FINAL

OIL AND GAS INDUSTRY CONSERVATION PLAN

Associated with Issuance of Endangered Species Act Section 10(a)(1)(B) Permits for the American Burying Beetle in Oklahoma

Prepared by

U.S. Fish and Wildlife Service
Oklahoma Ecological Services Field Office
9014 E. 21st St.
Tulsa, Oklahoma 74129

May 21, 2014

COVER SHEET

TITLE: OIL AND GAS INDUSTRY CONSERVATION PLAN Associated with Issuance of Endangered Species Act Section 10(a)(1)(B) Permits for the American Burying Beetle in Oklahoma (ICP)

PERMIT(S): See individual Applicants / Projects

SPECIES: American Burying Beetle (*Nicrophorus americanus*, ABB).

PLANNING AREA: The Planning Area encompasses the known and potential range of the ABB and its habitat in 45 counties in the state of Oklahoma, including: Adair, Atoka, Bryan, Carter, Cherokee, Choctaw, Cleveland, Coal, Craig, Creek, Delaware, Garvin, Haskell, Hughes, Johnson, Kay, Latimer, Le Flore, Lincoln, Love, Marshall, Mayes, McClain, McCurtain, McIntosh, Murray, Muskogee, Noble, Nowata, Okfuskee, Okmulgee, Osage, Ottawa, Pawnee, Payne, Pittsburg, Pontotoc, Pottawatomie, Pushmataha, Rogers, Seminole, Sequoyah, Tulsa, Wagoner, and Washington counties.

COOPERATORS: U.S. Fish and Wildlife Service; Individual Oil and Gas project proponents engaged in exploration, development, extraction, or transport of crude oil, natural gas, and/or petroleum products; Oklahoma Independent Petroleum Association (OIPA) members.

TAKE: The Service is using number of acres of occupied ABB habitat disturbed as a surrogate of number of individuals to estimate the amount of take that is likely to occur (Section 3.3.1). Disturbance of up to 32,234 acres of occupied ABB habitat may occur within the Planning Area. These impacts may occur in the form of permanent habitat impacts, temporary habitat impacts, and permanent change in cover type (fragmentation) resulting from construction of oil and gas facilities. Additionally, habitat may be affected during operations, maintenance, and emergency response (excluding crude oil spills) during the life of the ICP. We expect some level of effects on any ABBs located within the disturbed areas.

FUNDING PLAN: Applicants are committed to full implementation of the ICP and will mitigate for all unavoidable impacts according to the Mitigation Strategy for the ABB and the anticipated impacts described in their Individual Project Package (IPP) application (Section 7.2.1). Funding assurances will be provided with their Individual Project Package application (Section 6.0).

MONITORING PLAN: Annual report due on January 31 each year that the Permit is in effect.

DURATION OF AGREEMENT: 24 months for construction and up to 20 years for operations and maintenance.

Table of Contents

1.0 INTRODUCTION 4
- 1.1 Purpose and Need 4
- 1.2 Planning Area 6
- 1.3 Permittees 8
- 1.4 ICP and Permit Duration 8
- 1.5 Regulatory Context 8
- 1.6 Covered Species 9
- 1.7 Alternatives to the Taking 9

2.0 COVERED ACTIVITIES 9
- 2.1 Upstream Production 10
  - 2.1.1 Geophysical Exploration 10
  - 2.1.2 Well Field Development 11
- 2.2 Midstream Development 15
  - 2.2.1 Pipeline Construction 15
  - 2.2.2 Construction of Associated Surface Facilities 17
  - 2.2.3 Operation and Maintenance of Pipelines and Associated Surface Facilities 19
  - 2.2.4 Decommissioning and Reclamation 20
- 2.3 Spills or Releases of Crude Oil, Natural Gas, or Petroleum Products are NOT Covered Under the ICP 21

3.0 COVERED SPECIES 21
- 3.1 Species Information 22
  - 3.1.1 Species Description 22
  - 3.1.2 Life History 22
    - 3.1.2.1 Areas Unfavorable for the ABB 24
  - 3.1.3 Status 25
  - 3.1.4 Distribution 25
  - 3.1.5 Reasons for decline 26
  - 3.1.6 Threats 27
  - 3.1.7 American Burying Beetle Conservation Priority Areas 28
- 3.2 Anticipated Effects on the American Burying Beetle 29
  - 3.2.1 Vegetation Removal 30
  - 3.2.2 Use of Vehicles and Heavy Equipment 30
  - 3.2.3 Disturbance and Movement of Soil 31
  - 3.2.4 Human Presence and Movement 31
  - 3.2.5 Light 31
  - 3.2.6 Vegetation Maintenance 31

3.3 Impacts Analysis and Estimated Incidental Take 32
3.3.1 Use of Impacts to Habitat as a Proxy for Take 33
3.3.2 ABB Habitat within the ICP Planning Area 33
3.3.3 Temporary, Permanent Cover Change, and Permanent Impacts 36
3.3.4 Total Impact Estimates within Planning Area 38
4.0 CONSERVATION PROGRAM 39
4.1 Biological Goals and Objectives 39
4.2 Minimization and Mitigation Measures 40
4.2.1 Minimization Measures 41
4.2.2 Mitigation Measures 44
4.2.2.1 Post-construction Restoration for Temporary and Permanent Cover Change Impacts 44
4.2.2.2 Offsite Habitat Mitigation through Mitigation Lands for Temporary, Permanent Cover Change, and Permanent Impacts 46
4.2.2.3 Mitigation Ratios 47
4.2.2.4 Location of Offsite Mitigation 49
4.3 Monitoring 50
4.3.1 Compliance Monitoring 50
4.3.2 Biological/Effectiveness Monitoring 51
4.4 Adaptive Management 51
4.4.1 Adaptive Management Actions 52
5.0 CHANGED and UNFORESEEN CIRCUMSTANCES 52
5.1 Changed Circumstances Provided for in the ICP 53
5.1.1 Assumptions Used to Develop the ICP are Incorrect 53
5.1.2 Fire, Flood, Drought, and Tornadoes 54
5.1.3 Delisting During Permit Term 55
5.1.4 Potential Effects to Newly Listed Species or Critical Habitat 55
5.1.5 Emergency Repairs Requiring Habitat Clearing 56
5.1.6 Covered Species Adversely Affected by Invasive Species 56
5.1.7 ABB Range Expansion within the Planning Area 57
5.1.8 Permittee Unable to Implement Minimization or Post-Construction Restoration Measures 57
5.1.9 New Scientific or Commercial Data Related to Reference Documents 58
5.2 Changed Circumstances Not Provided for in the ICP 58
5.3 Unforeseen Circumstances 59
6.0 FUNDING 60
7.0 PERMIT PROCESSING AND IMPLEMENTATION 65
7.1 Permit Application Process 65
7.2 Permit Implementation 67

7.2.1 Individual Project Package Process 67
7.2.2 Impact, Mitigation, and Post-Construction Restoration Tracking 71
7.3 Reporting..... 72
7.4 Permit Amendments..... 75
7.5 Such Other Measures that the Service May Require 76
8.0 PREPARERS AND CONTRIBUTORS 77
9.0 LITERATURE CITED..... 78
10.0 SIGNATURES 85

List of Reference Documents (available on the Oklahoma Ecological Services Field Office website at ***http://www.fws.gov/southwest/es/oklahoma/ABBICP***):

- *Oklahoma Ecological Services Field Office Migratory Birds and Eagle Avoidance Measures from Actions Associated with Oil and Gas Projects*
- *Species Take Avoidance Measures for Non-covered Species Related to Selected Oil and Gas Projects within the American Burying Beetle Range in Oklahoma*
- *American Burying Beetle Oklahoma Presence/Absence Live-trapping Survey Guidance*
- *American Burying Beetle Conservation Strategy for the Establishment, Management, and Operations of Mitigation Lands*
- *American Burying Beetle Impact Assessment for Project Reviews*
- *Eligibility Determination for the American Burying Beetle ICP*
- *ABB Individual Project Package Checklist for the American Burying Beetle ICP*
- *Species Assessment and Mitigation Calculations for the American Burying Beetle ICP*
- *Calculation Spreadsheet for the American Burying Beetle ICP*
- *Estimate of ICP Implementation Costs*
- *Example Reporting Spreadsheet for the American Burying Beetle ICP*

1.0 INTRODUCTION

1.1 Purpose and Need

We, the U.S. Fish and Wildlife Service (Service) developed this short-term, Oil and Gas Industry Conservation Plan (ICP) to provide a mechanism to meet statutory and regulatory requirements by proponents engaged in geophysical exploration (seismic), development, extraction, transport, and/or distribution of crude oil, natural gas, and/or other petroleum products and maintenance, operation, repair, and decommissioning of oil and gas pipelines and well field infrastructure while promoting conservation of the endangered American burying beetle (*Nicrophorus americanus*, ABB). The Endangered Species Act (ESA) of 1973 prohibits "take" of species listed as threatened or endangered. The term "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct" (16 USC § 1532(3)(19)).

This ICP is a conservation plan as required in ESA Section 10(a)(2)(A) for issuance of a 10(a)(1)(B) incidental take permit (Permit). Participation in the ICP and an application for take authorization is voluntary. To be issued take through this streamlined process, applicants must:

- meet issuance criteria found at (50 CFR 13 and 17); and,
- document that their projects meet various qualifying criteria (described below); and,
- agree to implement the avoidance, minimization, and mitigation actions described in this document and comply with the terms and conditions in resulting Permit(s) issued under this ICP; and,
- provide documentation that they have met the minimization and mitigation requirements for their project as calculated by the methods described in this document.

Following Permit issuance, Permittees must submit Individual Project Packages (IPPs) for Service approval prior to the initiation of impacts occurring in occupied ABB habitat. Further discussion of requirements for Permit issuance and IPP approval is described in Section 7.0 of this ICP.

The Service recognizes that actions associated with the exploration, development, extraction, transport, and/or distribution of crude oil, natural gas, and petroleum products may result in take of the endangered ABB through crushing or collision and through impacts to habitat for the species (see Section 3.3.1 for discussion of the use of impacts to habitat as a proxy for take). This ICP describes a range of projects for which avoidance actions alone may not be sufficient to prevent take of the ABB, and describes actions that can serve to minimize and mitigate the impacts of such taking to the maximum extent practicable.

This ICP is focused on exploration, development, extraction, transport, and distribution of crude oil, natural gas, and petroleum products within the range of the ABB in Oklahoma. Project proponents engaged in actions described as "Covered Activities" in this document may participate through the ICP. Not all activities that could result in take of the ABB are covered by this ICP. Projects that have a Federal nexus, including those authorized, funded, or carried out by a Federal agency, should address their incidental take of listed species through consultation with the Service under Section 7 of the ESA, and are therefore not addressed here. This ICP, therefore, provides a streamlined compliance pathway for certain described non-Federal actions referred to as Covered Activities.

This document specifies the amount of incidental take anticipated to occur over the duration of the ICP; minimization, mitigation requirements, and all other measures necessary to meet Permit issuance criteria described in Section 10(a)(2)(B) of the ESA. Project proponents that choose to participate in the ICP and meet issuance criteria would subsequently be granted a Permit through the ICP. The Service will attempt to issue Permits in an expeditious manner.

The Service is required by statute to provide public notice before issuing a Permit under Section 10(a)(1)(B) of the ESA. The Service will publish notices of Permit applications (potentially in batches) in the *Federal Register* in accordance with 50 CFR 17.22 and 17.32 b(1)(ii) with a request to the public to submit written data, views, or arguments with respect to the application, within 30 days. No Permit may be issued until at least 30 days after publication of such notice. The Service will attempt to submit notices to the *Federal Register* once every two weeks if Permit applications have been received since the last publication. Permit application notices will not contain confidential, proprietary business information, personal information affecting an individual's privacy, or other exemptions to the Freedom of Information Act.

We developed this document in cooperation with the Oklahoma Independent Petroleum Association (OIPA), its members, and other interested oil and gas companies in an effort to best meet the current and anticipated needs of the industry and the Service's statutory and regulatory requirements.

Despite the best efforts of all stakeholders involved, some projects may result in take that was not foreseen during the development of this ICP, or that affect candidate or listed species not provided for here. Because this ICP only addresses incidental take of the ABB, the Service recommends that project proponents refer to the *Species Take Avoidance Measures for Non-covered Species Related to Selected Oil and Gas Projects within the American Burying Beetle Range in Eastern Oklahoma* and the *Oklahoma Ecological Services Field Office Migratory Birds and Eagle Avoidance Measures from Actions Associated with Oil and Gas Projects* available on the website at ***http://www.fws.gov/southwest/es/oklahoma/ABBICP***. If Covered Activities may result in take of non-covered, federally-listed, regulated, and protected species, projects are not

eligible to participate in this ICP unless they have obtained a Permit from the Service for the additional species. In these circumstances, project proponents are encouraged to work with the Service to develop an HCP that meets the needs or unique circumstances of their project and apply for an individual Permit. Conviction of an ESA violation is cause for suspension or revocation of a current Permit (50 CFR 13.27) and may disqualify a project proponent from receiving a Permit within five years of such a conviction (50 CFR 13.21(c)). A violation of other appropriate Federal, state, or local laws may also constitute an ESA violation (50 CFR 13.21(c)).

1.2 Planning Area

The Planning Area (Figure 1) encompasses the known and potential range of the ABB and its habitat in 45 counties in the state of Oklahoma. These include: Adair, Atoka, Bryan, Carter, Cherokee, Choctaw, Cleveland, Coal, Craig, Creek, Delaware, Garvin, Haskell, Hughes, Johnston, Kay, Latimer, Le Flore, Lincoln, Love, Marshall, Mayes, McClain, McCurtain, McIntosh, Murray, Muskogee, Noble, Nowata, Okfuskee, Okmulgee, Osage, Ottawa, Pawnee, Payne, Pittsburg, Pontotoc, Pottawatomie, Pushmataha, Rogers, Seminole, Sequoyah, Tulsa, Wagoner and Washington counties in Oklahoma.

Noble and Cleveland counties in Oklahoma are not currently considered to be within the range of the ABB. However, because of the proximity to occupied portions of the species range and existing potential habitat, we have included these counties in the Planning Area at this time to prevent delays in permitting if ABBs are found within county boundaries during the term of this ICP. The conservation program (minimization and mitigation measures) associated with this ICP only apply in occupied ABB habitat within the ABB range. To determine whether the ABB range and potential for take of ABB occurs in these counties, see Step 5 of the *Eligibility Determination for ABB ICP* and Section 5.1.7. of this ICP.

Land within the Planning Area includes undeveloped land, agricultural lands, and rural and urban development. The Planning Area includes numerous national wildlife refuges, wildlife management areas, state parks, and other lands managed for conservation. The vast size of the Planning Area includes significant diversity in habitats, resources, and degrees of development. Not all of the resources located within the Planning Area are expected to be affected by the Covered Activities.

Figure 1. Planning Area for the American Burying Beetle ICP.

1.3 Permittees

Project proponents planning to engage in Covered Activities (as identified in Section 2) within the Planning Area may be eligible for a Permit, if specific conservation measures identified in the ICP are being or will be implemented. Those measures include minimization, and mitigation measures for the ABB (Section 4). Following issuance of a Permit, these project proponents are referred to as Permittees.

1.4 ICP and Permit Duration

This ICP will not become effective until a decision is made under NEPA following publication of the *Federal Register* Notice of Availability of the draft Environmental Assessment and draft ICP, a 14-day public comment period, and the Service addresses public comments. If the Service makes a finding of no significant impact (FONSI), the ICP will be available for potential issuance of Permits for 24 months following its effective date, as identified at ***http://www.fws.gov/southwest/es/oklahoma/ABBICP***. Permits issued under the ICP may cover new construction for up to 24 months and operation and maintenance activities for up to 20 years after Permit issuance. Permit duration will not exceed 20 years. Therefore, take issued under this ICP may occur for a maximum of 22 years following ICP authorization.

1.5 Regulatory Context

The Service can only issue Permits to authorize incidental take resulting from activities which are otherwise lawful (ESA §10(a)(1)(B)). Project proponents seeking a Permit under this ICP, therefore, must comply with all applicable Federal, State, and local statutes and regulations.

Permittees under this ICP will coordinate with land managers within the Planning Area. All activities permitted through this ICP that occur on or impact any park, recreation or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (Executive Order 11990); floodplains (Executive Order 11988); national monuments; and other ecologically significant or critical areas under Federal ownership or jurisdiction will meet the requirements of the managing entities.

Additionally, Permittees under this ICP will work with the Service, State Historic Preservation Offices, and Tribal Historic Preservation Officers to assist the Service in fulfilling the requirements of Section 106 of the National Historic Preservation Act, 16 U.S.C. § 470f, and its implementing regulations at 36 C.F.R. part 800. Activities permitted through this ICP will accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sacred sites.

1.6 Covered Species

The ABB is the only species covered under this ICP and therefore only addresses incidental take of the ABB. The ABB is described further in Section 3.0 of this ICP.

The Service evaluated the potential for other federally-listed species, candidate species, species proposed for Federal listing, eagles, and migratory birds within the ICP Planning Area (Figure 1) that could be avoided or affected by the Covered Activities (Section 2). Service-recommended avoidance measures for other species with regulatory standing are provided in the *Species Take Avoidance Measures for Non-covered Species Related to Selected Oil and Gas Projects within the American Burying Beetle Range in Eastern Oklahoma* and the *Oklahoma Ecological Services Field Office Migratory Birds and Eagle Avoidance Measures from Actions Associated with Oil and Gas Projects* available on our website at ***http://www.fws.gov/southwest/es/Oklahoma/***. Project proponents must avoid or receive separate take authorization of other federally-protected species that occur within their respective project area(s) in order to meet issuance criteria for participation in the ICP. Failure to provide for ESA compliance for other regulated species may constitute a violation of Section 9, and may result in suspension or revocation of Permits issued under the ICP.

1.7 Alternatives to the Taking

Section 10(a)(2(A)(iii) of the Act requires that the applicant describe "what alternative actions to the taking the applicant considered, and the reasons why such alternatives are not being utilized."

The only alternative to the proposed incidental taking we considered is for project proponents to avoid any actions that could result in take of ABB within the species' range. Under this alternative, some exploration, development, and transportation of crude oil, natural gas, and petroleum products would be curtailed within the range of the ABB (to avoid take of the species) and therefore would not meet the needs of project proponents. Complete avoidance of ABB habitat is not practical or feasible for most oil and gas industry activities within the Planning Area.

2.0 COVERED ACTIVITIES

Only actions listed and described here as "Covered Activities" are eligible to receive incidental take authorization through this ICP. Industry standards, disturbance area estimates, and averages were obtained primarily from oil and gas industry representatives (primarily OIPA members) and were used when estimating the overall oil and gas development that may occur within the Planning Area over the ICP term.

All Covered Activities associated with each project must be fully contained within the ICP Planning Area in order to be eligible to participate through the plan. Therefore, pipelines or other infrastructure that extend beyond the ICP Planning Area are not eligible to participate in this ICP and project proponents should seek incidental take authorization independent of the ICP, if needed.

For the purposes of this ICP, Covered Activities are categorized and defined as "Upstream Production" and "Midstream Development", which are commonly used terms in the crude oil, natural gas, and petroleum products industries. There may be some overlap between the two categories and different Federal agencies may define "upstream" and "midstream" differently than the definitions in this ICP. The following descriptions provide an overview of the activities analyzed and for which incidental take coverage will be available through this ICP.

2.1 Upstream Production

Upstream production, as defined by this ICP, includes activities associated with oil, natural gas, and other petroleum products and development of the infrastructure required to extract those resources. Covered activities associated with upstream production include:

Geophysical Exploration – also known as seismic exploration

Construction, operation, and maintenance of new and existing well field infrastructure and decommissioning of obsolete facilities, including:

- Well pads
- Drilling and completion activities
- Wells
- Gas flaring
- Work and access roads
- Electrical distribution lines (voltage must be 34.5 kilovolts (kV) or less)
- Off-site impoundments
- Communication towers

2.1.1 Geophysical Exploration

Geophysical exploration is the process of locating oil and gas deposits beneath the earth's surface. This involves generating seismic waves and measuring their reflectance through differing geologic structures. These seismic waves may be initiated by detonating explosives or through a process known as "land vibroseis." Reflected seismic waves are recorded and interpreted to characterize subterranean landforms. Seismic companies often design sound

generation points to avoid identified sensitive habitats and hazards and still collect meaningful data.

Ground disturbance associated with geophysical exploration may include clearing vegetation or construction of roads. In some instances, hand crews are used to place source and receiver lines and drill shot holes, avoiding the necessity of road building. Hand crews and their equipment can be brought in to remote or environmentally sensitive sites by helicopter, known as heli-portable drilling. In other cases, small off-road vehicles can be used for equipment and personnel. Vehicles used in the course of geophysical exploration activities sometimes include the use of wide track or rubber tires and smooth treads on vibroseis trucks to minimize disturbance and soil compaction. Road building or clearing may result in a maximum ground disturbance of 2 acres per square mile (0.8 hectares per 2.6 square kilometers).

2.1.2 Well Field Development

Well Pad Construction

Areas determined to have recoverable crude oil or natural gas deposits must be developed as well fields to initiate extraction of these resources. Well fields include facilities and infrastructure that support oil and gas production. Well pads include all structures and equipment necessary for recovering crude oil or natural gas (production wells). Well pads may also be necessary for obtaining water for oil and gas recovery (water wells) or disposal of fluids used in the oil and gas recovery following production (disposal wells). This includes the primary facilities including the pad, drilling rig, pump or well head, and reserve pits for the containment of drilling muds and cuttings. The well pad also includes facilities such as storage tanks for extracted water and crude oil, fuel tanks, water tanks, mist pumps, mud pumps, flow lines, pipelines, and associated electrical equipment. The pad also houses structures such as the cellar (where the well's main borehole is drilled), drilling pipe storage areas (referred to as the rat and mouse holes), and various trenches and sumps (to collect liquids).

Typical well pad construction requires vegetation clearing; grading to level the site; construction of storm water and erosion control structures; laying shale, gravel, and/or rock over the well pad; and constructing reserve/cutting pits, trenches, sumps, a cellar, and the rat and mouse holes. Land clearing, grading, and construction are typically performed with a bulldozer or other heavy equipment. Soil is typically excavated to a depth of approximately 6 inches (15.2 centimeters) during routine well pad installation.

Topsoil removed from the construction area is typically stored for use during site restoration. Vegetation debris piles are stored along the edges of the construction site and are typically buried in the reserve pit, burned, or left in place after drilling operations are completed.

Additional shale, gravel, and/or rock may be delivered to the construction site via dump trucks to aid in leveling the site and raise the pad above grade. In most cases, two reserve pits are excavated using a bulldozer within the well pad site. The pits are approximately 75 by 75 feet (22.9 by 22.9 meters) each and are a minimum of 8 feet (2.4 meters) deep. Additional soil or fill may be hauled in for pit construction and/or clay may be hauled to the site to line the reserve pits. Once completed, additional gravel or rock is hauled in to cover the vehicular traffic areas and trailer areas associated with drilling operations. Once constructed, the majority of the pad site is a long term installation (30-40 years for a productive well). Once a well is ready for production, reserve pits and slopes used for drilling purposes are restored with topsoil and re-vegetated. Standard erosion control measures are incorporated into each well pad site. The average production well pad is approximately 4 acres (1.6 hectares) in size, not including associated electrical distribution lines, offsite impoundments, and access roads. The average water well pad is approximately 1 acre (0.4 hectares) and an average disposal well pad is approximately 6 acres (2.4 hectares)

Road Construction

Development of well fields relies on existing roadways or may require construction of new roads. Newly constructed roads are first cleared of vegetation with a bulldozer and leveled with a road grader. Shale/rock/gravel is used to stabilize the length of the road. Approximately 80 percent of newly constructed roads remain in permanent use, and 20 percent are used only temporarily (existing for less than five years) and are restored to natural conditions. Road length can vary significantly, however the average road length per well pad is 300 feet (91.4 meters). Rights-of-way (ROW) for access roads average 25 feet (7.6 meters) in total width for permanent roads and 15 feet (4.6 meters) for temporary roads. Roads require periodic maintenance to correct washouts or other deterioration. Where necessary, culverts and ditches may be installed to facilitate drainage away from the road.

Electrical Distribution Lines

Each well pad has its own electrical distribution line (voltage must be 34.5 kV or less to be covered under this ICP), unless power is provided by a generator. Vegetation clearing and grading along the electric transmission ROW are typically necessary prior to installation. The length of electric distribution line necessary at each facility is determined by the location and distance to the nearest existing active line and is, on average, 300 feet (91.4 meters) in length. ROWs average 30 feet (9.1 meters) in width. Distribution lines are typically suspended 30 feet (9.1 meters) above grade and are typically constructed above-ground, with 18 inch diameter poles approximately every 75 – 80 feet (22.8 – 24.4 meters). Electrical distribution lines and poles are needed throughout the life of the well.

Less often, electrical distribution lines may be buried to meet the needs of the project design. If distribution lines are buried below-ground, trenching is accomplished with back-hoes, track-hoes, or similar other ditching equipment. Excavated soil is placed to one side of the trench in a spoil pile. After the trench is excavated, the electric line is then strung in the open trench. The excavated trench is backfilled with the previously removed soil.

Off-Site Impoundments

Construction of an impoundment outside of the existing well pad is sometimes needed to maintain a water source for hydraulic fracturing operations. Hydraulic fracturing is a well stimulation process used to maximize the extraction of crude oil and natural gas, by injecting fluids into the geologic formation. Excavating equipment is used to construct impoundments and fill from the pit is stockpiled along its edge. Impoundments are lined with an impermeable liner to prevent leaks, breakage, or discharge of impounded materials into ground or surface water. Water is then pumped into the impoundment. Less than one percent of well pads require off-site impoundments. The average size of such impoundments is 2.5 acres (1.0 hectares) and the structure typically remains permanent after project completion.

Drilling, Completion, and Production

Following construction of access roads and well pads, drilling rigs and associated equipment are transported to the well pad and installed. Drilling rigs are approximately 140 to 180 feet (42.7 to 54.9 meters) in height. All drilling activities occur within the previously disturbed (cleared and graded) well pad. After drilling is completed, the rig is removed and hydraulic fracturing equipment may be brought onto the well pad to facilitate production. All activities associated with drilling and well completion occurs on previously disturbed areas. Drilling rigs typically include multiple sources of light. After drilling and completion, typically 35 percent of the well pad is re-vegetated. The remaining 65 percent is typically maintained as a well pad for 30-40 years.

Gas Flaring

Some operations may produce natural gas as a byproduct of other operations at rates that are not economically feasible to collect for sale. In some locations, no pipeline infrastructure is available to transport natural gas off-site. If no other use for the gas is found, such gas may be flared (burned in the air) for disposal over a 3 – 6 day initial period during drilling and production. This gas passes through a vent away from the well and is burned in the presence of a pilot flame. Additionally, smaller flares may be associated with tanks at production sites. These smaller flares may be burning constantly throughout the production process.

Communication Towers

Communication towers may be required at some facilities, are usually constructed within the permanent footprint of the well pad, and typically range from 10 – 200 feet (3.0 – 61.0 meters) in height. Under the ICP communication towers must be under 200 feet in height, shall not use any guy wires, and not use lighting, unless required by the Federal Aviation Administration. Communication towers that exceed 200 feet in height or require guy wires are not eligible for inclusion under this ICP. Project proponents with these towers should seek consultation with the Oklahoma Ecological Services Field Office to address potential impacts to listed species through a separate permitting process. Towers exceeding 200 feet in height typically have Federal oversight through the Federal Aviation Administration or Federal Communications Commission.

Operation, Maintenance, and Decommissioning of Wells, Roads, and Electrical Distribution Lines

Covered Activities for the purposes of this ICP include operation and maintenance of newly built and existing crude oil, natural gas, and petroleum facilities and decommissioning of obsolete facilities. Operation and maintenance activities may be routine (i.e., planned upgrades to equipment) or emergency (i.e., unplanned repairs).

Well operation and maintenance activities typically occur within the existing well pad. Erosion affecting adjoining property may require disturbance outside of the existing well pad to repair and install additional erosion control features. Decommissioning of wells may involve removing the permanent structures and restoring the area of the well pad to its original condition.

Operation and maintenance of permanent access roads includes adding additional surface material (i.e., gravel, dirt) to the road and maintaining bar ditches. Roads will require periodic maintenance to correct washouts or deterioration. To minimize dust, water may be applied to roads. All additional disturbances would occur within previously disturbed areas.

If a road is no longer needed, surface material would be removed and native vegetation is typically restored by seeding. Temporary roads may be restored with native vegetation following construction and would not require any operation and maintenance activities.

Operation and maintenance of electric distribution lines may include pole replacement and repairing above-ground lines. Most repairs require less than 1 acre (0.4 hectares) of disturbance, typically about 50 square feet (4.6 square meters). Electric distribution line ROWs are kept clear of trees and brush to provide for line maintenance. Vegetation is typically maintained with mowing equipment (tractor, brush hog, etc.) or herbicide application (by applicators on foot or all-terrain vehicles) once every one to three years. Decommissioning of above ground electric

distribution lines may involve removal of poles and distribution lines for above-ground lines. Buried electric lines would likely be left in place once disconnected from power sources.

2.2 Midstream Development

Midstream development, as defined in this ICP, includes gathering, processing and treatment, transmission, and distribution of crude oil, natural gas, or other petroleum products. Petroleum products may include unprocessed natural gas liquid or condensate streams (including methane, ethane, propane, butane, and pentane). Refined oil products including gasoline, diesel, and kerosene may also be transported via pipeline. Covered Activities associated with midstream development include the following:

Construction of gathering, transmission, and distribution pipelines

Construction of associated surface facilities, including:

- Access roads
- Booster, compressor, and pump stations
- Meter stations, mainline valves, pig launchers and receivers, regulator facilities, and other required facilities
- Natural gas processing and treatment facilities
- Communication towers
- Electric distribution lines (voltage must 34.5 kV or less)
- Electric substations

Operation and maintenance of pipeline and associated surface facilities

Decommissioning and reclamation of pipeline and associated surface facilities

Pipelines located within the boundaries of well pads are included in upstream production, while gathering, transmission, and distribution pipelines are considered midstream development.

2.2.1 Pipeline Construction

Oil and gas pipeline construction involves land clearing activity where ROWs are cleared and graded. Pipeline construction ROWs are typically divided into four areas of activity: trenching, spoil piles (excavated materials consisting of topsoil or sub-soils that have been removed and temporarily stored during the construction activity), pipeline assembly, and vehicle traffic areas. Clearing and installation of the pipeline typically requires the use of heavy equipment. The types of equipment used during construction may include track-hoes, bulldozers, side booms, bending

machines, ditching machines, boring machines, and in some cases hydraulic directional drilling rigs. Pipe hauling and welding trucks as well as miscellaneous smaller vehicles are also used on most projects.

Pipeline ROW widths are determined by the pipeline diameter and material, as well as terrain and site-specific conditions. Trench widths are determined by the pipeline diameters (e.g., typically the diameter of the pipe plus 6 to 12 inches (15.2 to 30.4 centimeters) clearance between the pipe and the trench wall) and pipeline burial depths (e.g., deeper trenches usually dictate greater trench widths to address sidewall instability and worker safety). Pipeline construction ROWs also vary based on the type of pipeline. Gathering pipeline ROWs (the smaller interconnected pipeline networks which bring crude oil or natural gas from wells to treatment plants or processing facilities) average 50 feet (15.2 meters) in width. Transmission pipeline (longer pipes with larger diameters that move oil and gas longer distances) typically have construction ROWs of 75 feet (22.9 meters) to 150 feet (45.7 meters) depending on pipe sizes. Distribution pipelines (pipelines used to take products to the final consumer, including feeder lines) typically consist of small diameter, pipelines with construction ROWs of 10 to 50 feet (3.0 to 15.2 meters).

Typical pipeline construction proceeds along the ROW in one continuous operation. Prior to initiating ground-disturbing activities, existing underground utilities (i.e., cables, conduits, and pipelines) must be located, identified, and flagged to prevent accidental damage during pipeline construction. Project areas are cleared of vegetation and large obstacles, such as trees, rocks, brush, and logs. Timber is only removed where necessary for construction purposes. Timber and other debris are burned or disposed of in accordance with applicable regulations.

Following clearing, the construction workspace is graded where necessary to allow safe passage of equipment. Temporary erosion and sediment controls are installed after initial disturbance of the soils, in accordance with local, state, and Federal regulations. Also during grading, topsoil may be stripped from the area overlying the pipeline trench and spoil piled in the ROW. The topsoil is stockpiled separately from the subsoil. The segregated topsoil is typically restored to its original location immediately following installation of the pipe and backfill of the trench to reduce erosion and preserve native seed stock.

Trenching may be accomplished with back-hoes, track-hoes, or similar other ditching equipment. Excavated soil is placed to one side of the trench in a spoil pile. After a trench is excavated and pipeline assembled, the pipe is laid in the open trench using a side boom. The excavated trench is backfilled with the previously removed soil.

Depending on pipeline size and type, hydrostatic tests may be conducted by filling the pipeline with water and pressurizing it to ensure integrity at operating pressures.

After backfilling the trench, work areas are graded and restored as closely as possible to preconstruction contours, and previously segregated topsoil is spread across the construction ROW. Surplus construction material and debris is removed, and typically vegetation is re-established (usually through seeding). To minimize future settling, the trench may be compacted with tracked construction equipment or left crowned. Permanent erosion controls are installed within the ROW as needed during the restoration phase.

Pipe installation by conventional or directional boring, also known as horizontal direction drilling (HDD), may be utilized at roads, railroad crossings, water crossings, or in other sensitive areas. Conventional road boring requires excavation of a pit on either side of the feature, the placement of boring equipment in the pit, and boring under the feature. HDD is a trenchless crossing method that is typically carried out in three stages: (1) directional drilling of a small-diameter pilot hole; (2) enlarging the pilot hole to a sufficient diameter to accommodate the pipeline; and (3) pulling the prefabricated pipeline into the enlarged bore hole.

Contractor yards and pipe storage areas are generally located in existing commercial/industrial sites or other previously disturbed areas, but may require land clearing in areas with native vegetation. Extra work space (i.e., areas needed for equipment storage and trenching) is sometimes required at stream, wetland, railroad, road, and other pipeline crossings due to extra safety and environmental precautions often taken in these areas.

2.2.2 Construction of Associated Surface Facilities

Surface facilities associated with crude oil, natural gas, and petroleum product pipelines may include access roads, booster stations, pump stations, compressor stations, valve sites, meter stations, pig (a device used to clean and/or inspect pipelines) launchers and receivers (locations where pigs are inserted into or removed from a pipeline), processing/treatment plants, communication towers, electric distribution lines and other utilities, electric substations, and others. The number, type, and size of facilities required for each pipeline varies depending on the size of the pipeline, product being transported, topography of the area, existing infrastructure in the area, and needs of the project proponents.

Construction of access roads may be necessary to reach pipelines and/or associated facilities if existing roads are not available. Some of these access roads may be reclaimed following construction; however others remain for operation and maintenance of the pipeline and associated facilities. Roads typically range in widths from 15-30 feet (4.6 – 9.1 meters), with an average length of 0.25 miles (0.40 kilometers), depending on the location and necessary use. Roads are expected to require periodic maintenance to correct washouts or other deterioration. Where necessary, culverts and ditches may be installed to facilitate drainage away from the road.

Booster, compressor and/or pump stations are generally required at intervals between 25 and 100 miles (between 40 and 160 kilometers) along a pipeline to maintain or increase internal pressures and keep the flow of oil or gas moving through the pipeline at an appropriate rate. The location of these stations is typically determined by topography, the type of product being transported, and system hydraulic requirements. Compressor, booster, and pump stations are usually built within or adjacent to the pipeline ROW. Additional clearing and grading may be required at these facilities during construction. Office, control, utility, storage, and maintenance buildings and parking areas, may be associated with these facilities. These associated facilities range in size from approximately 0.1 acres to over 5 acres (0.04 to over 2.0 hectares). Compressor and pump station facilities generally incorporate gravel or other hardened surfaces, lighting and perimeter fencing.

Associated surface facilities that occur within pipeline ROWs may include meter stations, mainline valves, pig launchers/receivers, regulator facilities, and other required facilities. Connections between large transmission pipelines and smaller pipelines require meter/regulator stations to control the metering and flow control. Mainline valves are installed along transmission pipelines to enable portions of the pipeline to be shut down or isolated, if necessary. Pig launcher/receiver facilities are usually installed at locations of other aboveground facilities such as compressor stations or meter stations, but these facilities may also be required at points of pipeline diameter change or to accommodate the maximum practical distance that can be recorded by a pig during internal inspections. Regulators, which control the pressure of sections of pipeline, are associated surface facilities for natural gas distribution pipelines. Gas flaring may be associated with tanks at surface facilities. Each meter station, mainline valve site, pig/launcher/receiver, and regulator facility may be surrounded by security fencing. Other appurtenances include miscellaneous facilities such as filter/separators, miscellaneous valves, sumps, tanks, yard piping, pipeline markers, cathodic protection system (a method of protection for iron and steel against electrochemical corrosion) components, offices, storage buildings, and sheds. These are often associated with other surface facilities like compressor stations, but some, such as pipeline markers, may be located independently on pipeline ROWs.

Additional processing or treatment facilities may be required to process natural gas before it can be transported. Relatively few natural gas processing facilities are necessary, as gathering systems may interconnect more than 100 wells to a processing facility. These facilities generally range in size from approximately 5 to 30 acres (2.0 to 12.1 hectares). Processing facilities generally include hardened surfaces, lighting, and perimeter fencing.

Communication towers may be required at some of the associated surface facilities, are usually constructed within the permanent footprint of the facility, and typically range from 10 – 200 feet (3.0 – 61.0 meters) in height. Under the ICP, communication towers must be under 200 feet in height, shall not use any guy wires, and not use lighting, unless required by the Federal Aviation

Administration. Communication towers that exceed 200 feet in height or require guy wires are not eligible for inclusion under this ICP. Towers exceeding 200 feet in height typically have Federal oversight through the Federal Aviation Administration or Federal Communications Commission.

Electric distribution lines (voltage of 34.5 kV or less) and other utilities are often constructed to serve facilities that need a source of electricity, such as compressor and pump stations, valve sites, and processing plants. Vegetation clearing and potentially grading along the electric distribution ROW are typically necessary prior to installation. The length of electric distribution line necessary is determined by the location and distance to the nearest substation. Distribution lines are usually between 0.5 miles (0.8 kilometers) and 5 miles (8 kilometers) in length. If distribution lines are buried below-ground, trenching is accomplished with back-hoes, track-hoes, or similar other ditching equipment. Excavated soil is placed to one side of the trench in a spoil pile. After the trench is excavated, the electric line is then strung in the open trench. The excavated trench is backfilled with the previously removed soil. If above-ground, distribution lines are approximately 18 – 40 feet (5.5 – 12.2 meters) high, depending on the voltage required. Poles are usually constructed every 75 – 80 feet (22.9 – 24.4 meters). The typical permanent ROW is approximately 20 feet (6.1 meters) wide. Electrical distribution lines and poles are needed throughout the life of the well pad and are considered permanent structures; however, ROWs associated with these lines may be maintained as native vegetation.

Electric substations may be associated with electric distribution lines. These substations generally require approximately 2 to 5 acres (0.8 to 2.0 hectares) of disturbance. Electric substations are usually located off a county road but occasionally require an access road to be built to the site. Electric substations are typically surrounded by fencing. When constructed in association with an associated facility, the substation may be constructed on the same facility site within an easement granted to the electric service provider.

2.2.3 Operation and Maintenance of Pipelines and Associated Surface Facilities

Covered Activities include operation and maintenance of existing and newly built facilities and decommissioning of obsolete facilities as described above. Operation and maintenance activities may be routine (i.e., planned upgrades to equipment) or emergency (i.e., unplanned repairs).

During the operation and maintenance phase of midstream development, visual inspections are performed in accordance with Oklahoma Department of Transportation regulations and pipeline operator procedures. Such inspections may be carried out by personnel on foot, in all-terrain vehicles, or aerially. Pipeline integrity is checked throughout the pipeline’s lifespan, sometimes requiring soil disturbance. Digging to, exposing, and in some instances replacing pipeline, may be necessary based on inspection results. Annual pipeline maintenance generates from 0.005 to

0.015 acres of soil disturbance per mile (0.002 to 0.006 hectares per 1.6 kilometers) of pipeline. The Service therefore estimates an average annual total of 0.01 acres per mile (0.0025 hectares per kilometer) of pipeline may be disturbed due to maintenance activities.

The permanent ROWs of larger transmission pipeline, some gathering lines, and the electric distribution lines are kept permanently clear of trees and brush to allow future maintenance and inspections. Vegetation maintenance is typically done by large mowing equipment (tractor, brush hog, etc.) or herbicide application, by foot or all-terrain vehicles, once every one to three years.

Gas flaring may be used at associated surface facilities and pipelines. Smaller gas flares may be burning constantly throughout the life of the project, while others may be short-term (20-30 minute intervals) that are used as control of pressure for emergency releases.

Operation and maintenance of permanent access roads includes adding additional surface material (i.e., gravel, dirt) to the road and maintaining bar ditches. Disturbances are expected to occur within previously disturbed areas. Roads will require periodic maintenance to correct washouts or deterioration. To minimize dust, water may be applied to roads.

Operation and maintenance of electric distribution lines may include pole replacement for above-ground lines. Repair of buried lines may require soil disturbance to locate problems. These repairs typically rely on existing roads. Most repairs require less than 1 acre (0.4 hectares) of disturbance, typically about 50 square feet (4.6 square meters).

2.2.4 Decommissioning and Reclamation

Decommissioning a pipeline and associated facilities occurs when the pipeline or facility is no longer functional or necessary. Such facilities are typically removed and the area may be restored to native vegetation conditions. Decommissioned pipelines are either dismantled and removed or left in place. Pipelines left in place are capped and grouted at locations of road/railroad crossings, which requires minor soil disturbance at the locations of the capping. Removing pipelines involves excavating to expose the pipeline, cutting and removing the pipe, and backfilling and reclaiming the area.

If an access road is no longer needed, surface material would be removed and native vegetation is typically restored by seeding. Decommissioning of above ground electric distribution lines involves removal of poles and distribution lines. Buried electric lines would likely be left in place following disconnection from power sources.

2.3 Spills or Releases of Crude Oil, Natural Gas, or Petroleum Products are NOT Covered Under the ICP

Crude oil, natural gas, and petroleum products (including fuel and other operational fluids) spills or releases associated with construction, operation, or maintenance actions are **not** covered under the ICP. Such spills or releases may impact vegetation and soils and may cause affected areas to become unsuitable for the ABB. To avoid and minimize chance of contamination, project proponents develop spill response protocols as required in the Spill Prevention Control and Countermeasures (SPCC) section of the Oil Pollution Act (40 CFR §112.3). The SPCC plan describes spill prevention, preparedness, and response to prevent discharges to navigable waters and adjoining shorelines.

Project proponents are required to respond to spills per the Clean Water Act (CWA) (33 U.S.C Title 33 Ch 26), the OPA (33 U.S.C Title 33 Ch. 40) and Oklahoma Corporation Commission rules (O.S. § Title 12 Ch. 3 sec 52). Response and cleanup of spills are not Covered Activities under the ICP. If the Environmental Protection Agency (EPA) is involved with a response, then EPA may consult with the Service through Section 7 of the ESA regarding effects to threatened and endangered species associated with response activities. Incidental take could be addressed through this Section 7 consultation, if appropriate.

Any injury to natural resources, including the ABB, associated with a release of oil or hazardous substances or the response to a release of oil or hazardous substances is not covered under the ICP and may constitute a violation of Section 9 of the ESA. Such injury(s) would be addressed under the Natural Resource Damage provisions in the CWA (33 USC §§ 1251, et seq.), OPA (33 USC §§ 2701, et seq.), Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) 42 USC §§ 9601, et seq.), National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 300), and/or other appropriate laws and regulations.

3.0 COVERED SPECIES

The ABB is the only Covered Species addressed in this ICP. The purpose of this chapter is to: (1) provide a concise review of pertinent information on the species, including a species description, review of the species' life history, status and distribution, reasons for the ABB's decline, threats, and survival and recovery needs; (2) describe the anticipated effects of the Covered Activities on the ABB, (3) analyze these impacts and estimate the resulting amount of incidental take; and (4) evaluate the impact of this taking on populations of the species within the Planning Area.

3.1 Species Information

3.1.1 Species Description

The ABB is the largest carrion beetle (silphid) in North America, reaching 1.0 to 1.8 inches (2.5 to 4.6 centimeters) in length (Wilson 1971, Anderson 1982, Backlund and Marrone 1997). ABBs are black with orange-red markings. The most diagnostic feature of the ABB is the large orange-red marking on the raised portion of the pronotum (the upper surface of the first segment of the body that lies between the head and the abdomen), a feature shared with no other members of the genus in North America (USFWS 1991). The ABB also has orange-red frons (the upper, anterior part of the head), and a single orange-red marking on the clypeus (the lower face located just above the mandibles). Antennae are large, with notable orange club-shaped tips.

3.1.2 Life History

The ABB is a nocturnal species active in the summer months (active season) when ambient nighttime air temperatures consistently exceed 60º F (15.5 º C) (Service 1991). They are most active from two to four hours after sunset (Walker and Hoback 2007, Bedick et al. 1999). During the daytime, ABBs are believed to bury themselves in vegetation litter. Some weather conditions, including rain and strong winds, reduce ABB activity (Bedick et al. 1999).

ABBs have been reported moving distances ranging from 0.10 to 18.6 miles (0.16 to 30 kilometers) in various parts of their range (Bedick et al. 1999, Creighton and Schnell 1998, Jurzenski et al. 2011, Schnell et al. 1997-2006). Creighton and Schnell (1998) conducted a study on movement patterns of ABBs at Camp Gruber and Fort Chaffee in 1992 and 1993. The longest distance recorded for an individual was 6.2 miles (10 kilometers) over six nights, or approximately 1.03 miles (1.66 kilometers) per night, and the maximum distance moved by one ABB was 1.8 miles (2.9 kilometers) in one night (Creighton and Schnell 1998). Schnell et al. (1997-2006) reported a one day movement of 2.6 miles (4.18 kilometers). Considering the ABB's mobility, small size, recorded movement distances, and distance from which they can detect carrion, the Service considers presence/absence surveys to be conservatively effective over a distance of 0.5 miles (0.8 kilometers).

Adult ABBs bury into the soil during the inactive season when ambient nighttime air temperatures consistently fall below 60°F (15.5º C) (USFWS 1991). In Oklahoma, this typically occurs for approximately 8 to 9 months from late September until mid-May (American Burying Beetle Oklahoma Presence/Absence Live-trapping Survey Guidance). The length of the active and inactive periods, however, fluctuates with temperature. Recent studies indicate that ABBs in Arkansas bury to depths ranging from 0 to 8 inches (0 to 20 centimeters) during the inactive

season (Schnell et al. 2007). Others have reported overwintering depths ranging from 0 – 27 inches (0 – 68.6 centimeters) (Hoback 2011).

Adult ABBs seek a mate soon after emergence following the inactive season. Male and female ABBs typically cooperatively bury a carcass, but individuals of either sex are capable of burying a carcass alone (Kozol et al. 1988). Once underground, both adults remove the fur or feathers from the carcass, roll it into a ball, and treat it with secretions that retard the growth of mold and bacteria. The female ABB lays eggs in the soil near the carcass, which is then used as a food source by larval ABBs until they emerge in approximately 48-65 days (Kozol et al. 1988). Typical broods consist of 12-18 larvae, though broods of more than 25 have been reported (Kozol 1990a). These newly emerged ABBs (tenerals) over-winter as adults and comprise the breeding population the following spring and summer (USFWS 1991). Individuals usually live for only one year.

Adults locate carcasses using chemoreceptors on their antennae. Burying beetles are capable of finding carrion at a distance of up to 18.6 miles (30 km, Jurzenski et al. 2011). Success in finding carrion depends upon many factors including availability of optimal habitats for small vertebrates (Lomolino and Creighton 1996), density of competing invertebrate and vertebrate scavengers, individual searching ability, reproductive condition, and temperature (Ratcliffe 1996). Once a carcass has been found, inter-specific and intra-specific competition may occur until a dominant male and female remain (Scott and Traniello 1989). Competition between *Nicrophorus* species can lead to injuries, as noted by Bedick et al. (1999) when burying beetles were commonly found with multiple appendages missing. Kozol (1991) reported that ABBs typically out-compete other burying beetles as a result of its larger size.

ABBs require larger carrion items to reach its maximum reproductive potential (i.e., to raise a maximum number of offspring) when compared to other burying beetle species (USFWS 1991, Kozol et al. 1988, Trumbo 1992). When selecting carrion for burying in larval brooding chambers, birds and mammals weighing from 1.7-10.5 oz. (48.19 – 297.67 g) are preferred, with an optimum weight of 3.5-7.0 oz. (99.22 – 198.45 g, USFWS 1991). Kozol et al. (1988) found no significant difference in ABB preference for avian verses mammalian carcasses. At Fort Chaffee, Holloway and Schnell (1997) found that ABBs numbers were higher in areas with high densities of small mammals (USFWS 2008b). Food item selection by adult ABBs can include live insects as well as an array of available carrion species and sizes (Trumbo 1992).

The ABB is considered a habitat generalist when searching for food items, and the species has been successfully live-trapped in several vegetation types including native grasslands, grazed pasture, riparian zones, coniferous forests, mature forest, and oak-hickory forest, as well as on a variety of various soil types (Creighton et al. 1993; Lomolino and Creighton 1996; Lomolino et al. 1995; USFWS 1991). Ecosystems supporting ABB populations are diverse and include

primary forest, scrub forest, forest edge, grassland prairie, riparian areas, mountain slopes, and maritime scrub communities (Ratcliffe 1996; USFWS 1991). The ABB readily moves between different habitats (Creighton and Schnell 1998, Lomolino et al. 1995) (USFWS 2008b).

ABB habitat in Oklahoma consists of fragmented grassland/woodland matrices. The species is found within a mixture of vegetation types from oak-hickory and coniferous forests on lowlands, slopes, and ridge tops to deciduous riparian corridors and valley pasturelands (USFWS 1991; Creighton et al. 1993). Habitat structure (i.e., woodland vs. grassland) does not appear to influence over-winter survival rate in Oklahoma (Holloway and Schnell 1997).

While studies indicate that the ABB is a habitat generalist in terms of feeding, it is likely more restricted when selecting burial sites for reproduction. Soil conditions must be conducive to excavation by ABBs (Anderson 1982; Lomolino and Creighton 1996). Soil moisture is also a factor because ABBs die quickly when desiccated (Bedick et al. 2006). Soils in the vicinity of captures are all well drained and include sandy loam and silt loam, with a clay component noted at most sites. Level topography and a well-formed detritus layer at the ground surface are common (USFWS 1991).

Lomolino and Creighton (1996) found reproductive success was higher in forest verses grassland habitat. Carcasses may be more difficult to secure in grassland due to the near absence of a leaf litter layer and may be more difficult to bury due to the tendency of grassland soils to be more compact than those in forest. However, of the carcasses buried, habitat characteristics did not significantly influence brood size. Holloway and Schnell (1997) found significant correlations between the numbers of ABBs caught in traps and the biomass of mammals and birds, irrespective of the predominant vegetation (USFWS 2008b).

3.1.2.1 Areas Unfavorable for the ABB

While the ABB uses a wide variety of habitats, the Service currently believes that areas exhibiting the following characteristics are *unfavorable* for use by ABBs based on disturbance regime, vegetation structure, unsuitable soil conditions, and carrion availability:

1. Land that is tilled on a regular basis, planted in monoculture, and does not contain native vegetation.
2. Pastures or grasslands that have been maintained through frequent mowing, grazing, or herbicide application at a height of 20 cm (8 inches) or less.
3. Land that has already been developed and no longer exhibits surficial topsoil, leaf litter, or vegetation.
4. Urban areas with maintained lawns, paved surfaces, or roadways.
5. Stockpiled soil without vegetation.

6. Wetlands with standing water or saturated soils (defined as sites exhibiting hydric-soils, and vegetation typical of saturated soils, and/or wetland hydrology).

NOTE: Areas adjacent to wetlands and/or riparian areas are not considered unfavorable for the ABB, as they may be important for ABBs seeking moist soils during dry conditions.

The Service considers all areas that do not fit within one of the above descriptions of "Areas Unfavorable for the ABB" as ABB habitat.

The most recent information regarding ABB biology and habitat can be found in the ABB Impact Assessment for Project Reviews and the ABB Oklahoma Presence/Absence Live-trapping Survey Guidance on the Oklahoma Ecological Field Service's website at: ***http://www.fws.gov/southwest/es/Oklahoma/***.

3.1.3 Status

The ABB was proposed for Federal listing in October 1988 (53 FR 39617) and designated as an endangered species on July 13, 1989 (54 FR 29652), and retains this status. Critical habitat has not been designated for the ABB. The ABB Final Recovery Plan was signed on September 27, 1991. At that time only two disjunct natural populations were known to occur (i.e., one population found in four counties in Oklahoma and one population from an island off the coast of Rhode Island) at the extremities of the species' historic range (USFWS 2008a).

Additional populations of ABB have been discovered since the Recovery Plan was completed in 1991. While four eco-regions currently support ABB populations, the most recent Five Year Review found that the ABB remains endangered throughout its current range due to ongoing threats to known populations and the failure to discover or establish viable populations in the remaining Recovery Areas (USFWS 2008a).

3.1.4 Distribution

The historic range of the ABB included over 150 counties in 35 states, including most of temperate eastern North America and the southern portions of three eastern Canadian provinces (USFWS 1991; Peck and Kaulbars 1987). Documentation confirming the species' presence is not uniform throughout this broad historical range. More records exist from the Midwest into Canada and in the northeastern United States than from the southern Atlantic and Gulf of Mexico region (USFWS 1991). During the 20th century, the ABB disappeared from over 90 percent of its historical range (Ratcliffe 1995). The last ABB specimens along the mainland of the Atlantic seaboard, from New England to Florida, were collected in the 1940s (USFWS 1991).

The ABB is currently known to occur in nine states: Rhode Island, Massachusetts, Oklahoma, Arkansas (Carlton and Rothwein 1998), Nebraska regions (Ratcliffe 1996, Bedick et al. 1999), Kansas (Sikes and Raithel 2002), South Dakota (Backlund and Marrone 1995, 1997; Ratcliffe 1996), Texas (Godwin 2003), and Missouri (personal communication with Bob Mertz, St. Louis Zoo, May 30, 2013). The ABBs in Missouri are part of a nonessential experimental population (under Section 10(j) of the ESA) that was reintroduced in 2012. Most populations are located on private land. Populations known to exist on public land include: Ouachita National Forest, Arkansas/Oklahoma; Ozark-St. Francis National Forests, Arkansas; Camp Gruber, Oklahoma; Fort Chaffee, Arkansas; Sequoyah National Wildlife Refuge, Oklahoma; Block Island National Wildlife Refuge, Rhode Island; Valentine National Wildlife Refuge, Nebraska; and Camp Maxey, Texas.

Confirmed Oklahoma ABB sightings since 1992 include the following counties: Atoka, Bryan, Cherokee, Choctaw, Coal, Craig, Creek, Haskell, Hughes, Johnston, Latimer, Le Flore, Marshall, Mayes, McCurtain, McIntosh, Muskogee, Okfuskee, Okmulgee, Osage, Pittsburg, Pontotoc, Pushmataha, Rogers, Seminole, Sequoyah, Tulsa, and Wagoner, and Washington (29 counties). Additional counties with ABB habitat and potential occurrence due the proximity to the above counties include: Adair, Carter, Delaware, Garvin, Kay, Lincoln, Love, McClain, Murray, Nowata, Ottawa, Pawnee, Payne, and Pottawatomie.

3.1.5 Reasons for decline

The ABB's decline may be due to the species' specialized resource requirements. Carrion is a finite resource widely scattered in space and time (Karr 1982, Pimm et al.1988, Peck and Kaulbars 1987). Since the middle of the 19th century, a number of species with ranges that co-occurred with historic ABB distributions and with sizes within the ABB's preferred carrion weights, including Greater Prairie-Chicken (*Tympanchus cupido*), Wild Turkey *(Meleagris gallopavo*), and the Passenger Pigeon (*Ectopistes migratorius*), have suffered significantly reduced ranges or been driven to extinction (USFWS 1991).

Land use changes that fragmented native forest and grasslands and created edge habitats (such as the edge between forest and grassland, or grassland and cropland), in addition to the removal of top-level carnivores such as the grey wolf (*Canis lupis)* and eastern cougar (*Puma concolor),* during the westward expansion of settlement in North America caused a decrease of indigenous species and an increase in meso-carnivores that thrive in areas disturbed by humans. These species include the American crow (*Corvus brachyrhynchos)*, raccoon (*Procyon lotor)*, red fox (*Vulpus fulva)*, opossum (*Didelphis virginiana)*, striped skunk (*Mephitis mephitis)*, coyotes (*Canis latrans)*, feral cats (*Felis domesticus*), and other opportunistic predators (Wilcove et al. 1986). A number of these species, especially the raccoon and striped skunk, have undergone dramatic population increases over the last century (Garrott et al. 1993), and the coyote and

opossum have expanded their range. These generalist predators have increased in abundance where edge habitats allow increased foraging opportunities (Ray 2000). Therefore, as habitat for species in the favored weight range for ABB reproduction decreased, populations of their predators (ABB competitors) increased; potentially further limiting ABB reproductive potential.

There is little doubt that habitat loss and alteration affect this species at local or even regional levels, and could account for the extirpation of populations once they become isolated from others (Kozol 1995, Ratcliffe 1996, Amaral et al. 1997, Bedick et al. 1999). The prevailing theory regarding the ABBs' decline is that habitat fragmentation (USFWS 1991): (1) reduced the carrion prey base of the appropriate size for ABB reproduction, and (2) increased the vertebrate scavenger competition for this prey (Kozol 1995, Ratcliffe 1996, Amaral et al. 1997, Bedick et al. 1999).

For most guilds (groups of organisms with similar habitat requirements and that respond in a similar way to changes in their environment), larger species tend to feed on larger prey, occupy a greater diversity of habitats, dominate in interference competition, and maintain larger home ranges. However, they may suffer from exploitative competition from smaller species (Ashmole 1968, Gittleman 1985, Hespenheide 1971, Rosenzweig 1968, Schoener and Gorman 1968, Werner 1974, Wilson 1975, and Zaret 1980). The comparatively large ABB must range over a larger area and a greater diversity of habitats to find suitable carcasses. Larger prey is typically less abundant than smaller prey (Peters 1983, Brown and Maurer 1987, Damuth 1991, and Lawton 1990) and typically requires more energy to bury than smaller prey (Creighton et al. 2007). While large size alone does not necessarily result in the species' endangered status, rarity and extinctions tend to be higher among larger species within trophic levels or guilds (Diamond 1984; Martin and Klein 1984; Vrba 1984; Owen-Smith 1988; and Stevens 1992). Although less than 2 grams in weight, the ABB is nevertheless the largest member of a guild that specializes on vertebrate carcasses, which are relatively unpredictable resources.

3.1.6 Threats

The ABB Recovery Plan (USFWS 1991) and the 5-year Species Status Review (USFWS 2008a) identify potential threats to the ABB, including: disease/pathogens, pesticides, direct habitat loss and alteration, interspecific competition, loss of genetic diversity in isolated populations, increase in competition for prey, increase in edge habitat, decrease in abundance of prey, agricultural and grazing practices, and invasive species.

Fire may cause mortality of individuals during the ABB's active season (Howard et al. 2012), and can impact ABB habitat during the active or inactive seasons.

ABBs are attracted to artificial lighting (Kozol 1990b), which can lead to disruptions of the species' normal behavior patterns. The species has been shown to respond differently to varying light sources, and UV or mercury vapor lights elicit stronger responses while sodium vapor lights are the least attractive to ABBs (Anshutz et al. 2007).

A study of genetic variation within and between ABB populations from Rhode Island and those in the Oklahoma - Arkansas area reportedly display low levels of genetic variation, most of which occurs within a single population (Kozol et al. 1994). There were no unique diagnostic bands within either population, but they found the Oklahoma -Arkansas population to be somewhat more diverse. Reduced genetic variation is often a result of founder effect, genetic drift, and inbreeding. This study suggests that multiple bottleneck events, small population sizes, and high levels of inbreeding may contribute to the genetic variation patterns observed in ABBs (Kozol et al. 1994).

Populations of ABBs from Rhode Island, Arkansas, South Dakota, Oklahoma, and Nebraska reportedly display little evidence of unique genetic variation and study authors suggest that there is no evidence to suggest that these five populations should be treated as separate, genetically independent conservation segments (Szalanski et al. 2000).

The red imported fire ant (*Solenopsis invicta*, RIFA*)* has become a formidable competitor for carrion and a potential source of mortality for burying beetles when they co-occur at a food source (Warriner 2004, Godwin and Minich 2005). Scott et al. (1987) studied the closely related *N. carolinus* in Florida and concluded that the inability of this species to successfully bury carrion was due to RIFA interference. Collins and Scheffrahn (2005) noted that RIFA may reduce ground-nesting populations of rodents and birds, and have reportedly completely eliminated ground-nesting species from a given area. Of the states containing populations of ABB, RIFA now occur in all or parts of Arkansas**,** Oklahoma, and Texas (USDA 2003).

3.1.7 American Burying Beetle Conservation Priority Areas

The Service reviewed the threats and known locations of ABB in Oklahoma to identify areas where we believe conservation of the ABB should be targeted in Oklahoma. The ABB Conservation Priority Areas (CPA) would support focused conservation efforts, such as mitigation lands. CPAs include areas with recent (within 10 years) documented ABB presence that the Service believes are likely to contain important elements for ABB conservation and recovery, such as documented presence over multiple years, relatively high density populations, breeding, feeding, and sheltering habitat, and carrion resources. Using presence/absence survey data from the previous 10 years (2003 – 2013), all surveys where ABBs were documented were selected. The Service buffered each of these positive survey point locations with a radius of 10 km (6.2 miles) based on documented maximum movement distance under normal conditions for

an ABB recaptured in Oklahoma (movement over 6 nights – Creighton and Schnell 1998). To remove potential isolated locations, only buffers that intersected three or more other buffers were included as a CPA. Based on previous survey locations, using a minimum of three intersections as the selection criteria reduced the number of outlying positive surveys and selected areas with numerous grouped surveys that identified the ABB. After selection, the CPA buffers that were within 10 km (6.2 miles) of each other were combined to create new polygons using the 'aggregate polygon' tool in ArcMap, resulting in a total of four CPA areas (Figure 2). These four areas make up the CPAs in Oklahoma. See the American Burying Beetle Impact Assessment for Project Reviews for additional information regarding CPAs.

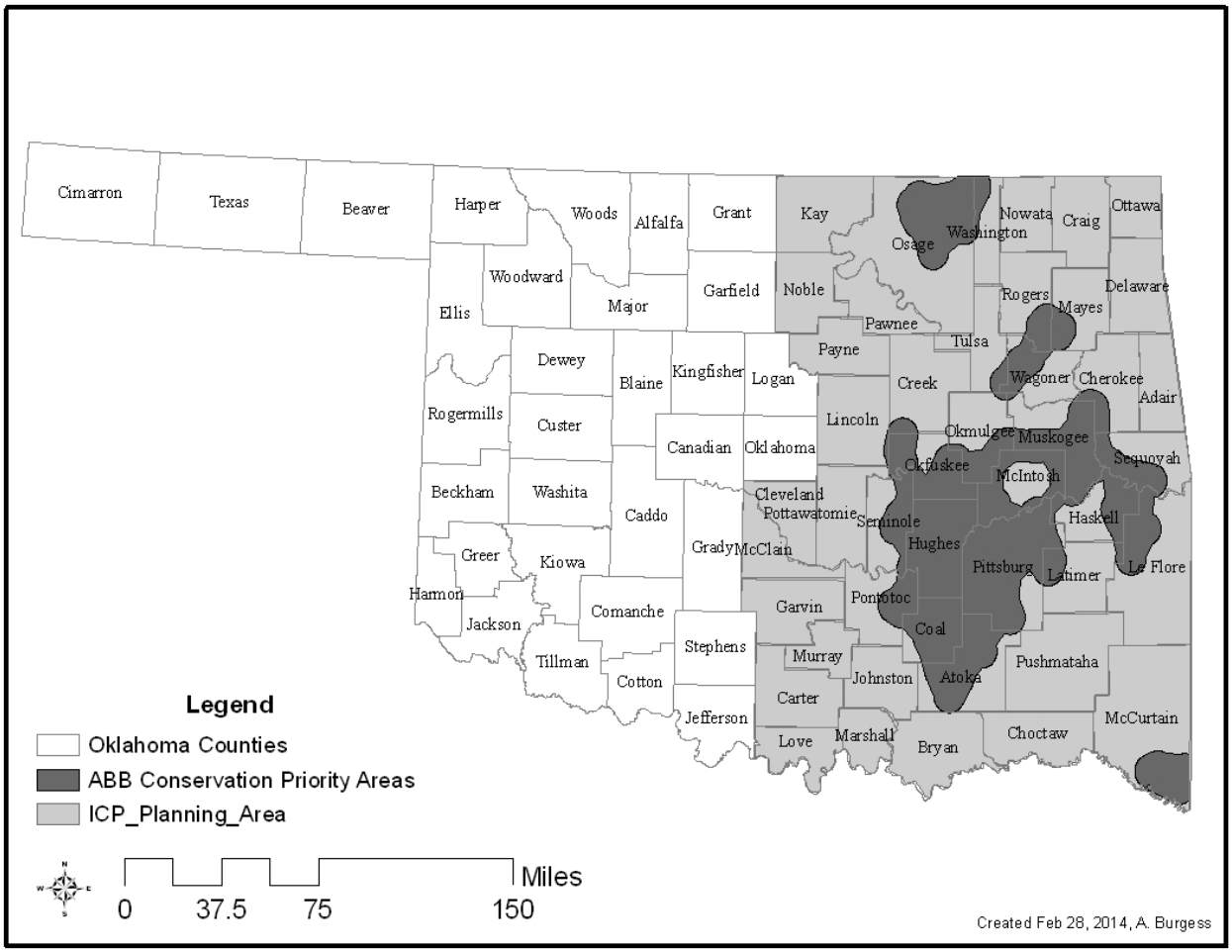

Figure 2. Conservation Planning Areas within the ICP Planning Area, as of February 2014.

3.2 Anticipated Effects on the American Burying Beetle

Covered Activities under this ICP are likely to result in take of ABBs and impacts to their habitat. Take of ABBs in the form of mortality or injury to adults, larvae, or eggs may result from crushing and collision; impacts to breeding, feeding, and sheltering habitat; increased habitat fragmentation; and changes from one vegetation community to another.

Take of ABBs is expected to result from human and equipment movement and ground disturbance associated with construction and installation of well pads, pipelines, access roads, electrical distribution lines and substations, and off-site reservoirs. Operation and maintenance, and decommissioning of these activities are also expected to result in take of the ABB.

Take of ABBs and impacts to their habitat will differ with methodologies implemented and with ABB activity level when these activities occur. Expected differences, if anticipated, are described for the ABB's active and inactive seasons.

Activities occurring during the ABB active season could reduce the species' foraging and reproduction efficiency for the duration of the active season. Species used by ABB (for food and reproduction) and their habitat within project areas would be impacted, likely reducing the available food sources, decreasing reproductive potential, and decreasing use by ABBs in the area. Reduced availability of carrion may result from greater competition from vertebrate scavengers; this is especially true in those areas where forested ABB habitats are fragmented (Kozol 1995, Ratcliffe 1996, Amaral et al. 1997, and Bedick et al. 1999). Installation of any permanent facilities (such as access roads) would remove ABB habitat used for breeding, feeding, or sheltering.

3.2.1 Vegetation Removal

Activities that include removal of vegetation may cause habitat degradation, a reduction of habitat connectivity, a loss of breeding and sheltering habitat by removing vegetation and altering soil moisture (loss of vegetation decreases soil moisture), and cause a species composition change within the small community that ABBs rely on for reproduction (Grant et al. 1982). ABBs are sensitive to soil moisture and die quickly when desiccated (Bedick et al. 2006). Additionally, these activities may increase the potential for introduction of non-native or invasive species due to the removal of existing vegetation. ABBs occurring within the leaf litter or uncovered during the removal of vegetation may be wounded or killed from exposure to adverse weather conditions or crushed by vegetation removal equipment.

3.2.2 Use of Vehicles and Heavy Equipment

Activities requiring off-road vehicles, trucks, or heavy equipment may cause a loss of breeding and sheltering habitat (suitable soil for excavation and burial) from soil compaction, vegetation crushing and trampling, and alteration of soil moisture. Equipment causing soil compaction may crush ABBs within the area, either above ground (during active season) or below ground (during active or inactive season). During the ABB active season, equipment may crush brood chambers containing ABB adults, larvae, and eggs. Direct physical injury or mortality may result when individuals collide with equipment. In dry conditions, equipment could increase the risk of

ignition of wildfire. Wildfire may cause loss of breeding, feeding, and sheltering habitat, alter the small mammal community (for a period of time) to a less optimal size class for optimal ABB reproduction (Kirchner et al. 2011), and injury or mortality for individuals exposed to fire. Operation fluids (for example, fuel and oil) required for equipment maintenance may cause take of ABBs if individuals or habitat are exposed to them during the active or inactive season.

3.2.3 Disturbance and Movement of Soil

Movement and physical disturbance of soil during construction activities such as grading, soil excavation, and topsoil stripping may crush or expose ABBs (adults, larvae, and/or eggs during the active season; adults during the inactive season) causing injury or mortality through direct impact or exposure to desiccation.

Soil erosion occurring during construction or following installation of project facilities may bury ABB adults or broods (during active season) or overwintering adults (during inactive season) too deep for them to emerge. Additionally, it may expose ABBs to adverse environmental conditions if soils (or individuals/broods) are washed away.

3.2.4 Human Presence and Movement

Introducing or increasing human presence and movement within or adjacent to ABB habitat may increase the amount of crushing or trampling of vegetation, leading to habitat degradation and potential displacement of ABBs in the area.

3.2.5 Light

Unnatural light sources occurring during the active season may attract ABBs, which could result in take through collision or crushing by equipment and/or increasing energetic demands. Many groups of insects have been shown to be attracted to lights, including beetles (Longcore and Rich 2004). Light used during nighttime construction can disrupt ABB foraging behavior and increase predation on ABBs (USFWS 1991). Additionally, light associated with the flame of gas flares used in drilling and production of natural gas alter the natural light regime and may attract ABBs. Light sources are not expected to affect ABBs during the inactive season, as ABBs are not above ground during that time period.

3.2.6 Vegetation Maintenance

Regular vegetation maintenance within project areas may cause injury or mortality of ABBs. During the active season, ABBs exposed to mowing/vegetation equipment may be crushed or exposed to desiccation. If vegetation maintenance reduces vegetation height to less than 8

inches, the soil may dry to the point that: 1) ABBs have difficulty burying carcasses, 2) soil may not structurally support reproductive chambers, or 3) adult or larval ABBs become desiccated (Bedick et al. 2006). Maintaining grass and vegetation at less than 8 inches tall could affect ABB reproduction (during the active season) and survival when ABBs are underground (during active or inactive season). If widespread application of herbicides are used to maintain the ROW (killing all vegetation within the ROW), instead of mechanical vegetation removal (i.e., mowing) or spot-treatment of herbicides, soil may also dry causing the same impacts as described above. Large mowing equipment operated within ABB habitat may cause soil compaction, resulting in take of buried ABBs during the active or inactive season (Hoback et al. 2012, Hoback 2013). Vegetation maintenance may result in temporary habitat loss, temporary habitat fragmentation, and/or alteration of ABB habitat.

3.3 Impacts Analysis and Estimated Incidental Take

The Service anticipates incidental take of ABBs will result from Covered Activities. Such take is expected to occur in the form of injury or death of adults, larvae, and eggs from by crushing or collision, or from limiting available resources, resulting in the loss of breeding, feeding, and sheltering habitat. Take of ABBs is expected to result from ground disturbance associated with geophysical exploration (seismic), development, extraction, transport, and/or distribution of crude oil, natural gas, and/or other petroleum products, electrical distribution lines and substations, and off-site reservoirs. Activities related to operation and maintenance, reclamation, and decommissioning are also expected to result in take of the ABB.

It is difficult to estimate the number of ABBs that will be taken because there is no density estimate for the Planning Area. Take of the ABB is also difficult to quantify because: 1) individuals of the species are small in size, making them difficult to locate, which makes encountering dead or injured individuals unlikely; 2) ABB losses may be masked by temporal fluctuations in numbers; 3) ABBs spend a substantial portion of their lifespan underground; and 4) the species is primarily active at night. These factors make it difficult to detect the amount of take that will occur. Although we cannot estimate the number of individual ABBs that will be incidentally taken, the Service is providing impacts to habitat as a proxy to quantify take levels and define when take would be considered to be exceeded.

While the oil and gas activities covered under the ICP would likely cause take of ABBs in the form of mortality, harm, and harassment, some of these losses constitute a one-time or short-duration pulse effect to the ABB populations in Oklahoma, so they will not affect ABB populations long-term. The restoration program would ensure that the acres disturbed by Projects will be either restored appropriately or mitigated at the rate for permanent impacts (1:1 or higher). In addition, protection of ABB habitat in previously unprotected areas would improve the likelihood of survival and recovery of the species.

3.3.1 Use of Impacts to Habitat as a Proxy for Take

The use of habitat as a proxy for take of individuals of a species is consistent with existing case law. Courts have recognized that as a general matter "Congress wanted incidental take to be stated in numbers of animals, where practical, not in terms of habitat markers" (*Miccosukke Tribe of Indians or Florida v. US*, 566 F.3d 1257 [11th Cir. 2009]). However, courts have also explained that "While Congress indicated its preference for a numerical value; it anticipated situations in which impact could not be contemplated in terms of a precise number.… In the absence of a specific numerical value, however, the Fish and Wildlife Service must establish that no such numerical value could be practically obtained" (see *Arizona Cattle Growers' Association v. U.S. Fish and Wildlife Service*, 273 F.3d 1229, 1249-50 [9th Cir. 2001]). See also *Oregon Natural Resources Council v. Allen*, 476 F.3.d 1031, 1037 [9th Cir. 2007] in which the Service was directed to explain why it was unable to numerically quantify the level of take. Because quantification of the number of ABBs impacted incidental to Covered Activities is not possible given available data, the Service believes that relying on impacts to occupied ABB habitat is a suitable surrogate to estimate the amount of take that is likely to occur. Within this ICP, "occupied ABB habitat" is defined as areas:

1) suitable for ABB use (containing ABB habitat)
   AND
2) Within the effective survey radius of a valid ABB survey where ABBs were identified *or* ABBs are assumed present by the Applicant/Permittee (no surveys have been conducted).

3.3.2 ABB Habitat within the ICP Planning Area

Some areas within the Planning Area are unsuitable for ABB use (i.e., areas that are developed, have unsuitable soils, or contain water). To determine how many acres within the Planning Area may be impacted by the Covered Activities in areas that are habitat for the ABB, the Service estimated the ratio of ABB habitat to areas unsuitable for the ABB using GIS and the 2006 National Land Cover Database (NLCD) (Fry et al. 2011). Permittees will likely delineate potential habitat for the ABB within their project areas at a smaller scale than the NLCD data, using different methods (for example, ground-truthing or satellite aerial photography). However, for the purpose of roughly estimating the total habitat within the Planning Area, the Service selected to use the NLCD data. Definitions for each of the land cover categories are in Table 1. Areas selected as ABB habitat included the land cover categories of Deciduous Forest, Evergreen Forest, Mixed Forest, Shrub/Scrub, Herbaceous, Woody Wetlands, Emergent Wetlands, and Hay/Pasture (Table 1). Although portions of the Woody Wetlands and Emergent Wetlands are likely unsuitable for the ABB, portions of those areas are likely suitable, especially during dry periods. Therefore, the entire category was included as habitat for this analysis. Areas unsuitable for the ABB (areas where take is not expected to occur) included the land cover

categories of Open Water, Developed Open Space, Developed Low Intensity, Developed Medium Intensity, Developed High Intensity, Barren Land, and Cultivated Crops. Approximately 85.8 percent (19,612,333 acres; 7,936,830 hectares) of the Planning Area was considered ABB habitat according to NLCD data, and approximately 14.2 percent (3,245,830 acres; 1,313,541 hectares) was not considered ABB habitat.

It is likely that some additional lands within the Planning Area are not suitable for the ABB (based on vegetation type and land management practices). However, the Service does not currently have the data necessary to determine the potential suitability of the entire Planning Area using these additional factors. Therefore, for the purpose of this analysis, the Service assumes that 85.8 percent of the Planning Area may be habitat for the ABB.

Table 1. Total Acres of ABB habitat within Planning Area.

Land Cover	NLCD Land Cover Description	Habitat (Acres)	Non-Habitat (Acres)
Open Water	Areas of open water, generally with less than 25% cover of vegetation or soil.	0	658,534
Developed, Open Space	Areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.	0	1,071,561
Developed, Low Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% percent of total cover. These areas most commonly include single-family housing units.	0	244,026
Developed, Medium Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50% to 79% of the total cover. These areas most commonly include single-family housing units.	0	82,823

Land Cover	NLCD Land Cover Description	Habitat (Acres)	Non-Habitat (Acres)
Developed, High Intensity	Highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80% to 100% of the total cover.	0	37,300
Barren Land	Areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.	0	36,710
Deciduous Forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species shed foliage simultaneously in response to seasonal change.	6,950,418	0
Evergreen Forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.	1,147,268	0
Mixed Forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75% of total tree cover.	393,081	0
Shrub/Scrub	Areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions.	165,290	0
Herbaceous	Areas dominated by gramanoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.	6,074,645	0

Land Cover	NLCD Land Cover Description	Habitat (Acres)	Non-Habitat (Acres)
Hay/Pasture	Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20% of total vegetation.	4,694,828	0
Cultivated Crops	Areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20% of total vegetation. This class also includes all land being actively tilled.	0	1,114,876
Woody Wetlands	Areas where forest or shrubland vegetation accounts for greater than 20% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.	155,185	0
Emergent Herbaceous Wetlands	Areas where perennial herbaceous vegetation accounts for greater than 80% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.	31,618	0
Total Acres		19,612,333	3,245,830

Metric conversion: 1 acre = 0.4 hectares

3.3.3 Temporary, Permanent Cover Change, and Permanent Impacts

Impacts to ABB habitat are categorized as follows:

Temporary Impacts

Temporary impacts include areas of ground disturbance resulting from Covered Activities restored to a condition suitable for ABB use within 5 years of the impact with similar vegetative cover. This restoration timeframe of 5 years is based on the amount of time in which the Service expects most grass and shrub dominated cover types could be re-established to their previously undisturbed state based on the climate and vegetation types within the Planning Area.

The ABB is a habitat generalist and specific vegetation types required for the ABB have not been identified, but they have been documented within grassland cover types and native grasses and shrubs are a component of most areas that support ABBs in Oklahoma. Native warm season

grasses can take several years to get established, but previous research suggests that 5 years is a realistic timeframe for restoration of these areas within the Planning Area (ODOT 2011, USDA 2009).

Permanent Cover Change Impacts

Permanent cover change impacts are defined here as changing a vegetation cover type to a different vegetation cover type (e.g., forest or shrubland to grassland), resulting in increased fragmentation of habitat (Oxley et al. 1974, Kozol 1995, Ratcliffe 1996, Amaral et al. 1997, Bedick et al. 1999, Trumbo and Bloch 2000, Marvier et al. 2004). Similar to temporary impacts, these areas will need to be restored to a condition suitable for ABB use within 5 years. If these areas will be purposefully maintained (through vegetation control) as a different land cover type than prior to project implementation, the Service considers the vegetation cover of the area to have a permanent cover change.

Man-made changes to land cover types can create intense, sudden contrast between land cover types (i.e., a grassland ROW fragmenting a contiguous stand of forest habitat), compared to natural patchy landscapes. These cover type conversions often occur within the ROWs of linear infrastructure, including electric transmission lines, pipelines, and roadways.

Evidence suggests that permanent change in cover types, even if they are both native to the area, can increase threats to ABBs (Trumbo and Bloch 2000) by increasing the number of invasive plant species present (Marvier et al. 2004), reducing the carrion prey base of the appropriate size for ABB reproduction (Oxley et al. 1974), or increasing the scavenger competition for carrion (Kozol 1995, Ratcliffe 1996, Amaral et al. 1997, Bedick et al. 1999) necessary for ABB reproduction. Additionally, changing the vegetation cover type from forest to grassland provides access, which may increase human use and presence (including use of vehicles) in the area.

To determine whether a project's cover change type will be permanently altered based on the proposed vegetation maintenance activities, project proponents should determine current land cover type using standard techniques (i.e., ground truthing; analysis of recent aerial or satellite imagery; as described in Table 1, or the latest version of the Multi-Resolution Land Characteristics Consortium's National Land Cover Database, available at ***http://www.mrlc.gov/***). The land cover type prior to impacts should be compared to the expected land cover type following the action (including any proposed maintenance/vegetation management activities and requests by the landowner). If the land cover type within the action area will be different (for example, prior to impact, NLCD classified the area at forest; following the impact, the land cover type will fit in the NLCD land cover description for herbaceous) than the original cover type 5 years after the action, the area will have a "permanent cover change." By definition, a permanent cover change does not eliminate ABB habitat.

Impacts within ROWs (for projects such as pipeline and electric distribution lines) that have a permanent change in cover and are immediately adjacent and parallel to existing ROWs, may be considered temporary because they do not increase habitat fragmentation. Co-locating ROWs along existing ROWs, roads, or other interruptions in habitat does not contribute to further fragmentation or edge effect and is preferable to crossing previously undisturbed areas.

Permanent Impacts

Permanent impacts are those that eliminate ABB habitat (i.e., buildings, roads, quarries, strip mines), as well as any impact to habitat that takes more than 5 years to restore to ABB habitat. Permanent impacts to ABB habitat are expected to result in the greatest amount of take of individuals of the species.

3.3.4 Total Impact Estimates within Planning Area

Although it is difficult to accurately predict upstream and midstream development due to factors including fluctuating economic markets for oil and gas, resource availability, and potential technological advances, the Service developed an estimate of this development within the Planning Area based on a review of Oklahoma Corporation Commission (OCC) data (average number of drilled production and disposal wells from 2003 to 2012 (OCC 2012), Oklahoma Water Resources Board data (average number of water wells within the Planning Area), and in close cooperation with OIPA representatives (amount of pipeline, associated facilities, and general information).

Given our estimate that 85.8 percent of the area within the Planning Area is ABB habitat and the estimated disturbance associated with Covered Activities (as described in Section 2.0), the Service's estimated total habitat impacts to the ABB (Table 2). Approximately 0.16 percent (28,657 acres; 11,597 hectares) of the 19,612,333 acres (7,936,830 hectares) of ABB habitat may be impacted over the 24 month construction period covered in the ICP. The methods used to determine the amount of ABB habitat within the ICP Planning Area in Oklahoma (described in Section 3.3.2) have not been applied to other states within the ABB range. However, given that the ABB range expands well beyond Oklahoma, the Service anticipates that the overall percentage of range-wide ABB habitat that may be impacted by Covered Activities in this ICP is likely much smaller than 0.16 percent (the percentage of Oklahoma ABB habitat in that may be impacted by Covered Activities.

The Service believes that not all ABB habitat impacts will occur in areas occupied by the ABB (determined through surveys or assuming presence). However, without knowing the locations of the impacts, the Service cannot estimate the exact amount of occupied ABB habitat that will be

impacted. Therefore, assuming that all ABB habitat may be occupied for the purpose of estimating take, a maximum of 32,234 acres of occupied ABB habitat would be impacted.

Table 2. New impacts of Oil and Gas Development within ABB habitat (approximately 0.16 percent of the 19,612,333 acres of ABB habitat within the Planning Area)**.**

	Acres
Planning Area Size	22,858,163
ABB Habitat within Planning Area	19,612,333
New Oil and Gas Activities Anticipated within Planning Area	37,569
New Oil and Gas Activities Anticipated within ABB Habitat	32,234

Metric conversion: 1 acre = 0.4 hectares

4.0 CONSERVATION PROGRAM

The Conservation Program describes actions project proponents will implement to provide for the conservation of the Covered Species.

4.1 Biological Goals and Objectives

This ICP establishes biological goals and objectives as required under the Service's "5 Point Policy" (65 FR 35242). The conservation measures described in the ICP, including measures to conserve and enhance ABB habitat, are consistent with the long-term survival and recovery of the ABB. Specifically, the goal and objectives of the ICP, over the 24-month ICP duration, are:

Biological Goal 1: Conserve ABB habitat within established Conservation Priority Areas

Objectives:

a) Conserve in perpetuity between 0.04 (8,059 acres) - 0.32 (64,468 acres) percent of the ABB habitat in the Planning Area (19,612,333 acres), assuming full use of authorized take described in Section 3.3.4. These estimates are based on a range of potential impacts: the minimum assuming that all impacts are temporary and outside of Conservation Priority Areas (8,059 acres of mitigation as described in Section 4.2.2.3; 0.04 percent of ABB habitat in the Planning Area) and the maximum assuming all impacts are permanent and within Conservation Priority Areas (64,468 acres of mitigation as described in Section 4.2.2.3; 0.32 percent of ABB habitat in the Planning Area). Meeting this objective will contribute toward the long-term viability of ABB populations in Oklahoma by providing permanent areas conserved and

managed for the species. See Section 3.1.7 for description of Conservation Priority Areas.

b) Impact, through temporary or permanent impacts, no more than 0.16 percent of ABB habitat in the Planning Area (32,234 acres impacted within 19,612,333 acres) associated with Covered Activities.

Method of Measuring Outcome: Each Permittee will submit an annual report to the Service quantifying the total amount of ABB habitat impacted by Covered Activities. We will analyze all reports to evaluate objectives (a) and (b).

Biological Goal 2: Restore ABB habitat impacted by Covered Activities

Objectives:

a) Ensure restoration of ABB habitat at sites with temporary or permanent cover change impacts by Covered Activities.

Method of Measuring Outcome: Restoration and enhancement actions will be quantified and described in the annual report to be submitted by each Permittee, in addition to Restoration Reports (Section 7.3). We will evaluate reports from all Permits on an annual basis and determine the cumulative amount of habitat restoration and enhancement within the Planning Area.

4.2 Minimization and Mitigation Measures

Section 10(a)(2)(B) of the ESA requires that conservation programs specify what steps an applicant will take to minimize and mitigate the impacts likely to result from taking that occurs incidental to carrying out otherwise lawful activities. Before issuing a Permit, the Service must find that the applicant will minimize and mitigate the impacts of such taking to the maximum extent practicable. The measures described here are intended to minimize and mitigate those impacts that cannot be avoided. Minimization and mitigation measures are required for covered activities occurring in occupied ABB habitat (ABB habitat where ABBs are assumed or documented through a valid survey). Minimization and mitigation measures are not required for activities occurring in areas unfavorable for the ABB (see Section 3.1.2.1) or within the effective area of a valid negative survey (as described in the Service's American Burying Beetle Oklahoma Presence/Absence Live-trapping Survey Guidance), as take is not expected in these areas.

Project proponents that choose to apply for a Permit by participating in the ICP will describe and document their compliance with these measures and will include an annual summary of these actions in the annual report, described further in Section 7.3.

4.2.1 MINIMIZATION MEASURES

Many of the industry standards described in Covered Activities (Section 2.0) also serve to minimize impacts to the ABB. Additionally, Permittees must agree to implement the following minimization measures. See Section 5.1 for Changed Circumstances relating to several of the minimization measures listed below.

1. Reduce motor vehicle, machinery, or heavy equipment use

Motor vehicles, machinery, and heavy equipment can generate take of ABBs by crushing and collisions when individuals of the species are above-ground or by soil compaction when the species is underground (Section 3.2.2). Reducing the number and use of motor vehicles and heavy equipment in occupied ABB habitat can minimize impacts from these activities. Permittees will minimize the number and use of motor vehicles and heavy equipment necessary in occupied ABB habitat to meet the objectives of the project. If heavy equipment, machinery, or motor vehicle use is required in occupied ABB habitat for a project, these vehicles will be allowed only in the areas that are necessary for the required activity. All motor vehicles, machinery, and heavy equipment shall be parked within areas already impacted, areas where disturbance is planned to occur, or areas where occupied ABB habitat impacts and mitigation, as appropriate, have been assessed.

2. Reduce risk of motor vehicles sparking wildfire

Vehicle use or improper maintenance of vehicles and machinery could ignite fires during dry conditions or in areas with dry vegetation, which may cause take of ABBs (Section 3.2.2). Motor vehicles, machinery, and heavy equipment should not be parked where dry grass or vegetation could be ignited. All vehicles will be maintained according to the respective service manuals. In dry conditions, grass and debris will be cleaned away from machinery exhaust systems and bearings on a weekly basis. All bearings will be lubricated and all spark arrestors will be serviced as necessary to reduce risk of sparking a fire. Equipment necessary at each project includes: a shovel, water, and working fire extinguisher in case of accidental ignition of a wildfire.

3. Increase safety during operation fluid use and storage

Operational fluids (fuel, oil, or other fluids for maintenance of equipment) may cause take of ABBs (Section 3.2.2). Permittees must be in compliance with all applicable state and Federal laws regarding fuel use and storage. Additionally, all operational fluids (fuel and motor vehicle oil) will be stored and all equipment must be fueled within areas already impacted, areas where disturbance is planned to occur, or areas where occupied ABB habitat impacts and mitigation, as appropriate, have been assessed.

4. Reduce erosion and increase soil stability

Land erosion can directly impact ABB habitat and cause take of ABBs (see Section 3.2.3). To prevent topsoil loss, gully formation, or other negative impacts to ABB habitat, Permittees will implement erosion control techniques in accordance with prudent industry standards for sediment and erosion control. Examples of prudent industry standards are described in the Independent Petroleum Association of America's Reasonable and Prudent Practices for Stabilization of Oil and Natural Gas Exploration and Production Sites found at: ***http://www.ipaa.org/governmentrelations/reasonable-and-prudent-practices-for-stabilization-rapps-for-oil-and-natural-gas-exploration-and-production-sites/***. Permittees must comply with all state and Federal laws regarding erosion control and soil stabilization.

5. Provide educational program for construction personnel

Human presence and movement within ABB habitat may cause take of ABBs (Section 3.2.4). All workers operating in the project area will be trained about ABB habitat, biology, reasons for ABB decline, and the responsibility of all workers to protect the ABB. Standardized ABB educational information is provided on the Service's website ***www.fws.gov/southwest/es/oklahoma/ABBICP***. Permittees will provide each worker with a full color Endangered Species Card with a picture of the ABB and a summary of information about the ABB and the ICP before conducting soil disturbing activities. Permittees will post signs at all access points to the project area highlighting the areas as occupied ABB habitat and reminding workers to follow special restrictions in the area. All workers are required to report any ABB sightings to the project manager or environmental inspector, remove all food wastes from the ROW each day, and prohibit dogs or cats on the ROW (workers may not bring animals on to the ROW). Additionally, all workers must park their vehicles within already impacted areas, areas where disturbance is planned to occur, or areas where impacts and mitigation, as appropriate, have been assessed.

6. Limit use of artificial lighting

Artificial lighting (i.e., from construction or operations at night) can cause take of ABBs by interfering with normal behavior patterns (Section 3.2.5). Therefore, activities occurring during the ABB active season within occupied ABB habitat will be limited to daylight hours, other than situations described below.

Necessary lighting associated with operations or in limited instances where it is necessary to extend construction activities beyond daylight hours (e.g. to maintain the integrity of a bore hole during horizontal directional drill activities when installing a pipeline) must be down-shielded to minimize the effect on ABBs. Additionally, sodium vapor lights are required, rather than UV or mercury vapor lights near occupied ABB habitat, because they have been shown to be the least attractive to ABBs (Anshutz et al. 2007).

Drilling rigs used during production, communication towers, or emergency response situations that require lighting are not required to use sodium vapor lighting or down shield lighting.

7. Limit use of gas flares

Light sources can cause take of ABBs by interfering with the species' normal behavior patterns and increasing energetic demands (Section 3.2.5). Current technology allows for enclosure of the flame for some types of flares, thus minimizing or eliminating emitted light. Projects requiring small, constantly burning flares throughout the life of the project will cover the flame to eliminate the visibility of all natural gas flares to minimize artificial light sources that are attractive to ABBs.

8. Limit disturbance from mechanical vegetation maintenance

Vegetation maintenance following construction in areas already restored to ABB habitat (areas with temporary and permanent cover change impacts) may disturb individuals of the species and alter their normal behavior (Section 3.2.6). Vegetation maintenance frequency and duration should be restricted to that necessary to allow for visual surveys and prevent hazards (e.g., fire). Vegetation must be maintained at a height of 8 inches or more to maintain soil moisture. Vegetation maintenance activities will be completed during the ABB inactive season (approximately late September – early May) because these activities may cause take of ABBs during the active season. Given the implementation of this minimization measure, the Service believes that no additional mitigation is necessary for post-construction, intermittent non-soil disturbing operations and maintenance (for example, mowing using tractor equipment or vehicle traffic along ROW) within ABB habitat.

9. Limit herbicide use

Removal of vegetation within ABB habitat may cause take of ABBs (Section 3.2.6). Herbicides necessary for vegetation maintenance or removal in areas already restored to ABB habitat (areas with temporary and permanent cover change impacts) must be applied by licensed applicators in accordance with label directions. Herbicides must be applied using methods that minimize spray drift. If broadcast application of herbicides is necessary for effective ROW vegetation control (e.g., in areas with dense stands of target woody plants and/or invasive forbs or grasses), application equipment must be equipped with spray nozzles designed to produce an herbicide spray pattern of uniform water droplet size and apply herbicides at a calibrated rate and at a set pattern on the ROW, thus ensuring precise application. Aerial broadcast application of herbicides cannot be used. Following complete restoration of ABB habitat, herbicides used for vegetation maintenance following construction may only be applied if vegetation can be maintained at a height of 8 inches or more (to maintain soil moisture). Large equipment and vehicles necessary for application of herbicides may only be used once in a given area during the ABB active season. Any additional use of herbicide during the ABB active season must be done by hand application instead of large equipment and vehicles.

10. Set aside topsoil for replacement following construction

Projects with temporary or permanent cover change impacts that require removal of top soil within occupied ABB habitat will set aside the top soil during construction activities for restoration following construction (see “Replacement of Top Soil” in Section 4.2.2.1).

4.2.2 Mitigation Measures

4.2.2.1 Post-construction Restoration for Temporary and Permanent Cover Change Impacts

Project proponents will implement the following measures for temporary and permanent cover change project impacts:

1. Replacement of Top Soil

During restoration of project areas within occupied ABB habitat that required top soil removal during project activities (as described above), top soil will be replaced at the original location.

2. Relief of Soil Compaction

Immediately following Covered Activities that removed vegetation and compacted soils by the use of heavy equipment, and prior to vegetation re-establishment, the impacted area will be ripped to a depth of 24 inches (or to rock, if present, whichever is less), to relieve soil compaction at depths used by ABBs. This effort will improve or enhance ABB habitat by making soils easier for ABBs to bury carrion or themselves. This measure is not required for small project areas (such as maintenance work on a pipeline) where the use of tractors and ripping equipment would result in increasing the impact area.

3. Re-Establishment of Vegetation

Following Covered Activities involving removal or killing of vegetation within a project area containing occupied ABB habitat prior to impacts, vegetation will be re-established with a native species composition similar to the surrounding area or, if requested by the landowner, the same vegetation type that existed prior to impacts. Preference should be given to the establishment of native vegetation if the landowner does not have specific requests and restoration of native vegetation is feasible. If construction/soil disturbance ends during the dormant vegetation season, bare soil will be temporarily stabilized if necessary to prevent erosion. At the beginning of the next growing season (preferably prior to the start of the ABB active season in mid-late May), these areas will be re-established with vegetation. Seeds used during vegetation re-establishment must be free of invasive species seeds. Invasive species to be avoided are listed at ***http://ok-invasive-plant-council.org/images/OKinvasivespp.pdf***. Where native vegetation restoration is appropriate and feasible, species composition of re-established vegetation will be based on the native plant communities described within the United States Department of Agriculture's Ecological Site Descriptions Datasets (USDA 2011), according to the location of each project site.

For an impact to be considered temporary, vegetation must be re-established to the original density (based on visual comparison of before/after photographs of the project area and comparison to adjacent undisturbed areas) within 5 years of the initial impact. Vegetation re-established for permanent cover change impacts should be restored to the density of the grasslands or pastures nearest to the project area, preferably restored with native species.

4. Inspection of Invasive Plant Species

Because vegetation composition may change the carrion base (small mammal and bird composition) of an area, Permittees will monitor project sites with temporary or permanent cover change impacts following post-construction restoration and document any invasive species (as

listed at ***http://ok-invasive-plant-council.org/images/OKinvasivespp.pdf***) in their annual reports during the 5-year restoration period.

4.2.2.2 Offsite Habitat Mitigation through Mitigation Lands for Temporary, Permanent Cover Change, and Permanent Impacts

This section describes how impacts to occupied ABB habitat will be offset through conservation and management of ABB habitat in perpetuity. Project proponents will mitigate temporary, permanent cover change, and permanent project impacts likely to result in take of ABBs (within occupied ABB habitat) using one of the three following options:

1. ***Individual- or Permittee-responsible for mitigation lands:*** These consist of mitigation lands established by the Permittee. Such mitigation tracts must be described in detail and included in the project description. Such lands must, to the maximum extent practicable, meet the minimum standards and other requirements described in Service guidelines, *American Burying Beetle Conservation Strategy for the Establishment, Management, and Operations of Mitigation Lands* found at ***http://www.fws.gov/southwest/es/oklahoma/ABBICP***. Also described in Service guidelines, conservation easements and agreements must be approved by the Service prior to any habitat impacts that could result in take of ABBs. The Permittee or their designee is responsible for ensuring the success of and managing the mitigation land in perpetuity, even if the project is finite in duration (refer to Service guidelines).

2. ***Conservation Banks***: Conservation banks are mitigation lands that are established by a Bank Sponsor. These sites are usually established to mitigate for the effects of multiple projects. By definition a Service-approved conservation bank meets the minimum standards and other requirements described in Service guidelines (*American Burying Beetle Conservation Strategy for the Establishment, Management, and Operations of Mitigation Lands* and *Guidance for the Establishment, Use, and Operation of Conservation Banks*, found at ***http://www.fws.gov/southwest/es/oklahoma/ABBICP***). Conservation banks are established through a conservation bank agreement with the Service and conservation easements for the bank must be approved by the Service. When a Permittee chooses to mitigate through the purchase of credits in a Service-approved conservation bank, the bank sponsor is responsible for ensuring the success of and managing the mitigation land in perpetuity upon sale of the credits. If a Permittee chooses this option, Permittee must purchase appropriate credits prior to any habitat impacts that could result in take of the ABB. Permittees can visit ***http://geo.usace.army.mil/ribits/index.html***, the Regulatory In-lieu Fee and Bank Information and Tracking System (RIBITS) for information on Service-approved conservation banks with available ABB credits.

3. ***Third party mitigation lands:*** These mitigation lands are usually established for a single project or project proponent rather than multiple projects or proponents as are conservation banks. Such lands and agreements must, to the maximum extent practicable, meet the minimum standards and other requirements described in Service guidelines, *American Burying Beetle Conservation Strategy for the Establishment, Management, and Operations of Mitigation Lands* found at ***http://www.fws.gov/southwest/es/oklahoma/ABBICP***. Conservation easements and agreements must be approved by the Service prior to any habitat impacts that could result in take of ABB. The mitigation land sponsor (landowner or easement holder) is responsible for and assumes liability for the success of and management of the approved mitigation land in perpetuity.

All mitigation proposals must, to the maximum extent practicable, meet the minimum standards and other requirements described in *American Burying Beetle Conservation Strategy for the Establishment, Management, and Operations of Mitigation Lands* found at ***http://www.fws.gov/southwest/es/oklahoma/ABBICP***.

4.2.2.3 Mitigation Ratios

Mitigation ratios are established to provide appropriate mitigation for the type, duration, and location of project-related impacts and related take or effects of take. These mitigation ratios (Table 3) are set to provide progressively more mitigation for progressively more severe levels of adverse effects or take.

Each acre of temporary impact (≤5 years) occurring within the ABB range (but not within a CPA), would require 0.25 acres of mitigation (1:0.25 ratio). These mitigation ratios are the base rates for impacts within the ABB range (but not within a CPA) and increase based on location or duration. For example, the Service believes ABB Conservation Priority Areas (CPAs) contribute more towards ABB conservation compared to other areas within the species range, but not within the CPAs, and therefore the ratio for each acre of temporary impact within a CPA is one-half acre of mitigation (1:0.5). To mitigate for each acre of temporary impact within a conservation bank or on mitigation lands the mitigation ratio is 1:1.5.

Although the Service has defined impacts removing occupied ABB habitat for less than 5 years as a "temporary impact," these impacts cause take of ABBs that may negatively affect the ABB population in the area permanently. Loss of individuals and their potential offspring, even during a 5-year or less timeframe, reduces the number of ABBs in the area and may decrease genetic diversity of the population. Because the ABB is an annual species, and the offspring of one year overwinter to become the reproductive adults the following year, ABBs that are removed from the reproductive population will cause a temporary decrease in the overall

population. Therefore, the Service requires mitigation to be provided in perpetuity for these "temporary impacts" to habitat, though at a lower ratio than for "permanent impacts" to habitat.

Permanent cover change has additional impacts to ABBs compared to temporary impacts, and mitigation ratios for permanent cover change impacts are higher. For permanent cover change impacts occurring within the ABB range, 0.5 acres of mitigation will be required (1:0.5 ratio) for each acre of impact. The ratio for each acre of these impacts within a CPA is 1 acre of mitigation (1:1). To mitigate for each acre of permanent cover change impact on mitigation lands, the mitigation ratio is 1:2, which is the same as the ratio for impacts in a CPA, plus replacement for the acre of mitigation from prior projects that would be impacted by the action.

Permanent impacts to occupied ABB habitat have higher mitigation ratios (Table 3) because they are expected to result in the highest level of effects over the longest period of time. For permanent impacts (>5 years) occurring within the ABB range, 1 acre of mitigation will be required for each acre of impact (1:1 ratio). The ratio for each acre of permanent impact within a CPA is 2 acres of mitigation (1:2), and on mitigation lands, the mitigation ratio is 1:3, which is the same as the ratio for impacts in a CPA, plus replacement for the acre of mitigation from prior projects that would be impacted by the action. This will ensure that earlier mitigation is not lost to a new project, while recognizing an earlier established land-use right (i.e., mineral extraction).

Permittees will estimate which type of habitat impact will occur on each portion of the project area and mitigate appropriately, with Service approval, prior to any ground-disturbing activities likely to result in take of ABBs in occupied ABB habitat. Permittees estimating permanent impacts will mitigate at the permanent ratio prior to impacts. No additional post-construction restoration measures are required for areas mitigated under the permanent mitigation ratio.

Permittees estimating temporary or permanent cover change impacts within all or part of their project area will mitigate with appropriate ratios prior to impacts and document the impact start date (the date impacts to occupied ABB habitat began). All areas mitigated as temporary or permanent cover change impacts must implement post-construction restoration measures described in 4.2.2.1 and these areas must be restored to a condition suitable for ABB use within 5 years of the impact start date. Permittees will include information about restoration methods within their annual reports (described in Section 7.3). When a Permittee has restored these areas, they will submit their restoration report to the Service (part of the requirements of reporting described in Section 7.3 below). All take of ABBs occurring on that project site prior to restoration following the initial impact (not to exceed 5 years) does not require any additional mitigation (habitat mitigation through provision of mitigation lands or conservation bank credits). Following restoration to ABB habitat, all future impacts to the then-restored ABB habitat will be considered a new impact and will require additional minimization and mitigation measures to be considered covered under this ICP.

If the area has not become suitable for ABB use within 5 years following the temporary or permanent cover change impact start date, Permittees must provide additional mitigation prior to the end of the 5 year period, since the impact was actually permanent instead of temporary or permanent cover change. The amount of additional mitigation required is the difference between the amount of mitigation required for a permanent impact and the amount of mitigation that a Permittee previously secured as a temporary or a permanent cover change impact.

Table 3. Mitigation Ratios for ICP Planning Area. Ratios = acres of impact : acres of mitigation.

	Areas of Impact		
Impact Period	ABB Range (but not within CPA)	Conservation Priority Area	Mitigation Land
Temporary	1:0.25	1:0.5	1:1.5*
Permanent Cover Change	1:0.5	1:1	1:2*
Permanent	1:1	1:2	1:3*
*Mitigation Land ratio is equal to the CPA ratio plus the mitigation acre(s) lost.			

4.2.2.4 Location of Offsite Mitigation

All offsite mitigation provided for the ABB under this ICP must be within an ABB CPA (see Section 3.1.7 and Figure 2). The location of the impacts determines which CPA polygon the mitigation should occur in by Service Area. The Service Area of any mitigation land defines the area in which mitigation lands and conservation bank credits may be used to offset project impacts. There are two Service Areas within the ABB Range in Oklahoma (Figure 3), dividing the northern and southern portions of the ABBs Oklahoma range. The Service delineated these Service Areas to encourage development of mitigation lands in appropriate portions of the ABB range in Oklahoma. For example, although the North Service Area appears to include a relatively isolated area of ABB habitat within Oklahoma (based on current survey information), it is contiguous with the Kansas ABB metapopulation and therefore may be important to ABB recovery.

Project impacts must be mitigated within the Service Area in which the impacts occur, unless the Permittee receives written Service approval to mitigate outside of the Service Area where impacts occur. If a Permittee chooses to provide mitigation through the conservation bank option, credits can be purchased at any conservation bank within the Service Area in which the impacts occur.

If project impacts occur in more than one Service Area, the Service may require split mitigation, based on the percentage of impacts to each area (e.g., if 70 percent of the impacts occur within the North Service Area, then 70 percent of the mitigation should occur within the North Service Area).

4.3 Monitoring

4.3.1 Compliance Monitoring

Compliance monitoring verifies that Permittees are fully implementing the ICP and meeting terms and conditions of their Permit(s). Compliance monitoring requires that the Permittee prepare and submit an annual report for Service review and comment. Annual report requirements are further described in Section 7.3. Failure to comply with Permit terms and conditions or failure to implement activities prescribed in this ICP may result in suspension or revocation of the Permit (50 CFR 13.27 & 13.28). Violations of Permit terms and conditions that contribute to a violation of the ESA could also subject Permittees to criminal or civil penalties.

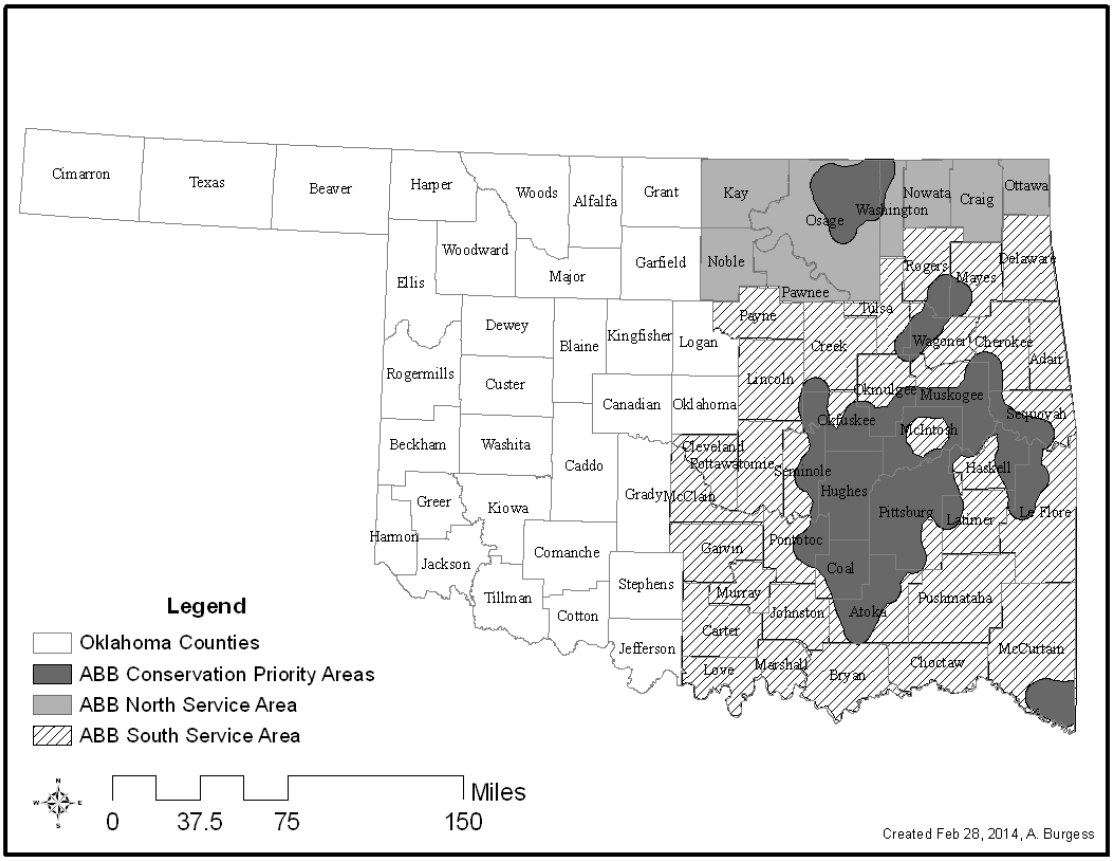

Figure 3. Service Areas and Conservation Priority Areas for the ABB within the ICP Planning Area.

Acceptance of a Permit documents the Permittee's acknowledgment of various requirements, including the obligation to allow Service staff, or other persons designated by the Service, to access, with 3-day notice, the property at any reasonable hour for the purpose of conducting compliance inspections (50 CFR 13.47).

4.3.2 Biological/Effectiveness Monitoring

Biological/Effectiveness monitoring relies on sound scientific principles and provides data used to assess whether the conservation program is working as anticipated. Monitoring will provide the scientific data necessary to evaluate the success of the ICP in meeting the Biological Goals and Objectives described in Section 4.1.

Impacts of the taking resulting from projects participating through this ICP may be mitigated by Permittees, or by acquiring conservation credits from an authorized ABB habitat conservation bank. Biological/effectiveness monitoring requirements are further described in *American Burying Beetle Conservation Strategy for the Establishment, Management, and Operations of Mitigation Lands*. Permittees are responsible for management, monitoring, and reporting the biological/effectiveness on those mitigation lands for which the Permittee is responsible (refer to American Burying Beetle Conservation Strategy for the Establishment, Management, and Operations of Mitigation Lands for reporting requirements associated with mitigation lands). Management, monitoring, and reporting the biological/effectiveness on Conservation Banks or other third party mitigation lands is the responsibility of the banker or third party, respectively.

Other than the biological/effectiveness monitoring that is being conducted on the mitigation lands, the Service will monitor and evaluate biological effectiveness of the ICP through review of annual reports and ABB presence/absence surveys. Each Permittee will allow Service staff, or other persons designated by the Service, to access the property at any reasonable hour for the purpose of monitoring ABB populations or trapping ABBs (50 CFR 13.47). Permittees will monitor restoration on project sites with temporary impacts to ensure that restoration goals are achieved. Results will be included in their annual reports and restoration report described in Section 7.3.

4.4 ADAPTIVE MANAGEMENT

Service policy (65 CFR 35242) defines adaptive management as a formal, structured approach for addressing the uncertainty inherent in all natural systems. It involves examining alternative strategies for meeting measurable biological goals and objectives, and then, if necessary, adjusting future conservation, management, monitoring, or mitigation actions based upon what is learned. Adaptive management plans are required for HCPs where there is substantial uncertainty regarding the effects of the action on the covered species or the efficacy of

minimization and mitigation measures. The adaptive management program identifies the potential need for modification of the Plan and uses research as an on-going feedback loop for continuous improvement. It should also identify triggers for certain responses and incorporate those triggers and responses into HCP implementation. If desired results are not being achieved, adjustments can be made to increase the HCP's implementation effectiveness.

Minimization and mitigation actions prescribed in this ICP will be monitored and analyzed to determine whether they are producing the anticipated results. If the desired results are not being achieved, adjustments based on monitoring and the analysis of monitoring results can be made to increase their effectiveness.

4.4.1 Adaptive Management Actions

The conservation actions described in this ICP are intended to mitigate for the impacts of the taking of the ABB resulting from Covered Activities. Management plans developed for mitigation lands (Permittee-responsible mitigation lands, conservation banks, and third party mitigation lands) incorporate adaptive management principles that provide flexibility to accommodate needed changes to achieve established biological goals and objectives as described in the *American Burying Beetle Conservation Strategy for the Establishment, Management, and Operations of Mitigation Lands*.

Adaptive management may include, but may not be limited to, periodic evaluation of the Service's protocol for ABB surveys, habitat delineation, ABB range, and ABB CPAs.

5.0 CHANGED AND UNFORESEEN CIRCUMSTANCES

The No Surprises Rule provides assurances to Permittees that no additional commitments of land, water, or financial compensation will be required for species adequately covered by the Permit under a properly implemented conservation plan without the consent of the Permittee (63 FR 8859). Regulations from 50 CFR § 17.22 (b)(5) related to no surprises, changed circumstances, and unforeseen circumstances state:

(i) *Changed circumstances provided for in the plan.* If additional conservation and mitigation measures are deemed necessary to respond to changed circumstances and were provided for in the plan's operating conservation program, the permittee will implement the measures specified in the plan.

(ii) *Changed circumstances not provided for in the plan.* Unforeseen circumstances are "changes in circumstances affecting a species or geographic area covered by a conservation plan that could not reasonably have been anticipated by plan developers or the Service at the time of the conservation plan's negotiation and development, and that result in a substantial and adverse change in the status of the covered species" (50 CFR 17.3).

5.1 Changed Circumstances Provided for in the ICP

The Service defines "changed circumstances" as "changes in circumstances affecting a species or geographic area covered by a conservation plan or agreement that can reasonably be anticipated by plan or agreement developers and the Service and that can be planned for (e.g., the listing of new species, or a fire or other natural catastrophic event in areas prone to such events)" (50 CFR § 17.3). If such changed circumstances occur during the term of the Permit, the Permittee is obligated to implement the additional conservation measures specified in the plan (50 CFR § 17.22(b)(5)(i)).

5.1.1 Assumptions Used to Develop the ICP are Incorrect

The Service, using the best available science, identifies the following assumptions within this ICP and potential Permittee responses to new information.

Assumption 1: ABB CPAs are the areas of higher ABB presence

Permittee Response to Assumption 1: The Service currently anticipates re-analyzing CPAs every three years. If research indicates that areas not selected as a CPA have high ABB numbers or if current CPAs are found to have low ABB numbers, the methods used to select CPAs will be re-evaluated during the process, potentially expanding, contracting, or shifting ABB CPAs. Following re-evaluation of CPAs, Permittees will mitigate appropriately for new impacts based on the location of project impacts, according to the latest CPA delineation method. If impacts have occurred, but restoration of temporary or permanent cover change impacts is not complete, the new CPA boundaries will not apply to the area previously impacted and additional mitigation credits will not be required.

Assumption 2: *ABB "Areas unfavorable for ABB use" are correct*

Permittee Response to Assumption 2: If research indicates that ABBs use areas described in "Areas unfavorable for ABB use," in the *ABB Impact Assessment for Project Reviews* those habitat types would be removed from the list and Permittees would need to consider these areas as ABB habitat when evaluating impacts for new projects and mitigate appropriately in occupied areas. If research indicates that ABBs avoid areas that are not currently described in "Areas unfavorable for ABB use," those areas would be added to the list and Permittees would no longer need to consider those areas as ABB habitat when evaluating impacts and mitigation in those areas would no longer be required.

Assumption 3: *Areas with "temporary impacts" or "permanent cover change impacts" become suitable for ABB use within 5 years of disturbance*

Permittee Response to Assumption 3: If research indicates that all or specific impacts to the ABB cannot be considered temporary or a permanent cover change because habitat does not become suitable for the ABB use within 5 years of disturbance, Permittees must increase mitigation ratios for all such impacts that would have previously been considered "temporary" or "permanent cover change" to the ratio for "permanent."

Assumption 4: *Vehicle use, tractor equipment, and implements used to maintain vegetation and inspect ROWs, when conducted during the ABB inactive season, and while maintaining vegetation at 8 inches or higher does not cause additional take of ABBs.*

Permittee Response to Assumption 4: If research indicates that tractor equipment in certain soil types with certain conditions would cause permanent removal of occupied ABB habitat, Permittees must use the mitigation ratio for "permanent" in areas with these soil types and/or conditions that require the use of tractor equipment for new or ongoing impacts.

Assumption 5: *Herbicides, if used as directed on the label and according to recommended minimization measures, would not cause additional take of the ABB.*

Potential Permittee Response to Assumption 5: If research indicates that a specific herbicide (or combination of herbicides) causes injury or mortality of ABBs, Permittees may no longer be allowed to use the herbicide (or specific combinations of them) within occupied ABB habitat.

Assumption 6: *Light sources that cannot be blocked, down-shielded, or use sodium vapor lights (examples include drilling rigs, some flares, and communication towers) do not attract and cause take of ABBs in habitat other than within the impacted, mitigated area.*

Potential Permittee Response to Assumption 6: If research indicates that light attracts and causes take of ABBs from outside of the area already impacted and mitigated, Permittees requiring light sources must appropriately mitigate (as based on research outcome) the area within the range of attraction to the ABB for new or ongoing activities requiring these light sources.

5.1.2 Fire, Flood, Drought, and Tornadoes

Restored ABB habitat (i.e., project areas with temporary impacts that have implemented restoration methods to restore ABB habitat as described in Section 4.2.2.1) may experience fire, flooding, or tornado impacts during the term of the ICP.

In the event that fire caused by a Permittee's activities substantially decreases the success of restoration and vegetation re-establishment efforts within 5 years of the impact start date, additional restoration actions will be repeated as necessary to restore ABB habitat within these areas within 5 years from the initial impact. If ABB habitat cannot be restored within 5 years of the initial impact due to the fire, Permittees will increase mitigation ratios for these areas to be equivalent to ratios for permanent impacts.

If natural events, such as fire, flood, drought, or tornados substantially decrease the success of restoration and vegetation re-establishment efforts, restoration actions will be repeated as necessary to restore ABB habitat in these areas within 5 years of the natural event, or the Permittees will increase mitigation ratios for these areas to be equivalent to ratios for permanent impacts.

If natural events impact project areas that had already been fully restored to ABB habitat (original density and distribution of vegetation based on visual comparison of before/after photographs of the project area and comparison to adjacent areas undisturbed by a Permittee's activities), no additional restoration or vegetation re-establishment efforts would be necessary.

If emergency operation and maintenance repairs are necessary to address the impacts of these events, such activities will be addressed as described in the "Emergency Repairs requiring Habitat Clearing" section below.

5.1.3 Delisting During Permit Term

If the ABB is delisted during the term of the Permit, it is expected that such delisting would be made partly in response to mitigation actions by the Permittees. Consequently, the Permittees may not seek any mitigation funding refund, and operation and maintenance of any established mitigation lands would continue into perpetuity. However, delisting would remove the prohibition for new project-related incidental take to occur, so restrictions related to future operation and maintenance activities within ABB habitat would no longer apply. Permittees may choose to continue implementation of these conservation measures to reduce threats to the species, especially during the Service's required 5-year post delisting monitoring of the species' status.

5.1.4 Potential Effects to Newly Listed Species or Critical Habitat

In the event that a species becomes listed under the ESA and may be affected by Covered Activities, the Service will determine whether current conservation measures in the ICP are sufficient to avoid take of the newly listed species. If not, the Service will work with Permittees to identify measures necessary to achieve avoidance of take. Permittees will implement these

measures until the Service notifies the Permittee that such measures are no longer necessary or the Permittee develops their own HCP and acquires a Permit for take of that species.

5.1.5 Emergency Repairs Requiring Habitat Clearing

Emergency repair situations may occur and could represent a changed circumstance. Damage to existing and future facilities caused by weather, degradation or malfunction of equipment, or other factors may require emergency repairs (not including spills). It is possible that damaged project materials or emergency repair operations could necessitate activities that may impact occupied ABB habitat.

Quick action to repair damaged or threatened equipment may be necessary to protect the safety of people and property in the vicinity of existing and future facilities. As such, the Permittees may conduct any emergency repairs or emergency maintenance on existing and future facilities as needed without prior notification to the Service. However, cases where these impacts are not covered by an approved IPP (see Section 7.0 below), the Permittee will notify (by e-mail to ***ABB_ICP@fws.gov***) the Service within 7 days of performance of the impacting activity that occurs in known or potential habitat for the ABB.

Upon notification, the Service will determine whether the activity resulted in a changed circumstance with respect to the ABB. If the Service determines that a changed circumstance has occurred, the following measures will be implemented:

- The Service, in cooperation with the Permittee, will determine the amount of negative impacts that rise to the level of take of the ABB resulting from the changed circumstance, based on the best available information.

- The Service will determine whether additional mitigation is needed to offset any negative impacts that rise to the level of take of ABB because of the changed circumstance. Permittees will provide mitigation to adequately cover impacts to ABB habitat.

5.1.6 Covered Species Adversely Affected by Invasive Species

If the Service determines that invasive species of plants or animals are adversely affecting the ABB to a degree not contemplated in the ICP within project areas that have been restored to ABB habitat as described in Section 4.2.2.1, Permittees will work with the Service to develop and implement an invasive species control plan for new projects and operation and maintenance activities, if appropriate (as determined by the Service). Such a plan might include modification of methods use for vegetation management (i.e., cleaning equipment to reduce spread of invasive

species) or capture or destruction of the invasive species through mechanical, biological, and in carefully limited circumstances, chemical measures.

5.1.7 ABB Range Expansion within the Planning Area

Although the Service does not currently consider Cleveland and Noble counties in Oklahoma to be a part of the current ABB range, the Service has included these counties within the Planning Area for several reasons. These counties are adjacent to counties within the ABB range that have documented ABB occurrence and habitat. The Service believes these counties may also contain potential habitat for the ABB. Additionally, these counties have not currently been widely surveyed for the ABB.

In addition to Cleveland and Noble counties, the Service believes there is potential for the ABB range to expand within counties on the western boundary of the current ABB range. Current ABB range exists in portions, but not the entirety, of Carter, Creek, Garvin, Kay, Lincoln, Love, McClain, Murray, Osage, Pawnee, Payne, and Pottawatomie counties in Oklahoma.

Therefore, the Service anticipates that ABBs may be found in these counties in the future. To prevent delays caused by the need to amend the ICP before Permittees can apply for take coverage for Covered Activities in these counties, the Service is including Cleveland and Noble counties and all portions of Carter, Creek, Garvin, Kay, Lincoln, Love, McClain, Murray, Osage, Pawnee, Payne, and Pottawatomie counties in the Planning Area at this time.

If ABBs are documented in these counties during the ICP duration and the Service adds these counties to the ABB species range, Permittees will implement ABB minimization and mitigation measures in these counties according to their Permit Terms and Conditions in order to receive take coverage for Covered Activities in these areas. Permittees will revisit the Service's Information, Planning, and Conservation (IPaC) website at ***http://ecos.fws.gov/ipac/*** within 90 days of beginning a project (as identified in Step 5 of the *Eligibility Determination for ABB ICP*) to ensure species information is correct. Results from IPaC are considered valid for 90 days.

5.1.8 Permittee Unable to Implement Minimization or Post-Construction Restoration Measures

If Permittees are unable to follow required Minimization Measures described in Section 4.2.1 and the post-construction restoration measures (for temporary or permanent cover change impacts) described in Section 4.2.2.1, additional measures must be implemented, as described below.

Minimization Measure: *Reduce erosion and increase soil stabilization*

If erosion control measures do not perform as intended and wash sediment into or disturb additional soil outside of the original project footprint, the project area must be expanded to include the additional ABB habitat that is impacted. Mitigation is required for these areas with impacts to occupied ABB habitat (temporary ratio if areas have not become suitable for ABB use within 5 years, permanent ratio if area is not restored to ABB habitat within 5 years).

Minimization Measure: *Limit disturbance from vegetation maintenance*

If a Permittee is unable to implement the vegetation maintenance minimization measure (as described in #8 in Section 4.2.2.1) additional mitigation must be provided to adequately cover impacts (temporary ratio if areas are restored to ABB habitat within 5 years, permanent ratio if area has not become suitable for ABB use within 5 years).

Post-Construction Restoration Measures: *Replacement of top soil, relief of soil compaction, and re-establishment of vegetation*

If a Permittee is unable to successfully implement any or all of the applicable post-construction restoration measures described in Section 4.2.2.1 (replacement of top soil, relief of soil compaction, re-establishment of vegetation, or inspection of invasive species) for "temporary" or "permanent cover change" impacts (for example, has not become suitable for ABB use within 5 years, landowner requests land is converted to a land cover that is unfavorable for ABB use, top soil cannot be replaced), these impacts must instead be considered a "permanent" impact. Additional mitigation must be provided to adequately cover "permanent" impacts prior to the 5 year anniversary of the initial impacts.

5.1.9 New Scientific or Commercial Data Related to Reference Documents

The information contained in reference documents on the website at ***http://www.fws.gov/southwest/es/oklahoma/ABBICP*** of the ICP is based on the best scientific and commercial data available at the time of its development. It is possible that new scientific and commercial data may become available, which could result in updates to survey protocols, species range, CPAs, and ABB habitat delineation. Following any changes and any required public notice, all Permits issued under the ICP will follow the updated reference documents.

5.2 Changed Circumstances Not Provided for in the ICP

If the Service determines that additional conservation and mitigation measures are deemed necessary to respond to changed circumstances and such measures were not provided for in the

plan's operating conservation program, the Service will not require any conservation and mitigation measures in addition to those provided for in the plan without consent of the permittee, provided the plan is being properly implemented.

5.3 Unforeseen Circumstances

Unforeseen circumstances are "changes in circumstances affecting a species or geographic area covered by a conservation plan that could not reasonably have been anticipated by plan developers or the Service at the time of the conservation plan's negotiation and development, and that result in a substantial and adverse change in the status of the covered species" (50 CFR 17.3).

From 50 CFR § 17.22 (b)(5) (iii) *Unforeseen circumstances.*

> (A) In negotiating unforeseen circumstances, the Director will not require the commitment of additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources beyond the level otherwise agreed upon for the species covered by the conservation plan without the consent of the permittee.
>
> (B) If additional conservation and mitigation measures are deemed necessary to respond to unforeseen circumstances, the Director may require additional measures of the permittee where the conservation plan is being properly implemented, but only if such measures are limited to modifications within conserved habitat areas, if any, or to the conservation plan's operating conservation program for the affected species, and maintain the original terms of the conservation plan to the maximum extent possible. Additional conservation and mitigation measures will not involve the commitment of additional land, water or financial compensation or additional restrictions on the use of land, water, or other natural resources otherwise available for development or use under the original terms of the conservation plan without the consent of the permittee.
>
> (C) The Director will have the burden of demonstrating that unforeseen circumstances exist, using the best scientific and commercial data available. These findings must be clearly documented and based upon reliable technical information regarding the status and habitat requirements of the affected species. The Director will consider, but not be limited to, the following factors:
>
> (*1*) Size of the current range of the affected species;
> (*2*) Percentage of range adversely affected by the conservation plan;
> (*3*) Percentage of range conserved by the conservation plan;
> (*4*) Ecological significance of that portion of the range affected by the conservation plan;
> (*5*) Level of knowledge about the affected species and the degree of specificity of the species' conservation program under the conservation plan; and

(*6*) Whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the affected species in the wild.

In the case of an unforeseen circumstance, the Service, any Federal, state, or local government agency, nongovernment organization, or private entity may take any actions necessary in order to conserve a species, as long as the actions are at the expense of that entity.

In the event of an unforeseen circumstance, the Service will provide at least a 30-day notice of a proposed finding of unforeseen circumstances to Permittees and will work with Permittees to develop an appropriate response to the new conditions. Permittees will have the opportunity to submit information to rebut the proposed finding, if it deems necessary.

6.0 FUNDING

Section 10(a)(2)(A)(ii) of the ESA requires that Permittees must specify the funding that will be available to implement actions that will be enacted to minimize and mitigate the impacts of the taking. The ESA also requires that the Service must find that "the applicant will ensure that adequate funding for the plan will be provided" (Section 10(a)(2)(B)(iii)).

Permittees must therefore demonstrate adequate funding sources to fully implement the actions described in the ICP and the terms and conditions of the Permit. Expenses related to these activities are the sole responsibility of the Permittee. Failure to demonstrate appropriate funding prior to IPP approval (discussed below in Section 7.0) or to meet funding obligations after the Permit is issued and IPPs are approved, may be grounds for denying IPPs for future projects or revoking or suspending an existing Permit, respectively. Permittees unable to meet the financial requirements described here may not meet qualifications for approval of IPPs and should contact the Service for additional guidance or potential approval of alternative funding mechanisms.

Funding for Off-Site Mitigation

Mitigation requirements for each Permittee's anticipated Covered Activities will be estimated during the IPP review process. If conservation banks are the selected mitigation method, documentation of credit purchase or reservation agreements must be provided to the Service prior to IPP approval. If Permittee-responsible or third party mitigation lands are the selected mitigation method, these lands must be acquired, have established endowments and completed management plans, and be approved by the Service prior to any impacts that may result in take, as described in *American Burying Beetle Conservation Strategy for the Establishment, Management, and Operations of Mitigation Lands* found on the Service's website (***http://www.fws.gov/southwest/es/Oklahoma/ABBICP***).

Funding obligations are directly related to the mitigation option(s) selected by the applicant, as described in *American Burying Beetle Conservation Strategy for the Establishment, Management, and Operations of Mitigation Lands*. If a Permittee chooses to fulfill mitigation requirements through the purchase of credits from a Service-approved conservation bank, the conservation bank will be responsible for the management of the mitigation lands secured through the purchase of bank credits. If a Permittee elects to fulfill mitigation obligations through Permittee-responsible or third party mitigation lands, all management responsibilities, including adaptive management procedures associated with those lands, must be fully funded and managed by the Permittee or designated third party entity, respectively.

Funding for Full Implementation of the ICP, Including Changed Circumstances and Post-Construction Restoration

Permittees must demonstrate funding assurances for full implementation of the ICP, including implementation of changed circumstances and restoration of areas with temporary or permanent cover change impacts. Funding required under ESA § 10(a)(2)(B)(iii) may be assured through one of the following options:

a) Financial Test and Corporate Guarantee:

(1) Permittees may satisfy the funding requirements of this section by demonstrating that they pass a financial test as specified in this paragraph. To pass this test Permittees must meet the criteria of either paragraph (i) or (ii) of this section and submit documentation of this information (signed by a corporate officer such as the CEO or Budget and Finance officer) to the Service with their IPP:

(i) The Permittee must have:

(A) Two of the following three ratios: a ratio of total liabilities to net worth less than 2.0; a ratio of the sum of net income plus depreciation, depletion, and amortization to total liabilities greater than 0.1; and a ratio of current assets to current liabilities greater than 1.5; and

(B) Net working capital and tangible net worth each at least six times the sum of the current ICP implementation cost estimates (including mitigation and Changed Circumstances), and

(C) Tangible net worth of at least $10 million; and

(D) Assets located in the United States amounting to at least 90 percent of total assets or at least six times the sum of the current ICP implementation cost estimates.

OR

(ii) The Permittee must have:

(A) A current rating for its most recent bond issuance of AAA, AA, A, or BBB as issued by Standard and Poor's or AAA, AA, A, or BAA as issued by Moody's; and

(B) Tangible net worth at least six times the sum of the current ICP implementation cost estimates; and

(C) Tangible net worth of at least $10 million; and

(D) Assets located in the United States amounting to at least 90 percent of total assets or at least six times the sum of the current ICP implementation cost estimates.

b) Letter of Credit

(1) A Permittee may satisfy the requirements of this section by obtaining an irrevocable standby letter of credit which conforms to the requirements of this paragraph and submitting the letter to the Service prior to IPP approval. The letter of credit must be effective before initiation of any impacts that may result in take of the ABB. The issuing institution must be an entity which has the authority to issue letters of credit and whose letter-of-credit operations are regulated and examined by a Federal or State agency.

(2) A Permittee who uses a letter of credit to satisfy the requirements of this section must also establish a standby trust fund. Under the terms of the bond, all payments made thereunder will be deposited by the surety directly into the standby trust fund and must be reported to the Service.

(3) The letter of credit must be accompanied by a letter from the Permittee referring to the letter of credit by number, issuing institution, and date, and providing the following information: the Permit Number, name, and address of the Permittee, and the *Estimate of ICP Implementation Costs* (***http://www.fws.gov/southwest/es/oklahoma/ABBICP***) assured by the letter of credit.

(4) The letter of credit must be irrevocable and issued for the Permit duration.

(5) The letter of credit must be issued in an amount at least equal to the amount estimated in the *Estimate of ICP Implementation Costs* document**.**

c) Trust Fund

(1) A Permittee may satisfy the requirements of this section by establishing a trust fund which conforms to the requirements of this ICP, the terms and conditions of any Permit issued under this ICP, the *Estimate of ICP Implementation Costs*, and submitting an originally signed duplicate of the trust agreement to the Service with their IPP.

(2) Deposits into the trust fund must be made annually over the term of the ICP Permit or over the remaining operating life of the Permit; this period is hereafter referred to as the "deposit period." The deposit into the trust fund must be reported to the Service and made as follows:

(i) The first deposit must be made before any impacts to ABB habitat that may result in take of the ABB. The first payment must be at least equal to the *Estimate of ICP Implementation Costs*, divided by the number of years in the deposit period. Subsequent deposits must be made no later than 30 days after each anniversary date of the first deposit.
(ii) If a Permittee establishes a trust fund and the value of that trust fund is less than the *Estimate of ICP Implementation Costs* when an IPP is approved, the ICP implementation cost estimate amount must be fully funded over the deposit period as defined above. Deposits must continue to be made no later than 30 days after each anniversary date of the first deposit throughout the term of the ICP and Permit.

(3) The Permittee may accelerate deposits into the trust fund or may deposit an amount equal to the *Estimate of ICP Implementation Costs* at any time once the fund is established.

d) Surety Bond

(1) A Permittee may satisfy the requirements of this section by obtaining a surety bond which conforms to the requirements of this ICP, the terms and conditions of any Permit issued under this ICP, and the *Estimate of ICP Implementation Costs* and submitting the bond to the Service with their IPP. The bond must be effective before IPP approval. The surety company issuing the bond must, at a minimum, be among those listed as acceptable sureties on Federal bonds in Circular 570 of the U.S. Department of the Treasury.

(2) The Permittee who uses a surety bond to satisfy the requirements of this section must also establish a standby trust fund. Under the terms of the bond, all deposits made thereunder will be deposited by the surety directly into the standby trust fund and must be reported to the Service. An originally signed duplicate of the trust agreement must be submitted to the Service with the surety bond.

(3) The bond must guarantee that the Permittee will fund the standby trust fund in an amount equal to the *Estimate of ICP Implementation Costs* and sum of the bond before any impacts under the ICP that may result in take of the ABB.

(4) Under the terms of the bond, the surety will become liable on the bond obligation if the Permittee fails to perform as guaranteed by the bond.

(5) The sum of the bond must be in an amount at least equal to the *Estimate of ICP Implementation Costs*.

e) Performance Bond

(1) A Permittee may satisfy the requirements of this section by obtaining a performance bond which conforms to the requirements of this ICP, the terms and conditions of any Permit issued under this ICP, the *Estimate of ICP Implementation Costs,* and submitting the bond to the Service with their IPP. The bond must be effective before IPP approval. The company issuing the bond must, at a minimum, be among those listed as acceptable sureties on Federal bonds in Circular 570 of the U.S. Department of the Treasury.

(2) The Permittee who uses a performance bond to satisfy the requirements of this section must also establish a standby trust fund. Under the terms of the bond, all deposits made thereunder will be deposited by the surety directly into the standby trust fund and must be reported to the Service. An originally signed duplicate of the trust agreement must be submitted to the Service with the performance bond.

(3) The bond must guarantee that the Permittee will fund the standby trust fund in an amount equal to the *Estimate of ICP Implementation Costs* and sum of the bond before any impacts under the ICP that may result in take of the ABB.

(4) Under the terms of the bond, the surety will become liable on the bond obligation if the Permittee fails to perform as guaranteed by the bond.

(5) The sum of the bond must be in an amount at least equal to the *Estimate of ICP Implementation Costs*.

f) Insurance

(1) A Permittee may satisfy the requirements of this section by obtaining insurance which conforms to the requirements of this paragraph and submitting a certificate of such insurance to the Service with their IPP. The insurance must be effective before any impacts that may result in take of the ABB. At a minimum, the insurer must be licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more States.

(2) The insurance policy must be issued for a face amount at least equal to the current *Estimate of ICP Implementation Costs*. The term “face amount” means the total amount the insurer is obligated to pay under the policy. Actual payments by the insurer will not change

the face amount, although the insurer's future liability will be lowered by the amount of the payments.

(3) The insurance policy must guarantee that funds equal to the *Estimate of ICP Implementation Costs* will be available to provide implementation of the Permit. The policy must also guarantee that once Permit is issued, the insurer will be responsible for paying out funds, up to an amount equal to the face amount of the policy, upon the direction of the Service, to such party or parties as the Service specifies.

(4) The Permittee must maintain the policy in full force and effect until the Service consents to termination of the policy by the Permittee. Failure to pay the premium, without substitution of alternate financial assurance as specified in this section, may constitute a violation of the Permit, warranting such remedy as the Service deems necessary.

(5) Each policy must contain a provision allowing assignment of the policy to a successor Permitee. Such assignment may be conditional upon consent of the insurer, provided such consent is not unreasonably refused.

(6) The policy must provide that the insurer may not cancel, terminate, or fail to renew the policy except for failure to pay the premium. The automatic renewal of the policy must, at a minimum, provide the insured with the option of renewal at the face amount of the expiring policy. If there is a failure to pay the premium, the insurer may elect to cancel, terminate, or fail to renew the policy by sending notice by certified mail to the Permittee and the Service. Cancellation, termination, or failure to renew may not occur, however, during the 120 days beginning with the date of receipt of the notice by both the Service and the Permittee, as evidenced by the return receipts.

7.0 PERMIT PROCESSING AND IMPLEMENTATION

To receive a Permit under the ICP, project proponents must submit a Permit application. The application and potential receipt of a Permit through the ICP is the first step of the approval process.

7.1 Permit Application Process

This section describes the Permit application process and provides information on the development and submission of the following items:

- A 3-200-56 *Federal Fish and Wildlife Permit Application Form* found on our website at ***http://www.fws.gov/permits/*** (including supplementary information requested in

the Permit application form: total number of acres, covered activities requested under the Permit, etc.);

- Application Processing Fee;
- A copy of the ABB ICP Eligibility Determination document
    - Project proponents interested in applying for a Permit must complete the Eligibility Determination document. This document can assist potential applicants with determining whether their project, or projects, may be eligible for a Permit under this ICP. If a proposed project is determined to not be eligible to participate through the ICP, the Eligibility Determination document provides recommendations intended to assist project proponents identify alternate processes that can help them achieve compliance with the ESA. If project proponents determine that their project, or projects, may be eligible for coverage they may seek Permit issuance through the application process.
- General map and counties included within the requested Permit coverage area (location of impacts, if known by Permit applicant, but may be the entire Planning Area if the applicant desires).

These items are located on our website at ***www.fws.gov/southwest/es/oklahoma/ABBICP***.

The total number of acres requested by the applicant within the Permit Application may either be a specific number (if known) or the total amount of take allowed within the ICP (32,234 acres). All Permits issued without a specific amount of take will state that take of "up to 32,234 acres" may be allowed through the Permit.

The Service will track the amount of take used under the ICP through the approval of IPPs (approval process described below). If the total take approved in IPPs reaches the total take analyzed under this ICP (32,234 acres), no additional IPPs will be approved by the Service (unless the total take for the ICP is amended as described in Section 7.4).

The total amount of take approved by the Service in IPPs and the amount of take remaining within the ICP will be posted on the Service's website, ***http://www.fws.gov/southwest/es/oklahoma/ABBICP.*** The amount of take will be updated following each approval of an IPP.

Permit Application Submission

Permit applications (with original signatures in blue ink), all associated information described above (and in the application instructions), and the processing fee must be submitted to the Service's Regional Office, Endangered Species Division—Environmental Review, Section 10 Permits, Room 6064, P.O. Box 1306, Albuquerque, NM 87103. For

faster processing, Applicants may also submit an electronic copy of the application by e-mail to ***FW2_HCP_Permits@fws.gov*** with the subject heading "ICP Application – Company Name."

7.2 Permit Implementation

Once a Permit is issued, the Permittee will be responsible for:

1) Fully implementing the actions described in this ICP;
2) Complying with all terms and conditions of the Permit;
3) Submitting Individual Project Packages (IPPs) and ensuring Service approval prior to initiation of impacts;
4) Ensuring that minimization measures are implemented and that adequate mitigation is in place before corresponding take occurs;
5) Monitoring and tracking their total take and impacts to occupied ABB habitat; and
6) Reporting occupied ABB habitat impacts and mitigation on an annual basis.

7.2.1 Individual Project Package Process

Following the receipt of a Permit under the ICP, Permittees are required to submit Individual Project Packages (IPPs) for Covered Activities within occupied ABB habitat occurring in the area covered by the Permit. These IPPs must be approved by the Service under the issued Permit prior to initiation of impacts. Permittees must submit IPPs electronically by e-mail to Service at ***ABB_ICP@fws.gov***. E-mail subject heading should read "Permit TEXXXXXXX – IPP – Company Name" with the applicable Permit number (found in Box 3 of Permit) and the Permittee's company name. All IPPs must contain the following:

- Individual Project Package Checklist
  - Copy of the Permit under which Permittee is requesting IPP approval;
  - A recent (within 90 days) printout of the IPaC query for the project area;
  - Map and description of the location of impacts, including photographs (as described below);
  - ABB survey results or notification that ABB presence will be assumed;
  - *Species Assessment and Mitigation Calculations for the ICP*
  - *Calculation Spreadsheet for Covered Activities*;
  - Mitigation and Funding Assurances;
    - Documentation demonstrating completion/reservation of mitigation requirements; and
    - Documentation of funding assurances and the *Estimate of ICP Implementation Costs* worksheet Each of these documents is described in more detail below.

Documents described above can be found at ***www.fws.gov/southwest/es/oklahoma/ABBICP***.

Permittees with newly-constructed oil and gas projects covered by the ICP may include both construction and operation and maintenance activities within the same IPP or may submit one IPP for construction and one for operation and maintenance activities. Permittees with oil and gas facilities existing prior to the ICP may submit IPPs for their ongoing operation and maintenance activities. The Service recognizes that it is not feasible to submit an IPP for each individual operation and maintenance activity proposed within occupied ABB habitat. Therefore, Permittees may lump these activities for multiple projects into one IPP. Individual Project Packages for operation and maintenance activities must include a general description of types of activities, estimations of typical size and frequency of operation and maintenance activities based on past activities, and typical impact type associated with activities, but are not required to provide specific location information and the exact amount of take. However, operation and maintenance IPP applications should provide as much information as possible for the Service to adequately evaluate proposed potential project(s). Mitigation completion/reservation for operation and maintenance IPPs must be documented in the IPP application and in place prior to impacts, unless it is an emergency repair as described in Section 5.1.5 of the ICP. Following operation and maintenance IPP approval, Permittees must ensure that take associated with these activities is appropriately mitigated prior to impacts.

Determining Amount of Take

Prior to submission of IPPs, the project proponent may have a qualified, federally-permitted (Section 10(a)(1)(a)) individual conduct presence/absence surveys within project areas containing ABB habitat, in accordance with the Service's most current ABB Survey Guidance (available at ***http://www.fws.gov/southwest/es/Oklahoma/***). "Take" in areas containing ABB habitat and within the effective areas of positive surveys must be minimized and mitigated appropriately (assurances of adequate mitigation must be provided) prior to project initiation. Any take of ABBs caused by these surveys are covered under the ESA § 10(a)(1)(A) Permit for scientific research. Minimization and mitigation measures are not required for activities within the effective area of a documented, valid negative survey result, as take is not expected in these areas.

A Permittee may choose to forgo surveys and assume that ABBs are present within the identified ABB habitat in their project area. Some examples of reasons the Permittee may choose to forgo surveys include:

1) Project timelines do not allow for survey protocols to be met, or

2) Project implementation will occur within the inactive season of the ABB, where surveys are not effective and a survey was not conducted after July 28th of the previous active season, or
3) The project is within or near an area known to have high numbers of ABBs (i.e., a Conservation Priority Area), or
4) The Permittee determines that assuming presence is more cost effective than paying for and waiting for survey results.

If surveys are not conducted for the entire impact area, the Permittees will assume ABB presence on all areas with ABB habitat during the IPP submission process.

Mitigation and Area of Impact Calculations

The *Species Assessment and Mitigation Calculations* and *Covered Activities Impact Area Calculations* documents provides a streamlined process that determines the amount of mitigation required to offset the impacts of incidental taking resulting from Covered Activities. Before the Service can approve an IPP, assurances of adequate mitigation must be provided. This calculator and spreadsheet assists applicants with projecting the potential amount of mitigation they will need prior to IPP approval. The *Calculation Spreadsheet for Area of Impact from Covered Activities* generates information that is used within the Mitigation Calculator.

IPaC Results and Map/Description of Project Area

Information obtained from IPaC, as identified in the *Species Assessment and Mitigation Calculations* document, will be used to identify the general Permit coverage area for each IPP. Within IPaC, Permittees should delineate their project areas by drawing a line or polygon over a map, or select by county. IPaC results will include a species list, which must be provided with the Permittee's IPP.

Permittees will use the location of project impacts to determine the appropriate location for mitigation, in accordance with the Service's *ABB Conservation Strategy for the Establishment, Management, and Operations of Mitigation Lands*. Take of ABBs occurring outside of each IPP's described location would <u>not</u> be covered under this ICP. If future incidental take is expected outside of the IPP's described location, a new IPP should be prepared and submitted that more correctly describes that project.

In addition to the IPaC Results, Permittees must submit maps and description of the area requested for IPP approval. Maps should include a large scale map with context of your project within the surrounding area, a small scale map specific to the project area. Maps should delineate ABB habitat from non-habitat (unless the entire project area is assumed to be ABB habitat).

Additionally, maps should delineate areas with anticipated temporary, permanent cover change, and permanent impacts.

Individual Project Packages that include temporary and/or permanent cover change impacts must submit color digital images taken prior to impacts, the date the photograph was taken, and the location of established photograph points (latitude and longitude recorded in NAD83). Photographs must be taken in the four cardinal directions (North, South, East, and West) at the established photograph points. For non-linear projects, such as well pads and associated surface facilities, photograph point locations must include, at a minimum, all 4 corners of the project site. For linear projects, such pipelines and electric distribution lines, photograph point locations must include, at a minimum, points every 0.25 miles along the project route. The Service prefers that pre-impact photographs be taken during late summer/early fall (August through October), but will accept pre-impact photographs taken at any time of the year. These photographs will be used to demonstrate vegetation establishment following impacts.

Mitigation Assurances

Permittees must demonstrate adequate funding for mitigation. If conservation banks are the selected mitigation method, documentation of credit purchase or reservation agreements must be provided to the Service prior to final IPP approval and initiation of impacts. If Permittee-responsible or third party mitigation lands are the selected mitigation method, these lands must be acquired, have completed management plans and perpetual protection (for example, a conservation easement), as described in the Service's *ABB Conservation Strategy for the Establishment, Management, and Operations of Mitigation Lands*, and be approved by the Service prior to the initiation of impacts. Permittees must, at a minimum, submit their plans for mitigation (type, location, status, and any reservation agreements in place) with their IPPs. Understanding that final purchase of Permittee-responsible mitigation lands, conservation bank credits, or third party mitigation lands may not be preferable prior to IPP approval, the Service will coordinate with the Permittee to ensure that mitigation funding and IPP approval are done concurrently. See Section 6.0 for more information on required funding.

Funding Assurances

In addition to mitigation funding, Permittees must also demonstrate adequate funding sources to fully implement the ICP, including complete and maintain required minimization and mitigation measures, conduct compliance and effectiveness monitoring, and implement measures that may be required due to changed circumstances. Funding options for changed circumstances and post-construction restoration are described in Section 6.0. For each IPP, Permittees must identify the selected funding option, submit applicable documentation of the selected funding assurance (as discussed in Section 6.0), and complete the *Estimate of ICP Implementation Costs* worksheet.

Understanding that establishment of some funding options may not be preferable prior to IPP approval, the Service will coordinate with the Permittee to ensure that funding and IPP approval are done concurrently.

Service Review and Notification of IPP Approval or Denial

Following the receipt of a complete IPP, the Service will review the IPP for potential approval. The Service will notify Permittees via e-mail (to the e-mail address submitted by Permittee(s) on the IPP Checklist) if and when their IPP is approved under their Permit. The Service will also correspond via e-mail if the IPP package is incomplete or has been denied for any reason.

7.2.2 Impact, Mitigation, and Post-Construction Restoration Tracking

Following Service approval of IPPs, Covered Activities under the IPP and Permit may begin. During and after implementation of Covered Activities, Permittees must:

Track Impacts to ABB

After project completion, the Permittee will document the actual amount of impacts to occupied ABB habitat. This will be necessary for two reasons: 1) impacts to occupied ABB habitat (incidental take) must be monitored and tracked to ensure that incidental take identified in the Service's Biological Opinion for the ICP has not been exceeded and 2) the Permittee must ensure that impacts to habitat did not exceed project specific estimates (based on habitat delineation above) and IPP projections (based on estimates in their IPP).

Ensure Minimization and Mitigation

The ESA requires that the conservation program meeting the requirements for Permit issuance must include measures to minimize and mitigate impacts to covered species to the maximum extent practicable. All minimization and mitigation measures, as identified in Section 4.0 of this document, should be tracked by the Permittee and reported in accordance with Section 7.3 below. Adequate mitigation, as described in the Service's *American Burying Beetle Conservation Strategy for the Establishment, Management, and Operations of Mitigation Lands* found at ***http://www.fws.gov/southwest/es/oklahoma/ABBICP***, must be in place before the corresponding take occurs.

Track Temporary and Permanent Cover Change Impacted Areas and Mitigation

An impact may be considered temporary or permanent cover change if the impacted area will be restored to an area suitable for ABB use (within 5 years of the initial impact). Permittees will

determine whether Covered Activities will cause temporary or permanent cover change impacts and mitigate appropriately for those impacts (see Temporary, Permanent Cover Change, and Permanent Impacts in Section 4.2.2.2 above). Following initial temporary or permanent cover change impacts, the Permittee may conduct additional Covered Activities within the impacted area without additional mitigation if the area has not yet been Service-validated as restored to ABB habitat (not to exceed 5 years from impact start date). For example, a Permittee determines that construction of a pipeline results in temporary and/or permanent cover change impacts and mitigates appropriately prior to impacts. Additional Covered Activities (i.e., maintenance or repair) occurring within the original construction area would not need additional mitigation, until the area has been restored to ABB habitat. If subsequent impacts or failure of restoration techniques will prevent the area from being restored to a condition suitable for ABB use within 5 years of the impact start date, then additional mitigation would be required before the 5th anniversary of the impact start date. All additional mitigation provided for these impacts must be reported in the annual report (Section 7.3 below).

7.3 Reporting

Annual Reports

An annual report of Covered Activities, as well as management activities undertaken under the terms of this ICP, will be prepared by Permittees and submitted electronically to ***ABB_ICP@fws.gov***. E-mail subject heading should read "XXXX Annual Report – Permit TEXXXXXXX – IPP #XXX" with the applicable year in four digit format, Permit number (found in Box 3 of Permit) and IPP number (found in IPP approval e-mail from Service) for the project. A copy of the cover letter (or e-mail) must be submitted to the Service's Regional Office (preferably by e-mail with the same subject heading to ***FW2_HCP_Permits@fws.gov***), Endangered Species Division - Environmental Review, Section 10 Permits, Room 6064, P.O. Box 1306, Albuquerque, NM 87103. Annual reports will be submitted by January 31 of each year that the Permit is in effect. The report will summarize information on the monitoring and management activities for all IPPs under the Permit, including:

- Permit number and IPP numbers
- Description of activity conducted within occupied ABB habitat
- Annual area (in acres) disturbed within occupied (either assumed or by surveys) ABB habitat occurring within each reporting year.
- Duration (temporary/permanent cover change/permanent) of all impacts in occupied ABB habitat
- Location (County, Township/Range/Section) of impacts
- Map identifying the location of impacts
- Habitat type impacted (CPA, non-CPA, or ABB Conservation Bank/mitigation lands)

- Minimization measures implemented within occupied ABB habitat
- Amount (acres) of mitigation required based on impacts (duration)
- Type (Permittee-responsible Mitigation Land, Conservation Bank, 3rd Party Mitigation Land) of mitigation provided
- Date of mitigation (mitigation provided but not yet used to offset impacts) credit purchase/mitigation land approval
- Total acres of mitigation provided for impacts in approved IPPs secured, but not yet applied to impacts
- Summary of the above information by year and cumulative for entire duration of this Permit (for each IPP). The amount of mitigation provided must always be higher than the amount of impacts
- All Permits that include any IPPs with temporary or permanent cover change impacts must also include:
    - Impact start date (used to determine 5 year- restoration period for temporary or permanent cover change impacts)
    - Map identifying the areas with temporary and permanent cover change impacts and restoration status
    - Number of acres with temporary or permanent cover change impacts
    - Number of acres with restoration still in progress
    - Number of acres considered by Permittee to be restored (and therefore already within separate Restoration Report described below)
    - Techniques implemented to restore areas (with temporary or permanent cover change impacts) to ABB habitat
    - Photographs of the project area are required with each annual report prior to submission of the restoration report described below. Permittees must submit color digital images, the date the photograph was taken, and the location of established photograph points (latitude and longitude recorded in NAD83). Photographs must be taken annually in the four cardinal directions (North, South, East, and West) at the established photograph points. The established photograph points used for reporting must be the same photograph points identified during the IPP approval process (described above in Section 7.2.1). Photographs must be taken annually during the late summer/early fall (August through October). These photographs will be used to demonstrate vegetation establishment following impacts.

Permittees will use the Reporting Spreadsheet for the American Burying Beetle ICP on our website. This reporting form, including the amount and type of information required, is subject to change as data organization or data needs are determined by the Service. Prior to annual report submittal, all Permittees will check the ICP website (***http:\www.fws.gov\southwest\es\oklahoma\ABBICP***) to ensure that they have the most up-to-

date reporting forms. If no impacts to the ABB occur during a given year of the Permit's duration, Permittees may send an e-mail to the Oklahoma Ecological Services Field Office at (***ABB_ICP@fws.gov***) and the Regional Office (***FW2_HCP_Permits@fws.gov***) stating that no impacts occurred during that calendar year. E-mail subject heading should read "XXXX Annual Report – Permit TEXXXXXXX – IPP #XXX – NO Impacts."

Restoration Report for Temporary or Permanent Cover Change Impacts

All IPPs with temporary or permanent cover change impacts must submit a restoration report when areas are considered by the Permittee to be fully restored to ABB habitat. This restoration report must be submitted within 5 years of Impact Start Date (without restoration the impact is considered permanent and mitigation must be increased). Restoration reports should include:

- Permit Number
- IPP Number
- Impact start date (used to determine 5 year- restoration period for temporary or permanent cover change impacts)
- Map identifying the areas with temporary and permanent cover change impacts and restoration status
- Number of acres with temporary or permanent cover change impacts
- Number of acres considered by Permittee to be restored
- Techniques implemented to restore areas (with temporary or permanent cover change impacts) to ABB habitat
- All color digital images previously taken for annual reports. Additionally, Permittees must submit photographs taken annually within two weeks of the date the pre-impact photographs were taken during the calendar year of the restoration report (for example, if pre-impact photographs were taken on July 15, 2015, the restoration report must include photographs taken within two weeks of July 15 of the given calendar year). Permittees will submit color digital images, the date the photograph was taken, and the location of established photograph points (latitude and longitude recorded in NAD83). Photographs must be taken in the four cardinal directions (North, South, East, and West) at the established photograph points. The established photograph points used for reporting must be the same photograph points identified during the IPP approval process (described above in Section 7.2.1) and annual reports.

Restoration reports must be submitted electronically to ***ABB_ICP@fws.gov***. E-mail subject heading should read "Restoration Report – Permit TEXXXXXXX – IPP #XXX" with the applicable Permit number (found in Box 3 of Permit) and IPP number (found in IPP approval e-mail from Service) for the project. This report, including the amount and type of information required, is subject to change as data organization or data needs are determined by the Service.

7.4 Permit Amendments

Clarifications and Minor Administrative Amendments

From time to time it may be necessary to clarify provisions of the ICP or Permits to address issues with respect to administration of the process or the precise meaning and intent of the language contained within those documents. Permittees may also wish to have provisions clarified and may request that the Service provide such clarifications. Clarifications do not change the substantive provisions of any of the documents in any way but merely clarify and make more precise the provisions as they exist.

In addition, it may be necessary to make Minor Administrative Amendments to the ICP that do not make substantive changes to any of the provisions, but which may be necessary or convenient, over time, to more fully represent the overall intent of the applicants and the Service. Any request for Clarification or any proposed Minor Administrative Amendment will be reviewed by the Service. If the Service approves the amendment or clarification, it will be processed and a response provided. Clarifications may be approved locally by the Field Supervisor of the Oklahoma Fish and Wildlife Service Office. Minor Administrative Amendments to the ICP may be approved by the local Field Supervisor or the Regional Office, depending on the nature of the amendment. Clarifications and Minor Administrative Amendments to the ICP shall be memorialized by a letter of agreement that will be archived at the Oklahoma Field Office and will be posted on the ICP website, ***http://www.fws.gov/southwest/es/oklahoma/ABBICP***

The ICP may be amended without amending issued Permits when the amendments are of a minor or technical nature such that the net impacts on Covered Species and levels of take resulting from the amendment are not increased over those described in the original ICP and the Service's decision documents. Examples of minor amendments to the ICP that would not require a Permit amendment include, but are not limited to, (a) minor revisions to monitoring or reporting procedures and (b) minor revisions in accounting procedures.

To propose a minor amendment to the ICP without amending their Permit, applicants must submit to the Service, in writing, a description of: (a) the proposed amendment; (b) an explanation of why the amendment is necessary or desirable; and (c) an explanation of why the applicants believe the effects of the proposal are not different from those described in the original ICP. If the Service concurs with the proposed amendment, then it shall authorize the ICP amendment in writing, and the amendment shall be considered effective upon the date of the written authorization from the Service.

Other circumstances which may require minor amendments include (but are not limited to) requests to update Permits with changes to Permittee name (such as after merger or acquisition) or mailing address.

Major Amendments

Major Amendments are modifications that result in impacts not previously analyzed, such as (but not limited to), new listing as threatened or endangered of species not addressed by this ICP that may be affected by Covered Activities, expansion of the ICP Plan Area, or the addition of Covered Activities. Substantive changes shall be processed as an amendment in accordance with the provisions of the ESA and regulations at 50 CFR Parts 13 and 17 and shall be subject to appropriate environmental review under the provisions of NEPA. Major Amendments to the ICP may be implemented by the Service following publication of the approved, amended ICP. Following completion of a Major Amendment to the ICP, all future Permits would contain the modifications contained within the Major Amendment. Previously-existing Permits will not be required to incorporate any changes caused by a Major Amendment, unless a Permittee voluntarily chooses to modify their Permit.

Major Amendments to individual Permits would be required for any modification of the Covered Activities that is expected to cause take of Covered Species not analyzed or authorized in the original Permit or if the authorized amount of take is insufficient for the Permittee's need. These amendments must be completed prior to the activities causing take. If Permittees need to expand project areas, the Service recommends that Permittees apply for an additional Permit under the ICP, rather than requesting a Major Amendment to an existing Permit.

7.5 Such Other Measures that the Service May Require

If dead, injured, or sick endangered or threatened species, migratory birds, or eagles are discovered, Permittees are required to contact the Service's Law Enforcement Office in Oklahoma (405-715-0617) for care and disposition instructions. Extreme care must be taken in handling sick or injured individuals to ensure effective and proper treatment. Care must also be taken in handling dead specimens to preserve biological materials in the best possible state for analysis of cause of death. In conjunction with the care of sick or injured endangered or threatened species or preservation of biological materials from any dead specimens, Permittees and their contractors/subcontractors have the responsibility to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

Permittees will notify (by e-mail to ***ABB_ICP@fws.gov***) the Service within 24 hours of spills or releases of crude oil, natural gas, and petroleum products (including fuel and other operational fluids) in areas with occupied ABB habitat.

If during the tenure of Permits issued through participation in the ICP, the project design and/or the extent of habitat impacts is altered, such that there may be an increase in the anticipated take of the covered species, Permittees are required to contact the Service and obtain a new Permit or IPP approval and/or amendment of their Permit before commencing any construction or other activities that might result in take beyond that described in their Permit.

The authorization granted by Permits issued through participation in the ICP will be subject to full and complete compliance with, and implementation of, the ICP and all specific conditions contained in resulting Permits. Permit terms and conditions shall supersede and take precedence over any inconsistent provisions in the ICP or other Permit documents.

Acceptance of Permits serves as evidence that Permittees understand and agree to abide by the terms of the Permit and all applicable Sections of 50 CFR Parts 13 and 17.

8.0 PREPARERS AND CONTRIBUTORS

U.S. Fish and Wildlife Service
OIPA and member Oil and Gas companies- Covered Activities data and descriptions

9.0 LITERATURE CITED

Amaral, M., A.J. Kozol, and T. French. 1997. Conservation strategy and reintroduction of the endangered American burying beetle. Northeastern Naturalist 4(3): 121-132.

Anderson, R.S. 1982. On the decreasing abundance of *Nicrophorus americanus* Olivier (Coleoptera: Silphidae) in eastern North America. The Coleopterists Bulletin 36: 362-365.

Anshutz, R.M., W.J. Allgeier, D.G. Snethen, W.W. Hoback. 2007. The impacts of light and light types on nocturnal carrion beetles, including the American Burying Beetle. Poster Presentation at North Central Branch Entomology Meeting, Winnipeg, Manitoba, Canada.

Ashmole, N.P. 1968. Body size, prey size, and ecological segregation in five sympatric tropical terns (Aves: Laridae). Syst. Zool. 17 (1968), pp. 292–304.

Backlund, D. and G. Marrone. 1995. Surveys for the endangered American burying beetle (*Nicrophorus americanus*) in Gregory, Tripp and Todd Counties, South Dakota. Final rep. to the Service, Pierre, SD. 12 pp. Unpub. MS.

Backlund, D. and G.Marrone. 1997. New records of the endangered American burying beetle, *Nicrophorus americanus* Olivier, (Coleoptera: Silphidae) in South Dakota. Coleopterists Bulletin 51(1): 53-58.

Bedick, J.C., Brett C. Ratcliffe, W. Wyatt Hoback, and Leon G. Higley. 1999. Distribution, ecology and population dynamics of the American burying beetle *Nicrophorus americanus* Olivier (Coleoptera, Silphidae)] in South-central Nebraska, USA. Journal of Insect Conservation 3(3): 171-181.

Bedick, J.C., W.W. Hoback, and M.C. Albrecht. 2006. High water-loss rates and rapid dehydration in the burying beetle, Nicrophorus marginatus. Physiological Entomology 31: 23-29.

Brown, J.H., and B. Maurer. 1987. Evolution of species assemblages: Effects of energetic constraints and species dynamics on diversification of the North American avifauna. American Naturalist 130: 1-17.

Carlton, C.E. and F. Rothwein. 1998. The endangered American burying beetle, *Nicrophorus americanus* Olivier, at the edge of its range in Arkansas (Coleoptera: Silphidae). Coleopterists Bulletin 52: 179-185.

Collins, L. and R.H. Scheffrahn. 2005. Featured creatures: Red-imported fire ant. University of Florida, Dept. of Entomology and Nematology. Publ. no. EENY-195.

Creighton, J.C. and G. Schnell. 1998. Short-term movement patterns of the endangered American burying beetle *Nicrophorus americanus*. Biological Conservation 86: 281-287.

Creighton, J.C., C.C. Vaughn, and B.R. Chapman. 1993. Habitat preference of the endangered American burying beetle (*Nicrophorus americanus*) in Oklahoma. The Southwestern Naturalist 38: 275-277.

Creighton, J.C., R. Bastarache, M.V. Lomolino, M.C. Belk. 2007. Effect of forest removal on the abundance of the endangered American burying beetle, Nicrophorus americanus. J Insect Conserv, Published online: 16 October 2007.

Damuth, J. 1991. Of size and abundance. Nature, Lond. 351**:** 268–269.

Diamond, J. 1984. Historic extinctions: a Rosetta stone for understanding prehistoric extinctions. Pages 824-862 in P. S. Martin and R. G. Klein, editors. Quaternary extinctions: a prehistoric revolution. University of Arizona Press, Tucson, Arizona, USA.

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, *PE&RS*, Vol. 77(9):858-864.

Garrott, R. A., White P.J., and Vanderbilt White C.A. 1993. Over-abundance: An Issue for Conservation Biologist? Conservation Biologist 7: 946-949.

Gittleman, J.L. 1985. Carnivore body size: ecological and taxonomic correlates. Oecologia, Berl. 67 (1985), pp. 540–554.

Godwin, W, B. 2003. Report of the discovery of the American burying beetle (*Nicrophorus americanus* Oliver) at the Texas Army National Guard facility Camp Maxey, Lamar County, Texas. Unpub. MS.

Godwin, W.B. and V. Minich. 2005. Status of the American burying beetle, *Nicrophorus americanus* Olivier, (Coleoptera: Silphidae) at Camp Maxey, Lamar County, Texas. Interagency final rep. to Texas Army Natl. Guard. 19 pp. Unpub. MS.

Grant, W.E., E.C. Birney, N.R. French, and D.M. Swift. 1982. Structure and productivity of grassland small mammal communities related to grazing-induced changes in vegetative cover. Journal of Mammalogy 63(2):248–260.

Hespenheide, H.A. 1971. Hespenheide, Food preference and the extent of overlap in some insectivorous birds, with special reference to Tyrannidae. Ibis 113**:** 59–72.

Hoback, W.W. 2011. Summary of Overwintering field activities. Report submitted to the U.S. Fish and Wildlife Service.

Hoback, W.W., S.R. Butler, and A. Conley. 2012. Trap and Relocate Effects and Impact of Vehicles on American Burying Beetle. Quarterly Report. September 15, 2012. Federal Highway Administration/Nebraska Department of Roads, Lincoln, NE.

Hoback, W.W. 2013. Research Project Quarterly Report: Compaction Effects on Burying Beetles. University of Nebraska, Kearney, Nebraska.

Holloway, A.K. and G. D. Schnell. 1997. Relationship between numbers of the endangered American Burying beetle, *Nicrophorus americanus* Olivier (Coleoptera: Silphidae) and available food resources. Biological Conservation 81:145-152.

Howard, D.R., C.L. Hall, and E. Bestul. 2012. Annual status update of the endangered American burying beetle at The Nature Conservancy's Tallgrass Prairie Preserve in Oklahoma. Unpublished report to TNC.

Jurzenski, J., D.G. Snethen, M. L. Brust, and W.W. Hoback. 2011. New Records of Carrion Beetles in Nebraska Reveal Increased Presence of the American Burying Beetle, *Nicrophorus americanus* Olivier (Coleoptera: Silphidae). Great Plains Research 21:131-43.

Karr, J.R. 1982. Population variability and extinction in the avifauna of a tropical land bridge island. Ecology 63: 1975-1978.

Kirchner, B.N., N.S. Green, D.A. Sergeant, J.N. Mink, and K.T. Wilkins. 2011. Responses of small mammals and vegetation to a prescribed burn in a tallgrass Blackland Prairie. American Midland Naturalist 166:122–125.

Kozol, A.J. 1990a. *Nicrophorus americanus* 1989 laboratory population at Boston University. Report prepared for the Service, Concord, NH. Unpub. MS.

Kozol, A.J. 1990b. The natural history and reproductive strategies of the American burying beetle, *Nicrophorus americanus*. Report to the Service, Hadley, MA. Unpub. MS.

Kozol, A.J. 1991. Annual monitoring of the American burying beetle on Block Island. Report to The Nature Conservancy, 294 Washington Street, Boston, Massachusetts. Unpub. MS.

Kozol, A.J. 1995. Ecology and population genetics of the endangered American burying beetle, *Nicrophorus americanus*. Dissertation, Boston University, Massachusetts.

Kozol, A.J., M.P. Scott, and J.A. Traniello. 1988. The American burying beetle: studies on the natural history of an endangered species. Psyche 95: 167-176.

Kozol, A.J., J.F.A. Traniello, and S.M. Wouldiams. 1994. Genetic variation in the endangered burying beetle *Nicrophorus americanus* (Coleoptera: Silphidae). Annals of the Entomological Society of America 6:928-935.

Lawton, J.H. 1990. Species richness and population dynamics of animal assemblages. In: Patterns in body size: abundance and space. Phil. Trans. R. Soc. Lond. B, 330**:** 283–291.

Lomolino, M.V., J.C. Creighton, G.D. Schnell, and D.L. Certain. 1995. Ecology and conservation of the endangered American burying beetle, Nicrophorus americanus. Conservation Biology 9:605-614.

Lomolino, M.V. and J.C. Creighton. 1996. Habitat selection, breeding success and conservation of the endangered American burying beetle, *Nicrophorus americanus*. Biological Conservation 77: 235-241.

Longcore T. and C. Rich. 2004. Ecological light pollution. Front Ecol. Environ. 2:191-198.

Martin, P.S., and R.G. Klein, editors. 1984. Quaternary extinctions: a prehistoric revolution. University of Arizona Press, Tucson.

Marvier, M., P. Kareiva, M.G. Neubert. 2004. Habitat Destruction, Fragmentation, and Disturbance Promote Invasion by Habitat Generalists in a Multispecies Metapopulation. Risk Analysis 24, 869–878.

Oklahoma Corporation Commission (OCC). 2012. 2012 Report on Oil and Natural Gas Activity Within the State of Oklahoma. Technical Services Department, Oil and Gas Conservation Division, Oklahoma City, Oklahoma.

Oklahoma Department of Transportation (ODOT). 2011. Vegetative Rehabilitation of Highway Cut Slopes in Eastern Oklahoma. Final Report – FHWA-OK-11-09.

Owen-Smith, R.N. 1988. Megaherbivores: The influence of very large body size on ecology. Cambridge University Press, Cambridge, England.

Oxley, D.J., M.B. Fenton, and G.R. Carmody. 1974. The effects of roads on populations of small mammals. Journal of Applications in Ecology 11: 51-59.

Peck, S.B. and M.M. Kaulbars. 1987. A synopsis of the distribution and bionomics of the carrion beetles (Coleoptera: Silphidae). Proceedings of the Entomological Society of Ontario. 118: 47-81.

Peters, R.H. 1983. The ecological implications of body size. Cambridge University Press, Cambridge.

Pimm, S.L., H.L. Jones, and J. Diamond. 1988. On the risk of extinction. Am. Nat. 132: 757-785.

Ratcliffe B. 1995. Nebraska's threatened and endangered species: American burying beetle. Nebraska Games and Parks commission. Unpub. MS.

Ratcliffe, B.C. 1996. The carrion beetles (Coleoptera: Silphidae) of Nebraska. Bulletin of the Nebraska State Museum Vol. 13.

Ray, J. C. 2000. Mesocarnivores in Northeastern North America: Status and Conservation Issues. WCS Working Papers No. 15. Available for download from ***http://www.wcs.org/science/***

Rosenzweig, M.L. 1968. The strategy of body size in mammalian carnivores. Amer. idl. Nat. 80: 299–315.

Schnell, G. D., A.H. Hiott and V. Smyth. 1997-2006. Evaluation of American burying beetles on the Weyerhaeuser Habitat Conservation Plan Area. Final rep. to Weyerhaeuser Company. Unpub. MS.

Schnell, G.D., A. E. Hiott, J.C. Creighton, V.L. Smyth, and A. Komendat. 2007. Factors affecting overwinter survival of the American burying beetle, Nicrophorus americanus (Coleoptera: Silphidae). Journal of Insect Conservation DOI 10.1007/s10841-007-90865.

Schoener, T.W. and G.C. Gorman. 1968. Some niche differences in three Lesser Antillean lizards of the genus Anolis. Ecology 49: 819–830.

Scott, M.P., J.F.A. Traniello, and I.A. Fetherston. 1987. Competition for prey between ants and burying beetles: differences between northern and southern temperate sites. Psyche 94: 325-333.

Scott, M.P. and J.F.A. Traniello. 1989. Guardians of the underworld. Natural History 6: 32-36.

Sikes, D.S. and Christopher J. Raithel. 2002. A review of hypotheses of decline of the endangered American burying beetle (Silphidae: *Nicrophorus americanus* Olivier). Journal of Insect Conservation 6: 103-113.

Stevens, G. 1992. Spilling over the competitive limits to species co-existence. Pages 40-56 in N. Eldredge, editor. Systematics, ecology and the biodiversity crisis. Columbia University Press, New York.

Szalanski, A.L., D.S. Sikes, R. Bischof and M. Fritz. 2000. Population genetics and phylogenetics of the endangered American burying beetle, *Nicrophorus americanus* (Coleoptera: Silphidae). Annals of the Entomological Society of America 93: 589-594.

Trumbo, S.T. 1992. Monogamy to communal breeding: exploitation of a broad resource base by burying beetles (*Nicrophorus*). Ecological Entomology 17: 289-298.

Trumbo, S.T. and P.L. Bloch. 2000. Habitat fragmentation and burying beetle abundance and success. Journal of Insect Conservation 4(4):245-252.

United States Department of Agriculture (USDA) -APHIS. 2003. Imported Fire Ants: An agricultural pest and human health hazard. March 2003 Fact Sheet.

United States Department of Agriculture (USDA) – NRCS. 2009. Natural Resources Conservation Service. Establishing Native Warm Season Grass Mixtures. April 2009 Fact Sheet.

United States Department of Agriculture (USDA) – Natural Resources Conservation Service. 2011. Ecological Site Information System Database. Ecological Site Description User

Guide. Revised January 4, 2011. Accessed at ***http://esis.sc.egov.usda.gov/Welcome/pgESDWelcome.***aspx on May 1, 2013.

United States Fish and Wildlife Service (USFWS). 1991. American burying beetle (*Nicrophorus americanus*) recovery plan. Newton Corner, Massachusetts. 80 pp.

United States Fish and Wildlife Service (USFWS). 2008a. Five-year review of the status of the American Burying Beetle. June 16, 2008. Southwest Regional Office, Albuquerque, New Mexico.

United States Fish and Wildlife Service (USFWS). 2008b. December 8, 2008 letter to Kimberly D. Bose, Federal Energy Regulatory Commission, transmitting its biological opinion regarding construction and operation of the Arkoma Connector Pipeline in Atoka, Coal, and Bryan counties, Oklahoma, by MarkWest Pioneer, L.L.C.

Vrba, E.S. 1984. Evolutionary patterns and process in the sister-group Alcephalinii-Aepycerotini (Mammalia: Bovidae). Pages 62-79 in N. Eldredege and S.M. Stanley, editors. Living fossils. Springer-Verlag, Berlin.

Walker, T.L. and W. Hoback. 2007. Effects of invasive eastern red cedar on capture rates of *Nicrophorus americanus* and other Silphidae. Env. Entolol. 36(2): 297-307.

Warriner , M.D. 2004. Survey for the American burying beetle (*Nicrophorus americanus*) On Arkansas Game and Fish Wildlife Management Areas (Coleoptera: Silphidae). Arkansas Nat. Heritage Comm. Unpubl rep. Little Rock, AR. 14 pp.

Werner, E.E. 1974. The fish size, prey size, handling time relation of several sunfishes and some implications. J Fish. Res. Bd. Can. 31: 1531–1536.

Wilcove, D.S., C.H. McLellan, and A.P. Dobson. 1986. Habitat fragmentation in the temperate zone. In M.E. Soule (ed.), Conservation Biology: The Science of Scarcity and Diversity, pp. 237-256. Sinauer Associates, Sunderlan, MA.

Wilson, E.O. 1971. The Insect Societies. Harvard University Press, Cambridge, MA.

Wilson, E.O. 1975. Sociobiology, the new synthesis. Belknap Press, Harvard University Press, Cambridge, Mass. 697 pp.

Zaret, T.M. 1980. Predation and freshwater communities. Yale University Press, New Haven, CT.

10.0 SIGNATURES

This OIL AND GAS INDUSTRY CONSERVATION PLAN Associated with Issuance of Endangered Species Act Section 10(a)(1)(B) Permits for the American Burying Beetle in Oklahoma is approved as of the last signature date below, and is in effect as of that date.

Approval Recommended:

Michelle Shaughnessy 5/21/14

Michelle Shaughnessy, Assistant Regional Director **Date**
Ecological Services
Southwest Region

Approved:

Joy E. Nicholopoulos 5/21/14

Joy E. Nicholopoulos **Date**
Deputy Regional Director
Southwest Region