	660	44	Valley
TP 45 –TP 46	615	41	Forested stream
TP 38 to TP 39	460	30	Stream
TP 25 to TP 27	365	24	Summit/slope
TP 14 to TP 17	670	44	Hillside/slope

Black-eyed tree frog, *Agalychnis moreletti*

At the time of the ESIA, *A. moreletti* was categorized as CR by the IUCN. In 2017, the IUCN re-categorized this species from EN to LC. A literature search of available information on this species indicates that despite its reclassification, populations may be at risk due to habitat destruction and infection by the chytrid fungus. Therefore, ERM recommends implementing the mitigation and monitoring measures proposed in the PMAS (section 6.7.2) as well as implementing a chytrid handling and hygiene protocol and monitoring for the presence of BD in the population... Recommended activities to mitigate potential negative impacts due to the project include:

- Rescue and translocation of individuals to nearby locations
- Avoidance of potential breeding sites
- Construction of water reservoirs/storage tanks in areas where frogs occur; ERM proposes the construction of two storage basins per site (sites are at Santa Rita and Tequendama plantations). These are commonly A total of four water storage tanks should be constructed that are approximately 2.5 m long and 1.5 wide and 1.6 m deep; these should have a tin roof and drainage gutter; (section 6.7.2 contains specifications for water storage tank construction).
- Educational outreach with landowners regarding biodiversity conservation and organic coffee growing techniques/incentives.

Apaneca Ilamatepec Biosphere Reserve

The following mitigation measures will be implemented to mitigate impacts to the Apaneca-Ilamatepec Biosphere Reserve; these are described in section 7.6.3, *Programa de la Reserva de la Biosfera Apaneca-Ilamatepec*:

- Cost benefit analysis of positioning towers outside of areas of woody vegetation to minimize impacts to trees
- Minimization, where possible of new access roads; restoration of temporary areas after construction is finalized
- Restoration of forests within the Reserve
- Construction of towers required 10 m x 10 m for tower foundations (vegetation permanently removed) and an area of 35 m x 35 m around each tower during construction (vegetation temporarily removed). Temporary areas will be restored after the construction phase is finalized.
- Environmental education outreach regarding the Biosphere Reserve and its objectives for conservation of biodiversity
- Installation of informative signs on public road regarding the Reserve and importance of biodiversity.
- In addition, EDP will establish a mechanism for communication and consultation with MARN and the Management Committee of the Apaneca-Ilamatepec Biosphere Reserve.

Their operations plans include the following objectives: i) contribute to the conservation of landscapes, ecosystems, species and genetic variation within the Biosphere Reserve; ii) Promote sustainable human and economic development from a sociocultural and ecological point of view iii) Support education, training, research and monitoring programs with regards to local, regional and national sustainable development and iv) strengthen the capacity of the territory to adapt to climate change, minimizing impacts on the population, agriculture and biodiversity.

IBA Los Cobanos

Section 6.7.4 of the PMAS, outlines steps that will be taken to mitigate impacts to the IBA Los Cobanos. These include:

- Installation of bird diverters along the length of the transmission line of this IBA
- Cost-benefit evaluation of positioning towers outside of areas of woody vegetation to minimize the removal of trees and shrubs
- Minimization of new access road construction; restoration via revegetation of these after construction is finalized
- Rescue and relocation of bird nests
- Restoration of vegetation within the IBA
- Environmental education program regarding the importance of this IBA and objectives for conservation
- Installation of informative signs regarding the IBA and its importance for biodiversity.

- Establishment of a communication and consultation mechanism with stakeholders that includes the NGO SalvaNATURA (NGO partner of Bird Life International).

Revegetation and Reforestation

Section 6.7.5 of the PMAS describes measures to be taken to reduce and restore vegetation in the area of the project. The reforestation program will be conducted via an agreement between EDP and the *Fondo de la Iniciativa para las Américas* (FIAES) of El Salvador. FIAES works in the field of ecosystem and landscape restoration within the Apaneca-Illamatepec Biosphere Reserve and a priority intervention site. FIAES is organized by MARN to fulfill environmental compensation activities.

According to the Guía Metodológica para el Cálculo de la Compensación Ambiental para Proyecto Ambientalmente Viable (MARN-DGECA, no date) national requirements for compensation are:

- Replanting of 10 trees for every tree cut, planting with a distance of 4 m x 4 m between trees. This will result in an area of 16 m² per tree planted or 1.60 ha for every 100 trees cut.
 - For protected species, the replanting ratio will be 25:1
- Replanting one shrub for every shrub cut, with a distance of 3 m by 3m between shrubs, resulting in an area of nine shrubs/ m² per planted shrub or 0.90 ha for each 1000 shrubs cut.
- Reference costs provided by MARN are approximately USD \$76 per cut tree for 10 replanted trees.
- Trees will be replanted in temporary areas near each tower. Native species will be replanted with the objective of protecting soil and contributing to the improvement of microclimate conditions, providing forage and refuge for bird, reptile, small mammals, and bats.
- It is estimated that 3,599 trees may be removed (see section 5.3.1 of the EISA, *Perdida de Cobertura Vegetal*), with approximately 36 individuals occurring within a protected category; the compensation costs associated with this are USD \$273,524.00. These figures will be confirmed during a pre-construction inventory.
- Prior to construction, trees that have been identified as threatened or are categorized as being 100 years old will be identified. Where possible they will be fenced with a wire mesh during construction
- The revegetation plan will be implemented the first year after construction and will be implemented over three years.

FIAES was notified by MARN regarding the compensation amount and times for the reforestation and compensation program. FIAS negotiated the conditions of compensation with EDP, including the disbursement schedule, and responsibilities of both parties. Both EDP and FIAES contributed to the elaboration of the agreement and signed once it was completed on February 2018. FIAES sent the agreement to MARN.

The implementation of the reforestation and revegetation project can be channeled through and NOG or Community Development Association supervised by FIAES.

Operations Phase

Section 6.8.2 describes the monitoring measure to be undertaken during the operational phase of the project.

During the first three years of the project, EDP will conduct twice-yearly audits of the Reforestation Program conducted by FIAES. During the following two years, annual inspections will be conducted.

After the fifth year, the need for monitoring will be assessed in consultation with MARN and responsible parties of the Biosphere Reserve and the IBA.

EDP will verify visually the water quality and habitats prior to the operations phase of the project and will take actions for remediation if contamination is noted. Additional monitoring is likely not necessary since impacts to aquatic habitats are not anticipated.

During the first three years of operation, EDP (or ETESAL, the Empresa Transmisora de el Salvador) will implement nocturnal monitoring of *A. moreletti* monitoring for three nights annually. Individuals will be recorded during three-hour periods of monitoring (using acoustic recordings and visual encounters) for three nights per year. Water storage basins will be inspected to determine use as reproductive sites. If results are negative, opportunities for improvement of the population status of frogs will be analyzed and if possible, implemented.

As part of maintenance, EDP will verify at least once per year the condition of bird diverters throughout the operations phase of the project. Maintenance personnel will report mortality events to the Environmental Supervisor of the Project. If mortality due to collisions occurs, EDP will study options to improve visibility of the cables and will take measure to minimize future collisions.

6.3.2. Actions to achieve Net Gains

Net gains are defined by the footnote to Paragraph 18 of PS6 as “additional conservation outcomes that can be achieved for the biodiversity values for which the critical habitat was designated. Net gains may be achieved through the development of a biodiversity offset and/or, in stances where the client could meet the requirements of paragraph 17 of the Performance Standard without a biodiversity offset, the client should achieve net gains through the implementation of programs that could be implemented in situ to enhance habitat, and protect and conserve biodiversity.”

No negative impacts to critical habitat triggers *Eugenia salamensis* and *Juglans olanchana* are anticipated due to Project construction or operations. Impacts on flora and fauna due to vegetation removal are anticipated for the IBA Los Cobanos and the Apaneca Ilamatepec Biosphere Reserve, areas that are critical habitat triggers.

Based on the findings of the Critical Habitat Assessment and review of the PMAS (2017), ERM finds that the in large part, the measures proposed in the PMAS adequately mitigate and

compensate for identified biodiversity impact. ERM therefore recommends the following actions to attain not only a no net loss of biodiversity but also to attain a net gain of biodiversity:

- An enhanced pre-construction survey of the construction areas of the TL to include small mammals and bats, and either capture and relocate or incite them to leave the area.
- Implementation of a hybrid fungus (*Batrachochytrium dendrobatidis*) prevention (hygiene and handling) protocol during frog rescue and translocation efforts as well as during monitoring and any related activities with amphibians.
- Incorporate monitoring of the chytrid fungus (*Batrachochytrium dendrobatidis*) into (*A. moreletti*) monitoring efforts.
- Perform an annual birds survey along representative habitat points along the transmission line corridor.
- EDP will hold a workshop with stakeholders such as NGO's (SalvaNatura), FIAES, and government (MARN) to discuss objectives, priorities and targets for areas that will be restored as well as decide potential sites for reforestation/compensation efforts utilizing the framework established in the PMAS (2017) for the Biosphere Reserve and IBA Los Cobanos. The goals will be to establish areas for reforestation/revegetation in line with national guidelines, the PMAS, and prioritize actions to attain net gains for biodiversity by working with FIAES to target specific areas for mitigation/compensation measures.

6.3.3. Biodiversity Monitoring

PS6 requires “a robust appropriately designed and long-term biodiversity monitoring and evaluation program” for any project in critical habitat. “ Section 6.8, of the PMAS outlines main indicators and guidelines for the monitoring plan for the project:

- For the construction phase, an inventory of trees and shrubs to be removed will be inventoried. This information will be used for final compensation calculations.
- Aquatic habitats will be visually inspected in order to assess pollution by hydrocarbons such as lubricants and fuel. If results are positive, EDP will take corrective actions.
- Prior to construction, a census of frogs will be undertaken for a duration of three nights during the reproductive phase. This will assist in the establishment of a baseline information for the frog populations detected during the baseline surveys of the ESIA. Surveys will include visual encounter and acoustic data and will last for at least three hours. EDP will verify the correct construction of water storage tanks, and any deficiencies noted will be corrected.
- EDP will verify the correct placement of bird diverters and will take measure necessary to correct deficiencies prior to the operations phase of the project.

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Appendix A1. Project footprint in modified and natural habitats for the substation, access roads, and lay down areas.

Impacts	Category	Modified or Natural	Impact Area (ha)
New Road	80-100% Cover	Natural	4.21
New Road	50-79% Cover	Natural	1.64
New Road	<50% Cover	Modified	3.55
Improved Road	80-100% Cover	Natural	6.50
Improved Road	50-79% Cover	Natural	3.11
Improved Road	<50% Cover	Modified	5.53
Storage Areas	<50% Cover	Modified	1.00
Ahuachapán Substation	<50% Cover	Modified	2.67
Acajutla Substation	<50% Cover	Modified	12.56
Acajutla Substation	50-79% Cover	Natural	0.10
Lay Down Area A	<50% Cover	Modified	0.23
Lay Down Area A	50-79% Cover	Natural	0.29
Lay Down Area A	80-100% Cover	Natural	0.12
Lay Down Area B	<50% Cover	Modified	0.85
Lay Down Area B	50-79% Cover	Natural	0.26
Lay Down Area B	80-100% Cover	Natural	0.02
Lay Down Area C	<50% Cover	Modified	0.61
Lay Down Area C	50-79% Cover	Natural	0.51
Lay Down Area C	80-100% Cover	Natural	0.01
Lay Down Area D	<50% Cover	Modified	0.11
Lay Down Area D	50-79% Cover	Natural	0.23
Lay Down Area D	80-100% Cover	Natural	0.06
Lay Down Area E	<50% Cover	Modified	0.37
Lay Down Area E	50-79% Cover	Natural	0.08
Lay Down Area F	<50% Cover	Modified	0.93
Lay Down Area F	50-79% Cover	Natural	0.11
Lay Down Area F	80-100% Cover	Natural	0.08
Lay Down Area G	<50% Cover	Modified	0.63
Lay Down Area H	<50% Cover	Modified	0.69
Lay Down Area I	<50% Cover	Modified	0.05
Lay Down Area I	50-79% Cover	Natural	0.43
Lay Down Area I	80-100% Cover	Natural	0.65

Appendix A2. Project footprint area for the tower construction according to vegetation cover categories and modified vs. natural habitats.

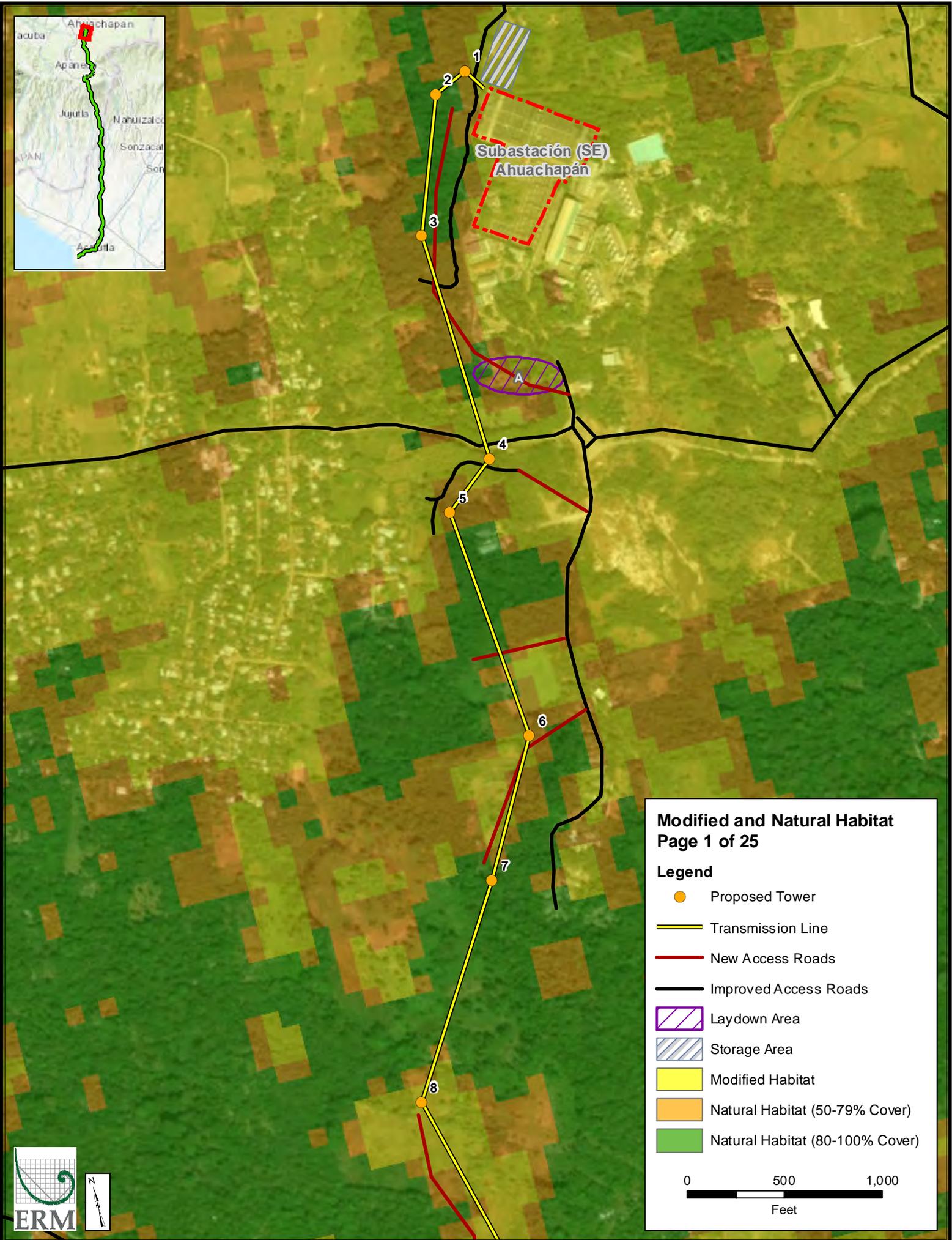
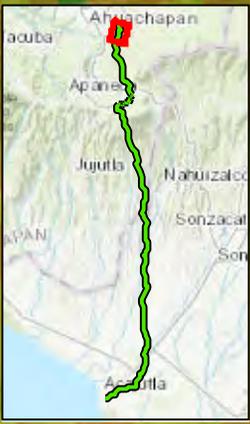
Tower Impacts	Category	Modified or Natural	Impact Area (m²)
C1	<50% Cover	Modified	350
C1	50-79% Cover	Natural	875
C10	50-79% Cover	Natural	454
C10	80-100% Cover	Natural	771
C11	<50% Cover	Modified	125
C11	50-79% Cover	Natural	1100
C12	50-79% Cover	Natural	1225
C13	50-79% Cover	Natural	421
C13	80-100% Cover	Natural	804
C14	50-79% Cover	Natural	317
C14	80-100% Cover	Natural	908
C15	<50% Cover	Modified	436
C15	50-79% Cover	Natural	789
C16	<50% Cover	Modified	1225
C17	80-100% Cover	Natural	1225
C18	<50% Cover	Modified	1225
C19	<50% Cover	Modified	471
C19	50-79% Cover	Natural	754
C2	<50% Cover	Modified	498
C2	50-79% Cover	Natural	727
C20	<50% Cover	Modified	1225
C21	<50% Cover	Modified	1225
C3	<50% Cover	Modified	1225
C4	<50% Cover	Modified	1225
C5	<50% Cover	Modified	1127
C5	50-79% Cover	Natural	98
C6	<50% Cover	Modified	1225
C7	<50% Cover	Modified	239
C7	50-79% Cover	Natural	258
C7	80-100% Cover	Natural	728
C8	<50% Cover	Modified	1225
C9	<50% Cover	Modified	104
C9	50-79% Cover	Natural	1121
TP 0	<50% Cover	Modified	691
TP 0	50-79% Cover	Natural	534
TP 1	50-79% Cover	Natural	935
TP 1	80-100% Cover	Natural	290
TP 100	<50% Cover	Modified	1225

Tower Impacts	Category	Modified or Natural	Impact Area (m²)
TP 101	<50% Cover	Modified	1225
TP 102	<50% Cover	Modified	1225
TP 103	<50% Cover	Modified	1225
TP 105	<50% Cover	Modified	1225
TP 106	<50% Cover	Modified	1225
TP 107	<50% Cover	Modified	1225
TP 108	<50% Cover	Modified	1225
TP 11	80-100% Cover	Natural	1225
TP 110	<50% Cover	Modified	1225
TP 111	<50% Cover	Modified	1225
TP 112	<50% Cover	Modified	1225
TP 113	<50% Cover	Modified	667
TP 113	50-79% Cover	Natural	558
TP 114	<50% Cover	Modified	349
TP 114	50-79% Cover	Natural	876
TP 114a	50-79% Cover	Natural	577
TP 114a	80-100% Cover	Natural	648
TP 116	<50% Cover	Modified	1225
TP 117	<50% Cover	Modified	1225
TP 118	<50% Cover	Modified	1225
TP 119	<50% Cover	Modified	546
TP 119	50-79% Cover	Modified	679
TP 12	80-100% Cover	Natural	1225
TP 122	50-79% Cover	Modified	1024
TP 122	80-100% Cover	Natural	201
TP 123	50-79% Cover	Modified	1225
TP 124	50-79% Cover	Modified	614
TP 124	80-100% Cover	Natural	611
TP 127	<50% Cover	Modified	5
TP 127	50-79% Cover	Natural	844
TP 127	80-100% Cover	Natural	377
TP 128	<50% Cover	Modified	193
TP 128	50-79% Cover	Natural	1032
TP 13	80-100% Cover	Natural	1225
TP 14	80-100% Cover	Natural	1225
TP 15	<50% Cover	Modified	318
TP 15	50-79% Cover	Natural	907
TP 16	80-100% Cover	Natural	1225
TP 17	80-100% Cover	Natural	1225
TP 18	80-100% Cover	Natural	1225
TP 19	80-100% Cover	Natural	1225

Tower Impacts	Category	Modified or Natural	Impact Area (m²)
TP 20	80-100% Cover	Natural	1225
TP 21	80-100% Cover	Natural	1225
TP 22	80-100% Cover	Natural	1225
TP 23	80-100% Cover	Natural	1225
TP 24	80-100% Cover	Natural	1225
TP 25	80-100% Cover	Natural	1225
TP 26	80-100% Cover	Natural	1225
TP 27	80-100% Cover	Natural	1225
TP 28	80-100% Cover	Natural	1225
TP 29A	80-100% Cover	Natural	1225
TP 29C	80-100% Cover	Natural	1225
TP 29F	80-100% Cover	Natural	1225
TP 29G	80-100% Cover	Natural	1225
TP 29I	50-79% Cover	Natural	516
TP 29I	80-100% Cover	Natural	709
TP 29J	80-100% Cover	Natural	1225
TP 30	50-79% Cover	Natural	832
TP 30	80-100% Cover	Natural	393
TP 33	80-100% Cover	Natural	1225
TP 34	80-100% Cover	Natural	1225
TP 36	80-100% Cover	Natural	1225
TP 37	80-100% Cover	Natural	1225
TP 38	80-100% Cover	Natural	1225
TP 39	80-100% Cover	Natural	1225
TP 4	<50% Cover	Modified	1225
TP 40	80-100% Cover	Natural	1225
TP 41	80-100% Cover	Natural	1225
TP 42	80-100% Cover	Natural	1225
TP 44	80-100% Cover	Natural	1225
TP 44a	80-100% Cover	Natural	1225
TP 44b	80-100% Cover	Natural	1225
TP 45	80-100% Cover	Natural	1225
TP 45a	80-100% Cover	Natural	1225
TP 46	80-100% Cover	Natural	1225
TP 47	80-100% Cover	Natural	1225
TP 48	80-100% Cover	Natural	1225
TP 49	80-100% Cover	Natural	1225
TP 5	<50% Cover	Modified	334
TP 5	50-79% Cover	Modified	891
TP 51	80-100% Cover	Natural	1225
TP 52	80-100% Cover	Natural	1225

Tower Impacts	Category	Modified or Natural	Impact Area (m²)
TP 53	<50% Cover	Modified	784
TP 53	80-100% Cover	Natural	441
TP 54a	50-79% Cover	Natural	47
TP 54a	80-100% Cover	Natural	1178
TP 56	80-100% Cover	Natural	1225
TP 56a	<50% Cover	Modified	1225
TP 58	50-79% Cover	Natural	79
TP 58	80-100% Cover	Natural	1146
TP 59	<50% Cover	Modified	161
TP 59	50-79% Cover	Natural	1064
TP 6	50-79% Cover	Natural	335
TP 6	80-100% Cover	Natural	890
TP 60	<50% Cover	Modified	1225
TP 61	<50% Cover	Modified	1097
TP 61	50-79% Cover	Natural	128
TP 63	<50% Cover	Modified	1225
TP 64	<50% Cover	Modified	1225
TP 65	<50% Cover	Modified	383
TP 65	50-79% Cover	Natural	842
TP 66	<50% Cover	Modified	511
TP 66	50-79% Cover	Natural	714
TP 67	<50% Cover	Modified	361
TP 67	50-79% Cover	Natural	864
TP 68	<50% Cover	Modified	729
TP 68	50-79% Cover	Natural	496
TP 7	<50% Cover	Modified	770
TP 7	80-100% Cover	Natural	455
TP 71	<50% Cover	Modified	1225
TP 72	<50% Cover	Modified	1225
TP 74	<50% Cover	Modified	1225
TP 76	<50% Cover	Modified	1225
TP 77	<50% Cover	Modified	1225
TP 78	<50% Cover	Modified	1225
TP 79	<50% Cover	Modified	57
TP 79	50-79% Cover	Natural	1168
TP 8	<50% Cover	Modified	1032
TP 8	50-79% Cover	Natural	193
TP 80	50-79% Cover	Natural	1225
TP 81	<50% Cover	Modified	1225
TP 82	<50% Cover	Modified	1079
TP 82	50-79% Cover	Natural	146

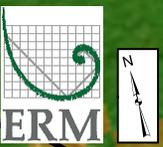
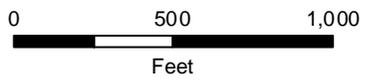
Tower Impacts	Category	Modified or Natural	Impact Area (m²)
TP 83	<50% Cover	Modified	1225
TP 84	<50% Cover	Modified	1066
TP 84	50-79% Cover	Natural	159
TP 85	<50% Cover	Modified	1225
TP 86	<50% Cover	Modified	1225
TP 87	<50% Cover	Modified	1225
TP 89	<50% Cover	Modified	1225
TP 9	<50% Cover	Modified	1123
TP 9	50-79% Cover	Natural	102
TP 90	<50% Cover	Modified	1225
TP 91	<50% Cover	Modified	1225
TP 92	<50% Cover	Modified	1225
TP 94	<50% Cover	Modified	1225
TP 95	<50% Cover	Modified	1225
TP 96	<50% Cover	Modified	177
TP 96	50-79% Cover	Natural	746
TP 96	80-100% Cover	Natural	302
TP 97	<50% Cover	Modified	1225
TP 98	<50% Cover	Modified	1225
TP 99	<50% Cover	Modified	1225
TP2	80-100% Cover	Natural	1225
TP3	50-79% Cover	Natural	1128
TP3	80-100% Cover	Natural	97
V24 / TP 31	80-100% Cover	Natural	1225
V35 / TP 32	80-100% Cover	Natural	1225

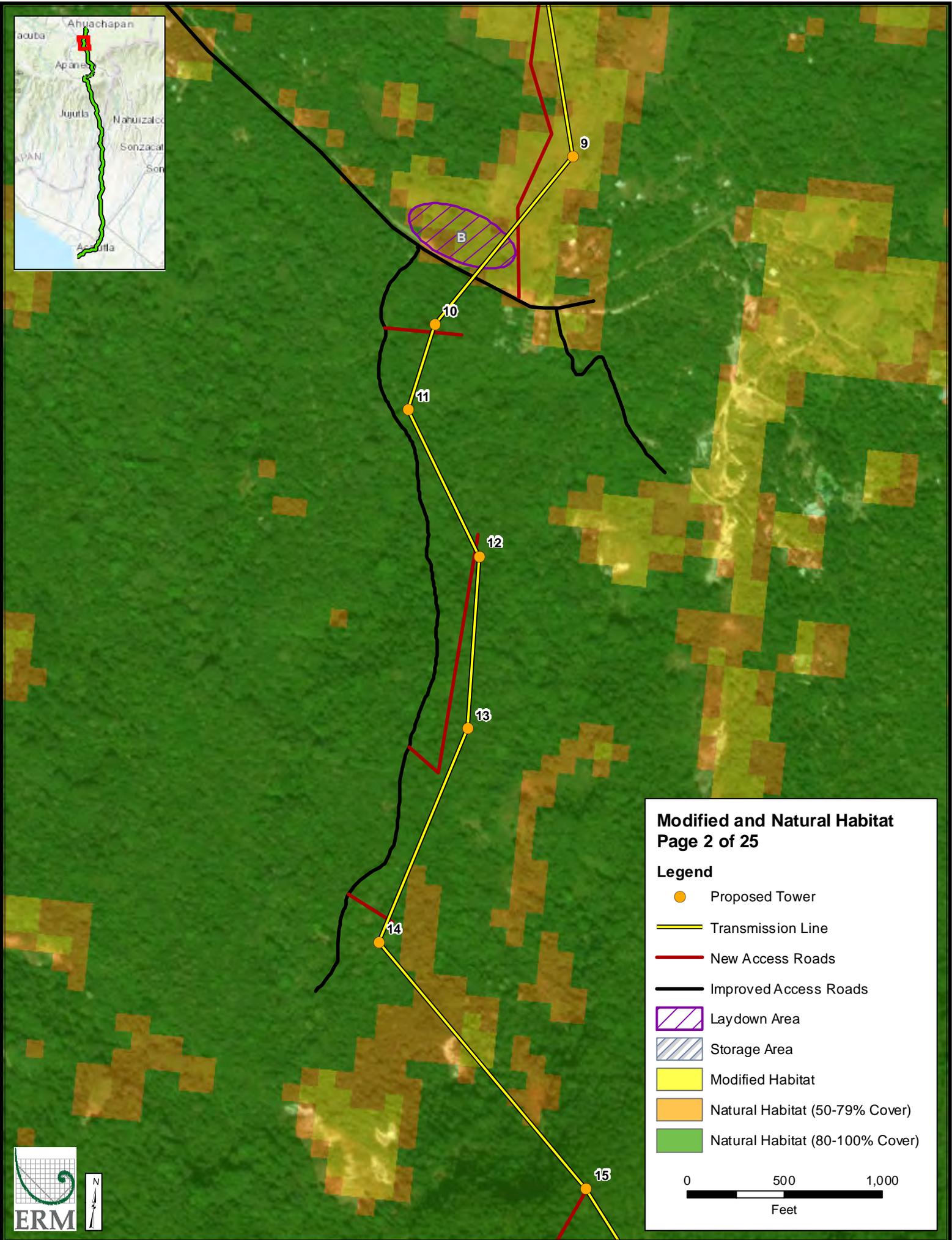


Modified and Natural Habitat
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Legend

-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)

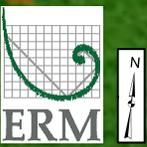
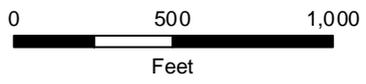


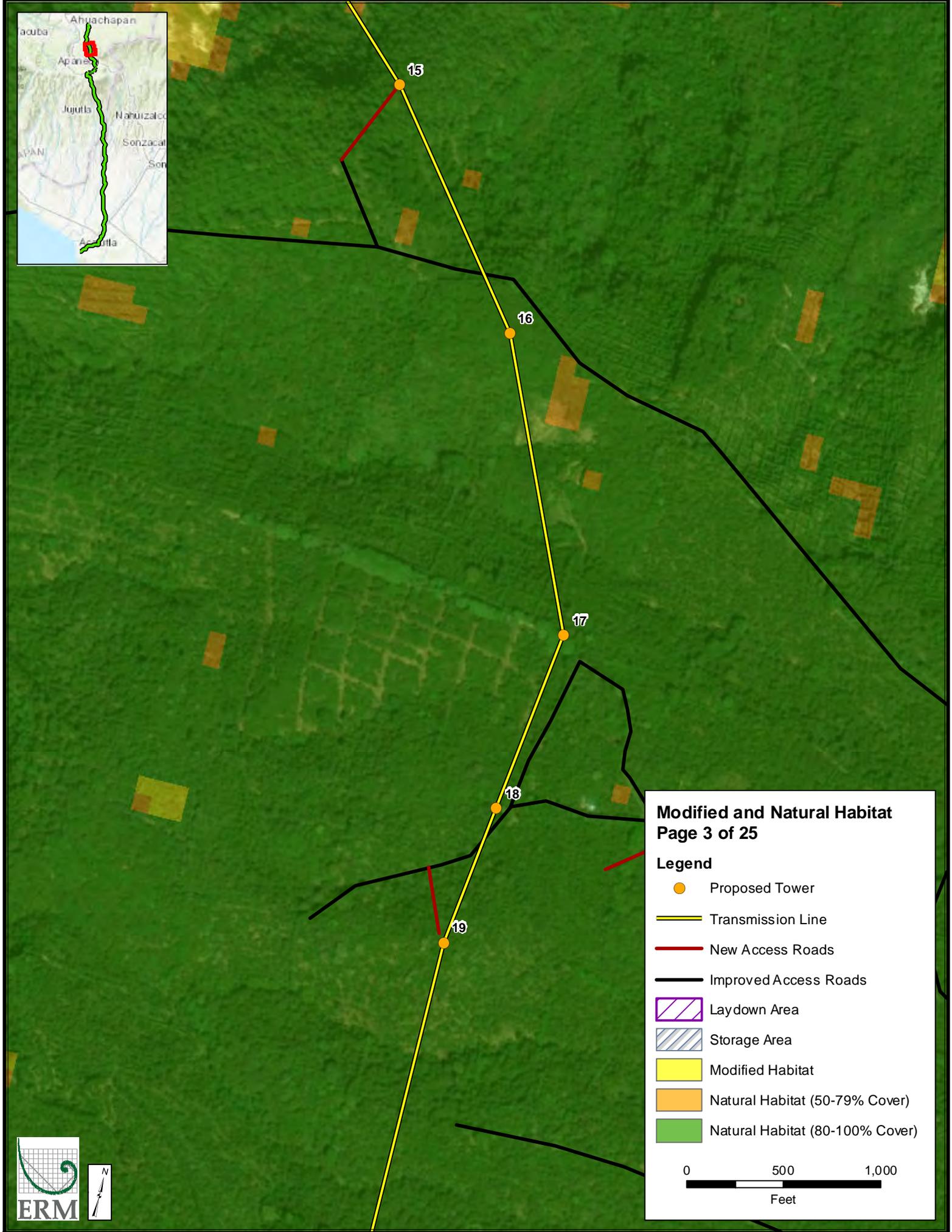


Modified and Natural Habitat
Page 2 of 25

Legend

-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)

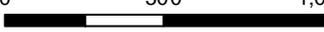


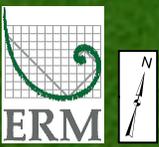


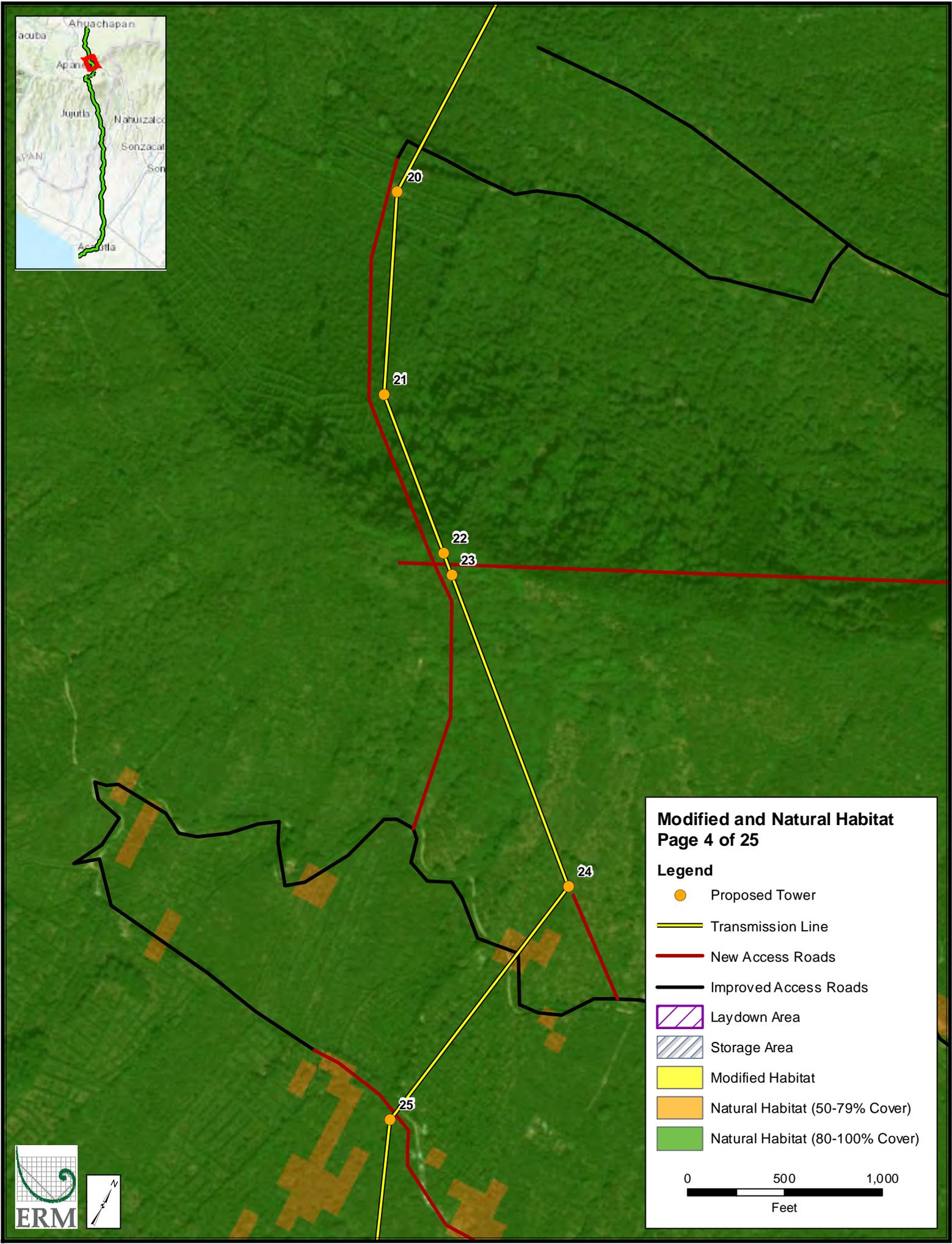
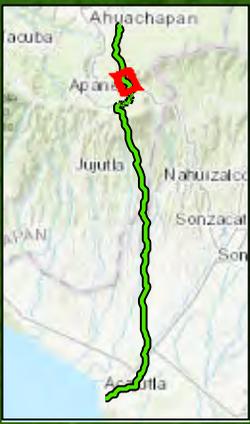
Modified and Natural Habitat
Page 3 of 25

Legend

-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)

0 500 1,000

 Feet

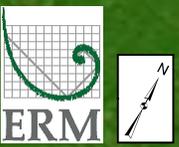
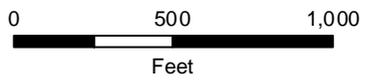


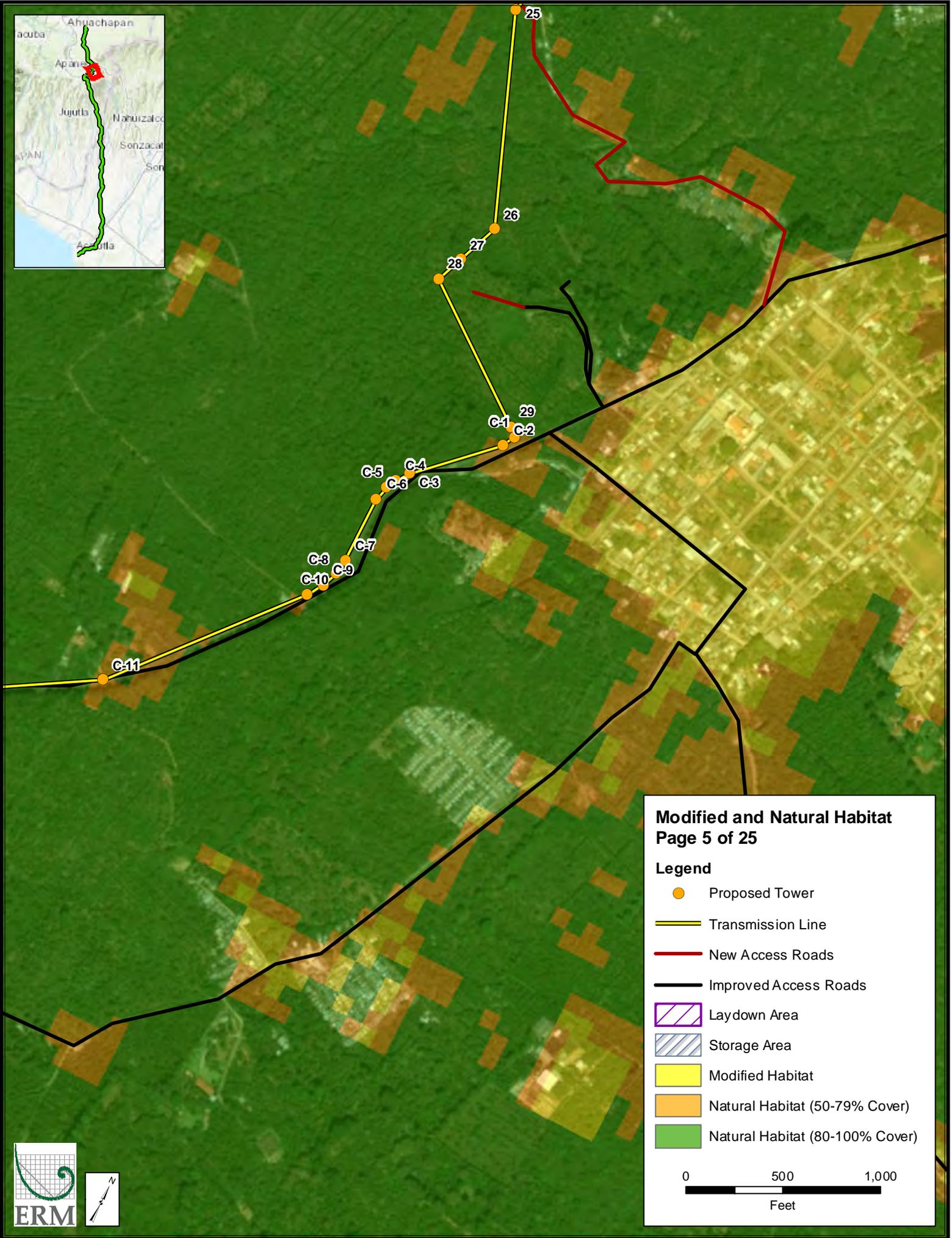
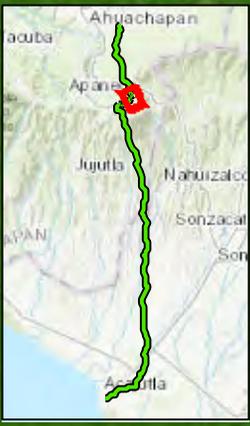


Modified and Natural Habitat
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Legend

-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)

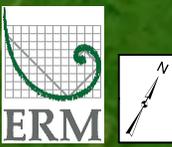
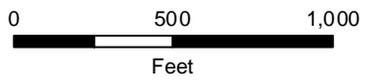




**Modified and Natural Habitat
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Legend

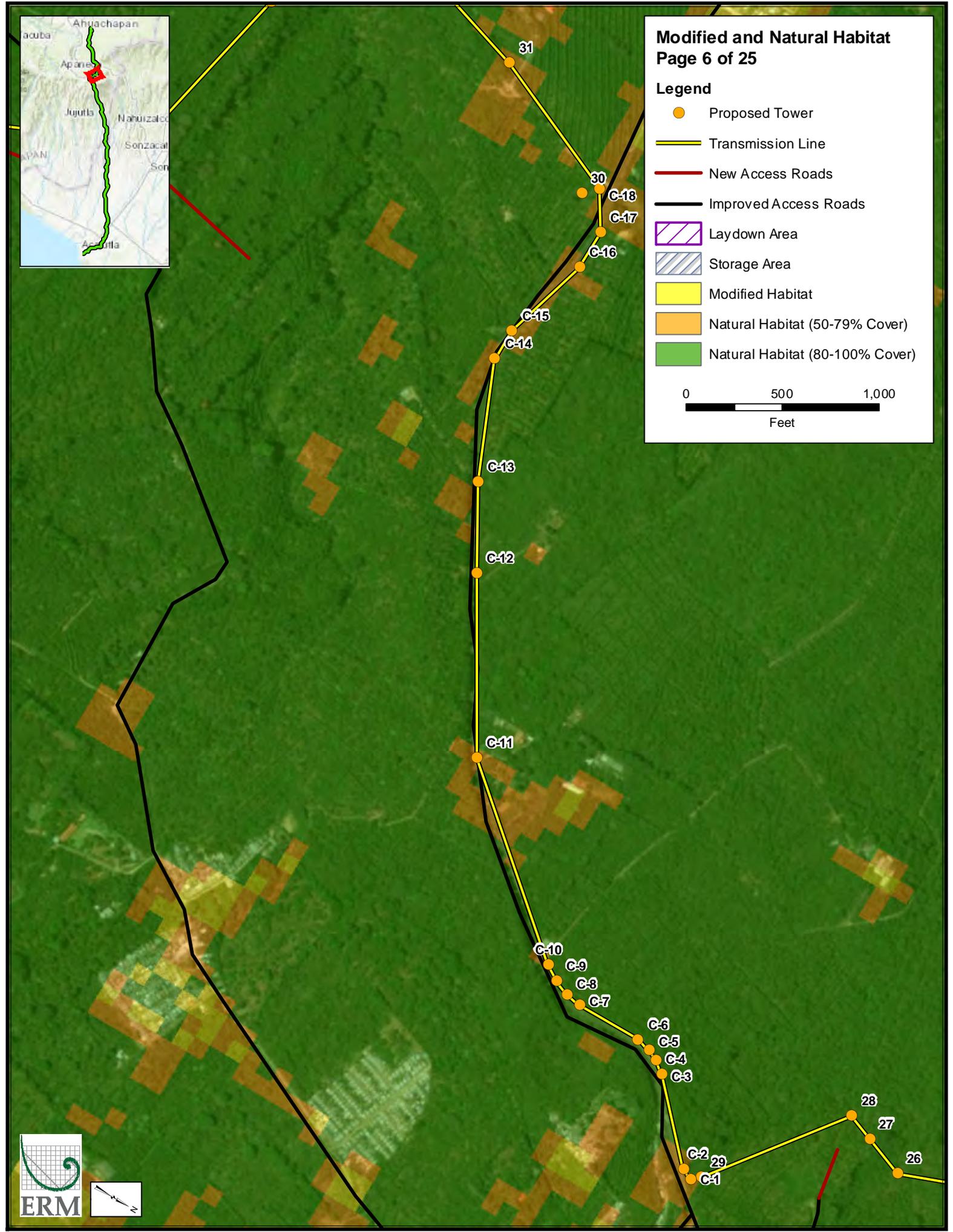
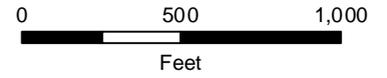
-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)

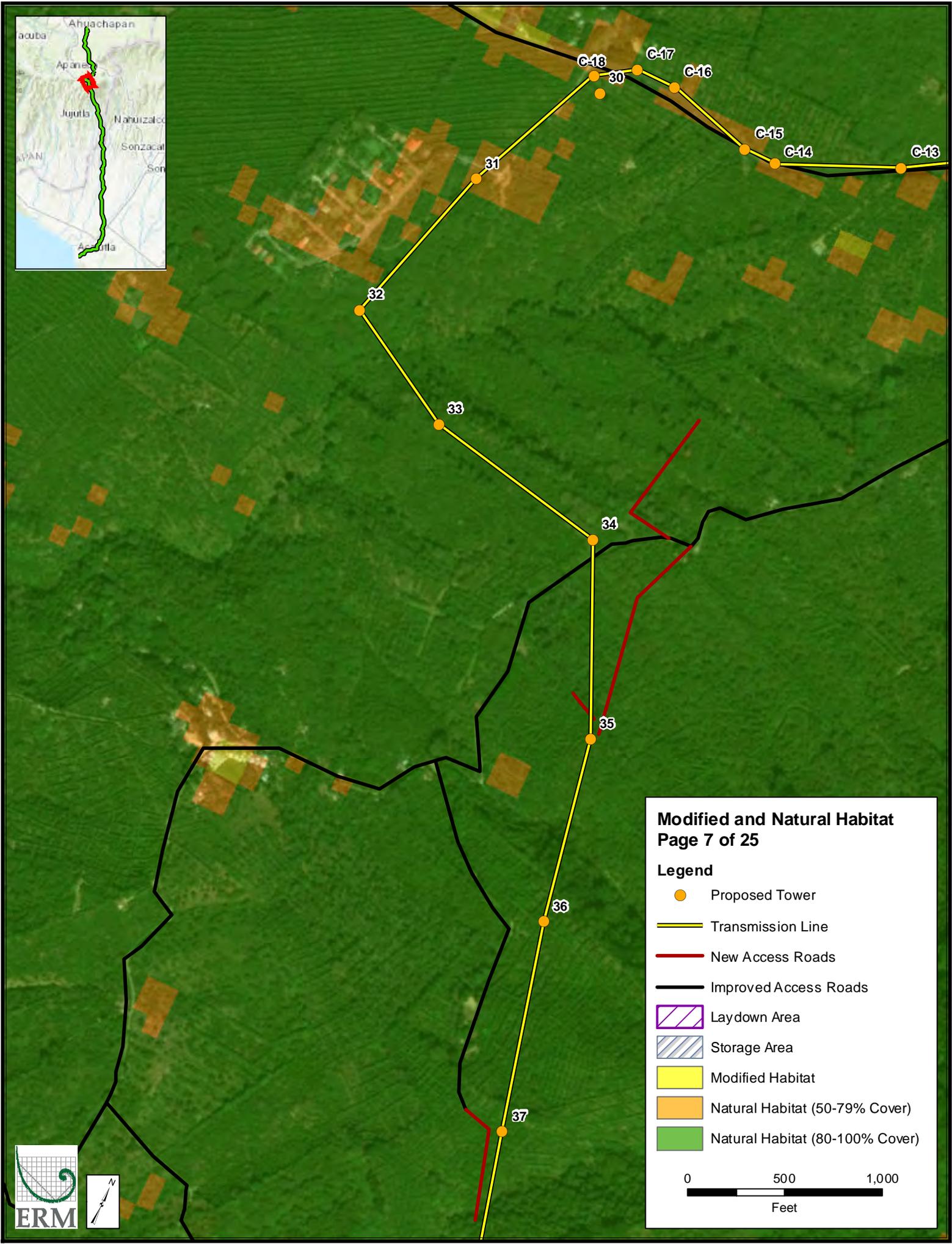
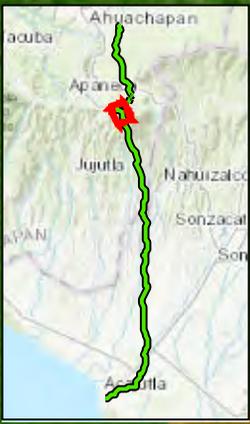


Modified and Natural Habitat
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Legend

-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)

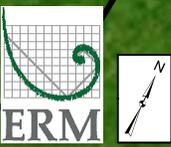
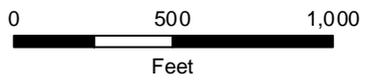


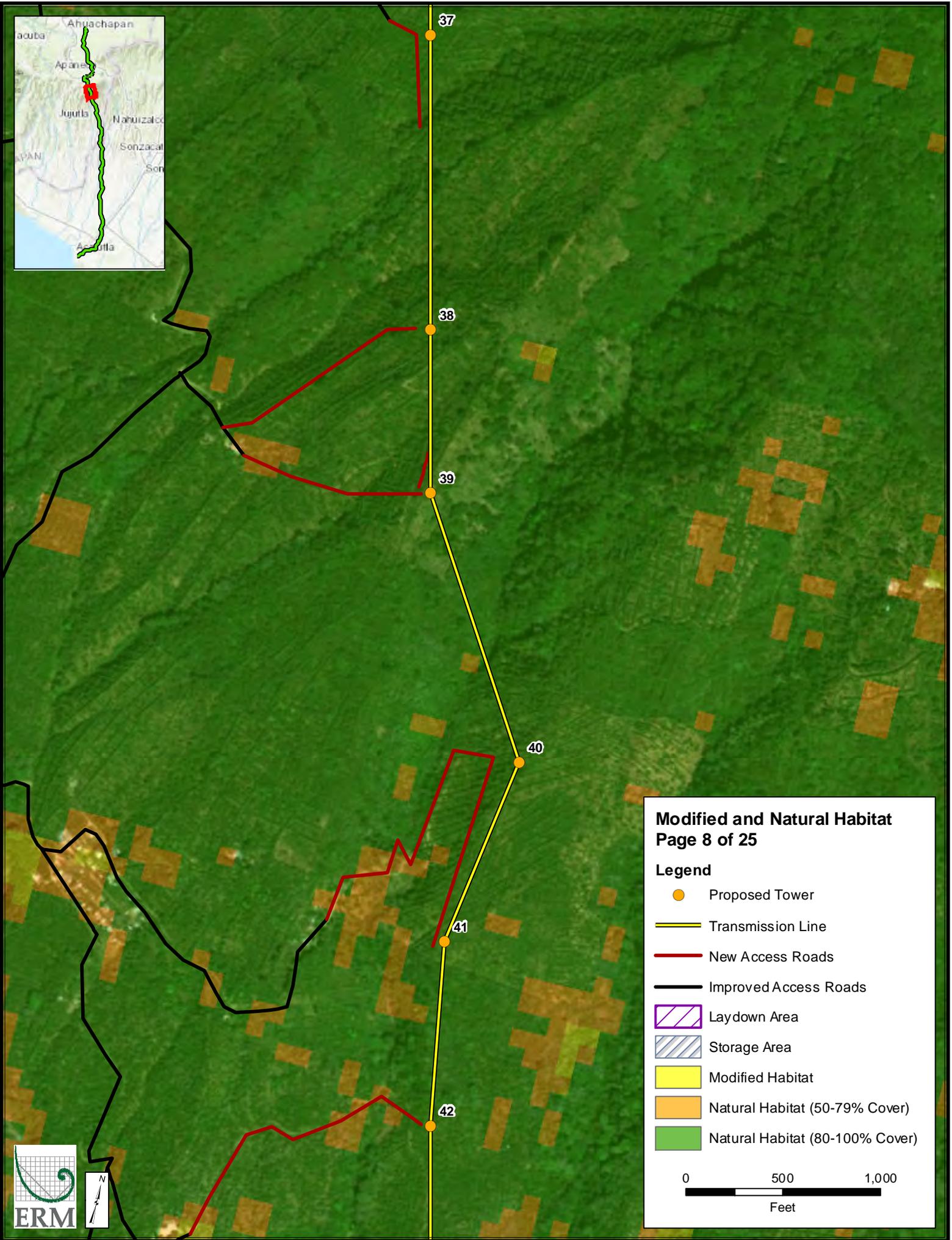


Modified and Natural Habitat
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Legend

-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)

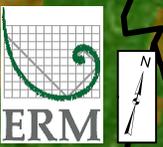
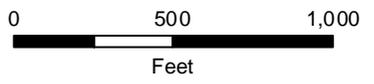


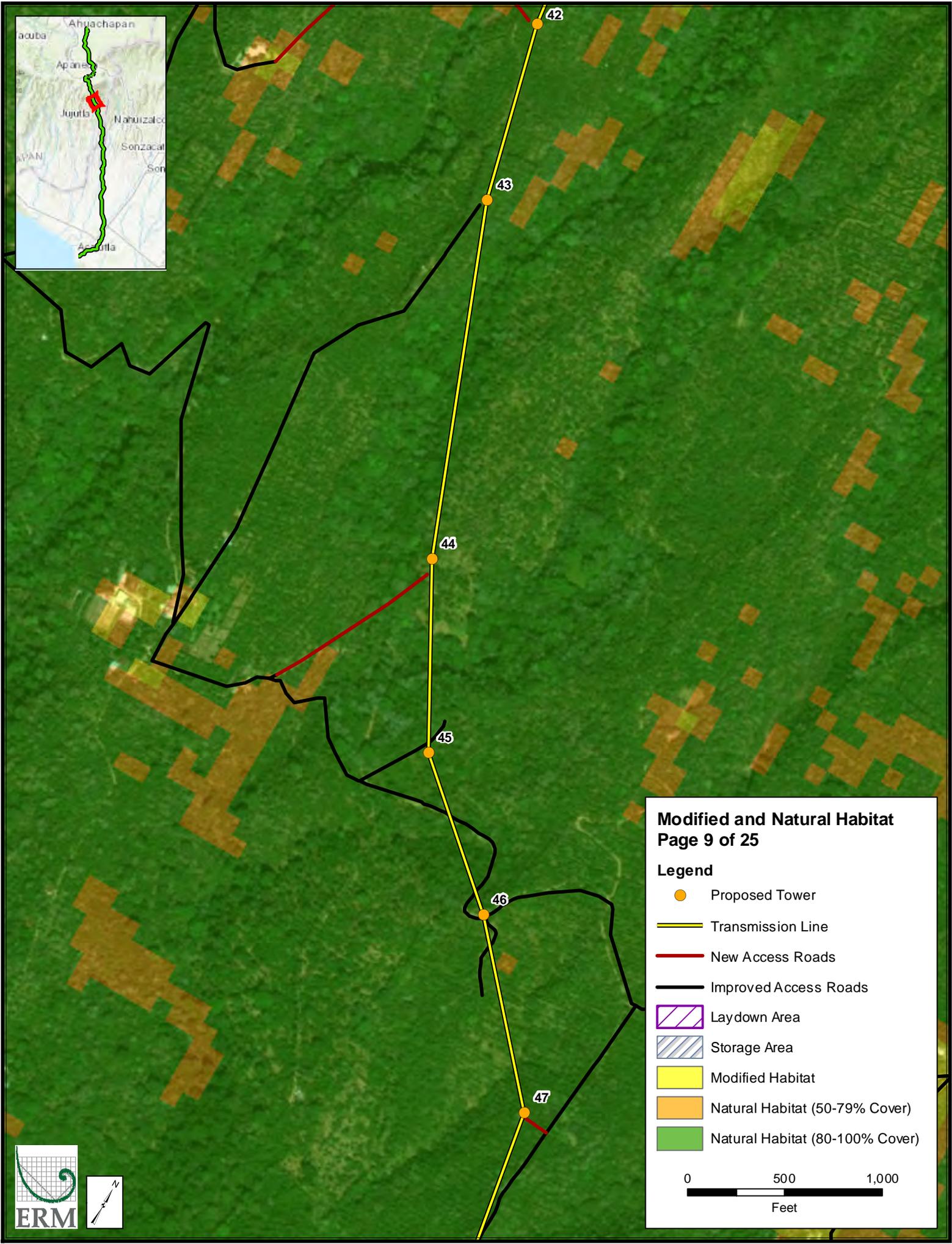


Modified and Natural Habitat
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Legend

-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)

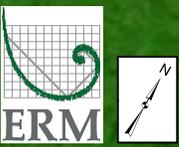
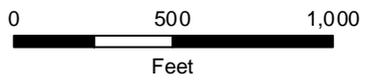


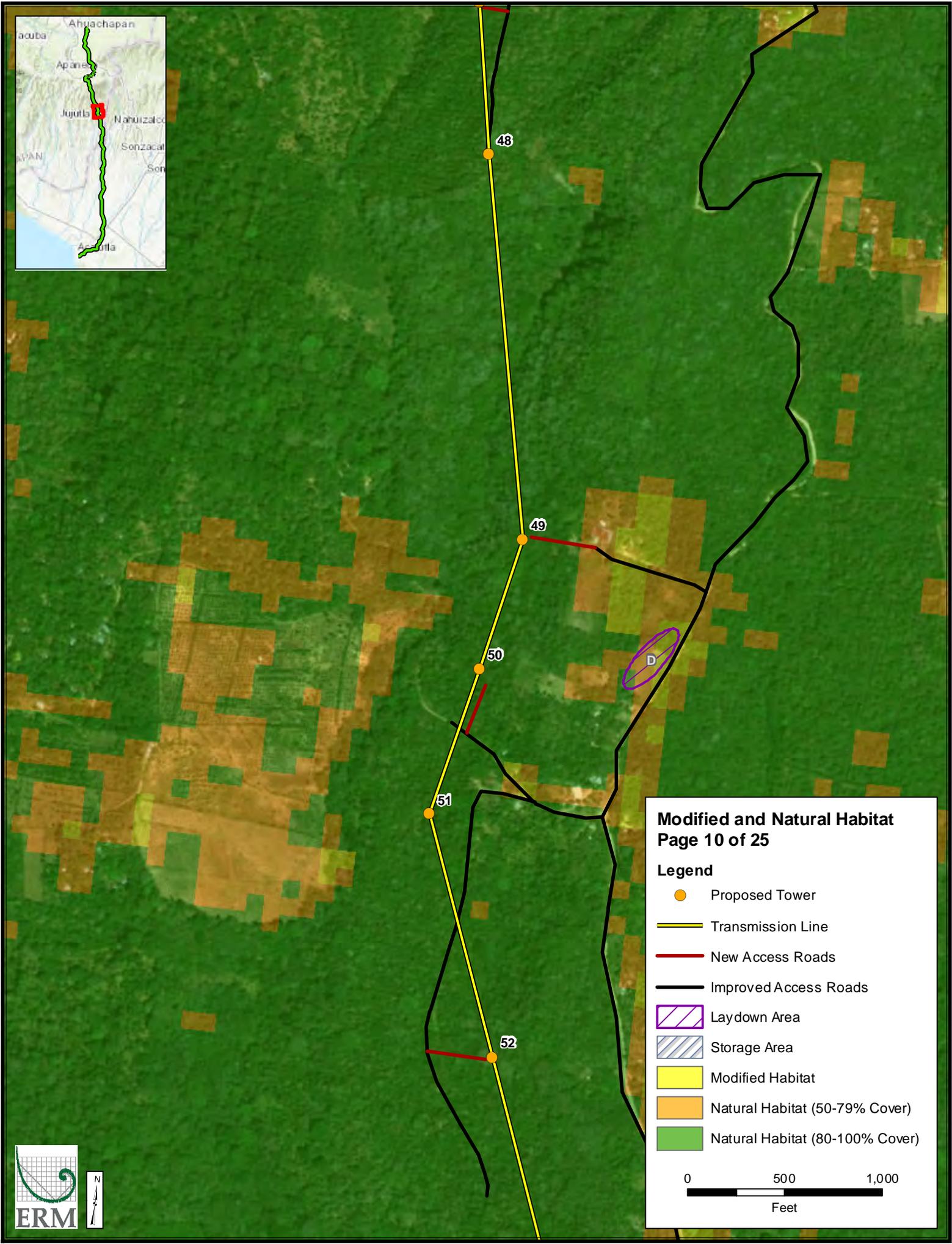


Modified and Natural Habitat
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Legend

-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)



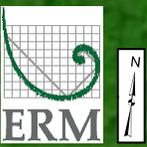


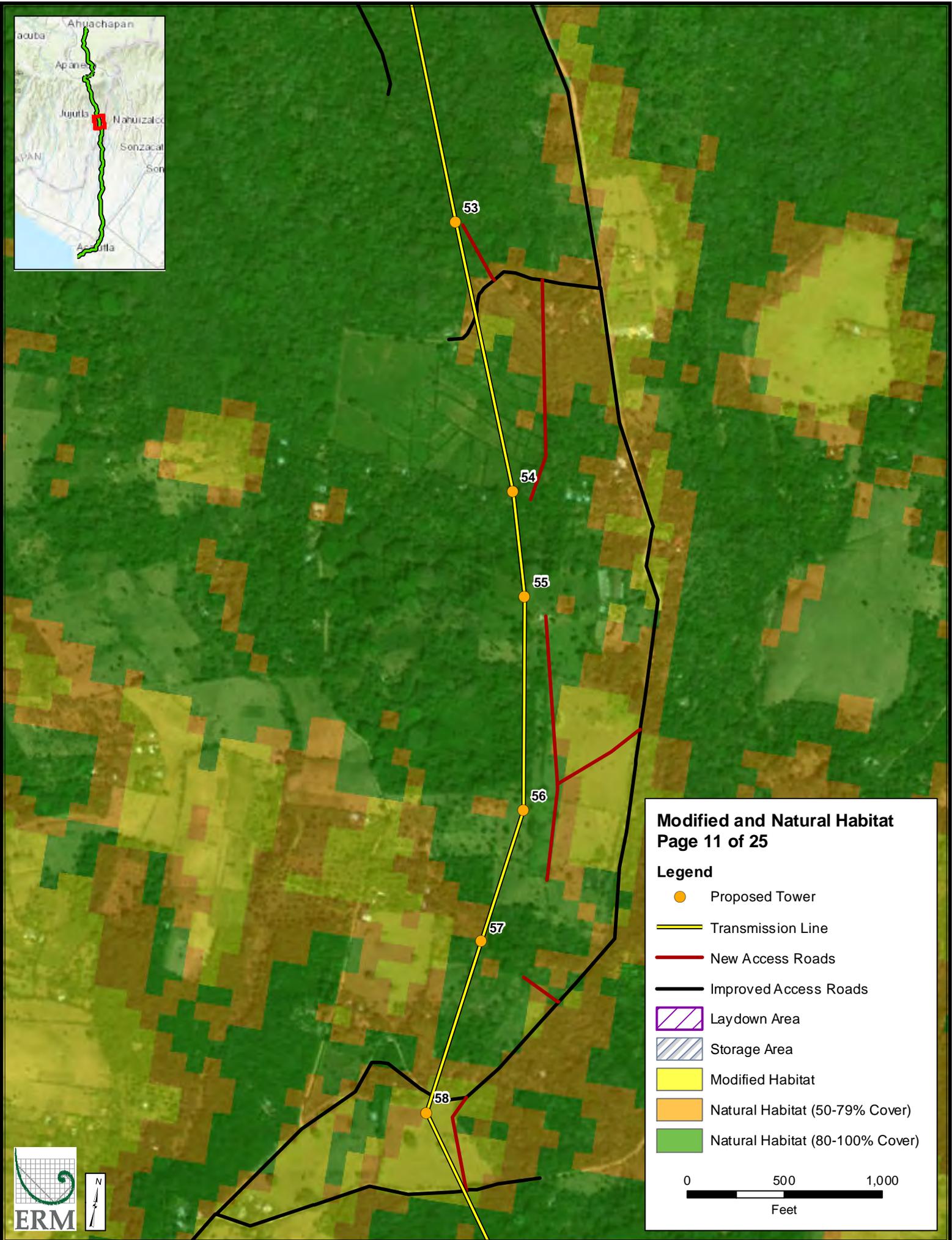
Modified and Natural Habitat
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Legend

- Proposed Tower
- Transmission Line
- New Access Roads
- Improved Access Roads
- Laydown Area
- Storage Area
- Modified Habitat
- Natural Habitat (50-79% Cover)
- Natural Habitat (80-100% Cover)

0 500 1,000
 Feet

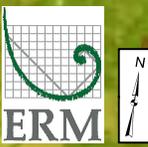
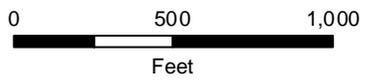


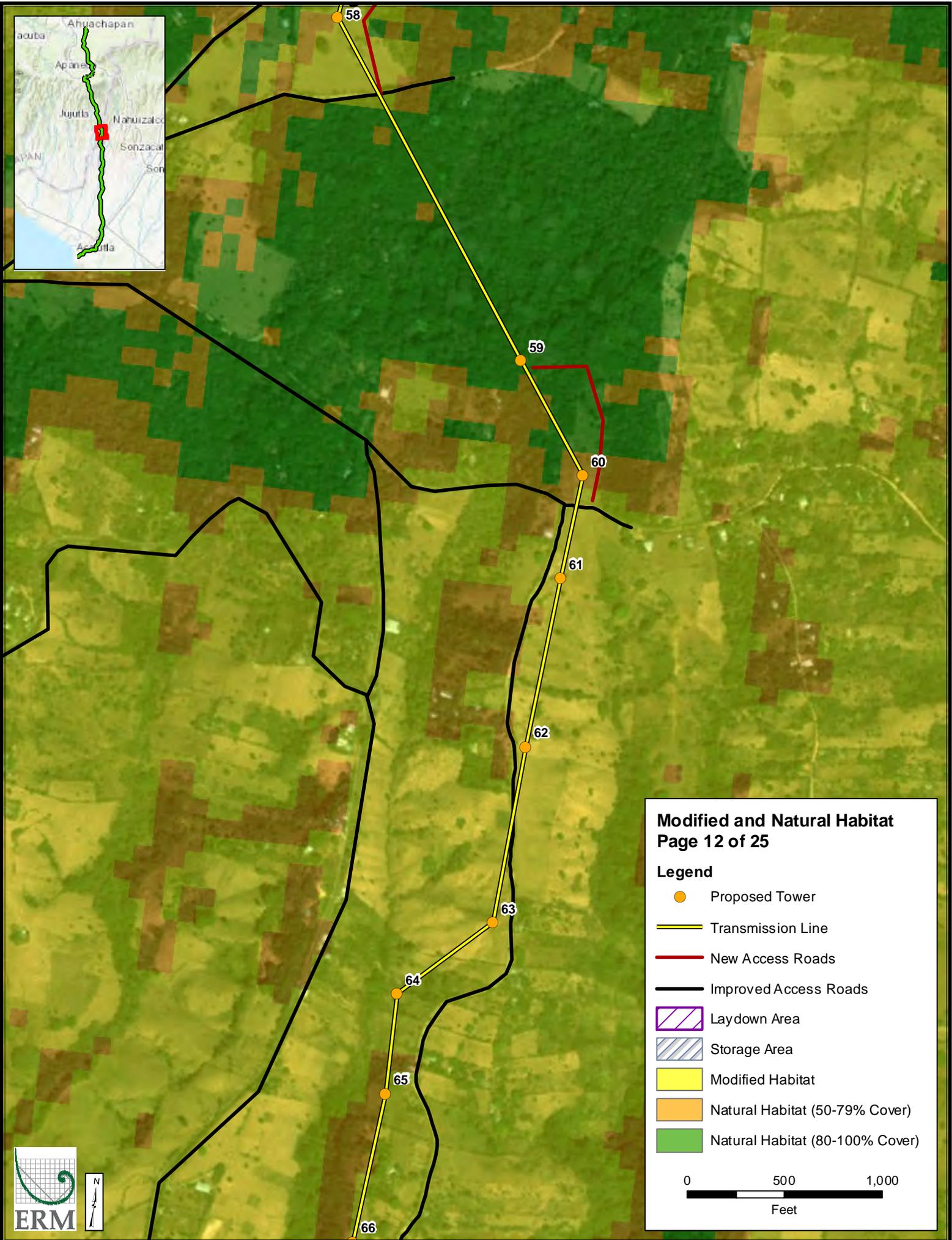


Modified and Natural Habitat
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Legend

-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)

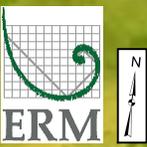
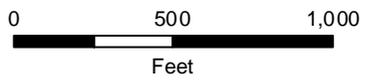


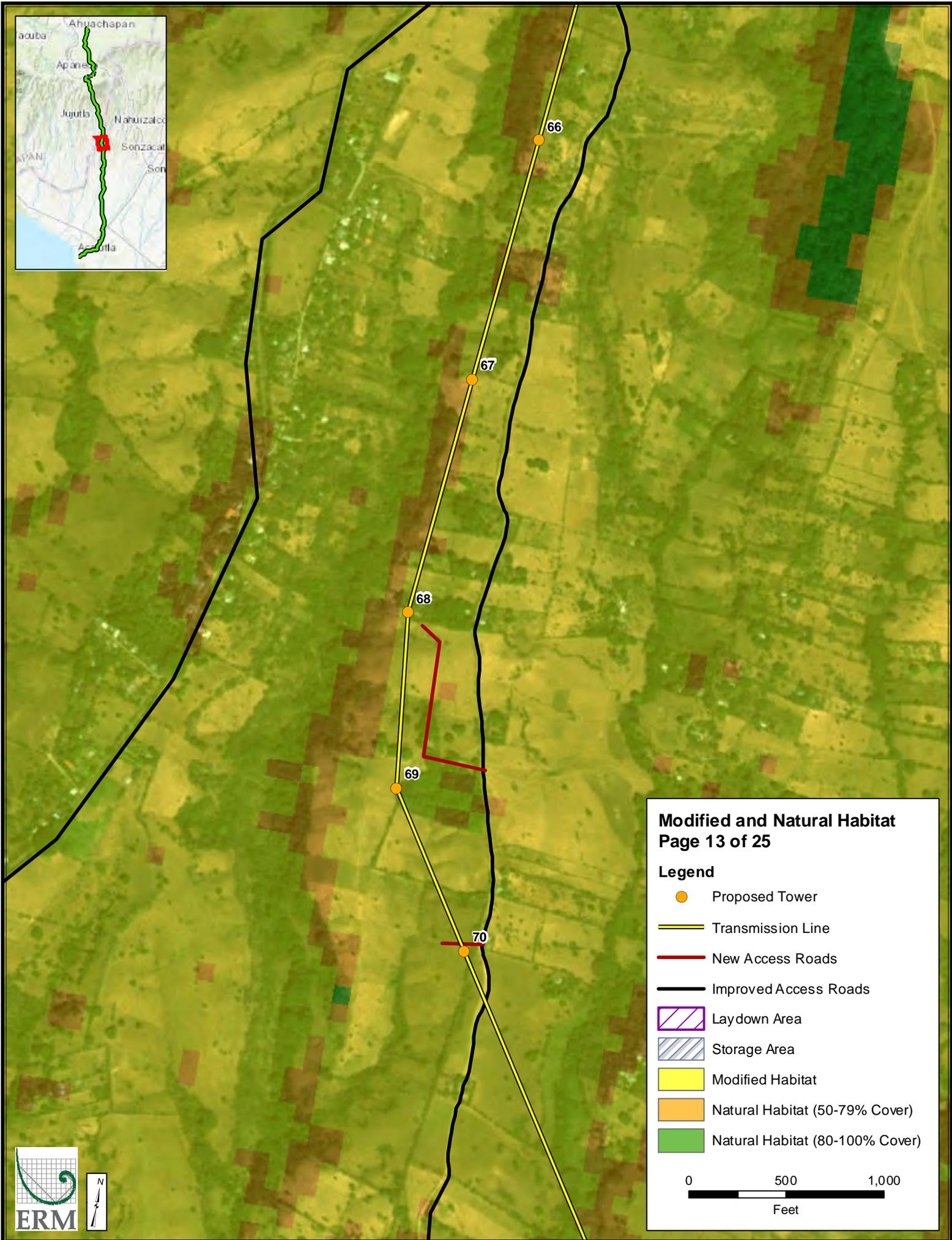


Modified and Natural Habitat
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Legend

-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)

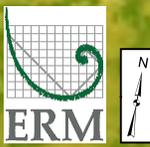
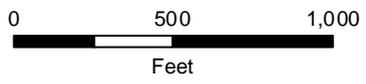


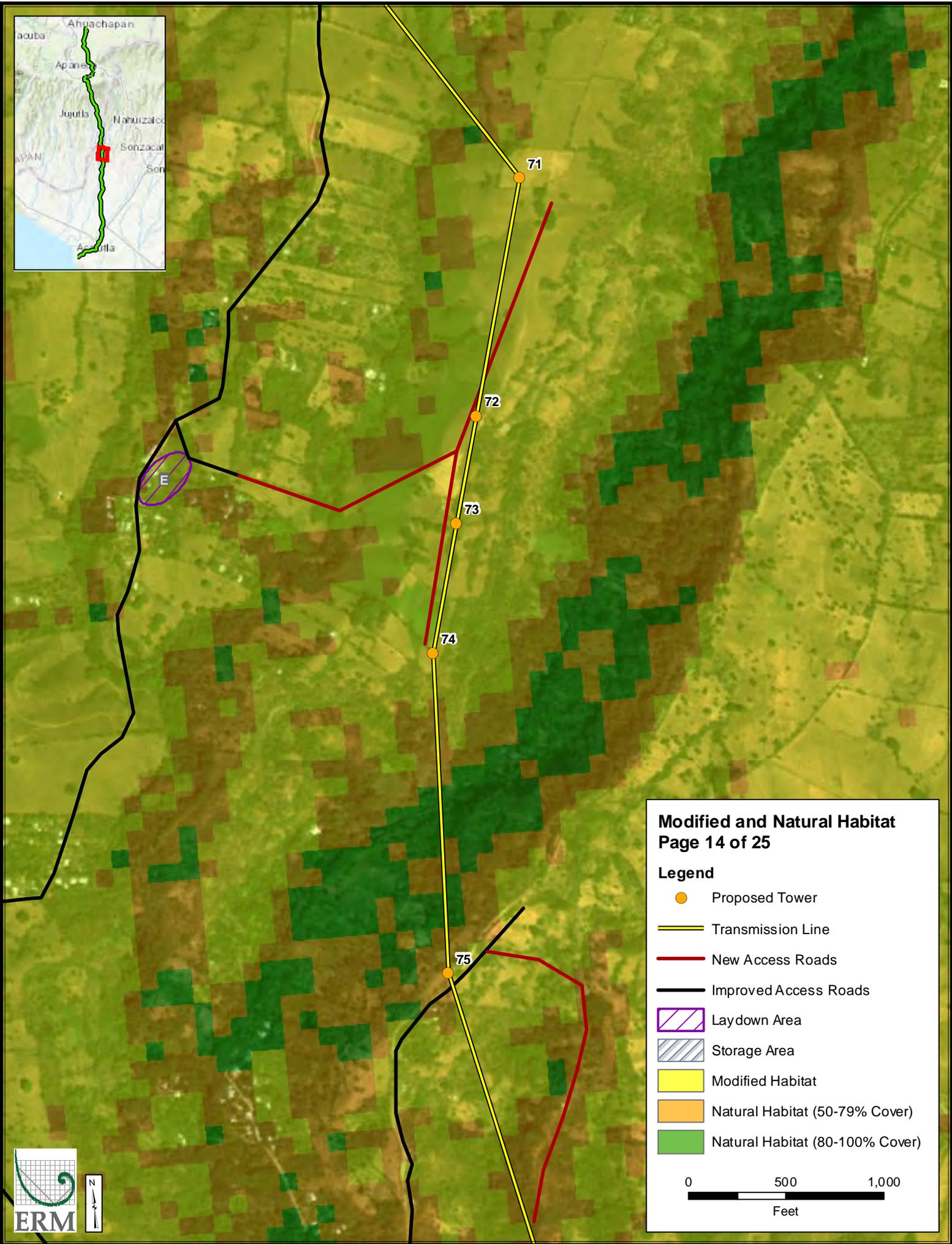


Modified and Natural Habitat
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Legend

-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)

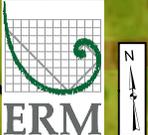
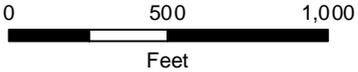


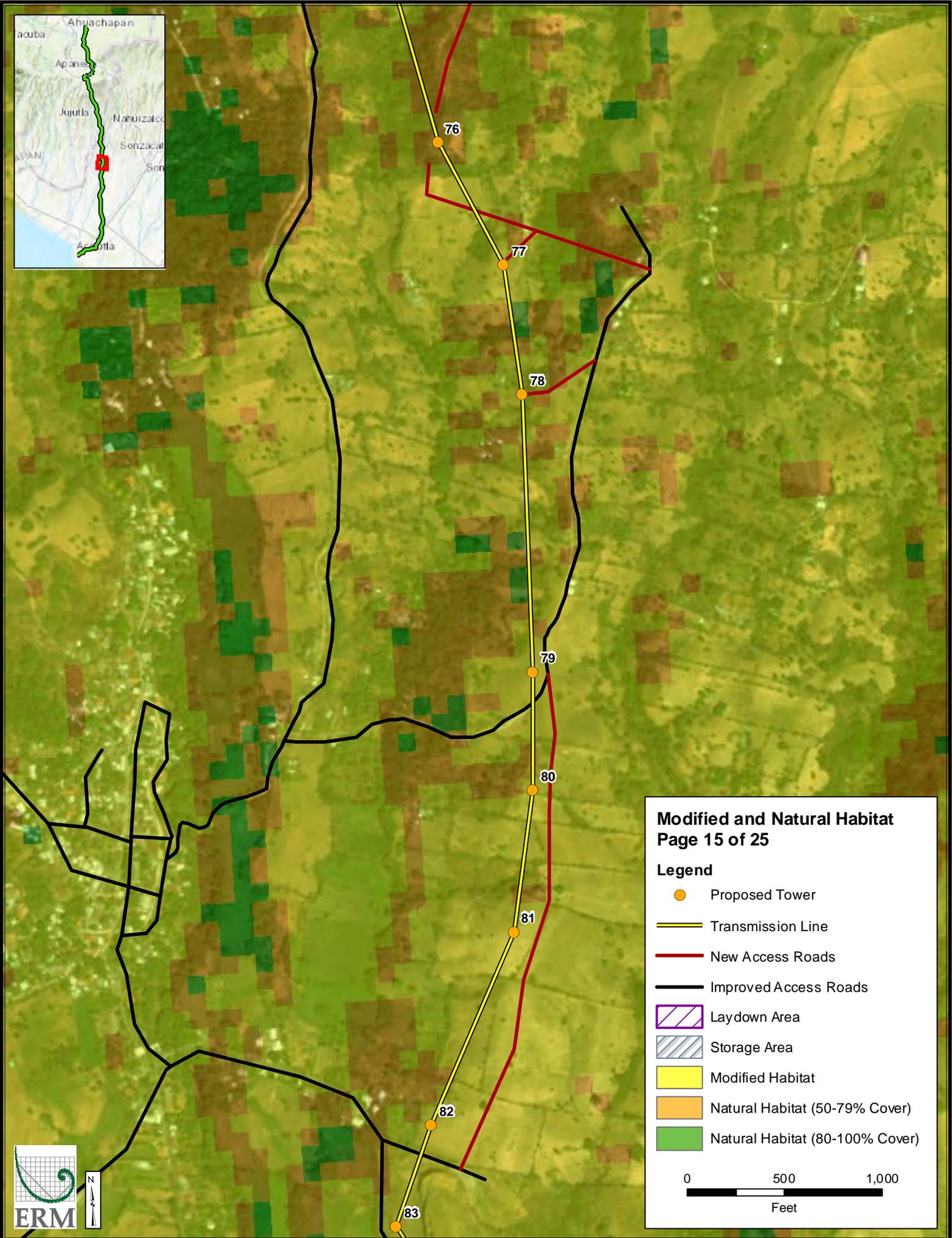
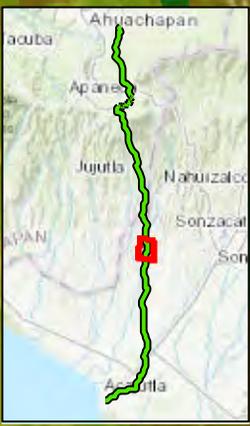


Modified and Natural Habitat
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Legend

-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)

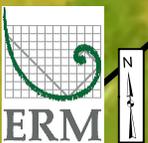
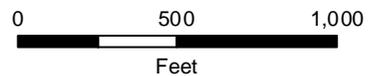


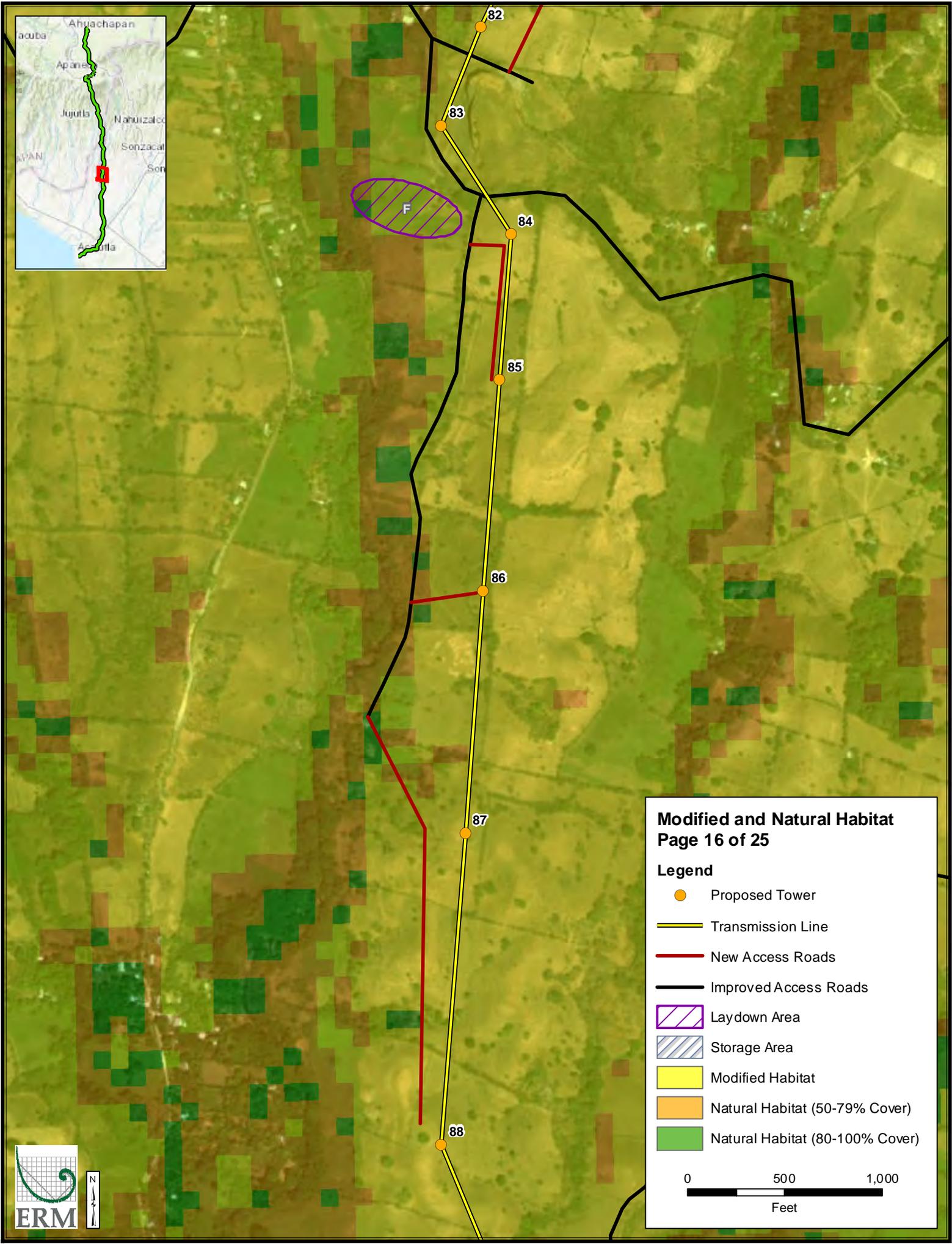


Modified and Natural Habitat
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Legend

-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)

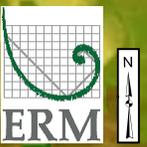
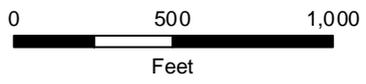


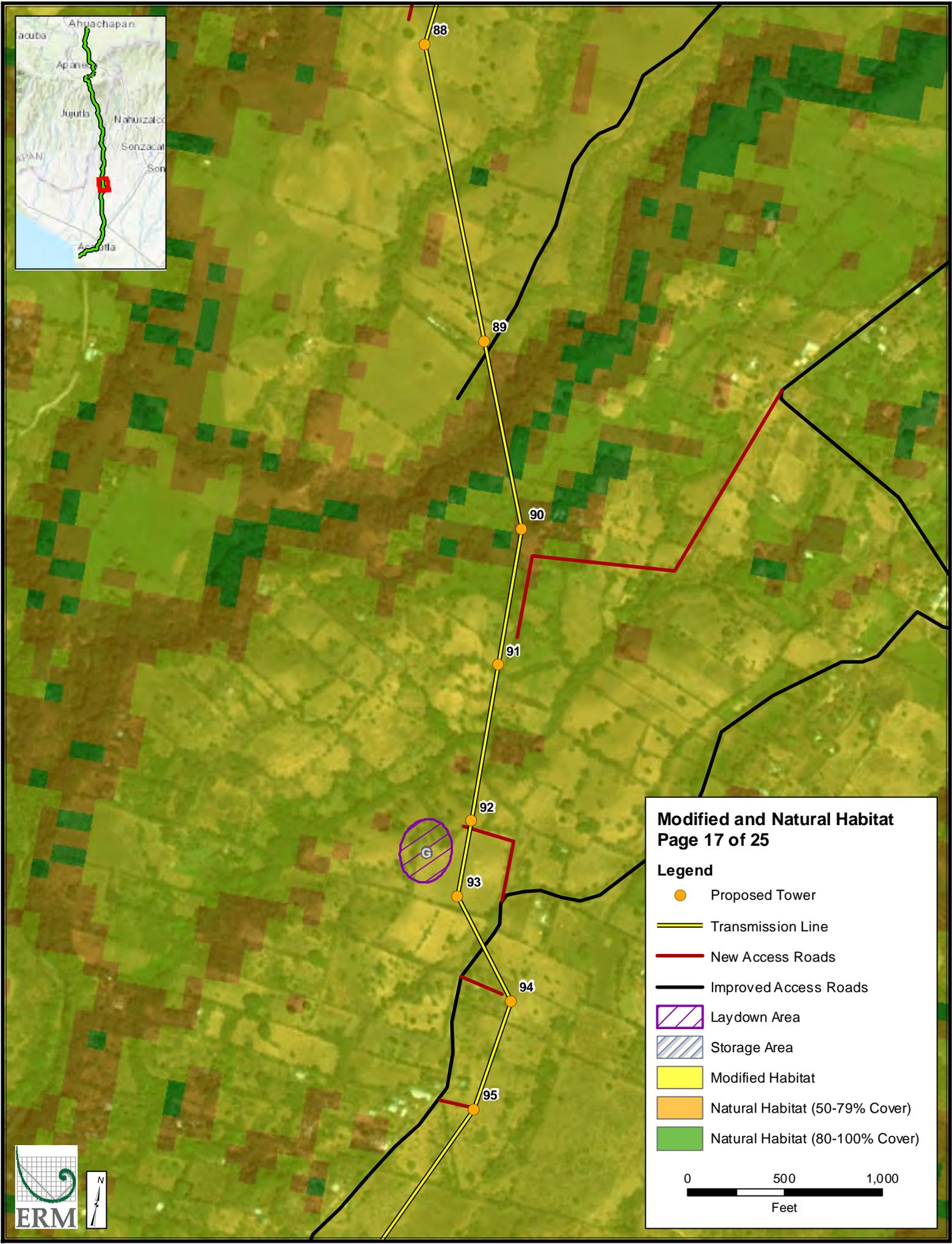
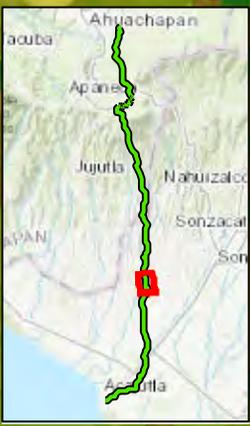


Modified and Natural Habitat
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Legend

-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)

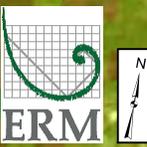
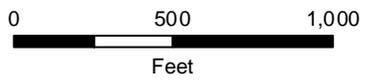


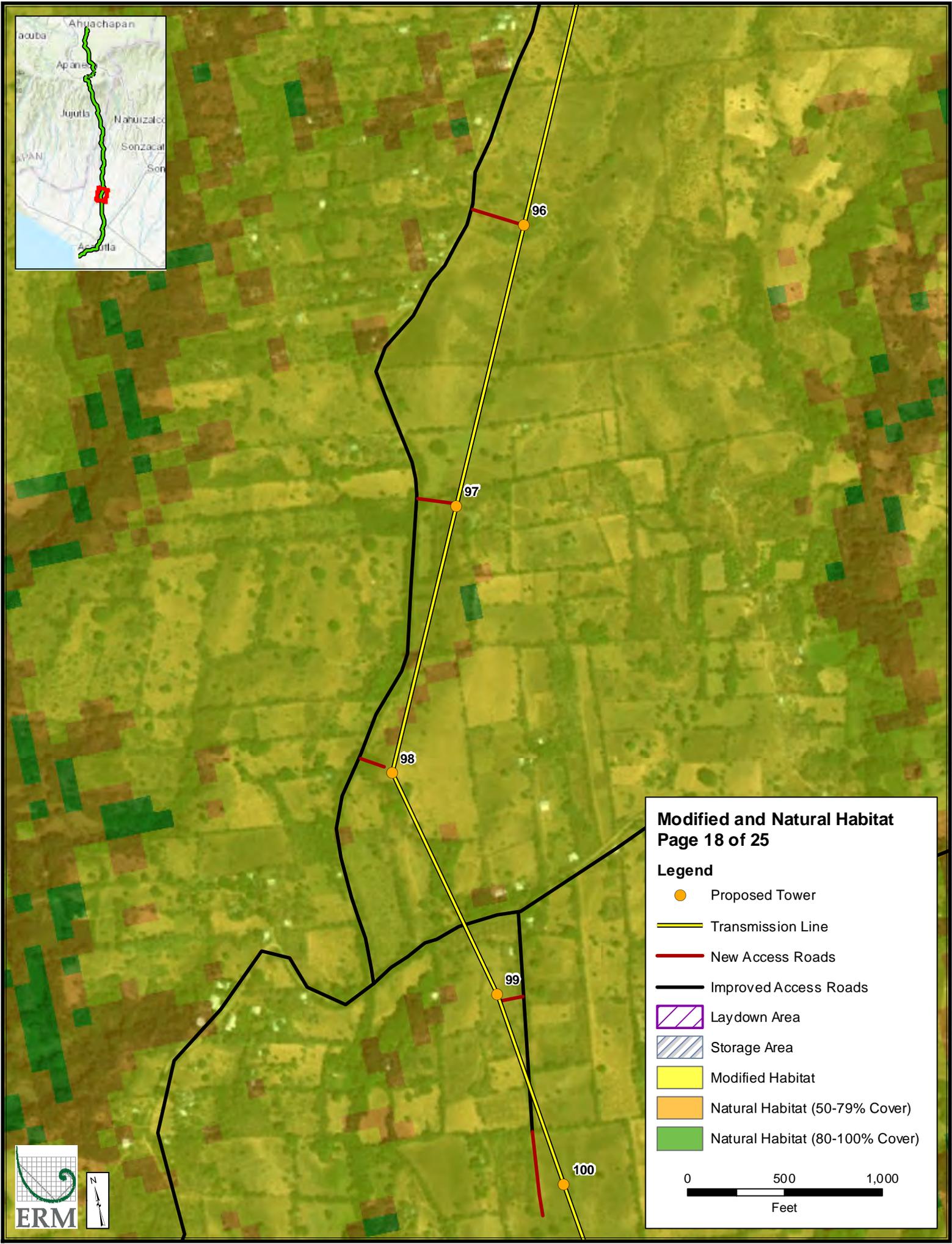


Modified and Natural Habitat
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Legend

-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)

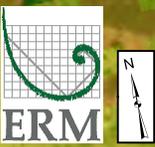
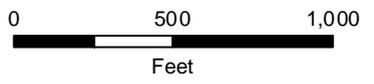


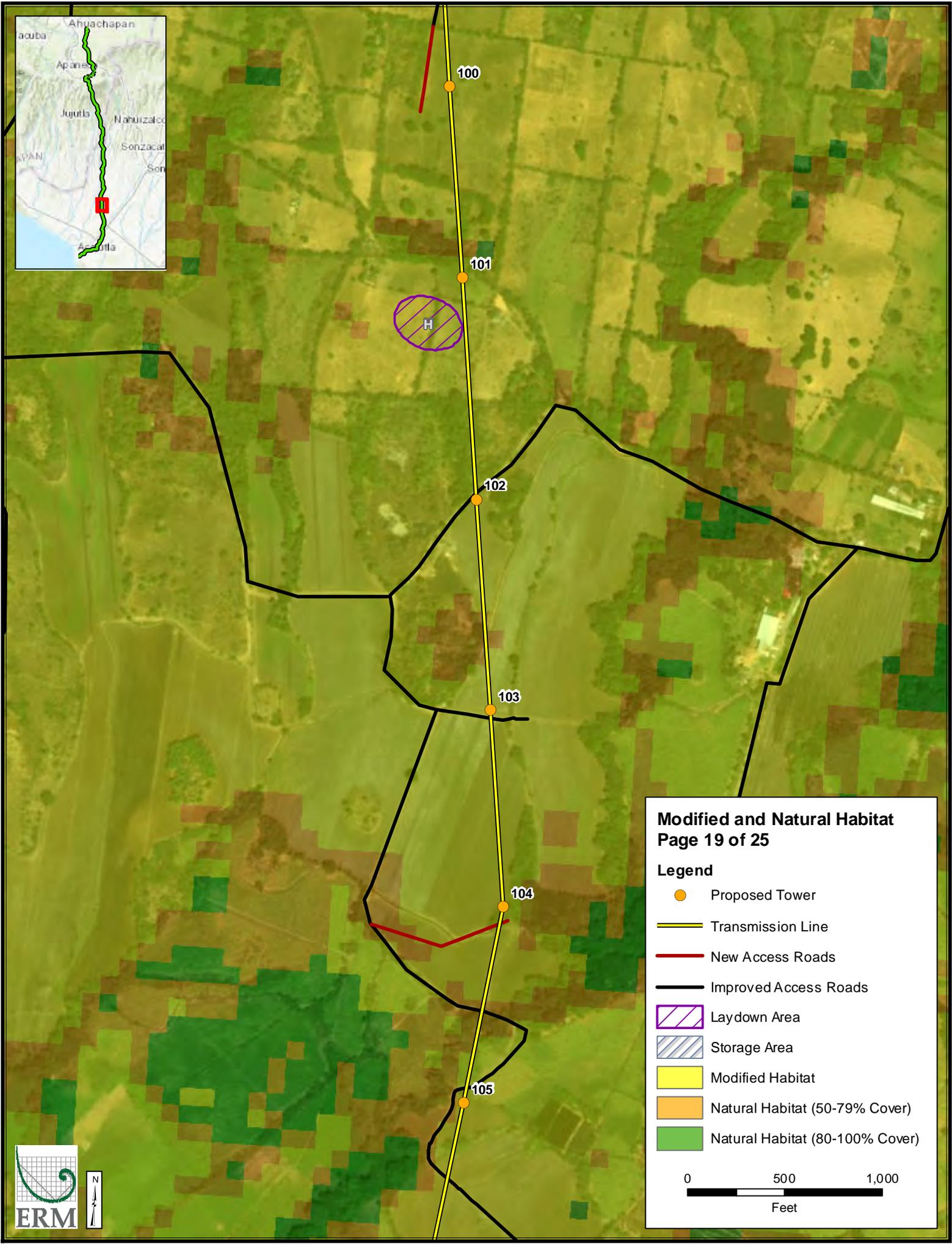
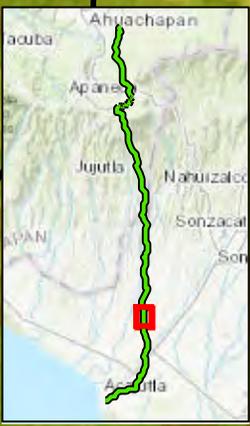


Modified and Natural Habitat
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Legend

-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)

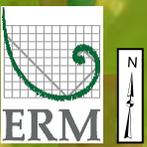
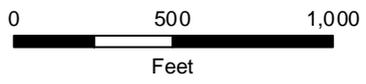


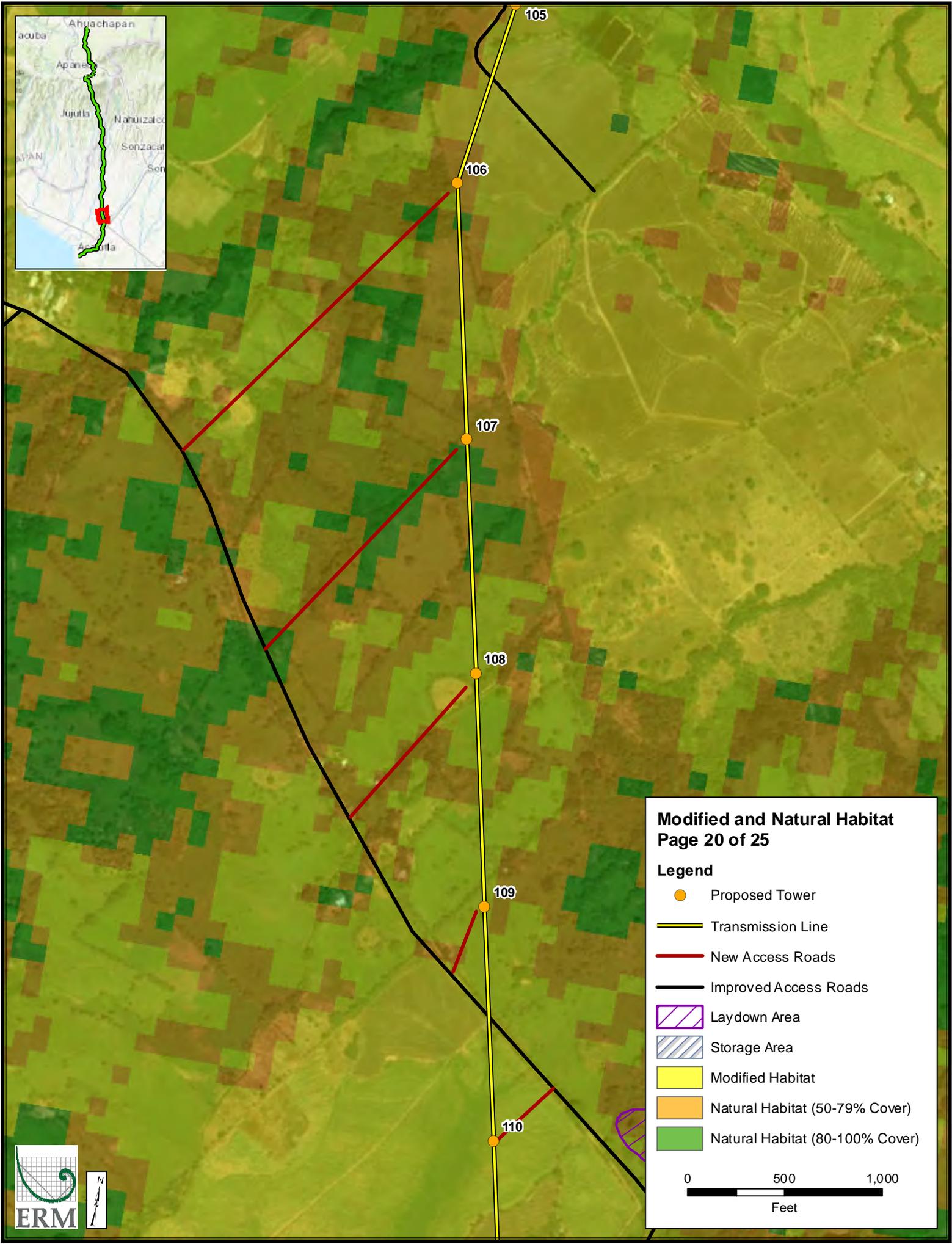
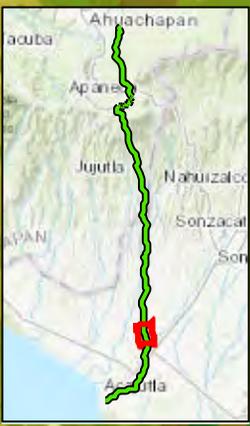


Modified and Natural Habitat
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Legend

-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)

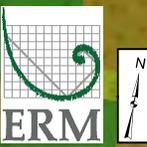
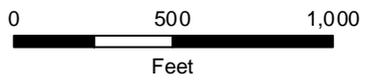


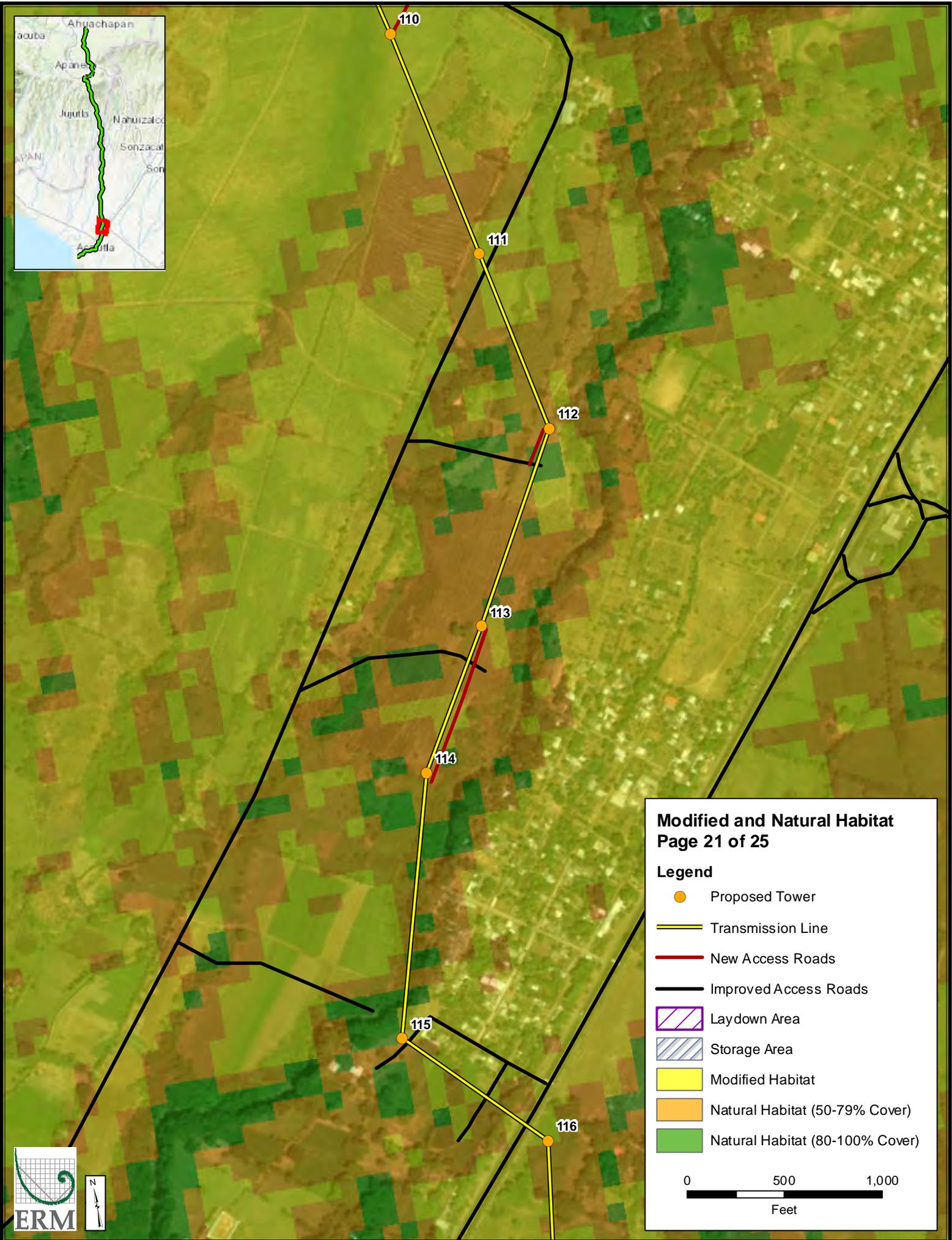
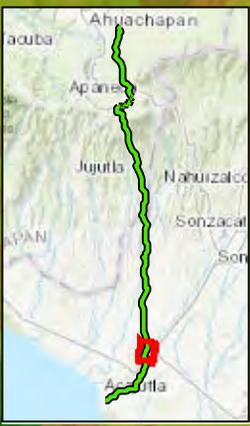


Modified and Natural Habitat
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Legend

-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)

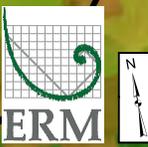
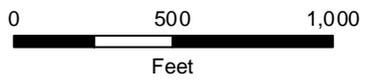


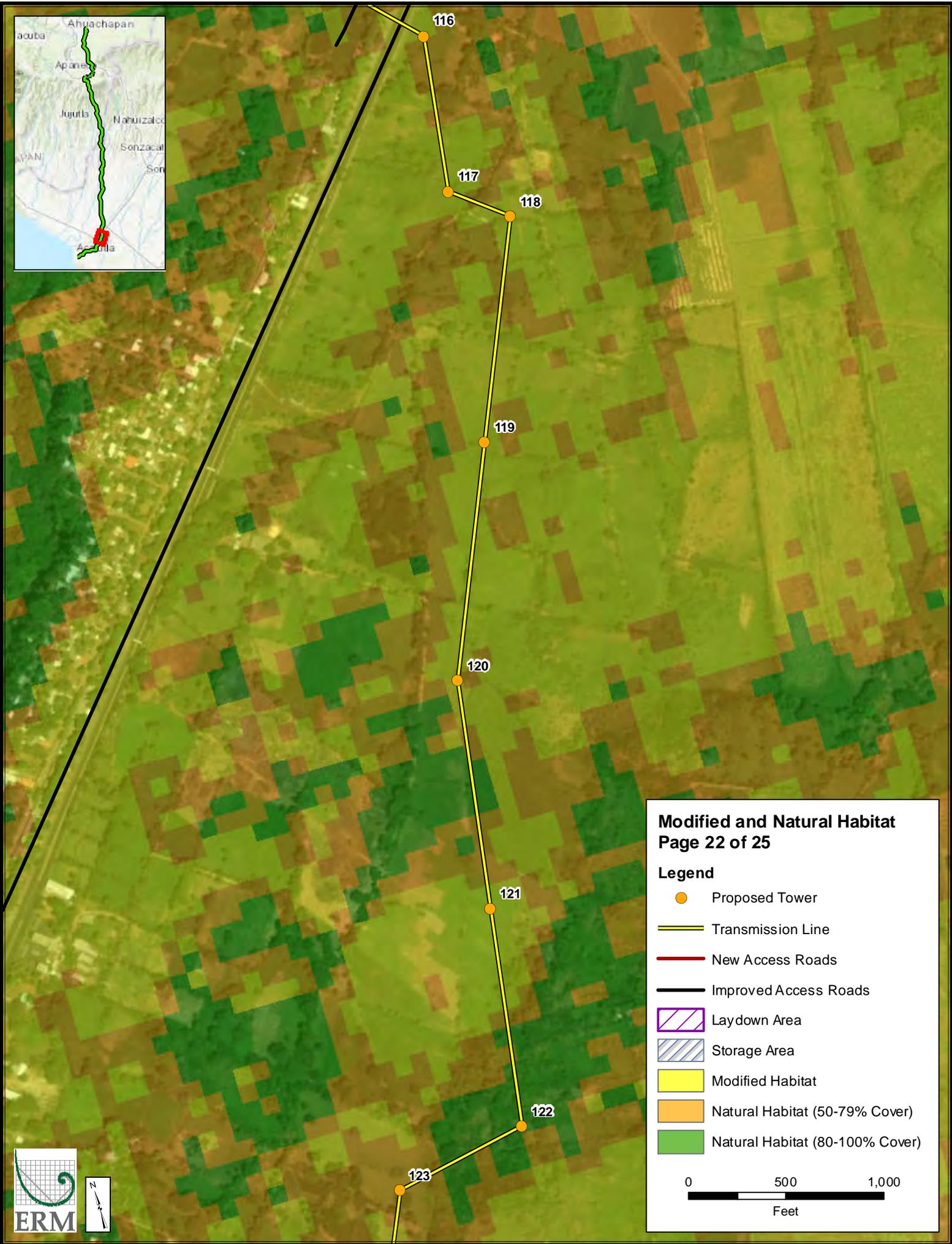
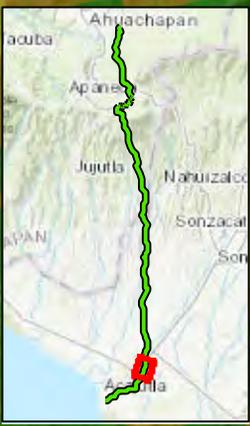


Modified and Natural Habitat
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Legend

-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)

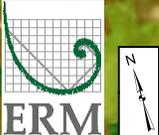
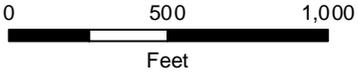




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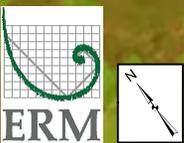
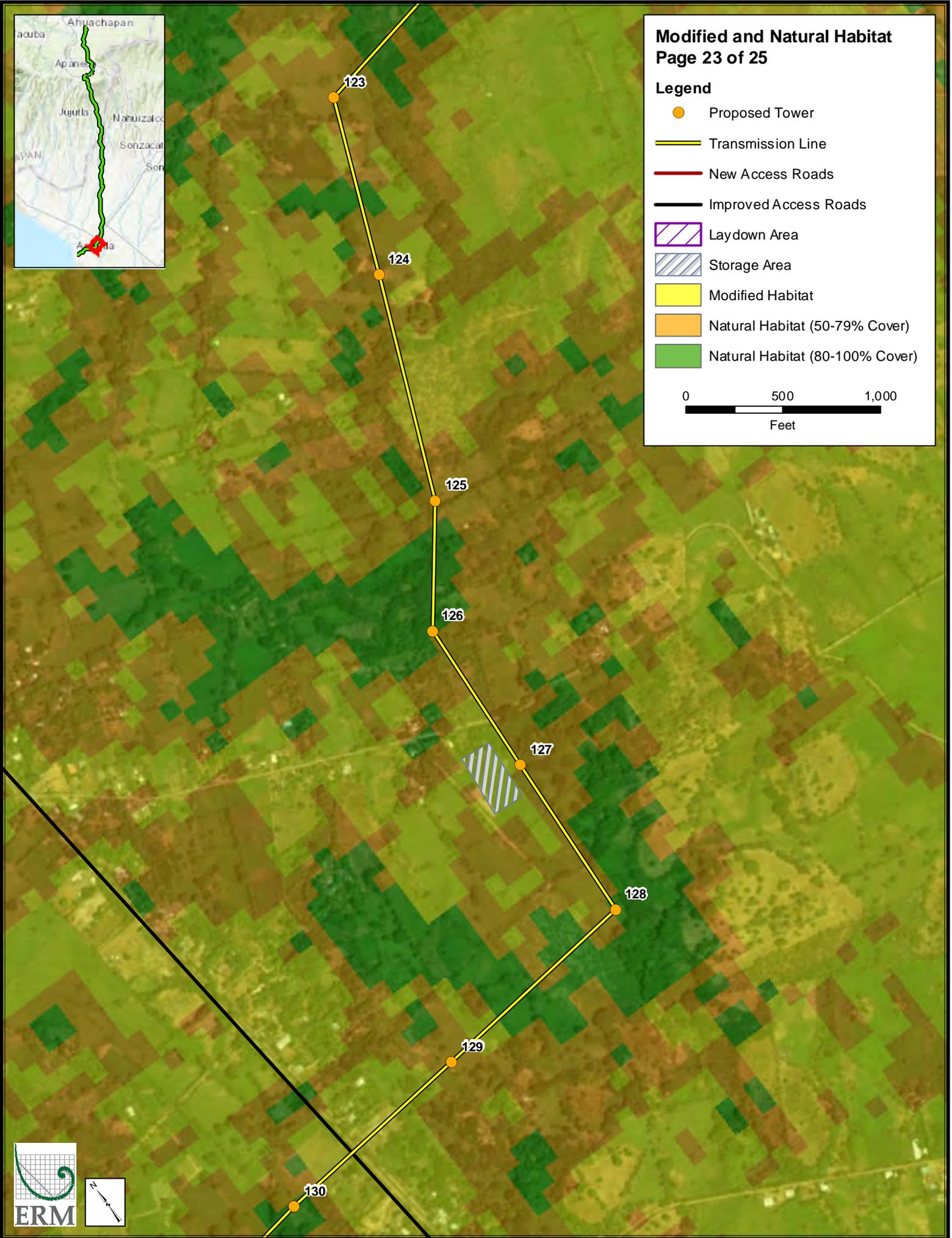
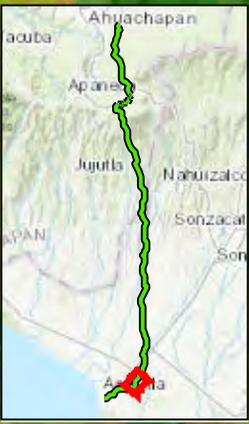
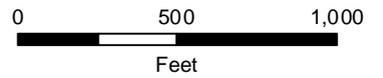
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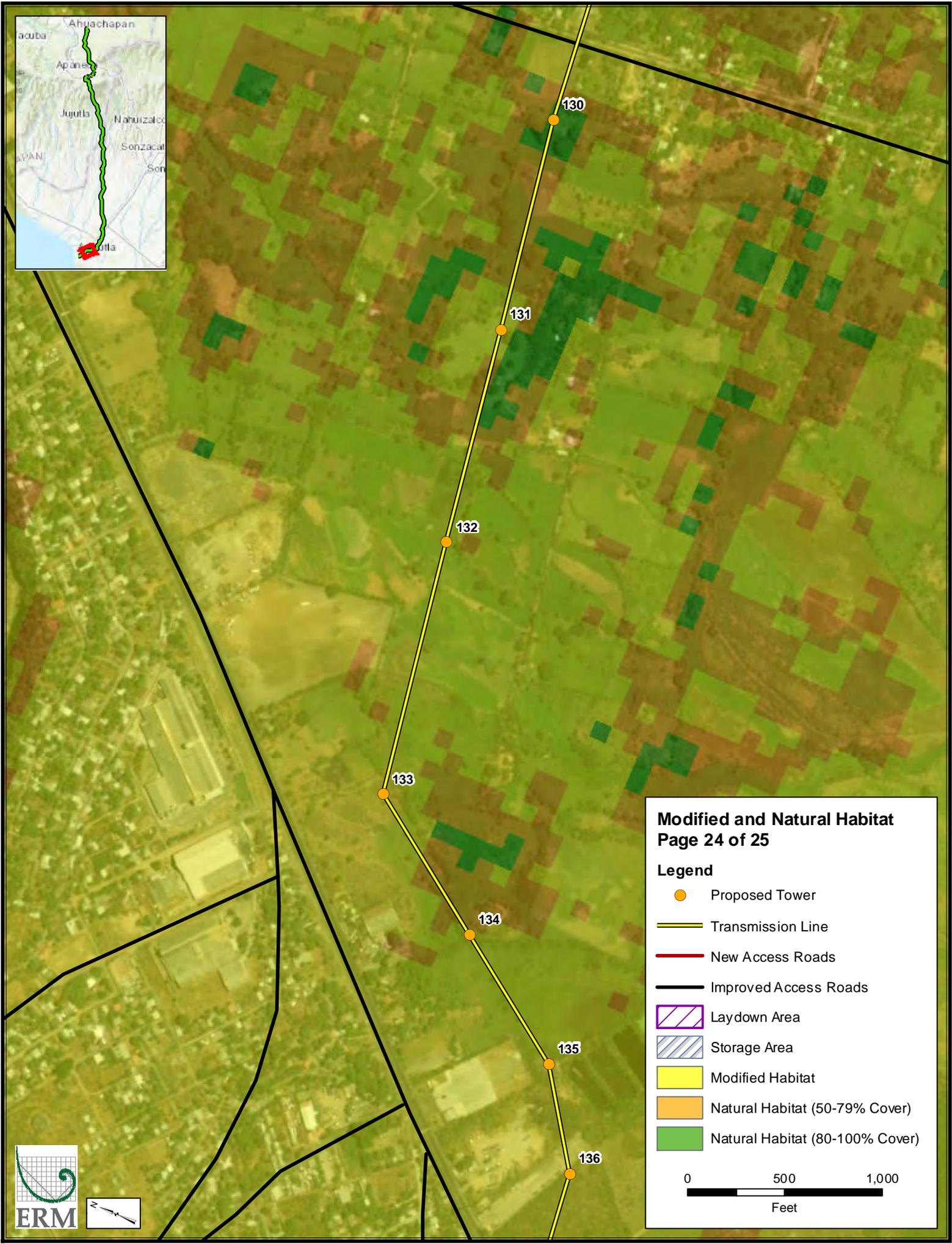
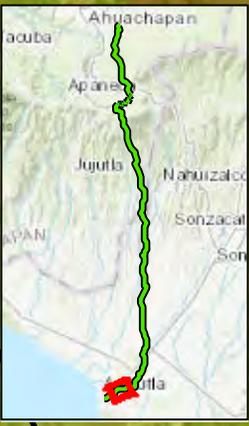
-  Proposed Tower
-  Transmission Line
-  New Access Roads
-  Improved Access Roads
-  Laydown Area
-  Storage Area
-  Modified Habitat
-  Natural Habitat (50-79% Cover)
-  Natural Habitat (80-100% Cover)



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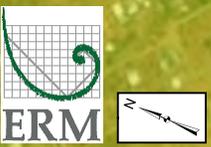
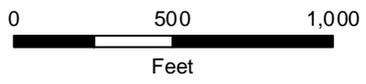


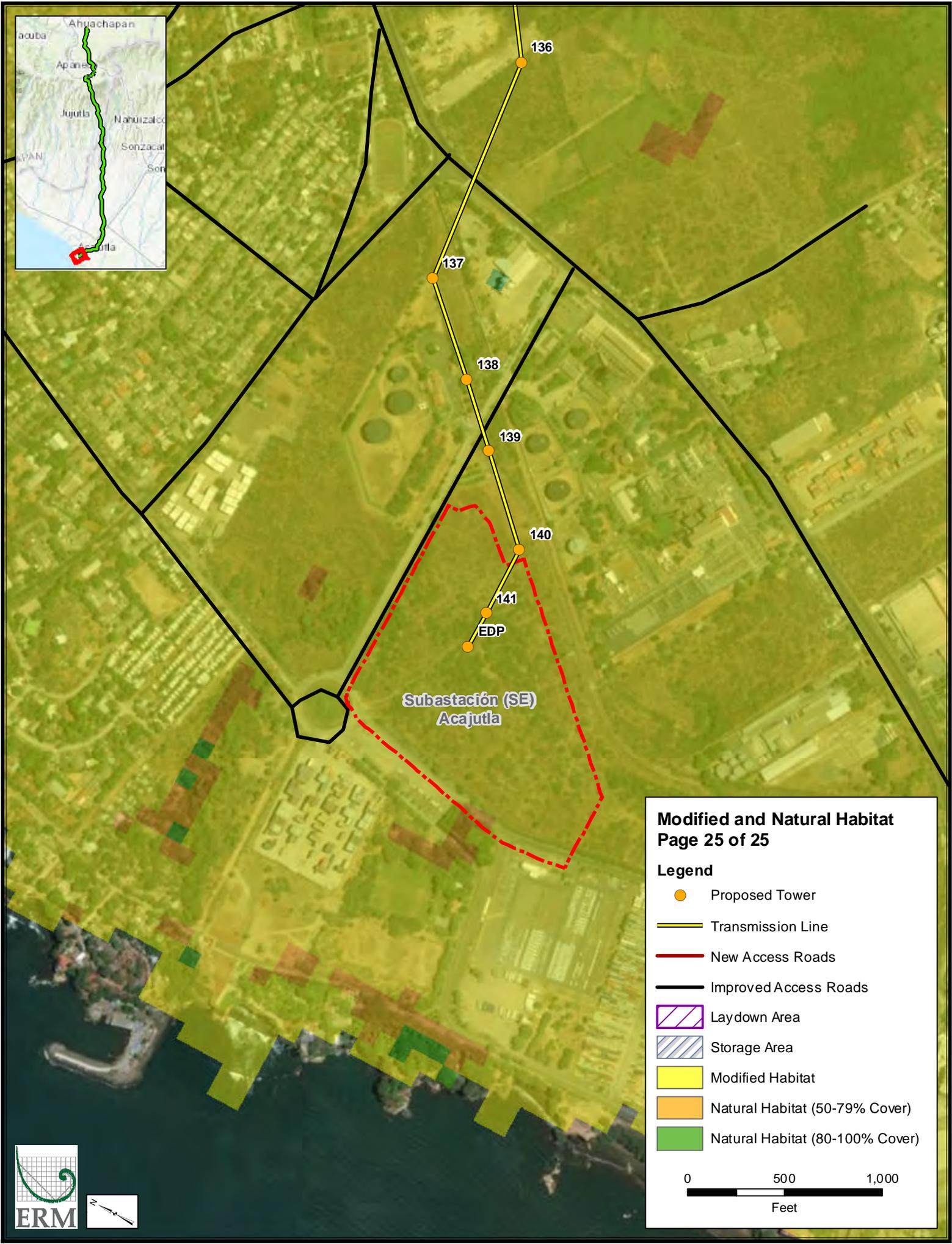


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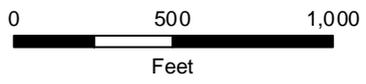




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Appendix C. Critical Habitat Designation Summary for the Project (✓ = Triggered, x = Not Triggered)¹ Species listed are categorized as Endangered, Vulnerable, or AM (Threatened) by the IUCN or MARN-El Salvador (2015).

Potential Triggering Species/ Site	Criterion 1 Critically Endangered/ Endangered Species (IUCN Red List)	Criterion 2 Endemic and Range Restricted Species	Criterion 3 Migratory Species and/or Congregatory Species	Criterion 4 Highly Threatened /Unique Ecosystems	Criterion 5 Key Evolutionary Processes	Other PS6 Triggering Feature	Location within Project Area /Habitat Recorded/or Potentially occurring	Rationale/PS6 Criteria
SPECIES								
<i>Eugenia salamensis</i> €, tree	✓ EN Tier 2 (not assessed by IUCN since 1998) AM (threatened) MARN	x	x	x	x	x	Recorded , Not directly impacted	Tier 2 c2a: version 2.3 Population estimated to number less than 2500 mature individuals and a continuing decline and severely fragmented (no subpopulations greater than 250 mature individuals). Native to Cosa Rica, El Salvador, Honduras, Mexico Nicaragua. A species of moist wooded ravines or rocky hills and dense wet mixed forest at medium to high altitudes.

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<i>Junglans olanchana</i> (EN) Central American Walnut; Cedro negro	✓ EN Tier 2 (Not assessed by IUCN since 1998 MARN 2015 EN	x	x	x	x	x	Recorded, Not directly impacted	Tier 2, c2a Version 2.3. Population estimated to number less than 2500 mature individuals and a continuing decline and severely fragmented (no subpopulations greater than 250 mature individuals.
<i>Swietenia humilis</i> Pacific Coast Mahogany	x IUCN VU MARN 2015 EN	x	x	x	x	x	East Canal-Caribbean Slope, Wet thickets along Atlantic lowlands Recorded Not impacted	Tier 2 A1cd Population reduction in the form of either of the following: 1) An observed, estimated, inferred or suspected reduction of at least 20% over the last 10 years or three generations, whichever is the longer, based on (and specifying) any of the following: a decline in area of occupancy, extent of occurrence and/or quality of habitat ; actual or potential levels of exploitation

Potential Triggering Species/ Site	Criterion 1 Critically Endangered/ Endangered Species (IUCN Red List)	Criterion 2 Endemic and Range Restricted Species	Criterion 3 Migratory Species and/or Congregatory Species	Criterion 4 Highly Threatened /Unique Ecosystems	Criterion 5 Key Evolutionary Processes	Other PS6 Triggering Feature	Location within Project Area /Habitat Recorded/or Potentially occurring	Rationale/PS6 Criteria
<i>Cedrela odorata</i> Cedro, Spanish Cedar	X IUCN VU MARN (Threatened)	x	x	x	x	x	Located within Project Area	Deforestation data across its full range indicate that the range has decreased by 28.8% in the last 100 years (approximately three generations); and it is estimated to decline by 40.4% in the next 100 years. The main threat to this species is unsustainable harvest of the timber. Deforestation and the associated habitat loss threaten the species.
<i>Quercus skinneri</i> Bellote	X IUCN VU MARN Threatened	x	x	x	x	x	Located within project area, not impacted	Found in moist montane forests, threatened by deforestation.
<i>Habromys lophorus</i> Crested-tailed deer mouse	X IUCN NT MARN 2015 EN	✓	x	x	x	x	Potentially occurring; Has not been recorded in El Salvador since the 1960's.	Listed as Near Threatened because its extent of occurrence is probably not much greater than 20,000 km ² , and the extent and quality of its habitat are declining, thus making the species close to qualifying for Vulnerable under criterion B1.

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<i>Paserina ciris</i> <i>Painted bunting</i> <i>Siete colores</i>	X IUCN NT MARN AM (threatened)							
<i>Accipiter stratus</i> <i>ssp. chionogaster</i>	X IUCN LC Subspecies <i>chionogaster</i> is EN MARN	x	x	x	x	x	Occurs	This species has an extremely large range, and hence does not approach the thresholds for Vulnerable under the range size criterion (Extent of Occurrence <20,000 km ² combined with a declining or fluctuating range size, habitat extent/ quality, or population size and a small number of locations or severe fragmentation). The population trend appears to be increasing, and hence the species does not approach the thresholds for Vulnerable under the population trend criterion (>30% decline over ten years or three generations).

Potential Triggering Species/ Site	Criterion 1 Critically Endangered/ Endangered Species (IUCN Red List)	Criterion 2 Endemic and Range Restricted Species	Criterion 3 Migratory Species and/or Congregatory Species	Criterion 4 Highly Threatened /Unique Ecosystems	Criterion 5 Key Evolutionary Processes	Other PS6 Triggering Feature	Location within Project Area /Habitat Recorded/or Potentially occurring	Rationale/PS6 Criteria
<i>Spizaetus tyrannus</i> Black hawk eagle	X IUCN LC MARN EN	x	x	x	x	x	recorded	This species has an extremely large range, and hence does not approach the thresholds for Vulnerable under the range size criterion (Extent of Occurrence <20,000 km ² combined with a declining or fluctuating range size, habitat extent/ quality, or population size and a small number of locations or severe fragmentation). Despite the fact that the population trend appears to be decreasing, the decline is not believed to be sufficiently rapid to approach the thresholds for Vulnerable under the population trend criterion (>30% decline over ten years or three generations).

Potential Triggering Species/ Site	Criterion 1 Critically Endangered/ Endangered Species (IUCN Red List)	Criterion 2 Endemic and Range Restricted Species	Criterion 3 Migratory Species and/or Congregatory Species	Criterion 4 Highly Threatened /Unique Ecosystems	Criterion 5 Key Evolutionary Processes	Other PS6 Triggering Feature	Location within Project Area /Habitat Recorded/or Potentially occurring	Rationale/PS6 Criteria
<i>Macrophyllum macrophyllum</i> Long-legged bat	X IUCN LC MARN 2015 EN	X	X	X	X	X	Potentially occurring; not recorded during field surveys	IUCN LC because of wide distribution, presumed large populations, occurrence in protected areas, tolerance to habitat modification; occurs from Mexico to Argentina.
<i>Tilmatura dupontii</i> <i>Sparkling tailed-woodstar</i>	X IUCN LC MARN EN	X	X	X	XX	X	Recorded	This species has a very large range, and hence does not approach the thresholds for Vulnerable under the range size criterion (Extent of Occurrence <20,000 km ² combined with a declining or fluctuating range size, habitat extent/quality, or population size and a small number of locations or severe fragmentation). The population trend appears to be stable, and hence the species does not approach the thresholds for Vulnerable under the population trend criterion (>30% decline over ten years or three generations). T

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<i>Chrotopterus auritus</i> Big eared wooly bat	X IUCN LC MARN 2015 EN	X	X	X	X	X	Potentially occurring Was not recorded during field surveys	This species is listed as Least Concern in view of its wide distribution, presumed large population, as it occurs in a number of protected areas, and because it is unlikely to be declining at nearly the rate required to qualify for listing in a threatened category. Occurs from Mexico to north Argentina.
<i>Neotoma ferruginea</i> Wood rat	X IUCN Not assessed; However is considered to belong to <i>N. mexicana</i> and is therefore categorized as being IUCN LC MARN 2015 EN	X <i>N. mexicana</i> ; <i>N. ferruginea</i> Data Deficient	X	X	X	X	Potentially occurring Was not recorded during field surveys	<i>N. ferruginea</i> is generally considered as belonging to <i>N. mexicana</i> , a species of LC as per IUCN. However, <i>N. ferruginea</i> may be a sister species to <i>N. mexicana</i> , Further determination awaits.

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<i>Brotogeris jugularis</i> Orange-chinned parakeet	X IUCN LC MARN AM (threatened)	X	X	X	X	X	Recorded	IUCN LC. This species has a very large range, and hence does not approach the thresholds for Vulnerable under the range size criterion (Extent of Occurrence <20,000 km ² combined with a declining or fluctuating range size, habitat extent/quality, or population size and a small number of locations or severe fragmentation). The population trend appears to be stable
<i>Eupsittula canicularis</i> Orange fronted parakeet	X IUCN LC MARN AM (threatened)	X	X	X	X	X	Recorded	IUCN LC. This species has a very large range, Extent of Occurrence <20,000 km ² combined with a declining or fluctuating range size, habitat extent/quality, or population size and a small number of locations or severe fragmentation).The population trend appears to be stable, The population size is very large,

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<i>Aularcorhynchus prasinus</i> Tucaneata verde	X IUCN LC MARN AM (threatened)	X	X	X	X	X	recorded	IUCN LC; This species has a very large range, and hence does not approach the thresholds for Vulnerable under the range size criterion (Extent of Occurrence <20,000 km ² combined with a declining or fluctuating range size, habitat extent/quality, or population size and a small number of locations or severe fragmentation). The population trend appears to be stable, and hence the species does not approach the thresholds for Vulnerable under the population trend criterion (>30% decline over ten years or three generations)

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<i>Chiroxiphia linearis</i> <i>Saltarin colilargo</i> <i>Long-tailed mannakin</i>	X IUCN LC MARN AM (threatened)	X	X	X	X	X	recorded	IUCN LC; This species has a very large range, and hence does not approach the thresholds for Vulnerable under the range size criterion (Extent of Occurrence <20,000 km ² combined with a declining or fluctuating range size, habitat extent/quality, or population size and a small number of locations or severe fragmentation). The population trend appears to be stable

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<i>Psittacara strenuus</i> Pacific parakeet Perico verde Centroamerican o	X	X	X	X	X	X	recorded	This species has a very large range, and hence does not approach the thresholds for Vulnerable; Despite the fact that the population trend appears to be decreasing, the decline is not believed to be sufficiently rapid to approach the thresholds for Vulnerable under the population trend criterion (>30% decline over ten years or three generations)
<i>Artibeus inopinatus</i> Honduran fruit-eating bat	X IUCN DD MARN Not Listed	X	X	X	X	X	Recorded during field surveys	This species is known from the Pacific versant of El Salvador, Honduras, and Nicaragua. It occurs from lowlands to 1,100 m. Listed as Data Deficient since, although it has been recorded over a wide area, and very little is known about its status and habitat requirements

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<i>Agalychnis moreletti</i>	X UCN LC	x	x	x	x	x	Recorded	This species was listed as Critically Endangered in 2004 by the IUCN; because of a predicted future decline of its population, which cannot be demonstrated based on current available information. In view of its large range and presumably large—and in some places recovering—population, it is now listed as Least Concern. However, although it seems to be quite resilient to habitat disturbance and degradation, the threats to this species might led to a future deterioration of its population status so monitoring is necessary.

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SITES								
IBA Los Cobanos	X	X	X	✓ Small remnants of dry forest	X	IBA Criterion A3	Project impacts a portion of this IBA	IBA Criteria A3: A3 are biome restricted species: This category applies to groups of species with largely shared distributions which occur mostly or wholly within all or part of a particular biome and are, therefore, of global importance.
Apaneca Ilamatepec Biosphere Reserve	✓ <i>Eugenia salamensis</i> <i>Junglaris olanchana</i>	✓ EBA		✓ Areas of tropical dry forest/remnants of pine-oak forest		X Biosphere Reserve that contains two IBA's (criterion A2 and A3) overlaps with national parks IUCN Category 5 protected area	Project crosses buffer zone and transition zone IUCN category 5	IUCN category 5 protected area: Category 5 applies to areas where landscapes have been transformed as a result of long-term interactions with humans. The Apaneca Ilamatepec Biosphere Reserve has highly diverse habitats including Paramo Montane forests, cloud forests, conifer forests and vegetation on volcanic lava flows

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El Imposible National Park	✓ <i>Eugenia salamensis</i>	X	X	✓ Areas of tropical dry forest	X	✓ Protected area/National Park	Project is located approximately 7 km from this National Park IUCN category 2 protected area	IUCN Category 2 Protected Area; El Salvador's largest national park; overlaps with El Imposible Forest IBA
The Volcans and San Marcelino IBA and EBA	X	✓ Bird species <50,000 km2 IUCN criteria for range restricted is <20,000 km2	X	✓ Areas of Dry forest	X	✓ IBA and EBA (endemic bird area) Criteria 2 (restricted range species)	IBAs located approximately 12 km from Project	IBA Criteria 2, 3 19 species or 53% of birds endemic to highlands of Central America EBA 018, as well as 40% of 45 species of Middle American Highlands (MAH). Dry forests contain Pacific Arid Slope species (PAS), with 70% of species for this biome in El Salvador

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North Central American Highlands Endemic Bird Area (EBA)	X	✓ Approx 20 species have <50,000 km ²	X	✓ Pine-oak Forests	X	Endemic Bird Area overlapping with protected areas	Distance from project: 12 km	Criterion 2: With 20 extant restricted-range species, these highlands hold more than any other of the north Central American and Mexican EBAs. The majority of the birds are found above 1,500 m in the pine-oak and montane forests,
Complejo Los Volcanes/Cerro Verde National Park	X	✓ Restricted range species <50,000 km ²	X	X	X	Protected área Criteria 2	Distance from Project: 12 km	Protected area IUCN criteria 2; National Park, overlaps with Volcans and San Marcelino IBA and North Central American Highlands EBA
Barra de Santiago IBA	X	X	X	X	X	X	Distance from project: 21 km	IBA Criteria A3, Biome restricted species

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Meso-American Biological Corridor	X	X	X	✓ Dry Forest Pine Oak Forest	✓ Biological Corridor	✓ Biological Corridor	Biosphere Reserve	PS6 Guidance Note paragraph 96: <i>Connectivity between habitats</i> (e.g., biological corridors) ensures species migration and gene flow, which is especially important in fragmented habitats and for the conservation of meta-populations. This also includes biological corridors across altitudinal and climatic gradients and from “crest to coast.”

CR = Critically Endangered; EN = Endangered; PS6 = Performance Standard 6; IBA = Important Bird Area; IUCN = International Union for Conservation of Nature; KBA = Key Biodiversity Area

¹ Tiers are only applicable to Criteria 1-3. Because the tiers are largely based on population size, it is important to understand the global population status. For most potentially triggering species related to the Project, local or global population estimates are not available. IFC PS6 and GN6 state that when estimates are not available for a species’ global population and/or local population size, the assessment should consider expert opinion to determine the significance of the discrete management unit with respect to the global population. Surrogates of population size (e.g., extent of occurrence, estimates of total area of known sites, estimates of area of occupied habitat) can be used.