

AVIAN HABITAT FRAGMENTATION

SULLIVAN COUNTY, PA

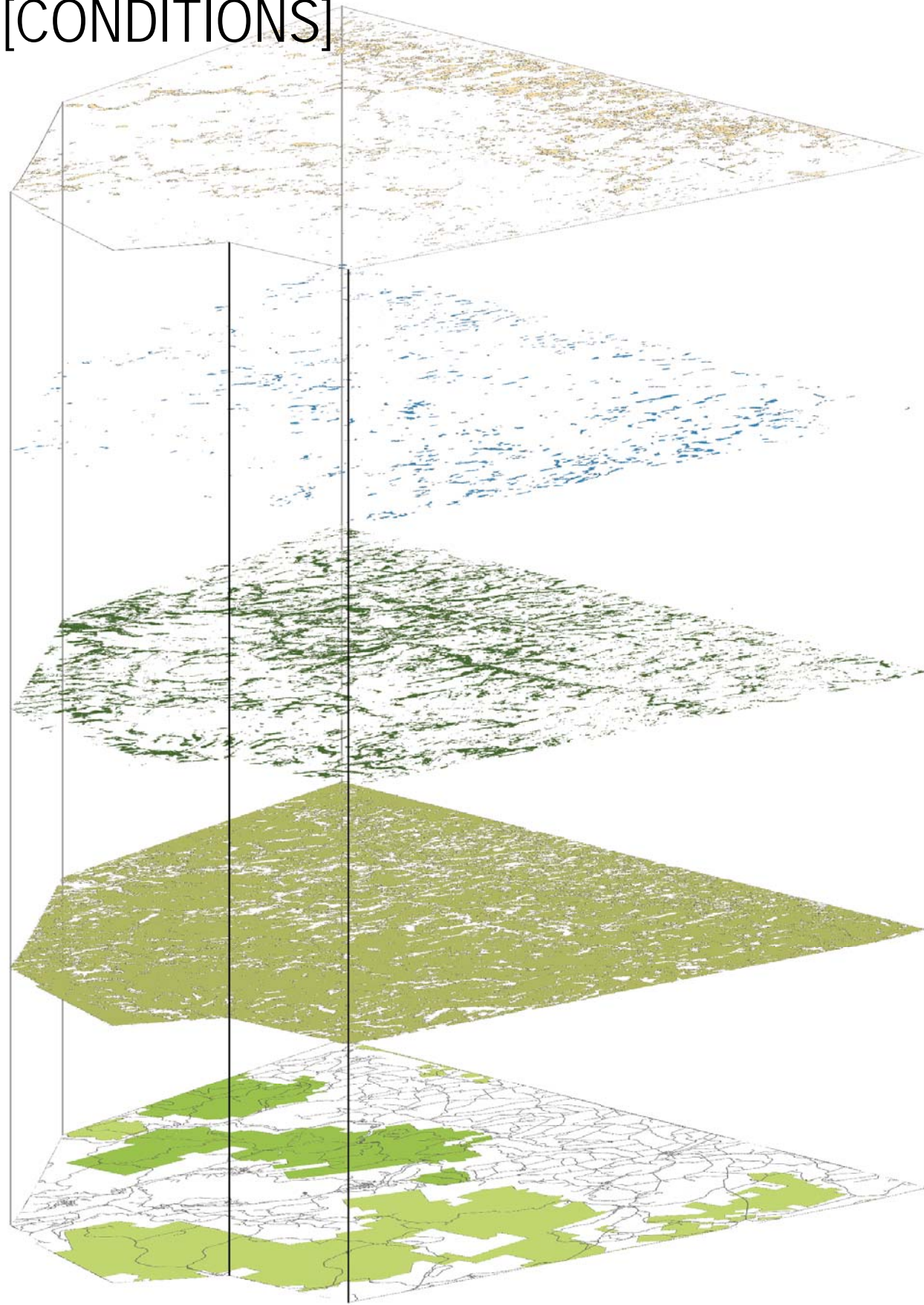


ARIEL RIES

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[CONDITIONS]



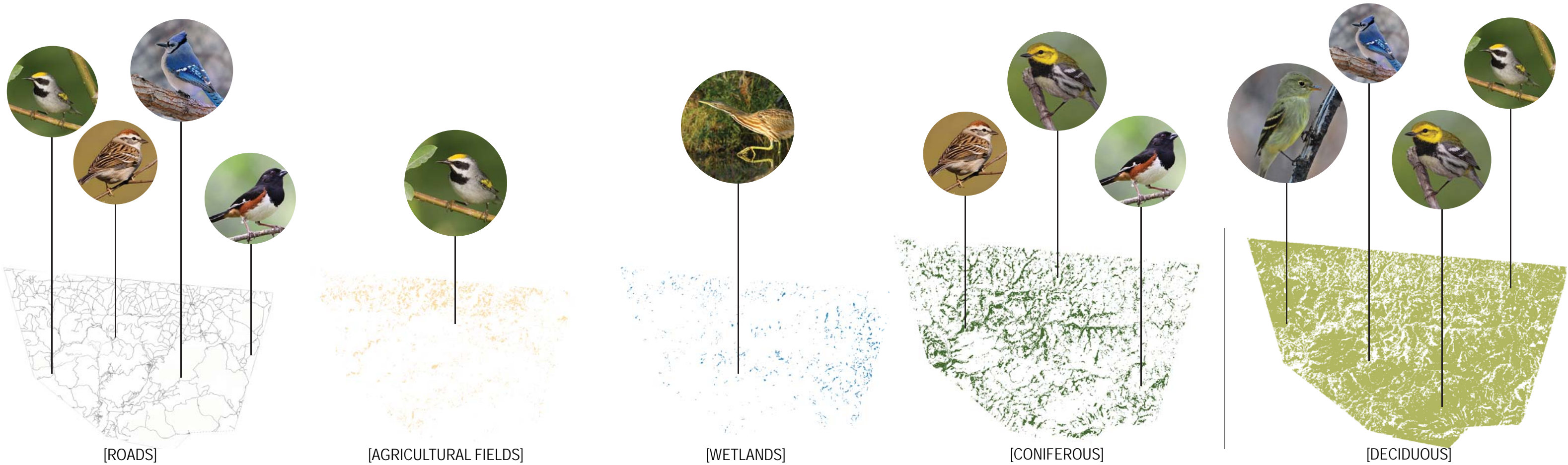
The changes of the natural ecosystem based on human interactions have altered the landscape over time. Pennsylvania has seen the change in the landscape from the booming natural gas industry, especially in the northern and western part of the state. As the landscape changes, so too does the natural habitats of the wildlife that depends on them. Ecosystem fragmentation is inevitable in human growth and development, but with planning and analysis, there can be pro-active ways to manage the fragmentation. Birds are one of the most identifiable wildlife species that can indicate disturbances in the natural ecosystem (McWilliams, xi). Indications can show the health of the ecosystem through the migration and immigration of bird habitats in the area. The health of the ecosystem for the avian species can indicate water quality, air quality, core forest acreage, and invasive wildlife species (US Forest Service, 'Importance'). Not only are birds important for the ecosystem, it is also a resource appreciated by humans alike. Visually and audibly stunning, birds are both a hobby and a connection to nature for many people. The early morning chirping of birds is a morning symphony for people who have located themselves within the natural landscape. With the absence of bird habitats, many birds are forced to relocate to other areas that can still support their breeding and nesting needs.



[CONDITIONS]

This project will highlight 7 key bird species that are either present in Sullivan County at the moment or will migrate in once Marcellus Shale gas drilling takes place, and their habitat changes through the process. The 3 species that have current habitats in Sullivan County are Yellow-bellied Flycatcher, American Bittern, and Black-throated Green Warbler. These 3 avian species highlight specific and different types of habitats that each prefer. This project will then look at the disturbance of natural gas drilling with relationships to the current species and the introduction of 4 other bird species.

By utilizing ArcGIS mapping systems and sourced information on the specific birds, habitat maps were created based on 3 conditions: current conditions, market based pipeline disturbance, and conservation based pipeline disturbance. For each of the maps, the natural habitat is in a color based on the color of the birds with a red showing fragmented habitats. Each of the maps show the specific disturbance pipelines for natural gas drilling has on fragmentation of habitats. The birds seen below correspond to the certain conditions for their habitat, such as agricultural lands, roads, wetlands, and forest.



YELLOW-BELLIED FLYCATCHER

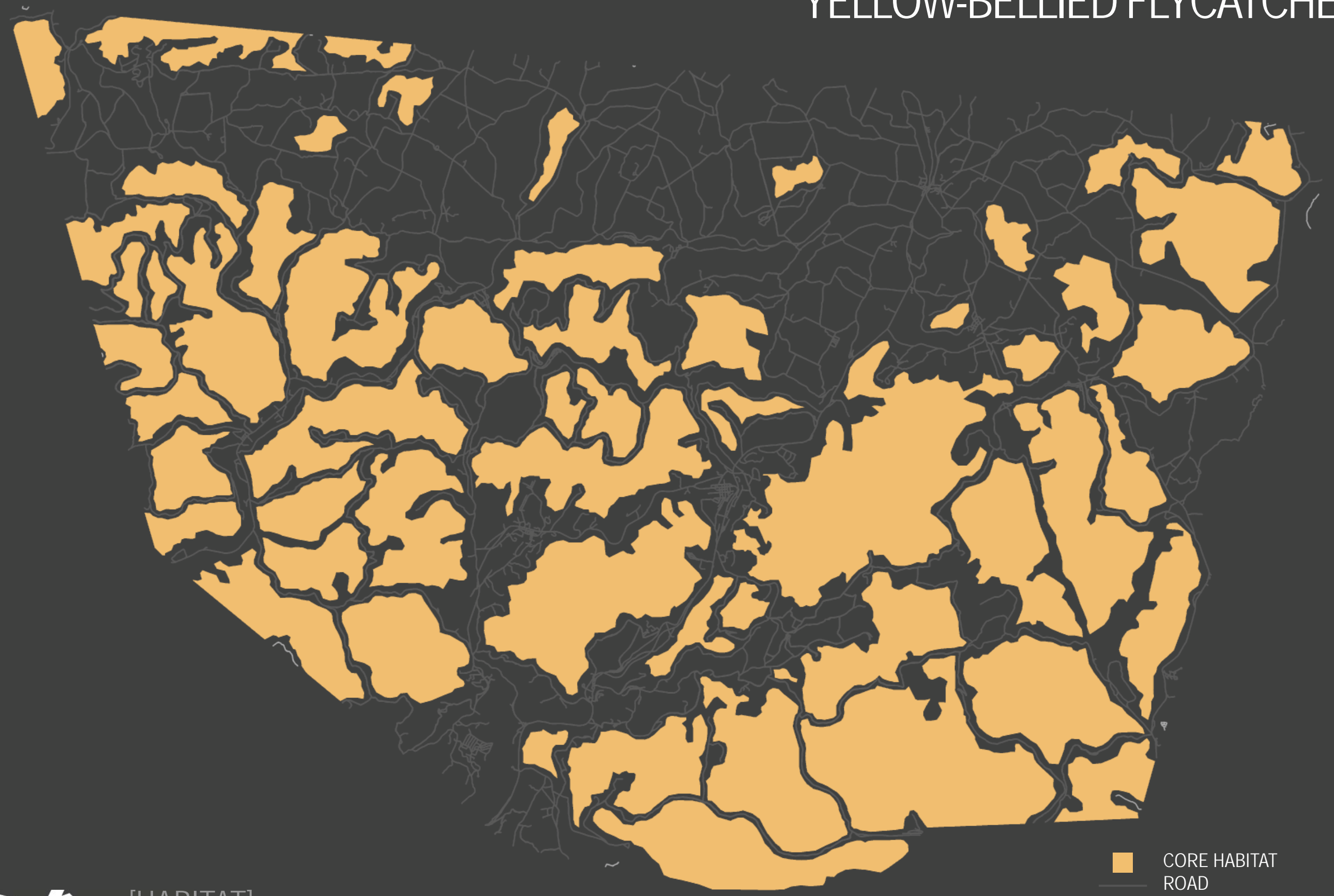
[CURRENT CONDITIONS]

[DISTURBED CONDITIONS - MARKET BASED]

[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
CORE DECIDUOUS & CONIFEROUS FOREST / FOUND IN THICKETS
[FOOD]
INSECTS / ANTHROPODS / FRUIT



YELLOW-BELLIED FLYCATCHER

[CURRENT CONDITIONS]

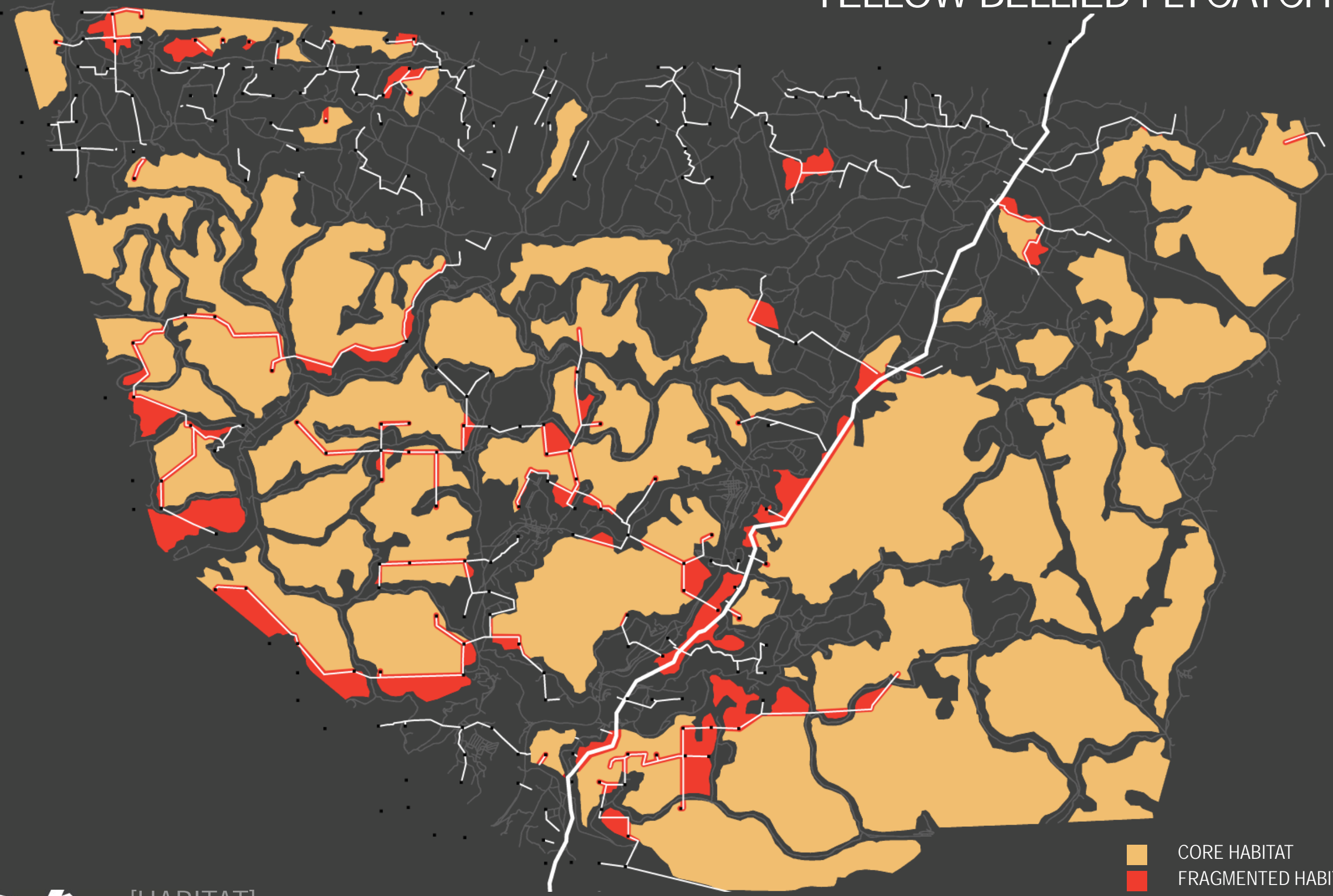
[DISTURBED CONDITIONS - MARKET BASED]

[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
CORE DECIDUOUS & CONIFEROUS FOREST / FOUND IN THICKETS

[FOOD]
INSECTS / ANTHROPODS / FRUIT



- CORE HABITAT
- FRAGMENTED HABITAT
- ROAD
- PIPELINE
- TNC WELL LOCATION

YELLOW-BELLIED FLYCATCHER

[CURRENT CONDITIONS]

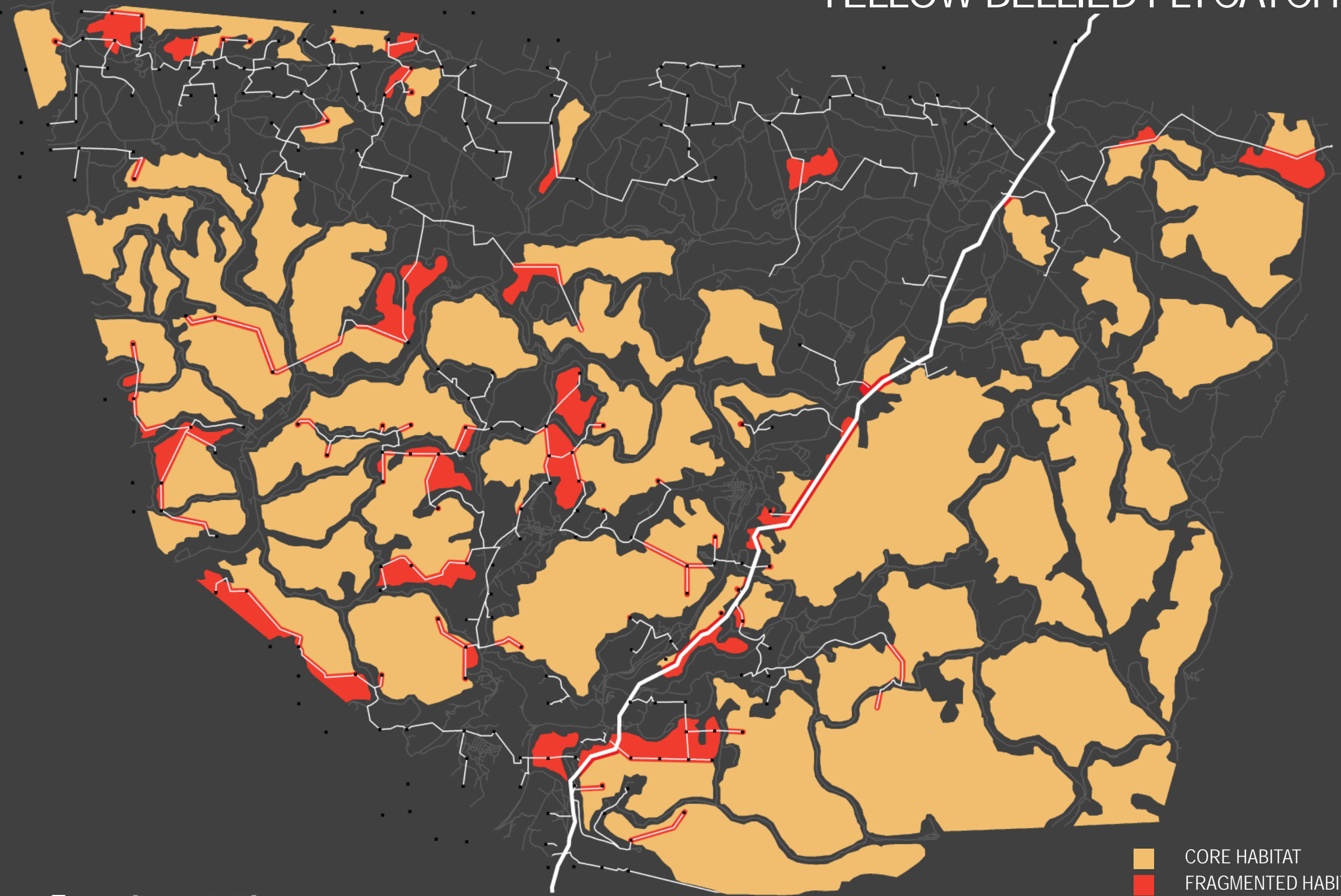
[DISTURBED CONDITIONS - MARKET BASED]

[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
CORE DECIDUOUS & CONIFEROUS FOREST / FOUND IN THICKETS

[FOOD]
INSECTS / ANTHROPODS / FRUIT



- CORE HABITAT
- FRAGMENTED HABITAT
- ROAD
- PIPELINE
- TNC WELL LOCATION

AMERICAN BITTERN

[CURRENT CONDITIONS]

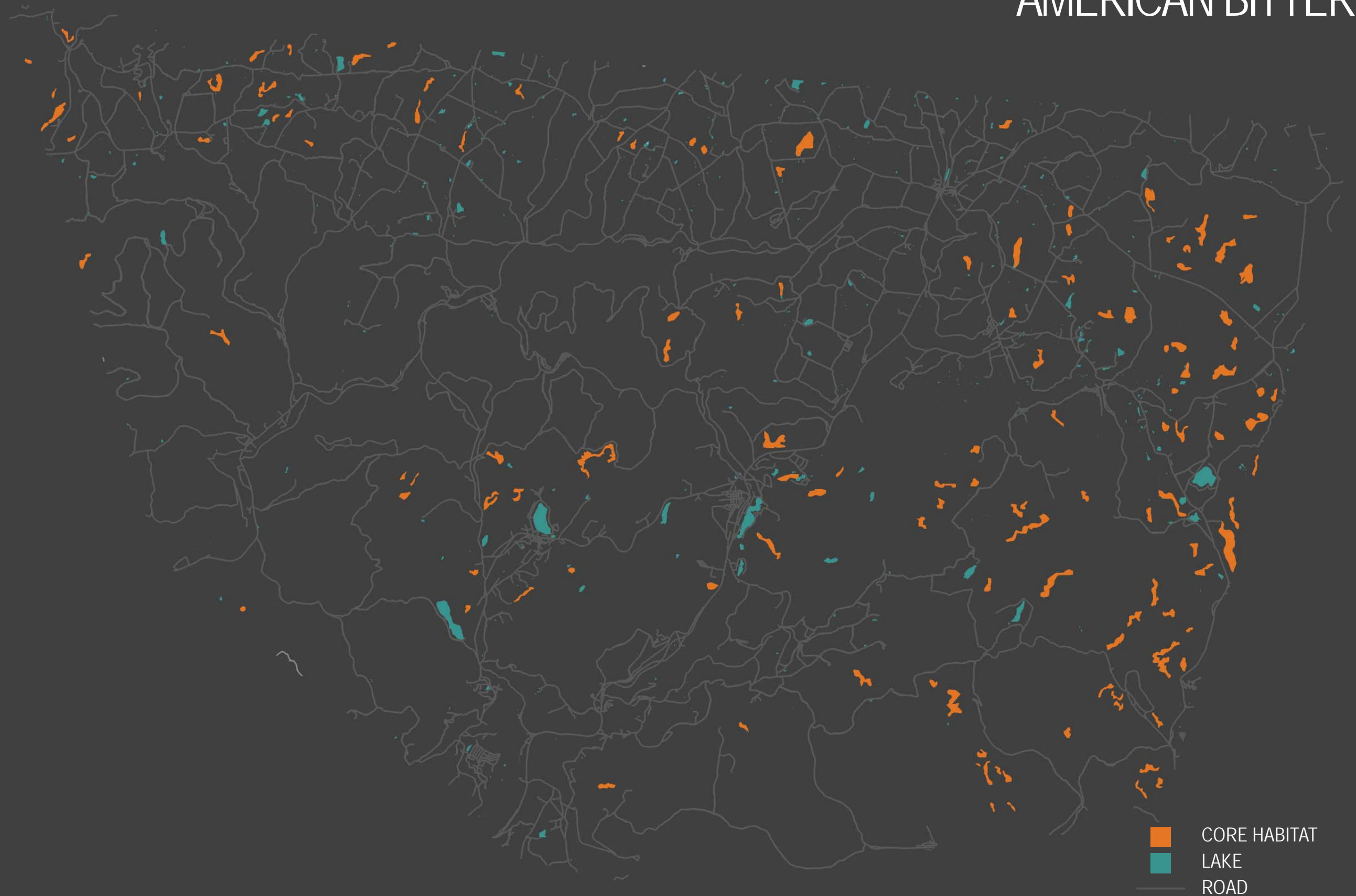
[DISTURBED CONDITIONS - MARKET BASED]

[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
FORESTED FRESH WATER WETLANDS

[FOOD]
INSECTS / FISH / CRUSTACEANS / AMPHIBIANS / REPTILES



[CURRENT CONDITIONS]

[DISTURBED CONDITIONS - MARKET BASED]

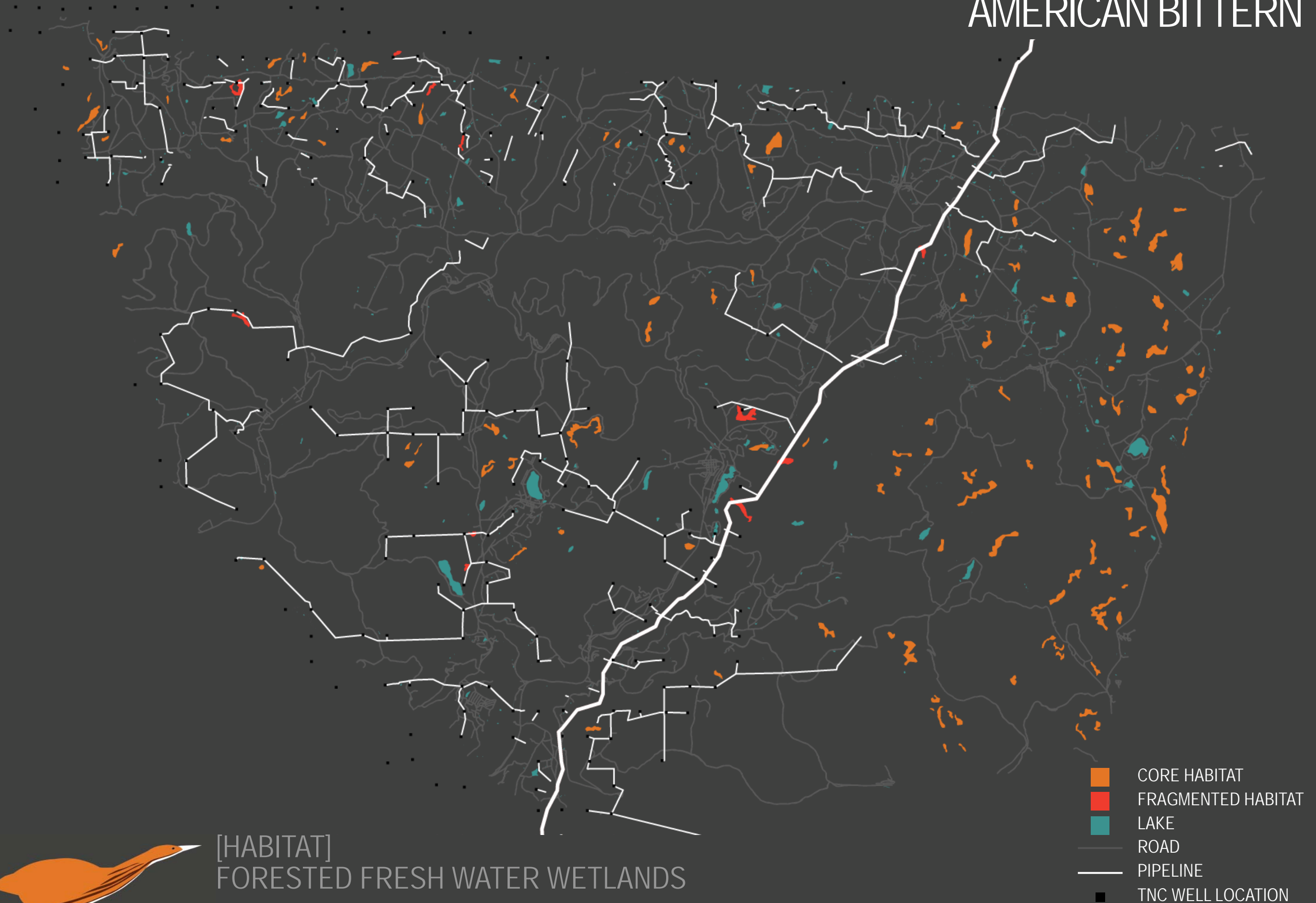
[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
FORESTED FRESH WATER WETLANDS

[FOOD]
INSECTS / FISH / CRUSTACEANS / AMPHIBIANS / REPTILES

AMERICAN BITTERN



[CURRENT CONDITIONS]

[DISTURBED CONDITIONS - MARKET BASED]

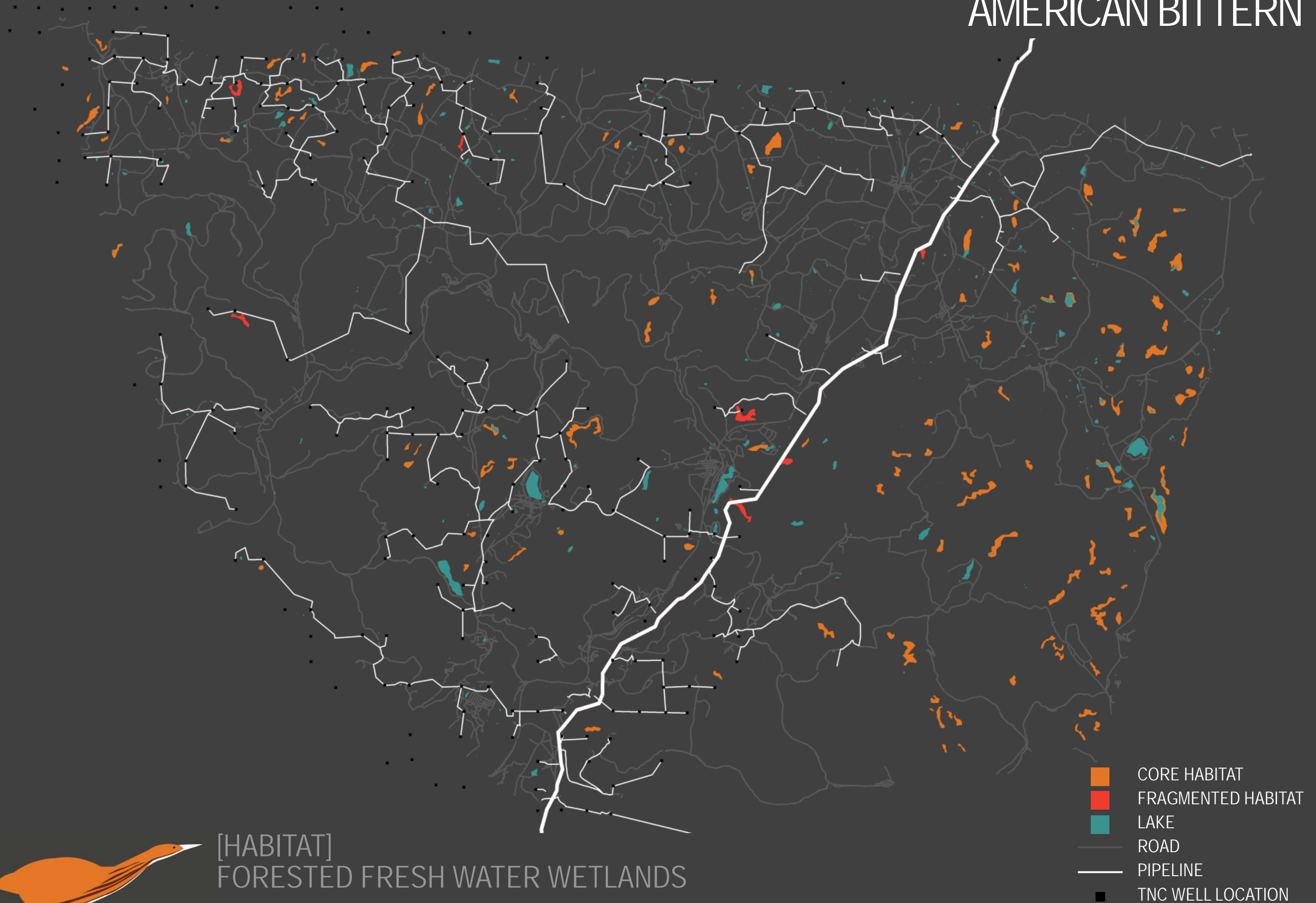
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[HABITAT]
FORESTED FRESH WATER WETLANDS

[FOOD]
INSECTS / FISH / CRUSTACEANS / AMPHIBIANS / REPTILES

AMERICAN BITTERN



BLACK-THROATED GREEN WARBLER

[CURRENT CONDITIONS]

[DISTURBED CONDITIONS - MARKET BASED]

[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
CONIFEROUS FOREST / TRANSITIONAL FOREST

[FOOD]
INSECTS / INSECT LARVAE



BLACK-THROATED GREEN WARBLER

[CURRENT CONDITIONS]

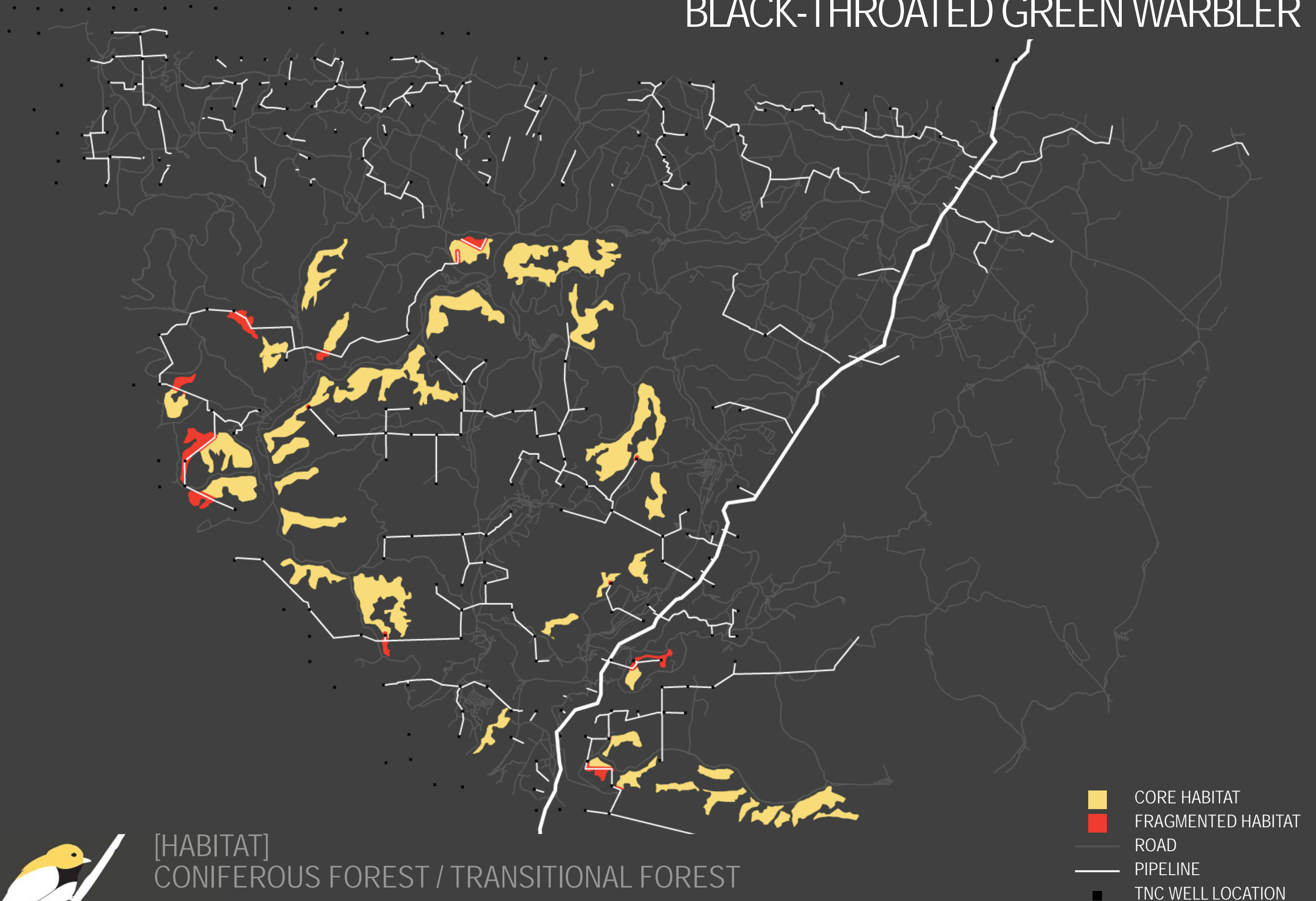
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[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
CONIFEROUS FOREST / TRANSITIONAL FOREST

[FOOD]
INSECTS / INSECT LARVAE



BLACK-THROATED GREEN WARBLER

[CURRENT CONDITIONS]

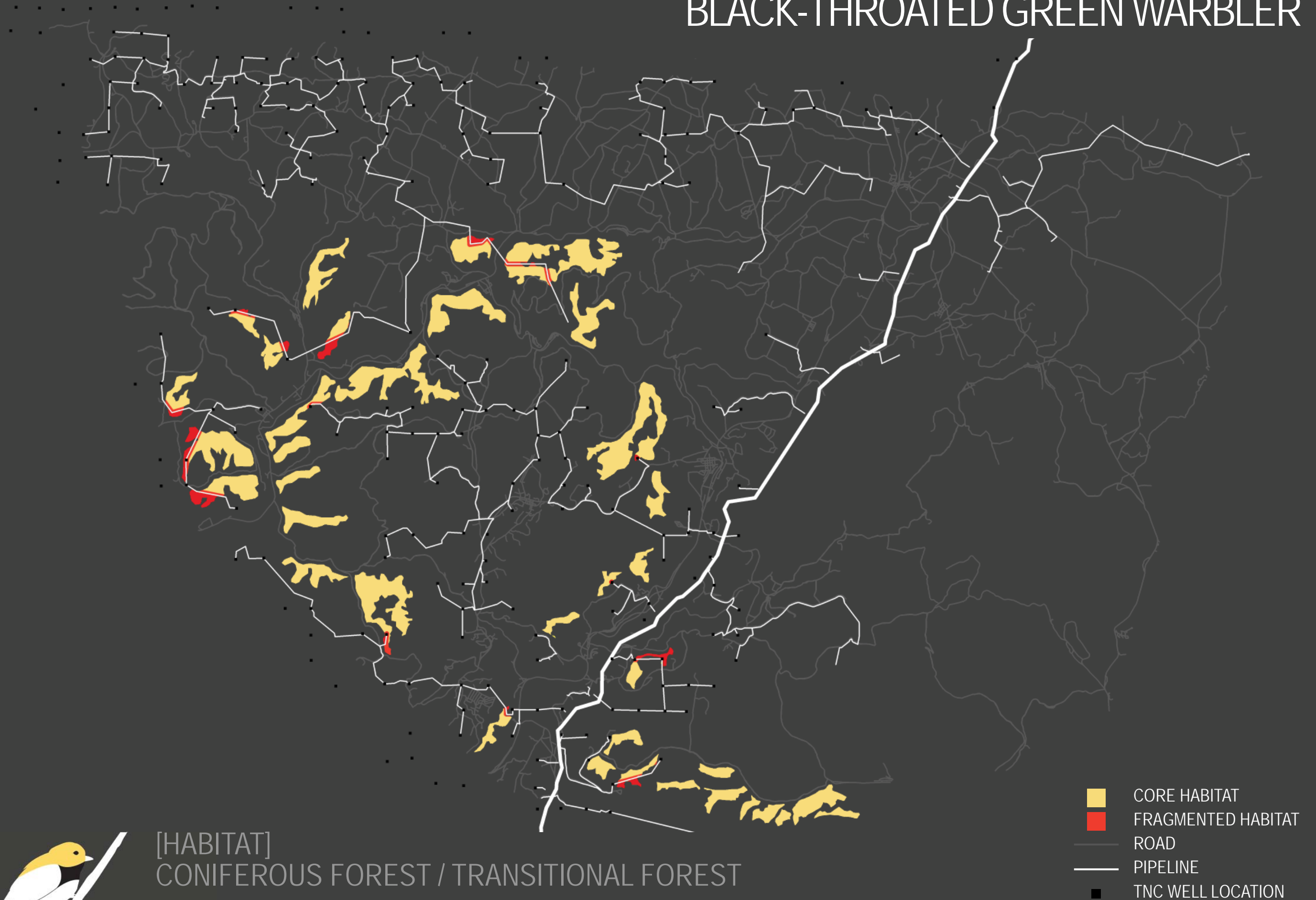
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[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
CONIFEROUS FOREST / TRANSITIONAL FOREST

[FOOD]
INSECTS / INSECT LARVAE



CHIPPING SPARROW

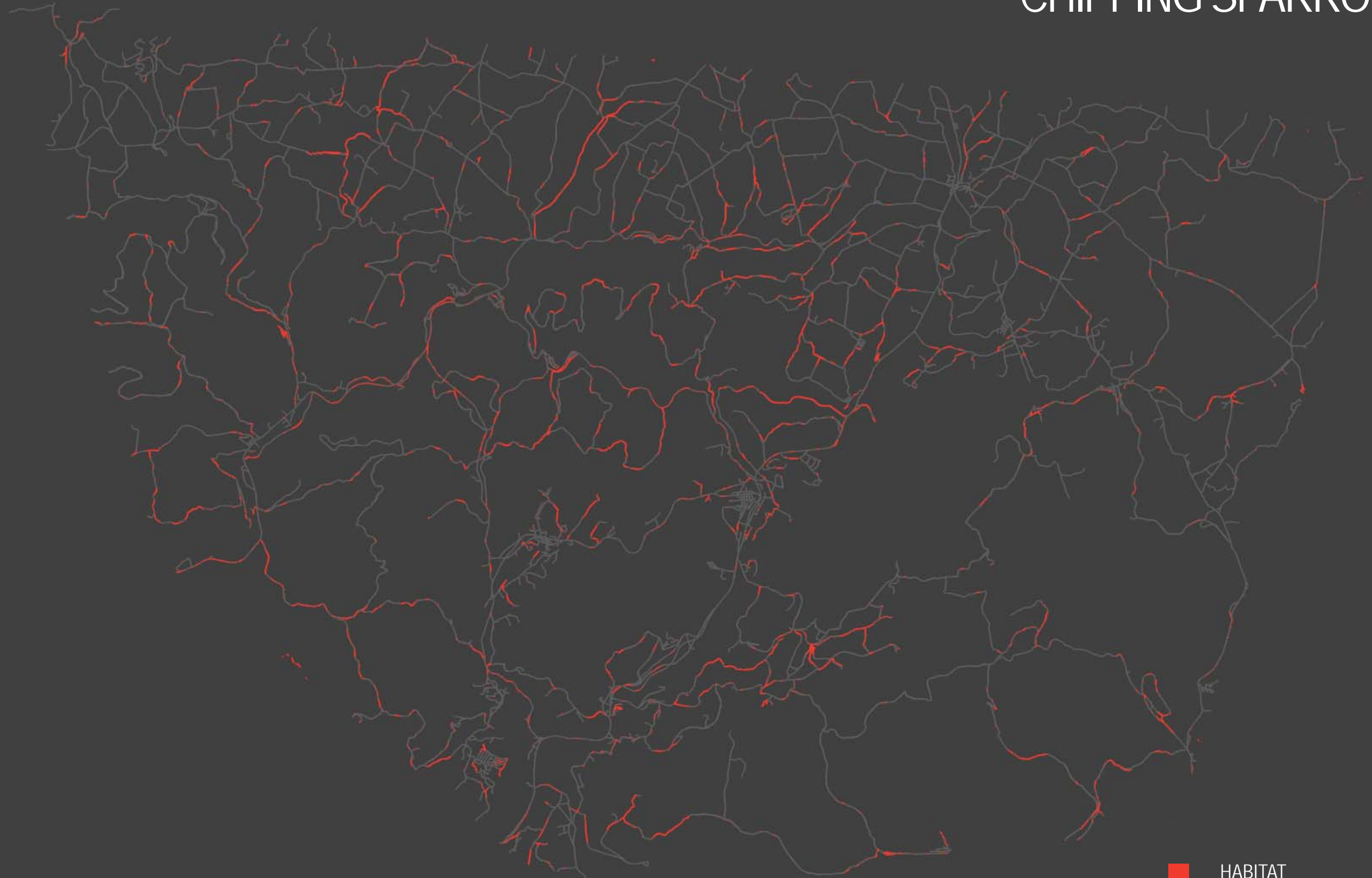
[CURRENT CONDITIONS]

[DISTURBED CONDITIONS - MARKET BASED]

[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
CONIFEROUS FOREST EDGES
[FOOD]
SEEDS / GRASSES / HERBS / INSECTS



■ HABITAT
— ROAD

CHIPPING SPARROW

[CURRENT CONDITIONS]

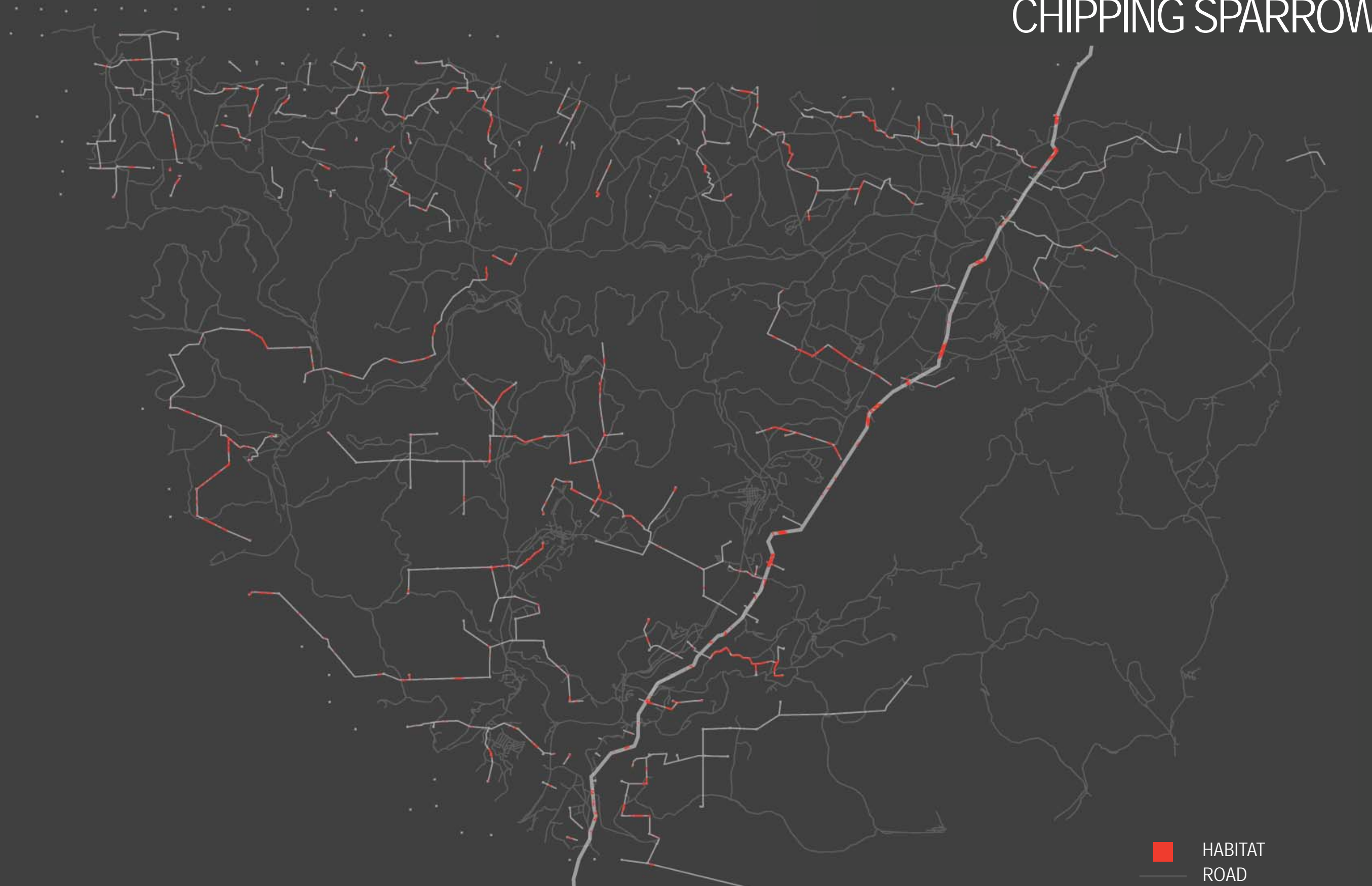
[DISTURBED CONDITIONS - MARKET BASED]





[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
CONIFEROUS FOREST EDGES

[FOOD]
SEEDS / GRASSES / HERBS / INSECTS



-  HABITAT
-  ROAD
-  PIPELINE
-  TNC WELL LOCATION

CHIPPING SPARROW

[CURRENT CONDITIONS]

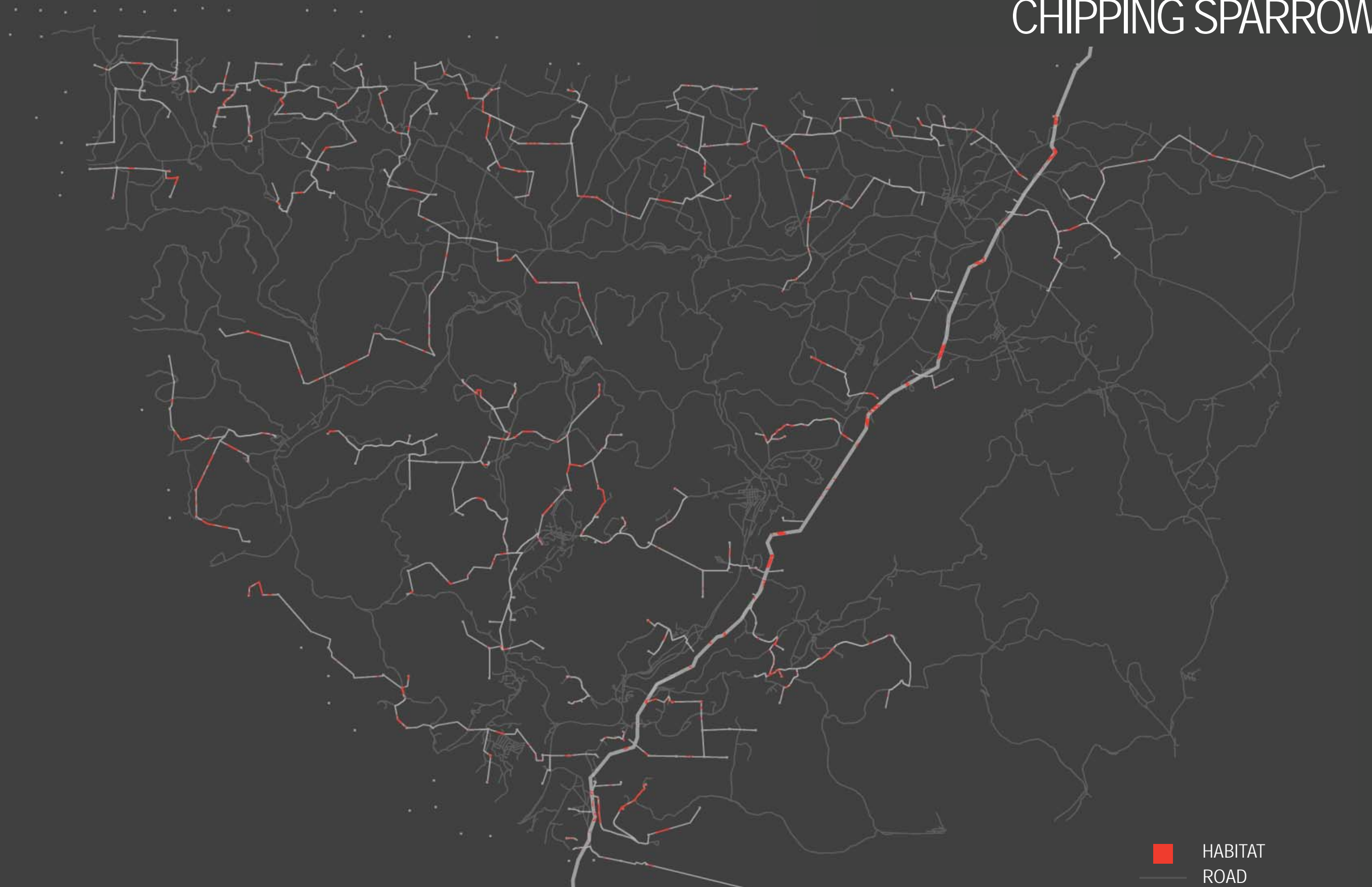
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


[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
CONIFEROUS FOREST EDGES

[FOOD]
SEEDS / GRASSES / HERBS / INSECTS



-  HABITAT
-  ROAD
-  PIPELINE
-  TNC WELL LOCATION

CHIPPING SPARROW

[CURRENT CONDITIONS]

[DISTURBED CONDITIONS - MARKET BASED]





[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
CONIFEROUS FOREST EDGES

[FOOD]
SEEDS / GRASSES / HERBS / INSECTS



-  HABITAT
-  ROAD
-  PIPELINE
-  TNC WELL LOCATION

CHIPPING SPARROW

[CURRENT CONDITIONS]

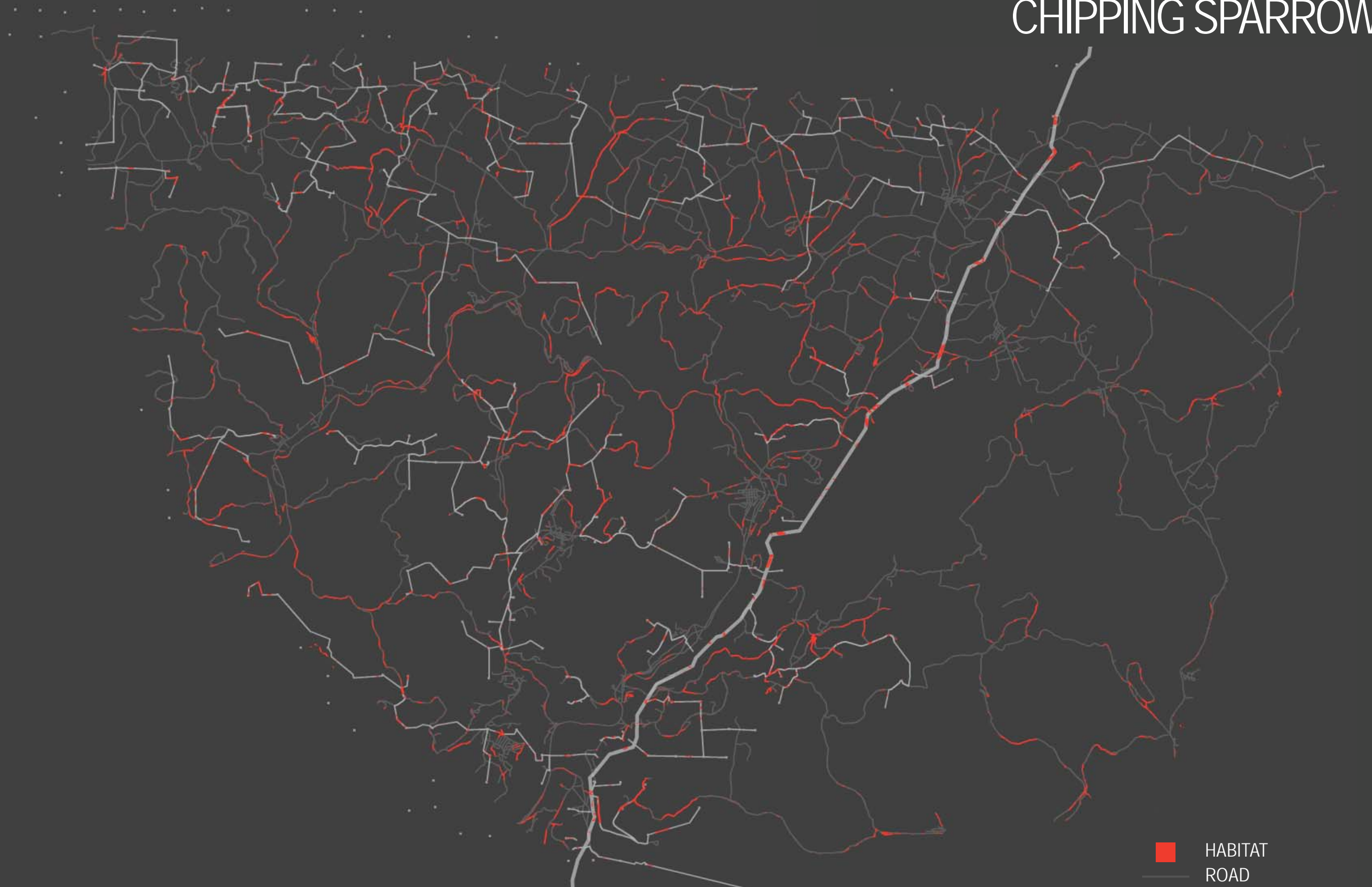
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


[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
CONIFEROUS FOREST EDGES

[FOOD]
SEEDS / GRASSES / HERBS / INSECTS



-  HABITAT
-  ROAD
-  PIPELINE
-  TNC WELL LOCATION

[CURRENT CONDITIONS]

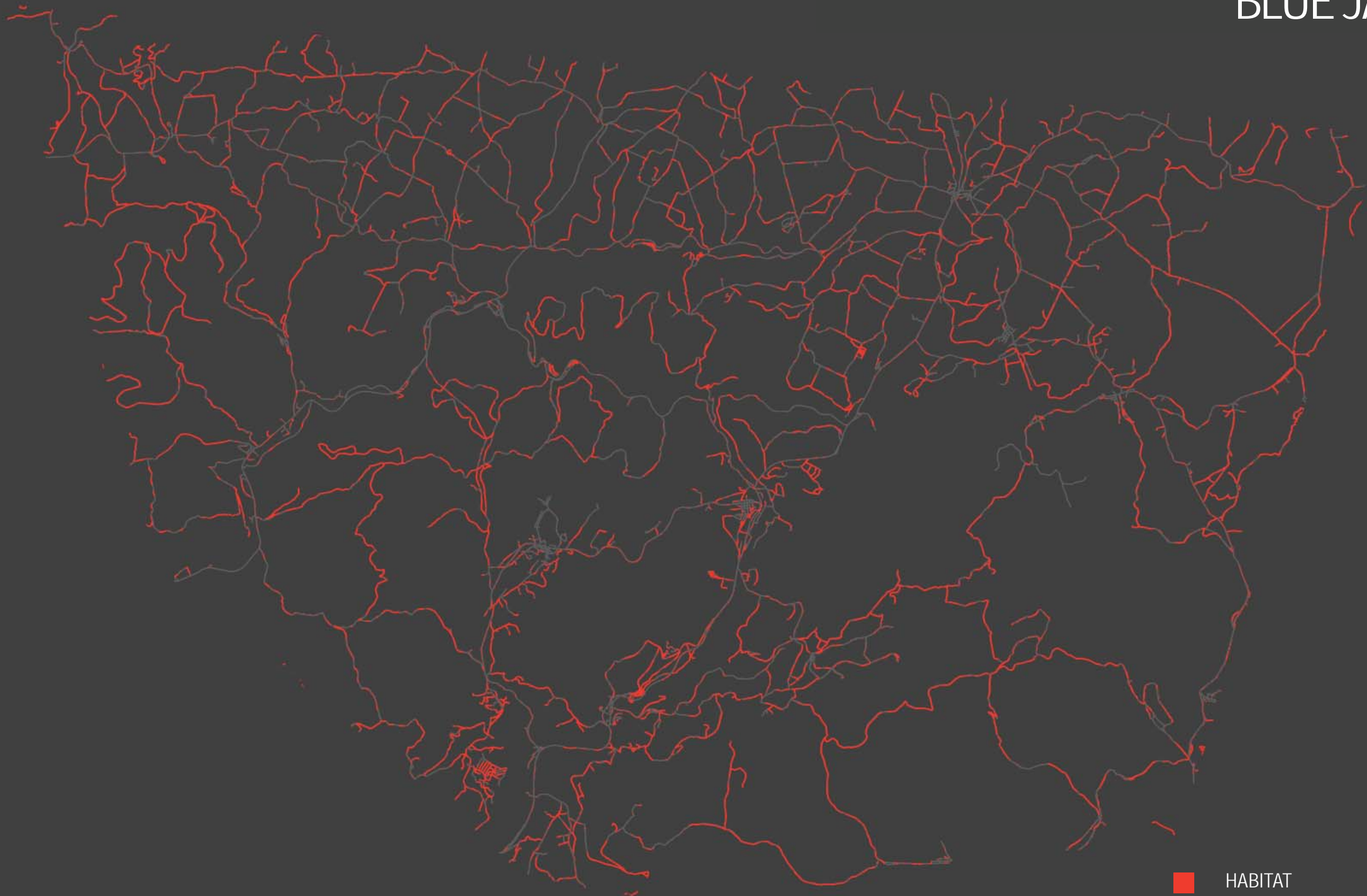
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
[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
DECIDUOUS FOREST EDGES / URBAN AREAS

[FOOD]
INSECTS / NUTS / SEEDS / OTHER BIRD SPECIES EGGS



 HABITAT
 ROAD

[CURRENT CONDITIONS]

[DISTURBED CONDITIONS - MARKET BASED]

[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
DECIDUOUS FOREST EDGES / URBAN AREAS

[FOOD]
INSECTS / NUTS / SEEDS / OTHER BIRD SPECIES EGGS



- HABITAT
- ROAD
- PIPELINE
- TNC WELL LOCATION

[CURRENT CONDITIONS]

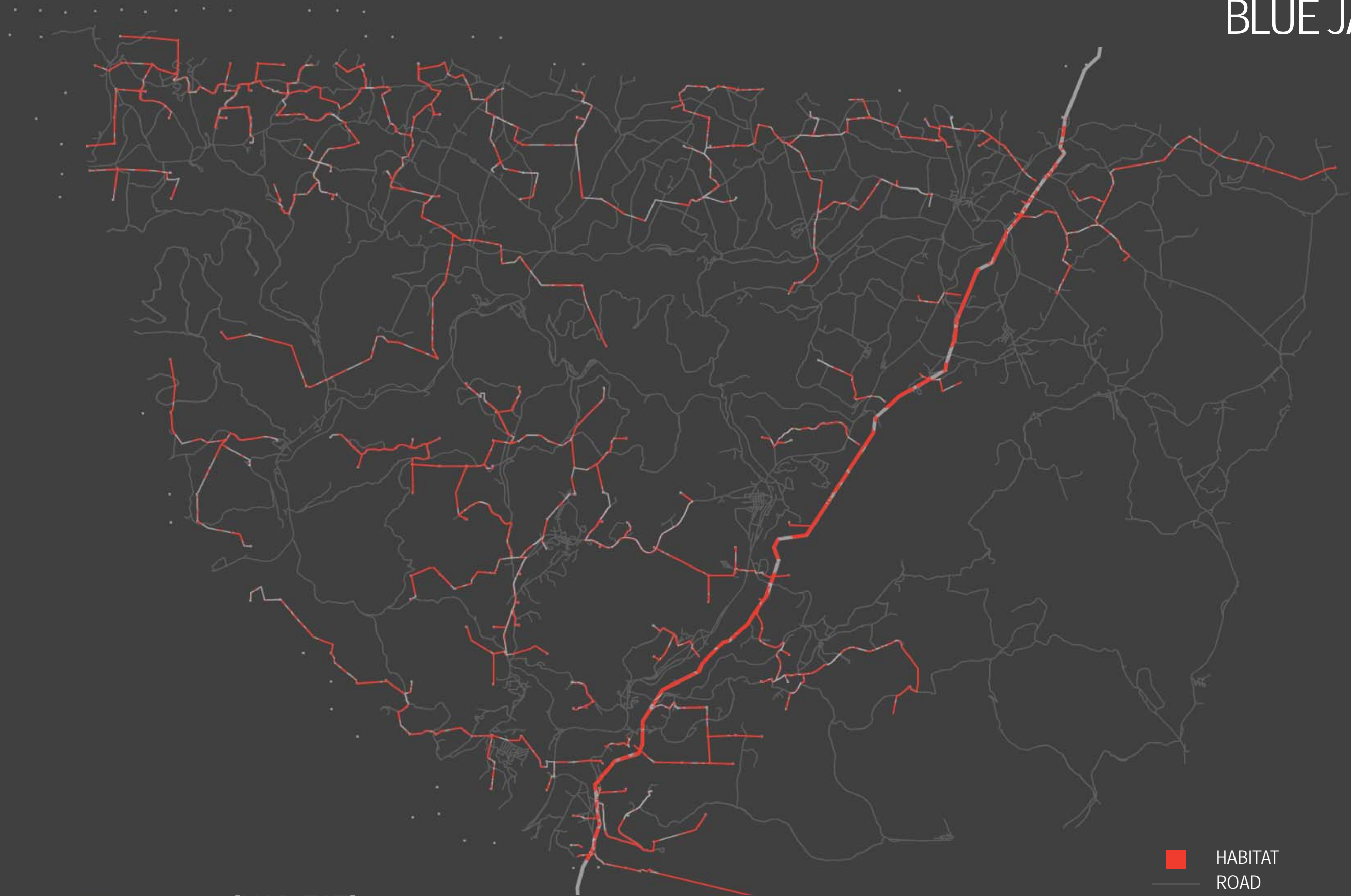
[DISTURBED CONDITIONS - MARKET BASED]





[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
DECIDUOUS FOREST EDGES / URBAN AREAS

[FOOD]
INSECTS / NUTS / SEEDS / OTHER BIRD SPECIES EGGS



-  HABITAT
-  ROAD
-  PIPELINE
-  TNC WELL LOCATION

[CURRENT CONDITIONS]

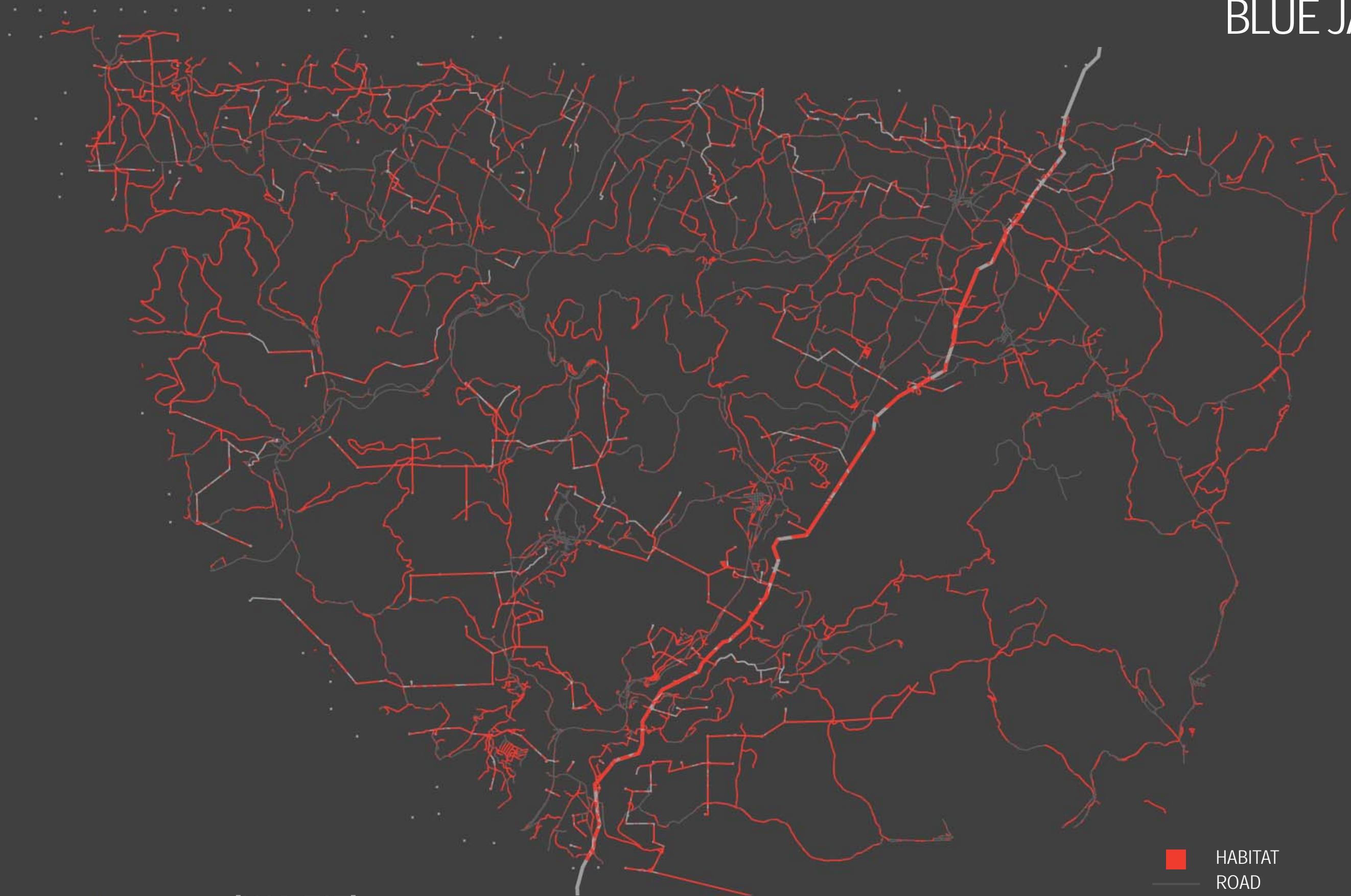
[DISTURBED CONDITIONS - MARKET BASED]

[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
DECIDUOUS FOREST EDGES / URBAN AREAS

[FOOD]
INSECTS / NUTS / SEEDS / OTHER BIRD SPECIES EGGS



- HABITAT
- ROAD
- PIPELINE
- TNC WELL LOCATION

[CURRENT CONDITIONS]

[DISTURBED CONDITIONS - MARKET BASED]

[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
DECIDUOUS FOREST EDGES / URBAN AREAS

[FOOD]
INSECTS / NUTS / SEEDS / OTHER BIRD SPECIES EGGS



- HABITAT
- ROAD
- PIPELINE
- TNC WELL LOCATION

GOLDEN-WINGED WARBLER

[CURRENT CONDITIONS]

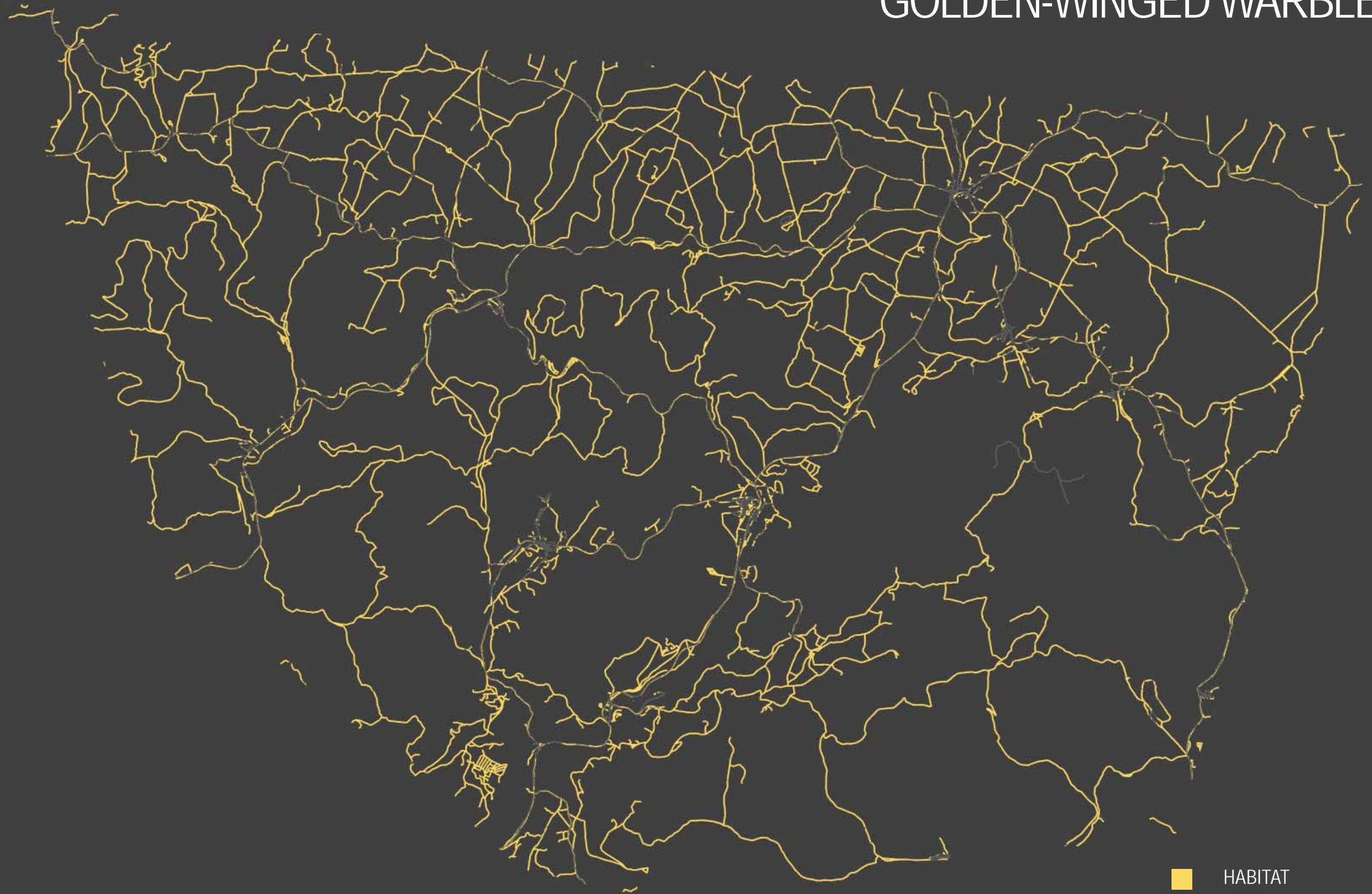
[DISTURBED CONDITIONS - MARKET BASED]

[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
SUCCESSIONAL FORESTS / CLEARCUTS / ABANDONED FARMS

[FOOD]
INSECTS / SPIDERS



■ HABITAT
— ROAD

GOLDEN-WINGED WARBLER

[CURRENT CONDITIONS]





[DISTURBED CONDITIONS - MARKET BASED]

[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
SUCCESSIONAL FORESTS / CLEARCUTS / ABANDONED FARMS

[FOOD]
INSECTS / SPIDERS

-  HABITAT
-  ROAD
-  PIPELINE
-  TNC WELL LOCATION

GOLDEN-WINGED WARBLER

[CURRENT CONDITIONS]





[DISTURBED CONDITIONS - MARKET BASED]

[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
SUCCESSIONAL FORESTS / CLEARCUTS / ABANDONED FARMS

[FOOD]
INSECTS / SPIDERS

-  HABITAT
-  ROAD
-  PIPELINE
-  TNC WELL LOCATION

GOLDEN-WINGED WARBLER

[CURRENT CONDITIONS]





[DISTURBED CONDITIONS - MARKET BASED]

[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
SUCCESSIONAL FORESTS / CLEARCUTS / ABANDONED FARMS

[FOOD]
INSECTS / SPIDERS

-  HABITAT
-  ROAD
-  PIPELINE
-  TNC WELL LOCATION

GOLDEN-WINGED WARBLER

[CURRENT CONDITIONS]





[DISTURBED CONDITIONS - MARKET BASED]

[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
SUCCESSIONAL FORESTS / CLEARCUTS / ABANDONED FARMS

[FOOD]
INSECTS / SPIDERS

-  HABITAT
-  ROAD
-  PIPELINE
-  TNC WELL LOCATION

[CURRENT CONDITIONS]

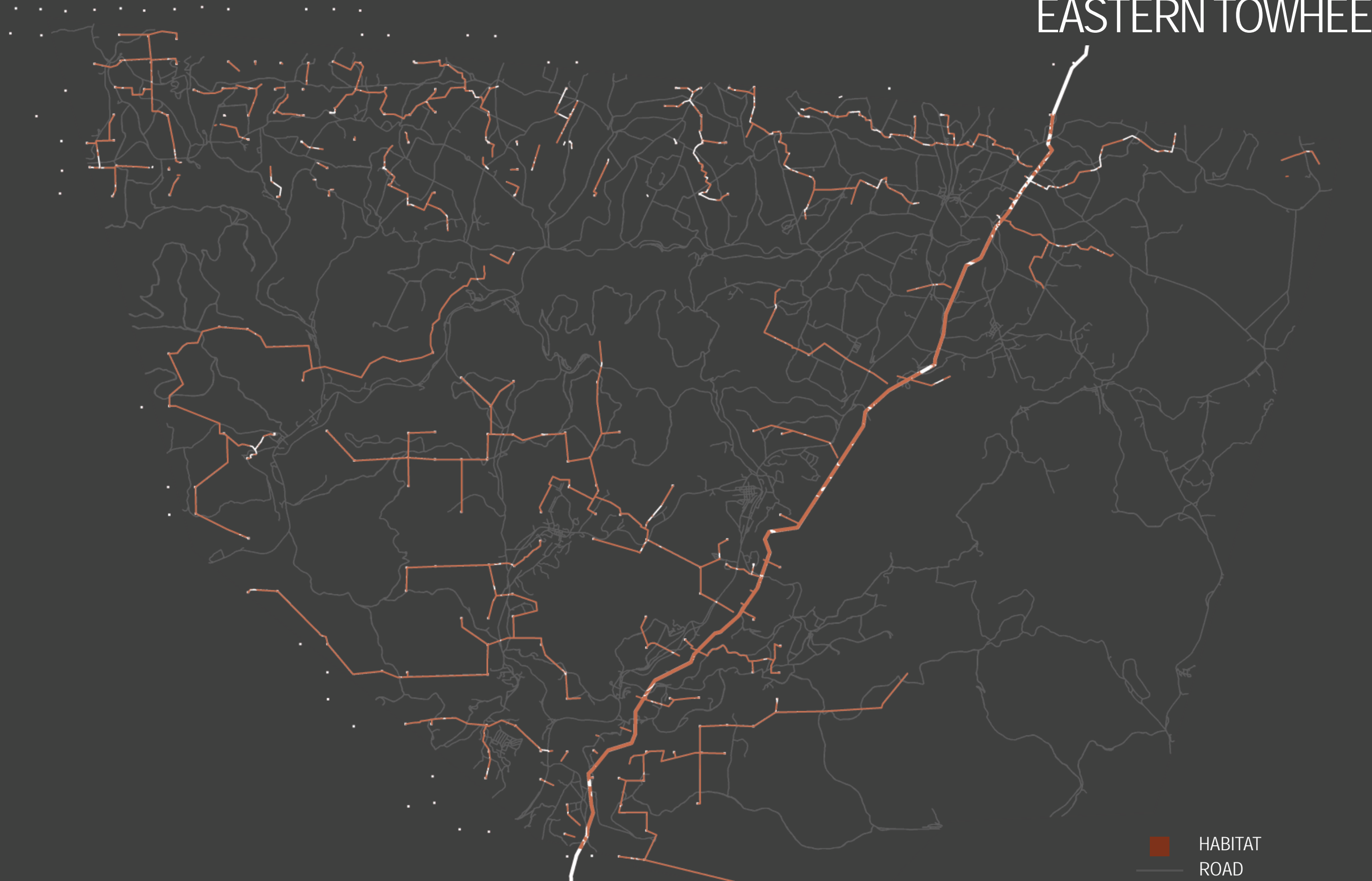
[DISTURBED CONDITIONS - MARKET BASED]

[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
FOREST EDGES / DENSE SHRUB
[FOOD]
SEEDS / INSECTS / FRUITS

EASTERN TOWHEE



- HABITAT
- ROAD
- PIPELINE
- TNC WELL LOCATION

[CURRENT CONDITIONS]

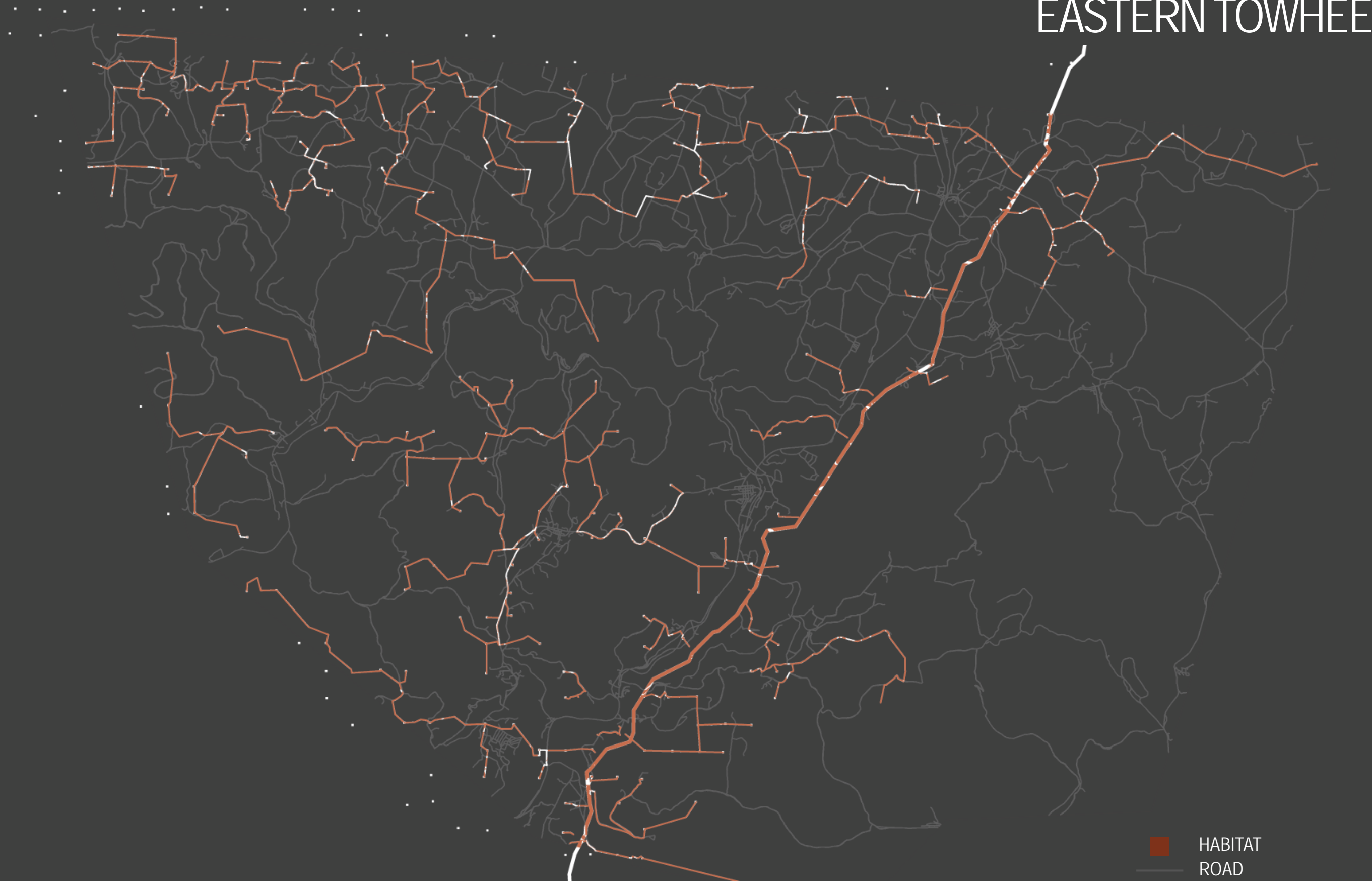
[DISTURBED CONDITIONS - MARKET BASED]





[DISTURBED CONDITIONS - CONSERVATION BASED]



[HABITAT]
FOREST EDGES / DENSE SHRUB
[FOOD]
SEEDS / INSECTS / FRUITS

EASTERN TOWHEE



-  HABITAT
-  ROAD
-  PIPELINE
-  TNC WELL LOCATION

YELLOW-BELLIED FLYCATCHER

[HABITAT LOSS]

125,350

CURRENT ACRES

35,870

MARKET BASED LOSS

32,461

CONSERVATION BASED LOSS

AMERICAN BITTERN

2,910

CURRENT ACRES

667

MARKET BASED LOSS

593

CONSERVATION BASED LOSS

BLACK-THROATED GREEN WARBLER

10,490

CURRENT ACRES

2,036

MARKET BASED LOSS

1,845

CONSERVATION BASED LOSS 31

YELLOW-BELLIED FLYCATCHER

[HABITAT LOSS]

125,350

CURRENT ACRES

28%

MARKET BASED LOSS



26%

CONSERVATION BASED LOSS

AMERICAN BITTERN

2,910

CURRENT ACRES

23%

MARKET BASED LOSS



20%

CONSERVATION BASED LOSS

BLACK-THROATED GREEN WARBLER

10,490

CURRENT ACRES

19%

MARKET BASED LOSS



17%

CONSERVATION BASED LOSS

CHIPPING SPARROW

3,460

CURRENT ACRES

917

MARKET BASED GAIN

[HABITAT INCREASE]

987

CONSERVATION BASED GAIN

BLUE JAY

11,305

CURRENT ACRES

4,214

MARKET BASED GAIN

4,678

CONSERVATION BASED GAIN

GOLDEN-WINGED WARBLER

17,533

CURRENT ACRES

5,783

MARKET BASED GAIN

6,580

CONSERVATION BASED GAIN

EASTERN TOWHEE

15,428

CURRENT ACRES

5,298

MARKET BASED GAIN

5,827

CONSERVATION BASED GAIN

CHIPPING SPARROW

3,460

CURRENT ACRES

27%

MARKET BASED GAIN

[HABITAT INCREASE]

29% ↑

CONSERVATION BASED GAIN

BLUE JAY

11,305

CURRENT ACRES

37%

MARKET BASED GAIN

41% ↑

CONSERVATION BASED GAIN

GOLDEN-WINGED WARBLER

17,533

CURRENT ACRES

33%

MARKET BASED GAIN

38% ↑

CONSERVATION BASED GAIN

EASTERN TOWHEE

15,428

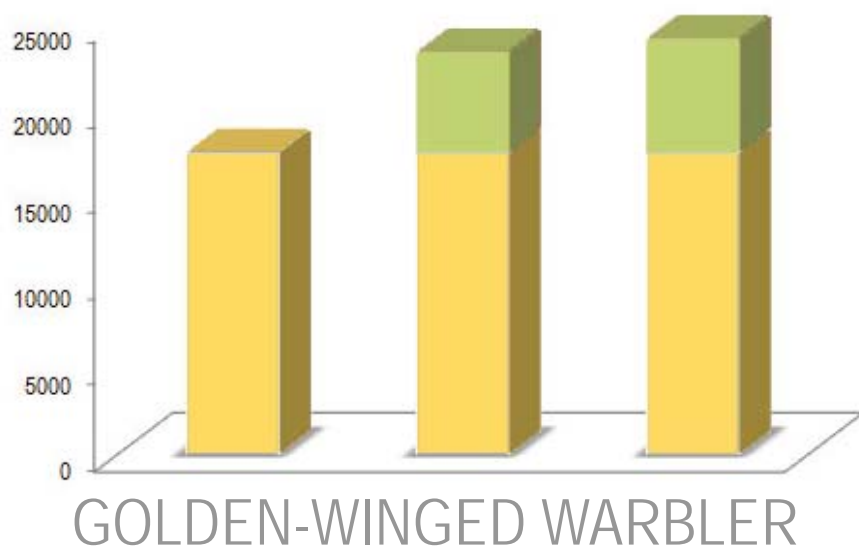
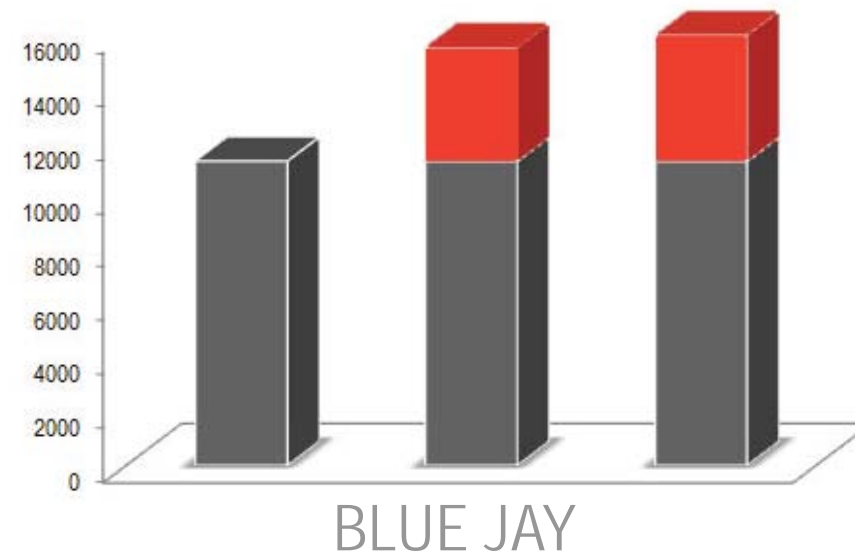
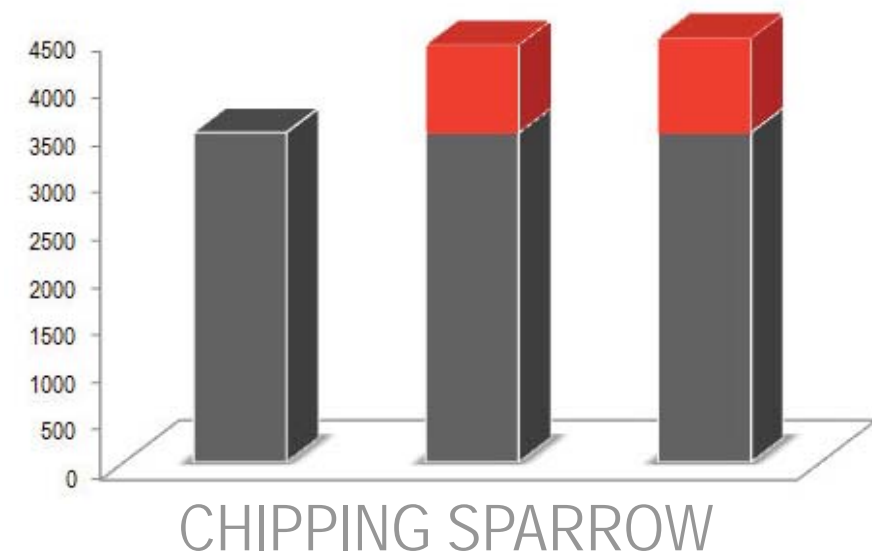
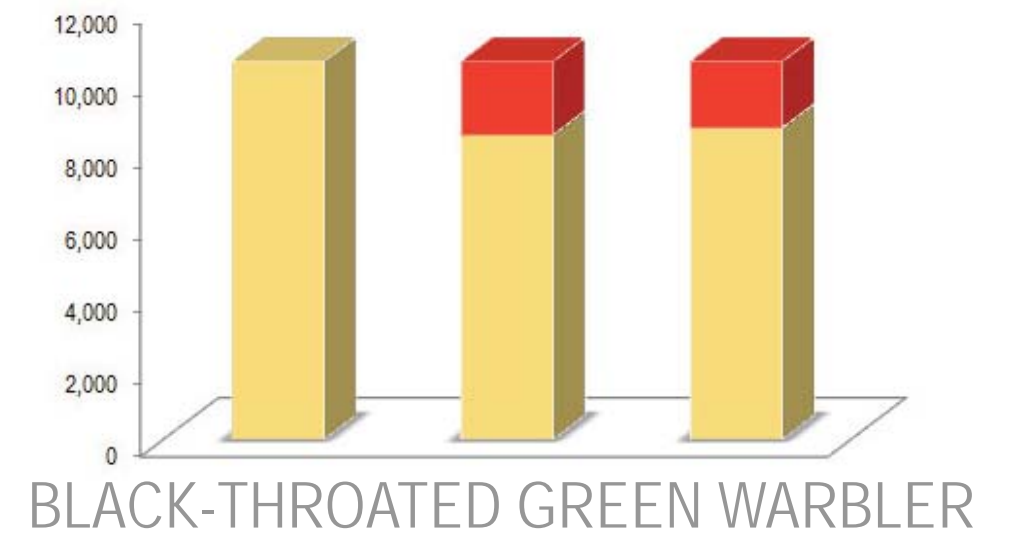
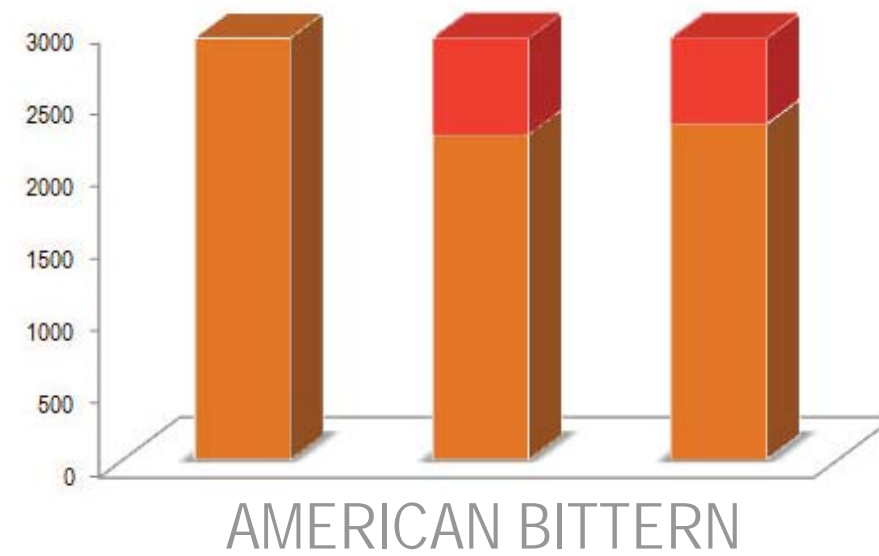
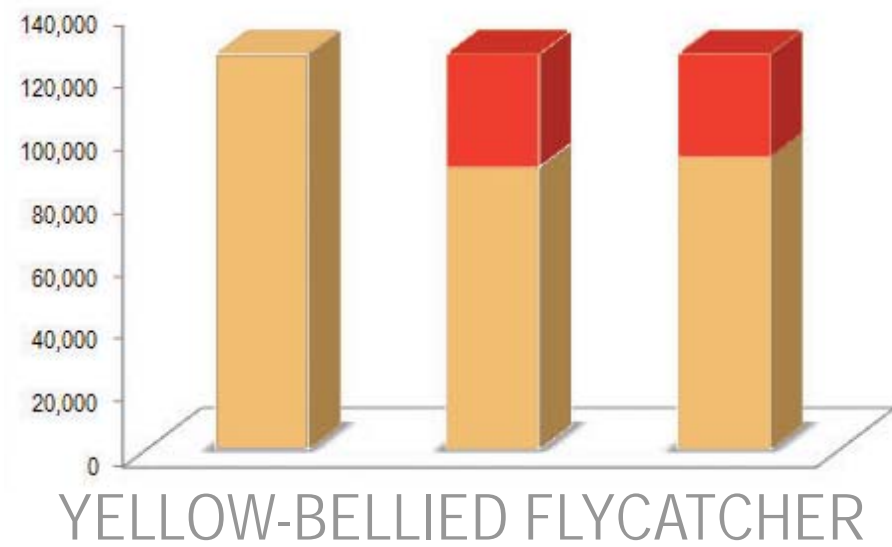
CURRENT ACRES

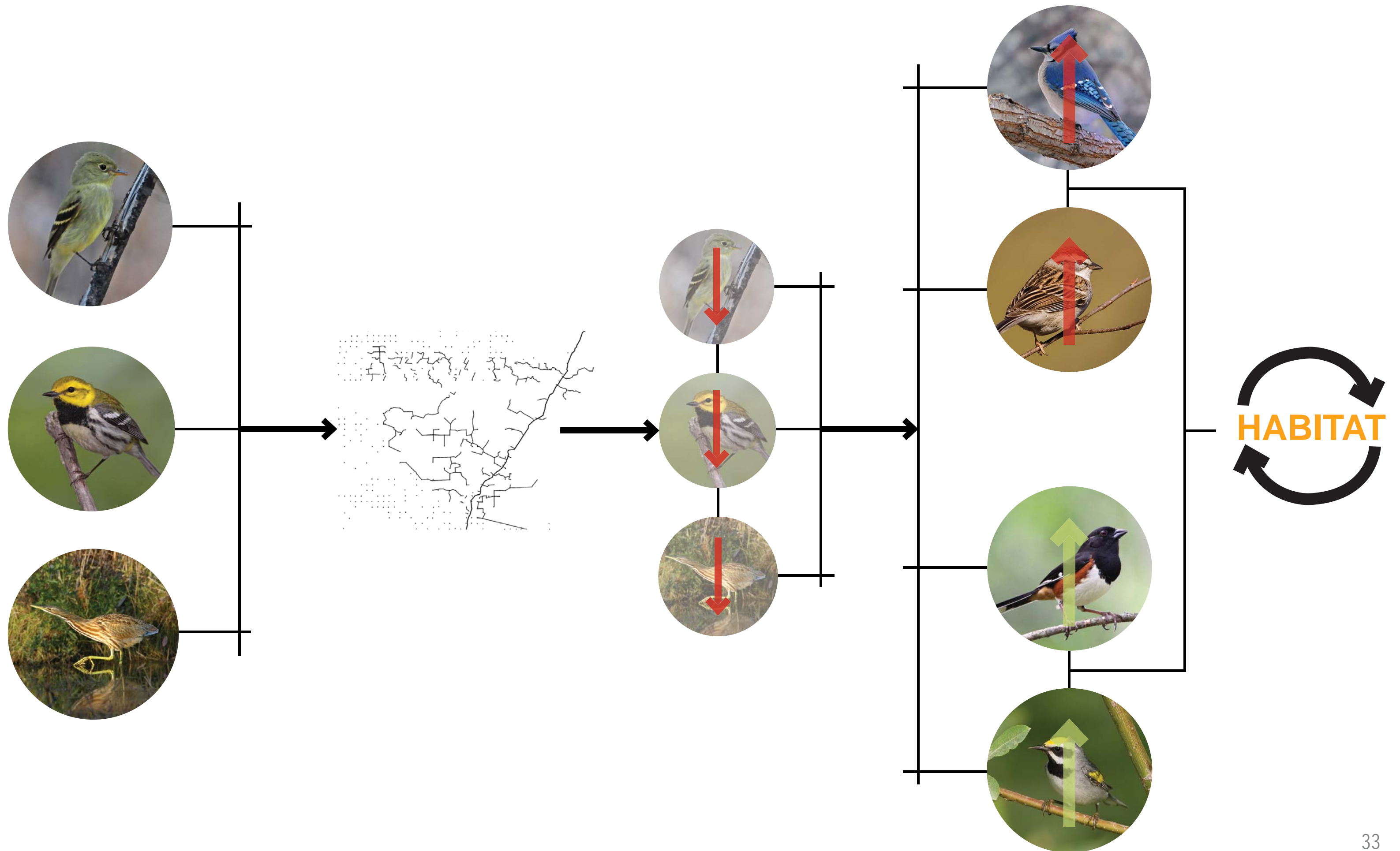
34%

MARKET BASED GAIN

38% ↑

CONSERVATION BASED GAIN





[IMPLICATIONS]

So what does all this mean for Sullivan County and the avian species that reside there? As the current conditions of Sullivan County already show, the core forest habitats are already heavily fragmented in the northern portion because of human development. With the introduction of natural gas development into the western southern portion of the county, we will see more fragmentation of core habitats with the development of edge conditions ideal for invasive bird species such as the Blue Jay and Chipping Sparrow. With proper ecological management of the pipeline right-of-ways, ideal habitats for invasive bird species that will benefit the ecosystem can thrive.

As seen in the final acreage of the 7 bird habitats, the differences in the market based pipelines and the conservation based pipelines are extremely minimal. It shows that even when ecological preferences are taken into account, many of the factors for bird habitats can be disturbed. It becomes inevitable for the avian species of Sullivan County to become fragmented in some aspect, but in many cases the amount of disturbed habitats are minimal and overall inconsequential in the larger picture of Pennsylvania bird habitats.

The word fragmentation is a word that is synonymous with bad and detrimental. Yet as this project shows, though habitat is lost for key species, many bird species are able to thrive with the created edge conditions. With the loss of habitat is the creation of new habitat, forming a continuous circle of new habitats that will forever be changing based on human conditions. As humans change and evolve over time, so too does the landscape that they inhabit. The evolution of bird species to adapt and survive changing landscapes has enabled them to thrive in today's fragmented society.



YELLOW-BELLIED FLYCATCHER *Empidonax flaviventris*

The easiest eastern Empidonax to identify, the Yellow-bellied Flycatcher is a bird of the boreal forests and bogs. Its yellow underparts distinguish it from the other eastern Empidonax

HABITAT



During migration they are found in thickets or the understory of deciduous, mixed, or coniferous woodlands.

Breeds in boreal coniferous forests and peatlands.

Nests in cool, moist forests, bogs, swamps, and muskegs.

Winters: forests to semi-open habitats. Most common in dense rain forest, montane evergreen forest, pine-oak forest, and shaded coffee plantations.

FOOD



Insects and arthropods

Occasionally takes fruit

BEHAVIOR



Flight song given at predawn or dusk.

Catches flying insects in mid-air, or gleans them from foliage

BREEDING

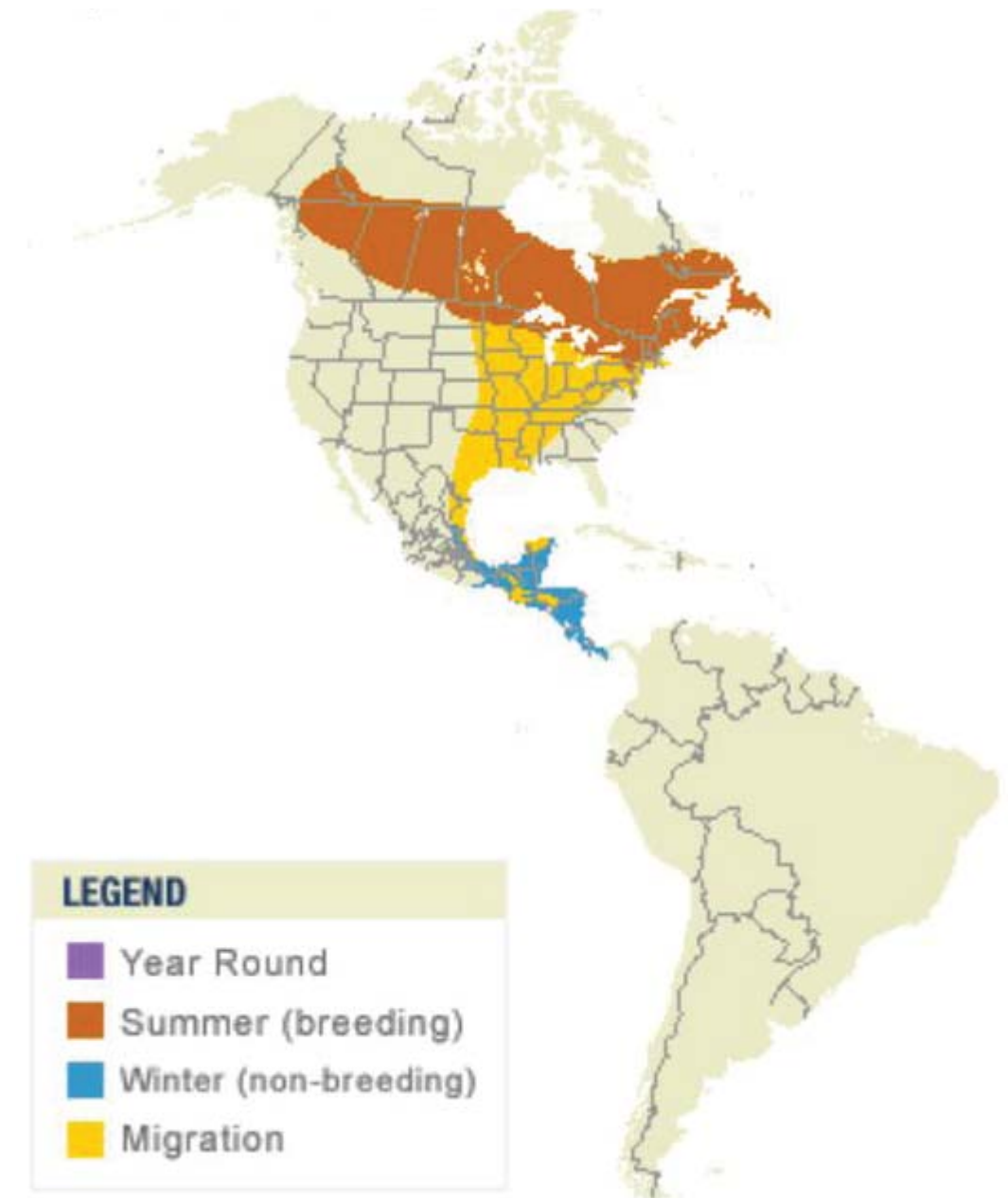


Breeding habitat is at elevations above 1700ft in poorly drained areas such as bogs or open swamps

Nest built on or near ground, well covered with hanging vegetation.

Nest made mostly of moss, lined with rootlets, pine needles, or grass stems

RANGE MAP



LEGEND

- Year Round
- Summer (breeding)
- Winter (non-breeding)
- Migration

Map by Cornell Lab of Ornithology
Range data by NatureServe



AMERICAN BITTERN *Botaurus lentiginosus*

A stocky and well-camouflaged heron of dense reed beds, the American Bittern is difficult to see. Its far-carrying booming call is distinctive, but the bittern itself likes to keep under cover.

HABITAT



Wetlands of many sizes and types, typically less densely vegetated and shallow

Breed in freshwater marshes with tall vegetation

Winter: they move to areas where water bodies don't freeze, especially near the coast, where they may occasionally use brackish marshes

FOOD



Prey upon insect, fish, crustaceans, amphibians, reptiles, and small mammals

Preferred insects include dragonflies, water striders, water beetles, and grasshoppers

Frequently consumed fish are eels, catfish, pickerel, sunfish, suckers, perch, killifish, and sticklebacks

BEHAVIOR



Almost always solitary and can be difficult to see

Often hide among wetland vegetation, walking slowly as they forage

Typically hunt in low light, catching food with their bill and killing prey with biting or shaking movements

Flight is stiff and fairly clumsy with rapid wingbeats

BREEDING

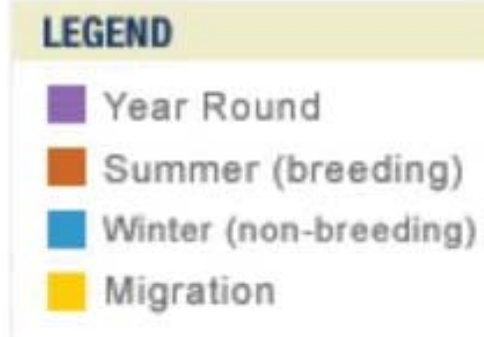
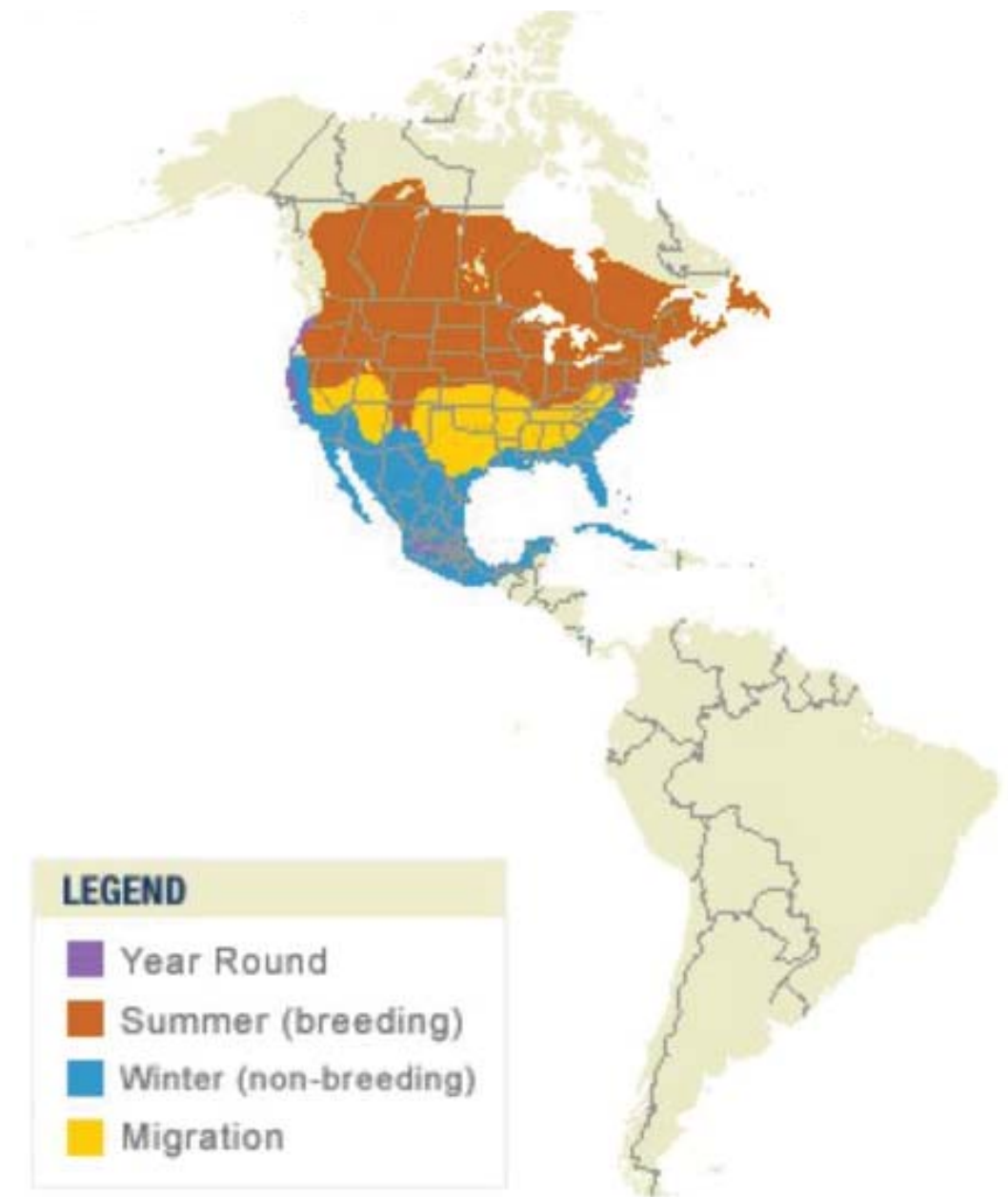


Typically sits 3-8 inches above the water

The nest is made of a foundation of emergent vegetation like reeds, sedges, or cattails

Build nests in an area of thick vegetation emerging from shallow water, such as cattails, bulrushes, and sedges

RANGE MAP



Map by Cornell Lab of Ornithology
Range data by NatureServe



BLACK-THROATED GREEN WARBLER *Dendroica virens*

An abundant breeder of the northeastern coniferous forests, the Black-throated Green Warbler is easy to recognize by sight and sound. Its dark black bib and bright yellow face are unique amongst Eastern birds, and its persistent song of "zoo-zee, zoo-zoo-zee" is easy to remember.

HABITAT



Boreal coniferous forest and transitional coniferous-deciduous forest

FOOD



Insects and insect larvae

BEHAVIOR



Gleans from small branches; sometimes hovers and picks prey from leaves and branches

Male sings persistently during the breeding season - one individual was observed singing 466 songs in one hour

BREEDING



Typically located at a fork in tree branches, one to three meters (three to ten feet) from the ground

An open cup of twigs, grass, bark, and spider silk, lined with moss, hair, and feathers

RANGE MAP



LEGEND

- Year Round
- Summer (breeding)
- Winter (non-breeding)
- Migration

Map by Cornell Lab of Ornithology
Range data by NatureServe



CHIPPING SPARROW

Spizella passerina

A crisp, pretty sparrow whose bright rufous cap both provides a splash of color and makes adults fairly easy to identify. Chipping Sparrows are common across North America wherever trees are interspersed with grassy openings.

HABITAT



Grassy forests, woodlands and edges, parks and shrubby or tree-lined backyards

Gravitate toward evergreens in places where these trees are available

Use aspen, birch, oak, pecan, and eucalyptus trees

FOOD



Mainly eat seeds of a great variety of grasses and herbs

During the breeding season they also hunt for protein-rich insects, and these form a large part of their summer diet

Sometimes eat small fruits such as cherries

BEHAVIOR



Feed on the ground, take cover in shrubs, and sing from the tops of small trees (often evergreens)

When singing, they cling to high outer limbs

On the ground they hop or run through grasses searching for seeds

BREEDING



Build their nests low in a shrub or tree

People have found their nests among hanging strands of chili peppers, on an old-fashioned mower inside a tool shed, and on a hanging basket filled with moss

RANGE MAP



Map by Cornell Lab of Ornithology
Range data by NatureServe



BLUE JAY *Cyanocitta cristata*

This common, large songbird is familiar to many people, with its perky crest; blue, white, and black plumage; and noisy calls. Blue Jays are known for their intelligence and complex social systems with tight family bonds.

HABITAT



Found in all kinds of forests but especially near oak trees; they're more abundant near forest edges than in deep forest

Common in urban and suburban areas, especially where oaks or bird feeders are found

FOOD



Glean insects and take nuts and seeds in trees, shrubs, and on the ground; they also eat grains

Take dead and injured small vertebrates

Sometimes raid nests for eggs and nestlings, and sometimes pick up dead or dying adult birds

Hold food items in feet while pecking them open

BEHAVIOR



Known for their intelligence and complex social systems, and have tight family bonds

Often mate for life, remaining with their social mate throughout the year

Frequently mimics the calls of hawks, especially the Red-shouldered Hawk

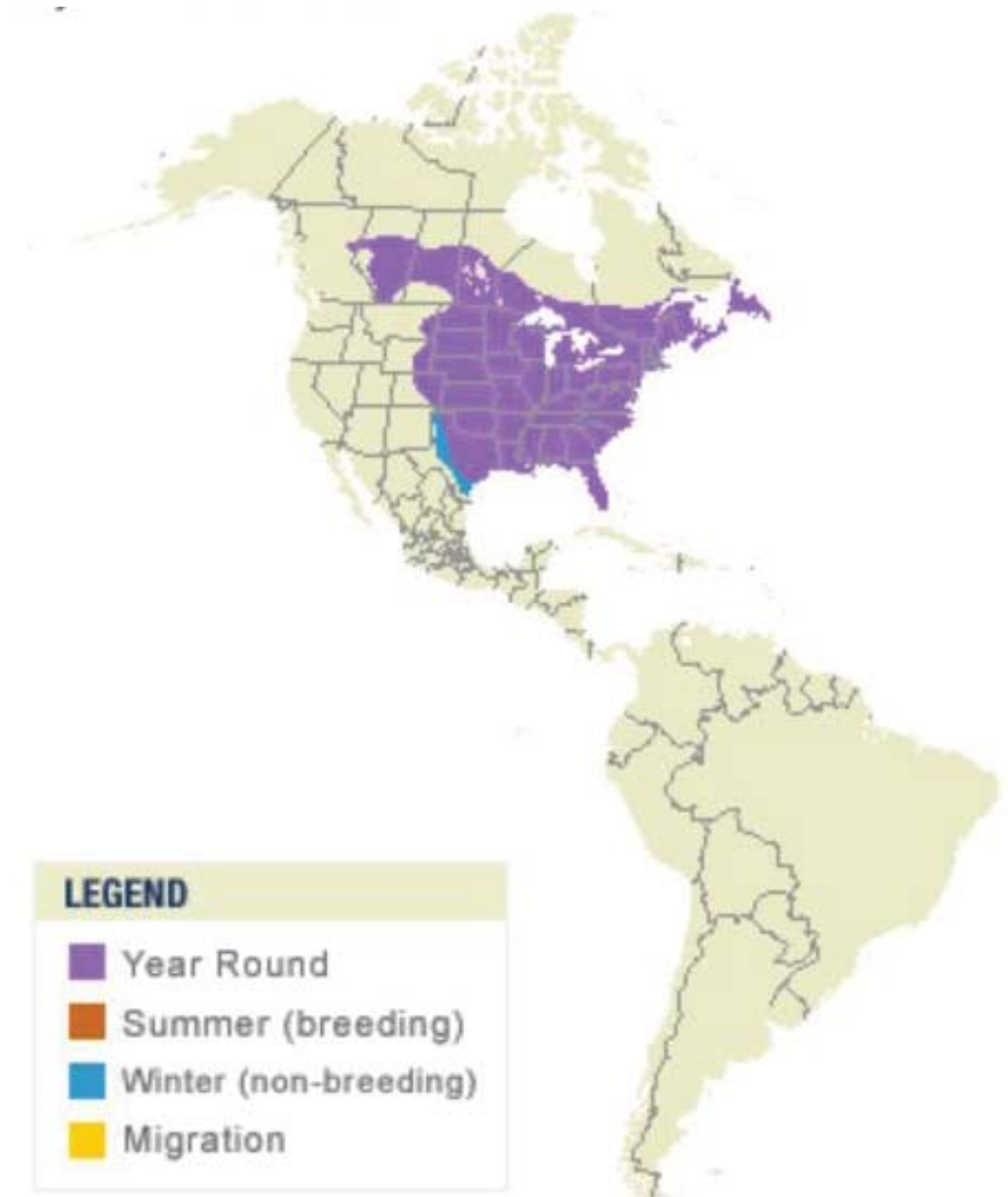
Wide variety of vocalizations, with an immense "vocabulary"

BREEDING



Build their nests in the crotch or thick outer branches of a deciduous or coniferous tree, usually 10-25 feet above the ground

RANGE MAP



Map by Cornell Lab of Ornithology
Range data by NatureServe



GOLDEN-WINGED WARBLER

Vermivora chrysoptera

The Golden-winged Warbler is a small, strikingly marked warbler of eastern early successional habitats. Its population increased for over 100 years as forests were cut down. Now, however, it is losing ground, both because of reforestation and displacement by the spreading Blue-winged Warbler.

HABITAT



Prefers early successional habitats for nesting

Recently abandoned farms and clearcuts are ideal

These habitats do not last long, and the warbler often quickly disappears from an area

Winters in canopy of tropical forests

FOOD



Insects and spiders

BEHAVIOR



Forages mostly in upper half of trees and shrubs

Probes dead leaf clusters in winter, spreading bill to open curled leaves

Often hangs upside down

BREEDING



Breeds in patchy shrubland and forest edge, such as shrubby fields, marshes, and bogs

Usually on or near ground

Open cup of grasses, bark, and dead leaves

RANGE MAP



LEGEND

- Year Round
- Summer (breeding)
- Winter (non-breeding)
- Migration

Map by Cornell Lab of Ornithology
Range data by NatureServe



EASTERN TOWHEE

Pipilo erythrophthalmus

A strikingly marked, oversized sparrow of the East, feathered in bold black and warm reddish-browns – if you can get a clear look at it. Eastern Towhees are birds of the undergrowth, where their rummaging makes far more noise than you would expect for their size.

HABITAT



Forest edges, overgrown fields and woodlands, and scrubby backyards or thickets

Dense shrub cover with plenty of leaf litter for the towhees to scratch around in

Occur in the Appalachians to about 6,500 feet,

Favor warm and dry south-facing slopes more than cool, moist northern faces

FOOD



Seeds, fruits, insects, spiders, millipedes, centipedes, and snails, as well as soft leaf and flower buds in spring

Eat seeds and fruits, including ragweeds, smartweeds, grasses, acorns, blackberries, blueberries, wheat, corn, and oats

BEHAVIOR



Rummaging in the leaf litter or creeping through thick shrubs

Tend to hop wherever they go, moving deliberately

Scratch at leaves with a characteristic two-footed backward hop, then dart after anything they've uncovered

Common victims of the parasitic Brown-headed Cowbird - female cowbirds lay eggs in towhee nests, then leave the birds to raise them

BREEDING



Usually nest on the ground, the nest cup sunk into the fallen leaves up to the level of the rim

Some cases they build their nests in shrubs or grape, honeysuckle, or greenbrier tangles, up to about 4 feet off the ground

RANGE MAP



LEGEND

- Year Round
- Summer (breeding)
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Map by Cornell Lab of Ornithology
Range data by NatureServe

[SOURCES]

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