

Optimas

Biodiversity Screening

June 2024



OPTIMAS

Overview:

This assessment was conducted as a desktop study using a combination of satellite imagery and online biodiversity data tools. The goal was to evaluate the ecological context and biodiversity significance of various sites using predefined criteria.

Approach:

1. Site Identification and Mapping:

- Utilized Google Earth to locate and observe each site.
- Mapped out the immediate surroundings to identify relevant land features such as woodlands, water bodies, and developed areas.

2. Criteria-Based Evaluation:

- Assessed each site against a set of criteria including:
 - **Protected Areas**
 - **Land Use and Land-Use Change**
 - **Ecosystem Services**
 - **Cumulative Impacts**
 - **Restoration and Conservation Opportunities**

3. Data Compilation and Analysis:

- Compiled observations and data into a structured format for each site.
- Analysed the data to identify common trends, key findings, and areas of concern.

Tools Used:

- **Google Earth:** For satellite imagery and direct observation of site surroundings.
- **Online Biodiversity Report Tool (<https://mol.org/>):** For retrieving detailed species data and understanding biodiversity significance.

Biodiversity Screening Criteria:

Protected Areas	• Proximity: Identify significant biodiversity areas near the warehouse.
Land Use and Change	• Current Use: Evaluate existing land use at the proposed warehouse site. • Connectivity and Fragmentation: Assess potential disruption to wildlife corridors.
Species Data	• Richness/Diversity: Assess species diversity in the area. • Notable Species: Identify any endangered or vulnerable species.
Ecosystem Services	• Key Services: Highlight important services such as pollination, water purification, and carbon sequestration.
Cumulative Impacts	• Combined Effects: Assess the impact of multiple warehouses or developments in the region.
Restoration and Conservation	• Habitat Restoration: Identify opportunities for habitat restoration around the site. • Greening Operations: Explore ways to make site operations environmentally friendly, like green roofs and native plant landscaping.

Site 1: Alcoa, TN, USA



Protected Areas:

- Warehouse is 350m from forested area to the SW and 1km from a woodland habitat to the NW.

Land Use and Land:

- The warehouse is in an area of significant land-use change.
- Situated in an industrial park, with residential areas surrounding it and a golf course.
- There appears to be further developments happening in this area in the NW side of the warehouse park.
- There is clear habitat fragmentation in this region

Species Data:

- A nearby biodiversity report identified 1,501 species, including:

5 Critically Endangered:

- Fish: Marbled Darter
- Bumblebee: Rusty-Patched Bumblebee
- Trees: American Chestnut, White Ash, Red Ash

9 Endangered:

- Mammals: Eastern Small-Footed Myotis, Little Brown Bat
- Amphibians: Berry Cave Salamander
- Fish: Lake Sturgeon, American Eel, Laurel Dace
- Dragonflies: Cherokee Clubtail
- Trees: White Walnut, American Elm

24 Vulnerable species

Ecosystem Services:

- The Know / Bount river is nearby
- Important river system which provides habitat for species, flood control, water purification.
- Water effluent treatment is vital.

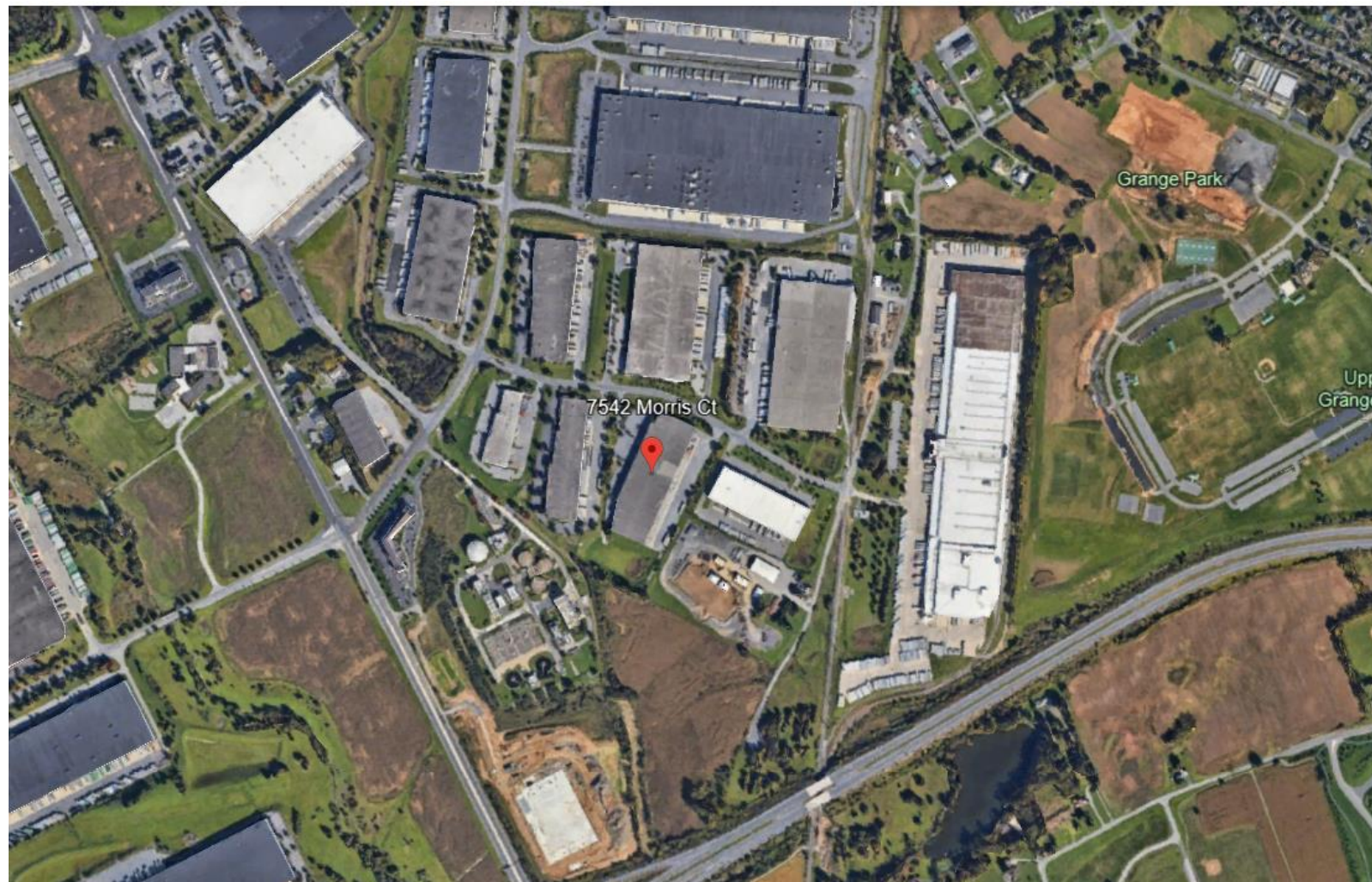
Cumulative Impacts:

- The area is under heavy development which suggests cumulative impacts may be significant.
- Golf course nearby which may lead to water stress.

Restoration and Conservation Opportunities:

- Support the protection and reforestation of woodland habitats nearby.

Site 2: Allentown, PA, USA



Protected Areas:

- The region is heavily developed with very few protected areas nearby.
- The nearest point of biodiversity interest is a lake 700m SE from the facility.

Land Use and Land:

- The land in this region has been changed to industrial and residential areas.
- Clear fragmentation with a few sparse woodland patches.

Species Data:

- A nearby biodiversity report identified 2,210 species, including:

9 Critically Endangered:

- Reptiles: Bog Turtle
- Fish: Eel
- Bumblebees: Rusty-Patched Bumblebee, Yellow-Faced Bumblebee
- Trees: American Chestnut, White Ash, Black Ash, Red Ash

11 Endangered:

- Mammals: Eastern Small-Footed Myotis, Little Brown Bat
- Fish: American Eel, Shecutts
- Reptiles: Spotted Turtle, North American Wood Turtle
- Trees: White Walnut, American Elm
- Other plants: Ginkgo

21 Vulnerable species

Ecosystem Services:

- Nearby Lake provides habitat for species, flood control, water purification.

Cumulative Impacts:

- There is a wastewater treatment site 200m from the facility.
- Cumulative water impacts should be considered.

Restoration and Conservation Opportunities:

- Reforestation of local area.

Site 3: Columbus, IN, USA



Protected Areas:

- The site is in a region surrounded by natural woodlands.
- Warehouse is situated near some patches of forested woodlands.

Land Use and Land:

- It is evident the surrounding region of the facility has been developed into predominantly agricultural land, and also some residential and other warehouse facilities.

Species Data:

- A nearby biodiversity report identified 1,186 species, including:

6 Critically Endangered:

- Bumblebees: Rusty-Patched Bumblebee, Yellow-Faced Bumblebee
- Trees: White Ash, Blue Ash, Red Ash, Pumpkin Ash

8 Endangered:

- Mammals: Eastern Small-Footed Myotis, Little Brown Bat
- Reptiles: Spotted Turtle, Blanding's Turtle
- Fish: American Eel
- Bumblebee: Southern Plains Bumble Bee
- Trees: White Walnut, American Elm

11 Vulnerable species

• Ecosystem Services:

- There is vast woodlands to the west of the facility.
- These are a vast carbon storage and sequester for the region.

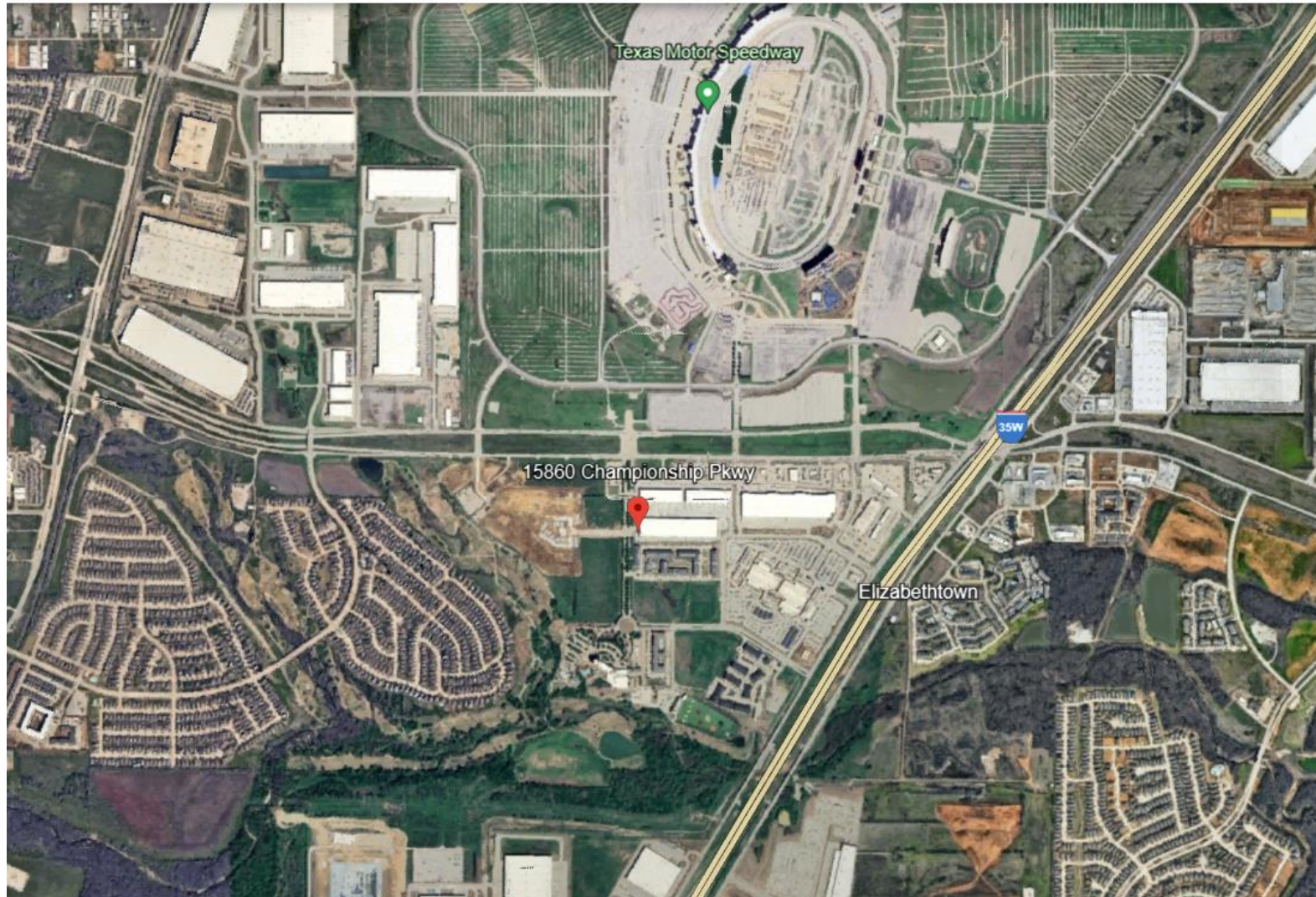
Cumulative Impacts:

- The combined impacts of the various warehouse facilities, agricultural practices, and residential areas should be considered, including potential habitat loss, increased pollution, and water resource depletion.

Restoration and Conservation Opportunities:

- Support the protection of nearby woodland habitats, which are crucial for maintaining regional biodiversity and ecosystem stability.

Site 4: Fort Worth, TX, USA



Protected Areas:

- The site is in a region surrounded by developments, with patches of natural woodland to the south and east.
- There is a creek south of the site.

Land Use and Land:

- The surrounding region of the facility has undergone intensive development, including residential areas and other warehouse facilities.
- There is clear habitat fragmentation due to these developments.

Species Data:

- A nearby biodiversity report identified 1,186 species, including:

1 Critically Endangered:

- Trees: Red Ash

6 Endangered:

- Birds: Whooping Crane
- Mammals: Black-Footed Ferret
- Butterflies: Arogos Skipper
- Bumblebee: Southern Plains Bumble Bee
- Trees: American Elm

11 Vulnerable species

• Ecosystem Services:

- There is a river system to the south, which is likely important for water supply, habitat, and biodiversity. It may also provide flood protection.

• Cumulative Impacts:

- The combined impacts of the various warehouse facilities, large-scale developments, and residential areas should be considered. These impacts include increased water demand, habitat fragmentation, and potential pollution.

Restoration and Conservation Opportunities:

- Support the protection of nearby woodland habitats, especially the stretch of woodland along the river to the south. This area serves as a crucial corridor connecting the remaining woodland patches in the region.

Site 5, Fresno, CA, USA



Protected Areas:

- The site is in a region surrounded by developments, notably a reservoir 200m to the north.

Land Use and Land:

- The surrounding region of the facility has undergone intensive development, including residential areas and other warehouse facilities.
- There is a major international airport and golf courses to the east and agriculture to the south.
- There is clear habitat fragmentation due to these developments, with little to no natural habitat remaining in this region.

Species Data:

- A nearby biodiversity report identified 754 species, including:

1 Critically Endangered:

- Bird: California Condor

8 Endangered:

- Mammals: Nelson's Antelope Squirrel, Giant Kangaroo Rat, Little Brown Bat
- Reptiles: San Joaquin Leopard Lizard
- Fish: Sacramento Perch
- Bumblebee: Crotch Bumble Bee

7 Vulnerable species

• Ecosystem Services:

- There is a reservoir to the north, which is likely important for water supply.

• Cumulative Impacts:

- The combined impacts of the various warehouse facilities, large-scale developments, and residential areas should be considered. These impacts include increased water demand, habitat fragmentation, and potential pollution.

Restoration and Conservation Opportunities:

- Minimize water waste.

Site 6, Grand Island



Protected Areas:

- The region is heavily developed with very few protected areas nearby.

Land Use and Land:

- The land in this region has been changed to industrial and residential areas.
- The town is surrounded by extensive agricultural crop land.
- Clear fragmentation with almost no natural vegetation in the vicinity.

Species Data:

- A nearby biodiversity report identified 965 species, including:

3 Critically Endangered:

- Birds: Eskimo Curlew
- Bumblebees: Yellow-Faced Bumblebee
- Trees: Red Ash

8 Endangered:

- Birds: Whooping Crane
- Mammals: Black-Footed Ferret, Little Brown Bat
- Bumblebees: Southern Plains Bumblebee
- Reptiles: Blanding's Turtle
- Butterflies: Arogos Skipper, Ottoe Skipper

10 Vulnerable species

Ecosystem Services:

- Heavy development in the region may restrict ecosystem services such as soil erosion prevention and reduce biodiversity.

Cumulative Impacts:

- The high level of developments should be considered for water use.

Restoration and Conservation Opportunities:

- Reforestation of local area where possible.

Site 7: Greenville



Protected Areas:

- Warehouse is surrounded by a woodland habitat to the south, with extensive woodland habitats in the region.
- There are various lakes and water bodies in the surrounding area, with some bodies of water within 150m from the warehouse.

Land Use and Land:

- The warehouse is in an area of a variety of land-use changes.
- Situated in an industrial park to the north, with residential areas surrounding the west, south, east.
- There is minor habitat fragmentation in this region, with a high risk of clear fragmentation with some habitats on the verge of being cut off from each other.

Species Data:

- A biodiversity report in this region identified 1,208 species, including:

4 Critically Endangered:

- Reptiles: Bog Turtle
- Bumblebee: Rusty-Patched Bumblebee
- Trees: White Ash, Red Ash

4 Endangered:

- Mammals: Eastern Small-Footed Myotis, Little Brown Bat
- Fish: American Eel
- Trees: American Elm

10 Vulnerable species

Ecosystem Services:

- Nearby water bodies which provides habitat for species, flood control, water purification.
- Water effluent treatment is vital.
- Woodland habitats are important for local biodiversity, particularly endangered trees.

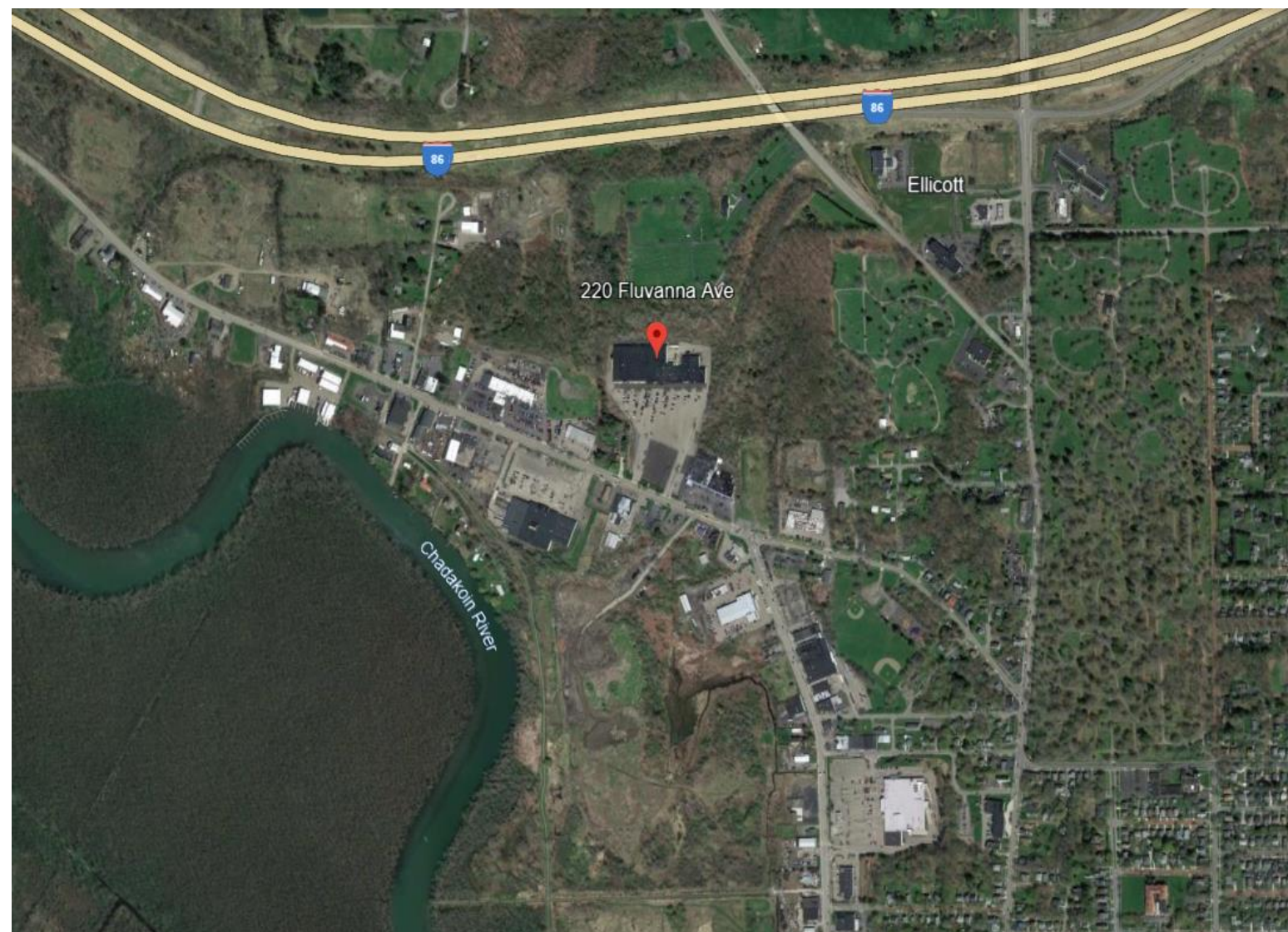
Cumulative Impacts:

- The area has various developments which suggests cumulative impacts may be significant.
- Water stress and pollution of nearby water bodies should be considered.

Restoration and Conservation Opportunities:

- Support the protection and reforestation of woodland habitats nearby.
- Restrict any more deforestation of woodland habitats to prevent further fragmentation.

Site 8: Jamestown, NY, USA



Protected Areas:

- Warehouse is situated near a wetland area, with an important estuary of the Chadakoin River 400m to the south.
- **Land Use and Land:**
- The warehouse is in an area of a variety of land-use changes.
- Situated in an industrial park to the north, with residential areas surrounding the west, south, east.

Species Data:

- A biodiversity report in this region identified 1,409 species, including:

7 Critically Endangered:

- Reptiles: Bog Turtle
- Bumblebee: Rusty-Patched Bumblebee, Yellow-Faced Bumblebee
- Trees: White Ash, Red Ash, Black Ash, American Chestnut

4 Endangered:

- Mammals: Eastern Small-Footed Myotis, Little Brown Bat
- Reptiles: Spotted Turtle, Blanding's Turtle, North American Wood Turtle
- Fish: American Eel, Lake Sturgeon
- Trees: American Elm, White Walnut

12 Vulnerable species

Ecosystem Services:

- Nearby water bodies which provides habitat for species, flood control, water purification.
- Water effluent treatment is vital.
- Surrounding shrubland important for endangered species mentioned and soil erosion control.

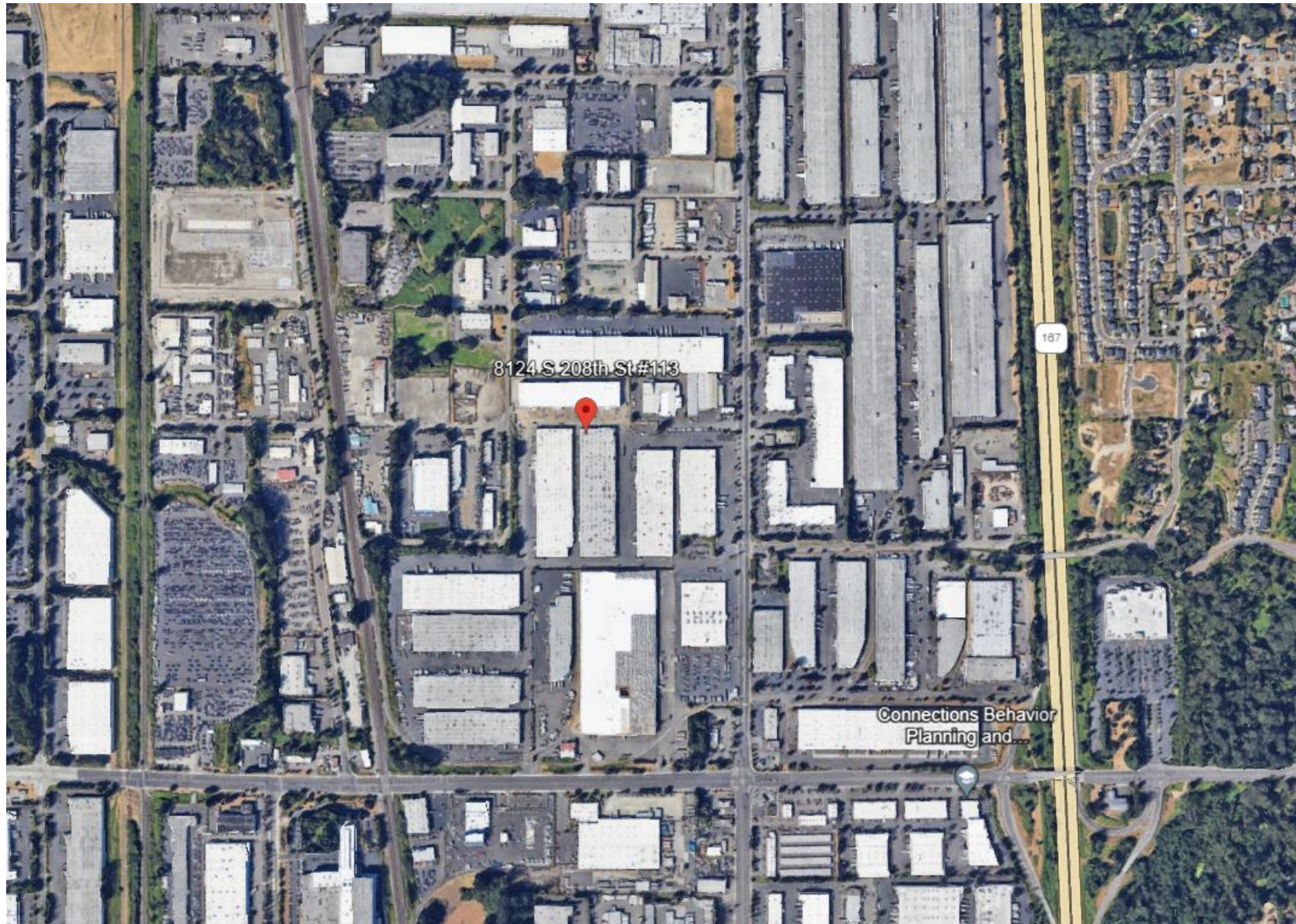
Cumulative Impacts:

- The area has various developments which suggests cumulative impacts may be significant.
- Water stress and pollution of nearby water bodies should be considered.

Restoration and Conservation Opportunities:

- Support the protection and reforestation of woodland habitats nearby.
- Prevent any more developments near the estuary system as this may have negative impacts on water quality through pollution and be at risk in the flood plain.

Site 9: Kent, WA, USA



Protected Areas:

- The region is heavily developed with very few natural areas nearby.
- The nearest point of biodiversity interest is a forested area 1,200m E from the facility.

Land Use and Land:

- The land in this region has been changed to industrial park in the west and residential areas to the east.
- Clear fragmentation with a few sparse woodland patches.

Species Data:

- A nearby biodiversity report identified 2,439 species, including:

5 Critically Endangered:

- Fish: Eel, Tope, Common Eagle Ray, Boccacio Rockfish
- Bumblebees: Suckley Cuckoo Bumblebee

13 Endangered:

- Birds: Marbled Murrelet
- Mammals: Eastern Small-Footed Myotis, Little Brown Bat
- Fish: Green Sturgeon, Dusky Shark, Sandbar Shark, Gulper Shark, Spinous Shark, Halibut, Sandy Ray, Giant Devil Ray, Smooth Hound, Shortspine Thornyhead, Bonnethead Shark

42 Vulnerable species

Ecosystem Services:

- Woodland habitats are important for local biodiversity.

Cumulative Impacts:

- There is a wastewater treatment site 200m from the facility.
- Cumulative water impacts should be considered.

Restoration and Conservation Opportunities:

- Reforestation of local area.

Site 10: Lockbourne, OH, USA



Protected Areas:

- The site is in a region surrounded by developments, with patches of natural woodland in the surrounding region.
- There are a couple reservoirs directly around the facility.

Land Use and Land:

- The surrounding region of the facility has undergone intensive development, including an airport to the north and agricultural cropland.
- There is clear habitat fragmentation due to these developments.

Species Data:

- A nearby biodiversity report identified 1,454 species, including:

6 Critically Endangered:

- Bumblebees: Rusty-Patched Bumblebee, Yellow-Faced Bumblebee
- Trees: American Chestnut, White Ash, Blue Ash, Red Ash

9 Endangered:

- Reptiles: Spotted Turtle, Blanding's Turtle
- Mammals: Eastern Small-Footed Myotis, Little Brown Bat
- Fish: Lake Sturgeon, American Eel
- Bumblebee: Southern Plains Bumble Bee
- Trees: American Elm, White Walnut

11 Vulnerable species

Ecosystem Services:

- There is a river system to the south, which is likely important for water supply, habitat, and biodiversity. It may also provide flood protection.

Cumulative Impacts:

- There is patches of woodland and extensive cropland in this region.
- These are a vast carbon storage and sequester for the region.

Restoration and Conservation Opportunities:

- Support the protection of nearby woodland habitats.

Site 11: Rocky Mount, NC, USA



Protected Areas:

- The warehouse borders significant woodland to the north.
- Various lakes and water bodies are nearby, some within 500 meters.

Land Use and Land:

- The area has mixed land uses, with natural woodland to the north and developed areas to the south.
- Minor habitat fragmentation exists, with a risk of increased fragmentation if northern developments occur.

Species Data:

- 1,118 species identified, including:

6 Critically Endangered

- Birds: Bachman's Warbler
- Bumblebee's: Yellow-Faced Bumblebee
- Trees: White Ash, Red Ash, Pumpkin Ash

10 Endangered

- Mammals: Little Brown Bat
- Reptiles: Spotted Turtle
- Fish: American Eel
- Butterflies: Arogos Skipper
- Bumblebee: Southern Plains Bumble Bee
- Trees: American Elm, Water Ash, Longleaf Pine
- Conifers: Longleaf Pine

8 Vulnerable species

Ecosystem Services:

- Woodlands provide local biodiversity, carbon storage, and habitat for endangered trees.
- Nearby water bodies offer habitat, flood control, and water purification.
- Water effluent treatment and fire risk precautions are vital.

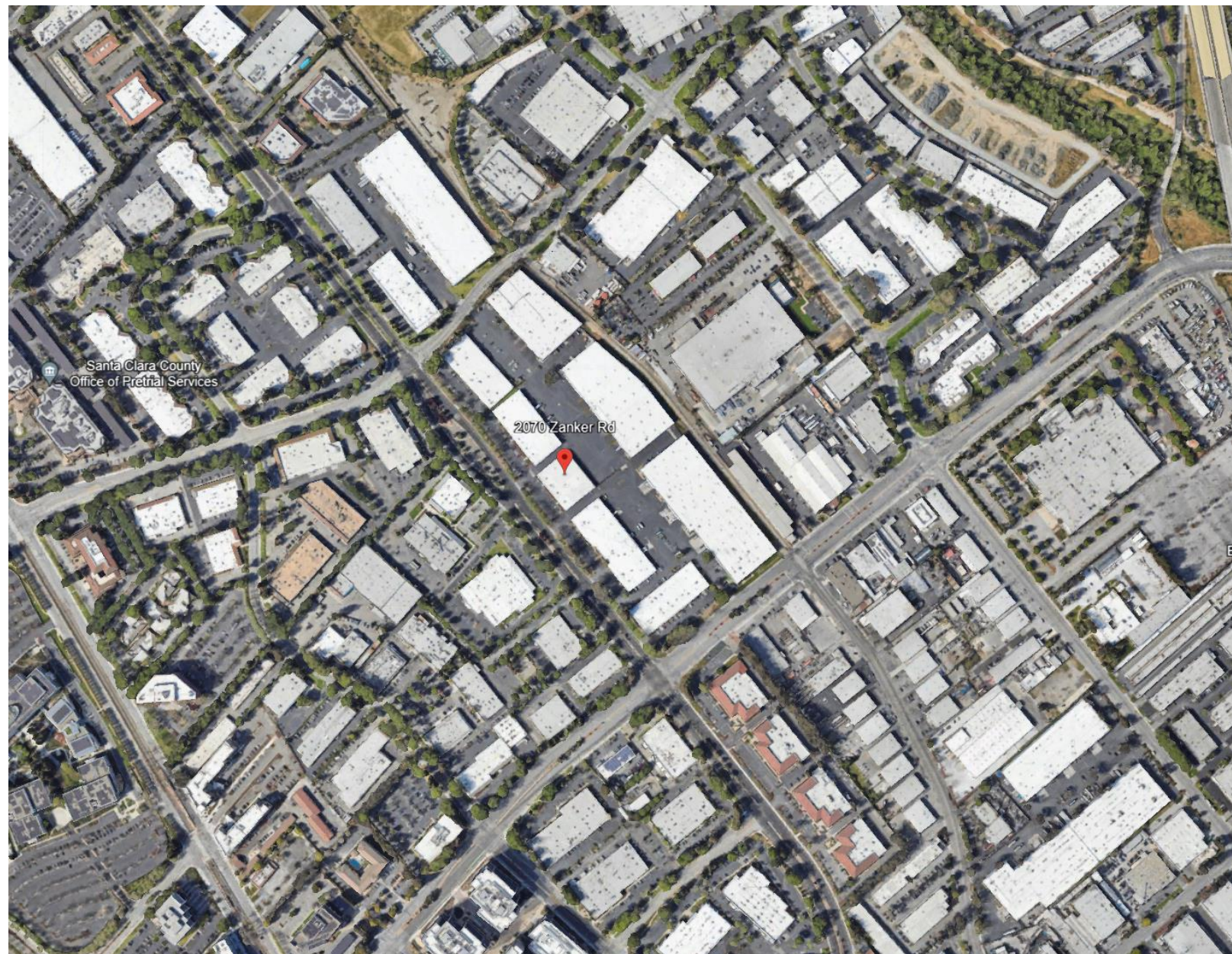
Cumulative Impacts:

- Ongoing developments may reduce forest cover.

Restoration and Conservation Opportunities:

- Support protection and reforestation of nearby woodland habitats.
- Restrict deforestation to prevent further fragmentation.

Site 12: San Jose, CA, USA



Protected Areas:

- The region is heavily developed with very few natural areas nearby.
- The nearest point of biodiversity interest is a grassland park 1,000m W from the facility. And Coyote creek 800m NE of the facility

Land Use and Land:

- The land in this region has been changed to industrial park in the west and residential areas to the east.
- Clear fragmentation with a few sparse woodland patches.

Species Data:

- A nearby biodiversity report identified 2,230 species, including:

4 Critically Endangered:

- Birds: Californian Condor
- Fish: Delta Smelt, Giant Sea Bass, Boccacio Rockfish

8 Endangered:

- Birds: Tricoloured Blackbird, Black Rail
- Fish: Green Sturgeon, Sacramento Perch
- Bumblebees: Crotch Bumble Bee
- Conifers: Coast Redwood

22 Vulnerable species

Ecosystem Services:

- Grassy park and Coyote Creek important for local biodiversity and endangered species identified.

Cumulative Impacts:

- The cumulative impacts of the various developments and industrial park should be considered for example water stress in the region.

Restoration and Conservation Opportunities:

- Advocate for protection of local creek, minimize pollution and maintain green parks in area.

Site 13: Sturtevant, WI, USA



Protected Areas:

- Warehouse is surrounded by croplands with a few natural woodland habitats sparsely spread around the region.

Land Use and Land:

- The warehouse is in an area of a variety of land-use changes.
- Situated in a small industrial park, which is surrounded by farm land.
- There is a golf course to the NW of the facility.

Species Data:

- A biodiversity report in this region identified 1,401 species, including:

5 Critically Endangered:

- Bumblebee: Rusty-Patched Bumblebee, Yellow-Faced Bumblebee
- Trees: White Ash, Red Ash, Black Ash

12 Endangered:

- Birds: Whooping Crane
- Mammals: Little Brown Bat
- Fish: Lake Sturgeon, American Eel
- Butterflies: Arogos Skipper, Ottoe Skipper
- Bumblebee: Southern Plains Bumble Bee
- Trees: American Elm, White Walnut

11 Vulnerable species

Ecosystem Services:

- Nearby water bodies which provides habitat for species, flood control, water purification.
- Water effluent treatment is vital.
- Woodland habitats are important for local biodiversity, particularly endangered trees.

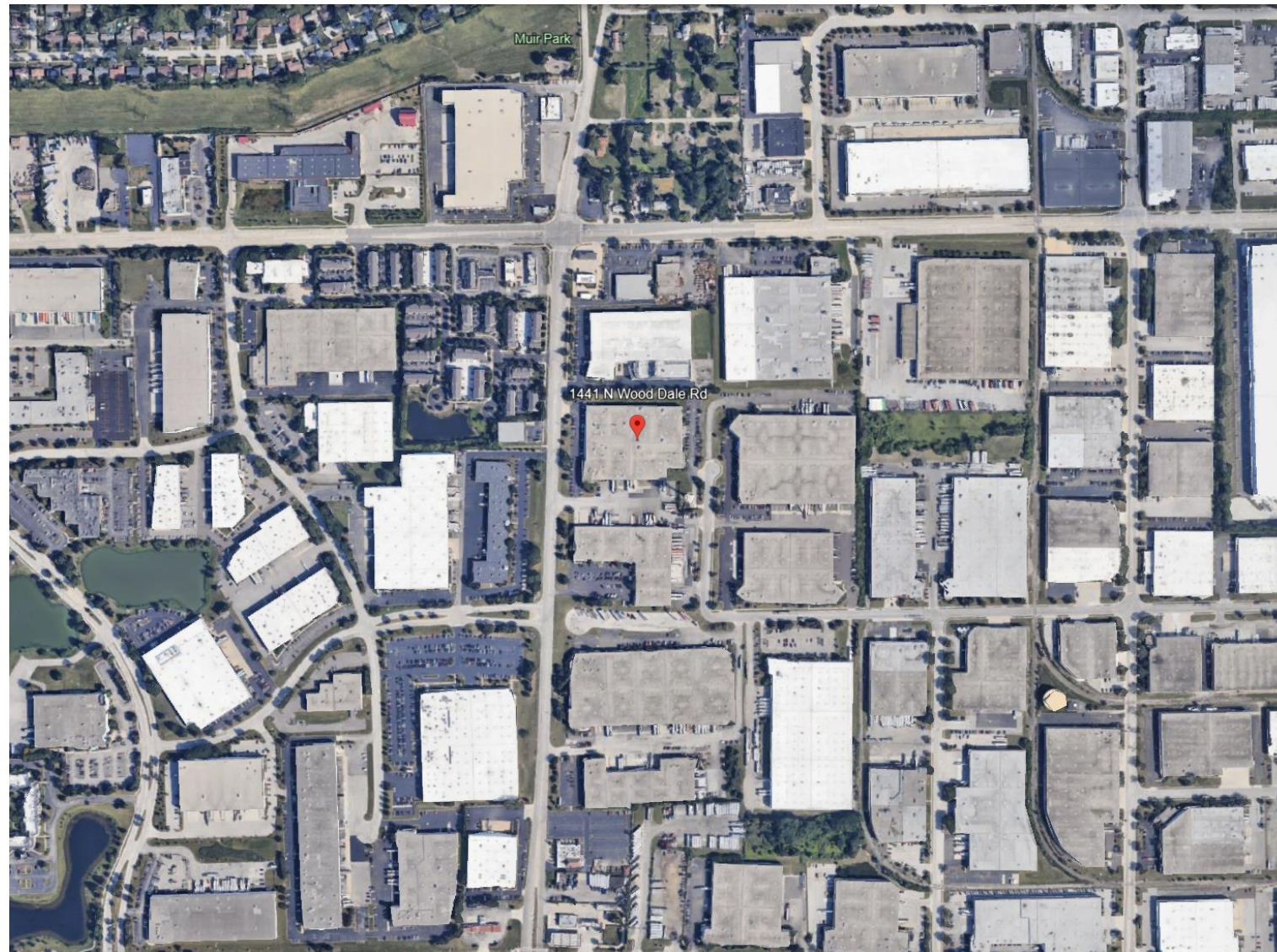
Cumulative Impacts:

- The area has various developments which suggests cumulative impacts may be significant.
- Water stress and pollution of nearby water bodies should be considered.

Restoration and Conservation Opportunities:

- Support the protection and reforestation of woodland habitats nearby.
- Restrict any more deforestation of woodland habitats to prevent further fragmentation.

Site 14: Wood Dale (DC), IL, USA



Protected Areas:

- Minimal Protected Areas in this region.
- Sparse woodlands patches and water bodies to the west.

Land Use and Land:

- Mixed land-use changes: small industrial park, Residential, golf course W.

Species Data:

- 1,741 species identified.

6 Critically Endangered:

- Bumblebees: Rusty-Patched, Yellow-Faced
- Trees: White Ash, Red Ash, Black Ash, Blue Ash

10 Endangered:

- Birds: Whooping Crane
- Mammals: Little Brown Bat
- Fish: Lake Sturgeon, American Eel
- Butterflies: Ottoe Skipper
- Bumblebee: Southern Plains Bumble Bee
- Trees: American Elm, White Walnut

8 Vulnerable

Ecosystem Services:

- Nearby water bodies: habitat, water purification.
- Vital water effluent treatment.
- Woodland habitats crucial for biodiversity, especially endangered trees.

Cumulative Impacts:

- Significant due to various developments.
- Consider water stress and pollution.

Restoration and Conservation Opportunities:

- Support reforestation and protection of nearby woodland habitats.
- Prevent further deforestation to avoid habitat fragmentation.

Site 15: Mexicali Mex, Baja California, Mexico



Protected Areas:

- Minimal Protected Areas in this region.
- Desert region.
- Water body and canals to the east.

Land Use and Land:

- Mixed land-use changes: small industrial park, Residential,.

Species Data:

- 1,637 species identified.

- **3 Critically Endangered:**

- Reptiles: Agassiz's Desert Tortoise
- Fish: Bonytail, Razorback Sucker

- **3 Endangered:**

- Birds: Tricoloured Blackbird
- Mammals: Little Brown Bat
- Bumblebees: Crotch Bumblee Bee

- **16 Vulnerable**

Ecosystem Services:

- Nearby water bodies: habitat, water purification.
- Vital water effluent treatment.

Cumulative Impacts:

- Significant due to various developments.
- Consider water stress and pollution.

Restoration and Conservation Opportunities:

- Ensure proper water use and minimise water waste.

Site 16: Monterrey MEX, Nuevo Leon, Mexico



Protected Areas:

- Minimal Protected Areas in this region.
- Sparse woodlands patches to the north.

Land Use and Land:

- Mixed land-use changes: small industrial park, Residential
- Canal system 300m to the north.

Species Data:

- 2,074 species identified.

0 Critically Endangered:

12 Endangered:

- Birds: Worthern's Sparrow, Lilac-Crowned Amazon, Yellow-Headed Amazon, Green-Cheeked Amazon
- Mammals: Mexican Long Nosed Bat
- Cacti: Corynopuntia bulbispina
- Conifers: Saltillo Juniper, Mexican Yew
- Other Plants: Agave albomarginata, Myrospermum sousanum, Quercus runcinatifolia

7 Vulnerable

Ecosystem Services:

- Nearby canal network: water purification, water management.
- Vital water effluent treatment.
- Woodland habitats crucial for biodiversity, especially endangered trees.

Cumulative Impacts:

- Significant due to various developments.
- Consider water stress and pollution.

Restoration and Conservation Opportunities:

- Support reforestation and protection of nearby woodland habitats.
- Prevent further deforestation to avoid habitat fragmentation.

Site 17: Queretaro MEX, Queretaro, Mexico



Protected Areas:

- Large protected area 1,000m SW of the facility.
- Sparse woodland patches and water bodies to the east.

Land Use and Land:

- Mixed land-use changes: Industrial parks, residential areas, and cropland.

Species Data:

- 1,549 species identified, including:

2 Critically Endangered:

- Birds: Imperial Woodpecker
- Cacti: Mammillaria albiflora

4 Endangered:

- Mammals: Mexican Long-Nosed Bat
- Reptiles: Blackbelly Garter Snake
- Cacti: Mammillaria mathildae
- Conifers: Mexican Yew

7 Vulnerable species

Ecosystem Services:

- Agricultural fields and woodland patches provide:
 - Pollination services from various insect species.
 - Soil stabilization and erosion control from vegetation.
 - Flood control and water purification services from natural water bodies.
 - Carbon sequestration and habitat provision from woodland areas.

Cumulative Impacts:

- Industrial park and surrounding developments contribute to habitat fragmentation.
- Agricultural activities may lead to soil degradation, water stress, and pollution.
- Combined industrial and agricultural activities could significantly impact local biodiversity and ecosystem health.

Restoration and Conservation Opportunities:

- Support reforestation and protection of nearby woodland habitats.
- Prevent further deforestation to avoid habitat fragmentation.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Site 18: Oklahoma City, OK, USA



Protected Areas:

- Shrubland and water body south of the facility.
- Various creeks flowing in this region.

Land Use and Land:

- Mixed land-use changes: Predominantly Industrial parks and residential areas

Species Data:

- 1,038 species identified, including:

2 Critically Endangered:

- Bumblebees: Yellow-Faced Bumbleb
- Trees: Red Ash

7 Endangered:

- Birds: Whooping Crane
- Mammals: Black-Footed Ferret, Little Brown Bat
- Butterflies: Arogos Skipper, Ottoe Skipper
- Trees: Red Ash, American Elm

13 Vulnerable species

Ecosystem Services:

- Agricultural fields and woodland patches provide:
 - Pollination services from various insect species.
 - Soil stabilization and erosion control from vegetation.
 - Flood control and water purification services from natural water bodies.
 - Carbon sequestration and habitat provision from woodland areas.

Cumulative Impacts:

- Industrial park and surrounding developments contribute to habitat fragmentation.
- Combined industrial and residential activities could significantly impact local biodiversity and ecosystem health.

Restoration and Conservation Opportunities:

- Support reforestation and protection of nearby woodland habitats.
- Prevent further deforestation to avoid habitat fragmentation.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Site 19: Kingston, PA, USA



Protected Areas:

- Closest protected area is a woodland 1,200m west.

Land Use and Land:

- Mixed land-use changes: Predominantly residential areas

Species Data:

- 1,038 species identified, including:

2 Critically Endangered:

- Bumblebees: Yellow-Faced Bumblebee
- Trees: Red Ash

7 Endangered:

- Birds: Whooping Crane
- Mammals: Black-Footed Ferret, Little Brown Bat
- Butterflies: Arogos Skipper, Ottoe Skipper
- Trees: Red Ash, American Elm

13 Vulnerable species.

Ecosystem Services:

- Woodland patches provide:
 - Pollination services from various insect species.
 - Soil stabilization and erosion control from vegetation.
 - Flood control and water purification services from natural water bodies.
 - Carbon sequestration and habitat provision from woodland areas.

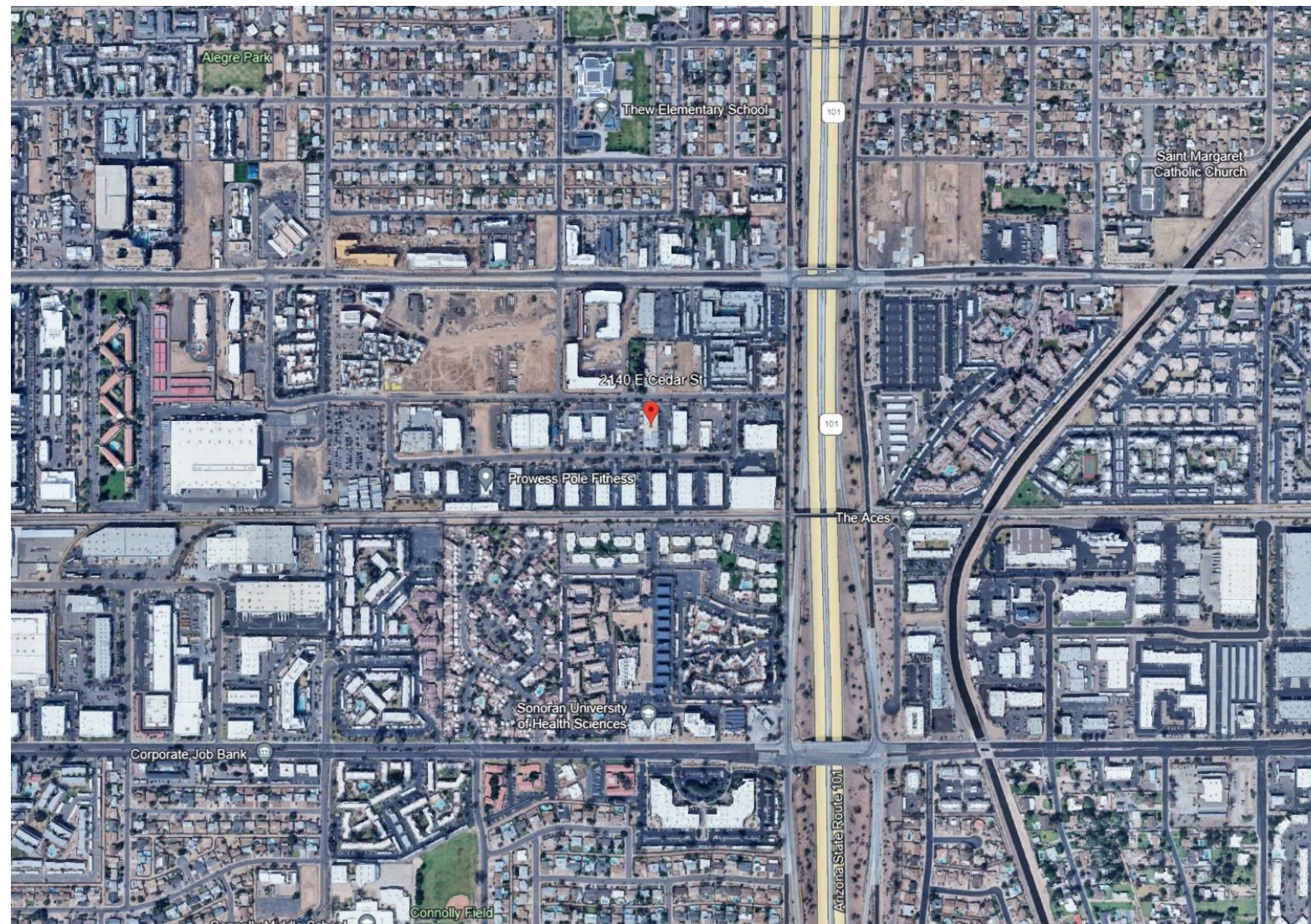
Cumulative Impacts:

- Residential developments contribute to habitat fragmentation.
- Combined residential activities could significantly impact local biodiversity and ecosystem health.

Restoration and Conservation Opportunities:

- Support reforestation and protection of nearby woodland habitats.
- Prevent further deforestation to avoid habitat fragmentation.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Site 20: Phoenix, AZ, USA



Protected Areas:

- Minimal Protected Areas in this region.
- Densely developed region with no natural habitat present.
- Salt River runs 2,500m north of the facility

Land Use and Land:

- Mixed land-use changes: Industrial parks, and Residential areas
- Canal system 300m to the north.

Species Data:

- 1,440 species identified.

3 Critically Endangered:

- Fish: Bonytail, Woundfin, Razorback Sucker

5 Endangered:

- Mammals: Black-Footed Ferret
- Cacti: Corynopuntia bulbispina
- Fish: Gila Chub, Spikedace, Gila Trout
- Bumblebees: Southern Plains Bumble Bee

17 Vulnerable

Ecosystem Services:

- Nearby river: water purification, water management.
- Vital water effluent treatment.

Cumulative Impacts:

- Significant due to various developments.
- Consider water stress and pollution.

Restoration and Conservation Opportunities:

- Support protection of nearby river.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Site 21: Atlanta, GA, USA



Protected Areas:

- Expansive Protected Areas in this region.
- Densely developed region with abundant natural habitat present.
- McGinnis Reserve and Martin Farm Park are within 1,000m of the facility.

Land Use and Land:

- Mixed land-use changes: Industrial parks, and Residential areas, with much of the natural forest cover still present.

Species Data:

- 1,368 species identified.

3 Critically Endangered:

- Birds: Bachman's Warbler
- Trees: White Ash, Red Ash

5 Endangered:

- Mammals: Eastern Small Footed Myotis, Little Brown Bat
- Reptiles: Spotted Turtle
- Fish: American Eel
- Trees: American Elm

11 Vulnerable

Ecosystem Services:

- Woodland patches provide:
 - Pollination services from various insect species.
 - Soil stabilization and erosion control from vegetation.
 - Flood control and water purification services from natural water bodies.
 - Carbon sequestration and habitat provision from woodland areas.

Cumulative Impacts:

- Significant due to various developments.
- Consider water stress and pollution.

Restoration and Conservation Opportunities:

- Support protection of nearby parks and reserves.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Site 22: Portland, OR, USA



Protected Areas:

- Wetland situated 200 metres north of the facility.
- Hedges Creek situated 800 metres from facility.

Land Use and Land:

- Mixed land-use changes: Industrial parks, and Residential areas, with clear habitat fragmentation.
- The wetland appears to be in natural condition.

Species Data:

- 1,477 species identified.

4 Critically Endangered:

- Birds: California Condor
- Fish: Boccacio Rockfish
- Bumblebees: Southern Plains Bumble Bee, Suckley Cockoo Bumble Bee

2 Endangered:

- Mammals: Little Brown Bat
- Bumblebee: Crotch Bumble Bee

14 Vulnerable

Ecosystem Services:

- Wetland provide:
 - Biodiversity hotspot.
 - Pollination services from various insect species.
 - Soil stabilization and erosion control from vegetation.
 - Flood control and water purification services from natural water bodies.

Cumulative Impacts:

- Significant due to various developments.
- Consider water stress and pollution.

Restoration and Conservation Opportunities:

- Support protection of nearby wetland.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Site 23: Tupelo, MS, USA



Protected Areas:

- Town Creek is 1,200m east of the facility.
- Area has patches of woodland spread across the region.

Land Use and Land:

- Mixed land-use changes: Predominantly industrial and residential areas

Species Data:

- 2,860 species identified, including:
 - 7 Critically Endangered:
 - Birds: Bachman's Warbler
 - Fish: Alabama Sturgeon
 - Bumblebees: Yellow-Faced Bumblebee
 - Trees: Red Ash, White Ash, American Chestnut
 - 7 Endangered:
 - Mammals: Eastern Small Footed Myotis, Little Brown Bat
 - Fish: American Eel
 - Butterflies: Arogos Skipper
 - Bumblebees: Southern Plains Bumble Bee
 - Trees: American Elm
 - 17 Vulnerable species.

Ecosystem Services:

- Woodland patches and river system provide:
 - Pollination services from various insect species.
 - Soil stabilization and erosion control from vegetation.
 - Flood control and water purification services from natural water bodies.
 - Carbon sequestration and habitat provision from woodland areas.

Cumulative Impacts:

- Residential developments contribute to habitat fragmentation.
- Combined residential and industrial activities could significantly impact local biodiversity and ecosystem health.

Restoration and Conservation Opportunities:

- Support reforestation and protection of nearby woodland habitats.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Site 24: Elkhart, IN, USA



Protected Areas:

- Puterbaugh Creek is 1,400m west of the facility.
- Area has patches of woodland spread across the region.

Land Use and Land:

- Mixed land-use changes: Predominantly industrial and residential areas, with an area converted to cropland.

Species Data:

- 1,294 species identified, including:

5 Critically Endangered:

- Bumblebees: Yellow-Faced Bumblebee, Rusty-Patched Bumblebee
- Trees: Red Ash, White Ash, Black Ash

8 Endangered:

- Mammals: Little Brown Bat
- Reptiles: Spotted Turtle, Blanding's Turtle
- Fish: American Eel
- Butterflies: Ottoe Skipper
- Bumblebees: Southern Plains Bumble Bee
- Trees: American Elm, White Chestnut

10 Vulnerable species.

Ecosystem Services:

- Woodland patches and river system provide:
 - Pollination services from various insect species.
 - Soil stabilization and erosion control from vegetation.
 - Flood control and water purification services from natural water bodies.
 - Carbon sequestration and habitat provision from woodland areas.

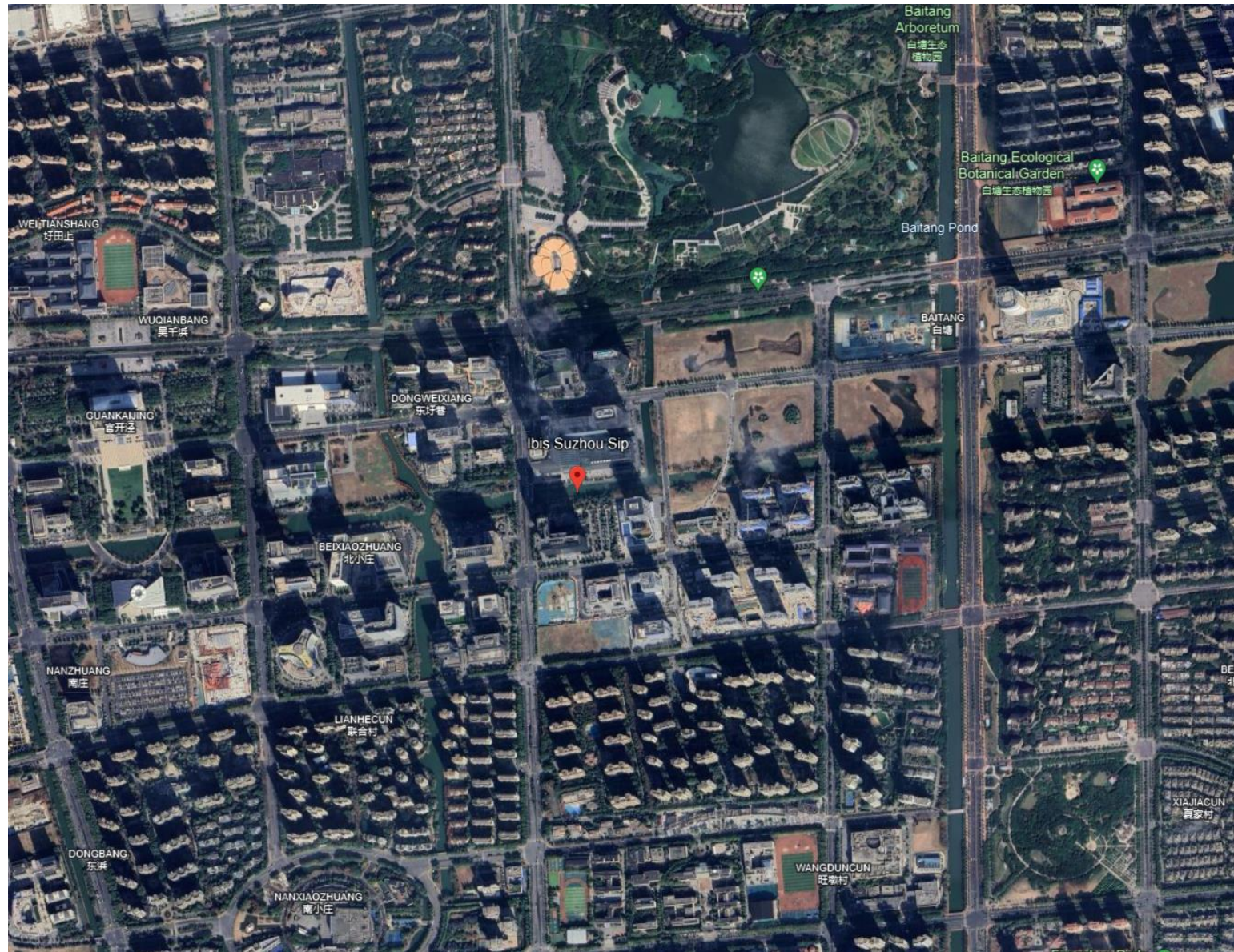
Cumulative Impacts:

- Residential developments contribute to habitat fragmentation.
- Combined residential and industrial activities could significantly impact local biodiversity and ecosystem health.

Restoration and Conservation Opportunities:

- Support reforestation and protection of nearby woodland habitats.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Site 25: Suzhou, China



Protected Areas:

- Baitang Ecological Botanical Gardens 800 metres north of facility
- Highly developed region with very few natural or protected areas

Land Use and Land:

- Mixed land-use changes: Predominantly residential areas, with an abundance of green spaces and trees planted in the surrounding streets.

Species Data:

- 1,223 species identified, including:
 - **5 Critically Endangered**
 - **8 Endangered**
 - **10 Vulnerable species**
 - *Details on specific species are currently unavailable for this site.

Ecosystem Services:

- Tree cover and river system provide:
 - Pollination services from various insect species.
 - Soil stabilization and erosion control from vegetation.
 - Flood control and water purification services from natural water bodies.
 - Carbon sequestration and habitat provision from woodland areas.

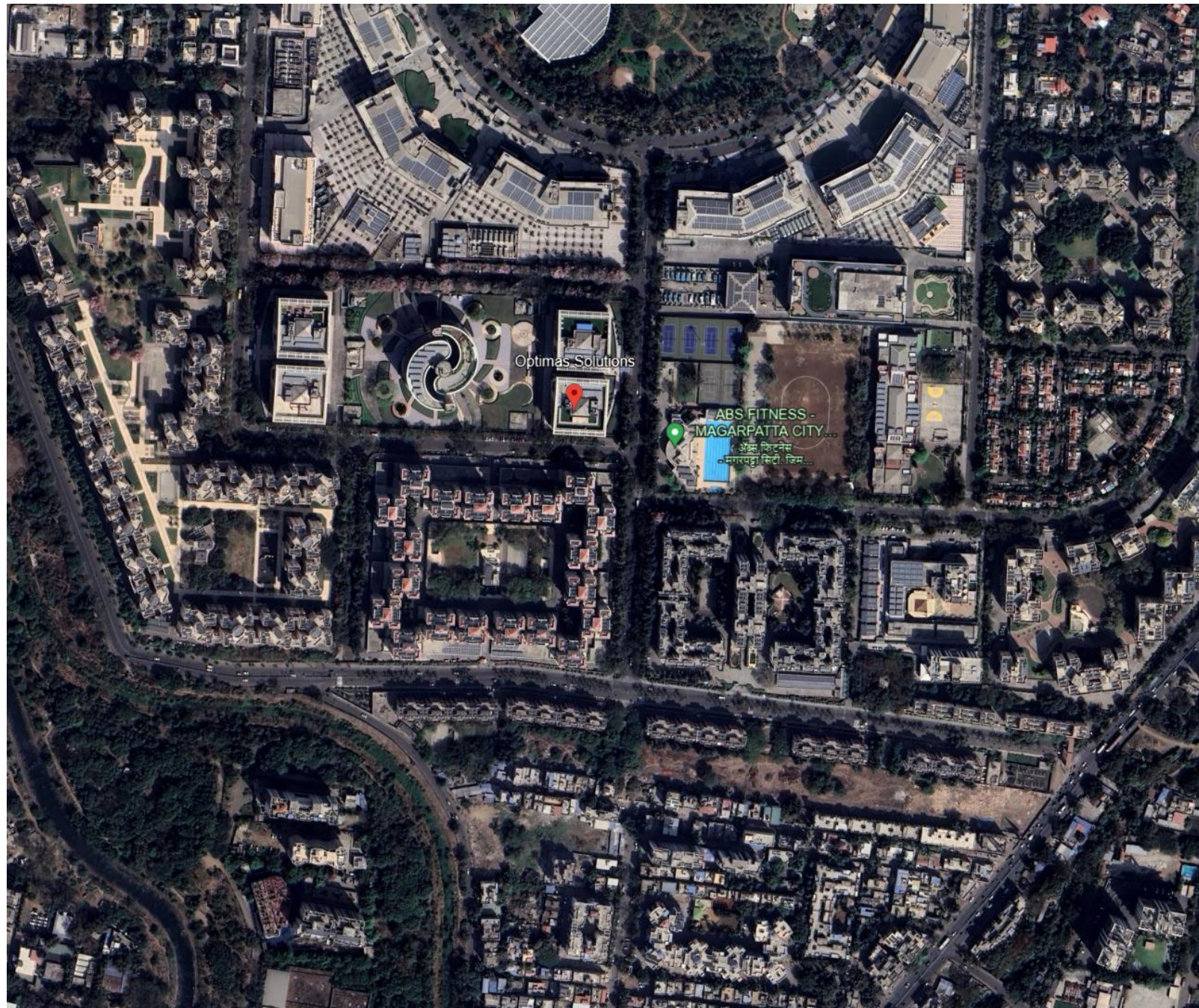
Cumulative Impacts:

- Residential developments contribute to habitat fragmentation.
- Combined residential and industrial activities could significantly impact local biodiversity and ecosystem health.

Restoration and Conservation Opportunities:

- Support reforestation and protection of nearby woodland habitats.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Site 26: Pune, India



Protected Areas:

- Aditi Garden is 250 metres to the north of the facility.
- Canal system 500 metres west.

Land Use and Land:

- Mixed land-use changes: Predominantly residential areas and commercial areas.
- Clear habitat fragmentation observed.
- Aditi Gardens, a large man-made biodiverse circular park.

Species Data:

- 1,088 species identified, including:
 - **10 Critically Endangered:**
 - **26 Endangered:**
 - **37 Vulnerable species.**
 - *Details on specific species are currently unavailable for this site.

Ecosystem Services:

- Woodland patches provide:
 - Pollination services from various insect species.
 - Soil stabilization and erosion control from vegetation.
 - Flood control and water purification services from natural water bodies.
 - Carbon sequestration and habitat provision from woodland areas.

Cumulative Impacts:

- Residential developments contribute to habitat fragmentation.
- Combined residential activities could significantly impact local biodiversity and ecosystem health.

Restoration and Conservation Opportunities:

- Support reforestation and protection of nearby woodland habitats.
- Prevent further deforestation.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Site 27: Pune – warehouse, India



Protected Areas:

- No Protected Areas visibly near this site.
- Some patches of natural shrubland NW of the site.

Land Use and Land:

- Mixed land-use changes: Predominantly in an industrial area with some agricultural practices scattered around.
- Residential areas towards the north.
- Clear habitat fragmentation observed.

Species Data:

- 1,088 species identified, including:

- **10 Critically Endangered:**
- **26 Endangered:**
- **37 Vulnerable species.**
- *Details on specific species are currently unavailable for this site.

Ecosystem Services:

- Shrubland patches provide:
 - Pollination services from various insect species.
 - Soil stabilization and erosion control from vegetation.
 - Flood control and water purification services from natural water bodies.
 - Carbon sequestration and habitat provision from woodland areas.

Cumulative Impacts:

- Industrial developments contribute to habitat fragmentation.
- Combined industrial, agricultural, and residential activities could significantly impact local biodiversity and ecosystem health.

Restoration and Conservation Opportunities:

- Support reforestation and protection of nearby woodland habitats.
- Prevent further deforestation.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Site 28: Istanbul – head office, Turkey



Protected Areas:

- Small natural park situated 800 metres south of the facility.
- Sea of Marmara metres from facility.

Land Use and Land:

- Mixed land-use changes: Commercial parks, and Residential areas, with clear habitat fragmentation with virtually no natural landscape
- The wetland appears to be in natural condition.

Species Data:

- 979 species identified.
 - **13 Critically Endangered:**
 - **21 Endangered:**
 - **43 Vulnerable**
 - *Details on specific species are currently unavailable for this site.

Ecosystem Services:

- Natural park provide:
 - Biodiversity hotspot.
 - Pollination services from various insect species.
 - Soil stabilization and erosion control from vegetation.
 - Flood control and water purification services from natural water bodies.

Cumulative Impacts:

- Significant due to various developments.
- Water stress and pollution particularly important considering proximity to the sea.

Restoration and Conservation Opportunities:

- Support local waste management practices.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Site 29: Istanbul warehouse, Turkey



Protected Areas:

- Natural woodland forests Located near the facility.
- Multiple creeks flow through the region, providing natural water bodies.
- There is a lake in the vicinity contributing to the local ecosystem.

Land Use and Land:

- Predominantly industrial parks and residential areas with clear habitat fragmentation.
- The woodland forests and creek system are in relatively natural conditions.

Species Data:

- 979 species identified.
 - **13 Critically Endangered:**
 - **21 Endangered:**
 - **43 Vulnerable**
 - *Details on specific species are currently unavailable for this site.

Ecosystem Services:

Natural Woodlands and Creeks Provide:

- Biodiversity hotspots
- Pollination services from various insect species
- Soil stabilization and erosion control from vegetation
- Flood control and water purification services from natural water bodies
- Carbon sequestration and habitat provision from woodland areas

Cumulative Impacts:

- Significant due to various developments.
- Water stress and pollution

Restoration and Conservation Opportunities:

- Support protection of nearby woodland habitats.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Site 30: Sarreguemines, France



Protected Areas:

- Abundance of natural woodland forests Located near the facility.
- Multiple creeks flow through the region, providing natural water bodies.

Land Use and Land:

- Predominantly industrial parks and residential areas with clear habitat fragmentation.
- The woodland forests and creek system are in relatively natural conditions.

Species Data:

- 2,033 species identified.
 - **1 Critically Endangered:**
 - Mammals: European Mink
 - **2 Endangered:**
 - Mammals: European Rabbit
 - Dragonflies: Cretan Bluet
 - **6 Vulnerable**

Ecosystem Services:

Natural Woodlands and Creeks Provide:

- Biodiversity hotspots
- Pollination services from various insect species
- Soil stabilization and erosion control from vegetation
- Flood control and water purification services from natural water bodies
- Carbon sequestration and habitat provision from woodland areas

Cumulative Impacts:

- Significant due to various developments.
- Water stress and pollution

Restoration and Conservation Opportunities:

- Support protection of nearby woodland habitats.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Site 31: Barton, Droitwich, UK



Protected Areas:

- Abundance of natural woodland forests Located near the facility.
- Multiple creeks flow through the region, as well as rivers and streams, providing natural water bodies.

Land Use and Land:

- Predominantly industrial parks and residential areas with clear habitat fragmentation.
- The woodland forests and creek system are in relatively natural conditions.

Species Data:

- 2,744 species identified.

1 Critically Endangered:

- Fish: Eel

3 Endangered:

- Mammals: European Rabbit
- Dragonflies: Cretan Bluet
- Conifers: Giant Sequoia

9 Vulnerable

Ecosystem Services:

Natural Woodlands and Creeks Provide:

- Biodiversity hotspots
- Pollination services from various insect species
- Soil stabilization and erosion control from vegetation
- Flood control and water purification services from natural water bodies
- Carbon sequestration and habitat provision from woodland areas

Cumulative Impacts:

- Significant due to various developments and varying land uses.
- Water stress and pollution of concern.

Restoration and Conservation Opportunities:

- Support protection of nearby woodland habitats.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Site 32: Bredbury, UK



Protected Areas:

- Sparse patches of natural woodland forests Located near the facility.
- The River Tame, Greater Manchester, flows 600 metres north of the site. Providing natural water bodies.

Land Use and Land:

- Predominantly industrial parks and residential areas with clear habitat fragmentation.
- The woodland forests and creek system are in relatively natural conditions.

Species Data:

- 2,283 species identified.

1 Critically Endangered:

- Fish: Eel

3 Endangered:

- Mammals: European Rabbit
- Dragonflies: Cretan Bluet
- Conifers: Giant Sequoia

8 Vulnerable

Ecosystem Services:

Natural Woodlands and Creeks Provide:

- Biodiversity hotspots
- Pollination services from various insect species
- Soil stabilization and erosion control from vegetation
- Flood control and water purification services from natural water bodies
- Carbon sequestration and habitat provision from woodland areas

Cumulative Impacts:

- Significant due to various developments and varying land uses.
- Water stress and pollution of concern.

Restoration and Conservation Opportunities:

- Support protection of nearby woodland habitats.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Site 33: Gloucester, UK



Protected Areas:

- Natural woodland forests, Hunts Grove Wood, borders the facility.
- The Gloucester and Sharpness canal which feed in the River Seven estuary are 1,800 metres west.

Land Use and Land:

- Predominantly industrial parks and residential areas with clear habitat fragmentation.
- The woodland forests are in relatively natural conditions.

Species Data:

- 2,359 species identified.

1 Critically Endangered:

- Fish: Eel, Atlantic Sturgeon, Black Grenadier, Grey Skate, Tope, Common Eagle Ray

3 Endangered:

- Mammals: European Rabbit
- Fish: American Eel, Sandbar Shark, Gulper Shark, Leafscale Gulper Shark, Spinous Shark, Puff Adder Shy Shark, Halibut, Sandy Ray, Smooth Hound, Ocean Perch, Shortspine Thornyhead.
- Dragonflies: Cretan Bluet

30 Vulnerable

Ecosystem Services:

Natural Woodlands and Rivers Provide:

- Pollination services from various insect species
- Soil stabilization and erosion control from vegetation
- Flood control and water purification services from natural water bodies
- Carbon sequestration and habitat provision from woodland areas

Cumulative Impacts:

- Significant due to various developments and varying land uses.
- Water stress and pollution of concern.

Restoration and Conservation Opportunities:

- Support protection of nearby woodland habitats.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Site 34: Barlborough, Chesterfield, UK



Protected Areas:

- Sparse patches of natural woodland forests spread around the region.
- A pond is situated next to the facility.

Land Use and Land:

- Predominantly commercial parks and residential areas with clear habitat fragmentation.
- Golf course to the east of site.
- The woodland forests are in relatively natural conditions, but clear reduction and fragmentation of natural landscape in region.

Species Data:

- 2,211 species identified.

1 Critically Endangered:

- Fish: Eel,

3 Endangered:

- Mammals: European Rabbit
- Fish: Halibut
- Dragonflies: Cretan Bluet

7 Vulnerable

Ecosystem Services:

Natural Woodlands and Rivers Provide:

- Biodiversity hotspots
- Pollination services from various insect species
- Soil stabilization and erosion control from vegetation
- Flood control and water purification services from natural water bodies
- Carbon sequestration and habitat provision from woodland areas

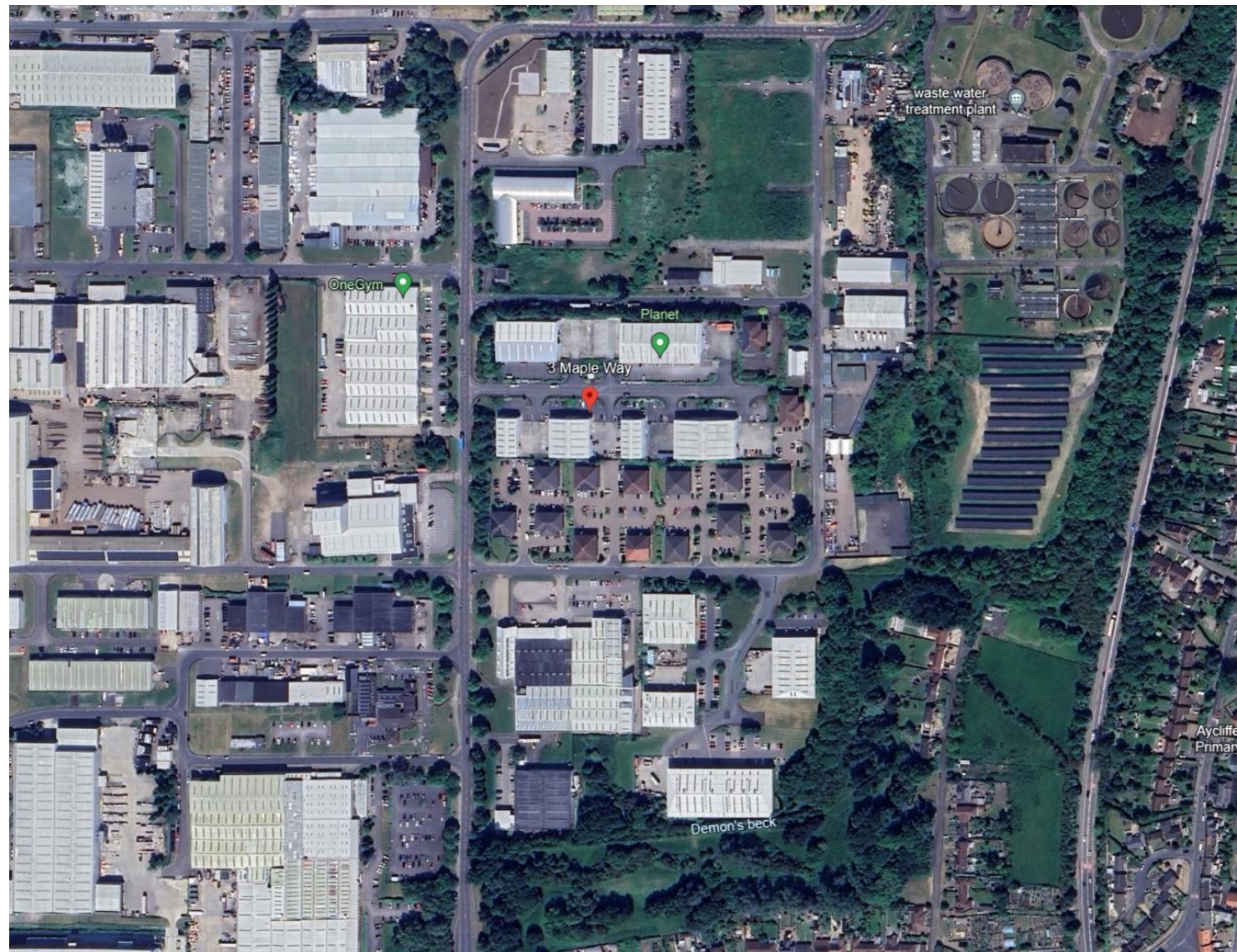
Cumulative Impacts:

- Significant due to various developments and varying land uses.
- Water stress and pollution of concern.

Restoration and Conservation Opportunities:

- Support protection of nearby woodland habitats.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Site 35: Newton Aycliffe, UK



Protected Areas:

- Sparse patches of natural woodland forests spread around the region.
- River Skerne flows 800 metres to the east of the site.

Land Use and Land:

- Predominantly commercial parks and residential areas with clear habitat fragmentation.
- The woodland forests are in relatively natural conditions, but clear reduction and fragmentation of natural landscape in region.

Species Data:

- 1,609 species identified.

1 Critically Endangered:

- Fish: Eel,

3 Endangered:

- Mammals: European Rabbit
- Fish: Halibut
- Dragonflies: Cretan Bluet

8 Vulnerable

Ecosystem Services:

Natural Woodlands and Rivers Provide:

- Biodiversity hotspots
- Pollination services from various insect species
- Soil stabilization and erosion control from vegetation
- Flood control and water purification services from natural water bodies
- Carbon sequestration and habitat provision from woodland areas

Cumulative Impacts:

- Significant due to various developments and varying land uses.
- Water stress and pollution of concern.

Restoration and Conservation Opportunities:

- Support protection of nearby woodland habitats.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Site 36: Erdington, Birmingham, UK



Protected Areas:

- Very little natural forest cover in this region.
- Brookvale Park Lake is situated 1,000 metres to the west of the site.

Land Use and Land:

- Predominantly residential areas with clear habitat fragmentation.

Species Data:

- 2,009 species identified.

1 Critically Endangered:

- Fish: Eel,

0 Endangered

6 Vulnerable

Ecosystem Services:

Natural Woodlands and Rivers Provide:

- Biodiversity hotspots
- Pollination services from various insect species
- Soil stabilization and erosion control from vegetation
- Flood control and water purification services from natural water bodies
- Carbon sequestration and habitat provision from woodland areas

Cumulative Impacts:

- Significant due to various developments and varying land uses.
- Water stress and pollution of concern.

Restoration and Conservation Opportunities:

- Support protection of nearby woodland habitats.
- Implement green infrastructure within the industrial park, such as green roofs, permeable pavements, and native plant landscaping, to mitigate impacts.

Key Findings from Biodiversity Screening

Protected Areas:

- Multiple sites are adjacent to significant natural areas, including woodlands and water bodies, underscoring the need for careful consideration of environmental impacts.

Land Use and Land-Use Change:

- Varied land uses include industrial parks, residential areas, and natural forests.
- Habitat fragmentation is common, posing risks to local biodiversity.

Species Data:

- Over 1,000 species identified across sites, including critically endangered, endangered, and vulnerable species.
- This underscores the need to be biodiversity conscious in business operations across the sites.

Ecosystem Services:

- Woodlands and water bodies provide essential services such as carbon storage, water purification, and flood control.
- These habitats are also crucial for supporting local biodiversity.

Cumulative Impacts:

- Development pressures threaten to reduce forest cover and increase habitat fragmentation.
- The cumulative impact of multiple developments could significantly harm local biodiversity and ecosystem health.

Restoration and Conservation Opportunities:

- Strong potential for habitat restoration, particularly in reforestation and protecting existing woodlands.
- Green infrastructure and limiting deforestation can mitigate adverse impacts.



Appendix 1: Assumptions

Data Reliability:

- Online biodiversity reports and Google Earth imagery are accurate and current.

Species Presence:

- Species listed in reports are present and using the habitats around the sites.

Impact of Land Use:

- Land use changes seen in satellite images reflect actual impacts on biodiversity.

Ecosystem Services:

- Natural features provide consistent ecosystem services (e.g., pollination, water purification).
- These services are crucial for local biodiversity and communities.

Cumulative Impacts:

- Visible land use and development patterns accurately indicate cumulative impacts.
- Future developments will have similar effects as past ones.

Restoration Feasibility:

- Identified areas for restoration and conservation are viable and beneficial.
- Reforestation and green infrastructure will mitigate development impacts.

General Applicability:

- Criteria and methods are equally applicable to all sites.
- Findings from one site inform recommendations for similar sites.