



IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE
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April 7, 2005

Memorandum

To: Assistant Regional Director, Ecological Services, Twin Cities, MN

From: Field Supervisor, East Lansing Field Office, Michigan 

Subject: Biological Opinion for Issuance of Section 10(a)(1)(B) Incidental Take Permit to Michigan Electric Transmission Company, LLC, for the take of Karner Blue Butterfly (*Lycaeides melissa samuelis*) in Muskegon and Newaygo Counties, Michigan, Log 05-R3-ELFO-05

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion for the proposed issuance of an Endangered Species Act section 10(a)(1)(B) permit for the incidental take of Karner blue butterfly (*Lycaeides melissa samuelis*) in Muskegon and Newaygo Counties, Michigan. This biological opinion (BO) documents the likely effects of the proposed action on Karner blue butterfly (KBB) in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

The BO is based on information provided in the Incidental Take Permit application (ITP), and **the accompanying Habitat Conservation Plan (HCP)**, telephone conversations, and other sources of information. A complete administrative record for this consultation is on file at the Service's East Lansing Field Office (ELFO), East Lansing, Michigan.

CONSULTATION HISTORY

January 30, 2004 – ENSR International (ENSR), on behalf of its client, Michigan Electric Transmission Company, LLC (METC), provided a letter to ELFO requesting information regarding **endangered** species, critical habitat, or sensitive resources along a 4-mile electrical power **transmission line right-of-way (ROW)** in southwestern Michigan (Muskegon and Newaygo Counties) for a reconductoring project.

February 4, 2004 – **Meeting at ELFO** with ENSR, METC, Michigan Department of Natural Resources (MDNR), and Michigan Natural Features Inventory (MNFI) to discuss proposed **construction activities and Karner blue butterfly management**; upcoming METC projects in **Michigan and threatened and endangered species issues**, including the ITP and HCP process; and access to the Michigan threatened and endangered species database.

February 5, 2004 – ELFO personnel faxed an excerpt from an existing HCP for the KBB to Mr. Gordon Ferguson (ENSR) for use as guidance in preparation for an ITP application and habitat conservation planning. ENSR had prior knowledge of KBB occurrences in the ROW via surveys conducted by the MNFI.

March 26, 2004 – Telephone conversation occurred between Mr. Matt Groves (ENSR) and ELFO personnel to discuss ENSR's plan to apply for an ITP and prepare a HCP for KBB.

April 13, 2004 – ELFO supplied a response to ENSR confirming KBB occurrences in the ROW.

September 12, 2004 – Mr. Ferguson, on behalf of METC, submitted a draft HCP to the Service.

September 30, 2004 – METC submitted the ITP application to the Service.

January 10, 2005 – The Service supplied comments on the draft HCP to Mr. Ferguson.

February 15, 2005 – Revised draft of HCP submitted to the Service.

February 22, 2005 – Notice of Availability (NOA) of the final HCP and permit application published in Federal Register (70 FR 34: 8602 – 8603).

March 24, 2005 – Public comment period opened with NOA ended.

DESCRIPTION OF THE PROPOSED ACTION

The proposed action is the issuance of a section 10(a)(1)(B) ITP for incidental take of the KBB. METC is proposing to replace 40 existing metal electric power transmission line towers with new wooden utility poles as part of the Cobb to Brickyard Reconducting Project (Project). These activities will occur along a 4.07-mile by 66-foot wide segment of utility ROW in Newaygo and Muskegon Counties, Michigan. New 138 kV power lines will be placed upon the new utility poles.

The utility corridor begins in the southwest corner of Newaygo County (T11N, R14W, Section 31), and continues in a southwesterly direction, terminating north of the Muskegon County Sewage Reclamation Area, in east-central Muskegon County (T10N, R15W, Sections 1, 2, and 11) (Figure 1). The towers are currently spaced approximately 300 to 400 feet apart and new poles will maintain this same spacing. METC expects to disturb an area approximately 200 feet long by 66 feet wide surrounding each tower. The sum of disturbed areas on a project-wide basis equals 12.12 acres. Based on recent survey data, the estimated area of wild lupine (*Lupinus perennis*)¹ patches or KBB habitat within the ROW is 14.23 acres, approximately 5.75 acres of KBB habitat will be disturbed.

¹ In this Biological Opinion, the term "lupine" will refer to *Lupinus perennis* to the exclusion of all other con-generic species.

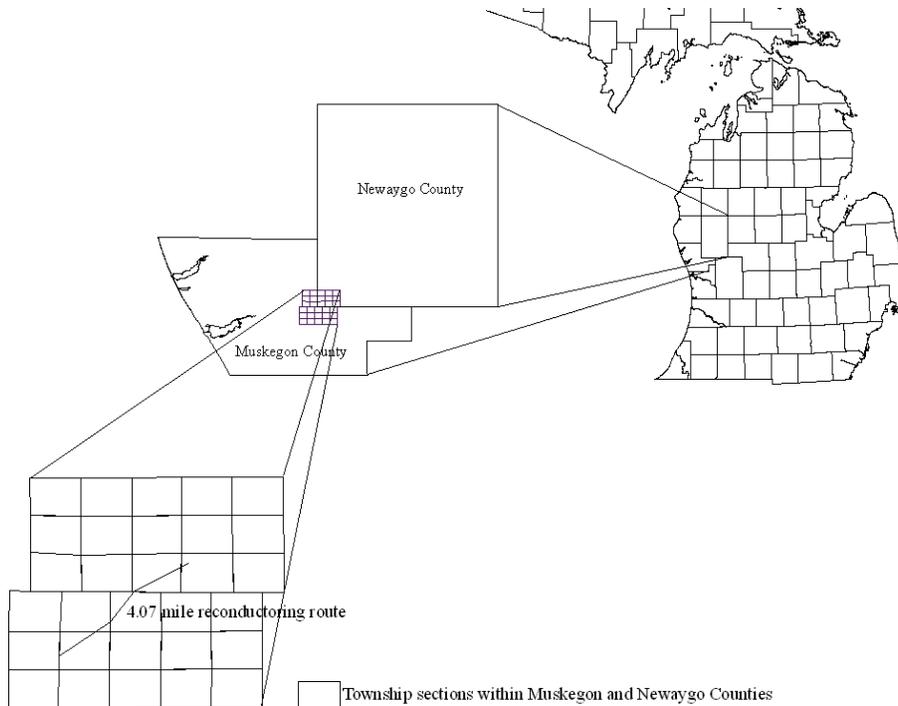


Figure 1. Location of the METC Cobb to Brickyard Reconductoring Project in Michigan.

Proposed activities include the dismantling and removal of the existing steel towers, on-site temporary storage of electric cable spools and equipment, installation of new wooden utility poles, and replacement of electric power lines with new heavier gauge cable upon the new insulators. Construction activities will disturb the ground from 0 to 6-inches below ground surface, except for boring holes for new power line poles, which will be bored to a depth of 10-feet below the ground surface. Except for the new poles, after construction, no new permanent structures or equipment will remain in the ROW and after construction, the amount of open ground will remain essentially unchanged.

ROW operation and maintenance (O & M) activities, such as mowing and tree cutting, are not subject to the provisions of this HCP, and are therefore not included. O & M activities will not be conducted within the construction area until they are included under the proposed State of Michigan Statewide HCP and ITP for KBB.

The HCP identifies conservation measures that METC intends to implement for the purposes of minimizing and mitigating incidental take that may occur as a result of the project.

Summary of proposed conservation measures:

1. Flags will be placed next to each tower to be removed in the direction of an area with either no lupine or an area that has the least amount of lupine. The placement of the flag will indicate which direction to drop the existing towers in order to minimize or avoid damage to lupine.

2. As an alternative to item 1, construction crews will further minimize disturbance to lupine patches at selected tower sites by installing new wooden utility poles adjacent to the metal towers prior to removal of the existing metal power line towers, transferring the power lines from the metal towers to the new wooden poles. A crane will then attach a cable to the top of the tower. Plasma cutting torches will be used to cut the three tower legs. The crane will then be used to support and vertically lift the towers setting them briefly on the ground and then lifting the towers onto the ROW road for disassembly.
3. Rubber tracked vehicles (rubber tracks over rollers) will be used during construction to minimize ground disturbance and damage to lupine.
4. If the area surrounding an existing tower is dense with lupine, the tower will be dismantled in place rather than dropped and dismantled on the lupine.
5. Additional lupine cover will be created equal to 25% of the area disturbed by reconductoring activities.
6. Impacted areas along the ROW will be monitored by an environmental inspector during the project and following its completion.
7. A monitoring plan, appended to the HCP, will be implemented to analyze the effects of reconductoring activities on lupine and KBB densities, the success of the return of lupine, grasses and nectar plants to disturbed areas and created habitat, and the presence/absence of populations after the completion of construction activities.

The applicant is responsible for ensuring implementation and compliance with the conservation measures in the ITP and the HCP. Specifically, METC will implement the conservation measures identified in the HCP through best management practices, monitor METC compliance with conservation measures, and implement prompt corrective action to remedy any non-compliance observed. METC will ensure implementation and compliance with the terms of the ITP. ENSR will provide assistance and support to METC in implementing the HCP, particularly monitoring and ITP required reporting activities. METC will be verbally alerted if such terms are violated. If prompt remediation does not occur, METC will notify the U. S. Fish and Wildlife Service (Service). Failure to abide by these processes may result in non-compliance with the ITP and METC could be subject to section 9 enforcement and incur section 11 penalties.

“Action area” is defined as all areas that will be affected directly or indirectly by the federal action (502 CFR 402.2). The area affected by the proposed ITP (i.e., action area) is the length and width of the METC powerline ROW (Figure 2). The northern limit of the ROW is located within the Muskegon State Game Area (MGSA) in Newaygo County. The MSGA also encompasses portions of Muskegon County, but does not include the METC ROW segment in Muskegon County. The northern portion of the ROW is surrounded by woods/savanna, lupine and nectar species. Mid and southern segments of the ROW, which occur north of the Muskegon County Sewage Reclamation Area (MCSRA) in east-central Muskegon County, are also surrounded by woods/savanna, nectar plants, grasses, and lupine in dense patches. The KBB is known to occur in four recovery units (RUs) in Michigan: Allegan, Ionia, Muskegon, and

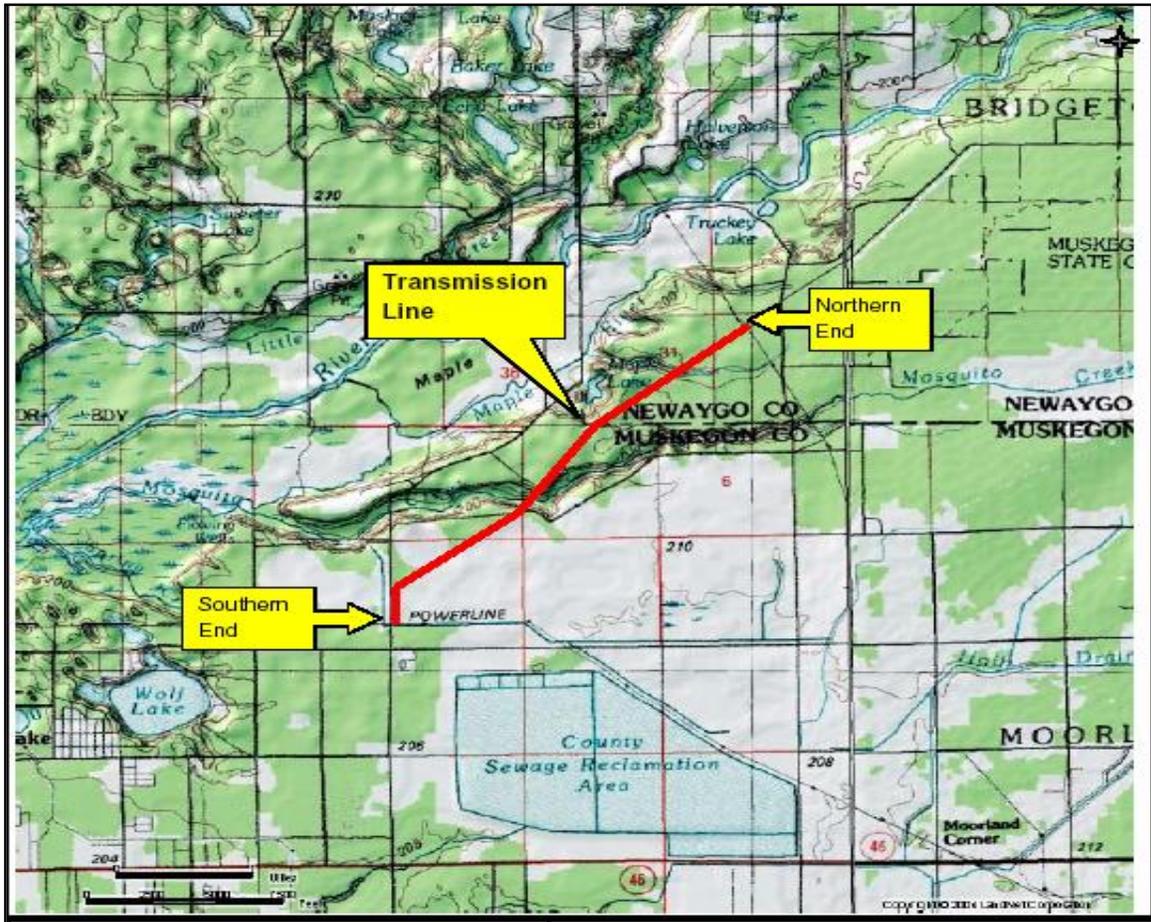


Figure 2 METC Cobb to Brickyard reconductoring rights-of-way segment in Muskegon and Newaygo Counties, Michigan. Adapted from ENSR.

Newaygo (Figure 3). RUs indicate the potential geographic extent of KBB based on current information about the location of suitable habitat. This ROW is included within the Muskegon RU.

STATUS OF THE KARNER BLUE BUTTERFLY & ITS CRITICAL HABITAT

Unless noted otherwise, all information is cited from U.S. Fish and Wildlife Service (2003) and references within. This section is a discussion of the Karner blue butterfly population and its habitat requirements. It includes information on the species' life history, its habitat and distribution, and past human and natural factors that have led to the current status of this species.

Species description and habitat requirements

The KBB is a small grayish-fawn to violet colored butterfly, with a wingspan of about 2.5 cm (1 in). The forewing length of the adult male is 1.2 to 1.4 cm (0.47 to 0.55 in) and 1.4 to 1.6 cm (0.55 to 0.62 in) for adult females. The dorsal side of the male wing is a violet-silvery blue with a black margin and a white-fringed edge. The upper side of female wings range from dull violet to bright purplish-blue near the body and central portion of the wings, while the remainder of the wing ranges from light to dark gray-brown, with marginal orange crescents typically restricted to

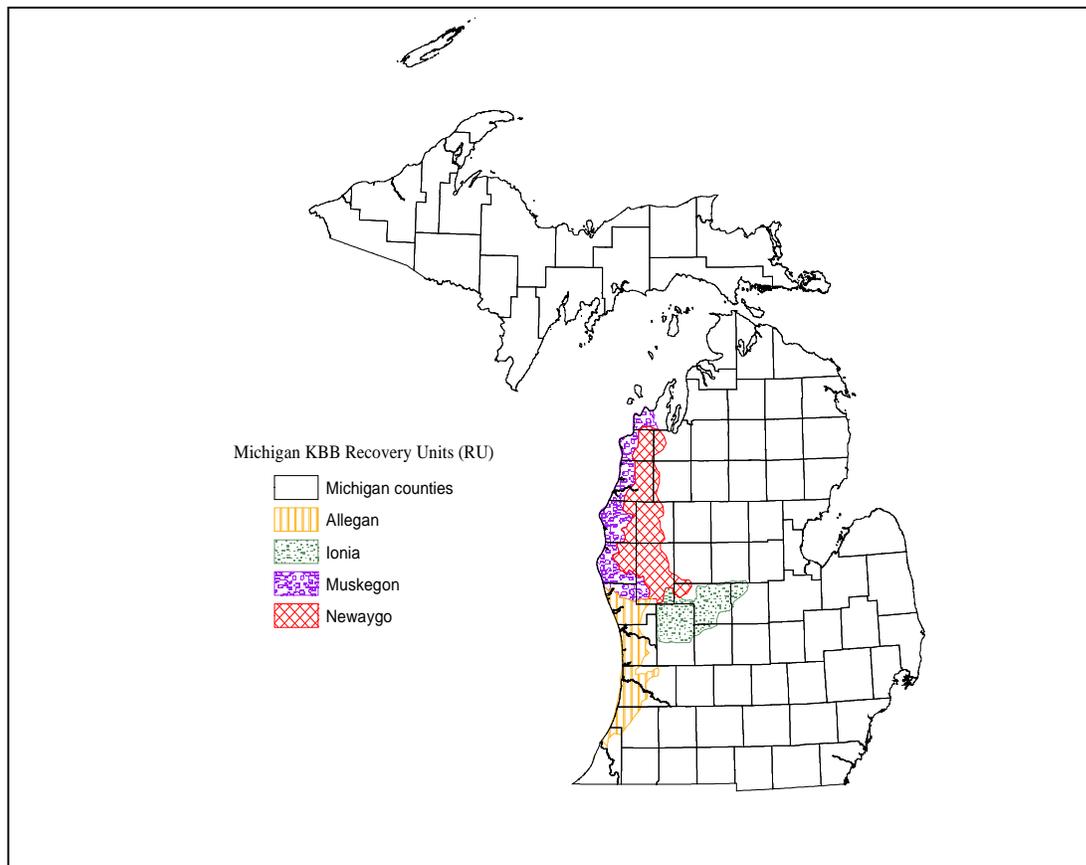


Figure 3. Karner blue butterfly recovery units in Michigan, adapted from USFWS 2003.

the outer edges of the hind wing. Both sexes have several rows of black spots on the inner portions on the ventral surface of the wings. Near the margins of the underside of both wings is a line of orange crescents and metallic spots. Further description and taxonomic information is provided in the U. S. Fish and Wildlife Service (2003).

The KBB was federally listed as endangered on December 14, 1992 (57 FR 59236). No critical habitat has been designated for this species. Factors causing the need for federal protection include range-wide habitat loss, accompanied by increased fragmentation of remaining suitable habitat and habitat alteration primarily resulting from vegetational succession. A recovery plan was approved on September 19, 2003 (68 FR 182: 54913 – 54914) with the recovery strategy focusing on perpetuating viable metapopulations of the KBB in the major ecological regions throughout its geographic range.

Throughout its range, the KBB was historically associated with landscapes composed of sandy soils, which supported oak or oak-pine savanna barrens and savanna ecosystems. It is now associated with remnant barrens and savannas, highway and powerline ROW, gaps within forest stands, young forest stands, forest roads and trails, airports, and military camps that occur on the landscapes previously occupied by native barrens and savannas. Almost all of these contemporary habitats are described as having a broken or scattered tree canopy that varies within habitats from zero to between 50 and 80 percent canopy cover, with grasses and forbs

common in the openings. These habitats have lupine and other nectar plants for adult KBB feeding, critical microhabitats, 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 lake beds, dune and swale lake shores, and steep, dissected hills.

KBB larvae feed exclusively on lupine. Lupine is an early successional species adapted to survive on dry, relatively infertile soils. Plants in dense shade rarely flower. All available evidence suggests that lupine thrives on nitrogen-poor soils in partial- to open-canopied areas, and is suppressed by shade; it may not be competitive with other plants on nitrogen-rich soils, 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. Consequently, disturbances that reduce tree and shrub canopy cover are necessary for lupine to persist. Several disturbances are beneficial for renewing lupine habitat, including prescribed fire, tree removal, and a variety of other methods to kill trees and shrubs.

Adults need adequate nectar resources and will utilize a wide variety of native and introduced flowering plants. In Michigan, KBBs frequently nectar on lupine and dewberry (*Rubus* spp.) during the spring brood, and horse mint (*Monarda punctata*), butterfly weed (*Asclepias tuberosa*), spotted knapweed (*Centaurea maculosa*), and blazing star (*Liatris aspera*) during the summer brood. In addition to nectaring, males and females sip at moist earth (mud-puddling) and human perspiration, and males sip at animal droppings. Adults may be obtaining sodium or other substances from this behavior. In addition to lupine, the KBB requires tall grass for late afternoon basking and overnight roosting, some shading vegetation to prevent overheating, and a source of water.

Adults and larvae use a variety of subhabitats created by variation in tree canopy and shrub cover, topography, and soil moisture. Mating, roosting, and adult feeding take place primarily in open-canopied areas. Oviposition occurs in many types of subhabitats, but larval growth and survival may be best in partial- to closed-canopy areas. It is important for butterflies to be able to move easily between subhabitat types, as optimal subhabitat types differ for adults and larvae. Small-scale variation in topography and soil moisture could be beneficial to KBB. A highly variable microtopography creates a highly variable thermal environment, plant community, and canopy structure. Variation in soil moisture will also contribute to variation in plant community and canopy structure. Variation in plant community and canopy could be beneficial to KBB in the long-term because in hot, dry years, the species can be found using shady, moist subhabitats, while in cool years, they are more strongly associated with sunny and partially sunny subhabitats.

Life history

The KBB is bivoltine, completing two generations per year. First brood larvae typically hatch from overwintered eggs in mid- to late April and begin feeding on lupine. Lupine is the only known larval food source. The larvae pass through four instars, feeding for approximately three to four weeks before pupation in late May to early June. KBB are known to pupate in leaf litter,

on stems and twigs, and occasionally on lupine leaves. Pupation generally lasts seven to eleven days, with adults 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, 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 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 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 typically tend both first and second brood larvae. During midday on hot days tending may be reduced.

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 as compared with the first brood, but exceptionally poor years can occur where the second brood is not larger than the first brood. The 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.

KBB 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° F (24° C), during heavy to moderate rains, or during extremely windy conditions.

Population dynamics

Literature on the historic distribution of the KBB suggests that this species occurred as shifting clusters of populations distributed across a vast fire-swept landscape covering thousands of acres. While the fires resulted in localized extirpations, vegetative succession following these fires maintained suitable habitat and allowed rapid population expansion or repopulation.

The KBB is an example of a species for which suitable habitat occurs in relatively small areas (or patches) distributed over larger areas. Like other species whose habitat occurs in patches rather than large continuous tracts of land, populations of KBB exist as dynamic collections of subpopulations that are interconnected by dispersal. Collectively these interconnected subpopulations make up a metapopulation. Metapopulations continually shift in distribution across the landscape as habitat patches change from suitable to unsuitable habitat. This change in habitat suitability is due to varying stages of disturbance and succession. No one theoretical metapopulation structure is advocated for KBB; rather, the recovery plan focuses on those factors that would restore healthy metapopulations including sufficient suitable habitat, connectivity of subpopulations, and management. Persistence of metapopulations is governed by the balance between extirpation of subpopulations and recolonization of unoccupied suitable habitat sites.

To preserve species with patchy distributions, it is necessary to maintain: (1) existing patches of suitable habitat, (2) the processes that create new habitat patches, and (3) the corridors that allow a species to migrate between habitat patches. Open linear areas such as road and railroad ROW, utility corridors, and forest roads and trails can serve as dispersal corridors for the KBB, allowing them to recolonize or colonize lupine patches. Research has shown dispersal of the KBB to range from about 600 ft (183 m) to about 2 mi (3.2 m).

Range-wide status and distribution of the species

Historically, the KBB occurred in a narrow geographic area that extended from eastern Minnesota, across portions of Iowa, Wisconsin, Illinois, Indiana, Massachusetts, Michigan, Ohio, Pennsylvania, New York, New Hampshire, Maine, and the province of Ontario, Canada. Over the past 100 years, KBB populations have declined significantly throughout the species' range. It is now believed to be extirpated from Ontario, Canada, Maine, Massachusetts, Pennsylvania, Iowa, and Illinois. Currently, the KBB is extant in seven states: Minnesota, Wisconsin, Indiana, Michigan, Ohio, New York, and New Hampshire. In 1998, it was reintroduced to Ohio as part of a 5-year reintroduction program. Wisconsin and Michigan have the largest number of local populations with the greatest numbers of individuals.

The recovery plan identifies thirteen ecological regions, called "recovery units" (RUs), based on known variation in physiography, climate, and vegetation, and potential geographic genetic variation in KBB populations. Wisconsin and western Michigan now harbor the largest metapopulations of KBB that occur in the greatest amount of area in the geographic range of the species. The goal for these areas is to stabilize and maintain, and in some cases expand, the populations that now occur. Because of the significance of these two states as the centers of KBB abundance, the recovery plan calls for more RUs and more metapopulations in these areas than in other parts of the range. These multiple RUs should protect the species against wide-scale declines in either state.

The RUs in New Hampshire, New York, Minnesota, parts of Indiana, and possibly parts of Michigan, have small populations that are at a greater risk of extinction. The goal for these areas is to protect existing habitat (both occupied and unoccupied sites) and to increase, stabilize, and maintain the populations. Fewer metapopulations are established in these RUs. Finally, six potential RUs are identified. These potential RUs are not essential for recovery, but the species would benefit if viable metapopulations were recovered in these RUs.

The recovery actions identified in the recovery plan are:

1. Protect and manage the KBB and its habitat to perpetuate viable metapopulations.
2. Evaluate and implement translocation where appropriate.
3. Develop range-wide and regional management guidelines.
4. Develop and implement information and education programs.
5. Collect important ecological data on KBB and associated habitats.

6. Review and track recovery progress.

Full recovery of the KBB is anticipated to require at least 20 years, until about 2023.

The following is a brief review of survey efforts and the distribution of KBB in each state where RUs have been established via this recovery planning process.

New Hampshire (Merrimack/Nashua River System RU)

The only remaining occurrence of KBB in New England is in the Concord Pine Barrens, Concord, New Hampshire. Two very small subpopulations occur on relatively small areas along a powerline ROW (Main Site) and in the grassy safeways of the Concord Airport. This population has severely declined in number from 2,000-3,000 estimated butterflies in 1983, to 219 butterflies in 1991 and to less than 50 in 1995 where subsequent numbers have remained below 50, making this site at extreme risk for extinction.

New York (Glacial Lake Albany RU)

KBB was once common in New York. In the Albany area alone, KBB inhabited most of the 25,000 acres of the original Albany Pine Bush, the area from which KBB were first described. The Albany Pine Bush area supported an estimated 17,500 butterflies in one 300 acre site in 1978. By the mid-1980's; however, much of the Albany Pine Bush had been destroyed by development, and degraded by introduction of non-Pine Bush species and natural succession. By 1988, only 2,500 acres of the original 25,000 acres remained, and loss of habitat has continued. Current populations number only in the several hundreds, and existing habitat continues to undergo succession and degradation.

Additional KBB sites occur in the Saratoga Sandplains and Saratoga West areas north of Albany. The majority of the sites in these areas support less than 100 butterflies. The largest population of the butterfly is at the Saratoga Airport, and is estimated to support 10,000 KBB.

Currently the New York Department of Environmental Conservation (NY DEC) has identified 70 KBB localities and 55 subpopulations in the Glacial Lake Albany RU. Of those, 45 subpopulations are within the 3 metapopulation goal areas; 8 in the Albany Pine Bush, 28 in Saratoga Sandplains, and 9 in Saratoga West.

Indiana (Indiana Dunes RU)

Historically, the KBB was reported from eight counties in Indiana. In 1990, KBB were identified at 10 sites out of 35 potential sites surveyed. Two population clusters were identified within two counties, the majority of which was associated with medium to high quality KBB habitat. The early surveys in Porter County, which includes portions of the Indiana Dunes National Lakeshore (IDNL), identified between 1,000 and 10,000 second brood adults. Several thousand second brood adults were estimated at IDNL in Lake County. Other Lake County

subpopulations likely number between 100-500. Several subpopulations occur in West Gary (Lake County) associated with a remnant dune and swale complex.

Currently it is estimated that 17 subpopulations of KBB (using the 200 meter separation criteria) 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 KBB. KBB have been documented on four of these tracts which comprise the only extant subpopulations of KBB in West Gary.

Wisconsin (Morainal Sands, Glacial Lake Wisconsin, West Central Driftless, Wisconsin Escarpment and Sandstone Plateau and Superior Outwash RUs)

The Wisconsin DNR began systematic statewide surveys for the KBB in 1990 including surveys of 33 of the 36 historic butterfly sites. Initial surveys reported that only 11 of the 33 historical sites supported KBB, and also identified 23 previously unknown sites. Additional survey efforts were subsequently conducted by the Wisconsin DNR, the Service, Fort McCoy, and other biologists. By 1993, there were an estimated 150 to 170 discrete KBB sites. In recent years, additional surveying has been done by partners to the Wisconsin Statewide Habitat Conservation Plan including county forest departments, the private forest industry, and utility companies. County and state foresters in Wisconsin routinely survey for KBB prior to conducting forestry activities in an effort to avoid adverse impacts to the butterfly.

As of May 1998, the Wisconsin DNR Natural Heritage Inventory data base noted 280 subpopulations (using a 200 meter separation criteria) of the butterfly in Wisconsin. Most of the subpopulations can be lumped into about 15 large population areas, many of which are found on sizable contiguous acreages in central and northwest Wisconsin. Wisconsin supports the largest and most widespread KBB population rangewide. At least one sizable population occurs in each of the five Wisconsin RUs with the West Central Driftless RU believed to support the largest populations. The largest KBB populations are found at Necedah NWR, Fort McCoy, Glacial Lake Grantsburg State Wildlife Area, Eau Claire County Forest, Jackson County Forest, Black River State Forest, and on a complex of state and private lands in Portage County.

Minnesota (Paleozoic Plateau RU)

KBB currently only occur at the Whitewater Wildlife Management Area (WMA) in southeastern Minnesota. Two to possibly five small local populations are located in a 1,770 ac (716 ha) expanse of poor to high quality oak savanna at the WMA.

Surveys conducted at two sites since 1992 (the "Cuthrell" and "Historic" sites), recorded peak second flight counts ranging from 9 to 64 butterflies (mean = 22.9) at Cuthrell; and from 2 to 8 butterflies (mean = 0.7) at Historic. A translocation project was started in 1999 to reintroduce KBB to Lupine Valley, a historic KBB site at the Whitewater WMA.

There are other locations in the southeastern and east-central part of the state that formerly supported lupine and the KBB, such as the Cedar Creek Natural History Area. Surveys of 50

potentially suitable sites in Minnesota (oak savanna with sandy soil and lupine) revealed that many lupine sites were no longer present and that the butterflies had been extirpated from the Cedar Creek site.

Michigan: (Ionia, Allegan, Newago and Muskegon RUs [Figure 3])

KBB is currently found in 10 of the 11 Michigan counties in which it historically occurred. Surveys noted that KBB populations were reduced and highly fragmented. The majority of KBB sites occur on state land (Flat River and Allegan State Game Areas [SGAs]) in the Ionia and Allegan RUs, and on federal lands (Huron Manistee National Forests [HMNF]) in the Newago and Muskegon RUs.

Survey efforts during 1994-1996 by the MNFI of 65 areas within the Ionia RU on public and private lands revealed nine extant sites, eight within the Flat River SGA; with the exception of one site, all supported low numbers of butterflies. Based on data through 1998, eight subpopulations (defined as separated by 200 meters of unsuitable habitat) have been identified at the Flat River SGA and 23 at the Allegan SGA. In addition, two other subpopulations occur on private property; one near each of these state properties. The Ionia RU is the least well surveyed of all the Michigan RUs with much of the area outside of the Flat River SGA developed for agriculture and other uses.

As of fall of 2002, Michigan, excluding the Allegan SGA, supported 158 subpopulations of KBB (based on a 200 meter separation criterion). As noted above, in 1998, Allegan SGA supported 23 subpopulations of KBB. The majority of KBB sites occurred in the Newago and Muskegon RUs on the HMNF.

Within the HMNF, approximately 14,000 acres (5,665 ha) including about 784 acres (317 ha) of private lands were surveyed for the presence of KBB since 1993 (USDAFS 2004, 2005). From these surveys, approximately 263 KBB occupied areas have been found on HMNF lands and 56 occupied areas were found on private lands. These occupied areas comprise approximately 2,026 ac (820 ha) of HMNF land and 441 ac (178 ha) of private ownership (USDAFS 2005).

Areas of occupied and potential KBB habitat on the HMNF have been segregated into four KBB Management Areas distributed in the two RUs, which collectively contain 24 KBB Management Units (KBBMU) (USDSFS 2004). KBBs occupy primarily five of the KBBMUs and four areas within the management units have been designated as metapopulation areas: Otto (Muskegon and Oceana Counties), White River (Oceana County), Brohman (Newago County), and Bigelow (Newago County) (USDAFS 2004). The metapopulation areas are composed of either large viable populations (LVP) or viable metapopulations (VP) (USDAFS 2004).

Two LVPs are being managed within the Muskegon RU: White River LVP and Otto LVP (USDAFS 2004). The White River LVP has approximately 6,674 acres (2,701 ha) (HMNF land and private lands), of which 620 acres (251 ha) are occupied by KBB. Otto LVP is almost twice as large with 11,313 acres (4,578 ha), with KBB occupying approximately 848 acres (343 ha). Within the Newago RU, the Brohman VP is composed of approximately 2,363 acres (956 ha)

and KBBs occupy about 91 acres (USDAFS 2004). Additionally, the Bigelow LVP totals 9,421 acres (3,740 ha), which supports 126 acres of occupied habitat.

MNFI statewide KBB surveys in 2002 and 2003 resulted in the discovery of 32 new element occurrences² on 610 acres of occupied habitat³, a new metapopulation and 26 element occurrence extensions on 808 acres of occupied habitat (Fettinger 2003). According to the surveys, new and known element occurrences and extensions totaled approximately 3,400 acres (1376 ha). Over 80% of the new occurrences were found on private land, many in Muskegon and Newaygo Counties, which demonstrated that KBBs are more prevalent in these counties than previously thought (Fettinger 2003). Nevertheless, surveys in Muskegon and northern Newaygo Counties indicated that some sites may no longer be occupied, in spite of lupine presence. But, according to Fettinger (2003) the discovery of the new Southern Muskegon RU metapopulation offsets the area presumed lost in these two counties.

Threats

The major threats to survival of the KBB include habitat conversion (to agriculture, urban areas, etc.), succession to woodlands and forests, and management for other wildlife and natural areas goals that do not take into account the needs of the butterfly, such as restoration and maintenance of native vegetation, or that encourage use by game animals and recreationists. Human land use has often resulted in suppression of disturbance and decline of KBB populations. Although wildlife and other management goals are often concordant with enhancement of KBB, too vigorous a pursuit of some goals can be detrimental to the butterfly.

KBB inhabits several non-native habitats, including some silvicultural areas, mowed ROW, and roadside edges. Some of these habitats are being lost to more intensive development pressures. Some silvicultural habitats that are suitable for KBB are being converted to more intensive silvicultural uses that may be less compatible and to incompatible residential and commercial uses. Along roadsides, uniform, exotic vegetation has replaced native vegetation. Roads can also fragment habitats and cause a portion of the population to be threatened by vehicle traffic, while adults are congregating at water sources or dispersing within these areas.

Improper timing and incompatible management practices can also threaten KBB, such as timing of pest control, timing of mowing, poorly planned prescribed fires, pesticide use, and deer and grouse management. Improper timing or poorly located herbicide treatment can kill or otherwise suppress lupine and other nectar-producing plants, thereby affecting the KBB. Mowing between late spring and early summer can damage or reduce lupine, eliminating food for larvae. Mowing can also directly crush eggs or larvae and decrease nectar sources. Poor timing and the improper use of fire in KBB habitat; severe fires at frequent intervals or burning during larval, first flight and second flight periods; or burning a majority of the habitat can be detrimental.

A variety of natural predators, such as spiders, predaceous insects, and even deer can cause direct mortality by ingestion of larvae. Heavy mammalian browsing on lupine has indirect effects on

² "Element occurrence" refers to the spatial representation of a species and its required habitat at a specific location (Fettinger 2003).

³ This definition of "occupied habitat" ,derived from Fettinger (2003), refers to lupine patches separated by at least 100m of unsuitable habitat, at least 200m of suitable habitat, or a barrier to dispersal.

habitat because fewer lupines are available for larvae and adults (USDAFS 1999). KBB are also susceptible to mortality caused by parasitoids and pathogens.

Collection of KBB is not currently considered to be a significant factor in population declines in most areas. Stochastic events, such as unusual weather, can detrimentally affect KBB populations. Large-scale wildfire events, although infrequent, could destroy a large metapopulation.

ENVIRONMENTAL BASELINE

This section is an analysis of the past effects of State, tribal, local, private actions already affecting the species within the action area and the present effects within the action area that will occur contemporaneously with the consultation in progress. It includes a description of the status of the species and its critical habitat within the action area.

As discussed under Project Description, the action area includes the entire 4.07 mile by 66-foot wide ROW segment proposed for reconductoring. The northern end of the Cobb to Brickyard ROW begins in the very southwest corner of Newaygo County within the MSGA and continues in a southwest direction, extending into central Muskegon County, ending just north of the MCSRA (Figure 2).

Status of the species within the action area

The KBB occurs in Muskegon and Newaygo Counties within the Muskegon RU (Fig. 3). The Muskegon RU is located in west-central Michigan along Lake Michigan, in four counties (Mason, Oceana, Newaygo, and Muskegon), and is associated with oak or white pine barrens scattered through the Manistee sand lake plain. It corresponds to ecoregion subsection IV.4, as described in Albert (1995). Climate is moderated by Lake Michigan, but is colder and more variable than other RUs in Michigan. There is considerable topographic relief in some parts of this RU.

The northern portion of the ROW within Newaygo County is located within the MSGA, which is also within the Muskegon RU. The majority of the metapopulations around the MSGA occur on private lands (Fettinger 2003). The known subpopulations within this area are currently confined to powerline ROWs and roadsides (Fettinger 2003). This particular METC operated transmission powerline ROW is owned by Consumer's Energy.

The action area and surrounding landscape, extending approximately two miles northeast from the northern end of the project ROW segment, and continuing approximately 1.5 miles south and southeast from the middle portion of the two mile segment, is composed of woods/savanna, lupine, nectar species, and grasses, all which provides suitable habitat for KBB. Additional KBB habitat also exists adjacent to the southern end of the project ROW segment for approximately ¼ mile in a southeast direction and south of the project ROW segment on MCSRA property.

According to the MNFI survey data from 2002, 2003 and 2004, the Cobb to Brickyard ROW has approximately 14.23 acres of lupine patches (5.75 acres will be disturbed), and a lupine density rank (Table 1) ranging from 0 (no lupine present) to 9 (dense, 67-100% of the area). Specifically, from the north terminus of the action area south to the Maple River (Newaygo County) 105 KBB were observed and lupine was dense. Continuing south from the Maple River

to Mosquito Creek (Muskegon County), KBBs were not as numerous (10 sightings) as the northern end and lupine was either patchy, absent or dense (0 or 8 lupine density rank). Further south along the ROW, from Mosquito Creek to the southern end, where a portion of this ROW encompasses the MCSRA, 13 KBBs were observed and lupine density ranged from clumped to dense (4–8 lupine density ranks).

Table 1. Michigan Natural Features Inventory lupine density ranking system.

<i>Lupine density code</i>	<i>Code definition</i>
0	No lupine present
1	Scattered plants present in <33% of the area
2	Scattered plants present in 33-66% of the area
3	Scattered plants present in 67-100% of the area
4	Clumps of plants present in <33% of the area
5	Clumps of plants present in 33-66% of the area
6	Clumps of plants present in 67-100% of the area
7	Dense areas of lupine present in <33% of the area
8	Dense areas of lupine present in 33-66% of the area
9	Dense areas of lupine present in 67-100% of the area
10	Lupine known to be present, density and distribution unknown

Overall, Michigan has over 5,800 acres (2,347 ha) of known occupied habitat² and more than 200 element occurrences. As mentioned in the Range-wide Status and Distribution of the Species section, over 2,400 acres of occupied habitat currently exists on the HMNF, within the Muskegon and Newaygo RUs. MNFI reported surveys from 2002 – 2004 indicate that approximately 3,400 additional acres of occupied habitat exists in various locations throughout the state. These locations include SGAs, State Parks, Linear Parks, and private lands, all occur within the Muskegon, Newaygo, Ionia, and Allegan RUs.

Factors Affecting the Species within the Action Area: *This analysis describes factors affecting the environment of the species or critical habitat within the action area. It includes Federal, State, tribal, local, and private actions already affecting the species or that will occur contemporaneously with the proposed action.*

There are currently no ROW maintenance or management activities occurring within the ROW. ROW maintenance has occurred in the past, and is largely responsible for the open conditions favoring lupine and KBB on the ROW. KBB management activities are being implemented on one private land ownership adjacent to the ROW. The MCSRA, located at the southern end of the ROW, protects and provides management for KBB on occupied sites on its property (John Lerg, MDNR, pers. comm. 2005). The MCSRA site, due its proximity and open connection to the affected ROW segment, may be a source of lupine and KBB for revegetation and repopulation of disturbed sites in the southern portion of the ROW.

The northern portion of the ROW occurs near the edge of the MSGA in southwest Newaygo County. For areas in the MSGA that have KBB, management proceeds under tenets of the State Game Area (SGA) recovery permit (John Lerg, MDNR pers. comm. 2005). The protection and

management of KBB and its habitat also should allow for natural revegetation of lupine and natural repopulation KBB on the METC ROW through connectivity between the utility corridor and the MSGA.

Recreational activities occur on the MSGA, but are not expected to impact the butterfly and are qualitatively assessed to prevent negative impacts (John Lerg, MDNR pers. comm. 2005). A limited amount of illegal recreational activities, including ORV use, does occur occasionally on the ROW and can pose threats to the KBB. The MDNR is aware of the resource threat posed by these illegal activities and is working to reduce the occurrence of such activities (John Lerg, MDNR pers. comm. 2005).

EFFECTS OF THE ACTION

This section includes an analysis of the effects of the proposed action on the species and its critical habitat and its interrelated and interdependent activities. It also includes indirect effects, which are caused by or result from the proposed action, later in time, and, reasonably certain to occur.

The proposed project is the replacement of 40 metal electric power transmission line towers with new wooden utility poles along 4.07-mile by 66-foot wide segment of utility ROW. An area 200 feet long by 66 feet wide surrounding each tower will be disturbed. After construction, no new permanent structures or equipment will remain in the ROW (except the new poles) and the amount of open ground will remain unchanged.

The estimated area of KBB habitat within the ROW is 14.23 acres. Of this, 5.75 acres of will be impacted by the proposed project. Direct take of KBB will occur in those 5.75 acres. Foot and heavy equipment traffic will trample, crush, or remove vegetation, including lupine and nectar plants. Eggs, larvae, and pupae under or on the vegetation will be destroyed. Loss of adults will be limited or avoided by conducting the project before spring and during late fall and winter.

The loss of KBB habitat in the ROW due to the reconductoring project is temporary. Heavy soil disturbance is not anticipated. Disturbance should be limited to crushing of vegetation and light soil disturbance due to the movement of vehicles and foot traffic. After the utility poles are replaced equipment and materials will be removed, and the vegetation will be given up to one growing season to recover naturally. The disturbed sites are expected to recover by the second growing season. Karner blue butterflies, lupine and native nectar plants that occur on other undisturbed portions of the ROW and on lands immediately adjacent to the proposed construction site should facilitate revegetation and repopulation of the affected areas. KBB are expected to easily repopulate revegetated areas because the short distances between disturbed, new and undisturbed lupine patches and the open nature of the ROW and connectivity to immediately adjacent occupied sites will allow easy movement and access by KBB. As described in the life history section, KBBs are adapted to a landscape constantly changed by disturbance.

To compensate for the temporary loss of 5.75 acres of KBB habitat, the HCP includes planting 1.4 acres of lupine (25% of the area disturbed) to create new KBB habitat. Additionally, the disturbed and mitigation sites will be monitored to ensure that revegetation and KBB repopulation occurs. If the disturbed and new sites do not revegetate or grow as expected by the second growing season, seeding or reseeding efforts will be implemented as necessary.

Direct take of KBB will occur as a result of implementation of the HCP. The ROW provides the physical attributes required for KBB egg laying, rearing, roosting, and foraging. Consequently, the majority of the take will be due to loss of eggs, through incidental trampling and crushing of larvae and lupine, neighboring nectar plants and grasses from foot and heavy equipment traffic. Loss of adults will be limited or avoided if the project is conducted before spring and during late fall and winter.

An indirect effect of issuing the ITP and implementing the HCP is the increase in the amount of KBB habitat and connectivity between local subpopulations as a result of land disturbances from construction activities, restoration of disturbed areas and mitigation, or creation of 1.4 acres of new habitat in the ROW. As indicated, land disturbance has both beneficial and adverse impacts on the butterfly. While vegetation trampling, tower removal disturb and sometimes kills vegetation and any butterfly eggs or larvae utilizing the vegetation at the time of disturbance, these same activities also promote lupine growth by maintaining the early successional habitat that the KBB depends upon.

Aside from losing eggs and, perhaps, larvae, reconductoring activities will cause a temporary disturbance to KBB habitat. Because natural disturbances, such as fire and large animal grazing, that open the canopy have decreased, disturbances of this type, including KBB habitat management, maintain the balance between decline in suitable habitat and its renewal. Lack of fire succession, coupled with conversion of lands to agriculture, pine plantations, residential and commercial areas have reduced KBB habitat size and quality. Therefore, KBB are currently found in remnant native habitat patches and other habitats managed for various other purposes, including powerline ROW.

These various contemporary habitats provide suitable soils for lupine growth, nectar plants for feeding, critical microhabitats, attendant ants, an open canopy, and are affected by maintenance and management activities that cause soil disturbance or suppression of shrubs and herbaceous vegetation (such as by mowing, brush-hogging, logging, chemical control, or prescribed fire). These habitats are vegetationally diverse, and support herbaceous species that co-occur with lupine in the native remnant barrens and savanna habitats.

Additional lupine and native nectar plants occur adjacent to the proposed construction site, inhabit other portions of the ROW, and are present on the neighboring MCSRA property and in the MSGA. Due to the close proximity of additional habitat, the potential for lupine and nectaring plants repopulating the affected area is high. It is likely that some adverse impacts will not be eliminated and that some individuals may be incidentally destroyed or injured. However, we do not anticipate that these effects will compromise the entire subpopulation in this area. Small distances between disturbed, new and undisturbed lupine patches and the open nature of the ROW should allow easy movement and access by KBB.

In summary, adverse effects expected from the action should be temporary, and after the active construction period longer term beneficial effects to KBB are likely. Further, the 5.75 acres of lupine habitat directly affected are relatively insignificant in comparison with the total acreage occupied by KBB in Michigan, and rangewide.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The Service is not aware of any additional state, tribal, local or private actions that are reasonably certain to occur on the METC ROW.

CONCLUSION

After reviewing the current status of KBB, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the action as proposed is not likely to jeopardize the continued existence of KBB. No critical habitat has been designated for KBB; therefore, none will be affected.

The proposed project may result in adverse effects to individual KBB eggs, larvae and pupae utilizing the ROW. However, take of KBB is due to the short term loss of 5.75 acres of lupine, as a result of removing and replacing 40 electric transmission towers. These activities will be implemented in a fashion to minimize detrimental impacts to KBB habitat within the action area. Additionally, as mitigation, 1.4 acres of KBB habitat will be created to assist in conservation efforts in the utility corridor. Habitat disturbed by construction and as a result of the ITP will recover. If adequate natural recovery does not occur, management will be applied as appropriate to restore disturbed areas. No permanent loss of KBB habitat is expected as a result of the ITP. KBB utilizing the habitat within, and to a lesser extent, surrounding the ROW are expected to repopulate the disturbed ROW in addition to the created habitat.

Therefore, based on our review of the information concerning the proposed action and considering the information available to us on the biology, ecology, distribution, and abundance of the KBB, we have concluded that the proposed action is not likely to jeopardize the continued existence of the KBB.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of the Incidental Take Statement.

The reasonable and prudent measures (RPM) and terms and conditions described below are non-discretionary, and must be undertaken by METC so that they become binding conditions of this BO issued to METC for the exemption in section 7(o)(2) to apply. The Service has a continuing duty to regulate the activity covered by this Incidental Take Statement. If METC fails to assume and implement the terms and conditions of the BO and Incidental Take Statement, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of the incidental take, METC must report the progress of the action and its impact on the species to ELFO as specified in the Incidental Take Statement [50 CFR par. 402.14(i)(3)].

Amount or extent of take anticipated

Because it is difficult to detect and quantify the number of KBB eggs, larvae, or adults taken as a result of reconductoring activities, take is expressed in acres of lupine habitat in the ROW disturbed by reconductoring activities. Disturbance of this habitat is expected to be short term, that is, lupine and KBBs are anticipated to re-occupy disturbed sites after recovery or restoration of disturbed areas and new habitat created; therefore, the take of KBBs is also considered short-term.

We anticipate a maximum of approximately 5.75 acres of short term take of occupied KBB habitat. The majority of take will result from the use of heavy equipment and vehicles for accessing the tower locations, and dismantling and removing existing towers and associated foot traffic. Minor, insignificant, amounts of take will occur from pole installation. No construction activities affecting KBB will occur outside of the ROW. Adherence to the conservation measures stipulated in the ITP and HCP should keep incidental take at a minimum; however, non-compliance, if it occurs, may result in a greater amount of take.

Effect of the incidental take

In the accompanying BO, the Service determined that this level of anticipated take is not likely to result in jeopardy to the KBB or destruction or adverse modification of critical habitat. This non-jeopardy BO is based on implementation of the conservation measures for the KBB discussed in the Description of the Proposed Action and in the HCP.

This level of incidental take will not reduce habitat to the point that the resultant conservation status of the subpopulations in the action area will decline. In fact, an increase in suitable habitat is expected. Thus, the likelihood of survival and recovery of the KBB will not be appreciably affected.

Reasonable and prudent measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of the incidental take of the KBB.

1. Conduct all construction activities in a manner that minimizes take to the maximum extent practicable.

2. Monitor impacted KBB habitat within the action area and mitigation area to ensure that that they revegetate and that KBB repopulate the areas. If revegetation does not occur naturally, take management steps to ensure revegetation.

Terms and conditions

In order to be exempt from the prohibitions of section 9 of the Act, METC must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. Conduct all construction activities in a manner that minimizes take to the maximum extent practicable.
 - a) Pole removal and installation activities along with equipment and vehicle traffic in the ROW are to be carried out as proposed in the HCP, Avoidance and Minimization of Impacts.
 - b) The Applicant will provide and distribute educational and species identification materials about the KBB to the Environmental Inspector and construction personnel.
2. Seek new information annually on KBB distribution and population status in the action area and apply such information to activities to minimize take.
 - a) Use annual surveys and pre- and post-reconductoring monitoring data to avoid activities that are unnecessary or that could result in excessive take.
3. Supply ELFO with an annual report, due by January 31st each year for the duration of the ITP and HCP that outlines the following:
 - a) Comparison of pre-disturbance KBB habitat (lupine densities, grasses and native nectar plants) to post-construction activities.
 - b) KBB population size pre- and post-construction activities.
 - c) Results of all monitoring activities and grasses, lupine and nectaring plants seeding efforts to restore and create additional KBB habitat.
 - d) This report should include what methods were used and pre- and post-disturbance photos.
 - e) Progress and results of applied terms and conditions.

The Service believes that no more than 5.75 acres of KBB habitat will be incidentally taken as a result of implementation of the reconductoring project. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from reconductoring activities. If, during the course of the

project, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

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