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TRANSMITTAL LETTER

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Publication #546, Revision #5 Threatened and Endangered Desk Reference January 2020

INFORMATION AND SPECIAL INSTRUCTIONS:

This revision of the Threatened and Endangered Species Desk Reference includes a complete reorganization and rewrite to improve usability. This update also adds detailed species specific modules and information on the use of endangered species programmatic consultations.

CANCEL AND DESTROY THE FOLLOWING:

This desk reference supercedes the previous version of PennDOT Publication # 546, Revision #4, Threatened and Endangered Species Desk Reference that was dated December 2013

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Threatened and Endangered Species Desk Reference

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Northern Riffleshells - EnviroScience, Inc.

Bog Turtles - Skelly & Loy

Clubshell - EnviroScience, Inc.

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Preface

The Bureau of Project Delivery, Environmental Policy and Development Section (BOPD-EPDS), is committed to integrating listed species (e.g. threatened, endangered, etc.) considerations into all aspects of transportation planning and development. The listed species evaluation process will be incorporated into the Pennsylvania Department of Transportation's (PennDOT's) transportation project development process starting with the planning process, continuing through the preliminary engineering/environmental decision-making process, extending into final design processes, and continuing through construction and maintenance. To achieve this goal, the processes described herein have been developed to identify potential conflicts early in the transportation project development process to avoid and/or minimize impacts to listed species.

This desk reference has been prepared as a guidance document for use in understanding the requirements of federal and state laws and regulations on listed species when planning, designing, constructing and maintaining transportation projects. The facts of each potential situation involving listed species may vary, and therefore, may need to be considered on a case-by-case basis.

The procedures herein are not an adjudication or regulation. There is no intent on the part of PennDOT to give the procedures in this desk reference weight or deference. This document establishes the framework within which PennDOT will exercise its administrative discretion in the future. PennDOT reserves the discretion to deviate from this document if circumstances warrant. This desk reference is for informational purposes only; it is not regulatory.

Acronyms

401 WQC	Water Quality Certification under Section 401 of the Clean Water Act
ACM	Agency Coordination Meeting
AMM	Avoidance and Minimization Measures
BMP	Best Management Practice
BA	Biological Assessment
BO	Biological Opinion
BOMO	Bureau of Maintenance and Operations
BOPD	Bureau of Project Delivery
BOPD-EPDS	Bureau of Project Delivery, Environmental Policy and Development Section
BRPA	Bridge and Roadway Programmatic Agreement
CCAA	Candidate Conservation Agreements with Assurances
CEE	Categorical Exclusion Evaluation
CWA	Clean Water Act of 1977, as amended 1987
Dkey	Determination Key
DBH	Diameter Breast Height
DCNR	Pennsylvania Department of Conservation and Natural Resources
DEP	Pennsylvania Department of Environmental Protection
DM	PennDOT Design Manual
DPS	Distinct Population Segment
DSEA	Pennsylvania Dam Safety and Encroachment Act
DSR	Detailed Studies Report
E&S	Erosion and Sedimentation Control Plan
EA	Environmental Assessment
ED	Environmental Documentation
EER	Environmental Evaluation Report
EIS	Environmental Impact Statement
ECMTS	Environmental Commitments and Mitigation Tracking System
EPA	U.S. Environmental Protection Agency
EPDS	Environmental Policy and Development Section (of PennDOT)
ESA	Endangered Species Act of 1973
ESU	Evolutionarily Significant Unit

EV	Exceptional Value
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
GIS	Geographic Information System
GP	General Permit
HCP	Habitat Conservation Plan
IBCF	Indiana Bat Conservation Fund
IPaC	Information, Planning, and Conservation System
JPA	Joint Permit Application
LAA	Likely to Adversely Affect
LOD	Limit of Disturbance
LRTP	Long-Range Transportation Plan
LEDPA	least environmentally damaging, practicable alternative
MOU	Memorandum of Understanding
MU	Management Unit
MPO/RPO	Metropolitan and Rural Planning Organizations
NE	No Effect
NEPA	National Environmental Policy Act of 1969
NLEB	Northern Long-Eared Bat
NLAA	Not Likely to Adversely Affect
NMFS	National Marine Fisheries Service (aka NOAA Fisheries)
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PASPGP	Pennsylvania State Programmatic General Permit
PC	Programmatic Category
PCE	Primary Constituent Elements
PennDOT	Pennsylvania Department of Transportation
PFBC	Pennsylvania Fish and Boat Commission
PGC	Pennsylvania Game Commission
PNDI	Pennsylvania Natural Diversity Inventory
PNHP	Pennsylvania Natural Heritage Program
PS&E	Plans, Specifications, and Estimates
PSF	Project Submittal Form
QBS	Qualified Bat Surveyor

RCS	Recovery Crediting Systems
ROD	Record of Decision
ROW	Right-of-Way
RPA	Reasonable and Prudent Alternative
RPM	Reasonable and Prudent Measure
SHA	Safe Harbor Agreements
SOP	Standard Operating Procedure
SOSC	Species of Special Concern
T&E	Threatened and Endangered
TNC	The Nature Conservancy
TIP	Transportation Improvement Program
TNW	traditional navigable waters
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAP	Wildlife Action Plan
WNS	White-nose Syndrome
WOTUS	Waters of the United States
WPC	Western Pennsylvania Conservancy
WQC	Water Quality Certification

Glossary

Act – the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 *et seq.*

Action – all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas. Examples include, but are not limited to: (a) actions intended to conserve listed species or their habitats; (b) the promulgation of regulations; (c) the granting of licenses, contract, leases, easements, right-of-way, permits, or grants-in-aid; or (d) actions directly or indirectly causing modifications to the land, water, or air. [50 CFR §402.02]

Action Area – all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. [50 CFR §402.02]

Affect/Effect – to affect (a verb) is to bring about a change ("The proposed action is likely to adversely affect piping plovers nesting on the shoreline"). The effect (usually a noun) is the result ("The proposed highway is likely to have the following effects on the Florida scrub jay"). "Affect" appears throughout Section 7 regulations and documents in the phrases "may affect" and "likely to adversely affect". "Effect" appears throughout section 7 regulations and documents in the phrases "adverse effects", "beneficial effects", "effects of the action" and "no effect." [Proper grammatical usage]

Agency Coordination Meeting (ACM) – a regularly scheduled meeting sponsored by PennDOT and held with federal and state environmental resource and regulatory agencies. The goal of the meeting is to review, discuss, and resolve environmental issues associated with a particular transportation project or regional transportation planning in Pennsylvania.

Anticipated/Allowable/Authorized – in incidental take statements, the Services determine the amount or extent of incidental take "anticipated" (expected) due to the proposed action or an action modified by reasonable and prudent alternatives. When writing incidental take statements, the phrase "anticipated" rather than "allowable" or "authorized" is used by the Services, as the formal permitting of incidental take cannot occur under section 7. [Clarification of usage]

Applicant – any person (an individual, corporation, partnership, trust, association, or any other private entity; or any officer, employee, agent, department, or instrumentality of the Federal Government, of any State, municipality, or political subdivision of a State; or any other entity subject to the jurisdiction of the United States) [ESA §3(12)] who requires formal approval or authorization from a Federal agency as a prerequisite to conducting the action. [50 CFR §402.02]

Appreciably Diminish the Value – to considerably reduce the capability of designated or proposed critical habitat to satisfy requirements essential to both survival and recovery of a listed species. [Clarification of usage]

Beneficial Effects – contemporaneous positive effects without any adverse effects to the species.

Best Available Scientific and Commercial Data – to assure the quality of the biological, ecological, and other information used in the implementation of the Act, it is the policy of the Services to: (1) evaluate all scientific and other information to ensure that it is reliable, credible, and represents the best scientific and commercial data available; (2) gather and impartially evaluate biological, ecological, and other information disputing official positions, decisions, and actions proposed or taken by the Services; (3) document their evaluation of comprehensive, technical information regarding the status and habitat requirements for a species throughout its range, whether it supports or does not support a position being proposed as an official agency position; (4) use primary and original sources of information as the basis for recommendations; (5) retain these sources referenced in the official document as part of the administrative record supporting an action; (6) collect, evaluate, and complete all reviews of biological, ecological, and other relevant information within the schedules established by the Act, appropriate regulations, and applicable policies; and (7) require management-level review of documents developed and drafted by Service biologists to verify and assure the quality of the science used to establish official positions, decisions, and actions taken by the Services during the implementation of the Act. [59 FR 34271 (July 1, 1994)]

Best Management Practices (BMPs) – structural and nonstructural practices designed to minimize the impacts of transportation projects on the environment.

Biodiversity – the variety of life and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur.

Biological Assessment (BA) – a document prepared for the Section 7 process including information prepared by, or under the direction of, a Federal agency to determine whether a proposed action is likely to: (1) adversely affect listed species or designated critical habitat; (2) jeopardize the continued existence of species that are proposed for listing; or (3) adversely modify proposed critical habitat. The outcome of this biological assessment determines whether formal consultation or a conference is necessary. [50 CFR §402.02, 50 CFR §402.12]

Biological Opinion (BO) – the product of formal consultation, a document which includes: (1) the opinion of the Fish and Wildlife Service or the National Marine Fisheries Service as to whether or not a Federal action is likely to jeopardize the continued existence of listed species, or result in the destruction or adverse modification of designated critical habitat; (2) a summary of the information on which the opinion is based; and (3) a detailed description of the effects of the action on listed species or designated critical habitat. [50 CFR §402.02, 50 CFR §402.14(h)]

Bureau of Project Delivery – a major administrative unit of PennDOT whose engineering staff administers design and construction policy, oversees the Transportation Project Development Process, obtains federal approvals for specific projects, and performs various quality assurance functions.

Candidate Species – plant and animal taxa considered for possible addition to the List of Endangered and Threatened Species. These are taxa for which the Fish and Wildlife Service has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposal to list, but issuance of a proposed rule is currently precluded by higher priority listing actions. [61 FR 7596-7613 (February 28, 1996)]

Categorical Exclusion Evaluation (CEE) – a process used in accordance with NEPA to document that a Federal-Aid project or action does not have a significant effect on the environment, either individually or cumulatively, and is categorically excluded from the need to prepare an EIS or an EA. (Now part of DM-1B, Post-TIP NEPA Procedures.)

Common Name – the nonscientific name of an animal or plant most widely used and accepted by the scientific community.

Conceptual Mitigation – the initial identification of measures that would need to be implemented to minimize, offset, or avoid environmental impacts associated with a given alternative.

Conference – a process of early interagency cooperation involving informal or formal discussions between a Federal agency and the Services pursuant to 7(a)(4) of the Act regarding the likely impact of an action on proposed species or proposed critical habitat. Conferences are: (1) required for Federal actions likely to jeopardize proposed species, or destroy or adversely modify proposed critical habitat; (2) designed to help Federal agencies identify and resolve potential conflicts between an action and species conservation early in a project's planning; and (3) designed to develop recommendations to minimize or avoid adverse effects to proposed species or proposed critical habitat. [50 CFR §402.02, 50 CFR §402.10]

Conservation – the terms "conserve", "conserving" and "conservation" mean to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to [the] Act are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking. [ESA §3(3)]

Conservation Measures – are actions to benefit or promote the recovery of listed species that are included by the Federal agency as an integral part of the proposed action. These actions will be taken by the Federal agency or applicant, and serve to minimize or compensate for, project effects on the species under review. These may include actions taken prior to the initiation of consultation, or actions which the Federal agency or applicant have committed to complete in a biological assessment or similar document.

Conservation Recommendations – the Services' non-binding suggestions resulting from formal or informal consultation that: (1) identify discretionary measures a Federal agency can take to minimize or avoid the adverse effects of a proposed action on listed or proposed species, or designated or proposed critical habitat; (2) identify studies, monitoring, or research to develop new information on listed or proposed species, or designated or proposed critical habitat; and (3) include suggestions on how an action agency can assist species conservation as part of their action and in furtherance of their authorities under section 7(a)(1) of the Act. [50 CFR §402.02]

Constituent Elements – physical and biological features of designated or proposed critical habitat essential to the conservation of the species, including, but not limited to" (1) space for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, rearing of offspring, germination, or

seed dispersal; and (5) habitats that are protected from disturbance or are representative of the historic geographic and ecological distributions of a species. [ESA §3(5)(A)(i), 50 CFR §424.12(b)]

Construction Phase – the last of the five phases of PennDOT's Transportation Project Development Process in which a contractor, selected by PennDOT, constructs the improvement alternative.

Critical Habitat – for listed species consists of: (1) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of the Act, on which are found those physical or biological features (constituent elements) (a) essential to the conservation of the species and (b) which may require special management considerations or protection; and (2) specific areas outside the geographic area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the Act, upon a determination by the Secretary that such areas are essential for the conservation of the species. [ESA §3(5)(A)] Critical habitat only applies to those areas identified under the ESA as "Designated Critical Habitat". Designated critical habitats are described in 50 CFR §17 and 226.

Cumulative Effects – are those effects of future State or private activities, not involving Federal activities that are reasonably certain to occur within the action area of the Federal action subject to consultation. [50 CFR §402.02] This definition applies only to section 7 analyses and should not be confused with the broader term in the National Environmental Policy Act or other environmental laws.

Delist – the process of removing an animal or plant from the list of Endangered and Threatened Wildlife and Plants.

Designated Non-Federal Representative – the person, agency, or organization designated by the Federal agency as its representative to conduct informal consultation or prepare a biological assessment. The non-Federal representative must be designated by giving written notice to the Director. PennDOT is the Designated Non-Federal Representative for the FHWA in the Commonwealth of Pennsylvania. If a permit or license applicant is involved and is not the designated non-Federal representative, then the applicant and the Federal agency must agree on the choice of the designated non-Federal representative. [50 CFR §402.02, 50 CFR §402.08]

Destruction or Adverse Modification of Critical Habitat – a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species. [50 CFR §402.02]

Direct effects – the direct or immediate effects of the project, including any interrelated and/or interdependent activities, on a species or its habitat, regardless of whether that effect is beneficial or adverse.

Director – the Assistant Administrator for Fisheries for the National Marine Fisheries Service, or his or her authorized representative; or the Director of the U.S. Fish and Wildlife Service, or his or her authorized representative.. [50 CFR §402.02]

Discountable Effects – are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur. [Clarification of usage]

Distinct Population Segment – "population", or "distinct population segment" are terms with specific meaning when used for listing, delisting, and reclassification purposes to describe vertebrate stock that may be added or deleted from the list of endangered and threatened species. The use of the term "distinct population segment" will be consistent with the Services' population policy. [61 FR 4722-4725 (February 7, 1996)]

Downlist – to reclassify an endangered species to a threatened species based on alleviation of any of the five listing factors provided under section 4(a)(1) of the ESA.

Early Consultation – a preliminary consultation requested by a Federal agency on behalf of a prospective permit or license applicant prior to the filing of an application for a Federal permit or license. [50 CFR §402.11]

Ecosystem – dynamic and interrelating complex of plant and animal communities and their associated nonliving (e.g. physical and chemical) environment.

Ecosystem Approach – protecting or restoring the function, structure, and species composition of an ecosystem, recognizing that all components are interrelated.

Effects of the Action – all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action. [50 CFR §402.02]

Endangered (PGC Definition) – species in imminent danger of extinction or extirpation throughout their range in this Commonwealth if the deleterious factors affecting them continue to operate. The term includes:

- Species whose numbers have already been reduced to a critically low level or whose habitat has been so drastically reduced or degraded that immediate action is required to prevent their extirpation from this Commonwealth.
- Species whose extreme rarity or periphery places them in potential danger of precipitous declines or sudden extirpation throughout their range in this Commonwealth.
- Species that have been classified as "Pennsylvania Extirpated", but which are subsequently found to exist in this Commonwealth as long as the conditions listed in subparagraph (i) or (ii) are met.
- Species determined to be "endangered" under the Endangered Species Act of 1973 (16 U.S.C.A. §§1531-1544).

Endangered Species (ESA Definition) – any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the provisions of this Act would present an overwhelming and overriding risk to man. [ESA §3(6)]

Endangered Species (PGC and PFBC Definition) – all species and subspecies of wildlife which have been declared by:

- The Secretary of the United States Department of the Interior to be threatened with extinction and appear on the Endangered Species List or the Native Endangered Species List published in the Federal Register, or
- The director to be threatened with extinction and appear on the Pennsylvania Endangered Species List published in the Pennsylvania Bulletin.

Endangered Species Act of 1973, as amended – federal legislation intended to provide a means whereby the ecosystems upon which endangered and threatened species depend may be conserved, and provide programs for the conservation of those species, thus preventing extinction of native plants and animals. [16 U.S. C. 1531 et seq.]

Endangered Species Permit – a document issued by the Service under authority of Section 10 allowing an action otherwise prohibited under Section 9 of the Endangered Species Act.

Endemic Species – a species native and confined to a certain region; having comparatively restricted distribution.

Environmental Assessment (EA) –

1. An exploratory report prepared for environmental clearance when the significance of impacts is not clearly known. An EA provides the analysis and documentation to determine whether an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI) should be prepared. (Now part of DM-1B, Post-TIP NEPA Procedures.)

2. A section of the DEP Joint Permit Application that presents the potential impacts on the physical, chemical, and biological characteristics of the aquatic ecosystems and Special Aquatic Sites in the project area.

Environmental Baseline – refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline. [50 CFR §402.02]

Environmental Impact Statement (EIS) – a written assessment required by NEPA analyzing the anticipated significant effects, both positive and negative, which a prospective action may have on the quality of the environment. The term “environment” encompasses the natural and physical environment and the relationship of people with that environment. (Now part of DM-1B, Post-TIP NEPA Procedures.)

Environmental Policy and Development Section (EPDS) – the section within PennDOT that develops long-range environmental and cultural resources policy and procedural guidance for PennDOT, leading to consistent and predictable best practices in environmental stewardship for transportation projects. EPDS also provides environmental and cultural resource services to PennDOT during the planning, design, construction, maintenance, and daily operation of transportation projects.

ESA – the Endangered Species Act of 1973, as amended, 16 U.S. C 1531 et seq.

ESA Webtool - an online tool to streamline preparation of Biological Assessments (BAs) and the consultation process under Section 7 of the Federal Endangered Species Act for projects where the Federal Highway Administration (FHWA) is the lead federal action agency.

Essential Habitat – contains habitat features critical to a species' viability. Includes any habitat used during a species' life cycle. Habitat units referred to as "occasional" and even "preferred" may not qualify as essential.

Export – the transfer of plants, or parts thereof, across state lines for profit.

Extinct species – a species no longer in existence.

Extirpated species – a species no longer surviving in regions that were once part of their range.

Federal agency – any department, agency, or instrumentality of the United States. [ESA §3(7)]

Field View – a site visit conducted by PennDOT to gather or verify data, define scopes of work, perform analyses, and make decisions about activities for specific projects. Field views are also used for meetings with permitting and other resource agencies to discuss permits and mitigation requirements.

Final Design Phase – the third of five phases of PennDOT's Transportation Project Development Process. It includes preparation of final right-of-way plans for property acquisition and construction plans and specifications for bidding contracts.

Fish or wildlife – any member of the animal kingdom, including without limitation any mammal, fish, bird (including any migratory, non-migratory, or endangered bird for which protection is also afforded by treaty or other international agreement), amphibian, reptile, mollusk, crustacean, arthropod or other invertebrate, and includes any part, product, egg, or offspring thereof, or the dead body parts thereof. [ESA §3(8)]

Formal consultation – a process, conducted under Section 7 of the Endangered Species Act, between the Services and a Federal agency or applicant that: (1) determines whether a proposed Federal action is likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat; (2) begins with a Federal agency's written request and submittal of a complete initiation package; and (3) concludes with the issuance of a biological opinion and incidental take statement by either one of the Services. If a proposed Federal action may affect a listed species or designated critical habitat, formal consultation is required (except when the Services concur, in writing, that a proposed action "is not likely to adversely affect" listed species or designated critical habitat). [50 CFR §402.02, 50 CFR §402.14]

Geographic Information System (GIS) – a computer-based system that provides users with the tools to visualize, question, analyze, and interpret data to understand relationships, patterns, and trends within geographic space.

Habitat – the location where a particular taxon of plant or animal lives and its surroundings (both living and nonliving) and includes the presence of a group of particular environmental conditions surrounding an organism including air, water, soil, mineral elements, moisture, temperature and topography.

Habitat Conservation Plan or HCP – under Section 10(a)(2)(A) of the Act, a planning document that is a mandatory component of an incidental take permit application, also known as a Conservation Plan. Habitat Conservation Plans are specific to Section 10 and are not developed as part of the Section 7 process under the Act.

Harass – is defined by FWS as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering, resulting in "take". [50 CFR §17.3]

Harm – is defined by FWS to include significant habitat modification or degradation that result in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering, resulting in "take". [50 CFR §17.3]

Historic Range – those geographic areas the species was known or believed to occupy in the past.

Implementation Schedule – an outline of actions, with responsible parties, estimated costs and timeframes, for meeting the recovery objectives in the species recovery plan.

Implementing Agreement – an agreement that legally binds the permittee to the requirements and responsibilities of a habitat conservation plan and section 10 permit. It may assign the responsibility for planning, approving, and implementing the mitigation measures under the HCP.

Incidental Take – take of listed fish or wildlife species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by a Federal agency or applicant. [50 CFR §402.02]

Incidental Take Permit – a permit issued under Section 10 of the Federal Endangered Species Act to private parties undertaking otherwise lawful projects that might result in the take of an endangered or threatened species. Application for an incidental take permit is subject to certain requirements, including preparation by the permit applicant of a conservation plan, generally known as a "Habitat Conservation Plan" or "HCP".

Incidental Take Statement – a term referring to that part of a biological opinion, issued under Section 7 of the Act, that exempts incidental take of a listed species from the Section 9 prohibitions.

Indirect Effects – those effects that are caused by the proposed action and are later in time, but still reasonably certain to occur. [50 CFR §402.02]

Informal Consultation – an optional process that includes all discussions, correspondence, etc., between the Service and the Federal agency or the designated non-Federal representative, designed to assist the Federal agency in determining whether formal consultation or a conference is required. If during informal consultation it is determined by the Federal agency, with the written concurrence of the Service, that the action is not likely to adversely affect listed species or critical habitat, the consultation process is terminated, and no further action is necessary. Upon receipt of a written request consistent with paragraph (c)(1) of this section, the Service shall provide written concurrence or non-concurrence with the Federal agency's determination within 60 days. The 60-day timeframe may be extended upon mutual consent of the Service, the Federal agency, and the applicant (if involved), but shall not exceed 120 days total from the date of receipt of the Federal agency's written request. [50 CFR §402.02, 50 CFR §402.13]

Interdependent Actions – actions having no independent utility apart from the proposed action. [50 CFR §402.02]

Interrelated Actions – actions that are part of a larger action and depend on the larger action for their justification. [50 CFR §402.02]

Is Likely to Adversely Affect – the appropriate finding in a biological assessment (or conclusion during informal consultation) if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or beneficial (see definition of "is not likely to adversely affect"). In the event that the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, then the proposed action "is likely to adversely affect" the listed species. If incidental take is anticipated to occur as a result of the proposed action, an "is likely to adversely affect" determination should be made. An "is likely to adversely affect" determination requires the initiation of formal section 7 consultation. [Clarification of usage]

Is Likely to Jeopardize Listed Species/Adversely Modify Designated Critical Habitat – the appropriate conclusion when the action agency or the Services identify situations where the proposed action is likely to jeopardize the listed species or adversely modify designated critical habitat. If this conclusion is reached, formal consultation is required, or in the case of species or designated critical habitat proposed for listing, a conference is required. [Clarification of usage].

Is Not Likely to Adversely Affect – the appropriate conclusion when effects on a listed species are expected to be discountable, insignificant or completely beneficial.

Insignificant Effects – relate to the size of the impact and should never reach a scale where take occurs.

Jeopardy Biological Opinion – a Service Section 7 biological opinion that determines that a Federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

Jeopardize the Continued Existence Of – to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species. [50 CFR §402.02]

Joint Permit Application (JPA) – the process required for the obstruction and encroachment of Waters of the United States, including wetlands. The Joint Permit streamlines the permit application process by providing a single form for both the state and federal permits required for the project.

Letter – refers to all written correspondence, such as letters, memoranda, or electronic mail messages, relating to formal or informal consultation. [Clarification of usage]

Listed Species – any species of fish, wildlife or plant which has been determined to be endangered or threatened under section 4 of the Act. [50 CFR §402.02]

Listing – the formal process through which the Service adds species to the Federal List of Endangered and Threatened Wildlife and Plants.

Listing Priority – candidate species under consideration for listing as threatened or endangered are sorted into five priority categories or "bins" based on the available biological data, threats to the species, conservation efforts planned or underway that can address those threats, and the existence of any new or developing science that can help inform the status review. The methodology ensures the species most in need of consideration for listing are addressed first.

The five prioritization bins for pending status reviews, listed in priority order, are:

1. Highest Priority: Critically Imperiled – Species that appear to be critically imperiled and in need of immediate action.

2. Strong Data Available on Species' Status – Species for which we have existing strong scientific data supporting a clear decision on status.

3. New Science Underway to Inform Key Uncertainties – Species for which important emerging science on their status is underway to answer key questions that may influence the petition finding; uncertainty about species' status can be resolved in a reasonable timeframe.

4. Conservation Efforts in Development or Underway – species for which proactive conservation efforts by states, landowners and stakeholders are underway or being developed. The conservation efforts should be organized and likely to reduce threats to the species. Conservation efforts should be developed or in place within a reasonable timeframe to be considered for placement in this bin.

5. Limited Data Currently Available – Species for which there is little information on status and threats available to inform a petition finding.

Major Construction Activity – a construction project (or other undertaking having similar physical effects) which is a major Federal action significantly affecting the quality of the human environment as referred to in the National Environmental Policy Act (NEPA, 42 U.S.C 4332(2)(C)). [50 CFR §402.02]

May Affect – the appropriate conclusion when a proposed action may pose any effects on listed species or designated critical habitat. When the Federal agency proposing the action determines that a "may effect"

situation exists, then they must either initiate formal consultation or seek written concurrence from the Services that the action "is not likely to adversely affect" [see definition above] listed species. [Clarification of usage]

Migratory game bird – any game bird defined in 50 CFR §20.11 (relating to meaning of terms), except as otherwise provided in Pennsylvania Game Commission regulations.

Migratory waterfowl - all species defined in 50 CFR by the United States Fish and Wildlife Service of the Department of the Interior.

Minor Change Rule – reasonable and prudent measures [specified by the Service when preparing incidental take statements], along with the terms and conditions that implemented them, cannot alter the basic design, location, scope, duration, or timing of the action and may involve only minor changes. [50 CFR §402.14(i)(2)]

Mitigation Measures – measures taken to offset the negative impacts of a project to protected species.

National Environmental Policy Act (NEPA) of 1969 – federal legislation requiring federal entities to consider and document the environmental impacts of their actions and decisions. PennDOT is delegated responsibility by FHWA for performing some tasks required by NEPA.

National Pollution Discharge Elimination System (NPDES) – mandated by Section 402 of the CWA for projects that involve the discharge of pollutants into surface waters (including wetlands) for disposal purposes. The EPA has granted DEP the authority to administer NPDES permits under the Pennsylvania Clean Streams Law.

Naturally Occurring – plant species whose natural range occurs in this Commonwealth.

No Effect – the appropriate conclusion when the action agency determines its proposed action will not affect a listed species or designated critical habitat. [Clarification of usage]

Occupied Critical Habitat – critical habitat that contains individuals of the species at the time of the project analysis. A species does not have to occupy critical habitat throughout the year for the habitat to be considered occupied (e.g. migratory birds). Subsequent events affecting the species may result in this habitat becoming unoccupied. [Clarification of usage]

PA Chapter 105 – the law that regulates Waters of the Commonwealth by issuing a permit that is required in accordance with Pennsylvania's Dam Safety and Encroachments Act of 1978, contained in Pennsylvania Code Title 25, Chapter 105, Dam Safety and Waterway Management Regulations. This permit is required for projects involving the construction, modification, or relocation of any dam, water obstruction, or encroachment. Activities that impact wetlands normally require a Chapter 105 permit. DEP automatically forwards PA Chapter 105 permit applications to the USACE in fulfillment of Section 401 of the CWA application requirements.

Participation Plan – a plan describing the means to carry out one or more tasks outlined in the Implementation Schedule of a species recovery plan, minimizing the socioeconomic impacts of the action.

Pennsylvania Endangered – a classification of plant species, designated under "Conservation of Pennsylvania Native Wild Plants" (17 Pa. Code §45.1-91), which are in danger of extinction throughout most or all of their range within this Commonwealth, if critical habitat is not maintained or if the species is greatly exploited by man. This classification also includes populations of plant species that have been classified as Pennsylvania Extirpated, but which subsequently are found to exist in this Commonwealth.

Pennsylvania Extirpated – a classification of plant species, designated under 17 Pa. Code §45.1-91, believed by the Pennsylvania Department of Conservation and Natural Resources, to be extinct within this Commonwealth. The plants may or may not exist outside this Commonwealth. If plant species classified as Pennsylvania Extirpated are found to exist, the species automatically will be considered to be classified as Pennsylvania Endangered.

Pennsylvania Rare – a classification of plant species which are uncommon within this Commonwealth because they may be found in restricted geographic areas or are low in numbers throughout the Commonwealth.

Pennsylvania Threatened – a classification of plant species, designated under 17 Pa. Code §45.1-91, which may become endangered throughout most or all of their natural range within this Commonwealth, if critical habitat is not maintained to prevent their further decline in this Commonwealth, or if the species is greatly exploited by man.

Pennsylvania Vulnerable – a classification of plant species, designated under 17 Pa. Code §45.1-91, which are in danger of population decline within this Commonwealth because of their beauty, economic value, use as a cultivar or other factors which indicate that persons may seek to remove these species from their native habitats.

Pennsylvania Natural Diversity Inventory (PNDI) – project screening tool for reviewing the state's native biological diversity, under the guidance of the DCNR.

Permit – written permission from an agency with governing authority over a regulated resource.

Petition (Listing) – a formal request, with the support of adequate biological data, suggesting that a species, with the support of adequate biological data, be listed, reclassified, or delisted, or that critical habitat be revised for a listed species.

Plant – any member of the plant kingdom, including, without limitation, seeds, roots, and other parts thereof [ESA §3(13)]

Population – "population," or "distinct population segment," are terms with specific meaning when used for listing, delisting, and reclassification purposes to describe a discrete vertebrate stock that may be added or deleted from the list of endangered and threatened species. The term "population" will be confined to those distinct population segments officially listed, or eligible for listing, consistent with section 4(a) of the Act and the Services' population policy. [61 FR 4722-4725 (February 7, 1996)]

Possession – the detention and control, or the manual or ideal custody, of anything which may be the subject of property, for one's use and enjoyment, either as owner or as the proprietor of a qualified right in it and

either held personally or by another who exercises it in one's place and name. Possession includes the act or state of possessing and that condition of facts under which one can exercise his power over a corporeal thing at his pleasure to the exclusion of all other persons. Possession includes constructive possession which means not actual but assumed to exist where one claims to hold by virtue of some title without having actual custody. The presence in a vehicle of any kind, or its attachments, of any unlawfully taken game or wildlife or unlawful device or contraband is presumptive evidence of its possession by all persons occupying the vehicle or its attachments.

Preliminary Biological Opinion – the opinion issued as a result of early consultation. [50 CFR §402.02]

Programmatic Consultation – consultation addressing an agency's multiple actions on a program, regional or other basis. [50 CFR §402.02]

Proposed Critical Habitat – habitat proposed in the Federal Register to be designated as critical habitat, or habitat proposed to be added to an existing critical habitat designation, under section 4 of the Act for any listed or proposed species. [50 CFR §402.02]

Proposed Species – any species of fish, wildlife or plant that is proposed in the Federal Register to be listed under section 4 of the Act. [50 CFR §402.02]

Range – the geographic area a species is known or believed to occupy.

Reasonable and Prudent Alternatives – recommended alternative actions identified during formal consultation that can be implemented in a manner consistent with the intended purpose of the action, that can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that the Director believes would avoid the likelihood of jeopardizing the continued existence of listed species or the destruction of adverse modification of designated critical habitat. [50 CFR §402.02]

Reasonable and Prudent Measures – actions the Director believes necessary or appropriate to minimize the impacts, i.e., amount or extent, of incidental take. [50 CFR §402.02]

Reclassify – the process of changing a species' official threatened or endangered classification.

Recovery – improvement in the status of listed species to the point at which listing is no longer appropriate under the criteria set out in section 4(a)(1) of the Act. [50 CFR §402.02]

Recovery Outline – the first Service recovery document provided for a listed species. While very brief, the document serves to direct recovery efforts pending the completion of the species' recovery plan.

Recovery Permit – permits issued under Section 10(a)(1)(A) of the Federal Endangered Species Act for scientific research and other activities benefiting the recovery of Federally listed species.

Recovery Plan – a document drafted by the Service or other knowledgeable individual or group, that serves as a guide for activities to be undertaken by Federal, State, or private entities in helping to recover and conserve endangered or threatened species.

Recovery Priority – a number, ranging from a high of 1 to a low of 18, whereby priorities to listed species and recovery tasks are assigned. The criteria on which the recovery priority number is based are degree of threat, recovery potential, taxonomic distinctiveness, and presence of an actual or imminent conflict between the species and development activities.

Recovery Unit – management subsets of the listed species that are created to establish recovery goals or carrying out management actions. To lessen confusion in the context of section 7 and other Endangered Species Act activities, a subset of animal or plant species that needs to be identified for recovery management purposes will be called a "recovery unit" instead of a "population." [Clarification of usage]

Resource Agencies – federal and state agencies that review regulated projects for consistency with environmental laws and policies. These agencies include but are not limited to:

- United States Army Corps of Engineers (USACE);
- United States Environmental Protection Agency (EPA);
- United States Fish and Wildlife Service (USFWS);
- Pennsylvania Department of Agriculture (PDA);
- Pennsylvania Department of Conservation and Natural Resources (DCNR);
- Pennsylvania Department of Environmental Protection (DEP);
- Pennsylvania Fish and Boat Commission (PFBC);
- Pennsylvania Game Commission (PGC); and
- Pennsylvania Historical and Museum Commission (PHMC).

Scientific Name – a formal, Latinized name applied to a taxonomic group of animals or plants. A species scientific name is a two-part combination consisting of the name of the genus, followed by species name.

Scientific Take Permit – a type of recovery permit authorized under Section 10 allowing for research pertaining to species recovery such as taking blood samples from a peregrine falcon for genetic analysis or conducting surveys of freshwater mussel beds to determine species status and distribution. [ESA §10]

Section 4 – the section of the Endangered Species Act of 1973, as amended, outlining procedures and criteria for: (1) identifying and listing threatened and endangered species; (2) identifying, designating, and revising critical habitat; (3) developing and revising recovery plans; and (4) monitoring species removed from the list of threatened and endangered species. [ESA §4]

Section 4(d) Rule – a special regulation developed by the Service under authority of Section 4(d) modifying the normal protective regulations for a particular threatened species when it is determined that such a rule is necessary and advisable to provide for the conservation of that species. [ESA §4(d)]

Section 6 – the section of the Endangered Species Act that authorizes the Service to provide financial assistance to States through cooperative agreements supporting the conservation of endangered and threatened species. [ESA §6]

Section 7 – the section of the Endangered Species Act of 1973, as amended, outlining procedures for interagency cooperation to conserve Federally listed species and designated critical habitats. Section 7(a)(1) requires Federal agencies to use their authorities to further the conservation of listed species. Section 7(a)(2) requires Federal agencies to consult with the Services to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Other paragraphs of this section establish the requirement for conducting conferences on proposed species; allow applicants to initiate early consultation; require FWS and NMFS to prepare biological opinions and issue incidental take statements. Section 7 also establishes procedures to seeking exemptions from the requirements of section 7(a)(2) from the Endangered Species Committee. [ESA §7]

Section 7 Consultation – the various section 7 processes, including both consultation and conference if proposed species are involved. [50 CFR §402]

Section 9 – the section of the Endangered Species Act of 1973, as amended, that prohibits the taking of endangered species of fish and wildlife. Additional prohibitions include: (1) import or export of endangered species or products made from endangered species; (2) interstate or foreign commerce in listed species or their products; and (3) possession of unlawfully taken endangered species [ESA §9]

Section 10 – the section of the Endangered Species Act of 1973, as amended, that provides exceptions to section 9 prohibitions. The exceptions most relevant to transportation actions are takings allowed by two kinds of permits issued by the Services: (1) scientific take permits and (2) incidental take permits. The Services can issue permits to take listed species for scientific purposes, or to enhance the propagation or survival of listed species. The Services can also issue permits to take listed species incidental to otherwise legal activity. [ESA §10]

Section 402 – the section of the CWA that established the NPDES permit program. [Not to be confused with Part 402 – Interagency Cooperation of the ESA (50 CFR §402)]

Section 404 – the section of the CWA that establishes the permit program for discharging dredged or fill material into WOTUS, including wetlands.

Service(s) – the Fish and Wildlife Service or the National Marine Fisheries Service (or both).

Special Concern Population – a classification that is composed of colonies, groups or single individuals of a plant species that DCNR has determined to be a unique occurrence deserving protection. Among the factors that may be used to classify a plant population within this category are the existence of unusual geographic locations, unisexual populations or extraordinary diverse plant populations.

Species – includes any subspecies of fish or wildlife or plants, any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature. [ESA §3(16)]

Survival – for determination of jeopardy/adverse modification: the species' persistence as listed or as a recovery unit, beyond the conditions leading to its endangerment, with sufficient resilience to allow for the potential recovery from endangerment. Said another way, survival is the conditions in which a species continues to exist into the future while retaining the potential for recovery. This condition is characterized

by a species with a sufficient population, represented by all necessary age classes, genetic heterogeneity, and number of sexually mature individuals producing viable offspring, which exists in an environment providing al of the requirements for completion of the species' entire life cycle, including reproduction, sustenance, and shelter. [Clarification of usage]

Take (PGC) – to harass, pursue, hunt for, shoot, wound, kill, trap, capture, possess or collect any game or wildlife, including shooting at a facsimile of game or wildlife, or attempt to harass, pursue, hunt for, shoot, wound, kill, trap, capture or collect any game or wildlife or aiding, abetting or conspiring with another person in that purpose.

Take (USFWS) – to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct. [ESA §3(19)]

Tentatively Undetermined – a classification of plant species which are believed to be in danger of population decline, but which cannot presently be included within another classification due to taxonomic uncertainties, limited evidence within historical data or insufficient data.

Threatened (PGC Definition) – species that may become endangered within the foreseeable future throughout their range in this Commonwealth unless the causal factors affecting the organism are abated. The term includes:

- Species whose populations within this Commonwealth are decreasing or have been heavily depleted by adverse factors and while not actually endangered, are still in critical conditions.
- Species whose populations may be relatively abundant in this Commonwealth but are under severe threat from serious adverse factors that have been identified and documented.
- Species whose populations re rare or peripheral and in possible danger of severe decline throughout their range in this Commonwealth.
- Species determined to be "threatened" under the Endangered Species Act of 1973 that are not listed as "Pennsylvania Endangered."

Threatened Species (ESA Definition) – any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. [ESA §3(20)]

Threatened species (PGC and PFBC Definition) – all species and subspecies of wildlife which have been declared by:

- The Secretary of the United States Department of the Interior to be in such small numbers throughout their range that they may become endangered in their environment worsens and appear on a Threatened Species List published in the Federal Register; or
- The director to be in such small numbers throughout their range that they may become endangered if their environment worsens and appear on the Pennsylvania Threatened Species List published in the Pennsylvania Bulletin.

Transportation Improvement Program (TIP) – the first four years of projects, constrained by anticipated funding, on the long-range transportation plan established by each region's metropolitan planning organization (MPO) or rural planning organization.

Unlisted – plant species which are native to this Commonwealth, presently capable of sustaining their populations successfully, not in need of protection currently and currently not included in classifications under this chapter.

Unoccupied Critical Habitat – designated critical habitat not occupied (i.e. not permanently or seasonally occupied) by the federally listed species at the time of the project analysis. The habitat may be suitable, but the species has been extirpated from this portion of its range. Conversely, critical habitat may have been designated in areas unsuitable for the species, but restorable to suitability with proper management, if the area is necessary to either stabilize the population or assure eventual recovery of a listed species. As recovery proceeds, this formerly unoccupied habitat may become occupied. Some designated, unoccupied habitat may never be occupied by the species, but was designated since it is essential for conserving the species because it maintains factors constituting the species habitat. For example, critical habitat may be designated for an upstream area maintaining the hydrology of the species' habitat downstream. [Clarification of usage]

Waters of the Commonwealth – includes all inland, tidal and boundary waters, whether navigable or non-navigable, under the jurisdiction of the Commonwealth. The term includes ice that forms on these waters.

Waters of the United States – includes all inland, tidal and boundary waters, whether navigable or non-navigable, under the jurisdiction of the United States.

Watershed – the total land area that drains to a river system.

Wetland – areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs, and similar areas.

Wild Plant – any and all naturally occurring native flora, except those commonly considered an agricultural commodity, including green and non-green species or subspecies for any part, seed or offspring thereof.

Wild Resource – all fauna not commonly pursued, killed or consumed either for sport or profit, but not including any domestic fauna or any domestic fauna that has reverted to feral existence, and all flora not commonly considered an agricultural commodity.

Chapter 1:
PennDOT and Listed Species

Regulatory compliance and environmental stewardship are key facets of the Pennsylvania Department of Transportation's (PennDOT) mission. As PennDOT advances a transportation project, the goal is to select, design, and construct the most reasonable, practical, cost-effective, technically sound, and environmentally sensitive transportation improvement option. Projects that could affect listed species must follow a specific process and comply with various state and federal regulations.

1.A. What Are Listed Species?

Plant and animal species may be listed and protected at either the state or federal level, or both, depending on the health of the state population compared to that of the U.S. population as a whole. Other considerations include the range of a particular species, if that range extends into the state, or if the species is believed to be extirpated from the state. Species may be listed at the state level while healthy populations may occur throughout the U.S.

Before a species can receive the protection provided by The Endangered Species Act of 1973 (ESA), it must first be added to the federal lists of endangered and threatened wildlife and plants. The List of Endangered and Threatened Wildlife (50 CFR 17.11) and the List of Endangered and Threatened Plants (50 CFR 17.12) contain the names of all species that have been determined by the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS) to be in the greatest need of federal protection.

A species is added to the list when it is determined to be endangered or threatened because of any of the following factors:

- the present or threatened destruction, modification, or curtailment of its habitat or range;
- overutilization for commercial, recreational, scientific, or educational purposes;
- disease or predation;
- the inadequacy of existing regulatory mechanisms; or
- other natural or manmade factors affecting its survival.

At the federal level, listed species include those plants and animals designated as endangered, threatened, proposed, or candidate. The Federal Highway Administration (FHWA) and PennDOT only pursue agency coordination for endangered and threatened species, species proposed as endangered or threatened, and designated and proposed critical habitat. Project review consultation for candidate species does not occur except for those cases where PennDOT is attempting to be proactive and develop prelisting conservation actions or agreements.

The federal definition of endangered species is any species in danger of extinction throughout all or a significant portion of its range. Threatened species are any species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Proposed species are any species of fish, wildlife, or plant that have been proposed in the Federal Register to be listed under Section 4 of the ESA. Proposed species typically become listed within one year of the date of publication in the Federal Register. Candidate species are plant and animal taxa under consideration for possible addition to the List of Endangered and Threatened Species in the ESA. These are taxa for which the USFWS has information on file regarding biological vulnerability and threat(s), but for which an official determination has yet to be made. The USFWS reviews the list of candidate species annually to update their status and determine if they can be removed from the candidate list or if their listing priority should change. The annually updated assessments of individual species are also the basis for a summary document, the Candidate Notice of Review (CNOR). The CNOR is published in the Federal Register and includes an updated list of candidate species.


Northeastern Bulrush, A. Brookens

At the state level, listed species designations include endangered, threatened, rare, vulnerable, special concern, and tentatively undetermined. The FHWA and PennDOT only pursue agency review and coordination for species listed as endangered and threatened. Conservation recommendations made by the agencies may be pursued subject to the Natural Resources Assessment and Mitigation Agency Partnering Policy (Publication 546, 2019 Version References).

State definitions for endangered and threatened species match the federal definitions in the ESA. Pennsylvania rare species are uncommon within the Commonwealth because they may be found in restricted geographic areas or are low in numbers throughout the Commonwealth. Pennsylvania vulnerable species are in danger of population decline within the Commonwealth because of their beauty, economic value, use as a cultivar, or other factors which indicate that persons may seek to remove these species from their native habitats. Special concern populations are composed of colonies, groups, or single individuals of a species that have been determined to be a unique occurrence deserving protection. Tentatively undetermined species are believed to be in danger of population decline but cannot presently be included within another classification due to taxonomic uncertainties, limited evidence within historical data, or insufficient data.

1.B. Why Are Listed Species Important?

As stated in the ESA:

> ***"these species of fish, wildlife, and plants are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people. Various species of fish, wildlife, and plants in the United States have been rendered extinct as a consequence of economic growth and development untempered by adequate concern and conservation. Other species have been so depleted in numbers that they are in danger of or threatened with extinction."***

The ESA was passed in 1973 to conserve "the ecosystems upon which endangered and threatened species depend," and to conserve and recover federally listed species.

1.C. Listed Species Regulations and Policies

Listed species are protected under federal and state laws. The primary laws that protect listed species in Pennsylvania are the following:

- The Endangered Species Act of 1973 (ESA)
- Wild Resource Conservation Act of 1982 (Act 170 of 1982) (32 P.S. §§ 5301-5314)
- Conservation of Pennsylvania Native Wild Plants (17 PA Code § 45.1-91)
- Pennsylvania Game and Wildlife Code (34 Pa.C.S. §§ 102, 925, 2164-67, and 2924)
- Pennsylvania Fish and Boat Code (30 Pa.C.S. §§102, 2502, 2504, and 2506)

These laws established regulatory programs that are administered by the USFWS, Pennsylvania Fish and Boat Commission (PFBC), Pennsylvania Game Commission (PGC), and Pennsylvania Department of Conservation and Natural Resources (DCNR). See ***Appendix A*** for useful websites and Chapter 5 for general information pertaining to the federal and state regulations that protect listed species in Pennsylvania. For in-depth detail of the ESA regulations, including informal and formal consultation, programmatic consultation and streamlining, and compensatory mitigation, refer to the ESA in Detail module.

Any person or entity—including PennDOT—who impacts a listed species must obtain authorization (approval) from the regulatory agency or agencies with jurisdiction over the affected species[1]. "Impacts" include filling, regrading, piping, draining, or flooding a listed species' habitat. Absent proper authorization, heavy fines may be assessed, or criminal charges may be filed against those knowingly violating any provision of these regulations and policies.

1.D PennDOT and Listed Species

This desk reference has been prepared to support PennDOT's environmental compliance and stewardship responsibilities. It provides guidance on federal and state laws and regulations that protect listed species in Pennsylvania, and the application of these laws and regulations to PennDOT projects.

For the purposes of this desk reference, protected or "listed" species for which review and environmental clearance **must be pursued** are those federal and state listed species classified as **Endangered, Threatened, Federally Proposed Species, or Federally Designated Critical Habitats**. However, in accordance with the FHWA's and PennDOT's Natural Resources Assessment and Mitigation Agency Partnering Policy (Publication 546 2019 Version References), PennDOT may take conservation stewardship action and assess natural resources and species that are not otherwise protected. The resource agencies (USFWS, PFBC, PGC, DCNR) may consider the unprotected natural resources biologically unique, of special ecological importance or societal value. Mitigation for these resources will be considered following the processes outlined in the Natural Resources Assessment and Mitigation Agency Partnering

[1] State-listed plants are not afforded the same level of legal protection as other species and impacts by "any person or entity" may not apply. However, as a state agency, PennDOT must obtain authorization from DCNR for impacts to state-listed plant species.

Policy (Publication 546 2019 Version References). Processes that assure that any mitigation be ecologically or socially relevant and "a reasonable expenditure of public funds." Mitigation or conservation best management practices (BMPs) may also be required for aquatic species as per Pennsylvania Department of Environmental Protection (DEP) Chapter 105 regulations.

Of course, the most effective form of regulatory compliance is to identify and avoid impacts to listed species from the earliest stages of a project. Addressing project needs, constructability and costs of avoidance and minimization must be considered when determining implementation of avoidance and minimization measures. Impacting listed species triggers permitting and mitigation requirements that may also add costs and delays. Project teams must carefully consider and select a balanced, constructible alternative.

PennDOT's highway operations are generally grouped into five phases, listed below. Regulatory compliance related to listed species is required during each phase.

- Planning and Programming Phase – Conduct secondary data source investigations and permitting feasibility, including budget and schedule.
- Preliminary Design Phase – Coordinate with appropriate agencies, perform surveys for listed species if necessary, perform avoidance, minimization, and effects analyses, and initiate mitigation planning with the appropriate agencies.
- Final Design Phase – Complete avoidance analysis, finalize agency coordination, and finalize mitigation requirements.
- Construction Phase – Implement permit conditions and incidental take statement terms and conditions. Operations and Maintenance Phase – Implement permit conditions, complete consultation and/or agency coordination, and implement terms and conditions of any biological opinions and incidental take statements.

Chapter 1 Summary

1. Regulatory compliance and environmental stewardship are key facets of PennDOT's transportation mission.

2. Listed species are important because they are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people.

3. Listed species are protected under federal and state laws.

4. PennDOT and FHWA recognize the following designations as "listed" requiring review and environmental clearance: Endangered, Threatened, Federally Proposed Species, or Federally Designated Critical Habitats.

5. PennDOT and FHWA may take conservation stewardship action and assess natural resources and species that are not listed as part of their Natural Resources Assessment and Mitigation Agency Partnering Policy (Publication 546 2019 Version References), if those resources are biologically unique, ecologically important, or have societal value. Mitigation for these resources will be considered under the policy but must be ecologically or socially relevant and "a reasonable expenditure of public funds."

6. DEP may require conservation BMPs for aquatic species under Chapter 105 regulations.

7. PennDOT's first choice is to avoid impacts to listed species; sometimes impacts are unavoidable.

8. All PennDOT work that may affect listed species is subject to federal and state regulations and requires approvals from the USFWS, PGC, PFBC, or DCNR.

9. Regulatory compliance related to listed species is required during each phase of PennDOT's highway operations: planning and programming, preliminary design, final design, construction, and operations and maintenance.

Chapter 2:
MPO/RPO Planning and Maintenance Planning Guides

2.A MPOs/RPOs Planning and Programming

During the initial transportation planning phases, PennDOT and its *planning partners*, typically the metropolitan planning organizations (MPOs) and rural planning organizations (RPOs), take responsibility for identifying potential transportation problems. The planning partners are asked to help develop project needs, identify potential alternatives, and create a fundable transportation plan. The transportation plan contains proposals and potential projects that will sustain and enhance the transportation network and our commonwealth's communities. Once the planning partners' proposals become projects to be developed and delivered, information from the pre-transportation improvement program (pre-TIP) and TIP project delivery procedures will be carried through to the post-TIP project delivery procedures. For further details regarding the process refer to the PennDOT Design Manual 1 publication series (Publication. 10).

Decisions regarding how available transportation funds are to be disbursed are made in the pre-TIP and TIP/State Transportation Improvement Plan (STIP) phases (Steps 1 through 4) of PennDOT's transportation program development and project delivery process. The post-TIP phases contain the bulk of the National Environmental Policy Act (NEPA) process (Steps 5 and 6). In the past, the pre-TIP planning phases and the post-TIP NEPA phases were predominately separate processes. However, PennDOT's transportation program development and project delivery process now includes increased consideration of project purpose and need, environmental impacts, alternatives, mitigation, and costs in the pre-TIP phases. We identify in this chapter the listed species related data collection and documentation necessary during the pre-TIP/TIP/STIP (Steps 1 through 4).

In preparing documents to comply with NEPA, a number of issues are addressed, including wetlands, streams, productive agricultural lands, displacements, community impacts, economic impacts, hazardous wastes, air and noise, historic structures, archaeology, Section 4(f) resources, and species of special concern.

NEPA balances issues relevant to a project – natural resources, socio-economic and cultural resources, while the ESA and other state statutes and regulations mentioned in ***Chapter 5, Overview of Applicable Laws and Regulations*** focus only on listed species. It is recommended to address NEPA, the ESA, and the other state listed species statutes and regulations concurrently during the development of transportation projects. Listed species coordination feeds into the NEPA process and should be considered for all levels of NEPA documentation. Coordination for state and federally listed species is initiated through the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review (ER) tool, which is a web-based tool used to identify potential impacts to listed species depending on the nature and location of the proposed project. Use of the PNDI ER tool is discussed in greater detail in ***Chapter 3, Project Guide***.

Listed species review and coordination is considered during many of the following steps of the transportation program development and project delivery process:

- Pre-TIP and TIP Activities
  - Proposal Evaluation (Step 3)
  - Proposal Addition to TIP/STIP (Step 4)
- Post-TIP NEPA Procedures
  - Preliminary Engineering and NEPA Decision (Step 5)
  - Final Design and Construction (Step 6)

Pre-TIP and TIP activities occur during the planning phase and listed species review for these steps is discussed in this chapter. Post-TIP NEPA procedures occur beginning in the preliminary engineering phase. Listed species coordination required for these steps is discussed in ***Chapter 3, Project Guide***.

2.A.1. Pre-TIP and TIP Listed Species Activities

Pre-TIP and TIP activities include project planning, screening, prioritization and programming. All projects go through a preliminary environmental screening prior to being programmed on a TIP. The preliminary environmental screening includes a review using the PNDI ER tool, generating a draft PNDI receipt. Use of the PNDI ER tool is discussed in greater detail in ***Chapter 3, Project Guide***. Administrative activities also include estimating the level of necessary environmental documentation, selecting a consultant (optional), establishing a technical support data file containing pertinent technical information collected during the environmental evaluation, and conducting a start-up meeting.

1. Problem Assessment (Step 1).

   The first step in the process is "problem assessment." Activities related to listed species do not typically occur during this step of the process.

2. Proposal Identification (Step 2)

   The second step in the Process is "proposal identification." Activities related to listed species do not typically occur during this step of the process.

3. Proposal Evaluation (Step 3)

   Once problems have been assessed and proposals have been identified, the proposals to address transportation problems are evaluated using PennDOT Connects proposal screening forms. Readily available land use, community context, environmental, cost, and engineering information is collected collaboratively between PennDOT and the regional planning organization in a standardized way and documented on the PennDOT Connects proposal screening form and

attachments. The completion of the PennDOT Connects proposal screening forms will include a review using the PNDI ER tool, generating a draft PNDI receipt. Summarize the findings of the draft PNDI receipt and attach the summary and the receipt to the PennDOT Connects proposal screening form, as appropriate. Use of the PNDI ER tool is discussed in greater detail in ***Chapter 3, Project Guide***. If the draft PNDI receipt indicates that further coordination with a resource agency is necessary, final coordination should wait until the project reaches the design phase (Step 5).

> **NOTE:** When using the PNDI ER tool during the planning and programming phases, a draft PNDI receipt should be generated but not finalized. Finalization may require additional agency coordination that is not necessary during the planning/programming process.

EPDS has compiled the species-specific construction restrictions and developed a guide that can be useful for project planning and scheduling purposes. This guide can be found in ***Appendix E***. This information can also be summarized and attached to the PennDOT Connects proposal screening forms as appropriate. This assessment, pursued by the MPO/RPO, should occur in coordination with the district environmental manager and other PennDOT and FHWA representatives as necessary.

Piping Plover, USFWS

NOTE: Agency Involvement in Planning

The agency coordination meeting (ACM) is available for use by the MPO/RPOs in order to involve the resource agencies in the transportation planning process. Opportunities for involving the agencies include participating in the development of long-range transportation plans (LRTPs), reviewing LRTPs and the TIP project selection process, review of the results of planning or feasibility studies, identification of potential risks, and discussing potential mitigation opportunities associated with long-range transportation improvements as required by legislation. Early and active participation with the ACM or ACM agencies is encouraged.

In response to these presentations, the agencies are expected to offer guidance and insight related to resources of concern, potential environmental mitigation activities and potential areas to carry out these activities, and potential permitting issues along with any other relevant information that could affect the long term implementation of the overall transportation plan.

It is recommended that for the ACM, MPO/RPOs and districts present the TIP plus four additional years of proposed projects. These proposed projects must have started the collaborative planning process and have documented the location, purpose and need, and run the environmental queries that are included in the proposal screening form. All other proposed projects on the LRTP should, at a minimum, be reviewed in PennDOT One Map to identify potential environmental resource impacts.

Additional information on ACM is included in Appendix E of Design Manual DM1X (Appendices to Design Manuals 1, 1A, 1B, and 1C).

4. Project Addition to TIP/STIP (Step 4)

   Candidate proposals are listed in funding categories and by prioritization in terms of timeliness of need to be addressed in regional TIPs, and become the short-range transportation planning document that is incorporated as the STIP. The Process intends that all environmental screening and public participation activities are documented appropriately by this time, and that the documentation can be moved forward to NEPA practitioners for use, without the need for rework.

   The documentation is intended to be contained in the PennDOT Connects proposal screening form database (Bureau of Planning and Research) and include associated attachments. This documentation may be digital data imported into the ECMS system. This is the handoff to preliminary engineering and environmental clearance activities for many projects.

2.B. Considering Listed Species During Maintenance Planning Activities

When planning and conducting maintenance activities, the district maintenance staff, county manager and assistant county managers need to be aware of and consider activities and the impact that they may have on the environment. There are certain maintenance activities that will require listed species consideration and resource agency coordination. To this end, it is important for county managers, assistant county mangers and forepersons to be aware of which assemblies/activities may affect listed species in their county and to consider these conflicts in planning work and developing schedules. These assemblies may require resource agency coordination for listed species, typically pursued with the assistance of the district environmental manager, that require additional time. In addition, there may be seasonal restrictions on performing the work that need to be considered in the planning and scheduling phases. Refer to Publication 23 for details on planning maintenance work and Publication 113 for additional information regarding specific maintenance assemblies/activities that may affect listed species.

Listed species review and coordination is considered during many of the following steps of maintenance planning:

Clubshell, G. Zimmerman

1. Needs Assessment – Roadway and Bridge Surveys

   The first step in the process is "needs assessment." Activities related to listed species do not typically occur during this step of the process, however, use of bridge structures by bat species or peregrine falcons may be identified in bridge survey reports and should be noted for use in planning work at these locations.

2. Long Range Planning – 4-5-year plan period

   The second step in the Process is "long range (strategic) planning". A county's long-range plan period is typically a 4-5-year plan as opposed to the PennDOT long-range plan which typically covers a 12-year period. The maintenance long-range plan establishes the direction for the subsequent intermediate and weekly plans. During development and monitoring of the long-range plan, county management should become aware of listed species known to occur within their county and maintenance activities that may result in conflicts with these species (see Publication 113). A summary of the species and their counties of potential occurrence is provided in **Table 2-1**. Maintenance assemblies that may affect these species are identified in Publication 113 and in the species modules associated with this publication (Publication 546).

Table 2.1 – Federally Listed Species Counties of Occurrence (as addressed in Publication 113)

District	Species/Species Group	County(ies)
1-0	Freshwater mussels	All counties
	Eastern Massasauga	Crawford, Mercer & Venango
	Bats	All counties
2-0	Freshwater mussels	McKean & Potter
	Bats	All counties
3-0	Bats	All counties
4-0	Bats	All counties
5-0	Bog Turtles	All counties
	Bats	All counties
6-0	Bog Turtles	Bucks, Chester & Montgomery
	Bats	All counties
8-0	Bog Turtles	Adams, Cumberland, Dauphin, Franklin, Lancaster, Lebanon & York
	Bats	All counties
9-0	Bats	All counties
10-0	Freshwater mussels	Armstrong, Butler, Clarion & Indiana
	Eastern Massasauga	Armstrong, Butler & Clarion
	Bats	All counties
11-0	Freshwater mussels	All counties
	Eastern Massasauga	Lawrence
	Bats	All counties
12-0	Freshwater mussels	Westmoreland
	Bats	All counties

Maintenance activities impacting undisturbed areas beyond existing pavement and graded shoulders may require a PNDI review and/or permits. Activities involving ground (earth) disturbance will most likely require a PNDI search. Ground disturbance as defined here would include ditch cleaning, shoulder cutting and debris removal. PNDI searches should also be conducted for activities involving pipes or drainage hydrologically connected (water flowing to or from) wetlands or streams. Maintenance activities that require permits, such as an Erosion & Sedimentation Control permit, 9999 permit, GP-11, GP-7, GP-3 permit, NPDES permit, or Section 404/Chapter 105 Joint permits may require resource agency coordination before the permit is approved. Additional communication with the district permit coordinator early in the project may be a good idea to determine whether a permit is necessary for the project. This information may be helpful in assessing how and when resource agency coordination should take place.

With the assistance of the district environmental unit as needed, verify the potential for conflicts by conducting a review using the PNDI ER tool, generating a draft PNDI receipt for these

situations. To facilitate the district environmental staffs' ability to provide technical assistance, the following items should be provided for their use:

- Map of the area (U.S. Geological Survey (USGS) 7.5-minute map series (1:24,000 scale) with quad name or Type 10 preferable), with project location highlighted and the S.R., segments and offsets clearly labeled.
- Project description.
- Photographs of the project area.
- A hand sketch of the project area.
- Timetable indicating when the activity is scheduled to take place.
- Identification of who is performing the activity.

These items will help the district environmental staff determine what coordination may be required for the maintenance activity. If these items are not available, a minimum of the map and project description is still required.


Dwarf Wedgemussel, USFWS

Use of the PNDI ER tool and any further coordination with a resource agency if necessary is discussed in greater detail in ***Chapter 3, Project Guide***. If the draft PNDI receipt indicates that further coordination with a resource agency is necessary, final coordination should be pursued just prior to annual planning. Listed species conflicts may impact how or when a maintenance activity is pursued that could result in additional budget needs and/or work scheduling calendar considerations.

> **NOTE:** If the activity requires the use of the PNDI ER tool during the long-range planning phase, a draft PNDI receipt should be generated but not finalized. Finalization may require additional agency coordination that is not necessary until shortly before development of the annual work plan and work scheduling calendar.

3. Annual Planning

Listed species conflicts can affect the annual work plan, and if unknown prior to development of the plan may result in the need to process annual work plan changes. Depending on the listed species, seasonal restrictions affecting the work scheduling calendar should be considered in the

same manner as cycle maintenance during development of the annual work plan. EPDS has compiled the species-specific information and developed a guide that can be a useful reference for seasonal scheduling purposes. This guide, *Threatened and Endangered Species Summary Sheet*, can be found in ***Appendix E***. The district environmental manager is a valuable resource and should be consulted for assistance for verifying seasonal work restrictions for listed species at the county level.

Completion of the final PNDI ER receipt and any required resource agency coordination identified should occur during the annual planning process. If the search identifies a listed species, it is then necessary to resolve the issue with the agencies. The process to conduct a review using the PNDI ER tool and resolving potential conflicts is discussed in ***Chapter 3, Project Guide*** and ***Chapter 4, ESA Consultation***. The district environmental manager or environmental staff should be contacted to provide guidance on addressing listed species issues.

Plan and conduct an annual awareness briefing for maintenance staff in counties where a species is identified as known to occur as listed in **Table 2-1** and Publication 113. Assistance from the district environmental manager for the annual awareness briefings is recommended.

4. Intermediate Planning

   The intermediate, or period, planning process adds additional detail to the annual work plan. County management should assure that seasonal scheduling developed to address listed species in the county is addressed by scheduling activities during the appropriate period.

5. Weekly Planning

   The weekly planning meeting provides the opportunity to review with the foreperson any listed species concerns or issues. In compliance with Publication 113, in counties with known listed species that could be impacted by an assembly planned to be undertaken during the upcoming week, the assistant county manager will review the appropriate species guidance brochure with the foreperson. Adequate copies of the brochure for review and distribution to the crew should be furnished to the foreperson.

> **NOTE:** If a listed species is encountered during a maintenance activity, stop the activity and contact the district environmental manager **immediately. Do not attempt to move, relocate or work around the species.**

There are also **emergency maintenance activities** that result when there is an action that is needed immediately, due to safety. These situations do not allow the planning time for resource agency coordination that routine maintenance projects may have. Do not delay in pursuing what is required to protect lives and property, however, a PNDI ER tool review should be conducted as soon as possible. For these activities, if additional resource agency coordination is indicated by the PNDI ER receipt, or if a species was affected during implementation of emergency actions, this additional coordination may have to be completed with the agency(ies) with jurisdiction over that species after the fact. Examples of types of emergency maintenance activities include, but may not be limited to:

- Flooding or flood damage,
- Icing on roadway,
- Water on roadway,
- Sinkholes off the roadway,
- Removal of one or more trees to address safety, or
- Road/bridge collapse

In cases of emergency activities, contact your environmental manager for assistance if the draft PNDI receipt indicates that further coordination with a resource agency is necessary, or if the assembly is identified in Publication 113 as potentially affecting a listed species in your county, or a listed species was encountered in the field during an immediate emergency activity.

Small-whorled Pogonia, Georgia DNR

Chapter 2 Summary

1. Listed Species are one of a multitude of environmental features and issues addressed during the preparation of environmental documents, including under NEPA.

2. NEPA documentation should summarize listed species review and coordination during all phases of the transportation project development process, including pre-TIP, TIP, post-Tip, final design, and construction.

3. If the project does not involve or lead directly to construction, involves maintenance actions identified in Publication 113 as not requiring PNDI review, or is limited to activities that don't have disturbance beyond the existing graded shoulders, PNDI reviews are not required. Actions, including inspection of bridges and other structures, that could impact listed bat and bird species located within or adjacent to the project area, are sometimes an exception. Refer to Chapter 3 and the bat and peregrine falcon species modules for additional details on these exceptions.

4. If the project requires the use of the PNDI ER tool during planning and programming, the PNDI review tool should be used to generate a draft PNDI receipt, but the draft PNDI receipt should not be finalized until the project enters the design phase.

5. ACMs are useful for involving the resource agencies during the transportation planning process so that they might provide guidance and insight related to potential resources of concern, potential environmental mitigation activities, and potential permitting issues that could affect the long-term implementation of the overall transportation plan. Maintenance activities that do not need NEPA documentation still require a PNDI ER receipt to identify any potential conflicts with listed species and resolve the issue with the agencies. The process to conduct a review using the PNDI ER tool and resolving potential conflicts is discussed in ***Chapter 3, Project Guide*** and ***Chapter 4, ESA Consultation***.

6. Knowledge of the local area must be considered when conducting a maintenance activity. A PNDI ER should be conducted for maintenance projects located in a federal or state forest, park or natural area, environmentally sensitive areas (i.e. wildlife refuge, hiking/biking trails, conservancy area), when the assembly is identified in Publication 113 as having potential to affect a listed species in your county, or those in close proximity to a previously completed project where a listed species was an issue.

7. Activities involving earth disturbance will likely require a review utilizing the PNDI ER tool. Each situation must be examined on a case-by-case basis. If there is any question or doubt, consult your district environmental manager or environmental staff for clarification.

8. Consult with your district environmental manager or environmental staff if you are not sure if agency coordination is needed for a specific project or activity.

9. If a listed species is encountered during a maintenance activity, stop the activity and contact the district environmental manager **immediately. Do not attempt to move, relocate or work around the species**.

Chapter 3:
Project Guide

As discussed in ***Chapter 2, MPO/PRO Planning and Maintenance Planning Guide***, if a potential conflict exists with a listed species as a result of a federal- or state-funded project or activity, further coordination with the federal and/or state regulatory agencies will be required. In this chapter, we review the types of projects that may or may not require listed species coordination, as well as the steps required to complete a project review for listed species. Further details on federal coordination are provided in ***Chapter 4, ESA Consultation***.

DCNR, PFBC, and PGC are each responsible for specific taxa of state listed species, while the USFWS oversees federally listed terrestrial and freshwater species. The NMFS maintains jurisdiction over federally listed marine and anadromous species. Currently, no marine species and only the federally endangered anadromous Atlantic sturgeon and shortnose sturgeon are found in Pennsylvania. Shortnose sturgeon habitat has been known to occur in the Delaware River within PennDOT District 6-0. **Table 3-1** summarizes the authority of the resource agencies.

Table 3.1 – Authority and Jurisdiction of Resource Agencies

Resource Agency	Level of Authority	Species Jurisdiction
DCNR	State listed species	Native wild plants
PFBC	State listed species	Fish, amphibian, reptile, and other aquatic organisms
PGC	State listed species	Wild birds and mammals
USFWS	Federally listed species	Terrestrial and freshwater species
NMFS	Federally listed species	Marine* and anadromous species

* No federally listed marine species or marine habitats are found in PA.

In most instances, a federally listed species is also state listed. Therefore, dual coordination may need to occur with both state and federal resource agencies with jurisdiction over the species; however, for some jointly listed species the state agency has designated the USFWS as the lead agency and dual coordination is not necessary.

3.A. Situations Where Resource Agency Coordination is Not Needed

Additional coordination and review related to listed species may not be needed in circumstances where a project or activity would have no potential to affect such a species. This would typically hold true for projects or actions where the following are true:

- The project/activity does not involve or lead directly to construction or maintenance, or
- The maintenance actions or assemblies being undertaken are not identified in Publication 113 as having potential to affect a species and a permit is not required. Refer to Publication 23 & Publication 113 for additional information regarding maintenance activities, or

- The project/activity does not involve land or water disturbance beyond the existing graded shoulders and will not disturb the roosts of listed bird or bat species located on or adjacent to bridges or in building structures.[2] [3]

> **NOTE:** Peregrine falcons have been known to attack bridge inspectors and others performing work that is of even minimal disturbance during the nesting season. It is recommended that bridge inspection and other contracts contain a special provision identifying the risk and a seasonal restriction to minimize the risk in Districts where peregrine falcons are frequently found nesting. For bridges on which peregrine falcons are known to nest, bridge inspections should be conducted between **August 1 and February 14**, outside peregrine falcon nesting season to avoid impacting nesting falcons. Refer to the Peregrine Falcon Module for additional information.

3.B. Situations Where Resource Agency Coordination is Needed

If a project does not conform to the criteria where coordination is not needed, then agency coordination is required. Conduct agency coordination regardless of whether the project is a maintenance activity or a planned and programmed project. Programmed projects/activities that have the potential to impact listed species require preparation of a categorical exclusion evaluation (CEE), a Bridge and Roadway Programmatic Agreement (BRPA) applicability matrix, environmental assessment (EA), or environmental impact statement (EIS) under NEPA. For more information on CEEs, EAs, EISs please refer to the Design Manual 1B, Publication 10B.

> **NOTE:** Listed species review is required for the actions included in the BRPA; however, projects **cannot be processed under the BRPA** if the project **"may affect- is likely to adversely affect"** a federally listed species or result in a similar outcome to a state threatened or endangered species.

3.C. PNDI Process and Online Conflict Resolution

3.C.1. Getting Started

PNDI project reviews are required for activities that have the potential to impact listed species under the jurisdictions of the USFWS, PGC, DCNR and PFBC. For the purposes of this desk reference, activities are

[2] Bird species may be impacted by increased presence of humans and equipment, and/or noise/vibration associated with activities located adjacent to nests, which may cause nest abandonment and/or nest failure. Bald eagles, peregrine falcons, osprey, and great blue heron have been documented to be affected by increased presence of humans and equipment, and/or noise; however, other bird species may also be susceptible. For this reason, coordination may be necessary with the USFWS and/or PGC for activities located near known nests even if the activities in question do not involve land or water disturbance beyond the existing graded shoulder. Refer to the bald eagle and peregrine falcon species modules for additional information.

[3] Similarly, bat species may be impacted by increased presence of humans and equipment, and/or noise/vibration associated with activities located adjacent to roosting and maternity sites, which may cause abandonment of those sites. Listed species of bats, including Indiana bats and northern long-eared bats are known to roost under bridges and in culverts and tunnels. For this reason, coordination may be necessary with the USFWS for activities located near known Indiana bat and northern long-eared bat hibernaculum even if the activities in question do not involve land or water disturbance beyond the existing graded shoulder. Consult the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat for additional information.

not limited to construction projects and include facility, highway and bridge maintenance, and, in some cases, bridge, culvert, or building inspections.

PNDI does not identify conflicts with species under the jurisdiction of NMFS. NMFS utilizes the NOAA (NMFS) Greater Atlantic Regional Fisheries Office (GARFO) Section 7 mapper (http://noaa.maps.arcgis.com/apps/webappviewer/index.html?id=1bc332edc5204e03b250ac11f9914a27). In a manner similar to PNDI, projects are drawn in the mapper and information is returned on conflicts by life stages and including avoidance/minimization measure information. The NMFS Section 7 Mapper must be used in District 6-0 for evaluating projects for shortnose and Atlantic sturgeon conflicts.


Sheepnose, G. Zimmerman

An accurate PNDI project review is dependent upon having complete and accurate information about the project location, project size, limits of disturbance, right-of-way or configuration, project type, and the presence/absence of environmental features such as wetlands, streams, forests, etc.

3.C.2. PNDI ER Tool

Any time a federal- or state-funded transportation project or maintenance activity could potentially affect a federal or state listed species, a review through the PNDI ER Tool should be undertaken. This tool can be accessed at http://www.naturalheritage.state.pa.us/.

The PNHP inventories include Rare, Threatened, and Endangered species, as well as species with unique or specific habitat needs or declining populations. Species tracked within PNDI are those classified as Extirpated, Endangered, Threatened, Rare, Tentatively Undetermined, or Candidate as listed by DCNR, PGC, PFBC, USFWS, and species recommended for classification by the Pennsylvania Biological Survey. Site-specific information is maintained in an integrated geographic information data management system consisting of map, manual, and computer files known as the PNDI. PNDI is continually refined and updated to include recently discovered locations and to describe environmental changes affecting known sites. This list represents the most up-to-date, accurate, scientific information available and reflects current species terminology. In addition to species, natural community types and geologic features are identified and mapped based on the recommendations of PNHP ecologists and the DCNR's Bureau of Topographic and Geologic Survey. For an up-to-date list of species and communities used as the basis for ER within the PNDI Tool, click on the "**Species List**" link.

For the purposes of this desk reference, those species for which review and environmental clearance **must be pursued** are those federal and state listed species classified as **Endangered, Threatened, Federally Proposed Species, or Federally Designated Critical Habitats**.

Field surveys are conducted to identify species and gather ecological data. Because new data are collected each field season, PNDI is continuously refreshed to reflect the updated information. Therefore, depending on the magnitude and longevity of a project, **review requests may need to be submitted more than once**

during the life of a project. PNDI Reviews are **valid for only two years** from the date of their final reply regarding a species conflict or clearance. Expired PNDI Receipts and coordination need to be reviewed and renewed during all project phases, **including the permitting phase**.

3.C.3. PNDI ER and Conservation Planning Tools – Which One to Use?

Both PNDI ER and Conservation Planning tools use web-mapping tools to search locations of (and potential impacts on) rare species and habitats; both produce reports used for planning and/or permitting.

Conservation Planning

This tool can be used for assessing conditions in a generic way – users can see approximate locations through color-coded shapefiles of DCNR Threatened and Endangered Species and Species of Special Concern, Combined State Agency Species, and Federal Species. The locations are not specific and the listed species or their habitat will not be identified in this tool.

The Conservation Planning tool will also display locations of natural heritage areas, protected lands, high quality water resources, PFBC trout stocking, and natural trout reproduction information, as well as Important Bird Areas, Natural Heritage Areas, and other conservation lands. Users can generate a Conservation Report for use in landscape-level or project-specific planning. **A receipt will not be generated with the use of this tool, and agency coordination for listed species will not be fulfilled for the purposes of NEPA documentation or permitting.**

PNDI ER

The PNDI ER Tool analyzes project footprints against species and/or habitat locations and recommends conservation measures and other actions that may be needed to fulfill the requirements of federal or state NEPA documentation or permits. The PNDI ER Tool will display locations of listed species and/or community habitat information. **This tool generates a receipt that is downloaded and saved as proof of state and federal agency coordination for use in NEPA documents and 404/105 Permits.**

3.C.4. How to Conduct a PNDI Review

Go to the PNHP website at http://www.naturalheritage.state.pa.us/. If you are a federal, state, or local government employee who must create PNDI Receipts as part of your job, or are a contract staff embedded in a government agency and performing job duties on behalf of that agency, there is no fee associated with the review.

Non-governmental or private sector users who require a PNDI Receipt will pay $40 per project using a credit card. The $40 is an up-front fee, and additional fees are not charged to rerun, update, or revise a PNDI Review on the same project. Users can opt to submit their project for review offline free of charge using a Manual Project Submission Form. Applicants must pursue manual coordination with all jurisdictional

agencies regardless of potential impacts on species. There is no charge for submitting a project manually; however, online submission is more efficient. Due to the additional work required of agency staff in completing manual reviews, the manual submission method is strongly discouraged for PennDOT projects.

Online tutorials and step-by-step instructions are available online at the following websites:

- https://conservationexplorer.dcnr.pa.gov/content/create-submit-project
- http://www.gis.dcnr.state.pa.us/PNDI/PNDI_HowTo.pdf
- https://www.youtube.com/watch?v=FrunvgRkY-8&feature=youtu.be
- https://www.youtube.com/watch?v=IYzCxTEVhn8&feature=youtu.be

When selecting the **Project Type** from the list of potential projects identified on the list note that only one project type can be selected per project. PennDOT projects may incorporate several of the listed project types within a single project, select the most applicable to the project.

The "**Transportation**" tab has the following types of projects broken down:

- Airports (runways, taxiways, terminals, control towers, beacons, fuel depots)
- Construction of support facilities adjacent to existing paved area (Park-n-Rides, Rest Areas, Maintenance Sheds, Stockpiles, and stormwater facilities)
- Other
- Public Transit (subways, busways, and Tramways)
- Railroads (track, bridge, roadway crossing – new, maintenance, removal)
- Roads
    - Drainage: ditch cleaning, cutting, pipe/culvert pipe replacement or repair <36"
    - New construction/New alignment
    - Other
    - Paving, widening within existing shoulders only, milling, patching, dust palliatives, and base repairs ONLY
    - Paving, widening within existing shoulders only, milling, patching, dust palliatives, and base repairs WITH drainage pipe replacements
    - Widening, adding lanes with disturbance beyond existing shoulders ONLY
    - Widening, adding lanes with disturbance beyond existing shoulders WITH drainage pipe replacements
- Structures and Bridges
    - Bridge Preservation, Restoration and/or Rehabilitation
    - Bridge Replacement adjacent to existing alignment (within 100 feet up/down stream)

- Bridge Replacement and/or Removal - on existing alignment (within 12 feet up/down stream)
- New Bridge construction on new alignment
- Other

> **NOTE:** Some projects and activities that PennDOT is involved in are not covered under "**Transportation**." In particular, if the "project" is limited to the development of a wetland mitigation site or stream restoration, the appropriate tab for these "Restoration/Conservation" activities should be used. Similarly, if the activity is tree clearing/roadside site distance clearing, then the "Forestry/Timbering" tab should be used. Using the Transportation tab for projects that are not strictly transportation will result in an inaccurate PNDI response.

The **Draft Receipt** can be used for planning purposes and does not need to be finalized until the project progresses to the design and permitting phases. The process to finalize the PNDI Receipt is discussed in detail on future pages.

Why Did Questions Pop Up?

Sometimes questions appear when you are generating the PNDI Review after the study area is drawn or imported. Most of the questions pertain to specific habitat requirements of listed species that may be in or near your project. Questions regarding wetlands and woodlots are asked to narrow down the response generated by the jurisdictional agencies that the PNDI Review provides. Please respond as accurately as possible to these questions so that the PNDI Receipt and jurisdictional agency responses and potential impact assessments of listed species and/or habitat are accurate.

> **NOTE:** It is **extremely important** to select the project type that most accurately defines the scope of the project you are running the PNDI Review for, as well as address any questions that are generated from the online query, since the results of the review are specific to the type and size of project selected. If the project type (category) does not seem to fit your project or if there are multiple categories, in these cases, it is best to choose a general category (e.g., Other) and coordinate with the jurisdictional agencies listed on the receipt.

Large Projects: When a project is greater than 10 miles in length or 5,165 acres, it is considered a Large Project (too large to be a standard project). Users have the option to submit a large project using the online tool. The project will be submitted to PFBC, PGC, DCNR, and USFWS (it may need to be emailed to the USFWS) and a $40 convenience fee will be applied to non-governmental or private sector users. Alternatively, users can submit their project manually, meaning it must be submitted to all four jurisdictional agencies, using the Manual Project Submission Form in the Resources section of the Help menu.

3.C.4 Processing the PNDI Review Result

The receipt generated after the PNDI Review is submitted will have a Project ID Number that is specific to each and every submission. If you are logged in to the PNHP system, the **"Menu"** tab in the upper right corner of the PA Conservation Explorer web page will have a "**My Projects"** tab, where you can find and download all of the receipts you have generated for every project.

On Page 1, Section 2, *Search Results* of the PNDI Receipt, the results for all four resource agencies (PGC, DCNR, PFBC, and USFWS) will be indicated. There are four results you can receive on your PNDI Review Receipt from any of the agencies: **1.) No Known Impact – No Further Review Required; 2.) Potential Impact – Further Review is Required; See Agency Response; 3.) Avoidance Measure(s): See Agency Comments; and 4.) Conservation Measure(s) – No Further Review Required; See Agency Comments.**

- **No Known Impact – No Further Review Required**

  If the response by the resource agency indicates "No Further Review Required," no additional communication with the respective agency is required.

  The PNDI Receipt should be downloaded from the PNHP website and saved in the project's technical file. A copy of the PNDI Receipt will need to be signed by the applicant or project proponent and attached to the project's environmental clearance document (EIS, EA, CEE, BRPA, Environmental Document, Environmental Evaluation Report) as well as the USACE and DEP permit applications, if required.

  
  Rabbitsfoot, G. Zimmerman

  Because PNDI and other databases are continually updated, coordination may be necessary later in the Transportation Project Development Process to confirm that this is still true. Contact the District Environmental Manager to clarify when this should occur.

- **Potential Impact – Further Review is Required; See Agency Response**

  If the response "Further Review Required" or "See Agency Response" is indicated, refer to the appropriate agency comments in Section 3, Agency Comments of the PNDI Receipt.

  Agency Comments: In Section 3, Agency Comments of the PNDI Receipt, each agency will provide a response to the search for listed species. The message: ***Further review of this project is necessary to resolve the potential impact(s). Please send project information to this agency for review (see What to Send)*** will appear under the agency name with jurisdiction over the listed species. See **What To Send To Jurisdictional Agencies** below for information on the materials required for agency consultation.

If the project may affect a species for which there is a programmatic agreement, Agency Comments in Section 3 of the PNDI Receipt may include a response similar to the following:

> ***Information Request: Design bridge projects in accordance with the USFWS Biological Opinion on the Effects of the Pennsylvania Department of Transportation Bridge Replacement and Maintenance Program on the Northern Riffleshell, Clubshell, Rayed Bean, Snuffbox and Sheepnose Pearly Mussels in the Ohio River Basin, Pennsylvania (amended December 6, 2012). Consult with the USFWS on individual bridge projects in Management Units 1 and 2.***

Depending on the nature and location of the project, Section 3 might include a statement concerning the results of a Phase 1 Bog Turtle Survey. This statement requires the signature of a qualified bog turtle surveyor or environmental professional having been trained and experienced in the identification of wetlands and bog turtle habitats.

- **Avoidance Measure(s): See Agency Comments**

Avoidance measures are automatically produced steps that can be taken to avoid impacting a listed species. Avoidance measures do not require consultation with the jurisdictional agencies if they are implemented. The checklist on the PNDI Receipt, **When Filled Out Completely**, documents the commitment to conduct the avoidance measure(s). By signing the avoidance measure on the PNDI Receipt, the applicant or project proponent agrees to implement the avoidance measure(s). This is a project commitment and must be signed by the district environmental manager, project manager or other PennDOT representative responsible for assuring compliance with the avoidance measure. Therefore, no further coordination with the jurisdictional agency regarding a listed species and/or special concern species and resources is required.


Eastern Massasauga, USFWS

Examples of avoidance measures include, but are not limited to:

- Do not conduct this activity within 50 feet of any streams, rivers, creeks, or tributaries.
- Conduct any tree cutting, tree inundation (flooding), and prescribed burning between November 15 and March 31. Also, when conducting timber harvesting (rather than land clearing for development), implement the Fish and Wildlife's Forest Management Guidelines for Indiana Bat Swarming Habitat found at https://www.fws.gov/northeast/pafo/endangered/forestry.html.

If you are not able to comply with the avoidance measure(s), the jurisdictional agency must be contacted for consultation. If an IPaC Effect Determination Key is relevant, the USFWS may direct use of IPaC as a next step. In all other cases refer to **What To Send To Jurisdictional Agencies** below for information on the materials required for agency consultation.

> **NOTE:** When a PNDI Receipt with avoidance measures for listed species is submitted as part of a DEP permit application, the DEP will include the measures in the issued permit. Avoidance measures for listed species should be included by the applicant in the Project Description for applications for coverage under General Permits. For individual permits, the avoidance measures should be included in the Project Description contained in the permit application and may be added as conditions of the permit. In addition, for project delivery projects, the avoidance measure commitments need to appear in the ECMTS form regardless of permitting.

- **Conservation Measure(s) – No Further Review Required; See Agency Comments**

  Conservation measure(s), when indicated on the PNDI Receipt, are generated for projects with no potential impact to listed species; however, a jurisdictional agency may issue conservation measures to reduce further impact to a non-listed/other species of concern in the vicinity of the project. Conservation measures are encouraged to be followed in their entirety and are generally accepted by the Districts; however, they are not required. Conservation measures are evaluated using the *Natural Resources Assessment and Mitigation Agency Partnering Policy* (Publication 546 2019 Version References). Although, if a USACE or DEP permit is required for the project, the conservation measures indicated on the PNDI Receipt may become conditions of the permit.

  In cases where the jurisdictional agency encourages/provides comments to the DEP on the avoidance or conservation measures during their comment review, the DEP has discretion to apply these, with limits (must be aquatic related) as conditions of the permit. If the measures are included as permit conditions, they should meet the Ch. 105.14(4) general aquatic ecology statement. It is important to review DEP permit conditions prior to acceptance, especially conditions for non-listed species not based on the PNDI Receipt but based on a DEP determination regarding the general aquatic ecology.

3.C.5 Finalizing a PNDI Receipt

During the PNDI validation process, a Draft PNDI Receipt will be created. Go to the **"My Projects"** tab on the **"Menu"** toolbar in the upper right corner of the PA Conservation Explorer web page to view the Draft PNDI Receipt. You will be able to access the Draft PNDI Receipt for the project created by clicking on the link for the project's receipt. Projects are listed by Project ID Number, Project Title, Date, and Contact (your name should be listed under Contact).

The project will remain in a draft phase until finalized. Please note that projects should remain in draft format until the appropriate project information is available and attached. Jurisdictional agencies do not review Draft PNDI Receipts and do not begin the review process until such time that the PNDI receipt is

finalized and all necessary additional information is provided. Some projects will need additional correspondence with jurisdictional agencies before finalization is accepted if potential impacts or avoidance measures are indicated, as noted above.

Within the "**My Projects**" tab, select "**Edit Details/Finalize"** where final questions will be prompted, including:

1. "I will mail my project documentation to the agencies requesting coordination on the PNDI receipt" – this box is to be selected if the user will NOT be uploading project documentation to DCNR, PGC, or PFBC for environmental review, or emailing project documentation to USFWS; or
2. "No further review is required" – to be selected if the Draft PNDI Receipt indicates no impacts to threatened, endangered, and/or species of special concern are present and (if applicable) the user agrees to comply with all avoidance measures listed on the Receipt.

After all documents are uploaded for coordination, or the "**No Further Review**" option is selected, choose the "**Submit Final Receipt for Review**" option to finalize the PNDI Receipt.

At this point, you will receive a confirmation email with a link to the Final PNDI Receipt. A copy of the Final PNDI Receipt will be accessible in the "**My Projects**" tab at all times. This Final PNDI Receipt will always have the project name and end with _FINAL_1.pdf.

Be aware that the steps to conduct a Draft PNDI Receipt and finalize a PNDI Receipt may change within the PNDI system. Instructions for generating Draft and Final PNDI Receipts, including uploading project materials, can be found on the PNHP website.

3.C.6. How Long are PNDI Reviews Valid?

PNDI Reviews are valid for only two years from the date of their final reply regarding a species conflict or clearance. After two years, project PNDI Review requests must be resubmitted to the jurisdictional resource agency to account for any updates to species occurrence data, unless construction on the project has started. Data files and the PNDI system are continuously being updated with species occurrence information. An absence of recorded species information does not necessarily imply species absence. Updates can be requested directly through the PNDI system.

A project can be reanalyzed using the existing footprint by using the "**Generate Receipt**" button. A new version of the receipt is generated and stored with the project page. You can update supplementary project information at any time using the "**Edit Details/Finalize**" button.

If any of the following change: 1) project location; 2) project size, limits of disturbance, right-of-way, or configuration; 3) project type; or 4) responses to the questions that were asked during the online review, the results of the PNDI Review are not valid, and the review and/or agency consultation must be reinitiated or updated via the PNDI ER Tool and resubmitted to the jurisdictional agencies. If the scope of the project changes from the planning phases through preliminary and final design, it is critical that the PNDI Reviews be updated to reflect these changes to avoid any unexpected hurdles that could affect project schedules.

The PNDI Tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on the PNDI Receipt. The jurisdictional agencies and PennDOT strongly advise against conducting surveys for the species listed on the Receipt prior to consultation with PennDOT and the agencies.

3.C.7. What to Send to Jurisdictional Agencies

The PNDI Receipt provides contact information and a list of information to include in the required jurisdictional agency review request. The review request, also referred to as a biological assessment under the ESA when federally listed species are involved, is typically in the form of a letter, with varying attachments and graphics and maps depicting project conditions. The letter can be uploaded through the PNDI Tool, or sent via mail before finalizing the PNDI Receipt, as described above.


Northern Long-eared Bat, S. Smith, GF Inc.

Coordination with resource agencies should be initiated as soon as possible during the project development process in order to identify potential issues. To process the project review request, the jurisdictional agencies need to receive the following information:

- A complete and specific description of the project, the project action area, construction details, and effects of the action using best professional judgment;
- Detailed description of both the project location and the affected area, and copies of United States Geological Survey (USGS) quadrangles with labeled project area; and
- For projects involving federally listed species, the determination of the non-federal representative and/or lead federal agency regarding the effect of the project (i.e., a clear statement of whether the project is a "No Effect" or a "May Affect") should be stated. For projects resulting in a "May Affect – likely to adversely affect," the review request may be skipped and preparation of a Biological Assessment **[BA]** for initiation of formal consultation pursued.

These items should be included in your review request to avoid delays. In addition, keep the following in mind when preparing your review request:

- **Include the project name and details of the project location, project action area and landscape**. List as much information as you can, including such items as the S.R. number and section, or township road, USGS quadrangle name, county, township and describe existing conditions to provide a baseline condition for the effect analysis. Define the **action area** for the analysis of effects to include the direct impact area as well as areas where indirect impacts might occur resulting in **indirect effects** on the species. Definitions for these terms are provided in *Chapter 4, ESA Consultation*.

- **Describe the project**. Widen a road, improve drainage, add a ramp, build a Park-and-Ride Facility, etc. Is the project new construction or repair or replacement of an existing structure? Is the planned work on the same or a new alignment? Is the planned work within the existing right-of-way, and if so, what is the width of this right-of-way from the existing paved shoulder of road? Describe all aspects of the project including stormwater facilities, necessary tree clearing, drainage improvements, etc.

  Proposed project descriptions should be as specific as possible to give the agencies enough detailed information to thoroughly review a project. The agencies want to review project information for the preferred or selected alternative, so avoid conducting extensive early coordination/consultation when multiple alternatives may still be under consideration. The agencies view project descriptions differently than PennDOT project managers in that the end product (design considerations, BMPs including implementation of any seasonal restrictions, avoidance and minimization measures, and all mitigation, etc.) is considered the "project description." For example, if the project is a bridge replacement over a creek, describe the bridge design, type of construction, and construction sequencing schedule if known, so that general impacts to the creek (potential habitat) or seasonal effects can be determined. Descriptions of the affected area should detail the presence or absence of certain natural features that may be possible habitat for a listed species in the project area. Explain Best Management Practices (BMPs) or seasonal restrictions that are being integrated into the project design, if any. For example, if your project is in a region known to support bog turtles, provide information about whether there are wetlands in your project area and how the project design may avoid affecting the species. Photographs and plans, if available, can also be included to provide the reviewer with an accurate view of the project area.

  A recommended method for developing a project description and determining effects is to "deconstruct" the project, identifying each construction activity and considering whether each activity will affect the species.

  If limited project information is provided in the review request, the agency may request additional information, and follow-up correspondence (continued informal consultation if federal species are involved) that includes greater project details will be necessary. **Provide the best project description possible to avoid project delays and to effectively reduce agency response times for projects Commonwealth-wide.** The agency could issue a response letter stating concurrence with a "not likely to adversely affect" determination based upon the project information provided if it is adequate. Consultation is complete upon receipt of concurrence from the agency. The concurrence response is utilized as documentation of completion of the Section 7 process for the National Environmental Policy Act (NEPA) document and as documentation for a Chapter 105/Section 404 or NPDES Permit Application if one is required for the project.

  A non-concurrence response from a jurisdictional agency or a determination by the action agency of "may effect – likely to adversely affect" will require additional consultation.

> **NOTE:** The importance of a good project description that includes details that truly reflect the disturbances that might affect species cannot be overstated. Additional information on preparing a strong project description can be found in ***Chapter 4, ESA Consultation***. In the absence of detailed project descriptions, the agencies err on the side of the species which could result in additional coordination or mitigation when it may not be necessary.

- **Describe the land cover of the project area**. Again, the jurisdictional agency environmental reviewer will be better able to determine the potential effects of your proposed action if given as much detail as possible. For example, if the land cover of your project is an existing parking lot, potential impacts will be very different than a wooded project area. Establishing the baseline is critical as effects are measured as the incremental increase in effect to a species above the baseline condition.
- **Identify all habitat types** including streams, wetlands, or other water bodies that will be impacted directly or indirectly by the project and how this was determined (e.g., by a qualified wetland biologist). List the impacted habitat, wetland, or water by name, if possible. If present, describe how these resources will be impacted. Be specific – will there be clearing and grubbing, dewatering, pile driving, temporary roads, dropping a bridge, etc. If no water, wetland, or habitat features are impacted, state this specifically.
    - Describe all effects to species and supporting habitats and when federally listed species are involved provide an effect determination. Include direct, indirect, and cumulative effects, and interrelated and interdependent actions. These terms are defined in ***Chapter 4, ESA Consultation***.
- **Attach a copy of the portion of the USGS quadrangle** with the location of the project area clearly shown and a reference to the quadrangle name in the submittal letter.
- **Include color photographs in the review request package**. These photographs should be dated, labeled, and keyed to a map so that each photograph's location and direction of exposure are indicated. This is recommended because it allows the reviewer to make a better judgment of the habitat of your project area, and the review process may be expedited by including photos.

> **NOTE:** The PFBC refers to the review request as a Species Impact Review (SIR) for Rare, Candidate, Threatened, and Endangered Species. Always include the SIR number on all correspondence.

Some of the items listed above may be additional to those listed on the PNDI Receipt; however, it is recommended that they be included in the initial request.

For all jurisdictional agencies it is essential that all correspondence and coordination regarding listed species for a proposed project are uploaded directly on the PNHP website or sent as mail to the correct agency office, program, and review personnel. Otherwise, a project review request may be lost or substantially delayed in arriving at the correct office. Refer to the contact information indicated on the PNDI Receipt and/or see ***Appendix C, Directory of Resource Agencies and Conservancies*** for correct email and mailing addresses. Absence of a reply from the jurisdictional resource agency is not to be assumed as an automatic project clearance. ***Appendix D*** contains examples of review requests.


Rusty-Patched Bumble Bee, USFWS

The following methods can be used to send project information to the jurisdictional agencies:

- Upload or email the information to the jurisdictional agencies in the PNHP system. Instructions for uploading project materials can be found on the PNHP website. This option provides the applicant with the convenience of sending project materials to a single location accessible to all three state agencies.
- Email or mail project materials to the appropriate Agency Contact.

> **NOTE:** The USFWS requires applicants to mail hard copies of, at a minimum, the initial project materials to the USFWS PA field office. The USFWS may provide follow-up responses via email depending on the review results and complexity of the project. Be sure to include email addresses for follow-up coordination in all project correspondence sent to the USFWS.

3.D. DEP Permit Requirements

The DEP requires that a signed copy of the PNDI Receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI Review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving listed species.

Under **sequential review,** the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with the application both a PNDI Receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a potential impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies.

Under **concurrent review,** the DEP, where feasible, will allow technical review of the permit to occur concurrently with the listed species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with the permit application. The PNDI Receipt should also be submitted

to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). This is not the preferred option for PennDOT and should not be pursued unless a sequential review is not feasible due to the project schedule.

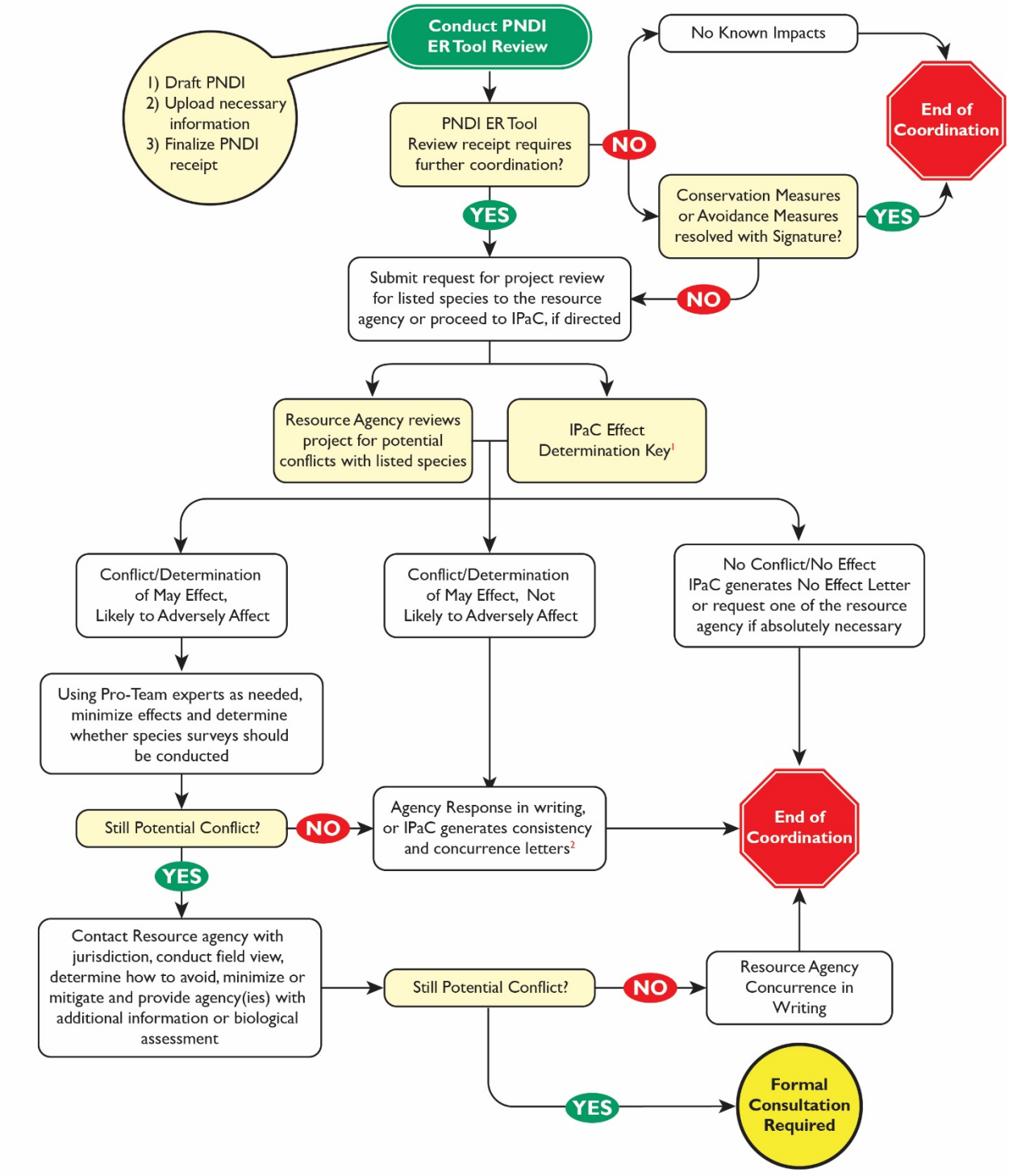
DEP's "Policy for Pennsylvania Natural Diversity Inventory (PNDI) Coordination during Permit Review and Evaluation" that includes DEP procedures for the PNDI ER Tool use can be found at: http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-95198/021-0200-001.pdf

3.E. Agency Coordination/Informal Consultation

Following submission of the jurisdictional agency review request generated by the PNDI Review, jurisdictional resource agencies will respond separately, either via email or through a standard letter depending on the agency. If there is a delay in receiving a response from the jurisdictional agency that is **greater than 30 working days** from the anticipated date of receipt following submittal, then contact the jurisdictional agency to inquire about the receipt of the project review request and the status of the review.

Figure 3-1 outlines the **Jurisdictional Agency Coordination Process**, the different agency responses, and how to address them.

Figure 3-1 Jurisdictional Agency Coordination Process



Footnote

[1] Currently used for Indiana and Northern Long-eared bats, but is likely to be used for additional species in the future.

[2] IPaC generates concurrence letters that identify that if the USFWS does not respond to the contrary within a specified number of days (varies depending on the species programmatic) concurrence is granted and you may proceed.

3.E.1. Types of Jurisdictional Agency Responses

There are several responses that could be generated by the jurisdictional resource agencies after the PNDI Review is conducted and additional information is submitted for their review. **Table 3-2** provides examples of agency responses and instructions, tips, and cautions to consider when working with the agencies to resolve the potential conflicts.

Table 3-2 – Examples of Jurisdictional Agency Responses

<table>
<tr><th>Agency Response</th><th>Specific Examples of Agency Responses</th><th>Additional Instructions, Tips, or Cautions</th></tr>
<tr><td rowspan="2">No Conflict Response</td><td>“Except for occasional transient species, rare, candidate, threatened, or endangered species are not known to exist in the vicinity of the project area. Therefore, no biological assessment or further consultation regarding rare species is needed.”</td><td rowspan="2">No additional coordination is required for two years following a determination of "No Conflict".</td></tr>
<tr><td>“An element occurrence of a rare, candidate, threatened, or endangered species under our jurisdiction is known from the vicinity of the proposed project. However, given the nature of the proposed project, the immediate location, or the current status of the nearby element occurrence(s), no adverse impacts are expected to the species of special concern.”</td></tr>
<tr><td rowspan="3">Potential Conflict Anticipated Response</td><td>“Avoidance Measure Request
Potential habitat could be present within the proposed disturbance area - Avoidance Measures Requested.
Do not conduct this project/activity within 50 feet of any streams, rivers, creeks, or tributaries. This includes both perennial and intermittent waterways.”</td><td>Avoidance measures do not require consultation with the jurisdictional agencies if they are implemented. By signing the avoidance measure on the PNDI Receipt, PennDOT agrees to implement the avoidance measures requested by the agency. The PNDI Receipt must be signed by the district environmental manager, project manager or other PennDOT representative responsible for assuring compliance with the avoidance measure.</td></tr>
<tr><td>“Avoidance Measure Request
Conduct any tree cutting or prescribed burning between November 15 and March 31. ALSO, when conducting timber harvesting (rather than land clearing for development), implement the Fish and Wildlife Service's Forest Management Guidelines for Indiana Bat Swarming Habitat found at http://www.fws.gov/northeast/pafo/forestry.html.

As the project proponent or applicant, I certify that I will implement the above Avoidance Measure: _____(Signature)
SPECIAL NOTE: If you agree to implement the above Avoidance Measure, no further coordination with this agency regarding threatened and endangered species and/or special concern species and resources is required. If you are not able to comply with the Avoidance Measures, you are required to coordinate with this agency - please send project information to this agency for review (see "What to Send" section).”</td><td>As stated in the example above, if PennDOT agrees to implement the avoidance measure, the PNDI receipt must be signed and coordination ends. However, if PennDOT is unable to comply with the avoidance measure (or conservation measure), the PNDI would trigger the use of the IPaC Effect Determination Key.</td></tr>
<tr><td>“Species Survey Request
PNDI records indicate species or resources under DCNR’s jurisdiction are located in the project vicinity. Based on a detailed PNDI review, DCNR determined potential impacts to the following threatened or endangered species or species of special concern.
<table>
<tr><th>Scientific Name</th><th>Common Name</th><th>PA Current Status</th><th>PA Proposed Status</th></tr>
<tr><td>Carex prairea</td><td>Prairie Sedge</td><td>Threatened</td><td>Threatened</td></tr>
<tr><td>Lathyrus palustris</td><td>Vetchling</td><td>Undetermined</td><td>Endangered</td></tr>
<tr><td>Carya laciniosas</td><td>Shellbark Hickory</td><td>Not Listed</td><td>Species of Concern</td></tr>
</table>
DCNR requests a survey for the following species:
• Carex prairea (Prairie Sedge): documented in a calcareous wetland; prefers moist calcareous meadows, marshes, and fens; fruits June – July
• Lathyrus palustris (Vetchling): documented in a calcareous wetland; prefers shores, moist meadows, sand plains, swamps, and thickets; flowers June – August
• Carya laciniosas (Shellbark Hickory): documented in wet, poorly drained bottomland soils and floodplains.
A botanical survey for the above species should be conducted by a qualified botanist at the appropriate time of year. Please submit the resulting report to our office for review. Contact our office prior to the survey for detailed information about the species or for a list of qualified surveyors.”</td><td>PennDOT is only required to perform surveys for species listed as threatened, endangered, proposed threatened, or proposed endangered. In this example, the survey is only required for the Prairie Sedge and the Vetchling. Consult with the District Environmental Manager prior to conducting any surveys.</td></tr>
</table>

<table>
<tr><th>Agency Response</th><th>Specific Examples of Agency Responses</th><th>Additional Instructions, Tips, or Cautions</th></tr>
<tr><td></td><td>“Species Survey Request
PNDI records indicate the following rare and protected freshwater mussel species under PFBC's jurisdiction are known in the vicinity of the proposed project.
<table><tr><th>Scientific Name</th><th>Common Name</th><th>PA Current Status</th><th>PA Proposed Status</th></tr><tr><td>Alasmidonta undulata</td><td>Triangle Floater</td><td>Special Concern Species</td><td>Species of Concern</td></tr><tr><td>Villosa fabalis</td><td>Rayed Bean Mussel</td><td>Endangered</td><td>Endangered</td></tr></table>Given the status and sensitivity of the species of concern and to avoid potential impacts to these rare mussels, PFBC recommends that you arrange for a survey of the project site to identify mussel species and determine their abundance. A list of qualified malacologists is enclosed. As our schedule allows, PFBC may be able to conduct this survey.”</td><td>PennDOT is only required to perform surveys for species listed as threatened, endangered, proposed threatened, or proposed endangered. In this example, PennDOT is not required to perform a survey for the Triangle Floater. The PFBC would have to voluntarily conduct a survey or relocation for the Triangle Floater (this is what they typically do) prior to construction. Keep PFBC apprised of the schedule so that they can do this survey on their own. Because it is listed as endangered, the Rayed Bean Mussel requires a survey. If the project schedule allows, consider requesting that PFBC conduct the survey. If threatened or endangered mussels are located within the project area, PFBC may be able to relocate the mussels to another site. Consult with the District Environmental Manager prior to conduction any surveys.</td></tr>
<tr><td></td><td>“Species Survey Request
Based on a review of the Phase I Bog Turtle Habitat Survey Report supplied to this office, the USFWS has determined that the project area wetlands contain habitat characteristics suitable for bog turtles. If direct or indirect adverse effects to Wetland SW22 cannot be avoided, a more detailed and thorough survey will be necessary, as described under Phase 2 of the Guidelines for Bog Turtle Surveys.”</td><td>Refer to the Bog Turtle Programmatic User Guide for further information regarding in this case. PennDOT would have the option to conduct the Phase 2 survey or assume presence for bog turtles and make the appropriate mitigation commitments. Mitigation commitments could include redesigning the project to avoid impacts to the wetlands or proposing avoidance measures such as a pre-construction survey and installation of exclusionary fencing. Consult with the District Environmental Manager prior to conduction any surveys or proposing any mitigation commitments.</td></tr>
<tr><td></td><td>“Information Request
Design bridge projects in accordance with the USFWS Biological Opinion on the Effects of the Pennsylvania Department of Transportation Bridge Replacement and Maintenance Program on the Northern Riffleshell, Clubshell, Rayed Bean, Snuffbox and Sheepnose Pearly Mussels in the Ohio River Basin, Pennsylvania (amended December 6, 2012). Consult with the USFWS on individual bridge projects in Management Units 1 and 2.”</td><td>Consult with the District Environmental Manager regarding the USFWS Programmatic BO for mussels to determine the Management Unit (MU) for the project area waterway and apply the appropriate avoidance and minimization measures for that MU.</td></tr>
<tr><td></td><td>“Habitat Survey Request
Based on the review of this information and the proximity of the project to known element occurrences of the species of concern listed above, potential habitat could be present within the proposed disturbance area. Therefore, additional evaluations are necessary to confirm whether or not the project site contains habitat and to determine the potential for adverse impacts to this species. We request completion of a habitat assessment to characterize and determine if potential habitat exists within the vicinity of the proposed project area.”</td><td>In order to conduct a habitat assessment, the jurisdictional agency must identify the species. If the PNDI Receipt does not identify the species, contact the jurisdictional agency for additional information.</td></tr>
</table>

Any potential impacts to listed species and resources must be resolved with the appropriate jurisdictional agency. There are a number of actions based on the Potential Conflict response that can take place at this point in the Jurisdictional Agency Coordination Process.

In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided. Actions for potential impacts to federally listed species not resolved through the PNDI online review process are discussed further in *Chapter 4, ESA Consultation*.

3.F. USFWS IPaC Review Tool

In addition to the PNDI ER Tool, the USFWS has a project planning tool created to streamline the USFWS environmental review process. The IPaC tool can be accessed at https://ecos.fws.gov/ipac/. IPaC does not replace the PNDI ER Tool for federal species coordination with the USFWS, but it can be the next step for projects that generate PNDI results indicating a Potential Conflict for some federally listed species. USFWS indicates that soon the PNDI response (for Indiana and northern long-eared bats) will direct you to the USFWS Information for Planning and Consultation (IPaC) Effect Determination Key. As IPaC Effect Determination Keys are developed for other species, PNDI receipt responses for those taxa will also direct you to IPaC. Look for bog turtles and federally listed mussels to be the next two taxa to have Effect Determination Keys developed.

When directed to IPaC during the PNDI Review, or if utilizing a programmatic consultation that references use of IPaC, an Effect Determination through IPaC is the next step in the endangered species review process for projects and activities. When designating the project location in IPaC, it is essential that consideration be given not only to the physical location of project activities, but should include the surrounding area on the landscape where potential effects to species may occur, referred to as the Action Area (consider direct and indirect effects). For projects that require consultation with the USFWS under Section 7 of the ESA, definitions of Action and Action Area are defined below.

Action – all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas. Examples include, but are not limited to: (a) actions intended to conserve listed species or their habitats; (b) the promulgation of regulations; (c) the granting of licenses, contract, leases, easements, right-of-way, permits, or grants-in-aid; or (d) actions directly or indirectly causing modifications to the land, water, or air. [50 CFR §402.02]

Action Area – all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. [50 CFR §402.02]

Shortnose Sturgeon, PFBC

IPaC is a tool to assist in increasing the compatibility of project activities with the conservation of USFWS resources in an expedited manner. It is meant to assist in the implementation of all activities implemented through Section 7 of the ESA. For additional information regarding Section 7 of the ESA, refer to ***Chapter 4, ESA Consultation*** and ***Chapter 5, Overview of Applicable Laws and Regulations***.

> **NOTE:** IPaC does not include listed species that fall under the sole jurisdiction of NMFS. IPaC does show critical habitat for NMFS species on the **Resources** page, but critical habitat for those species is not included on the IPaC official species list, which represents official correspondence from the Department of Interior who does not have the authority to speak on behalf of NMFS and the Department of Commerce. IPaC includes only those species for which USFWS is the sole lead agency or for which USFWS and NMFS share the lead responsibilities. To obtain a list of species in the project area for which NMFS is the sole lead agency, contact NMFS directly at https://www.greateratlantic.fisheries.noaa.gov/protected/section7/contactus/index.html.

3.F.1. How to Conduct an IPaC Effect Determination Review

Go to the IPaC website: https://ecos.fws.gov/ipac/.

To utilize the Assisted Determination Keys, you must be logged in with an account on the IPaC system, create a and save a project, start review and then select "Evaluate" to skip the species list process[4] and go direct to the Assisted Determination Key function. Check to see if your project qualifies under the scope of the conditions of a programmatic for the species in your project area. A qualification interview and project interview will follow resulting in an effects determination for your project. For additional details refer to the Standard Operating Procedure for Site-Specific Project(s) Submission in the User's Guide for the Range-wide Programmatic Consultation for Indiana Bat and Northern Long-eared Bat and the IPaC Assisted Determination Key Webinar Recording. Although these materials reference these species the materials provide general guidance relevant to use of assisted determination keys for any species that such a key has been developed for.

3.G. Programmatic Agreements

FHWA and the USFWS have consulted and USFWS has issued programmatic biological opinions for the Indiana and Northern Long-Eared Bat range-wide, the Bog Turtle in Pennsylvania, and for federally listed freshwater mussels in the Ohio Basin in Pennsylvania. These programmatic consultations, their applicability to projects and how to use them are described in the species modules.

3.H. FHWA ESA Webtool

The ESA Webtool is an online tool to help project proponents prepare complete biological assessments (BAs) and streamline the consultation process under Section 7 of the federal ESA for projects where the FHWA is the lead federal action agency. The ESA Webtool provides links to a national BA template

[4] The species list function in IPaC is redundant with and not as geographically specific as the PNDI process and is therefore not utilized for PennDOT reviews.

developed to help preparers produce high quality, complete, and consistent BA documents. The ESA Webtool also has links to existing BAs including the Range-Wide BA for Transportation Projects for Indiana Bat and Northern Long-Eared Bat. The ESA Webtool will be discussed in greater detail in ***Chapter 4, ESA Consultation***.


Atlantic Sturgeon, NMFS

Chapter 3 Summary

1. The NMFS maintains jurisdiction over federally listed marine and anadromous species. Currently, no marine species and only the federally endangered anadromous Atlantic Sturgeon and Shortnose Sturgeon are found in Pennsylvania. Shortnose Sturgeon habitat has been known to occur in the Delaware River within PennDOT District 6-0.
2. Additional coordination and review related to listed species may not be needed in circumstances where a project or activity would have no potential to affect such a species. This would typically hold true for projects or actions where the following are true:
    a. The project/activity does not involve or lead directly to construction (including maintenance), or
    b. The project/activity does not involve land or water disturbance beyond the existing graded shoulders (except for those activities that could impact listed bird or bat species located on or adjacent to the structures requiring maintenance or inspection).
3. Those species for which review and environmental clearance must be pursued are those federal and state listed species classified as Endangered, Threatened, Federally Proposed Species, Federally Listed Species, or Federally Designated Critical Habitats.
4. Online agency coordination for listed species under the jurisdiction of the USFWS, PFBC, PGC, and DCNR is conducted through the PNDI ER Tool. The PNDI Review may require additional online consultation with the USFWS outside of the PNDI system utilizing the IPaC review tool.
5. Because new data are collected each field season, PNDI is continuously refreshed to reflect the updated information. Therefore, depending on the magnitude and longevity of a project, review requests may need to be submitted more than once during the life of a project. PNDI Reviews are valid for only two years from the date of their final reply regarding a species conflict or clearance. Expired PNDI Receipts determination need to be reviewed and renewed during all project phases.
6. The PNDI ER Tool analyzes project footprints against species locations and recommends conservation measures and other actions that are necessary for regulatory compliance and avoidance, minimization, or mitigation of effects on listed threatened and endangered species. This Tool generates a Receipt that is downloaded and saved as proof of state and federal agency coordination.
7. The PNDI Review Receipt will generate one of the following four responses from any of the agencies: 1.) No Known Impact; 2.) Potential Impact; 3.) Avoidance Measure(s); and 4.) Conservation Measure(s).
8. For the result "Potential Impact – FURTHER REVIEW IS REQUIRED; See Agency Response," further review of this project is necessary to resolve the potential impact, and additional information will need to be provided to the agency/agencies to make a final determination of the potential impacts of the project to listed species.
9. Avoidance measures are automatically produced steps that can be taken to avoid impacting a listed species. Avoidance measures do not require consultation with the jurisdictional agencies if they are implemented. By signing the avoidance measure on the PNDI Receipt, PennDOT agrees to implement the avoidance measures. The PNDI Receipt must be signed by the district

environmental manager, project manager or other PennDOT representative responsible for assuring compliance with the avoidance measure.

10. Conservation measures or recommendations are encouraged to be followed in their entirety and are generally accepted by the District; however, they are not technically required. If a USACE or DEP permit is required for the project, the conservation measures indicated on the PNDI Receipt may become conditions of the permit.

11. PNDI is a primary screening tool, and a desktop review by the jurisdictional agencies may reveal more or fewer impacts than what is listed on the PNDI Receipt. Due to collector permit requirements, seasonal limitations to effective surveys, etc., additional agency coordination is necessary prior to conducting any surveys for listed species.

12. PennDOT, FHWA and USFWS developed Programmatic BOs and BAs for the bog turtle, Indiana bat and northern long-eared bat and listed species of freshwater mussels within the Ohio River Basin. The purpose of these is to streamline the clearance process. These programmatic processes require completion of a project submittal form or, when available, completion of an effect determination using the programmatic determination keys in IPaC. These processes allow the agencies to focus on projects that result in significant effects/take and determinations of May Effect, Likely to Adversely Affect.

Bald Eagle, USFWS

Chapter 4
ESA Consultation (USFWS)

This chapter discusses the procedures for conducting coordination for **federally** listed species. The ESA and its regulations can be found at http://www.fws.gov/endangered/esa-library/pdf/ESAall.pdf.[5] Regulatory revisions to the ESA, effective September 26, 2019, are available at https://www.fws.gov/endangered/improving_ESA/regulation-revisions.html.

If a project is supported by a federal action, including but not limited to: issuance of a permit, funding approval, actions involving approval of a highway network or design criteria requirements, point of access approvals and the project area houses a federally listed species, the project will enter **ESA Section 7 Interagency Consultation** (50 CFR 402).

NOTE: This chapter has been prepared as guidance for use in understanding the requirements of the ESA Section 7 Consultation process. The facts of each potential situation/project involving threatened and endangered species may vary, and therefore, should be considered on a case-by-case basis. This section establishes the framework within which PennDOT shall conduct said consultation and provides an overview of the flexible system/framework that is the ESA Consultation process. Additional consultation details can also be found in the species modules.

NOTE: The following interagency consultation procedures reference the USFWS as the administrating agency. The NMFS must also be consulted for projects located along the Delaware River and some of its tributaries in District 6-0. The NMFS follows the same interagency coordination procedures as the USFWS. Refer to https://www.greateratlantic.fisheries.noaa.gov/protected/section7/listing/index.html for additional information.

4.A. ESA Section 7 – Interagency Consultation

Interagency consultation is outlined in Section 7 of the ESA and 50 CFR 402. Section 7 consultation applies to actions in which there is discretionary federal involvement or control. The Federal Highway Administration (FHWA), the Federal Railroad Administration, and the Federal Transit Administration have determined, and established in programmatic Section 7 consultations that they have taken actions[6] in support of roadway, highway, bridge, rail and transit systems in their entirety, therefore, FHWA takes responsibility as the lead federal agency for PennDOT actions. Section 7 of the ESA is applicable to all

[5] The streamlined discussion of the federal process, specifically for the federal formal consultation process, was borrowed from a newsletter prepared by the FHWA called *Back to the Basics: The Endangered Species Act and Section 7 Consultations*. The newsletter can be found at FHWA Back to the Basics: The Endangered Species Act and Section 7 Consultations (https://www.environment.fhwa.dot.gov/Pubs_resources_tools/publications/newsletters/oct17nl.pdf)

[6] These actions include establishment of standards, point of access, the promulgation of rules and regulations and/or the provision of funding.

PennDOT activities, including 100% state funded maintenance on all routes regardless of whether a permit is required — except for those projects meeting the criteria outlined in section 3.A where no agency coordination is required. For projects that do not involve FHWA, as described above (extremely rare), but require a federal permit, the USACE would assume the lead federal agency role going into the consultation process.

Section 7(a)(1) of the ESA requires federal agencies to use their authorities to carry out programs for the conservation of species under the ESA. This is achieved through the implementation of proactive conservation actions integrated at a program level. These initiatives pursued by FHWA and PennDOT in fulfillment of Section 7(a)(1):

- Completing comprehensive mussel surveys on the Allegheny and Shenango Rivers.
- Conducting a two-day interagency and academic expert workshop to develop a multi-agency research work plan to advance the science on freshwater mussels.
- Propagation, captive husbandry and reintroduction of juvenile seed mussels.
- The utilization of materials in bridge construction that require reduced maintenance minimizing harm to listed species.
- Increased aggregate recycling measures including use of recycled asphalt paving (RAP) to reduce the need for virgin aggregate materials from rivers, the extraction of which effects listed species.

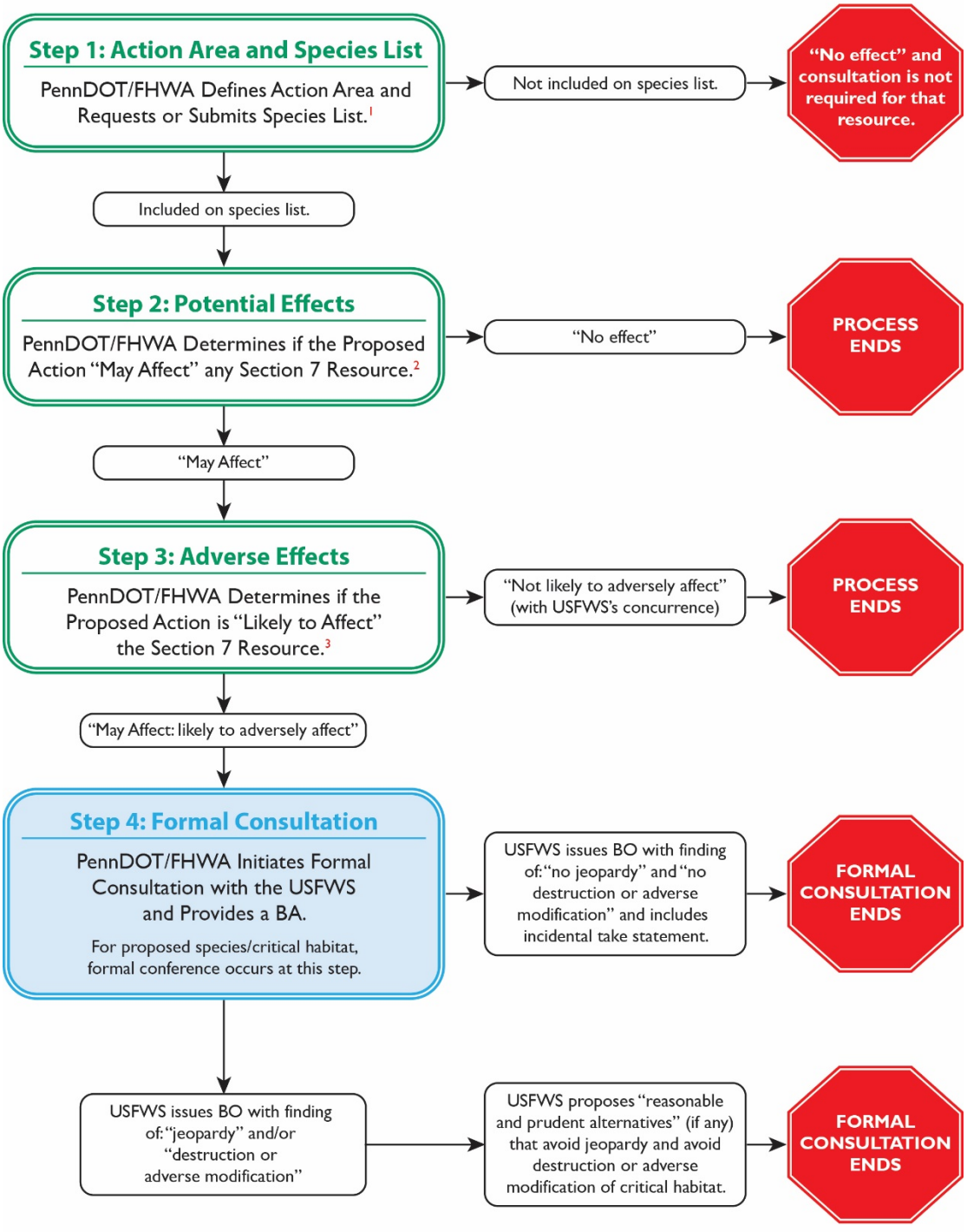
Federal agencies shall also ensure their actions are not likely to jeopardize the continued existence of any threatened or endangered species (Section 7(a)(2) of the ESA). Section 7(a)(2) requires project level consultation. There are two levels of Section 7 consultation for listed threatened and endangered species or designated critical habitat: 1) informal consultation and 2) formal consultation. Similarly, informal and formal conferences are pursued for species proposed for listing under the ESA.

Before consultation on a project can begin, the following agency roles should be defined:

- **Administering Agencies –** The USFWS and NMFS administer the ESA.
- **Lead Federal Agency –** The federal action agency with the most control over a project is the lead (for PennDOT actions, typically FHWA).
- **Non-Federal Representative** – The lead federal agency can designate a non-federal representative to represent the lead federal agency through informal consultation. PennDOT and other DOTs have been given this role by FHWA through the issuance of a nationwide delegation policy.
- **Applicant** – An applicant is any person or agency who requires formal approval or authorization from a federal agency as a prerequisite to conducting the action. PennDOT is an applicant as well as a non-federal representative.

Once roles have been clearly defined for a project, Section 7 consultation can begin. The general steps of the federal agency consultation process are outlined in **Figure 4-1**.

Figure 4-1 - Federal Agency Consultation Process



Footnote

[1] Step 1 is performed using PNDI or NMFS e-mapper.

[2] Step 2 may occur using IPaC for some programmatic consultations

[3] ESA Formal Consultation Process: FHWA. PennDOT and Pro-Team Internal Coordination Process (2007). This pro-team process should be utilized for projects when a District or project team needs assistance in determining effects.

ESA Formal Consultation Process: FHWA, PennDOT and Pro-Team Internal Coordination Process (Publication 546 2019 Version References)

It is imperative that sufficient time be allocated for the consultation process. The Section 7 consultation process can take a significant amount of time, especially for projects requiring formal consultation on multiple species. Agency review time for individual formal consultations will be 135 days. Building in sufficient time in the project schedule for the Section 7 consultation process is highly recommended.


Gadwall, USFWS

4.B. Informal Consultation

The USFWS's informal consultation process is outlined in **Figure 4-2** and serves the following purposes:

- to clarify whether and what federally listed or proposed species or designated or proposed critical habitats may be in the project area;
- to conclude what effect, if any, the project may have on these species or critical habitats;
- to explore ways to modify the project to remove or reduce potential adverse effects to the species or critical habitats;
- to determine the need to enter into formal consultation for listed species or designated critical habitats; and
- to suggest modifications of an action to lessen harm to species.

Participation in informal consultation may include (1) USFWS or NMFS, (2) any involved federal action agency (including the lead agency), (3) a designated non-federal representative (PennDOT), (4) an applicant or permittee (also PennDOT), and (5) consultants working on behalf of any of the others.

4.B.1. Review Request

As discussed in ***Chapter 3, Project Guide***, the first step of informal consultation with the USFWS, is to conduct the PNDI ER review. This should be done early in the development of the project so that any potential conflicts with federally listed species can be identified and addressed. If no species or no need for additional coordination with any agencies is indicated on the PNDI receipt, then the project has "no effect" or is "not likely to adversely affect." There are exceptions to this rule:

1. If a federal action agency, non-federal representative, or other agency with permit or authorization authority is aware of recent habitat or species occurrence data that conflict with the PNDI receipt (e.g., the proposed project may affect a federally listed species), then consultation should be continued;
2. If the details of a project or the project impact area changes then the PNDI should be re-run; and
3. All PNDIs should be refreshed after 2 years due to expiration unless construction has started.

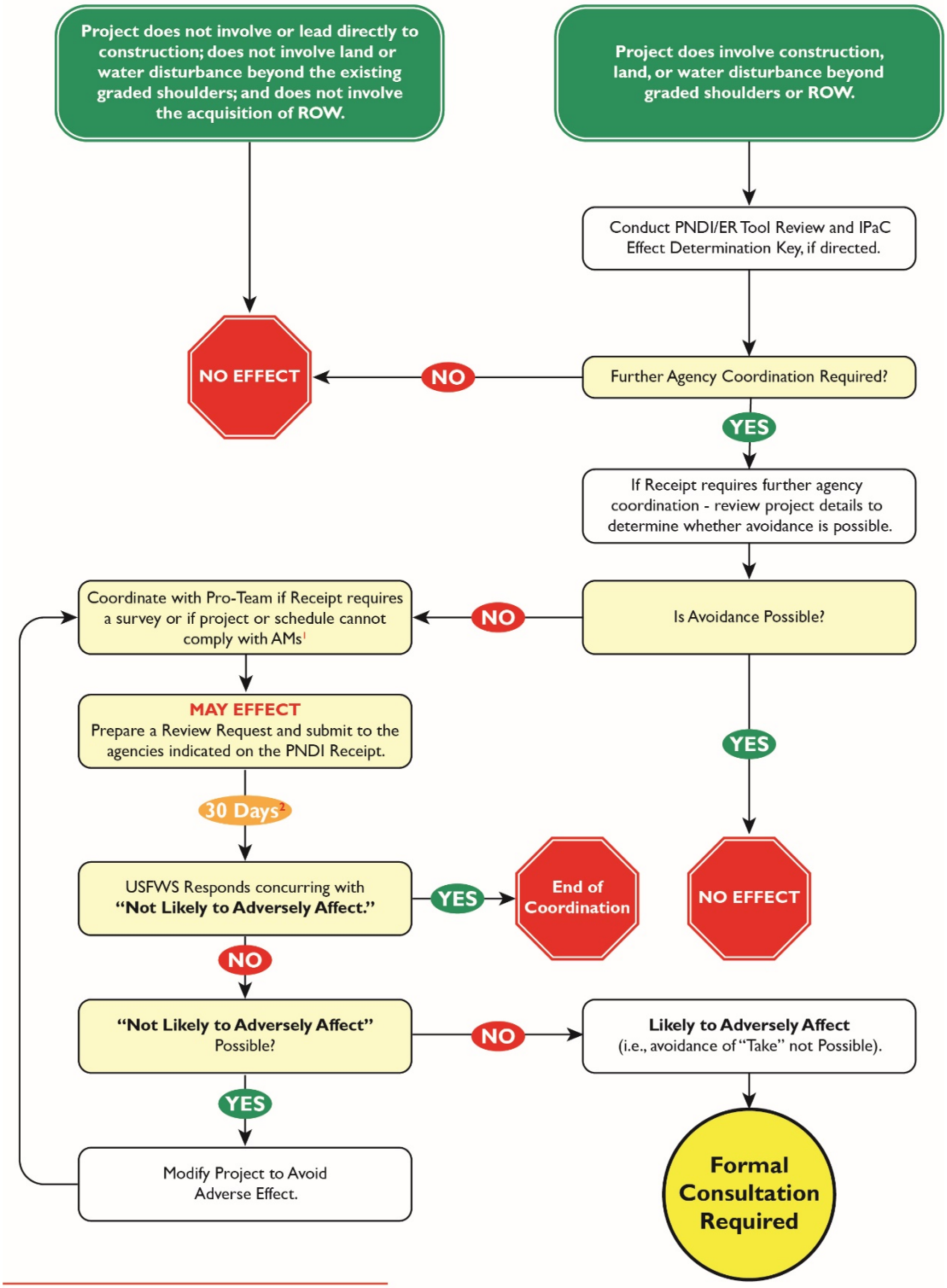
> **NOTE:** New species listed during construction will be identified by the jurisdictional agency and the information disseminated to applicable construction teams.

As directed by the PNDI ER tool review, requests to the USFWS for additional coordination, aka informal consultation, should be prepared and submitted. Review requests, coordination letters and biological assessments all require a detailed project description that evaluates the possible impacts of the project activities on the species leading to an ability to make an accurate determination of effect. Prepare additional information using the biological assessment outline to assure submission of appropriately detailed information. Additional information regarding this process is provided in ***Chapter 3, Project Guide***.

Upon review of the biological assessment/additional coordination information, it is possible that the USFWS could issue a response letter confirming that "A species is present; however due to the design of the project there is "no effect" or concurring in a "may effect - not likely to adversely affect" determination. Consultation is complete upon receipt of these responses from the USFWS.

NOTE: In some cases, it is readily apparent that the project will result in a may effect, likely to adversely affect determination, requiring formal consultation. It is typically expeditious and prudent to utilize the *ESA Formal Consultation Process: FHWA, PennDOT and Pro-Team Internal Coordination Process* (Publication 546 2019 Version References), to determine whether to forego submission of additional information to the USFWS and proceed directly to the preparation of a biological assessment. The pro-team can also be helpful in assisting with decisions regarding assumption of presence versus the need to conduct surveys.

Figure 4-2 - Federal Section 7 Informal Consultation Process



Footnote

[1] ESA Formal Consultation Process: FHWA. PennDOT and Pro-Team Internal Coordination Process (2007). This pro-team process should be utilized for projects when a District or project team needs assistance in determining effects.

[2] This assumes agency funded position 30 day review time. If there is no funded position, this may be longer than 30 days.

ESA Formal Consultation Process: FHWA, PennDOT and Pro-Team Internal Coordination Process (Publication 546 2019 Version References)

NOTE: Following the PNDI ER tool review, the action agency (FHWA/PennDOT) may determine that the project will have "no effect." In this circumstance further consultation is not required under the ESA; however, if documentation of "no effect" is required for obtaining a Chapter 105/Section 404 permit and the PNDI receipt is not sufficient, then an initial USFWS review request to confirm "no effect" will be necessary.

Modules were prepared for the most common federal and state listed species encountered during project review requests, including listed freshwater mussels, listed bats, bog turtles, peregrine falcons, bald eagles, and eastern massasauga rattlesnakes. Districts 5-0, 6-0, and 8-0 must follow the *Programmatic Biological Assessment for the Effects of Transportation Actions on the Bog Turtle within the Commonwealth of Pennsylvania* discussed in detail in the Bog Turtle User Guide. For projects that may impact listed bats or mussels, districts must follow the *Programmatic Consultation for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat* and the *Programmatic Biological Opinion for Effects of the Pennsylvania Department of Transportation Bridge Replacement and Maintenance Program on the Northern Riffleshell, Clubshell, Rayed bean, Snuffbox, Sheepnose, and Rabbitsfoot Pearly mussels in the Ohio River Basin, Pennsylvania* discussed detail in the Threatened and Endangered Bat Species Module and Threatened and Endangered Mussels Species Module. Contact the Environmental Policy and Development Section (EPDS) for the most current guidance.

4.B.2. USFWS IPaC

As discussed in ***Chapter 3, Project Guide***, the PNDI ER review might direct users to the IPaC on-line project planning tool to streamline the USFWS environmental review process. With this tool, users can perform an impact analysis utilizing the effect determination keys and receive automated USFWS "no effect" and "may effect, not likely to adversely effect" correspondence to complete the consultation process. An IPaC-Assisted Determination Key has been developed for use with the *Programmatic Consultation for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat* and development of similar keys is planned for listed mussel species in the Ohio Basin and for bog turtles. These keys allow for the evaluation of proposed activities for consistency as well as a determination of effect. Additional assisted determination keys may be developed in the future for use with other species. More information can be found on the IPaC website at https://ecos.fws.gov/ipac/.

Activities that May Affect Listed Species or Critical Habitat

If the USFWS responds that there may be listed species or designated critical habitat present, and that based upon the project information they were provided the project "may effect" the listed species, or if the USFWS responds that they cannot concur with a "may effect – not likely to adversely affect" determination, informal consultation continues.

PennDOT and the FHWA will implement the internal coordination process provided in *ESA Formal Consultation Process: FHWA, PennDOT and Pro-team Internal Coordination Process* (Publication 546 2019 Version References). PennDOT Engineering Districts will follow the steps provided to determine whether an "adverse effect" on a federally threatened or endangered species is likely. PennDOT will utilize a team of in-house and FHWA experts ("Pro-team") for projects where formal consultation is required. Contact BOPD-EPDS for initial effect determination discussion and for assistance in assembling a Pro-team for a project.

1. The Need to Prepare the BA

The purpose of a BA is to evaluate the potential effects of the action on listed and proposed species and designated and proposed critical habitat, to determine whether any such species or habitat is likely to be adversely affected by the action, and to decide whether formal consultation or a conference is necessary.

The FHWA national BA template outline is provided in an automated system that further allows for online consultation, review, and assembly of an online project file cabinet. This automated system for BA preparation is the preferred method for BA development and should be utilized by PennDOT districts and their consultants. The FHWA's nationwide web BA tool can be accessed through the FHWA ESA Webtool.

2. Collect Data/Perform a Field Survey

Begin to collect data (literature search, past surveys, etc.) on the biology of the species. Investigate information related to a species' breeding, feeding, nesting, lifespan, etc. Possible sources for this information include technical literature reviews, academic institutions, the FHWA nationwide web BA tool news and online file cabinets, the USFWS, and other specialists.

Do not assume that field surveys are always necessary, even if suggested by the USFWS or identified on a PNDI receipt. Consult with the BOPD-EPDS and the FHWA before engaging in field surveys. Biological data (existing data/best available commercial and scientific data) together with specific information regarding habitat in the study area may be enough for the USFWS to concur that the project would either have no effect or is not likely to adversely affect the species nor adversely modify designated critical habitat. Habitat surveys may be recommended to verify desktop landcover analysis. Species surveys may not be recommended. In many cases, it is prudent to assume presence of a species in lieu of conducting species surveys. Survey results may be inconclusive in verifying the presence of a species resulting in project delays and unnecessary costs. Efforts may be better focused on mitigation (avoidance, minimization and compensatory mitigation) to avoid, minimize or offset harm to a species. In some instances, studies may be conducted by an environmental resource agency partner. In these circumstances, arrangements should be made with the appropriate resource agency representative(s) to conduct these studies.

> **EXAMPLE:** A mussel survey needs to be conducted for a federally endangered mussel. The expert collector of this mussel works for the United States Geological Survey (USGS). Consultation should be undertaken with EPDS to determine if an existing agency agreement may be utilized for conducting the survey.
>
> **EXAMPLE**: Stream shocking needs to be done to identify fish species inhabiting project streams or a mussel salvage/relocation is requested for a state listed or state mussel species of concern. The PFBC may be willing to conduct these studies.

If a survey is determined appropriate (in consultation with BOPD-EPDS and the FHWA), a qualified professional must perform the survey. Utilizing qualified professionals has the potential to substantially reduce project review delays. The USFWS maintains lists of qualified professionals for the federally listed species under their jurisdiction. The PFBC qualified surveyor requirements can be found at: http://www.fishandboat.com/Resource/Documents/qualified_surveyor_requirements.pdf.

Qualified professional surveyors must submit a work plan for agency review and approval prior to conducting surveys. Species protocols should be used to perform the survey, when applicable, however, the qualified surveyor may propose an alternate survey methodology if site conditions warrant a protocol modification. Species protocols are updated periodically; contact the USFWS, the district environmental manager, or EPDS for new and updated protocols. Note that not every species has a protocol.

Sometimes there are seasonal requirements to species surveys. Some species are not present in all occupied habitats, or are not easily found, or cannot be readily identified at all times of the year. Project environmental clearance may be delayed if the field survey can only be performed during a specific time of year and this window of opportunity is missed. EPDS has compiled the species-specific survey dates and developed a guide that can be useful for project planning and scheduling purposes. This guide, *Threatened and Endangered Species Summary Sheet*, can be found in ***Appendix E***. Assumption of presence of a species may be a prudent alternative to conducting a survey when a significant project delay may occur as a result of the seasonal requirement for a species survey.

NOTE: Be aware that certain species have seasonal requirements for species field surveys.

Bog Turtle (*Clemmys muhlenburgii*)	April 15 – June 15
Indiana Bat (*Myotis sodalis*)	
acoustic surveys:	May 15 – August 15
summer mist net surveys:	May 15 – July 31
fall mine/cave entrance surveys:	September 15 – October 31
Freshwater Mussels	May 15 – September 30
Eastern Massasauga Rattlesnake (*Sistrurus catenatus catenatus*)	April 15 – June 15

Many native listed plant species can only be identified during their flowering and fruiting seasons.

EPDS has developed a guide that provides seasonal survey, seasonal construction restriction, and other mitigation options. This guide can be found in ***Appendix E***.

Species-specific guidance has been incorporated into the modules of this desk reference. Contact the EPDS for technical assistance, as needed.

3. Determination of Effect

As part of the review request and/or BA development process, the federal action agency (or the designated non-federal representative – PennDOT) determines the effect of its action on each species or critical habitat in the action area.

Based on the project, habitat, species survey, baseline and other species life history information collected and evaluated during preparation of the biological assessment, PennDOT, on behalf of FHWA, will conclude that the project action or activity results in one of the following effect determinations:

No effect - the appropriate conclusion when the action agency determines its proposed action will not affect a listed species or designated critical habitat.

May affect - the appropriate conclusion when a proposed action may pose any effects on listed species or designated critical habitat. When the federal agency proposing the action determines that a "may affect" situation exists, then they must either initiate formal consultation or seek written concurrence from the Services that the action "is not likely to adversely affect" listed species.

Is not likely to adversely affect - the appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.

Is likely to adversely affect - the appropriate finding in a biological assessment (or conclusion during informal consultation) if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or beneficial (see definition of "is not likely to adversely affect"). In the event the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, then the proposed action "is likely to adversely affect" the listed species. If incidental take is anticipated to occur as a result of the proposed action, an "is likely to adversely affect" determination should be made. An "is likely to adversely affect" determination requires the initiation of formal Section 7 consultation.

4. BA Format

Utilize the FHWA national BA template, FHWA ESA Webtool to prepare BAs.

Every project with its specific attributes, project area, and species and/or critical habitat affected will lend itself to its own level of detail and documentation. While it is the federal action agency's responsibility to determine the contents of the BA, specific contents should be discussed between the FHWA and the USFWS prior to and during preparation. The BA can also serve as the formal consultation initiation package.

The following components should now be included in a BA/formal consultation initiation package in accordance with regulatory changes to the ESA effective September 26, 2019:

(1) A written request to initiate formal consultation shall be submitted to the Director from the FHWA (lead federal action agency), and shall include attachments that provide:

> (i) a description of the proposed action, including any measures intended to avoid, minimize, or offset effects of the action. Consistent with the nature and scope of the proposed action, the

description shall provide sufficient detail to assess the effects of the action on listed species and critical habitat, including:

(A) The purpose of the action;

(B) The duration and timing of the action;

(C) The location of the action;

(D) The specific components of the action and how they will be carried out;

(E) Maps, drawings, blueprints, or similar schematics of the action; and

(F) Any other available information related to the nature and scope of the proposed action relevant to its effects on listed species or designated critical habitat.

(ii) a map or description of all areas to be affected directly or indirectly by the Federal action, and not merely the immediate area involved in the action (i.e., the action area as defined at § 402.02).

(iii) information obtained by or in the possession of the Federal agency and any applicant on the listed species and designated critical habitat in the action area, including available information such as the presence, abundance, density, or periodic occurrence of listed species and the condition and location of the species' habitat, including any critical habitat.

(iv) a description of the effects of the action and an analysis of any cumulative effects.

(v) a summary of any relevant information provided by the applicant, if available.

(vi) any other relevant available information on the effects of the proposed action on listed species or designated critical habitat, including any relevant reports such as environmental impact statements and environmental assessments.

(2) the federal action agency may substitute existing documents prepared for the proposed action such as NEPA analyses or other reports for some or all of the above listed elements. However, any such substitution shall be accompanied by a written summary specifying the location of the information that satisfies the elements above in the submitted document(s).

(3) formal consultation shall not be initiated by the federal action agency until any required biological assessment has been completed and submitted to the Director in accordance with § 402.12.

(4) any request for formal consultation may encompass, subject to the approval of the Director, a number of similar individual actions within a given geographical area, a programmatic consultation, or a segment of a comprehensive plan. However, this does not relieve the federal action agency of the requirements for considering the effects of the action or actions as a whole.

Use the best available scientific and commercial data available when preparing a BA. More information regarding best available scientific and commercial data can be found in *AASHTO Practitioner's Handbook –*

Complying with Section 7 of the ESA for Transportation Projects, located at http://environment.transportation.org/pdf/programs/ph17%20esa%20final.pdf.

Accurately define the action area for the BA. The *action area* includes all areas affected either directly or indirectly by the proposed action, not simply the area where project activity will occur. It will most likely extend beyond the *project area* itself. Follow the following process for defining the action area:

1. Identify all potential project impacts (e.g., habitat destruction, noise disturbance, sedimentation, lighting).
2. Determine the geographic extent of each impact type to define a zone of impacts for that impact type.
3. Overlay the multiple zones to establish the geographic extent of all project impacts.
4. These can be effectively presented using different colors to identify different elements of the action area (aquatic, noise, soil, and so on).
5. Define the action area based on the farthest geographic extent of potential project impacts.

Perform the effects analysis by determining and evaluating all aspects of the effects of the action including the:

1. Nature of the effect
2. Timing of the effect,
3. Proximity of the effect,
4. Duration of the effect,
5. Disturbance frequency,
6. Distribution of the effect, and
7. Expected recurrence of the effect.


Allegheny Woodrat, J. Mibroda

Include consideration of direct effects including, the effects of interrelated and interdependent actions, indirect effects, and any cumulative effects. **Additional guidance on deconstructing a project and evaluating effects is provided in Chapter 3.**

Direct effect – the direct or immediate effect of the project, including any interrelated and/or interdependent activities, on a species or its habitat, regardless of whether that effect is beneficial or adverse.

Interrelated and Interdependent Actions – these are projects or actions that either have no independent utility "but for" the proposed project under consideration or are dependent on the larger project for justification and would not occur absent the larger project, for example, utility relocations associated with a project.

Indirect Effect – are caused by the action, occur later in time after the action is completed and may occur beyond the extent of the project area. These effects should be considered when defining the project action area.

Cumulative Effects – are considered by USFWS only for projects requiring formal consultation and are defined under the ESA as development in the project vicinity that cannot be attributed or linked to the project as interrelated or interdependent actions and are future state or private actions (actions not subject to a federal action and thereby requiring Section 7 consultation) that are reasonably certain to occur within the action area as defined for the project under consideration. Unlike indirect effects, these effects are not considered when defining the project action area.

> **NOTE**: Per the implementing policies for the ESA, the BA must be submitted to the USFWS within **180 calendar days** of receipt of the USFWS review response letter. **50 CFR § 402.12(h)**. In practice, development of the BA is subject to development of the project details and will take longer than 180 days, particularly if the BA outline format was not utilized for submission of additional information as part of the review request/agency coordination during informal consultation. Apply the 180 days to the point at which accurate project details are completed to conclusively determine effect without anticipating a need to re-initiate informal or formal consultation to adjust for changes in project details. Early submissions, lacking adequate project details may not be wise as they are likely to require re-initiation.

4.C. Formal Consultation

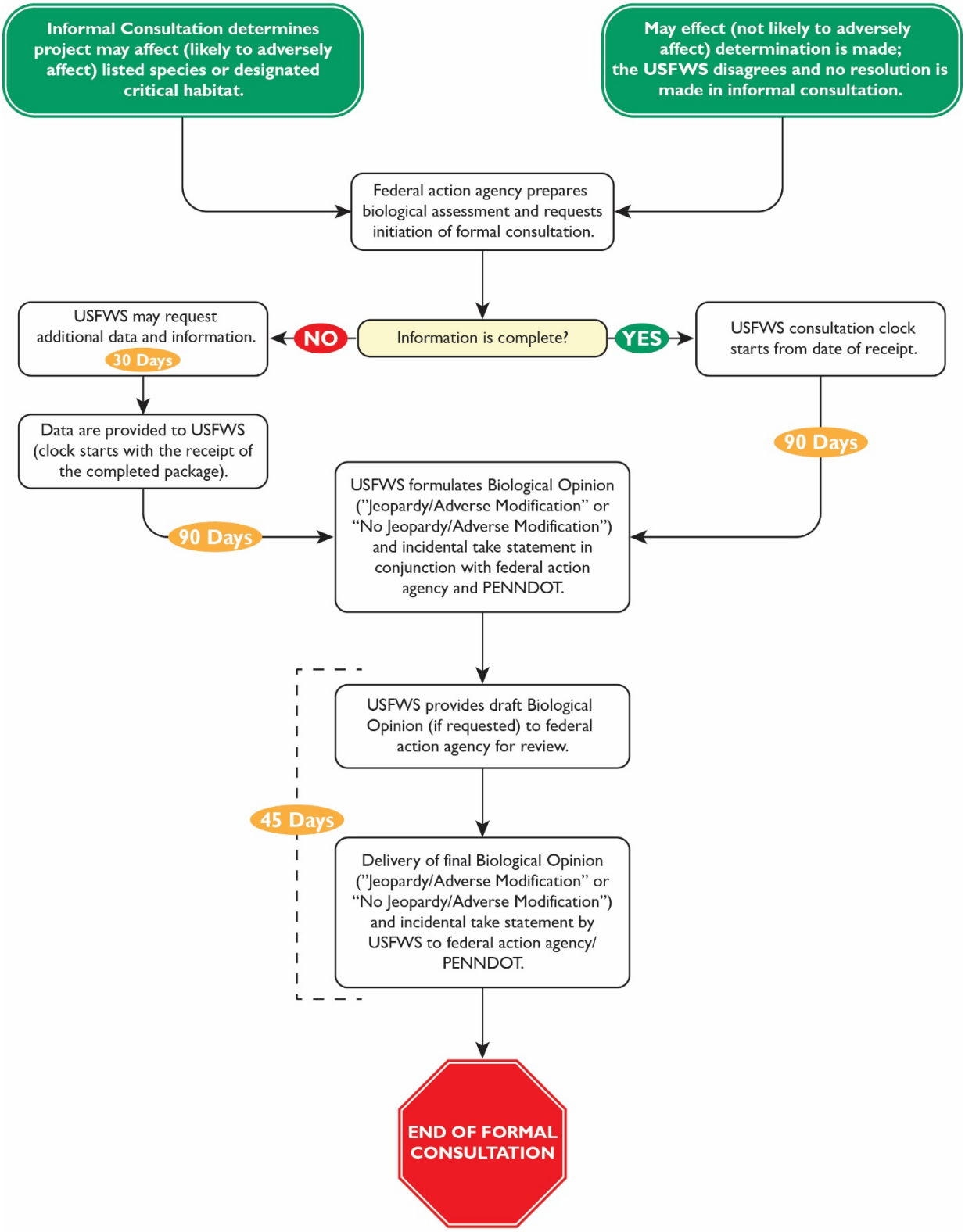
Formal consultation is a process between the USFWS and a federal action agency(ies) that: (1) determines whether a proposed federal action is likely to jeopardize the continued existence of a federally listed species or destroy or adversely modify designated critical habitat; (2) begins with a federal action agency's written request and submittal of a complete initiation package; and (3) concludes with the issuance of a BO and incidental take statement by the USFWS. **Figure 4-3** illustrates the formal consultation process described in 50 CFR §402.14.


Showy Lady's Slipper, DCNR

Whereas the FHWA has delegated authority to the state DOTs for informal consultation, PennDOT does not have delegated authority to pursue formal consultation. As informal consultation progresses, if, and when it appears that a project is likely to result in a "may affect, is likely to adversely affect" determination requiring formal consultation, the lead federal action agency and BOPD-EPDS must be advised and be included in the process.

If not initiated earlier, a project file cabinet including invitations to project team members, identification of roles and uploading of documents must be completed in the FHWA BA WebTool now. For redundancy, identify at least two individuals as "project managers" as only they may upload documents or archive the project. Identify PennDOT, FHWA and other consultant contractors as "team members" and USFWS and state resource agency representatives as "reviewers". Drafts for internal team review should be placed in the "working" file drawer. Documents in the "working" drawer are not visible to "reviewers". Documents to be accessed or reviewed by USFWS and other agencies must be placed in the "completed" or "consultation" drawers. An ESA WebTool Checklist can be found at https://www.environment.fhwa.dot.gov/ESAWebTool/Site/Checklist.aspx.

Figure 4-3 - Federal Section 7 Formal Consultation Process



Remember that the terms and conditions of the BO must be entered into ECMTS as mitigation commitments.

4.C.1. Initiation of Formal Consultation

If a may affect – likely to adversely affect finding is determined by PennDOT and FHWA, formal consultation should be initiated. At the discretion of the federal action agency, formal consultation can be initiated simultaneously with the submission of a BA to the USFWS. PennDOT and FHWA have selected to always initiate formal consultation concurrent with the BA submission.

The federal action agency will be included in review of the biological assessment and upon their acceptance of the same will prepare correspondence requesting initiation of formal consultation. Also, include BOPD-EPDS in the development and or review of the biological assessment. Correspondence to the BOPD-HDTS engineer, requesting that BOPD, in turn, request initiation of formal consultation by FHWA must be prepared by the engineering district. Include a link to the FHWA BA WebTool Project File Cabinet where the final BA has been uploaded within the content of this request. Upon receipt of the PennDOT request, FHWA will submit the initiation package including the BA to USFWS.

4.C.2. Conference Process for Proposed Species and Critical Habitats

Species and critical habitats that have been proposed for listing in the Federal Register are subject to the conferencing process established in 50 CFR §402.10. Conferences are required for proposed Federal actions likely to jeopardize proposed species or destroy or adversely modify proposed critical habitat. Conferencing is a process of early interagency coordination involving informal and formal discussions between a federal action agency and USFWS regarding the potential impact of a project on proposed species or proposed critical habitat. The procedure is designed to help federal agencies identify and resolve potential conflicts between federal projects and species conservation by developing recommendations to minimize or avoid adverse effects on proposed species or proposed critical habitat.

1. Informal Conferences

After the USFWS project review response indicates the presence of a proposed species or proposed critical habitat, informal conferences or discussions can occur between USFWS, the federal action agency and the applicant (if any). For projects involving federal funding, PennDOT, the applicant, as a designated non-federal representative, may carry out the informal conference with USFWS, however, it is advised that FHWA is notified and invited to conference with the USFWS. During the conference, USFWS may assist in determining effects and may advise on ways to avoid or minimize adverse effects to proposed species or proposed critical habitat.

Following informal conferencing, USFWS issues a conference report containing recommendations for reducing adverse effects. These recommendations are advisory because the federal action agency is not prohibited from jeopardizing the continued existence of a proposed species or adversely modifying proposed critical habitat until the species is listed or critical habitat is designated. However, if a listing becomes effective, the prohibition against jeopardy or adverse modification applies regardless of the project's state of completion. As a risk management measure, USFWS recommendations may need to be utilized to avoid likely future conflicts.

If it is determined that a project is likely to jeopardize a proposed species or adversely affect proposed critical habitat, a formal conference is required and must be initiated by the federal action agency (FHWA or USACE).

2. Formal Conferences

The federal action agency may request a formal conference on a proposed action. Although the regulations permit USFWS to decide whether formal conferencing is appropriate, generally USFWS provides a formal conference if requested.

Formal conferences follow the same procedures as formal consultation. The opinion issued by USFWS at the end of a formal conference is called a conference opinion. This opinion follows the content and format of a biological opinion. Any recommendations contained in the conference opinion are advisory. Again, as a risk management measure, the recommendations may be utilized to avoid future conflicts if the species is later listed. Moreover, the incidental take statement provided with the conference opinion does not take effect until USFWS adopts the conference opinion as a biological opinion on the proposed action after the species is listed.

Section 7 of the ESA does not provide specific timeframes for conferences. However, by USFWS policy, formal conferences will follow the same timeframes as formal consultations.

4.C.3. USFWS Issuance of a BO

The USFWS may do the following in reviewing a BA and request for initiation of formal consultation:

- Review all relevant information provided by the federal action agency or information otherwise available. Such reviews may include an on-site inspection of the action area with representatives of the federal action agency and the applicant.
- Evaluate the current status and environmental baseline of the listed species or critical habitat.
- Within 30 days of receipt, request, if appropriate, pursuant to 50 CFR 402.14(f) additional data to determine how, or to what extent, the project may affect a listed species or its critical habitat.
- Add the effects of the action and cumulative effects to the environmental baseline and in light of the status of the species and critical habitat, formulate the Service's opinion as to whether the action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. Discuss with the federal action agency and any applicant, the USFWS review and evaluation conducted towards a finding for the BO. Discuss the availability of reasonable and prudent alternatives if a jeopardy opinion is to be issued.

Formal consultation concludes with an issuance of a BO. The duration of formal consultation is 90 days after which consultation is closed and the USFWS must deliver a BO within 45 days of the close of formal consultation. During the 90-day formal consultation period, USFWS will openly communicate with the action agency, designated non-federal agency and the applicant to discuss the project, confirm and clarify project details, and to gather any additional information as required to complete the jeopardy analysis and preparation of a biological opinion. Consultations conducted utilizing the FHWA nationwide web BA tool are date stamped and time frames are tracked by the online tool.

An extension to the 90-day period can be granted if requested and justified by the USFWS and agreed upon by the federal action agency. The USFWS justification for an extension must be submitted within the initial 90-day period and must include: (1) the reasons why a longer period is required; (2) the information that is required to complete the consultation; and (3) the estimated date on which the consultation will be

completed. Consultation that includes an applicant (PennDOT) cannot be extended for more than 60 days without the consent of the applicant.

Within 45 days of concluding formal consultation, the USFWS should deliver a BO to the federal action agency.

> **NOTE**: The federal action agency and any applicant may request a copy of the draft BO during formal consultation, however, this may result in project delays. The USFWS encourages requesting a draft BO for particularly complex formal consultations and to utilize the draft to work with the USFWS and ensure that all information is correct before the USFWS finalizes the BO.

The BO will state the opinion of the USFWS in terms of whether the project will "jeopardize the continued existence of" the listed species. The BO will reach one of the following conclusions:

- the project is not likely to jeopardize the continued existence of species or result in the destruction or adverse modification of critical habitat (**"no jeopardy or no adverse modification" BO**).
- the project **is likely** to jeopardize the continued existence of species or result in the destruction or adverse modification of critical habitat (**"jeopardy or adverse modification" BO**); or

1. "No Jeopardy/No Adverse Modification" BOs

A "no jeopardy/no adverse modification" BO concludes that the project will not result in jeopardizing a listed species or adversely modify a designated critical habitat, but that the incidental take of a listed species would likely occur. An **incidental take statement** should be issued by the USFWS as part of the BO that specifies the impact, the amount or extent, of such incidental take on a species. The USFWS will estimate the number of species individuals that will be taken during a specified length of time. The implementation of reasonable and prudent measures (RPMs) could potentially eliminate the risk of take; in which case, there may be an incidental take statement that concludes that no take will occur. Incidental take statements are not issued for plant species, only animal species. The procedure to be used to handle or dispose of any species individuals taken should be detailed. The incidental take statement should also address the monitoring and reporting of the numbers of individuals of a species taken by the project.

RPMs are non-discretionary and should be addressed in the incidental take statement included in the "no jeopardy/no adverse modification" BO; they are ways that the USFWS considers necessary or appropriate to minimize and monitor project impacts on the listed species. These measures, along with the terms and conditions that implement them, cannot alter the basic design, location, scope, duration, or timing of the project and may involve only minor changes. The inclusion of constructible avoidance and minimization measures within the project description of the biological assessment on the part of PennDOT and FHWA will typically result in few if any surprise RPMs appearing in the BO.

The USFWS may provide discretionary **conservation recommendations** with the BO statements. These recommendations are advisory and are not intended to carry any binding legal force. They represent the USFWS's non-binding suggestions resulting from formal or informal consultation that: (1) identify discretionary measures a federal agency can take to minimize or avoid the adverse effects of a proposed

action on listed or proposed species or designated or proposed critical habitat; (2) identify studies, monitoring, or research to develop new information on listed or proposed species or designated or proposed critical habitat; and (3) include suggestions on how an action agency can assist species conservation as part of their action and in furtherance of their authorities under Section 7(a)(1) of the ESA. PennDOT and FHWA may discuss pursuit of these conservation recommendations on a program level, through implementation of program level policy or research opportunities but they are not typically measures that can or would be pursued as part of the project.

2. "Jeopardy/Adverse Modification" BOs

A "jeopardy/adverse modification" BO is a strong statement by the USFWS and an undesirable outcome from the perspective of FHWA and PennDOT. Typically, this outcome is avoided by the USFWS, PennDOT and through an effective informal consultation process. Avoidance, minimization and compensatory mitigation, including measures to offset take should have been developed in consultation with USFWS during informal consultation so that this outcome does not occur.

This situation should never occur when there is effective coordination between PennDOT and the USFWS during the design process to incorporate necessary avoidance and minimization measures. PennDOT controls the BA and should integrate avoidance and minimization measures into the project design. Therefore, it would behoove PennDOT to resolve potential issues during the design process to avoid a "jeopardy/adverse modification" BO. If the USFWS issues a "jeopardy/adverse modification" BO, the USFWS will engineer the project, taking control from FHWA and PennDOT.

If USFWS issues a "jeopardy/adverse modification" BO, it should include reasonable and prudent alternatives (RPAs), if available. The USFWS must develop such alternatives to the best of its knowledge that will address the need of the project and be within the scope of the undertaking but eliminate or reduce the risk of take. Upon receipt of the BO, FHWA may:

- adopt one (or a number) of the RPAs for eliminating jeopardy/adverse modification of critical habitat in the opinion;
- decide not to fund the project or undertake the action;
- reinitiate the consultation by proposing modification of the project or offering RPAs not yet considered;
- choose to take other action if it believes, after a review of the BO and best available scientific information, such action will not result in a jeopardy of a listed species; or
- request an exemption from the Endangered Species Committee (see http://www.gpo.gov/fdsys/pkg/CFR-2005-title50-vol7/pdf/CFR-2005-title50-vol7-chapIV.pdf).

Note that the latter is an option that is rarely pursued by action agencies, is considered an exceptionally extreme course of action, will likely result in multiple years of project delay, and an option that should not be considered viable despite its inclusion in the ESA. FHWA must notify the USFWS of its final decision on the project.

3. Reinitiation of Formal Consultation

Reinitiation of formal consultation is required and should be requested by the federal action agency or by the USFWS in the following circumstances:


Spreading Globeflower, DCNR

- If the amount or extent of take specified in the incidental take statement is exceeded (work on the project can be immediately shut down);
- If new information reveals effects of the project that may affect listed species or designated critical habitat in a manner or to an extent not previously considered;
- If the project is modified in a manner that causes an effect to a listed species or designated critical habitat that was not considered in the BO; or
- If a new species is listed or critical habitat designated that may be affected by the project.

It is the goal of PennDOT and FHWA to minimize the occurrence of reinitiations. Preparation of biological assessments and initiation of formal consultations based on early preliminary engineering details tends to increase the likelihood that reinitiations will be necessary. It is important to include additional geographic areas/footprint within the project action area, describe predictable final design elements such as stormwater facilities, and describe the effects of these project elements within the BA to minimize the risk of needing to reinitiate. Other options to consider are delaying initiation of formal consultation to assure improved accuracy and detail in the BA and minimizing changes after receipt of the BO.

> **NOTE:** The District should coordinate with BOPD-EPDS and the lead federal agency, FHWA, to determine when to reinitiate formal consultation.

4.D. Formal Consultation Aspects of Programmatics

The FHWA and PennDOT have coordinated and developed with the USFWS several approaches to streamline the Section 7 consultation process. USFWS has also established a programmatic approach for the NLEB for use by all applicants. Traditionally, these efforts have been species specific. Examples of species-specific programmatic approaches that have been developed are available in the species modules for bog turtles, bats, and mussels.

Strategies in development will be incorporated in future updates of this publication. Contact EPDS for the most up-to-date information on these programmatic and streamlined processes.

NOTE: The Endangered Species Consultation Handbook (1998) and the Habitat Conservation Planning and Incidental Take Permit Processing Handbook (2016) prepared by the USFWS and the NMFS provide valuable information on the federal consultation processes. These handbooks are available at https://www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf and https://www.fws.gov/endangered/esa-library/pdf/HCP_Handbook.pdf. The AASHTO Practitioner's Handbook #17 provides an excellent reference resource for federal consultation under the ESA as well as advice on conducting Section 7 consultation for transportation projects. It can be found at http://environment.transportation.org/pdf/programs/ph17%20esa%20final.pdf. The AASHTO handbook is intended primarily for use by transportation agencies and their consultants and therefore focuses on the consultation process from the perspective of the federal action agency and applicant.

Chapter 4 Summary

1. There are two levels of USFWS Section 7 consultation for listed species and designated critical habitat: 1) informal consultation and 2) formal consultation.
2. It is important to include time in the project schedule for the consultation process which can take a significant amount of time, especially for projects requiring formal consultation.
3. Informal consultation with the USFWS begins with the PNDI ER and IPaC review. If the result is a determination of "no effect" or "not likely to adversely affect", consultation with the USFWS is complete.
4. The IPaC-assisted determination key is used to assess potential project effects in accordance with the *Programmatic Consultation for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat.* Assisted Determination Keys may be developed in the future for use with other species.
5. The FHWA national BA template outline is provided through the in FHWA ESA Webtool an automated system that facilitates online project assembly, consultation, and review.
6. To prepare the BA, collect data and/or perform any necessary field surveys. Keep in mind that seasonal restrictions may apply to species surveys and that an assumption of presence is an option that might expedite the process if avoidance measures and/or compensatory mitigation can be implemented.
7. The BA should be prepared using the FHWA national BA template and also serves as the supporting documentation in a formal consultation initiation package submitted by FHWA to the USFWS.
8. It is important to use the most detailed project description and the best available scientific and commercial data available when preparing a BA and to provide a complete, detailed, and accurate report.
9. The FHWA/PennDOT make an effect determination of whether a proposed project may effect and is likely to adversely affect a federally listed species or destroy or adversely affect designated critical habitat
10. The USFWS determines whether a proposed project is likely to jeopardize a federally listed species or destroy or adversely affect designated critical habitat.
11. If the USFWS determines that the project action will not jeopardize the continued existence of a federally listed species, then, formal consultation concludes with the issuance of a BO and incidental take statement by the USFWS.
12. The BO is the opinion of the USFWS as to whether the project will "jeopardize the continued existence of" the listed species. The BO will state one of the following conclusions: the project is not likely to jeopardize the continued existence of species or result in the destruction or adverse modification of critical habitat **("no jeopardy or no adverse modification" BO**); or the project **is likely to** jeopardize the continued existence of species or result in the destruction or adverse modification of critical habitat **("jeopardy or adverse modification" BO**).

13. Projects likely to be determined to result in the issuance of a jeopardy or adverse modification BO by USFWS should not be submitted for formal consultation. In informal consultation with the USFWS, projects should be modified until the effects have been reduced to a point that will result in the issuance of a no jeopardy BO.
14. Reinitiation of formal consultation with the USFWS is required if the incidental take statement is exceeded, if previously unidentified effects are anticipated, or if newly listed species or designated critical habitats may be affected.
15. Programmatic BOs and BAs for bats, mussels, and bog turtles have been developed for transportation projects, and the processes identified therein should be followed to streamline informal and formal consultation. Refer to the species-specific modules in the appendices of this desk reference for additional information regarding the programmatic BOs and BAs.


Canby's Mountain Lover, DCNR


White Monkshood, K. McKenna

Chapter 5
Overview of Applicable Laws and Regulations

Some listed species have both federal and state requirements that must be followed throughout the entire transportation project development process. Pertinent acronyms are provided at the beginning of this desk reference. A ***glossary*** of federal and state listed species terms is provided at the beginning of this desk reference. Listed species must also be taken into consideration when applying for certain federal and state permits. Permit requirements are outlined later in this chapter.

5.A. Federal Regulatory Requirements

5.A.1. The Endangered Species Act of 1973 (16 U.S.C. 1531-1543)

The Endangered Species Act (ESA) was passed in 1973 to conserve "the ecosystems upon which endangered and threatened species depend," and to conserve and recover federally listed species.

The ESA is administered by the Interior Department's U.S. Fish and Wildlife Service (USFWS) and the Commerce Department's National Marine Fisheries Service (NMFS). The USFWS has primary responsibility for terrestrial and freshwater organisms, while the NMFS's responsibilities are for marine and anadromous species. Because the USFWS is the primary federal resource agency encountered in Pennsylvania, this desk reference will often only reference USFWS, although the ESA and its processes also apply to NMFS.

> **NOTE:** The USFWS maintains an Endangered Species Program website that can be found at https://www.fws.gov/endangered/. The NMFS also maintains a website that provides information for marine and anadromous species (including endangered species) under their jurisdiction at https://www.fisheries.noaa.gov/topic/endangered-species-conservation. These sites contain current species status information, as well as laws, policies, and Federal Register Notices.

The primary objective of the Endangered Species Program of the USFWS and NMFS is to implement the ESA. The following sections discuss topics and sections of the ESA that are related to the work of PennDOT. The sections described can be found in their entirety in the text of the ESA, located at http://www.fws.gov/endangered/esa-library/pdf/ESAall.pdf.

5.A.1.a Determination of Threatened and Endangered Species

Section 4 of the ESA addresses the listing of a threatened or endangered species. Specifically, Section 4 states that the Secretary of Interior or Commerce determines, on the basis of the best scientific and commercial data available after conducting a review of the species' status, whether any species is an endangered or threatened species by any of the following factors: the present or threatened destruction, modification, or curtailment of its habitat or range; over utilization for commercial, recreational, scientific, or educational purposes; disease or predation; inadequacy of existing regulatory mechanisms; or other natural or manmade factors affecting its continued existence.

The following terms are defined according to the ESA:

> **Endangered Species:** Any species that is in danger of extinction throughout all or a significant portion of its range [ESA §3(6)].
>
> **Threatened Species:** Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range [ESA §3(20)].
>
> **Conserve/Conserving/Conservation:** To use and the use of all methods and procedures which are necessary to bring any endangered or threatened species to the point at which the measures provided, pursuant to the Act, are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management, such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking [ESA §3(3)].
>
> **Physical or Biological Features Essential to the Conservation of the Species:** The features that occur in specific areas and that are essential to support the life-history needs of the species, including but not limited to, water characteristics, soil type, geological features, sites, prey, vegetation, symbiotic species, or other features. A feature may be a single habitat characteristic, or a more complex combination of habitat characteristics. Features may include habitat characteristics that support ephemeral or dynamic habitat conditions. Features may also be expressed in terms relating to principles of conservation biology, such as patch size, distribution distances, and connectivity.

The Department of Interior publishes lists of all endangered and threatened species in the Federal Register. Each list specifies over what portion of the species range it is endangered or threatened and identifies any critical habitat within its range. The list is reviewed every five years to determine if a species should be removed from a list, or if the species status should be reclassified. Whenever a species is listed as threatened, regulations may be issued to provide for the conservation of such species. Species of a similar appearance to an endangered or threatened species may be treated the same [ESA §4(3)].

The USFWS has a 7-Year National Listing Workplan for addressing ESA listing and critical habitat decisions over a 7-year period. The workplan is used to prioritize the timing of listing determinations based on the needs of candidate and petitioned species with the goal of encouraging proactive conservation so that federal protections are not needed. The current version was prepared in September 2016 and is available online at the following address:
https://www.fws.gov/endangered/esa-library/pdf/Listing%207-Year%20Workplan%20Sept%202016.pdf

NOTE: As verified in December 2017, Pennsylvania did not have any federal "similar appearance" species that receive protection under the ESA. However, bog turtles in the southern population (Virginia, North Carolina, South Carolina, Georgia, and Tennessee) are protected and classified based on similarity of appearance to the threatened northern population found in Pennsylvania, Maryland, New York, Connecticut, Delaware, Massachusetts, and New Jersey.

5.A.1.b Critical Habitats

Outlined in Section 4 of the ESA, a **critical habitat** for listed species consists of: (1) the specific areas within the geographical area occupied by the species at the time it is listed, on which are found those physical or biological features (a) essential to the conservation of the species and (b) which may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species at the time it is listed, if there is reasonable certainty both that the area will contribute to the conservation of the species and that the area contains on or more physical or biological features determined by the Secretary to be essential to the conservation of the species. The Secretary may determine that a designation of critical habitat would not be prudent. [ESA §3 (5)(A)].

Critical habitats are published in the Federal Register as they are designated. Only those habitats published as "critical habitat" in the Federal Register are designated critical habitat. The term "critical habitat" has been utilized to describe other habitats that are not designated as such under the ESA. Only habitat listed under the ESA that is occupied by, or is essential for the survival of, federally listed species is considered critical habitat in this document.

> **NOTE:** As verified in December 2017, Pennsylvania has federally designated critical habitats for two federally listed species, the piping plover and the rabbitsfoot mussel. See http://www.gpo.gov/fdsys/pkg/FR-2001-05-07/pdf/01-11205.pdf for more information on the listed critical habitat of the Great Lakes breeding population of the piping plover. See https://www.fws.gov/arkansas-es/docs/FWS-R4-ES-2013-0007-4500030114.pdf for more information on the listed critical habitat of the rabbitsfoot mussel.

5.A.1.c Proposed and Candidate Species

Proposed species are species of fish, wildlife or plants that are proposed in the *Federal Register* to be listed under Section 4 of the ESA. The federal agency is required as per the ESA to assess the effect of a project on both proposed and listed species. Therefore, if there is a proposed species (or proposed critical habitat) potentially impacted by a project, the conferencing process established in 50 CFR §402.10 should be followed. Refer to ***Chapter 4, ESA Consultation*** for more detail on the conference process.

Candidate species are species for which there is sufficient information on their biological status and enough threats to their continued existence to propose them as endangered or threatened under the ESA, but development of a proposed listing regulation is precluded by other higher priority listing activities. Under Section 4 of the ESA, ***candidate species receive no statutory protection***, however they are by definition, species that may warrant future protection under the ESA. Candidate species should be considered in accordance with the *Natural Resources Assessment and Mitigation Agency Partnering Policy* (Publication 546 2019 Version References).

5.A.1.d Recovery Plans

Section 4 of the ESA details that **recovery plans** are developed and implemented for the conservation and survival of endangered and threatened species, unless it is determined that such a plan would not promote conservation. Priority is given to species that are most likely to benefit from plans, particularly those species that are, or may be, in conflict with construction or other development projects or other forms of economic activity.

> **NOTE:** A current list of federal recovery plans can be found at the USFWS Endangered Species Program website, https://www.fws.gov/endangered/species/recovery-plans.html Recovery plans for anadromous species can be searched for on the NOAA website at https://www.fisheries.noaa.gov/welcome.

5.A.1.e Agency Consultation

Section 7(a)(1) of the ESA directs all federal agencies to use their existing authorities to conserve threatened and endangered species and, in consultation with the USFWS or NMFS, to ensure that their actions do not jeopardize listed species or destroy or adversely modify critical habitat. Under the provisions of Section 7(a)(2) of the ESA, a federal agency that permits, licenses, funds, or otherwise authorizes activities must consult with the USFWS or NMFS, as appropriate, to ensure that its actions will not jeopardize the continued existence of any listed species.

Section 7 agency consultation is further described in ***Chapter 4, ESA Consultation***.

5.A.1.f Prohibited Acts

Section 9 of the ESA makes it unlawful for a person to "take" a listed species, except when alternate protective measures are identified for a threatened species pursuant to 4(d) of the ESA. This section applies to individuals and government agencies and is not limited to federal agencies undertaking projects. The term **"take"** is defined to mean to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Through later regulations, the terms "harass" and "harm" are further discussed. **"Harass"** is defined by USFWS as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or shelter. The term **"harm"** is defined by USFWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns, such as breeding, feeding, or sheltering.

Channel Darter, PFBC

Section 11 of the ESA outlines the penalties and enforcement of the ESA. Heavy fines may be assessed or criminal charges may be filed against those knowingly violating any provision of this Act or any regulation issued in order to implement the ESA. PennDOT, its contractors, and individuals working for either may be fined or charged.

5.A.1.g Section 10

Section 10 of the ESA allows for an incidental take permit to be issued for any non-federal project that will result in the "incidental take" of a listed species. Given the federal nexus of the Federal Highway Administration (FHWA) support of Pennsylvania highways, Section 10 is not the process utilized to address the ESA for PennDOT projects.

5.A.1.h Implementing Policies

Summaries of major ESA regulations and policies prepared by the USFWS are available at https://www.fws.gov/endangered/laws-policies/regulations-and-policies.html. A brief discussion of several policies relevant to PennDOT projects is discussed below.

USFWS Policy Regarding Voluntary Prelisting Conservation Actions

On January 18, 2017, the USFWS announced a final policy on crediting voluntary conservation actions taken for species prior to their listing under the ESA, as amended. The policy gives landowners, government agencies, and others incentives to carry out voluntary conservation actions for unlisted species by allowing the benefits to the species from a voluntary conservation action undertaken prior to listing under the ESA to be used, either by the person who undertook such action or by a third party, to mitigate or to serve as a compensatory measure for the detrimental effects of another action undertaken after listing.

The policy is meant to incentivize voluntary conservation actions on behalf of species before they reach the point at which they need to be listed as threatened or endangered under the ESA. The policy seeks to reward those who voluntarily undertake actions to help the species when they have no legal obligation to do so.

Refer to Policy Regarding Voluntary Prelisting Conservation Actions for the January 18, 2017 Director's Order 218 for the new USFWS policy.

USFWS Mitigation Policy

On November 21, 2016, the USFWS announced revisions to their mitigation policy, which has guided USFWS recommendations on mitigating the adverse impacts of land and water developments on fish, wildlife, plants, and their habitats since 1981. The revisions were motivated by changes in conservation challenges and practices, including accelerating loss of habitats, effects of climate change, and advances in conservation science. The primary intent of the policy is to apply mitigation in a strategic manner that ensures an effective linkage with conservation strategies at appropriate landscape scales.

Refer to https://www.gpo.gov/fdsys/pkg/FR-2016-11-21/pdf/2016-27751.pdf for the revised November 21, 2016 mitigation policy.

USFWS Compensatory Mitigation Policy

On December 27, 2016, the USFWS announced their final ESA compensatory mitigation policy (CMP). The new policy implements recent mitigation policies that reflect a shift from the project-by-project approach to a landscape-scale approach to planning and implementing compensatory mitigation. The new policy was established to improve consistency and effectiveness in the use of compensatory mitigation as recommended or required under the ESA. The ESA CMP covers permittee-responsible mitigation, conservation banking, in-lieu fee programs, and other third-party mitigation mechanisms, and stresses the need to hold all compensatory mitigation mechanisms to equivalent and effective standards.

Compensatory mitigation is defined in the CMP as compensation for remaining unavoidable impacts after all appropriate and practicable avoidance and minimization measures have been applied, by replacing or providing substitute resources or environments through the restoration, establishment, enhancement, or preservation of resources and their values, services, and functions.

Refer to https://www.gpo.gov/fdsys/pkg/FR-2016-12-27/pdf/2016-30929.pdf for the revised December 27, 2016 CMP.

USFWS Interim Guidance on Implementing the Compensatory Mitigation Policy

On January 17, 2017, the USFWS issued guidance to USFWS personnel on how to implement the final ESA CMP. The guidance provides operational detail on the establishment, use, and operation of compensatory mitigation projects and programs as tools for offsetting adverse impacts to endangered and threatened species, species proposed as endangered or threatened, and designated and proposed critical habitat under the ESA. This interim guidance clarifies the standards that compensatory mitigation programs and projects must meet in order to achieve conservation that is effective and sustainable. Compensatory mitigation projects and programs are authorized by the USFWS or a combination of the USFWS and other federal and/or state regulatory agencies.

Refer to USFWS Interim Guidance for Implementing the ESA Compensatory Mitigation Policy for the January 17, 2017 guidance document.

Recovery Credit Systems and Conservation Banks

In May 2003, the USFWS issued *Guidance for the Establishment, Use, and Operation of Conservation Banks*. In July 2008, the USFWS issued *Endangered and Threatened Wildlife and Plants; Recovery Crediting Guidance*. Conceptually, recovery crediting systems and conservation banks are similar; both processes provide advance compensation for adverse impacts to federally listed species. Conservation banks typically involve the permanent conservation of lands; whereas, recovery credit systems allow for credits for permanent and temporary habitat enhancements. Temporary credits may be used to compensate for temporary impacts to species.

The following could be considered for establishing a recovery credit system: Agreements entered into with landowners, including state agencies, to plant riparian buffers or reforest areas utilizing trees that provide Indiana or northern long-eared bat habitat; or additional mussel surveys conducted to locate relocation sites and relocate and monitor listed mussels to augment low density populations.

Conservation banking is modeled after wetland banking. The conservation and preservation of non-federal lands in perpetuity are required. This compensation tool is oriented toward private, local, and state agency participation. Prior to establishment of a conservation bank, the applicant must enter into a conservation banking agreement, secure conservation easements, determine appropriate service areas, and develop monitoring and long-term management plans. Credits are determined on the basis of established habitat condition, habitat size, and other factors. A conservation bank credit may be expressed as either an acre of habitat for a particular species, or as a wetland unit along with its supporting uplands.

5.A.2. Other Federal Regulations

There are many federal regulations that serve to interpret and implement the ESA. Links to the primary federal regulations can be found in **Table 5-1**. The relevant requirements were extracted from these regulations and integrated into the desk reference.

Table 5.1 – Primary Federal Regulations Under the ESA

Citation	Description
DO No. 218	USFWS Director's Order No. 218 of the policy regarding voluntary prelisting conservation actions
FR Doc. 2016–27751	USFWS's mitigation policy
81 FR 95316	USFWS's ESA Compensatory Mitigation Policy
Interim Guidance for 81 FR 95316	USFWS's Interim Guidance on Implementing the Final ESA CMP
50 CFR 13	USFWS's general permit procedures
50 CFR 13	USFWS's general permit procedures
50 CFR 17	USFWS's regulations regarding endangered and threatened wildlife and plants
50 CFR 402	Interagency Cooperation – ESA of 1973
50 CFR 424	Endangered species committee regulations regarding listing endangered and threatened species and designating critical habitat

5.B. State Regulatory Requirements

5.B.1 The Wild Resource Conservation Act (Act 170 of 1982)

The purpose of the Wild Resource Conservation Act of June 23, 1982 is to "preserve and enhance flora and fauna species, including those that are rare or endangered which are not commonly pursued, killed or consumed either for sport or profit." This Act delegates its powers and duties to the Pennsylvania Department of Conservation and Natural Resources (DCNR). DCNR has adopted the Conservation of Pennsylvania Native Wild Plants (17 PA Code § 45.1-91) Regulations to implement this Act.

Under this Act, DCNR was directed to establish a plant species classification system that follows below. This desk reference contains procedures for addressing issues with species classified as endangered, threatened, and vulnerable. Species classified as undetermined under this Act are addressed through the *Natural Resources Assessment and Mitigation Agency Partnering Policy* (Publication 546 2019 Version References).

- **Extirpated** – Species that once occurred in Pennsylvania but are no longer known to exist.
- **Endangered** – Species in danger of extinction throughout all or most of its range if critical habitat is not maintained or is greatly exploited by man.
- **Threatened** – Species likely to become endangered throughout all or most of its range if critical habitat is not maintained or is greatly exploited by man.
- **Disjunct** – Species that are significantly separated from the main area of distribution.
- **Endemic** – Species confined to a specialized habitat and limited ranges.

- **Restricted** – Species with epidemic distribution but found in specialized habitats or habitats infrequent in Pennsylvania.
- **Limit of Range** – Species that are uncommon or rare in Pennsylvania because they are at or near the peripheral of their distribution.
- **Vulnerable** – Species that are in danger of loss because of their beauty, economic value, use as cultivar, or other factors which make them prime targets for being removed from native habitats.
- **Undetermined** – Species suggested as needing protection because of their infrequent occurrence, but their status in Pennsylvania is unclear.

This Act also created the Wild Resource Conservation Fund. The Fund contributes money to the Pennsylvania Natural Heritage Program (PNHP), the mechanism for resource agencies to maintain the Pennsylvania Natural Diversity Index (PNDI), an inventory of species of special concern and their habitats throughout the Commonwealth. PNHP and PNDI are discussed in ***Chapter 3, Project Guide***.


Eastern Mud Salamander, PFBC

NOTE: Additional information related to the Wild Resource Conservation Act can be found on these web pages:

DCNR Wild Resource Conservation Fund: http://www.dcnr.pa.gov/Conservation/Biodiversity/WildResourceConservationProgram/Pages/default.aspx

PNHP: http://www.naturalheritage.state.pa.us/

5.B.2 Conservation of Pennsylvania Native Wild Plants (17 PA. Code § 45.1-91)

This chapter "establishes a plant classification system, creates permit and license procedures and regulates other activities related to this Commonwealth's native wild plant management." These regulations are applicable to plant species of special concern, to naturally occurring wild plants native to Pennsylvania, and to the activities and people associated with them.

Plant ***species of special concern*** classifications include: PA extirpated, PA endangered, PA threatened, PA rare, PA vulnerable, special concern population, and tentatively undetermined. This desk reference contains procedures for addressing issues with species classified as endangered, threatened, and vulnerable.

NOTE: Plants thought to be extirpated that are rediscovered within the Commonwealth are automatically classified as Pennsylvania endangered.

According to this chapter, a person may not "disturb, pick, take, possess, destroy, mutilate, remove, collect or transplant" or "transport with the intent to sell or export" any plants that are classified as Pennsylvania endangered, threatened, or vulnerable, unless otherwise provided in the chapter. DCNR has the authority to issue permits and licenses for the above-mentioned activities to individuals who have valid reasons to do so. These reasons include uses for botanical and taxonomic studies, transplantation in order to protect the plants from areas where their existence is threatened by future activities, or transplantation to sanctuaries or areas that will protect and restore their existence. Any violations of these regulations are subject to punishment and fines.

5.B.3 Pennsylvania Game and Wildlife Code – Wildlife Classification (58 PA. Code § 133.1-41)

Under the Pennsylvania Game and Wildlife Code, Consolidated Statutes Title 34, Subsection 2167, Endangered or Threatened Species, the Pennsylvania Game Commission (PGC) is given the authority to "add or remove any wild bird or wild animal native to this Commonwealth to or from the Pennsylvania native list of endangered or threatened species." This subsection also states that it is unlawful for any person to possess, transport, capture, kill, purchase, sell, barter or exchange any endangered or threatened species or subspecies under the PGC's jurisdiction. Under Section 2924, Endangered or Threatened Species Permits, the PGC is given the power to issue permits, when necessary, to individuals who are in need of importing, exporting, selling, exchanging, taking, or possessing any of these species. Any violations of these regulations are considered misdemeanors of the second degree and are subject to fines.

Under Title 58, Chapter 133 of the Pennsylvania Code, Wildlife Classification, the PGC's definitions of the protected species (wild birds or mammals) and lists of those species considered threatened or endangered can be found. Endangered species are defined as "species in imminent danger of extinction or extirpation throughout their range in this Commonwealth if the deleterious factors affecting them continue to operate." Threatened species are defined as "species that may become endangered within the foreseeable future through their range in this Commonwealth unless the causal factors affecting the organism are abated." The processes and procedures contained in this desk reference are applicable only to those species listed as endangered or threatened by the PGC under Title 34 of the Pennsylvania Code. All other species are considered through the procedures found in *Natural Resources Assessment and Mitigation Agency Partnering Policy* (Publication 546 2019 Version References).

> **NOTE:** Wild bird and mammal species thought to be extirpated that are rediscovered are automatically classified as Pennsylvania endangered.

5.B.4 Pennsylvania Fish and Boat Code – Endangered Species (58 PA. Code § 75.1-4)

Under the Pennsylvania Fish and Boat Code, Consolidated Statutes Title 30, Section 2305, Threatened or Endangered Species, the Pennsylvania Fish and Boat Commission (PFBC) is authorized to "establish a Pennsylvania threatened species list and a Pennsylvania endangered species list." The lists are to be revised by the PFBC and published in the *Pennsylvania Bulletin*. This section further states that the PFBC may declare regulations pertaining to the catching, taking, killing, importing, introducing, transporting, removing, possessing, selling, offering for sale, or purchasing threatened and endangered species under the PFBC's jurisdiction. The PFBC is also authorized to issue permits, if considered prudent, for the catching, taking, or possessing of any of these species. Any violations of these regulations are considered

misdemeanors of the third degree and a separate offense for each species for which the rules were violated. Penalties, including fines and/or imprisonment, are also established for these violations. If the species was caught and immediately released where it was captured, in the same condition that it was captured, it is not considered a violation of the regulations.

The PFBC defines endangered species as all species and subspecies of fish that appear to be threatened with extinction and appear on either the USFWS's endangered species list published in the *Federal Register* or the PFBC Pennsylvania endangered species list published in the *Pennsylvania Bulletin*. Threatened species are defined as all species and subspecies of fish that are in such small numbers throughout their range that they may become endangered if their environment worsens and appear on either the USFWS's threatened species list published in the *Federal Register* or the PFBC Pennsylvania threatened species list published in the *Pennsylvania Bulletin*. Note that the PFBC definition of "fish," when used as a noun, includes all game fish, fish bait, amphibians, reptiles, and aquatic organisms.

Under Title 58, Chapter 75 of the Pennsylvania Code, PFBC classifies fish, amphibian, reptile, or other aquatic organisms as endangered, threatened, or candidate under their jurisdiction. They also have the authority to add or remove species from this list at any time. Special permits may also be issued under this chapter for an individual to "take, catch, kill or possess threatened and endangered species upon written application on forms provided by the Commission." The processes and procedures contained in this desk reference are applicable only to those species listed as endangered or threatened under Title 58, Chapter 75 of the Pennsylvania Code. All other species are considered through the procedures found in *Natural Resources Assessment and Mitigation Agency Partnering Policy* (Publication 546 2019 Version References).

> **NOTE:** Fish, amphibian, reptile, or other aquatic organisms thought to be extirpated that are rediscovered within the Commonwealth enter the PFBC regulatory process for listing where there is a vote of final rulemaking by the Commissioners.

> **NOTE:** Additional information about threatened and endangered species and the PFBC can be found at: https://www.fishandboat.com/Resource/SpeciesofSpecialConcern/Pages/EndangeredSpeciesandthePFBC.aspx

5.C. Endangered Species NEPA/Act 120 Requirements

5.C.1. NEPA

If a federal agency is funding (either fully or partially) a project or providing general support of a project, the federal agency must fulfill the requirements of the ESA. FHWA implements this requirement through its National Environmental Policy Act (NEPA) process. FHWA completes this process through the issuance of a Record of Decision (ROD), Finding of No Significant Impact (FONSI) or by delegation to PennDOT by agreement.

Evaluation of impacts to federally listed endangered species is required for all levels of NEPA documentation consisting of Categorical Exclusion Evaluations (CEE), Environmental Assessments (EA), or Environmental Impact Statement (EIS). The details of the analysis are based on:

1. Scope of the project;
2. Listing status and distribution of the affected species;
3. Intensity, extent, duration, and timing of potential effects of the project.

The NEPA and ESA Section 7 processes interact in the early phases of the environmental analysis of a project. The NEPA process drives the evaluation of biological resources in the project area concurrent with the ESA Section 7 consultation process.

PennDOT and the USFWS have developed programmatic consultation processes for Indiana and northern long-eared bats, several species of endangered mussels, and bog turtles to expedite and provide consistent and adequate biological review and fulfillment of Section 7 obligations for a wide range of minor transportation projects and activities. These are outlined in ***Chapter 3, Project Guide*** and ***Chapter 4, ESA Consultation*****.**

Upon review of project details provided through NEPA documentation, an agency coordination meeting, or PNDI follow-up coordination, etc., the FHWA and PennDOT have the option of entering **informal consultation** if the USFWS determines that protected species or habitats are known or likely to occur in the project action area. If the FHWA determines that the action "may effect and is likely to adversely affect," then FHWA may forego informal consultation and prepare a BA and initiate **formal consultation**. More detail on the consultation process is included in ***Chapter 4, ESA Consultation*****.**

An effect on species or habitat protected by the ESA does not automatically require elevation of the NEPA documentation (CEE, EA, EIS). This depends on the listing status of the species and the scope of the effect.

5.C.2. State

For projects that are 100% state-funded (in both design and construction) and do not require any other major federal action (federal permits, etc.), an Environmental Evaluation Report (EER) or Environmental Documentation (ED) would be prepared, rather than an EIS, EA, or CEE. EERs and EDs are prepared to comply with PA Act 120: The Administrative Code of 1929, 71 P.S. §512(b), and other applicable laws, including those related to listed species.

An EER is required by PA Act 120 if the following conditions exist:

- The project is a transportation route or program; and
- The project requires new or additional right-of-way.


Eastern Massasauga, PFBC

If none or only one of the two aforementioned conditions apply to the project, an EER is not required by PA Act 120; however, it may be appropriate to prepare ED for the project file.

In general, development of a project as an EER or ED would follow the same process as for a CEE, Bridge and Roadway Programmatic Agreement, EA, or EIS. The concurrent process for addressing listed species as described for federal projects requiring NEPA compliance is the same for these projects.

In practice, PennDOT seldom prepares EER documents because projects with that level of complexity commonly have federal funding.

5.D. Permit Requirements

Listed species must be considered when applying for many federal and state permits. The following programs review for potential listed species conflicts. The permits all require a PNDI search prior to the time of application. For additional details regarding permits refer to Publication 783, Environmental Permitting Handbook.

5.D.1. Federal Permits - United States Army Corps of Engineers

The Commonwealth of Pennsylvania falls under the jurisdiction of three districts of the U.S. Army Corps of Engineers (USACE) – the Philadelphia, Baltimore, and Pittsburgh Districts. The USACE maintains the Section 404 permitting program including the Pennsylvania State Programmatic General Permit (PASPGP). Section 7 of the ESA requires Federal agencies, including FHWA and the USACE, to use their legal authorities to promote the conservation purposes of the ESA and to consult with the USFWS and NMFS, as appropriate, to ensure that effects of actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of listed species. As a result, the USACE has a responsibility during the permit review and authorization process, to review and assure that ESA consultations have been completed and that the actions requiring permits will not jeopardize listed species.

5.D.1.a. Section 404 Program

Section 404 is contained within the Federal Water Pollution Control Act, as amended (also called the Clean Water Act). The Clean Water Act (CWA) establishes the basic scheme for restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. The USACE implements the Section 404 Permit Program. Under Section 404, a permit is required for the discharge of dredged or fill materials into waters of the U.S.

In Pennsylvania, the Pennsylvania Department of Environmental Protection (DEP) and the Philadelphia, Baltimore, and Pittsburgh Districts of the USACE have developed a joint application for the Pennsylvania Obstruction and Encroachment Permit (Chapter 105 Permit) and the USACE Section 404 Permit. *As part of the permit application, a PNDI Receipt and documentation of any subsequent agency coordination is required*. Relying on the appropriate federal and state resource agencies to provide the species technical

support, the USACE does not complete its own species searches. Section 404 Permits are issued by the USACE in coordination with the U.S. Environmental Protection Agency, USFWS, PFBC, PGC, and DCNR. For additional details regarding permits refer to Publication 783, Environmental Permitting Handbook.

5.D.1.b. PASPGP

Section 404(e) of the CWA allows for the issuance of general permits on a statewide basis, which operate in conjunction with a state regulatory program that serves to protect the aquatic environment in a manner equivalent to the USACE regulatory program.

The current PASPGP (PASPGP-5 went into effect July 1, 2016) authorizes the discharge of dredged or fill materials and/or the placement of structures that are components of a single and complete project, including all appurtenant structures both temporary and/or permanent, which individually or cumulatively result in impacts to 1.0 acre or less of waters of the U.S., including jurisdictional wetlands. These discharges and placement of structures must comply with all the terms, conditions, and processing procedures identified in the PASPGP.

The eligibility of the PASPGP depends upon the nature of the proposed activity and the associated impacts, as well as the geographical location. Approximately a dozen watersheds across the Commonwealth are ineligible for the PASPGP. Consult the PASPGP for the current list (Part III(A)(5) in the PASPGP-5). If the proposed project is located within one of these ineligible watersheds, the PASPGP cannot be authorized and additional Section 404 coordination with the USACE would be required.

> **NOTE:** As PASPGPs are issued for five-year periods, please be sure you are aware of the current PASPGP and its criteria.

Threatened and endangered species are specifically discussed and protected in the PASPGP. No activity is authorized under the PASPGP which is likely to, individually or cumulatively, adversely affect a federally listed threatened or endangered species or a species proposed for such designation, as identified under the ESA, or which will destroy or adversely modify the critical habitat of such species. If an activity is authorized under the PASPGP and a federally listed threatened or endangered species or proposed species or critical habitat is subsequently found to be present, all work must cease, and the USACE and USFWS (or NMFS) must be notified. The PASPGP authorization is suspended until the conclusion of Section 7 consultation in accordance with the ESA. The PASPGP authorization will be revoked for the specific project if the species or critical habitat is adversely affected.

5.D.1.c. Non-Reporting Activity

Part IV(A) of the PASPGP details authorization without notification of the applicable USACE District (defined as a **Non-Reporting Activity**) on activities involving listed species, pursuant to Section 7 of the Dam Safety and Encroachments Act, 32 P.S. § 693.1, et seq., and rules and regulations codified at 25 Pa. Code, Chapter 105. Non-reporting activities require the following:

- An up-to-date PNDI search receipt that states “no known impact, no further review required” for USFWS;


Delmarva Fox Squirrel, PGC

- An up-to-date PNDI search receipt which contains avoidance measures (AMs) for federally listed species whereby the applicant has agreed to implement the AMs by signing the submitted PNDI receipt. In such cases, all AMs become special conditions of the PASPGP-5 authorization without the need for USACE review. By signing the PNDI receipt, the applicant agrees to abide by all AMs;
- An up-to-date written "no effect" determination from the USACE;
- An up-to-date written clearance from the USFWS stating that the activity will not affect federally listed species, including the Northern long-eared bat; or
- Correspondence[7] from the USFWS containing AMs for federally listed species whereby the applicant has agreed to implement AMs as part of the application. In such cases, all AMs become Special Conditions of the PASPGP-5 authorization without the need for a Corps review.

> **NOTE:** If the PNDI receipt or correspondence from the USFWS includes AMs, and the applicant does not agree to, or cannot comply with the AMs, or the applicant believes that the AMs are outside of the USACE's Section 7 scope of analysis, then the application must be processed as a Reporting Activity. For activities proposed outside of the USACE's Section 7 Scope of Analysis, the applicant/permittee is responsible for compliance with the ESA.

Emergency activities identified under non-reporting activity 22 are eligible for PASPGP verification provided the applicant, the DEP, or the USACE will complete a PNDI search prior to verification of the PASPGP or promptly after issuance of PASPGP verification, unless the USFWS and/or the USACE determines that the activity will have no effect on listed species. Where the PNDI receipt identifies a potential impact or includes AMs related to a federally listed species, the USACE will consult with the USFWS in accordance with the Emergency Consultation provisions of the ESA (50 CFR 402.05), unless the applicant agrees to comply with all of the listed AMs.

[7] Including programmatic biological opinions.

5.D.1.d. Reporting Activity

Part IV(B) of the PASPGP addresses project-specific review by the USACE (defined as a **Reporting Activity**) on activities involving listed species, pursuant to Section 7 of the Dam Safety and Encroachments Act and rules and regulations codified at 25 Pa. Code, Chapter 105. Reporting activities require project-specific review by the USACE prior to the issuance of the federal and state permits to verify that no more than minimal adverse environmental impacts will occur. The USACE will coordinate with the appropriate federal and state agencies in order to make a minimal impact determination and to ensure compliance with other federal laws and regulations.


Common Tern, PGC

Part IV(B)(5) of the PASGP, "Activities Which May Affect Threatened or Endangered Species and Their Critical Habitat Under Section 7 of the ESA", outlines:

a. Activities or projects proposed in waterways occupied by federally listed, proposed, or candidate mussels or fish as indicated below in **Table 5-2**, or in waters of the United States **within 300 feet** of these listed waterways, unless the activities or projects have received documented clearance from USFWS, or an up-to-date no effect determination from the USACE.

> **NOTE:** Many of the transportation activities that could potentially impact listed mussel species will receive documented clearance from USFWS through the programmatic biological opinion for endangered freshwater mussels, "*Effects of the Pennsylvania Department of Transportation Bridge Replacement and Maintenance Program on the Northern Riffleshell, Clubshell, Rayed Bean, Snuffbox, and Rabbitsfoot Pearly mussels in the Ohio River Basin, Pennsylvania.*" Guidance for freshwater mussels is contained in the **Threatened and Endangered Mussels Species Module**.

Table 5.2 – Waterways Occupied by Federally Listed, Proposed, or Candidate Mussels

Waterways	Counties
Allegheny River (from Kinzua Dam to the Ohio River and from Port Allegheny to NY line)	Allegheny, Armstrong, Clarion, Forest, McKean, Venango, Warren, and Westmoreland
Conewago Creek	Warren
French Creek	Crawford, Erie, Mercer, and Venango
Conneaut Outlet	Crawford
Conneauttee Creek	Crawford
LeBoeuf Creek	Erie
Muddy Creek	Crawford
Shenango River (Pymatuning Reservoir to Big Bend)	Crawford and Mercer
Delaware River	Monroe, Pike, and Wayne
Cussewago Creek	Crawford
Little Mahoning Creek	Indiana
Little Shenango River	Mercer
Oil Creek	Venango
Oswayo Creek	McKean
West Branch of French Creek	Erie
Woodcock Creek	Crawford

b. Activities or projects with proposed impacts to wetlands require bog turtle screening procedures when such is noted on a PNDI receipt. The bog turtle screening must be completed unless the activities or projects have received documented clearance from the USFWS, or an up-to-date No Effect determination from the USACE.

> **NOTE:** Many of the transportation activities that could potentially impact bog turtle species will receive USFWS clearance under the bog turtle programmatic biological opinion, "*Programmatic Biological Opinion for the Effects of Transportation Actions on the Bog Turtle within the Commonwealth of Pennsylvania*". Guidance for bog turtles is contained in the **Bog Turtle User Guide.**

c. Activities or projects, whereby an up-to-date PNDI search identifies potential conflict(s) for federally listed species, and/or AMs unless:

   i. The applicant has agreed in writing to implement and comply with all AMs on the PNDI receipt or other USFWS correspondence;

   ii. The activities or projects have received documented clearance from the USFWS; or

   iii. A No Effect determination from the USACE, for the project.

d. Activities that cannot comply with General Condition 35 which pertains to the Atlantic and shortnose sturgeon and the conservation measures required by NMFS, unless specifically waived by the USACE in writing.

> **NOTE:** For more information regarding USACE permitting programs, visit the USACE- Baltimore Division Permit Web Page found at: http://www.nab.usace.army.mil/Missions/Regulatory/Permit-Types-and-Process/

5.D.2. State Permits - DEP

The DEP has the state authority to oversee programs and approve or deny permits required for certain activities. The programs and permits applicable to the transportation project development process include those that fall under 25 Pa. Code Chapter 93 (Water Quality Standards), Chapter 102 (Erosion and Sediment Control), and Chapter 105 (Dam Safety and Waterway Management). Under these regulations, DEP is able to protect threatened and endangered species and their habitats by placing permit conditions and requirements on the permittee. DEP is the administering agency for the federal Section 401 Water Quality Certification (WQC) and National Pollutant Discharge Elimination System (NPDES) programs. For additional details regarding permits refer to Publication 783, Environmental Permitting Handbook.

5.D.2.a. 25 Pa. Code Chapter 93. Water Quality Standards

DEP offers existing use water protection through its implementation of antidegradation requirements in *Section 93.4(c)(a)(2,) Endangered or threatened species.* This section states: "If the Department [DEP] has confirmed the presence, critical habitat, or critical dependence of endangered or threatened Federal or Pennsylvania species in or on a surface water, the Department will ensure protection of the species and critical habitat."

5.D.2.b. 25 Pa. Code Chapter 102. Erosion and Sediment Control

The Chapter 102 regulations necessitate planning for erosion control for all types of earthmoving activities and require anyone "proposing or conducting earth disturbance activities to develop, implement and maintain BMPs to minimize the potential for accelerated erosion and sedimentation and to manage post construction stormwater." Under *Chapter 102.6(a)(2) Permit applications and fees*, it states that: "A person proposing or conducting an earth disturbance activity which requires a permit under § 102.5 (relating to permit requirements), shall:

> ***(2) Provide proof of consultation with the Pennsylvania Natural Diversity Inventory (PNDI) regarding the presence of a State or Federal threatened or endangered species on the project site. If the Department or conservation district determines, based upon PNDI data or other sources, that the proposed earth disturbance activity may adversely impact the species or critical habitat, the person proposing the earth disturbance activity shall consult with the Department [DEP] or conservation district to avoid or prevent the impact. If the impact cannot be avoided or prevented, the person proposing the activity shall demonstrate how the impacts will be minimized in accordance with State and Federal laws pertaining to the protection of threatened or endangered flora and fauna and their habitat."***

NOTE: If there is a potential conflict, both DEP and the county conservation district will refer PennDOT personnel to the appropriate jurisdictional agency for the species for further consultation. PNDI is discussed in ***Chapter 3, Project Guide***.

5.D.2.c. 25 Pa. Code Chapter 105. Dam Safety and Waterway Management

In Chapter 105, subsections 105.16(c)(3), 105.17(1)(i) and (ii), 105.381(e), and 105.401(3) specifically address threatened and endangered species.

Subsection 105.16(c)(3) states:

> ***(c) An application for a permit will not be approved by the Department in the following areas unless the applicant demonstrates and the Department finds that the project will not have an adverse impact upon the public natural resources:***
>
> > ***(3) A project located within an area which serves as a habitat of a threatened or endangered species protected by the Endangered Species Act of 1973 or for a species which has been designated as a threatened or endangered species under the Wild Resource Conservation Act, the Fish and Boat Code or the Game and Wildlife Code.***

Section 105.17 also establishes special protection for wetlands that exhibit certain characteristics. For the sake of this desk reference, concerns include:

> ***(1) Exceptional value wetlands. This category of wetlands deserves special protection. Exceptional value wetlands are wetlands that exhibit one or more of the following characteristics:***
>
> > ***(i) Wetlands which serve as habitat for fauna or flora listed as ''threatened'' or "endangered" under the Endangered Species Act of 1973, the Wild Resource Conservation Act, 30 Pa.C.S. (relating to the Fish and Boat Code) or 34 Pa.C.S. (relating to the Game and Wildlife Code).***
> >
> > ***(ii) Wetlands that are hydrologically connected to or located within 1/2-mile of wetlands identified under subparagraph (i) and that maintain the habitat of the threatened or endangered species within the wetland identified under subparagraph (i).***

Section 105.381(e) Location of dredging determines that:

> ***(e) Dredging may not occur in, encroach upon or cause siltation in areas of riffles or shallow pools whenever the areas are contributing to the sustenance of game fish or endangered species in a free-flowing reach of a stream. Game fish includes species and varieties defined as such by 30 Pa.C.S. § 102 (relating to definitions). Endangered species include those species so defined by the Fish Commission, under 30 Pa.C.S. § 102 or defined by 50 CFR 17.12 (relating to endangered and threatened species). A free-flowing reach of a stream includes a reach, segment or area of a stream except where a pool has been created by a dam.***

Section 105.401(3) Permit applications requires that the following information must be included in the application:

> ***(3) The impact of the activity upon a threatened or endangered species as identified under the Endangered Species Act of 1973, and the critical habitat of the species.***

With the stipulations that Chapter 105 requires for any permit under the Dam Safety and Waterway Management statute, listed threatened and endangered species will be protected, as long as the permittee adheres to the conditions that are put upon them. DEP has developed its own "Policy for Pennsylvania Natural Diversity Inventory (PNDI) Coordination During Permit Review and Evaluation" that can be found at:

http://www.depgreenport.state.pa.us/elibrary/GetDocument?docId=7724&DocName=021-0200-001.pdf

5.D.2.d. NPDES Program

The NPDES was authorized under Section 402 of the federal CWA and was designed to control water pollution by regulating discharges into waters of the United States. Implementation of the NPDES program for stormwater is contained within 40 CFR §122.26, *Implementation of the NPDES Program – Stormwater Discharges*. This serves as a guide for states to develop their own NPDES programs in lieu of a federal program. The states develop their own program which must then be approved by the United States Environmental Protection Agency (EPA). Section 402 of the federal CWA is administered by the EPA but has been delegated to DEP by agreement. Authorized by the state Clean Streams Law, 25 Pa. Code Chapters 92a and 102 provide Pennsylvania state implementation of the NPDES program. This program and its permits are administered by DEP.

DEP requires a PNDI Environmental Review Tool search and receipt with both general and individual NPDES permits. Section 92a.12(c) states that, "If the Department [DEP] has confirmed the presence or critical habitat of endangered or threatened species under federal or state law or regulation, discharges to these waters shall be limited to ensure protection of these species and critical habitats."

5.D.2.e. Section 401 Water Quality Certification (WQC)

Under Section 401 of the federal CWA, any applicant for federally permitted or licensed activities that may result in a discharge to waters of the United States must obtain a WQC from the DEP. To obtain a WQC, the applicant must demonstrate compliance with Pennsylvania water quality standards, which includes Chapters 93, 102 and 105, and other federal and state laws and regulations. When WQC is denied, a federal agency may not issue a permit or license for the project in question.

Short-eared Owl, PGC

Chapter 5 Summary

1. Some listed species have both federal and state requirements that must be followed throughout the entire Transportation Project Development Process. Regulatory compliance and environmental stewardship are key facets of PennDOT's transportation mission.

2. The ESA was passed in 1973 to conserve "the ecosystems upon which endangered and threatened species depend," and to conserve and recover federally listed species. The ESA is administered by the Interior Department's USFWS and the Commerce Department's NMFS.

3. Section 4 of the ESA addresses the listing of a threatened or endangered species, critical habitats, proposed and candidate species, and recovery plans. The Department of Interior publishes lists of all endangered and threatened species in the *Federal Register*.

4. Section 7 of the ESA directs all federal agencies to use their existing authorities to conserve threatened and endangered species and, in consultation with the USFWS or NMFS, to ensure that their actions do not jeopardize listed species or destroy or adversely modify critical habitat. Section 7 consultation, informal or formal, is the typical process for PennDOT compliance with the ESA.

5. Section 9 of the ESA makes it unlawful for a person to "take" a listed species.

6. The term "take" is defined to mean to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

7. Section 10 of the ESA allows for an incidental take permit to be issued for any non-federal project that will result in the "incidental take" of a listed species. Given the federal nexus of FHWA support of Pennsylvania highways, Section 10 is not the process utilized to address ESA for PennDOT projects.

8. Section 11 of the ESA outlines the penalties and enforcement of the ESA.

9. The USFWS Policy Regarding Voluntary Prelisting Conservation Actions gives landowners, government agencies, and others incentives to carry out voluntary conservation actions for unlisted species by allowing the benefits to the species from a voluntary conservation action undertaken prior to listing under the ESA to be used, either by the person who undertook such action or by a third party, to mitigate or to serve as a compensatory measure for the detrimental effects of another action undertaken after listing.

10. USFWS Mitigation Policy was revised in 2016 to address changes in conservation challenges and practices, including accelerating loss of habitats, effects of climate change, and advances in conservation science.

11. USFWS CMP implements recent mitigation policies that reflect a shift from the project-by-project approach to a landscape-scale approach to planning and implementing compensatory mitigation.


West Virginia Water Shrew, PGC

12. The purpose of the Wild Resource Conservation Act of June 23, 1982 is to "preserve and enhance flora and fauna species, including those that are rare or endangered which are not commonly pursued, killed or consumed either for sport or profit." The DCNR has the duty to protect listed species of wild plants under the chapter of the law entitled Conservation of Pennsylvania Native Wild Plants. Under the Pennsylvania Game and Wildlife Code, the PGC is given the authority to protect listed species of wild birds and mammals of the Commonwealth. Under the Pennsylvania Fish and Boat Code, the PFBC is authorized to protect listed species of "fish"; when used as a noun, "fish" includes fish, amphibians, reptiles, and aquatic organisms.

13. Federal nexus goes beyond funding and permitting. The FHWA and the USFWS are now recognizing FHWA funding involvement and general support of transportation projects as a federal nexus in multiple programmatic biological opinions. Projects with a federal nexus must fulfill the requirements of the ESA.

14. The USACE implements the Section 404 Permit Program of the CWA, including the PASPGP. Under Section 404, projects involving the discharge of dredged or fill materials into waters of the U.S must comply with the ESA.

15. PASPGPs are issued for five-year periods. The current PASPGP (PASPGP-5) went into effect July 1, 2016.

16. Projects with an up-to-date PNDI search receipt that states "no known impact, no further review required" for USFWS, those with AMs for federally listed species agreed to by PennDOT, an up-to-date written "no effect" determination from the USACE or up-to-date written clearance from the USFWS stating that the activity will not affect federally listed species, may qualify as a non-reporting activity under the PASPGP.

17. Projects that do not meet the criteria for a non-reporting activity will be a reporting activity under the PASPGP.

18. The DEP administers several laws that must comply with the ESA, including Chapter 102 Erosion and Sediment Control, Chapter 105 Dam Safety and Waterway Management, Section 401 WQC, and the NPDES Program.

APPENDIX A

USEFUL WEBSITES AND FORMS

USEFUL WEBSITES

Clean Water Act of 1977, as amended, 1987, Section 404

Conservation of Pennsylvania Native Wild Plants at 17 Pa. Code § 45.1-91

DCNR Rules and Regulations for Finalizing Plant Species Classifications

DCNR Botanical Survey Protocols

DCNR Wild Resources Conservation Program

DEP Policy for Pennsylvania Natural Diversity Inventory (PNDI) Coordination During Permit Review and Evaluation

Endangered and Threatened Wildlife and Plants; Recovery Crediting Guidance (Federal Register / Vol. 73, No. 148 / Thursday, July 31, 2008)

Endangered Species Committee Regulations regarding the committee at 50 CFR 450-453

Federal Highway Administration Endangered Species Act Legal Analysis, Assistant Director, Endangered Species, U.S. Fish and Wildlife Service, and Federal Highway Administration, Division Administrators, (February 18, 2005)

Federal Highway Administration Endangered Species Webtool

Federal Highway Administration Memorandum to Division Federal Highway Administrators, Information: Management of the Endangered Species Act (ESA) Environmental Analysis and Consultation Process, (February 20, 2002)

Final Compensatory Mitigation Rule (2008)

Memorandum to USFWS Regional Directors; Guidance for the Establishment, Use, and Operation of Conservation Banks, (May 2, 2003)

National Environmental Policy Act (NEPA) of 1969 and Project Development

National Marine Fisheries Service Listed Species

Pennsylvania Fish and Boat Commission Endangered and Threatened Species at 58 PA Code §75.1-5

Pennsylvania Fish and Boat Commission – Information Regarding Scientific Collecting Program

Pennsylvania Fish and Boat Commission – Environmental Services

Pennsylvania Fish and Boat Commission List of Qualified Surveyors for Bog Turtle

Pennsylvania Fish and Boat Commission – Scientific Collectors' Permit Database

Pennsylvania Fish and Boat Commission – Species Action Plan: Bog Turtle (*Glyptemys muhlenbergii*), June 2011

Pennsylvania Game and Wildlife Code, Sections pertaining to Enforcement, Threatened and Endangered Species, and Threatened and Endangered Species Permits at 34 Pa.C.S. §§ 102, 925, 2164-67, and 2924

Pennsylvania Game Commission Endangered and Threatened Species List

Pennsylvania Game Commission's Endangered Species at 58 PA Code § 133.1-41

Pennsylvania Natural Heritage Program

Pennsylvania Natural Heritage Program – Pennsylvania Conservation Explorer (PNDI ER)

Section 7 Consultation Handbook

State-Listed Species

- Endangered and Threatened Birds
- Endangered and Threatened Mammals
- Endangered Fish, Reptiles, Amphibians, and Invertebrates
- Threatened Fish, Reptiles, Amphibians, and Invertebrates
- Endangered Plants
- Threatened Plants

The Endangered Species Act of 1973 at 16 U.S.C. 1531-1543

The Wild Resource Conservation Act at 32 P.S. §§ 5301-5314, (Act 170 of 1982)

U.S. Army Corps of Engineers Baltimore District Contacts & PennDOT Contacts

U.S. Army Corps of Engineers Regulatory Guidance Letters

U.S. Army Corps of Engineers, *33 CFR Parts 325 and 332* and Environmental Protection Agency, *40 CFR Part 230*

U.S. Fish and Wildlife Service Bat Survey Protocol for Assessing Use of Potential Hibernacula

U.S. Fish and Wildlife Service Biological Opinion: Effects of the Canoe Creek Transportation Improvement Project on the Indiana Bat, Blair County, Pennsylvania, 2012

U.S. Fish and Wildlife Service Biological Opinion: Effects of the South Valley Parkway (S.R. 3046, Section 301) Transportation Project on the Indiana Bat, Luzerne County, Pennsylvania, 2012

U.S. Fish and Wildlife Service – Candidate Conservation Process

U.S. Fish and Wildlife Service Endangered Species Program Permits website

U.S. Fish and Wildlife Service Endangered Species Program website

U.S Fish and Wildlife Service Federally Listed Species in Pennsylvania

U.S. Fish and Wildlife Service Final Rule on Candidate Conservation Agreements with Assurances

U.S. Fish and Wildlife Service Final Rule on Safe Harbor Agreements

U.S. Fish and Wildlife Service Guidance for Preparing a Biological Assessment

U.S. Fish and Wildlife Service Habitat Conservation Planning and Incidental Take Permit Processing Handbook. 2016

U.S. Fish and Wildlife Service Indiana Bat Conservation Plan Guidance

U.S. Fish and Wildlife Service Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision, 2007

U.S. Fish and Wildlife Service Interim Guidance on Implementing the Final ESA Compensatory Mitigation Policy

U.S. Fish and Wildlife Service Mitigation Policy

U.S. Fish and Wildlife Service National Bald Eagle Management Guidelines

U.S. Fish and Wildlife Service Northern Long-eared Bat Final 4(d) Rule

U.S Fish and Wildlife Service List of Qualified Indiana Bat Surveyors

U.S Fish and Wildlife Service Policy Regarding Voluntary Prelisting Conservation Actions (1/18/17)

U.S Fish and Wildlife Service Recovery Plans

U.S. Fish and Wildlife Service Revised (December 2016) Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-eared

U.S. Fish and Wildlife Service Addendum to the Revised (December 2016) Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-eared

U.S. Fish and Wildlife Service User's Guide for the Range-wide Programmatic Consultation for Indiana Bat and Northern Long-eared Bat, Versions4.0, December 2016

U.S. Fish and Wildlife Service's Endangered Species Committee Regulations regarding listing endangered and threatened species and designating critical habitat at 50 CFR 424

U.S. Fish and Wildlife Service's Final Rule Designation of Critical Habitat for Neosho Mucket and Rabbitsfoot; Final Rule

U.S. Fish and Wildlife Service's Final Rule Determination of Critical Habitat for the Great Lakes Breeding Population of the Piping Plover

U.S. Fish and Wildlife Service's general permit procedures at 50 CFR 13

U.S. Fish and Wildlife Service's Interagency Cooperation – Endangered Species Act of 1973 as Amended implemented at 50 CFR 402

U.S. Fish and Wildlife Service's regulations regarding cooperation with the States at 50 CFR 81

U.S. Fish and Wildlife Service's regulations regarding endangered and threatened wildlife and plants at 50 CFR 17

U.S. Fish and Wildlife Service's regulations regarding convention on international trade in endangered species (CITES) at 50 CFR 23

FORMS

U.S. Fish and Wildlife Service Bald Eagle Project Screening Form

U.S. Fish and Wildlife Service Federal Fish and Wildlife Permit Application Form for an Incidental Take Associated with a Habitat Conservation Plan

APPENDIX B

AGENCY WEBSITE ADDRESSES

AGENCY WEBSITE ADDRESSES

DCNR Pennsylvania Department of Conservation and Natural Resources

http://www.dcnr.pa.gov/Conservation/Biodiversity/Pages/default.aspx

http://www.dcnr.pa.gov/Conservation/WildPlants/Pages/default.aspx

http://www.dcnr.pa.gov/Conservation/WildPlants/RareThreatenedAndEndangeredPlants/Pages/default.aspx

DEP Pennsylvania Department of Environmental Protection

www.dep.pa.gov

FHWA Federal Highway Administration

https://www.fhwa.dot.gov/hep/

NMFS National Marine Fisheries Service

https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-take-reporting-programmatics?utm_medium=email&utm_source=govdelivery#fhwa-garfo-streamlining

PennDOT Pennsylvania Department of Transportation

http://www.penndot.gov/ProjectAndPrograms/RoadDesignEnvironment/Environment/environmental-policy/Pages/Natural-Resources.aspx

PFBC Pennsylvania Fish and Boat Commission

http://www.fishandboat.com/Resource/SpeciesofSpecialConcern/Pages/default.aspx

PGC Pennsylvania Game Commission

http://www.pgc.pa.gov/Wildlife/EndangeredandThreatened/Pages/default.aspx

PNHP Pennsylvania Natural Heritage Program

http://www.naturalheritage.state.pa.us/

http://www.naturalheritage.state.pa.us/Species.aspx

https://conservationexplorer.dcnr.pa.gov/

USACE United States Army Corps of Engineers

www.usace.army.mil

www.nab.usace.army.mil Baltimore District

www.nap.usace.army.mil Philadelphia District

www.lrp.usace.army.mil Pittsburgh District

Regulatory Guidance Letters
www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/Guidance-Letters/

USFWS United States Fish and Wildlife Service

https://www.fws.gov/endangered/?ref=topbar

https://www.fws.gov/northeast/pafo/index.html

https://www.fws.gov/northeast/pafo/endangered/index.html

https://ecos.fws.gov/ipac/

APPENDIX C

DIRECTORY OF RESOURCE AGENCIES AND CONSERVANCIES

DIRECTORY

THREATENED AND ENDANGERED SPECIES JURISDICTIONAL AGENCIES AND CONSERVANCIES

Area of Interest	Agency	Address	Phone/Contact Information
Terrestrial and Freshwater Species	US Fish & Wildlife Service, Pennsylvania Field Office	110 Radnor Road, Suite 101 State College, PA 16801	814-234-4090 https://www.fws.gov/northeast/pafo/connect.html
Marine and Anadromous Species	National Marine Fisheries Service, Northeast Regional Field Office	Protected Resource Division 55 Great Republic Drive, Gloucester, MA 01930	978-281-9300 https://www.greateratlantic.fisheries.noaa.gov/protected/section7/contactus/index.html
General PNDI Information and Native Plants	DCNR Environmental Review Bureau of Forestry	6th Floor, Rachel Carson State Office Building P.O. Box 8552 Harrisburg, PA 17105-8552	717-705-2819 RA-HeritageReview@pa.gov
Fish, Reptiles, Amphibians, Aquatic Organisms	PA Fish & Boat Commission, Division of Environmental Services	595 East Rolling Ridge Dr. Bellefonte, PA 16823	814-359-5236
Birds and Mammals	PA Game Commission, Division of Environmental Planning & Habitat Protection	2001 Elmerton Avenue Harrisburg, PA 17110-9797	717-787-4250
Natural Heritage Program	The Western Pennsylvania Conservancy	800 Waterfront Drive Pittsburgh, PA 15222	412-288-2777 http://www.naturalheritage.state.pa.us/Staff.aspx
Lead Federal Agency Threatened and Endangered Species Policies	Federal Highway Administration	228 Walnut Street Room 508 Harrisburg, PA 17101	Jonathan Crum – Technical Specialist 717-221-3735 jonathan.crum@dot.gov

APPENDIX D

PROJECT REVIEW REQUEST CONTENT EXAMPLES

REVIEW REQUESTS

Review requests should be prepared in letter form. To process the review request, the resource agency needs to receive the following information:

- A complete and specific description of the project and construction details, using best professional judgment, and
- Detailed description of both the project location and the affected area, and copies of USGS quadrangles with labeled project area.

Proposed project descriptions should be as specific as possible to give the resource agency enough detailed information to thoroughly review a project. For example, if the project is a bridge replacement over a creek, describe the bridge design, type of construction and construction sequencing schedule if known, so that general impacts to the creek (potential habitat) or seasonal effects can be determined. Descriptions of the affected area should detail the presence or absence of certain natural features that may be possible habitat for a listed species in the project area. Explain Best Management Practices or seasonal restrictions that are being integrated into the project design if any. For example, if your project is located in a region known to support bog turtles, provide information on whether or not there are wetlands in your project area and how the project design may avoid affecting the species. Photographs and plans, if available, can also be included to provide the reviewer with an accurate view of the project area. A recommended method for developing a project description is to "deconstruct" the project, identifying each construction activity and considering whether each activity will affect the species.

The sample information that follows provides a sample letter template and PNDI information from one project, and reasonably adequate project and habitat description information from some other projects. These were prepared considering specific species; however, the level of detail provided is a good guide for a standard level of detail that should be contained in a good Review Request for any project.

Prepared by:

PENNDOT District 10-0 Environmental Unit

Armstrong County State Route 4023, Section 191, Over Fish Run

Project Description

Existing Structure

The existing structure over Fish Run is a reinforced concrete slab which carries State Route 4023 over Fish Run in East Franklin Township, Armstrong County, Pennsylvania. The bridge roadway width is 30 feet 3 inches curb to curb with a structure length of 13 feet. The bridge was constructed in 1937 and will be replaced in its entirety due to the extent of structural deterioration.

The approximate stream width under the bridge is 4 feet. There is some sediment buildup under the entire length of the bridge. The stream actually flows against an existing abutment and has created a 6-inch scour under the wing.

Proposed Structure

The proposed structure will be a reinforced concrete box culvert approximately 15 feet in length with a curb-to-curb width of 30 feet. The exact span length will be determined based on the hydraulic requirements at the site. The culvert will be depressed 1 foot so that a natural streambed forms inside the culvert. The proposed bridge will be slightly larger than that of the existing bridge. Rock riprap protection will also be provided to prevent erosion.

The existing bridge is in poor condition and is currently scheduled for construction late in the year 2002. This project is not of an emergency nature.

Existing Bridge Removal

The existing bridge will be removed in sections off the cut stone abutments. The cut stone will then be removed. Portions of the structure may enter Fish Run during the removal operation. Any material that enters the stream will be removed promptly. Construction equipment will remain on the stream banks at all times.

Proposed Bridge Construction

A standard temporary stream crossing approximately 24-feet wide will be provided for traffic during construction of this project. Streamflow will be maintained at all times during construction.

Construction equipment will remain on the stream banks at all times.

An approved Erosion and Sedimentation (E&S) Pollution Control Plan will be properly implemented and closely monitored during construction. Best Management Practices (BMPs) for erosion and sedimentation controls will greatly reduce the potential for indirect impacts due to construction-related sedimentation.

Extent of Previous Disturbance Within Project Area

Disturbances that exist at the project site include the following:

A. Streambed Scour

The bridge inspection records for this structure indicate that a 6-inch deep scour exists near the wing due to current stream alignment.

B. Coal-Related Activities

An old bituminous coal strip cut with an active coal tipple and processing plant presently operates upstream within 500 feet of the bridge. Stream enclosures exist at the site with open coal stockpiles located on the facility.

Other Comments

Fish Run empties into the Allegheny River just south of Tarrtown, Pennsylvania. A distance of approximately 700 feet exists from the construction site to the confluence of Fish Run with the Allegheny River. Numerous sand and gravel dredging activities occur in this section of the Allegheny River. Freshwater mussel surveys have not been reviewed but likely exist having been conducted in response to dredging activities on the Allegheny River in the vicinity of the project site.

Armstrong County State Route 4023, Section 191, Over Unnamed Tributary to the Allegheny River

Project Description

Existing Structure

The existing structure over the unnamed tributary to the Allegheny River is a reinforced concrete slab which carries State Route 4023 over the tributary in East Franklin Township, Armstrong County, Pennsylvania. The bridge roadway width is 30 feet curb to curb with a structure length of approximately 8 feet. The existing wingwalls and abutments have recently been repaired. Forms were attached to the structures and poured creating a concrete parge over the existing wingwalls and abutments. The underside of the bridge deck was also parged with concrete.

The approximate stream width under the bridge is 7 feet. A minimal amount of sand and gravel was noted under the structure. Streamflow under the bridge is even with no undercutting or scouring evident. A 7½-foot under clearance presently exists on the structure.

Proposed Structure

The proposed structure will be a reinforced concrete arch approximately 8 feet in length with a 30-foot curb-to-curb width. The exact span length will be determined based on the hydraulic requirements at the site. Rock riprap protection will also be provided to prevent erosion.

The existing bridge is in good condition from a superficial standpoint since the parging was completed. The structural integrity of the bridge is in poor condition and, therefore, scheduled for construction late in the year 2002. The project is not of an emergency nature.

Existing Bridge Removal

The existing bridge will be dismantled in sections starting with the parapets and deck followed by the wingwalls and abutments. Portions of the structure may fall into the unnamed tributary during dismantling operations. Any material that falls into the tributary will be removed promptly. Construction equipment will remain on the stream banks at all times.

Proposed Bridge Construction

A standard temporary stream crossing approximately 24-feet wide will be provided for traffic during construction of this project. Streamflows will be maintained during construction. Construction equipment will remain on the stream banks at all times.

An approved Erosion and Sedimentation (E&S) Pollution Control Plan will be properly implemented and closely monitored during construction. Best Management Practices (BMPs) for erosion and sedimentation controls will greatly reduce the potential for indirect impacts due to construction-related sedimentation.

Extent of Previous Disturbance Within Project Area

Disturbances which exist at the project site include the following:

A. Coal Mining Activity

Coal surface and deep mining exist upstream of the unnamed tributary to the Allegheny River. These mining activities may have a negative effect on downstream water quality and quantity. Coal mining activities may also increase sediment loading in the tributary.

B. Sand and Gravel Mining

Sand and gravel pit mining exist within the watershed of the unnamed tributary to the Allegheny River. This type of mining may increase sedimentation in the tributary.

During a field view of the project site, a steep tributary gradient was noted upstream of the bridge. The steep gradient allows for a well-flushed stream, as was evident. Little sediment accumulation was noticed in the channel.

Other Comments

The unnamed tributary to the Allegheny River empties into the Allegheny River just northeast of Tarrtown, Pennsylvania. A distance of approximately 600 feet exists from the construction site to the confluence of the unnamed tributary with the Allegheny River. Sand and gravel dredging activities presently occur in this section of the Allegheny River. Freshwater mussel surveys have not been reviewed but likely exist having been conducted in response to dredging activities on the Allegheny River in the vicinity of the project site.

Armstrong County State Route 4023, Section 191, Over Caldwell Run

Project Description

Existing Structure

The existing structure over Caldwell Run is a reinforced concrete slab which carries State Route 4023 over Caldwell Run in East Franklin Township, Armstrong County, Pennsylvania. The structure is located in the community of Tarrtown, Pennsylvania. The bridge roadway is approximately 35 feet wide with a structure length of approximately 12 feet. The bridge was constructed in 1937 and will be replaced in its entirety due to the extent of structural deterioration.

The approximate stream width under the bridge is 4 feet. Sediment and gravel buildup has accumulated under the entire length of the bridge against the northern wingwalls and abutment. The stream presently flows against the southern abutment. No scouring is evident at this time. A 4-foot under clearance exists beneath the bridge deck.

Proposed Structure

The proposed structure will be a reinforced concrete box culvert approximately 15 feet in length with a curb-to-curb width of 30 feet. The exact span length will be determined based on the hydraulic requirements at the site. The culvert will be depressed 1 foot so that a natural streambed forms inside the culvert. The proposed bridge will be slightly larger than that of the existing bridge. Rock riprap protection will also be provided to prevent erosion.

The existing bridge is in poor condition and is currently scheduled for construction late in the year 2002. This project is not of an emergency nature.

Existing Bridge Removal

The existing bridge will be removed in sections off the cut stone abutments. The cut stone will then be removed following deck removal. Portions of the structure may enter Caldwell Run during the removal operation. Any material that enters the stream will be removed promptly. Construction equipment will remain on the stream banks at all times.

Proposed Bridge Construction

Various existing roads in Tarrtown will be utilized as detour roads during bridge construction. No temporary stream crossings will be necessary. Stream flows will be maintained during construction.

Construction equipment will remain on the stream banks at all times.

An approved Erosion and Sedimentation (E&S) Pollution Control Plan will be properly implemented and closely monitored during construction. Best Management Practices (BMPs) for erosion and sedimentation controls will greatly reduce the potential for indirect impacts due to construction-related sedimentation.

Extent of Previous Disturbance Within Project Area

No significant disturbances were noted within the vicinity of the project site. A potential for open sewage drainage into Caldwell Run exists as the stream drains through the town of Tarrtown, Pennsylvania.

Other Comments

Caldwell Run empties into the Allegheny River within Tarrtown, Pennsylvania. A distance of approximately 1,200 feet exists from the construction site to the confluence of Caldwell Run with the Allegheny River. Numerous sand and gravel dredging activities occur in this section of the Allegheny River. Freshwater mussel surveys have not been reviewed but likely exist having been conducted in response to dredging activities in the vicinity of the project site.

[*Date*]

[Contact]
U.S. Fish and Wildlife Service
Pennsylvania Field Office
110 Radnor Road, Suite 101
State College, PA 16801

RE: [*Threatened and Endangered Species Coordination or Phase (I or II) Bog Turtle Survey*]
[*SR No.*][*Section No.*]
[*Project Name*]
[*Municipality*][*County*]
[*USFWS Reference No. or PNDI Search No. (if applicable)*]

Dear [*Contact*]:

[*Opening Paragraph – include submitter (Consultant on behalf of Engineering District X-0 or Engineering District X-0 directly); summary of PNDI search result; reference a copy of PNDI Project Environmental Review Receipt and attach; and identify county name and identify whether the county is on the Bog Turtle Counties of Occurrence or Likely Occurrence List.*]

[*Project Area/Property Size and Extent – include project location; limits of disturbance; identify the limits of the Wetland Identification and Delineation Study; identify limits of bog turtle habitat (Phase I) assessment; and reference and attach Regional and Project Location Maps.*]

[*Current Land Use and Setting – describe for both the local area and the project area.*]

[*Project Description – provide to the greatest level of detail available at the time of submission.*]

[*Wetland Bog Turtle Habitat Information – include wetland study methods; describe each wetland; provide location information for each wetland; and reference and attach NWI maps, soil survey maps and photographs.*]

[*Bog Turtle Habitat Information – include survey methods; level of effort information; extents of mucky soils; and an assessment of whether potential habitat was identified.*]

[*Closing paragraph – include contact information.*]

Sincerely,

[*Submitter's Name*]
[*Submitter's Title*]

Enclosures

APPENDIX E

THREATENED AND ENDANGERED SPECIES SUMMARY SHEET

Threatened and Endangered Species Summary Sheet - USFWS

Threatened and Endangered Species Summary Sheet

**** Note:** The information provided below is for reference only. A PNDI search **Must** still be completed and **ALL** conflicts **Must** still be coordinated with the appropriate resource agency.
This guide is only a tool to assist in planning purposes only.

Common Name	Scientific Name	Federal Status	State Status	County	Habitat	Survey dates	Collectors Permit?	Possible Work Restriction Dates	Mitigation Notes
Amphibians & Reptiles									
Bog Turtle	*Glyptemys muhlenbergii*	THREATENED	ENDANGERED	Adams, Berks, Bucks, Carbon (only Aquashicola Creek Watershed), Chester, Cumberland, Dauphin (only Swatara Creek Watershed), Delaware, Franklin (only Antietam Creek Watershed), Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill (only Swatara Creek Watershed), and York. **Historically:** Crawford, Mercer and Philadelphia	Deep, soft, mucky soils in open wet meadows, shallow water marshes, spring seeps, flood plain wetlands, bogs, and fens. The wetland plants most often found in these areas include cattails, rushes, jewelweed, skunk cabbage, sedges (particularly tussock sedge), sphagnum, and various native grasses. Utilizes waterways as travel corridors.	April 15 - June 15 (w/ 2 surveys in May)	Yes	Conservation Zone 1 (This zone includes the wetland habitat and visible spring seeps): For project with no indirect effects a preconstruction survey may avoid direct take - April 1 - October 31 Conservation Zone 2 (The boundary of this zone extends at least 300 feet from the edge of Zone 1 and includes upland and riparian areas adjacent to Zone 1). If no indirect effects are anticipated without Survey - October 1 - March 31; or with preconstruction survey- April 1 - October 31 Conservation Zone 3: This zone includes upland, wetland, and riparian areas extending either to the geomorphic edge of the drainage basin or at least one-half mile beyond the boundary of Zone 2. If no indirect effects are anticipated complete work from October1 to March 31 to avoid direct take.	Seasonal restrictions are intended to only avoid directly killing or injuring bog turtles during construction. Indirect effects cannot be avoided with seasonal restrictions. Indirect effects can be anticipated to occur when adequate upland buffer is not retained around the wetland (see bog turtle conservation zones); or when roads, stormwater/sediment basins, impervious surfaces or wells affect the hydrology of the wetland.
Birds									
Bald Eagle	*Haliaeetus leucocephalus*	REGULATED UNDER THE BALD AND GOLDEN EAGLE PROTECTION ACT	N/A	Allegheny, Armstrong, Berks, Bradford, Bucks, Butler, Cameron, Carbon, Centre, Chester, Clarion, Clearfield, Clinton, Columbia, Crawford, Cumberland, Dauphin, Delaware, Elk, Erie, Forest, Franklin, Huntington, Jefferson, Juniata, Lancaster, Lawrence, Luzerne, Lycoming, McKean, Mercer, Mifflin, Monroe, Montgomery, Montour, Northampton, Northumberland, Perry, Philadelphia, Pike, Snyder, Sullivan, Susquehanna, Tioga, Venango, Warren, Wayne, Westmoreland, Wyoming, and York	Prefers habitats near seacoasts, rivers, large lakes, oceans, and other large bodies of open water with an abundance of fish. The Bald Eagle requires old-growth and mature stands of coniferous or hardwood trees for perching, roosting, and nesting. Selected trees must have good visibility, an open structure, and proximity to prey, but the height or species of tree is not as important as an abundance of comparatively large trees surrounding the body of water. Forests used for nesting should have a canopy cover of no more than 60 percent, and no less than 20 percent, and be in close proximity to water. Recently nests have been appearing in urban and industrial areas.	*for nests February 1 - May 1 (late winter early spring. When leaves are off)	Yes	January 15 - August 1	If the activity will be visible from the nest and there is no similar activity within 1 mile of the nest, then the closest activity should occur to the nest is 660 feet with landscape buffers recommended. If activity is visible from the nest and there is similar activity closer than 1 mile from the nest, then activities should not occur within 660 feet, or as close as existing tolerated activity with landscape buffers. If the activity is not visible from the nest, and there is no similar activity within 1 mile of the nest, then the closest activity should be to the nest is 330 feet, and clearing, external construction and landscaping between 330 and 660 feet should be done outside the breeding season. If the activity is not visible from, but there is similar activity closer than 1 mile to, the nest, than the closest activity to the nest should be 330 feet and any clearing/construction activity within 660 feet of the nest should be done outside the breeding season. Reference: National Bald Eagle Management Guidelines (2007) . To avoid disturbance at foraging areas and communal roost site, see page 14 of the National Bald Eagle Guidelines. For any blasting and other loud, intermittent noises, work should be avoided within 1/2 mile of any active nest, unless greater tolerance to the activity has been demonstrated.
Piping Plover	*Charadrius melodus*	ENDANGERED	N/A	Erie - Designated critical habitat on Presque Isle	Beaches along shorelines of the Great Lakes (Lake Erie, Pennsylvania)				
Migratory Birds	*Multiple Species*	REGULATED UNDER THE MIGRATORY BIRD TREATY ACT	N/A	All Counties	Multiple-Species Dependant			During bird nesting season: April 1 to August 31st. Clearing of natural and semi-natural migratory bird habitats should be carried out between September 1 and March 31.	**Avoidance and minimization measures :** 1) minimization of land and vegetation disturbance during project design and construction; 2) keep new activities constrained to previously disturbed areas wherever possible (e.g., road and utility line rights-of-way, agricultural fields, previously mined areas, etc.); 3) co-locate roads, fences, lay down areas, staging areas, and other infrastructure in or immediately adjacent to already-disturbed areas (e.g., existing roads, pipelines, agricultural fields); 4) minimize roads, fences, and other infrastructure; 5) cluster development features (e.g., houses, commercial buildings, roads) rather than distributing them throughout land parcels. **If cannot implement TOY restrictions:** develop a Bird and Bat Conservation Strategy that identifies 1) proposed activities during the TOY restrictive window (i.e., types of activities - clearing, grubbing, trenching, ROW allowance, access road, staging or lay down area, etc); 2) effects of activities on breeding habitats (i.e., forest interior, edge nesters, ground nesters, canopy dwellers, etc); 3) specific species likely to be breeding in those specific habitats (can impacts to birds be avoided by using a shorter, more targeted TOY restriction); 4) special concern species breeding in project area (e.g. Birds of Conservation Concern vs. starlings); and 5)activities/methods/ means that could be employed to improve existing migratory bird habitat.
Freshwater Mussels									
Northern Riffleshell	*Epioblasma torulosa rangiana*	ENDANGERED	ENDANGERED	Allegheny, Armstrong, Butler, Clarion, Crawford, Erie, Forest, Mercer, Venenago, Warren. **Historically:** Lawrence	The northern riffleshell occupies swift runs and riffles with beds of clean gravel, sand and stones. In Pennsylvania it has been recorded from streams ranging from medium size creeks to large rivers in drainages of glacial landscapes of the Ohio River basin. The riffleshell shuns areas of calm water or deep silt.	May 1-September 30	Yes		See Programmatic Biological Opinion for Mussels in the Ohio River Basin dated January 29, 2016.
Clubshell	*Pleurobema clava*	ENDANGERED	ENDANGERED	Armstrong, Clarion, Crawford, Erie, Forest, Mercer, Venango and Warren. **Historically:** Butler, Beaver, Fayette, Greene, Indiana, Lawrence and Westmoreland	The Clubshell is generally found in clean, coarse sand, and gravel in the runs of medium sized to large rivers.	May 1-September 30	Yes		See Programmatic Biological Opinion for Mussels in the Ohio River Basin dated January 29, 2016.
Snuffbox	*Epioblasma triquetra*	ENDANGERED	ENDANGERED	Armstrong, Butler, Clarion, Crawford, Erie, Forest, Greene, Indiana, Mercer, Venango, Warren	The snuffbox is usually found in small to medium-sized creeks in areas with a swift current, although it is also found in Lake Erie and some larger rivers. Adults often burrow deep in sand, gravel or cobble substrates, except when they are spawning or the females are attempting to attract host fish.	May 1-September 30	Yes		See Programmatic Biological Opinion for Mussels in the Ohio River Basin dated January 29, 2016.
Sheepnose	*Plethobasus cyphyus*	ENDANGERED	THREATENED	Clarion, Forest, Venango, Warren. **Historically:** Allegheny, Armstrong, Beaver, Lawrence, Washington.	Sheepnose mussels live in larger rivers and streams where they are usually found in shallow areas with moderate to swift currents flowing over coarse sand and gravel. Sheepnose have also been found in mud, cobble, and boulders. In larger rivers they may also be found in deep runs.	May 1-September 30	Yes		See Programmatic Biological Opinion for Mussels in the Ohio River Basin dated January 29, 2016.
Rayed Bean	*Villosa fabalis*	ENDANGERED	ENDANGERED	Allegheny River (Armstrong, Clarion, Forest, McKean,Venango, Warren); Cussewago Creek (Crawford); French Creek (Crawford, Erie, Mercer, Venango); LeBoeuf Creek (Erie); Muddy Creek (Crawford). **Historically:** Lawrence.	The rayed bean habitat is varied and includes small to medium sized streams to larger rivers and lakes. The species often occurs in or near shoal or riffle areas, deep slow runs and in the shallow, wave-washed areas of glacial lakes. Substrates typically include gravel and sand. Rayed bean are sometimes associated with the roots of vegetation in and adjacent to riffles and shoals, but the species also lives in relatively deep-water (10 to 20 feet) and sparsely vegetated habitat.	May 1-September 30	Yes		See Programmatic Biological Opinion for Mussels in the Ohio River Basin dated January 29, 2016.
Rabbitsfoot	*Quadrula cylindrica cylindrica*	THREATENED	ENDANGERED	Crawford, Erie, Mercer, Venango, Warren	The rabbitsfoot occurs in a variety of flowing water habitats including small to medium-sized streams and some larger navigable rivers. It usually occurs in shallow areas along the bank and adjacent runs and shoals where the water velocity is reduced, although specimens have been reported in 9-12 feet of water. Bottom substrates generally include sand and gravel. This species seldom burrows, but lies on its side.	May 1 - October 15	Yes		See Programmatic Biological Opinion for Mussels in the Ohio River Basin dated January 29, 2016.

Threatened and Endangered Species Summary Sheet - USFWS

Threatened and Endangered Species Summary Sheet

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Common Name	Scientific Name	Federal Status	State Status	County	Habitat	Survey dates	Collectors Permit?	Possible Work Restriction Dates	Mitigation Notes
Dwarf Wedgemussel	*Alasmidonta heteredon*	ENDANGERED	ENDANGERED	Monroe, Pike, Wayne. **Historically:** Bucks, Carbon, Chester, Lancaster, Philadelphia	The dwarf wedgemussel generally lives on muddy sand, sand, or sand and gravel bottoms in creeks and rivers in areas of slow to moderate current, with little silt deposition.	May 1-September 30	Yes		Avoid Hydraulic modifications to the stream channel
Mammals									
Indiana Bat	*Myotis sodalis*	ENDANGERED	ENDANGERED	**Hibernacula:** Armstrong, Beaver, Blair, Centre, Fayette, Huntingdon, Lawrence, Luzerne, Mifflin Somerset. **Maternity & Male Sites:** Adams, Armstrong, Bedford, Berks, Blair, Greene, Pike, Washington, York. **Statewide** there is potential winter habitat in caves or abandoned mines and potential habitat in forests and wooded areas.	The Indiana bat hibernates in caves or, less frequently, abandoned mines during the winter. It prefers a stable, low temperature limestone cave between 39 and 46 degrees F. During the summer Indiana Bats travel to flood plains and riparian forests.	Habitat Surveys - Year-round Acoustic Surveys - May 15 - August 15 Summer Mist-netting - May 15- July 31. See most recent survey protocol for survey specifications. Spring mine/cave entrance - April 10-May 10 Fall mine/cave entrance - September 15 - October 31. See most recent survey protocol for survey specifications. Interior cave - January 1-March 10	Required for most survey types	To avoid directly killing or injuring Indiana bats, cut trees between November 16 and March 31 within hibernacula swarming habitat, or October 15 to March 31 in the vicinity of maternity colony activity. Indirect effects are evaluated during consultation and cannot be avoided through seasonal restrictions.	This seasonal restriction on tree cutting applies to trees that are greater than or equal to 5 inches in diameter at breast height (d.b.h). Where possible, retain shagbark hickory trees, dead and dying trees, and large diameter trees (greater than 12 inches d.b.h.) to serve as roost trees for bats. Where possible, also retain forested riparian corridors and forested wetlands.
Northern Long-eared Bat Northern Myotis	*Myotis septentrionalis*	THREATENED	ENDANGERED	**Hibernacula and or Maternity, Roosting or Swarming Habitat:** All counties but potentially less likely in Beaver, Butler, Crawford, Delaware, Erie, jefferson, Montour, Perry, Philadelphia, Potter, Susquehanna and Wayne. **Statewide** there is potential winter habitat in caves or abandoned mines and potential habitat in forests and wooded areas.	In Pennsylvania, this bat is found in forests around the state. Northern Myotis hunt at night over small ponds, in forest clearings, at tree top level and along forest edges. This species uses caves and underground mines for hibernation and individuals may travel up to 35 miles from their summer habitat for hibernation. Maternity roosts are located in tree cavities, under exfoliating tree bark and in buildings. Long eared bats roost singly or in small colonies in caves, behind window shutters, under loose tree bark, in cliff crevices.	Habitat Surveys - Year-round Acoustic Surveys - May 15 - August 15 Summer Mist-netting - May 15- July 31. See most recent survey protocol for survey specifications. Spring mine/cave entrance - April 10-May 10 Fall mine/cave entrance - September 15 - October 31. See most recent survey protocol for survey specifications. Interior cave - January 1-March 10	Required for most survey types	To avoid directly killing or injuring Northern Myotis bats, cut trees between November 16 and March 31 within hibernacula swarming habitat, or October 15 to March 31 in the vicinity of maternity colony activity. Indirect effects are evaluated during consultation and cannot be avoided through seasonal restrictions.	
Plants									
Small-Whorled Pogonia	*Isotria medeoloides*	THREATENED	ENDANGERED	Centre, Venango, Chester **Historically:** Berks, Greene, Monroe, Montgomery and Philadelphia	dry, open oak forests	May 15- July 31	Yes		
Northeastern Bullrush	*Scirpus ancistrochaetus*	ENDANGERED	ENDANGERED	Tioga, Blair, Clinton, Centre, Union, Snyder, Mifflin, Cambria, Huntingdon, Bedford, Perry, Cumberland, Franklin, Dauphin, Fulton, Adams, Lackawanna, Columbia, Lackawanna, Carbon, Monroe, Lehigh, Northampton, Schuylkill. **Historically:** Northampton	intermittently wet or inundated depressions	June 1-September 30	Yes		

Threatened and Endangered Species Summary Sheet - NMFS

Threatened and Endangered Species Summary Sheet

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Common Name	Scientific Name	Federal Status	State Status	County	Drainage	Habitat	Survey Dates	Collectors Permit?	Possible Work Restriction Dates	Mitigation Notes
Shortnose Sturgeon	*Acipenser brevirostrum*	ENDANGERED	ENDANGERED	Bucks, Chester, Delaware and Philadelphia	Delaware River and other Atlantic coastal waters	Shortnose sturgeons are most abundant in estuaries within a few miles of the sea. They are also found in large deep rivers. Shortnose sturgeon spawn over gravel, cobble and boulder substrate in rapidly flowing and turbulent waters. Eggs sink in water column and are adhesive to substrate on the river bottom. Eggs hatch into larvae after about 13 days and are believed to remain hidden interstitially in the river bottom substrate. Larvae are expected to begin swimming in the water column and drift downstream at 9-14 days old. Studies suggest that sturgeon larvae move approximately 4.7 miles per day so the sturgeon larvae would reach the tidal river in 2 to 3 days. Scudders Falls is a known spawning area. Sturgeon eggs and larvae may be present in the Scudder Falls Bridge area for as long as 28 days after spawning; i.e. until mid-June. Individuals have, in recent years, been taken in the lower Delaware River and there are records of specimens being taken from freshwater at Torresdale, Pennsylvania.	Conduct Habitat Assessment and utilize existing NMFS mark and recapture survey data.	Yes	Generally, March 15 – June 30. However, these dates are based upon spawning temperature data that supports the following restriction: No in-water work outside of cofferdams beginning when mean daily water temperature is 8°C and ending 28 days after mean daily water temperature reaches 18°C. Based on historic water temperature data, this time period was expected to encompass approximately March 26-June 11 in the Trenton to Scudders Falls area of the Delaware River.	Pre-construction habitat surveys as baseline for restoration of habitat to pre-construction conditions. Dewatering pumps must sized to be able to pass eggs and larvae - no filter bags. Minimize footprint.
Atlantic Sturgeon	*Acipenser oxyrhynchus*	ENDANGERED	ENDANGERED	Bucks, Chester, Delaware and Philadelphia	Delaware River and Delaware Bay (new York Bight Distinct Population Segment) and other Atlantic coastal waters	The Atlantic Sturgeon is an anadromous species; it is found close to shore when not breeding. It can also be found in bays, estuaries, and large rivers. In the Delaware River this species is primarily found in tidal waters. Known spawning area is upstream of Wilmington, DE.	Conduct Habitat Assessment and utilize existing NMFS mark and recapture survey data.	Yes	April 1 – June 15	

Threatened and Endangered Species Summary Sheet - PGC

Threatened and Endangered Species Summary Sheet

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Common Name	Scientific Name	State Status	Federal Status	County	Habitat	Species Survey Dates	Collectors Permit?	Possible Work Restriction Dates (may be extended or shortened depending on activities)	Mitigation Notes
Mammals									
Indiana Bat	*Myotis sodalis*	ENDANGERED	ENDANGERED	defer to USFWS (See USFWS tab)	defer to USFWS (See USFWS tab)	defer to USFWS (See USFWS tab)	Yes - if handling mammals	defer to USFWS (See USFWS tab)	
Delmarva Fox Squirrel	*Sciurus niger cinereus*	ENDANGERED	ENDANGERED	defer to USFWS (See USFWS tab)	defer to USFWS (See USFWS tab)	defer to USFWS (See USFWS tab)	Yes - if handling mammals	defer to USFWS (See USFWS tab)	
Least Shrew	*Cryptotis parva*	ENDANGERED	N/A	Adams, York	Mostly associated with successional fields that may be kept from succession by either mechanical means (agricultural use or periodic burning) or by natural means such as periodic flooding. Mostly associated with grasslands and sedge meadows, they are less common in fields where shrub growth exceeds 50%.	late August - early October	Yes - if handling mammals	depends on potential impacts to species	
Northern Flying Squirrel	*Glaucomys sabrinus*	ENDANGERED	N/A	Carbon, Luzerne, Monroe, Pike, Potter, Susquehanna, Wayne, Warren	Most commonly found in riparian or wetland habitats (and adjacent upland habitats) that contain a mature forest with the dominant canopy species including red spruce, balsam fir, hemlock, beech, and yellow birch.	no species survey currently exists	Yes - if handling mammals	depends on potential impacts to species	
Eastern Small-footed Bat	*Myotis leibii*	THREATENED	N/A	Adams, Allegheny, Armstrong, Bedford, Berks, Blair, Bradford, Bucks, Carbon, Centre, Clinton, Clearfield, Columbia, Fayette, Fulton, Huntingdon, Indiana, Lackawanna, Luzerne, Lycoming, Mifflin, Monroe, Northumberland, Pike, Schuylkill, Snyder, Somerset, Tioga, Warren, Wayne, Westmoreland, Wyoming	Forest habitat, usually upland forests. Caves, abandoned mines, rock fissures, talus, rock outcrops including highway cuts, and bridge crevices.	mist net: May 15 - August 15; emergence counts: late June - late July; hibernation surveys: Sept 15 - Oct 31	Yes - if handling mammals	depends on potential impacts to species	
West Virginia Water Shrew	*Sore palustris punculatus*	THREATENED	N/A	Fayette, Somerset, Westmoreland	Riparian corridors and sometimes small wetlands and bogs. Primarily mixed forests with hemlock, various oaks, American beech, yellow birch and red and sugar maple being common components along with cherry and some ash. Shrub layers usually contain witch hazel, spice bush, rhododendron and, in drier areas, mountain laurel and high concentrations of rhododendron are common at sites where they have been captured.	no species survey currently exists	Yes - if handling mammals	depends on potential impacts to species	
Northern Long-eared Bat	*Myotis septentrionalis*	ENDANGERED	THREATENED	defer to USFWS (See USFWS tab)	defer to USFWS (See USFWS tab)	Defer to USFWS (See USFWS tab)	Yes - if handling mammals	defer to USFWS (See USFWS tab)	
Little Brown Bat	*Myotis lucifungus*	ENDANGERED	N/A	Statewide	Forest habitats, caves, abandoned mines, and human structures.	mist net: May 15 - August 15; emergence counts: late June - late July; hibernation surveys: Sept 15 - Oct 31	Yes - if handling mammals	depends on potential impacts to species	
Tri-colored Bat	*Perimyotis subflavus*	ENDANGERED	N/A	Statewide	Forest habitat, caves, abandoned mines, human strucutres.	mist net: May 15 - August 15; emergence counts: late June - late July; hibernation surveys: Sept 15 - Oct 31	Yes - if handling mammals	depends on potential impacts to species	
Allegheny Woodrat	*Neotoma magister*	THREATENED	N/A	Bedford, Blair, Cambria, Cameron, Carbon, Centre, Clearfield, Clinton, Cumberland, Dauphin, Fayette, Franklin, Fulton, Huntingdon, Indiana, Juniata, Lebanon, Lehigh, Luzerne, Lycoming, Mifflin, Monroe, Northampton, Northumberland, Perry, Potter, Schuylkill, Snyder, Somerset, Tioga, Westmoreland	Caves and rocky cliffs, but also found in wooded bottomlands, swamps, and in outbuildings and abandoned structures. Food consists primarily of fruits, berries, nuts, seeds, bark, and grasses. Surface rock with accessible openings (caves, crevices, and mine openings) located within unregimented forest habitat provides dinning opportunities and often with a slope component greater than 10%.	Camera Surveys: year-round; Trapping: May 15 - Oct 15, but mid-Sept - Oct 15 is preferred	Yes - if handling mammals	depends on potential impacts to species	
Birds									
Red Knot	*Calidris canutus rufa*	Proposed THREATENED (September 2018)	THREATENED	defer to USFWS (See USFWS tab)	defer to USFWS (See USFWS tab)	Defer to USFWS (See USFWS tab)	Yes - if handling birds	defer to USFWS (See USFWS tab)	

Threatened and Endangered Species Summary Sheet - PGC

Threatened and Endangered Species Summary Sheet

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Common Name	Scientific Name	State Status	Federal Status	County	Habitat	Species Survey Dates	Collectors Permit?	Possible Work Restriction Dates (may be extended or shortened depending on activities)	Mitigation Notes
Piping Plover	*Charadrius melodus*	Currently EXTIRPATED, Proposed ENDANGERED (September 2018)	ENDANGERED	defer to USFWS (See USFWS tab)	defer to USFWS (See USFWS tab)	Defer to USFWS (See USFWS tab)	Yes - if handling birds	defer to USFWS (See USFWS tab)	
American Bittern	*Botaurus lentiginosus*	ENDANGERED	N/A	Luzerne, Tioga, Sullivan, Wyoming	Primarily emergent wetlands with >1m tall herbaceous vegetation. Also associated with adjacent uplands that have prairie- or grassland-like structure and tall herbaceous vegetation, wet meadows with tall herbaceous vegetation, and other wetland communities that have	April 25 - June 15	Yes - if handling birds	April 15 - August 15	
Least Bittern	*Ixobrychus exilis*	ENDANGERED	N/A	Bedford, Crawford, Delaware, Erie, Lawrence, Mercer, Philadelphia	Primarily emergent wetlands with very dense rank >1m tall herbaceous and woody vegetation and significant edges to open water.	May 1 - June 15	Yes - if handling birds	April 15 - August 15	
Great Egret	*Ardea alba*	ENDANGERED	N/A	Dauphin, York	Wetlands in general, but seems to prefer large undisturbed wetlands and shallows of riverine habitats including water willow – smartweed riverbed community.	no spp survey currently exists	Yes - if handling birds	March 1 - July 31	
Yellow-crowned Night-Heron	*Nycticorax violacea*	ENDANGERED	N/A	Bucks, Cumberland, Dauphin, Lancaster, York	Associated exclusively with aquatic habitat that supports abundant crustaceans and nearby woodlands or urban parks with large trees, usually sycamores.	April 20 - May 1	Yes - if handling birds	April 1 - July 31	
Black-crowned Night-Heron	*Nycticorax nycticorax*	ENDANGERED	N/A	Berks, Cumberland, Dauphin, Delaware, Lancaster, Lebanon, Philadelphia, York	Forested and scrub/ shrub wetlands next to open waters (riverine, lacustrine, palustrine) and on islands.	April 20 - May 1	Yes - if handling birds	April 1 - July 31	
Peregrine Falcon	*Falco peregrinus*	Currently ENDANGERED, but proposed THREATENED (September 2018)	N/A	Allegheny, Armstrong, Beaver, Berks, Bradford, Bucks, Chester, Clinton, Columbia, Dauphin, Delaware, Erie, Northampton, Lackawanna, Lancaster, Lehigh, Luzerne, Lycoming, Monroe, Montgomery, Montour, Northumberland, Philadelphia, Snyder, Union, Westmoreland, York	Cliffs that are open with large spaces of air around them associated with forests along rivers; also nest on tall buildings and bridges within enclosed steel beams accessible through holes of various sizes; have also been found to nest on power plant smokestacks with catwalks or other horizontal surfaces.	March 1 - May 15	Yes - if handling birds	Feb 15 - July 31	
Short-eared Owl	*Asio flammeus*	ENDANGERED	N/A	Allegheny, Cambria, Chester, Clarion, Delaware, Lawrence, Philadelphia, Somerset, Washington	Grassy fields, grasslands, meadows, marshlands, peat bogs, and other open habitat with little or no woody vegetation including reclaimed surface mines and large airport grass buffers.	Jan 15 - March 15 and April 15 - July 31	Yes - if handling birds	April 15 - July 31	
King Rail	*Rallus elegans*	ENDANGERED	N/A	Butler, Delaware, Philadelphia	Primarily emergent wetlands with >1m tall herbaceous vegetation with dense rank standing emergent vegetation, including tidal wetlands (formerly).	May 7 - June 30	Yes - if handling birds	May 1 - August 31	
Black Tern	*Chlidonias niger*	ENDANGERED	N/A	Erie, Crawford	Primarily emergent and aquatic bed wetlands and lake margins with a matrix of open water, and stands of dense standing emergent vegetation.	no species survey currently exists	Yes - if handling birds	May 1 - August 31	
Loggerhead Shrike	*Lanius ludovicianus*	ENDANGERED	N/A	Franklin, Adams	Hedgerow and woodland edges around grasslands, pastures, and shrub lands. Found around prairies, CRP fields, grassed waterways, grassy roadsides, old fields, hayfields, old orchards, golf courses, lawns, and lightly grazed pastures in association with thorny woody vegetation (e.g. hawthorns, honey-locust, osage orange, prickly-ash). Habitat structure is important with a preference towards areas with abundant perches, short to medium-height vegetation, and high prey availability.	no species survey currently exists	Yes - if handling birds	April 1 - August 31	
Common Tern	*Sterna hirundo*	ENDANGERED	N/A	Erie	Lakes, slow-moving rivers, and marshes; beaches, sand pits, mudflats. Areas with watery action such as currents, slapping waves or, tossing shoals that churns small fish and aquatic insects. Nesting habitat is restricted to sandy shorelines and barren islands of large lakes; prefer islands over beaches, when available. They also have nested on muskrat houses in marshes.	no species survey currently exists	Yes - if handling birds	April 15 - July 31	
Yellow-bellied Flycatcher	*Empidonax flaviventris*	ENDANGERED	N/A	Luzerne, Lycoming, Sullivan, Wyoming	Nesting habitat usually are spruces or balsam fir, but may also be hemlock, pine, or larch. Most wetlands classified as peat lands with extensive sphagnum layer. Conifers may be mixed with as much one-half deciduous species. Forage in dense understory broad-leafed trees in a cool micro-climate. Plants commonly found near nests: goldthread, twinflower, starflower, bunchberry, creeping snowberry, and cinnamon fern where sphagnum moss is prevalent ground cover including areas along cool, shady streams with conifers, moss, and downed timber.	June 10 - July 15	Yes - if handling birds	May 15 - August 15	

Threatened and Endangered Species Summary Sheet - PGC

Threatened and Endangered Species Summary Sheet

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Sedge Wren	*Cistothorus platensis*	ENDANGERED	N/A	Erie, York, Elk, Butler, Bedford	Areas with low, dense vegetation composed primarily of grasses and sedges or rushes and characterized as "wet meadows" or emergent wetlands. Intermixed woody vegetation, bogs, fens, grasslands (native or non-native), tidal wetlands, grassy riparian areas (fluvial or lacustrine), ditches, grassed waterways, wet hay fields, propagation areas, and wet old fields. Periodic flooding may be a contributing habitat feature or it may encourage the formation of the necessary vegetation structure. Areas with dense cattail and sparsely vegetated or denuded areas are avoided. Prefers native grasses to cool season grasses or legumes.	May 1 - July 31	Yes - if handling birds	April 15 - August 31	
Dickcissel	*Spiza americana*	ENDANGERED	N/A	Beaver, Chester, Cumberland, Clarion, Lawrence	Grasslands with dense herbaceous vegetation with a thick litter layer such as prairies, Conservation Reserve Program (CRP) fields, grassed waterways, grassy roadsides, old fields, hayfields, and lightly grazed pastures; cool-season herbaceous species rather than the warm-season herbaceous species. Also associated with mixed hayfields that included legumes and other forbs as well as older reclaimed strip mine fields planted with grasses and legumes.	May 20 - July 15	Yes - if handling birds	April 1 - August 31	
Blackpoll Warbler	*Dendroica striata*	ENDANGERED	N/A	Luzerne, Wyoming	Breeds in red spruce dominated swamps, but may occur in ericaceous shrub swamps with scattered trees dominated by highbush blueberry and including swamp azalea, mountain holly, leatherleaf, and Labrador tea. They also forage in adjacent conifer woodland and there is potential in balsam fir and high elevation eastern hemlock.	June 15 - July 15	Yes - if handling birds	May 15 - August 15	
Upland Sandpiper	*Bartramia longicauda*	ENDANGERED	N/A	Adams, Bedford, Butler, Cambria, Clarion, Crawford, Erie, Franklin, Lancaster, Lawrence, Somerset, Venango	Fields, meadows, grasslands, blueberry barrens and managed farms, airports, and other open habitat with little woody vegetation.	May 8 - June 30	Yes - if handling birds	April 1 - August 15	
Long-eared Owl	*Asio otus*	THREATENED	N/A	Centre, Clearfield, Columbia, Indiana, Lebanon, Montour, Northumberland, Perry, Somerset, Westmoreland	Areas of conifer forests and areas where conifers mingle with field, meadow and wetland. nest in conifer forests as well as agricultural or park-like settings where the combination of conifer woods and open fields mingle; typically lay eggs in other bird or squirrel nests that are located in conifers.	January 15 - June 15	Yes - if handling birds	February 15 - July 31	
Northern Harrier	*Circus cyaneus*	THREATENED	N/A	Allegheny, Bradford, Cambria, Centre, Clarion, Clearfield, Columbia, Crawford, Cumberland, Elk, Forest, Lawrence, Somerset, Sullivan, Susquehanna, Tioga, Venango, Wayne, Wyoming	Open habitat grasslands, wetlands, agricultural lands and barrens. Nest in areas of large terrestrial grasslands and open wetlands, and will nest in a mosaic of habitats including fields, grasslands, meadows, marshlands, scrub-shrub, and other open habitat with little or no woody vegetation; nest sites vary and may be found on dry ground or over water.	May 15 - July 15	Yes - if handling birds	April 15 - August 31	

Threatened and Endangered Species Summary Sheet - PFBC

Threatened and Endangered Species Summary Sheet

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Common Name	Scientific Name	State Status	Federal Status	County	Habitat	Survey Dates	Collectors Permit?	Possible Work Restriction Dates	Mitigation Notes
Fish									
Northern brook lamprey	*Ichthyomyzon fossor*	ENDANGERED		Crawford, Erie	The northern brook Lamprey inhabits clean headwater areas of creeks and small rivers with coarse gravel to rock bottoms located in once glaciated terrain.	June 1 - September 30	Y	May 1 - June 15	
Shortnose sturgeon	*Acipenser brevirostrum*	ENDANGERED	ENDANGERED	Bucks	Shortnose sturgeons are most abundant in estuaries within a few miles of the sea. They are also found in large deep rivers. Individuals have, in recent years, been taken in the lower Delaware River and there are records of specimens being taken from freshwater at Torresdale, Pennsylvania.	June 1 - September 30	Y	April 1 – June 15	
Lake sturgeon	*Acipenser fulvescens*	ENDANGERED		Erie	Lake sturgeon occur in larger rivers and lakes. In Pennsylvania, they are presently known in Lake Erie.	June 1 - September 30	Y	April 1 - June 15	
Atlantic Sturgeon	*Acipenser oxyrhynchus*	ENDANGERED	ENDANGERED	Bucks	The Atlantic Sturgeon is primarily a marine species but is found close to shore when not breeding. It can also be found in bays, estuaries, and large rivers	June 1 - September 30	Y	April 1 – June 15	
Spotted Gar	*Lepisosteus oculatus*	ENDANGERED		Erie	The spotted gar prefers clear, weedy backwaters and oxbows of low-gradient creeks and rivers; also swamps, sloughs, ditches, and lakes.	June 1 - September 30	Y	May 1 – July 15	
Hickory Shad	*Alosa mediocris*	ENDANGERED		Chester, Delaware, Philadelphia	Hickory shad are anadromous. They live in coastal ocean waters as adults and enter brackish estuaries, like the Delaware, and swim upstream to spawn in freshwater rivers and creeks.	June 1 - September 30	Y	April 15 - June 15	
Cisco	*Coregonus artedi*	ENDANGERED		Erie	The cisco is a pelagic species occurring in infertile lakes greater than 10 m deep and large rivers	June 1 - September 30	Y	October 15 - January 15	
Gravel Chub	*Erimystax x-punctatus*	ENDANGERED		Allegheny, Armstrong, Butler, Clarion, Crawford, Erie, Forest, Mercer, Venango, Warren, Westmoreland	Moderately deep portions of large, clear creeks and rivers, or shallow riffles flowing over a sand-gravel-rock bottom, are preferred.	June 1 - September 30	Y	April 1 – June 30	
Bridle shinner	*Notropis bifrenatus*	ENDANGERED		Monroe	Moderately deep portions of large, clear creeks and rivers, or shallow riffles flowing over a sand-gravel-rock bottom, are preferred. Found in small, warm-water creeks and ponds to large lakes and rivers with clear to moderately turbid waters. It is usually over mud, silt, or detritus in sluggish pools, or in backwaters in moderate to abundant vegetation.	June 1 - September 30	Y	May 1 – August 31	
River Shiner	*Notropsisblennius*	ENDANGERED		Allegheny, Washington, Westmoreland	Large rivers such as the Ohio and Monongahela	June 1 - September 30	Y	June 1 – August 31	
Ghost Shiner	*Notropis buchanani*	ENDANGERED		Allegheny	The ghost shiner is often found in low-gradient sections of large streams and rivers, usually in quiet water with sluggish current.	June 1 - September 30	Y	May 1 – August 15	
Ironcolor Shiner	*Notropis chalybaeus*	ENDANGERED		Monroe	Found primarily in acid, tannin-stained, non-turbid sluggish Coastal Plain streams and rivers of low to moderate gradient. Occurs in aggregation, often at the upstream ends of pools, with a moderate to sluggish current, and sand, mud, silt, or detritus substrata; usually associated with aquatic vegetation	June 1 - September 30	Y	May 1 – August 31	
Blackchin Shiner	*Notropis heterodon*	ENDANGERED		Erie	The blackfin shiner prefers shallow sections of glacial lakes with stands of dense aquatic vegetation	June 1 - September 30	Y	April 15 - July 15	
Redfin Shiner	*Lythrurus umbratilis*	ENDANGERED		Crawford, Erie, Mercer	The redfin shiner can be found in warm-water creeks and small rivers with a mud and sand bottom in quiet water	June 1 - September 30	Y	May 1 – August 15	
Lognose Sucker	*Catostomus catostomus*	ENDANGERED		Somerset	Longnose suckers prefer cold, clear waters, over gravel and cobble substrates	June 1 - September 30	Y	April 1 – July 15	
Bigmouth buffalo	*Ictiobuscyprinellus*	ENDANGERED		Allegheny, Erie	Bigmouth buffalo can be found in rivers, lakes, reservoirs, oxbows, and bayous with still waters or sluggish currents.	June 1 - September 30	Y	April 1 - June 15	
Black bullhead	*Ameiurus melas*	ENDANGERED		Beaver, Lawrence	The black bullhead prefers backwaters, oxbows, impoundments, ponds, lakes, and low-gradient streams, including pools of intermittent creeks. Largest populations occur in turbid waters with mud or silt substrates	June 1 - September 30	Y	May 1 – July 1	
Mountain madtom	*Noturus eleutherus*	ENDANGERED		Armstrong, Butler, Clarion, Crawford, Erie, Forest, Mercer, Venango, Warren	The mountain madtom requires clean, moderate- to swift-flowing large streams or rivers with a bottom of large stones, rubble, gravel and sand. It is usually found in deep, fast riffles, sometimes in dense vegetation attached to the bottom material.	June 1 - September 30	Y	June 1 – August 15	
Tadpole madtom	*Noturus gyrinus*	ENDANGERED		Erie, Crawford	The tadpole madtom species is most often found in quiet or slow running waters such as weedy, shallow bays or sloughs or streams.	June 1 - September 30	Y	May 1 – August 31	
Northern madtom	*Noturus stigmosus*	ENDANGERED		Armstrong, Butler, Clarion, Crawford, Erie, Forest, Mercer, Venango, Warren	The northern madtom requires clean, moderate- to swift-flowing large streams or rivers and prefers a bottom of shifting sand and mud in moderate current. It is usually found in deep, fast riffles, sometimes in dense vegetation attached to the bottom material.	June 1 - September 30	Y	June 1 – August 15	
Hornyhead Chub	*Nocomis biguttatus*	ENDANGERED		Lawrence, Mercer, Crawford, Erie	Prefers clear, small to medium sized streams with clean gravel, cobble, rubble, and sandy substrates. Can tolerate some turbidity but gravel habitat must be free of silt or sediment.	June 1 - September 30	Y	May 15 - August 15	
Burbot	*Lota lota*	ENDANGERED		Armstrong, Butler, Clarion, Forest, McKean, Potter, Venango, Warren	Burbot prefer the deep, cold waters of lakes and rivers. During late winter and early spring, after spawning, they often migrate from lakes to tributary rivers. The only Pennsylvania populations occur in Lake Erie and the Allegheny River headwaters.	June 1 - September 30	Y	December 1 - March 15	
Threespine stickleback	*Gasterosteus aculeatus*	ENDANGERED		Philadelphia	Occurs in the lower Delaware river and some of its tributaries as well as the Delaware River estuary.	June 1 - September 30	Y	March 1 - August 1	

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Banded sunfish	*Enneacanthus obesus*	ENDANGERED		Delaware	The banded sunfish is found in small ponds and backwaters of creeks to small and large rivers and boggy brooks over sand or mud in sluggish, acidic, heavily vegetated waters.	June 1 - September 30	Y	April 1 – August 1	
Warmouth	*Lepomis gulosus*	ENDANGERED		Allegheny, Crawford, Erie, Greene, Mercer	The warmouths preferred habitats are Lakes, ponds, swamps, and quiet areas of streams with muddy bottoms and emergent vegetation.	June 1 - September 30	Y	May 1 – August 15	
Longear sunfish	*Lepomis megalotis*	ENDANGERED		Beaver	The longear sunfish prefers clear, shallow, well-vegetated, headwaters of low gradient streams and rocky and sandy pools. It is generally absent from downstream lowland sections.	June 1 - September 30	Y	May 15 – August 15	
Iowa Darter	*Etheostoma exile*	ENDANGERED		Crawford, Erie, Mercer, Venango	The Iowa darter prefers water less than 1.5 m deep in areas of natural lakes w/substrates of sand, muck, and organic debris, and with dense aquatic vegetation.	June 1 - September 30	Y	April 1 - June 15	
Eastern sand darter	*Ammocrypta pellucida*	ENDANGERED		Crawford, Erie, Mercer, Venango	The eastern sand darter occurs in habitat ranging from small creeks up to large rivers with bottoms of sand, silt, mud or gravel. The preferred habitat is sandy raceways of large rivers, but the greatest densities are in small river or large creek habitats.	June 1 - September 30	Y	May 15 – August 31	
Northern redbelly dace	*Phoxinus eos*	ENDANGERED		Erie, Warren	The northern redbelly dace is found in boggy lakes, ponds, pools of headwaters and creeks. It is often in tea colored water over fine detritus or silt, usually near vegetation.	June 1 - September 30	Y	May 1 – August 31	
Bigmouth shinner	*Notropis dorsalis*	THREATENED		Crawford, McKean, Potter	The bigmouth shiner prefers small rivers and streams with clear water and moderate gradient; with sand and gravel substrates.	June 1 - September 30	Y	May 1 – August 15	
Southern redbelly dace	*Phoxinus erythrogaster*	THREATENED		Beaver, Crawford, McKean, Mercer, Warren	The southern redbelly dace is found in headwaters and upland creeks (often spring-fed) in generally clear water. It has been found to school under bank overhangs among tree roots in clear ponds with muck bottoms and also over gravel, rubble or sand.	June 1 - September 30	Y	May 1 – July 31	
Spotted sucker	*Minytrema melanops*	THREATENED		Crawford, Greene	The spotted sucker prefers clear to slightly turbid waters of streams, rivers, lakes, and reservoirs with submerged aquatic vegetation, soft substrates, and detritus.	June 1 - September 30	Y	April 1 – June 15	
Brindled madtom	*Noturus miurus*	THREATENED		Crawford, Erie, Greene, Mercer, Venango	Brindled madtoms can be found in low gradient sections of streams, rivers, lakes. Especially areas of little or no current with substrates of sand, silt, mud, and organic debris.	June 1 - September 30	Y	June 1 – August 15	
Chesapeake Log Perch	*Percina bimaculata*	THREATENED		Lower Susquehanna River and tributaries (notably Fishing and Octoraro Creeks), Lancaster, York, Chester	Logperch inhabit mud-bottomed, sandy, gravelly and rocky areas in large rivers. They tend to stay offshore in water deeper than three or four feet. Logperch tolerate a wide variety of habitats, including stream riffles, and they can tolerate silty water. During its spawning runs, the logperch swims from the larger waterway in which it makes its usual home into smaller tributary streams, where for a short time the fish is abundant.	June 1 - September 30	Y	April 1 –August 1	
Freshwater Mussels									
Northern riffleshell mussel	*Epioblasma torulosa rangiana*	ENDANGERED	ENDANGERED	Allegheny, Armstrong, Butler, Clarion, Crawford, Erie, Forest, Mercer, Venango, Warren	The northern riffleshell occupies swift runs and rimes with beds of clean gravel, sand and stones. In Pennsylvania it has been recorded from streams ranging from medium size creeks to large rivers in drainages of glacial landscapes of the Ohio River basin. The riffleshell shuns areas of calm water or deep silt.	May 1-September 30	Y	-	
Clubshell mussel	*Pleurobema clava*	ENDANGERED	ENDANGERED	Allegheny, Armstrong, Butler, Clarion, Crawford, Erie, Forest, Mercer, Venango, Warren, Westmoreland	The Clubshell is generally found in clean, coarse sand, and gravel in the runs of medium sized to large rivers.	May 1-September 30	Y	-	
Dwarf wedgemussel	*Alasmidonta heterodon*	ENDANGERED	ENDANGERED	Monroe, Pike, Wayne	The dwarf wedgemussel generally lives on muddy sand, sand, or sand and gravel bottoms in creeks and rivers in areas of slow to moderate current, with little silt deposition.	May 1-September 30	Y	-	
Eastern pearlshell mussel	*Margaritifera margaritifera*	ENDANGERED		Berks, Schuylkill	The eastern pearlshell mussel is generally found in cold, nutrient-poor, unpolluted trout streams and smaller rivers with moderate flow rates. Benthic substrate is usually sand, fine gravel, or a sand-gravel mix where mussels can bury themselves.	May 1-September 30	Y	-	
Rabbitsfoot mussel	*Quadrula cylindrica*	ENDANGERED	THREATENED	Crawford, Erie, Mercer, Venango, Warren	The rabbitsfoot occurs in a variety of flowing water habitats including small to medium-sized streams and some larger navigable rivers. It usually occurs in shallow areas along the bank and adjacent runs and shoals where the water velocity is reduced, although specimens have been reported in 9-12 feet of water. Bottom substrates generally include sand and gravel. This species seldom burrows, but lies on its side.	May 1-September 30	Y	-	
Snuffbox mussel	*Epioblasma triquetra*	ENDANGERED	ENDANGERED	Armstrong, Butler, Clarion, Crawford, Erie, Forest, Greene, Indiana, Mercer, Venango, Warren	The snuffbox is usually found in small to medium-sized creeks in areas with a swift current, although it is also found in Lake Erie and some larger rivers. Adults often burrow deep in sand, gravel or cobble substrates, except when they are spawning or the females are attempting to attract host fish.	May 1-September 30	Y	-	
Salamander mussel	*Simpsonaias ambigua*	ENDANGERED		Armstrong, Crawford, Greene	The salamander mussel is typically found under flat rocks, a common habitat of the mud puppy. This species has also been reported from mud and gravel bars. This species is rarely encountered, but when found is often quite numerous.	May 1-September 30	Y	-	
Rayed Bean	*Villosa fabalis*	ENDANGERED	ENDANGERED	Allegheny River (Armstrong, Clarion, Forest, McKean, Venango, Warren); Cussewago Creek (Crawford); French Creek (Crawford, Erie, Mercer, Venango); LeBoeuf Creek (Erie); Muddy Creek (Crawford). **Historically:** Lawrence.	The rayed bean habitat is varied and includes small to medium sized streams to larger rivers and lakes. The species often occurs in or near shoal or riffle areas, deep slow runs and in the shallow, wave-washed areas of glacial lakes. Substrates typically include gravel and sand. Rayed bean are sometimes associated with the roots of vegetation in and adjacent to riffles and shoals, but the species also lives in relatively deep-water (10 to 20 feet) and sparsely vegetated habitat.	May 1-September 30	Y		

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Pistolgrip	*Quadrula verrucosa (aka Tritogonia verrucosa)*	ENDANGERED		Allegheny, Armstrong, Beaver, Greene, Lawrence, Mercer	Large to medium streams and rivers especially in reaches with gravel or cobble substrate and moderate to high flows .	May 1-September 30	Y		
Round Hickorynut	*Obovaria subrotunda*	ENDANGERED		Allegheny, Armstrong, Lawrence, Mercer	Medium-sized streams in sand and gravel in areas with moderate flow	May 1-September 30	Y		
Sheepnose mussel	*Plethobasus cyphyus*	THREATENED	ENDANGERED	Clarion, Forest, Venango, Warren	Sheepnose mussels live in larger rivers and streams where they are usually found in shallow areas with moderate to swift currents flowing over coarse sand and gravel. Sheepnose have also been found in mud, cobble, and boulders. In larger rivers they may also be found in deep runs.	May 1-September 30	Y	-	
Amphibians & Reptiles									
Bog turtle	*Glyptemys muhlenbergii*	ENDANGERED	THREATENED	Adams, Berks, Bucks, Carbon, Chester, Cumberland, Dauphin, Delaware, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Pike, Schuylkill, York	Bog turtles occur in wet meadows and bogs where tussock sedge and grasses dominate the wetlands. They require open conditions associated with early-successional wetland habitats. The substrate must consist of deep mucky soils fed by groundwater seeps, with only modest amounts of open water.	Phase I: Any time Phase II: April 15 - June 15 Phase II Lake Plain Recovery Unit: May 1 - June 30	Y	If avoiding wetlands, avoid work during active season: April 1 - October 31 . If direct wetland impacts, then work during active season with additional restrictions.	
Eastern Mud Turtle	*Kinosternon subrubrum subrubrum*	ENDANGERED		Bucks	Primarily an aquatic species, though overland travel for males is quite common during the late spring. The aquatic habitats used by this turtle are mixed, from shallow ephemeral depressions that may only be wet for a few days following a rain event, or wetlands over a meter (approximately 3') deep. Eastern Mud Turtle wetlands are typified by soft muddy bottoms, and abundant vegetation. Both fresh and brackish waters may be inhabited by the Eastern Mud Turtle. It is largely secretive, and usually only encountered if specifically searching for it.	In development Contact EPDS	Y		
New Jersey chorus frog	*Pseudacris kalmi*	ENDANGERED		Bucks, Montgomery	The New Jersey chorus frog breeds in small, relatively open bodies of water with a mixture of shrubby and herbaceous aquatic vegetation, or sometimes in the shallow backwater areas of larger bodies of water with similar vegetation.	In development	Y	-	
Southern leopard frog	*Lithobates sphenocephalu*	ENDANGERED		Bucks, Delaware, Philadelphia	Southern leopard frogs frequent vegetated edges of shallow wetlands, along the Coastal Plain Province of Pennsylvania. Breeding typically occurs in April, with tadpoles transforming into froglets and becoming terrestrial in June. While the breeding wetlands are typically open habitats, outside of the breeding season, southern Leopard Frogs are known to frequent shaded areas with large areas of grass, rush, and sedge cover.	In development	Y	-	
Northern cricket frog	*Acris crepitans*	ENDANGERED		Bucks, Carbon, Franklin, Luzerne	The northern cricket frog prefers permanent water sources with little canopy cover like slow-moving streams, the margins of lakes and ponds, and around springs or marshy areas.	In development	Y	-	
Massasauga rattlesnake	*Sistrurus catenatus catenatus*	ENDANGERED		Armstrong, Butler, Clarion, Crawford, Lawrence, Mercer, Venango	Mississauga's require relatively open old field and wet meadow habitat with low lying areas of saturated soil and higher, drier ground nearby. In Pennsylvania, this combination of wet and dry habitat is found only in relict prairie terrain of certain western counties.	April 15 - June 15	Y	No work in wetlands from: September 1 - April 30 Avoidance measures for uplands from April 1 - November 1	
Kirtland's snake	*Clonophis kirtlandii*	ENDANGERED		Allegheny, Clarion, Forest, Jefferson	Kirtland's snake prefers open damp habitats, such as marsh edges, wet fields and pastures, and along creeks, canals, sluggish ponds and ditches.	Not Available	Y	-	
Eastern mud salamander	*Pseudotriton m. montanus*	ENDANGERED		Franklin	The eastern mud salamander inhabits low elevation swamps, bogs, springs, and streams that provide a muddy substrate (bottom) as well as clear, clean water.	April 1 - September 30	Y	-	
Blue-spotted salamander	*Ambystoma laterale*	ENDANGERED		McKean, Northampton, Warren	Blue spotted salamanders live mostly a terrestrial existence. They require both breeding (aquatic) and nonbreeding (upland) habitats. Breeding habitat consists of hardwood swamps, open marshes, oxbow ponds, ditches, and seasonal forest pools, often within or near floodplains of large streams and rivers. Nonbreeding habitat can be characterized as deciduous and mixed forests surrounding breeding habitats	April 1 - September 30	Y	-	
Eastern spadefoot toad	*Scaphiopus holbrookii*	ENDANGERED		Adams, Berks, Bucks, Centre, Cumberland, Franklin, Lehigh, Northampton, Northumberland, Snyder, Union, York	The eastern spadefoot toad is an inhabitant of sandy soils along the floodplains of streams and rivers and in temporary depressions in agricultural fields. Reproduction occurs within one or two nights during and after heavy rain events, concentrated in vernal pools, rain-filled depressions in farm fields and along streams.	In development	Y	-	
Rough green snake	*Opheodrys aestivus*	ENDANGERED		Chester, Lancaster, York	The rough green snake prefers moist habitats such as wet meadows and the borders of lakes, marshes and woodland streams. It is frequently found in woody vegetation growing along or overhanging water, sometimes up to 20 feet above the ground.	April 15 - September 15	Y	-	
Green salamander	*Aneides aeneus*	THREATENED		Fayette	Green salamanders have been found in Pennsylvania only in certain crevices in sandstone rock cliffs or out croppings of the Pottsville formation. These rocks are located on moist hardwood forest slopes or ravines, often near streams.	April 1 - September 30	Y	-	
Eastern redbelly turtle	*Pseudemys rubriventris*	THREATENED		Adams, Berks, Bucks, Chester, Delaware, Franklin, Lancaster, Lebanon, Montgomery, Philadelphia, York	Eastern redbelly turtles prefer relatively deep water bodies such as moderate gradient rivers, reservoirs, ponds, and marshes. Transient turtles may occur in faster-moving streams, shallow ponds impoundments, or ditches. Red-bellied Turtles spend a considerable amount of time basking; therefore the need for woody debris above water level is an important habitat characteristic for the species. Additional habitat requirements include aquatic vegetation for feeding, sandy or loamy soils for nesting, and soft substrates at a sufficient depth for hibernation.	Phase I: Anytime Phase II: April 15 - October 1 Nesting Survey: May 1 - July 31	Y	Brumation Restriction: October 15 - April 14 Active Season Restriction: April 15 - October 14	

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Timber rattlesnake	*Crotalus horridus*	CANDIDATE		Adams, Bedford, Berks, Blair, Bradford, Cambria, Cameron, Carbon, Centre, Clarion, Clearfield, Clinton, Columbia, Cumberland, Dauphin, Elk, Fayette, Forest, Franklin, Fulton, Huntingdon, Indiana, Jefferson, Juniata, Lackawana, Lebanon, Lehigh, Luzerne, Lycoming, McKean, Mifflin, Monroe, Northampton, Northumberland, Perry, Pike, Potter, Schuylkill, Snyder, Somerset, Sullivan, Susquehanna, Tioga, Union, Venango, Warren, Wayne, Westmoreland, Wyoming, York	Timber rattlesnakes inhabit the mountainous regions of Pennsylvania. They prefer upland forested areas where they forage for small mammals. Talus slopes, rocky ledges and outcrops, and boulder fields with open, primarily southern-facing exposures, create ideal conditions for basking.	April 15 - September 15	Y	Active Season Restriction: April 15 - November 15	

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Common Name	Scientific Name	State Status	Federal Status	County	Wetland Indicator	General Habitat	Flowering/Fruiting Time (either acceptable for surveys unless otherwise noted)	General Survey Time (if not noted, assume flowering/fruiting period)	Collectors Permit?	Possible Work Restriction Dates	Mitigation Notes
A Clubmoss	*Lycopodiella margueritae*	ENDANGERED		Erie, Huntingdon	n/a	moist sandy wetlands and shores	deciduous; sporulates July-Oct	deciduous; sporulates July-Oct	Yes		
A Sedge	*Carex foenea*	ENDANGERED		Potter	n/a	dry, gravelly or sandy banks	June-July	June-July	Yes		Perennial-rhizomatous habit, unknown specific success rates for this species, refer to above general Carex transplanting information-
A Sedge	*Carex tetanica*	THREATENED		Mercer, Lawrence, Bedford, Centre, Adams, Chester, Berks, Lehigh, Bucks, Northampton, Monroe, Pike	FACW	calcareous wet meadows and swales	June-July	June-July	Yes		Perennial-unknown specific success rates for this species, refer to above general Carex transplanting information, possibly does well for transplanting-very narrow habitat requirements
American Beachgrass	*Ammophila breviligulata*	THREATENED		Erie	FACU-	sand dunes and beaches	July	can be surveyed anytime during summer-early fall	Yes		perennial-seed production usually poor for this species-properly applied fertilizer is key to vigorous growth of newly established stands of beachgrass-Vegeative establishment, with dormant stem divisions, from October 15th to April 1, is effective
American Beakgrain	*Diarrhena obovata*	ENDANGERED				moist, shaded to partly-shaded floodplain forests-requires light natural disturbances such as windthrows	late summer-early fall when distinctive beaked fruits are mature-could be recognizable by experienced botanists throughout growing season		Yes		Perennial-may be able to tolerate propagation and transplant-no specific information on success rate-
American Columbo	*Swertia caroliniensis*	ENDANGERED		Forest, Mercer, Venango, Lawrence, Butler, Clarion	n/a	open deciduous woods on calcareous soils	flowers May-June		Yes		Perennial, seed collection or transplant may be possible
American Gromwell	*Lithospermum latifolium*	ENDANGERED			n/a	rich, wooded limestone slopes and hilltop woods	flowers late May-June		Yes		Transplants are likely to fail; seed collection may be possible, requires cold period for germination
American Holly	*Ilex opaca*	THREATENED		Perry, Bucks, Dauphin, Lebanon, Lancaster, York, Chester, Northampton	FACU	moist alluvial woods and wooded slopes	flowers May - early June, fruits October - winter	Year-round	Yes		Perennial-should be done during the dormant season, November to March-young trees should be allowed to flower before transplanting-fairly easily to transplant if conditions are met-a few examples show that this species can be difficult to transplant
Annual Fimbry	*Fimbristylis annua*	THREATENED		Chester, Schuylkill, Delaware, Lancaster	FACW-	moist depressions on serpentine barrens	flowers and fruits July - October		Yes		Annual-no information can be found on transplanting or propagation success rates of this species
Appalachian Blue Violet	*Viola appalachiensis*	THREATENED		Erie, Crawford, Mercer, Warren, Cambria, Westmoreland, Somerset	FACU	bogs and stream banks in rich, moist woods	flowers April - June		Yes		Perennial
Appalachian Gametophyte Fern	*Vittaria appalachiana*	THREATENED		Clearfield, York, Lancaster, Sullivan, Union	n/a	heavily shaded, moist crevices and overhangs in noncalcareous rock. Occurs in PA as gametophytes only		April-August	Yes		Perennial
Appalachian Sandwort	*Minuartia glabra*	THREATENED		Pike, Lackawanna, Monroe	UPL	exposed sandstone rocks	flowers May-August		Yes		Buffer, control invasives, monitor; seeds warm stratified; perennial, transplanting may work
Arrow-feathered Three Awned	*Aristida purpurascens*	THREATENED		Lancaster, York, Delaware, Chester, Bucks	n/a	serpentine barrens and other dry, sandy soils	flowers August-September	August-October is optimum time-fruits mature in October	Yes		Perennial-warm season grass, used as secondary species for restoration of dry grasslands or meadows on open, sterile, sandy soil, concrete debris-
Aster-like Boltonia	*Boltonia asteroides*	ENDANGERED		York, Lancaster	FACW	rocky shores and exposed rocky river beds	flowers July-October	all known occurrences were surveyed in early October-September -early October seem to be peak months for survey for this species	Yes		Perennial-fairly easily grown in medium, well-drained soils in full sun-transplanting success is unknown but likely fairly high
Autumn Bluegrass	*Poa autumnalis*	ENDANGERED		Berks, Montgomery, Philadelphia, Bucks, Chester, Delaware	FAC	moist woods	late May-June		Yes		Deer fencing, invasive removal, buffer, transplant after seeds have matured/been collected
Autumn Willow	*Salix serissima*	THREATENED		Erie, Lehigh, Northampton, Warren, Crawford, Mercer, Lawrence	OBL	fens and wet meadows, on calcareous soils	flowers after leaves emerge		Yes		Shrub, transplanting may be possible
Awned Sedge	*Carex atherodes*	ENDANGERED		Erie, Warren	OBL	open, seepy slopes	July-August		Yes		Perennial-Below ground biomass production is low in this species, and the small rhizomes are difficult to extract from the soil-the species is tolerant of periodic drought so it may survive harsh conditions
Backward Sedge	*Carex retrorsa*	ENDANGERED		Erie, Montour, Bradford, Warren, Potter, Tioga, Lycoming, Centre, Bedford	FACW+	marshes, swales, wet thickets	late June-early September		Yes		Perennial-unknown specific success rates for this species, refer to above general Carex transplanting information, possibly does well for transplanting if habitat is suitable
Balsam Poplar	*Populus balsamifera*	ENDANGERED		Erie, Forest, McKean, Elk, Lawrence, Butler, Westmoreland, Union, Delaware	n/a	cool, seasonally wet soils and bog margins		Late May- September	Yes		Transplanting or seed collection may work, specific habitat requirements
Baltic Rush	*Juncus arcticus var. littoralis*	THREATENED		Erie, Franklin, Bedford, Northampton	OBL	calcareous swamps and shores	flowers/fruits Summer	June - July is best time for surveying this species	Yes		Perennial-no information is available on transplanting success-likely low rates of success due to restricted habitat requirements-
Bayard's Malaxis	*Malaxis bayardii*	ENDANGERED		Bedford, Centre, Fayette, Lackawanna, Luzerne, Monroe, Schuylkill, Susquehanna, Wayne	n/a	dry open upland forest, shale barrens	flowers July-September	July-September	Yes		
Bayonet Rush	*Juncus militaris*	ENDANGERED		Pike, Susquehanna, Wayne	OBL	shallow water of lakes and ponds	flowers/fruits Summer	July - August is best time to survey for this species	Yes		Perennial-no information is available on transplanting success-likely low rates of success due to restricted habitat requirements-
Beach Peavine	*Lathyrus japonicus*	THREATENED		Erie	n/a	sandy or gravelly shores, sand plains and dunes	flowers June-Sept		Yes		Perennial-transplanting can occur, but conditions must be met for it to survive and prosper-The beach pea's extensive native range is due to the ability of the seeds to remain viable in seawater up to 5 years. The plant can germinate when the tough seed shell is broken open by abrasion with the sand.
Beach Plum	*Prunus maritima*	ENDANGERED		Bucks	n/a	dry roadside banks and hedgerows	flowers late April, before the leaves, fruits Aug		Yes		Transplanting possible

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Beach Wormwood	*Artemisia campestris ssp. caudata*	ENDANGERED		Erie, Lackawanna	n/a	dry, sandy shores or sand flats	flowers in August	August, especially late August, when most known occurrences were surveyed	Yes		biennial/Perennial-can spread vigorously from a prominent taproot-plants can easily be divided and replanted-needs full sun in a light loose soil and rooting zone needs to be moist-no information on success of replanting propagation
Beaked Spike-rush	*Eleocharis rostellata*	ENDANGERED		Lawrence	OBL	calcareous swamps	flowers/fruits Mid-late Summer	August-September	Yes		Perennial-very specific habitat requirements, no specific information regarding transplanting success
Bebb's Sedge	*Carex bebbii*	ENDANGERED		Erie, Butler, Crawford, Tioga, Centre, Monroe	OBL	calcareous or neutral wet meadows, moist sand flats, and shores	late June-August	late June-August	Yes		Perennial-outlook for propagation by transplanting of this species is good-according to the limited literature-
Beck's Water-marigold	*Megalodonta beckii*	ENDANGERED		Erie, Wyoming, Crawford, Luzerne	OBL	Lakes and swamps, usually in calcareous water	flowers July-October		Yes		Seeds unreliable; transplanting rhizomes or stem fragments may work
Bicknell's Hoary Rockrose	*Helianthemum bicknellii*	ENDANGERED		Clinton, Lackawanna, Luzerne, Centre, Bedford, Adams, Berks, Chester	n/a	dry rocky slopes,open woods and serpentine barrens	flowers June-early July		Yes		Perennial-no information found on transplanting success or seed propagation success-specific habitat requirements may be limiting factor-
Bicknell's Sedge	*Carex bicknellii*	ENDANGERED		Luzerne, Monroe, Chester	n/a	dry woods, thickets, fields and serpentine barrens	June-August	June-August	Yes		Perennial-can be transplanted, probably good success
Black-stemmed Spleenwort	*Asplenium resiliens*	ENDANGERED		Franklin	n/a	on limestone rocks	fronds evergreen-sporulating from June-September	June-September is optimal survey time, but other survey times are possible due to the fronds of the plant being evergreen-id of this fern is difficult, however	Yes		Perennial-likely not very successful for transplanting due to habitat restriction of restricted calcareous cliffs or cedar glades
Blue Monkshood	*Aconitum uncinatum*	THREATENED		Greene, Fayette, Westmoreland	n/a	rich, moist deciduous woods	flowers August to October	some occurrences were identified with just leaf and/or buds, May-July. Most flowers occur in late August into September	Yes		Perennial-Species of Aconitum are typically easily propagated by divisions of the root or by seeds-roots are poisonous
Blue-curls	*Trichostema setaceum*	ENDANGERED		Berks		dry, sandy banks and shaly slopes	flowers August-September		Yes		Annual
Blue false indigo	*Baptisia australis*	THREATENED		Allegheny, Armstrong, Beaver, Butler, Clarion, Elk, Fayette, Forest, Indiana, Jefferson, Luzerne, Venango, Warren, Washington, Westmoreland	n/a	river cobble bars and banks	flowers May - June	May-June	Yes		
Blunt Manna-grass	*Glyceria obtusa*	ENDANGERED		Somerset, Monroe, Montgomery	OBL	swamps, bogs and moist, sandy, peaty ground	flowers July-Aug		Yes		Perennial-seed propagation success is good-no information on transplanting, likely low success rates due to habitat requirements-
Blunt-leaved Pondweed	*Potamogeton obtusifolius*	ENDANGERED		Wayne, Susquehanna	OBL	rare in boggy ponds and lakes		July-September	Yes		Avoid invasives, buffer, place geotextile fabric down, monitor; seeds must be stored cold; stem cuttings, rhizomes, seed tubers possible
Bog Aster	*Oclemena nemoralis*	ENDANGERED		Tioga, Somerset	FACW+	sphagnum bogs		July-August	Yes		Perennial, but FACW+, transplanting may be difficult
Bog Bluegrass	*Poa paludigena*	THREATENED		Erie, Lancaster, Carbon, Warren, Crawford, Mercer, Lawrence, Westmoreland, Bedford, Lebanon, Berks, Chester, Monroe	FACW	Boggy woods and swamps	late may - June		Yes		Perennial; seed collection and transplanting may work
Bog Goldenrod	*Solidago uliginosa*	THREATENED		Beaver, Butler, Cambria, Carbon, Centre, Chester, Crawford, Cumberland, Delaware, Erie, Fayette, Forest, Lackawanna, Lancaster, Lawrence, Lycoming, Mercer, Monroe, Northampton, Philadelphia, Pike, Somerset, Sullivan, Tioga, Wayne	OBL	Bogs, swamps, wet meadows, fens	flowers August -October	August-October	Yes		
Bog Sedge	*Carex paupercula*	THREATENED		Warren, Forest, Elk, Clearfield, Tioga, Sullivan, Lackawanna, Carbon, Monroe, Wayne, Pike	OBL	sphagnum bogs and boggy woods	June-early August (latest)		Yes		Perennial-unknown specific success rates for this species, refer to above general Carex transplanting information, possibly does well for transplanting if habitat is suitable-very nar row habitat requirements
Box Huckleberry	*Gaylussacia brachycera*	THREATENED		Perry, Bedford	n/a	dry oak woods	flowers. May, frt. Aug.	evergreen foliage can be seen in fall and winter, turning red in winter	Yes		Perennial-is difficult to propagate, as it is self-sterile, so single plants cannot reproduce sexually-they form colonies which spread by vegetative reproduction along rootstocks-
Bradley's Spleenwort	*Asplenium bradleyi*	THREATENED		York, Chester, Lancaster	n/a	crevices of dry, shaded , acid rock outcrops	fronds evergreen-sporulating from June-September	June-September is optimal survey time, but other survey times are possible due to the fronds of the plant being evergreen-id of this fern is difficult, however	Yes		Perennial-restricted and inhospitable habitat makes mitigation and transplanting of this species unlikely
Branching Bur-reed	*Sparganium androcladum*	ENDANGERED		Wayne, Erie, Pike, Monroe	OBL	wet meadows, swales, stream banks and shallow water	fruits July-Sept		Yes		Perennial, seed collection or transplant may be possible
Braun's Holly Fern	*Polystichum braunii*	ENDANGERED		Luzerne, Sullivan, Wayne	n/a	cool, rocky, shaded ravines		August-October	Yes		Perennial, root division may work
Broad-leaved Beardgrass	*Gymnopogon ambiguus*	ENDANGERED				serpentine barrens	July-early October		Yes		Perennial-transplanting can be done, mixed results-seed propagation success is potentially good given suitable habitat

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Broad-winged Sedge	*Carex alata*	THREATENED		Erie, Crawford, Lawrence, Butler	n/a	swamps, peaty shores, wet thickets, and woods, usually on calcareous soils	Summer-late June-late August		Yes		Perennial-sedges in general can be transplanted by digging clumps and dividing them into smaller units for replanting in similar locations. Transplanting should be done in winter or early spring. Caution: Species by species information is typically not available-results suggest that restoration will be most successful if transplanting occurs in summer, using large wildling transplants when under stressful conditions such as waterlogged or dry soils, and when species are planted at appropriate groundwater depths.
Brook Lobelia	*Lobelia kalmii*	ENDANGERED		Erie, Pike, Butler, Monroe, Northampton	OBL	calcareous swamps, moist pastures and fens	flowers Aug-early Oct.		Yes		Perennial, OBL, requires specific site conditions, rhizome division or seed collection possible
Bugleweed	*Lycopus rubellus*	ENDANGERED		Berks, Monroe, Bucks, Philadelphia, Delaware	OBL	bogs, river banks, pond margins and wet ditches	flowers June-early Sept.		Yes		Perennial- transplant of tubers or seed collection may work; requires wet conditions
Bull Sedge	*Carex bullata*	ENDANGERED		Adams, Montour, Lancaster, Bucks	OBL	swamps	May-July (possibly into August, one survey was conducted at this time)	May-July (possibly into August, one survey was conducted at this time)	Yes		Perennial-unknown specific success rates for this species, refer to above general Carex transplanting information
Bushy Cinquefoil	*Potentilla paradoxa*	ENDANGERED		Erie	OBL	moist, sandy shores	flowers July-Sept		Yes		Perennial, transplanting or seed collection possible; seeding or division
Bushy Naiad	*Najas gracillima*	THREATENED			OBL	shallow water of lakes, ponds, and reservoirs		Mid-late summer	Yes		Annual, seed collection only
Bushy St. John's-wort	*Hypericum densiflorum*	THREATENED		Fayette, Carbon, Somerset	FAC+	rocky river banks, swampy meadows and sphagnum bogs	flowers July-August	fruit appears in August-flowers can be seen up until this time	Yes		Perennial-fairly adaptive plant that tolerates a wide range of soil conditions and sunlight conditions-may propagate well and transplanting may be successful with this species-
Butterfly-pea	*Clitoria mariana*	ENDANGERED		Berks	n/a	dry, open areas on sandy soils	flowers July-September		Yes		Perennial-on example showed that this species does not transplant well and is "picky" about where it grows-
Canada Buffalo-berry	*Shepherdia canadensis*	ENDANGERED		Erie, Tioga	UPL	wet, shaley banks and open to partly shaded slumps along Lake Erie	flower late June, fruit July		Yes		Shrub, transplanting may be possible
Canby's Mountain-lover	*Paxistima canbyi*	ENDANGERED		Bedford	n/a	calcareous cliffs and slopes	flowers April-May, fruits August-September		Yes		Perennial, rhizomes or roots can be transplanted
Capillary Beaked-rush	*Rhynchospora capillacea*	ENDANGERED		Bedford, Erie, Northampton	OBL	calcareous swamps and fens		July-August	Yes		Perennial, seed collection possible, transplanting- site condition specific
Capitate Spike-rush	*Eleocharis caribaea*	ENDANGERED		Erie	n/a	damp, sandy depressions	flowers/fruits Mid-late Summer		Yes		Annual-no information on transplanting or propagation
Carey's Sedge	*Carex careyana*	ENDANGERED		Juniata, Bedford, Fayette	n/a	rich, calcareous woods	May-July	May-July	Yes		Perennial-unknown specific success rates for this species, refer to above general Carex transplanting information
Carey's Smartweed	*Polygonum careyi*	ENDANGERED		Centre, Bedford, Carbon, Northampton, Wayne	FACW	sandy, open woodlands and disturbed places, particularly after fire	summer and early fall		Yes		Annual- seed collection may be possible
Carolina Grass-of-parnassus	*Parnassia glauca*	ENDANGERED		Erie, Pike, Lawrence, Monroe, Northampton, Lehigh	OBL	boggy meadows or seeps, on calcareous soils	flowers August-September		Yes		Perennial, transplanting should be possible
Carolina Leaf-flower	*Phyllanthus caroliniensis*	ENDANGERED		Butler, Lancaster, York	n/a	moist, sandy soil, stream banks, and ravines	flowers August-September		Yes		Annual, seed collection may be possible
Case's Ladies'-tresses	*Spiranthes casei*	ENDANGERED		McKean, Elk	n/a	dry, open, sandy soil	flowers Aug-Sept		Yes		Propagation and transplanting likely difficult
Cat's-paw Ragwort	*Packera antennariifolia*	ENDANGERED		Franklin, Fulton	n/a	shale barrens	flowers April-June		Yes		Transplants and seed collection possible
Cattail Sedge	*Carex typhina*	ENDANGERED		Crawford, Butler, Armstrong, Huntingdon, Bedford, Franklin, Snyder, Montour, Schuylkill, Chester, Bucks, Pike, Elk, Lycoming, Berks, Dauphin	FACW+	calcareous bottomlands, swamps, and wet woods	June-early August		Yes		Perennial-unknown specific success rates for this species, refer to above general Carex transplanting information, possibly does well for transplanting.
Chamisso's Miner's-lettuce	*Montia chamissoi*	ENDANGERED		Wayne	n/a	moist, rocky ledges and river banks	flowers June-July		Yes		Seed collection should work; transplanting unknown
Checkered Rattlesnake-plantain	*Goodyera tesselata*	ENDANGERED		Clinton, Huntingdon, Lycoming, Monroe, Pike, Sullivan, Susquehanna, Wayne	FACU	moist coniferous and deciduous forest	flowers July early September	July-early September	Yes		
Cluster Fescue	*Festuca paradoxa*	ENDANGERED		Chester	FAC	moist, open ground and thickets	flowers May - July	fruits can be identified through September	Yes		Perennial-propagation success from seeds has been noted, but not from transplanting the plants-
Coast Violet	*Viola brittoniana*	ENDANGERED		Bucks	FAC	moist sandy woods and flats	flowers April-May		Yes		Perennial
Collin's Sedge	*Carex collinsii*	ENDANGERED		Schuylkill, Lackawanna, Carbon, Monroe, Pike	OBL	sphagnum bogs and swampy woods	late June-early August	late June-early August	Yes		Perennial-unknown specific success rates for this species, refer to above general Carex transplanting information
Common Hemicarpa	*Lipocarpha micrantha*	ENDANGERED		York, Lancaster, Erie	FACW+	moist sand	fruits July-October		Yes		Annual, seed collection may work
Common Hop-tree	*Ptelea trifoliata*	THREATENED		Erie, Perry, Allegheny, Fulton, Bucks	FAC	old fields, stream banks and alluvial thickets	flowers Late may-early June, fruits Jul-September.		Yes		Transplanting possible
Common Shooting-star	*Dodecatheon meadia*	ENDANGERED		Bedford, Fulton, Franklin, Snyder	FACU	open wooded slopes, bluffs and meadows on limestone	late April-May	seeds in late June to early July-	Yes		Perennial-possibly difficult to grow from seed-some studies show success of transplanting is possible after flowering and seeding, usually around June-July
Cooper's Milk-vetch	*Astragalus neglectus*	ENDANGERED		Centre, Blair	FACU	gravelly thickets and roadsides, believed to be extirpated	flowers June-July	fruiting July-September, can be surveyed during this time	Yes		Perennial-recent disturbances can increase population-
Cranesbill	*Geranium bicknellii*	ENDANGERED		Erie, Clinton, Potter, Tioga, Carbon, Lebanon	n/a	dry, open woods, clearings and rocky ledges	flowers June-Aug		Yes		Annual-biennial-seed propagation success is usually good, no information on transplanting success
Crested Dwarf Iris	*Iris cristata*	ENDANGERED		Greene, Bedford, Fulton, Carbon	n/a	wooded slopes and streambanks	flowers in May		Yes		Perennial-one example shows that this species propagates more reliably on division compared to seeds, needs appropriate habitat
Cross-leaved Milkwort	*Polygala cruciata*	ENDANGERED		Fayette, Lancaster, Berks, Delaware, Philadelphia	FACW+	boggy pastures and mountain bogs	flowers late July-September		Yes		Annual, seed collection may be possible
Cuckooflower	*Cardamine pratensis var. palustris*	ENDANGERED		Erie, Crawford	OBL	swamps, wet meadows, moist shores and alluvial woods	flowers May-June		Yes		Perennial-
Curtis' Golden-rod	*Solidago curtisii*	ENDANGERED		Greene, Washington	n/a	floodplain forests	August - October		Yes		Perennial, seeds or transplanting may be possible
Curtis's Milkwort	*Polygala curtissii*	ENDANGERED		Chester	n/a	dry, open serpentine barrens	flowers July-earlyOctober		Yes		Annual, seed collection may be possible

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Cyperus-like Sedge	*Carex pseudocyperus*	ENDANGERED		Erie, Butler, Crawford	OBL	Calcareous swamps and swales	June - August		Yes		Perennial-unknown specific success rates for this species, refer to above general Carex transplanting information, possibly does well for transplanting if habitat is suitable
Downy Lobelia	*Lobelia puberula*	ENDANGERED		York, Chester, Delaware	FACW-	moist, sandy soil of old fields, gravel pits and serpentine barrens	flowers late August-September		Yes		Perennial, transplanting possible
Dwarf Azalea	*Rhododendron atlanticum*	ENDANGERED		York	FAC	moist woods	flowers May		Yes		Shrub, transplanting may be possible
Dwarf Huckleberry	*Gaylussacia dumosa*	ENDANGERED		York	FAC	wet woods and thickets	flowers. June, fruits July-Aug	deciduous ericad	Yes		Perennial-propagation success not known-, but seed is best sown in the autumn - transplantation likely has low success rates-
Dwarf Iris	*Iris verna*	ENDANGERED		Cumberland, Adams	n/a	dry to moist, acidic, sandy soils	flowers May	most surveys in May-fruit can be identified by experienced botanist later in growing season-	Yes		Perennial-anecdotal information-can be transplanted easily but should occur in autumn-fairly wide range of soil conditions-
Dwarf Mistletoe	*Arceuthobium pusillum*	THREATENED		Lackawanna, Pike, Monroe	n/a	sphagnum bogs where host Picea mariana is found	June-July		Yes		Perennial-needs Picea mariana or rubens as host, possibly Larix
Dwarf Scouring-rush	*Equisetum scirpoides*	ENDANGERED		Erie	FAC	wet woods and peaty openings	sporulates Aug - Sept	evergreen, identifiable year-round	Yes		
Dwarf Spiraea	*Spiraea betulifolia*	THREATENED		Fulton	n/a	rocky wooded slopes	flowers June		Yes		Shrub, transplant should be possible
Eared False-foxglove	*Agalinis auriculata*	ENDANGERED		Lehigh, Bucks	n/a	moist meadows, fields, roadsides and waste ground	flowers late August-September	surveys for flowers in late August-mid September-fruits mature by early November	Yes		Annual-transplanting of this species is likely tricky, due to the plant being semi-parasitic, relying on root systems of nearby plants to provide some of its nutritional needs. However, seeding propagation has occurred in restoration of prairies in the Midwest.
Eastern Blue-eyed Grass	*Sisyrinchium atlanticum*	ENDANGERED		Allegheny, Lancaster, Bucks	FACW	moist to dry, sandy, open ground of fields and thin woods	may-June		Yes		Transplanting may be possible
Ebony Sedge	*Carex eburnea*	ENDANGERED		Erie, Huntingdon, Blair, Tioga, Bradford, Northampton	FACU	limestone ledges	June-early August		Yes		Perennial-unknown specific success rates for this species, refer to above general Carex transplanting information, possibly does well for transplanting if habitat is suitable-
Elk Sedge	*Carex garberi*	ENDANGERED		Erie	FACW	sandy swales and calcareous gravel	June-July		Yes		Perennial-unknown specific success rates for this species, refer to above general Carex transplanting information, possibly does well for transplanting if habitat is suitable-very narrow habitat requirements
Ellisia	*Ellisia nyctelea*	THREATENED		Dauphin, Lancaster, York, Chester, Bucks, Northampton	FACU	damp, shady banks and rich alluvial woods	flowers in May	most surveys have been conducted in May -June, a few in late April	Yes		Annual-no information is available on transplanting success-likely low rates of success, seeds may propagate with some success
Fall Dropseed Muhly	*Muhlenbergia uniflora*	ENDANGERED		Sullivan, Wyoming, Luzerne, Monroe, Somerset	OBL	marshes, bogs and moist, sandy roadsides	flowers August-September		Yes		Seed collection; perennial; may be transplantable
False Gromwell	*Onosmodium molle var. hispidissimum*	ENDANGERED		Centre, Juniata, Allegheny, Huntingdon	n/a	dry, calcareous hillsides and old pastures	flowers late June-early July		Yes		Perennial
False Loosestrife Seedbox	*Ludwigia polycarpa*	ENDANGERED		Northampton, Perry, Lancaster, Dauphin, York	OBL	wet meadows and swales	flowers July-Sept		Yes		Transplant possible (Munro, John W., 1998 Successful transplant…)
Farwell's Water-milfoil	*Myriophyllum farwellii*	ENDANGERED		Monroe, Carbon, Lackawanna, Pike	OBL	lakes & ponds		July-September	Yes		Seeds unlikely to work; stem and root fragments regrow, conditions must be conducive
Few Flowered Nutrush	*Scleria pauciflora*	THREATENED		Lancaster, Chester, Delaware	FACU+	dry, open woods and serpentine barrens	fruits June - September		Yes		Seed collection may be possible
Few-flowered Sedge	*Carex pauciflora*	ENDANGERED		Warren, Susquehanna, Wayne, Pike	OBL	open sphagnum bogs	June - early August		Yes		Perennial-unknown specific success rates for this species, refer to above general Carex transplanting information, possibly does well for transplanting if habitat is suitable-very narrow habitat requirements
Few-flowered Spike-rush	*Eleocharis pauciflora var. fernaldii*	ENDANGERED		Erie	n/a	wet, calcareous sand	flowers/fruits Mid-late Summer		Yes		Perennial-no specific information regarding the success rates of propagation of this species
Few-seeded Sedge	*Carex oligosperma*	THREATENED		Mercer, Luzerne, Tioga, Centre, Sullivan, Monroe	OBL	spagnum bogs	June-August		Yes		Perennial-at least one study showed seedlings can be easily be transplanted in peat land habitats-
Field Chickweed	*Cerastium velutinum var. velutinum*	ENDANGERED			UPL	limestone, serpentine barrens	flowers May-August		Yes		Perennial-no information on transplanting or propagation
Flat-leaved Bladderwort	*Utricularia intermedia*	THREATENED		Sullivan, Susquehanna, Luzerne, Wayne, Carbon, Pike, Crawford, Erie	OBL	lakes and wet edges of exposed floating bog mats	flowers July - Aug.		Yes		Avoid invasives, buffer, place geotextile fabric down, monitor; seeds must be stored cold; stem cuttings, rhizomes, seed tubers possible
Flat-stemmed Spike-rush	*Eleocharis compressa*	ENDANGERED		Crawford, Venango, Perry, Dauphin, York, Lancaster	OBL	wet, sandy ground and stream banks	flowers/fruits Mid-late Summer	July-late August	Yes		Perennial-in suitable habitat, this species can likely be successfully transplanted-
Floating-heart	*Nymphoides cordata*	THREATENED		Wayne, Pike	OBL	lakes and ponds	July-August		Yes		Perennial, rhizomes, tubers and seeds; transplant may work
Fogg's Goosefoot	*Chenopodium foggii*	ENDANGERED		Luzerne, Clinton, Carbon	n/a	dry, shaley slopes	flowers/fruits late summer - early fall		Yes		Annual-no information is available on transplanting success-likely low rates of success
Forked Rush	*Juncus dichotomus*	ENDANGERED		Monroe, Chester, Carbon, Northampton, Bucks, Montgomery, Philadelphia, Delaware, Lancaster	FACW-	moist, sandy old fields, open woods and gravel pits	flowers/fruits Summer	June - August	Yes		Perennial-no information is available on transplanting success-fairly adaptive plant, could have high transplanting success rates-
Four-angled Spike-rush	*Eleocharis quadrangulata*	ENDANGERED		Erie, Allegheny, Mercer, Washington, Bucks	OBL	lake margins, swamps and ponds	flowers/fruits Mid-late Summer	early August is when most known occurrences were surveyed	Yes		Perennial-no specific information is available for this species
Foxtail Clubmoss	*Lycopodiella alopecuroides*	ENDANGERED			FACW+	moist, sandy-peaty openings		July-October	Yes		Vegetative reproduction by fragmentation
Fraser's Sedge	*Cymophyllus fraserianus*	ENDANGERED		Somerset	n/a	rich, wooded slopes	flower/fruit April-July	May - July appear to be best times to capture flowering time	Yes		Perennial-species probably can be transplanted, but habitat must be suitable
Fries' Pondweed	*Potamogeton friesii*	ENDANGERED		Erie, Crawford, Bedford	OBL	calcareous streams		July-September	Yes		Avoid invasives, buffer, place geotextile fabric down, monitor; seeds must be stored cold; stem cuttings, rhizomes, seed tubers possible
Fringed-leaved Petunia	*Ruellia humilis*	ENDANGERED		Franklin	UPL	limestone barrens and quarry waste	flowers late June - late July		Yes		Perennial, transplanting may be possible
Geyer's Sedge	*Carex geyeri*	ENDANGERED		Centre	n/a	dry, wooded limestone bluff	late June-July		Yes		Perennial-a very rare sedge in PA, habitat vulnerable-no transplanting information found-refer to general information on Carex transplanting

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Glade Spurge	*Euphorbia purpurea*	ENDANGERED		Fulton, Chester, Cumberland, York, Lancaster	FAC	swamps or moist thickets on rich soil	flowers May-July	May through July	Yes		Perennial-can be propagated by seeds-fairly resistant to drought and likes full sun to shade-it self seeds freely-no information on whether transplanting of plants to another site works-
Goat Hill Chickweed	*Cerastium velutinum var. villosissimum*	ENDANGERED		Lancaster, Chester	n/a	serpentine barrens	flowers May-August		Yes		Perennial-no information on transplanting or propagation
Golden-fruited Sedge	*Carex aurea*	ENDANGERED		Erie	FACW	moist, calcareous slumps and seeps	June-early August	Most sedges are difficult to indentify past recommended survey time	Yes		Perennial-one site shows that Carex aurea is an easy sedge to transplant and grow-prefers partial sun to shade in moist, acidic, fertile soil but will tolerate ordinary soil. It will also grow in shallow water 2" - 3" deep. Propagate by division in spring.
Grass-leaved Goldenrod	*Euthamia tenuifolia*	THREATENED		Delaware, Bucks	FACU	moist sandy or clayey fields	flowers July - October		Yes		Perennial-no information on transplanting success of the species, could respond well to seed propagation-
Grassy Pondweed	*Potamogeton gramineus*	ENDANGERED		Erie, Mercer, Forest, Centre, Bradford, Wayne	OBL	lakes and streams		July-September	Yes		Avoid invasives, buffer, place geotextile fabric down, monitor; seeds must be stored cold; stem cuttings, rhizomes, seed tubers possible
Gray-headed Prairie Coneflower	*Ratibida pinnata*	ENDANGERED		Allegheny, Bucks, Washington	n/a	dry fields, limestone uplands, open road- sides	flowers June-August	June-August	Yes		
Green Sedge	*Carex viridula*	ENDANGERED		Erie	OBL	wet calcareous sand flats	late June - August		Yes		Perennial-one successful transplanting known-probably known as a dispersal generalist
Green-and-gold	*Chrysogonum virginianum*	ENDANGERED		Fulton, Franklin	n/a	open woods on limestone	Flowers May-August		Yes		Perennial-best propagated by division-no further information on transplanting success
Grooved Yellow Flax	*Linum sulcatum*	ENDANGERED		Centre, Juniata, Lancaster	n/a	sandy barrens		August-October	Yes		Annual, seed collection may work, seed late fall
Handsome Sedge	*Carex formosa*	ENDANGERED		Centre	FAC	dry calcareous woods	early June-early July (possibly later, but further north)		Yes		Perennial-a very rare sedge in northern PA, habitat vulnerable-no transplanting information found-refer to general information on Carex transplanting
Harbinger-of-spring	*Erigenia bulbosa*	THREATENED		Erie, Armstrong, Crawford, Butler, Beaver, Allegheny, Westmoreland, Washington, Greene, York, Lancaster	n/a	seeps and spring heads on wooded slopes, only a concern in the East	flowers March - April	very early flowering plant-easily overlooked	Yes		Annual-success of transplanting is likely low due to habitat requirements and being easily outcompeted by more vigorous plant species
Hard-stemmed Bulrush	*Schoenoplectus acutus*	ENDANGERED		Erie, Crawford, Lawrence, Butler, Snyder	OBL	shallow water of lake and pond margins	fruits June - August		Yes		Seed collection may be possible
Harris' Golden-rod	*Solidago arguta var. harrisii*	ENDANGERED		Bedford, Fulton		shale barrens	flowers July-October		Yes		Perennial, seeds or transplanting may be possible
Heart-leaved Twayblade	*Listera cordata*	ENDANGERED		Huntingdon, Somerset	FACW+	cool sphagnum bogs or mossy woods	flowers June-July		Yes		Transplants and seed collection are likely to fail; care must be taken avoid damaging roots
Hemlock-parsley	*Conioselinum chinense*	ENDANGERED		Lycoming, Monroe, Northampton	FACW	moist rich woods & streambanks	Flowers August-September	can be identified without flowers	Yes		Perennial-no specific information regarding success of transplanting of this species-this species has a narrow habitat requirement, making transplanting tricky-
Hill's Pondweed	*Potamogeton hillii*	ENDANGERED		Erie, Warren, Bedford, Fulton	OBL	lakes and streams		July-September	Yes		Avoid invasives, buffer, place geotextile fabric down, monitor; seeds must be stored cold; stem cuttings, rhizomes, seed tubers possible
Hispid Gromwell	*Lithospermum caroliniense*	ENDANGERED		Erie	n/a	open sandy barrens and roadsides	flowers June-July		Yes		Transplants are likely to fail; seed collection may be possible, requires cold period for germination
Hoary Willow	*Salix candida*	THREATENED		Monroe, Northampton	OBL	fens and wet meadows, on calcareous soils			Yes		Shrub, transplanting may be possible
Hooded Ladies'-tresses	*Spiranthes romanzoffiana*	ENDANGERED		Erie, Crawford, Warren	OBL	bogs or rich, open woods	fl. July-Aug		Yes		Propagation and transplanting likely difficult
Horrible Thistle	*Cirsium horridulum*	ENDANGERED		Adams, Chester	FACU-	moist, sandy or peaty meadows	May-July	most surveys from known occurrences conducted in June	Yes		Annual/biennial-no information found on transplanting
Houghton's Flatsedge	*Cyperus houghtonii*	ENDANGERED		Centre	n/a	railroad ballast and dry, sandy soil	flower/fruit mid summer-early fall		Yes		Perennial-this species likely does not do well for propagation-but no specific information can be found
Huron Green Orchid	*Platanthera huronensis*	ENDANGERED		Erie	FACW	wet meadows, bogs, woods	flowers June— August	June-August	Yes		
Jacob's-ladder	*Polemonium vanbruntiae*	ENDANGERED		Sullivan, Susquehanna, Wyoming, Luzerne	FACW	sphagnous glades, swamps or marshes	flowers June-July		Yes		Perennial, seeds require cold stratification, transplanting possible
Jeweled Shooting-star	*Dodecatheon radicatum*	THREATENED		Montour, Northumberland, Dauphin, Lancaster, Franklin, Columbia	FACU	open wooded slopes, bluffs and meadows on limestone	late April-May	most known occurrences were surveyed in early May with flowers-flowering time may be earlier with climatic changes	Yes		Perennial-this species has specific microsite conditions, and is sensitive to any changes in soil ph and moisture-most likely difficult to transplant-
Kate's Mountain Clover	*Trifolium virginicum*	ENDANGERED		Huntingdon, Bedford, Fulton, Franklin	n/a	shale barrens	flowers May-Aug		Yes		Perennial
Kidney-leaved Twayblade	*Listera smallii*	ENDANGERED		Franklin, Huntingdon, Somerset, Adams	FACW	damp, shady forests or bogs	flowers June-July		Yes		Transplants and seed collection are likely to fail; care must be taken avoid damaging roots
Labrador Marsh Bedstraw	*Galium labradoricum*	ENDANGERED		Bedford, Crawford, Erie, Pike	OBL	sphagnum bogs and moist banks	flowers June-Aug	Fruits in August-September	Yes		Perennial-mostly a bog species, likely low success rates of transplanting, seed propagation is possible-
Lance-leaved Buckthorn	*Rhamnus lanceolata*	ENDANGERED		Centre, Bedford, Fulton, Franklin	n/a	boggy fields, stream banks and calcareous woods	flowers late April-May		Yes		Shrub, transplanting may be possible
Large-flowered Marshallia	*Marshallia grandiflora*	ENDANGERED		Fayette	FAC	sandy and rocky stream banks	flowers June-Aug		Yes		Transplant, seed collection- propagation by division or seed have high success rates reported
Large-leaved Waterleaf	*Hydrophyllum macrophyllum*	ENDANGERED				mesic, calcareous woods	flowers early June		Yes		Perennial-no information found on this species-propagation success would depend upon suitable habitat, which is fairly restrictive-
Larger Canadian St. John's-wort	*Hypericum majus*	THREATENED		Erie, Tioga	FACW	swampy ground and sand plains along Lake Erie	flowers July-Sept		Yes		Perennial-sensitive species to hydrological changes-so propagation and transplanting may be difficult
Leafy White Orchid	*Platanthera dilatata*	ENDANGERED		Erie, Crawford	FACW	bogs, marshes, or wet meadows	flowers June		Yes		Transplants and seed collection are likely to fail
Leopard's-bane	*Arnica acaulis*	ENDANGERED		Lancaster	FACU	open woods and thickets on serpentine barrens	flowers May-June	no additional survey information	Yes		Perennial-no information on transplanting or propagation
Lesser Panicled Sedge	*Carex diandra*	THREATENED		Erie, Susquehanna, Crawford, Mercer, Warren, Tioga, Bradford, Wayne	OBL	bog hummocks and pond margins	June-August		Yes		Perennial-unknown specific success rates for this species, refer to above general Carex transplanting information
Limestone Adder's-tongue	*Ophioglossum engelmannii*	ENDANGERED		Franklin	FACU	limestone glades and pastures		June-August	Yes		Perennial

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Limestone Petunia	*Ruellia strepens*	THREATENED		Allegheny, Franklin, Cumberland, Dauphin	FAC	rich wooded slopes, bluffs, and roadsides on limestone	flowers late June - late July		Yes		Perennial, transplanting may be possible
Little-spike Spike-rush	*Eleocharis parvula*	ENDANGERED		Delaware, Bucks	OBL	tidal shores and mudflats	flowers/fruits Mid-late Summer		Yes		Annual-Perennial- some information on propagation, so successful transplanting must occur-no specific information on success rates
Long-bracted Green Orchid	*Coeloglossum viride*	ENDANGERED		Bedford, Blair, Cambria, Franklin, Luzerne, Northampton, Pike, Sullivan, Susquehanna, Wayne	FACU	rich woods	flowers May—August	May-August	Yes		
Long-fruited Anemone	*Anemone cylindrica*	ENDANGERED		Centre, Lebanon	n/a	dry open slopes and calcareous fields	flowers June-August		Yes		Perennial-propagation rates of success are high in at least one case, from seeds to individual pot to the field, the species grew rapidly-other sources indicate species is difficult to transplant, being temperamental.
Long-lobed Arrow-head	*Sagittaria calycina var. spongiosa*	ENDANGERED		Bucks, Erie, Delaware, Philadelphia	OBL	tidal mudflats	flowers July-early Sept		Yes		Seeds, runners, transplanting; site condition specific
Low Showy Aster	*Eurybia specabilis*	ENDANGERED				rock outcrops and in sandy woods	flowers August - early October, fruits to November	August - early October, fruit to November	Yes		Perennial-known to be easily cultivated and propagated but information on transplanting plants is lacking-
Maryland Golden-aster	*Chrysopsis mariana*	THREATENED		Lancaster, Chester, Philadelphia	UPL	dry, sandy woods or clearings, roadside banks and serpentine barrens	flowers July-October		Yes		Perennial-no information is available on transplanting success-likely low rates of success
Maryland Hawkweed	*Hieracium traillii*	ENDANGERED		Bedford, Blair, Huntingdon	FACU	dry wooded slopes, bluffs and shale barrens	flowers May-Aug	optimal time is June-July for flowers	Yes		Perennial-habitat requirements specific, so transplanting could be tricky-no info on seed propagation success rates-
Maryland Meadow-beauty	*Rhexia mariana*	ENDANGERED		Bucks	OBL	moist, open sandy soils	flowers July-August		Yes		Perennial, slender rhizomes may be divisible, seed collection may work
Matted Spike-rush	*Eleocharis intermedia*	THREATENED		Erie, Warren, Blair, Berks, Crawford, Mercer, Bedford, Carbon, Monroe, Northampton, Lehigh	FACW+	marshes, wet meadows, and stream banks, on calcareous substrates	flowers/fruits Mid-late Summer		Yes		Perennial-no specific information regarding transplanting success of this species-
Minor Nutrush	*Scleria minor*	ENDANGERED			FACW	sphagnum bogs and swamps	fruits June-July		Yes		Seed collection may be possible
Missouri Gooseberry	*Ribes missouriense*	ENDANGERED		Adams, Cumberland, Union	n/a	rich woods	flowers late April-May		Yes		Shrub, transplanting may be possible
Missouri Rock-cress	*Arabis missouriensis*	ENDANGERED		Columbia, Montgomery	n/a	dry slopes	flowers April-early June	known occurrence has survey date of May 18th-one site lists survey period from first week of May to fourth week of July	Yes		Perennial-no information on transplanting or propagation
Mitchell's Sedge	*Carex mitchelliana*	ENDANGERED		Crawford	OBL	swamps, wet meadows, and stream banks	mid-June - August		Yes		Perennial-a very rare sedge in PA, habitat vulnerable-no transplanting information found-refer to general information on Carex transplanting
Mock Bishop-weed	*Ptilimnium capillaceum*	ENDANGERED			OBL	swamps and marshes	flowers June-August		Yes		Annual, seed collection
Moss Pink	*Phlox subulata ssp. brittonii*	ENDANGERED		Bedford	n/a	dry slopes, rocky ledges and serpentine barrens	flowers April-June		Yes		Transplants may be possible
Mountain Alder	*Alnus viridis*	ENDANGERED		Bedford	FAC	cool rocky wooded slopes	flowers in June	can be surveyed by experienced botanist during any time of leaf-out, can easily be confused with other alder species	Yes		Perennial-nitrogen fixer-seeds have been successfully introduced to areas-no information on transplanting success-shallow root system, vigorous production of stump and root suckers
Mountain Bugbane	*Actaea podocarpa*	THREATENED		Indiana, Cambria, Blair, Westmoreland, Fayette, Somerset	n/a	rich moist wooded slopes and coves in the mountains	flowers in August	August-September for flowers-fruiting can be identified in October by experienced botanist-	Yes		Perennial-no further information found on this species
Mountain Fly Honeysuckle	*Lonicera villosa*	ENDANGERED		Warren, Centre, Crawford, Monroe	n/a	bogs, swamps and wet thickets	flowers May, fruits July		Yes		Transplants may be possible?
Mountain Pepper-bush	*Clethra acuminata*	ENDANGERED		Fayette	n/a	rocky wooded slopes	flowers July-August	flowers and fruits in August	Yes		Perennial-no specific information regarding success of transplanting of this species-success rates likely vary-
Mountain Phlox	*Phlox ovata*	ENDANGERED		Blair, Huntingdon, Dauphin	n/a	openings and edges in dry, sandy woods	flowers late May-July		Yes		Transplants may be possible
Mountain Pimpernel	*Taenidia montana*	ENDANGERED		Bedford	n/a	shale barrens and roadside banks	flowers May		Yes		Perennial
Mountain Wood Fern	*Drypoteris campyloptera*	ENDANGERED		Wayne	n/a	cool moist woods	June- August is best time for this species, possibly May and September as well		Yes		Perennial-no information on transplanting or propagation -species requires moisture and shading, also somewhat acidic-specific microclimate for success
Multiflowered Mud-plantain	*Heteranthera multiflora*	ENDANGERED		Delaware, Philadelphia, Bucks	OBL	tidal shores and mudflats	flowers July-early October.	fruits begin to appear in September-	Yes		Annual-more information is needed on propagation and transplanting success of this species-none found
Naked Bishop's-cap	*Mitella nuda*	ENDANGERED		Warren	FACW-	swamps and moist, mossy woods	flowers May - June		Yes		Perennial; transplant, root or runner division, seed collection (sow fresh seeds in moist soil level)
Narrowleaf Bushclover	*Lespedeza angustifolia*	ENDANGERED			FAC	moist, open, sandy soil of abandoned gravel pits	flowers August-September		Yes		Perennial-no information on success rates of propagation of this species-
Narrow-leaved White-topped Aster	*Sericocarpus linifolius*	ENDANGERED		Chester	n/a	dry woods, serpentine barrens, and sandy roadsides	flower summer-fall		Yes		Perennial, transplanting or seed collection
New England Grape	*Vitis novae-angliae*	ENDANGERED		Blair, Somerset, Fayette, Union	n/a	moist mountain woods, ravines and roadside thickets	flower May, frt. Aug-Nov.		Yes		Perennial
New York Aster	*Symphyotrichum novi-belgii*	THREATENED		Bucks	FACW+	swamps and moist meadows		late summer to fall	Yes		Perennial, seed collection or transplant may be possible
Nodding Pogonia	*Triphora trianthophora*	ENDANGERED			UPL	humus-rich, moist forests	flowers July-August		Yes		Perennial
Nondo Lovage	*Ligusticum canadense*	ENDANGERED		Bedford, Fulton	FAC	mountain woods, stream banks, wooded roadsides	flowers June		Yes		Perennial-no information found on propagation or transplanting success rates
Northeastern Bulrush	*Scirpus ancistrochaetus*	ENDANGERED	ENDANGERED	Tioga, Blair, Clinton, Centre, Union, Snyder, Mifflin, Cambria, Huntingdon, Bedford, Perry, Cumberland, Franklin, Dauphin, Fulton, Adams, Lackawanna, Columbia, Lackawanna, Carbon, Monroe, Lehigh, Northampton, Schuylkill	OBL	intermittently wet or inundated depressions	fruits in July		Yes		Seed collection may be possible
Northeastern Sedge	*Carex cryptolepis*	THREATENED		Crawford	OBL	wet calcareous meadows and fens	June - August	June - August	Yes		Perennial-unknown specific success rates for this species, refer to above general Carex transplanting information
Northern Green Orchid	*Platanthera aquilonis*	ENDANGERED		Crawford, Erie, Warren, Wayne	FACW	wet meadows, marshes, fens, stream banks, moist deciduous forest slopes	flowers June— August	June - August	Yes		

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Northern Small Yellow Lady's-slipper	*Cypripedium parviflorum var. makasin*	ENDANGERED		Beaver, Crawford, Erie, Luzerne, McKean, Mercer, Venango, Warren	n/a	moist woods, bogs	flowers April—June	April-June	Yes		
Northern Water-milfoil	*Myriophyllum sibiricum*	ENDANGERED		Erie, Crawford, Beaver, Allegheny, Cumberland, Lehigh, Northampton	OBL	still waters of rivers, lakes, ponds and marshes		July-September	Yes		Seeds unlikely to work; stem and root fragments regrow, conditions must be conducive
Northern Water-plantain	*Alisma triviale*	ENDANGERED		Erie, Venango, Crawford, Mercer, Clarion, Warren, McKean, Potter, Tioga, Northumberland, Northampton	OBL	shallow water of ditches, lake margins and stream edges	late July-late August	flowering and fruiting time fairly close together	Yes		Perennial-colonial, growth rate moderate, has been used for wetland restoration and mitigation-very tolerant and sturdy-no information on transplanting.
Nuttall's Hedge-nettle	*Stachys cordata*	ENDANGERED		Washington, Greene	FAC	wooded mountain slopes	June-July		Yes		Perennial, seed collection or transplant may be possible
Oblique Milkvine	*Matelea obliqua*	ENDANGERED		Mifflin, Perry, Franklin, Lancaster, York, Montgomery	n/a	mesic woods, wooded edges and thickets	flowers late April-October		Yes		Perennial- transplants or seed collection may work; rhizomes can be divided
Oblong-fruited Serviceberry	*Amelanchier bartramiana*	ENDANGERED		McKean, Sullivan, Monroe	FAC	sphagnum bogs and peaty thickets	flowers Apr-early May, fruits June	can a also be surveyed by experienced botanist July-September during leaf out	Yes		Perennial-Suckers, root cuttings, and softwood cuttings may be taken in the spring and fall and the cuttings rooted with the aid of root-inducing hormone-no information on success of transplanting
October Ladies'-tresses	*Spiranthes ovalis*	ENDANGERED		Blair, Huntingdon, Greene, Franklin	FAC	damp, humus-rich forests	flowers in October		Yes		Propagation and transplanting likely difficult
Passion-flower	*Passiflora lutea*	ENDANGERED		Allegheny, Westmoreland, Washington, Fayette, Greene	n/a	moist stream bank thickets	flowers July		Yes		Transplants and seed collection well documented
Pink Milkwort	*Polygala incarnata*	ENDANGERED			UPL	serpentine barrens	flowers July-August		Yes		Annual, seed collection may be possible
Pod-grass	*Scheuchzeria palustris*	ENDANGERED		Erie, Pike, Warren, Dauphin	OBL	sphagnum bogs	Flowers/fruits late June-early Aug		Yes		Perennial
Possum-haw	*Viburnum nudum*	ENDANGERED		Berks, Lancaster, Chester, Bucks	OBL	wet woods, swamps and margins of vernal pools	flowers June, fruits August - November		Yes		Shrub, transplanting may be possible
Prairie Dropseed	*Sporobolus heterolepis*	ENDANGERED		Lancaster, Chester, Delaware	UPL	serpentine barrens	flowers August - September		Yes		Perennial, seed collection
Prairie Sedge	*Carex prairea*	THREATENED		Erie, Mercer, Franklin, Northampton, Warren, Crawford, Lawrence, Bedford, Centre, Northampton	FACW	wet calcareous marshes and fens	June - July - (early August ?)		Yes		Perennial-unknown specific success rates for this species, refer to above general Carex transplanting information, possibly does well for transplanting if habitat is suitable
Pumpkin Ash	*Fraxinus profunda*	ENDANGERED		Crawford, Erie, Warren	OBL	wet bottomland forest, often in shallow water	late April - Early May	identifiable year-round	Yes		
Purple Rocket	*Iodanthus pinnatifidus*	ENDANGERED		Lawrence, Beaver, Washington, Westmoreland	FACW	moist alluvial woods and wooded slopes	flowers May-June	most surveys conducted in May through late June	Yes		Perennial-given suitable habitat, this species may do well for propagation, but floodplain forests are notorious for invasive plants outcompeting natives, so care should be given to the species if transplanting is done-
Purple Sandgrass	*Triplasis purpurea*	ENDANGERED		Erie, Philadelphia, Delaware, Bucks	n/a	dry, open sandy soils ; Coastal Plain and Lake Erie shore	August -September		Yes		Annual, seed collection may work
Purple-fringeless Orchid	*Platanthera peramoena*	THREATENED		Allegheny, Armstrong, Bedford, Cambria, Chester, Dauphin, Delaware, Fayette, Indiana, Lancaster, Northampton, Potter, Somerset, Westmoreland	FACW	moist meadows, low wet woods, ditches	flowers July—August	July-August	Yes		
Red Currant	*Ribes triste*	THREATENED		Erie, Sullivan, Warren, McKean, Crawford, Wayne, Susquehanna, Lackawanna	OBL	wet, rocky woods, swamps & cliffs	flowers June-July		Yes		Shrub, transplanting may be possible, site condition specific
Red-head Pondweed	*Potamogeton richardsonii*	THREATENED		Erie, Warren, Crawford, Venango, Forest, Clarion, Armstrong, Union, Cumberland, Wayne, Pike	OBL	ponds, lakes and streams		July-September	Yes		Avoid invasives, buffer, place geotextile fabric down, monitor; seeds must be stored cold; stem cuttings, rhizomes, seed tubers possible
Reflexed Flatsedge	*Cyperus refractus*	ENDANGERED		Lancaster, York, Montgomery, Bucks	FACU+	sandy, alluvial banks and dry woods	flower/fruit mid summer-early fall	August-September	Yes		Perennial-no specific information regarding propagation of this species
Reticulated Nutrush	*Scleria muehlenbergii*	ENDANGERED		Chester, Berks	OBL	moist, sandy meadows and boggy pastures	fruits August to October		Yes		Seed collection may be possible
Retrorse Flatsedge	*Cyperus retrorsus*	ENDANGERED		Lehigh	FAC-	dry, sandy soil and ballast	flower/fruit mid summer-early fall		Yes		Perennial-very rare in PA and likely not a species that will need to be transplanted-no information on propagation rates
Richardson's Rush	*Juncus alpinoarticulatus ssp. nodulosus*	THREATENED		Erie, Tioga	OBL	moist, sandy, calcareous shores and seeps	flowers/fruits Summer	most surveys have been conducted in late August	Yes		Perennial-no information is available on transplanting success-likely low rates of success
Robbins' Spike-rush	*Eleocharis robbinsii*	THREATENED		Wyoming, Susquehanna, Sullivan, Wayne, Pike	OBL	shallow water of glacial lakes and ponds	flowers/fruits Mid-late Summer	this species occurs in wetlands with seasonally fluctuating water tables--early as late June through October	Yes		Perennial-no specific information is available for this species-transplanting would need to take place in suitable habitat where fluctuating water levels are present-
Rock Clubmoss	*Huperzia porophila*	ENDANGERED		Carbon, Pike	FACU-	shaded sandstone cliffs, often within the spray zone of waterfalls	June - August	can be identified during most of growing season	Yes		Perennial-generally club mosses do not transplant well, seed propagation not well known-
Roseroot Stonecrop	*Sedum rosea*	ENDANGERED		Pike, Wayne, Bucks	FACU-	moist cliffs & ledges	flowers Late may		Yes		Perennial; cuttings or seed collection may work
Rough Cotton-grass	*Eriophorum tenellum*	ENDANGERED		Susquehanna, Pike, Warren, Monroe	OBL	bogs and peaty depressions	fruits in June	June - August	Yes		Perennial-due to acidic bog/fen habitat restriction, this species probably has a poor success rate for propagation-however it has been noted that it may be possible to restore this species to other wetland habitats-but complexity of plant communities may be inhibiting factor-
Rough Dropseed	*Sporobolus clandestinus*	ENDANGERED		Lancaster	n/a	dry, sandy or rocky soil	flowers late August-October		Yes		Perennial, seed collection
Round-leaved Fame-flower	*Phemeranthus teretifolius*	THREATENED		Lancaster, Chester	n/a	serpentine barrens	flowers open for only a few hours; flowers late June- July		Yes		Perennial, site condition specific
Rush Aster	*Symphyotrichum boreale*	ENDANGERED		Erie, Crawford	OBL	cold bogs	late summer to fall		Yes		Perennial, seed collection or transplant may be possible
Sand Blackberry	*Rubus cuneifolius*	ENDANGERED		Bucks, Chester, Dauphin, Delaware, Lancaster	UPL	Sandy dry open thickets and roadsides	Flowers May-June; fruits July	flowers May—June, fruits in July, identifiable by leaf spring—fall	Yes		
Sand Grape	*Vitis rupestris*	ENDANGERED		Fayette, Lancaster, Somerset	UPL	River cobble bars and banks	Flowers May; fruits Aug-Nov	flowers in May, fruits August-November; identifiable by leaf spring—fall	Yes		
Sandplain Wild Flax	*Linum intercursum*	ENDANGERED		Bucks, Chester	n/a	moist, clayey, open thickets and serpentine barrens	flowers July - August		Yes		Perennial-transplanting and propagation into suitable habitats needs careful attention, due to the species being outcompeted by more aggressive plants-needs disturbance to reduce competition-success rates unknown
Scarlet Ammannia	*Ammannia coccinea*	ENDANGERED		Allegheny, Lancaster, York, Bucks	OBL	wet, sandy or silty shores	flowers July-August	most known occurrences were surveyed in early August or early September	Yes		Annual-has been used for mitigation purposes for wetlands-one mitigation study using seeds found that seeds fared better when temporarily flooded-possible self-pollinator

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Schweinitz's Sedge	*Carex schweinitzii*	THREATENED		Bedford, Blair	OBL	calcareous marshes and stream banks	late May- late July		Yes		Perennial-unknown specific success rates for this species, refer to above general Carex transplanting information, possibly does well for transplanting if habitat is suitable
Scirpus-like Rush	*Juncus scirpoides*	ENDANGERED		Chester, Northumberland, Pike	FACW	moist, sandy or peaty soil	flowers/fruits Summer	July - August is best time to survey for this species	Yes		Perennial-no information is available on transplanting success-fairly adaptive plant, could have high transplanting success rates-
Serpentine Aster	*Symphyotrichum depauperatum*	THREATENED		Lancaster, Chester	n/a	open areas of serpentine barrens	late summer to fall		Yes		Perennial, seed collection or transplant may be possible
Shale-barren Evening-primrose	*Oenothera argillicola*	THREATENED		Huntingdon, Bedford, Fulton	n/a	shale barrens	flowers July-September		Yes		Biennial, seed collection on 2nd year plants, transplanting may be possible on 1st year plants
Short Hair Sedge	*Carex crinita var. brevicrinis*	ENDANGERED		Juniata, Berks, Bucks, Northampton	OBL	moist to wet woods	July-early September	July-early September	Yes		Perennial-unknown specific success rates for this species, refer to above general Carex transplanting information
Short-fruited Rush	*Juncus brachycarpus*	ENDANGERED		Cumberland, Adams	FACW	moist open ground	flowers/fruits Summer	can be surveyed later in summer and early fall by experienced botanists	Yes		Perennial-no information is available on transplanting success-likely low rates of success due to restricted habitat requirements-
Showy Lady's-slipper	*Cypripedium reginae*	THREATENED		Erie, Crawford, Lawrence, Cumberland, Juniata	FACW	bogs, fens and swampy woods	flowers May-June	many surveys of known occurrences were conducted in July for this species	Yes		Perennial-very difficult to transplant-most plants will not survive-
Showy Mountain-ash	*Sorbus decora*	ENDANGERED		Erie, Crawford, Clinton, Tioga	FAC	Rocky slopes	flowers May, frt. Sept.-Oct.		Yes		Transplanting may be possible, or seed collection
Shrubby Cinquefoil	*Potentilla fruticosa*	ENDANGERED		Pike	FACW	calcareous swamps	flowers June-August		Yes		Perennial, transplanting or seed collection possible; seeding or division
Shumard's Oak	*Quercus shumardii*	ENDANGERED		Erie, Centre, Crawford, Bedford, Franklin, Juniata, York, Adams	FAC+	moist to wet woods		May-October	Yes		Transplant, buffer, collect acorns for local nursery
Sida	*Sida hermaphrodita*	ENDANGERED		Bedford, Huntingdon, Dauphin, York, Lancaster	FAC	stream banks	flowers July - October		Yes		Perennial; information on use of seeds and rhizomes available
Slender Blue Iris	*Iris prismatica*	ENDANGERED		Bucks, Montgomery, Chester	OBL	moist meadows and sandy or gravely shores	flowers late May - June	possibly blooms into July	Yes		Perennial-potentially relatively easy to propagate from seed into suitable habitat-not known whether transplanting plant can yield success-
Slender Cotton-grass	*Eriophorum gracile*	ENDANGERED		Erie, Warren	OBL	bogs and peaty depressions	fruits in May	June-July and can be seen later	Yes		Perennial-due to acidic bog/fen habitat restriction, this species probably has a poor success rate for propagation-however it has been noted that it may be possible to restore this species to other wetland habitats-but complexity of plant communities may be inhibiting factor-
Slender Golden-rod	*Solidago erecta*	ENDANGERED		Cumberland, Lancaster, York, Fulton	n/a	dry, acidic shaley banks	flowers late August - October		Yes		Perennial, seeds or transplanting may be possible
Slender Mountain-ricegrass	*Oryzopsis pungens*	ENDANGERED		Lackawanna, Luzerne, Pike	n/a	dry, sandy thickets and barrens	flowers in May		Yes		Perennial, seed collection possible
Slender Panic-grass	*Panicum xanthophysum*	ENDANGERED		Luzerne, Pike	n/a	dry rocky slopes or sandy, open woods, mostly in the mountain		mid-July- mid-September	Yes		Transplants and seed collection possible
Slender Rock-brake	*Cryptogramma stelleri*	ENDANGERED		Cambria, Lycoming, Sullivan	FACU-	moist calcareous cliffs and ravines	June-August		Yes		Perennial-probably difficult to transplant
Slender Sea-oats	*Chasmanthium laxum*	ENDANGERED		Bucks	FAC	moist sandy soils of the coastal plain	Flowers August-September	late July also	Yes		Perennial-no information on transplanting or propagation
Slender Spike-rush	*Eleocharis elliptica*	ENDANGERED		Erie, Bedford, Crawford, Venango, Lawrence, Fayette	FACW+	moist, calcareous, sandy flats, fens and swales	flowers/fruits Mid-late Summer	some surveys conducted in May-June-August seems to be best time	Yes		Perennial-no specific information regarding transplanting success of this species-
Slender Spike-rush	*Eleocharis tenuis var. verrucosa*	ENDANGERED		Butler	FACW+	moist, open ground	flowers/fruits Mid-late Summer		Yes		Perennial-no specific information regarding transplanting success of this species-
Slender Water-milfoil	*Myriophyllum tenellum*	THREATENED		Wayne, Sullivan, Pike	OBL	shallow water of lakes and ponds		July-September	Yes		Seeds unlikely to work; stem and root fragments regrow, conditions must be conducive
Small Sea-side Spurge	*Chamaesyce polygonifolia*	THREATENED		Erie	n/a	dunes and sand plains	flowers July-August		Yes		Annual-no information on transplanting or propagation, but shallow roots suggest that this plant is not easy to propagate
Small Swollen Bladderwort	*Utricularia radiata*	ENDANGERED			OBL	shallow ponds and ditches	flowers June-August		Yes		Avoid invasives, buffer, place geotextile fabric down, monitor; seeds must be stored cold; stem cuttings, rhizomes, seed tubers possible
Small Yellow Lady's-slipper	*Cypripedium calceolus var. parviflorum*	ENDANGERED		Mercer, Crawford, Erie, Warren, McKean, Forest	FACW-	moist woods and bogs, often on limestone	flowers April - June		Yes		Perennial-likely unsuccessful for transplanting due to narrow habitat requirements and the reliance on a fungus to absorb nutrients from the soil-
Small-floating Manna-grass	*Glyceria borealis*	ENDANGERED			OBL	shallow water of lakes and streams	July	July - early August	Yes		Perennial-seed propagation success is good-no information on transplanting, likely low success rates due to habitat requirements-
Small-flowered False-foxglove	*Agalinis paupercula*	ENDANGERED		Delaware, Mercer	FACW+	moist sandy fields, rocky shores, and serpentine barrens	flowers August-September	most known occurrences were surveyed in early August	Yes		Annual-transplanting of this species is likely tricky, due to the plant being semi-parasitic, relying on root systems of nearby plants to provide some of its nutritional needs.
Small-headed Rush	*Juncus brachycephalus*	THREATENED		Erie, Pike	OBL	muddy or sandy calcareous shores clayey seeps and springy or gobby fields	flowers/fruits Summer	some surveys were conducted in August-September for this species	Yes		Perennial-no information is available on transplanting success-likely low rates of success due to restricted habitat requirements-
Small-whorled Pogonia	*Isotria medeoloides*	ENDANGERED	THREATENED	Centre, Venango, Chester	FACU	dry, open oak forests	flowers Late May-June		Yes		Perennial-globally rare plant, transplanting not recommended and must be coordinated with federal agencies-
Smith's Bulrush	*Schoenoplectus smithii*	ENDANGERED		Erie, Monroe, Bucks, Delaware	OBL	freshwater intertidal marshes and moist lake shores	fruits July - September		Yes		Seed collection may be possible
Southern Bog Clubmoss	*Lycopodiella appressa*	THREATENED		Fulton, Cumberland, Lancaster, Lebanon, Berks, Bucks, Monroe	FACW+	moist, sandy-peaty openings		July-October	Yes		Vegetative reproduction by fragmentation
Southern Red Oak	*Quercus falcata*	ENDANGERED		Bucks, Montgomery, Chester, Delaware, Philadelphia	FACU-	dry to moist woods		May-October	Yes		Transplant, buffer, collect acorns for local nursery
Southern Twayblade	*Listera australis*	ENDANGERED		Warren, Bucks	FACW	bogs	flowers May-June		Yes		Transplants and seed collection are likely to fail; care must be taken avoid damaging roots
Spotted Bee-balm	*Monarda punctata*	ENDANGERED		Montour	UPL	dry, open, sandy fields	flowers June-Sept		Yes		Transplanting, seeds, stem cuttings all well documented as successful
Spotted Pondweed	*Potamogeton pulcher*	ENDANGERED		Juniata, Northampton, Bucks	OBL	shallow acidic water, swamps and peaty or muddy shores		July-September	Yes		Avoid invasives, buffer, place geotextile fabric down, monitor; seeds must be stored cold; stem cuttings, rhizomes, seed tubers possible
Spreading Globeflower	*Trollius laxus*	ENDANGERED		Monroe, Lawrence, Northampton	OBL	rich moist calcareous meadows, swamps and open woods	flowers April-May		Yes		Perennial, transplanting or seed collection may work
Spring Ladies'-tresses	*Spiranthes vernalis*	ENDANGERED		Chester, Delaware	FAC	moist, open sandy soils and serpentine barrens	flowers May - August		Yes		Propagation and transplanting likely difficult
Stagger-bush	*Lyonia mariana*	ENDANGERED		Carbon, Chester, Delaware, Montgomery, Bucks	FAC-	dry woods and serpentine barrens	flowers June		Yes		Shrub, transplant may work
Stalked Bulrush	*Scirpus pedicellatus*	THREATENED		Erie, Warren, Washington, Venango, Forest, Armstrong, Potter, Tioga	OBL	lowland alluvial wetlands and stream valleys	fruits in July		Yes		Seed collection may be possible
Sterile Sedge	*Carex sterilis*	THREATENED		Bedford, Lawrence, Mercer, Erie, Northampton	OBL	calcareous swamps and fens	June - August (possibly into September, at least one survey was in September)		Yes		Perennial-unknown specific success rates for this species, refer to above general Carex transplanting information, possibly does well for transplanting-very narrow habitat requirements

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Sticky Golden-rod	*Solidago simplex ssp. randii var. racemosa*	ENDANGERED		Lancaster, York	n/a	rock crevices and shores of the Lower Susquehanna River	flowers Aug-Sept		Yes		Perennial, seeds or transplanting may be possible
Swamp Beggar-ticks	*Bidens bidentoides*	THREATENED		Delaware, Philadelphia, Bucks	FACW+	tidal shores and mudflats	flowers September - October	known occurrences have been surveyed in August and September-can be surveyed for fruiting which appears in mid to late September	Yes		Annual-no information is available on transplanting success-likely low rates of success
Swamp Fly Honeysuckle	*Lonicera oblongifolia*	ENDANGERED		Erie, Crawford, Venango	OBL	bogs and swamps	flowers July-August		Yes		Transplants may be possible?
Swamp-pink	*Arethusa bulbosa*	ENDANGERED		Erie, Fayette, Adams, Wayne	OBL	sphagnum bogs and seeps	flowers late May-June	optimum survey time is when flowers are in bloom, usually late May to late June, easily overlooked if not in bloom	Yes		Perennial-likely low rate of success from propagation-deer fencing is a must, very specific environmental conditions-very rare
Sweet Bay Magnolia	*Magnolia virginiana*	THREATENED		Montgomery, Cumberland, Lancaster, Lebanon, Chester, Bucks, Lawrence	FACW+	moist woods and swamps, in sandy-peaty soils	flowers late May - June		Yes		Transplant, seed collection
Sweet Flag	*Acorus americanus*	ENDANGERED		Crawford, Erie	OBL	Shallow water of ponds	flowers May-August		Yes		perennial-known to vigorously spread in wet soils, also successfully transplanted in at least one researchable mitigation project. Sweet flag can be propagated by plant or rhizome division, or by seed. They should be transplanted at 1 foot spacing.
Sweet-gale	*Myrica gale*	THREATENED		Carbon, Lackawanna, Susquehanna, Monroe, Pike, Northampton, Wayne	OBL	bogs and shallow water of lake and stream edges	flowers in May before leaves emerge		Yes		Shrub, transplants may work, conditions must be wet
Tall Gramma	*Bouteloua curtipendula*	THREATENED		Bedford, Blair, Centre, Franklin, Juniata, Cumberland, Snyder, Lycoming, Chester	n/a	serpentine barrens, dry calcareous clearings, and other dry, rocky, or sandy sites	flowers August - September	late July to early September seems to be best time for surveying this species	Yes		Perennial-seed transplanting has been done with this species-no information on whether transplanting clumps of plants has actually been successful
Tall Larkspur	*Delphinium exaltatum*	ENDANGERED		Beaver, Allegheny, Huntingdon, Washington, Westmoreland, Fayette, Bedford	n/a	rich shaded woods and on rocky limestone bluffs	flowers July - August	possibly blooms into September	Yes		Perennial-no specific information is available, but transplanting may be successful in cool summer microclimatic conditions-
Tawny Ironweed	*Vernonia glauca*	ENDANGERED		Lancaster, Montgomery, York, Chester, Philadelphia, Delaware	n/a	dry fields, upland wooded slopes, or clearings	flowers July-Oct		Yes		Perennial, seed collection or transplant may be possible
Tennessee Pondweed	*Potamogeton tennesseensis*	ENDANGERED		Beaver, Allegheny, Fayette, Bedford	OBL	ponds or streams		July-September	Yes		Avoid invasives, buffer, place geotextile fabric down, monitor; seeds must be stored cold; stem cuttings, rhizomes, seed tubers possible
Thick-leaved Meadow-rue	*Thalictrum coriaceum*	ENDANGERED		Westmoreland, Fayette, Bedford, Blair, Huntingdon	FACU	rich rocky woods, thickets, and moist alluviums	flowers late May-June		Yes		Avoid invasives, buffer, transplant
Thin-leaved Cotton-grass	*Eriophorum viridicarinatum*	THREATENED		Erie, Warren, Crawford, Lawrence, Monroe, Northampton	OBL	bogs, wet meadows, and swamps	flowers May - June	June - August can be identified in early September (not reliable though)	Yes		Perennial-due to acidic bog/fen habitat restriction, this species probably has a poor success rate for propagation-however it has been noted that it may be possible to restore this species to other wetland habitats-but complexity of plant communities may be inhibiting factor-
Three-flowered Melic-grass	*Melica nitens*	THREATENED		Blair, Huntingdon, Bedford, Lancaster, York	n/a	steep rocky slopes and river banks (C3)	flowers late May-July		Yes		Perennial; seeds or rhizomes may work
Three-toothed Cinquefoil	*Potentilla tridentata*	ENDANGERED		Lackawanna, Luzerne, Monroe, Pike	n/a	dry, exposed, rocky balds and mountain tops	flowers June-July		Yes		Perennial, transplanting or seed collection possible; seeding or division
Torrey's Bulrush	*Schoenoplectus torreyi*	ENDANGERED		Tioga, Susquehanna, Wayne, Luzerne, Carbon, Huntingdon, Clinton, Sullivan, Wyoming, Monroe	OBL	shallow water of lake and pond margins	fruits July - September		Yes		Seed collection may be possible
Torrey's Mountain-mint	*Pycnanthemum torrei*	ENDANGERED		Indiana, Bedford, Bucks	n/a	upland woods and thickets	flowers July-Sept		Yes		Perennial, seed collection or transplant may be possible
Torrey's Rush	*Juncus torreyi*	THREATENED		Erie, Tioga, Greene, Northampton, Mercer, Lawrence, Washington, Westmoreland, Somerset, Cambria, Blair, Centre, Lebanon, Chester, Lehigh	FACW	muddy or sandy shores, strip mine areas, swales or ditches	flowers/fruits Summer		Yes		Perennial-no information is available on transplanting success-fairly adaptive plant, could have high transplanting success rates-
Tuckerman's Panic-grass	*Panicum tuckermanii*	THREATENED		Erie, Warren	FAC-	sandy flats	July-Sept		Yes		Transplants and seed collection possible
Tuckerman's Pondweed	*Potamogeton confervoides*	THREATENED		Sullivan, Bradford, Carbon, Wyoming, Lackawanna	OBL	glacial lakes and boggy ponds		July-September	Yes		Avoid invasives, buffer, place geotextile fabric down, monitor; seeds must be stored cold; stem cuttings, rhizomes, seed tubers possible
Tufted Buttercup	*Ranunculus fascicularis*	ENDANGERED		Centre, Franklin, Adams, York, Lebanon, Lancaster, Montgomery, Monroe	FACU	thin, dry woods and exposed calcareous slopes and edges	flowers Apr-May		Yes		Avoid invasives, buffer, place geotextile fabric down, monitor, seed collection
Twig Rush	*Cladium mariscoides*	ENDANGERED		Erie, Crawford, Sullivan, Pike, Butler, Bedford, Wayne, Monroe, Lancaster	OBL	marshes, floating bog mats, and shallow lake margins	fruits in summer/fall	August-September	Yes		Perennial-transplanting may be difficult due to competition with established plants in narrow habitat conditions-
Twinflower	*Linnaea borealis*	THREATENED		Erie, Huntingdon, Bedford, Bradford	FAC	cool, moist woods	flowering May - July		Yes		Perennial-low to medium transplanting success-specific habitat conditions-planting-easy to propagate by division from young, rooted sections of runner, and seeds-
Umbrella Flatsedge	*Cyperus diandrus*	ENDANGERED		Erie, Wayne, Luzerne, Pike	FACW	moist stream banks, bogs, and marshes	flower/fruit mid summer-early fall	August-September	Yes		Annual-no specific information regarding transplanting success of this species
Umbrella Magnolia	*Magnolia tripetala*	THREATENED		Dauphin, Bucks, Fayette, York, Lancaster, Chester	FACU	rich wooded slopes and floodplains	flowers in May with the leaves		Yes		Transplant, seed collection
Upright Primrose-willow	*Ludwigia decurrens*	ENDANGERED		Lancaster	OBL	sandy shores	flowers July-September		Yes		Seedlings require cold stratification, seedlings have low vigor; sprig propagation may work
Vanilla Sweet-grass	*Hierochloe odorata*	ENDANGERED			FACW	Moist meadow or river shore	May-June		Yes		Perennial-propagation from rootstock is possible-produces many rhizomes, and can be propagated from seed-sites must have adequate soil moisture, and watering is important
Variable Sedge	*Carex polymorpha*	ENDANGERED		Luzerne, Cumberland, Carbon, Monroe	FACU	thin woods and barrens in sandy-peaty soil	mid-June - early August		Yes		Perennial-a rhizomatous sedge that has been successful in transplanting in the northeast/New England-habitat is variable throughout range
Variegated Horsetail	*Equisetum variegatum*	ENDANGERED		Erie, Tioga	FACW	damp soil of stream banks and sandy flats, in circumneutral to alkaline soil	species can be properly identified throughout growing season, mostly from June - September	late spring - summer	Yes		Perennial-likely not difficult to transplant, as plants have a deep and penetrating root system-best propagated by spores- and best collected as soon as they are ripe in spring and surface-sown immediately on sterile compost-plants usually spread very freely when well sited
Vase-vine Leather-flower	*Clematis viorna*	ENDANGERED		Beaver, Washington, Franklin, Chester	n/a	rich wooded banks and thickets	flowers May-July	fruits can be identified in August	Yes		Perennial-probably difficult to obtain entire root system without damage-
Vasey's Pondweed	*Potamogeton vaseyi*	ENDANGERED		Erie, Crawford, Potter, Lycoming, Luzerne, Fulton	OBL	ponds, lagoons and other slow-moving water		July-September	Yes		Avoid invasives, buffer, place geotextile fabric down, monitor; seeds must be stored cold; stem cuttings, rhizomes, seed tubers possible

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Velvety Panic-grass	*Dichanthelium scoparium*	ENDANGERED		Chester, Delaware, Philadelphia, Bucks	FACW	moist meadows and swales	vernal terminal panicles May-early July, or late summer or early fall		Yes		Perennial-no specific information but generally needs a soil ph of about 6.0 for transplanting-
Walter's Barnyard-grass	*Echinochloa walteri*	ENDANGERED		Delaware, Erie, Philadelphia, Bucks	FACW+	tidal marshes & mudflats, restricted to Coastal Plain	August-September	most known occurrences were surveyed in mid-August	Yes		Annual-no specific information regarding transplanting success of this species
Water Lobelia	*Lobelia dortmanna*	THREATENED		Susquehanna, Wayne, Pike	OBL	glacial ponds and lakes	flowers July-August		Yes		Perennial, OBL, requires specific site conditions, rhizome division or seed collection possible
Water Sedge	*Carex aquatilis*	THREATENED		Erie, Warren	OBL	marshy swales	July-August		Yes		Wild plants can be collected and transplanted directly into the desired project site. Care should be taken not to collect plants from weedy areas as these weeds can be relocated to the transplant site and the hole left at the collection site may fill with undesirable species. For wetland plantings using greenhouse grown transplants or wildings, plant at 15, 30 or 60 cm (0.5, 1.0 or 2.0 ft) spacing for uniform ground cover in 1, 2 and 3 years respectively
White Camas	*Zigadenus glaucus*	ENDANGERED		Huntingdon	n/a	limestone ledges	flowers in August	August	Yes		
White Milkweed	*Asclepias variegata*	ENDANGERED		Berks, Bucks, Chester, Cumberland, Delaware, Franklin, Lancaster, Lebanon, Lehigh, Luzerne, Monroe, Montgomery, Northampton, Philadelphia	FACU	dry woods	flowers late May—July	May-July	Yes		
White Monkshood	*Aconitum reclinatum*	ENDANGERED		Fayette, Somerset	n/a	shaded ravines in rich, moist mountain woods	flowers June-Sept	for known occurrences, surveys were conducted in mid to late August	Yes		Perennial-species of Aconitum are typically easily propagated by divisions of the root or by seeds-roots are poisonous
White Twisted-stalk	*Streptopus amplexifolius*	THREATENED		Sullivan, Luzerne, Wayne, Pike, Monroe, Carbon	FAC+	seepy outcrops (often near waterfalls) and cool slopes	flowers June-July		Yes		Perennial, transplants may work
Whorled Nutrush	*Scleria verticillata*	ENDANGERED		Northampton	OBL	moist, calcareous meadows, bogs and fens	fruits July-Sept		Yes		Seed collection may be possible
Whorled Water-milfoil	*Myriophyllum verticillatum*	ENDANGERED		Erie, Crawford, Lehigh	OBL	shallow (<1 m deep) water of ponds or marshes		July-September	Yes		Seeds unlikely to work; stem and root fragments regrow, conditions must be conducive
Wiegands Sedge	*Carex wiegandii*	THREATENED		McKean, Elk	OBL	sphagnum bogs, openings or thickets	June-July		Yes		Perennial-a very rare sedge in PA, habitat vulnerable-no transplanting information found-refer to general information on Carex transplanting
Wild Bleeding-hearts	*Dicentra eximia*	ENDANGERED		Beaver, Carbon, Northampton, Bedford, Adams	n/a	rich woods and cliffs	flowers June-July	flowers can appear in May-fruiting in June-July	Yes		Perennial-no specific information on transplanting success of the native bleeding heart-
Wild Hyacinth	*Camassia scilloides*	THREATENED		Lawrence, Washington, Allegheny	FAC	moist woods	flowers April-May	An early flowering species, surveys can be done as late as mid to late May-basal leaves disappear by mid-summer	Yes		Perennial-transplants may do well early in spring, but no data backs this up. It has been documented that seedlings to planting works well.
Wild Ipecac	*Euphorbia ipecacuanhae*	ENDANGERED		Bucks	n/a	sandy or gravelly soil of the coastal plain	flowers April-June	very rare in PA	Yes		Perennial-no information can be found on transplanting success-it's a slow growing plant and can be easily outcompeted from other species-the presence of a long root would likely make propagation and survival more difficult-
Wild-pea	*Lathyrus ochroleucus*	THREATENED		Warren, Bradford, Blair, Tioga, Bradford, Wyoming	n/a	dry, upland woods and slopes	flowers May-July		Yes		Perennial-a nitrogen fixing rhizomatous herb, preferring sandy loam to loam soils-fall planting is preferable to allow winter stratification assist in seed dormancy-success rates of transplanting are unknown
Willow Oak	*Quercus phellos*	ENDANGERED		Bucks, Philadelphia, Delaware	FAC+	moist to wet woods		May-October	Yes		Transplant, buffer, collect acorns for local nursery
Wrights Spike Rush	*Eleocharis obtusa var. peasei*	ENDANGERED		Delaware, Philadelphia, Bucks	OBL	tidal shores & mudflats	flowers/fruits Mid-late Summer		Yes		Annual-perennial-no specific information
Yellow Sedge	*Carex flava*	THREATENED		Erie, Crawford, Monroe, Northampton	OBL	calcareous wet meadows and fens	June-late August, can be surveyed in September but perigynia are starting to fall off by then		Yes		Perennial-unknown specific success rates for this species, refer to above general Carex transplanting information, possibly does well for transplanting if habitat is suitable-very narrow habitat requirements

SPECIES MODULES

Bald Eagle

(*Haliaeetus leucocephalus*)

Federal Protection/
PA Protected Species

Photo: Pennsylvania Fish and Game Commission

History

Species Decline

- Was once persecuted and shot as a nuisance species
- Water pollution affects fish and aquatic life which bald eagles depend upon
- Habitat encroachment, timbering, and farming
- Primary reason for the decline was DDT pesticide and bio-accumulation t
- DDT was banned in 1972 along with other bio-accumulating pesticides

Protections and Listings/Delisting

- The bald eagle was removed from the federal Endangered Species list in 2007
- The bald eagle is federally protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act
- Pennsylvania status was changed to Protected in January 2014 and is protected under the Game and Wildlife Code

Species Recovery in Pennsylvania

- Bald eagles are nesting in sites in PA where they have not nested in decades
- Active nests increased from 8 in 1990, to 100 by 2006
- Nesting pairs increased from 150 pairs in 2008, to more than 270 pairs in 2013

Identification Characteristics

- Weigh up to 14 pounds and have seven-foot wingspans
- Brown bodies with white heads and tails once mature
- Immature plumage is dark brown with white mottling
- Tarsi are not feathered
- Adults have a yellow bill

Pennsylvania Habitat

- High quality riparian forests and wetlands for nesting habitat
- Thrive near bodies of water where they have access to a food supply

- Need large trees for large nest support
- Require low disturbance by nearby human activity

Natural History

- Most often found near bodies of water where they can hunt and scavenge for fish most of the year
- Also eat small mammals, waterfowl, turtles, and carrion more commonly in winter months
- Build large nests near water that are reused year to year near water, riparian woods, hillsides, and swamps
- In PA, most eggs are laid between mid-February and mid-March, with early March as the peak period
- Eggs commonly hatch in April and the young fledge after 8-14 weeks, by the end of June or in July

Migration

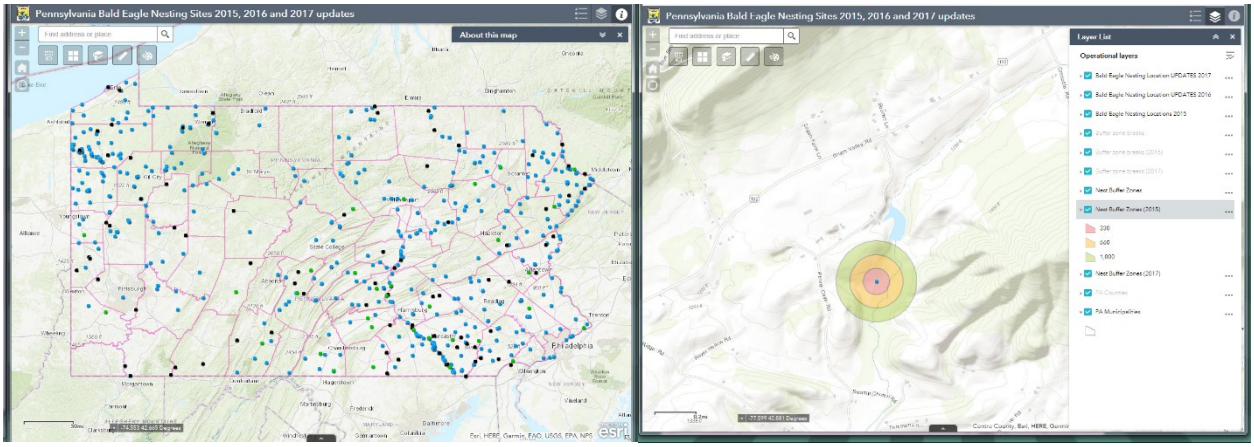
- Outside of the bald eagle nesting period, some eagles from southern states, northern states, and Canada migrate to Pennsylvania to overwinter.

Source: PGC Bald Eagle (Haliaeetus leucocephalus) – Fact sheet
http://www.pgc.pa.gov/Wildlife/EndangeredandThreatened/Documents/Bald%20Eagle.pdf

Project Due Diligence

The Bald and Golden Eagle Protection Act protects bald eagles from takes and disturbance. Once a project has been reviewed through the PNDI review tool, here are the next steps to take in planning for implementing avoidance measures near nesting habitat during construction or maintenance activities. *Note: The Pennsylvania Game Commission will typically defer comments to the USFWS if the project has the potential to disturb bald eagle nesting sites.*

1. Find out if your project is located near or within the buffer of a known bald eagle nest. The USFWS Pennsylvania Field Office has an interactive map tool, "Pennsylvania Bald Eagle Nest Locations and Buffer Zones." The map includes locations from 2015-2017 nesting seasons. It is not a conclusive list and there are likely nests that are not included on the map.



The photo on the left shows the nesting sites and the photo on the right shows the breeding habitat buffers around the nesting site when zoomed in. *USFWS PA Field Office interactive map tool* https://www.fws.gov/northeast/pafo/bald_eagle_map.html

2. There are three breeding habitat buffer zones which are described on the "Bald Eagle Project Screening Form" (rev. 10/27/16) for each activity that may disturb bald eagle nests within 330 feet, 660 feet, or 1000 feet.

3. If the project is near a known bald eagle nest or breeding habitat buffer zone, perform further screening via the "Bald Eagle Project Screening Form". The USFWS Pennsylvania Field Office uses this form as a guidance document for new or intermittent activities in PA during the planning of construction/development, maintenance/restoration, and inspection activities that may impact Bald Eagles and their nesting habitat. The form asks several project specific questions and recommends Avoidance Measures (AM) based upon those answers. The AM's include buffer distances between project activities and nest sites and seasonal work restricting timeframes. The form does not screen for disturbance near foraging or roosting habitats. *PennDOT projects may fall into the categories of Blasting and Other Loud, Intermittent noises, Maintenance and Restoration Activities, and Construction and Development Activities. Each activity lists avoidance measures that apply to that specific group of activities.*

Construction and Development Activities

- **AM 1:** A distance buffer of at least 660 feet (200 meters) will be maintained between all project activities and the nest (including alternate nests). An alternate nest is a nest that is built or maintained by eagles, but not used for nesting in a given year.
- **AM 2:** A distance buffer of at least 660 feet (200 meters) will be maintained between all project activities and the nest (including alternate nests). These activities include, but are not limited to: construction, excavation, use of heavy equipment, use of loud equipment or machinery, vegetation clearing, earth disturbance, planting, and landscaping.
    - If a similar activity (i.e., similar in kind and size) is closer than 660 feet and has been tolerated by eagles, then:
        1) the distance buffer will be the same or greater than that of the existing tolerated activity, (similar existing tolerated activity can occur within the 660-foot buffer) and
        2) between the modified distance buffer and 660 feet, all activities that may disturb bald eagles will be avoided from January 1 to July 31.
- **AM 3:** A distance buffer of at least 330 feet (100 meters) will be maintained year-round between all project activities and the nest (including alternate nests). If a similar activity (i.e., similar in kind and size) is closer than 330 feet and has been tolerated by eagles, the distance buffer will be the same or greater than that of the existing tolerated activity.
- **AM 4:** Within 660 feet of the nest, all activities that may disturb bald eagles will be avoided from January 1 to July 31. These activities include, but are not limited to: construction, excavation, use of heavy equipment, use of loud equipment or machinery, vegetation clearing, earth disturbance, planting, and landscaping.
- **AM 5:** Established landscape buffers that screen the activity from the nest will be maintained.

Blasting and Other Loud, Intermittent noises

- AM6: From January 1 to July 31 (breeding season), blasting and other activities that produce extremely loud noises will not occur within a *½-mile radius* of active nests

Maintenance and Restoration Activities

- **AM7:** From January 1 to July 31 (breeding season), all activities that may disturb bald eagles will be avoided within 660 feet (200 meters) of the nest. This includes, but is not limited to the following: construction, excavation, use of heavy equipment, use of loud equipment or machinery, vegetation clearing, earth disturbance, planting, landscaping, and habitat restoration activities.
- **AM8:** Established landscape buffers that screen the activity from the nest will be maintained.
- **AM9:** If prescribed burning is necessary during the breeding season (January 1 to July 31), burns will only be conducted when adult eagles and young are absent from the nest tree (i.e., at the beginning of, or end of, the breeding season, either before the particular nest is active or after the young have fledged from that nest). Leaves and woody debris will be raked from around the nest tree to prevent crown fire or fire climbing the nest tree.

If all USFWS avoidance measures applicable to the project **can be followed**, and disturbance of bald eagles is unlikely to occur, the signed and dated project screening form will serve as documentation that the project

will implement USFWS recommendations and avoid disturbance to bald eagles. No submission or USFWS concurrence is required. Sign, date and maintain in the project file.

If all avoidance measures **cannot be implemented** during the project the action may disturb bald eagles. To determine whether bald eagles may be disturbed, contact the USFWS Northeast Regional Bald and Golden Eagle Coordinator at 413-253-8577 or Thomas_Wittig@fws.gov to determine if an incidental take permit will be required.

Useful Links

PGC Bald Eagle (*Haliaeetus leucocephalus*) – Fact sheet
http://www.pgc.pa.gov/Wildlife/EndangeredandThreatened/Documents/Bald%20Eagle.pdf

USFWS PA Field Office interactive map tool
https://www.fws.gov/northeast/pafo/bald_eagle_map.html

USFWS Bald Eagle Project Screening Form
https://www.fws.gov/northeast/pafo/pdf/endspecies/Bald_Eagle_Project_Screening_Form_102716.pdf

Eastern Massasauga Rattlesnake (EMR)

(*Sistrurus catenatus catenatus*)

PA Endangered Species
Federally Threatened

Photo: USFWS PA Field Office

Identification Characteristics

- 20-30 inches long
- Brownish gray to black with rounded dark-brown or black spots down the back and sides
- Black belly with white or yellow markings
- 9 plates/scales cover the crown of the head
- Facial pit between the eye and nostril
- Stocky tail ends in a moderately developed rattle

Pennsylvania Habitat

- Low lying saturated soils with higher dry ground nearby
- Open old fields, wet meadows
- Wetlands, lakes, rivers
- In PA, this wet and dry combination habitat is found in relict prairie terrain of counties in western PA
- Extant populations are known in Butler and Venango Counties in PA
- Former range included Armstrong, Lawrence, Crawford, Mercer, and Clarion Counties in PA

Habitat Loss

- Draining and filling wetlands for agriculture or urban development
- Habitats dissected by infrastructure, agriculture fields, and development
- Barriers isolate populations from each other
- Isolated populations often decrease in size until extirpated

Natural History

- Hibernates in saturated soil, 6" to 24" underground
- Some remain active in water through winter
- Crayfish burrows may also be used to overwinter, small mammal burrows, under logs/tree roots
- Emerge in mid-April
- Feed on frogs and crayfish when on wet grounds in the fall, winter, and spring
- Sun themselves to warm up and then move to higher, drier grounds in the summer
- Feed on small rodents, frogs, snakes, and insects when on drier ground
- Females with young bask in dry areas and give birth in August or early September
- Hibernation begins in mid-October

Sources:

PNHP Eastern Massasauga (Sistrurus catenatus catenatus) – Fact Sheet

Western Pennsylvania Conservancy, "Species At Risk: Eastern Massasauga Rattlesnake" website https://waterlandlife.org/wildlife-pnhp/species-at-risk-in-pennsylvania/eastern-massasauga-rattlesnake/

The table below is an abbreviated excerpt from Appendix 1 in the "Range wide Extinction Risk Modeling for the Eastern Massasauga Rattlesnake (*Sistrurus catenatus catenatus*) – Final Report, April 11, 2011" from the USFWS and the Lincoln Park Zoo. The table lists locations where EMR populations may still occur in Pennsylvania.

Abbreviated Appendix 1 – EMR Possible Locations

Model Label	Site Name
PA1	Fenelton – Butler County
PA2	Glades – Butler County
PA3	Jennings – Butler County
PA4	Rattlesnake Swamp – Venango County
PA5	Ten Mile Bottom – Venango County

Additional populations may have been identified after 2011.
County location information from PNHP Butler and Venango County Natural Heritage Inventories.

Project Due Diligence

Once a project has been reviewed through the PNDI, here are the next steps to take in planning for mitigation of potential impacts during construction, maintenance, or inspections.

1. As a matter of practice, United States Fish and Wildlife Service (USFWS) defers review requests for this species to the Pennsylvania Fish and Boat Commission (PFBC). As a best management practice, the USFWS should be copied on all correspondence to PFBC. Where avoidance and minimization measures cannot be implemented, and it is determined that the project or activity may effect and is likely to adversely affect the Eastern Massasauga, coordinate with both agencies.
2. Finalize the PNDI Receipt and coordinate the review request with the PFBC to confirm potential presence of EMR within project area.
3. An IPaC effect determination key is in development for this species. Complete the IPaC effect determination if so directed by the PNDI receipt.
4. Surveys are triggered if the project is located within the watershed or vicinity of extant or historic sites. Species surveys should be conducted between April 15 – June 15.
5. Presence of the species may be assumed in lieu of a survey. Work restrictions may be implemented in wetlands from September 1 – April 30. Avoidance measures for associated uplands are implemented between April 1 – November 1.
6. If the PFBC requires a survey for EMR, it must be performed by qualified PFBC EMR surveyors in PA and hold a Scientific Collector's Permit for EMR. Any encounter with EMR must be reported to the PFBC Natural Diversity Section in writing.
7. Phase 1 Habitat Assessment: If wetland or stream habitats are present in the disturbance area, a Phase I survey for overwintering habitat should be completed within the project area. Associated open upland areas should be surveyed for summer gestation habitat.
8. Phase 2 Presence/Absence Assessment: If potential EMR habitat is identified during the Phase 1 Assessment, presence/absence surveys are then conducted using PFBC methods; these consist of Visual Encounter and Coverboard surveys.
9. With PFBC coordination and a qualified EMR biologist, direction may be given for mitigation measures to implement during construction, maintenance, or inspection activities. This can be pursued with an assumption of presence. Examples include, proper installation of sediment and erosion controls so that snakes do not get trapped in the project area, installing exclusion fencing/compost filter sock around potential habitat such as wetlands or streams, or having an EMR monitor on site should any snakes be encountered during construction so that they can be relocated.

Useful Links

USFWS survey guidelines:
https://www.fws.gov/midwest/endangered/reptiles/eama/eama-survey.html

List of Qualified Surveyors
https://www.fws.gov/northeast/pafo/pdf/endspecies/EMR_Surveyors_08122015.pdf

PennDOT PUBLICATION 113 Guidance

In Districts 1-0, 10-0, and 11-0, if the assembly is proposed within the counties of Armstrong, Butler, Clarion, Crawford, Lawrence, Mercer, or Venango, then this activity must avoid adverse impacts to the EMR. The EMR is a federally threatened, and state endangered species protected by applicable laws. This species is typically found in a variety of wetland and stream habitats particularly during spring, fall, and winter and utilize drier adjacent forest openings, old or agricultural fields, and prairie upland habitats in the summer. If wetland or stream habitats are present in the disturbance area for the assemblies identified below, then avoidance and minimization measures including time of year restrictions may be necessary. All operators, employees, and contractors working on assemblies (as shown in the table below) in areas where this species may be present must be provided briefing materials (Publication 546B) prior to initiating the activity. **If an EMR is encountered, then all work activities will cease immediately and through the District Project Manager and District Environmental staff the PFBC Natural Diversity Section will be notified and further agency consultation in accordance with applicable laws will be coordinated.**

Assembly #	Assembly
621-2541-01 Through 621-2549-01	FHWA Disaster Recovery (Federal Aid Routes)
663-2541-01 Through 663-2549-01	FEMA Disaster Recovery (Non-Federal Routes)
711-7215-01	Shoulders – Unpaved Cutting/Belt Loader Mechanized
711-7215-02	Shoulders – Unpaved Cutting/Front End Loader Mechanized
711-7216-01	Shoulders – Unpaved Upgrading Mechanized
711-7311-01	Drainage Cleaning, Inlets and Endwalls, Manual and Mechanized
711-7311-02	Drainage Cleaning, Inlets and Endwalls – Clogged, Mechanized
711-7312-01	Drainage Cleaning Ditches and Drainage Channels Mechanized
711-7312-02	Drainage Cleaning Parallel Channels Manual
711-7312-03	Drainage Cleaning Swales Mechanized
711-7314-01	Drainage Cleaning, Pipes and Culverts, Mechanized
711-7321-01	Drainage, Replacement, Inlets – Endwalls
711-7321-02	Drainage, Repair Only, Inlets – Endwalls, Manual
711-7324-01	Drainage, Replacement/Installation, Pipes/Culverts under 36” Diameter, Mechanized
711-7324-02	Drainage, Replacement/Installation, Pipes/Culverts 36” Diameter and over, Mechanized
711-7324-03	Drainage Replacement/Installation Pipes Parallel Mechanized
711-7324-04	Drainage, Replacement/Installation, Pipes Extension Only
711-7325-01	Repair or Replacement of Structures under 8’ in length
711-7326-01	Drainage, Pipes/Culverts, Repair
711-7328-01	Drainage Installation Subsurface Drains (U-Drain)
711-7333-01	Roadway Section Restoration, Repair Sink Holes/Slides
711-7425-01 thru 711-7460-01	Bridge Maintenance Cost Functions

A summary of the required avoidance and minimization measures (AMMs) is available as Publication 546B. Publication 546B should be reviewed during scheduled maintenance training, weekly planning meetings, and/or at the beginning of performing the transportation activity.

Threatened and Endangered Mussel Species

Photo: Greg Zimmerman of EnviroScience

History of the Mussel Species

Species Decline

- These mussel species are declining throughout the Ohio River Basin in Pennsylvania.
- Habitats are altered by siltation, drainage of bottomland lakes, swamps, and prairie marshes, desiccation during drought, species introductions, pollution, impoundments, and increased water temperatures.
- Zebra mussels (*Dreissena polymorpha*) have destroyed mussel populations in the Great Lakes and significantly reduced native mussel populations in many of the large rivers of eastern North America.
- Pollution through point (industrial and residential discharge) and non-point (siltation, herbicide, and fertilizer run-off) sources is perhaps the greatest on-going threat to most freshwater mussels.
- Dredging of streams has an immediate effect on existing populations by physically removing and destroying individuals, destroying much of the potential habitat, and making the substrates and flow rates uniform throughout the system.

Protections and Listings/Delisting

- See **Table 1.**

Identification Characteristics

- Mussels have a hard shell that is divided in half.
- The shell is usually oval or oblong.
- They can range in color from black and brown to yellow and green and have different textures on the shell.
- They can range in size from an inch to several inches.

Habitat

- Freshwater – Large to small rivers and streams with low to high gradients.
- Mussels are benthic invertebrates that thrive in both flowing and standing water (Lakes/Ponds).
- Gravel, cobble substrates, sand, and silt.

Natural History

- Nearly all mussels require a host or hosts during the parasitic larval portion of their life cycle.
- Hosts are usually fish, but a few species utilize amphibians or may metamorphose without a host.
- Larvae (glochidia) of freshwater mussels generally are parasitic on fish and display varying degrees of host specificity.
- Adults are detritivores/filter feeders.

Migration

- Mussels are rather sessile with limited movement through the substrate. Downstream movement may occur when mussels are displaced from the substrate during floods. Major dispersal occurs when glochidia are encysted on their hosts.

Source: NatureServe Explorer – Fact Sheets ***http:/explorer.natureserve.org/***

Table 1 below provides information regarding the listing status and distributions for state and federally listed mussels in Pennsylvania.

Table 1 - Federally Listed and State Listed Species in Pennsylvania

Common Name	Scientific Name	Federal Status [1]	PA Status	Distribution (Basins and/or Major Waterways)
Brookfloater 	*Alasmidonta varicose*	Under Review		**Atlantic Slope:** Susquehanna and Delaware R. Basins (Adams, Bedford, Clinton, Cumberland, Dauphin, Huntingdon, Lebanon, Monroe, Northampton, Pike, Snyder, Tioga, Union, Wayne and York. *Has not been found recently in streams of historical occurrence in Berks, Blair, Bradford, Bucks, Cameron, Franklin, Fulton, Indiana, Lancaster, Lycoming, Montgomery, Perry and Philadelphia.* Photo: Allen Barlow
Clubshell 	*Pleurobema clava*	E	E	**Ohio Basin:** Allegheny River; Conneaut Outlet; Conneauttee Creek; French Creek; LeBoeuf Creek; Muddy Creek; Shenango River; Tionesta Creek *Has not been found recently in 13 streams of historical occurrence in Butler, Beaver, Fayette, Greene, Indiana, Lawrence, and Westmoreland Co.* Photo: USFWS
Dwarf wedgemussel 	*Alasmidonta heterodon*	E	E	**Atlantic Slope**: Delaware River (Monroe, Northampton, Pike, Wayne Co.). *Has not been found recently in streams of historical occurrence in the Delaware River watershed (Bucks, Carbon, Chester, Philadelphia) or Susquehanna River watershed (Lancaster).* Photo: Natureserve
Eastern pearlshell 	*Margaritifera margaritifera*		E	**Atlantic Slope**: Delaware River (Berks and Shuykill). *Has not been found recently in streams of historical occurrence in Monroe Co.* Photo: Natureserve
Fanshell 	*Cyprogenia stegaria*	E	Extirpated	**Ohio Basin** Photo: USFWS

Common Name	Scientific Name	Federal Status [1]	PA Status	Distribution (Basins and/or Major Waterways)
Green Floater 	*Lasmigona subviridis*	Under Review		**Atlantic Slope:** Susquehanna and Delaware R. Basins (Adams, Bedford, Clinton, Cumberland, Dauphin, Huntingdon, Lebanon, Monroe, Northampton, Pike, Snyder, Tioga, Union, Wayne and York Co.) *Has not been found recently in streams of historical occurrence in Berks, Blair, Bradford, Bucks, Cameron, Franklin, Fulton, Indiana, Lancaster, Lycoming, Montgomery, Perry and Philadelphia Counties.* Photo: PNHP
Long-solid 	*Fusconaia subrotunda*	Under Review		**Ohio Basin:** Allegeny R., French Creek and Shenango R. *Has not been found recently in these streams of historical occurrence: Redbank Ck., Manoning, Beaver, and Ohio R.* Photo: USFWS
Northern riffleshell 	*Epioblasma torulosa rangiana*	E	E	**Ohio Basin**: Allegheny River: Conewango Creek; French Creek; LeBoeuf Creek; Muddy Creek *Has not been found recently in streams of historical occurrence, including Shenango River (Lawrence).* Photo: USFWS
Orange-foot pimpleback 	*Plethobasus cooperianus*	E	Extirpated	**Ohio Basin** Photo: Archive.org
Pink Mucket 	*Lampsilis abrupta*	E	Extirpated	**Ohio Basin** Photo: USFWS

Common Name	Scientific Name	Federal Status [1]	PA Status	Distribution (Basins and/or Major Waterways)
Pistolgrip 	*Quadrula verrucosa*		E	**Ohio Basin**: Shenango River. *Has not been found recently in these rivers/streams of historical occurrence: Crooked Ck., Conewango, Allegheny R., Monongahela R., Dunkard Ck., Ohio R.,Mahoning, Pymatuning Ck., Little Shenango and Beaver R.* Photo: Jim Rothert
Rabbitsfoot 	*Quadrula cylindrica cylindrica*	T	E	**Ohio Basin**: Allegheny River; Conneauttee Creek; French Creek; LeBoeuf Creek; Muddy Creek; Shenango River. **Designated critical habitat -** Shenango River (Porter Road to Shenengo R. Lake); French Creek (Union City Dam to Allegheny R. Confluence/Franklin); Allegheny River (Franklin to I-80/Emlenton); Muddy Creek (Little Cooley to French Creek Confluence). Photo: USFWS
Rayed bean 	*Villosa fabalis*	E	E	**Ohio Basin**: Allegheny River; Cussewago Creek; French Creek; LeBoeuf Creek; Muddy Creek; Oswayo Creek *Potentially extant in Shenango River and Woodcock Creek* *Has not been found recently in 5 streams of historical occurrence in Armstrong, Lawrence, Mercer and Warren Co.* Photo: USFWS
Ring Pink 	*Obovaria retusa*	E	Extirpated	**Ohio Basin** Photo: USFWS
Rough Pigtoe 	*Pleurobema plenum*	E	Extirpated	**Ohio Basin** Photo: USFWS

Common Name	Scientific Name	Federal Status [1]	PA Status	Distribution (Basins and/or Major Waterways)
Round Hickorynut 	*Obovaria subrotunda*	Under Review	E	**Ohio Basin:** Shenango River. *Has not been found recently in these rivers/streams of historical occurrence: Crooked Ck., Conewango, Allegheny R., Monongahela R., Ohio R.,Mahoning, Pymatuning Ck., Little Shenango and Beaver R.* Photo: Scott Gibson
Salamander mussel 	*Plethobasus cyphyus*		E	**Ohio Basin**: Cussewago and Allegheny River. *Has not been found recently in streams of historical occurrence, including: French Ck.* Photo: Environment Canada
Sheepnose 	*Simpsonaias ambigua*	E	T	**Ohio Basin**: Allegheny River (Forest and Venango Co.). *Has not been found recently in streams of historical occurrence, including: Allegheny River (other counties); Beaver River; Monongahela River; Ohio River.* Photo: USFWS
Snuffbox 	*Epioblasma triquetra*	E	E	**Ohio Basin**: Allegheny River, Conneaut Outlet; Cussewago Creek; Dunkard Creek; French Creek; LeBoeuf Creek; Little Mahoning Creek; Muddy Creek; Shenango and Little Shenango River; West Branch French Creek.

[1] E = Endangered; T = Threatened

The table above is taken from the USFWS – Northeast Region, Pennsylvania Field Office website (September 26, 2017 Federal List). Cross checked with PNHP website - Mussel list updated October 2017 http://www.naturalheritage.state.pa.us/species.aspx (Ohio River Basin Species only), other references and recent survey results.

Project Due Diligence for All Mussel Species

Anytime a transportation project or maintenance activity could potentially affect a listed species, a review through the PNDI Environmental Review Tool should be undertaken. This tool can be accessed at http://www.naturalheritage.state.pa.us/. The PNDI receipt will provide direction for pursuing additional coordination and consultation with the PFBC and USFWS. For species located in the Atlantic Slope (Delaware and Susquehanna River Drainages) direction on additional surveys, coordination and consultation will be indicated on the receipt. For projects that could potentially effect species in the Ohio Basin, the receipt will direct the applicant (for transportation projects) to consult under the programmatic biological opinion *Effects of the PennDOT Bridge Replacement and Maintenance Program on the Northern Riffleshell, Clubshell, Rayed Bean, Snuffbox, Sheepnose, and Rabbitsfoot Pearly mussels in the Ohio River Basin, Pennsylvania* (May 2016) (Publication 546 2019 Version References).

When surveys are indicated, in the PNDI receipt or by follow-up correspondence with PFBC or USFWS, for an Atlantic Slope species identified in **Table 1**, contact the PFBC first to determine whether they can assist in completing a survey or a pre-construction salvage. The same procedure should be pursued when a survey is requested for a species not listed in **Table 1**.

Consult BOPD-EPDS prior to pursuing surveys for species in the Ohio Basin that fall under the programmatic. The basic premise of the programmatic is one that negates the need for surveys in most stream and rivers. In lieu of performing surveys pursue the programmatic BMPs indicated for the Management Unit of your project location. BOPD-EPDS has developed GIS mapping of the management units for reference.

Threatened and Endangered Mussel Species in the Ohio River Basin – Programmatic

There are six federally listed Freshwater Pearly mussels in the Ohio River Basin: the northern riffleshell (*Epioblasma torulosa rangiana*), clubshell (*Pleurobema clava*), rayed bean (*Villosa fabalis*), snuffbox (*Epioblasma triquetra*), sheepnose (*Plethobasus cyphyus*), and rabbitsfoot (*Quadrula cylindrica cylindrica*). The PFBC has listed three species in the Ohio drainage. The salamander mussel (*Simpsonaias ambigua*) that was thought to exist only in Navigational Pool 5, 6 and 8 of the Allegheny River (BO of the PFBC, 2014), but has recently been found in the Cussewago Creek. The round hickorynut (*Obovaria subrotunda*) and pistolgrip (*Quadrula verrucosa*) are two additional, state listed only, species within the Ohio Drainage. These two species have only been found recently in the Shenango River between the Pymatuning Reservoir and Shenango River Lake (Nelson and Villella, 2010). The USFWS Programmatic Biological Opinion (PBO) for Effects of the PennDOT Bridge Replacement and Maintenance Program on the Northern Riffleshell, Clubshell, Rayed Bean, Snuffbox, Sheepnose, and Rabbitsfoot Pearly mussels in the Ohio River Basin, Pennsylvania (May 2016) and a similar PFBC biological opinion, apply to Districts 1-0, 10-0, 11-0, 12-0, and minor geographic portions of Districts 2-0 and 9-0[8].

Recognizing repetition in the effects of bridge projects on freshwater mussel species and the application of similar conservation measures to minimize these effects, PennDOT and the USFWS determined that a programmatic consultation could result in a more streamlined and predictable Section 7 consultation process for bridge and emergency projects. The PBO addresses the effects of PennDOT's Bridge Program,

[8] As of the date of this writing, no threatened or endangered mussel species have been found in District 9-0, however, it is in part within the Ohio Basin.

disaster response and emergency projects. Project types applicable under the programmatic include bridge replacement, removal, rehabilitation, preservation, restoration, highway resurfacing and other projects that could have structure add-ons, and emergency actions. Major transportation projects on new alignments involving river crossings and projects affecting mussel populations with significantly high densities (well above the average density of a MU1 stream/river segment as defined within the programmatic) are excluded from the programmatic and individual consultations must be pursued in these cases. The projects considered in the PBO are those funded, permitted, or generally supported[9] by the FHWA, the USACE Pittsburgh District, and FEMA in the Ohio River basin in the range of these listed mussel species, including maintenance activities. These projects will result in varying levels of temporary and permanent impacts to aquatic habitat and may adversely affect listed freshwater mussels. Always contact EPDS to obtain the most recent updates to this programmatic consultation before proceeding.

Programmatic Consultation Overview:

The programmatic consultation for listed mussel species involves a two-tiered approach: Tier 1 consists of the programmatic consultation on the overall bridge program (mentioned above), while Tier 2 involves streamlined consultations on individual projects carried out under the program. The Tier I consultation requires the submission of streamlined Tier 2 BAs to address project specific details. A Tier 2 BA Template has been developed and should be utilized for these submissions until an online IPaC Effect Determination Key (in development) for this species is developed and implemented by reference on PNDI receipts. The USFWS review period and issuance of project-specific opinions and incidental take statements for these projects are streamlined from 135 days to a 60-day period in most cases.

To ensure the protection of the federally listed mussels, PennDOT developed programmatic conservation measures that are required to be incorporated into bridge projects within the Ohio River Basin that are pursued under the programmatic consultation. The required conservation measures are integrated in checklist form in the Tier 2 BA Template to assure implementation. Conservation measures required for bridge projects within the Ohio River Basin vary based on predefined geographic management units (MUs).

> **NOTE**: For Tier II BAs prepared under the *PBO for Effects of the Pennsylvania Department of Transportation Bridge Replacement and Maintenance Program on the Northern Riffleshell, Clubshell, Rayed bean, Snuffbox, Sheepnose, and Rabbitsfoot Pearly mussels in the Ohio River Basin, Pennsylvania*, use the modified/streamlined FHWA BA Template found at PennDOT/FHWA BA Template for Mussels. Once an IPaC Determination Key is implemented for these taxa, use of the Tier II submission form will be phased out.

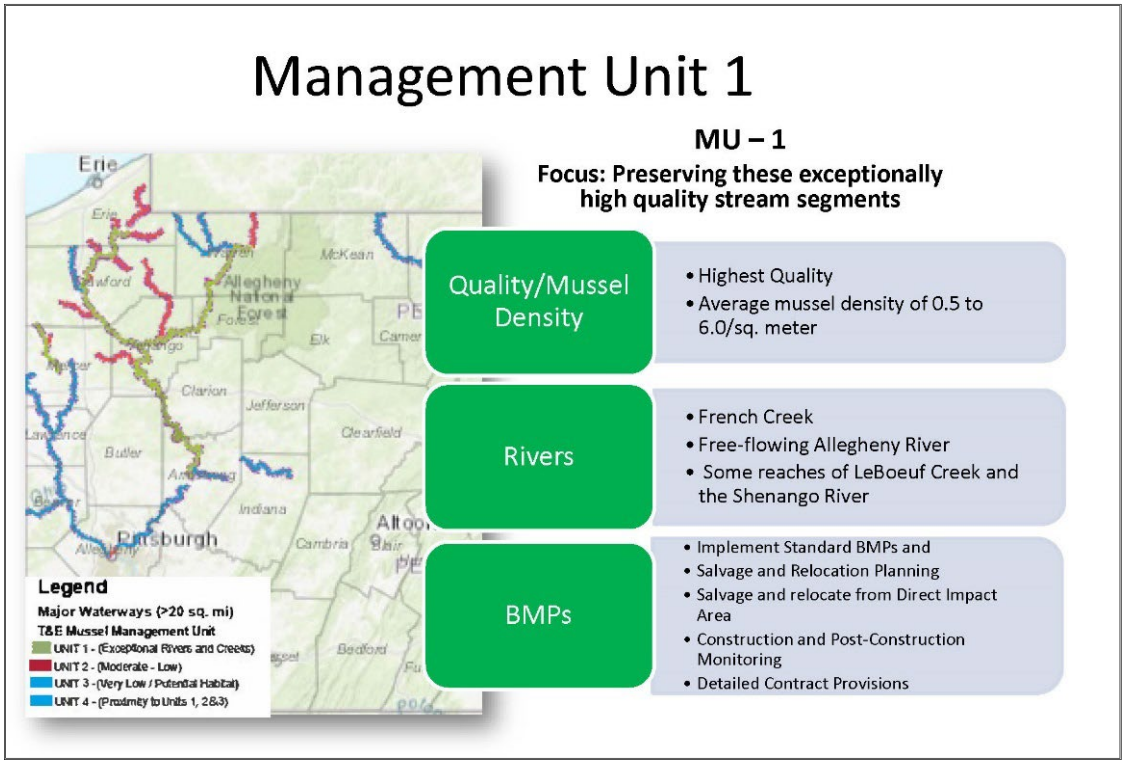
MUs as used in the programmatic consultation refer to a qualitative grouping of mussel habitat drainage areas which, based on a review of available documentation (population surveys, BOs, water quality and sediment monitoring studies, published literature, etc.), share similar characteristics and site conditions

[9] A federal nexus is required for Section 7 consultations. The federal nexus is any action of the federal agency (FHWA) and includes not only federal funding and permitting but all design criteria, guidance, point of access approvals. In other words, in some manner, FHWA, has some federal action involved on almost every roadway managed by PennDOT in the Commonwealth.

resulting in a relatively predictable range of mussel population density. The classification of rivers and streams is updated as additional survey data is obtained. EPDS maintains updated mapping of the MUs in the PennShare GIS platform. EPDS must be contacted for access to this mapping. A different range of measures for avoidance, minimization, conservation, and recovery is applied in each of five major MUs. Location maps identifying the MUs are provided as Figures 1 through 4, and a summary of applicable conservation measures for each MU is provided in **Table 2**. The MUs are described as follows:

MU-1 - This MU represents some of the highest quality streams in Pennsylvania, including French Creek and the middle, free-flowing section of the Allegheny River. Numerous mussel surveys have been completed in this MU and, based on a compilation of available surveys, the average Threatened & Endangered (T&E) mussel species population density is ≥ 0.5 per square meter (EnviroScience, 2007), the highest in the Ohio River Basin System in Pennsylvania. Due to the well-documented reference studies in this MU, the presence of high densities of T&E mussels is acknowledged without need for additional surveying, and translocations of animals in directly impacted areas is a presumed commitment. Having the greatest mussel population densities, projects located in MU-1 will require the most extensive avoidance, minimization, and conservation measures to be applied. MU-1 streams and rivers are located only in Districts 1-0 and 10-0.

Figure 1 – Management Unit-1 Location Map and Summary

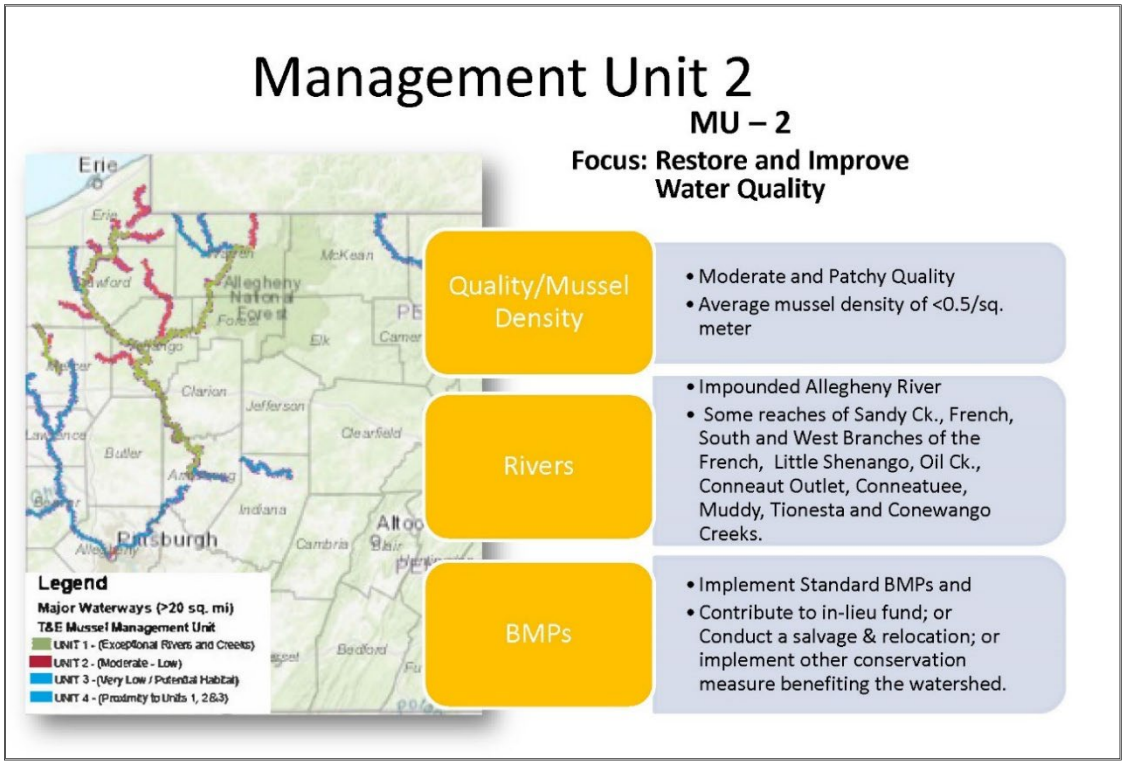


Note: Mussel surveys are performed on a continuing basis resulting in updates to the list of MU streams. These map snapshots should not be assumed to be the most up to date information. Contact the EPDS to obtain the most recent updates to the list of MU streams.

MU-2 - The average T&E mussel population densities in this MU are moderate to low, estimated at <0.5 per square meter. Thus, the presence of T&E mussels species is assumed but at lesser population densities. Conservation measure options in this MU include: improving water quality and mussel habitat utilizing an

ecosystem-wide improvements approach through the implementation of restoration activities (such as but not limited to riparian buffers, appropriate substrate restoration following pier removal, dam removals, stream restorations in upstream tributaries to reduce siltation to downstream MUs, etc.); conducting a mussel salvage and relocation; or use of an in-lieu fee program referred to as the Mussel Conservation Fund (Appendix 1). MU-2 streams and rivers are primarily located in Districts 1-0, 10-0, and 11-0.

Figure 2 – Management Unit-2 Location Map and Summary



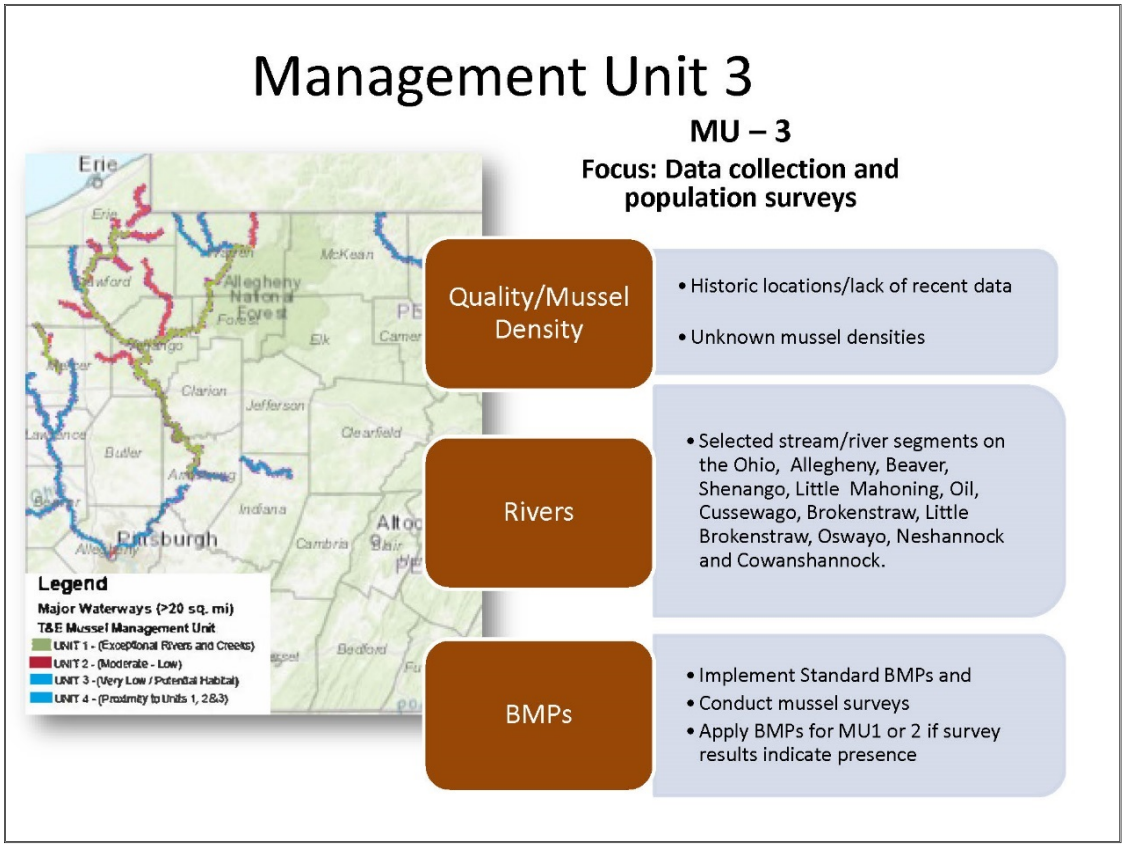
Note: Mussel surveys are performed on a continuing basis resulting in updates to the list of MU streams. These map snapshots should not be assumed to be the most up to date information. Contact the EPDS to obtain the most recent updates to the list of MU streams.

MU-3 - This unit includes the impounded segment of the Allegheny River from Ford City to upstream of the 40th Street Bridge in the City of Pittsburgh; reaches of the Allegheny River in McKean and Potter Counties, the Ohio and Beaver Rivers, the Shenango River from Shenango River Lake downstream to the Beaver River, Neshannock, Cowanshannock, Little Mahoning, Brokenstraw, Little Brokenstraw, Cussewago Creeks and other stream segments that are known to contain potential T&E mussel habitat, but lacking recent population survey information describing current mussel distributions. The limited survey information presently available suggests low probability but, unlike MU-1 and MU-2 which assume population presence based on known habitat quality or previous surveys, drainages within MU-3 lack sufficient or reliable data upon which to guide recovery planning or conservation efforts. Comprehensive surveys of many these MU-3 streams are being conducted through EPDS. Verify with EPDS prior to conducting any surveys.

If there is no recent survey data, population surveys are required for projects involving in-stream activities in this unit. Under this programmatic, typically, a minimum of a Phase 1 Endangered Species Survey is required for projects that "may affect" threatened or endangered mussels, although in some circumstances a verification

of lack of habitat, severely graded habitat and/or water quality may be accepted. USFWS mussel survey guidelines are available at https://www.fws.gov/northeast/pafo/endangered/surveys.html. The application of conservation measures will be based on the results of the survey, and if T&E mussel densities are found to correspond to the levels of MU-1 or MU-2, the stream section may be appropriately reclassified and the applicable conservation measures will reflect this new information. Conversely, surveys in this MU may reveal that these species are not present, resulting in a "No Effect" determination and no further need to consult. MU-3 streams and rivers are located only in Districts 1-0, 2-0, 10-0, 11-0, and 12-0.

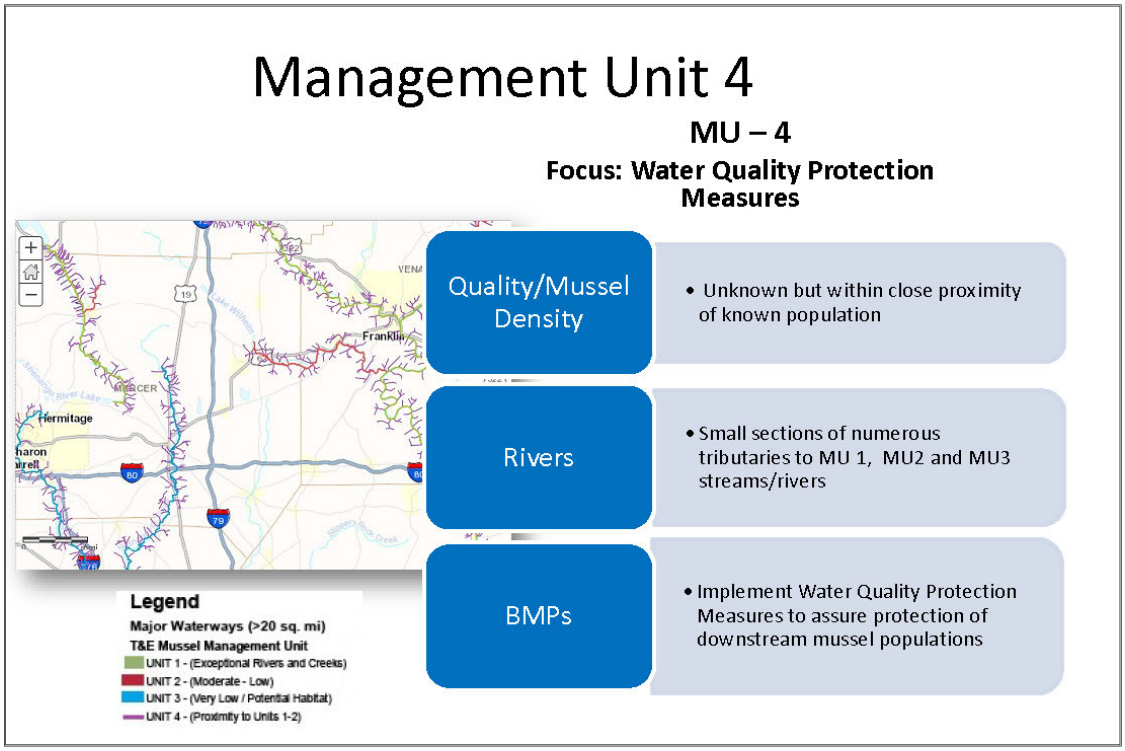
Figure 3 – Management Unit-3 Location Map and Summary



Note: Mussel surveys are performed on a continuing basis resulting in updates to the list of MU streams. These map snapshots should not be assumed to be the most up to date information. Contact the EPDS to obtain the most recent updates to the list of MU streams.

MU-4 - Includes all streams that confluence with and are located within a mile of other known T&E mussel population units (i.e., MU-1, MU-2 and MU-3). Stream reaches in MU-4 are considered not to support T&E mussel populations but are tributaries to known habitat areas. Projects in such areas may have downstream impacts but can typically be conducted in a manner that does not result in take of listed mussels. The implementation of MU-4 BMPs, consisting of rigorous erosion & sedimentation and pollution prevention measures are required in these locations. These BMPs must be included in the contract Special Provisions. Special Provisions should be clearly identified as T&E Mussel Avoidance and Minimization BMPs in the Project Development Checklist and the BMPs should be provided in a Notice to Contractor. Refer to Appendix 2 for Special Provision examples. With the application of the prescribed BMPs these projects are not likely to adversely affect T&E mussels. MU-4 streams and rivers are located only in Districts 1-0, 2-0, 10-0, 11-0 and 12-0.

Figure 4 – Management Unit-4 Location Map and Summary



Note: Mussel surveys are performed on a continuing basis resulting in updates to the list of MU streams. These map snapshots should not be assumed to be the most up to date information. Contact the EPDS to obtain the most recent updates to the list of MU streams.

MU-5 – Included in MU-5 are degraded, intermittent, or headwater streams within the Ohio River Watershed which do not support suitable habitat for T&E mussels. Projects in this MU will individually have no effect on the listed mussels considered in the programmatic consultation. Collectively, MU-5 projects are not likely to adversely affect listed mussels with conservation measures that include standard BMPs and Erosion and Sediment (E&S) controls used for in-stream locations to protect water quality and to control invasive species.

A summary of the most significant conservation measures by MU can be found in **Table 2. Projects that cannot be designed or carried out to conform to the protective programmatic conservation measures indicated will require individual Section 7 consultations.**

Table 2 – Summary of Programmatic Conservation Measures for T&E Mussels in the Ohio Basin

Conservation Measures	Applicable MUs				
	MU-1	MU-2	MU-3	MU-4	MU-5
E&S Measures	✓	✓	✓	✓	✓
Water Quality & Pollution Prevention ➢ Fuel, material, and waste containment, buffered from watercourses & inspected ➢ Minimize direct runoff from bridge decks	✓	✓	✓	✓	✓
Control of Invasive Species ➢ Cleaning & inspection of vehicles & equipment to address zebra mussel and other invasive or exotic species	✓	✓	✓	✓	✓
Minimizing Future Maintenance Impacts ➢ Utilization of materials that do not require maintenance such as sand-blasting and painting	✓	✓	✓	✓	✓
Minimizing Effects through Effective Communication ➢ Notify and instruct contractors on all environmental issues & commitments & conduct daily compliance inspections ➢ On-site inspection proficient in E&S, pollution prevention, and other bridge- & roadway-related environmental issues ➢ Post-construction monitoring for removal of construction debris for all projects involving in-stream work	✓	✓	✓	✓	✓
Geotechnical Borings ➢ Avoid stream impacts – drill through piers or utilize offsite borings	✓	✓	✓		
Minimize Footprint Area ➢ Minimize in-stream work areas ➢ Minimize use of rock fills and causeways	✓	✓	✓	✓	
Minimizing Negative Hydraulic Effects ➢ Minimize changes in river flows and reduce scour	✓	✓	✓	✓	
Placement of New Structures ➢ Limit in-stream work to one construction season ➢ Place work platforms and causeways in unsuitable habitat or lowest mussel densities ➢ Remove construction debris from streambed	✓	✓	✓	✓	

Conservation Measures	Applicable MUs				
	MU-1	MU-2	MU-3	MU-4	MU-5
Minimizing Effects of Bridge Removal ➢ Utilize alternatives to dropping structures in rivers ➢ Utilize deconstruct methods ➢ Utilize non-shattering methods ➢ Restore scoured areas with natural cobble & gravel ➢ Remove existing piers to below streambed level, unless such pier removal increases the take of mussels	✓	✓	✓	✓	
Minimizing Effects through Effective Communication ➢ Notify and instruct contractors on T&E presence and avoidance & minimization measures ➢ Include conditions related to T&E mussels in contracts ➢ Notification to the USFWS & PFBC in the event "take" may be exceeded ➢ Notification to the USFWS & PFBC of spill or sedimentation events that might result in increased take of T&E mussels	✓	✓	✓	✓	
Maintain Host Fish Populations if T&E Mussels are Present ➢ Fish habitat such as deep pools, riffles, and woody debris will be avoided or restored post-construction ➢ Emergent vegetation beds will be avoided or restored post-construction	✓	✓	✓	✓	
Mussel Salvage, Relocation, and Monitoring ➢ Minimize take of T&E mussels by salvaging and relocating to suitable habitat and/or an appropriate holding facility ➢ Prepare a mussel relocation and monitoring plan for all bridge projects ➢ Assess and report impacts to mussel communities and T&E mussels in direct and indirect effects areas ➢ Monitor (one monitoring event) direct effect area 3-5 years post-construction to assess recolonization ➢ Monitor (two monitoring events) relocation sites within 5 years post-construction to assess survival of relocated mussels	✓	*[10]			

[10] Optional in MU-2.

Conservation Measures	Applicable MUs				
	MU-1	MU-2	MU-3	MU-4	MU-5
Take Monitoring ➢ Take of T&E mussels will be monitored and reported based upon anticipated populations in the disturbance area (footprint)		✓			
Conduct Mussel Surveys[1] ➢ If results indicate presence of T&E mussels at densities ≥0.50/m^2, apply conservation measures as indicated for MU-1 ➢ If results indicate presence of T&E mussels at densities <0.50/m^2, apply conservation measures as indicated for MU-2 ➢ If results do not indicate presence of T&E mussels, apply conservation measures as indicated for MU-5			✓		
Apply Conservation Recovery Measures ➢ Apply measures that focus on improving water quality and mussel habitat utilizing an ecosystem-wide improvements approach through the implementation of restoration activities, OR ➢ Contribute to the Mussel Conservation Fund (Appendix 1).		✓			

[1] Freshwater mussel species have seasonal survey restrictions between *May 15 and September 30*.

The USFWS, the PFBC, and the EPDS monitor overall compliance and take under the PBO. Periodic review may result in adaptive management updates and/or reinitiation of the programmatic consultation. Updates are most likely to include:

- Addition of new listed T&E species;
- Modifications/improvements to BMPs based on effectiveness assessments;
- Modifications to the MU designations of certain stream reaches based on new survey information;
- Modifications to translocation protocols based on post-relocation monitoring or as new regional or national studies are completed;
- Additions, deletions, or modifications of projects included in the programmatic consultation; and
- Modification of estimated take.

An IPaC Assisted Determination Key is under development with the USFWS for future evaluations of site-specific transportation project(s) for inclusion in the mussel programmatic consultation. Contact the EPDS to obtain the most recent updates to this programmatic consultation.

MAINTENANCE ACTIVITIES

PennDOT PUBLICATION 113 Assembly Requirements

Note: The programmatic consultation with the USFWS requires the implementation of BMPs during the performance of maintenance activities (Publication 113). These programmatic conditions reduce risk and liability to PennDOT and its employees and contractors and allow for expedited endangered species reviews for both maintenance and planned projects. The following waterways are protected for mussel species in the Ohio River Basin.

Listed Mussel Waterways

District	County	Waterways
1-0	Crawford	French Creek, Shenango River, Conneaut Outlet, Oil Creek, Conneautee Creek, Muddy Creek, Cussewago Creek
	Erie	French Creek, LeBoeuf Creek, South Branch French Creek, West Branch French Creek, Brokenstraw Creek, Little Brokenstraw Creek
	Forest	Allegheny River, Tionesta Creek
	Mercer	French Creek, Shenango River, Sandy Creek, Little Shenango River, Neshannock Creek
	Venango	Allegheny River, French Creek, Sandy Creek, Oil Creek
	Warren	Allegheny River, Conewango Creek, Brokenstraw Creek, Little Brokenstraw Creek
2-0	McKean	Allegheny River, Oswayo Creek
	Potter	Allegheny River
10-0	Armstrong	Allegheny River, Cowanshannock Creek
	Butler	Allegheny River
	Clarion	Allegheny River
	Indiana	Little Mahoning Creek
11-0	Allegheny	Allegheny River, Ohio River
	Beaver	Ohio River
	Lawrence	Shenango River, Neshannock Creek
12-0	Westmoreland	Allegheny River

In Districts 1-0 (all counties), 2-0 (McKean and Potter only), 10-0 (all counties except Jefferson), 11-0 (all counties) or 12-0 (Westmoreland only), if the assembly will involve an in-stream activity and is proposed at or on a tributary within 1 mile of one of the "Listed Mussel Waterways" table above, this activity may effect state and federally threatened and endangered freshwater mussels protected by applicable laws and should coordinate with the District Environmental Manager. All operators, employees, and contractors working on assemblies in areas where these species may be present must be provided briefing materials (Publication 546D) prior to initiating the activity. A summary of the required avoidance and minimization measures (AMMs) is available as Publication 546D. Publication 546D should be reviewed during scheduled maintenance training, weekly planning meetings, and/or at the beginning of performing the transportation activity.

Assembly #	Assembly
621-2541-01 Through 621-2549-	FHWA Disaster Recovery (Federal Aid Routes)
663-2541-01 Through 663-2549-	FEMA Disaster Recovery (Non-Federal Routes)
711-7311-01	Drainage Cleaning, Inlets and Endwalls, Manual and Mechanized
711-7311-02	Drainage Cleaning, Inlets and Endwalls – Clogged, Mechanized
711-7314-01	Drainage Cleaning, Pipes and Culverts, Mechanized
711-7321-01	Drainage, Replacement, Inlets – Endwalls
711-7321-02	Drainage, Repair Only, Inlets – Endwalls, Manual
711-7324-01	Drainage, Replacement/Installation, Pipes/Culverts under 36” Diameter, Mechanized
711-7324-02	Drainage, Replacement/Installation, Pipes/Culverts 36” Diameter and over, Mechanized
711-7324-04	Drainage, Replacement/Installation, Pipes Extension Only
711-7325-01	Repair or Replacement of Structures under 8’ in length
711-7326-01	Drainage, Pipes/Culverts, Repair
711-7332-01	Roadway Section Restoration, Gabions and Retaining Walls, Install/Repair
711-7333-01	Roadway Section Restoration, Repair Sink Holes/Slides
711-7425-01 thru 711-7460-01	Bridge Maintenance Cost Functions refer to Pub 55
711-7425-01	Pub 55: Repair or Replacement of Bridge Over 8’ in length
711-7431-02	Pub 55: Clean/Flush Bearing/Bearing Seat, Steel Horizontal Surfaces (if scaffolding placed on stream bottom is utilized)
711-7435-02	Pub 55: Steel Bearings (Replace), Expansion Bearings (Reset) (if temporary bents or other supports placed on the streambed are utilized)
711-7435-03	Pub 55: Bearing Pedestal/Seats (Reconstruct) (if temporary bents or other supports placed on the streambed are utilized)
711-7446-01	Pub 55: Timber Stringers (Repair/Replace), Other Timber Members (Repair/Replace), Steel Stringer (Repair/Replace), Steel Floor beam (Repair/Replace), Steel Girder (Repair), Steel Diaphragm/Lateral Bracing (Repair/Replace), Reinforced/Prestressed Concrete Stringer (Repair/Replace), (if temporary bents or other supports placed on the streambed are utilized)
711-7447-01	Pub 55: Steel Truss Member (Strengthen/Repair/Replace), (if temporary bents or other supports placed on the streambed are utilized)
711-7448-01	Pub 55: Abutment Backwalls (Repair/Replace)
711-7448-02	Pub 55: Abutments (Repair), Abutments Wingwalls (Repair/Replace), Piers
711-7448-03	Pub 55: Footing (Underpin)
711-7448-04 or 711-7450-01	Pub 55: Masonry (Repoint)
711-7451-01	Pub 55: Abutment Slopewall (Repair/Replace) or (Construct New)
711-7452-01	Pub 55: Culvert Headwall/Wings (Repair/Replace), Culvert Apron/Cutoff Wall (repair/Replace), Culvert Barrel (Repair)
711-7453-01	Pub 55: Streambed Paving (Repair/Construct), Paving Metal Bottom Pipes, Arches and Culverts, Rock Protection, Stream Deflector (Repair/Construct)
711-7453-01 or 02	Pub 55: Scour Hole
711-7453-03	Pub 55: Vegetation/Debris (Remove), Deposition (Remove)
711-7454-01	Pub 55: Construct Temporary Support Bent, Construct Temporary Pipes, Construct Temporary Bridge

APPENDIX 1

Interagency Agreement Between Commonwealth of Pennsylvania, Department of Transportation (PennDOT) and Commonwealth of Pennsylvania, Fish and Boat Commission (PFBC) for a Statewide Mussel Conservation Fund (2013)

Agreement No. 405002
Federal Id. No. 25-1898690

Interagency Agreement

Between
Commonwealth of Pennsylvania, Department of Transportation (PennDOT)
And
Commonwealth of Pennsylvania, Fish and Boat Commission (PFBC)
For
A Statewide Mussel Conservation Fund

This Interagency Agreement ("IA") is entered into this 19th day of November, 2013, by and between the Department of Transportation ("PennDOT") and the Fish and Boat Commission ("PFBC"), both agencies of the Commonwealth of Pennsylvania. PFBC and PennDOT are collectively referred to as "the Parties."

WHEREAS, the PFBC has entered into an agreement with the U.S. Fish and Wildlife Service (USFWS) on February 13, 2013 for the purpose of establishing and operating a Mussel Conservation Fund (MCF) that functions in conjunction with the USFWS consultation and permitting activities under Sections 7 and 10 of the Endangered Species Act and PFBC coordination and permitting activities under the Pennsylvania Fish and Boat Code; and,

WHEREAS, under that agreement, which is incorporated herein by reference, the MCF is administered by PFBC; and,

WHEREAS, pursuant to sections 321 and 2101 of the Pennsylvania Fish and Boat Code 30 Pa. C.S.A., §§ 321 and 2101, PFBC has jurisdiction over the protection, propagation and distribution of fish, including fin fish, reptiles, amphibians and aquatic invertebrates within the Commonwealth of Pennsylvania; and,

WHEREAS, under section 2305 of the Fish and Boat Code, 30 Pa. C.S.A. §2305, and PFBC's regulations at 58 Pa. Code Chapter 75, PFBC is authorized to issue special permits for the taking, catching, killing and possession of state threatened or endangered species under its jurisdiction when such taking is necessary and appropriate in the interests of public health and safety or in the best interest for the protection, conservation and management of the species; and,

WHEREAS, PFBC reviews applications for said permits which requires that PFBC have an adequate understanding of the effectiveness of conservation actions undertaken by applicants to mitigate the taking of the species; and,

WHEREAS, PennDOT, in pursuit of its mission to provide an improved and safe transportation system for the citizens of the Commonwealth, is required to consider the effects of its projects on federally- and state-listed threatened or endangered species pursuant to the National Environmental Policy Act of 1969, 42 U.S.C. § 4321 et seq. as amended, the Clean Water Act of 1977, 33 U.S.C. §

1251 et seq., as amended, the Endangered Species Act of 1973, 16 U.S.C. §§ 1531-1544 as amended, the Pennsylvania Clean Streams Law, 35 P.S. §§ 691.1 et seq., as amended, and the Pennsylvania Fish and Boat Code, 30 Pa. C.S.A. § 101 et seq.; and,

WHEREAS, PennDOT projects may result in the taking of state and/or federally listed threatened and endangered species of freshwater mussels protected by the Endangered Species Act of 1973, 16 U.S.C. §§ 1531-1544, as amended, and the Pennsylvania Fish and Boat Code, 30 Pa. C.S.A. § 101 et seq.; and,

WHEREAS, pursuant to Section 2001(a)(6) of the Administrative Code of 1929, 71 P.S. § 512(a)(6), PennDOT has the duty to coordinate its transportation activities with other public agencies, commissions, and authorities including PFBC; and,

WHEREAS, Section 501 and 502 of the Administrative Code of 1929 (71 P.S. §§ 181 &182) require Commonwealth departments and agencies to coordinate their work and activities with other Commonwealth departments and activities; and,

WHEREAS, pursuant to 30 Pa. C.S.A., § 328, PFBC may enter into Cooperative Agreements with any government agency to further the programs of PFBC; and,

WHEREAS, the Federal Highway Administration (FHWA), USFWS, PennDOT, and PFBC have pursued a programmatic consultation to address the unavoidable taking of state and/or federally listed threatened and endangered species of freshwater mussels as a result of bridge replacement and other projects in the Ohio Drainage in Pennsylvania, which incorporates the implementation of a MCF as a mitigation measure; and,

WHEREAS, utilizing a contribution system to the MCF will provide the ability for mitigation funds to be directed to efforts having increased species recovery benefits and will streamline PennDOT and PFBC consultation resulting in reduced staff time and costs used to process the projects towards construction.

NOW, THEREFORE, for and in consideration of the foregoing premises and of the mutual promises set forth below, the parties agree, with the intention of being legally bound, to the following conditions:

I. RECITALS

a. The recitals set forth above are incorporated by reference as a material part of this IA.

II. INTRODUCTION

a. Purpose – The purpose of this IA is as follows:

i. Establish an instrument to facilitate the interdepartmental transfer of funds from PennDOT to PFBC for the maintenance of the MCF, a dedicated source of funding administered by PFBC that provides adequate offset of direct, indirect

and cumulative adverse effects on state and federally listed mussels and results in tangible conservation and recovery benefits for these species.

b. Goals – The goals of this IA are as follows:

i. To implement a predictable means of mitigation that will provide for the conservation and recovery of listed threatened and endangered mussel species with the ultimate goal of delisting.

ii. To streamline PFBC special permit process for the taking of threatened and endangered freshwater mussels resulting in reduced PennDOT and PFBC staff time and costs to process the projects toward final design and construction.

iii. To establish PennDOT as a contributor to the MCF and as such subject to the terms of the *Agreement between the U.S. Fish and Wildlife Service and Pennsylvania Fish and Boat Commission to Establish and Operate a Mussel Conservation Fund*, as executed on the 13th day of February, 2013.

III. TERMS AND CONDITIONS

1. PFBC will establish and administer the MCF and place all funds transferred in accordance with this IA and the aforementioned agreement between PFBC and USFWS, in a discrete account established exclusively for the purpose of funding conservation projects for the benefit of threatened and endangered freshwater mussel species

2. The MCF may be applied as mitigation of take of all threatened or endangered freshwater mussels within the Commonwealth of Pennsylvania.

3. The Parties agree that for projects resulting in the take of freshwater mussel species that are listed as threatened or endangered by the Commonwealth or the United States, PennDOT will contribute to the MCF according to the current Calculation Sheet as established by that fund and the Mussel Contribution Acceptance Form set forth at Appendix A.

4. The Parties agree that for projects resulting in the take of freshwater mussel species that are listed as threatened or endangered, PennDOT will contribute according to the fee schedule established for listed species in the Mussel Contribution Acceptance Form (Appendix A). PFBC must provide its signature concurrence of the contribution as an acceptable measure for the offset of take or mitigation, as required under Pennsylvania Fish and Boat Code and supporting regulations, prior to the transfer of funds. Should the amount of direct effect area (defined as the area where the streambed disturbance is directly impacted) increase due to changes in the project after payment has been made to the MCF, PennDOT shall pay additional monies equal to the cost per square meter established in the current Calculation Sheet for the difference in area after PFBC issues an invoice for said amount. Conversely, should

the amount of direct effect area decrease due to changes in the project after payment has been made to the fund, a credit in that amount will be applied to future PennDOT projects equal to the cost per square meter established in the current Calculation Sheet.

5. The Parties agree that if PennDOT funds the salvage and relocation or refugia measures on any PennDOT project with state or federal listed threatened or endangered freshwater mussel species located within the project area, a contribution to the MCF will not be required for any incidental takes of the state listed species. The salvage and relocation or refugia measures will serve as the mitigation required under the Pennsylvania Fish and Boat Code and supporting regulations.

6. For projects located in close proximity (approximately one river mile) of known habitat of state and/or federally listed mussel species, which are anticipated to result in in-stream substrate disturbance, but do not result in take of state or federally listed mussels, PennDOT may contribute a flat rate of $10,000 per project in lieu of other conservation measures designed to provide benefit to mussel populations as identified in PFBC project coordination correspondence or within any programmatic agreement (e.g. Management Unit 4 requirements within the programmatic agreement for the Ohio Drainage of Pennsylvania).

7. PennDOT and PFBC will execute a Mussel Contribution Acceptance Form (Appendix A) for each project-specific contribution or change in direct affect area.

8. Following the execution of the Mussel Contribution Acceptance Form (Appendix A), PFBC will enact a cost allocation payment in accordance with current procedures of the Office of the Budget by submitting a general invoice for the agreed upon amount to the Engineering District identified on said Form.

9. Monies from the MCF may be used only for projects that support the conservation and recovery of state or federally-listed freshwater mussel species in accordance with the goals established in *Agreement between the U.S. Fish and Wildlife Service and Pennsylvania Fish and Boat Commission to Establish and Operate a Mussel Conservation Fund* (February 13, 2013), with the ultimate goal of delisting from endangered or threatened species status.

10. PFBC will provide PennDOT a copy of any proposed action (e.g., Requests for Proposals, Scopes of Work) that have been identified through the implementation of the MCF and provide PennDOT an opportunity to offer comment.

11. For all actions funded with MCF monies, PFBC will provide final reports to PennDOT.

12. A tracking spreadsheet detailing MCF deposits, disbursements, and investment income will be provided to PennDOT annually.

13. The Pennsylvania Right-to-Know Law, 65 P.S. §§ 67.101—3104, applies to this Agreement. Therefore, this Agreement is subject to, and the Parties shall comply with the Right–to-Know Law.

IV. RATIFICATION, MODIFICATION AND TERMINATION OF THIS AGREEMENT

1. The initial term of this IA shall run from its effective date through June 30, 2014, and will renew automatically for successive one-year periods, on the first date of the Commonwealth fiscal year, unless terminated sooner or until all duties and obligations are fulfilled by the Parties.

2. Either party may terminate its participation in this IA upon written notice to the other party. Termination does not excuse any payment obligation accruing under this IA, which shall survive termination.

3. In the event of a dispute, controversy or claim arising out of or relating to this Agreement, or the breach, termination or invalidity thereof (a "dispute"), the Parties will use their best efforts to settle promptly such dispute through direct negotiation. Any dispute that is not settled within sixty (60) days from the date either party has notified the other party of the nature of the dispute and of the measures that should be taken to rectify it will be resolved through consultation between PFBC's Executive Director and PennDOT's Secretary or designees of such officials. The decision of PFBC's Executive Director and PennDOT's Secretary, or their designees, will be final and binding on both parties. Even though there may be a dispute, the Parties will each continue to perform its obligations under this Agreement.

4. Any programmatic changes, corrections or additions to this IA shall be in the form of a letter describing the change, with signature lines on which each party signs and endorses the change(s). The terminology and provisions of such correspondence must be reviewed and executed by each of the Parties' Office of Chief Counsel and fiscal representatives.

5. In the event either present or future Commonwealth or federal law or regulations render performance under this IA illegal, void or impossible, this IA shall terminate automatically.

6. The Parties will communicate with each other to resolve any problems that might arise under this IA. The following are identified as points of contacts for this IA:

As to PFBC: *Chief, Environmental Services Division*
450 Robinson Lane
Bellefonte, PA 16823

As to PennDOT: *Chief, Environmental Policy and Development Section*
400 North Street, 7th Floor
Keystone Commonwealth Building
Harrisburg, PA 17105-3161

7. In the event that there is a conflict between the terms of this IA and the terms of the *Agreement between the U.S. Fish and Wildlife Service and Pennsylvania Fish and Boat Commission to Establish and Operate a Mussel Conservation Fund* (February 13, 2013), the terms of the latter will govern.

8. This IA will not be effective until it has been executed by all necessary Commonwealth officials as required by law. Following full execution, PennDOT will insert the effective date on Page 1.

9. Upon execution, this IA, together with all exhibits and attachments annexed to it, constitutes the entire agreement between the Parties and completely expresses their intent. All prior or contemporaneous agreements are merged into this document. No amendment or modification of this IA shall be valid unless it is in writing and duly executed and approved by the Parties.

10. This Agreement may be executed in counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

THE PARTIES HEREBY ACKNOWLEDGE the foregoing as the terms and conditions of their agreement.

DEPARTMENT OF TRANSPORTATION

Scott Christ 9/11/13
Deputy Secretary DATE

Approved as to Form and Legality:

BJS 9/5/13 Michael Elliott
Chief Counsel, PennDOT DATE 9/12/2013

PENNSYLVANIA FISH AND BOAT COMMISSION

17 Oct 2013
Executive Director DATE

Approved as to Form and Legality:

Laurie E Stephen 10/16/13
Chief Counsel, PFBC DATE

COMPTROLLER OPERATIONS:

I hereby certify that funds are available to fund DOT's obligations under Account Code:

Richard C. Lepley II 11/19/13
Comptroller Operations DATE

Approved as to Form and Legality

OFFICE OF GENERAL COUNSEL

10/30/13
Deputy General Counsel DATE

Approved as to Form and Legality

OFFICE OF ATTORNEY GENERAL

11/12/13
Deputy Attorney General DATE

RECEIVED
NOV 14 2013

Appendix A
Pennsylvania Mussel Conservation Fund
Contribution Acceptance Form[1]

Project Name:	Date:
County, SR and Sec:	Engineering District:
Contact Person:	MPMS #:
Phone: ( ) -	Email:

TYPE OF SUBMISSION:

☐ New Project Request (section "A" only) ☐ Modification Request (section "B" only)

☐ Attach an 8½ x 11 sketch plan showing the limits of direct effect area for the project.

SECTION A[2]

The above mentioned project results in unavoidable take of:

☐ State and Federally listed threatened or endangered freshwater mussels within the Ohio River Drainage. Mussel Conservation Fund deposit is required at the following rate:

_____m² of direct effect area X $100.00 = $_____

☐ State and Federally listed threatened or endangered freshwater mussels within drainages other than the Ohio. Mussel Conservation Fund deposit is required at the following rate:[3]

_____m² of direct effect area X $_____ = $_____

☐ Does not result in take of either state or federally listed freshwater mussels but is in proximity of known habitat and anticipated to result in in-stream substrate disturbance. The Mussel Conservation Fund contribution for this project is $10,000.00.

SECTION B

☐ The above listed project has an **INCREASE** in Direct Effect Area

☐ The above listed project has a **DECREASE** in Direct Effect Area

Original _____ m² **New _____ m²** **Difference_____**

Difference_____ X $100.00 = $_____

SIGNATURES

By signing this form the PFBC is in agreement that the above contribution is acceptable for offsetting take or mitigating for the unavoidable losses to listed freshwater mussel species *as required under* Pennsylvania Fish and Boat Code 30 Pa. C.S.A., §§ 2102 and 2305, *and supporting regulations,* prior to the transfer of funds.. **(PFBC should return this form with a cost allocation invoice for the amount of the contribution)**

Commonwealth of Pennsylvania
Fish and Boat Commission

_____
Signature Date

_____
Printed Name

_____
Title

PFBC USE ONLY

☐ Provide an invoice in the amount of $_____ ☐ Request a cost allocation invoice in the amount of $_____

☐ Provide a credit receipt in the amount of $_____

[1] Submission is recommended during final design/permitting to assure the accuracy of the m2 of the direct effect area

[2] Attach a completed Calculation Sheet (obtain most current version from the PFBC) – see SAMPLE

[3] As determined through project coordination

APPENDIX 2

Examples of a Project Development Checklist Referencing T&E Mussel Avoidance and Minimization BMPS, and a Notice to Contractor

From: Wolfgong, Christopher R
To: Zawisa, Amanda
Subject: FW:
Date: Thursday, April 27, 2017 10:17:56 AM

We've been adding the list of BMP's to the Project Development Checklist along with the BA and BO for reference.

Chris

Christopher R. Wolfgong | Environmental Planner II
PA Department of Transportation | Engineering District 1-0
255 Elm Street, PO Box 398 | Oil City, PA 16301
Phone: 814.678.7009 | Fax: 814.678.7030
www.penndot.gov

From: Rickard, Marc C
Sent: Thursday, April 27, 2017 10:16 AM
To: Wolfgong, Christopher R <cwolfgong@pa.gov>
Subject:

Back Go Help

PROJECT DEVELOPMENT CHECKLIST

Project: 97925 GO | Standard / PENNDOT Oversight Non-NHS | Pre-Construction (Post-Award)

Short Description: PA 426: PA 27 - Old PA Rt 77
County: Warren
District: 01
SR: 426
Group ID: ---
Org Code: 0160
Section: 02M
Municipality: SPRING CREEK

Checklist Items View: Current GO

Filter Action GO

Records 1 to 43 of 43 Page 1 of 1 Records Per Page: 250

Category	Title	Modified	BP Ind	Completed	Contract	DocLink	Addendum	Action
Project-Specific Checklist Items	Project Specific - Commonwealth Public Works Employment Verification Form	02/14/2017	Yes	Yes	Yes			
	Project Specific - Threatened and Endangered Mussel Avoidance and Minimization Measures	02/14/2017	Yes	Yes	Yes			
	Project Specific - Biological Opinion - US. Fish & Wildlife Service	02/14/2017	Yes	Yes	Yes			
Reviews	Constructability Review	01/31/2017	No	Yes				
	Design Field View - Final	01/30/2017	No	Yes				
	DM3 Plan Review Report	01/30/2017	No	Yes				
	Engineering and Environmental Scoping Field View	01/30/2017	No	Yes				
	Non-Standard Special Provision Worksheet	02/13/2017	No	Yes				
	PS&E Certification List - Project Mngr and Contract Mngmnt	02/13/2017	No	Yes				
	Safety Review	01/30/2017	No	Yes				
Contract Award Items	Disclosure of Lobbying Activities	02/09/2017	Yes	Yes	Yes			
	F.A.R. Req Contract Provisions Federal-Aid Constr. Contracts	01/31/2017	Yes	Yes	Yes			
	Federal Wage Rate - 3/3/2017	03/10/2017	Yes	Yes	Yes		1	Modified
	Trainee Worksheet	02/13/2017	No	Yes				
Local Agreements and Coordination	Notification to Local Municipality - Spring Creek Township	01/30/2017	No	Yes				
	Notification to Local Municipality - Pittsfield Township	01/30/2017	No	Yes				
Environmental Clearances	Environmental Clearance Eval. (CEES link)	02/03/2017	No	Yes				
	Environmental Clearance Scoping (CEES link)	12/02/2016	No	Yes				
	ECMTS Report (Matrix)	02/13/2017	Yes	Yes	Yes			
	ECMTS Signature Page	02/13/2017	Yes	Yes	Yes			
Permits	Environmental Due Diligence (EDD) - Contractor	01/30/2017	Yes	Yes	Yes			
	Environmental Due Diligence (EDD) - PennDOT	01/31/2017	Yes	Yes	Yes			

Marc Rickard | Environmental Planner
PA Department of Transportation | Engineering District 1-0
255 Elm Street | Oil City, PA 16301
Phone: 814.678.7008 | Fax: 814.678.7030
www.penndot.gov

Freedom Road Upgrade Project (ECMS# 82615)

Notice to Contractor

Crows Run has been identified as being a Federal / State Listed Mussel Management Unit 4 (MU-4) stream. MU-4 includes all stream reaches within 1 River Mile of the confluence with an MU-3 stream (Ohio River). As such, water quality protective measures which provide benefits to downstream mussel population habitats have been developed and are to be implemented during construction. The following BMP's are to be implemented on Crows Run (MU-4) stream and tributaries during the project:

- Before any earth disturbance activities begin, install temporary silt fencing downslope of the affected area
- Inspect equipment and vehicles daily to prevent possible toxic chemicals leaking into the stream
- Clean and inspect equipment and vehicles to address zebra mussel and other invasive or exotic species (specifically equipment coming from other projects/locations)
- Minimize sedimentation impacts by strict adherence to E & S control plan and by regular daily inspections and maintenance of all E & S measures immediately after all runoff events storms.
- Delineate clearly in the field direct and indirect impact areas to ensure that only planned activities occur in each area.
- Notification and instruction for the contractor regarding the possible presence of endangered species and proper implementation of avoidance and minimization measures.
- Contractor will complete daily monitoring checklist to assure compliance
- Remove all waste material from the project area to an approved site outside the floodplain in an upland area (no wetland impacts).
- PENNDOT inspection personnel (proficient in E&S, pollution prevention and other bridge and roadway related environmental issues) will conduct compliance inspections, including a post-construction monitoring assessment.
- Seed and mulch all affected areas within 7 days of completion of construction activities using rapid seed and mulch and where necessary supplement with additional topsoil and/or erosion control matting.
- Transfer of fuel and vehicle maintenance will occur within a containment site with adequate buffering (berms, vegetation, etc.) from receiving waters
- Staging areas for construction vehicles and equipment will be on appropriate work pads located at least 150 feet away from receiving waters
- All potential toxic substances such as fuels, paints, solvents, lubricants, etc. will be stored within a containment area with adequate buffering (berms, vegetation, distance, etc.) from streams
- Unpermitted discharges to waterways shall be reported to the PennDOT District Environmental Unit immediately upon discovery
- Remove loose debris and road surface material piles from the work site promptly to eliminate possible scattering by rain or wind
- Minimize effects of bridge removal by utilizing alternatives to dropping structures into stream, utilizing deconstruct methods, utilizing non-shatter methods and restoring scoured areas with natural cobble and gravel.
- At the preconstruction meeting the Environmental Unit will discuss the scope, specific E&S control measures, the presence of endangered species, and the proper implementation of avoidance and minimization measures to limit impacts to stream quality.

Peregrine Falcon

(*Falco peregrinus*)

Federal Protection under the Migratory Bird Treaty Act/ PA Threatened Species

History

Species Decline

- Primary reason for the decline was DDT pesticide and bio-accumulation
- DDT was banned in 1972 along with other bio-accumulating pesticides
- Peregrines were extirpated from PA and the eastern United States due to pesticides like DDT
- Airplane collisions and reflective/mirror glass on buildings also lead to mortality along with egg collecting and falconer take

Protections and Listings/Delisting

- The peregrine falcon was listed federally as an Endangered Species in 1972 and removed in August of 1999
- The peregrine falcon is federally protected from take and disturbance by The Migratory Bird Treaty Act
- The Pennsylvania status was upgraded to threatened in 2018 and remains protected under the Game and Wildlife Code – Title 34

Species Recovery in Pennsylvania

- Population has increased due the banning of DDT and limiting of take
- Reintroduciton jump started the recovery with captive birds
- Peregrine falcons are nesting mostly on manmade structures
- Statewide population has increased from 13 pairs in 2006 to more than 30 pairs in 2011
- In 2017 there were 50 known nests (of which 9 were located on cliffs and 41 on manmade structures), comparable to the pre-DDT total of 44 in PA. However, pre-DDT totals only included 1 nest located on a manmade structure and the remaining were on cliff faces.
- Surveys for new nest sites are ongoing

Identification Characteristics

- Female and males weigh between 1.2 - 2.5 pounds and have 36 to 44-inch wingspans
- Adults have dusky to bluish gray or brownish to blackish feathers on the back, with dark barring that contrasts against a throat of pure white to cream
- Dark band across face and dark head (helmet/sideburn appearance)
- Birds up to two years old, are dark brown (rather than gray) on their wings and back with vertical brown streaks against a pale chest

Pennsylvania Habitat

- Historically peregrine falcons nested on cliffs often with southern or western exposure
- Have reoccupied historic cliff nests sites recently
- Since the population collapse, most commonly found nesting on bridges and tall buildings within cities with southern or western exposure
    - The protection of urban nest sites and maintenance schedules that avoid disturbance during nesting and brooding periods have contributed to the delisting of the falcon
    - Nest on tops of concrete piers, within steel beams, gusset plates, or catwalks
- Prefer large open spaces with expansive views, inaccessible ledges
- From 2013 - 2018, nests were located in the following counties: Allegheny, Armstrong, Beaver, Berks, Bradford, Bucks, Clinton, Columbia, Dauphin, Delaware, Erie, Lancaster, Lehigh, Luzerne, Lycoming, Montgomery, Montour, Northampton, Northumberland, Philadelphia, Pike, Snyder, Union, and Wyoming, but have the potential to show up in any county.[11] Nest locations change annually; verify bridge nesting locations in your District annually with the environmental manager or bridge engineer.

Natural History

- Nesting season is primarily February 15th to July 31st, or until 30 days after the last nestling fledges, with all nesting activities finished by September 15.
- Feed exclusively on small to large birds by striking them in flight
- Do not typically build nests
- Nests at same site each year and mate for life or until one of the pair dies
- In a natural habitat eggs are laid in small depressions called “scrapes” on a high ledge or cliff
- In developed areas nest platforms and boxes are installed on bridges and buildings

Migration

- Adult peregrine falcons may remain in PA year-round but can migrate from their nesting territory during the winter for 2 – 3 months
- Young disperse throughout the Mid-Atlantic region and may return to natal areas

[11] It is important to verify the most current information with the PennDOT Environmental Manager or the PGC PennDOT funded position.

- In spring and fall, migrants from Arctic regions of the subspecies *Falco peregrinus tundrius* pass through the state en route to Latin American wintering grounds

Sources:

PGC – Bureau of Wildlife Habitat Management & Bureau of Wildlife Management. July 26, 2016. PGC Peregrine falcon (Falco peregrinus) – Environmental Review Guidance Document.

PGC – Peregrine Falcon
http://www.pgc.pa.gov/Wildlife/EndangeredandThreatened/Pages/PeregrineFalcon.aspx

Project Due Diligence and Management Practices

During peregrine falcon nesting season, the Pennsylvania Game Commission provides weekly updates on nesting and fledging activity on Pennsylvania bridges. This information is disseminated by e-mail to PennDOT Environmental Managers and Bridge Engineers. The PennDOT Districts should maintain awareness of the bridges being utilized by the species and avoid scheduling inspection activities, maintenance and programmed projects during peregrine falcon nesting season (February 15th through July 31st) on such bridges.

When human activity interferes with breeding and nesting, aggressive behavior can be displayed by peregrine falcons. Falcons swoop/dive near personnel and have inflicted personal injury. Restrictions are in place to protect both the falcons and humans. In PennDOT Districts where peregrine falcons nest, it is recommended that bridge inspections and other contracts contain a special provision identifying the risk and a seasonal restriction to minimize the risk. **For bridges on which peregrine falcons are known to nest, bridge activities should be conducted between September 15 and February 15, outside peregrine falcon nesting season to avoid impacting nesting falcons.**

Project Coordination

PNDI reviews are required for planned and programmed projects. For other activities for which PNDI reviews are not required, the most recent list of nest locations (please contact the District PennDOT Environmental Manager and/or Bridge Engineer) should be checked to determine if the bridge in question has nesting falcons. If the PNDI receipt and/or if the most recent list of nest locations identifies the project location as has having nesting peregrine falcons, proceed by coordinating with the PGC PennDOT funded position, Tracey Librandi Mumma. It is also recommended that the PGC *Peregrine Falcon (Falco peregrinus) Environmental Review Guidance Document*" (July 26, 2016) be reviewed (Appendix 1).

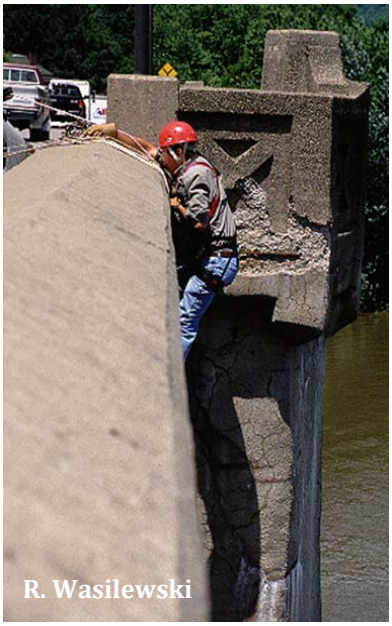
Coordination with the PGC PennDOT funded position must occur to resolve any PNDI hits for peregrine falcons as well prior to implementing any activities within 1000 feet of a peregrine falcon nest during the nesting season (February 15th through July 31st). The following information should be provided to the PGC PennDOT funded position so that a more accurate determination can be made regarding which, if any, activities can be conducted within 1000 feet of a peregrine falcon nest during nesting season:

- Map illustrating the location and extent of each activity being proposed within 1000' of the nest location.
- Narrative for each activity outlining:

- For work on the bridge, whether it is located above and/or below deck.
- Distance of each activity from the nest location.
- Equipment to be used to complete activity.
- Noise level associated with activity, especially for those activities for which noise will be above ambient noise levels.
- Construction timeline - general sequence and time duration of each activity.

- Any other relevant information such as the need for blasting, reasons why work needs to be within 1000' during nesting season, etc.

The PGC may request that one or more of the following management practices may be implemented:



- Restrict all activities within 300 feet, in all directions, of a nest location during nesting season (February 15th through July 31st).
- Restrict activities located between 300 and 1000 feet of the nest during nesting season (February 15th through July 31st) for which the PGC has determined are visible to falcons and/or that exceed ambient noise levels.
- Avoid aerial flyovers (planes, helicopters, drones, etc.) within 1,000 feet of the nest in all directions.
- With PGC approval, installation of barriers to visually separate the birds and workers during the nesting period may be used. Barricades and warning signs will need to be installed at access points to the protected zone and to higher locations visible from the nest to prevent workers from accidentally entering these areas. All screening, barricades, and warning signs must be in place before work begins and before the start of the nesting season (prior to February 15th). Removal shall not occur prior to the end of the nesting season (September 15).
- Schedule bridge inspections outside the nesting season (September 15st through February 14th). When bridge inspections cannot be scheduled outside these nesting dates, contact the PGC funded biologist to further coordinate least impactful dates.

Implementation of avoidance measures and management practices are to help ensure a successful falcon breeding season and to protect bridge inspectors, contractors and PennDOT employees working in the vicinity of the nests. The PGC determination, if impacts (during construction, maintenance, or inspections) are anticipated, provides project specific recommendations for avoiding and minimizing impacts to nesting falcons. Inquiries regarding potential peregrine falcon impacts should be addressed to the PGC PennDOT funded position, Tracey Librandi Mumma at tlibrandi@pa.gov or 717-787-4250 ext. 3614.

Unavoidable Disturbance

If project disturbance cannot be avoided (PGC requested avoidance and minimization measures cannot be implemented), coordination with the PGC and USFWS will likely be necessary to determine if and what permits may be necessary. Contact the Bureau of Project Delivery, Environmental Policy and Project Development Section for further guidance.


M. Bacon

Surveys

Peregrine Falcon breeding surveys do not provide presence/absence information, rather they may be useful in pinpointing or narrowing down the project action area to avoid nest failure if transportation activities must be conducted during the nesting and fledging season. See Appendix A of the "*PGC Peregrine Falcon* (*Falco peregrinus*) *Environmental Review Guidance Document*" for additional details.

Nest Boxes

PGC does not recommend the installation of nest boxes unless there has been a well-documented history of repeated nest failure. The installation of nest boxes, though a voluntary measure, should be done in coordination with the PGC following the standard nest box design and mounting plans found in Appendix B ("PGC Peregrine Falcon (*Falco peregrinus*) Environmental Review Guidance Document"). If a nest box is already present and must be removed to conduct project-related activities, the box must be removed between August 1st and February 14th to avoid impacts to the nesting pair. Boxes must to be placed back in their original positions prior to February 15th and filled with a 4" to 6" deep layer of fresh pea gravel (see Appendix B). PGC approval is necessary for the removal and replacement of nest boxes. Additionally, limited maintenance will be needed by the site owner to ensure that adequate amounts of gravel are present, and that the integrity of the box is maintained.

Sources: PGC – Bureau of Wildlife Habitat Management & Bureau of Wildlife Management. July 26, 2016. PGC Peregrine falcon (*Falco peregrinus*) – Environmental Review Guidance Document.

PGC Access

PGC requests that access be given to PGC staff to inspect nest sites and wherever feasible, evaluate the health of nestlings. The PGC acknowledges that access to nest locations may be cancelled or suspended due to unforeseen circumstances such as inclement weather, high winds or any other safety concerns.

APPENDIX 1

Pennsylvania Game Commission
Peregrine Falcon (*Falco peregrinus*)
Environmental Review
Guidance Document

Pennsylvania Game Commission
PEREGRINE FALCON
(*Falco peregrinus)*
ENVIRONMENTAL REVIEW GUIDANCE DOCUMENT

Photo: J. Kosack

Prepared By:

Pennsylvania Game Commission
Bureau of Wildlife Habitat Management
& Bureau of Wildlife Management

July 26, 2016

TABLE OF CONTENTS

PEREGRINE FALCON

This document provides information that can be used to identify peregrine falcon habitat, verify their presence on site, and explain how to manage the habitats that support the species. Coordination with the Pennsylvania Game Commission (PGC) should occur prior to conducting any survey. The methods prescribed in this document for surveys are the minimum effort required and if the methods are not followed as presented, the PGC may not accept the results.

STATUS

In 1972, peregrine falcons were listed as endangered by the U.S. Fish and Wildlife Service at which time the species no longer nested in the eastern United States. Following a significant effort to reestablish them, they were removed from the federal Endangered Species List in August 1999. However, the peregrine falcon remains a state-listed endangered species that is protected under the Game and Wildlife Code. All migratory birds are protected under the federal Migratory Bird Treaty Act of 1918. The PGC has jurisdiction over wild birds and mammals and is mandated by Title 34 (Game and Wildlife Code) to protect these species.

IDENTIFYING CHARACTERISTICS

The peregrine falcon is a medium to large-sized bird of prey with females typically weighing from 750 to 1,120 grams (1.6 to 2.5 lbs.), and males from 550 to 660 grams (1.2 to 1.4 lbs.). Wingspan ranges from 90 to 110 cm (36 to 44 inches), with males notably smaller than females. Both sexes are dusky to bluish gray or brownish to blackish on the back as adults, with dark barring and spotting that contrasts against a throat of pure white to cream (Pyle et. al. 2008). The species is best identified by a dark band across the face that merges with other dark areas on the head to form a distinct helmeted or “sideburned” appearance. In flight, peregrines display the distinctive falcon shape of pointed wings and narrow tail with quick and shallow wing-strokes (Peterson 1980).

Nestlings, approximately 16 days old.

Nestlings, approximately 30 days old.

Immature falcons, approximately 2 weeks after fledging.

Photo: J. Kosack

LIFE HISTORY

Peregrines require large open areas for hunting and high, inaccessible ledges, preferably with some type of overhang, for nesting purposes and protection from predation (Ratcliffe 1993). Historical records indicate resident adult peregrines appeared to spend much of the year in the vicinity of nest sites, vacating nesting territories for only a few months, if at all, in the middle of winter (Poole 1964; Brauning, Barber, and McMorris 2013).

Peregrines do not build nests, but lay their clutch in a shallow indentation in the ground. They have also been known to use stick nests built by other cliff-nesting species, most notably the common raven (*Corvus corax)*. Nests are typically placed on high, inaccessible locations, often near water. Nesting sites must be steep enough to afford the falcons protection from potential mammalian nest predators (Ratcliffe 1993). Cliffs or structures that are topographically varied with recesses and overhangs for shelter will provide more locations for the nest scrape. Nest sites must also have ledges large enough to accommodate the clutch and brood (Ratcliffe 1993).

Nesting locations on human structures, notably tall buildings and bridges, throughout the state are being occupied. Nests on bridges often are placed within enclosed steel beams accessible through holes of various sizes, on gusset plates or catwalks, or on the top of concrete piers. Typical locations on buildings are ledges and small rooftops with a southern or western exposure.

Photo: J. Kosack

Photo: M. Bacon

Photo: F. A. McMorris

Photo: R. Wasilewski

Peregrines feed nearly exclusively on live birds captured in flight. The majority of prey items range in size from 50 to 500 grams (.11 lbs. to 1.1 lbs.). However, the peregrine is clearly an opportunistic species, taking advantage of appropriately-sized prey species as they become locally available (Ratcliffe 1993).

The breeding cycle begins with attraction of a mate and pair bonding. Elaborate courtship may be observed at this time with aerobatic flights, exchange of food items from male to female and loud vocalizations. Characteristic courtship displays have been described and illustrated (Ratcliffe 1993). Peregrine falcon nesting season extends from February 15 to July 31st, or 30 days after the last nestling fledges. A peregrine generally nests at the same site each year and remains paired with the same mate until one member of the pair dies or is driven off, at which time the survivor attracts a new mate and continues to nest at the same site.

Clutches of three to five eggs are common, with each egg laid on alternate days. Incubation, which is usually initiated when the third egg is laid, lasts 31 to 35 days (Ratcliffe 1993). Both sexes share incubation. Hatching is roughly synchronous. Young begin moving around the nesting area at 4 weeks of age and fledge at 40 to 46 days of age, males fledging several days earlier than females (Ratcliffe 1993). Incubation typically begins in late March or early April, with fledging in early to late June. Some pairs in Pennsylvania have established a pattern of egg-laying beginning as early as late February. Clutches found in June or July are assumed to be

replacements of earlier failed nesting attempts or delayed recruitment of a replacement mate, not second broods.


Photo: F. A. McMorris

The chicks can stand in the nest at about three weeks and begin tearing food and feeding themselves shortly thereafter. The nest site is very active, with fights over food common and mobbing of adults frequent prior to fledging (Sherrod 1983). Young are totally dependent on adults for several weeks after fledging and may remain with them for several months, occasionally being found near the nest site until the initiation of breeding the next season. Patterns of juvenile dispersal are largely unknown, although satellite-telemetry studies indicate that some falcons spend at least their first winter in Central or South America while others remain in North America (Canadian Peregrine Foundation 2000; Falcon Trak 2000).


Photo: J. Kosack


Photo: J. Kosack

Most female peregrines begin breeding when two years old; males tend to delay reproductive activity, often not nesting until three years old, although both sexes have nested successfully as one-year-olds (Ratcliffe 1993; McMorris and Brauning 2009). Peregrine falcons display high nest fidelity, using the same nest location year after year. Adults have remained active at nest sites for over 12 years in the wild (McMorris and Brauning 2010).

In many cases, one or both members of a nesting pair remain on their nesting territory year-round. Adults that depart typically do so for only 2-3 months in mid-winter. Very little is known about where these departed birds overwinter, although some have been identified at wintering sites within 10-20 miles of their nest site.

BREEDING SURVEY

PGC may suggest that surveys be conducted if evidence of peregrine falcon breeding behavior is documented within proximity of the project area. The survey is designed to require the minimal amount of effort while using standard and proven methods, to locate the species nest. Appendix A outlines the survey methods that are acceptable to the PGC. *If the PGC methods outlined in Appendix A are not used, the results may not be accepted and could cause project delays.* ***It should be noted that the surveys can only be conducted during the peak of the breeding season (March 1 through May 15), and as such, project proponents should plan accordingly.***

The purpose of the survey is not to determine presence/absence of the species but instead to narrow down the potential project area that will need restrictions. For example, if there is evidence of falcons nesting on a bridge and the exact nest location has not yet been identified this survey may be suggested. Without knowing the exact nest location the entire bridge structure would be treated as the nest location since the falcons could be nesting anywhere on the bridge. However, if the survey is conducted and observations can confirm that the falcons are nesting at a specific location, then restrictions would only be placed on project areas within 1000 feet of the nest location. The latter allows the project proponent more flexibility in project scheduling, as potentially less of their project area would have restrictions. Please note, that due to the secretive nature of peregrine falcons during the incubation and early nestling periods, determining the exact location of the nest can be challenging, and therefore, even when using this protocol, there are no guarantees that the exact nest location will be able to be identified.

Photo: J. Kosack

MANAGEMENT PRACTICES FOR ACTIVE NEST SITES

Below are recommendations to ensure the protection of existing nesting sites and to promote future nesting at sites occupied by peregrine falcons in recent years, or that have the potential for foraging or nesting use. Since conditions vary and unanticipated circumstances may be encountered, recommendations may vary from these guidelines on a case-by-case basis. Additionally, the recommendations provided by the PGC will depend on the type of structure that the nest is located on.

All maintenance and/or construction activities on structures supporting nesting peregrines should be coordinated with the PGC Environmental Review Staff prior to the start of any activity within 1,000 feet of an active nest. The nesting season is February 15 through July 31, or until 30 days after the last nestling fledges. The nesting season restrictions for an individual territory may be shortened or lengthened as it depends on the actual fledge date. Some activities may be allowed during nesting season with PGC approval. Approval of activities during the nesting season and within the below restricted areas may depend on the activity's location relative to the nest, visibility from the nest, equipment to be used, noise levels associated with each activity, as well as duration of each activity. As such, the PGC recommends that such information be submitted to the PGC so that an accurate determination can be made regarding necessary restrictions during the nesting season. Humans to falcon proximity during nesting season has resulted in aggressive behavior by the falcons thought to ward off potential predators. Falcons swoop/dive very close to personnel with talons extended and have inflicted personal injury such as gashes and scrapes from their talons and/or beaks. Therefore, some of the restrictions below are recommend not just to protect the falcons during nesting season, but also for human safety. The following general management practices are also recommended for active nest sites:

- Restrict activities within 300 feet, in all directions, of a nest location during nesting season (February 15th through July 31st).

- Restrict activities located between 300 and 1000 feet of the nest which the falcons can see from the nest location during nesting season (February 15th through July 31st).

- Avoid aerial flyovers (planes, helicopters, drones, etc.) within 1,000 feet of the nest in all directions.

- Installation of barriers to visually separate the birds and workers during the nesting period may be used, with PGC approval. Barricades and warning signs should also be installed at access points to the protected zone and to higher locations visible from the nest, to prevent workers from accidentally entering these areas. All screening, barricades and warning signs must be in place before work begins and before the start of the nesting season (prior to February 15th). Removal shall not occur prior to the end of nesting season (July 31st or 30 days after fledge date).

- Limit noise within 1,000 feet of the nest during nesting season (February 15th through July 31st) to not substantially exceed the ambient noise levels normally encountered at the site.

- Schedule inspections for all man-made structures (bridges, buildings, etc.) outside the nesting season, August 1st through February 14th.

- Nest Boxes: PGC does not recommend the installation of nest boxes unless there has been a well-documented history of repeated nest failure. The installation of nest boxes, though a voluntary measure, should be done in coordination with the PGC following the standard nest box design and mounting plans found in Appendix B. If a nest box is already present and must be removed to conduct project-related activities, the box must be removed between August 1 and February 14th to avoid impacts to the nesting pair. Boxes must to be placed back in their original positions prior to February 15th and filled with a 4" to 6" deep layer of fresh pea gravel (see Appendix B). PGC approval is necessary for the removal and replacement of nest boxes. Additionally, limited maintenance will be needed by the site owner to ensure that adequate amounts of gravel are present and that the integrity of the box is maintained.

- PGC Access: PGC requests that access be given to PGC staff to inspect nest sites and wherever feasible, evaluate the health of nestlings and band. The PGC acknowledges that access to nest locations may be cancelled or suspended due to unforeseen circumstances such as inclement weather, high winds or any other safety concerns.

If unavoidable disturbance to nesting peregrine falcons are anticipated, then a PGC Special Use Permit and/or USFWS Migratory Bird Permit may be necessary. Coordination with the PGC is necessary to determine which if any permits are needed for such projects. If it is deemed that the take of an active nest, egg, young, or adult cannot be avoided, then a United States Fish and Wildlife Service (USFWS) Migratory Bird Permit will likely be required. The permit is issued by the USFWS Northeast Regional Office in Hadley, Massachusetts. All questions regarding this permit must be directed to the USFWS Northeast Region's Division of Migratory Birds at 413-253-8643. A PGC addendum permit will also be required after the USFWS permit is issued in order for the federal permit to be valid in Pennsylvania. The addendum permit will be issued by the PGC Bureau of Wildlife Protection, in coordination with the Bureau of Wildlife Habitat Management and the Bureau of Wildlife Management.

CONCLUSIONS

The PGC follows a process of determining if peregrine falcon nests are present, and of working to avoid and minimize potential impacts. In order to accomplish this task the PGC may require additional information and review of projects in the field. The information collected will be used by the PGC to determine what actions (if any) need to be taken in regards to a particular project. The determinations of potential impacts and the recommendations on how to avoid and minimize such impacts are specific to each project.

Additional information can be obtained by calling the PGC, Division of Environmental Planning and Habitat Protection at 717-783-5957.

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APPENDIX A – BREEDING SURVEY PROTOCOL

PENNSYLVANIA GAME COMMISSION
PEREGRINE FALCON BREEDING SURVEY PROTOCOL

The peregrine falcons (*Falco peregrinus*) is a state listed endangered species requiring large open areas for hunting and high, inaccessible ledges for nesting, typically overlooking major river systems. Modern nesting locations include tall buildings, bridges, and cliffs throughout the state. PGC annually inventories all nesting territories to document recovery (Brauning, Barber and McMorris 2013), and may suggest this surveys be conducted if evidence of peregrine falcon breeding behavior is documented within proximity of the project area. The purpose of the survey is to pinpoint the nest site so that restrictions can be tailored to the potential project area restrictions can be established to reduce risk of nest failure; not to determine presence/absence of the species. Please note that due to the secretive nature of peregrine falcons during the incubation and early nestling periods, determining the exact location of the nest is challenging; and therefore, even when using this protocol, there are not guarantees that the exact nest location will be able to be identified. Peregrine falcons nest between February 15 and July 31.

Coordination on state listed endangered, threatened, and special concern species of birds and mammals is done through the Division of Environmental Planning and Habitat Protection located at the PGC office in Harrisburg, PA. A study plan should be submitted to the PGC for review and approval at least 30 days prior to initiating the survey. The study plan should include maps delineating all areas to be surveyed, observation locations, anticipated survey schedule, a list of the individuals that will be completing the survey along with their experience, equipment to be used to conduct survey, etc. Individuals conducting the survey should have experience monitoring peregrine falcons.

SURVEY METHODS

Peregrine falcons are challenging to survey because of their discreet and inaccessible nesting locations, often over or adjacent to water. Surveys should be conducted between March 1 and May 15 and focus especially on areas over, adjacent to, or within sight of water.

Birds' behavior changes dramatically through the course of the season. Since the goal is to identify the nest site early in the season, surveys during courtship and egg laying provide an ideal window of time in which behavior of adults may lead to a nest site. Courtship behavior is minimal for well-established pairs, but food exchanges, copulation, and general investigation of several potential nest sites occurs through the day and can help focus attention on potential sites. Egg laying and incubating birds (anticipated from March 15 to April 30) are very secretive, and typically the only opportunity to pinpoint the nest location is when adults exchange incubation duties, which can happen at any time of day, but generally does so at dawn and dusk. Surveys during these months in the middle of the day are likely to be unproductive.

To improve the likelihood of success, survey plans should consist of sufficient observation sites to ensure that all potential nesting habitat is observed (i.e. entire bridge, building, cliff, etc.) and

should be conducted at each observation site for a minimum of three survey days. Each survey day should consist of 2 hours of observations starting ½ hour before sunrise and continue for at least 1 ½ hours after sunrise. The surveys are not be conducted during rain events or when high winds (>10mph) are persistent. If more than one observation site is necessary, then additional survey days will be needed. For example, if two sites are needed to observe all potential nesting habitat, a minimum of 6 days of surveys should be conducted, 3 days at each site.

All observation should be taken from below the anticipated nesting areas if within 1000 feet, or at least 1000 feet from any potential nest locations if approached from above. Surveying from positions on the same horizon or above a potential nest within 1000 feet of active nests can disrupt nesting activity and may cause nest abandonment, and can minimize the chances of discovering the nest location. If a nest is located the PGC should be contacted immediately for further instructions.

A survey report should be sent to the PGC that includes the following: project description; survey area map and GIS shapefile(s) to illustrate observation areas; location(s) from which observations were made; dates, times, and weather while survey was conducted; observer names and falcon monitoring experience; potential or confirmed nest location(s) observed, location and behavior of each species observed (peregrine falcons plus any other species of special concern); and any other pertinent information. All location information should be recorded in decimal degrees using WGS84, and all GIS shapefile(s) provided should include the projection.

APPENDIX B – DESIGN FOR STANDARD MOUNT NEST BOX

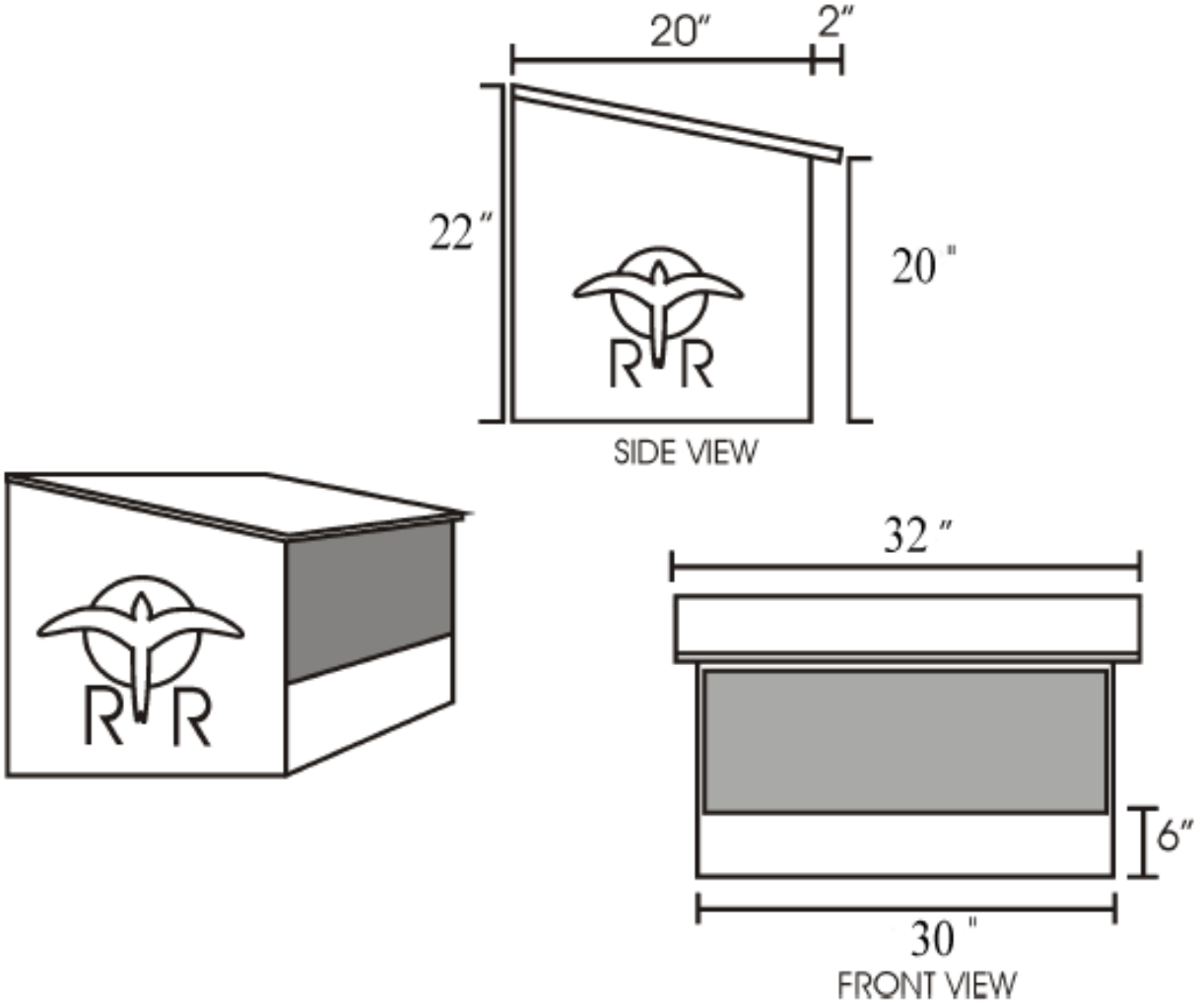
Source: Raptor Resource Project. http://www.raptorresource.org/pdf/standard_mount_doc.pdf

This is a standard mount nest box. It is 22" deep, 22" high in the back, 20" high in the front and 34" wide. The box uses T-111 cedar siding for the outside. T-111 siding is lightweight, easy to get, and very durable. The long arm provides a perch for the falcons.

It's important to have 4-6" of pea gravel for nesting substrate. Too little gravel could cause egg punctures. Too much gravel will interfere with drainage, causing the box to rot quickly.

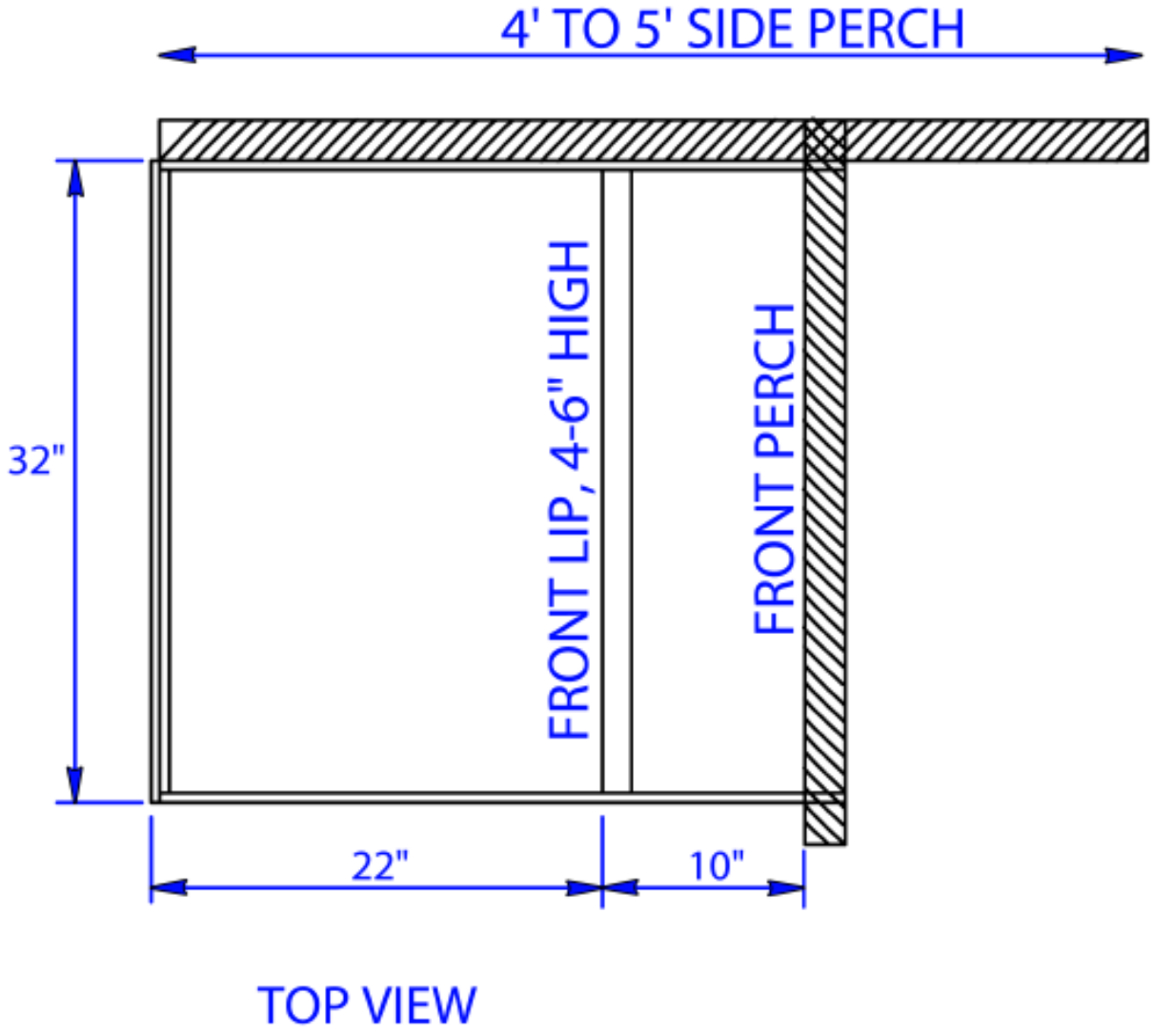
Drill 15-20 small evenly-spaced holes in the bottom for drainage,

Diagram of Standard Mount Nest Box



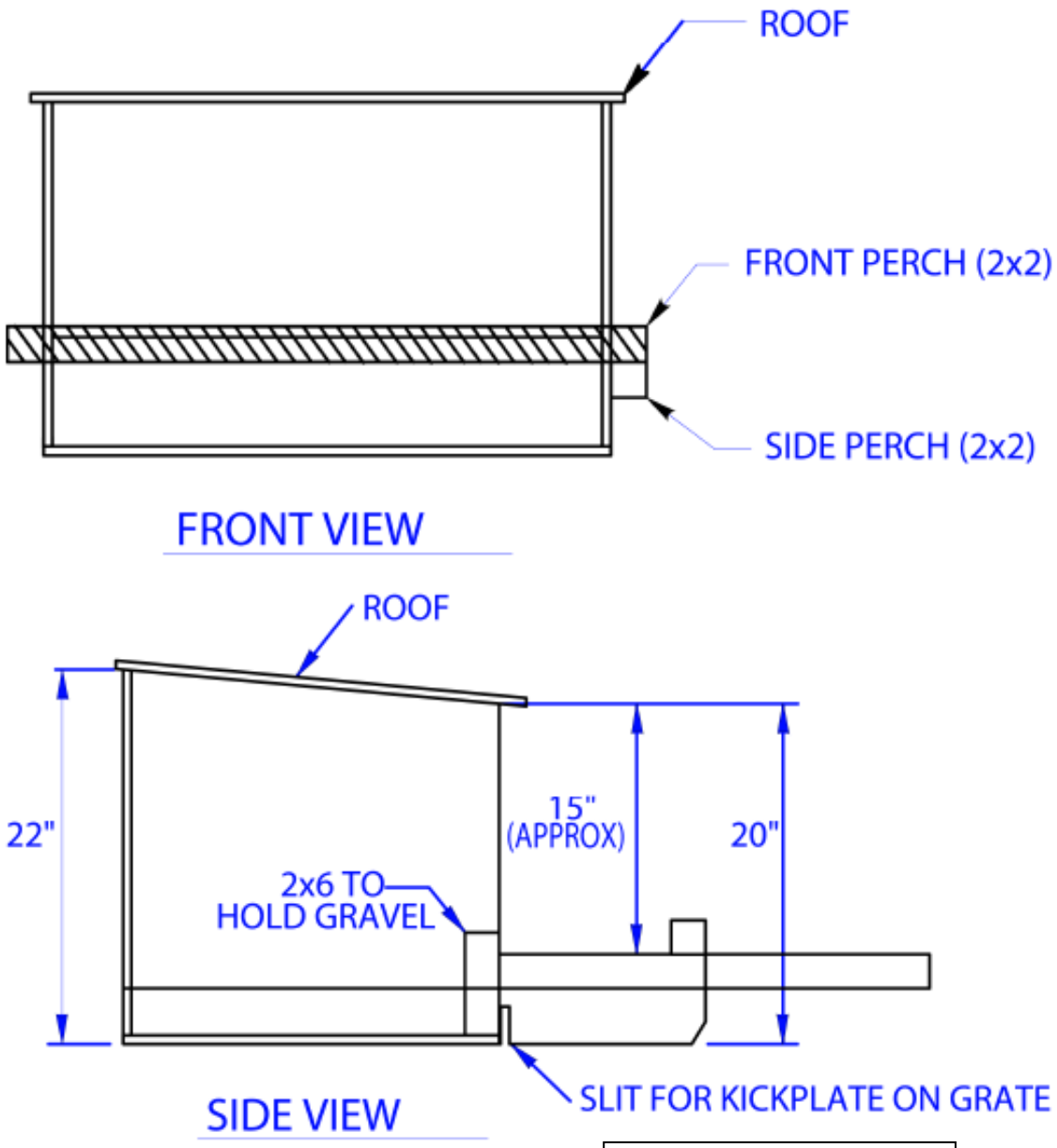
Here is a diagram of the standard mount nest box from the side and front, sans perches. People often want to modify this design by building an access door on the back. Don't do this – it is very, very dangerous for the chicks. If people reach in to the box from the back, they will chase the nestlings to the front. If the nestlings are panicked enough, they can be force fledged. Premature flight is a very bad thing.

Blueprint of Standard Mount Nest Box: Top



This is a blueprint of the box from the top. Note that the perch on this box is on the left side of the box. The perch may be on either the left or right side.

Blueprints of Standard Mount Nest Box: Front and Side



*****NOTE: The "slit for kickplate on grate" is unnecessary.**

Eastern Small-Footed Bat

(*Myotis leibii*)

PA Threatened
Not listed federally

Photo: Pennsylvania Game Commission

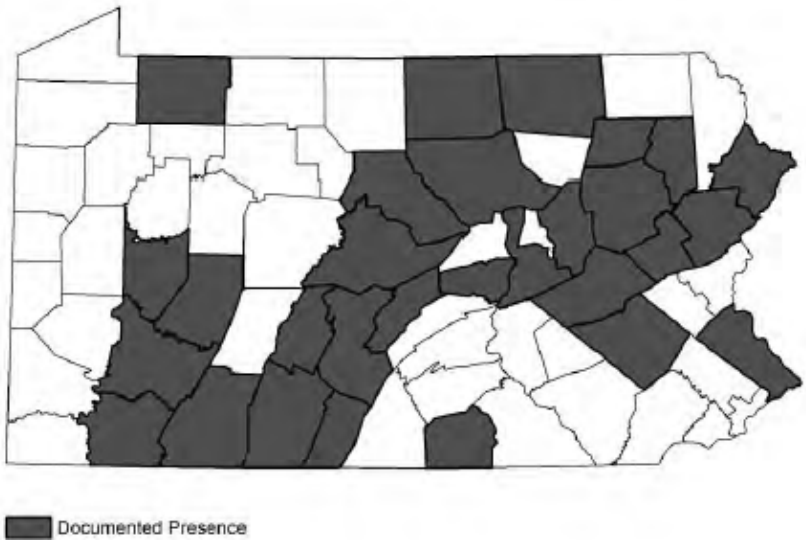
History

- Species Decline (WAP, 2015)
    - Anthropogenic disturbance to roosting and foraging habitat
    - Mining and quarrying cause direct mortality, alter hibernation sites, and remove roosting and foraging habitat
    - Rockslides near known summer roost sites causing direct mortality
    - Vehicular impacts causing mortality (new roads cause increased fragmentation and permanent loss of foraging and roosting habitat)
    - White-Nose Syndrome (WNS)
- Protections and Listings
    - Eastern small-footed bat is listed as threatened in Pennsylvania and is protected under the Pennsylvania Game Commission's (PGC) Game and Wildlife Code (PGC, 2014).
    - PGC manages and conserves eastern small-footed bats and is also a priority species in the state's Wildlife Action Plan (2015).

Identification Characteristics

- The eastern small-footed bat has brownish fur, often with a golden sheen, that contrasts (PGC, 2014).
- It has a black face and blackish brown wing and tail membranes (PNHP, 2007).
- Its small body measures 3.5 inches, including a 1.5 inch tail, with feet measuring less than 0.33 inch and short forearms measuring less than 1.5 inch (PNHP 2007).
- Wingspan ranges from 8.25 to 9.75 inches (PGC, 2014).
- Similar in appearance to the little brown bat and other species making field ID difficult (PNHP, 2007).
- Positive ID is best determined by PGC staff or a qualified bat biologist.

Preferred Habitat

- Key winter habitat (PGC, 2014)
  - Caves and mines
  - Species is more tolerant of cold temperatures and prefers hibernating under large rocks that make up cave floors, and in tight crevices in cave and mine walls or ceilings
- Summer roosts (PGC, 2014)
  - Roosts include caves and mines, bridge structures/culverts (if large enough), hollow trees and under bark, cracks and crevices in rock walls, and ridge-top talus fields.
  - This suggests that forested areas with caves, mines, rock outcrops or talus provide key summer habitat.
  - Few small-footed bats are captured during mist-netting surveys on potential summer foraging habitat, so little is known about the species' reproduction or summer behavior.
  - Because of this secretive behavior, some researchers think this species may be more common than it appears.
  - Deciduous/mixed forested areas containing rock outcrops and talus (WAP, 2015)
  - 

Wildlife Action Plan – Map of documented presence[1], 2015
Note: This map does not replace the information provided in PNDI.

[1] Documented presence is defined as a known site

Natural History

- This species enters hibernation later and leaves earlier than other bat species (PGC, 2014).
- Eastern small-footed bat hibernation is generally from mid-November through March (PGC, 2016).
- Often selects a location close to the cave or mine entrance where temperature and humidity are lower (PGC, 2014).
- Roosts singly during hibernation (PGC, 2014)
- Breeding occurs in the fall and the spermatozoa are stored in the uterus of the hibernating females until spring ovulation after which a single pup is born in May or June (PGC, 2016).
- Lifespans in the wild are estimated to be about 12 years (PGC, 2016).
- Foraging habit (PGC, 2016)
    - Nocturnal foragers – primarily forage over water sources where nocturnal insect concentrations are high.
    - Forages on soft-bodied prey (insects) by hawking prey in flight or gleaning prey off of surfaces.

Tricolored Bat (eastern pipistrelle)

(*Perimyotis subflavus*)

PA Endangered
Not listed federally

Photo: C. Butchkoski, Pennsylvania Game Commission

History

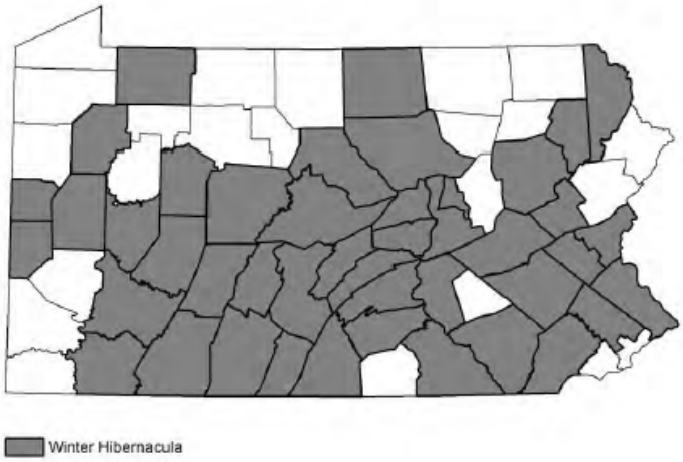
- Species Threats (WAP, 2015)
    - Anthropogenic disturbance to roosting and foraging habitat
    - Recreational and commercial caving causes disturbances that lead to direct mortality and lower fecundity of adult females, and exacerbates problems caused by white-nosed syndrome (WNS)
    - Mining and quarrying cause direct mortality, alter microclimates of hibernacula, and remove roosting and foraging habitat
    - Large scale wind farms have been documented to directly cause mortality
    - Flooding can drown and kill hibernating bats in subterranean environments
    - Removal of mature trees to maintain younger forests limits potential roosting sites
    - Residential, commercial, and industrial development, and permanent loss of forested habitat impact maternity colonies
    - White-Nose Syndrome (WNS)
- Protections and Listings
    - PGC manages and conserves tricolored bats in the state's Wildlife Action Plan (WAP, 2015).
    - The tricolor bat is listed as state endangered (58 PA Code § 133.41)

Identification Characteristics (PGC, 2017)

- The tri-colored bat, previously known as the eastern pipistrelle, also is called the pygmy bat because of its small size: length, 2.9 to 3.5 inches; wingspread, 8.1 to 10.1 inches; weight, 0.14 to 0.25 ounces
- Its fur is yellowish brown, darker on the back. The back hairs are tri-colored: gray at the base, then a band of yellowish brown, and dark brown at the tip.
- The forearms are distinctly pink and contrast with the black wing membrane.

Preferred Habitat (PGC, 2017)

- Winter habitat
    - Tri-colored bats hibernate from September through April or early May
    - Hibernate deep inside caves and away from openings, where temperature is about 52-55 degrees
- Summer roosts
    - In summer, they inhabit open woods near water, bridge structure/culverts (if large enough), rock or cliff crevices, buildings, and caves



Wildlife Action Plan – Map of documented presence, 2015
Note: This map does not replace the information provided in PNDI.

Natural History (PGC, 2017)

- Tri-colored bats hibernate from September through April or early May
- They sleep soundly, often dangling in the same spot for months.
- Tri-colored bats breed in November, and two young are usually born per litter in June or July
- Tri-colored bats live 10 to 15 years
- Found throughout PA except in the southeastern corner of the state
- Foraging habits
    - Tri-colored bats take wing early in the evening and make short, elliptical flights at treetop level
    - Tri-coloreds eat flies, grain moths and other insects.

Little Brown Bat

(*Myotis lucifugus*)

PA Endangered
Not listed federally

Photo: U.S. Fish and Wildlife Service

History

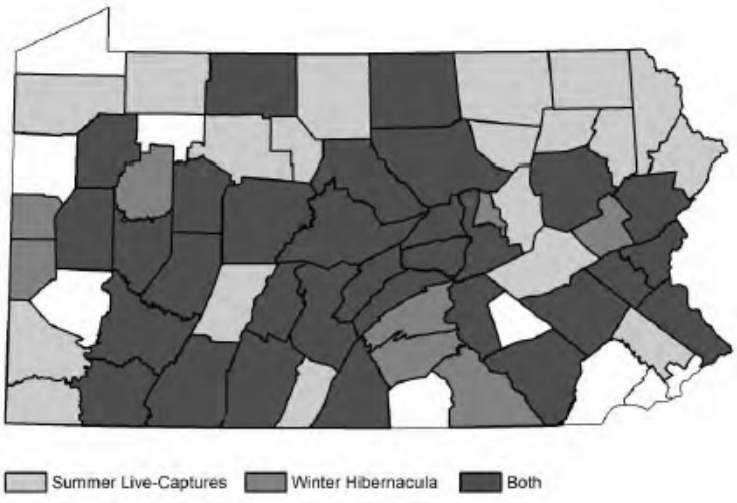
- Species Decline (WAP, 2015)
    - Anthropogenic disturbance to roosting (i.e., removal of barns, outbuildings, and old structures) and foraging habitat
    - Commercial application of mines for storage and office use create noise, light, and climate variations that may impact hibernation
    - Recreational and commercial caving causes disturbances that lead to direct mortality and lower fecundity of adult females, and exacerbates problems caused by white-nosed syndrome (WNS)
    - Large scale wind farms have been documented to directly cause mortality
    - Mining and quarrying cause direct mortality, alter microclimates of hibernacula, and remove roosting and foraging habitat
    - Residential and commercial development, permanent loss of forested habitat and impact maternity colonies
    - Logging causes loss of older forests with more potential roosting sites
    - Loss of forested habitat due to energy production and mining reduces foraging quality and quantity, and reduces or eliminates roosting
    - Flooding can drown and kill hibernating bats in subterranean environments
    - Predation by feral cats, raccoons, and owls
    - Vehicular impacts causing mortality (new roads cause increased fragmentation and permanent loss of foraging and roosting habitat)
    - White-Nose Syndrome (WNS)
- Protections and Listings
    - PGC manages and conserves little brown bats and is also a priority species in the state's Wildlife Action Plan (WAP, 2015).
    - The little brown bat is listed as state endangered (58 PA Code § 133.41).

Identification Characteristics (PGC, 2017)

- The little brown bat is found statewide.
- Length, including the tail, is 3.1 to 3.7 inches; wingspread, 8.6 to 10.5 inches; weight ranges from 0.25 to 0.35 ounces and is greatest just before hibernation.
- Females are slightly larger than males. Color: a rich brown approaching bronze, usually with a dark spot on the shoulders.
- The fur is dense, fine and glossy; the wings are black and bare.

Preferred Habitat

- Utilizes various habitats, from forested to urban/human structures (WAP, 2015)
- Primarily caves and mines but also minimal use in rock fissures and structures such as ditches and tunnels where more stable temps in 40-50-degree Fahrenheit range are found (WAP, 2015)
- Winter habitat (PGC, 2017)
    - In October and November, little brown bats leave their summer roosts and move to tunnels, mine shafts and caves
    - Clinging to the ceilings and clustered against one another, they hibernate
- Summer roosts (PGC, 2017)
    - They emerge from hibernation in April and May
    - They return to the same hibernation and summer roost sites year after year.
    - Females gather in summer nursery colonies in attics, barns and other dark, hot retreats
    - Males roost in hollow trees, under loose bark, behind loose siding and shingles, in rock crevices, and bridge structures/culverts (if large enough).



Wildlife Action Plan – Map of documented presence, 2015
Note: This map does not replace the information provided in PNDI.

Natural History (PGC, 2017)

- Females disperse from the hibernation roosts and gather in summer nursery colonies of 10 to 1,000 individuals in attics, barns and other dark, hot retreats
    - A single young is born to each female in June or early July
    - After four weeks, the young bat is fully grown, and ready to leave the colony
    - Females mature sexually at about eight months of age, while males mature in their second summer
    - Little brown bats are relatively long-lived, with recorded ages of more than 30 years (USFWS, 2016).
- Males are solitary
- Foraging Habits (PGC, 2017; USFWS, 2016)
    - This bat eats a wide variety of flying insects, including nocturnal moths, bugs, beetles, flies and mosquitoes.
    - Insects are regularly caught with the wing or tail membrane and transferred to the mouth.
    - An individual emerges from its day roost at dusk, and usually seeks a body of water, where it skims the surface for a drink, and then hunts insects.
    - Bats examined within an hour of taking flight often have full stomachs weighing one-fifth of their body weight.

      The little brown bat makes several feeding flights each night and is capable of catching 1,200 insects per hour. A nursing female may eat her own weight in insects nightly

Indiana Bat

(*Myotis sodalis*)

PA Endangered
Federally Endangered

Photo: C. Butchkoski, Pennsylvania Game Commission

History

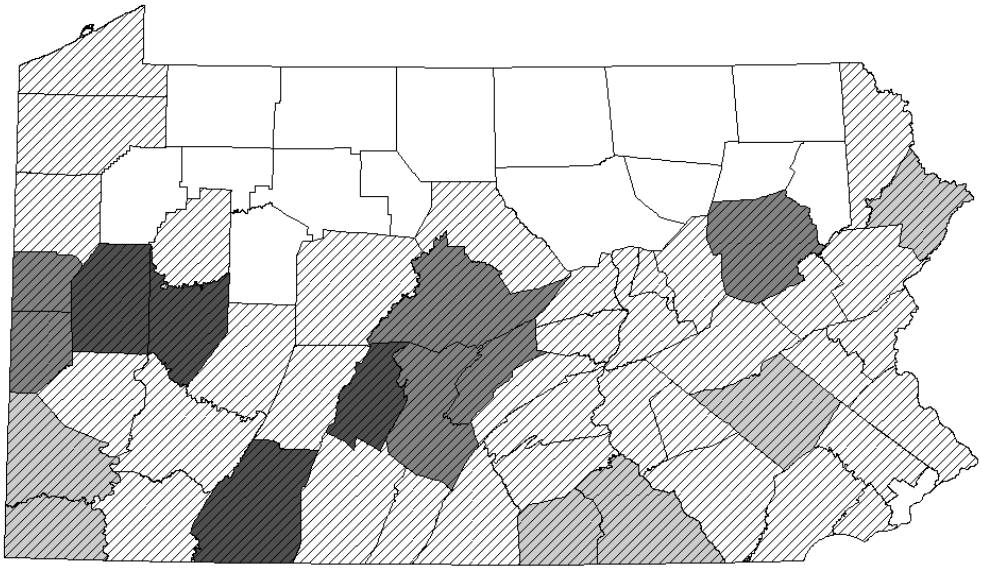
- Species Decline (WAP, 2015)
    - Primary reason for the decline is anthropogenic disturbance to hibernacula and summer forest habitats (mining, commercial caves, and improper gating), deforestation, and habitat fragmentation
    - Low birth rate and high death rate
    - Highway traffic
    - Wind turbines
    - Predation by feral cats
    - Pesticides (DDT)
    - White-Nose Syndrome (WNS)
- Protections and Listings
    - Indiana bat was listed as federally endangered in March 1967 (USFWS, 2019).
    - Critical habitat was designated in 1976; however, there is no critical habitat designated for Indiana bat in Pennsylvania (USFWS, 2019).
    - Indiana bat is also listed as endangered in Pennsylvania and is protected under the Pennsylvania Game Commission's (PGC) Game and Wildlife Code (PGC, 2010).
    - PGC manages and conserves Indiana bats through the Wildlife Action Plan (2015).

Identification Characteristics (PGC, 2010)

- The Indiana bat closely resembles the very common little brown bat
- The facial area of the Indiana bat appears pink, rather than dark like similar *Myotis* species.
- Its pinkish-brown fur lacks luster and its ears and wing membranes have a dull appearance that does not contrast with the fur.
- Indiana bats have small, delicate feet with short toe hairs that do not extend beyond the toenails, and there is a small cartilage spur off the foot that supports the tail membrane
- The total body length of an adult Indiana bat is 3.5 to 5.5 inches and its wingspan is 9.5 to 10.5 inches

Pennsylvania Habitat (PGC, 2010)

- Indiana bat hibernation sites have stringent requirements including:
  - Noticeable airflow and the lowest non-freezing temperatures possible, and
  - Some standing or flowing water.
- Maternity roosts
  - Roosts are trees with exfoliating bark (often dead/large) and high temperature sun exposure (males seek cooler roosts).
  - Most roosts are within 0.75 mile of water.
  - May roost in buildings, although this is the exception and not the rule as most maternity sites are in trees.
- Summer habitat
  - Indiana bats have also been found, rarely, utilizing structures, such as barns and sheds or bridge structures/culverts (if large enough) as summer roosting habitat.



Note: This map does not replace the information provided in PNDI.

Natural History (PGC, 2010)

- Enter hibernation sites in the fall
- Begin entering mines and caves in mid-September, with most in hibernation by early November
- Hibernacula are found in regions with well-developed limestone caverns and abandoned mines.
- Of the 18 known hibernacula in PA, 11 are abandoned mines and 6 are limestone caves.
- Before going into hibernation, and again during the spring emergence, bats swarm around entrances to hibernation sites and rely on nearby surface habitat to forage for insects.
- Mating occurs in fall, but females store sperm through the winter and fertilization occurs in spring
- In mid-April to late May, females arrive at summer maternity sites (roost trees) where they form small colonies under loose bark.
- They give birth to one young per year from mid-June to early July and young bats are able to fly by mid-July to early August.
- Male Indiana bats are less selective, using trees of almost any size if they have loose bark or cavities.

Migration (PGC, 2010)

- The maximum migration distance from hibernacula to summer habitats is estimated to be 320 miles.

Northern Long-Eared Bat (NLEB)

(*Myotis septentrionalis*)

PA Endangered
Federally Threatened with 4(d) Rule

Photo: A. Froschauer, U.S, Fish and Wildlife Service

History

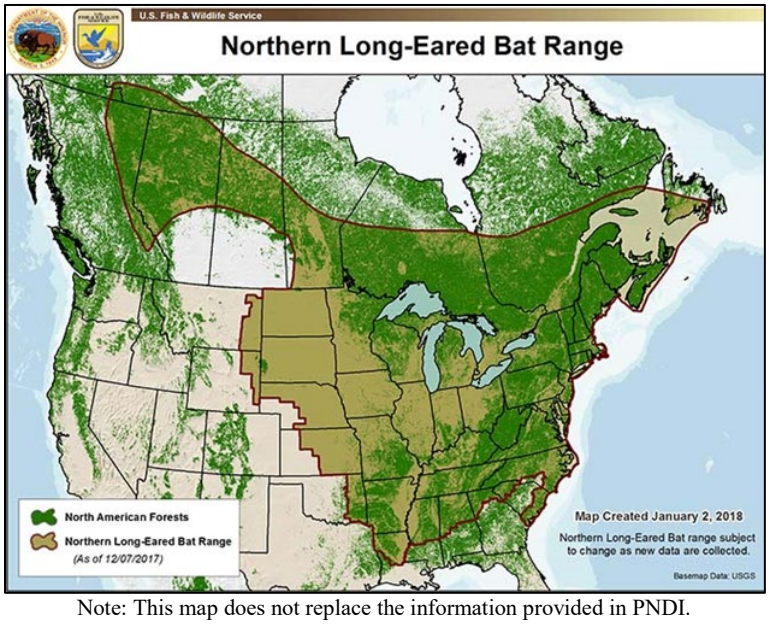
- Species Decline (USFWS, 2015)
  - Primary reason for the decline is the disease, WNS.
    - It is unlikely the NLEB would be experiencing such a dramatic population decline if not for WNS.
  - Since 2006, WNS has spread across the NLEB range.
  - WNS is expected to spread throughout the U.S., including Pennsylvania.
  - Impacts to Hibernacula: exclusion gates are meant to keep people from caves and mines. If they are improperly installed or not a PGC approved design, they can restrict bat flight and movement, and change airflow and internal cave and mine microclimates.
  - Loss or Degradation of Summer Habitat
    - Highway construction, commercial development, surface mining, and wind facility construction permanently remove habitat and are activities prevalent in many areas of this bat's range.
  - Wind turbines kill bats and mortality has been documented for NLEBs, although a small number have been found to date.
  - There are many wind projects within a large portion of the bat's range and many more are planned.
- Protections and Listings
  - The NLEB was listed as threatened under the ESA on April 2, 2015 (USFWS, 2019a).
  - The NLEB is listed as a state endangered species (58 PA Code § 133.41).
  - The final 4(d) rule, which was published in the Federal Register on January 14, 2016, specifically defines the "take" prohibitions (USFWS, 2019b).
  - Actions have been taken to try to reduce or slow the spread of WNS through human transmission of the fungus into caves (e.g., cave and mine closures and advisories, national decontamination protocols) (USFWS, 2015).
  - The USFWS and others are working to minimize bat mortality from wind turbines (USFWS, 2015).

Identification Characteristics (USFWS, 2015)

- As its name suggests, this bat is distinguished by its long ears, particularly as compared to other bats in its genus, *Myotis*.
- Their fur color can be medium to dark brown on the back and tawny to pale brown on the underside.
- The NLEB is a medium-sized bat with a body length of 3.0 to 3.7 inches and a wingspan of 9 to 10 inches.

Habitat

- The range for the NLEB includes the entire state of Pennsylvania (USFWS, 2019a)
- Winter habitat (USFWS, 2015)
    - NLEBs spend winter hibernating in caves and mines, called hibernacula.
    - NLEBs use areas in various-sized caves or mines with constant temperatures, high humidity, and no air currents.
    - Most often found in small crevices or cracks, often with only the nose and ears visible.
- Summer habitat (USFWS, 2015)
    - NLEBs roost singly or in colonies underneath bark, in cavities, or in crevices of both live trees and snags (dead trees).
    - Males and non-reproductive females may also roost in cooler places, such as caves or mines.
    - NLEBs seem to be flexible in selecting roosts, choosing roost trees based on suitability to retain bark or provide cavities or crevices.
    - NLEBs have also been found, rarely, roosting in structures, such as barns and sheds or bridge structures/culverts (if large enough).



Note: This map does not replace the information provided in PNDI.

Natural History (USFWS, 2015)

- Breeding begins in late summer or early fall when males begin to swarm near hibernacula.
- Females store sperm during hibernation until spring
- In spring, they emerge from their hibernacula, ovulate, and the stored sperm fertilizes an egg (delayed fertilization)
- Pregnant females migrate to summer areas where they roost in small colonies and give birth to a single pup
- Most bats within a maternity colony give birth around the same time, which may occur from late May or early June to late July, depending where the colony is located within the species' range
- Maximum lifespan for the NLEB is estimated to be up to 18 years.
- Foraging habits
    - Primarily fly through the understory of forested areas feeding on insects in flight or from vegetation

Migration

- Migratory movements are short compared to the Indiana bat, with movement typically between 35 miles and 55 miles (USFWS-, 2019b)

Project Due Diligence

A review through the PNDI Environmental Review Tool should be undertaken. This tool can be accessed at http://www.naturalheritage.state.pa.us/. The PNDI receipt will provide direction for pursuing additional coordination and consultation with the PGC and USFWS. If conflicts are only with state-listed species, the necessary coordination and consultation will only be indicated for the PGC. If a PGC conflict with eastern small-footed bat (*Myotis leibii*) is identified, refer to the PGC eastern small-footed bat environmental review guidance document (2016), also provided as Appendix 1.

For the Indiana bat and NLEB, which are under the jurisdiction of both the PGC and USFWS, the PNDI receipt will provide direction for additional coordination with USFWS. As a matter of practice, PGC defers review requests for the Indiana and NLEB to the USFWS.

The USFWS consultation options for the Indiana bat and NLEB are:

1. Nationwide Programmatic for 4(d) Rule – Applicable for only NLEB
    a. For federal, USFWS, consultations, projects located in Venango, Warren, Forest, Jefferson, Elk, McKean, Potter, Tioga, Lycoming, Sullivan, Bradford, Susquehanna, Wyoming, Lackawanna, or Philadelphia counties, are within the range of NLEB only and may qualify under the Nationwide Programmatic for the 4(d) Rule, which applies only to NLEB. Completion of consultation under this programmatic should be through the USFWS IPaC Effect Determination Key.
2. USFWS and FHWA Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat
    a. This programmatic is applicable to both the NLEB and Indiana bat in any county in their respective ranges within Pennsylvania. Completion of consultation under this programmatic should be through the USFWS IPaC Effect Determination Key.
3. Individual Consultation
    a. Appropriate when the required avoidance and minimization measures cannot/will not be implemented, or the project is not consistent with either of the programmatics.

Maintenance Units statewide should refer to Publication 113 for specific direction for activities/assemblies that may affect the Indiana or northern long-eared bats.

Consultation/Coordination Process Steps

Step 1) Perform online PNDI.

- No Potential Impacts – If no potential impacts are identified, then no further coordination with PGC or USFWS is required.
- Potential Impacts to State-Listed Bat Species – If the PNDI search results identify potential impacts to the Eastern Small-Footed Bat, Tricolored Bat, and/or the Little Brown Bat, coordinate with PGC to determine appropriate conservation and avoidance measures, and identify any additional data concerns.

- Potential Impacts to Federally-Listed Bat Species – If the PNDI search results identify potential impacts to the Indiana Bat and NLEB, perform online IPaC (**Step 2**).

Step 2) Perform online IPaC (https://ecos.fws.gov/ipac/). Additional resources including videos are available under the Frequently Asked Questions section of the IPaC website.

Use of the IPaC Assisted Determination Keys are highly recommended. Results of the Determination Key will indicate if the project will have one of the following:

- Determination of eligibility of project with Programmatic
- No Effect (NE) on either bat species,
- Not Likely to Adversely Affect (NLAA) either bat species,
    - NLAA with Avoidance and Minimization Measures (AMMs) – The project as proposed with the recommended AMMs is not likely to adversely affect either bat species.
    - NLAA without AMMs – The project as proposed without any AMMs is not likely to adversely affect either bat species.
- Likely to Adversely Affect (LAA) either bat species.

After receiving the result of the IPaC determination, proceed to **Step 3**.

Step 3) If the result from Step 2 is NE, then consultation is then complete and no further coordination with USFWS is required (Refer to Appendix A: Assisted Determination Key Process of the *User's Guide*).

If the result from Step 2 is NLAA or NLAA with AMMs, submit the determination key results to USFWS via the IPaC system for review and to generate an automated verification letter. USFWS will respond within 30 days if the determination was incorrect. If no response is received after 30 days, coordination for Indiana bat and/or NLEB is complete and no further coordination is necessary.

If the result from Step 2 is LAA, submit the determination key results to USFWS via the IPaC system for review and to generate an automated consistency letter. USFWS will respond within 30 days if the determination was incorrect. If compensatory mitigation is needed, then proceed to **Step 4**.

Step 4) If the effects determination is LAA and compensatory mitigation is required to offset adverse effects to the Indiana bat or NLEB, PennDOT must notify the local USFWS Field Office of the mechanism it has selected to implement compensatory mitigation. Options for compensatory mitigation include: the range-wide in lieu fee program, a USFWS-approved state- or regional-specific in lieu fee program, a conservation bank, or local conservation site (see Section 2.1 of the BO for details of each mitigation option). The local USFWS Field Office should be notified of which methods PennDOT will use to implement compensatory mitigation. The USFWS prepared a tool to calculate the offsets required to mitigate for the conversion of Indiana bat habitat and the credits achieved through the conservation of suitable habitat. The Ibat Offset-Conservation Calculator can be accessed at the following link:

https://www.penndot.gov/ProjectAndPrograms/RoadDesignEnvironment/Environment/environmental-policy/Pages/Threatend-and-Endangered-Species.aspx

Programmatic Consultation Overview:

Nationwide NLEB 4(d) Rule Programmatic

On January 5, 2016, the USFWS published a final species-specific rule pursuant to Section 4(d) of the ESA for the NLEB (**50 CFR §17.40(o)**). The Section 4(d) rule identifies prohibited take of the NLEB, as well as take that is exempted from Section 9 prohibitions of the ESA. Incidental take of the NLEB that may occur from the programmatic is in compliance with the Section 4(d) rule and thus not prohibited. For additional information and instructions for use of the IPaC online determination key visit https://www.fws.gov/midwest/endangered/mammals/nleb/s7.html.

Range-wide Programmatic Consultation for Indiana Bat and NLEB

The USFWS and FHWA developed the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat (BO) as an approach to address potential conflicts with these species from transportation activities. This approach can be broadly summarized as: 1) performing IPaC/PNDI and habitat screening procedures; 2) modifying projects as possible to avoid and minimize impacts; 3) conducting actions during the appropriate seasonal time period to avoid adverse effects; 4) implementing appropriate measures for the exclusion of the species from disturbance areas during their active seasonal time period; or 5) providing for compensation of anticipated limited adverse effects. While the NLEB and Indiana bat are both federally and state protected within Pennsylvania, the USFWS (PGC defers to USFWS) is the lead natural resource agency for project coordination. A *User's Guide* was prepared for the range-wide programmatic to help navigate the intricacies of the document.

The USFWS encourages all parties who plan to use the Range-wide Programmatic Consultation to review the Biological Assessment (BA) if there are questions regarding interpretation. The BA contains detailed information on the proposed action, an analysis of the potential effects to the species and their resources, and support of their effect determinations. The BA and implementation documents relevant for compliance with the Range-wide Programmatic Consultation are available at the USFWS website: http://www.fws.gov/midwest/endangered/section7/fhwa/index.html. If compensatory mitigation is a required AMM, utilize the Ibat Offset-Conservation Calculator on the PennDOT website at the following link:
https://www.penndot.gov/ProjectAndPrograms/RoadDesignEnvironment/Environment/environmental-policy/Pages/Threatend-and-Endangered-Species.aspx

Projects included in the range-wide programmatic scope of this consultation include those that result in NE, NLAA with and without AMMs, and LAA determinations. The Range-wide Programmatic Consultation also provides the opinion of the USFWS that projects which are consistent with the program are not likely to jeopardize the continued existence of the two bat species. It provides an incidental take statement for the Indiana bat, but not for the NLEB. The Indiana bat incidental take statement includes terms and conditions for FHWA/PennDOT's implementation of the program. Descriptions of NE, NLAA, and LAA categories of projects, and the corresponding project-level processes for using this document to comply with ESA Section 7 are provided below.

The transportation agencies and the USFWS have made a preliminary determination that some proposed activities do not meet the criteria for inclusion in the Range-wide Programmatic Consultation. Listed in

Chapter 2.1 of the *User's Guide*, there are 10 categories of activities that are NOT covered by the Range-wide Programmatic Consultation for Indiana bats and NLEBs. Individual consultation with the USFWS Field Office is necessary to make a final effect determination on these projects.

Some projects for reasons of location or activity type will have "no effect" on either bat species or Indiana bat designated critical habitat. Within Chapter 2.2 of the *User's Guide*, there are several examples of actions that result in NE to the Indiana bat and/or NLEB. During PNDI review, the online system will provide questions related to project activities and tree clearing acreages, which may automatically clear a project that will have no effect on either bat species and conclude coordination without the need for IPaC consultation.

Actions NLAA bats

- Projects occurring near suitable habitat (e.g., non-forested area between patches of suitable habitat that Indiana bat or NLEB would typically cross) or within suitable habitat may affect the Indiana bat or NLEB. Some of these projects may have a discountable or insignificant effect on either bat species and thus are considered NLAA actions. Within Chapter 2.3 of the *User's Guide*, there are several examples of actions that result in NLAA.

Actions NLAA bats with Avoidance and Minimization Measures (AMMs)

- As identified above, transportation projects occurring near or within suitable habitat "may affect" the Indiana bat or NLEB. In many such circumstances, the implementations of AMMs (Appendix C of the *User's Guide*) are required for the project to reach NLAA for both bat species. Within Chapter 2.3 of the *User's Guide*, there are several examples of actions that result in NLAA with AMMs.

Actions LAA bats

- If adverse effects to either bat species cannot be avoided, formal consultation with the USFWS is required. Transportation projects that are within the scope of the Range-wide Programmatic Consultation, and meet the conditions listed within Chapter 2.3 of the *User's Guide*, and implement all applicable AMMs, may still include project components or activities that are likely to adversely affect the Indiana bat and/or NLEB. Within Chapter 2.3 of the *User's Guide*, there are several examples of actions that result in LAA. These projects are then covered by the incidental take statement for the Indiana bat and incidental take of the NLEB which is in compliance with the 4(d) rule and thus not prohibited.

Individual Consultation

Individual consultation is relevant when neither of the above-mentioned programmatic processes apply. For projects that may affect either the Indiana bat or NLEB in which suitable habitat is present, and the programmatic processes cannot be applied, individual consultation may be needed, and the Pro-Team should be consulted. Refer to ESA Formal Consultation Process: FHWA, PennDOT and Pro-Team Internal Coordination Process (Publication 546 2018 Version References). Further information on completing individual consultation can be found in Publication 546, Section 4.C.

If it is determined that the project may cause impacts to Indiana bats, NLEBs, or their habitat, agencies may request additional surveys conducted by a qualified bat surveyor (QBS) to determine if the species is present. Species surveys that may be effective in some situations include emergence surveys, fall swarm surveys, habitat assessments, and radio tracking of bats. Some of these surveys require completion during

specific timeframes and PGC permits. Therefore, they should be planned for accordingly. These surveys must be completed by a qualified bat surveyor. Where no bat surveys have been conducted, PennDOT can assume presence of the appropriate species in lieu of completing surveys to determine if the species is present and make the appropriate mitigation commitments. This is particularly encouraged in lieu of summer netting or acoustic surveys where a lack of positive data is not likely to be conclusive enough to determine absence, particularly since populations have declined so precipitously in recent years due to WNS. The assumption of presence is based upon the presence of suitable habitat and the capability of bats to occupy it because of their mobility.

Additional Useful Links

A list of qualified bat surveyors (QBS) can be found on the USFWS Pennsylvania Field Office list:
https://www.fws.gov/northeast/pafo/PDF/2015%20QBS%20and%20BI%20List_05182015.pdf

USFWS Pennsylvania Field Office: Northeast Region – Survey Guidelines – Indiana Bat
https://www.fws.gov/northeast/pafo/endangered/surveys.html

PennDOT PUBLICATION 113 Guidance (July 2019 effective revision)

Statewide activities must avoid adverse impacts to Northern Long-eared and Indiana Bats. The Northern Long-eared Bat is a federally threatened species, and the Indiana Bat is federally and state endangered. Both species are protected by applicable laws. These species hibernate in winter in caves, mine openings and sink holes. They roost in fall, spring and summer typically in trees greater than 5 inches dbh (diameter basal height) but can be found roosting under bridges, in tunnels, building structures or in rock/rock-like faces. The identified assemblies have potential to affect these species and Avoidance and Minimization Measures (AMMs) including time of year restrictions may be necessary. All operators, employees, and contractors working on assemblies in areas where these species may be present must be provided briefing materials (Publication 546A) prior to initiating the activity. If a bat is encountered, then all work activities will cease immediately. The District Project Manager and/or District Environmental staff will notify the US Fish and Wildlife Service and further agency consultation in accordance with applicable laws will be coordinated. Consult the Threatened and Endangered Species Desk Reference (Publication 546) for standard operating procedures for the avoidance of adverse effects to these federally listed bat species.

Assembly #	Assembly
621-2541-01 Through 621-2549-01	FHWA Disaster Recovery (Federal Aid Routes)
663-2541-01 Through 663-2549-01	FEMA Disaster Recovery (Non-Federal Routes)
711-7325-01	Repair or Replacement of Structures under 8’ in length
711-7332-01	Roadway Section Restoration, Gabions and Retaining Walls, Install/Repair
711-7333-01	Roadway Section Restoration, Repair Sink Holes/Slides
711-7426-03	Structural Repair or Replace Tunnel Roof/Ceiling Girders
711-7425-01 thru 711-7460-01	Bridge Maintenance Cost Functions
714-7715-01	Vegetation Management Brushing, Selective Thinning, Tree Removal and Tree Trimming
714-7715-02	Vegetation Management Brushing, Selective Thinning, Tree Removal and Tree Removal Mechanized

A summary of the required AMMs is available as Publication 546A. Publication 546A should be reviewed during scheduled maintenance training, weekly planning meetings, and/or at the beginning of performing the transportation activity.

Sources

Eastern Small-Footed Bat

PGC Eastern Small-footed bat (*Myotis leibii*) – Fact sheet (PGC, 2014)
https://www.pgc.pa.gov/Wildlife/EndangeredandThreatened/Pages/EasternSmall-FootedBat.aspx

PGC Wildlife Note on Bats: Eastern Small-footed (*Myotis leibii*) – Fact sheet (PGC, 2017)
https://www.pgc.pa.gov/Education/WildlifeNotesIndex/Pages/Bats.aspx

PNHP Eastern Small-footed bat (*Myotis leibii*) – Fact Sheet (PNHP, 2007)
http://www.naturalheritage.state.pa.us/factsheets/11450.pdf

PGC Wildlife Action Plan (WAP, 2015), Species Accounts (Appendix 1.4): Eastern Small-footed Bat
https://www.pgc.pa.gov/Wildlife/WildlifeActionPlan/Pages/default.aspx

PGC. 2016. *Eastern Small-Footed Bat (Myotis leibii) Environmental Review Guidance Document.* Prepared Pennsylvania Game Commission Bureau of Wildlife Habitat Management & Bureau of Wildlife Management. 26 Jul 2016.

Tricolored Bat (eastern pipistrelle)

PGC Wildlife Note on Bats: Tri-colored Bat (*Perimyotis subflavus*) – Fact sheet (PGC, 2017)
https://www.pgc.pa.gov/Education/WildlifeNotesIndex/Pages/Bats.aspx

PGC Wildlife Action Plan (WAP, 2015), Species Accounts (Appendix 1.4): Tricolored Bat
https://www.pgc.pa.gov/Wildlife/WildlifeActionPlan/Pages/default.aspx

Little Brown Bat

PGC Wildlife Note on Bats: Little Brown Bat (*Myotis lucifugus*) – Fact sheet (PGC, 2017)
https://www.pgc.pa.gov/Education/WildlifeNotesIndex/Pages/Bats.aspx

PGC Wildlife Action Plan (WAP, 2015), Species Accounts (Appendix 1.4): Little Brown Bat
https://www.pgc.pa.gov/Wildlife/WildlifeActionPlan/Pages/default.aspx

USFWS. 2016. *Status Review for the Eastern Subspecies of the Little Brown Bat (Myotis lucifugus lucifugus)*. Prepared for U.S. Fish and Wildlife Service. Prepared by Karl Tinsley. 21 Nov 2016.

Indiana Bat

PGC Indiana bat (*Myotis sodalis*) – Fact sheet (PGC, 2010)
http://www.pgc.pa.gov/Wildlife/EndangeredandThreatened/Pages/IndianaBat.aspx

PGC Wildlife Action Plan (WAP, 2015)
https://www.pgc.pa.gov/Wildlife/WildlifeActionPlan/Pages/default.aspx

USFWS ECOS Species Profile for Indiana bat (*Myotis sodalis*) (USFWS, 2019)
https://ecos.fws.gov/ecp0/profile/speciesProfile.action?spcode=A000

Northern Long-Eared Bat

PGC Wildlife Note on Bats: Northern Long-eared Bat (*Myotis septentrionalis*) – Fact sheet (PGC, 2017)
https://www.pgc.pa.gov/Education/WildlifeNotesIndex/Pages/Bats.aspx

USFWS Northern Long-Eared Bat (*Myotis septentrionalis*) – Fact sheet (USFWS, 2015)
https://www.fws.gov/midwest/endangered/mammals/nleb/nlebfactsheet.html

USFWS ECOS Species Profile for Northern Long-Eared Bat (*Myotis septentrionalis*) (USFWS, 2019a)
https://ecos.fws.gov/ecp0/profile/speciesProfile.action?spcode=A0JE

USFWS New Jersey Field Office – Northern Long-eared Bat (*Myotis septentrionalis*) (USFWS, 2019b)
https://www.fws.gov/northeast/njfieldoffice/endangered/NLEbat.html

APPENDIX 1

Pennsylvania Game Commission
Eastern Small-Footed Bat
(*Myotis leibii*)
Environmental Review
Guidance Document

Pennsylvania Game Commission
EASTERN SMALL-FOOTED BAT
(*Myotis leibii*)
ENVIRONMENTAL REVIEW
GUIDANCE DOCUMENT


Photo: G. Turner

Prepared By:

Pennsylvania Game Commission
Bureau of Wildlife Habitat Management
& Bureau of Wildlife Management

July 26, 2016

CONTENTS

EASTERN SMALL-FOOTED BAT

This document provides information that can be used to identify eastern small-footed bats, their summer day roost habitat, suitable bat hibernacula, verify presence at roost habitat, verify winter hibernacula use, and explain how to manage the habitats that support the species. The following guidance has been developed to ensure the protection of eastern small-footed bats and their associated habitats, to provide consistence during the environmental review process, establish best management practices, and enhance and create habitat for the species. Coordination with the Pennsylvania Game Commission (PGC) should occur prior to conducting any suitable habitat or presence/absence survey. The methods prescribed in this document are the minimum effort required and if the methods are not followed as presented, the PGC may not accept the results.

STATUS

Eastern small-footed bats are widespread throughout their range, however, they are considered rare because of spotty distributed and low population numbers (Barbour and Davis 1969). In Pennsylvania, eastern small-footed bats were listed as threatened by the state in the 1980's due to an apparent population decline between the 1930's and 1970's (Felbaum et al. 1995). In recent years eastern small-footed bats have been shown to be susceptible to White-nose Syndrome (Turner et al. 2011, Moosman et al. 2013) and habitat loss and degradation (Gargas et al. 2009, Hayes and Loeb 2007). Eastern small-footed bat population declines of 100 percent may be attributed to WNS at Hailes Cave, New York between 2005 and 2008 (Hicks et al. 2008) The PGC has jurisdiction over wild birds and mammals and is mandated by Title 34 (Game and Wildlife Code) to protect these species.

IDENTIFYING CHARACTERISTICS

Eastern small-footed bats are Pennsylvania's smallest bat, ranging from 3 to 6 grams (Harvey and Redman 2003), with a length from 7.3 to 8.5 cm, and a wingspan from 21 to 25 cm (Erdle and Hobson 2001; Amelon and Burhans 2006). As their name suggest, eastern small-footed bats have feet measuring less than 8 mm (Barbour and Davis 1969). Eastern small-footed bats have a prominent keeled calcar (Best and Jennings 1997). Their fur is black at the root with brown shiny tips giving them a golden sheen (Best and Jennings 1997). A completely black face and ears contrast with the bat's light back fur providing a mask (Barbour and Davis 1969). Sexes are similar in size and coloration. This species flies slowly and erratically, usually low to the ground (Harvey et al. 1999). The following photos show the eastern small-footed bat's black mask, small foot, and keeled calcar.


Photo: G. Turner


Photo: G. Turner


Photo: G. Turner

LIFE HISTORY

During the spring and summer, eastern small-footed bats roost in crevices of buildings, bridges, caves, mines, hollow trees, tunnels, rock crevices, beneath rocks, and in rocky outcrops (Barbour and Davis 1969; MacGregor and Kiser 1998; Amelon and Burhans 2006; Johnson et al. 2011, Moosman et al. 2013). Over 65 day roost locations have been identified through PGC permitted telemetry surveys conducted on eastern small-footed bats in Pennsylvania. Ninety-five percent of the roosts were within rocky habitat, 3% were in buildings, and 2% were in trees. Males and females have different criteria for summer roost selection, with males typically roosting singly or in small groups while females form small colonies (Erdle and Hobson 2001). Both males and females change roost sites often, requiring an abundance of suitable roosting locations within their home range (Johnson et al. 2011). Little information is readily accessible via published research regarding home range estimates for eastern small-footed bats. Johnson et al. 2009 radio telemetry surveys on four female *Myotis leibii* in Maryland yielded home range size ranging from 10.2 to 99.7 ha using 95 percent fixed kernel method. Data collected through PGC permitted telemetry surveys on 18 eastern small-footed bats (6 males and 12 females) in Pennsylvania have yielded a mean home range of 191 hectares (472 acres) using the 95 percent fixed kernel method with a range of 0.1 to 828 hectares (0.2 to 2046 acres).

Hibernation for eastern small-footed bats is generally from mid-November through March, being one of the last to enter hibernation and the first to exit in the spring (Barbour and Davis 1969). Eastern small-footed bats overwinter in hibernacula that include caves and mines. They are generally found close to the entrance where it tends to be colder and drier than other areas of the hibernacula. These bats hibernate solitarily in rock crevices and beneath rocks within the hibernacula (Barbour and Davis 1969). In Pennsylvania, the largest number of eastern small-footed bats documented in one hibernaculum post-WNS is 23 bats, however, this is not typical as the majority of hibernacula in which eastern small-footed bats have been documented only containing one to four bats of this species (Turner and Scafini 2015). Eastern small-footed bats exhibit a high site fidelity to hibernacula from year to year (Gates et al. 1984). Migration distances between winter hibernacula and summer foraging areas area not well documented in the literature. One small telemetry study of four female eastern small-footed bats exiting their winter hibernaculum migrated 0.1-1.1 km to day roosts (Johnson and Gates 2009). Careful

interpretation of these short migration distances should be taken because of the small sample size and proximity of day roost habitat to this hibernaculum (Jonson and Gates 2009), however, wing morphology of eastern small-footed bats is consistent with other bat species having short migration distances (Johnson and Gates 2009, Farney and Fleharty 1969, and Fleming and Eby 2003).


Photo: G. Turner


Photo: G. Turner

Eastern small-footed bats are nocturnal foragers and primarily forage over water sources where concentrations of nocturnal insects are high (MacGregor and Kiser 1998). These bats are dietary generalists that feed primarily on soft-bodied prey by hawking prey in flight or gleaning prey off of a surfaces (Moosman et al. 2007)

Breeding occurs in the fall and the spermatozoa are stored in the uterus of hibernating females until spring ovulation after which a single pup is born in May or June (Barbour and Davis 1969; Amelon and Burhans 2006; Best and Jennings 1997). Lifespans in the wild are estimated to be about 12 years (Hitchcock 1965). Mean annual survival rates differ significantly between sexes, with males having greater survival rates (75.7 percent) than females (42.1) (Hitchcock et al. 1984).

HABITAT SUITABILITY ASSESSMENTS

The PGC reviews thousands of projects (cell towers, pipe lines, housing and commercial developments, wind farms, transportation projects, mining, etc.) every year for potential impacts to wildlife and their habitat. When the PGC has records of eastern small-footed bats in the vicinity of the project area, the first step is to determine if suitable summer and winter habitat is present within or adjacent to the proposed project area. In order to determine if suitable habitat is present within or adjacent to a project area, the PGC has developed a Habitat Suitability Assessment (HSA) for eastern small-footed bat summer day roost habitat as well as an assessment for potential hibernacula. PGC staff will evaluate the data collected during these assessments to determine if summer and/or winter habitat exists in or the vicinity of the project area. All data should be collected by biologists with knowledge of eastern small-footed bat habitat requirements. Draft survey plans should be submitted to the PGC at least 30 days prior to the start of the survey for PGC review and approval. Survey reports must be submitted to the PGC no later than December 31 of the year the assessment was conducted. ***If the PGC methods outlined below are not used, the results may not be accepted and could cause project delays.***

SUMMER DAY ROOST HABITAT ASSESSMENT

The PGC may request a Summer Day Roost Habitat Assessment be completed following the protocol in Appendix A. The PGC will use the survey report to determine if any additional surveys and/or mitigation is necessary. The following should be included in the report:

1. The name of the biologist(s) that conducted the work, the firm they represent, and the date(s) the HSA was conducted.

2. A map and GIS shapefile(s) that illustrates the limits of the project area and delineates each area of surface rock located both within and adjacent to the project area. All surface rock on and within 1000 feet of the project area should be identified.

3. A narrative description of each area of surface rock that is encountered that is illustrated via the mapping outlined in Item 2 above, that includes the following:

a. Total acreage of each area of surface rock;
b. Estimated canopy cover over the surface rock;
c. The amount and size of crevices available for roost sites;
d. Presence of organic material, soil, or water within those crevices;
e. Additional details not easily conveyed via photos; and
f. Reasons specifying why surface rock encountered is deemed suitable or not suitable as day roost habitat.

4. Representative color photographs of all surface rock encountered during the assessment and delineation, regardless of whether the surface rock is considered to be potential day roost habitat or not (numerous photos for each area of surface rock are strongly recommended). A photo location and orientation map should be provided.

WINTER HIBERNACULA HABITAT ASSESSMENT

The PGC may request a Winter Hibernacula Habitat Assessment be completed using the PGC's *Protocol For Assessing Bat Use of Potential Hibernacula* (Appendix B). Prior to an assessment being conducted, project proponents should access cave and mine databases to determine if any known active mines, abandoned mines, or natural cave features are present on or within 1000 feet of the proposed project. Please note, that mining records may not be accurate, subsidence or reclamation may have occurred, and therefore ground truthing the project area is necessary to determine if features are located in the vicinity of the project. The criteria for dismissing a cave or mine opening as being suitable habitat can be found in Appendix B. The PGC will use the survey report to determine if any additional surveys and/or mitigation is necessary. The following should be included in the report:

1. The name of the biologist(s) that conducted the work, the firm they represent, and the date(s) the HSA was conducted.

2. A map and GPS coordinates of all mine or cave features investigated.

3. A narrative description of each opening, that includes the following:
   a. Photo of the opening
   b. Size of the opening
   c. Airflow coming in or out of the opening
   d. Estimated length of tunnel or cave, if it is safely accessible
   e. Evidence of flooding or collapses
   f. Reason opening deemed unsuitable, if applicable

SPECIES SURVEYS

The PGC may request species-specific surveys as deemed necessary based on the proposed project area and/or results of habitat assessments. The surveys are designed to require a minimal amount of effort while using standard and proven methods to locate species. Draft survey plans should be submitted to the PGC at least 30 days prior to the start of the survey for PGC review

and approval. Survey reports must be submitted to the PGC by December 31 of the year the survey was conducted. ***If the PGC methods outlined below and in Appendix B and C are not used, the results may not be accepted and could cause project delays.***

SUMMER DAY ROOST EMERGENCE COUNT SURVEY

Appendix C outlines the Summer Day Roost Presence/Absence Survey methods acceptable to the PGC. Summer Day Roost Presence/Absence Surveys can only be conducted from mid-June through July, therefore project proponents should plan accordingly.

HIBERNACULA ASSESSMENT SURVEYS

All mine and cave openings deemed suitable based on the results of the habitat suitability assessment will need to conduct presence/absence surveys following the methods outlined in the PGC's *Protocol for Assessing Bat Use of Potential Hibernacula* (Appendix B). Trapping surveys at hibernacula are to be conducted between September 15 and October 15, therefore project proponents should plan accordingly. A PGC Special Use Permit will need to be obtained by the consultant in order to conduct such surveys that involve the handling of bats.

SUMMER MIST NET AND TELEMETRY SURVEYS

Summer mist net and telemetry surveys may be requested based on project location and habitat assessment results. Mist netting and telemetry must follow the methods outlined in the *PGC's Bat Surveyor Packet,* which is provided with the PGC's survey request. These surveys are to be conducted between May 15 and August 15, therefore project proponents should plan accordingly. A PGC Special Use Permit will need to be obtained by the consultant in order to conduct such surveys that involve the handling of bats.

HABITAT MANAGEMENT AND ENHANCEMENT

The PGC recommends the following best management practices be implemented to the greatest extent practicable, unless otherwise noted, to ensure the protection to eastern small-footed bats. Since conditions and circumstances vary among projects, recommendations may vary from these guidelines on a case-by-case basis.

- Avoid habitat disturbance within 1000 feet of all known eastern small-footed bat hibernacula. Disturbance includes but is not limited to tree removal, blasting, prescribed burns, etc. that may alter the hibernacula and/or disturb bats hibernating within.

- Avoid disturbing or the removal of any known and suitable eastern small-footed bat summer day roost habitat.

- Provide forested corridors to connect roost habitat and hibernacula to streams, rivers, and foraging habitat.

- Retain a riparian buffer of at least 150 feet on each side of stream, pond, wetland, etc. to protect foraging habitat.

- Removal of suitable day roost habitat, which cannot be avoided and must be removed to facilitate the project, should be removed between November 16 and March 31 in order to avoid impacting roosting bats. Project proponents must coordinate with the PGC prior to the removal of any suitable day roost habitat as mitigation will likely be necessary for such unavoidable impacts.

- Closing of mine or cave portal openings, which must be done in coordination with both PGC and USFWS, in which bat use has not documented but the feature does meets the PGC and USFWS criteria of a potential hibernaculum, should be completed between May 15 and August 30.

- The creation of eastern small-footed roost structures can be done voluntarily on sites with excessive quantities of rock generated from some projects. This can potentially save project proponents the cost of removing excess rock off-site. Appendix D details the roost structure specification and provides examples of constructed structures.

- Keep areas around known and created summer roost habitat clear of vegetation to ensure that overgrowth does not prohibit necessary solar exposure.

- Limit high-volume foliar application of herbicide within 50 feet of any known or created eastern small-footed bat summer roosts or hibernacula openings.

- Mitigation for impacts to eastern small-footed bats and their habitats will be determined by the PGC on a case-by-case basis. Mitigation projects must be reviewed and approved by the PGC. The PGC will have the opportunity to review and monitor all aspects of the mitigation measures throughout the lifetime of the project. Appendix D details roost structure specifications and provides examples of summer roosting habitat mitigation.

CONCLUSIONS

The PGC follows a process of determining if suitable habitat is present, determining the presence or absence of the species, and working to avoid and minimize potential impacts to the species. In order to accomplish these tasks, this information has to be collected using the standardized methods outlined in this document. The data collected will be used by the PGC to determine what actions (if any) need to be taken in regards to a particular project. The determinations of potential impacts and the recommendations on how to avoid and minimize such impacts are specific to each project.

Additional information can be obtained by calling the PGC, Division of Environmental Planning and Habitat Protection at 717-783-5957.

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APPENDIX A - SUMMER DAY ROOST HABITAT SUITABILITY ASSESSMENT

PENNSYLVANIA GAME COMMISSION
EASTERN SMALL-FOOTED BAT SUMMER DAY ROOST HABITAT SUITABILITY ASSESSMENT (HSA)

1. Project Name:

2. Date(s) of Eastern Small-footed Bat HSA:

3. Contact Information for Biologist(s) completing the HSA (attach resume(s) and/or qualifications):
   Name:
   Company
   Address:
   Phone:
   Email:

4. Project Contact Information:
   Name:
   Company:
   Address:
   Phone:
   Email:

5. A map and GIS shapefile(s) that illustrates the limits of the project area and delineates each area of surface rock located both within and adjacent to the project area. All surface rock on and within 1000 feet of the project area should be identified.

6. A narrative description of each area of surface rock that is encountered that is illustrated via the mapping outlined in Item 2 above, that includes the following:
   a. Total acreage of each area of surface rock
   b. Estimated canopy cover over the surface rock
   c. The amount and size of crevices available for roost sites
   d. Presence of organic material, soil, or water within those crevices
   e. Additional details not easily conveyed via photos
   f. Reasons specifying why surface rock encountered is deemed suitable or not suitable as day roost habitat.

7. Representative color photographs of all surface rock encountered during the assessment and delineation, regardless of whether the surface rock is considered to be potential day roost habitat or not (numerous photos for each area of surface rock are strongly recommended. A photo location and orientation map should be provided.

APPENDIX B – PROTOCOL FOR ASSESSING HIBERNACULA

PROTOCOL FOR ASSESSING BAT USE OF POTENTIAL HIBERNACULA
(*PGC/USFWS Revised 9/10/12*)

RATIONALE: A typical cave or mine portal survey is an attempt to determine presence or probable absence of bats; it does not provide sufficient data to determine population size or structure, or to determine the number, type or relative abundance of bat species using a hibernaculum. Following these guidelines will standardize procedures for bat surveys at caves and mine portals. Although the capture of an endangered or threatened bat confirms its presence, failure to catch an endangered or threatened species solely using this protocol does not absolutely confirm its absence.

ASSESSING SUITABILITY OF CAVES / ABANDONED MINES FOR BAT SURVEYS: In general, a cave or mine opening can be dismissed from bat surveys under any of the following circumstances:

- There is only one horizontal opening, and it is less than 6 inches in diameter, and no or very little airflow is detected.
- The opening is a vertical shaft less than 1 foot in diameter.
- The passage continues less than 50 feet and terminates with no fissures that bats can access. (This assumes the passage is safe enough to enter, and has been thoroughly inspected.)
- The mine is prone to flooding, collapsed shut and completely sealed, or otherwise inaccessible to bats.
- It is a "new" opening, which has occurred recently (less than 1 year old) due to subsidence.

Additional notes: Bats can access mines via old open buildings such as a fan house. Foliage and other vegetation in front of mine openings do not stop use by bats. They can navigate through foliage. Collapsed entrances with multiple crevices between boulders, etc. are accessible to bats and should be sampled. Collapses completely sealed with fine soil are of course inaccessible to bats.

SAMPLING DATES, TIMES AND TEMPERATURE CRITERIA

- Sampling will be conducted between September 15 and October 15
- Sampling will start ½ hour before sunset and continue for at least 5 hours. This applies for all sampling methods (harp-trapping, mist-netting, use of bat detectors, *etc*.)
- During each sampling period, weather must provide for:
    - Temperatures >50ºF (10ºC) for first 2 hours of sampling and must not fall below 35ºF (1.7ºC) before the end of the first 5 hours of sampling.
    - At least 3 hours free of rain.
    - At least 3 hours free of high wind.
- Sampling will be conducted for at least 3 evenings (do not have to be consecutive), with at least 1 of the 3 sampling events occurring between September 25 and October 10.
- Noise and the shining of lights will be kept to a minimum with no smoking around the sample site. The use of radios, campfires, running vehicles, punk sticks, citronella candles

and other disturbances will not be permitted within 300 feet of site during surveys.

- Before conducting surveys, local residents and/or law enforcement agencies should be informed of the scheduled nighttime activities.

EQUIPMENT: *No equipment, litter or other debris will be left unattended at site that could result in the capture or entanglement of any animals. Any equipment stored at site between sampling sessions will be clearly labeled with contact information.*

Harp Trap (first choice): Place in front of opening and block surrounding space with plastic sheeting or bird netting. Traps should be tended at least once per hour. When the catch rate is high (>25 bats per hour) or during inclement weather, traps should be tended more frequently.

Mist Nets (second choice): 50 denier, 38mm mesh. Place in front of or around openings that cannot be harp-trapped. Nets need to be monitored closely and checked at least once every 10 minutes. At sites with a heavy bat swarm, the net should be monitored continuously.

Bat Detector: In addition to the harp trap or mist nets, an ultrasonic bat detector should be on site to monitor bat activity when trapping or netting, and assess the general effectiveness of the harp trap or mist-net placement. Detector should be pointed toward cave or mine opening, approximately 5 to 15 feet from the entrance to detect swarming bats and bats going in/out of opening. Bat passes should be monitored and tallied on an hourly basis throughout the entire sampling period (≥ 5 hours). Reporting format will be: Start and end time for each 1-hour interval and bat passes for that hour.

Alternative Monitoring Techniques: In situations where it is too dangerous to approach an entrance, night vision/infrared/thermal-imaging recording devices should be used to monitor and record bat activity to determine bat use of the site. However, this should be done in conjunction with acoustic monitoring (use of an ultrasonic bat detector, see above), so bats can be identified to species. Bat activity in or around the entrance can be monitored by counting bat passes with a bat detector, or night vision/infrared video tapes can be recorded to provide actual counts of bats entering and exiting the opening. Bat passes should be monitored and tallied on an hourly basis throughout the entire sampling period (≥ 5 hours). Reporting format will be: Start and end time for each 1-hour interval and bat passes for that hour.

REPORTING: In addition to reports for the client, the Pennsylvania Game Commission requires copies of the report as part of their permitting requirements. To simplify data entry, mandatory sampling summary forms are also required by the PA Game Commission for bat surveys within the Commonwealth. Provide copies of these reports and completed forms to both the PGC and USFWS. If the bat surveyor did not receive a copy of the data form with the permit, the form can be obtained by contacting: Pennsylvania Game Commission, Bureau of Law Enforcement, Technical Services Division, 2001 Elmerton Avenue, Harrisburg, PA 17110-9797, (717) 787-5740.

INTERIOR WINTER HIBERNACULA SURVEYS: Sites that are determined to be safe for entry to conduct winter counts (primarily caves & stable hard rock mines) will be coordinated with the Pennsylvania Game Commission, Wildlife Diversity Section and scheduled for interior surveys between January 1 and March 10. Contact information for the Wildlife Diversity Section is: PA Game Commission, Bureau of Wildlife Management, Wildlife Diversity Section, 2001 Elmerton Avenue, Harrisburg, PA 17110-9797, (717) 787-5529.

APPENDIX C – EMERGENCE COUNT SURVEY PROTOCOL AND DATA SHEETS

PENNSYLVANIA GAME COMMISSION
EASTERN SMALL-FOOTED BAT SUMMER ROOST EMERGENCE COUNT SURVEY PROTOCOL

Eastern small-footed bats (*Myotis leibii*), a state threatened species, roost under rocks and in crevices of rock bluffs, rocky cliffs, talus slopes, shale fields, buildings, and bridges during the day. The following survey protocol is a framework for conducting surveys to determine presence or absence of the species as part of the ongoing efforts to protect eastern small-footed bats. The following survey should be conducted after the Pennsylvania Game Commission (PGC) has indicated the potential for adverse impacts to eastern small-footed bats as a result of a proposed project. Coordination concerning potential impacts to state-listed endangered and threatened birds and mammals (i.e. PNDI Environmental Reviews) is completed through the PGC's Bureau of Wildlife Habitat Management, Division of Environmental Planning & Habitat Protection located at 2001 Elmerton Avenue, Harrisburg, PA 17110.

A study plan should be submitted to the PGC at the above address at least 30 days prior to initiating the survey for review and approval. The study plan should include maps delineating all areas to be surveyed, observation locations, anticipated survey schedule, a list of the individuals that will be completing the survey along with their experience, and equipment to be used to conduct the survey.

SURVEY METHODS

Eastern small-footed bat day roost surveys should be conducted between June and July. Each potential day roost should be surveyed a minimum of 3 times, with the first survey occurring in mid-June, the second survey occurring the second week of July, and the final survey occurring the last week of July. Each survey should begin ½ hour before sunset and continue for two hours, or until lighting diminishes to a point at which the surveyor can no longer see. Emergence counts should be conducted when the starting temperature is 60^{o} or greater and wind codes are less than 4. A PGC Bat Emergence Form (Appendix C) should be completed for each emergence count at each potential day roost.

PGC Form:
WD-DR-02/13

PA GAME COMMISSION
Wildlife Diversity Section
Day Roost Data Sheet

Section 4

1-

Landowner: **Name:** _____ **Address:** _____

Phone: _____ _____

2-BAT INFO

Dates on Roost: _____ **Day Roost Number:** _____

(Date = Date bat was on roost; Roost No.= Bat # & numbered roost, in sequence, for that bat ~ 241PGC-01)

Surveyors: _____ **Type:** Tree - Building - Rock - Other _____

(Describe rock and other roost structures)

Bat Species: _____ **Band No.:** _____ **Transmitter Frequency:** _____

Ht.(m) bat is roosting off ground: _____ Was Bat Emergence Form Completed? **YES - NO**

Comments: *(Where is bat roosting? Under bark? If building-describe)*

_____

3-LOCATION

County: _____ **Quadrangle:** _____

Latitude: _____(DMS) **Elevation (ft.):** _____

Longitude: _____(DMS) **%Slope:** **Slope Aspect (0-360):**

Datum: Nad27 (preferred) NAD83 / WGS84 (circle one)

4-Roost INFORMATION *(If other than tree, indicate rock, rock cliff, house, barn etc. for species)*

Species: _____ **DBH (cm):** _____ Is Tree Alive? **YES - NO** *(CIRCLE)*

Height: (%UP _____ + %DOWN _____) X Dist.(m) to tree _____ = _____ m *(For Trees)*

1st Branch Ht. *(%UP _____ + %DOWN _____) X Dist.(m) to tree _____ = _____ m* *(For Trees)*

Estimate % Canopy Cover Around Roost: _____

Is suitable roost area exposed to direct sunlight? **YES - NO** *(circle one)*

If so - estimate # of hours of exposure to direct sun: _____

Azimuth of Exposure (which way does exposed part of roost face): _____ *(1-360)*

For Trees:

Exfoliating Bark? **YES - NO** **Estimate % of tree with Exfoliating Bark:** _____ **%**

Cavities? **YES - NO If yes - Describe:** _____

5-SURROUNDING HABITAT

Distance (m) to Water: _____ **Water Type:** _____

Understory Species: _____

Overstory Species: _____

6-Comments *(Comment on Overstory Species, Habitat Composition and non-tree roosts. Use back if needed)*

PGC Form:
WD-EM-02/13
Section 4

PA GAME COMMISSION, Wildlife Diversity Section
Bat Emergence Form

*** It is important to keep lights and noise disturbance to a minimum during the emergence period. ***

ROOST NO.:_____ **DATE:**_____

ROOST TYPE: Building - Tree - Rock - Other _____

Surveyors:_____

_____

Transmittered Bat Band No.:_____ **Transmitter Frequency:**_____

Weather **Temperature:**_____ ***F**

Sky Condition Code:_____ **Wind Scale Code:**_____

Sky Conditions

Code	
0	Clear or a few clouds
1	Partly cloudy/variable sky
2	Cloudy (broken) or overcast
4	Fog or smoke
5	Drizzle
7	Snow
8	Showers

Beaufort Wind Scale

Code	MPH	Indicators
0	<1	Smoke rises vertically
1	1-3 mph	Smoke Drift shows wind direction
2	4 - 7 mph	Wind felt on face/leaves rustle
3	8 - 12 mph	Leaves&sm.twigs in constant motion
4	13 - 18 mph	Raises dust & loose paper
5	19 - 24 mph	Small trees in leave sway

Night Vision Equipment Used? **YES - NO** Bat Detector Used? **YES - NO**

Telemetry Equipment Present? **YES - NO**

Time Surveyors arrived at Roost :_____ ***(use 24 hour clock for times)***

Time First Bat Seen Flying:_____

Time Transmittered Bat Emerged:_____ **And Azimuth Last Detected:**_____

Time Last Bat Seen Emerging:_____ **Total Emergence Count:**_____

Comments: *(include other emergence observations, weather, bat behavior, etc.)*

APPENDIX D – REPLACEMENT ROOST STRUCTURE DOCUMENT

Pennsylvania Game Commission
Eastern Small-footed Bat
(*Myotis leibii*)
Replacement Roost Structure Document

Prepared By:

Pennsylvania Game Commission
Bureau of Wildlife Habitat Management

August 2014

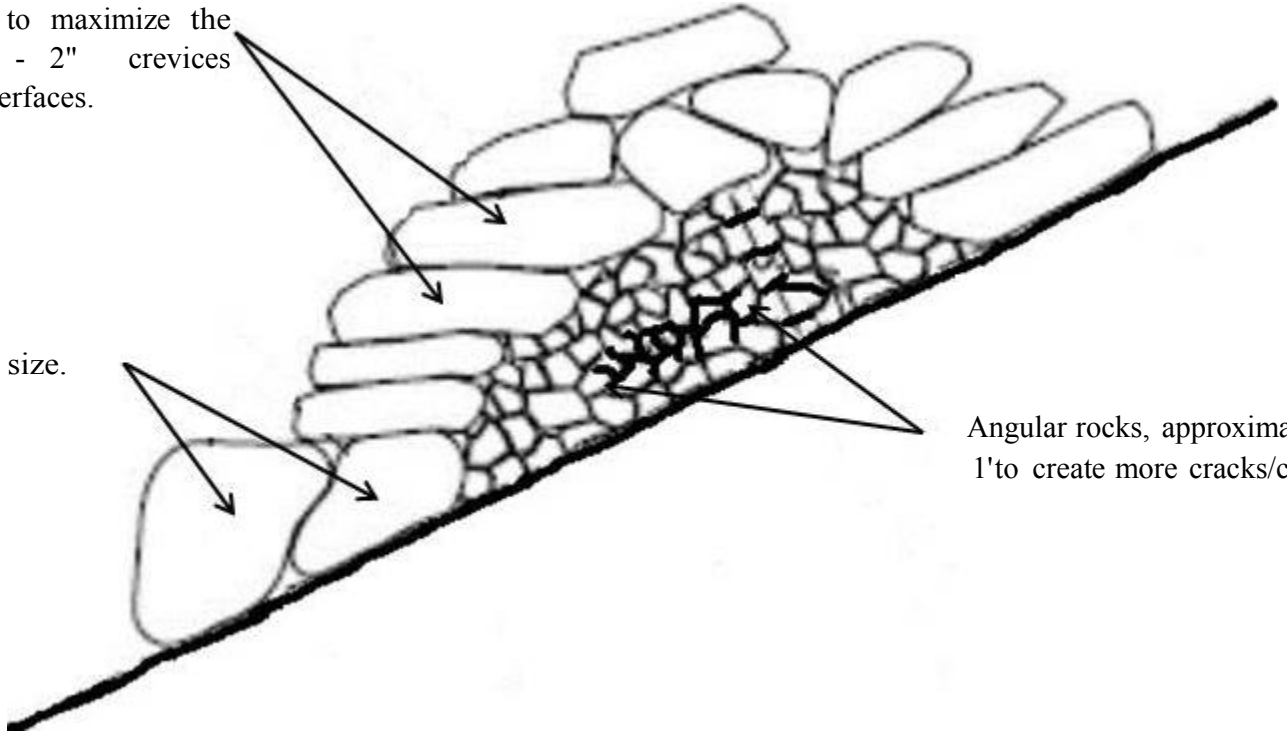
Included within this document are:

1. *Diagram of eastern small-footed bat roost structure*
2. *Roost structure dimensions and composition*
3. *Roost structure placement*
4. *Examples of created structures*

Diagram of Eastern Small-footed Myotis Roost Structure

Large, platy rock of varying size, placed such as to maximize the creation of 1" - 2" crevices between rock interfaces.

Footer rocks 3' – 5' in size.



Angular rocks, approximately 1' by 1'to create more cracks/crevices.

Section View
Not to Scale

Rock Pile Dimensions & Composition

Basal Diameter: 20 to 30 feet
Height: 7 to 10 feet
Side Slopes: 2:1

The piles should begin with a rock core measuring a minimum of 10 feet wide and 5 feet tall, consisting generally of 1-foot by 1-foot angular rock to create numerous interior cavities and crevices. The core is then covered by an exterior composed of multiple layers of large, flat rock of varying sizes carefully placed to maximize the creation of 1 to 2-inch crevices between shingled rocks. The best exterior crevice design is 1 to 2-inch openings that taper to almost nothing, with ¼-inch interior portions to provide security from predators (i.e. snakes). Preferably, the exterior cap rocks should not exceed 4 feet in length/width, should have a minimum length/width of at least 2 feet, a maximum thickness of 18 inches, and a minimum thickness of 6 inches. However, as long as the cap rock has dimensions that will allow it to be shingled with other cap rocks, and is large enough or sufficiently secured by other cap rocks to minimize shifting or movement by humans, these cap rock dimensions are rather flexible.

Relatively clean rock (i.e. separate rock from organic material and dirt/mud prior to placement) should be used for both the interior and exterior of the piles, and the shingling of the exterior rock should be completed to keep precipitation and organic material out of the piles. Unless working in a karst area, the use of limestone should be avoided, at least for the exterior cap rocks.

Rock Pile Placement

The structures must be constructed where they will receive sunlight for the majority of the day. Exposures ranging from southeast to southwest (135^{o} to 270^{o}) are preferred for the creation of summer roost habitat. Although they need solar exposure, the piles also need to be placed close to forested or early successional habitat to provide cover and travel corridors for emerging bats. Roost structures placed in open fields or other large open areas where bats will have to travel considerable distances before reaching cover should be avoided due to the higher risk for predation. When placed at the edges of utility rights-of-way or the edges of other clearings, generally the northern or eastern side of those clearings will provide the best opportunities for proper solar exposure. Proximity to perennial sources of water, such as 2nd or 3rd order streams or larger rivers, larger wetlands/bodies of water, or areas with high concentrations of wetlands/bodies of water is also preferred, especially where the structures can be placed within a ¼-mile of these resources. In addition to forested or early successional cover being necessary immediately next to the structures, more extensive forested tracts for foraging are also preferable within a ½-mile radius of the structures.

If multiple structures will be constructed in a given area, the spacing between the piles should be roughly the basal diameter of the structures being constructed. However, ensuring proper solar exposure should take precedent over maximizing spacing between structures. Especially where optimal exposure can be achieved and acreage is available, the grouping of a number of piles would be preferable to evenly spacing the piles along a corridor (i.e. 3 groups of 3 to 4 piles vs. 10 piles evenly distributed across the landscape). Roost structures should be placed as close as possible to existing roost habitat (when present), or the impacted roost habitat (when applicable). However, roost structures should be separated as far from human disturbance as possible (i.e. compressor stations, higher volume roads, developments, etc.).

These two photos show examples of a good roost structure. Eastern small-footed bats were documented using the completed structures. Please note that rocks do not need to be spread around the vicinity of the roost structures as in this example.

These examples of roost structures were clustered in the area with optimal solar exposure. These structures documented eastern small-footed bats using the structures months after construction was completed.

Here is another example of an eastern small-footed bat roost structure. This structure was constructed away from the tree line to ensure adequate solar exposure.

This example of an eastern small-footed bat roost structure was constructed away from the wood line in an area that provides adequate solar exposure to all sides of the structure. The bottom photo shows the crevices in the cover stones that provide access to the small interior rocks.

Bog Turtle User's Guide

User's Guide for the Pennsylvania Transportation Action Programmatic Consultation for Bog Turtle

Version 4.0, December 2019

Federal Highway Administration
U.S. Fish and Wildlife Service
Pennsylvania Department of Transportation

Table of Contents

1. Introduction

This document provides implementation guidance for the U.S. Fish & Wildlife Service (USFWS) programmatic biological opinion (BO) based on the PennDOT/FHWA programmatic biological assessment (BA), *Effects of Transportation Actions on the Bog Turtle within the Commonwealth of Pennsylvania*.

This user's guide provides:

- **Programmatic Scope and Effects Analysis Summary:** Actions appropriate for use of the bog turtle programmatic consultation and key effects analysis decision points;
- **Standard Operating Procedure (SOP) for Project(s) Submission:** Guidance for project submission under the bog turtle programmatic consultation for FHWA and its designated non-federal representative, PennDOT; and SOPs for the USFWS review and tracking of the bog turtle programmatic consultation;
- **Project Submittal Form**: A form for transportation agencies to use for submitting project level information to the Pennsylvania USFWS Field Office (**Appendix 2**);
- **Avoidance and Minimization Measures**: A summary of avoidance and minimization measures (AMMs) to reduce the potential effects of projects, consistent with the scope of the bog turtle programmatic consultation (**Tables 4** and **5**); and
- **IPaC Assisted Determination Key:** A web-based tool to assist in the identification of potential project effects on the bog turtle and applicable AMMs to reduce potential impacts to the bog turtle (**in development**).

The USFWS encourages all parties who plan to use the bog turtle programmatic consultation to review the BA and BO if there are questions regarding interpretation. These documents contain detailed information on the proposed action, an analysis of the potential effects to the species and their resources, and support of affect determinations. These and implementation documents relevant for compliance for the bog turtle programmatic consultation in Pennsylvania are available at the USFWS Pennsylvania Field Office website at: https://www.fws.gov/northeast/pafo/.

1.1. Bog Turtle [*Glyptemys (Clemmys) muhlenbergii*] Description and Life History

Identification Characteristics

- Small-sized (4-inch adult shell length)
- Dull brown upper shell (carapace) can vary from rough to smooth
- Lower shell (plastron) can vary from rough to smooth and is generally dull brown with white/yellow starbursts
- Each section of the shell may exhibit annual growth rings (annuli), especially younger individuals
- Shells of older turtles typically appear smooth or polished

- Has a black head with a very characteristic orange skin patch on the neck, can be yellow or white in some individuals. Coloration tends to be more vibrant in younger individuals and duller in older individuals.

Pennsylvania Habitat

- Typically occur in open-canopy, herbaceous sedge meadows, fens, wet pastures, and sphagnum bogs bordered by or interspersed with scrub-shrub and forested components
- Supporting habitats typically characterized by ample sunlight, high evaporation rates, high humidity in the near-ground microclimate, and perennial saturation of portions of the ground by slow-moving water often forming a network of shallow pools and rivulets
- Majority of the wetlands occupied by the species are located in agricultural areas and subject to grazing by livestock
- Due to the lack of pristine habitat resulting from anthropogenic[1] disturbance and plant succession processes throughout its range, the species can become accustomed to disturbed, low-quality wetland complexes which continue to maintain a persistent groundwater discharge regime
- Have been observed to be transients in forested habitat associated with springs and small streams leading to more open marshes. Forested habitat areas, as well as, headwater riparian corridors may be utilized as dispersal corridors to other wetlands.
- Extant populations are documented throughout a 17-County Range in Southcentral, Southeastern, and Northeastern PA

Natural History

- Bog turtles rely upon different portions of the wetland and surrounding habitats at different times of year to fulfill various needs
- Species become particularly active during spring emergence (late-March through mid-April), mating (mid-April through mid-June), and nesting (late May to early July)
- Eggs are often laid in elevated areas, such as the tops of tussocks and pedestal vegetation with open exposure to sunlight
- Are generally sedentary during the heat of summer (aestivation), and then become more active in the pre-brumation period (September through early-October) in preparation for, and movement to their hibernaculum
- Bog turtles are generally sedentary during the winter brumation period (mid-October through late-March)
- Will overwinter in typical fen/wetland habitat (under root mats of woody vegetation, submerged rock crevices, under tussocks and sphagnum bog mats), as well as streambanks in habitats which lack, or are deficient in typical hibernaculum microhabitat
- Average home range estimates for the species acquired from various research efforts have ranged from 0.05 to 0.13 acre (NatureServe 2017)
- Bog turtles are known to use streams as travel corridors and avenues for dispersal into new, unoccupied wetlands
- Have also been observed traveling overland through cornfields and pine plantations, across roadways, and through other terrestrial upland habitats
- Omnivorous and will feed on a variety of items including worms, slugs, insects, and plant materials

[1] Caused by humans activity.

Reasons for Species Decline

- Loss, degradation, and fragmentation of specialized habitat type due to land development, infrastructure, and natural succession
- Land development and infrastructure may result in barriers which isolate populations
- Isolated populations often decrease in size until extirpated
- Illegal collection and trade
- Invasive species
- Reptile pathogens

2. Programmatic Scope and Effects Analysis Summary

The range-wide programmatic consultation can be used for transportation activities[2] conducted by PennDOT, in coordination with FHWA and other state and federal agencies, that may affect the bog turtle (federally listed as threatened) within the extant range in Pennsylvania (**Figure 1** and **Table 1**). FHWA, the federal agency that supports PennDOT in the design, construction and maintenance through the Federal Aid Highway Program with approvals, reviews, funding and other actions, will be considered the lead federal agency for all transportation activities regardless of whether other federal permits are required, such as U.S. Army Corps of Engineers (USACE) permits under the Clean Water Act. FHWA (the lead agency), and PennDOT (as its non-federal representative) may use this programmatic consultation for included activities, or complete individual consultation, or use any other applicable programmatic consultation for their actions on a case-by-case basis.

The programmatic BO is designed to streamline the consultation process, and as such is the recommended consultation process. When the required information is provided, and the project qualifies for programmatic coverage, informal consultations will be completed within 14 days and formal consultations will be completed within 30 days. Staffing shortages at the USFWS may result in some limited variations in the 30-day review time for formal consultations.

[2] Includes planned or programmed transportation improvement projects and maintenance activities.

Figure 1. Programmatic consultation range and extant range of the bog turtle in Pennsylvania[3].

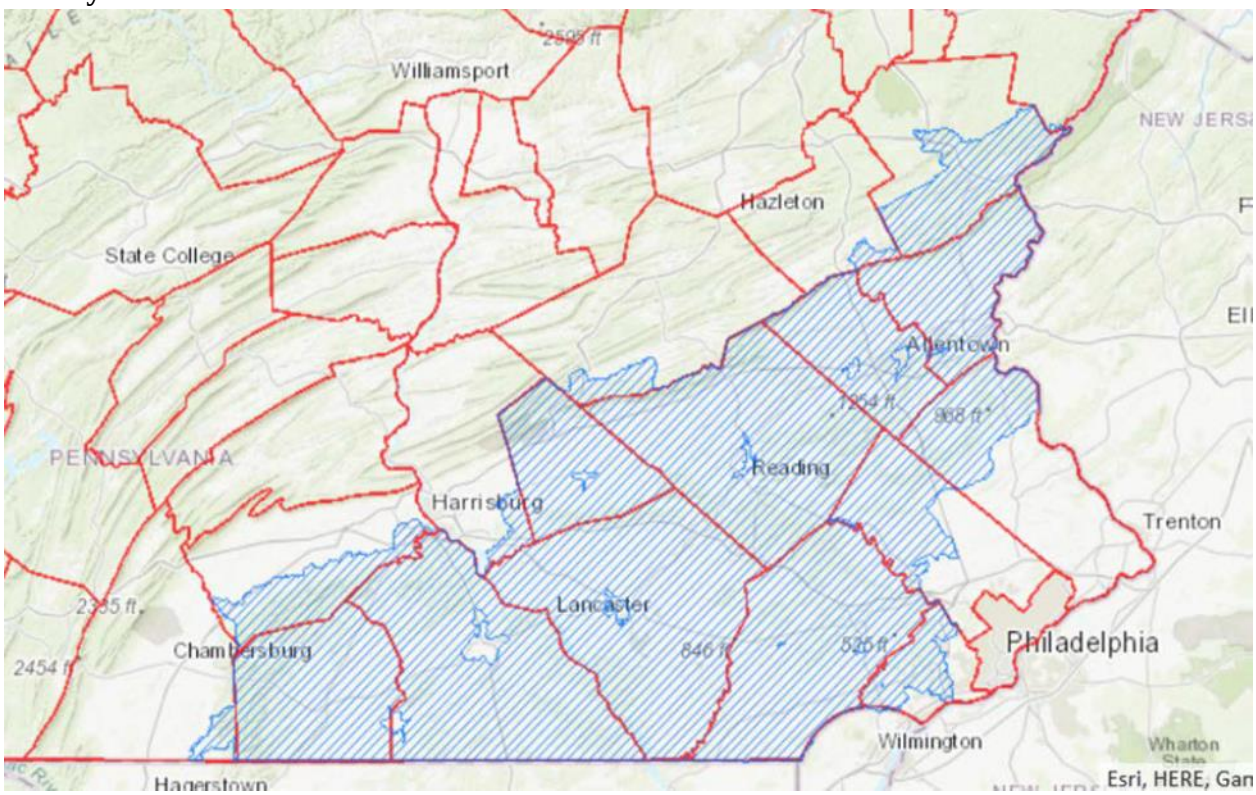


Table 1. Extant Range of the Bog Turtle Within Pennsylvania[3]

COUNTY	EXTANT RANGE	COUNTY	EXTANT RANGE
Adams	Entire County	Lancaster	Entire County excluding urban City of Lancaster
Berks	Entire County	Lebanon	Entire County
Bucks	Northern Watersheds	Lehigh	Entire County
Carbon	Aquashicola Creek Watershed	Monroe	Southern Watersheds
Chester	Entire County	Montgomery	Northern Watersheds
Cumberland	Southern Watersheds	Northampton	Entire County
Dauphin	Spring Creek and Conewago Creek Watersheds	Schuylkill	Swatara Creek Watershed
Delaware	In part (see Conservation Explorer Map)	York	Entire County excluding urban City of York
Franklin	Antietam Creek Watershed		

This programmatic consultation is generally all-inclusive for transportation activities, including routine maintenance activities and the construction of new roadways on new alignments. The intent is to cover the majority of transportation activities, however, some activities, upon USFWS review, may be determined to exceed the scope of the programmatic consultation and will require additional coordination or individual consultation. The ability and commitment to implement

[3] Changes to the extant range may occur. Utilizing an account login and selecting federal species/bog turtles the Conservation Explorer Planning Mapping (http://conservationexplorer.dcnr.pa.gov/content/map) will provide the most current range. The most current range will always be considered as the Action Area for this programmatic consultation.

avoidance and minimization measures (AMMs) is a key factor in the USFWS determination of whether a transportation activity is eligible to utilize the programmatic consultation, therefore, give full consideration to applying the AMMs relevant to your transportation activity. Transportation activities found ineligible for the programmatic consultation will require individual consultation, potentially including formal consultation, resulting in delays and cost increases.

2.1. No Effect

The USFWS, FHWA, and PennDOT have agreed that if any of the following are true, there is no effect of the transportation activity on the bog turtle. No AMMs related to the programmatic are required to be applied in these situations:

a. The activity is not within the extant range of the bog turtle as identified in **Figure 1** and **Table 1**[4]; or

b. The activity is a maintenance activity identified in **Table 2**; or

c. Wetlands are absent from the project area (including a 300-foot buffer around the limit of disturbance/limit of indirect effect); or

d. A Phase I habitat assessment (habitat assessment) of the project area (including a 300-foot buffer around the limit of disturbance/limit of indirect effect) conducted by a qualified bog turtle surveyor has determined the absence of species supporting habitat conditions; or

e. The transportation activity is within the main channel (within the ordinary high-water mark) of water courses greater than 30 feet in width with persistent cobble/boulder substrate[5]; or

f. The transportation action has been determined by the FHWA or PennDOT to completely avoid all potential effects on the species; or

g. A Phase II/Phase III Presence- Inferred Absence Survey (species survey) conducted by a qualified bog turtle surveyor has determined that the species is not likely to be present within the project area and the USFWS has concurred with these findings[6].

[4] Note that some urbanized areas within the counties depicted in Figure 1 are excluded. Updates to the extant range may occur. Utilizing an account login and selecting federal species/bog turtles in the Conservation Explorer Planning Mapping (http://conservationexplorer.dcnr.pa.gov/content/map) will provide the most current range. The most current range will always be considered as the extant range for this programmatic consultation. The PNDI Environmental Review Tool recognizes the most current extant range.

[5] Appendix 1 contains a listing of watercourses within the extant range that may have reaches greater than 30' wide with persistent cobble/boulder substrates.

[6] Conducting these surveys is not recommended or necessary to utilize the programmatic, however, if a survey has been conducted by others in the immediate vicinity, this available data may be useable as best available commercial and scientific data. Consider performing these surveys when the project activity is not eligible under the programmatic, or when AMMs cannot be implemented.

Table 2. Maintenance Assemblies with USFWS Agreement have NO EFFECT on Bog Turtles[7,8]

CODE	BRIEF DESCRIPTION
711-7114-01	Dust Palliative - Bit./Calcium Chloride/Other Product
711-7115-01	Patch/Base Repair
711-7113-01	Dust Palliative - Bit./Calcium Chloride/Other Product
711-7115-01	Patch/Base Repair
711-7121-01	Patching - Manual
711-7121-02	Patching – Manual (Emergency)
711-7121-03	Patching – Manual – Pipe Trenches
711-7121-04	Patching – Layered – Including Patch Machine
711-7122-01	Patching – Mechanical – Tow Paver
711-7122-02	Patching – Mechanical – Mixer Paver
711-7122-03	Patching – Mechanical – Paver Finisher
711-7122-04	Patching – Edge – Mechanical
711-7123-01	Surface Treatment – Mixer Paver
711-7123-09	Surface Treatment – Mixer Paver – Pre-Hauling
711-7124-01	Surface Treatment – Liquid Bituminous Mechanical
711-7124-02	Surface Treatment – Sand Bleeding Roads
711-7124-03	Surface Treatment – Slurry Seal and Ralumac and Nova Chip
711-7124-04	Surface Treatment – Liquid Bituminous – Seal Coat – Double Application
711-7124-09	Surface Treatment – Liquid Bituminous – Pre-Hauling
711-7126-01	Base/Subbase Repair – Flex. Base – Light Duty
711-7126-02	Base/Subbase Repair – Flex. Base – Heavy Duty
711-7126-03	Base/Subbase Repair – Rigid Base
711-7126-04	Base/Subbase Repair – Widener
711-7127-01	Skin Patch – Liquid Bituminous – Manual
711-7127-02	Skin Patch – Liquid Bituminous – Mechanical
711-7127-03	Skin Patch – Liq. Bit. Manual – Dist. and Spray Wand
711-7128-01	Crack Sealing – Bituminous Surface Lane
711-7131-01	Leveling – Tow Pav./Pav. Finish – Mechanical
711-7131-02	Leveling – Mixer Paver – Mechanical
711-7131-03	Leveling Course > 2" – Binder Finish Paver Mechanized
711-7131-09	Leveling – Mixer Paver – Pre-Hauling
711-7132-01	Milling – Bituminous Surfaces
711-7132-02	Spot Milling Only
711-7133-01	Recycling – Bituminous Surfaces
711-7134-01	Slurry Seal and Ralumac
711-7135-01	Surface Treatment – Plant Mix – Paver 1½
711-7135-02	Surface Treatment – Plant Mix ID3
711-7141-01	Concrete Patching – Full Depth
711-7141-02	Concrete Patching – Spalls
711-7147-01	Joint Sealing Concrete Roads Lane
711-7147-02	Joint Sealing Concrete Rds. – Pavement/Shoulders Separation Lane
711-7148-01	Stockpile Aggregate
711-7213-01	Stabilization – Add Material Mechanical
711-7214-01	Dust Palliative Bituminous or Calcium Chloride
711-7217-01	Stabilization – Add Material Manual
711-7221-01	Patching – Manual
711-7222-01	Patching – Mechanical – Plant Mix
711-7222-02	Surface Treatment – Pant Mix
711-7224-01	Surface treatment – Mechanical – Liquid Bituminous
711-7224-09	Surface Treatment – Liquid Bituminous – Pre-Hauling

[7] Refer to PennDOT Publication 113, Maintenance Foreman Manual for detailed descriptions

[8] Same description of activity regardless of the first three numbers indicated – program code may also be 612, 618, 621, 663, 712, 713, or 714

CODE	BRIEF DESCRIPTION
711-7225-01	Driveway Adjustment
711-7226-01	Base/Subbase Repair – Light Duty
711-7226-02	Base/Subbase Repair – Heavy Duty
711-7227-01	Skin Patching – Manual – Liquid Bituminous
711-7227-02	Skin Patching – Mechanical – Liquid Bituminous
711-7227-03	Skin Patching – Mech. – Liq. Bit. – Distr. and Spray Wand
711-7227-09	Skin Patching – Pre-Hauling
711-7232-01	Milling
711-7233-01	Recycling
711-7213-01	Stabilization – Add Material Mechanical
711-7213-09	Stabilization – Pre-Hauling
711-7214-01	Dust Palliative Bituminous or Calcium Chloride
711-7217-01	Stabilization – Add Material – Manual
711-7221-01	Patching – Manual
711-7222-01	Patching – Mechanical – Plant Mix
711-7222-02	Surface Treatment – Pant Mix
711-7224-01	Surface treatment – Mechanical – Liquid Bituminous
711-7224-09	Surface Treatment – Liquid Bituminous – Pre-Hauling
711-7225-01	Driveway Adjustment
711-7226-01	Base/Subbase Repair – Light Duty
711-7226-02	Base/Subbase Repair – Heavy Duty
711-7227-01	Skin Patching – Manual – Liquid Bituminous
711-7227-02	Skin Patching – Mechanical – Liquid Bituminous
711-7227-03	Skin Patching – Mech. – Liq. Bit. – Distr. and Spray Wand
711-7227-09	Skin Patching – Pre-Hauling
711-7232-01	Milling
711-7233-01	Recycling
711-7324-05	Drainage – Pipe Trenches Trench Restoration Manual
711-7324-09	Replace Pipes and Culverts – Pre-Hauling
711-7331-01	Side Dozing – Mechanical
711-7334-01	Graffiti Removal
711-7351-01	Rain or Wind Patrol
711-7431-01	Cleaning/Flush Deck
711-7431-02	Cleaning/Flush – Bearing and Super Structure
711-7431-03	Cleaning/Flush Open Grid
711-7432-01	Painting – Spot
711-7433-01	Seal – Joints (Liquid Only)
711-7433-02	Repair Joints
711-7434-01	Repair/Replace Guiderail/Median Barrier/Parapet
711-7435-01	Lubricate Bearings
711-7435-02	Repair/Replace Bearings
711-7435-03	Repair/Replace – Pedestal/Seat
711-7442-01	Repair/Replace – Approach Slab
711-7443-01	Repair/Replace Deck
711-7443-02	Repair/Replace Sidewalk/Curb
711-7444-01	Repair/Replace Deck Drainage
711-7459-01	Other Bridge Activities
711-7421-01	Washing
711-7422-01	Traffic Services – Traffic Incident Management
711-7422-02	Repair Tunnel Roadway Wearing Surface
711-7422-03	Repair/Replace Tunnel Barrier
711-7422-04	Tunnel Lane Signal
711-7422-05	Tunnel Signs
711-7422-06	Over Height Truck Warning System
711-7423-01	Lighting Systems – General Maintenance and Inspection
711-7423-02	Repair Tunnel Lighting Systems
711-7424-01	Electrical Systems – General Maintenance/Inspection (SWO)
711-7424-02	Electrical Systems – Switch Gear

CODE	BRIEF DESCRIPTION
711-7424-03	Electrical Systems – Motor Control Center
711-7424-04	Electrical Systems – Repair or Replace Transformer
711-7424-05	Electrical Systems – Repair or Replace Transfer Switch
711-7424-06	Electrical Systems – Panel Board
711-7424-07	Electrical Systems – Universal Power Supply
711-7426-01	Structural – General Maintenance/Inspection
711-7426-02	Structural – Tunnel Liner
711-7426-03	Structural – Tunnel Roof/Ceiling Girders
711-7426-04	Structural – Tunnel Cross Passageway
711-7426-05	Structural – Tunnel Interior Walls
711-7426-06	Structural – Tunnel Portals
711-7426-07	Structural – Invert Concrete Slab on Grade
711-7426-08	Structural – Tunnel Invert Girders
711-7426-09	Structural – Tunnel Joints
711-7426-10	Structural – Tunnel Structure Members
711-7427-01	Mechanical Systems – General Maintenance/Inspection
711-7427-02	Mechanical Systems – Ventilation Systems and Fans
711-7427-03	Mechanical Systems – Drainage and Pumping Systems
711-7427-04	Mechanical Systems – Emergency Generator Systems
711-7428-01	Fire/Life Safety Systems – General Maintenance/Inspection
711-7428-02	Fire/Life Safety Systems – Carbon Monoxide Monitoring System
711-7428-03	Fire/Life Safety Systems – Tunnel Fire Protection System
711-7428-04	Fire/Life Safety Systems – Emergency Communication System
711-7428-05	Fire/Life Safety Systems – Operations and Security Systems
711-7428-06	Fire/Life Safety Systems – Fire Protective Coatings
711-7428-07	Fire/Life Safety Systems – Concrete Protective Coating Systems
711-7429-01	Other – Tunnel Activities
711-7491-01	Hauling Non-Disabled Equip. – Lowboy Operation Only
711-9003-01	Under-Utilized Rented Equipment
711-9812-01	In-Service Training
712-7521-01	Plowing, Applying Material/Chemicals - Mechanized
712-7522-01	Snow and Ice Control - Other
712-7523-01	Anti-Icing Operations
712-7524-01	Salt Brine Manufacture/Distribution
713-7611-01	Traffic Line Painting – Mechanized Yellow
713-7612-01	Traffic Line Painting – Mechanized
713-7613-01	Pavement Marking – Hand Operated Machine
713-7614-01	Raised Pavement Markers
713-7615-01	Pavement marking paint line eradication
713-7616-01	Pavement marking thermoplastics installation
713-7617-01	Repair Paint Machines – Crew Only
713-7618-01	Pavement Marking Small Paint – Waterborne Site
713-7618-02	Pavement Marking Small Paint – Durable
713-7619-01	Other Pavement Marking activities
713-7621-01	Construction Detour and Other Temporary Signs
713-7622-01	Delineations, Hazard
713-7623-01	Sign Reviews
713-7624-01	Regulatory, Warning and Guide Signs Under 16 Sq. Feet
713-7624-02	Regulatory, Warning and Guide Signs Over 16 Sq. Feet
713-7625-01	SR and Segment Markers
713-7629-01	Other – Sign Activities
713-7631-01	Repair/Removal – Low-tension Cable Barrier (Old Style – Non-Tensioned)
713-7631-02	Guide-Rail Repair/Replace – W-Beam; Mechanized
713-7631-03	Guiderail Repair/Replace Manual
713-7631-04	Guider Rail Upgrade Remove Cable/Replace with W-Beam; Mechanized
713-7631-05	Guiderail Resetting W-Beam Guide Rail; Mechanized
713-7632-01	Guiderail Removal
713-7632-02	Guiderail Removal – Dept. Force/Contract install

CODE	BRIEF DESCRIPTION
713-7633-01	High-Tension Cable Median Barrier
713-7639-01	Median Barrier/Guiderail Impact Attenuation Devices; Other
713-7671-01	Traffic Services – Lighting/Highway, Bridge and Sign Lighting Systems
713-7681-01	Sweeping; Manual/Mechanized
713-7682-01	Deer Removal
713-7683-01	Traffic Services-Homeland Security
713-7689-01	Other – Incidental Service Activities
714-7715-01	Brushing, Selective Thinning, Tree Removal, and Tree Trimming
714-7715-02	Brushing, Tree Trimming, and Tree Removal; Mechanized
714-7715-03	Herbicide Basal Bark and Cut Stump
714-7716-01	Revitalization – Seeding and Soil Supplement; Mechanized
714-7717-01	Wildflowers (formerly Wildflower Planting)
714-7731-01	Maintenance of Interstate Roadside Rests with All-Weather Buildings
714-7732-01	Maintenance of Roadside Rest, Table Sites, Overlooks, Scenic Feature, and Park-and-Ride Lots
714-7735-01	Roadside Litter Pickup and Debris Removal/Routine
714-7735-02	Roadside Tire Remnant Removal – Debris Removal
714-9813-01	Special Roadside Litter Pick Up and Debris Removal/Great PA Cleanup
714-9848-01	Special Roadside Litter Pick Up and Debris Removal/Litter Brigade
714-9849-01	Special Roadside Litter Pick Up and Debris Removal/Adopt-A-Highway
719-9829-01	Maintenance Administration
719-9851-01	Hazardous Waste/Inventory Control
621-2542-01	FHWA Disaster Recovery (Federal Aid Routes)/Protective Measures
621-2543-01	FHWA Disaster Recovery (Federal Aid Routes)/Emergency Road Repairs
663-2542-01	FEMA Disaster Recovery (Non-Federal Routes)/Protective Measures
663-2543-01	FEMA Disaster Recovery (Non-Federal Routes)/Emergency Road Repairs

2.2. May Affect

To be eligible under this programmatic, transportation activities other than those having No Effect under Section 2.1[9] must include AMMs. When a transportation activity may affect the bog turtle, PennDOT/FHWA must determine whether the effect will be adverse.

When conducted within 300 feet of wetlands, the transportation maintenance activities listed in **Table 3** may affect the bog turtle and require consultation under the Endangered Species Act. These activities are eligible for the streamlined consultation process provided through this programmatic consultation. Maintenance activities[10] with potential for conflict with bog turtles are identified within the detailed assembly descriptions within PennDOT Publication 113. Applicable AMMs (**Table 5**) must be implemented for these activities to be eligible for bog turtle review and clearance. A summary of the required AMMs is also available as Publication 546C. Publication 546C should be reviewed during scheduled maintenance training, weekly planning meetings, and/or at the beginning of performing the transportation activity.

In most cases, the application of the prescribed and relevant AMMs included in the bog turtle programmatic to a transportation activity that may affect the bog turtle will result in a "not likely to adversely affect (NLAA)" determination.

Transportation activities that are "likely to adversely affect (LAA)" are those:

- Where the relevant prescribed AMMs cannot be implemented, for example an inability to implement a seasonal restriction appropriately; or
- That result in permanent effects to potential hibernacula microhabitat; or
- That result in permanent effects to potential foraging habitat; or
- When permanent modifications to the hydrology of supporting habitat will occur.

Transportation activities with these effects may result in a "take" of bog turtles and must be mitigated with the application of additional compensatory AMMs. In most cases these transportation activities are still eligible for processing through the bog turtle programmatic consultation. However, USFWS could find these transportation actions to be ineligible for the programmatic and require individual formal consultation (if that determination is made).

Table 4 summarizes the AMMs to be applied to programmatic categories (PCs) of transportation activities that may affect the bog turtle. **Table 5** provides the AMM descriptions.

The standard operating procedures for submission and review of transportation activities is essentially the same for NLAA and LAA as detailed in Section 3.

[9] Reminder: If wetlands are not present with 300 feet of the transportation activity, then the transportation activity has no effect on the bog turtle.

[10] Maintenance activities are also referred to as "assemblies".

Table 3. Maintenance Assemblies that MAY AFFECT Bog Turtles[11,12,13]

CODE	BRIEF DESCRIPTION
711-7112-01	Shaping
711-7113-01	Restabilization
711-7136-01	Pavement Widening BCBC Mechanized
711-7137-01	Pavement Widening Recycled Material – Mechanical
711-7151-01	Minor Risk Management/Safety
711-7212-01	Grading - Mechanical
711-7215-01	Cutting – Belt Loader
711-7215-02	Cutting – Front End Loader
711-7216-01	Upgrading – Paving Mechanized
711-7311-01	Cleaning – Inlet/Endwall/Basin – Manual/Mechanical
711-7311-02	Cleaning – Inlet Clogged
711-7312-01	Cleaning – Ditch/Drain Chan. Mech.
711-7312-02	Cleaning – Ditch/Drain Chan. Manual
711-7312-03	Cleaning – Swales – Mech.
711-7314-01	Cleaning Pipes and Culverts
711-7315-01	Install Rock Lining
711-7321-01	Replace Inlet and Endwall – Manual
711-7324-01	Replace Pipes and Culverts under 36 inches – Mech.
711-7324-02	Replace Pipes and Culverts over 36 inches– Mech.
711-7324-03	Replace/Install Parallel Pipe
711-7324-04	Drainage – Replacement/Installation Pipes Extension Only
711-7325-01	Repair/Replace Structure under 8-foot Length
711-7326-01	Repair Pipe and Culvert
711-7328-01	Install Subsurface Drain (U-Drain)
711-7332-01	Repair/Install Gabions/Ret. Walls
711-7333-01	Repair Sink Holes/Slides
711-7425-01	Repair/Replace – Bridge over Eight-Foot Length
711-7432-02	Painting - Full
711-7446-01	Repair/Replace – Superstructure Member
711-7447-01	Repair/Replace – Truss Member
711-7448-01	Repair/Replace Backwalls
711-7448-02	Replace/Repair Substructure
711-7448-03	Maintenance – Underpinning
711-7450-01	Maintenance – Repointing
711-7451-01	Repair/Replace Slopewalls
711-7452-01	Repair/Replace – Culverts
711-7453-01	Erosion Protection – Stream Bed/Rock/Deflector
711-7453-03	Erosion Protection – Culverts
711-7454-01	Const./Install – Temporary Supports
711-7455-01	Repair/Replace Slabs/Box Culvert
714-7711-01	Mowing
714-7711-02	Mowing – Tractor Type; Mechanized
714-7711-03	Plant Growth Reg. (PGRs) Herbicide Application
714-7712-01	Herbicide Application – Non-Selective
714-7713-01	Herb Application – Broadcast Foliage
714-7714-01	Herbicide Application: Broadcast Chemical Trimming (Fosamine)
621-2541-01	FHWA Disaster Recovery (Federal Aid Routes): Debris Clearance
621-2544-01	FHWA Disaster Recovery (Federal Aid Routes): Emergency Bridge Repairs
621-2545-01	FHWA Disaster Recovery (Federal Aid Routes): Emergency Shoulder Repairs
621-2546-01	FHWA Disaster Recovery (Federal Aid Routes): Emergency Pipe Installation
621-2549-01	FHWA Disaster Recovery (Federal Aid Routes): Other Costs
663-2541-01	FEMA Disaster Recovery: (Non-Federal Routes) Debris Clearance
663-2544-01	FEMA Disaster Recovery: (Non-Federal Routes) Emergency Bridge Repairs

[11] Refer to PennDOT Publication 113, Maintenance Foreman Manual for detailed descriptions

[12] Same description of activity regardless of the first three numbers indicated – program code may also be 612, 618, 621, 663, 712, 713, or 714

[13] If conducted in or near (within 300' of) wetlands occupied or assumed to be occupied by bog turtles

CODE	BRIEF DESCRIPTION
663-2545-01	FEMA Disaster Recovery: (Non-Federal Routes) Emergency Shoulder Repairs
663-2546-01	FEMA Disaster Recovery: (Non-Federal Routes) Emergency Pipe Installation
663-2549-01	FEMA Disaster Recovery: (Non-Federal Routes) Other Costs

Table 4. Transportation Action Effects and Applicable Avoidance and Minimization Measures (AMMs)

		Not Likely to Adversely Affect (NLAA) with AMMs									Likely to Adversely Affect (LAA)		
PROGRAMMATIC CATEGORY (PC)	**DESCRIPTION**	**AMMS 1-9**	**AMM 10**	**AMM 11**	**AMM 12**	**AMM 13**	**AMM 14**	**AMM 15**	**AMM 16**	**AMM 17**	**AMM 18**	**AMM 19 IN LIEU OF AMMS[14]**	**AMM 19 FOR OFFSET**
1A	Actions where temporary effects to potential hibernacula[15] are anticipated to occur without any hydrologic modification.	X	X		X	X	X	X	X	X		X	
1B	Actions where permanent effects to potential hibernacula microhabitat[14] are anticipated to occur without any hydrologic modification.	X	X		X	X	X	X	X	X	X	X	X
2A	Actions where temporary effect to potential foraging habitat[16] are anticipated to occur without any hydrologic modification.	X		X								X	
2B	Actions where permanent effects to potential foraging habitat[15] are anticipated to occur without any hydrologic modification.	X		X								X	X
3A	Actions which will occur during the seasonal period of April 1 – October 31 with exclusionary measures and without any permanent hydrologic impacts.	X			X	X	X	X	X	X		X	
3B	Actions which will occur during the seasonal period of November 1 – March 31 associated exclusively with stream corridors or upland habitats in the vicinity of occupied/assumed supporting wetland habitat without any permanent hydrologic impacts.	X		X									
4	Actions where the hydrology of supporting habitat will be permanently altered by the action, resulting in take due to modified hydrology.	X	X		X	X	X	X	X	X	X		X

[14] Requires USFWS concurrence

[15] Hibernacula microhabitat is typical fen/wetland habitat characterized by root mats of woody vegetation, submerged rock crevices, tussocks and sphagnum bog mats.

[16] Foraging habitat is wetland habitat not characterized by persistent groundwater discharge and deep mucky soil conditions.

Table 5. Take Avoidance and Minimization Measure (AMM) Descriptions

AVOIDANCE AND MINIMIZATION MEASURE	AMM REQUIRED FOR	DESCRIPTION
AMM 1	Any Transportation Activity (including maintenance activities identified in Table 3) in all Programmatic Categories (PCs) identified in Table 4.	Ensure that all wetland, bog turtle habitat and species surveyors, operators, employees, and contractors working in areas of known, or assumed occupied bog turtle habitat are aware of and implement all PennDOT environmental commitments, including all applicable AMMs, PA DEP permit conditions, USACE permit conditions, and Bog Turtle Health Bulletin (2015) equipment disinfection and infected specimen protocols. Sensitivity training and briefing materials will be provided to all applicable personnel prior to the initiation of the action. Sensitive resource signage will be placed at the site of the action to notify personnel of the potential presence of the species.
AMM 2	Any Transportation Activity (including maintenance activities identified in Table 3) in all PCs identified in Table 4.	All work associated with the action shall be conducted in accordance with the Erosion and Sediment Pollution Control Plan approved by the County Conservation District or PA DEP. Erosion and sediment control best management practices will be implemented before, during, and after all land disturbance to prevent the potential for asphyxiation and smothering of species individuals as well as accidental sedimentation and filling of adjacent wetland habitats that may potentially support the species. All erosion and sediment control features will be properly installed and maintained in accordance with the County Conservation District and PA DEP. The project site will be monitored daily, as is also required for all Chapter 102 and NPDES permitting, to ensure the erosion and sedimentation control practices are implemented and properly maintained, and to identify any project related impacts due to sediment accumulation. The daily inspection may be completed by the on-site environmental monitor/inspector or project foreman.
AMM 3	Any Transportation Activity (including maintenance activities identified in Table 3) in all PCs identified in Table 4.	All rock scour protection areas associated with an action will be completed in such a manner that precludes large voids for potential impingement and entrapment of species individuals. Any voids in the rock scour protection will be choked with smaller rock and mineral material in order to avoid the creation of potential traps for the species. All rock scour protection areas must be installed and depressed below the appropriate stream water elevation as conditioned by PA DEP authorization.
AMM 4	Any Transportation Activity (including maintenance activities identified in Table 3) in all PCs identified in Table 4.	A hazardous material construction spill avoidance/remediation plan (Spill Prevention Control and Countermeasure Plan – SPCC Plan) will be developed and implemented during the fulfillment of the transportation action. The project site will be monitored daily to ensure spill avoidance/remediation practices are implemented. The daily inspection may be completed by the on-site environmental monitor/inspector or project foreman.
AMM 5	Any Transportation Activity (including maintenance activities identified in Table 3) in all PCs identified in Table 4.	Project storage and staging areas will be located only in upland areas located as far as possible from wetland/watercourse habitat areas. This shall include all areas required for stockpiles, equipment storage, and parking.
AMM 6	Any Transportation Activity (including maintenance activities identified in Table 3) in all PCs identified in Table 4.	All public utilities potentially associated with the action due to the necessary relocation of their services will be notified of the potential presence of the species and their need to consult with the USFWS and Pennsylvania Fish and Boat Commission (PFBC) on their respective relocation activities.
AMM 7	Any Transportation Activity (including maintenance activities identified in Table 3) in all PCs identified in Table 4.	High visibility orange construction fencing shall be used to delineate avoidance areas during the action. The fencing will act as a visual warning to prevent construction equipment and personnel from entering and disturbing sensitive areas outside of the project limit of disturbance.
AMM 8	Any Transportation Activity (including maintenance activities identified in Table 3) in all PCs identified in Table 4.	In order to avoid the introduction and spread of invasive species into supporting habitats, minimize the duration of exposed soils, utilize erosion control blankets on disturbed areas immediately after project completion to minimize sedimentation, and promptly re-vegetate areas of temporary disturbance with native wetland or upland seed mixes dependent on the location of the disturbance. Thoroughly wash construction equipment and vehicles offsite, especially the undercarriage and wheels, before use within 300 feet of supporting habitat. Thoroughly wash temporary crossing measures such as composite matting or timber matting before use within 300 feet of supporting habitat.

AVOIDANCE AND MINIMIZATION MEASURE	AMM REQUIRED FOR	DESCRIPTION
AMM 9	Any Transportation Activity (including maintenance activities identified in Table 3) in all PCs identified in Table 4.	Specific coordination and construction operating procedures approved by the USFWS/PFBC shall be implemented in the event that a bog turtle is encountered during preconstruction exclusion surveys, on-site monitoring, or within the vicinity of the limit of disturbance (LOD) during the course of the action (i.e., construction). These specific procedures include the following: • If a turtle is encountered, then all construction activities within 300 feet of the capture will cease immediately. The District Environmental Manager and qualified surveyor will be contacted immediately to inform them of the encounter. • If the turtle appears dead or immobile, then the turtle will be left where it was initially observed. If the turtle appears to be mobile, then efforts will be made to mark the exact location where the turtle was found and temporarily contain the turtle until the qualified bog turtle surveyor can take possession of it. Temporary containment will consist of placing the turtle in a thoroughly clean bucket that has a depth of more than 18 inches. Pieces of native vegetation and 0.5 - 1 inch of water will be placed in the bucket with the turtle to keep the animal cool and hydrated. The bucket will be placed in a quiet, well- shaded area. The turtle will be handled as little as possible, and temporary containment must not exceed 6 hours. The qualified bog turtle surveyor will take possession of the turtle and identify the species as well as document the capture location and condition of the turtle. The qualified surveyor will conduct a thorough search of the area within and in the vicinity of the limit of disturbance of the action to determine if any other turtles may be in the construction area. The qualified surveyor will also inspect the exclusion barrier fencing and direct any repairs as needed. If there are breaches in the exclusion barrier and/or the turtle is identified as a bog turtle, then construction will not resume until coordination with the USFWS and PFBC is completed and all breaches in the exclusion barrier are repaired. If the qualified bog turtle surveyor identifies the turtle species as a bog turtle, then the surveyor will immediately notify endangered species biologists at both the USFWS and PFBC. The elapsed time for contacting both agencies will be as soon as possible but must not exceed 24 hours. Following the arrival of the qualified bog turtle surveyor at the project site, the turtle must be handled by the biologist according to the recommendations of the USFWS and PFBC. The qualified surveyor will consult with the USFWS and PFBC concerning the safe handling and necessary relocation of the turtle outside of the project disturbance area. Construction will resume only after the completion of this consultation. If the qualified bog turtle surveyor identifies the turtle as a species other than the bog turtle, and the turtle appears healthy, then the qualified surveyor will release the turtle unharmed no further than 300 feet from the site of discovery to a safe location outside of the limit of disturbance. Construction may continue once the turtle is relocated. If any turtle found appears injured or dead, the qualified bog turtle surveyor will coordinate with the USFWS and PFBC concerning the safe handling of an injured turtle and the taking of possession of the specimen whether injured or dead by one of these agencies. Construction will resume only at the completion of this coordination. In order to offset the adverse effects of the take, compensatory mitigation credits will be calculated in accordance with USFWS credit metrics and acquired from a USFWS approved conservation bank.
AMM 10	Any Transportation Activity (including maintenance activities identified in Table 3) when PC # 1A, 1B or 4 applies	In order to avoid the killing or harm of brumating bog turtles within hibernacula microhabitat during the species inactive period, the action will be completed during the active season for the species between April 1 and October 31.
AMM 11	Any Transportation Activity (including maintenance activities identified in Table 3) when PC # 2A, 2B or 3B applies	In order to avoid the killing or harm of bog turtles during the species active period, the action will be completed during the inactive season for the species between November 1 and March 31.

AVOIDANCE AND MINIMIZATION MEASURE	AMM REQUIRED FOR	DESCRIPTION
AMM 12	Any Transportation Activity (including maintenance activities identified in Table 3) when PC # 1A, 1B, 3A or 4 applies	In order to avoid the killing or harm of individual bog turtles during the species active period, a preconstruction exclusion survey to remove any bog turtle individuals within the LOD will be conducted by a USFWS/PFBC recognized-qualified bog turtle surveyor immediately prior to the commencement of the action. Exclusion surveys may also be necessary for the assembly/disassembly of temporary streamflow diversion measures; the placement of rock scour protection materials; and the internal confines of an existing bridge or culvert crossing structure. Any captured individuals will be relocated outside of the project disturbance area into suitable habitat. The USFWS/PFBC recognized-qualified bog turtle surveyor will oversee and supervise any necessary vegetation cutting or clearing (4 to 6 inches height) for the effective survey of the excluded area. All exclusionary surveys will be conducted according to the most current Phase 2/Phase 3 survey protocol(s) provided by the USFWS and PFBC.
AMM 13	Any Transportation Activity (including maintenance activities identified in Table 3) when PC # 1A, 1B, 3A or 4 applies	In order to avoid the killing or harm of individual bog turtles during the species active period, an exclusionary barrier (silt fence, super silt fence, adequate silt sock, sand bag wall, sheeting, Jersey barrier) will be erected immediately following the species exclusionary survey and prior to the commencement of the activity to isolate the disturbance area associated with the action (See Appendix D). Sand bag walls, sheeting, Jersey barrier, etc. may be necessary within watercourse channel environments to isolate in-stream disturbance areas. No other construction/maintenance activities may commence until the exclusionary barrier has been installed. The exclusionary barrier is to be installed a minimum of 6-inches into the underlying habitat where appropriate. The installation/removal of the exclusionary barrier must be completed by hand through wetland habitats. The installation/removal of the exclusionary barrier through upland habitats may be completed with the assistance of equipment. The exclusionary barrier shall be installed and removed under the supervision of a USFWS/PFBC recognized-qualified bog turtle surveyor. While in use, the exclusionary barrier shall be inspected daily to ensure its competency and function. The daily inspection may be completed by the on-site environmental monitor/inspector or project foreman. Straw bales, sand bags, or temporary fencing may be used as temporary barriers at ingress/egress locations to provide access to equipment/personnel through the exclusionary barrier. Should the exclusionary barrier become compromised during its use, then all construction/maintenance activities will cease until an exclusionary survey of the action area has been completed by a USFWS/PFBC recognized-qualified bog turtle surveyor and the compromise has been remediated. The exclusionary barrier is to be removed immediately following the completion of the action. The USFWS/PFBC recognized-qualified bog turtle surveyor will ensure that potential pitfalls are not created by trenching associated with the installation and/or removal of the exclusionary barrier.
AMM 14	Any Transportation Activity (including maintenance activities identified in Table 3) when PC # 1A, 1B, 3A or 4 applies	All temporary streamflow diversion measures must be implemented in a manner that will not result in the possible collection and entrainment of species individuals into pumping equipment.
AMM 15	Any Transportation Activity (including maintenance activities identified in Table 3) when PC # 1A, 1B, 3A or 4 applies	In order to avoid the killing or harm of species individuals during the species active period, a USFWS/ PFBC recognized-qualified bog turtle surveyor shall conduct inspections of spoil materials from excavation areas to ensure that species individuals are recovered and relocated.
AMM 16	Any Transportation Activity (including maintenance activities identified in Table 3) when PC # 1A, 1B, 3A or 4 applies	In order to avoid the killing or harm of individual bog turtles during the species active period, a USFWS/ PFBC recognized-qualified bog turtle surveyor will provide continuous monitoring during the active construction.
AMM 17	Any Transportation Activity (including maintenance activities identified in Table 3) when PC # 1A, 1B, 3A or 4 applies	A USFWS/PFBC recognized-qualified bog turtle surveyor will be retained throughout the duration of the transportation action to monitor the effectiveness of the implemented AMMs. The surveyor will also provide recommendations to PennDOT and the FHWA concerning the implementation of the necessary measures.
AMM 18	Any Transportation Activity (including maintenance activities identified in Table 3) when PC # 1B or 4 applies	To reduce the amount of take associated with the permanent loss of habitat, a salvage survey effort will be undertaken in conjunction with the USFWS/PFBC to relocate any individuals within the impact area prior to disturbance. Any recovered individuals will be relocated in suitable habitat a maximum of 300 feet from the impact area within the same drainage basin.

AVOIDANCE AND MINIMIZATION MEASURE	AMM REQUIRED FOR	DESCRIPTION
AMM 19	Any Transportation Activity (including maintenance activities identified in Table 3) when PC # 1B or 2AB applies or if approved by USFWS in lieu of other required AMMs	In order to offset the adverse effects for the permanent loss of supporting habitat and/or incidental take, compensatory mitigation credits will be calculated in accordance with USFWS credit metrics and purchased from a USFWS-approved conservation bank with receipt of credit purchase being provided to the USFWS prior to the start of any work. If a conservation bank has not yet been developed, PennDOT/FHWA may adopt an alternate equivalent mechanism, with USFWS concurrence.

3. Standard Operating Procedure (SOP) for Project(s) Submission

3.1. **Conduct a Pennsylvania Natural Diversity Inventory (PNDI) Review**. PNDI will identify the potential for a conflict under the jurisdiction of the USFWS if bog turtles may be present. Note that the PNDI has been refined so that projects or activities in urbanized areas in counties within the range of the species should not result in conflicts.

It is possible that a project or activity may potentially conflict with more than one federally listed species. It is important to coordinate with the USFWS for all federally listed species. This programmatic consultation addresses only the bog turtle and additional consultation processes will need to be completed for other species if identified. The PNDI conservation measures may provide additional insights in respect to the conflicts.

3.2. **Complete Project Submittal Form (PSF) or Bog Turtle Programmatic IPaC Effect Determination Key**. When the potential for a conflict with the bog turtle is evident by a PNDI environmental review receipt proceed with determining whether the proposed project adheres to the scope and criteria for the programmatic biological opinion utilizing the PSF[17] or when available the IPaC effect determination key (Dkey) as provided below. Note that the PSF is an interim submittal form process that will be replaced with the IPaC Dkey. Once the Dkey is available the PSF will be phased out.

3.2.1. **PSF Process**. (Complete PSF form found in **Appendix C**)

3.2.1.1. **No Effect**. Determine whether any of the no effect criteria detailed in section 2.1 apply. This will require knowledge of the project or activity details, identification of wetlands within 300' of the proposed activity and a phase I habitat assessment if wetlands are present[18]. If one of these criteria applies, your project or activity has no effect on the bog turtle. Document the file by completing the PSF and incorporate this result in NEPA and permitting documents as necessary[19].

3.2.1.2. **May Affect, Not Likely to Adversely Affect (NLAA) by Avoidance**. If a no effect determination does not apply, determine if the project will completely avoid all potential effects on the bog turtle. Provide supporting documentation and submit with a PSF to the USFWS for concurrence.

3.2.1.3. **May Affect, Not Likely to Adversely Affect (NLAA) by Negative Phase II/Phase III Bog Turtle Survey.** The basic premise of the bog turtle programmatic is the ability to assume presence and implement avoidance and minimization measures. This approach provides a streamlined review and reduced costs, therefore conducting a phase II/phase III bog turtle survey is not typical, and should only be pursued in consultation with BOPD-EPDS and FHWA in instances where the programmatic consultation may not be applicable. However, if a phase II/phase III survey has been

[17] The PSF is to be used only during the interim period prior to the IPaC Dkey being available.

[18] There is no requirement to complete a Phase II/III survey (see 2.1.7) and one should not be pursued without prior consultation with BOPD-EPDS and FHWA.

[19] The IPaC effect determination key (under development) will generate "no effect" correspondence.

conducted and the results indicate that the species is not present provide the results of the survey to USFWS with a completed PSF for concurrence in a NLAA.

3.2.1.4. **May Affect with Implementation of Avoidance and Minimization Measures.** If the no effect or NLAA effect determinations by avoidance or negative Phase II/III Survey do not apply, complete the sections of the PSF where the programmatic consultation is applicable only when appropriate AMMs are applied. Note that AMMs 1-9 must be applied to all projects requiring AMMs. Additional AMMs must be applied when applicable to the project or maintenance activity and habitat type specific to the project. Detailed project information and a habitat assessment are critical information for accurate completion of these sections of the form. In some infrequent cases, with the concurrence of the USFWS, compensatory mitigation may be permitted in lieu of seasonal restrictions if the seasonal avoidance measures cannot be applied.

Identify with an "X" all AMMs that will be applied to the project. These are project commitments and must be communicated to contractors, maintenance forces and included as special provisions in contracts. The commitments must be certified by the signature of the district environmental manager, ADE-design or district administrator. If it is later determined that one or more of these commitments cannot be met, the programmatic concurrence is void and consultation with the USFWS will need to be re-initiated.

If AMM 19, compensatory mitigation, is applied to the project it will be necessary to identify a commercial banker with USFWS approved available credits. If none are available, alternative mitigation should be discussed with the USFWS. Bog turtles should be present or likely to be present at compensatory mitigation sites. For this reason, the preservation of existing bog turtle sites by acquisition or the application of conservation easements are the most likely alternative mitigation opportunities to be accepted. Prior to preliminary identification of any sites coordinate with the USFWS to identify areas with known bog turtle populations requiring conservation.

The outcomes of application of the AMMs may be either NLAA or likely to adversely affect (LAA). The USFWS review under the programmatic consultation varies depending on whether the effect is a NLAA or a LAA as follows:

a. **NLAA**. USFWS has 14 calendar days to notify PennDOT if they determine a particular project does not meet the criteria for a NLAA. If reviewed before the 14-day period ends, the USFWS reviewer will send an email verification to expedite the project. If PennDOT is not so notified, they may proceed under the programmatic consultation. This process is to verify that the submitted project includes implementation of the required AMMs resulting in a NLAA.

b. **LAA.** If through completion of the PSF, the project submittal indicates that the effect of the project is LAA, the USFWS will respond within 30 calendar days to consultation requests completed by PennDOT, submitted prior to project

commencement, and accompanied by a complete PNDI and PSF. The USFWS review and response will include verification that the programmatic is applicable and that applicable AMMs are included in the project proposal; describe the anticipated incidental take; and, identify any project-specific monitoring and reporting requirements.

Monitoring requirements for LAA outcomes will include:

i. Two (1-year and 4-years post-construction) mark/ recapture surveys (using a qualified bog turtle surveyor) on all bog turtle wetlands with impacts (both temporary and permanent) to hibernating habitat following a USFWS approved protocol. The surveys will assess the extent of bog turtle reestablishment in the areas of impact and the overall status of the bog turtle population in the wetlands. The survey report will be submitted to the Service within 30 days of the survey being completed.

ii. Vegetation monitoring of impacted bog turtle wetlands (known sites and sites with assumed bog turtle presence) annually for a minimum of 3 years post-construction. FHWA/PennDOT will provide annual reports to the USFWS, including written and photo documentation of the site. The report will document the progression of revegetation, noting the types and densities of native and exotic plant species present. The presence of invasive species and/or non- native species within the site will be documented during each vegetation monitoring event. If invasive plants and/or non-native species are found within the former construction area, the applicant will prepare a proposal to implement an invasive species control plan in coordination with the USFWS.

3.2.2. **IPaC Effect Determination Key Process** (when available)

To begin the process, go to the Information for Planning and Conservation (IPaC) website at http://ecos.fws.gov/ipac/. Login to your IPaC account (first time users need to create an account and activate as directed) and follow these steps:

a. Under “My Projects,” select “Create a Project”;
b. Enter project location, define the area, confirm and select “Continue”;
c. A resources page will be displayed that provides trust resource information in the project action area;
d. Select "Define Project";
e. Give project name, description and “Save”;
f. The project home page will be displayed; select "Start Review", and then "Continue";
g. Skip the official species list step, do not request an official species list (This information is provided by the PNDI and is not required for using the assisted determination key);

h. A description will be displayed for the bog turtle programmatic Dkey that is applicable to the USFWS programmatic biological opinion;
i. Select “Check if my project qualifies”;
j. Answer the questions in the qualification interview (determining applicability of the programmatic);
k. A preliminary qualification determination is displayed, select “Save and Continue”;
l. Complete the project questionnaire (a series of questions requiring detailed project information, a phase I habitat survey, and ability to determine which AMMs/commitments will be applied to the project to complete) and select “Continue”;
m. The determination key result is displayed (No Effect, NLAA or LAA);
    1. If a NLAA, the USFWS Pennsylvania Field Office will receive notice of your project and will contact you within 14 days if necessary;
    2. If a LAA, the USFWS Pennsylvania Field Office will receive notice of your project and will respond within 30 days;
n. To generate IPaC automated correspondence for No Effect or NLAA:
    1. If you are a federal action agency (FHWA) or designated non-federal representative (PennDOT):
        i. Submit the project for “Concurrence Verification” to the USFWS,
        ii. Compete contact information and submit, a “No Effect or Concurrence Letter” will be generated;
        iii. Select “View Concurrence Verification Letter” (you may wish to print or save a copy for your files),
    2. If you are not an FHWA or PennDOT representative (e.g., consultant or local transportation agency):
        i. Request to generate a “Consistency Letter”,
        ii. Verify project name and description and select “Generate Consistency Letter”,
        iii. Select “View Consistency Letter” and save,
        iv. Provide consistency letter to PennDOT, the designated non-federal representative for submittal to the USFWS via IPaC;

For LAA determinations concurrence letters are not generated. A consistency letter may be generated for the file, however, USFWS must respond with correspondence to complete the consultation process.

Appendix 1

Large Watercourse Habitats with the Extant Range that May Include Reaches Greater than 30’ in Width with Persistent Cobble/Boulder Substrates

PENNSYLVANIA COUNTY	WATERCOURSE
Cumberland	Conodoguinet Creek
Adams and York	Conewago Creek
York	Codorus Creek
York	Muddy Creek
York	Yellow Breeches Creek
Dauphin, Schuylkill, and Lebanon	Swatara Creek
Lebanon	Quittapahila Creek
Lebanon and Lancaster	Conewago Creek
Lancaster	Conestoga River
Lancaster	Octoraro Creek
Chester	Brandywine Creek
Berks	Tulpehocken Creek
Montgomery	Perkiomen Creek
Bucks	Neshaminy Creek
Northampton	Bushkill Creek
Monroe	Big Bushkill Creek
Monroe, Northampton, Bucks, and Delaware	Delaware River
Lehigh and Northampton	Lehigh River
Dauphin, York, and Lancaster	Susquehanna River
Berks, Chester, Montgomery	Schuylkill River

Appendix 2

Project Submittal Form

Federal Highway Administration and
Pennsylvania Department of Transportation
Programmatic Consultation for
Effects of Transportation Actions on the Bog Turtle Project

Project Submittal Form (PSF)

The Federal Highway Administration (FHWA) and Pennsylvania Department of Transportation (PennDOT) must complete this submittal form (and documentation) to describe project-level information for use of the programmatic consultation covering transportation actions that May Affect the federally threatened bog turtle (*Clemmys muhlenbergii*). The completed project submittal form (PSF) should be submitted to the USFWS Pennsylvania Field Office prior to project commencement if the project may affect the bog turtle. The PSF will be maintained in the project file without submission to the USFWS for projects that are determined to have No Effect.

By submitting this PSF, the FHWA/PennDOT ensures that the proposed project adheres to the criteria and conditions of the programmatic consultation, as outlined in the biological assessment (BA) and biological opinion (BO). Upon submittal of this PSF, the Pennsylvania Field Office may review the project-specific information provided and request additional information. For projects that result in a No Effect determination, no submission to the USFWS is necessary. An electronic copy of all completed PSFs should be submitted to the PennDOT Environmental Policy and Development Section (EPDS) for tracking and annual reporting purposes.

For projects that May Affect but are Not Likely to Adversely Affect (NLAA), the bog turtle, if the USFWS does not respond with any questions or concerns within 14 calendar days of PSF submission, then it may proceed under the programmatic consultation and assume concurrence of the NLAA determination made by the Service in the BO. For projects that May Affect, and are Likely to Adversely Affect (LAA), the bog turtle, the USFWS will respond within 30 calendar days of receiving a complete project- level submission, which includes, but may not be limited to this completed PSF. A response from the Pennsylvania Field Office must be received prior to the commencement of a LAA activity.

Project Description

1. Date of Submission	
2. Project Representative	Name:
	Title:
	Organization:
	Phone Number:
	Email:
3. Project Name	
4. PennDOT Engineering District	
5. County	
6. Municipality	
7a. PNDI Environmental Review Number	7b. USFWS TAILS #
8. Project Description: (Attach Necessary Documentation, Engineering Plans, Habitat Assessment Reports, Survey Reports, List Maintenance Assemblies for Maintenance Activities, etc.)	

Programmatic Consultation Consistency Determination Rationale

I. NO EFFECT DETERMINATION (No submission to USFWS, submit an electronic copy to EPDS and retain PSF with documentation in project file)

(X)	Basis of Determination
	Project Not Located Within 300 Feet of Wetland OR Wetland within 300' has negative Phase I assessment signed by qualified bog turtle surveyor (QBTS) (*Submittal Form Complete*)
	Project Associated With Maintenance Activity Determined To Have No Effect on the Species. Publication 113 does not reference the bog turtle within the proposed assembly(ies). (*Submittal Form Complete*)
	Project Limited to the Main Channel of a Watercourse Greater Than 30 Feet In Width With Persistent Cobble/Boulder Substrate *(*Determination Does Not Apply to Adjacent Wetlands or Tributaries)* (*Submittal Form Complete*)

II. MAY EFFECT – NOT LIKELY TO ADVERSELY AFFECT DETERMINATION

(X)	Basis of Determination
	Wetland Phase I habitat assessment not done by QBTS AND Transportation actions which have been determined by the FHWA/PennDOT to completely avoid all potential effects on the species. Justification of this conclusion needs to be documented for consultation with the USFWS. *(Submit Form to USFWS - Documentation Must Be Provided to the USFWS for Concurrence)*

III. MAY EFFECT – NOT LIKELY TO ADVERSELY AFFECT DETERMINATION

(X)	Basis of Determination
	Negative Phase II/Phase III Bog Turtle Survey (*Submit Form to USFWS - Survey Results Must Be Provided to the USFWS for Concurrence*)

IV. MAY EFFECT – NOT LIKELY TO ADVERSELY AFFECT DETERMINATION WITH THE IMPLEMENTATION OF AMMs

(X)	Basis of Determination
	Transportation maintenance actions determined by FHWA/PennDOT to May Effect, and concurred in by the USFWS in the programmatic biological opinion if conducted in or near wetlands occupied or assumed to be occupied by bog turtles with application of AMMs 1-9. Alternatively, AMM 19 may be utilized with the concurrence of the USFWS instead of AMMs 1-9. Publication 113 identifies maintenance assembly(ies) that May Effect the bog turtle. *(Submit Form to USFWS)*

V. MAY EFFECT – NOT LIKELY TO ADVERSELY AFFECT DETERMINATION WITH THE IMPLEMENTATION OF AMMs – PROGRAMMATIC CATEGORY 1A ACTION

(X)	Basis of Determination
	For projects where temporary effects to potential hibernacula microhabitat are anticipated to occur then, in addition to AMMs 1-10, AMMs 12-17 must be applied where appropriate and applicable, for use of this programmatic consultation. Alternatively, AMM 19 may be utilized with the concurrence of the USFWS instead of the application of AMMs 1-0 and 12-17. *(Submit Form to USFWS)*

VI. MAY EFFECT – NOT LIKELY TO ADVERSELY AFFECT DETERMINATION WITH THE IMPLEMENTATION OF AMMs – PROGRAMMATIC CATEGORY 1B ACTION

(X)		Basis of Determination
		For projects where permanent effects to potential hibernacula microhabitat are anticipated to occur then, in addition to AMMs 1-10, AMMs 12-19 must be applied where appropriate and applicable, for use of this programmatic consultation. Alternatively, AMM 19 may be utilized with the concurrence of the USFWS instead of the application of AMMs 1-10 and 12-17. *(Submit Form to USFWS)*
#	Acres	Area of Permanent Habitat Impact

VII. MAY EFFECT – NOT LIKELY TO ADVERSELY AFFECT DETERMINATION WITH THE IMPLEMENTATION OF AMMs – PROGRAMMATIC CATEGORY 2A ACTION

(X)	Basis of Determination
	For projects where temporary effects to potential foraging microhabitat are not anticipated to occur, then AMMs 1-9 and AMM 11 must be applied where appropriate and applicable, for use of this programmatic consultation. Alternatively, AMM 19 may be utilized with the concurrence of the USFWS instead of the application of AMM 11. *(Submit Form to USFWS – Include Justification for USFWS if AMM 19 is Proposed)*

VIII. MAY EFFECT – LIKELY TO ADVERSELY AFFECT DETERMINATION WITH THE IMPLEMENTATION OF AMMs – PROGRAMMATIC CATEGORY 2B ACTION

(X)		Basis of Determination
		For projects where permanent effects to potential foraging microhabitat are not anticipated to occur, then AMMs 1-9, AMM 11, and AMM 19 must be applied where appropriate and applicable, for use of this programmatic consultation. Alternatively, AMM 19 may be utilized with the concurrence of the USFWS instead of the application of AMM 11. *(Submit Form to USFWS – Include Justification for USFWS if AMM 19 is Proposed)*
#	Acres	Area of Permanent Habitat Impact

IX. MAY EFFECT – NOT LIKELY TO ADVERSELY AFFECT DETERMINATION WITH THE IMPLEMENTATION OF AMMs – PROGRAMMATIC CATEGORY 3A ACTION

(X)	Basis of Determination
	For projects which will occur during the seasonal period of April 1 – October 31, then AMMs 1-9, and AMMs 12-17 associated with Exclusionary Measures must be applied where appropriate and applicable, for use of this programmatic consultation. Alternatively, AMM 19 may be utilized with the concurrence of the USFWS instead of the application of AMMs 12-17. *(Submit Form to USFWS – Include Justification for USFWS if AMM 19 is Proposed)*

X. MAY EFFECT – NOT LIKELY TO ADVERSELY AFFECT DETERMINATION WITH THE IMPLEMENTATION OF AMMs – PROGRAMMATIC CATEGORY 3B ACTION

(X)	Basis of Determination
	For projects which will occur during the seasonal period of November 1 – March 31 associated exclusively with stream corridors or upland habitats in the vicinity of occupied/assumed supporting wetland habitat, then AMMs 1-9, and AMMs 11 must be applied where appropriate and applicable, for use of this programmatic consultation. *(Submit Form to USFWS)*

XI. MAY EFFECT – LIKELY TO ADVERSELY AFFECT DETERMINATION WITH THE IMPLEMENTATION OF AMMs – PROGRAMMATIC CATEGORY 4 ACTION

(X)	Basis of Determination
	For projects where the hydrology of supporting habitat will be permanently affected by the action implementation of AMMs 1-9, AMM 10, and AMMs 12-19 are required for the use of this programmatic consultation. *(Submit Form to USFWS)*

PROGRAMMATIC AMMs COMMITTED FOR IMPLEMENTATION WITH THE TRANSPORTATION PROJECT

(X)	AVOIDANCE AND MINIMIZATION MEASUREs
	AMM 1 - Ensure that all operators, employees, and contractors working in areas of known, or assumed occupied bog turtle habitat are aware of all PennDOT environmental commitments, including all applicable AMMs, PA DEP permit conditions, and USACE permit conditions. Sensitivity training and briefing materials should be provided to all applicable personnel prior to the initiation of the action. Sensitive resource signage will be placed at the site of the action to notify personnel of the potential presence of the species.
	AMM 2 - All work associated with the action shall be conducted in accordance with the Erosion and Sediment Pollution Control Plan approved by the County Conservation District or PA DEP. Erosion and sediment control best management practices will be implemented before, during, and after all land disturbance to prevent the potential for asphyxiation and smothering of species individuals as well as accidental sedimentation and filling of adjacent wetland habitats that may potentially support the species. All best management practices will be properly installed and maintained in accordance with the County Conservation District and PA DEP. The project site will be monitored daily to ensure the erosion and sedimentation control practices are implemented and properly maintained, and to identify any project related impacts due to sediment accumulation.
	AMM 3 - All rock scour protection areas associated with an action will be completed in such a manner that precludes large voids for potential impingement and entrapment of species individuals. Any voids in the rock scour protection will be choked with smaller rock and mineral material in order to avoid the creation of potential traps for the species. All rock scour protection areas must be installed and depressed below the appropriate stream water elevation as conditioned by PA DEP authorization.
	AMM 4 - All storage and dispensing of vehicular fuels and fluids will occur at least 300 feet from the action's limit of disturbance and any aquatic habitats present. A hazardous material construction spill avoidance/remediation plan (Spill Prevention Control and Countermeasure Plan – SPCC Plan) will be developed and implemented during the fulfillment of the transportation action. The project site will be monitored daily to ensure spill avoidance/remediation practices are implemented.
	AMM 5 - Project storage and staging areas will be located only in upland areas away from wetland/watercourse habitat areas. This shall include all areas required for stockpiles, equipment storage, and parking.
	AMM 6 - All public utilities potentially associated with the action due to the necessary relocation of their services will be notified of the potential presence of the species and their need to consult with the USFWS/PFBC on their respective relocation activities.
	AMM 7 - High visibility orange construction fencing shall be used to delineate avoidance areas during the action. The fencing will act as a visual warning to prevent construction equipment and personnel from entering and disturbing sensitive areas outside of the project limit of disturbance.
	AMM 8 - In order to avoid the introduction and spread of invasive species into supporting habitats, minimize the duration of exposed soils, utilize erosion control blankets on disturbed areas immediately after project completion to minimize sedimentation, and promptly re-vegetate areas of temporary disturbance with native wetland mix or upland seed mixes dependent on the location of the disturbance. Thoroughly wash construction equipment and vehicles offsite, especially the undercarriage and wheels, before use within 300 feet of supporting habitat. Thoroughly wash temporary crossing measures such as composite matting or timber matting before use within 300 feet of supporting habitat.

(X)	AVOIDANCE AND MINIMIZATION MEASUREs
	AMM 9 – Specific coordination and construction operating procedures approved by the USFWS/PFBC shall be implemented in the event that a bog turtle is encountered during preconstruction exclusion surveys, on-site monitoring, or within the vicinity of the limit of disturbance (LOD) during the course of the action (i.e. construction). These specific procedures include the following: A. If the turtle appears dead or immobile, then the turtle will be left where it was initially observed. If the turtle appears to be mobile, then efforts will be made to temporarily contain the turtle until the qualified bog turtle surveyor can take possession of it. Temporary containment will consist of placing the turtle in a thoroughly clean bucket that has a depth of more than 18 inches. Pieces of native vegetation and 0.5 - 1 inch of water should be placed in the bucket with the turtle to keep the animal cool and hydrated. The bucket should be placed in a quiet, well-shaded area. The turtle should be handled as little as possible, and temporary containment must not exceed 6 hours. B. The qualified bog turtle surveyor will take possession of the turtle and identify the species, as well as, document the capture location and condition of the turtle. The qualified surveyor will conduct a thorough search of the area within, and vicinity of the limit of disturbance of the action to determine if any other turtles may be in the construction area. The qualified surveyor will also inspect the exclusion barrier fencing and direct any repairs as needed. If there are breaches in the exclusion barrier and/or the turtle is identified as a bog turtle, then construction will remain ceased until coordination with the USFWS and PFBC is completed. Construction will remain ceased until all breaches in the exclusion barrier are repaired. C. If the qualified bog turtle surveyor identifies the turtle species as a bog turtle, then the surveyor will immediately notify endangered species biologists at both the USFWS and PFBC. The elapsed time for contacting both agencies should be as soon as possible, but must not exceed 24 hours. Following the arrival of the qualified bog turtle surveyor at the project site, the turtle must be handled by the biologist according to the recommendations of the USFWS and PFBC. The qualified surveyor will consult with the USFWS and PFBC concerning the safe handling and necessary relocation of the turtle outside of the project disturbance area. Construction will resume only after the completion of this consultation. D. If the qualified bog turtle surveyor identifies the turtle as a species other than the bog turtle, and the turtle appears healthy, then the qualified surveyor will release the turtle unharmed no further than 300 feet from the site of discovery to a safe location outside of the limit of disturbance. Construction may continue once the turtle is relocated. E. If any turtle found appears injured or dead, the qualified bog turtle surveyor will coordinate with the USFWS and PFBC concerning the safe handling of an injured turtle and the taking of possession of the specimen whether injured or dead by one of these agencies. Construction will resume only at the completion of this coordination.
	AMM 10 - In order to avoid the killing, harm, or harassment of brumating species individuals within hibernacula microhabitat during the species inactive period, the action will be completed during the active season for the species between April 1 and October 31.
	AMM 11 - In order to avoid the killing, harm, or harassment of species individuals during the species active period, the action will be completed during the inactive season for the species between November 1 and March 31.
	AMM 12 - In order to avoid the killing, harm, or harassment of species individuals during the species active period, an exclusionary survey to remove any bog turtle individuals within 300-feet of an action will be conducted by a USFWS/PFBC recognized-qualified bog turtle surveyor immediately prior to the commencement of the action. Exclusionary surveys may also be necessary for the assembly/disassembly of temporary streamflow diversion measures; the placement of rock scour protection materials; and the internal confines of an existing bridge or culvert crossing structure. Any captured individuals would be relocated outside of the project disturbance area. The USFWS/PFBC recognized-qualified bog turtle surveyor will oversee and supervise any necessary vegetation cutting or clearing (4 to 6 inches height) for the effective survey of the excluded area. All exclusionary surveys will be conducted according to the most current Phase 2/Phase 3 survey protocol(s) provided bythe USFWS and PFBC.

(X)	AVOIDANCE AND MINIMIZATION MEASUREs
	AMM 13 - In order to avoid the killing, harm, or harassment of species individuals during the species active period, an exclusionary barrier (silt fence, super silt fence, adequate silt sock, sand bag wall, sheeting, Jersey barrier) will be erected immediately following the species exclusionary survey and prior to the commencement of the activity to isolate the disturbance area associated with the action. Sand bag walls, sheeting, Jersey barrier, etc. may be necessary within watercourse channel environments to isolate in-stream disturbance areas. No other construction/maintenance activities may commence until the exclusionary barrier has been installed. The exclusionary barrier is to be installed a minimum of 6-inches into the underlying habitat where appropriate. The installation/removal of the exclusionary barrier must be completed by hand through wetland habitats. The installation/removal of the exclusionary barrier through upland habitats may be completed with the assistance of equipment. The exclusionary barrier shall be installed and removed under the supervision of a USFWS/PFBC recognized-qualified bog turtle surveyor. While in use the exclusionary barrier shall be inspected daily to ensure its competency and function. The daily inspection may be completed by the on-site environmental monitor/inspector or project foreman. Straw bales, sand bags, or temporary fencing may be used as temporary barriers at ingress/egress locations to provide access to equipment/personnel through the exclusionary barrier. Should the exclusionary barrier become compromised during its use, then all construction/maintenance activities will cease until an exclusionary survey of the action area has been completed by a USFWS/PFBC recognized-qualified bog turtle surveyor and the compromise has been remediated. The exclusionary barrier is to be removed immediately following the completion of the action. The USFWS/PFBC recognized-qualified bog turtle surveyor will ensure that potential pitfalls are not created by trenching associated with the installation and/or removal of the exclusionary barrier.
	AMM 14 - All temporary streamflow diversion measures must be implemented in a manner that will not result in the possible collection and entrainment of species individuals into pumping equipment.
	AMM 15 - In order to avoid the killing, harm, or harassment of species individuals during the species active period, a USFWS/PFBC recognized-qualified bog turtle surveyor shall conduct inspections of spoil materials from excavation areas to ensure that species individuals are recovered and relocated.
	AMM 16 - In order to avoid the killing, harm, or harassment of species individuals during the species active period, a USFWS/PFBC recognized-qualified bog turtle surveyor will provide continuous monitoring during the fulfillment of the activity.
	AMM 17 - A USFWS/PFBC recognized-qualified bog turtle surveyor will be retained throughout the duration of the transportation action to monitor the effectiveness of the implemented avoidance and minimization measures. The surveyor will also provide recommendations to PennDOT and the FHWA concerning the implementation of the necessary measures.
	AMM 18 - To reduce the amount of take associated with the permanent loss of habitat, a salvage survey effort will be undertaken in conjunction with the USFWS/PFBC to relocate any individuals within the impact area prior to disturbance. Any recovered individuals will be relocated a maximum of 300 feet from the impact area within the same drainage basin.
	AMM 19 - In order to offset the adverse effects for the permanent loss of supporting habitat and/or incidental take, compensatory mitigation credits will be calculated in accordance with USFWS credit metrics and acquired purchased from a USFWS approved conservation bank with receipt of credit purchase being provided to USFWS prior to the start of any work.

Programmatic Category Actions and Application of AMMs Summary

PROGRAMMATIC CATEGORY	DESCRIPTION	AMMs 1-9	AMM 10	AMM 11	AMM 12	AMM 13	AMM 14	AMM 15	AMM 16	AMM 17	AMM 18	AMM 19 in lieu of AMMs1	AMM 19 for Offset
1A	Actions where temporary effects to potential hibernacula are anticipated to occur without any hydrologic modification.	**X**	**X**		**X**	**X**	**X**	**X**	**X**	**X**		**X**	
1B	Actions where permanent effects to potential hibernacula microhabitat are anticipated to occur without any hydrologic modification.	**X**	**X**		**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
2A	Actions where temporary effect to potential foraging habitat are anticipated to occur without any hydrologic modification.	**X**		**X**								**X**	
2B	Actions where permanent effects to potential foraging habitat are anticipated to occur without any hydrologic modification.	**X**		**X**								**X**	**X**
3A	Actions which will occur during the seasonal period of April 1 – October 31 with exclusionary measures and without any permanent hydrologic impacts.	**X**			**X**	**X**	**X**	**X**	**X**	**X**		**X**	
3B	Actions which will occur during the seasonal period of November 1 – March 31 associated exclusively with stream corridors or upland habitats in the vicinity of occupied/assumed supporting wetland habitat without any permanent hydrologic impacts.	**X**		**X**									
4	Actions where the hydrology of supporting habitat will be permanently altered by the action, resulting in take due to modified hydrology.	**X**	**X**		**X**	**X**	**X**	**X**	**X**	**X**	**X**		**X**

[1] Requires USFWS concurrence

XII. AMM 19 DESCRIPTION OF COMPENSATORY MITIGATION CREDIT ACQUISITION

Conservation Bank Information Name: Location: Bank Proprietor: Credits To Be Purchased:

XIII. CERTIFICATION

I certify that ALL information contained within this project submittal form is accurate, and that the indicated avoidance and minimization measures (AMMs), and compensatory commitments will be implemented. I agree to re-consult with the USFWS on this project if changes to the project type, location, timing, size or configuration become necessary. Re-consultation will also be necessary if the avoidance, minimization, and compensatory commitments cannot be implemented.

Signature of FHWA/PennDOT Representative: _____
Date: _____

XIV. USFWS PENNSYLVANIA FIELD OFFICE REVIEW COMMENTS

Date of Project Submittal Form Receipt	
USFWS Project Number	
Reviewing Biologist	
Signature of Supervisory Biologist	
(X)	**USFWS DETERMINATION**
	Project as proposed with commitments is consistent with the programmatic consultation.
	Project as proposed with commitments is not consistent with the programmatic consultation; additional information/coordination is requested.
	Project as proposed is not consistent with the programmatic consultation and requires individual consultation.

Appendix 3

Bog Turtle Exclusion Barrier Specifications

BOG TURTLE EXCLUSION BARRIER SPECIFICATIONS

1. AN APPROXIMATELY 30–INCH HIGH EXCLUSION BARRIER FENCE SHALL BE ERECTED NEAR THE LIMITS OF DISTURBANCE OF THE PROPOSED TRANSPORTATION ACTIVITY. THE EXCLUSIONARY FENCE WILL FUNCTION AS A BARRIER TO PREVENT BOG TURTLES FROM MIGRATING OUT OF WETLANDS AND WATERWAYS INTO THE DISTURBANCE AREA. THE BARRIER WILL ALSO PREVENT TRANSPORTATION ACTIVITIES FROM EXTENDING BEYOND THE PRESCRIBED LIMITS OF DISTURBANCE. THE BARRIER WILL BE INSTALLED AS INDICATED AS SOON AS PRACTICABLE FOLLOWING ANY NECESSARY SPECIES EXCLUSIONARY SURVEY EFFORTS, AND PRIOR TO THE COMMENCEMENT OF ANY LAND DISTURBANCE ACTIVITIES. THE BARRIER WILL BE INSTALLED ONLY AFTER RECEIVING APPROVAL TO DO SO FROM THE QUALIFIED BOG TURTLE SURVEYOR. SILT SOCK, SAND BAG WALL, SHEETING, JERSEY BARRIER, ETC. MAY BE NECESSARY TO ESTABLISH THE EXCLUSION BARRIER IN LIEU OF THE FENCING AS DETERMINED BY THE QUALIFIED BOG TURTLE SURVEYOR TO ADDRESS SITE SPECIFIC CONDITIONS SUCH AS WATERCOURSE CHANNEL ENVIRONMENTS, TIE–IN AREAS TO EXISTING STRUCTURES, PAVEMENTS, ETC.

2. THE EXCLUSIONARY BARRIER IS TO BE INSTALLED A MINIMUM OF 6–INCHES INTO THE UNDERLYING HABITAT WHERE APPROPRIATE. THE INSTALLATION/REMOVAL OF THE EXCLUSIONARY BARRIER MUST BE COMPLETED BY HAND THROUGH WETLAND HABITATS. THE INSTALLATION/REMOVAL OF THE EXCLUSIONARY BARRIER THROUGH UPLAND HABITATS MAY BE COMPLETED WITH THE ASSISTANCE OF EQUIPMENT. THE EXCLUSIONARY BARRIER SHALL BE INSTALLED AND REMOVED UNDER THE SUPERVISION OF A QUALIFIED BOG TURTLE SURVEYOR. WHILE IN USE, THE EXCLUSIONARY BARRIER SHALL BE INSPECTED DAILY TO ENSURE ITS COMPETENCY AND FUNCTION. THE DAILY INSPECTION MAY BE COMPLETED BY THE ON–SITE ENVIRONMENTAL MONITOR/INSPECTOR OR PROJECT FOREMAN. STRAW BALES, SAND BAGS, OR TEMPORARY FENCING MAY BE USED AS TEMPORARY BARRIERS AT INGRESS/EGRESS LOCATIONS TO PROVIDE ACCESS TO EQUIPMENT/PERSONNEL THROUGH THE EXCLUSIONARY BARRIER. SHOULD THE EXCLUSIONARY BARRIER BECOME COMPROMISED DURING ITS USE, THEN ALL CONSTRUCTION/MAINTENANCE ACTIVITIES WILL CEASE UNTIL AN EXCLUSIONARY SURVEY OF THE ACTION AREA HAS BEEN COMPLETED BY A QUALIFIED BOG TURTLE SURVEYOR AND THE COMPROMISE HAS BEEN REMEDIATED. THE EXCLUSIONARY BARRIER IS TO BE REMOVED IMMEDIATELY FOLLOWING THE COMPLETION OF THE DISTURBANCE ACTIVITIES. THE QUALIFIED BOG TURTLE SURVEYOR WILL ENSURE THAT POTENTIAL PITFALLS ARE NOT CREATED BY TRENCHING ASSOCIATED WITH THE INSTALLATION AND/OR REMOVAL OF THE EXCLUSIONARY BARRIER.

DETAIL NOTES

1. POSTS ARE TO BE SPACED AT 10 FOOT MAXIMUM DISTANCES USING 2.5 INCH DIAMETER GALVANIZED OR ALUMINUM MATERIAL.

2. CHAIN LINK TO POST FASTENERS ARE TO BE SPACED AT 14–INCH MAXIMUM USING NO. 6 GALVANIZED ALUMINUM WIRE OR NO. 9 GALVANIZED STEEL PRE–FORMED CLIPS.

3. CHAIN LINK TO TENSION WIRE FASTENERS SPACED AT 60–INCHES MAXIMUM USING NO. 10 GAGE GALVANIZED STEEL WIRE.

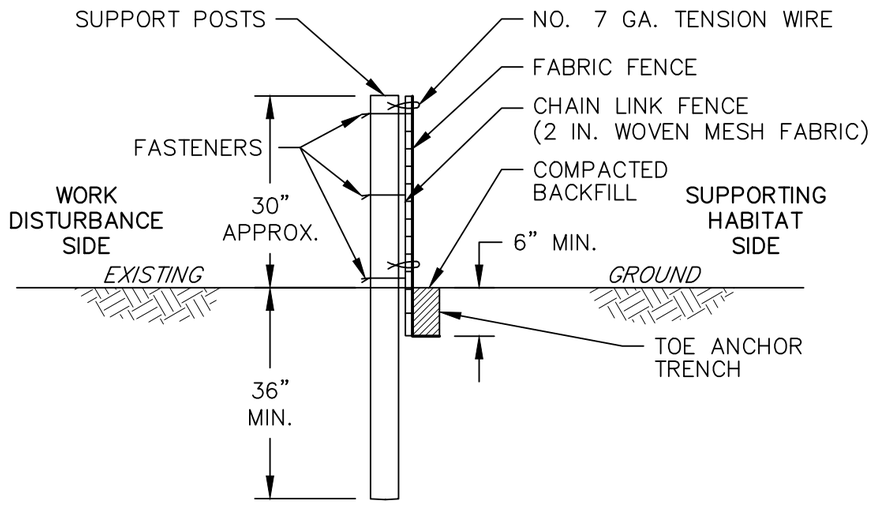
4. NO. 7 GAGE TENSION WIRE INSTALLED HORIZONTALLY AT TOP AND BOTTOM OF CHAIN–LINK FENCE.

5. CHAIN LINK FENCE AND FABRIC FENCE MUST BE INSTALLED ON THE SIDE OF THE POSTS FACING THE SUPPORTING WETLAND HABITAT. NO FENCING SHOULD ON THE SIDE OF THE POSTS FACING THE WORK DISTURBANCE SIDE. THIS IS OPPOSITE OF THE TYPICAL INSTALLATION FOR EROSION AND SEDIMENT POLLUTION CONTROL PURPOSES.

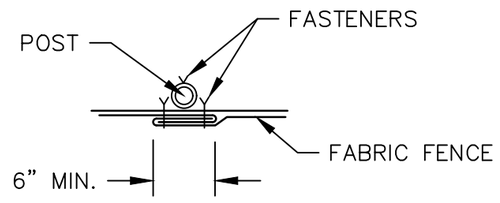
6. FENCING SHOULD BE INSTALLED TO A MINIMUM DEPTH OF 6 INCHES INTO THE UNDERLYING GROUND WHERE POSSIBLE.

7. INSTALLATION SHOULD ENSURE THAT GROUND ELEVATION IS RE–ESTABLISHED WITH COMPACTED BACKFILL ALONG BOTH SIDES OF THE FENCING TO PREVENT THE FORMATION OF A TRENCH OR PITFALL.

8. IN AREAS ALONG THE EXCLUSION BARRIER WHERE DRAINAGE IS NECESSARY TO PREVENT PONDING BEHIND THE FENCE AND POSSIBLE BREACH/COMPROMISE, A SECTION OF 0.5 INCH X 0.5 INCH OR 1 INCH X 1 INCH HARDWARE CLOTH MAY BE AFFIXED TO THE CHAIN LINK FENCE IN LIEU OF THE FABRIC FENCE.



SECTION VIEW



JOINING FENCE SECTIONS

BOG TURTLE EXCLUSION BARRIER

NOT TO SCALE