

A HABITAT CONSERVATION PLAN
SUBMITTED BY
NORTHERN INDIANA PUBLIC SERVICE COMPANY
&
INDIANA - AMERICAN WATER COMPANY, INC.

AS PART OF A JOINT
SECTION 10(a)(1)(B) INCIDENTAL TAKE PERMIT
APPLICATION
FOR THE

FEDERALLY ENDANGERED
KARNER BLUE BUTTERFLY

May 2, 2005

Prepared by:

Brian Kortum
Natural Resources Specialist
NiSource, Inc.

TABLE OF CONTENTS

Executive summary

- 1.0 INTRODUCTION
 - 1.1 Overview and Background
 - 1.2 Regulatory / Legal Framework for Plan
 - 1.2.1 The Endangered Species Act
 - 1.2.2 The ESA and Non-public lands
 - 1.2.3 Purpose and Need
 - 1.3 Plan Area
 - 1.3.1 Aetna ROW
 - 1.3.2 Miller ROW
 - 1.3.3 Stagecoach Road ROW
 - 1.3.4 Ogden Dunes INAWC ROW
 - 1.4 Species to be Covered
 - 1.4.1 Karner Blue Butterfly
 - 1.4.2 Habitat information
- 2.0 ENVIRONMENTAL SETTINGS/BIOLOGICAL RESOURCES
 - 2.1 Environmental Setting
 - 2.1.1 Climate
 - 2.1.2 Topography/Geography
 - 2.1.3 Existing land use
 - 2.2 Species of Concern in the plan area
 - 2.2.1 Karner Blue Butterfly
 - 2.2.2 Wild Lupine
 - 2.2.3 Nectar Plants
- 3.0 DESCRIPTION OF ACTIVITIES COVERED BY PERMIT
 - 3.1 NIPSCO Activities covered by permit
 - 3.1.1 Transmission line maintenance
 - 3.1.2 Replacement of electric conductor
 - 3.1.3 Gas line maintenance
 - 3.1.4 Gas line construction and replacement
 - 3.1.5 Emergency work
 - 3.1.6 Vegetation management
 - 3.2 INAWC activities covered by permit
 - 3.2.1 Water Main maintenance
 - 3.2.2 Water Main Construction
 - 3.2.3 Emergency work
 - 3.3 Implementation of KBB HCP
- 4.0 POTENTIAL BIOLOGICAL IMPACTS/TAKE ASSESSMENT
 - 4.1 Direct and Indirect Impacts
 - 4.1.1 Anticipated take: wildlife species

4.1.2 Anticipated impacts: plant species

5.0 CONSERVATION STRATEGY/MEASURES TO MINIMIZE AND MITIGATE FOR IMPACTS

- 5.1 Measures to Minimize Impacts (KBB Habitat Improvement Plan)
- 5.2 Monitoring and Reports
- 5.3 Measures to Mitigate Unavoidable Impacts

6.0 FUNDING

- 6.1 Funding for minimization and mitigation measures

7.0 ALTERNATIVES

- 7.1 No Action Alternative
- 7.2 Alternative 1 No Change from Historic Maintenance Plan
- 7.3 Alternative 2 Proposed action alternative (Preferred Alternative)

8.0 PLAN IMPLEMENTATION, UNFORESEEN CIRCUMSTANCES

- 8.1 Plan implementation
- 8.2 Unforeseen Circumstances
- 8.3 Implementing Agreement

9.0 LITERATURE CITED

APPENDIX

- A. Maps/ Figures
- B. 2004 Baseline Monitoring Report by JFNEW
- C. Department of Interior, U.S. Fish & Wildlife Service, Federal Fish and Wildlife License/Permit Application
- D. Implementing Agreement
- E. Photos of equipment potentially used on ROW
- F. Excerpt of Wisconsin Protocol (prescribed burning)

LIST OF FIGURES in Appendix A:

- Figure 1: KBB HCP Plan Area Locations
- Figure 2: NIPSCO Aetna & Miller ROW
- Figure 3: NIPSCO Stagecoach Rd. ROW & INAWC Ogden Dunes ROW
- Figure 4: Karner blue butterfly
- Figure 5: Phenology of the Karner Blue and lupine
- Figure 6: KBB Life Cycle
- Figure 7: Wild Lupine
- Figure 8: KBB Nectar Species
- Figure 9: Habitat Management Area Sign

Thanks to all who assisted in the creation of this HCP. Special thanks to: Paul Labus, Liz McCloskey, John Shuey, Jim Barnhart, Jason Lietz, and Brian Stage.

NIPSCO Habitat Conservation Plan (HCP)

Executive Summary:

NIPSCO

This document pertains to certain gas and electric Rights of Way (ROW) owned and operated by the Northern Indiana Public Service Company, and one easement owned by the Indiana-American Water Company, Inc (INAWC) hosting electrical facilities, which are maintained by NIPSCO. These facilities are vital to the economy and infrastructure of the region, delivering vital electric, gas, and water resources throughout Northwest Indiana.

NIPSCO with headquarters in Merrillville, Ind., is one of the 10 energy distribution companies of NiSource Inc. (NYSE: NI). With nearly 700,000 natural gas customers and 430,000 electric customers across the northern third of Indiana, NIPSCO is the largest natural gas distribution company, and the second largest electric distribution company, in the state. NiSource distribution companies serve 3.7 million natural gas and electric customers primarily in nine states.

INAWC is part of American Water. American Water, a part of RWE's water division, serves 20 million customers in 27 states, 4 Canadian provinces, Puerto Rico, and South American. Over 8,000 employees provide water, wastewater and other related services. RWE's water division is the third largest water and wastewater service company in the world.

Current Species Status: The Karner blue butterfly (KBB), *Lycaeides melissa samuelis* Nabokov (Lepidoptera: Lycaenidae) formerly occurring in a band extending across 12 states from Minnesota to Maine and in the Province of Ontario, Canada, now only occurs in the seven states of Minnesota, Wisconsin, Indiana, Michigan, New York, New Hampshire, and Ohio. In 1998, it was reintroduced to Ohio. Wisconsin and Michigan support the greatest number of Karner blue butterflies and butterfly sites. The majority of the populations in the remaining states are small and several are at risk of extinction from habitat degradation or loss. Based on the decline of the Karner blue across its historic range, it was listed as endangered in 1992.¹

Habitat Requirements and Limiting Factors: The Karner blue butterfly is dependent on wild lupine, *Lupinus perennis* L. (Fabaceae), its only known larval food plant, and on nectar plants. These plants historically occurred in savanna and barrens habitats typified by dry sandy soil, and now occur in remnants of these habitats, as well as other locations such as roadsides, military bases, and some forestlands. The primary limiting factors are loss of habitat through development, and canopy closure (succession) without a concomitant restoration of habitat. A shifting geographic mosaic that provides a balance between closed and open-canopy habitats is essential for the maintenance of large viable populations of Karner blue butterflies.¹

Karner blue butterflies and Northern Indiana Public Service Company: In 1993, the United States Fish and Wildlife Service informed NIPSCO that the Karner blue butterfly (*Lycaeides melissa samuelis*) was present on property owned in Gary, Indiana. The area of concern is the Miller ROW owned by NIPSCO for locating an overhead electrical transmission line. Associated with the butterfly were several potential habitat sites containing wild lupine and various other nectar plants. Since that time, populations of the butterfly were also discovered on the company's Aetna ROW and Stagecoach Rd. ROW, both containing overhead electrical transmission lines. Several potential sites were present on NIPSCO properties.

Current and potential Karner blue butterfly habitat on NIPSCO properties consists of utility ROW, surrounded by adjacent oak savannas and lakeshore dunes. Past ROW maintenance included mowing every six years, which benefited the butterflies by acting as the disturbance necessary to restart succession and maintain the open areas that lupine needs to thrive. This maintenance can be performed seasonally in order to avoid or limit contact with lupine and Karner blue butterflies, which are active during periods between May and August. Emergency maintenance or repairs of the electric transmission lines, though, may be required at any time of the year, creating a potential operational conflict and a greater risk of butterfly disturbance or destruction due to vehicular or pedestrian traffic.

Since the initial discovery, NIPSCO has worked cooperatively with the U.S. Fish & Wildlife Service (USFWS), The Nature Conservancy (TNC), the Indiana Dunes National Lakeshore (IDNL), the Indiana Department of Natural Resources (IDNR) and others to maintain conditions favorable for successful butterfly production. These properties are some of the few sites in Indiana where the Karner blue butterfly is known to exist. NIPSCO also has facilities located on an easement in Ogden Dunes that hosts the Karner blue butterfly. This corridor is owned by INAWC, which also has a water line located underground on this ROW.

This HCP will describe methods that NIPSCO and INAWC will undertake to continue to assist in the monitoring and maintenance of favorable Karner blue butterfly habitat in appropriate areas on company properties. Also, it will describe the development of favorable Karner blue butterfly habitat in the Miller Substation savanna, which is immediately adjacent to the Miller ROW. This area will be set aside as a mitigation site for potential impacts on the plan ROW.

This HCP and incidental take permit is being sought to reduce NIPSCO's and INAWC's liability under the Endangered Species Act in the event of an incidental take of Karner blue butterfly(s) as a result of NIPSCO's operation and maintenance of the Aetna, Miller and Stagecoach Rd. ROWs, as well as the electric facilities located on the Ogden Dunes INAWC easement. Furthermore, this HCP and incidental take permit is being sought to reduce INAWC's liability

under the ESA in the event an incidental take of KBB as a result of INAWC's operation and maintenance of the water facilities located on the Ogden Dunes ROW. NIPSCO and INAWC request that the incidental take permit be in effect for a period of ten (25) years, at which time they will reevaluate the plan. This will provide the opportunity to incorporate new ideas and methods and to address issues that have developed during the term of the previous plan.

1.0 Introduction

This Document provides the required application components for section 10(a)(1)(B), incidental take permit application, a Habitat Conservation Plan (HCP), and application Form 3-200. The duration requested for this section 10(a)(1)(B) permit is for twenty five (25) years from the date of issuance. This allows NIPSCO and INAWC to "take" the KBB within the geographical boundaries identified within this HCP over that period; it will also require NIPSCO and INAWC to follow the provisions of this HCP in order to comply with the permit requirements.

Since it is difficult to take into account the population of Karner Blue Butterflies and the potential take of the KBB, and since the KBB is tied directly to the wild lupine plant, this plan will focus on various habitat levels. KBB habitat on ROW covered by this HCP will fit into one of three categories. They are: known habitat, known occupied habitat, and potential habitat, and will be defined in section 2.2.1 of this plan. Wild lupine surveys will be done to develop a baseline, which will be used to determine HCP compliance.

1.1 Overview and Background

This section introduces the NIPSCO Karner Blue Butterfly Habitat Conservation Plan (HCP). General information is provided on endangered species laws, the Karner blue butterfly and their relationships. An introduction to the regulatory framework for the NIPSCO Karner Blue Butterfly HCP is provided. In addition, the purpose and need for the HCP and an incidental take permit are documented.

1.2 Regulatory and Legal Framework for Plan

1.2.1 The Endangered Species Act

The U.S. Congress enacted the Endangered Species Act (ESA) in 1973 to protect plant and animal species that are in danger of, or threatened with, extinction. The U.S. Fish and Wildlife Service (USFWS) is responsible for implementing the ESA for those species under its jurisdiction. Section 9 of the ESA, its primary species protection provision, generally

prohibits the taking of federally listed threatened or endangered fish and wildlife species.

"Take" relative to the KBB is the act of killing, harming, collecting, capturing, or harassing the species. This includes all life stages of the KBB. In some instances, modifying or disturbing the habitat of a listed species to the point that the ecological processes of the species are adversely affected can also constitute take, because it harms the species. These processes include feeding, breeding and sheltering.

Before issuing an incidental take permit, the USFWS must ensure that all requirements of section 10(a)(1)(B) of the ESA are met. After evaluating the requirements, the USFWS may:

- deny the permit,
- issue a permit based on implementation of the HCP as received, or
- issue a permit conditioned on implementation of the HCP and other measures specified by USFWS.

Under section 7(a)(2) of the ESA, issuance of an incidental take permit by the USFWS is a federal action subject to section 7 compliance. Therefore, a USFWS internal section 7 consultation must be conducted to insure that issuance of the permit will not jeopardize the continued existence of the Karner blue butterfly.

1.2.2 The ESA and Non-federal Lands.

The ESA establishes two processes that allow for the limited take of federally listed species on non-federal lands, provided measures are taken to conserve affected species. These processes are the formal section 7-consultation process [section 7(a)(2), ESA] and the incidental take permit process [section 10(a)(1)(B), ESA].

Section 7(a)(2) requires federal agencies to consult with the USFWS to insure that any action authorized, funded, or carried out by such an agency is not likely to jeopardize the continued existence of any

endangered or threatened species or result in the destruction or adverse modification of critical habitat. Federal actions that result in take are subject to a formal consultation process, the conclusion of which is the issuance by the USFWS of a Biological Opinion and an Incidental Take Statement. The Incidental Take Statement authorizes a defined amount of take and the Biological Opinion establishes reasonable and prudent measures to minimize harm to the species. The consultation process under section 7 can affect non-federal landowners if a project or activity on non-federal lands requires some form of federal approval, such as a permit, or involves the expenditure of federal funds.

Section 10(a)(1)(B) provides a mechanism to address situations in which non-federal projects or activities not requiring federal authorization or funding are in potential conflict with the protection of a listed species. Under section 10(a)(1)(B), an Incidental Take Permit (ITP) allows for the take of federally-listed species on non-federal lands where their presence interferes with land use activities that would otherwise be legal, as long as certain conditions are met. The ESA specifies those conditions as follows:

- The taking will be incidental
- the applicant will minimize and mitigate the impacts of such takings
- the applicant assures that adequate funding for the plan will be provided
- the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild
- any additional measure, assigned by the Secretary, will be met.

To obtain an ITP, the non-federal landowner must develop a habitat conservation plan (HCP). An HCP is a formal plan that specifies:

- the impact to the species which will likely result from the taking
- what steps the applicant will take to minimize and mitigate the impact and the funding that will be available to implement such steps
- what alternative actions to the taking were considered and the reasons why the alternative actions were not used
- other measures that the Secretary may require as necessary or appropriate for the purposes of the plan.²

1.2.3 Purpose and Need

The purpose of the proposed federal action is the issuance of a permit pursuant to the provisions of section 10(a)(1)(B) of the ESA, which would authorize the incidental take of Karner blue butterflies on selected NIPSCO and INAWC ROW for a period of 25 years.

The purpose of the proposed action on the part of NIPSCO and INAWC is preparation and implementation of an HCP which will contribute to the conservation of the Karner blue butterfly and its habitat, while allowing planned management and maintenance activities to continue.

Due to Karner blue butterfly presence, certain management practices that were legal prior to federal listing in 1992 are no longer permissible because of the possibility of incidental take. However, because of the intermittent distribution and disturbance-dependence of the Karner blue butterfly and its host plant, wild lupine, it is likely that such management activities, specifically those that result in disturbance (i.e. Vegetation Management) could improve the conditions to support Karner blue butterflies. Despite the short-term incidental take of some individual butterflies, this could potentially increase the chances of Karner blue butterfly population viability over the long-term.

The USFWS is required to respond to all applicants seeking permits, which would allow the incidental take of listed species. It is necessary for the USFWS to assure that the HCP and the implementing agreement submitted by the applicant comply with the provisions of the ESA with regard to incidental taking [50 CFR 17.22 (b)(2)] prior to issuance of a permit for the take of Karner blue butterflies. ²

1.3 Plan Area

The plan area consists approximately 86 acres made up of three distinct segments of NIPSCO rights-of-way (ROWs): Aetna ROW, Miller ROW, and Stagecoach Road ROW, and one easement in Ogden Dunes, owned by INAWC. (Appendix A, Figure 1) In 2004, JF New and Associates performed a habitat survey on these 86 acres. During that survey, the total amount of Wild Lupine found on these ROW was 4.244 Acres. This establishes the base line habitat level for this plan.

1.3.1 Aetna ROW

The Aetna ROW (see Appendix A, figure 2), located in Section 12, Township 36 North, Range 8 West, Lake County, Indiana at the NIPSCO Aetna location, lies in Gary, Indiana, approximately two miles from Lake Michigan. The total acreage at the Aetna location is just less than 15, however the area is divided into 2 separate locations, labeled 1a & 1b on figure 2, with 1a being inside the fenced complex and 1b south of 15th Avenue. (Figure 2) The area within the fenced complex (1a) includes a ROW 300 feet by 1000 feet. This 6.8-acre area extends from 15th Avenue, which is the south boundary of the fenced Aetna Complex, north to an electrical transmission substation within the complex. The west ROW border contains sparsely wooded areas, and the east ROW border is partly residential, partly wooded area. The majority of the ROW is a mix of dune, sand prairie, and marsh. The northern portion of the ROW consists of high dunes. These dunes, although nearly devoid of lupine, are home to numerous potential nectar plants, including columbine, Rudbeckia, goat's rue, spiderwort, phlox, coreopsis, sand cress, various asters, and prickly pear cactus. The west central portion of the ROW contains a low, marshy area, relatively degraded and thick with Phragmites, a non-native reed. The east central portion of the ROW is a relatively diverse sand prairie. Scattered patches of lupine are found in this area, mostly in the center of the ROW near the border with the marshy area.

Immediately south of the marshy area exists a small, relatively diverse area, including numerous lupine patches mixed with a diverse array of other wildflowers. This small area lies directly east of the NIPSCO Communications building. The southern portion of the six acres is heavily degraded and vegetation consists primarily of undesirable and invasive species including downy broom (*Bromus tectorum*), Canada thistle (*Cirsium arvense*), henbit (*Lamium amplexicaule*), honeysuckle (*Lonicera* spp.) Kentucky blue grass (*Poa pratensis*), and glossy buckthorn (*rhamnus frangula*).³ During the 2004 baseline survey conducted by JF New and associates, eight wild lupine populations were observed and mapped on the Aetna ROW A, totaling .476. Karner Blue butterfly nectar species such as dogbane and sand cress among others were also found.

Area 1b is located south of 15th Avenue, is a triangular shaped area consisting of approximately 8 acres. It has similar characteristics to the area to the north, however no wild lupine has been observed in this area. A portion of the area contains sparse woods containing mostly cottonwood trees. During the 2004 baseline survey conducted by JF New and Associates, 0 acres of wild lupine were mapped in section 1b. Although this site does not contain wild lupine site, characteristics are conducive to wild lupine growth.

A complete report for this ROW can be found in the JF New 2004 Baseline Monitoring Report (Appendix B).

The ROW consists of 4 rows of lattice towers with each tower supporting 2 138KV circuits. There are also 4 wood pole lines consisting of three 69KV and three 34 KV lines.

In Aetna area 1a, there are 2 12-inch steel natural gas pipelines on the eastern edge of the ROW. In area 1b there are 3 natural gas pipelines, an 8-inch, 22-inch and 30-inch. All of these lines are on the eastern side of the area.

In consultation with the U.S. FWS, this ROW was mowed in 1999 and herbicide was applied in 2000, with a follow up spot treatment in September 2002.

1.3.2 Miller ROW

Located in Section 1, Township 36 North, Range 8 West, Lake County, Indiana, just to the North of Aetna, but is

separated by the Dunes Highway and by 2 sets of railroad tracks. (Appendix A, Figure 2)

The Miller ROW is dune and swale topography and therefore has several wetlands, although navigation around them is not difficult. The total acreage at Miller location covered by this HCP is just less than 37 acres.

The Miller ROW location consists of a 0.75-mile section of right-of-way. In this ROW are 2 rows of lattice tower structures carrying 4 -138 KV circuits to the south of the substation and a single row of lattice tower structures carrying 2 138 KV circuits to the north of the substation.

This plan area also consists of a 12.85-acre wood/ wetland area. This area includes 3.85 acres of wetlands and 9 acres of uplands. This site will be known as the "Mitigation Area". This area currently supports .406 acres of Wild Lupine.

The ROW runs north and south and is transected several times by RR tracks at differing intervals dividing the area into 3 sections, labeled 2a, 2b & 2c on figure 2.

Area 2a has 4 unequal sides. The North side is 705 feet, the East is 1742 feet, the south is 730 feet, and the west is 1648 feet. The total area is 27 acres, however a gravel-covered substation 440 feet by 430 feet, or 4.35 acres, is not included in the plan area. This fenced substation area is located in the North East corner of this section. The area included in the plan is 22.65 acres, and consist of 9.8 acres of ROW and 12.85 acres of mitigation area. During the 2004 baseline survey conducted by JF New and Associates, .602 acres of wild lupine were mapped on the ROW portion of section 2a, and as stated above, .406 acres was located in the mitigation area, for a total of 1.08 acres of wild lupine in section 2a.

Section 2b is to the north between 2 sets of RR tracks and includes an undeveloped old access road used when necessary by the Dunes National Lakeshore to reach their property east and west of the ROW. The area consists of ROW 300 feet wide by 1200 feet long (8.25 Acres). During the 2004 baseline survey conducted by JF New and Associates, 0.443 acres of wild lupine were mapped in section 2b.

Section 2c is the furthest North section of this ROW before it turns west, and enters US Steel's Gary Works, at which point there is no KBB habitat associated with the ROW. This area is 350 feet wide by 800 feet long (6.42 Acres). During the 2004 baseline survey conducted by JF New and Associates, 1.278 acres of wild lupine were mapped in section 2c.

Bordering the ROW to the southwest is remnant black oak savanna known as the Gary Enterprise Zone. The Miller Woods section of the Indiana Dunes National Lakeshore borders the remainder of the ROW. The Miller Woods area as well as the GEZ is noted for its dune and swale characteristics, with the dune areas being black oak savanna habitat and the swales wetland. The dunes and swales are oriented somewhat east and west; therefore the ROW crosses this dune and swale topography several times. The plan site lies in Gary, Indiana, less than one mile from Lake Michigan. (Appendix A , Figure 2)

In the mid 1990's, Karner blue butterflies were confirmed to exist on the Miller ROW. In 1998, the USFWS marked the extent of lupine and documented the presence of nectar plants on the ROW. Sightings of Karner blue butterflies were also noted (E. McCloskey, pers. comm.). NIPSCO hired JF New and Associates to conduct a wild lupine and nectar plant survey using GPS along the ROW in 2004. JF New also conducted presence/absence surveys for the Karner blue during both first and second flights in 2004 using GPS. See appendix B for survey results.

1.3.3 Stagecoach Road ROW:

The Stagecoach Road ROW is located in Sections 2 & 3 Township 36 North, Range 7 West, and Sections 35 & 36 Township 37 North, Range 7 West, Porter County, Indiana, adjacent to the Coulter Nature Preserve and The Indiana Dunes National Lakeshore, just to the south of Ogden Dunes. (Appendix A , Figure 3) This ROW consists of 2 rows of lattice tower structures comprised of 4-138 KV electric lines between County Line Road and the third crossing of Stage Coach Road. At this point it is joined by an additional lattice tower structure that carries a single 345 KV circuit, and continues to the east until it crosses Burns Ditch. Included in this ROW is a 22" natural gas pipeline. This section of ROW is less than two miles from Lake Michigan, and exhibits oak savanna characteristics. Karner

blue butterflies were identified on this ROW in 1997. During surveys performed by the U.S. Fish and Wildlife in 1998, Karner blues were present and the extent of lupine was marked (E. McCloskey, pers. comm.). In 2001, surveys were performed along the westernmost portion of the ROW, adjacent to the Coulter Preserve managed by the Shirley Heinze Environmental Fund (SHEF) (Figure 3). Lupine was recorded in the same two general areas along this segment of the ROW as noted during the 1998 surveys, and both male and female Karners were found in the vicinity of those two lupine areas.

The portion of this ROW that is covered by the plan is divided into 3 sections. The west section, 3a is 14.7 acres and starts at the first crossing of Stagecoach Road east of County Line Road and heads Northeast for 4,000 feet. During the 2004 baseline survey conducted by JF New and Associates, 0.274 acres of wild lupine were mapped in section 3a. This section ends where the ROW crosses Stagecoach Road for the third time. At this point Stagecoach Road will be bordered on the east by a farm field. The middle 4.4 acre section, 3b, is 1,200 feet long and bordered to the east and west by the fourth and fifth crossings of Stagecoach Road, which winds around a sand dune area. During the 2004 baseline survey conducted by JF New and associates, 0.123 acres of wild lupine were mapped in section 3b. The eastern 12.8-acre section, 3c, starts about 3000 feet past the middle section and continues 3500 feet until it reaches Burns Ditch. During the 2004 baseline survey conducted by JF New and Associates, 0.086 acres of wild lupine were mapped in section 3c. The total distance of Stagecoach Road ROW covered in this plan is 8700 feet and the width is 160 feet, totaling almost 32 acres (0.483 acres of wild lupine). More information can be found in the JF New 2004 Baseline Monitoring Report (Appendix B).

1.3.4 Ogden Dunes Easement

Located in Section 35 Township 37 North, Range 7 West, Porter County Indiana. The 2-acre easement begins at a point west of Hillcrest Drive, which is the entrance road to Ogden Dunes. (Appendix A, Figure 3) This easement contains a 69 KV circuit on wood poles and runs due west along the south line of Ogden Dunes, with National Lakeshore property on its south side. At the west edge of Ogden Dunes, it turns north and goes to the water treatment

plant, which is located in the southwest corner of the town. INAWC owns this ROW, which includes a 36-inch water main. The electric line is maintained by NIPSCO. During the 2004 baseline survey conducted by JF New and Associates, 0.556 acres of Wild Lupine was recorded.

Location	2004 Acreage
Aetna A	0.476
Aetna B	0
Miller A	0.602
Miller B	0.443
Miller C	1.278
Miller Mitigation	0.406
Stagecoach A	0.274
Stagecoach B	0.123
Stagecoach C	0.086
Ogden Dunes	0.556
Total	4.244

1.4 Species to be Covered by Permit

1.4.1 The Karner Blue Butterfly

The Karner blue butterfly (*Lycaeides melissa samuelis*) (Appendix A, Figure 4) was proposed for federal listing on January 21, 1992 (U.S. Fish and Wildlife Service [USFWS] 1992b), and on December 14, 1992 it was listed as federally endangered range wide (USFWA 1992b). Historically, the Karner blue occurred in 12 states and at several sites in the province of Ontario. It is currently extant in seven states (including Ohio where it was reintroduced in 1998) with the greatest number of occurrences in the western part of its range (Michigan and Wisconsin). It is considered extirpated from five states and the Canadian province of Ontario. The historic habitat of the butterfly was the savanna/barrens ecosystem. Much of these ecosystems have been replaced by other unsuitable habitat, especially in the eastern part, and along the margins of the butterfly's range. The loss of suitable habitat resulted in a decline in Karner blue locations and numbers with some large populations lost, especially in the eastern and central portions of its range. Presently, the Karner blue occupies remnant savanna/barrens habitat and other sites that have historically supported these habitats,

such as silvicultural tracts, rights of way, airports, military bases and utility corridors.

The ecology of the Karner blue butterfly is closely tied to its habitat, which provides food sources and key sub habitats for the butterfly. The larvae feed only on one plant, wild lupine (*Lupinus perennis*). Adults require nectar sources to survive and lay sufficient eggs. These habitat components are provided by a variety of sites, including savanna/ barrens remnants, silvicultural tracts, rights-of-way, etc. Because these habitat components can be lost to succession, Karner blue butterfly persistence is dependent on disturbance and/or management to renew existing habitat or to create new habitats. The distribution and dynamics of these habitats in the establishment of viable metapopulations of this species forms the ecological basis for this Habitat Conservation Plan.¹

1.4.2 Habitat / Ecosystem

The physical features that affect Karner blue butterfly habitat vary across its geographic distribution. The western part of the range is subject to greater continentality effects, which include greater annual variation in temperature, lower precipitation, and greater year-to-year variation in precipitation. Average annual precipitation is higher in the eastern part of the range than in the western part of the range. Annual variation in precipitation is generally less than 10 percent of normal in the East, but more variable in the West at 15 percent of normal. In the East, the annual range in temperature is less than 28 degrees Celsius, but in the west the annual range is greater than 28 degrees Celsius. Thus in the west, Karner blue habitat will be subjected more frequently to drought and temperature extremes, such as cool springs or hot summers, than in the East.

Throughout its range, the Karner blue butterfly was historically associated with native barrens and savanna ecosystems, but it is now associated with remnant barrens and savannas, highway and power line rights-of-way, gaps within forest stands, young forest stands, forest roads and trails, airports, and military bases that occur on the landscapes previously occupied by native barrens and savannas. Almost all of these contemporary habitats can be described as having a broken or scattered tree canopy that varies within the habitats from 0 to between 50 and 80 percent canopy cover, with grasses and forbs common in the

openings. The habitats have wild lupine, the sole larval food source, nectar plants for adult feeding, critical microhabitat, and attendant ants. The stature and spacing of trees in native savannas is somewhat variable, reflecting differences in soils, topography and climate, and the distribution of trees in contemporary habitat is similarly diverse. Soils are typically well drained sandy soils which influences both plant growth and disturbance frequency. These conditions are generally wet enough to grow trees but dry enough to sustain periodic fires. Topography is diverse and includes flat glacial lakebeds, dune and swale lakeshores and steep dissected hills.

Dune and swale habitats are one of the most biologically diverse in the Great Lakes Basin, originally extending along the shore of Lake Michigan from southern Wisconsin through the Chicago and Gary metropolitan areas and north into southwestern Michigan. The dunes are in close proximity to the swales creating an extreme diversity of regularly alternating sub-habitats from xeric, sandy upland habitats to wetlands, and back to uplands and again to wetlands over a distance of less than 50 meters. Karner blue populations can be found in the upland, which are oak barrens habitats, but adults will forage on nectar-producing plants in the adjacent wetlands.

Karner blues also occur in many other habitats managed for various purposes. These include power line and highway rights-of-way, airport safe ways, young managed forest stands, open areas within managed forest stands, along forest trails and roads on military bases, and many other such areas. These areas all have soils that are suitable for lupine growth, an open canopy, and management that causes soil disturbance or suppression of perennial shrub and herbaceous vegetation (such as mowing, brush hogging, logging, chemical control or prescribed fire). These habitats are very diverse vegetationally, and support herbaceous species that co-occur with lupine in the native remnant barrens and savanna habitats.¹

2.0 ENVIRONMENTAL SETTINGS / BIOLOGICAL RESOURCES

2.1 Environmental Setting

The following is general information of the climate, geological history and current geography and ecology of the Dune and Swale

oak savanna areas south of Lake Michigan. The information is intended as an overview of how the area was formed and why it has the unique characteristic that it has, which leads to the presence of wild lupine and the Karner blue butterfly.

Each location that will be covered by this HCP may vary slightly and specific site characteristics are described more in depth in part 1.3.

2.1.1 Climate

The weather in the Great Lakes Basin is affected by three factors: air masses from other regions, the location of the basin within a large continental landmass, and the moderating influence of the lakes themselves. These factors result in a wide range of climatic conditions throughout the year, ranging from dank, humid days in the summer to Arctic cold blasts resulting in lake effect snow on the lee side of the lakes. Average temperatures are 20 degrees Fahrenheit in January to 73 degrees Fahrenheit in July. Snowfall averages per year is 39.2 inches and average rainfall is 34.66 inches per year.⁴

2.1.2 Geography/Ecology

The extraordinary diversity of the flora and fauna in the Lake Michigan coastal area is a result of several natural processes that have contributed to the formation of the shoreline. As the glacial ice retreated about 12,000 years ago, fluctuating lake levels in combination with wind and wave actions contributed to the formation of the physiography of the coastal area and influenced the distribution of the plant and animal species. Habitat formation resulted from the development of the Calumet Lacustrine Plain, the Valparaiso Moraine Area, and the stabilization of these areas by vegetation. The species diversity and complexity of the initial stabilizing plant communities changed with time, subsequently resulting in a series of habitat types ranging from bare sand to forest, and from open water to marsh.

As the glacier retreated north, erosion continued to cut new channels and deepen existing channels, causing the elevation of the glacier formed lake to rise and fall - and rise and fall again. Three times the elevation of the lake stabilized at a particular level, marking these stages clearly in the Indiana Dunes in the form of beach ridges and

wetland complexes. The sand hills, lined up in rows parallel to the lakeshore, represent old shoreline dune complexes.

The water level fluctuated many times before stabilizing approximately 2,000 years ago at approximately 575 to 585 feet above sea level; however, these stages are less distinct.⁵

The dune ridges and swales areas were formed about 4000 years ago. There are several schools of thought concerning the manner in which the beach ridge and swale topography was created. One maintains that the ridges are former offshore shoals or sand bars, which were left exposed after establishment of each successively lower major shoreline. This implies that a rapid major lowering of lake level was involved. Another view suggests that each ridge represents a gradual lowering of lake level and northward shoreline recession. This thesis is predicated on the thickness of organic deposits in the swales. Thicker organic deposits are found further inland. Another thought is that these features are compound structures representing alternating periods of erosion and deposition.⁵

Deposition is the result of sediment dis-equilibrium caused by the transportation of an overabundance of sediments by along-shore currents. The deposits are highly mobile and impermanent and easily susceptible to erosion by near-shore processes. During constructional periods the beach ridges are added in regular manner and exhibit a uniform spacing. Erosional stages, however, do not remove the ridges in a regular manner but reflect directions of maximum wave energy.⁶

The soils in the Dune and Swale areas are of the Oakville-Tawas Association. The ridge soils are Oakville fine sand, which consists of deep excessively drained, coarse textured sand, on moderate to strong slopes (12 to 25%). The Tawas muck soils of the swales consists of deep, very poorly drained, organic matter over mineral soil.⁷ These swales have a high water tables, but may dry up during the summer season.⁶ Ground water table are directly related to lake levels, and can be noticeably higher when there is a strong north wind causing lake levels in the south to rise.

Other soils in the plan area are Adrian and Houghton, which are located in the wet areas.⁷

Plant succession is influenced by surface geology, soil type, nutrient availability, drainage, exposure, slope, and other factors. The general trend of plant succession in the coastal area, if undisturbed by man, is from (1) bare sand to forest, (2) old field to forest, and (3) open pond to swamp.

Beach grass is the first vegetation to become established in shifting sand, beginning the gradual process of dune stabilization. Bearberry, a procumbent evergreen shrub, begins to occur just north of the beach grass. Species such as sumac, sand cherry, cottonwood, and prostrate juniper are present as elevation increases.

The dunes are characterized by a series of hills comprised of foredunes, interdunes, and backdunes. The interdunes are protected by the foredunes and as a result, moisture availability increases. The moisture allows the occurrence of basswood, oaks, tulip poplar, white pine, and ash. On drier ridges and slopes of the interdunes, black oak is the dominant species. The backdunes, the third row of sand hills from the lakeshore, are forested with black oak, white oak, and sassafras. Blueberry, greenbrier, false Solomon's seal, and bracken fern occur in the understory. As moisture increases, Canada mayflower, Indiana cucumber, cinnamon fern, and royal fern begin to occur.⁵

2.1.3 Existing Land Use

The current land uses of the areas covered by this HCP are electric, natural gas, and water utility right-of-way and easement. The ROWs are typically 50-150 feet wide and may carry 1-4 different high voltage transmission circuits ranging from 34KV to 375KV, and natural gas or water pipelines ranging from 8"-36" in diameter. Greater description of the individual ROW was covered in 1.3 Plan area site description section of this HCP. All of the ROW covered by this HCP are owned and operated by the Northern Indiana Public Service Company with the exception of the Ogden Dunes ROW, which is owned by the Indiana-American Water Company.

2.2 Species of Concern

2.2.1 Karner Blue Butterfly

Karner Blue Butterflies (Appendix A, Figure 4) are small with a wingspan of about 2.5 cm. (one inch). The forewing length

of adult Karner blues is 1.2 to 1.4 cm for males and 1.4 to 1.6 cm for females (Opler and Krizek 1984 USFWL). The upper (dorsal) side of the male wing is a violet blue with a black margin and white-fringed edge. The female upper side ranges from a dull violet to bright purplish blue near the body and central portions of the wings, and the remainder of the wing is a light or dark gray-brown, with marginal orange crescents typically restricted to the hind wing. Both sexes are a grayish fawn color on the ventral side. Near the margins of the underside of both wings are orange crescents and metallic spots. The black terminal line along the margin of the hind wing is usually continuous (Klots 1929, Nabokov 1944). Male genitalia is the most reliable character for distinguishing adult *L.m.samuelis* from other subspecies (and species)(Nobokov 1944,1949).

The eggs of the Karner blue are tiny and radially symmetric, about 0.7 mm in diameter, somewhat flattened, and pale greenish-white in color (Dirig 1994). The surface is deeply reticulated with a fine geometric pattern (Scudder 1889). Larvae are a pea-green color, pubescent and dorsally flattened, with a brown-black to black head capsule. The head is often not visible as it is tucked under the body. Older larvae have pale green (to white) lateral stripes, and a dark green longitudinal stripe dorsally. In pre-pupal larvae the lateral stripes become less distinct and the color becomes a duller green. Larvae have four instars (Savignano 1990), and three glandular structures that are known to mediate interactions with ants in other species of Lycaenidae. Some of these glandular structures mediate interactions with ants in Karner blue, but it is not known what is secreted by any of the structures, and it is not known if any of the structures are active throughout larval life. Pupae are bright green and smooth, changing to a light tan with hints of purple shortly before emergence when the pharate adult cuticle separates from the cuticle of the pupal case.¹

Karner Blue Life Cycle

The Karner blue butterfly is a bivoltine (Appendix A, Figure 5), which means that it completes two generations (Appendix A, Figure 6) per year. In typical years, first brood larvae hatch from overwintered eggs in mid to late April and begin feeding on wild lupine (*Lupinus perennis*) (Appendix A, Figure 7), the only known larval food source. Larvae pass through four instars, between which the relatively soft larval exoskeleton is shed. Feeding by first and second instar

larvae results in tiny, circular holes in the lupine leaves while older larvae eat all but the upper and lower epidermis, creating a characteristic window-pane appearance. Larvae feed for about three to four weeks and pupate in late May to early June. Ants commonly tend larvae. Larvae tended by ants have a higher survival rate than those not tended, presumably because the ants provide some protection from larval natural enemies. Larvae possess specialized glands that secrete a liquid that is avidly harvested by ants, probably containing carbohydrates and amino acids. Tending levels for late instar larvae are close to 100 percent. In most cases, however, very few early instars are tended. Mature larvae enter a wandering phase after which the pre-pupal larvae attach themselves to various substrates with a silk thread. Karner blues are known to pupate in the leaf litter, on stems and twigs, or occasionally on lupine leaves. Pupation generally lasts seven to eleven days. Adults begin emerging in late May through mid-June. Peak flight for males usually precedes peak flight for females by a couple of days. Adults are believed to live an average of four to five days, but can live as long as two to three weeks. First flight adult females lay their eggs primarily on lupine plants, often singly on leaves, petioles, or stems, or occasionally on other plants or leaf litter close to lupine plants.

Second brood eggs hatch in five to ten days, and larvae can be found feeding on wild lupine leaves and flowers from early June through late July. Typically, a larva can survive on one large lupine stem, however, it moves from leaf to leaf on the lupine stem, often returning to leaves fed on during earlier instars, and it may even move to other lupine stems. Larvae are found often on the lower parts of the stems and petioles. Ants also typically tend second brood larvae, but during midday on hot days tending may be reduced. Ants also frequently tend pupae.

Second brood adults begin to appear in early to mid-July and fly until mid-August. Flight phenology may be delayed because of cool wet summers and result in an adult flight period lasting through late August. The peak flight period usually lasts one to two weeks. Generally, there are about three to four times as many adults in the second brood compared with the first brood, but exceptionally poor years can occur where the second brood is not larger than the first brood. First brood is usually smaller probably because of high overwintering mortality of eggs, the inability of larvae to

find lupine in the spring, or greater oviposition success of first flight females.

Karner Blue adults are diurnal and initiate flight between 8:00-9:00 a.m. and continue until about 7:00 P.M. a longer flight period than most butterflies. Adult activity decreases in very hot weather, at temperatures lower than 75 degrees Fahrenheit, during heavy to moderate rains, or during extremely windy conditions.¹

Dispersal

Nearly all researchers that have examined Karner blue dispersal concluded that dispersal rates and distances for the butterfly are relatively low and short with nearly all movement less than 200 meters (220 yards). In one study a maximum dispersal distance of 3 kilometers and 92.5% of Karner blues moving less than 1.5 kilometers in an open habitat area of Necedah NWR, were measured. Although these findings expand the spatial scale of dispersal by almost an order of magnitude, the inferred rates and distances are still relatively low and short.¹

Rangewide Distribution of Karner Blues

Historically, the Karner blue butterfly occurred in a geographic band between 41° and 46° N latitude extending from Minnesota to Maine (Dirig 1994). The butterfly is commonly found on sandy soil types that have populations of *Lupinus perennis* (the only known larval food source), and often inhabits communities similar to oak and pine savanna/barrens communities. In this conservation plan, the term "lupine" will refer to *Lupinus perennis* to the exclusion of all other species of *Lupinus*. Dirig (1994) reviewed numerous locality records of Karner blue, and his work is an exhaustive summary of the reports of Karner blue occurrence. The historic northern limit of the butterfly corresponds roughly with the northern limit of lupine (Dirig 1994), but many of the most northern populations of Karner blue have been extirpated. Lupine has been reported from as far north as northern Vermont, and Elk Rapids, MI, but there are no records of Karner blue from these sites. The only populations of Karner blue now near the northern limit of lupine occur within the Superior Outwash Recovery Unit in Wisconsin.

The historic western limit of the butterfly roughly corresponds with the western limit of lupine (Dirig 1994), and butterfly

distribution appears to have contracted away from this limit as well. Although lupine occurs as far west as central Minnesota, the western-most record of Karner blue is at Anoka, MN, approximately 50 miles to the east. The Anoka population was extirpated sometime after 1984. The Iowa populations on the southwest fringe are also extirpated. Currently, the western-most populations of Karner blue occur in the Superior Outwash Recovery Unit and a small population occurs at the Whitewater Wildlife Management Area in southeast Minnesota in the Paleozoic Plateau Recovery Unit.

The historic eastern limit of the butterfly roughly corresponds with the eastern limit of lupine. No historic or current records of Karner blue exist in Connecticut, Rhode Island, eastern Massachusetts, or eastern Long Island, but these native habitats were converted to incompatible human uses long ago, so the previous presence of the butterfly cannot be verified. Nonetheless, based on the biology of the butterfly and information on the native habitats, the butterfly probably inhabited these areas in the past. The eastern-most historic records of Karner blue exist from southwest Maine and throughout the Merrimack River valley system in New Hampshire and Massachusetts, but currently, this eastern-most population has contracted to a very small population near Concord, NH.

Unlike the other geographic limits, the historic southern limit of the butterfly does not correspond to the southern distribution of lupine. The distribution of lupine extends farther south than Karner blue in eastern U.S. along the eastern Appalachian Mountains and the Atlantic Coastal Plain, and in central U.S. in Illinois (Dirig 1994). Some of the historic records of Karner blue along this southern limit are uncertain. The southern-most record near Covington, IN, is probably erroneous. The recovery team could not find a specimen associated with this record, and lupine has not been recorded from near this locality. The lack of correspondence of the southern limits of Karner blue and lupine has not been adequately addressed. Dirig (1994) suggested that the southern limit of Karner blue may follow the band of 80-100 days continuous winter snow cover, which he hypothesized was necessary for high overwintering egg survival. Many other hypotheses could explain the southern distribution limit of Karner blue.

Despite this uncertainty, similar to the other geographic limits, the distribution of Karner blue has contracted away from its historic southern limit. Populations have been extirpated from southern New York, Pennsylvania, Ohio, Illinois, and Iowa.

In Indiana, the distribution has contracted. Once present throughout northern Indiana, it now occurs only in a few localities in northwestern Indiana, associated with the dune fields and dune and swale complexes near the southern end of Lake Michigan.

As of fall, 1996, populations of Karner blue existed in Indiana, Michigan, Minnesota, New Hampshire, New York and Wisconsin. Almost all known extant populations occur on sandy soils associated with glacial outwash plains and terraces, glacial moraines, the shores and bottoms of glacial lakes, the glacial shores of existing lakes, and dissected sandstone outwashes (Andow et al. 1994 and references therein). Wisconsin and Michigan have the largest number of local populations with the greatest numbers of individuals, and New York also has one large population (Baker 1994). Many local populations of the butterfly appear extirpated, and the states of Iowa, Illinois, Ohio (reintroduced in 1998) Pennsylvania, Massachusetts, Maine, and the Canadian province of Ontario no longer support populations of the butterfly (Baker 1994).²

Indiana

Historically, the Karner blue was reported from eight counties in Indiana. In 1990, Karner blue butterflies were identified at 10 sites out of 35 potential sites surveyed. Two population clusters were identified within two counties (Lake and Porter), the majority of which was associated with medium to high quality Karner blue habitat. The early surveys in Porter County (including Indiana Dunes National Lakeshore) identified between 1,000 and 10,000 second brood Karner blue adults. In Lake County, at the IDNL, several thousand second brood adults were estimated, and in other Lake County sites, the subpopulations likely number between 100-500. Several subpopulations occur in West Gary associated with a remnant dune and swale complex.

Currently it is estimated that 17 subpopulations of Karner blues occur at IDNL. In West Gary, about 21 tracts clustered into 11 individual preserves and management areas have

been identified as potentially able to at least periodically support the Karner blue. Karner blues have been documented on four of these tracts, which comprise the only extant subpopulations of Karner blues in West Gary.¹

Importance of Conservation Measures to Karner Blue Butterflies in Northwest Indiana

Insects are a vital part of prairies and other plant communities, and although *there have been no reported extinctions of prairie insects*, a number of insect species have declined seriously (Pyle, *et al.* 1981). Invertebrates, however, are often not considered in conservation efforts. Most prairie reserves or parks are managed with maintenance of plants or particular vertebrate species as the focus. Other lands with prairie or similar habitats are managed for a variety of economic purposes unrelated to conservation. Success or failure of property management plans, where they exist, is generally based on the maintenance of the overall prairie habitat (Opler 1981) or other economic outcomes.

The Karner blue butterfly is representative of many species that are threatened with extinction, as anthropogenic modification of whole landscapes causes the loss of habitat (Andow, *et al.* 1994). Today, the disappearance and fragmentation of the pine and oak savanna habitats, through a variety of causes, has been a major contributor to the range-wide decline of the Karner blue butterfly (USFWS 1992a, 1992b; and works cited therein). In addition, natural plant succession in these habitats has eliminated Karner blue butterflies from some areas.

There is reason to believe that small, isolated insect populations that persist on small sites may do so precariously (Panzer 1988). In general, small populations are subject to debilitating effects of demographic instability, genetic deterioration and natural catastrophes (Wilcove 1987). Several attributes, including fluctuating population densities, relatively poor dispersal abilities and patchy distributions make remnant-restricted insects particularly susceptible to extinction from these phenomena (Panzer 1988). Butterflies that specialize on plants found primarily in early successional habitats track an ephemeral food supply that is dependant on unpredictable ecosystem disturbances. For such species, suitable habitat can be a shifting and increasingly smaller fraction of a greater landscape mosaic

that results in local species extinction events that are both frequent and inevitable (Cushman and Murphy 1993). Karner blue butterflies appear to have all of these characteristics. As such, the availability -- or absence -- of suitable habitat mosaics will play a key role in the long-term survival of the species.¹

Karner Blue Butterfly on NIPSCO and INAWC Properties

This section briefly describes the distribution and abundance of known and potential Karner blue butterfly habitat on NIPSCO and INAWC properties.

- **Known habitat**

Defined as those surveyed areas where wild lupine has been found and which can support Karner blue butterflies. This area is delineated by the JF New 2004 baseline survey and will be updated every other year.

- **Known-occupied habitat**

Defined as, those areas that currently support Karner blue butterflies in association with wild lupine. These areas are delineated by the JF New 2004 Baseline Monitoring Report and will be updated every other year.

- **Potential habitat**

Defined as, areas where wild lupine is likely to grow or has been known to have grown in the past. Given the knowledge of certain ecological criteria such as the distribution of wild lupine, general soils information and climatic parameters relating to the Karner blue butterfly, potential habitat distribution and abundance is somewhat predictable. All areas covered by this HCP will be considered potential habitat unless otherwise specified.

2.2.2 Wild Lupine

Lupinus perennis (Appendix A, Figure 7) is a member of the pea family (Fabaceae) and has the common names wild lupine and blue lupine. Lupine is the only known food plant of larval Karner blues and is an essential component of its habitat. Two varieties have been identified: *Lupinus perennis* var. *occidentalis* S. Wats and *L. perennis* Ivar. *Perennis* L. The varieties are morphologically similar except for the former has spreading pilose hairs and the latter thinly pubescent hairs. The Karner blue may use both varieties, but the details of the interaction are not known. The inflorescence is a raceme of numerous small flowers which

are two lipped, with the upper lip two-toothed and the lower lip unlobed. Flower color ranges from blue to violets and occasionally white or pink. Peak bloom typically occurs from mid-May to late June within the geographic range of the Karner blue, but varies depending upon weather, degree of shading, and geographic location in its range. Stem density and flowering is greatest in open-to partial-canopied areas, although areas receiving high solar radiation can have low lupine densities and may be less than ideal habitat. Plants in dense shade rarely flower.

Lupine distribution extends from Minnesota east to New England, then southward along the eastern Appalachian Mountains to southern Virginia and along the eastern coastal plain to Georgia wrapping around the Gulf coastal plain to Louisiana. Surveys of lupine throughout its northern range all report populations to be declining and many sites have been extirpated. The primary cause of this decline appears to be loss of habitat from conversion to housing, retail, light industrial, and agricultural development, and degradation of habitat because of the deep shade that develops when disturbance is interrupted.

Lupine reproduces vegetatively and by seed. Seedpods have stiff hairs with an average of 4-9 seeds per pod. When seedpods are dry, they suddenly twist and pop open (dehisce), throwing seeds several feet. This is the only known dispersal mechanism, giving lupine a colonization distance of about 20-79 inches per year. Seeds are known to remain viable for at least three years, do not have physiological dormancy, and will readily germinate if moisture and temperature conditions permit. The hard seed coat produces an effective dormancy and germination is usually enhanced by scarification, stratification and/or soaking in water.

Lupine also reproduces vegetatively by sending up new stems from rhizomatous buds. Usually plants a few years old will form a clump of several stems and in areas with dense lupine it is difficult to distinguish individual lupine plants. Established lupine plants do not grow every year. It is not known how long established plants can remain dormant.

Lupine is an early successional species adapted to survive on dry, relatively infertile soils. Even the seedlings have long

taproots that presumably allow the plant to reach soil moisture. It can grow on soils low in nitrogen because of its association with nitrogen fixing bacterium *Rhizobium lupina*, and does not do well when grown without *R. lupina*. Similar to other legumes, it probably does best when growing on nitrogen-poor soils that have sufficient phosphorus. Lupine does not reproduce in dense shade. All available evidence suggests that lupine thrives on nitrogen-poor soils in partial- to open-canopied areas, and phosphorus-poor soils.

Several species of pines, oaks, and shrubby vegetation are adapted to the same soils and habitat as lupine, and without disturbance, they will close the canopy, shading and suppressing lupine. The rate of closure will vary from locality to locality, based on edaphic and prevailing climatic conditions and current and historic management practices. If the habitat supports high grass and sedge productivity, litter could build up and suppress lupine. Consequently, disturbances that reduces tree and shrub canopy cover are necessary for lupine to persist, and under some conditions, occasional disturbances that remove the litter layer are needed for lupine regenerations. Several disturbances have been suggested to be beneficial for renewing lupine habitat, including prescribed fire, tree removal, and variety of methods to kill trees and shrubs.¹

2.2.3 Nectar Food Resources

Adult Karner blue butterflies feed at flowers, sipping nectar and presumably obtaining nourishment; adult feeding increases longevity and fecundity in many Lepidopteran species, especially butterflies. Although increased longevity and fecundity have not been specifically demonstrated for the Karner blue butterfly, it is generally agreed that nectar is an essential adult resource. Adult Karner blue butterflies spend considerable time nectaring on a wide variety of plant species. Adults have been observed during the first brood to feed on flowers of 39 species of herbaceous plants, and 9 species of woody plants, and during the second brood on flowers of 70 species of herbaceous plants and 2 woody plants.¹ Appendix A, Figure 8 shows nectar species found in the HCP area.

3.0 Description of activities covered by permit

Actions by NIPSCO or INAWC that may result in an incidental take of Karner blue butterfly(s) include any otherwise lawful activity by any

NIPSCO or INAWC employee, contractor or agent required to safely and effectively operate and maintain the electrical transmission lines along the Aetna, Miller, and Stagecoach Rd. ROWs, and the Ogden Dunes easement on the INAWC ROW and water mains and pipelines within the Ogden Dunes ROW. To NIPSCO's and INAWC's knowledge, no incidental take has occurred at these locations to date.

3.1 NIPSCO Maintenance Activities covered by permit

Disturbances caused by maintenance activities that will take place on these ROW will be temporary in nature. These activities are listed below.

3.1.1 Transmission Line Maintenance

Transmission lines do not require extensive annual maintenance. Activities that may take place during the existence of a transmission line may include, but are not limited to the following: tower maintenance, insulator cleaning, repair or replacement, static line maintenance, tower painting, Emergency Work (described below), replacing conductors (described below), and Vegetation Management (described below). Each type of maintenance is distinct but will require vehicle access to the ROW and along the path of the conductors. Photos of the potential vehicle can be found in Appendix E

3.1.2 Replacing Electrical Conductors.

When an electrical conductor reaches a certain age, shows signs of wear, or does not meet the load requirement it may need to be replaced. The replacement of conductors requires vehicle access along the length of the ROW. The replacement may take several weeks to several months, however work in any one location may be limited to a few weeks at a time. Vehicles used in the replacement of an electrical conductor are similar to those in Appendix E.

3.1.3 Gas Line Maintenance.

Gas lines similar to electric transmission lines do not require extensive annual maintenance, however when maintenance is required, soil disturbance is necessary. Gas line maintenance may include but is not limited to valve replacement, and pipeline replacement in total or section. In the event that maintenance is required on a gas line, excavation will be required. The area will be excavated exposing the pipe. Soil removed from the trench will be placed on the ROW adjacent to the work area. Upon completion of the required work the pipe will be buried, using

the soil removed from the trench. Vehicle used in the gas line maintenance are similar to those in Appendix E.

3.1.4 Gas line construction or replacement.

When a gas line reaches a certain age, fails to function as designed, or does not meet the load requirements, the entire line may be replaced, or an additional line added to the ROW. In such a situation excavation and earth disturbance will be required. Construction or replacement of a gas pipeline will require a disturbed area of ROW 50-70 feet wide, the entire length of the project. A typical cross section of this type of construction would involve an access road, trench and spoil pile. Project lengths vary depending upon the scope of the project. Vehicles used in the gas line construction or replacements are similar to those in Appendix E.

3.1.5 Emergency work

At any given time an emergency may arise in which repairs and maintenance must be done immediately. **An emergency is defined as an immediate danger to life, health or the environment.** Examples of emergencies are, but are not limited to, the following, towers or lines failure due to ice storms or tornados, trees falling into conductors, damage caused by a vehicle, or gas line or facility rupture. This work will usually result in vehicle access to the ROW day or night, without prior consultation with the Nisource Environmental Health and Safety Department and hence the US Fish and Wildlife Service. Vehicles used in Emergency work are similar to those in Appendix E.

3.1.6 Vegetation Management

All of the ROWs covered in this plan are subject to a cyclical vegetation management schedule to control tall growing tree species. Integrated Vegetation Management (IVM) techniques are currently being used on these ROWs. This IVM plan includes mowing or hand cutting to reduce the height and density of woody stems. This will be accomplished by using a Brown Cutter with the minimum cut height of 8-inches or higher, or manually with chainsaws. Mowing will take place after first frost, and preferable when the ground is frozen to reduce rutting. This will be followed by herbicide application the next fall, using a low-volume radiarc application. In subsequent years, spot herbicide treatment with backpack or ATV sprayer will be used to

selectively target woody species that regenerate. All herbicides used on NIPSCO ROW will be pre-approved by NIPSCO Forestry Operations. A current list of pre-approved herbicides can be found in appendix E. This list will be updated from time to time if new or other herbicides are determined to be beneficial in achieving the goals of IVM on the ROW. Side trimming of adjacent trees from a bucket truck will also be done to protect the conductors from contact with ground vegetation. Vegetation management will follow the protocol established in Appendix F of the Wisconsin HCP (Conservation Protocols and Guidelines for the Karner Blue Butterfly) for mechanical management. Photos of typical vegetation management equipment used can be seen in Appendix E of this HCP.

Fires in the areas adjacent to the ROW are frequent and sometimes spread to the plan area. NIPSCO may use fire as a vegetation management tool and will follow the protocol established in the Wisconsin HCP. See Appendix F for an excerpt of Appendix F from the Wisconsin HCP.

3.2 INAWC Activities covered by permit

Disturbances caused by construction and/or maintenance activities that may take place within the Ogden Dunes easement will be temporary in nature, and include:

3.2.1 Water Main Maintenance

Water mains typically do not require extensive annual maintenance, however when maintenance is required soil disturbance is necessary. Water main maintenance typically includes minor leak repair and/or the replacement of corroded appurtenances related to water mains, bolts, fittings, etc. Maintenance requires the excavation of the affected area to expose the water main for repairs. Soil removed from the excavation will be placed within the easement adjacent to the work area. Upon completion of the repairs, the water main will be reburied using these excavated soil materials. Equipment used in water main maintenance typically includes backhoes, track excavators, front-end loaders, bulldozers, air compressors, dump trucks and crew trucks.

3.2.2 Water Main Construction

When a water main reaches the end of its useful life or additional supplemental water supply capacity is needed, the main may be replaced or an additional water main may be

constructed within the easement. The related construction activities will typically require use of the entire width of the easement for the entire length of the project. This is necessary for the on-site stringing of new pipe materials, trench excavation, and temporary placement of trench spoils before backfilling. Equipment used for water main construction and/or replacement would include that listed above for water main maintenance (3.2.1).

3.2.3 Emergency Work

Emergency work includes repairs and/or maintenance activities that must be done immediately because of loss of water service, danger to public safety or health, or damage to the environment. Typically, emergencies involve major ruptures of water mains and the dispersion of water main contents under high pressure. Emergency work will usually require equipment access to the easement at any time of day or night without prior consultation with the US Fish and Wildlife Service. Equipment used in emergency work is the same as that listed for water main construction and maintenance.

3.3 Implementation of the Karner Blue Butterfly Habitat Conservation Plan.

Any activities that will take place on the plan ROW's specifically intended to improve the KBB habitat have the potential to cause temporary impacts to the habitat.

4.0 Potential Biological impacts/Take Assessment

4.1 Direct and Indirect Impacts

Direct impacts to the KBB's or its habitat that will most likely result from activities covered by this plan (section 3) are described below.

- Personnel, vehicles or other equipment crushing wild lupine or nectar plants or root systems, resulting in the death of the plants
- Personnel, vehicles or equipment killing a resting KBB
- Excavating an area where wild lupine or nectar species are present, resulting in the death or destruction of the plants
- Piling spoils from excavation on KBB, wild lupine, or nectar species resulting in the death or destruction of the butterflies and/or the plants.
- Personnel, vehicles, or equipment disturbing plants or soil containing KBB eggs, resulting in destroyed eggs.

- Woody debris resulting from mowing may cover wild lupine or nectar species locations and inhibit growth until debris biodegrades.

4.1.1 Anticipated Take: Wildlife Species

The Karner blue butterfly, *Lycaeides melissa samuelis* Nabokov (Lepidoptera: Lycaenidae).

4.1.2 Anticipated Impacts: Plant Species

Wild lupine, *Lupinus perennis* L. (Fabaceae)
KBB Nectar species

5.0 CONSERVATION STRATEGY/MEASURES TO MINIMIZE AND MITIGATE FOR IMPACTS

5.1 Karner Blue Butterfly Habitat Improvement Plan

This KBB habitat improvement plan will be implemented as part of the desired alternative described below. The key to the HCP is directly related to the success of the plan described below.

Since it is difficult to take a census of KBB populations and the potential take of the KBB, and since the KBB is tied to its habitat, this plan will focus on suitable habitat level along with occupied habitat rather than population numbers. Therefore a baseline habitat survey was conducted. In the summer of 2004, biologists from JF New and Associates surveyed and plotted the wild lupine populations on the 86 acres of NIPSCO and INAWC ROW covered in this plan using GPS technology. Notes were also made regarding the nectar species present. **The baseline for this Habitat Conservation Plan is 4.244 acres. This will be referred to throughout the plan as the “2004 HCP Baseline”, “baseline habitat” or simply the “baseline”.**

A copy of the 2004 baseline survey report can be found in Appendix B.

This baseline will establish the levels of wild lupine located in the plan area. At no time will the acreage fall below the established baseline level as a result of activities by or authorized by NIPSCO or INAWC.

In order to ensure that wild lupine populations stay at or above the baseline level, the KBB habitat improvement plan as detailed in this section, will be implemented.

The success of this HCP will be measured by the availability of potential KBB habitat in the plan area at any give time throughout the year. A key component of the NIPSCO KBB HCP is the improvement of the KBB habitat. NIPSCO will enhance the current habitat and promote the distribution of wild lupine and nectar species throughout the plan area. NIPSCO will modify it's vegetation management techniques to specifically target the enhancement of Karner blue habitat. Tall growing species that shade lupine out to the point they cannot survive will be eliminated or altered to reduce shading. Non-native exotic species will be treated with herbicide to increase the potential for wild lupine and nectar plants to spread and become established in new areas. Vegetation management techniques will generally not be implemented from April through August. Prescribed burning may also be used as a management tool to help restoration and enhancement efforts. All burning will follow the requirements in the Wisconsin KBB HCP. See appendix F for an excerpt from the Wisconsin Conservation Protocols and Guidelines for the Karner Blue Butterfly.

To further increase the Karner habitat and minimize the potential to drop below the baseline level, active habitat restoration efforts will take place throughout the HCP areas. These efforts will take place in all areas that will support KBB habitat where it currently does not exist, including the 9 upland acres of the 12.85-acre mitigation area adjacent to the Miller substation and ROW. NIPSCO will plant Wild Lupine seed using a non-till native seed drill at a rate of 14 lbs/acre or 224,000 seeds per acre. In addition to the wild lupine seed, small amounts of forbs will be added which will provide nectar sources for the Karner blue butterflies. NIPSCO's current budget will support 15 acres of seeding every other year. This will take place over the next 6 years and will create nearly 60 additional acres of KBB habitat in the HCP area.

The mitigation area will be the priority for restoration. Once this is successful, the planting will take place adjacent to known habitat so that the KBB can spread into these areas. This will also connect occupied habitats with unoccupied habitats, which will allow the KBB to spread into these areas.

The mitigation area adjacent to the Miller ROW and substation does not contain any facilities. The area, which is composed of dense honeysuckle brush, wetlands, and a dense stand of black oak, will be thinned in an effort to release dormant wild lupine that once was present in this area. The mitigation area will be set-aside as a habitat management site and will not be subject to any disturbances or impacts, other than managing for KBB suitability,

and therefore should increase the available KBB habitat. Since the current baseline habitat level is 4.244 acres, the 9 acres of upland at the mitigation site will be large enough to support that level as well as additional habitat. This site will be managed as KBB habitat for the life of this HCP.

To aid in the distribution of the Karner blue, efforts may be implemented to transplant adult Karner blue to unoccupied locations covered by this HCP, in a manner approved by the US Fish and Wildlife.

All activities taking place on ROW covered by this plan will be coordinated through the NiSource Environmental Health and Safety Department. No routine maintenance will be scheduled to take place from April through August, unless it can be demonstrated that the temporary impacts will not reduce the amount of KBB habitat or occupied habitat below the 2004 HCP Baseline level. Any emergency work that must take place during this time will be done in a manner to minimize impacts to the KBBs, wild lupine and nectar species. Upon completion of any maintenance activities, the ROW will be restored to its natural grade and over seeded with wild lupine at a rate of 14 lbs/acre or 224,000 seeds per acre. In addition to the wild lupine seed, small amounts of forbs will be added which will provide nectar sources for the Karner Blue butterflies. Temporary impacts should never cause the population of wild lupine to fall below the 2004 HCP Baseline level.

NIPSCO will conduct annual awareness training for its employees to ensure that any NIPSCO employee who will be working in the areas described in this plan are aware of the restriction of this plan. Furthermore they will be instructed to contact the NiSource Environmental Health & Safety Department during the planning stage of proposed work in the plan areas. Signs will be posted on ROW covered by this HCP that alert personnel that this is a sensitive site that requires coordination with the NiSource Environmental Health and Safety Department, or the INAWC Environmental Management and Compliance department, prior to any activity. Examples of the signs can be seen in Appendix A, figure 9.

Every two years the wild lupine populations will be surveyed using GPS technology, nectar species will be noted. The results will be charted to determine the success of the plan. A layer will be added to the NIPSCO internal GIS system and engineering drawings. This will allow project coordinators to take the habitat information into account during the planning phase of any proposed project.

5.2 Monitoring and Reports

Since numbers of active Karner blue butterflies can vary due to its life cycle, it is unlikely that an accurate count of Karner blues can be obtained. Instead, surveys will focus on amount and quality of suitable habitat for the Karner blue butterfly along with KBB presence/absence surveys. Plant surveys will primarily concentrate on wild lupine, which is the only known host plant for the larval stage of the Karner, and therefore the Karner could not exist without it. Secondary information will be gathered for nectar plants. Baseline data for the wild lupine has been gathered by means of a GPS unit and recorded as a layer on a GIS system. Data will be collected every two years to track the changes in wild lupine distribution. This will help determine if the management techniques are meeting the plan objectives or if they need to be altered. All surveys will be done using methods approved by the USFWS.

An annual report will be prepared that will describe the techniques used to enhance the habitat and will present the results of this years or previous years management. Included in the report will be maps indicating known habitat, known-occupied habitat (presence/absence data), and potential habitat. These maps will also include previous years information so that the distribution and populations can be tracked. Copies of this annual report will be sent to the local office of the US Fish and Wildlife and the local office of the Nature Conservancy.

5.3 Measures to Mitigate Unavoidable Impacts

The 12.85 acre area as described in section 5.1 Karner Blue Butterfly Habitat Improvement Plan, will be used as mitigation. Once the wild lupine population at this site covers an area of 4.244 acres or larger, there will be no risk of falling below the baseline. This site will be set aside specifically for the management of KBB habitat. No activities will take place on this site other than habitat management. In addition to this mitigation site, habitat improvement will be implemented as described in section 5.1 on all areas covered by this HCP. These improvements along with the mitigation site will ensure that activities performed by NIPSCO or INAWC will not impact the current level (4.244 acres) of KBB habitat located on the ROW covered by this plan.

6.0 FUNDING

6.1 Funding for minimization and mitigation measures

All work done as part of NIPSCO's vegetation management program will be funded through the NIPSCO Forestry Operations. Any activity above and beyond the scope of vegetation management will be funded through a specific Karner Blue Butterfly Plan line item in the NIPSCO annual budget. Budgeted funds will be sufficient to cover work including but not limited to; all work on areas off of ROW, data collection, seeding, planting or transplanting wild lupine and/or nectar species, and preparing annual reports.

Any activity above and beyond the scope of vegetation management on INAWC ROW will be funded by INAWC, unless initiated by NIPSCO.

7.0 ALTERNATIVES

This plan is being implemented on electric, gas and water ROW that has been constructed prior to the listing of the Karner blue butterfly. Routine maintenance, improvement, and emergency work, however must take place at times on these ROWs. The project alternative listed below will focus on routine electric, natural gas, and water line construction, maintenance, emergency work procedures, and ROW vegetation management.

7.1 No action Alternative

The alternative of no action was considered. This alternative is not possible since the infrastructure to be maintained is already present. These facilities absolutely must be maintained in order for safe and reliable distribution and transmission of gas and electric energy. Consequently if vegetation management were not performed, woody species would shade the ROW and wild lupine populations would decline, and therefore would result in a loss of KBB.

7.2 Alternative 1: No Change from historic maintenance plan

Perform electric, gas, and water line construction, maintenance, and emergency work, and vegetation management at any time during the year, disregarding the life cycle or habitat of the Karner blue butterfly.

This alternative would result in habitat destruction, with no provision for habitat improvements; this would result in a reduction of habitat below the 2004 Baseline level. This alternative has too many

circumstances, which would result in a take, or habitat destruction; therefore, it is unacceptable.

7.3 Alternative 2: Proposed Action Alternative (Preferred Alternative)

This alternative focuses on the protection and improvement of potential and existing Karner Blue Butterfly habitat on 84 acres of NIPSCO owned ROW, and 2 acres of INAWC ROW, as described in section 5.0. The baseline level of KBB habitat established in 2004 is 4.244 acres. To minimize impacts to the KBB and its habitat, no maintenance shall be planned to take place on ROW included in this plan, from April through August, unless it can be demonstrated that the resulting habitat destruction would not reduce the total KBB habitat below the 2004 Baseline level of 4.244 acres. Habitat areas will be staked and efforts will be made to limit the impacts those areas that absolutely cannot be avoided.

Emergency work may take place anywhere and at any time during the year, however all attempts must be made to avoid impact to KBB and their habitat.

HCP compliance training will be offered on an annual basis. All NIPSCO employees who may participate in any level of a project proposed to take place in the plan area will be trained.

Since this plan focuses on habitat improvement, an increase in habitat would allow for temporary destruction of portions of the habitat without threatening the 2004 habitat baseline level. For example, the most destructive work that would take place on the ROW would be replacing all of the underground pipelines at the same time. This would result in the loss of about 1.5 acres of KBB habitat that was recorded as part of the 2004-baseline. Included in the plan area is a 12.85-acre mitigation site that will be managed for KBB habitat only. It is estimated that 9 acres of this 12.85-acre area can be successfully restored to lupine habitat. There are also an additional 42 remaining acres that contain power lines but no underground pipelines and which would be managed for KBB habitat. It is also estimated that between 30 and 35 acres of lupine habitat is restorable in these 42 acres. Therefore, there would be a huge buffer to ensure that under even the worst possible circumstances, (required replacement of all underground pipelines simultaneously); a sufficient amount of wild lupine will exist in the plan area to ensure that the 2004 baseline level is not reached.

The only potential for the 2004 habitat to be compromised would be habitat destruction resulting from emergency work prior to habitat improvement and the spread of the KBB.

With the exception of emergency work resulting in habitat destruction prior to habitat improvements, this alternative avoids any foreseeable situation where a take below the 2004 baseline level may be possible; therefore it is the desired alternative.

8.0 PLAN IMPLEMENTATION, UNFORSEEN CIRCUMSTANCES

8.1 Plan implementation

Upon acceptance of this plan, the maintenance restrictions for ROW listed within this plan will be implemented immediately. HCP training will be incorporated into normal training schedules. The habitat improvement plans will be completed as described in section 5.

8.2 Unforeseen Circumstances

“Unforeseen circumstances” are changes in circumstances affecting the KBB or its habitat covered by the HCP that could not reasonably have been anticipated by the plan developers at the time of the HCP’s development and that result in a substantial and adverse change in the status of the KBB. “Unforeseen circumstances” would include natural disasters of a scale or magnitude not anticipated under normal circumstances, such as wildfire of unanticipated size, an earthquake or other catastrophic event not normally expected to occur. Pursuant to the rule, the USFWS will determine whether an “unforeseen circumstance” has occurred, and if such occurs, the Service will work cooperatively with NIPSCO and INAWC on conservation measures (if needed) to address the impacts. However, any conservation measures identified will be limited to the HCP’s operation program and will not include more lands, financial compensation, or additional restrictions on land use or other natural resources otherwise available for development or use without the consent of NIPSCO, NiSource Environmental Health and Safety Department, and INAWC

The Parties acknowledge that liability for violations of the ESA incorporate ordinary requirements of proximate causation and foreseeability, including with regard to acts of third parties.

8.3 Implementing Agreement

An Implementing Agreement between NIPSCO, the US Fish and Wildlife Service, and INAWC has been developed and is attached as appendix D to the Plan.

9.0 LITERATURE CITED

¹ US Fish and Wildlife Service, 2001 Karner Blue Butterfly (*Lycaeides Melissa samuelis*) Technical/Agency Draft Recovery Plan, Fort Snelling, Minnesota

² Wisconsin Department of Natural Resources, 1999, Wisconsin Statewide Karner Blue Butterfly Habitat Conservation Plan and Environmental Impact Statement, Madison Wisconsin

³ JF New and Associates, 2004 Baseline Monitoring Report, NiSource, Wild Lupine and Karner Blue Butterfly Survey, Lake and Porter Counties, Indiana

⁴ US Environmental Protection Agency, 1995, The Great Lakes, An environmental atlas and Resource Book, Chicago, Illinois

⁵ [www .state.in.us/nrc_dnr/lakemichigan/natural/natural1.html](http://www.state.in.us/nrc_dnr/lakemichigan/natural/natural1.html)

⁶ Bacone, John A., 1979, Shell Oil Dune and Swale, A Report On A Natural Area. Division of Nature Preserves, IDNR, Indianapolis, Indiana

⁷ USDA 1981 Soil Survey of Porter County, Indiana, Soil Conservation Service, Purdue University