

**Canadian National Rail Corridor in Port Huron Township, Michigan, and Habitat for
Indiana Bats**

A Report to
DLZ, Inc.

by

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Introduction

Background

The Indiana bat is a small 6–10 gram, insectivorous bat that ranges across much of the eastern United States. This species hibernates in a limited number of mines and caves, primarily in the karst regions of Missouri, Kentucky, and Indiana (USFWS, 1983, 1999). Some hibernacula contain up to 100,000 Indiana bats, and at one time, more than 90% of the known population hibernated in just three caves and one mine. Known populations declined drastically during the 1960s because of disturbance while hibernating and because human alteration of some hibernation sites modified the cave microclimate (Richter et al., 1993). This lack of suitable hibernacula (critical habitat) and severe declines in size of wintering populations were the reasons that the Indiana bat initially was placed on the original, federal list of endangered species in 1967 (Humphrey, 1978; USFWS, 1999). Hibernating Indiana bats are now well protected, but the species continues to decline at an alarming rate (Clawson, 2002). Overall, hibernating populations have fallen by 56% since the species was listed, and the decline since 1980 alone has reached a staggering 80% in some areas. The continued decline, despite protection in winter, suggests that there are problems on the summer range.

During warm-weather months, male Indiana bats generally are solitary, roosting in trees or perhaps caves on occasion (Hall, 1962). Female Indiana bats, in contrast, gather in small maternity colonies of less than 100 adults, where they give birth and raise their single young to maturity. Indiana bats typically roost underneath the loose bark of dead trees, but sometimes, the bark of living trees, such as shagbark hickory (*Carya ovata*) are used. Maternity colonies occasionally roost in narrow crevices within the trunk of a tree, but unlike many other species of bat, Indiana bats do not form maternity colonies in tree hollows (cavities) that were created by rot or woodpeckers. A colony of Indiana bats may use over 15 roost trees in a single season. Although roost trees most often occur in clumps, with different trees 1–100 meters apart, alternate roosts may be separated by many kilometers (Callahan et al., 1997; Kurta, in press; Kurta et al., 1996, 2002).

Trees that most frequently are used as roosts include oaks, hickories, maples, elms, and ashes (Kurta, in press). Preferred trees are not obstructed by vines or small branches, are in early-to-mid stages of decay, and receive large amounts of sunlight, presumably creating a warm microclimate for this essentially southern species. Maternity colonies concentrate their roosting in large trees, particularly those that are greater than 22 cm (9 inches) in diameter (Gardner et al., 1991), and average size of trees used in Michigan is 41 cm (Kurta and Rice, 2002). Roosts typically are located in forests with low-to-moderate subcanopy, and often are in or near riparian woodlands or other wetlands (Callahan et al., 1997; Gardner et al., 1991; Humphrey et al., 1977; Kurta et al., 1993a, 1993b, 1996, 2002; Romme et al., 1995). Indiana bats often use the same tree in multiple years and are highly loyal to a general area, moving from tree to tree as once-suitable roosts lose bark, decay, and fall over (Kurta and Murray, 2002). Summer records and actual roosts of this endangered species are known from the southern three rows of counties in Michigan, and the species is considered widespread but uncommon in summer (Kurta, 1980, 1995; Kurta and Rice 2002). Indiana bats from southern Michigan migrate up to 575 kilometers (350 miles) to caves in southern Indiana and Kentucky for the winter (Kurta, 1980; Kurta and Murray, 2002; L. Winhold and A. Kurta, unpublished data).

Limited radiotracking data suggest that these insectivorous bats often forage in areas of open forest, above and below the canopy (Brack, 1985; Gardner et al., 1991), although they occasionally hunt in more open habitats (Gardner et al., 1991; Kurta and Whitaker, 1998; Murray, 1999). Foraging areas may be 2–4 km from a roost tree (Gardner et al., 1991; Murray and Kurta, 2004). Diet in Michigan primarily consists of flies, caddisflies, moths, and beetles (Kurta and Whitaker, 1998; Murray and Kurta, 2002). Indiana bats prefer not to cross large, open expanses of land and travel many kilometers out of their way to follow wooded corridors between roosts and other sites that are used for foraging, drinking, or roosting (Murray and Kurta, 2004; Winhold et al., in press). Indiana bats rest (night-roost) between foraging bouts, often in trees but also under bridges (Kiser et al., 2002; Murray and Kurta, 2004).

Proposed Action

The St. Clair County Road Commission and the Canadian National Railway Company propose to re-route a number of roads and rail lines near a current rail yard in Port Huron Township, Michigan (T6N R17E Sections 7, 8, 17, and 18). Coupling and uncoupling of rail cars frequently results in trains blocking automobile traffic on nearby roads for prolonged periods, and re-routing is proposed to ease this congestion.

Previous Records of the Indiana Bat near St. Clair County

The distance from St. Clair County to known hibernacula of the Indiana bat in Kentucky is at the edge of the maximum migratory abilities of the species (Gardner and Cook, 2002, Kurta and Murray, 2002; Winhold and Kurta, in press). Consequently, it is possible that Indiana bats summer in areas of suitable habitat within the county. No records exist for the species in St. Clair County, but this may reflect limited attempts to catch bats of any kind in this region of Michigan. To my knowledge, capture of bats has been attempted only at a few sites in nearby Oakland County and Lapeer County (A. Kurta, unpublished data), but none has taken place in St. Clair County or adjacent Macomb County. The closest actual capture of an Indiana bat in summer to the proposed project occurred in Hartland Township, Livingston County, about 75 miles southwest of Port Huron Township, in 1971 (Kurta, 1982).

Purpose of Study

I was asked by Mr. Adrian Stroupe of DLZ, Inc., to evaluate the area surrounding proposed construction as possible summer habitat for the Indiana bat and to estimate potential impacts of construction on the bat.

Methods

I visited the site on 19 and 20 March 2005 and made a qualitative investigation of the habitat and of potential roost trees. I walked through the area with the intention of ranking the overall habitat as high, medium, low, or zero in its potential to provide summer habitat for a maternity colony of Indiana bats, based on the literature and my experience with this bat in Michigan. Factors that I considered included:

- 1) extent and openness of the forest and availability of more forest nearby,
- 2) availability of open, standing water at the site or nearby,

- 3) availability of flight space to provide access to roosts and foraging habitat,
- 4) abundance of trees of species known to be used as maternity roosts
- 5) approximate size (diameter) of trees, and
- 6) abundance of trees suitable for roosting right now (i.e., dead with peeling bark, moderate to heavy sunlight, absence of vines and other obstructions, sufficient diameter).

I also examined topographic maps and aerial photographs and drove through some of the surrounding areas to estimate extent of potential habitat.

Results

General Areas of Proposed Construction

There were two large areas for which I was asked to evaluate the habitat. One of these was centered on the intersection of Griswold and Michigan roads. This crossroads is indicated as the community of Tappan on a number of maps, but it is not an incorporated village, just a scattering of commercial buildings and homes. The second area consisted of mostly vacant land and was located about 0.5–1.0 mile farther west along Griswold Road, stretching from I-94 to slightly west of Range Road. Both sites were within 1 mile of the complex and busy intersection of I-94 and I-69. Hereafter, I will refer to these two broad areas as the Eastern Site and Western Site, respectively.

Eastern Site

Northeast of the Intersection of Griswold and Michigan Roads

Northeast of the intersection were residential parcels along Michigan Road in the north, a towing/storage operation at the corner, and open sites, a bar, and a ball diamond to the east along Griswold Road. A rail line (Grand Trunk Western; GTW) passed northeast to southwest behind the bar, and north of this railroad was a wooded area. The trees were primarily moderate-sized maple, white birch, and poplar, with a few ash and elm. Most trees were living, and the only potential roosts were a dead elm and two dead poplars; all three, however, were less than 20 cm in diameter, highly shaded, and difficult to access by a flying bat.

Northwest of the Intersection of Griswold and Michigan Roads

Northwest of the intersection of Griswold and Michigan roads, the land contained commercial buildings, homes, and vacant land. The biggest commercial enterprise was a large, fenced scrap-yard off Griswold Road. Houses were located at the intersection and along Michigan Road to the north, and some of these homes were associated with outbuildings, such as garages and even chicken coops. Vacant parcels along Michigan Road were largely open fields with only scattered trees. Most trees in this quadrant of the Eastern Site were located behind the houses in the extreme north. However, there were no trees that could be used as roosts by Indiana bats at this time.

Southwest of the Intersection of Griswold and Michigan Roads

Southwest of the intersection of Griswold and Michigan roads, there were vacant lots (buildings torn down and removed) and two large commercial buildings along Griswold Road, as well as a decrepit house at the corner. South of Griswold Road was the Grand Trunk rail line, as well as multiple tracks of the Canadian National Railroad (CN). Trees varied from large living cottonwoods in the vacant parcels along Griswold Road to mostly small-diameter poplar and birch in a stand between the GTW track and the CN tracks. No potential roost trees were seen north of the CN tracks.

South of the CN tracks and west of Michigan Road, there was a wetland with shrubs and some cattails and then an area thick with small trees (10–20 feet tall) and shrubs. This area was not even indicated as forested on the 1991 U.S.G.S. topographic map. During my survey, there were scattered willow, cottonwood, and box elder, and the largest trees were 40–60 cm in diameter. However, only one potential roost tree occurred in these woods; it was a dead cottonwood (55 cm diameter) that was located just north of a small ditch and about 50 feet from Michigan Road. It was ranked as low-to-medium quality as a potential roost, because branches of nearby living trees created problems for access and limited the amount of sunlight striking the dead tree.

Southeast of the Intersection of Griswold and Michigan Roads

This portion of the Eastern Site was dominated by the extensive CN rail yard, which bisected the area, cutting across from east to west. At the intersection of Griswold Road and Michigan Road, there were open wetlands, with a thin fringe of trees. North of the yard and farther east along Griswold Road was a woodlot with maple, birch, and poplar, as well as many shrubs. Large trees (25–45 cm) were scattered throughout, but they were uncommon. No potential roost trees were identified between the CN yard and Griswold Road.

South of the CN yard, the land was largely wooded, although there were some open scrub/shrub wetlands too. Trees were mostly maple, white birch, and some black cherry. There were only two potential roost trees with diameters greater than 20 cm—a low-quality oak in the interior of the woods, and a medium-quality tree (willow?) at the edge of the rail yard. There were many shrubs and saplings that made walking through the woods difficult and that would limit bat foraging to the space above the canopy, in the openings and the wetlands, and along the forest edges. The North Branch of Bruce Creek runs through the southern part of the Eastern Site. This creek was about 5–7 feet wide, and was open enough in places that bats could potentially obtain drinking water from it.

Overall Evaluation of the Eastern Site

The site was highly disturbed, with houses, railroad tracks, a rail yard, a scrap-yard, demolished building sites, piles of debris, and other signs of human presence. There was constant activity at the rail yard, with concomitant noise from moving trains, rail cars coupling and decoupling, automobiles on the roads, and frequent and prolonged warning bells when trains cross the roads. Limited foraging could take place in woods south of the rail yard, some open water was available on site, and there were a number of ponds nearby. However, there were very few dead trees within the entire Eastern Site, and most of these were small diameter (<20 cm). All potential roost trees were low quality, except one located

near Michigan Road and another next to the rail yard. The Eastern Site provided low-quality habitat for Indiana bats.

Western Site

The Western Site was an odd-shaped area of mostly vacant land that was roughly 0.75 mile long and 0.25 mile wide. For ease of discussion, I divided the site into four main areas. Area A was north of a right-of-way for the Chesapeake and Ohio Railway that was abandoned a number of years ago; the tracks have been removed, and the gravel right-of-way is now part of the “Wadams to Avoca Rail Trail” and under control of the St. Clair County Parks Commission. Area B was a triangular-shaped parcel between the abandoned rail line and the currently used, double tracks of the Canadian National Railway. Area C was south of the CN tracks, and Area D was west of Range Road, which was the boundary between Port Huron and Kimball townships.

Area A—North of the Abandoned Railway

The Huffman Drain traveled in a north-south direction at the eastern end of Area A. This drain was about 15 feet across. Dredged material was piled on the eastern bank long ago, and trees were growing on top of it; the western bank, in contrast, was level and has been kept free of trees within 20 feet of the drain. Just north of Area A, there was at least one large pond in the east, next to the Huffman Drain, and another was located in the west. Both the drain and the ponds could provide drinking water for bats in summer.

The eastern third of Area A contained the most mature forest of either the Eastern or Western sites. Cottonwood and maple dominated, and there were scattered ash, elm, and oak. Many trees were 35 to 80 cm in diameter, and some cottonwoods apparently were over 100 cm in diameter. The subcanopy was only moderately developed, and the forest was more open than anywhere else in the Eastern or Western sites. Foraging would be possible within this part of the forest, as well as above and along its edges. There also was a 2-track on slightly elevated ground (an old road or rail bed?) that appeared to follow the boundary between sections 7 and 18 and contributed slightly to the openness of the forest in this area.

As one moves northwest through Area A, the forest becomes younger, and more dense. Large-diameter cottonwood becomes less common, whereas small-diameter oak and elm become more abundant. There are occasional openings in the forest or at least areas in which stem density is relatively low. The extreme western portion of Area A contained houses, outbuildings, and mowed areas that are associated with residences along Range Road.

There were at least 14 potential roost trees in Area A. Five of these were in the eastern third of Area A, near the 2-track, and all were considered low quality because of limited sun and/or limited safe access. Most other potential roosts were clustered in the western half of Area A south of the elongated pond; although most of these trees also were low in quality, two were considered high quality and one was medium.

Area B—Between the Abandoned Railway and the CN Tracks

Area B was generally low land that was mostly forested. American elm seemed to be the most abundant species of tree, although there were many ash, oak, maple, birch, and

poplar too. Although all species were found throughout Area B, the maple, birch, and oak seemed more abundant on small islands of marginally higher ground.

There were hundreds of dead trees within Area B. Most of these were elm, and most occurred between Range Road and a narrow right-of-way for a petroleum pipeline that bisected Area B in a north-south direction. My notes indicated that, at one point, dead elms could be seen in every direction. Although many of these dead elms were small trees with diameters less than 15 cm, there were a number of high- and medium-quality trees. Some high- and medium-quality trees occurred along the edge of the CN tracks in the western part of Area B (easily visible from Griswold Road). Another small site, which also was located west of the pipeline right-of-way, had a concentration of eight high-quality trees. These latter trees were up to 45 cm in diameter, and despite being located in the interior of the woods, access to the trees and amount of sunlight falling on their trunks were both high, largely because all nearby trees also were dead.

Area C—South of the CN tracks

Woods occur south of the CN tracks in the eastern part of Area C. Ash was the dominant type of tree, but there were scattered cottonwood oak, maple, black cherry, elm, and even American beech. Some large cottonwood and ash (diameter > 50 cm) occurred in the eastern part of this site, near the Huffman Drain, but in general, there were fewer large trees as one moved west. There were very few dead trees throughout Area D. Only one potential roost tree, a medium-quality elm was seen, and it was located near the western edge of Area C.

Some foraging could take place in Area C. The Huffman Drain was forested on both sides in Area C, and there may be a clear flight space for bats over the drain in summer. Foraging also might occur along the drain, although it likely could not occur within the interior of the woods. Most foraging would be restricted to above the canopy and around the crowns of the larger trees that prominently extended above the canopy.

Area D—West of Range Road

Area D was wooded. Most trees were oak and ash, with the largest in the range of 30–50 cm in diameter. The subcanopy was quite dense, and there was no flight space for bats. There were no dead trees that potentially could be used as roosts by Indiana bats.

Overall Evaluation of the Western Site

Overall, the Western Site potentially provides high-quality habitat for Indiana bats. There was a very large number of dead elm trees that could be used as alternate roosts, and these were located throughout most of the Western Site, with a huge concentration in the western half of Area B. In addition, there were a few medium-quality trees and at least 10 high-quality trees that could serve as primary roosts. All wooded areas were contiguous, and these wooded areas continued out of the project area to the north, south, and west. Potential drinking water was readily available at the Huffman Drain and the ponds north of Area B. Foraging habitat in the eastern part of Area A was very good, allowing the bats to forage above and below the canopy. Elsewhere, foraging habitat was mediocre, but the bats could forage along edges, along the drain, and in forest openings, in addition to above the canopy.

Conclusions

The Eastern Site is poor-quality habitat for Indiana bats, whereas the Western Site provides high-quality habitat. The new intersection that is proposed for Griswold and Range Roads would be constructed in the best roosting habitat (i.e., Area B), resulting in the destruction of many potential roost trees and fragmentation of the habitat.

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