APPENDIX C

HABITAT ASSESSMENT

LEGOLAND NEW YORK
THREATENED AND ENDANGERED SPECIES HABITAT ASSESSMENT
TOWN OF GOSHEN
ORANGE COUNTY, NEW YORK

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I. INTRODUCTION AND PROJECT DESCRIPTION

EcolSciences, Inc. was retained to conduct an environmental assessment focusing on potential threatened and endangered species habitat of the proposed Legoland New York Theme Park ("Site") located in the Town of Goshen, Orange County, New York. The site consists of 524 acres and is located south of Route 17 and Harriman Road (Attachment A - Figure 1). The Site contains a mix of land uses including former agricultural lands, second growth forest, as well as State and Federal regulated forested and emergent wetlands (Figure 2). Several years ago, construction of the eastern half of the site was initiated for a single family residential development that was never completed. However, the gravel road system, drainage improvements, and developed wells are still evident in the field. A hotel/restaurant was formerly located at the terminus of the paved access road accessing the site from Harriman Drive. Remnant paved parking lots are all that remains after the facility was destroyed. An Orange-Rockland overhead utility Right-of-Way (ROW) crosses east to west through the central portion of the site (Figure 3).

Merlin Entertainments Group US Holdings, Inc., as project sponsor, proposes to construct a theme park and resort on approximately 153 acres of a 524 acre site. The park will include rides and attractions, an aquarium, theaters, restaurants, a hotel and various back of the house facilities including offices and staff areas as well as associated parking and drainage facilities. Parking will be provided for approximately 5,000 cars. A gated emergency access road will be provided to Arcadia Road. The project has been designed to minimize impacts to the environmental setting of the property, especially on-site wetlands. No project impacts are proposed to wetlands regulated by the Army Corps of Engineers or New York State. The project avoids all impacts to the one New York State (NYS) regulated wetland (GO 41) adjacent areas. Impacts to potential New York State wetlands have been minimized upon meeting with the New York State Department of Environmental Conservation (NYSDEC, Figure 4).

In connection with the preparation of this Threatened and Endangered Species Habitat Assessment, EcolSciences conducted a desktop review of the Site, including review of maps, plans, and agency databases. EcolSciences biologists traveled to the Site to conduct multiple field inspections in May, June, July, and August. This report provides the results of the field investigation conducted by EcolSciences, as well as data from the New York Breeding Bird Atlas (NYBBA), United States Fish and Wildlife Service (USFWS) and NYSDEC. The report is intended to be reviewed in conjunction with the enclosed figures, tables, and attachments as well as site plans prepared by project engineers and similar supplemental reports provided by other project consultants, particularly where such reports provide a discussion of other ecological resources, such as wetlands that are not intended to be addressed in this report.

II. BACKGROUND DATA COLLECTION

Prior to conducting the on-site investigation, EcolSciences collected background information on local conditions and rare wildlife records from the United States Fish and Wildlife Service (USFWS) and New York Natural Heritage Program (NYNHP) database. EcolSciences has also assembled a collection of reference materials regarding threatened and endangered species from prior studies, scientific journals, State protocols, recovery plans and "fact-sheets." Together, these reports provide information regarding the natural history, habitat requirements and survey methodologies for each species.

A. USFWS IPaC Database

Based on the IPaC report from the USFWS, the site is located within the range of five Federally threatened or endangered species known from Orange County; bog turtle (*Glyptemys muhlenbergii*), Indiana bat (*Myotis sodalis*), northern long-eared bat (*Myotis septentrionalis*), dwarf wedge-mussel (*Alasmidonta heterodon*), and small whorled pogonia (*Isotria medeoloides*). In addition, the USFWS lists twenty-one migratory bird species of conservation concern that may occur within the project area (Attachment B).

B. New York Natural Heritage Program Database

The New York Natural Heritage Program (NYNHP) was established in 1985 and is a partnership between the NYSDEC and the State University of New York College of Environmental Science and Forestry. The NYNHP maintains a database on New York's flora and fauna to deliver information to partners working in natural resource conservation. To obtain records of known rare species on the site, EcolSciences requested a review of the NYNHP database for the property. In their response dated July 5, 2016, the NYNHP did not have records for any rare species or habitats on or adjacent to the site (Attachment C).

C. NYSDEC Environmental Resource Mapper

The NYSDEC Environmental Resource Mapper (ERM) provides the general areas where rare animals, rare plants, and rare and significant natural communities have been documented by the NY Natural Heritage Program. These maps (containing known locations mapped with a surrounding buffer) are intended as one source of information for landowners, land managers, citizens, local officials, and project sponsors engaged in land use decision making, conservation, or environmental

assessment. The ERM Mapper identifies the site to be partially located within the buffer of a rare resource (Figure 5). In a July 14, 2016 letter from the New York State Department of Environmental Conservation (NYSDEC), appears to confirm that the species buffer is associated with the State endangered northern cricket frog (*Acris crepitans*), identified in proximity to the site (Attachment C).

D. New York Breeding Bird Atlas

Fieldwork for The Second Atlas of Breeding Birds in New York State was conducted from 2000 through 2005. All birds observed within individual 3 x 3-mile blocks were recorded and assigned a breeding code signifying either possible, probable, or confirmed breeding (McGowan and Corwin 2008). The Site is part of two blocks where a combined total of seventy-eight bird species were documented. No endangered or threatened species were observed. Three State species of special concern were noted: osprey (*Pandion haliaetus*), Cooper's hawk (*Accipiter cooperii*), and cerulean warbler (*Setophaga cerulea*).

E. Field Investigation

The site includes a mix of second growth forest, successional farmfields, wetlands, and disturbed vegetative communities associated with the above-ground utility easements, and previous development (former hotel and road improvements associated with an approved but not built residential subdivision). The forested communities include a mix of deciduous forest species including white oak, northern red oak, tulip poplar, sugar maple, red maple, American beech, hickory species, and shagbark hickory. The successional farmfields include dense thickets of multiflora rose, autumn olive, and bush honeysuckle. A large emergent wetland area associated with a former farm pond located south of Harriman Road is characterized by sedges, tussock sedge, cattail, and common reed. Most of the other wetlands are located within forested and scrub/shrub areas, associated with on-site intermittent stream channels. None of the on-site stream channels appear to have year round flow, except for the northernmost portion of Otter Creek and a large man-made swale constructed along the perimeter of New York State wetland GO-41, west of Gumwood Drive.

Based on the initial site investigation, no appropriate habitat was identified for dwarf wedge mussel. All of the on-site stream channels were found to be largely ephemeral in nature and not conducive to supporting a mussel population throughout the year. During EcolSciences' summer field investigation, the stream channels were characterized by intermittent puddles of water in streambeds characterized by cobble, rock, silt, sand, and occasional muck soils. With limited ability to move,

dwarf wedge mussels are dependent on consistent stable stream flows. The on-site stream channels do not provide sufficient habitat and no additional field habitat assessments for dwarf wedge mussel was conducted.

Although small whorled pogonia was identified by USFWS as potentially occurring in Orange County, based on available literature, the State of New York has only one know population of the Federally protected plant species and it is not found in the vicinity of the Site. Therefore, no additional field habitat assessment for small whorled pogonia was conducted.

Based on EcolSciences' preliminary habitat assessment, potential habitat was identified for Indiana and Northern long-eared bat, bog turtle, and northern cricket frog and additional field habitat surveys were conducted. Species habitat requirements for each species are discussed in the following sections. As part of the habitat assessment, a list of avian species utilizing the site in the spring and early summer was compiled. Table 1 in Attachment D provides a list of fifty-two birds identified during the site visits. The bird list predominantly consists of common year-round and summer residents of woodlots and successional fields. An adult Cooper's hawk (*Accipiter cooperii*), a New York species of special concern, has territory that includes a portion of the on-site woodland. Two USFWS-listed birds of conservation concern, wood thrush (*Hylocichla mustelina*) and willow flycatcher (*Empidonax trailli*), likely nest on-site. No other species of special concern, and no threatened or endangered species listed by either USFWS or NYSDEC, were identified during the field visits.

During the habitat assessment, other wildlife observations were also collected. In addition to the avian species, six (6) mammal species; white-tailed deer, muskrat, gray squirrel, eastern chipmunk, raccoon, and opossum were observed on site by sight, sign, or track. One large bat (species unknown) was observed foraging over New York State wetland G)-41. Herptile species observed included American toad, green frog, northern gray tree frog, bullfrog, painted turtle, and common snapping turtles, also observed by sign or direct observation during the site visits.

III. SPECIES ECOLOGY

Based on the above, the site was identified as potential habitat by USFWS migratory bird species of conservation concern, bog turtle, Indiana bat, northern long-eared bat, and northern cricket frog. A description of the distribution and habitat for these threatened and endangered wildlife species is provided in the following sections.

A. Bog Turtle

Bog Turtle (*Glyptemys muhlenbergii*), is Federally threatened and New York State endangered species, documented to occur within Orange County, New York. Bog turtle habitat is recognized by three criteria; suitable hydrology, soils and vegetation. Hydrology is the driving force behind a wetland system and is extremely important in maintaining the soil and vegetative characteristics preferred by this species. In general, appropriate wetland hydrology consists of shallow, spring-fed seepages with water or soil saturation present year-round. Hydrology to the wetlands is typically provided by calcium-enriched seepages and groundwater discharges although surface flows may not always be evident and "pseudo-rivulets" developed within game trails may be present. Suitable soils generally consist of organic mucks or muck-like soils. The characteristic mucky soils are often easily compressed and, in grazed areas, the turtles for basking often use pockets of standing water in old hoof-prints.

Vegetatively, an open, emergent wetland community that may be interspersed with shrub/scrub areas and with a forested wetland perimeter generally characterized bog turtle habitats. Wet meadows, marshes, pastures, swamps and more acidic "poor" fens are typical habitats. Common emergent wetland species include hydrophytic grasses and sedges, including tussock sedge (*Carex stricta*), woolgrass (*Scirpus cyperinus*), soft rush (*Juncus effuses*) and rice cut grass (*Leersia oryzoides*). Associated herbaceous species include skunk cabbage (*Symplocarpus foetidus*), arrowhead (*Sagittaria latifolia*), sweet flag (*Acorus calamus*) and cattail (*Typha* sp.). Shrubby vegetation includes alder (*Alnus* sp.), shrubby cinquefoil (*Dasiphora fruticosa*) and red maple (*Acer reubrum*) saplings. In disturbed areas, purple loosestrife (*Lythrum salicaria*), reed canary grass (*Phalaris arundinacea*) and multiflora rose (*Rosa multiflora*) are also common (USFWS, 2001; NJDEP, 1995).

Bog turtles commonly use the open, emergent areas for foraging and basking. Nests are often placed in the open, on top of tussock sedge hummocks. For over-wintering, the turtles may crawl into the soft substrate, use old muskrat borrows, or be found around the roots of woody vegetation.

B. Indiana Bat

The Indiana bat is known to occur in throughout eastern New York State including Orange County. 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 (USFWS, 2015, NYSDEC, 2010, NJDEP, January 2013).

Maternity colonies generally 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 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 (USFWS, 2015, NJDEP, 2013, NYSDEC, 2010).

C. Northern Long-Eared Bat

The Northern long-eared bat is found throughout New York State and appears to be associated with mature un-fragmented interior forest. Northern long-eared bats may be found in uplands as well as along forested streams and vernal habitats. Some studies indicate that they select for forest hilltops rather than the lowland forest favored by Indiana bats. However, like Indiana bats, they will roost in dead and live trees under exfoliating (loose) bark, in fissures, crevices, and cavities (U.S. Fish and Wildlife Service 2015). Northern long-eared bats have been known to roost in human structures including houses, sheds, barns, and man-made bat boxes. Maternity roosts tend to be in large diameter trees, but individuals have been found in trees as small as 3 inch diameter at breast height (DbH). Northern long-eared bats hibernate in caves and mines where the air temperature is constant, preferring cooler areas with high humidity (U.S. Fish and Wildlife Service 2013

D. Northern Cricket Frog

Northern cricket frogs (including several regional varieties or subspecies) are widely distributed in the eastern and central United States from southeastern New York to Florida, west to New Mexico and north to South Dakota. Within New York, northern cricket frogs reach their northernmost limit within the Hudson Highlands-Shawangunk region of Ulster, Dutchess and Orange Counties. Northern cricket frogs are considered endangered in New York State.

Northern cricket frog populations across much of their range have experienced declines due to (among other factors) development and loss of wetland and upland habitats, water quality degradation (from road salts, fertilizers, etc.) and threats posed by commonly used agricultural and household chemicals and pesticides (which may be acutely toxic or which may skew sex ratios or otherwise diminish reproduction). In addition, northern cricket frogs are also expected to be susceptible to loss of populations from disease, persistent drought, severe winters, and similar events due to their low site populations, short life spans, high predation losses, and possible poor winter survival. Due to their relatively short life spans, cricket frogs may have a reduced ability to recover from environmental stressors.

Northern cricket frog breeding habitat may include any permanent body of freshwater, including lakes, ponds, rivers, and streams that exhibit sunny, open canopy shallows, gently sloping muddy banks, and abundant aquatic or shoreline vegetation. Preferred habitats tend towards slower and shallower water bodies with a mat of floating vegetation and organic debris and tend not to be deep, open waters or those with swift current. Use of non-traditional wetland habitats including cattail marshes and red maples swamps has also been documented, as has use of man-made wetlands which provide the desired structure.

Male northern cricket frogs use vegetated aquatic areas for calling and females use them for egg deposition. Breeding occurs in water, where the female lays numerous individual eggs or small clusters of eggs on vegetation, substrate or loosely.

In addition to the preferred characteristics of the wetlands, northern cricket frog breeding habitats are typically bordered by at least some surrounding forest, which provides for upland foraging and dispersal and, in some cases, potential overwintering locations. Current data indicates that upland behaviors generally take place within 1,500 feet of known breeding locations. While using these terrestrial habitats, northern cricket frogs may be found taking cover beneath grasses or other vegetation.

The diagnostic call of the northern cricket frog consists of a "cricket-like" chirp or trill. Sporadic daytime calling begins in early to mid-spring and generally extends well into the night as the season progresses (May to August) when nighttime temperatures exceed 60F. Increased vocalization appears to be correlated with warm, humid and still conditions.

E. Endangered, Threatened and Special Concern Bird Species

A review of the Second Atlas of Breeding Birds of New York shows that no breeding records of endangered or threatened birds were documented in two survey blocks that include the site from 2000 to 2005. These blocks have breeding records of three State species of special concern: osprey (*Pandion haliaetus*), Cooper's hawk (*Accipiter cooperii*), and cerulean warbler (*Setophaga cerulea*). An expanded review of Atlas maps and data that evaluated all of Orange County found that there are breeding records of one State-endangered, four State-threatened, and fourteen special concern birds (Attachment D, Table 2). The USFWS lists twenty-one bird species of conservation concern (Attachment B) that could occur on the site, including seven that are among the State endangered, threatened, and special concern species listed in Attachment D, Table 2. The USFWS list also includes birds that only occur outside the breeding season. The lists include a variety of birds ranging from small songbirds to large raptors that occupy a range of habitats.

The lists include several raptors. Nests of the State special concern bald eagle (*Haliaeetus leucocephalus*) and osprey (*Pandion haliaetus*) typically occur near large waterbodies. Sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*Accipiter cooperii*), northern goshawk (*Accipiter gentilis*), and red-shouldered hawk (*Buteo lineatus*), all State special concern, are all forest dwelling birds of prey. The State-threatened northern harrier (*Circus cyaneus*) nests in extensive grasslands. The State-endangered peregrine falcon (*Falco peregrinus*) is a cliff-nester that has adapted to use buildings and bridges.

There are three birds exclusively associated with wetland and aquatic habitats: the State-threatened pied-billed grebe (*Podilymbus podiceps*) and least bittern (*Ixobrychus exilis*) and the special concern American bittern (*Botaurus lentiginosus*). Of these, least bittern is not known to nest in Orange County.

Several songbirds are associated with forested habitats including the State species of special concern cerulean warbler (*Setophaga cerulea*) and the USFWS-listed Canada warbler (*Wilsonia canadensis*), olive-sided flycatcher (*Contupus cooperii*), fox sparrow (*Passerella iliaca*), Louisiana waterthrush (*Parkesia motacilla*), rusty blackbird (*Euphagus carolinus*), wood thrush (*Hylocichla mustelina*), and worm-eating warbler (*Helmitheros vermivorum*). Olive-sided flycatcher, fox sparrow, and rusty blackbird only occur outside the breeding season in Orange County. Other forest-dwelling breeding birds include the State special concern red-headed woodpecker (*Melanerpes erythrocephalus*) and eastern whip-poor-will (*Antrostomus vociferus*).

In addition to northern harrier noted above, there are other obligate grassland birds typically found in extensive areas with suitable cover like the State-threatened upland sandpiper (*Bartramia longicauda*) and State special concern grasshopper sparrow (*Ammodramus savannarum*) and horned lark (*Eremophila alpestris*), and USFWS-listed short-eared owl (*Asio flammeus*). Short-eared owl is also State-endangered, but it is only known to nest at isolated locations in western and northern New York.

Much of the remaining birds listed in Attachment B and Attachment D, Table 2 consist of species associated with successional habitats including the State special concern golden-winged warbler (*Vermivora chrysoptera*) and yellow-breasted chat (*Icteria virens*) and the USFWS-listed blue-winged warbler (*Vermivora cyanoptera*), black-billed cuckoo (*Coccyzus erythropthalmus*), prairie warbler (*Setophaga discolor*), and willow flycatcher (*Empidonax traillii*).

IV. HABITAT EVALUATION

The USFWS and NYSDEC identified potential habitat for the Federally-endangered Indiana bat, dwarf wedge mussel, and small whorled pogonia, Federally-threatened bog turtle and northern long-eared bat; and State-endangered northern cricket frog. Based on the initial field habitat evaluation, habitat for dwarf wedge mussel does not occur on-site in the absence of perennial stream. Small whorled pogonia is only known from one site in New York which is not proximate to the subject parcel. Therefore, these species were not evaluated further.

EcolSciences conducted field habitat evaluations between June and August 2016 and confirmed potential forested roosting habitat for the Indiana bat and northern long-eared bat. Although several large emergent wetlands were identified within the site, based on wetland specific habitat assessments, the on-site wetlands were determined not to be potential habitat for bog turtle. The presence of a large pond and man-made ditch/swale were identified as potential northern cricket frog habitat. Based on the presence of predatory species (bullfrog and snapping turtle), water quality concerns, and a late season northern cricket frog survey, these on-site water features were determined not to support northern cricket frog. The results of the habitat assessment are discussed in the following sections.

A. Bog Turtle

EcolSciences' USFWS Recognized Qualified bog turtle surveyor completed New York Phase 1 habitat assessments of the on-site emergent wetlands on June 7 and 24, 2016(Figure 6). The on-site emergent wetlands identified along the Gumwood swale was not determined to be potential habitat since the NYSDEC wetland maps do not identify the wetland as potential habitat, the swale effectively removes most surface hydrology from the wetland, and absence of muck like soils and was not further surveyed. The emergent wetlands around the Harriman Road pond, and emergent inclusions within the large forested wetland located north of Conklingtown Road are characterized by cattail, tussock sedge, purple loosestrife, reed canary grass, skunk cabbage, jewelweed, sweet flag, and woolgrass. These species can be associated with disturbed potential bog turtle habitats, but do not include the common calciphiles often found in New York bog turtle habitats. The wetland soils, identified by the Orange County, Soil Survey (SCS, 1981) as Madalin silt loam (Ma) (Figure 7) are characterized as poorly drained to very poorly drained silt loams formed in former silt/clay lake beds with very poor permeability. In the field, the soils were not characterized by the soft muck or muck-like soil associated with bog turtle habitats. None of the soils were probable to depths of over 3 inches or greater.

In addition, none of the emergent wetlands were characterized by surface rivulets, springs, or other surface or groundwater features that could support a year round bog turtle population. In the absence of these critical habitat features, the emergent wetlands identified within the Site was determined not to provide potential bog turtle habitat. Bog turtle Habitat Evaluation Field Forms supporting this determination are found in Attachment E. Annotated color photographs documenting the emergent wetlands are found in Attachment F.

Based upon the field inspection, EcolSciences concludes that there are no on-site habitats which meet the very specific habitat criteria common to Bog Turtle sites in the New York portion of the USFWS Hudson/Housatonic/Wallkill Recovery Unit.

B. Indiana Bat and Northern Long-Eared Bat

Both forested uplands and forested wetlands occur within the site. The western portion of the site where the previous development disturbances occurred is generally associated with younger trees or smaller diameter at breast height (DBH) and height. In this portion of the site cluttered vines, shrubs, and small trees characterize the understory. Most of the remaining forested areas are characterized by second growth trees including tulip poplar, sugar maple, red maple, white oak, northern red oak, and shagbark hickory. This forest community includes scattered dead snags, live trees with dead limbs, and several trees with exfoliating bark, fissures, holes, and crevices. The understory varies from sparse with scattered shrubs/saplings to extremely cluttered with dense shrubs, brambles and hanging vines. The open and closed forest community, identified snags, trees with exfoliating bark (shagbark hickory), hilltops, proximity to streams and ponds, and wetlands all confirm that the site could be potential Indiana and northern long-eared bat habitat.

C. Northern Cricket Frog

Based on the presence of the on-site pond and man-made swale, potential northern cricket frog habitat was identified on-site (Figure 8). However, further inspection of the pond indicated that the pond receives runoff from the adjacent highways and may serve as a detention area for water quality treatment. Road runoff including road salt, particulates, petroleum products, and waste oil are some of the materials that may enter the wetland/pond after heavy rains. Road salts in particular have been found to be extremely toxic to frogs. As such, the pond may not provide the high water quality generally associated with northern cricket frog habitat. Similarly, the man-made wetland ditch displayed evidence of extensive eutrophication with a dense algae bloom observed on its entire surface. So a similar concern regarding the water quality was raised. No cricket frogs were heard spontaneously call from either area during EcolSciences' June 4, 21, or 24, 2016 field

investigations. Cricket frogs are known to actively call during the day in the early breeding season (May-June).

As noted above, the July 5, 2016 New York Natural Heritage Program response did not identify Northern cricket frog as a species that may occur on-site when their response was solicited on June 3, 2016. However, in their letter of July 14, 2016, NYSDEC indicated the presence of Northern cricket frog "in the proximity of the site" and requested a site biological assessment for this species. Although a habitat assessment can be conducted at any time of year, a presence/absence survey for northern cricket frog in accordance with NYSDEC standard protocols *should be conducted between May 20 and July 10, with at least one survey performed in June and each survey separated by seven (7) or more days.* Since the need for a survey was not provided to the applicant until after the survey period, it was determined with NYSDEC input that a modified late season northern cricket frog survey be conducted to determine if there was any evidence of cricket frog use of the Site.

The northern cricket frog survey was conducted in accordance with many of the protocols established in the *Guidelines for Reviewing Projects for Potential Impacts to the Northern Cricket Frog* (S. Joule, 2009, G. Kenny, 2010). This protocol was also affirmed in the *Recovery Plan for New York State Populations of the Northern Cricket Frog (Acris crepitans)* (NYDEC, 2015). Based on these guidelines, qualified surveyors with knowledge of northern cricket frog ecology and experience identifying frog calls conducted a field survey July 28, 31, and August 5, 2016 to identify if northern cricket frog vocalization could be heard from the on-site waterbodies. Due to the late season, surveys were conducted as quickly as possible to take advantage of appropriate weather conditions. The two (2) on-site survey station locations focused on the areas of potentially suitable on-site open water habitats. The large off-site Goshen Reservoir located at the intersection of Reservoir and Conklingtown Roads was also surveyed. Northern cricket frogs are not known from this location, but the large size of the reservoir and its close proximity to the site made it a potential cricket frog location (Figure 8).

The fourth survey location is off-site at Glenmere Lake, which supports a large well-documented northern cricket frog population. Glenmere Lake is located approximately 2.0 miles from the Site. Based on a review of aerial mapping, the large "floating mat" wetlands located near the Warwick Road cul-de-sac appeared to provide excellent cricket frog habitat (see Insert Figure 8). Each site is described below.

- Harriman Road Pond - is at a man-made pond located along Harriman Road. The approximately 3.0- acre pond appears to collect road runoff from Highway 6 and Harriman Road. The pond is located on a formerly farmed parcel and extensive alterations of the

drainage was observed including bermed pond edges, man-made culverts, and a gravel road around portions of the pond. The pond edge is characterized by a dense edge of cattail and scattered areas of common reed. The pond surface is generally open with areas of dense algae/duckweed observed. The pond does not exhibit the classic floating/matted vegetation characteristic breeding northern cricket frog populations. Due to extensive road noise along Harriman Road, the survey stations consisted of a transect along the eastern and southern edges of the pond.

- Gumwood Drive Swale - is a man-made swale/ditch located along the eastern edge of the site along Gumwood Drive. The swale follows a gravel road that leads to a series of well houses for the Town of Goshen Water. Water quality of the swale appears stagnant with a heavy layer of duckweed. Marsh purslane forms dense rooted vegetation mats across the shallower portions of the swale. . Culverts lead into the swale from adjacent wetlands. The adjacent area includes maintained lawn to the east and to the west reed canary grass, woolgrass, smartweed, sweetflag, purple loosestrife dominated wet meadow of New York State wetland GO 41. Water levels in the adjacent wetlands appear significantly lowered by the adjacent swale. Due to the length of the swale, the survey consisted of walking the length of the swale along the open water perimeter. The extent of highway noise each evening determined how far the surveyor approached toward the highway.

- Goshen Reservoir, Reservoir Road – In addition to the on-site water courses, surveys were conducted on a portion of the 49 acre Goshen Reservoir located west of Reservoir Road, within several hundred feet of the site. This pond was surveyed due to its size and proximity to the site. The survey location was limited to one area located on the southern portion of the wetland, near the intersection of Reservoir and Conklingtown Roads. The Reservoir is a large open body of water. A small common reed/purple loosestrife wetland was identified to the south and a cattail dominated wetland was identified to the north within the survey area. The survey location consisted of one point adjacent to the reservoir playing the tape toward the north and south identified wetlands.

- Glenmere Lake, Warwick Place – The control site was located on portion of the 309 – acre Glenmere Lake located off of Warwick Place, in the Town of Warwick. Glenmere Lake is the home of one of Orange County's largest northern cricket frog populations and is located approximately three (3) miles south of the Site. Warwick Place provided a convenient cul-de-sac access the south central portion of Glenmere Lake. The road provides a clear overview of the lake and associated wetlands. Extensive floating and emergent wetlands characterized the survey area. Shrub islands and lily pads dominated much of the water surface. The survey

location consisted of multiple points from the Warwick Place cul-de-sac playing toward Glenmere Lake.

It should be noted that the vegetative characteristics of the documented Northern cricket frog habitat Glenmere Lake, differed significantly from all the other survey sites by the extensive area of lily pads, shrub islands, and other submerged/rooted vegetation observed within the shallow lake.

At the selected stations, each survey involved playback of recorded cricket frog calls in attempt to elicit a vocal response. The recording was played multiple times at each station, with silent listening before and between each recording. An additional period of silent listening followed the last of the recordings before proceeding to the next sampling point. Each survey location was surveyed for a minimum of ten (10) minutes. In addition, surveyors remained alert at all times for any spontaneous vocalizations that were not elicited by the playback. All surveys were conducted during evening hours beginning generally within 30 minutes after sunset, when other frog species were found to be extensively calling, and ending before midnight. Surveys all occurred on warm nights (66 to 74 F) with moderate to high humidity (64 to 75%) and little to no wind (0 to 3 on Beaufort Scale). On July 28 and July 31, heavy rains immediately preceded the survey. On August 5, no rains occurred before the survey, however extremely humid, warm, overcast weather characterized the survey period. Survey dates were each separated by a minimum of three (3) days.

On July 28 and July 31, northern cricket frogs were heard spontaneous calling from the wetlands/waters of Glenmere Lake. Additional northern cricket frogs began responding when the taped calls were played. No northern cricket frogs were calling or responded to taped calls on August 5 at Glenmere Lake. No northern cricket frogs were heard calling or responded to the tape at any of the on-site survey locations or at the Goshen Reservoir location. The summary of survey results is found in Table 3 (Attachment D).

Although the survey was conducted outside of the recommended Northern cricket frog survey of May 20-Julye 10, these observations of calling cricket frogs at a known site on two of the three survey dates validates the timing and methods of the survey that was conducted on the LEGOLAND New York property and confirmed the absence of Northern cricket frogs on-site.

D. Endangered, Threatened and Special Concern Bird Species

Attachment D, Table 2 lists nineteen birds recognized in the State of New York as either endangered (one), threatened (four), or species of special concern (fourteen) that may nest or have nested in Orange County based on a review of the New York Breeding Bird Atlas (McGowan and

Corwin 2008) and eBird online maps and database. This table provides a brief description of their typical habitat, whether such habitat is found on-site and local occurrence and distribution.

In addition, the USFWS lists twenty-one migratory bird species of conservation concern that may occur within the project area according to the IPaC response prepared for this site (Attachment B). According to the USFWS (2008), "the conservation concerns may be the result of population declines, naturally or human-caused small ranges or population sizes, threats to habitat, or other factors". The USFWS prohibits the take of migratory birds without authorization. Birds are protected by the federal Migratory Bird Treaty Act.

Potential nesting habitat for listed species predominantly associated with forested communities occurs on-site. Of these, only the State special concern Cooper's hawk (*Accipiter cooperii*) and the USFWS listed wood thrush (*Hylocichla mustelina*) and willow flycatcher (*Empidonax trailli*) were observed on-site. A more detailed evaluation of the on-site habitats in terms of the species listed in Attachment B and Attachment D, Table 2 is provided here.

The endangered and threatened birds listed in Attachment D, Table 2 consist of species associated with open country, extensive emergent wetlands, broad areas of grassland, and large waterbodies; all habitats that do not occur on-site. The State-endangered peregrine falcon (*Falco peregrinus*) hunts birds in extensive open areas and cityscapes. It is a cliff nester that has adapted to also use large structures such as buildings and bridges. Bald eagle (*Haliaeetus leucocephalus*) nests are typically located near large waterbodies in which to forage. The nearest eagle nest is likely at Glenmere Lake, approximately three miles south of the site. Pied-billed grebe (*Podilymbus podiceps*) inhabits ponds with floating vegetation that provides its nest substrate. Both northern harrier (*Circus cyaneus*) and upland sandpiper (*Bartramia longicauda*) need large contiguous fields unimpeded by hedgerows and woodlots in which to nest. On-site fields are generally too small, isolated, and overgrown for these species.

According to NYSDEC, species of special concern warrant attention and consideration but current information collected by the Department does not justify listing these species as either endangered or threatened. As with the threatened and endangered birds described above, there are water and wetland dependent birds such as osprey (*Pandion haliaetus*) and American bittern (*Botaurus lentiginosus*) and obligate grassland birds such as horned lark (*Eremophila alpestris*) that have no suitable on-site nesting habitat based on a combination of lack of suitable cover and inappropriate habitat extent.

There are several State-listed special concern birds of forested habitats that could potentially occur on-site. These are: sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk, northern goshawk (*Accipiter gentilis*), red-shouldered hawk (*Buteo lineatus*), whip-poor-will (*Caprimulgus vociferus*), red-headed woodpecker (*Melanerpes erythrocephalus*), and cerulean warbler (*Setophaga cerulea*). Of these, only Cooper's hawk was observed on-site. An adult Cooper's hawk was noted June 21, 2016 in low brush off a gravel access road in the northwestern quarter of the site. The presence of an adult bird on this date indicates the site is part of a Cooper's hawk breeding territory. The New York Breeding Bird Atlas shows Cooper's hawk is the most common of the special concern hawks occurring in Orange County (McGowan and Corwin 2008).

In addition to the State-listed special concern birds of forested habitats, on-site successional fields may provide suitable habitat for golden-winged warbler (*Vermivora chrysoptera*) and yellow-breasted chat (*Icteria virens*). Also Grasshopper sparrow (*Ammodramus savannarum*) is an obligate grassland bird that could potentially use the agricultural field east of the terminus of Harriman Drive. None of these species were detected on-site.

The USFWS list of birds of conservation concern in Attachment B includes seven species that are also among the State-listed birds in Attachment D, Table 2. Of the USFWS-listed birds, wood thrush and willow flycatcher likely nest on-site based on a survey of breeding birds conducted June 21, 2016. A total of six wood thrush were heard singing at scattered locations within on-site woodland. A single willow flycatcher was heard singing in a successional field in the northwest quarter of the site. Singing is indicative of territorial birds.

The USFWS lists additional species of successional habitats that could occur on-site such as blue-winged warbler (*Vermivora cyanoptera*), prairie warbler (*Setophaga discolor*), and black-billed cuckoo (*Coccyzus erythropthalmus*). There are also other listed forest species that could potentially occur on-site during the breeding season including Canada warbler (*Wilsonia canadensis*) and worm-eating warbler (*Helmitheros vermivorum*).

The USFWS lists four birds that are noted as occurring in winter only. Of these, there is only potential habitat present for fox sparrow (*Passerella iliaca*) and rusty blackbird (*Euphagus carolinus*). Fox sparrow occurs in forested habitats with a good understory, and rusty blackbird is often associated with forested wetlands and wet thickets.

V. SUMMARY AND CONCLUSIONS

- EcolSciences, Inc. conducted a desktop review and field evaluation of the LEGOLAND New York theme park site, to determine if the site had the potential for threatened or endangered species habitat.

- Based on information received from the USFWS, the site is located within a portion of Orange County that may provide habitat from Indiana and Northern long-eared bat, bog turtle, dwarf wedge mussel, and small whorled pogonia. The USFWS also identified twenty-one bird species of conservation concern.

- Information from the New York Natural Heritage Program did not identify potential habitat for rare, threatened or endangered species.

- The New York State DEC indicated that the site was located in proximity to known habitat for northern cricket frog, a State endangered species.

- Based on EcolSciences field habitat assessment, the Site did not provide potential habitat for dwarf wedge mussel in the absence of perennial streams.

- The absence of small whorled pogonia in the vicinity indicates that it is unlikely to occur within the Site.

- Although potential habitat was identified for bog turtle due to the presence of on-site emergent wetlands, bog turtle field habitat assessments did not identify the shallow surface hydrology or muck-like soils necessary to support bog turtles.

- The on-site open waters did not appear to provide habitat for northern cricket frogs. Late seasons surveys did not identify Northern cricket frogs on the site, while confirming their presence at a documented control site.

- The site does provide potential summer roost habitat for Indiana and Northern long-eared bat due to the presence of upland and wetland forest communities.

- Fifty-two birds, seven mammals, four amphibians, and two reptiles were observed on-site during the field inspection. Birds observed on the Site are listed in Attachment D, Table 1.

- No threatened or endangered bird species (Attachment D, Table 2) or their critical habitats were observed on the Site.

- Potential habitat of several State-listed bird species of special concern (Attachment D, Table 2), especially those associated with forested communities, occurs on-site. An adult Cooper's hawk was observed during the field inspection, indicating the on-site woodland is part a breeding territory. No other State-listed special concern birds were observed on-site.

- Two USFWS-listed migratory birds of conservation concern (Attachment B), wood thrush (*Hylocichla mustelina*) and willow flycatcher (*Empidonax trailli*) likely nest on-site. Wood thrush is associated with forested habitat. Willow flycatcher occurs in early successional habitat.

VI. REFERENCES

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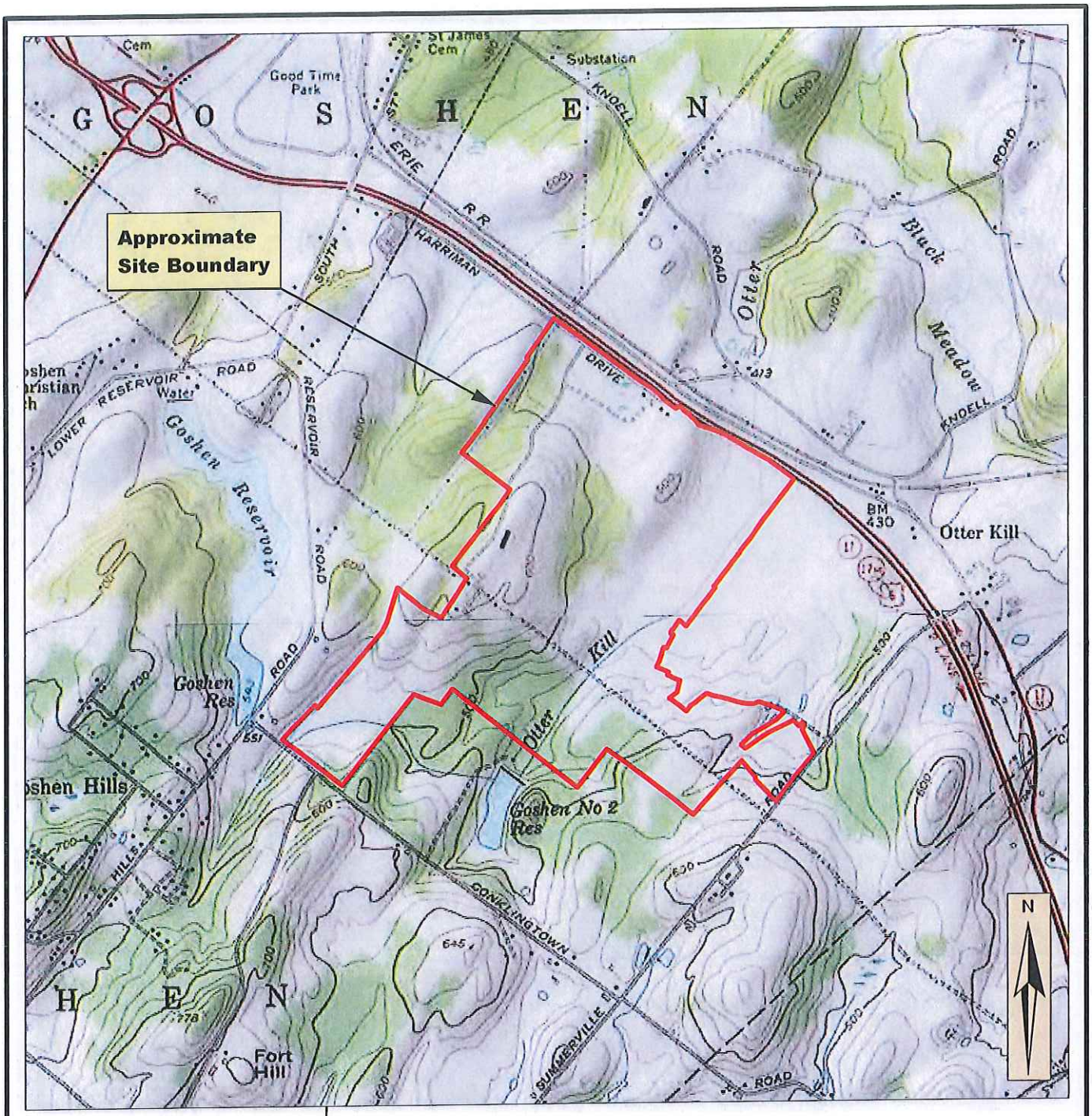
ATTACHMENT A

Figures



SITE LOCATION

UTM Coordinates (Zone 18N NAD 83)
557,346 meters E; 4,580,824 meters N

FIGURE 1: USGS SITE LOCATION

Legoland
Town of Goshen
Orange County, New York

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 8/16

Scale 1:24,000

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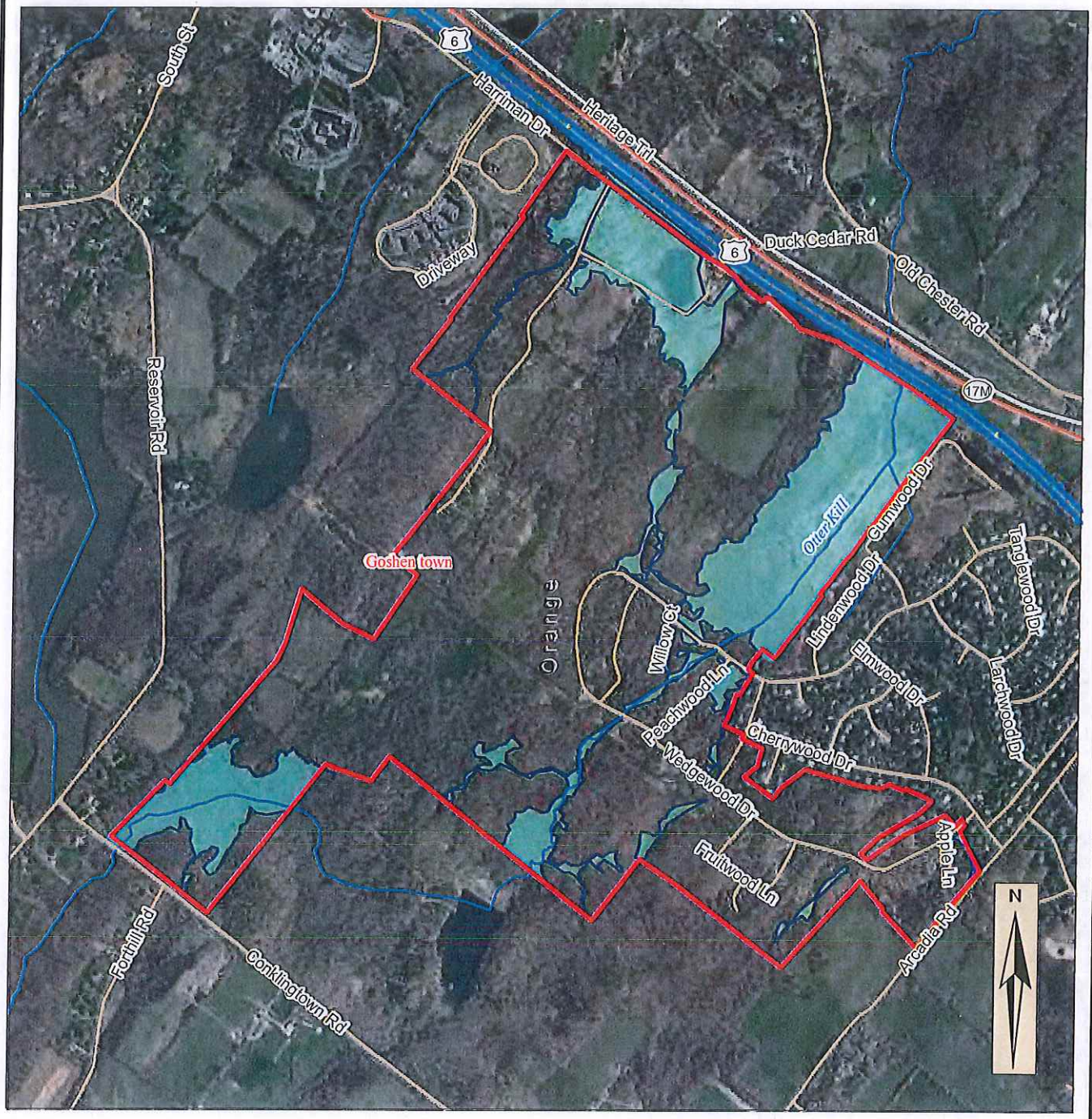

Approximate site boundary

Wetland line

Wetland polygon

FIGURE 2: WETLAND SURVEY

Legoland
Town of Goshen
Orange County, New York

Sources:
Lanc & Tully Engineering and Surveying, P.C.. 2016. Wetland line and polygon.
NY DHSES. NY Statewide Digital Orthoimagery Program. 2013 aerial imagery.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 8/16

Scale 1:15,000

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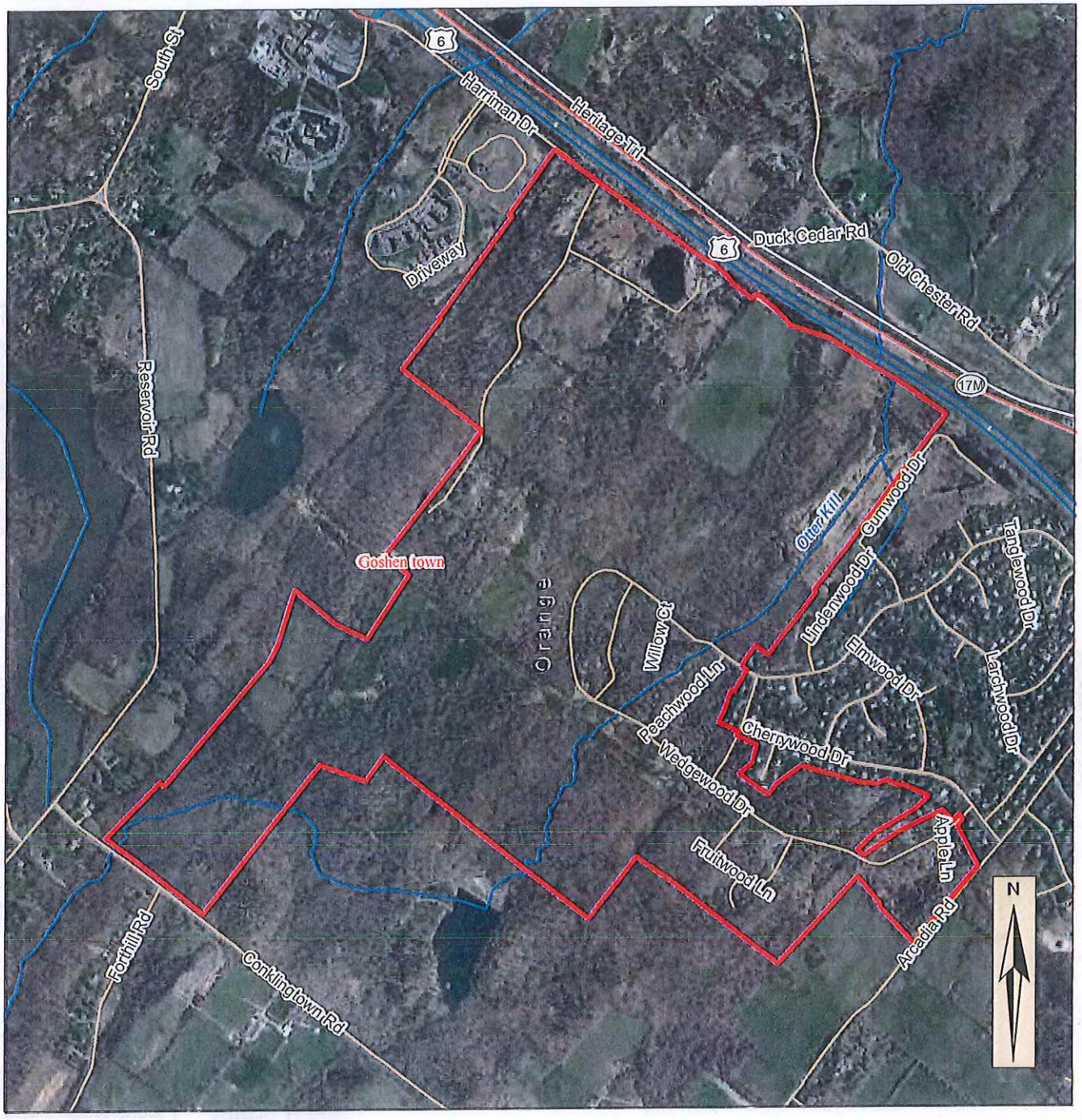

Approximate site boundary

FIGURE 3: 2013 AERIAL IMAGERY

Legoland
Town of Goshen
Orange County, New York

Source: NY DHSES. NY Statewide Digital Orthoimagery Program. 2013 aerial imagery.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 8/16

Scale 1:15,000

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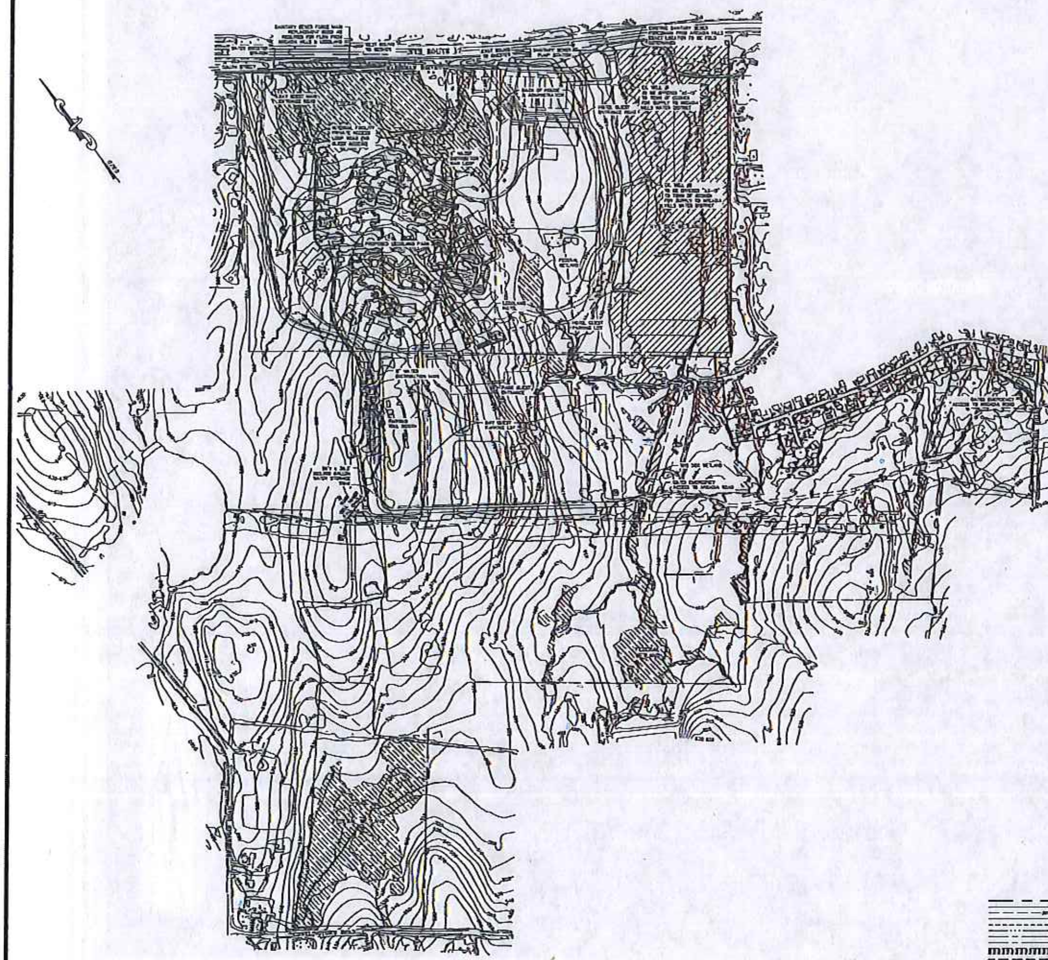


SITE

LOCATION PLAN
1 INCH = 2,000± FEET
TAKEN FROM NYS DOT DIGITAL RASTER QUADRANGLES FOR GOSHEN AND WARWICK

NOTES:
1. PARCEL BOUNDARIES TAKEN FROM AVAILABLE TOWN OF GOSHEN TAX PARCEL DATA AS PROVIDED BY ORANGE COUNTY GIS.
2. TOPOGRAPHY BASED UPON AERIAL MANUSCRIPT PREPARED BY GEODETIC ASSOCIATES INTERNATIONAL.
3. WETLANDS DELINEATED BY ECOLOGICAL SOLUTIONS, LLC JUNE 2018 AND FIELD LOCATED BY LANC & TULLY ENGINEERING AND SURVEYING, P.C. JUNE 2018.

TABLE OF ZONING REQUIREMENTS
TOWN OF GOSHEN
RURAL (RU)
HAMLET RESIDENTIAL (HR)
COMMERCIAL RECREATION OVERLAY (CR)*

MINIMUM	"RU" ZONING DISTRICT AQ3 OVERLAY REQUIRED #	"HR" ZONING DISTRICT AQ3 OVERLAY REQUIRED #	"HR" ZONING DISTRICT REQUIRED	"CR" OVERLAY ZONING DISTRICT REQUIRED	PROPOSED LEGOLAND
LOT AREA	[illegible] ACRES	2 ACRES	SUBJECT TO USE TABLE AND HR DISTRICT DIMENSIONAL REQUIREMENTS STANDARDS ESTABLISHED AT THE TIME OF SITE PLAN APPROVAL	REQUIREMENTS SUBJECT TO REVIEW BY THE PLANNING BOARD	[illegible]± AC.
ROAD FRONTAGE	[illegible] FEET	[illegible] FEET			HARRIMAN DR. [illegible]± FT. ARCADIA RD. [illegible]± FT. CONKLINGTOWN RD. [illegible]± FT.
FRONT YARD SETBACK ON TOWN ROAD	35 FT.	50 FT.			[illegible]± FT.
FRONT YARD SETBACK ON COUNTY/STATE ROAD	50 FT.	50 FT.			
SIDE YARD SETBACK	30 FT.	30 FT.			[illegible]± FT.
REAR YARD SETBACK	50 FT.	50 FT.			[illegible]± FT.
MAXIMUM					
IMPERVIOUS SURFACE COVERAGE	[illegible]	[illegible]	N/A		
BUILDING HEIGHT	35 FT.	35 FT.	35 FT.		[illegible]± FT.
FOOTPRINT FOR NEW RESIDENTIAL STRUCTURES	N/A	N/A	[illegible] SF		N/A

* COMMERCIAL RECREATION OVERLAY ZONE SUBJECT TO ADOPTION BY TOWN BOARD
# SUBJECT TO ENVIRONMENTAL CONTROL FORMULA

APPLICABLE OVERLAY DISTRICTS:
AQ 3, AQ 6
FLOODPLAIN & PONDING AREA OVERLAY
STREAM CORRIDOR AND RESERVOIR WATERSHED OVERLAY
SCENIC ROAD CORRIDOR OVERLAY

RECORD OWNERS:

GOSHEN LAND OWNER LLC
152 W 57TH ST FL 10TH
NEW YORK, NY 10019
L. 13837 P. 1121
11 - 1 - 48
13 - 1 - 50

[illegible] BROTHERS
P.O. BOX [illegible]
GOSHEN, NY 10924
L. 2578 P. 332
11 - 1 - 58
L. 2821 P. 105
11 - 1 - 49.2

[illegible] RESERVOIR LLC
173 WEST STREET
WARWICK, NY 10990
L. 14015 P. 1047
11 - 1 - 43

[illegible] CAREY
JEAN MARIE CAREY
7 OLD TOWN ROAD
MONROE, NY 10950
L. 11271 P. 623
11 - 1 - 47

TOWN OF GOSHEN
41 WEBSTER AVENUE
GOSHEN, NY 10924
L. 2205 P. 703
11 - 1 - 62
11 - 1 - 63
11 - 1 - 64
11 - 1 - 65
11 - 1 - 66
11 - 1 - 67
11 - 1 - 68
11 - 1 - 69

GRAPHIC SCALE
(IN FEET)
1 inch = [illegible] ft.

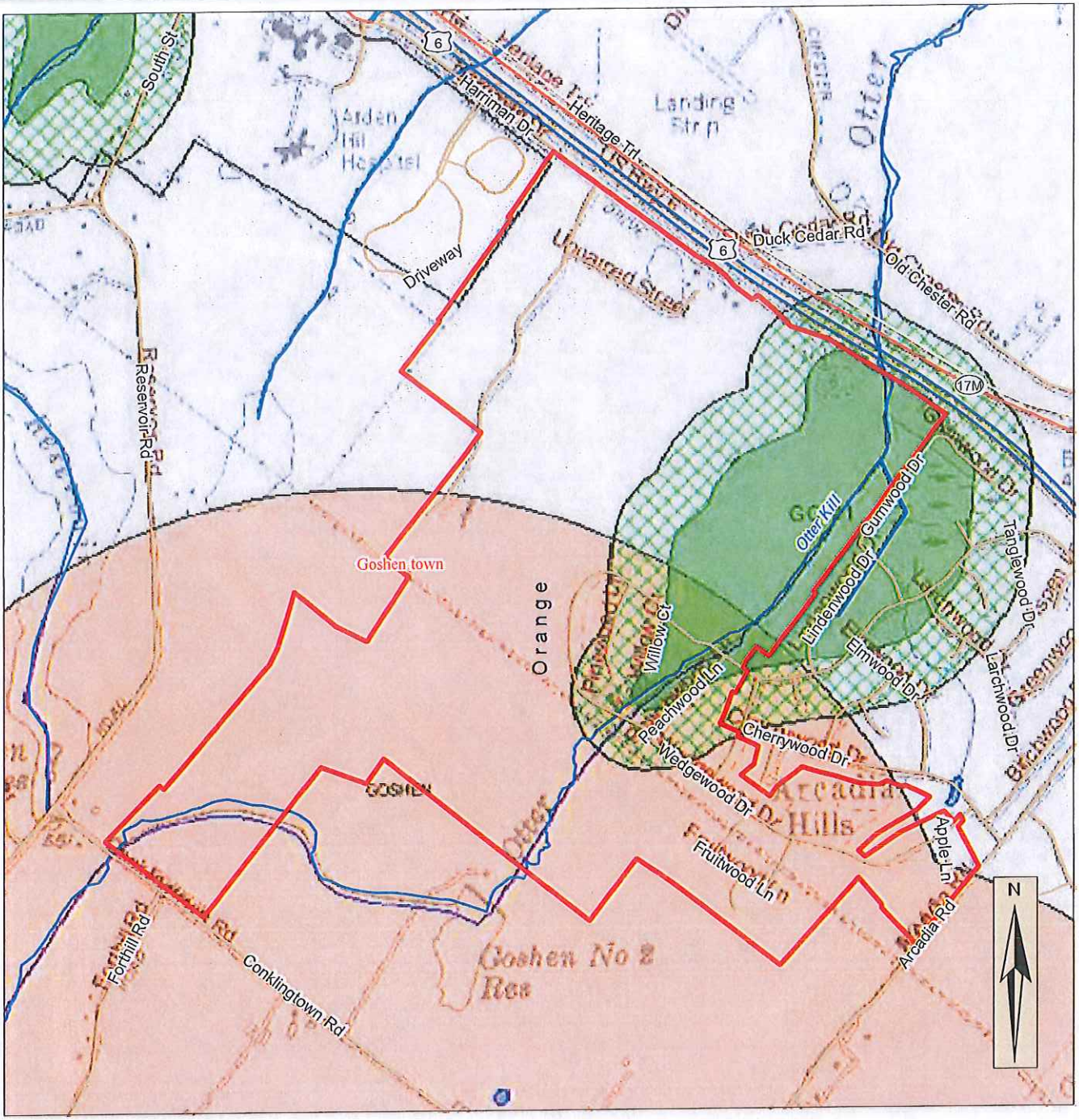
LEGEND
- PROPERTY LINE
- ADJOINING PARCEL LINES
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING EASEMENT
- EXISTING WATERCOURSE
- EXISTING FEDERAL WETLAND BOUNDARY
- EXISTING NYS WETLAND BOUNDARY
- STREAM CORRIDOR AND RESERVOIR
- [illegible] OVERLAY ZONING DISTRICT LIMIT
- FLOODPLAIN AND PONDING AREA OVERLAY
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED EDGE OF PAVEMENT
- PROPOSED DRAINAGE
- PROPOSED SWALE
- PROPOSED SANITARY SEWER
- PROPOSED WATER MAIN
- PROPOSED HYDRANT/VALVE
- PROPOSED DRAINAGE MANHOLE
- PROPOSED FLAT INLET CATCH BASINS
- PROPOSED CURB INLET CATCH BASIN

LANC & TULLY
ENGINEERING AND SURVEYING, P.C.
P.O. Box 687, Rt. 207
Goshen, N.Y. 10924
(845) 294-3700

OVERALL SITE CONCEPT PLAN FOR

LEGOLAND NEW YORK
TOWN OF GOSHEN
ORANGE COUNTY, NEW YORK

JULY 2?, 2018



Approximate site boundary

- Classified Water Bodies
- Unique Geological Features
- Classified Water Bodies
- State-Regulated Freshwater Wetlands
- Wetland Checkzone ?
- Rare Plants and Rare Animals
- Significant Natural Communities
- Natural Communities Vicinity ?
- Background Map
- Adirondack Park Boundary
- Counties

0 1,250 2,500 Feet

FIGURE 5: ENVIRONMENTAL RESOURCE MAPPER

Legoland
Town of Goshen
Orange County, New York

Source: NYSDEC. Environmental Resource Mapper. Available at: http://www.dec.ny.gov/imsmaps/ERM/viewer.htm. Accessed August 2016.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 8/16

Scale 1:15,000

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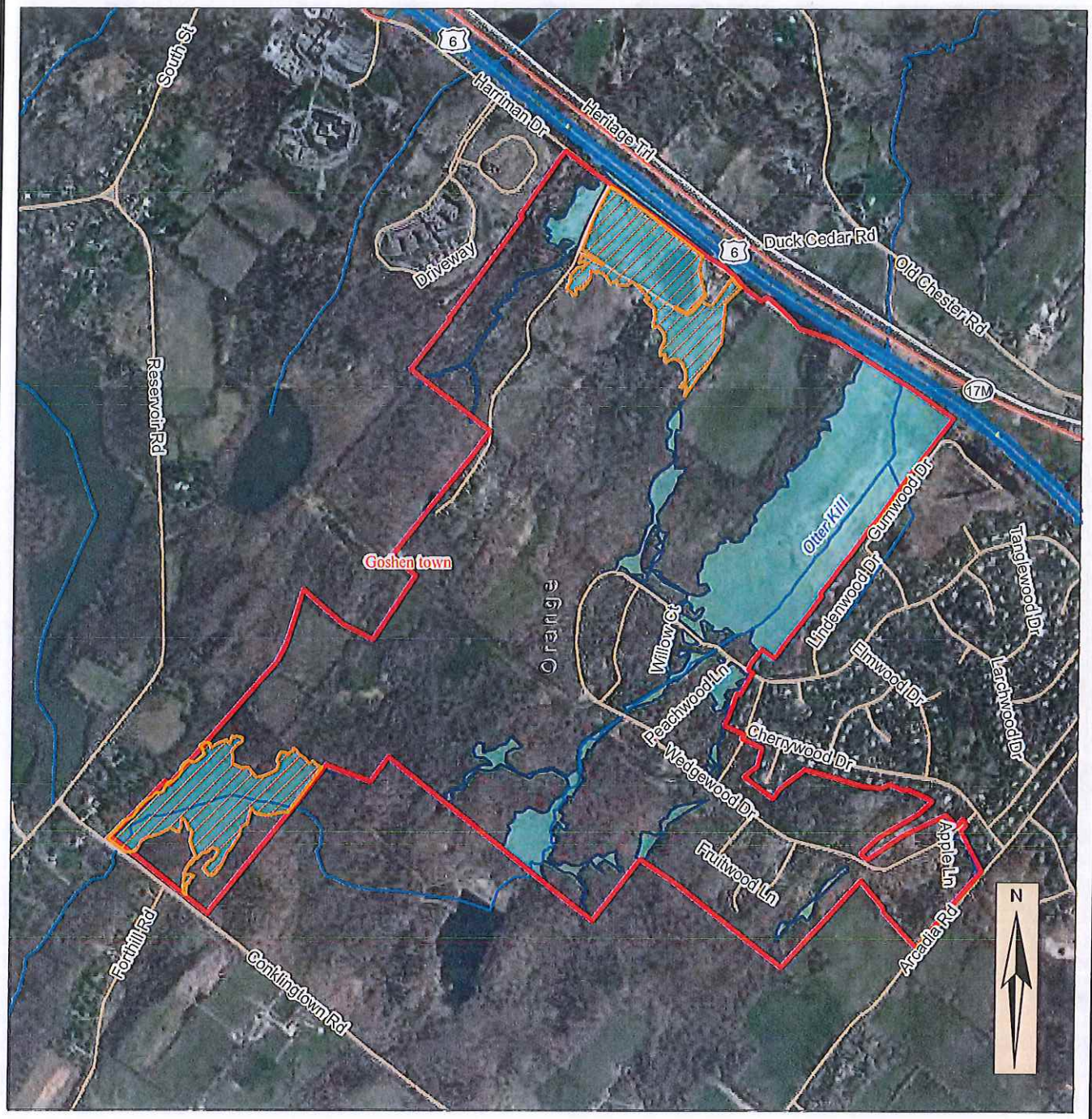

0 1,250 2,500 Feet

Bog Turtle survey locations

Approximate site boundary

Wetland line

Wetland polygon

FIGURE 6: BOG TURTLE PHASE I HABITAT ASSESSMENT

Legoland
Town of Goshen
Orange County, New York

Sources:
Lanc & Tully Engineering and Surveying, P.C.. 2016. Wetland line and polygon.
NY DHSES. NY Statewide Digital Orthoimagery Program. 2013 aerial imagery.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 8/16

Scale 1:15,000

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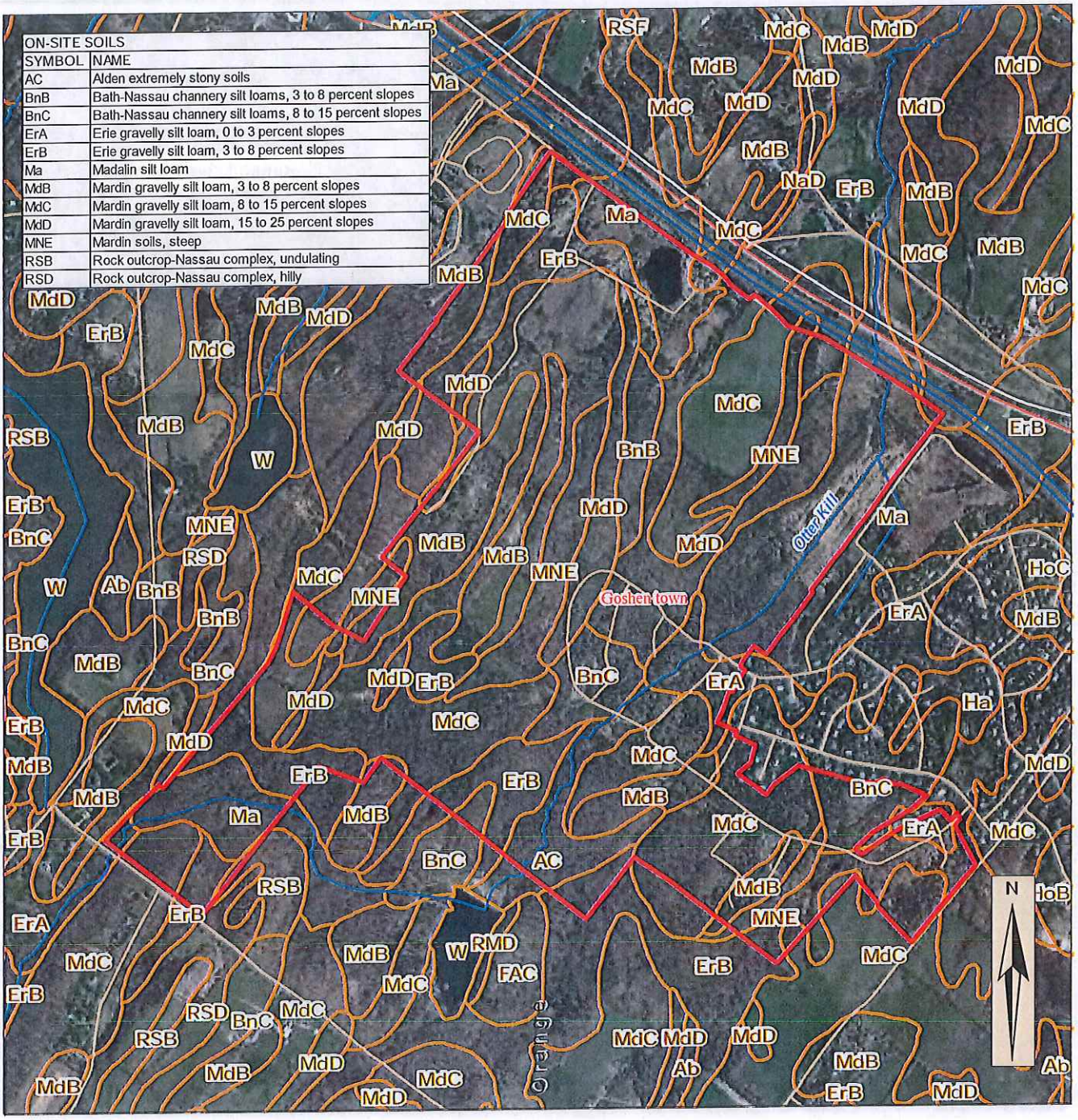

Approximate site boundary

Soil boundary

FIGURE 7: SSURGO MAPPING

Legoland
Town of Goshen
Orange County, New York

Sources:
NY DHSES. NY Statewide Digital Orthoimagery Program. 2013 aerial imagery.
USDA, NRCS. 2013. SSURGO Database for Orange County, NY.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 8/16

Scale 1:15,000

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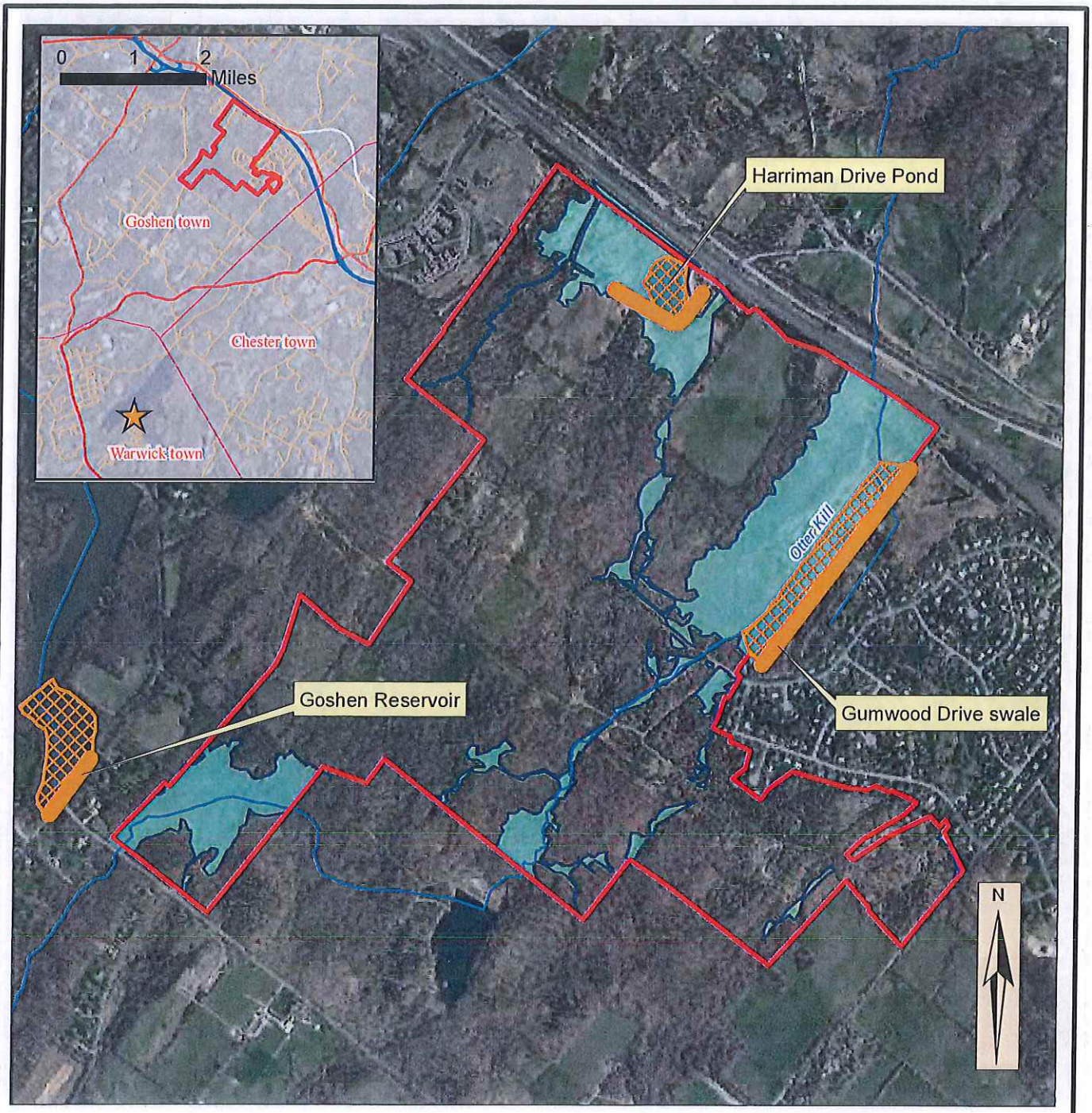

Northern Cricket Frog survey route

Northern Cricket Frog survey area

Northern Cricket Frog control site survey point (Warwick Place, Glenmere Lake, Warwick Town)

Approximate site boundary

Wetland line

Wetland polygon

FIGURE 8: NORTHERN CRICKET FROG SURVEY LOCATIONS

Legoland
Town of Goshen
Orange County, New York

Sources:
Lanc & Tully Engineering and Surveying, P.C.. 2016. Wetland line and polygon.
NY DHSES. NY Statewide Digital Orthoimagery Program. 2013 aerial imagery.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 8/16

Scale 1:15,000

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ATTACHMENT B

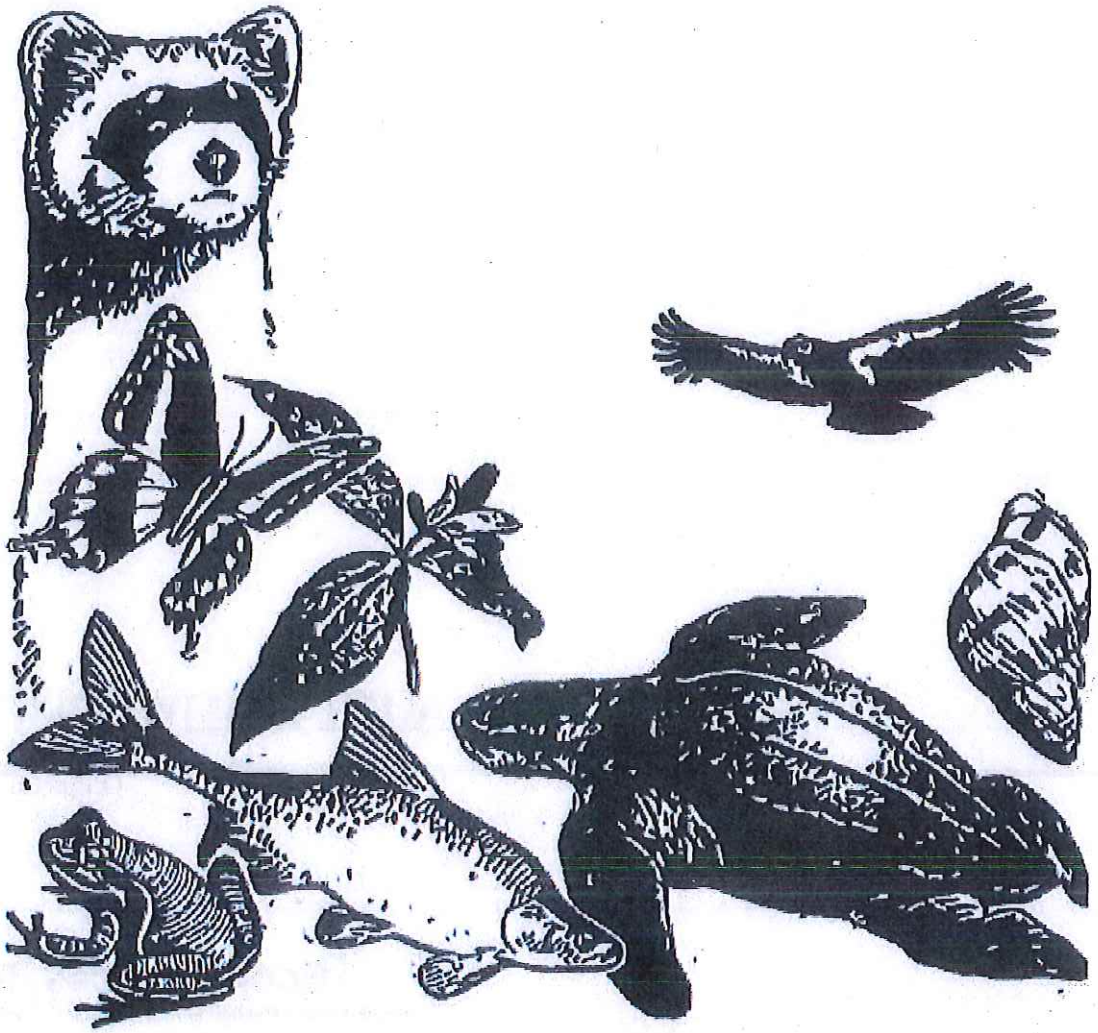
USFWS IPaC

U.S. Fish & Wildlife Service

IPaC Trust Resources Report

Generated March 14, 2016 11:18 AM MDT, IPaC v3.0.0

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.



IPaC - Information for Planning and Conservation (https://ecos.fws.gov/ipac/): A project planning tool to help streamline the U.S. Fish & Wildlife Service environmental review process.

Table of Contents

U.S. Fish & Wildlife Service

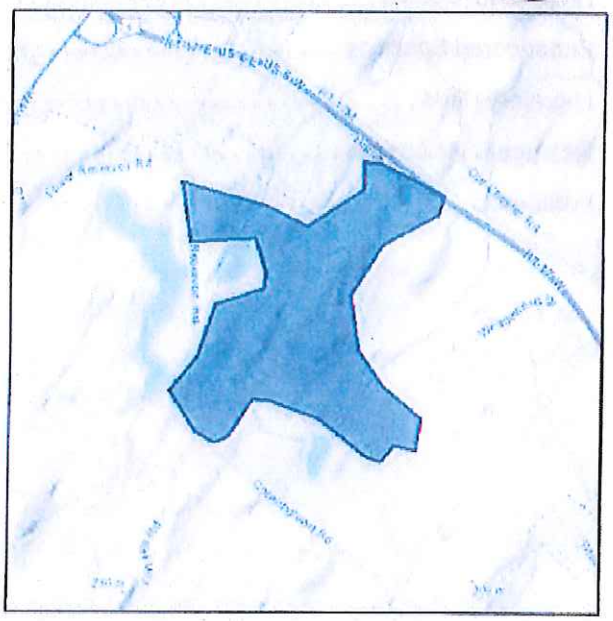
IPaC Trust Resources Report

LOCATION

Orange County, New York

IPAC LINK

https://ecos.fws.gov/ipac/project/NZEOE-4VCTJ-ETTJS-KVE56-FPKBUA



U.S. Fish & Wildlife Service Contact Information

Trust resources in this location are managed by:

New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9349
(607) 753-9334

Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the Endangered Species Program of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list either from the Regulatory Documents section in IPaC or from the local field office directly.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Clams

Dwarf Wedgemussel Alasmidonta heterodon — Endangered

CRITICAL HABITAT
No critical habitat has been designated for this species.
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=F029

Flowering Plants

Small Whorled Pogonia Isotria medeoloides — Threatened

CRITICAL HABITAT
No critical habitat has been designated for this species.
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=Q1XL

Mammals

Indiana Bat Myotis sodalis — Endangered

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A000

Northern Long-eared Bat Myotis septentrionalis — Threatened

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A0JE

Reptiles

Bog (=muhlenberg) Turtle Clemmys muhlenbergii — Threatened

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=C048

Critical Habitats

There are no critical habitats in this location

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish & Wildlife Service.[1] There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

---

1. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern
  http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Conservation measures for birds
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/akn-histogram-tools.php

The following species of migratory birds could potentially be affected by activities in this location:

American Bittern Botaurus lentiginosus — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0F3

Bald Eagle Haliaeetus leucocephalus — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B008

Black-billed Cuckoo Coccyzus erythropthalmus — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HI

Blue-winged Warbler Vermivora pinus — Bird of conservation concern
Season: Breeding

Canada Warbler Wilsonia canadensis — Bird of conservation concern
Season: Breeding

Fox Sparrow Passerella iliaca — Bird of conservation concern
Season: Wintering

Golden-winged Warbler Vermivora chrysoptera — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0G4

Least Bittern Ixobrychus exilis — Bird of conservation concern
Season: Breeding

Louisiana Waterthrush Parkesia motacilla — Bird of conservation concern
Season: Breeding

Olive-sided Flycatcher Contopus cooperi — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0AN

Peregrine Falcon Falco peregrinus — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FU

Pied-billed Grebe Podilymbus podiceps — Bird of conservation concern
Year-round

Prairie Warbler Dendroica discolor — Bird of conservation concern
Season: Breeding

Purple Sandpiper Calidris maritima — Bird of conservation concern
Season: Wintering

Red-headed Woodpecker Melanerpes erythrocephalus — Bird of conservation concern
Season: Breeding

Rusty Blackbird Euphagus carolinus — Bird of conservation concern
Season: Wintering

Short-eared Owl Asio flammeus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HD

Upland Sandpiper Bartramia longicauda — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HC

Willow Flycatcher Empidonax traillii — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0F6

Wood Thrush Hylocichla mustelina — Bird of conservation concern
Season: Breeding

Worm Eating Warbler Helmitheros vermivorum — Bird of conservation concern
Season: Breeding

Wildlife refuges and fish hatcheries

Refuge and fish hatchery data is unavailable at this time.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Wetland data is unavailable at this time.

ATTACHMENT C

NY Natural Heritage Program
NYSDEC Correspondence

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th Floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **Fax:** (518) 402-8925
Website: www.dec.ny.gov

July 05, 2016

Daniel Laue
EcolSciences, Inc.
75 Fleetwood Drive, Suite 250
Rockaway, NJ 07866

Re: Proposed recreational facility south of NYS Route 17
Town/City: Goshen. County: Orange.

Dear Daniel Laue:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.

We have no records of rare or state-listed animals or plants, or significant natural communities at your site or in its immediate vicinity.

The absence of data does not necessarily mean that rare or state-listed species, significant natural communities, or other significant habitats do not exist on or adjacent to the proposed site. Rather, our files currently do not contain information that indicates their presence. For most sites, comprehensive field surveys have not been conducted. We cannot provide a definitive statement on the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other resources may be required to fully assess impacts on biological resources.

This response applies only to known occurrences of rare or state-listed animals and plants, significan natural communities, and other significant habitats maintained in the Natural Heritage Database. Your project may require additional review or permits; for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the NYS DEC Region 3 Office, Division of Environmental Permits, as listed at www.dec.ny.gov/about/39381.html.

Sincerely,

Nicholas Conrad
Information Resources Coordinator
New York Natural Heritage Program

809

New York State Department of Environmental Conservation
Division of Environmental Permits, Region 3
21 South Putt Corners Road, New Paltz, NY 12561
Phone: (845) 256-3054 • **FAX:** (845) 255-3042
Website: www.dec.ny.gov

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

July 14, 2016

Lee Bergus, Chairman
Town of Goshen Planning Board
41 Webster Avenue
Goshen, New York 10924

Re: LEAD AGENCY DESIGNATION
LEGOLAND – New York
Town Goshen, Orange County
DEC ID: CH# 6540

Dear Chairman Bergus,

The New York State Department of Environmental Conservation (DEC) has reviewed the Town of Goshen Planning Board's State Environmental Quality Review (SEQR) notice of intent to serve as lead agency on the above-referenced project, received by DEC on June 20, 2016. The information provided consisted of a cover letter dated June 13, 2016; the Town of Goshen Building and Zoning Department application; a Concept Plan, dated 5/31/2016; a Full Environmental Assessment Form; Draft Scoping Document for LEGOLAND New York Draft Environmental Impact Statement; and additional associated information.

According to the information submitted, the proposed LEGOLAND - New York project consists of the construction of a theme park and resort on approximately 153 acres of a 524 acre site off of Harriman Drive in the Town of Goshen. The park will include rides and attractions, an aquarium, theaters, restaurants, a hotel, offices and staff areas, as well as associated parking and drainage facilities. The proposed facility will generate a demand for water of approximately 236,000 gpd, with the proposed water supply from the Village of Goshen district service area. The anticipated wastewater flow is undetermined, and the Village of Goshen WWTP is proposed to serve the project. The Village of Goshen WWTP is not in the existing district. The project will result in approximately 76.5 acres of new impervious surfaces.

The DEC has no objection to the Town of Goshen Planning Board serving as lead agency for this proposed action.

Based on our review of the circulated documents, the Department offers the following comments based on DEC jurisdiction, project considerations, and comments related to the Draft Scoping Document.

Re: LEAD AGENCY DESIGNATION
LEGOLAND – New York
Town Goshen, Orange County
DEC ID: CH# 6540

Freshwater Wetlands – The proposed LEGOLAND – New York project site contains New York State Freshwater Wetland GO-41, Class 2. In addition, there are wetlands on the project site that appear to be large enough (12.4 acres or larger) to be eligible to be mapped and regulated by New York State under Article 24 of the Environmental Conservation Law. Eligible wetlands are located on the northern corner of the site adjacent to Harriman Drive, and on the western corner of the project site, adjacent to Conklin Town Road.

Eligible wetlands that meet the regulatory criteria but are not shown on the regulatory maps[1] should be afforded the same level of protection as the wetlands that are currently on the regulatory map. A field delineation of all wetlands on the property will need to be completed in order to determine DEC and federal jurisdiction.

Wetlands provide functions and benefits to the people of New York State as outlined in Article 24. The loss of wetlands will cause a reduction in these benefits including an increase in the volume of water in streams during times of flood events and a segregation of water quality. All development should be planned to avoid the state regulated wetlands and the 100 foot adjacent areas. Unavoidable impacts such as for access to unregulated areas must be minimized and mitigated to the maximum extent practicable.

A Freshwater Wetlands permit is required for any physical disturbance to regulated freshwater wetlands or to the 100 foot wetland adjacent area. The project sponsors have contacted the Department for a field boundary inspection. A preliminary site visit has been conducted by staff with additional site visits anticipated. Wetland delineations will require DEC validation, as noted in the enclosed sheet entitled "Delineating and Surveying Freshwater Wetland Boundaries".

Protection of Waters – Tributary of Otter Kill, Waterbody Index No. H-89-20-17, Class A, is located in the western corner of the project site adjacent to Conklin Town Road. Tributary of Otter Kill is a "protected" waterbody. A Protection of Waters permit is required to physically disturb the bed or banks (up to 50 feet from stream) of any streams identified as "protected."

Tributary and subtributary of Otter Kill, Waterbody Index No. H-89-20-17, Class C, is located on the eastern portion of the site. This is a "non-protected" waterbody. A permit is not required to disturb the bed or banks of "non-protected" streams.

In planning for this project, disturbances to the protected stream and all watercourses should be avoided to the maximum extent practicable. A vegetated buffer should be

[1] The Freshwater Wetlands Act (Article 24 of the Environmental Conservation Law) requires DEC to map the freshwater wetlands that are subject to jurisdiction of the law. The law requires the maps to show "the approximate location of the actual wetland boundary".

designed into lands that are adequate to minimize unintended impacts to the streams. Crossings of the streams should be avoided and where necessary be designed to the standards outlined in the stream crossing brochure (enclosed).

If a permit is not required, please note, however, you are still responsible for ensuring that work shall not pollute any stream or waterbody. Care shall be taken to stabilize any disturbed areas promptly after construction, and all necessary precautions shall be taken to prevent contamination of the stream or waterbody by silt, sediment, fuels, solvents, lubricants, or any other pollutant associated with the project.

Water Withdrawal – According to the Full EAF, the proposed facility will generate a demand for water of approximately 236,000 gpd. The proposed source of water supply for the LEGOLAND facility will be the Village of Goshen service area, and extensions are proposed to the east of the site. The source of supply for the district is the Prospect and Greenhill Reservoirs and CRV wells.

Please note that if this project will be served by an existing municipal water service, then additional Department approval may be required to ensure that the site is covered under an existing Water Withdrawal permit and does not exceed the authorized maximum taking of water into the existing water district or service area encompassing the project site to be served. For more information, contact DEC Division of Water at (914) 428-2505.

An assessment of water supply needs should be fully evaluated, and documentation of sufficient capacity must be demonstrated.

The draft scoping document, under Section E. Groundwater/Water Supply, outlines the need for a description of available public water supply in terms of available infrastructure and capacity. Discussion and investigation of capacity should also examine groundwater and surface water quantity and quality, for the proposed source of supply, beyond what is simply permitted for use. This investigation should discuss the increase in usage will impact source water and surrounding land uses. Section E also outlines the need to identify any existing wells on the property and their pumping capacity. Please be aware of the Department's pumping test procedures for water withdrawal permitting. Information on pumping procedures can be found at the following link: http://www.dec.ny.gov/lands/86950.html. Section E discusses well abandonment, please be aware of information regarding this matter on the Departments website regarding decommissioning procedures (http://www.dec.ny.gov/lands/86955.html).

SPDES (State Pollutant Discharge Elimination System) Sanitary Permit – According to the Full EAF, the total anticipated liquid waste generation is undetermined at this time. The proposed treatment facility identified in the Full EAF to serve the proposed project is the Village of Goshen WWTP. In addition, the project site is not

within the existing district, and an expansion of the district would be needed. Please be aware that if a sewer line extension is required, review by our Department's Division of Water is required.

The assessment of wastewater management needs should include the amount of flow capacity at the Village of Goshen Wastewater Treatment Plant reserved for future development and assurances from the Village that the potential increase in flow will not adversely affect plant performance.

Water Quality Certification – This project site appears on the National Wetlands Inventory. The project sponsor should contact the United States Army Corps of Engineers in New York City, 917-790-8411, for any permitting they might require. If this project requires an ACOE permit, or qualifies for a Nationwide Permit, it may qualify for a Blanket Water Quality Certification from DEC, or require an individual Water Quality Certification from DEC.

Threatened & Endangered Species - DEC has reviewed the State's Master Natural Heritage records. Department records indicate the presence of Northern Cricket Frog (Acris crepitans), a New York State listed endangered species, in proximity to the project site. As per the draft scoping document, under Section D. Vegetation and Wildlife, a site biological assessment and mapping for habitats of threatened and endangered species and species of special concern will be prepared. The assessment should include Northern Cricket Frogs as part of this investigation.

The absence of other data does not necessarily mean that rare or state-listed species, natural communities or other significant habitats do not exist on or adjacent to the proposed site. Rather, our files currently do not contain information which indicates their presence. For most sites, comprehensive field surveys have not been conducted. We cannot provide a definitive statement on the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

Compliance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities (GP-0-15-002): Compliance with this SPDES General Permit is required for construction projects that disturb one or more acres of land. For construction permits, if this site is within an MS4 area (Municipal Separate Storm Sewer System), the stormwater plan must be reviewed and accepted by the municipality and the MS-4 Acceptance Form must be submitted to the Department. If the site is not within an MS4 area and other DEC permits are required, please contact the regional Division of Environmental Permits.

Cultural Resources: Please also be aware that we have reviewed the statewide inventory of archaeological resources maintained by the New York State Museum and

Re: **LEAD AGENCY DESIGNATION**
LEGOLAND – New York
Town Goshen, Orange County
DEC ID: CH# 6540

the New York State Office of Parks, Recreation, and Historic Preservation. These records indicate that the project is located within an area considered to be sensitive with regard to archaeological resources. For more information, please visit the New York State Office of Historic Preservation website at http://www.nysparks.com/shpo/.

If you have any questions regarding the above request, do not hesitate to contact Tracey O'Malley of my staff at 845-256-3059, or via e-mail at Tracey.Omalley@dec.ny.gov.

Sincerely,

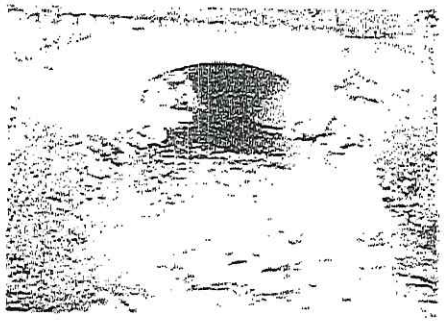
Daniel T. Whitehead
Regional Permit Administrator

Encl. NYS DEC Stream Crossing Brochure
Delineating and Surveying Freshwater Wetland Boundaries
Project Location Map

Ecc. Town of Goshen Planning Board
Lee Bergus, Chairman
Cordisco@gmail.com
Brian Drumm, BOH
Heather Gierloff, BOH
Lisa Masi, BOW,
Armand DeAngelis, DOW

A goal of this brochure is to provide practical, effective, long-term solutions for protecting and restoring stream continuity. Crossings that meet this goal are those that are "invisible" to fish and wildlife. They should be designed and installed so that natural stream flow and substrate are mimicked throughout the crossing and so that they do not constrict or fragment the stream.

Good crossings that create no noticeable change in the stream include bridges and open-bottom arches and culverts that sufficiently span the stream-channel bed, and box and pipe culverts that sufficiently span and are adequately sunk into the stream-channel bed.



References

Singler, A. and B. Graber. 2005. *Massachusetts Stream Crossings Handbook*. Massachusetts Riverways Program, Massachusetts Department of Fish and Game

Bates, K., P.E., 2003. *Design of Road Culverts for Fish Passage*. Washington Department of Fish and Wildlife

www.streamcontinuity.org 2004. River and Stream Continuity Project, University of Massachusetts Amherst

- All streams classified as C(T) or higher
- All navigable waters
- NYSDEC-regulated freshwater wetlands, i.e., outside the Adirondack Park

Contact the appropriate regional DEC Environmental Permits office, based on the county where the project is located. A listing of regional offices can be found at **www.dec.ny.gov/about/39381.html** on DEC's website.

, including but not limited to:

Adirondack Park Agency (APA) - 518-891-4050

U.S. Army Corps of Engineers - 518-266-6350

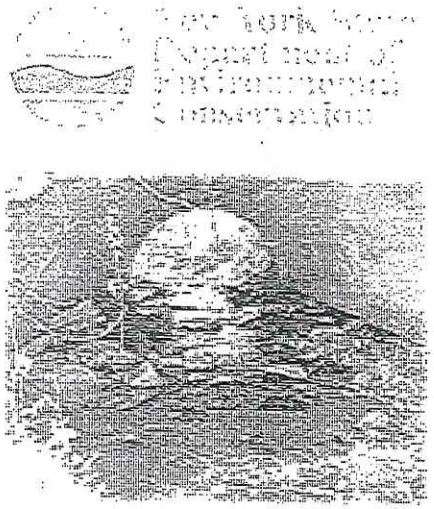


photo: Scott Jackson

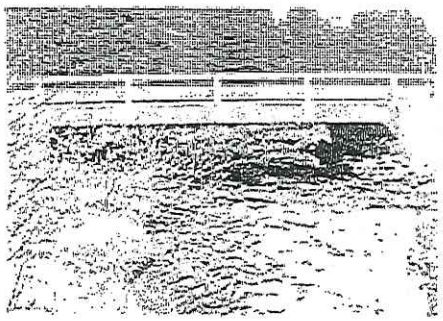
This brochure was developed for those involved in designing and constructing stream crossings with an eye toward protecting and restoring stream continuity.

The guidelines and standards presented here describe minimum criteria to avoid fragmentation of streams. The objective is to maintain natural conditions that do not restrict the movement of fish and wildlife through the stream system. Although these guidelines meet this objective, additional engineering design may be necessary to ensure structural integrity and appropriate hydraulic capacity.

The following recommended standards are effective for reducing stream barriers and impediments to fish and wildlife, and they meet the criteria for project authorization under the Municipal General Permit (GP-5-06-001).

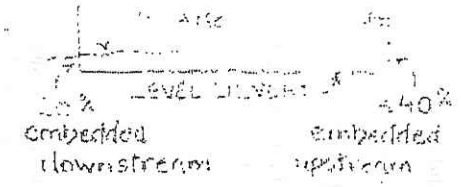
I. Type

A. Bridges and bottomless arches are preferred and should be used whenever possible.



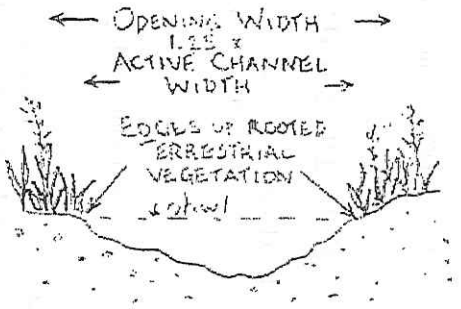
B. Box and Pipe culverts, if used, must be:

- Embedded into the streambed to at least 20 percent of the culvert height at the downstream invert
- Used only on "flat" streambeds (slopes no steeper than 3 percent)
- Installed level



II. Width

The crossing opening (whether an open arch, bridge or culvert) should be at least 1.25 times the width of the stream channel bed. This width is measured bank to bank at the ordinary high-water level (ohwl) or at the edges of terrestrial, rooted vegetation. An average of three measurements (project location and straight sections of stream upstream and downstream) should be used to determine the channel bed width.

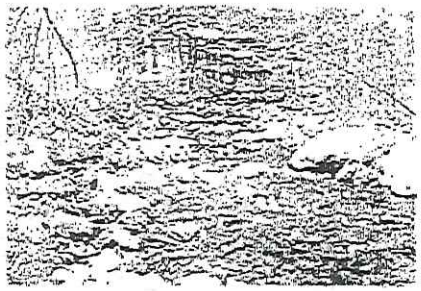


III. Depth and Velocity

At low flows, water depths and velocities should be the same as they are in natural areas upstream and downstream of the crossing.

A. Substrate

Natural substrate should be used within the crossing, and it should match the upstream and downstream substrates. It should resist displacement during floods and should be designed so that appropriate material is maintained during normal flows.



Awareness of the benefits of maintaining stream continuity is essential to protecting this valuable resource. This brochure presents stream crossing design standards that promote stream continuity, allowing unrestricted movement of fish and wildlife within the stream corridor while maintaining our access and transportation needs. The guidelines and standards also meet criteria for project authorization under DEC's Municipal General Permit (GP-5-06-001).The information presented in this brochure should be used as a supplement to sound engineering designs that provide appropriate structural integrity and hydraulic capacity.

New York State Department of Environmental Conservation
21 South Putt Corners Rd., New Paltz, NY 12561-1620
Telephone: (845) 256-3054 • FAX: (845) 255-4659
Website: www.dec.ny.gov

DELINEATING AND SURVEYING FRESHWATER WETLAND BOUNDARIES

1. The purpose of the delineation of freshwater wetland boundaries is to provide a precise identification of the regulated wetland boundary and its 100 foot adjacent area in order to aid in the planning and design of projects which may affect the wetland resource.

2. New York State regulated freshwater wetlands may be delineated by qualified consultants. However, for a delineation to be official (e.g., for use in permit applications), it must be validated by Department of Environmental Conservation (DEC) staff. For more information, contact the appropriate staff, as follows:

(845) 256-3086	Heather Gierloff	Dutchess, & Westchester
(845) 256-3057	Doug Gaugler	Orange, Putnam, Rockland, Sullivan
(845) 256-3091	Brian Drumm	Ulster

3. In general, DEC requires that sponsors of development projects retain licensed engineers or surveyors to accurately plot the delineated wetland boundary on project plans. However, such surveys may not be needed for very small projects, inquiries of a general nature, or certain land sales.

4. Surveys and development plans for DEC permit applications must include the following validation block:

NYSDEC FRESHWATER WETLAND BOUNDARY VALIDATION

The freshwater wetland boundary as represented on these plans accurately depicts the limits of Freshwater Wetland _____ as delineated by _____ on _____

DEC Staff:_____ ___/___/___Surveyor/Engineer:_____

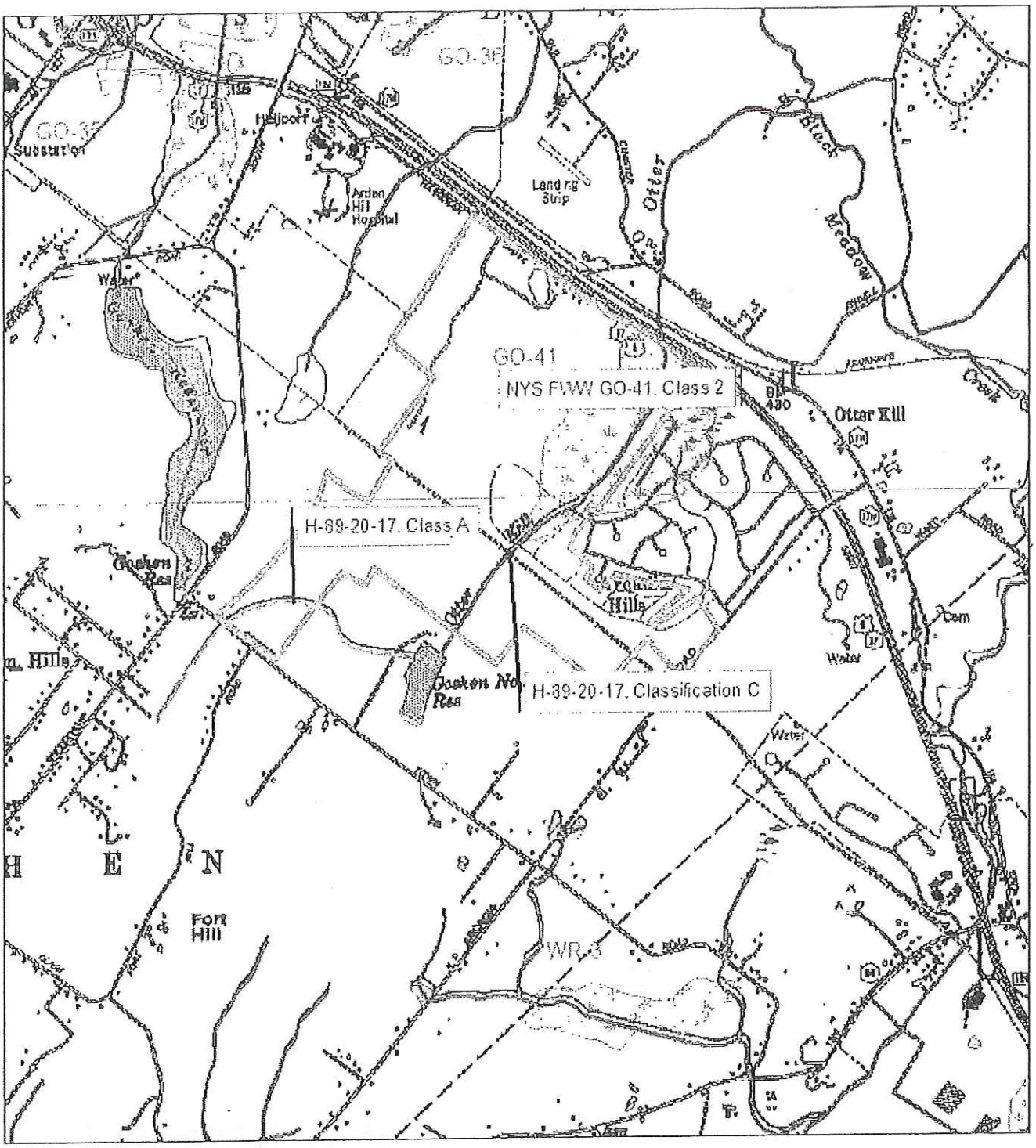
Date Valid:_____ Expiration Date:_____ SEAL

Wetland boundary delineations as validated by the New York State Department of Environmental Conservation remain valid for five (5) years **unless** existing exempt activities, area hydrology, or land use practices change (e.g., agricultural to residential). **After five (5) years the boundary must be revalidated by DEC staff.** Revalidation may include a new delineation and survey of the wetland boundary.

Any proposed construction, grading, filling, excavating, clearing or other regulated activity in the freshwater wetland or within 100 feet of the wetland boundary as depicted on this plan requires a permit from the NYS Department of Environmental Conservation under Article 24 of the Environmental Conservation Law (Freshwater Wetlands Act) prior to commencement of work.

5. In addition to the accurate identification of the freshwater wetland boundary, the limit of the 100 foot adjacent area must also be plotted on development plans and survey.

6. Copies of plans or surveys containing the boundary delineation and validation block must be submitted to the appropriate DEC staff person as listed above in item #2 for validation and original signature before applying for a DEC permit. One copy will be retained by DEC as a file copy. **The signature and seal of the surveyor/engineer must be present prior to requesting DEC validation.**



DEC ID CH# 6540
Legoland NY - Harriman Dr.
Town of Goshen, Orange County

DEC Division of
Environmental Permits
Tracey O'Malley
7/14/2016

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ATTACHMENT D

Tables

Table 1
Legoland – Goshen, NY
Bird Checklist with number observed and breeding/behavior code
June 21, 2016

Wood Duck 6 (H)
Mallard 4 (H)
Great Blue Heron 1
Black Vulture 1 (F)
Turkey Vulture 3 (F)
Cooper's Hawk 1 (H)
Red-tailed Hawk 3 (FL)
Mourning Dove 2 (H)
*Great Horned Owl 1 (H)
Chimney Swift 1 (F)
Red-bellied Woodpecker 4 (H)
Downy Woodpecker 8 (NY)
Hairy Woodpecker 2 (FL)
Northern Flicker (Yellow-shafted) 1 (H)
Eastern Wood-Pewee 3 (S)
Willow Flycatcher 1 (S)
Great Crested Flycatcher 3 (S)
Eastern Kingbird 1 H)
Yellow-throated Vireo 2 (S)
Blue Jay 4 (H)
Tree Swallow 2 (H)
Barn Swallow 2 (H)
Black-capped Chickadee 1 (H)
Tufted Titmouse 7 (S)
White-breasted Nuthatch 2 (H)
House Wren 8 (M)
Carolina Wren 1 (S)
Blue-gray Gnatcatcher 1 (H)
Veery 9 (M)
Wood Thrush 6 (S)
American Robin 10 (FL)
Gray Catbird 22 (CF)
Brown Thrasher 1 (S)
Northern Mockingbird 1 (S)
Cedar Waxwing 12 (H)
Ovenbird 4 (S)
Common Yellowthroat 13 (CF)
American Redstart 8 (M)
Yellow Warbler 10 (M)
Field Sparrow 12 (M)
Song Sparrow 9 (M)
Swamp Sparrow 1 (S)
Eastern Towhee 6 (S)
Scarlet Tanager 2 (S)
Northern Cardinal 4 (S)
Rose-breasted Grosbeak 3 (S)
Indigo Bunting 2 (S)
Bobolink 2 (CF)
Red-winged Blackbird 8 (CF)
Brown-headed Cowbird 2 (H)
Orchard Oriole 1 (H)
American Goldfinch 5 (S)

*Observed July 28, 2016

Breeding Codes

NY Confirmed--Nest with Young
FL Confirmed--Recently Fledged young
CF Confirmed--Carrying Food
M Probable--Multiple (7+) singing males
S Possible--Singing male
H Possible--In appropriate habitat
F Flyover -- Flying over only

Table 2
State-listed Endangered, Threatened, and Special Concern Nesting Birds of Orange County New York

Common Name	Scientific Name	State Listing	On-site habitat?
Peregrine Falcon	*Falco peregrinus*	Endangered	No appropriate on-site habitat. Open-country bird that nests on cliffs, bridges, and buildings. County breeding records primarily associated with Hudson River.
Pied-billed Grebe	*Podilymbus podiceps*	Threatened	No appropriate on-site habitat. Secretive marsh bird that nests in freshwater habitats with emergent vegetation. Few county breeding records.
Northern Harrier	*Circus cyaneus*	Threatened	No appropriate on-site habitat. An area-sensitive species associated with open grasslands, shrublands, and marshes. Isolated possible county breeding records.
Bald Eagle	*Haliaeetus leucocephalus*	Threatened	No appropriate on-site habitat. Nests are often closely associated with large waterbodies in which to forage. Several nests in Orange County.
Upland Sandpiper	*Bartramia longicauda*	Threatened	No appropriate on-site habitat. Scarce breeding bird in western New York. Area-sensitive species requiring very large fields (50 - 100 hectares) of forbs and grasses of mixed height interspersed with bare ground.
American Bittern	*Botaurus lentiginosus*	Special Concern	No appropriate on-site habitat. Secretive marsh bird that nests in extensive freshwater habitats with tall emergent vegetation. Isolated county records.
Sharp-shinned Hawk	*Accipiter striatus*	Special Concern	Local woodland may provide potential breeding habitat. Nests in coniferous, mixed, and deciduous forests with a dense canopy and small-diameter trees. Several possible and probable county records.
Cooper's Hawk	*Accipiter cooperii*	Special Concern	Local woodland may provide potential breeding habitat. Nests in coniferous and mixed forests. Well-distributed in Orange County.
Northern Goshawk	*Accipiter gentilis*	Special Concern	Local woodland may provide marginal potential breeding habitat. Nests in mature deciduous, coniferous, and mixed forests. Isolated county records.
Red-shouldered Hawk	*Buteo lineatus*	Special Concern	Local woodland may provide marginal potential breeding habitat. Nests in extensive, mature mixed forests. Fairly common in forested areas in county.
Osprey	*Pandion haliaetus*	Special Concern	No appropriate on-site habitat. Nests are often closely associated with large waterbodies in which to forage. Breeding Bird Atlas indicates a scattered and local inland distribution, including Orange County.
Whip-poor-will	*Camprimulgus vociferous*	Special Concern	Local woodland may provide limited potential breeding habitat. A few possible and probable county records.
Common Nighthawk	*Chordeiles minor*	Special Concern	No appropriate on-site habitat. Nests in variable semi-open country habitats and on rooftops. A few possible and probable records in county.
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Special Concern	Local woodland may provide potential breeding habitat. Nests in open deciduous woodlands. A few nesting records in county.
Horned Lark	*Eremophila alpestris*	Special Concern	No appropriate on-site habitat. An area-sensitive species that nests in short grasses in fallow fields, airports, and sand dunes. A few possible nesting records in county.
Cerulean Warbler	*Setophaga cerulea*	Special Concern	Local woodland may provide potential breeding habitat. Nests in mature deciduous forests. Narrow concentration in Sterling Forest area; isolated records elsewhere in county.
Golden-winged Warbler	*Vermivora chrysoptera*	Special Concern	Potential habitat in old fields and ROW. Nests associated with brushy early successional habitats with scatterd trees. Scattered nesting records in county.
Yellow-breasted Chat	*Icteria virens*	Special Concern	Local hedgerows and woodland edges may provide limited potential breeding habitat. Single probable nesting record in county.
Grasshopper Sparrow	*Ammodramus savannarum*	Special Concern	Potential habitat in field beyond the terminus of Harriman Drive. An area-sensitive species requiring large fields (20 - 30 hectares) of moderately tall vegetation with some bare ground. Isolated records in county.

Sources:

McGowan, Kevin J. and Kimberly Corwin, editors. 2008. The Second Atlas of Breeding Birds in New York State. Comstock University Press.

eBird. 2016. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: http://www.ebird.org. (Accessed: Date [e.g., August 2016]).

Table 3
Northern Cricket Frog Survey Results
Legoland New York
Town of Goshen
Orange County, New York

DATE	*LOCATION*	*TIME (START/ FINISH)*	*TEMPERATURE START/STOP*	*CLOUD COVER START/ STOP*	*RELATIVE HUMIDITY START/STOP*	*WIND SPEED START/STOP*	*RAIN START/ STOP*	*NOISE LEVELS*	*NORTHERN CRICKET FROG OBSERVED?*	*OTHER REPTILES/ AMPHIBIANS OBSERVED (numbers)*	*COMMENTS*	*SURVEYORS*
7/28/2016	1) Gumwood Swale 2) Goshen Reservoir 3) Harriman Pond 4) Glenmere Lake	8:20 pm - 8:35 pm 8:45 pm - 9:00 pm 9:05 pm - 9:19 pm 9:39 pm - 9:47 pm	76.0 °F / 73.7°F	100% / 100%	79% / 88%	0 mph / 0.6 mph	Drizzle/Light sprinkles*	1) Low to moderate 2) Low to moderate 3) Moderate to high 4) Low	1) No 2) No 3) No 4) Yes	1) green frog (6-10), northern gray treefrog (5); 2) bullfrog (3), green frog (6-10); 3) bullfrog (4), painted turtle (1); 4) Northern cricket frog (>10), N. gray treefrog (6-10)	At Glenmere Lake off of Warwick Place, cricket frogs spontaneously calling and responding to taped call.	Laura Newgard Gary Standard
7/31/2016	1) Glenmere Lake 2) Goshen Reservoir 3) Harriman Pond 4) Gumwood Swale	8:17 pm - 8:35 pm 8:47 pm - 8:54 pm 9:01 pm - 9:24 pm 9:34 pm - 9:53 pm	69.2 °F / 69.0 °F	98% / 90%	93% / 92%	3.2 mph /0 mph	No/No*	1) Low 2) Moderate 3) Moderate to high 4) Moderate to high	1) Yes 2) No 3) No 4) No	1) Northern cricket frog (6-10), N. gray treefrog (6-10); 2) bullfrog (2), green frog (4), N. gray treefrog (6-10); 3) N gray treefrogs (>10); 4) N. gray treefrog (3), green frog (6-10)	At Glenmere Lake off of Warwick Place, cricket frogs spontaneously calling and responding to taped call.	Laura Newgard Gary Standard
8/5/2016	1) Gumwood Swale 2) Harriman Pond 3) Goshen Reservoir 4) Glenmere Lake	8:25 pm - 8:43 pm 8:54 pm -9:10 pm 9:16 pm - 9:27 pm 9:40 pm - 9:27 pm	75.2 °F / 77.9 °F	100% / 0%	72% / 77%	0.6 mph / 0 mph	No/No	1) Moderate 2) Moderate to high 3) Moderate 4) Low	1) No 2) No 3) No 4) No	1) green frog (3); 2) N. gray treefrog (6-10), green frog (3), A. toad (1); 3) N. gray treefrog (6-10), green frog (5), bullfrog (5); 4) green frogs (6-10)	At Glenmere Lake off of Warwick Place, no cricket frogs calling. No cricket frogs responding to taped calls.	Laura Newgard Gary Standard

* Very heavy rain preceeded survey

ATTACHMENT E

Bog Turtle Habitat Evaluation Field Forms

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

USFWS Hudson-Housatonic Recovery Unit Bog Turtle
Habitat Evaluation Field Form[1] *(Revised 12/2013)**

Project/Property Name: Legoland
Project Name/Type: "
Applicant/Landowner Name: "
County: Orange Quad: Goshen Warwick Township/Municipality: Goshen
NYNHP Species Hit ☐ Y ☒ N Map attached ☐ Y ☐ N Aerial attached ☒ Y ☐ N

ACTION AREA[2]

Action area size: ~35 A **Does the Phase 1 survey include all wetlands in the action area?** ☒ Y ☐ N[3]
If no, give wetland ID #s and reasons for no survey: _____
If yes, give wetland ID #s for each: B, CA, CB, CC Submit one survey form per wetland.

WETLAND ID: Conklingtown Rd **PHOTOS TAKEN:** ☒ Yes ☐ No **WETLAND SIZE:** 35± **acres**
Wetland size estimation – If actual acreage is not known at time of investigation, check one:
☐ < 0.1 acre ☐ 0.1-0.5 acre ☐ >0.5 to <1 acre ☐ 1-2 acres ☐ 2-4 acres ☒ 5+ acres ☐ 12+ acres

WETLAND LOCATION: Lat 41.37128° Long 074.32593°
(approximate center of wetland) GPS Datum (check one): ☐ NAD 27 ☐ NAD 83 ☒ WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 6/24/2016 Time In: 9:09 AM Time Out: 9:25 AM
Last precipitation: ☐ < 24 hours ☒ 1-7 days ☐ > 1 week ☐ unknown Drought conditions? ☐ Y ☐ N ☐ Unknown
by mapquad

How much of this wetland is located *off-site* (*i.e.*, outside the project boundaries or right-of-way)?
☒ none of it – the entire wetland is within the project boundaries (skip next 2 questions)
☐ some of it – _____ acres or _____ % of the wetland appears to be located off-site

If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?[4]
☐ none of it ☐ all of it ☐ part of it (_____% or _____ acres of the off-site portion)

How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)? ☐ all of it ☐ part of it (at least _____ acres) ☐ none of it

Are there any wetlands located off-site and close enough to be affected by this project? ☐ Y ☒ N ☐ Unknown If yes, *could* they be potential bog turtle habitat? ☐ Y ☐ N ☐ Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):
Upland forest/old field

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: ☒ PEM _____ ☐ PSS _____ ☐ PFO _____ ☐ POW _____
NYSDEC Mapped Wetland ☐ Y ☒ N Name _____ NWI Mapped Wetland ☒ Y ☐ N
Edinger *et. al.* (2002)[5] Community Types: PEM

Project Name Legoland Wetland ID B, CA, CB, CC
(Conklingtown Rd wetland)

ENDNOTES – Bog Turtle Habitat Evaluation Form

[1] This is a non-agency field form, to be used by consultants with training and expertise in Phase 1 bog turtle surveys.

[2] The action area includes all areas that will be affected directly or indirectly by the action and not merely the immediate area involved in the action. For example, if the proposed action is a wetland fill to accommodate access to a proposed development, then the development is included in the action area.

[3] The Phase 1 survey should include all wetlands in the action area. Contact the USFWS if you have questions about the extent of the action area for a particular project. **Please submit map(s) and photo(s), along with this form, that indicates area surveyed.**

[4] As a reminder, landowner permissions may be needed if portion of wetland is outside project boundary.

[5]Community types as described by Edinger *et al.* (2002) can be found at: www.dec.ny.gov/animals/29392.html.

[6]Hydrologic regimes as described by Cowardin (1979) can be found at: www.fws.gov/wetlands/documents/classwet/index.html

[7] Soils are considered "mucky" if one can probe them to a depth of ≥ 3".

[8] Probing is done with an approximately 1" diameter, blunt-ended pole (*e.g.*, a plastic/aluminum broom handle).

[9] Soils are considered "non-mucky" if one can probe them to a depth of < 3".

[10] **Please report observations of bog turtles to the New York State Department of Environmental Conservation and the New York Field Office within 48 hours.**
For the HHRU, please submit observations to:
Lisa Masi, NYSDEC Region 3 – (845) 256-3098; lmmasi@gw.dec.state.ny.us
Noelle Rayman, USFWS, New York Field Office – (607) 753-9334; noelle_rayman@fws.gov

[11] See "BOG TURTLE HABITAT CRITERIA" (below)

*This form is a modified version of the Pennsylvania Field Office/Pennsylvania Fish and Boat Commission form to be used in the HHRU of NYS. Qualified Bog Turtle Surveyors and state/federal biologists from the region provided comments and suggestions.

Project Name _____ Wetland ID _____

BOG TURTLE HABITAT CRITERIA

Compare your Phase 1 survey observations to the habitat criteria below.

Suitable hydrology. Bog turtle wetlands are typically spring-fed with shallow surface water or saturated soils present year-round, although in summer the wet area(s) may be restricted to near spring head(s). Typically these wetlands are interspersed with dry and wet pockets. There is often subsurface flow. In addition, shallow rivulets (less than 4 inches deep) or pseudo-rivulets are often present. In some cases, the source of a wetland's hydrology is difficult to determine because springs and seeps are not visible. However, the *influence* of springs and seeps will be apparent (*e.g.*, presence of saturated soils year-round).

Suitable soils. Usually a bottom substrate of permanently saturated organic or mineral soils. These are often soft, mucky-like soils (this does not refer to a technical soil type); you will usually sink to your ankles (3-5 inches) or deeper, although in degraded wetlands or summers of dry years this may be limited to areas near spring heads or drainage ditches. In some portions of the species' range, the soft substrate consists of scattered pockets of peat instead of muck. In the areas of the wetland where saturated soils are present, you will be able to probe them to a depth of at least 3 inches, but pockets of 5 to 12 inches are likely to be present. During drought conditions, the extent and depth of mucky soils may be dramatically reduced over non-drought conditions, with soft, saturated soils being limited to areas near springs or seeps. Some sites within the HHRU do not necessarily have mucky soils; therefore suitable hydrology and vegetation may be more heavily weighted when determining a bog turtle wetland.

Suitable vegetation. Dominant vegetation of low grasses and sedges (in emergent wetlands), often with a scrub-shrub wetland component. Common emergent vegetation includes, but is not limited to: tussock sedge (*Carex stricta*), soft rush (*Juncus effusus*), rice cut grass (*Leersia oryzoides*), sensitive fern (*Onoclea sensibilis*), tearthumbs (*Polygonum* spp.), jewelweeds (*Impatiens* spp.), arrowheads (*Saggitaria* spp.), skunk cabbage (*Symplocarpus foetidus*), panic grasses (*Panicum* spp.), other sedges (*Carex* spp.), spike rushes (*Eleocharis* spp.), grass-of-Parnassus (*Parnassia glauca*), shrubby cinquefoil (*Dasiphora fruticosa*), sweet-flag (*Acorus calamus*), and in disturbed sites, reed canary grass (*Phalaris arundinacea*) , purple loosestrife (*Lythrum salicaria*) or common reed (*Phragmites australis*). Common scrub-shrub species include alder (*Alnus spp.*), red maple (*Acer rubrum*), willow (*Salix spp.*), tamarack (*Larix laricina*), and in disturbed sites, multiflora rose (*Rosa multiflora*). Some forested wetland habitats are suitable given hydrology, soils and/or historic land use. These forested wetlands include red maple, tamarack, and cedar swamps.

****Calciphiles**: "include numerous herbs, such as marsh muhly (*Muhlenbergia glomerata*), bluejoint grass (*Calamagrostis canadensis*), twig rush (*Cladium mariscoides*), several sedges (*Carex flava, C. hystericina, C. sterilis, C. lasiocarpa, C. lacustris, C. stricta,* and *C. utriculata*), thinleaf cotton-sedge (*Eriophorum viridicarinatum*), moor rush (*Juncus stygius*), grass-of-Parnassus (*Parnassia glauca*),white beakrush (*Rhynchospora alba*), rough-leaved goldenrod (*Solidago patula*), swamp goldenrod (*Soidago uliginosa*), purple avens (*Geum rivale*), white lady's slipper (*Cypripedium candidum*), and marsh cinquefoil (*Comarum palustre = Potentilla palustris*), plus several shrubs including shrubby cinquefoil (*Dasiphora fruticosa ssp. floribunda = Potentilla fruticosa*), alderleaf buckthorn (*Rhamnus alnifolia*), sageleaf willow (*Salix candida*), autumn willow (*S. serissima*), bog birch (*Betula pumila*), sweetgale (*Myrica gale*), speckled alder (*Alnus incana*), and red-osier dogwood (*Cornus stolonifera*). Minerotrophic moss species (e.g., *Drapanocladus aduncus* and *Campylium stellatum*) may or may not be present".
From: U.S. Army Corps of Engineers. 2011. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)*, ed. J. S. Wakeley, R. W. Lichvar, C. V. Noble, and J. F. Berkowitz. ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

Project Name _____ Wetland ID _____

USFWS Hudson-Housatonic Recovery Unit Bog Turtle
Habitat Evaluation Field Form[1] *(Revised 12/2013)**

Project/Property Name: Legoland
Project Name/Type: —
Applicant/Landowner Name: —
County: Orange Quad: Goshen/Washington Township/Municipality: Goshen
NYNHP Species Hit ☐ Y ☒ N Map attached ☐ Y ☐ N Aerial attached ☒ Y ☐ N

ACTION AREA[2]

Action area size: 30+ Acres **Does the Phase 1 survey include all wetlands in the action area?** ☒ Y ☐ N[3]
If no, give wetland ID #s and reasons for no survey: _____
If yes, give wetland ID #s for each: D, E, F, GG Submit one survey form per wetland.

WETLAND ID: Harriman 1 **PHOTOS TAKEN:** ☒ Yes ☐ No **WETLAND SIZE:** 30+ **acres**
Wetland size estimation – If actual acreage is not known at time of investigation, check one:
☐ < 0.1 acre ☐ 0.1-0.5 acre ☐ >0.5 to <1 acre ☐ 1-2 acres ☐ 2-4 acres ☐ 5+ acres ☒ 12+ acres

WETLAND LOCATION: Lat 41. 384167 Long 074. 311156
(approximate center of wetland) GPS Datum (check one): ☐ NAD 27 ☒ NAD 83 ☐ WGS 84

SURVEY CONDITIONS & LIMITATIONS

Date of survey: 6/7/2016 Time In: 1:04 pm Time Out: 2:20 pm
Last precipitation: ☐ < 24 hours ☒ 1-7 days ☐ > 1 week ☐ unknown Drought conditions? ☐ Y ☐ N ☐ Unknown
81°F 48% Humidity 25% cloud cover

How much of this wetland is located *off-site* (*i.e.*, outside the project boundaries or right-of-way)?
☒ none of it – the entire wetland is within the project boundaries (skip next 2 questions)
☐ some of it – _____ acres or _____ % of the wetland appears to be located off-site

NA If part of this wetland continues off-site, how much of the *off-site portion* was surveyed (on foot)?[4]
☐ none of it ☐ all of it ☐ part of it (_____% or _____ acres of the off-site portion)

NA How much of the *off-site portion* of this wetland is visible (*e.g.*, from the subject property or from a public road)? ☐ all of it ☐ part of it (at least _____ acres) ☐ none of it

Are there any wetlands located off-site and close enough to be affected by this project? ☐ Y ☒ N ☐ Unknown If yes, *could* they be potential bog turtle habitat? ☐ Y ☐ N ☐ Unknown

Describe surrounding landscape (wetlands, forest, subdivision, agricultural field, fallow field, etc.):
Abandoned Farmland

WETLAND CHARACTERISTICS

Wetland type(s) present and % cover: ☒ PEM _____ ☐ PSS _____ ☐ PFO _____ ☐ POW _____
NYSDEC Mapped Wetland ☐ Y ☒ N Name _____ NWI Mapped Wetland ☒ Y ☐ N
Edinger *et. al.* (2002)[5] Community Types: PEM

Project Name Legoland Wetland ID D, E, F, 66
(Harriman Drive Wetland)
Farm pond

☒ Y ☐ N Are there any signs of disturbance to *hydrology* (ditching, filling, ponds, roads, etc.)? If yes, describe Pond, appears constructed- stormwater for road? farm
☐ Y ☐ N Are there any signs of disturbance to *vegetation* (mowing, pasturing, burning, etc.)? If yes, describe Unknown

Hydrology

☐ Y ☒ N Springs or seeps ☐ visible or ☐ likely ? Muskgrass (*Chara spp.*) present? ☐ Yes ☐ No
☒ Y ☐ N Saturated soils present? If yes, year-round? ☐ Likely ☐ Unlikely ☒ Unknown
☐ Y ☐ N Water visible on surface? Check all that apply: ☐ small puddles/depressions (___" deep)
☐ rivulets (___" deep) ☒ larger pools/ponds (<" deep) one farm pond / deluion Pond
☐ Y ☒ N Evidence of flooding? If yes, describe indicators
Hydrological Regime (Cowardin 1979)[6]: ☐ Semi-permanently flooded ☒ Seasonally flooded ☐other
Notes: evidence of ditching along Hamilton Road
evidence of road through wetland 8A/B

Soils Mapping Unit (optional): na / nadali silt loam)
Field observations confirm mapped type? ☒ YES ☐ NO ☐ Unknown

Soils – PEM Portions of Wetland			
Mucky[7]? ☒ YES ☐ NO	How much of it (PEM) is mucky? ☒ <10% ☐ 10-29% ☐ 30-49% ☐ 50-70% ☐ >70%	Mucky soils range in depth from: 3 to 4"	Most of the mucky part(s) of the wetland can be probed[8]: ☒ 3-5" ☐ 6-8" ☐ 9-11" ☐ ≥12"
Non-mucky[9]? ☒ YES ☐ NO	How much of it (PEM) is non-mucky? ☐ <10% ☐ 10-29% ☐ 30-49% ☐ 50-70% ☒ >70%	most of wetland NOT probable	

Soils – PSS and PFO Portions of Wetland			
Mucky[7]? ☐ YES ☐ NO	How much of it is mucky? ☐ <10% ☐10-29% ☐ 30-49% ☐ 50-70% ☐ >70%	Mucky soils range in depth from: ____ to ____"	Most of the mucky part(s) of the wetland can be probed[8]: ☐ 3-5" ☐ 6-8" ☐ 9-11" ☐ ≥12"

NOT

Notes: Extreme fly issue system - no rivulets, seeps, springs observed (very dense veg)

Wetland Vegetation (characterize the wetland as a whole)

Dominant Vegetation: Reed canary grass, tussock sedge, sedges

Calciphiles** (See list for examples) ☒ tussock sedge ☐ grass-of-Parnassus ☐ poison sumac ☐ shrubby cinquefoil ☐ other:

Project Name Legoland Wetland ID D, E, F, 66.

Reptiles and Amphibians

Were any bog turtles observed? ☐ YES[10] ☒ NO If yes, how many? _____
If you are permitted to handle bog turtles, please fill out a data form (Appendix A) and submit to state contacts[10].
If you are not permitted, please take a photo(s) of bog turtle (without handling) and submit to state contacts[10].
Other reptiles or amphibians ☐ observed ☐ previously observed: NA

Additional Comments/Observations: (use additional sheets if necessary)
predated snapper & painted turtle eggs along pond

INVESTIGATOR'S OPINION

☐ YES ☒ NO ☐ UNSURE The hydrology criterion[11] for bog turtle habitat is met.
Notes: excavated fen pond appears to have altered hydrology - no seepage, rivulets, observed

☐ YES ☒ NO ☐ UNSURE The soils criterion[11] for bog turtle habitat is met.
Notes: very limited mucklike soils. NO areas where soils can be probed greater than 4 inches

☒ YES ☐ NO ☐ UNSURE The vegetation criterion[11] for bog turtle habitat is met.
Notes: PEM wetland - but monocultures of plants

☐ YES ☒ NO ☐ UNSURE This wetland is potential bog turtle habitat.

Notes: Hydrology altered by pond, water quality at issue due to adjacent road runoff. Dense soils, monoculture vegetation. Absence of appropriate hydrology.

I certify that to the best of my knowledge, all of the information provided herein is accurate and complete.

Laura Nawgard — Investigator's Name (print)
L Nawgard — Investigator's Signature
6/7/2016 — Date

Contact info: EcoSciences, Inc. Rockaway, NJ
LaNawgard@ecosciences.com
973-366-9500
973-479-7843

Project Name _____ Wetland ID _____

ENDNOTES – Bog Turtle Habitat Evaluation Form

[1] This is a non-agency field form, to be used by consultants with training and expertise in Phase 1 bog turtle surveys.

[2] The action area includes all areas that will be affected directly or indirectly by the action and not merely the immediate area involved in the action. For example, if the proposed action is a wetland fill to accommodate access to a proposed development, then the development is included in the action area.

[3] The Phase 1 survey should include all wetlands in the action area. Contact the USFWS if you have questions about the extent of the action area for a particular project. **Please submit map(s) and photo(s), along with this form, that indicates area surveyed.**

[4] As a reminder, landowner permissions may be needed if portion of wetland is outside project boundary.

[5]Community types as described by Edinger *et al.* (2002) can be found at: www.dec.ny.gov/animals/29392.html.

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[7] Soils are considered "mucky" if one can probe them to a depth of ≥ 3".

[8] Probing is done with an approximately 1" diameter, blunt-ended pole (*e.g.*, a plastic/aluminum broom handle).

[9] Soils are considered "non-mucky" if one can probe them to a depth of < 3".

[10] **Please report observations of bog turtles to the New York State Department of Environmental Conservation and the New York Field Office within 48 hours.**
For the HHRU, please submit observations to:
Lisa Masi, NYSDEC Region 3 – (845) 256-3098; lmmasi@gw.dec.state.ny.us
Noelle Rayman, USFWS, New York Field Office – (607) 753-9334; noelle_rayman@fws.gov

[11] See "BOG TURTLE HABITAT CRITERIA" (below)

*This form is a modified version of the Pennsylvania Field Office/Pennsylvania Fish and Boat Commission form to be used in the HHRU of NYS. Qualified Bog Turtle Surveyors and state/federal biologists from the region provided comments and suggestions.

BOG TURTLE HABITAT CRITERIA

Compare your Phase 1 survey observations to the habitat criteria below.

Suitable hydrology. Bog turtle wetlands are typically spring-fed with shallow surface water or saturated soils present year-round, although in summer the wet area(s) may be restricted to near spring head(s). Typically these wetlands are interspersed with dry and wet pockets. There is often subsurface flow. In addition, shallow rivulets (less than 4 inches deep) or pseudo-rivulets are often present. In some cases, the source of a wetland's hydrology is difficult to determine because springs and seeps are not visible. However, the *influence* of springs and seeps will be apparent (*e.g.*, presence of saturated soils year-round).

Suitable soils. Usually a bottom substrate of permanently saturated organic or mineral soils. These are often soft, mucky-like soils (this does not refer to a technical soil type); you will usually sink to your ankles (3-5 inches) or deeper, although in degraded wetlands or summers of dry years this may be limited to areas near spring heads or drainage ditches. In some portions of the species' range, the soft substrate consists of scattered pockets of peat instead of muck. In the areas of the wetland where saturated soils are present, you will be able to probe them to a depth of at least 3 inches, but pockets of 5 to 12 inches are likely to be present. During drought conditions, the extent and depth of mucky soils may be dramatically reduced over non-drought conditions, with soft, saturated soils being limited to areas near springs or seeps. Some sites within the HHRU do not necessarily have mucky soils; therefore suitable hydrology and vegetation may be more heavily weighted when determining a bog turtle wetland.

Suitable vegetation. Dominant vegetation of low grasses and sedges (in emergent wetlands), often with a scrub-shrub wetland component. Common emergent vegetation includes, but is not limited to: tussock sedge (*Carex stricta*), soft rush (*Juncus effusus*), rice cut grass (*Leersia oryzoides*), sensitive fern (*Onoclea sensibilis*), tearthumbs (*Polygonum* spp.), jewelweeds (*Impatiens* spp.), arrowheads (*Saggitaria* spp.), skunk cabbage (*Symplocarpus foetidus*), panic grasses (*Panicum* spp.), other sedges (*Carex* spp.), spike rushes (*Eleocharis* spp.), grass-of-Parnassus (*Parnassia glauca*), shrubby cinquefoil (*Dasiphora fruticosa*), sweet-flag (*Acorus calamus*), and in disturbed sites, reed canary grass (*Phalaris arundinacea*) , purple loosestrife (*Lythrum salicaria*) or common reed (*Phragmites australis*). Common scrub-shrub species include alder (*Alnus spp.*), red maple (*Acer rubrum*), willow (*Salix spp.*), tamarack (*Larix laricina*), and in disturbed sites, multiflora rose (*Rosa multiflora*). Some forested wetland habitats are suitable given hydrology, soils and/or historic land use. These forested wetlands include red maple, tamarack, and cedar swamps.

****Calciphiles**: "include numerous herbs, such as marsh muhly (*Muhlenbergia glomerata*), bluejoint grass (*Calamagrostis canadensis*), twig rush (*Cladium mariscoides*), several sedges (*Carex flava, C. hystericina, C. sterilis, C. lasiocarpa, C. lacustris, C. stricta,* and *C. utriculata*), thinleaf cotton-sedge (*Eriophorum viridicarinatum*), moor rush (*Juncus stygius*), grass-of-Parnassus (*Parnassia glauca*),white beakrush (*Rhynchospora alba*), rough-leaved goldenrod (*Solidago patula*), swamp goldenrod (*Soidago uliginosa*), purple avens (*Geum rivale*), white lady's slipper (*Cypripedium candidum*), and marsh cinquefoil (*Comarum palustre = Potentilla palustris*), plus several shrubs including shrubby cinquefoil (*Dasiphora fruticosa ssp. floribunda = Potentilla fruticosa*), alderleaf buckthorn (*Rhamnus alnifolia*), sageleaf willow (*Salix candida*), autumn willow (*S. serissima*), bog birch (*Betula pumila*), sweetgale (*Myrica gale*), speckled alder (*Alnus incana*), and red-osier dogwood (*Cornus stolonifera*). Minerotrophic moss species (e.g., *Drapanocladus aduncus* and *Campylium stellatum*) may or may not be present".
From: U.S. Army Corps of Engineers. 2011. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)*, ed. J. S. Wakeley, R. W. Lichvar, C. V. Noble, and J. F. Berkowitz. ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

Project Name _____ Wetland ID _____

Turtle Data Sheet

County: _____ Town: _____ Quad: _____

Site name: _____ Date: ___/___/_____

Capture Time:_____(E.S.T.) Investigator(s)_____

GPS Model:_____ Coord:_____ WAAS? Yes No

Species: _____ Sex: M, F, JUV, HATCH, UNK: _____

ID: L_____R_____ Marked this capture? Yes No Weight (g):_____

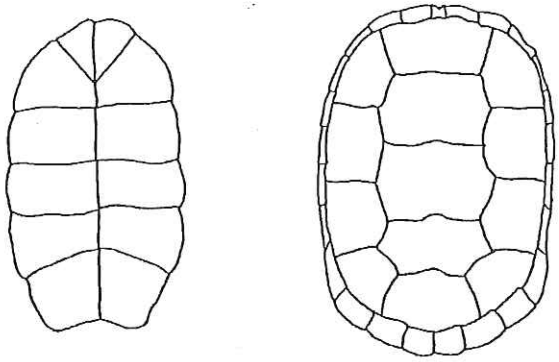
Transmitter ? Yes No Frequency?_____ Annuli: [worn]_____

Gravid? Yes No N/A Carapace Length (mm)_____ Width (mm)_____ Height (mm)_____

Plastron Length (mm)_____ Width (mm)_____ Ectoparasites? Yes No _____

==========

Specimen Characters (markings, deformities, scars, etc.) [noted below]



Photos: Yes No

==========

Method of capture: Trap Hand _____ Trap #:_____

Behavior: in trap basking walking swimming stationary feeding

mating escaping nesting other _____

Behavioral notes:_____

Habitat: _____

_____ Water temp: _____°C Air temp: _____°C

Substrate type_____ Substrate temp: _____°C Cloud Cover: _____%

Notes: _____

ATTACHMENT F

Annotated Color Photographs

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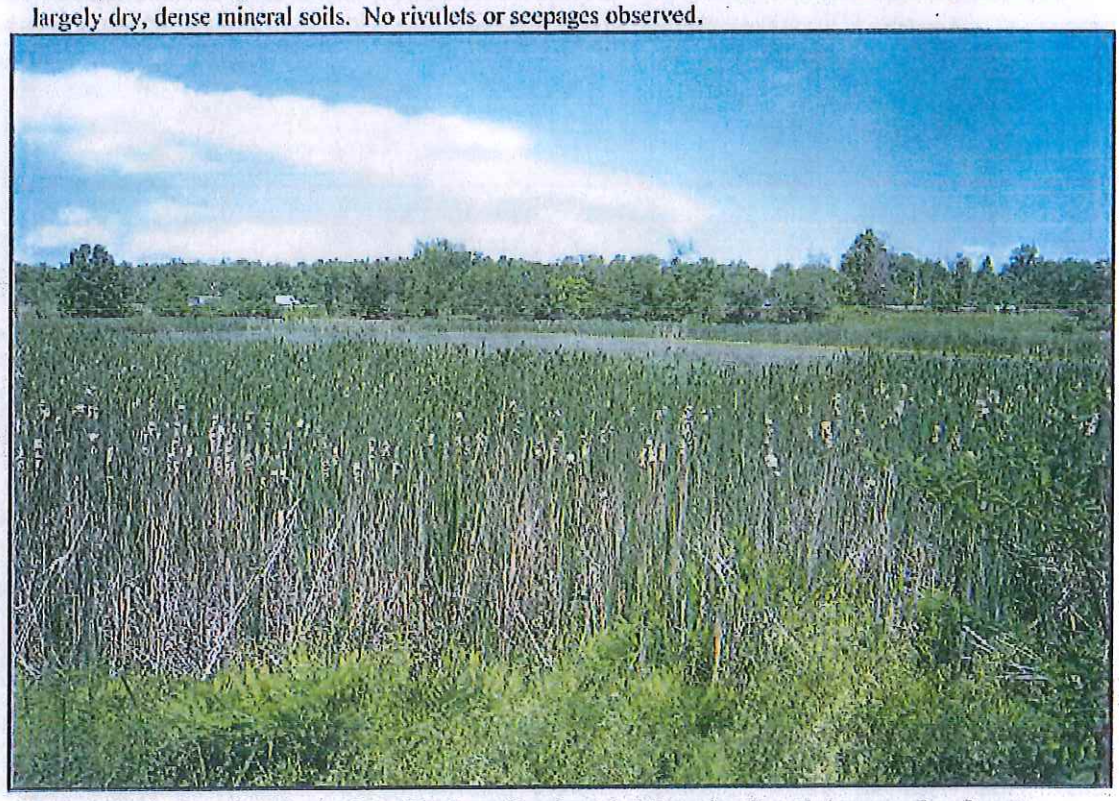
1

June 7, 2016 – Emergent wetland located Harriman Drive. Note extensive sedge community. Soils are largely dry, dense mineral soils. No rivulets or seepages observed.

2



June 7, 2016 –Cattail wetlands along Harriman Road pond. Mineral soils and absence of surface or groundwater hydrology. Pond appears to connect to roadway runoff.

3

June 29, 2016 – Emergent wetland located in dense forested wetland north of Conklingtown Road. Associated with rocky intermittent stream channel. Dense mineral soil with no seepages or muck soils.

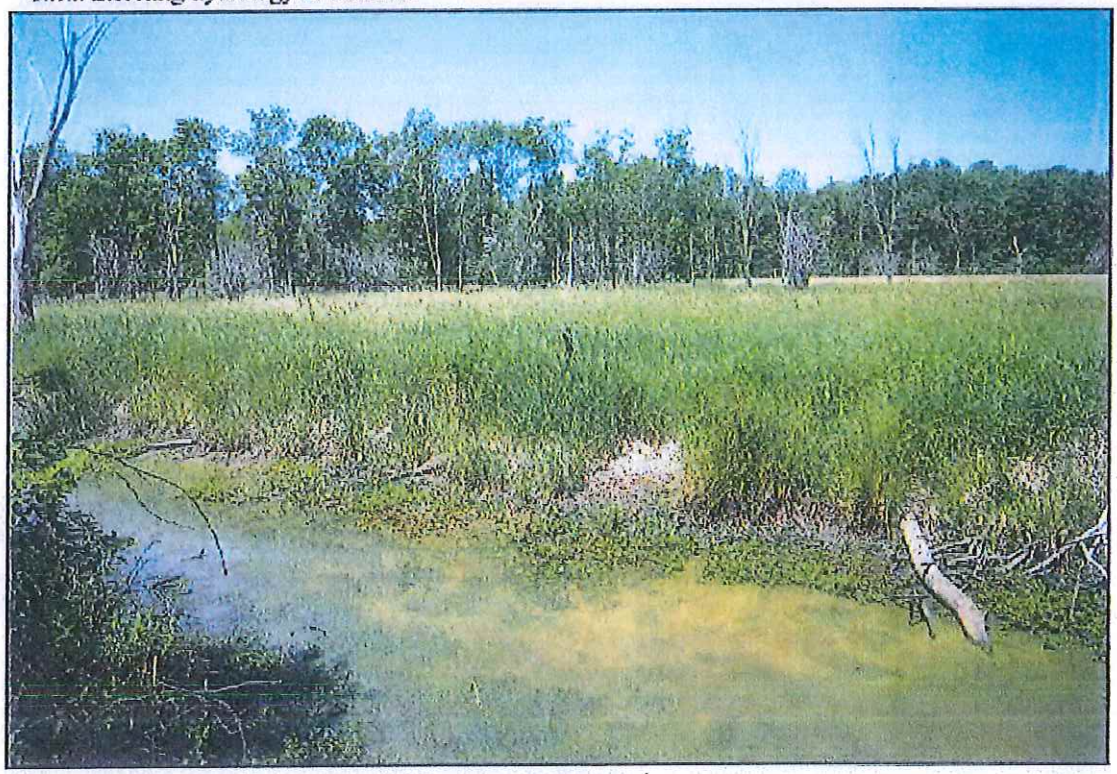
4

June 29, 2016 – Sweetflag dominated emergent wetland.

5

June 29, 2016 – Emergent wetland located along man-made ditch. Note significant subsidence along ditch. Effecting hydrology of wetland.

6



June 29, 2016 - North western ditch along Gunwood Drive.

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ATTACHMENT G

Qualifications of Preparers

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

ECOLSCIENCES, INC.
CORPORATE HISTORY

EcolSciences, Inc., was founded in 1973 in response to the growing need for responsible environmental planning, as mandated by NEPA, The National Environmental Policy Act. EcolSciences specializes in performing environmental investigations relating to permit acquisition and regulatory compliance, demonstration of "due diligence", waste management, impact analysis, mitigation, and remediation. EcolSciences' strength is a proficiency in current environmental and waste management laws, regulations, and policies, coupled with a practical problem-solving approach to analyzing the environmental consequences of projects.

During its forty-one years under the same management, EcolSciences has successfully completed more than 10,000 studies for private, quasi-public and public clients. Over the years EcolSciences was awarded a number of "Mission Contracts" wherein EcolSciences worked as USEPA's surrogate in preparing EPA Environmental Impact Statements in Region II, Region II and Region V. In addition, EcolSciences was contracted to provide training on the regulatory process associated with NEPA to USEPA employees and State Environmental Agency employees in all ten USEPA regions. Personnel involved in that work remain part of EcolSciences' team. EcolSciences has represented many of the country's leading industries, corporations, developers, and financial institutions including AT&T, American Cyanamid Company, Lucent Technologies, Merck, Johnson & Johnson, Hartz Mountain Industries, Exxon, K. Hovnanian Companies, Roseland Property Company, Trammell Crow Company, Principal Real Estate Investors, PNC Bank, The Bank of New York and JP Morgan Chase. Among the many utilities that EcolSciences has served are Jersey Central Power & Light, New Jersey Natural Gas Company, Verizon Wireless, Sprint, Elizabethtown Gas Company, Essex and Hudson County Improvement Authorities, Ocean County Utilities Authority, and numerous municipal utilities authorities. Representative government agency clients, in addition to the U.S. Environmental Protection Agency, include New York City Economic Development Corporation, New York City Department of Design and Construction, and New York City Department of Sanitation.

EcolSciences' interdisciplinary staff of environmental engineers, geologists, biologists and scientists has extensive experience in a diversity of studies related to biological assessment and toxic and hazardous materials management. EcolSciences has performed environmental assessments and has acquired appropriate permits and approvals under a wide variety of federal, state, regional, and local jurisdictions. These include, but are not limited to: federal Section 404 and Section 10 authorizations; New York SEQRA and CEQR approvals; New Jersey CAFRA, Waterfront Development, and Freshwater Wetlands Protection Act permits (both general and individual); NJ Pinelands Commission certifications; Hackensack Meadowlands Development Commission (HMDC) approvals; and Delaware & Raritan Canal Commission approvals. EcolSciences' senior staff is experienced in the delivery of expert testimony; senior staff of the firm have testified in public hearings, Administrative Law proceedings, and county, regional and municipal planning boards.

The ecological\biological staff of EcolSciences has conducted over 5,000 wetland delineations and environmental assessments throughout the eastern and central portions of the United States. Our staff is skilled in all technical aspects of wetland identification and delineation methodologies established by the ACOE, USFWS, EPA and SCS; the assessment of wetland functions and values using techniques such as HEP, WET, and IVA; the assessment of development-related wetland impacts; the acquisition of wetland permits; and the development and implementation of mitigation plans. Key members of our staff are certified as Professional Wetland Scientists and provisionally certified by the ACOE. Additionally, EcolSciences' biologists routinely perform specialized studies related to federally- and state-listed threatened and endangered plant and animal species, wildlife habitat surveys, and the assessment of development-related impacts. Five of EcolSciences' biologists are USFWS Qualified bog turtle surveyors and two are NJDEP Qualified Ornithologists.

Since the promulgation of the New Jersey Environmental Cleanup Responsibility Act (ECRA) and it successor, the Industrial Site Recovery Act (ISRA), EcolSciences has been involved in the implementation of the entire ECRA/ISRA program for its industrial clients. More recently, as the demonstration of "due diligence" has become a lending industry standard, EcolSciences has completed numerous Phase I environmental audits per ASTM E1527-05 and AAI and follow-up Phase II studies to clarify the level of environmental risk and liability associated with past and current practices at a particular site or facility. These audits typically include such activities as hazardous materials inventories, building and site inspections, subsurface soil investigations, groundwater monitoring, tank testing, asbestos bulk sampling, development of remediation plans and supervision of cleanup activities. The firm and technical staff members are also certified by the NJDEP for the performance of underground storage tank installation, closure, and subsurface evaluation. All work is conducted under the supervision of a licensed professional engineer.

EcolSciences is a multi-disciplinary firm that has the experience and capabilities to provide a full range of environmental services. Studies are conducted in a manner that emphasizes the balance of environmental, engineering and cost factors. This approach provides the information necessary for sound and practical project decisions.

LAURA NEWGARD

EDUCATION:

M.S., 1984 - Wildlife and Fisheries Sciences
Texas A & M University

B.S., 1982 - Forestry/Wildlife Management
Purdue University

AREAS OF EXPERTISE:

Wildlife Ecology
Wetlands and Terrestrial Ecology
Rare Species Surveys and Construction Monitoring
Environmental Impact Assessment and Mitigation Planning

PROFESSIONAL CERTIFICATION:

Recognized Qualified Bog Turtle Surveyor; New York, Pennsylvania and New Jersey (USFWS)
Professional Wetland Scientist (PWS)
NJDEP qualified Venomous Snake Monitor (Tertiary)
NJDEP qualified Wood Turtle Monitor
Threatened and Endangered Species in New Jersey: Regulations, Identification and Assessment - Rutgers University
BCI Bat Conservation and Management Workshop
Interagency Coordination for Endangered Species (USFWS)
Federal Manual for Identifying and Delineating Wetlands

OTHER:

Sparta Township Environmental Commission - Co-Chairman
USFWS Adopt-a-Swamp Pink Population Volunteer
NJDEP Bog Turtle Survey and Trapping Volunteer
NJ Venomous Snake Response Team (NJDEP) Volunteer
NJDEP Bobcat Trapping/Telemetry Volunteer
USFWS/NJDEP Bat Mist Net Survey Volunteer
PA Chapter of the Nature Conservancy Bog Turtle Volunteer

EXPERIENCE:

Ms. Newgard is a Vice President with EcolSciences, Inc. Her expertise lies in the identification and evaluation of land for the presence/absence of rare wildlife and plant resources, including habitat assessments and species specific surveys; and providing guidance on the preservation and protection of these terrestrial, wetland, and aquatic ecosystem through environmental planning and construction monitoring.

Ms. Newgard's responsibilities include: wildlife and plant surveys; threatened and endangered species studies; delineating wetland systems based on the Federal "three-parameter" methodology; the preparation of wetland and habitat mitigation plans to compensate for unavoidable disturbances to natural systems; and preparation of environmental impact assessments. Ms. Newgard has conducted threatened and endangered species surveys at the request of the United State Environmental Protection Agency (USEPA), New Jersey Department of Environmental Protection (NJDEP), United States Fish and Wildlife Service (USFWS), National Park Service (NPS), New York State Department of Environmental Conservation (NYSDEC), and New York City Department of Environmental Protection (NYCDEP). In addition, Ms. Newgard has been involved with permit acquisition including nationwide permits from the Army Corp of Engineers and wetland permits from the New Jersey Department of Environmental Protection (NJDEP).

A summary of relevant project experience accumulated over the last several years includes:

- Design, manage, and conduct wildlife habitat studies and threatened and endangered species surveys for numerous wildlife species, including; wood turtle, bog turtle, osprey, grasshopper sparrow, short-ear owl, long-ear owl, long-tailed salamander, blue-spotted salamander, pine snake, pine barren's tree frog, southern gray tree frog, timber rattlesnakes, red-shouldered hawk, barred owl, Coopers hawk, goshawk, bobcat, Indiana bat, and northern long-eared bat . These studies provided comprehensive wildlife lists inhabiting a site, identified existent and potential habitat communities, and identified or confirmed the absence of, rare species and their suitable habitat on certain sites. Select studies include telemetry surveys for wood turtles, bog turtles, and pine snakes; trapping for bog turtle, vernal pool species, and northern pine snake; vernal habitat surveys, migration studies, design, enhancement, and restoration; drift fences and pitfall traps for reptiles and amphibians; Indiana bat and Northern long-eared bat habitat assessments, mist net surveys, acoustic surveys, and emergence surveys. Work conducted in New York, Pennsylvania, and New Jersey.

Selected sites include:

- *12-mile utility alignment* (Biologist and Construction monitor coordinator for Bog turtle, Timber rattlesnake, and Indiana bat)
  2015: Orange County, New York.
- *250-mile utility alignment* (Phase 1 and Phase 2 bog turtle surveys)
  2007-2009: York, Adams, and Franklin Counties, Pennsylvania.
- *44-mile above-ground utility alignment* (Phase 1 and Phase 2 bog turtle surveys, Wood turtle surveys, timber rattlesnake den and gestation surveys, vernal habitat surveys, Indiana bat mist net surveys, timber rattlesnake, northern copperhead, and wood turtle construction monitoring, vernal habitat restoration and creation plans, bat emergence surveys, bat habitat assessments, bat mist net surveys.
  2005-2016: Morris and Sussex Counties, New Jersey.
- *20-mile above ground utility alignment* (Phase 1 and Phase 2 bog turtle surveys, Great Swamp National Wildlife Refuge bog turtle habitat restoration and construction monitoring, surveys, telemetry assisting USFWS)
  2009 – 2014: Morris County, New Jersey.
- *16 – mile and 8 – mile pipeline easements* (Phase 1 and Phase 2 bog turtle surveys, wood turtle surveys, wood turtle hibernacula surveys, wood turtle, bog turtle, and timber rattlesnake construction monitoring)
  2007-2013: Sussex and Passaic Counties, New Jersey.
- *2,000-acre mixed use development site* (timber rattlesnake and copperhead den surveys, Indiana bat mist net/acoustic surveys, vernal habitat surveys, marbled salamander pitfall trap surveys)
  1995-current: Rockland and Orange Counties, New York.
- *3,200-acre mixed use development site* (Phase 1 and Phase 2 bog turtle surveys)
  2006-2008: Tobyhanna and Monroe Counties, Pennsylvania.
- 200-*acre redevelopment site* (bog turtle Phase 1 surveys, timber rattlesnake habitat assessment/den emergent surveys, cricket frog survey)
  2014: Sterling Forest, New York.
- 6-mile and 8-mile pipeline project (Indiana bat/Northern long-eared bat habitat assessment)
  2014- 2015: Somerset, Mercer, and Hunterdon Counties, New Jersey.
- 55-mile pipeline project (Indiana bat/Northern long-eared bat habitat assessment, Timber rattlesnake/Northern copperhead surveys, raptor surveys, turtle surveys, vernal habitat surveys)
  2014- 2016: Somerset, Mercer, and Hunterdon Counties, New Jersey.
- National Park Service (turtle surveys – presence/absence, telemetry, trapping)
  2015- 2016: New Jersey/Pennsylvania.
- 14 acre development site (bald eagle nest monitoring survey and permit application)
  2015- 2016: Sussex County, New Jersey.

Design, manage, and conduct vegetative inventories and threatened and endangered species surveys for several plant species, including; swamp pink, Kneiskern's beaked-rush, curly-grass fern, small whorled pogonia, spreading globeflower, little lady tresses, climbing fern, and serpentine aster. These studies also served to confirm the absence of these species and their suitable habitat on certain sites.

Wetland delineation and impact assessment for numerous commercial and residential development projects throughout New Jersey, New York and Pennsylvania. Reports analyzed site conditions, classified wetlands and were prepared for submission to the appropriate agency.

Preparation of wetland creation/mitigation reports for commercial and residential projects in which unavoidable disturbances will occur to existing wetland communities. Programs were designed to replace and enhance the system which was to be disturbed through careful site preparation, species composition and planting and monitoring. Recent creation projects focus on creating vernal habitats for obligate vernal pool species.

DANIEL BRILL

EDUCATION:	*B.A., 1996 – Environmental Studies* *Richard Stockton College* *Galloway, New Jersey*
AREAS OF EXPERTISE:	*Threatened & Endangered Species Habitat Assessments and Surveys* *Geographic Information Systems*
PROFESSIONAL CERTIFICATIONS:	*Rutgers Cook College Office of Continuing Professional Education* *- Wetlands Delineation Certificate Series* *- Professional Certificate Program in Geomatics* *Birder Certification Online – Certification Level 3, Bird Conservation Regions 28, 29 & 30 (www.birdercertification.org/)*

EXPERIENCE:

Mr. Brill is a senior environmental scientist with EcolSciences, Inc. His particular specialties are in threatened and endangered species studies and the use of Geographic Information Systems (GIS) software as an instrument of environmental analysis.

Responsibilities include: support in the planning, implementation, documentation, and analysis of plant and wildlife habitat assessments and surveys, the delineation of wetlands based on the Federal Manual for Identifying and Delineating Jurisdictional Wetlands, and the preparation of various wetland-related permit applications and Environmental Impact Statements.

Mr. Brill was an educator at the Cooper Environmental Center with Ocean County Parks and Recreation and a frequent volunteer with the New Jersey Department of Environmental Protection and New Jersey Audubon Society prior to his employment with EcolSciences.

Threatened and Endangered Plant and Wildlife Studies

Contribute to the design, implementation, documentation, and analysis of habitat evaluations and surveys of endangered, threatened, and special concern flora and fauna. Such studies include:

- Lead Bald Eagle monitor from 2012-2014 on a multi-year overhead transmission line ROW construction project in northern New Jersey in accordance with USFWS permit conditions. Three eagle territories in Morris County have been in close proximity to construction activities that included intense helicopter usage.

- Avian monitor April – July 2014 at ROW construction project on the Raritan Estuary in Middlesex County as provided in a NJDEP Waterfront Development Permit. Work activities approach multiple Osprey nests. Several other State-listed birds have been observed in the work area including Black-crowned Night-heron, American Bittern, Bald Eagle, Northern Harrier, Least Tern, and Black Skimmer.

- Other avian studies of raptors such as Red-shouldered Hawk, Cooper's hawk, and Barred Owl; grassland species including Horned Lark, Vesper Sparrow, Savannah Sparrow, Grasshopper Sparrow, and Bobolink; wading birds like Yellow-crowned Night-heron and Great Blue Heron; and other birds such as Red-headed Woodpecker and Golden-winged Warbler.

- Large-scale and long-term studies of the New Jersey State-endangered Corn Snake and Timber Rattlesnake and State-threatened Northern Pine Snake, including the use of trapping and radio telemetry equipment.

- Other NJ State-listed herptiles such as Bog Turtle, Wood Turtle, Southern Gray Treefrog, Pine Barrens Treefrog, and Long-tailed Salamander.

- Plants such as the Federally-threatened and New Jersey State-endangered Swamp Pink (*Helonias bullata*) and Knieskern's Beaked-rush (*Rhynchospora knieskernii*) and Pinelands-listed Little Ladies Tresses (*Spiranthes tuberosa*).

Geographic Information Systems

Almost all projects have a geographic component that can be expressed via maps. Geographic Information Systems software has been used to:

- Quickly determine and effectively communicate potential environmental and cultural constraints on a given site such as historic features, wetlands, vernal habitat, Category One waters and associated Special Water Resource Protection Area, riparian zones, floodplains, rare plants and ecological communities, and critical wildlife habitat.

- Plot results of plant and wildlife species surveys, establish and quantify critical nesting and foraging habitat according to peer-reviewed models, and develop species management strategies.

- Analyze land use/land cover change over time in areas with records of threatened and endangered species such as Bald Eagle, Black-crowned Night-heron, Barred Owl, Red-headed Woodpecker, and Northern Pine Snake to determine if these areas remain suitable habitat.

- Prepare portions of a Natural Resource Inventory for the Borough of Milltown, Middlesex County, New Jersey.

- Successfully demonstrate to NJDEP that the width of a wetlands transition area can be reduced or that a site should remain within a sewer service area.

Other Applicable Experience

- Presented at the Endangered and Nongame Species Advisory Committee meeting September 21, 2010 as part of a gathering of various users of the NJDEP Landscape Project critical wildlife habitat map to discuss its application, strengths, limitations, and suggested improvements.

- Participated in the 2007 Special Pinelands Plants Course offered by the Pinelands Preservation Alliance, consisting of fourteen full-day sessions designed to instruct students in the identification, habitat, distribution, threats, and possible management strategies of rare Pinelands plants.

- Assisted in the delineation of wetlands using the Federal Manual three-parameter approach using vegetation, soils, and hydrology.

- Assembled application packages for submission to the NJDEP including Letters of Interpretation, Statewide General Permits, Transition Area Waivers, and CAFRA Permits (including Endangered or Threatened Wildlife Habitat Evaluations and Impact Assessments).

- Contributed in the composition of Environmental Impact Statements and Assessments for residential, industrial, and commercial projects.

- Helped conduct a bird/tower collision study during the spring and fall migrations in the New Jersey Meadowlands.

- Assisted the annual Sandy Hook Hawk Watch for New Jersey Audubon Society. Upwards of fifteen or more species of diurnal raptors can be expected at this location. Results over a number of years can help determine long-term trends in raptor populations and migratory movements. Work included educating the public on raptor identification and conservation.

- Project assistance for Neotropical Passerine Critical Areas: Pinelands Survey (Landscape Project for Protection of Rare Species). The objective of this NJDEP-sponsored study was to determine the distribution, abundance, and habitat characteristics of neotropical birds and other observed species.

- Participation in the New Jersey Breeding Bird Atlas with data contributed towards *Birds of New Jersey* (Walsh, Elia, Kane, and Halliwell, 1999) published by the New Jersey Audubon Society. Work involved identifying and recording all breeding bird species and observed behaviors in predetermined survey blocks.

GARY W. STANDARD

EDUCATION: *B.S., 1978 – Wildlife & Fisheries Sciences, Texas A&M University*
M.S., 1982 – Wildlife & Fisheries Sciences, Texas A&M University

AREAS OF EXPERTISE: *Wildlife Ecology*
T&E Surveys
Construction Monitoring

PROFESSIONAL ASSOCIATIONS: *Nature Conservancy*
New York-New Jersey Trail Conference
NJ Wildlife Conservation Corps

EXPERIENCE:

EcolSciences, Inc. – Rockaway, NJ
Environmental Scientist

- NJDEP qualified construction monitor for Timber Rattlesnake, Northern Copperhead, Northern Pine Snake, Wood Turtle, Bog Turtle
- Participated in habitat assessment, emergence and gestation surveys for Timber Rattlesnake and Northern Copperhead
- Conducted grid-search surveys and drift fence trapping for Northern Pine Snake
- Conducted radio telemetry studies for Northern Pine Snake
- Participated in Phase I and Phase II Bog Turtle surveys in New Jersey and Pennsylvania
- Conducted surveys and radio telemetry studies for Wood Turtle
- Conducted Amphibian surveys including Pine Barrens Treefrog, Southern Gray Treefrog, Blue-spotted Salamander, Marbled Salamander, Long-tailed Salamander
- Conducted Raptor surveys including Sharp-shinned Hawk, Cooper's Hawk, Northern Goshawk, Broad-winged Hawk, Red-shouldered Hawk, Barred Owl, Long-eared Owl
- Participated in plant surveys including Swamp Pink, Bog Asphodel and Small Whorled Pogonia
- Conducted vernal pool surveys

TK Wildlife, LLC – Narrowsburg, NY
Timber Rattlesnake Monitor

- Timber Rattlesnake Monitor on construction sites in Pennsylvania and New Jersey

Texas Parks & Wildlife - Brownsville, TX
State Biologist – Coastal Fisheries

- Co-managed regional field station operations
- Collected biological data on commercial and recreational fisheries to assist in establishing/revising State game regulations
- Coordinated extensive sampling program to monitor local shellfish and finfish populations

Texas A&M University/U.S. Dept. of Energy/Strategic Petroleum Reserve Program-College Station, TX
Research Technician II

- Conducted extensive trawl program to monitor effects of brine disposal on marine life
- Carried out onboard and laboratory processing of nekton trawl catches
- Collected data for life history studies of finfish species found off the Texas coast

Texas A&M University/ NOAA/NMFS - Galveston, TX
Research Assistant

- Field test government 'turtle excluder' trawls aboard commercial shrimp trawlers
- Collect field data on sea turtles, penaeid shrimp and incidental finfish catch
- Maintain government test nets and assist in vessel operations

VOLUNTEER PROGRAMS:

USGS/North American Amphibian Monitoring Program
USFW Adopt-a-Swamp Pink Population Monitor
NJDEP/USFW Bog Turtle Volunteer
NJDEP Venomous Snake Response Team
NJDEP Bobcat Trap/Telemetry

PUBLICATIONS:

Standard, G.W., and M.E. Chittenden, Jr. 1984. Reproduction, movements, and population dynamics of the banded drum, *Larimus fasciatus*, in the Gulf of Mexico. Fish. Bull., U.S. 82:337-363.

Rockett, M.D., G.W. Standard, and M.E. Chittenden, Jr. 1984. Bathymetric distribution, spawning periodicity, sex ratios, and size compositions of the mantis shrimp, *Squilla empusa*, in the northwestern Gulf of Mexico. Fish. Bull., U.S. 82:418-426.