



# EcolSciences, Inc.

Environmental Management & Regulatory Compliance

**ENVIRONMENTAL ASSESSMENT  
PROPOSED SPORTS FIELD LIGHTING  
TATLOCK SPORTS COMPLEX  
BLOCK 401, LOT 1  
CITY OF SUMMIT  
UNION COUNTY, NEW JERSEY**

*Prepared for:*

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## **I. EXECUTIVE SUMMARY**

The Tatlock Sports Complex is a ± 29.0-acre community park located west of Butler Parkway and south of Route 646 (AKA River Road) in the City of Summit, Union County, New Jersey (Figure 1). The park includes Martin's Brook Park to the north (where no development is proposed) and the Sports Complex to the south. The Sports Complex is currently developed with multiple recreation areas including playgrounds, tennis courts, Upper Tatlock field, Lower Tatlock field, track, and supporting structures, stadium seating and large, paved parking lot (Figure 2). The City is proposing to add stadium lighting to two of the existing fields: the Upper Tatlock field and Lower Tatlock field. Both of these fields are currently characterized as artificial turf within the developed park setting. The Upper Tatlock field is located north of Butler Parkway and east of Washington Elementary School. A dense, but narrow, forest buffer separates the field from Butler Parkway. Currently the Upper Tatlock field is lit by three 25-foot tall mercury vapor lights. The Lower Tatlock field is located west of Butler Parkway and south of Martin's Brook Park. Martin's Brook, a tributary to the Passaic River, flows south from a culvert originating under Butler Parkway through the Martin's Brook Park forested area. The Lower Tatlock field currently has no permanent lights, relying on temporary lighting brought to the field for games. The City is proposing four 70- to 80-foot-tall support poles mounted with Musco DarkSky LEED lighting at each field. The new lighting is designed to allow additional use of the fields in the evenings primarily for practice and occasional night games or events while preventing spillover lighting from disturbing wildlife and adjacent residences.

The proposed lighting project will have no impact on most of the natural resources of the property. The site is located in a largely urban Land Use/Land Cover Unit (Figure 3) with surrounding areas defined by dense to medium residential development, with commercial development to the west, and industrial development to the north and northwest. Due to the largely developed nature of the Tatlock Sports Complex, the lighting plan will not result in changes to soils, geology, hydrology, vegetation, or increase demands on any resources such as water withdrawal, sewer treatment, garbage facilities, or traffic. Wetlands (Figure 4) and a tributary to the Passaic River (Figure 5) located within Martin's Brook Park are not impacted by the proposed lighting improvements. Because the two sport fields that are to be lit are already developed and improved as artificial turf fields, no direct impacts are anticipated to wetlands, streams, vegetation, and wildlife habitats. The exception may be light impacts to nocturnal species, primarily night-flying bats.

According to New Jersey Landscape Project Mapping (Version 3.3), the forested portions of site are mapped with Rank 5 habitats (Figure 6). Rank 5 habitats are habitats that may support

Federally threatened or endangered species. Most of the identified forested habitat occurs in Martin's Brook Park but does extend to the wooded forest fringe located within the Sports Complex facility and mapped along Butler Parkway. The Rank 5 habitats contain occurrences of the Federally-endangered Indiana bat (*Myotis sodalis*). The habitat determination is likely resulting from the Sports Complex's location approximately 2.5-miles from the Great Swamp National Wildlife Refuge (GSNWR) located in Chatham Township, Morris County. The 7,853 acres GSNWR has historically and currently supported maternity colonies and roosting trees occupied by Indiana bats.

An additional environmental concern of the proposed lighting project is the potential impact of the proposed sports field lights on the surrounding residential neighborhoods. Although, a forest buffer is located along the boundaries of both the Upper and Lower Tatlock fields, the wooded buffer is not complete along the Lower Tatlock field perimeter and the density of the forest to absorb light spillover will decrease in some areas as the deciduous trees lose their leaves in the fall and winter.

Therefore, as discussed in the following sections, the environmental assessment focuses on the environmental impacts of the proposed sports field lighting project on these two concerns: bats and light pollution impacting nearby residences.

## II. SPECIES HABITAT REQUIREMENTS

As introduced above, wildlife species are largely absent from the existing ballfields. Species that might utilize a grassed field may include common species of mammals and birds that are tolerant of human activity including chipmunks, grey squirrels, white tail deer, red fox, and cottontail rabbit. However, in this case the fields proposed for lighting are artificial turf which provides no food, water, or cover that wildlife species may utilize. Similarly, the artificial turf fields would not be attractive to songbirds, raptors, reptiles, or amphibians. However, certain bat species may utilize the airspace surrounding the fields for foraging. New Jersey supports nine bat species. Of these, two species are Federally endangered, the Indiana bat and the northern long-eared bat (*Myotis septentrionalis*). Additionally, one bat species is proposed for endangered species listing the tricolor bat (*Perimyotis subflavus*). As identified on the Landscape Project Mapping (Figure 6), Indiana bat habitat has been identified from the site and along the Passaic River riparian corridor.

The Indiana bat is known to occur in Sussex, Passaic, Morris, Union, Essex, Somerset, and Hunterdon Counties. The species' geographic range (where bats may occur) also includes Warren and parts of Bergen, Middlesex, and Mercer Counties. The City of Summit is located within Union County and has been identified by USFWS as having or being in the vicinity of an Indiana bat maternity colony (USFWS, revised February 14, 2023).

The USFWS defines suitable Indiana bat summer habitat as consisting of a wide variety of forested/wooded habitats where they roost, forage and travel. Habitat may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, successional fields, and pastures. These habitats include forested woodlots containing potential roosts (i.e., live trees and/or snags) that have exfoliating bark, cracks, crevices, and/or hollows. Potential roost trees for Indiana bats are generally greater than 5-inch Diameter at Breast Height (DBH). Linear features such as fencerows, riparian forest, and other wooded features may also be considered travel corridors if they connect to larger interior forest habitat.. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of similar forested/wooded habitat. Indiana bats are more likely to use forest edges for foraging and are strongly associated with wetlands, floodplains, and riparian corridors.

Within potential summer habitat areas, the USFWS New Jersey Field Office has provided *Forest Management Recommendations for Indiana Bats Summer Breeding Range (2019)*. These

recommendations include maintaining 60% canopy closure in forested stands, retaining snags wherever possible, maintaining shagbark hickory or other high value trees (large trees with shaggy bark, crevices, or hollows), not harvesting timber within 300 feet of a streambank, and not removing trees when Indiana bats may be present, generally between April 1 and September 30. Tree clearing restrictions extend to November 15, if a site is located within potential hibernacula habitat.

Maternity colonies, which are critical locations for rearing young, in general occur in riparian and floodplain forests under the loose bark of dead or dying trees. They also have been found under the loose bark of live trees and in the cavities of dead trees. In recent years, Indiana bats have also been documented to occasionally use buildings. Factors influencing the stability of a particular tree as a roost site include the tree's solar exposure, location in relation to other trees, and the tree's spatial relationship to water sources and foraging areas. Studies have shown that Indiana bats show a strong site fidelity to summer colony areas (NJDEP, 2013). Adult males usually roost in trees near maternity roosts, but some males remain near the hibernaculum and have been found in caves and mines during the summer ((USFWS, 2024).

Indiana bats hibernate in limestone caves and open, abandoned mine shafts. The hibernacula caves are typically medium sized with large, shallow passageways and suitability is determined by the configuration so as to trap cold air and provide stable low temperatures that allow bats to maintain low metabolic rates and conserve fat resources throughout the winter (NJDEP, 2013). In New Jersey, most Indiana bat hibernacula are known from Morris County.

All three of the New Jersey's rare bat species exhibited a catastrophic decline starting in 2008 with the discovery of White Nose Syndrome (WNS). WNS has since decimated populations of *Myotis* species and tricolor bats in New Jersey and surrounding states by as much as 95 to 99 percent. Many known hibernacula and maternity colonies/roost trees are based on data collected prior to the advent of White Nose Syndrome (Cheng, 2021). As a result, previously occupied habitats may no longer support these rare species. For these reasons, habitat loss is not considered the primary cause for the species decline, but rather the toll the disease takes on adult bats both in direct death of adults, and reduced fecundity in the remaining females.

Both Indiana bat and Northern long-eared bat like many *Myotis* species are considered light adverse species. These species are more likely associated with large areas of contiguous forest and field habitat with little artificial light penetration. These small bats are so sensitive to light, they often will not fly during periods of a bright full moon, likely to avoid visibility to other aerial predators. They are not attracted to insect prey that may fly towards outside light fixtures and

rarely are they identified inhabiting human occupied structures (Seewagen, CL, et al, 2024). All three species are considered cave bats and overwinter in caves, mines, and other below ground containments that provide the proper airflow and winter temperature to support torpor and avoid freezing.

Common bats in New Jersey that are considered light attractive bats include the big brown bat (*Eptesicus fuscus*) and the northern red bat (*Lasiurus borealis*). Big brown bats, which appear to have a high tolerance to WNS, is New Jersey's most common bat species and the species most likely to be found in urban areas, especially residential areas. These bats are often seen flying around streetlights, outdoor floodlights, and other lighted structures that may attract moths, beetles, and other insects that fly at night. They are also the most likely bat species to be found within a human occupied or abandoned structure, often found in attics, barns, sheds, and other structures that provide protection from precipitation and temperature extremes. Although big brown bats are also considered cave bats, they often overwinter in these non-traditional human structures.

Red bats are another common bat species that generally prefers open forest communities but have adapted to fields, treelines, fence rows, scrubby openings and are found in both urban and rural areas. Unlike the previous species, the red bat is largely solitary in the active season, with females rearing their young alone in the leafy portions of a tree. Red bats also migrate to warmer climates to spend the winter months and therefore remain active most of the year. Since red bats remain largely in the trees without the need for a true hibernaculum, they are generally referred to as migratory or tree bats.

### III. LIGHTING

The project proposes to introduce new stadium lighting to illuminate the existing Upper and Lower Tatlock fields. Currently the Lower Tatlock does not have permanent lights and relies on portable lights brought in for events. The Upper Tatlock field is currently lit by three 25-foot mercury vapor lights which do not provide significant lighting to the entire ball field. To address the need to maximize utilization of the two artificial turf fields, new lighting is proposed to allow for evening practices and occasional games and events. The project proposes 4 sets of downward facing LEED lighting on 70-foot poles at each field.

The specific lights proposed are Musco DarkSky Approved LED lighting. DarkSky Approval is a specific program that follows an independent third-party certification for lighting products, designs, and installation. Specifically to be approved by DarkSky the lighting project must minimize glare, reduce light trespass, and reduce light pollution. To be certified, the project must:

- ☐ Restrict the amount of upward-directed light
- ☐ Avoid glare
- ☐ Avoid over-lighting
- ☐ Utilize dimming and other appropriate lighting controls
- ☐ Minimize short-wavelength (bluish) light in the nighttime environment

[\(https://darksky.org/what-we-do/darksky-approved/\)](https://darksky.org/what-we-do/darksky-approved/)

Based on the design proposed by the New Jersey office of Musco Sports Lighting, LCC., the lighting plan for Tatlock has been prepared to fit the size and needs of High School sports fields (Musco, 2021). Specifically, the lighting plans require that there be zero-footcandles (One foot-candle is defined as enough light to saturate a one-foot square with one lumen of light or the amount of light from a birthday cake) that extends beyond the limits of the feature being lit. In the case of the Lower Tatlock field, the lighting is focused on the playing field and generally excludes associated features including the surrounding running track.



#### IV. IMPACTS

The New Jersey Landscape Project mapping identifies the wooded portions of the Tatlock Sports Complex and all of Martin's Brook Park as habitat for the endangered Indiana bat. This occurrence stems from a "Live Individual Sighting" that likely originates from the Great Swamp National Wildlife Refuge and may also be associated with the riparian corridor of the Passaic River. Both of these "occupied" Habitats, which may be attributed to sightings that originated prior to WNS, are largely undeveloped and not subject to the more urban setting associated with the Tatlock Sports Complex.

As discussed above, the two sports fields that are proposed for Musco LEED lighting currently provide no wildlife habitats, due to their developed nature and artificial turf stratum. However, bats may still be utilizing the adjacent woods for roosting and hunting over the fields or gleaning insects from the woods edge. Bats that are light adverse may be deterred by the introduction of an additional new light source. However, based on the existing lighting of the parking lot, surrounding streets and homes, school, and tennis courts, light attracted bats would likely not be adversely impacted by additional lights, assuming that under either scenario there are insects prey to attract bats to the site.

Although the official survey season for bats is between May 15 and August 15, to focus on locating female maternity colonies, bats are generally active from April through October. To determine if bats are active at Tatlock Sports Complex and determine if the bats species identified are considered light adverse or light attracted, EcolSciences deployed a Wildlife Acoustics bat monitor at the south end of Martin's Brook Park and just north of the Lower Tatlock field, along the forest edge, outside of the fence around the track. The acoustic monitor was set up the afternoon of October 2, 2024 and retrieved the afternoon of October 7, 2024. The weather during the survey period, daily from sunset to sunrise, was above the minimum temperature of 50° Fahrenheit, with light winds and no measurable rainfall.

Based on the survey results, during the five-night survey, 196 bat calls were processed by Kaleidoscope Pro (a USFWS approved program to identify bat acoustic calls to species) belonging to six (6) species. Of the six species identified, Kaleidoscope Pro assigned significant maximum likelihood indicators (MLE) values to four (4) species: big brown bat (EPFU - *Eptesicus fuscus*), eastern red bat (LABO - *Lasiurus borealis*), hoary bat (LACI - *Lasiurus cinereus*), silver-haired bat (LANO - *Lasionycteris noctivagans*). Calls identified as little brown bat (MYLU - *Myotis luciferus*), northern long-eared bat (MYSE), and tri-colored bat (PESU) were identified, but not

determined to be significant by the program. No Indiana bat (MYSO) calls were detected during the survey (Table 1).

Table 1: Output results from Kaleidoscope Pro Version 5.4.7 (a USFWS approved software for Indiana and Northern long-eared bat presence/absence surveys) recorded with the Wildlife Acoustics SM4FS from The Tatlock Sports Complex located west of Butler Parkway and south of Route 646 in the City of Summit, Union County, New Jersey. Significant maximum-likelihood estimator (MLE) of <0.05, are highlighted in green, while non-significant MLE values are highlighted in gray. Above each MLE value is the number of call files identified as each species.

Adjusted Date		EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	MYSO	PESU	NOID	Empty/ Noise
2-Oct-24	# of Call Files	4	5	1			2			4	0	104
	MLE Value	0.0011901	0.000014	0.6683358	1	1	0.9455926	1	1	0.393036		
3-Oct-24	# of Call Files	26	5	1	14		3			3	1	6
	MLE Value	0	0.0000241	1	0.0614748	1	0.6151598	1	1	0.684968		
4-Oct-24	# of Call Files	20	5	7	7		5			4	1	11
	MLE Value	0	0.000115	0.0184842	0.9169637	1	0.1597427	1	1	0.398658		
5-Oct-24	# of Call Files	22	5	5	17		5	1		2	0	5
	MLE Value	0	0.000107	0.3394533	0.0056076	1	0.1014736	0.748893	1	0.95774		
6-Oct-24	# of Call Files	2	4	2	5		3			6	0	4
	MLE Value	0.6273439	0.0007627	0.1954304	0.0354798	1	0.5822347	1	1	0.050078		

MLE values are used to determine if any of the recorded calls were of good enough quality to make a species identification. A significant MLE value indicates that the program believes identification is possible, but due to overlapping call frequencies, quality of calls, background noise, or other variables, does not always correctly identify the bat species. In that case, manual vetting of each call is the best means of determining if the species identification is correct. Manual vetting of all these high frequency calls by a United States Fish and Wildlife New Jersey Recognized Qualified Indiana and Northern Long-Eared Bat Surveyor (RQINLEBS) verified that no Indiana, northern long-eared, tricolor, or little brown bats were present during the survey.

The RQINLEBS determined that the acoustic calls attributed to hoary and silver-haired bats, high flying migratory bats, did appear to confirm the presence of these two species. However, the call files were poor-quality calls since they are almost out of range of the detector, likely indicating they were flying high over the site and not actively using the site.

The call files for both the big brown bat and eastern red bat were also confirmed as present. As discussed above, these light-attracted species were the species most likely to be encountered in the type of disturbed habitat surrounding the Tatlock Sports Complex. The addition of new lights in a community with streetlights, outside house and driveway lights, ambient lights from homes and commercial areas will likely not impact bat activity by these tolerant species. As discussed below, the DarkSky lighting with glare protection also prevents light spillover into the adjacent undeveloped parklands.

As proposed above the Musco lighting plan also minimizes any light spillover into adjacent residential areas. The DarkSky lighting ensures that all light fixtures are downward facing to

eliminate glare and extra light entering the night sky. The proposed lighting plan has been strictly structured to light only the two respective ballfields proposed for lights to ensure that no light extends beyond the Tatlock Sports Complex active recreation area. The sport lighting should result in no change in current ambient light levels experienced by adjacent residential properties (Attachment B).

As stated by Musco Sports lighting, the goal of the Tatlock Park Field Lighting Project is to provide safe, playable, community friendly field lighting by:

- ☐ Designing the lighting using the right amount of light, no more, no less, for the safety of the players. This field is for high school level play only and the lighting will match that.
- ☐ Aim the lighting fixtures where they are needed to cut off the spill light. The poles provide a steep aiming angle so we can cut the light off just outside the perimeter of the field with resulting horizontal spill of 0.0 Footcandles at the property line.
- ☐ Use state of the art Musco lighting fixtures with external visors on them to shield any glare to minimize the view of the light source.
- ☐ Use a timer (aka Musco Control Link) to turn the lights off at a designated time so that the lights do not stay on all night.
- ☐ Propose a design which meets the criteria for responsible outdoor lighting by the Dark Sky Association.

## V. SUMMARY AND CONCLUSION

In summary, the proposed lighting of the Upper and Lower Tatlock fields will not adversely affect the natural resources of the existing ballfields or increase glare or light pollution to the neighbors if developed using the Musco DarkSky Approved LED lighting as summarized below:

- The eight new light poles are proposed in areas that are already significantly developed. The lights are proposed in areas that are already impacted by human activity. The fields to be lit are already artificial turf fields. Therefore, no impacts to native vegetation, soils, topography, wetlands/waters, or wildlife habitat are proposed.
- Although wildlife species that are tolerant of human habitation, such as grey squirrels, chipmunks, red fox, white-tailed deer, and certain songbirds may utilize portions of the Tatlock Sports Complex where trees, shrubs, and successional field vegetation occur or Martin's Brook Park with its associated forest, wetlands and stream habitats, the artificial turf fields to be lit provide no food, cover or water to attract wildlife.
- The exception is whether the lights might attract insects and serve as an attractant to bats. As discussed, when it comes to artificial lights, there are two types of bats: light-attracted or light-adverse. Based on EcolSciences acoustic survey, the bats identified in the vicinity the Tatlock Sports Complex are all considered light attracted bats and the addition of the proposed LED lights would likely not modify their behavior since the City of Summit is already well-developed with multiple light sources including streetlights, house lights, commercial lights, and vehicular lights.
- In terms of light impacts to surrounding residences, the Musco DarkSky Approved LED lighting proposed for the Upper and Lower Tatlock fields have been specifically designed to minimize light pollution and focus all lighting directly on the fields of play. The lights are shielded to prevent light spillage into the night sky and focused on the playing fields. The design also ensures that there are zero-footcandles of horizontal light spillage extending beyond the boundary of the Tatlock Sports Complex property into adjacent roadways or residential properties.

## VI. REFERENCES

- Beans, B.E. and Niles, L., editors.** 2003. Endangered and Threatened Wildlife of New Jersey. Rutgers University Press, New Brunswick.
- Cheng, T.L.** July 28, 2020. The Scope and Severity of White-Nose Syndrome on Hibernating Bats in North America. Conservation Biology.
- MUSCO. 2021.** Sports Lighting Answers to Nine Common Questions.
- New Jersey Department of Environmental Protection (NJDEP).** 1989. New Jersey Wildlife Profiles. Vol. 1. 112p.
- New Jersey Division of Fish and Wildlife.** 2017. New Jersey Landscape Project, Version 3.3. New Jersey Department of Environmental Protection, Division of Fish and Wildlife, Endangered and Nongame Species Program. pp. 33.
- NJDEP.** Re-Adopted July 17, 2023. Last Amended December 18, 2023. Surface Water Quality Standards.
- NJDEP.** Last updated January 18, 2024. NJ-GeoWeb Map <https://www.nj.gov/dep/gis/geoweb splash.htm>.
- Seewagen, CL, JN. Gneckow, AM. Adams. 2024.** Far-Reaching Displacement Effects Of Artificial Light At Night In A North American Bat Community. Global Ecology And Conservation.
- United States Fish and Wildlife Service (USFWS).** March 2024. Range-Wide Indiana and Northern Long-eared Bat Survey Guidelines.
- USFWS.** August 2024. Standing Analysis and Implementation Plan – Northern Long-Eared bat and Tricolored Bat Assisted Determination Key.
- USFWS.** October 15, 2024. Northern Long-eared Bat and Tricolored Bat Voluntary Review Process for Development Projects Version 1.0.

# **ATTACHMENT A**

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**Figures**

**EcolSciences, Inc.**

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# **ATTACHMENT B**

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**Pertinent Correspondence**

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# **ATTACHMENT C**

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**Qualifications of Preparers**

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