



January 15, 2016

John Taucher
PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning & Habitat Protection
2001 Elmerton Avenue
Harrisburg, PA 17110

**Subject: PGC ID Number: 201312180001
Request for Effects Determination Concurrence
Sunoco Pipeline, L.P. - Pennsylvania Pipeline Project**

Dear Mr. Taucher:

Tetra Tech, Inc. (Tetra Tech) has been retained by Sunoco Pipeline, L.P. (SPLP) to conduct environmental field surveys and permitting services for the Pennsylvania Pipeline Project (PPP). On behalf of SPLP, Tetra Tech is requesting effects determination concurrence from the Pennsylvania Game Commission (PGC) for the PPP.

On December 12, 2013 a Large Project Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Request including a large project form, project description, and preliminary project USGS topographic mapping was initially provided to the PGC under the preliminary project name "Mariner East 2 Pipeline - Trans-Pennsylvania". The Mariner East 2 Project was described as traversing the state of Pennsylvania. However, after field activities began, the project was split into two separate and independent projects; the PPP and the Ohio Pipeline Project (OPP) (Attachment 1). The PPP involves the phased installation of approximately 561 miles of two parallel pipelines within a 306-mile, 50-foot-wide right-of-way (ROW) from Houston, Washington County, Pennsylvania to SPLP's Marcus Hook facility in Delaware County, Pennsylvania with the purpose of interconnecting with existing SPLP Mariner East pipelines. Initially, a 20-inch diameter pipeline would be installed within the ROW from Houston to Marcus Hook (306 miles) and a second, up to 20-inch diameter pipeline, would be installed in the same ROW. The second line is proposed to be installed from SPLP's Delmont Station, Westmoreland County, Pennsylvania to the Marcus Hook facility, paralleling the initial line for approximately 255 miles.

We received a response letter dated March 14, 2014 from PGC. That letter is included for reference as Attachment 2. PGC indicated that the following species were located within the vicinity of the Mariner East 2 Project: Allegheny woodrat (*Neotoma magister*) and Eastern small-footed bat (*Myotis leibii*).

PGC also provided details on areas to be surveyed for Eastern small-footed bat and Allegheny woodrat habitat. As a result of these correspondences with the PGC, Allegheny woodrat and eastern small-footed bat habitat surveys were performed by Wildlife Specialist's biologists. These surveys were completed for the areas initially provided by PGC as well as additional areas along the re-route south of Altoona. The final report summarizing the survey findings has been previously submitted to PGC.

During further coordination and project review, PGC requested the submittal of Conservation Plans for the Allegheny woodrat and eastern small-footed bat that outline SPLP's commitment to avoidance, minimization, and mitigation measures to prevent impacts to these species within the Project area. Attachments 3 and 4, the Allegheny Woodrat Conservation Plan for the PPP and the Eastern Small-footed Bat Conservation Plan for the PPP, respectively, includes these commitments. From the onset of the Project, SPLP has instructed project designers to consider environmental impacts in regard to all aspects of the proposed Project and to avoid and minimize wherever possible while allowing safe installation. Pipeline engineers were provided a list of restrictions, recommendations, and requirements to consider during the design phase. Major considerations were co-location with existing utility corridors, limiting the

Tetra Tech

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construction corridor to the minimum width practicable, and avoidance and minimization of sensitive habitats.

Evidence of woodrat presence was found at 4 areas, Jacks Mountain 2, Jacks Mountain 3, Blacklog Mountain, and Bowers Mountain 2. Following construction, SPLP will restore habitat in temporary workspaces and create new potential woodrat habitat in the form of rock structures at the four survey areas containing AC's following the criteria stated in the PGC's BMPs. Five rock structures are proposed to be built within the four areas containing delineated woodrat habitat and ACs. The structures will be constructed along temporary ROW's, access roads, or workspaces, or in areas adjacent to these spaces based on an evaluation of the impacted landscape, land availability, and land owner approval.

Habitat surveys for small-footed bats identified 1.7 acres of habitat within the proposed LOD. SPLP proposes to prevent small-footed bats from accessing summer roosting habitat within the Project LOD to avoid any chance of incidental take that could occur during construction activities. During construction, SPLP will seal off these areas using a geotextile material such as silt fencing, mesh screening, or other appropriate materials. Additionally, following the completion of construction, SPLP will construct new roosting structures as close to the areas of impacted areas as possible. SPLP will construct twenty new roosting structures along temporary Right of Ways (ROWs), access roads, or temporary workspaces, or in areas adjacent to these spaces based on an evaluation of the landscape. These structures will be monitored for use for a period of three years or until bats are seen emerging from the structures.

Based on the information provide herein, the previously provided survey reports, the attached conservation plans, what is known about the presence and/or potential presence of the Allegheny woodrat and the eastern small-footed bat in the vicinity of the project areas, and SPLP's commitments to the protection and conservation of these species, it is Tetra Tech's conclusion that the PPP is not likely to impact the Allegheny woodrat and eastern small-footed bat. On behalf of SPLP, Tetra Tech would like to request the PGC's concurrence with this determination to satisfy State permit requirements.

Thank you for your assistance in this matter and we look forward to your review and concurrence. If you have any questions regarding this request, please feel free to contact me at 412.921.8167 or preston.smith@tetrattech.com.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. Smith', with a long horizontal line extending to the right.

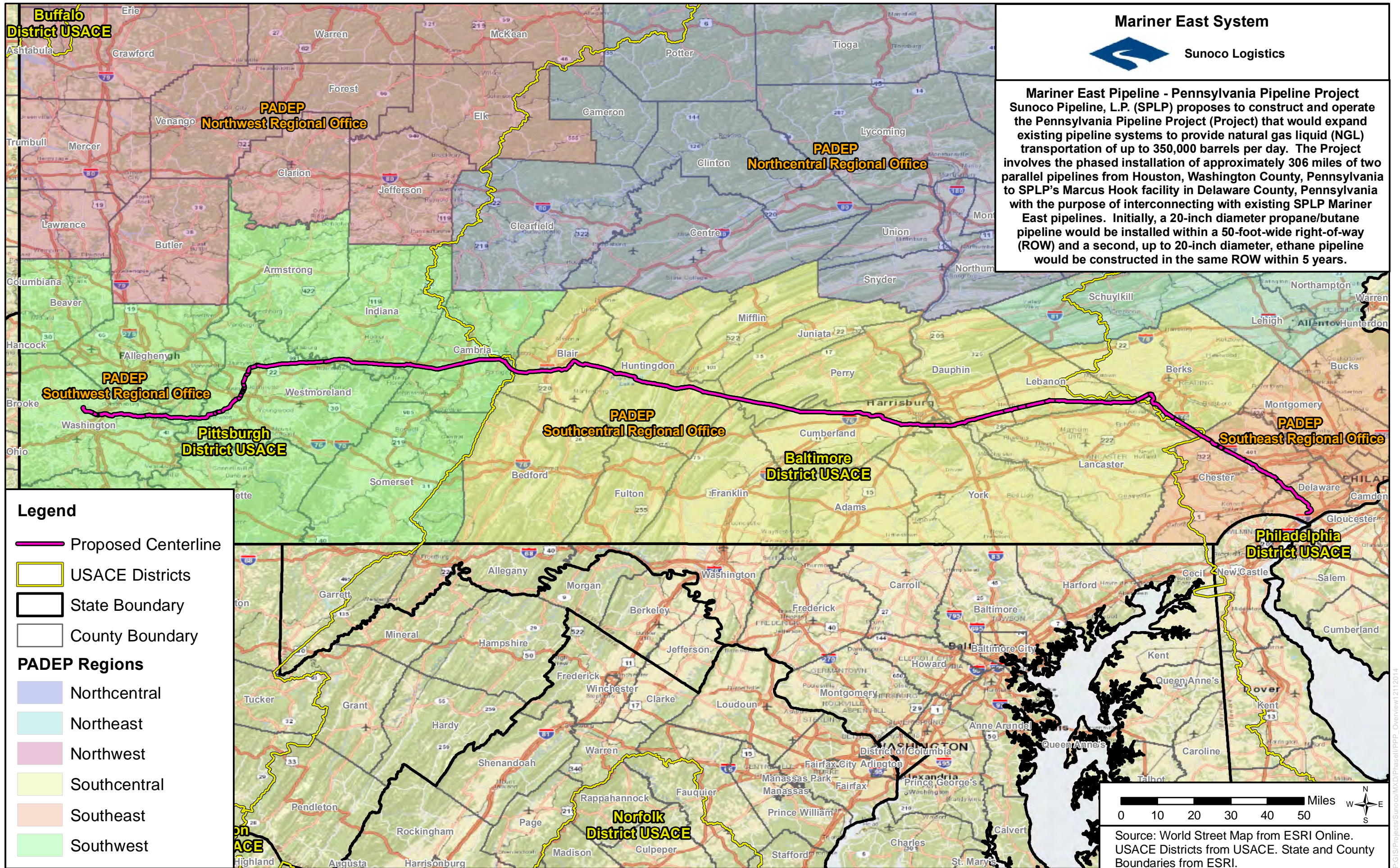
Preston R. Smith
Manager, Wetlands and Ecological Services Department

Attachments:

- Pennsylvania Pipeline Project Maps
- PA Game Commission PNDI Response Package
- Allegheny Woodrat Conservation Plan
- Eastern Small-footed Bat Conservation Plan

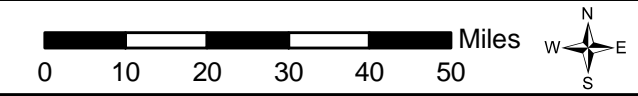
CC: Christopher Embry, Sunoco Logistics
Monica Styles, Sunoco Logistics
Matt Gordon, Sunoco Logistics
Brad Schaffer, Tetra Tech
Sandy Lare, Tetra Tech
File 112IC05958

ATTACHMENT 1



Mariner East Pipeline - Pennsylvania Pipeline Project
 Sunoco Pipeline, L.P. (SPLP) proposes to construct and operate the Pennsylvania Pipeline Project (Project) that would expand existing pipeline systems to provide natural gas liquid (NGL) transportation of up to 350,000 barrels per day. The Project involves the phased installation of approximately 306 miles of two parallel pipelines from Houston, Washington County, Pennsylvania to SPLP's Marcus Hook facility in Delaware County, Pennsylvania with the purpose of interconnecting with existing SPLP Mariner East pipelines. Initially, a 20-inch diameter propane/butane pipeline would be installed within a 50-foot-wide right-of-way (ROW) and a second, up to 20-inch diameter, ethane pipeline would be constructed in the same ROW within 5 years.

- Legend**
- Proposed Centerline
 - USACE Districts
 - State Boundary
 - County Boundary
- PADEP Regions**
- Northcentral
 - Northeast
 - Northwest
 - Southcentral
 - Southeast
 - Southwest



Source: World Street Map from ESRI Online.
 USACE Districts from USACE. State and County Boundaries from ESRI.

ATTACHMENT 2



Division of Environmental
Planning and Habitat
Protection
717-783-5957

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

2001 ELMERTON AVENUE
HARRISBURG, PA 17110-9797

*"To manage all wild birds, mammals and their habitats
for current and future generations."*

ADMINISTRATIVE BUREAUS:

ADMINISTRATION.....717-787-5670
HUMAN RESOURCES.....717-787-7836
FISCAL MANAGEMENT.....717-787-7314
CONTRACTS AND
PROCUREMENT.....717-787-6594
LICENSING.....717-787-2084
OFFICE SERVICES.....717-787-2116
WILDLIFE MANAGEMENT.....717-787-5529
INFORMATION & EDUCATION.....717-787-6286
WILDLIFE PROTECTION.....717-783-6526
WILDLIFE HABITAT
MANAGEMENT.....717-787-6818
REAL ESTATE DIVISION.....717-787-6568
AUTOMATED TECHNOLOGY
SERVICES.....717-787-4076

www.pgc.state.pa.us

March 14, 2014

PGC ID Number: 201312180001

Mr. Preston Smith
Tetra Tech
661 Anderson Drive, Foster Plaza
Pittsburgh, Pa 15220
preston.smith@tetrattech.com

Re: Sunoco Pipeline, LP – Pennsylvania Pipeline Project
State Game Lands Nos. 46, 52, 71, 118, 147, 153, 198, 220, and 276
Large Project PNDI Review
Washington, Westmoreland, Indiana, Cambria, Blair, Huntingdon, Perry, Cumberland, Lebanon,
Lancaster, Berks, and Chester Counties, PA

Dear Mr. Smith,

Thank you for submitting your Pennsylvania Natural Diversity Inventory (PNDI) Large Project Environmental Review request. The Pennsylvania Game Commission (PGC) screened this project, including the requested 1500-foot buffer, for potential impacts to species and resources of concern under PGC responsibility, which includes birds and mammals only.

Potential Impact Anticipated

PNDI records indicate species or resources of concern are located in the vicinity of the project. The PGC has received and thoroughly reviewed the information that you provided to this office as well as PNDI data, and has determined that potential impacts to threatened, endangered, and species of special concern may be associated with your project. Therefore, additional measures are necessary to avoid potential impacts to the species listed below:

Scientific Name	Common Name	PA Status	Federal Status
<i>Myotis sodalis</i>	Indiana Bat	ENDANGERED	ENDANGERED
<i>Neotoma magister</i>	Allegheny Woodrat	THREATENED	
<i>Myotis leibii</i>	Eastern Small-footed Bat	THREATENED	
<i>Circus cyaneus</i>	Northern Harrier	THREATENED	
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	SPECIAL CONCERN	
<i>Lasionycteris noctivagans</i>	Silver-haired Bat	SPECIAL CONCERN	
<i>Haliaeetus leucocephalus</i>	Bald Eagle		

Next Steps

Indiana Bat

Indiana bats are a federally listed endangered species under the jurisdiction of the U.S. Fish and Wildlife Service. As a result, our agency defers comments on potential impacts to Indiana bats to the U.S. Fish and Wildlife Service.

Allegheny Woodrat

The PGC has identified portions of the proposed project where potential Allegheny woodrat habitat may exist, and could be impacted by the proposed project. The PGC is requesting that Allegheny woodrat surveys be completed within the Allegheny Woodrat Survey Areas (see Maps 1-7 attached). The surveys should be completed by a qualified biologist and follow protocols found in the attached *PGC Allegheny Woodrat* guidance document. Please be sure that the following information, at a minimum, is provided for further review and comment by the PGC:

- a 1:24,000 scale copy of a USGS topo map and a GIS shapefile illustrating the locations (i.e. points) of all woodrat activity centers and potential activity centers, as well as the limits (i.e. polygons) of all woodrat habitat sites (central point locations with average width and length measurements will not be accepted to illustrate the habitat sites)
- color photographs, keyed to a location and orientation map, of any woodrat habitat sites, activity centers, potential activity centers, or woodrat sign that are identified during the surveys
- a Woodrat Habitat Site Survey form for each habitat site identified during the survey

The survey report should be submitted to the PGC no later than December 31st of the year it is completed.

Eastern Small-footed Bat

The PGC has identified portions of the project where potential eastern small-footed bat day roost habitat may exist, and could be impacted by the proposed project. The PGC is requesting that all potential eastern small-footed bat day roost habitat be assessed and delineated by a qualified biologist within the Small-footed Bat Survey Areas (see Maps 1-7 attached). Please be sure that the following information, at a minimum, is provided for further review and comment by the PGC:

- a 1:24,000 scale copy of a USGS topo map and a GIS shapefile illustrating the limits of all potential small-footed bat day roost habitat that is identified
- a GIS shapefile illustrating the proposed limits of tree clearing throughout the Small-footed Bat Survey Area
- a GIS shapefile illustrating the proposed limits of earthwork, including any proposed grubbing or erosion and sedimentation pollution controls, throughout the Small-footed Bat Survey Area
- representative color photographs of all surface rock encountered during the assessment and delineation regardless of whether the rock is considered to be potential eastern small-footed bat day roost habitat or not (numerous photos for each area of surface rock are strongly recommended)

- a narrative or table detailing the following information for each area of surface rock that is encountered during the assessment and delineation to support or refute the rock's potential as eastern small-footed bat day roost habitat:
 - the estimated canopy cover over the rock
 - anticipated solar exposure of the rock
 - amount and size of crevices available for roost sites
 - presence of organic material, soil, or water within those crevices
 - other details as necessary that cannot be adequately conveyed via the photos provided
- a narrative detailing the reason(s) for any surface rock encountered not being considered potential small-footed myotis day roost habitat;
- and a photo location and orientation map for all photos provided.

The survey report should be submitted to the PGC no later than December 31st of the year it is completed.

Northern Harrier

The PGC is requesting that all site preparation, construction, reclamation, and future maintenance mowing within the Northern Harrier Restriction Area (see Map 8 attached) avoid the period between April 15 and August 31 to minimize potential impacts to northern harriers and their habitat during the breeding and nesting season.

The PGC is also recommending that Sunoco use the following seed mix within this section of the project area to ensure the establishment of beneficial herbaceous habitat for grassland species post-construction.

Species	Common Name	Seed/Acre	Percent Live Seed
<i>Avena sativa – spring planting</i>	annual oats	30lb	
<i>Lolium multiflorum- fall planting</i>	annual ryegrass	10lb	
<i>Schizachyrium scoparium</i>	little bluestem	4 lbs	10-67
<i>Sorghastrum nutans</i>	indian-grass	2 lbs	10-50
<i>Bouteloua curtipendula</i>	side-oats grama	1 lb	5-25
<i>Panicum virgatum</i>	switchgrass	1 lb	10-12
<i>Rudbeckia triloba plus another*</i>	black-eyed susan	¼ lb	1-5, each
<i>Coreopsis tripteris</i>	tall tickseed	1 oz	1-5
<i>Chasmanthium latifolium</i>	sea-oats	1lb	1-30
Straw Mulch – NO HAY			

Furthermore, when plans are developed illustrating the specific location and extent of any proposed permanent facilities (e.g. access roads, extra work spaces, launcher/receiver sites, meter sites, compressor stations, etc.) within this section of the project area, please provide a copy of those plans to this office for further review and written comment so that any permanent impacts to northern harriers can be considered. Every effort should be made to avoid and minimize permanent impacts to northern harrier habitat as these plans are developed, and depending on the nature and extent of any such impacts, habitat assessments, species surveys and/or mitigation may be necessary.

Northern Long-eared Bats and Silver-haired Bats

Northern long-eared bats and silver-haired bats are species of special concern, and therefore, not target species for additional surveys. However, because of their ecological significance, all trees or dead snags greater than 5 inches in diameter at breast height that need to be harvested to facilitate the project (including any access roads or off-ROW work spaces) should be cut between November 1st and March 31st.

Bald Eagle

In January 2014, the PGC Board of Commissioners approved the removal of bald eagles from the state-listed endangered and threatened list. This status change will be reflected in an upcoming edition of the Pennsylvania Bulletin. Bald eagles are now classified as a Pennsylvania “protected” species. As the name implies, bald eagle will continue to enjoy protections provided by the Federal Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, and the Lacey Act. As a result, the PGC defers comments on potential impacts to bald eagles to the U.S. Fish and Wildlife Service.

The Bald and Golden Eagle Protection Act protects eagles from various forms of take, including disturbance. Please refer to the U.S. Fish and Wildlife Service's National Bald Eagle Management Guidelines (<http://www.fws.gov/migratorybirds/baldeagle.htm>) for specific measures that should be taken to ensure bald eagles are not disturbed. If you have questions about when and how to obtain a federal permit because you believe your proposed project will disturb bald eagles, and you are not able to implement measures to avoid disturbance, please contact the Fish and Wildlife Service's Pennsylvania Field Office at 814-234-4090.

For additional information on bald eagles and bald eagle nest etiquette refer to the “Bald Eagle Watching in Pennsylvania” link on the PGC’s website (www.pgc.state.pa.us), under the Wildlife tab and then by clicking on Birding and Bird Conservation.

Wetlands

National Wetland Inventory Mapping (NWI) and/or aerial photos suggest that wetlands are located within the requested review area along the Little Conemaugh River, the Raystown Branch Juniata River, Marsh Creek, and Middle Creek. The PGC is requesting that the final project avoid, or at least minimize to the greatest practical extent, any adverse impacts to these resources and their associated wildlife habitat.

Potential Bat Hibernacula

In addition, the PA Department of Environmental Protection’s *Abandoned Mine Land (AML) Inventory Points* from www.pasda.psu.edu indicates abandoned mine features within the requested review area. These mine features have the potential to connect to abandoned deep mine workings that can serve as hibernacula for a variety of cave bat species. These AML openings and any undocumented openings and caves located along the proposed alignment and within the review buffer must be assessed following the attached *PGC Protocol for Assessing Bat Use of Potential Hibernacula*. Any features having potential as bat hibernacula will need to be surveyed to determine the presence or absence of bat species. A special use permit will need to be obtained by the consultant in order to conduct such surveys that involve the handling of bats.

State Game Lands

Portions of the proposed project are located on State Game Lands Nos. 46, 52, 71, 118, 147, 198, and 276 and adjacent to State Game Lands Nos. 153 and 220. Please contact Mr. Travis Anderson, Southwest Region Land Management Supervisor, at 724-238-9523 to discuss and coordinate the project on SGL 153 and 276, Mr. Robert Einodshofer, Southcentral Region Land Management Supervisor, at 814-643-1831 to discuss and coordinate the project on SGL 71, 118, 147, and 198, and Mr. Bruce Metz, Southeast Region Land Management Supervisor, at 610-926-3136 to discuss and coordinate the project on SGL 46, 52, and 220.

This response represents the most up-to-date summary of the PNDI data files and is valid for two (2) years from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on site. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

Should the proposed work continue beyond the period covered by this letter, please resubmit the project to the PGC at the following address as an "Update" (including an updated PNDI receipt, project narrative and accurate map):

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning & Habitat Protection
2001 Elmerton Avenue
Harrisburg, PA 17110-9797

If the proposed work has not changed and no additional information concerning listed species is found, the project will be cleared for PNDI requirements by the PGC for an additional 2 years.

This finding applies to impacts to birds and mammals only. To complete your review of state and federally-listed threatened and endangered species and species of special concern, please be sure that the U.S. Fish and Wildlife Service, the PA Department of Conservation and Natural Resources, and/or the PA Fish and Boat Commission have been contacted regarding this project as directed by the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Please be sure to include the above-referenced PGC ID Number on any future correspondence with the PGC regarding this project.

If you have any questions regarding this letter, or any future review requests for this or any other projects, please contact John Taucher at 717-787-4250, extension 3632 or via e-mail at jotaucher@pa.gov.

Sincerely,



Corrie Laughlin
Division of Environmental Planning & Habitat Protection
Bureau of Wildlife Habitat Management
Phone: 717-787-4250, Extension 3634
Fax: 717-787-6957
e-Mail: claughlin@pa.gov

A PNHP Partner



CLL/jwt

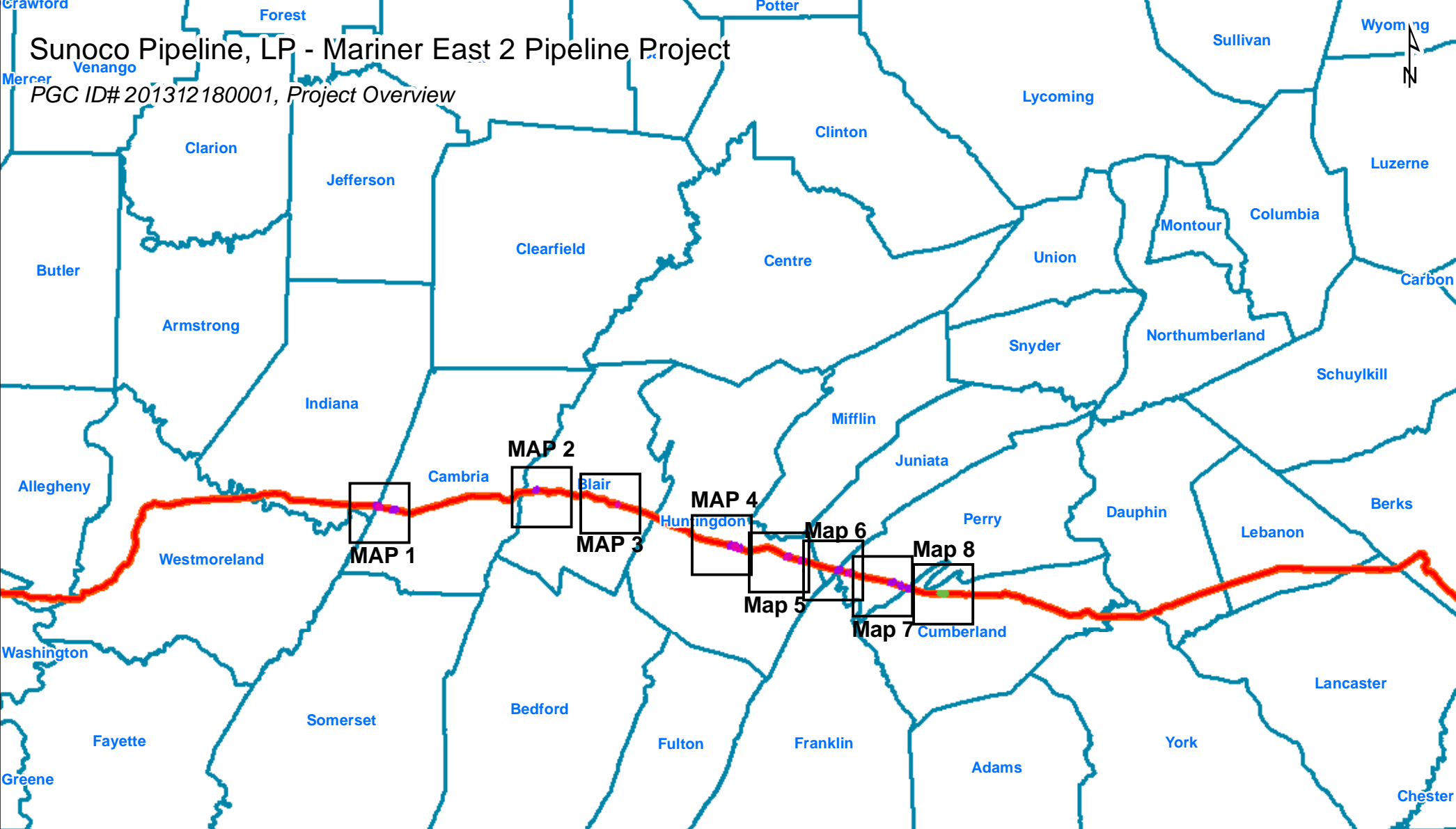
Enclosures:







- Project Overview Map
- Maps 1-8
- PGC Allegheny Woodrat guidance document
- PGC Protocol for Assessing Bat Use of Potential Hibernacula

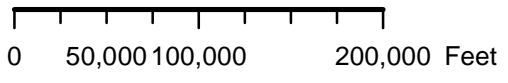
cc: W. Anderson
Myers
Grohol
Trusso
Vreeland
Morgan
T. Anderson
Einodshofer
Metz
DuBrock
Brauning
Butchkoski
Turner
Gross
Barber
DiMatteo
Havens
Taucher
Librandi Mumma
Ms. Jennifer Siani, U.S. Fish and Wildlife Service
Ms. Pamela Shellenberger, U.S. Fish and Wildlife Service
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Sunoco Pipeline, LP - Mariner East 2 Pipeline Project

PGC ID# 201312180001, Project Overview

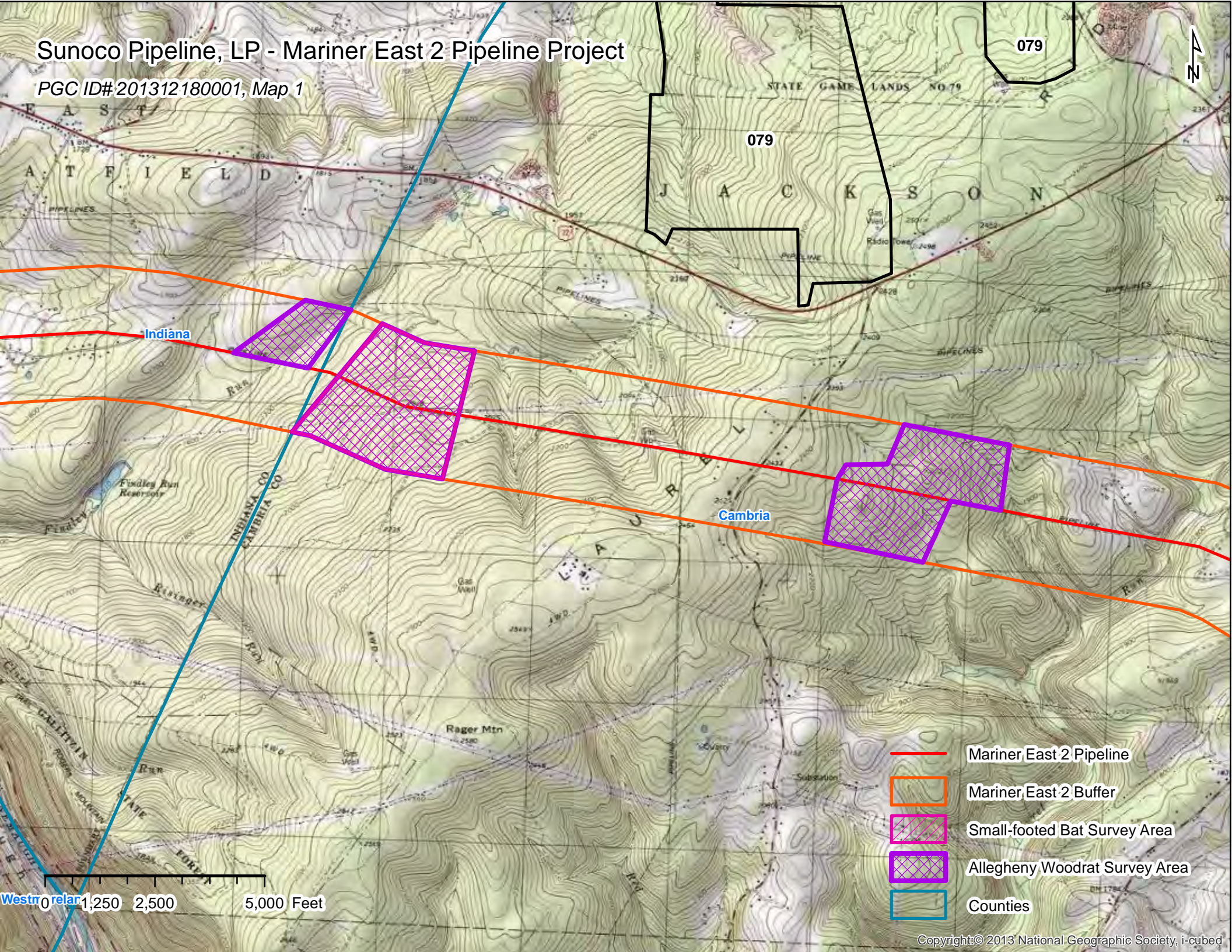


-  Mariner East 2 Pipeline
-  Mariner East 2 Buffer
-  Small-footed Bat Survey Area
-  Allegheny Woodrat Survey Area
-  Northern Harrier Restriction Area
-  Counties








Sunoco Pipeline, LP - Mariner East 2 Pipeline Project

PGC ID# 201312180001, Map 1



Indiana

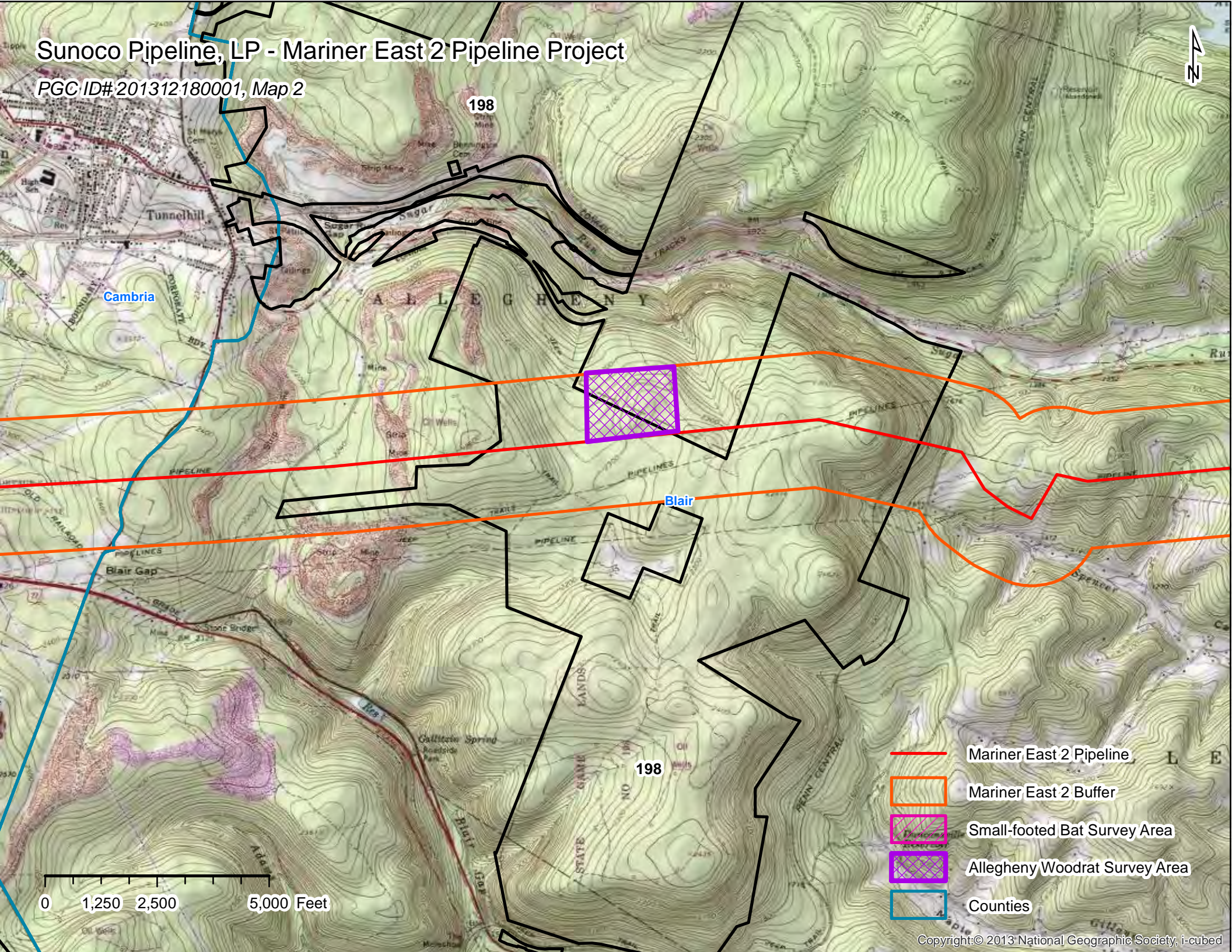
Cambria


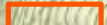

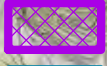

-  Mariner East 2 Pipeline
-  Mariner East 2 Buffer
-  Small-footed Bat Survey Area
-  Allegheny Woodrat Survey Area
-  Counties

Westmar 0 1,250 2,500 5,000 Feet

Sunoco Pipeline, LP - Mariner East 2 Pipeline Project

PGC ID# 201312180001, Map 2

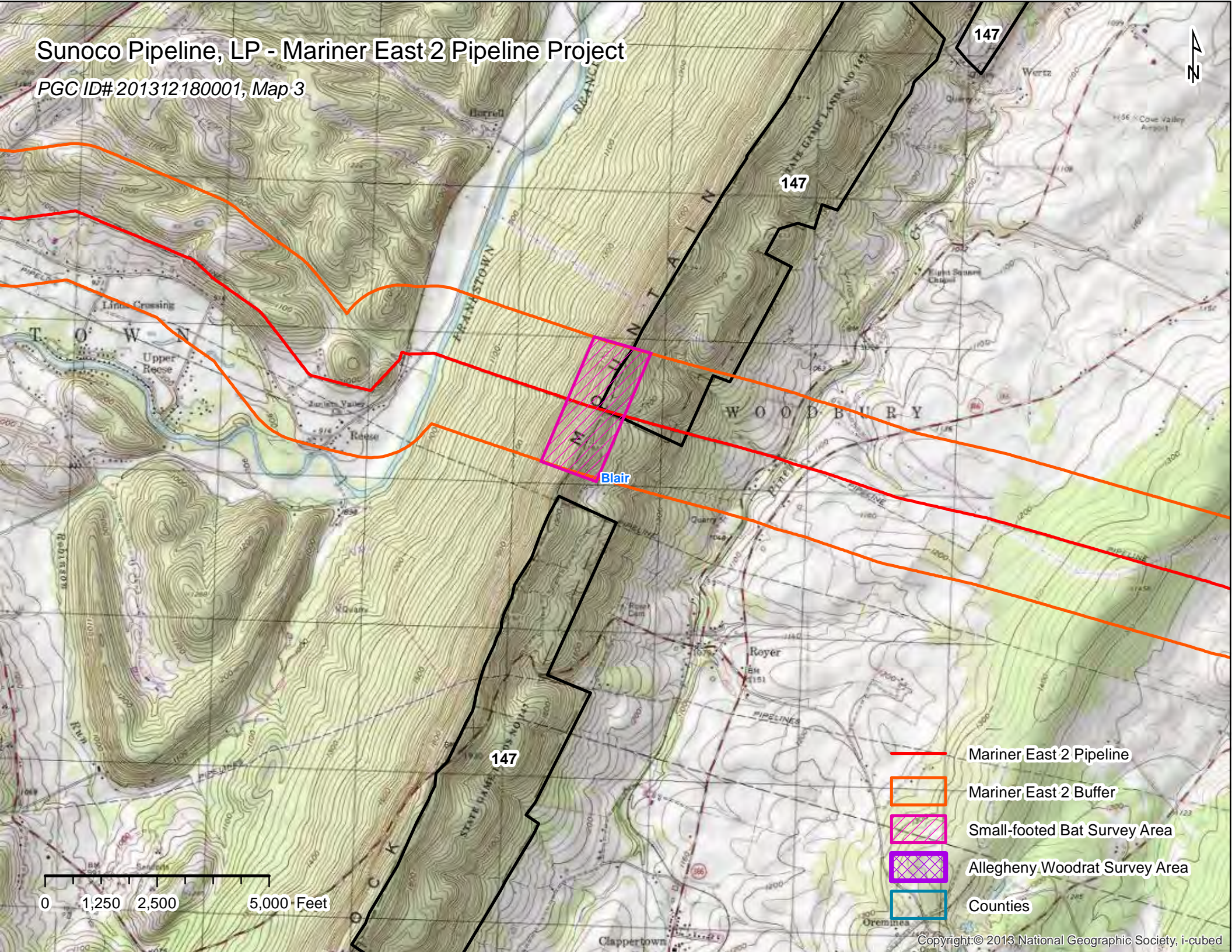







-  Mariner East 2 Pipeline
-  Mariner East 2 Buffer
-  Small-footed Bat Survey Area
-  Allegheny Woodrat Survey Area
-  Counties

0 1,250 2,500 5,000 Feet

Sunoco Pipeline, LP - Mariner East 2 Pipeline Project

PGC ID# 201312180001, Map 3

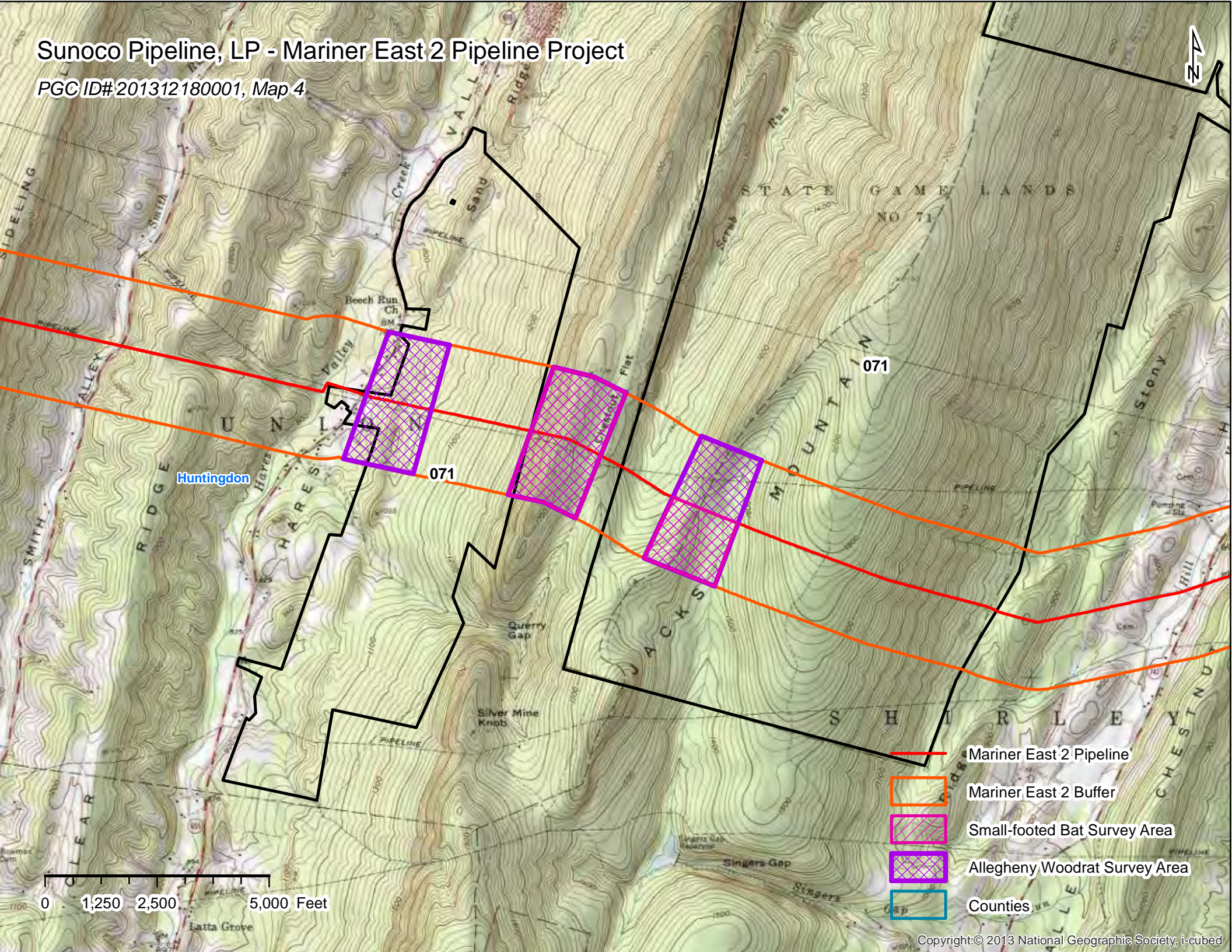


-  Mariner East 2 Pipeline
-  Mariner East 2 Buffer
-  Small-footed Bat Survey Area
-  Allegheny Woodrat Survey Area
-  Counties

0 1,250 2,500 5,000 Feet

Sunoco Pipeline, LP - Mariner East 2 Pipeline Project

PGC ID# 201312180001, Map 4



Huntingdon

071

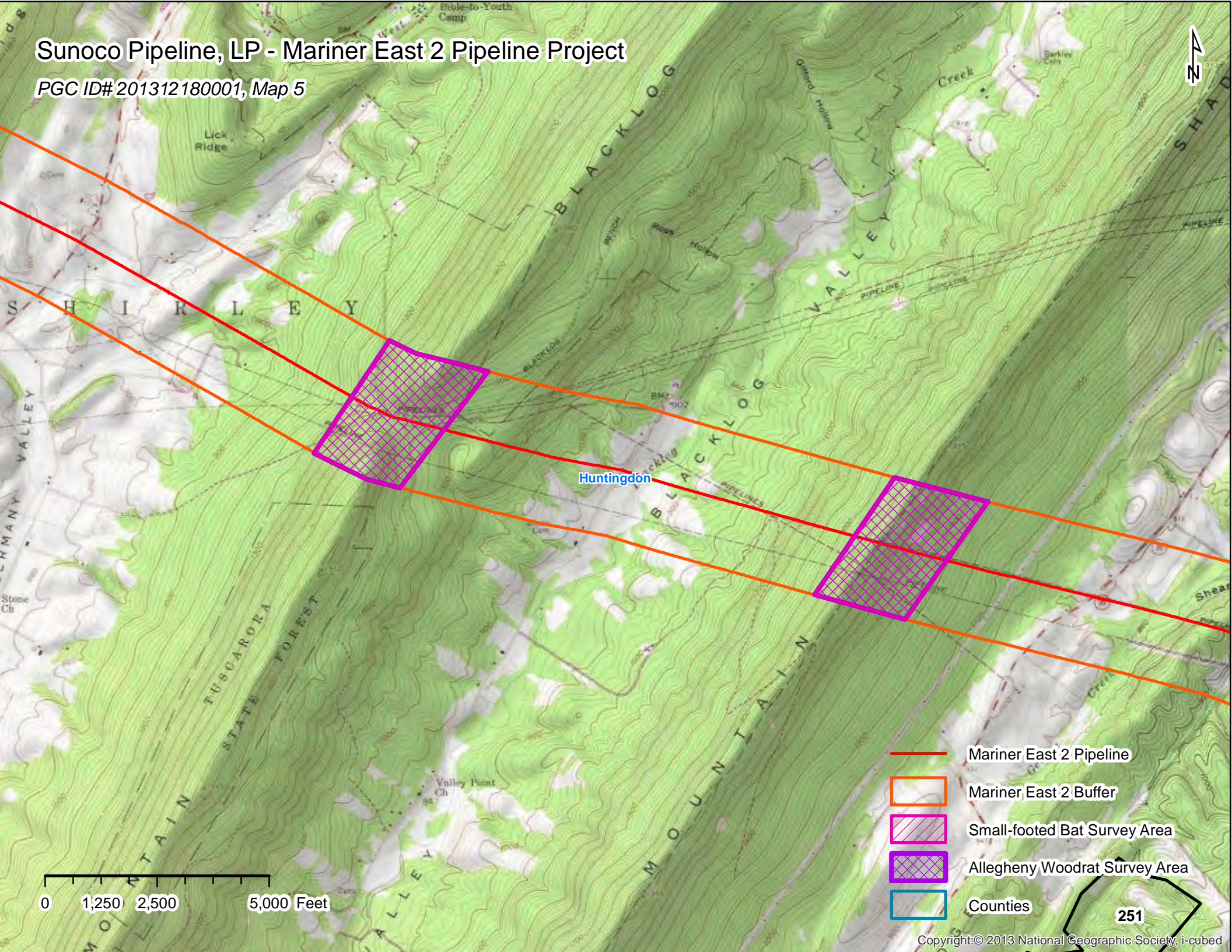
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- Mariner East 2 Pipeline
- Mariner East 2 Buffer
- Small-footed Bat Survey Area
- Allegheny Woodrat Survey Area
- Counties

0 1,250 2,500 5,000 Feet

Sunoco Pipeline, LP - Mariner East 2 Pipeline Project

PGC ID# 201312180001, Map 5



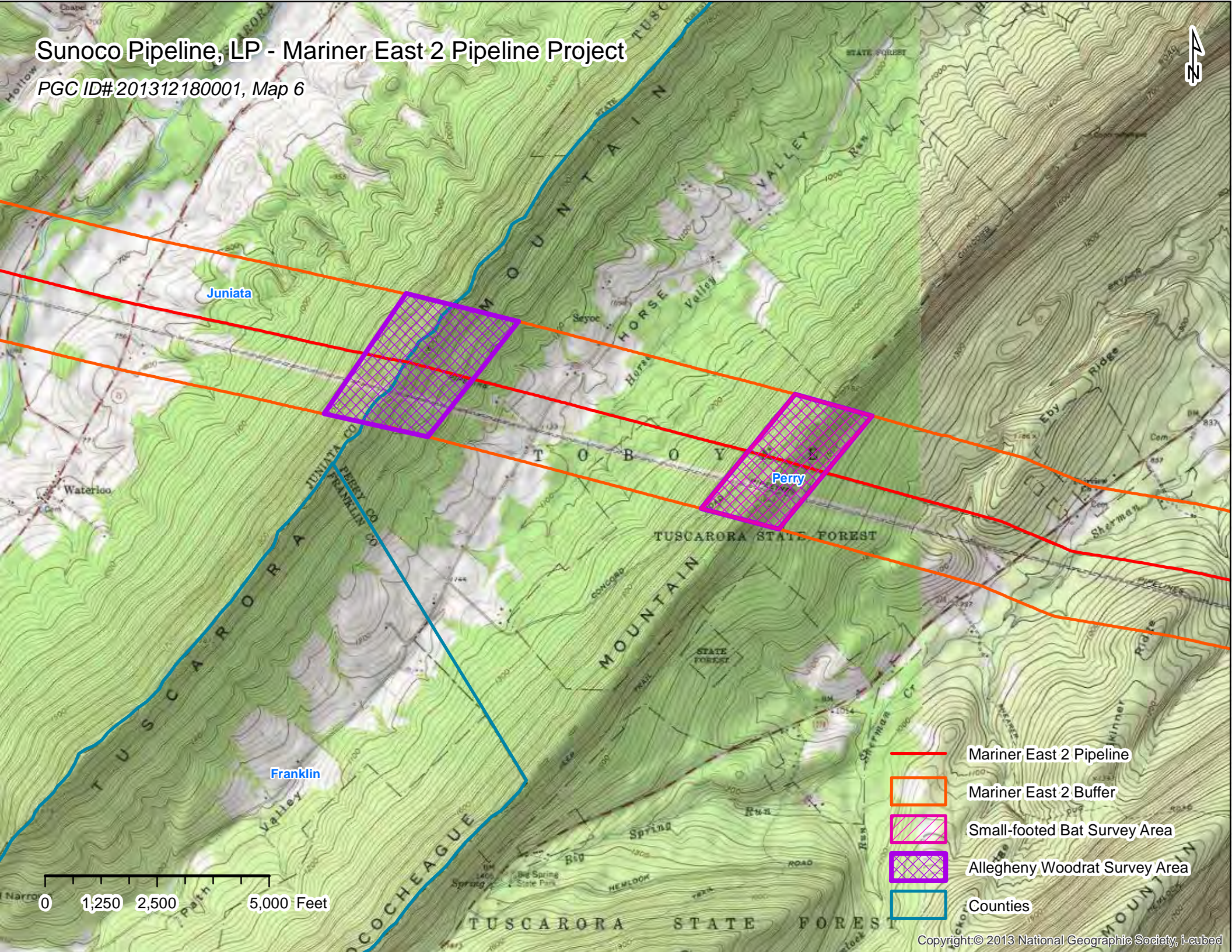
Huntingdon

0 1,250 2,500 5,000 Feet

- Mariner East 2 Pipeline
- ▭ Mariner East 2 Buffer
- ▨ Small-footed Bat Survey Area
- ▩ Allegeny Woodrat Survey Area
- ▭ Counties

Sunoco Pipeline, LP - Mariner East 2 Pipeline Project






PGC ID# 201312180001, Map 6



Juniata

Perry

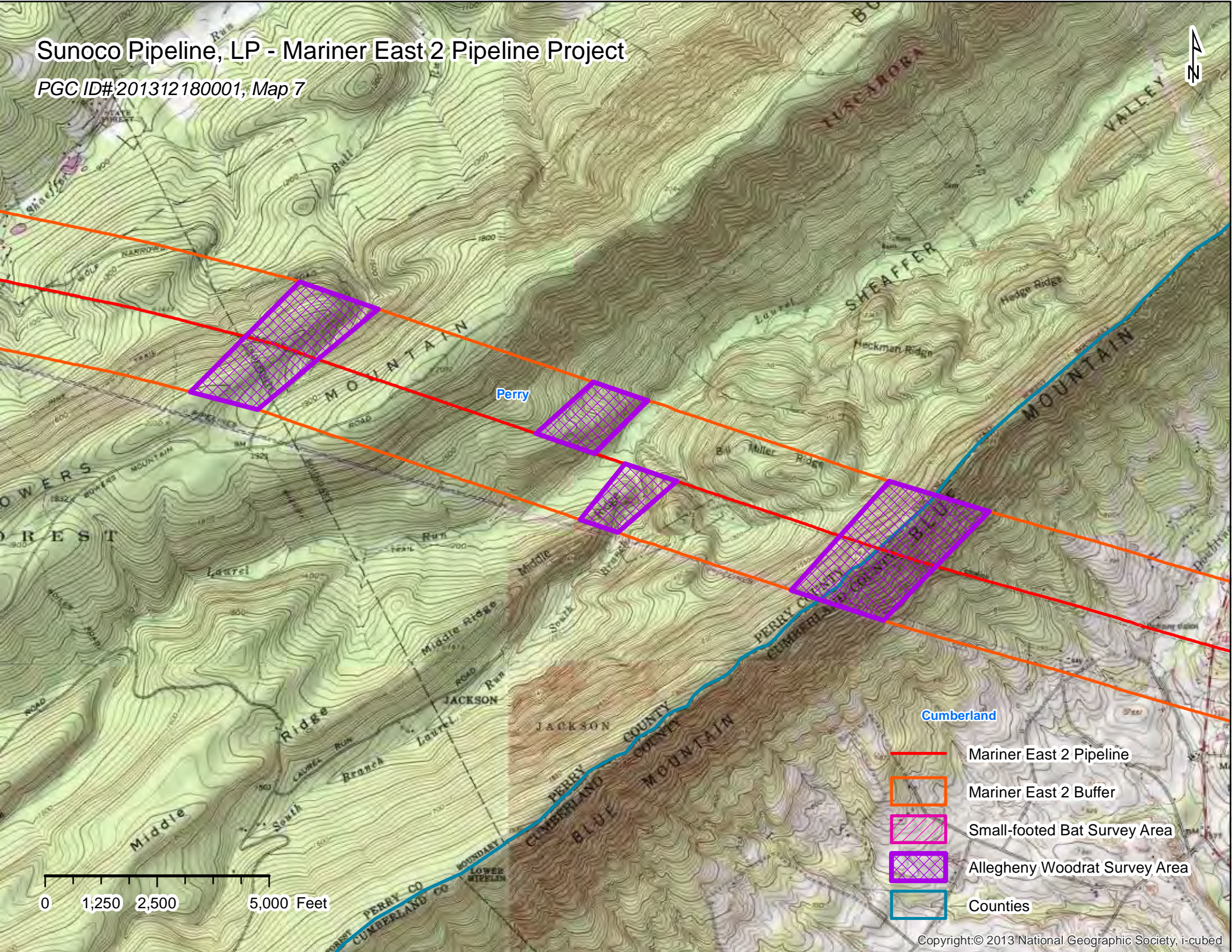
Franklin

-  Mariner East 2 Pipeline
-  Mariner East 2 Buffer
-  Small-footed Bat Survey Area
-  Allegheny Woodrat Survey Area
-  Counties






0 1,250 2,500 5,000 Feet

Sunoco Pipeline, LP - Mariner East 2 Pipeline Project

PGC ID#201312180001, Map 7

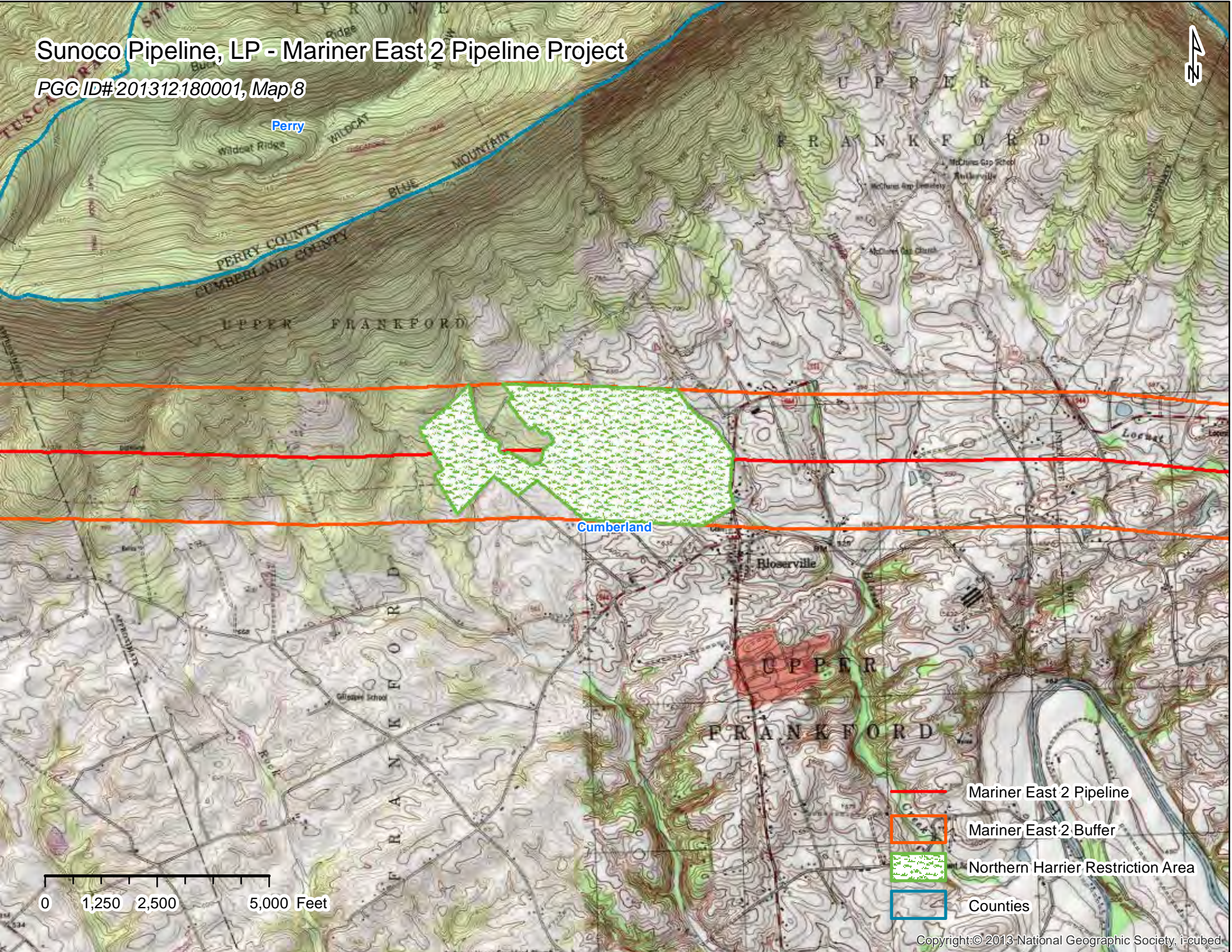


0 1,250 2,500 5,000 Feet

-  Mariner East 2 Pipeline
-  Mariner East 2 Buffer
-  Small-footed Bat Survey Area
-  Allegheny Woodrat Survey Area
-  Counties

Sunoco Pipeline, LP - Mariner East 2 Pipeline Project

PGC ID#201312180001, Map 8



Perry

PERRY COUNTY
CUMBERLAND COUNTY





UPPER FRANKFORD

UPPER
FRANKFORD

Cumberland

UPPER
FRANKFORD

Blosserville

-  Mariner East 2 Pipeline
-  Mariner East 2 Buffer
-  Northern Harrier Restriction Area
-  Counties

0 1,250 2,500 5,000 Feet

ALLEGHENY WOODRAT
(Neotoma magister)

THE ENVIRONMENTAL REVIEW PROCESS
for
PENNSYLVANIA



**Prepared
By**

**Pennsylvania Game Commission
Bureau of Wildlife Habitat Management
& Bureau of Wildlife Management**

June 2008

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APPENDIX

A) HABITAT ASSESSMENT

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Allegheny Woodrat

Allegheny woodrats inhabit steep rocky/talus slopes, boulder fields, or caves in a forest interior matrix in the Appalachian mountain areas of Pennsylvania. The woodrat is less a "rat" than a large, native mouse living in areas sparsely populated by humans. The following guidelines have been developed to: ensure the protection of active woodrat colonies across the state of Pennsylvania, provide consistency during the impact assessment process, establish best management practices, and enhance & create habitat for the species.

STATUS

The woodrat has been declining over much of its historic range. The decline is thought to be a result of a combination of habitat variables including: reduced acorn crops in areas severely impacted by gypsy moth, fragmentation of forest habitat, and an increase in raccoon populations that act as vectors of an internal parasite fatal to woodrats. The woodrat is officially listed as a Pennsylvania threatened species. The Pennsylvania Game Commission (PGC) has jurisdiction over state listed birds and mammals and is mandated by Title 34 (Game and Wildlife Code) to protect the species.

IDENTIFYING CHARACTERISTICS

Woodrats are a buffy gray above, with white underparts and paws and long whiskers. The adult averages just over a pound, and 17 inches in length, including an 8 inch tail. Its ears are large and may appear naked. The eastern woodrat is distinguished from the Norway rat by its hairy, bicolored tail: the Norway rat has a hairless tail (Wild Resources Conservation Fund, 1995).

LIFE HISTORY

The nest of the woodrat is usually found near an entrance on a dry cave floor, on narrow ledges along cave passages, or in inaccessible crevices of large rocks. The nest consists of shredded bark in a round/oval shape that is roughly 18 inches wide (Genoways and Benner, 1995). The breeding season runs from February until September, during which time up to three litters containing two or three young each may be produced (Wild Resources Conservation Fund).

The diet consists of a wide diversity of plant parts including ferns, fungi, fruits, and soft and hard mast (acorns). They also store food in midden-caches that are located in dry ledges or crevices. A telltale sign that woodrats are storing food is the accordion folded herbaceous plants that are within the food cache. The caches can also contain all sorts of items including bottle caps, plastic, and numerous shiny items.



Food Cache



Folded Vegetation

Woodrats use "toilet areas" where large quantities of droppings collect. The toilet areas are typically located below an overhanging rock in close proximity to their denning area. The toilet areas can contain dozens to thousands of droppings.



Toilet Area

The first phase of impact assessment involves an initial office review or Environmental Review (www.naturalheritage.state.pa.us) to determine if any potential exists for woodrat habitat. The office review involves a review of the type of project, existing woodrat data and modeling for potential habitat. If potential habitat exists the PGC may request photographs, a habitat assessment (Appendix A), or a field view to determine the presence of habitat.

The second phase involves surveying potential habitat for woodrat sign (toilet areas, food caches, and nests). The survey needs to be conducted by a qualified biologist with experience surveying and locating woodrat sign. The survey involves a detailed search by the lead biologist and several assistants for all potential habitat in the project area and within 200 meters of the project area. The project area includes all facilities, roads, utility lines, etc. For linear or point projects the distance from the project site to survey will be determined by the PGC based on site specific conditions. The survey data must be recorded on the PGC standardized survey form (Appendix B).

The third phase takes place if woodrat sign is found during phase II or if the habitat is present and could be re-colonized by known woodrat populations in the surrounding area. Phase III follows the pattern of avoiding, minimizing, and as a last resort (if possible) mitigating for impacts to woodrat habitat or their travel corridors. Avoidance and minimizing impacts can involve shifting the project to another location, modification of the project design, or maintaining/enhancing travel corridors.

MONITORING

On some projects the PGC will request monitoring of the woodrat population to determine if the avoidance, minimization, or mitigation efforts are successful at maintaining the post-construction woodrat population. The monitoring information will assist the PGC to further refine and assess the viability of the avoidance, minimization, and mitigation efforts. Monitoring may include a determination of presence of the species or may involve population estimates pre and post-construction.

BEST MANAGEMENT PRACTICES
for
OCCUPIED WOODRAT HABITAT

Primary Allegheny woodrat habitat consists of activity centers, supporting landscape, and dispersal corridors. Following are three management zones based on the woodrats primary habitat components and the Best Management Practices (BMP) for each zone (modified from the PGC Woodrat Management Plan):

ZONE 1

CORE HABITAT consists of the overtop or near subsurface core habitat that supports the species nesting and denning sites. Activity centers are characterized by observable woodrat sign in the form of toilet area (s) and midden-cache(s) (food cache) linked in most cases to a complex of surface rocks and fissures or to a cave/mine entrance zone.

Best Management Practices

No disturbance to the Core Habitat including but not limited to:

- 1) No hard mast tree harvesting or salvage of downed trees.
- 2) No temporary or permanent haul roads, cell towers, buildings, pipelines, etc.

Enhancements *

- 1) Release cuts around hard mast producing trees is favorable.
- 2) Red Maple is a lower value seed producer; kill or hinge-cut red maple.
- 3) In areas lacking canopy closure find, fertilize and fence (if necessary) hard mast producing seedlings or saplings.
- 4) Plantings of grape vines (summer grape *Vitis aestivalis*) or Virginia creeper provides a valuable food source and cover.
- 5) Evergreens, particularly hemlock, represent food, cover, and water to woodrats. If a suitable location exists a limited number can be planted.
- 7) Additional plantings of grape, gooseberry, red elderberry, Hercules club, mountain sumac, serviceberry, sassafras, mountain ash, dwarf chestnut oak, and American chestnut hybrids (if available) are beneficial.
- 8) If the woodrats are using caves or old mine openings they should be examined for the potential of gating.

*Some enhancement techniques may be difficult to accomplish in the Core Habitat due to the dominance of rock and lack of suitable soil.

ZONE 2

SUPPORTING LANDSCAPE is the area that extends 200 meters from the edge of the Core Habitat polygon. The Supporting Landscape typically consists of mature forest that provides food sources to the woodrat.

Apply the same Best Management Practices and enhancements as Zone 1. The enhancements should be easier to apply within Zone 2 than in Zone 1 due to the potential increase in suitable soil that would support the plantings.

ZONE 3

GENERAL LANDSCAPE is the area extending from the edge of the supporting landscape for a 1.25 mile distance. Generally this zone should be maintained in a forested condition with minimal to no permanent fragmentation.

Best Management Practices

- 1) Limit permanent haul roads, cell towers, buildings, pipelines, etc.
- 2) Temporary haul roads and timber harvest are acceptable. The timber harvest should focus on maintaining hard mast producing trees.

DISPERSAL CORRIDORS

Occupied, recently occupied, and potential woodrat habitat needs to be connected in order to provide dispersal corridors from one known woodrat location to another. When dispersal corridors are fragmented it increases the chances of existing populations to die off and not be reoccupied.

- 1) Dispersal corridors should be a minimum of 100 meters wide when connecting core habitat areas within 500 m of each other.
- 2) Forestry operations can occur within the corridor provided the corridor is maintained in pole size or larger trees.
- 4) No new permanent fragmentation to the corridor should occur from logging roads, developments, utility lines, etc. that breaks the corridor and would reduce the ability of woodrats to disperse and or would increase their mortality.
- 5) In some instances, breaks in the travel corridor (Ex. highways) can be improved by providing various forms of wildlife passages.

HABITAT CREATION

Habitat creation for the Allegheny woodrat (*Neotoma magister*) involves the construction of large boulder fields with numerous rock ledges and overhangs that provide deep fissures that provide protection from predators and the weather.

The following criteria should be used to determine if woodrat habitat should be created:

- 1) The area is in a forest interior setting with acorn producing species present.
- 2) The area is within 3 miles of an active woodrat population that is connected to the creation site by a travel corridor.
- 3) The area has a steep slope with supporting talus slopes and rock outcrops immediately adjacent to the site.
- 4) No major forest fragmentation (highways, developments, etc.) is within 1.25 miles.

The woodrat habitat creation should adhere to the following criteria:

1) Enough material is present to create a minimum of 1 acre of core habitat. The largest and flattest rock material should be stored and stockpiled from the entire work area. Core habitat consists of boulders with a minimum diameter of 3 feet with larger boulders being better. The boulders are placed in a manner to create the highest amount of openings that extend as far as possible under ground level. If possible, underground openings should be created that have the boulders placed on top to create the deepest caverns as possible. Smaller boulders are placed on the outside edges of the core habitat.

Typically woodrats locate their toilet areas and food caches on larger and flatter boulders with over hanging rocks above that shelter them from the weather and/or predators. The best woodrat habitat has numerous flat ledges leading to underground caverns and as many of them as possible should be created.

- 2) A biologist with experience surveying for woodrats should be hired to oversee the creation of woodrat habitat.
- 3) A planting plan needs to be developed for the site that includes trees, shrubs, and vines that provide overhead cover and food. Following are examples of beneficial plants that can be included in the planting plan: drupe grape, Virginia creeper, gooseberry, red elderberry, serviceberry, mountain sumac, sassafras, mountain ash, dwarf chestnut oak, hemlock and all hard mast producing species such as chestnut oak, red oak, and white oak.



CONCLUSIONS

The PGC follows a process of determining if habitat is present, determining the presence or absence of the species, and working to avoid and minimize potential impacts. In order to accomplish this task the PGC may require additional information and review 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.

The Pennsylvania Game Commission, Bureau of Wildlife Habitat Management, should be contacted at the following address to coordinate reviews and impact assessments for the Allegheny woodrat.

Pennsylvania Game Commission
Division of Environmental
Planning and Habitat Protection
Bureau of Wildlife Habitat Management
2001 Elmerton Avenue
Harrisburg, PA 17110
Phone (717) 783-5957

REFERENCES

Genoways, H.H., and F.J. Benner, 1985. Species of Special Concern in Pennsylvania. Trustees of Carnegie Institute, pp. 316-318.

Pennsylvania Game Commission, 2006. Woodrat Management Plan.

Wild Resources Conservation Fund, 1995. Endangered and Threatened Species of Pennsylvania. p. 13.

APPENDIX A

ALLEGHENY WOODRAT HABITAT ASSESSMENT

In Pennsylvania Allegheny woodrats (*Neotoma magister*) are primarily forest interior species that occupy rocky islands embedded in a forested matrix. Their habitat in Pennsylvania can be categorized as 1) den sites consisting primarily of an island and/or corridor of rocks surrounded and typically overtopped by tree canopy; 2) foraging habitat that may extend greater than 100 meters beyond rocks (Wright and Hall 1996); and 3) forested dispersal habitat (between colony areas) that is often absent of surface rocks.

Den site size is a limiting factor for woodrats. The den site is a core area (s) within a rocky island of rocks and boulders with an abundance of large deep crevices characterized by tree canopy cover.

1) Den site size

Den site size is less than 1.0 acres	0.1
Den site size is 1.0 - 2.5 acres	0.3
Den site size is 2.5-3.5 acres	0.7
Den site size is greater than 3.5 acres	1.0

2) Percent of tree canopy within 300 meters of den site.

Tree canopy cover 25% or less	0.1
Tree canopy cover 26%-50%	0.4
Tree canopy cover 51%-75%	0.7
Tree canopy cover 76%-100%	1.0

3) Distance to major forest fragmentation (paved highway, large agriculture fields, large housing and commercial developments, etc.)

Fragmentation within 0.25 miles	0.0
Fragmentation between 0.25 to 0.75 mile	0.4
Fragmentation between 0.75 to 1.0 mile	0.8
No major fragmentation within 1.0 mile	1.0

4) Dispersal corridors are forested tracts of land (>200 feet wide) that connect to other rock outcrop areas

No dispersal corridors exist	0.0
One travel corridor exists	0.5
Multiple corridors exist	1.0

Allegheny Woodrat
(*Neotoma magister*)

Site Survey form

and

Code Manual

PENNSYLVANIA GAME COMMISSION

WILDLIFE DIVERSITY SECTION

ALLEGHENY WOODRAT HABITAT SITE SURVEY

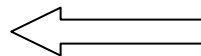
CODE MANUAL

This manual provides instructions, definitions and codes for completing the Allegheny Woodrat Habitat Site Survey



The Allegheny Saxicole or THE ĀSAX

Saxicole: Dwelling in stony places; something that lives on or among rocks; a saxicolous species.



Chittering and twittering,
Chompin and stompin,
The āsax is home.
In the shadow of stone

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): _____

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common (see Table 1):

1) Code # _____ % _____, 2) Code # _____
% _____,

3) Code # _____ % _____, 4) Code # _____
% _____

Geological formation:

Nearest mapped water: Name: _____ Distance to:
_____ m

FORM PGC 4150 wdrat

Forest Fragmentation Code: _____ Two-digit Habitat Disturbance code: _____

Anderson Level III cover code on site: _____ and adjacent to site: _____

Tree canopy coverage overtop Habitat Site: _____%

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last):

Shrub, Vine and Briar (Rubus) Species:

Herbaceous Species:

General Description of Surrounding Habitat (>100m & <500m): _____

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)

Establish up to 10 ACs and/or PACs for every 1 km of Habitat Site length.

No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		#Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
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21										
22										
23										
24										
25										

TOTAL =

--	--	--	--	--	--	--	--	--	--

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	
Raccoon Feces	

WOODRAT HABITAT SITE SURVEY CODE BOOKLET

This booklet will help you to complete the accompanying woodrat site survey form. Some questions are self-explanatory and therefore not covered here. The site survey form should be completed for all initial surveys, resurveys, and trapping surveys of suitable rocky habitat even if no woodrats were found.

Important Definitions:

Activity Center: Activity centers are overtop or near subsurface woodrat nesting or denning sites. Activity centers are characterized by observable woodrat sign in the form of toilet area(s) and midden-cache(s) linked in most cases to a complex of surface rocks and fissures or to a cave/mine entrance zone. The estimated center of activity is GPSed. Then all toilet areas and midden-caches within a 15 m radius of this GPS point are tallied. Multiple Activity Centers within the same Habitat Site should not overlap. Repeatedly or perennially used Activity Centers likely consist of an adult female and her young. Older daughters are tolerated nearby. In essence, Activity Centers (previously referred to as den sites) contain a breeding assemblage. Males disperse from, visit, travel through, or occasionally occupy vacant activity centers. Generally, prime den sites or Activity Centers are defended and are rarely closer than 30 m to one another.

Potential Activity Center: Some areas look like good woodrat habitat but fail to have any sign of being used by woodrats. In these survey instances, the most complex surface rock found, characterized by rock overhangs, ledges, small caves and numerous fissures, can be defined as a Potential Activity Center.

Habitat Site: A Habitat Site is a variable sized area of more or less contiguous surface rock without a break in the surface rock of 200 m or more. A Habitat Site is an island or a “patch” of rock (sometimes referred to as a rock pile) or a cluster of islands. A Habitat Site and its adjacent fringing apron (ecotone) of rock and non-rock surface area has all the necessary resources for the persistence of a local subpopulation, and it is separated by unsuitable denning habitat from other Habitat Sites. At any given time, a Habitat Site may be occupied or empty. Adjacent Habitat Sites are separated by at least 200 m of non-surface rock habitat or by a substantial barrier in the form of a major, hardtop road or wide stream. Habitat Sites contain one or more Activity Centers or Potential Activity Centers. An active Habitat Site contains a woodrat subpopulation which may be as small as a single breeding assemblage or contain multiple breeding assemblages. The most common kinds of movements by woodrat are foraging forays within and on the fringe of the Habitats Site, den shifts within a Habitat Site, and short distance dispersal within larger Habitat Sites. See Figure 2.

Metapopulation Area: Metapopulation Areas are separated from the nearest, adjacent Metapopulation Area by at least 10 km of non-woodrat habitat or a significant barrier to dispersal, e.g. a river or farmed valley bottom. A Metapopulation Area contains at least one but usually numerous topographically related woodrat Habitat Sites; some Habitat Sites may not be occupied. A Metapopulation Area contains a metapopulation defined as a set of subpopulations (one per active Habitat Site) where typically migration from one subpopulation to at least some other subpopulations (Habitat Sites) is possible. The

subpopulations are able to exchange individuals and recolonize Habitat Sites in which the species has recently become extinct.

Conservation Management Unit: A Conservation Management Unit contains physiographically related Metapopulation Areas. Administratively, a Conservation Management Unit represents an economy of scale; and different Metapopulation Areas within a Conservation Management Unit are likely to be impacted similarly regarding regional threats and public land management.

INSTRUCTIONS FOR COMPLETING FORM PGC 4150 wdrat

Habitat Site Name: Give each site a short individual name consisting of no more than two words. Group names (e.g. Big Mountain #4) may also be appropriate. Resurveys of previous Sites may require these Sites to be merged under a new name because previous adjacent Sites may not have the required ≥ 200 m of non-surface rock between them. The ≥ 200 m rule is new as of the year 2006. For example, Ellendale 1 through Ellendale 17 (absent ≥ 200 between adjacent Sites) would be merged into a single Habitat Site renamed Ellendale Merged or Ellendale A.

Trap-site Number: Enter if known otherwise leave blank, a number will be assigned later.

Location: Miles or kilometers due north or south and due east and west of nearest town on the topographic map.

Conservation Management Unit: Use only the approved name or abbreviation from Appendix I and Figure 1.

Habitat Site Code: Enter if known, otherwise leave blank and a code will be assigned later.

Habitat Site size: See definition of Habitat Site. The longest length is measured along or close to the contour. Find the end of surface rock adjacent to an area spanning at least 200 m of mostly non-surface rock. The longest length of the surface rock island, without a break of 200 m or more, is estimated to the nearest 50 m, but not zero. Habitat Sites longer than 2 km (about a mile) should be GPSed at both ends and the longest length should be taken off of a topographic map rather than visually estimated. The width of a surface rock island is usually but not always at right angles to the contour, i.e. downhill or uphill. The average width in a few instances will be longer than the length. Estimate the average width of the Habitat Site to the nearest 25 m but not zero. The width range is the shortest and widest width of the surface rock island.

Area of Occupancy or Activity Extent: Estimate the length and width of a rectangle that includes all Activity Centers that have evidence (new and/or old) of being used by woodrats.

Latitude and Longitude: On the contour, estimate the middle of the Habitat Site and GPS this point.

Elevation Range, Example: 332' to 610'
15%.

Percent Slope, Example (%):10% to 15%.

Aspects (degrees), Example: southerly aspects: 100 % 180°; in this example 100% of the Habitat Site was facing due south.

northerly aspects clockwise 315° to 45°
southerly aspects clockwise 135° to 225°
easterly aspects clockwise 45° to 135°
westerly aspects clockwise 225° to 315°

Note: numerous ridgetop sites will have contrasting aspects.

Classification of Rocky Habitat: This code can be determined with the use of Appendix II. Key down from column 1 to column 3; the number in the third column is the code number(s) to use. Spaces are available for only the four most common rocky habitat types.

Geological formation: This data comes from the Preliminary Atlas of Geologic Quadrangles for Pennsylvania, Map 61 from the Pennsylvania Geological Survey; refer to the DCNR website. If not available, briefly describe rock (limestone outcrop, sandstone talus, etc.).

Nearest mapped water: Provide the distance to and name of the nearest stream or other body of water taken from the 7.5' quadrangle map.

Forest Fragmentation: This is a basic distance code to measure massive encroachment of agricultural/urban areas into the forest cover type. For this reason consider only agricultural/urban areas >100 hectares. Usually this entry will be the closest measurement from the Habitat Site to the edge of the forest cover type where it meets the expansive, developed, cleared land of the valley.

<u>Code</u> <u>Number</u>	<u>Distance from</u> <u>>100 ha opening</u>	<u>Code</u> <u>Number</u>	<u>Distance from</u> <u>>100 ha opening</u>
1	On site	5	>1km to 2km
2	≤ 100m	6	>2km to 3km
3	>100m to 500m	7	>3km to 5 km
4	>500m to 1km	8	>5km

Normally the measurement can be taken off a 7.5 minute topographic map (closest distance to edge of white areas >100 hectares). However, this is not always the case. For example, large housing developments (>100ha.) in a forested site may still be colored green on a topographic map.

Linear agricultural/urban areas >100 hectares should be considered. Example: an agricultural/urban river bottom that measures 250m x 5,000m would qualify for this entry.

For this code, do not measure the distance to small housing developments, strip mines, clearcuts, forest clearings or other small disturbances <100 hectares. These smaller site disturbances should be recorded in the following "Two-digit Habitat Disturbance Codes."

Two-digit Habitat Disturbance Code: Disturbance code that may affect the Habitat Site. Space is available to list up to 3 disturbance codes. Get from Appendix IV.

Anderson Level III land cover code: Determine from Appendix III. Key down from column 1 to column 3; use the 3 digit number (code number) in the third column.

Tree canopy coverage overtop Habitat Site: Estimate to nearest 10%.

ACTIVITY CENTERS and POTENTIAL ACTIVITY CENTERS (PAC): (see definitions) this is a major change compared to previous (pre-2006) surveys.

Within Habitat Sites, Activity Centers are over-top or near subsurface woodrat nesting or denning sites. Activity Centers are characterized by observable woodrat sign in the form of toilet area(s) and midden-cache(s) linked in most cases to a complex of surface rocks and fissures or to a cave/mine entrance zone. Some areas look like good woodrat habitat but fail to have any sign of being used by woodrats. In these survey instances, the most complex surface rock found, characterized by rock overhangs, ledges, small caves and numerous fissures, can be defined as a Potential Activity Center (PAC). The estimated center of activity (actual or potential) is GPSed. Then, if present, all toilet areas and midden-caches within a 15 m radius of this GPS point are tallied. Multiple Activity Centers and/or PACs within the same Habitat Site

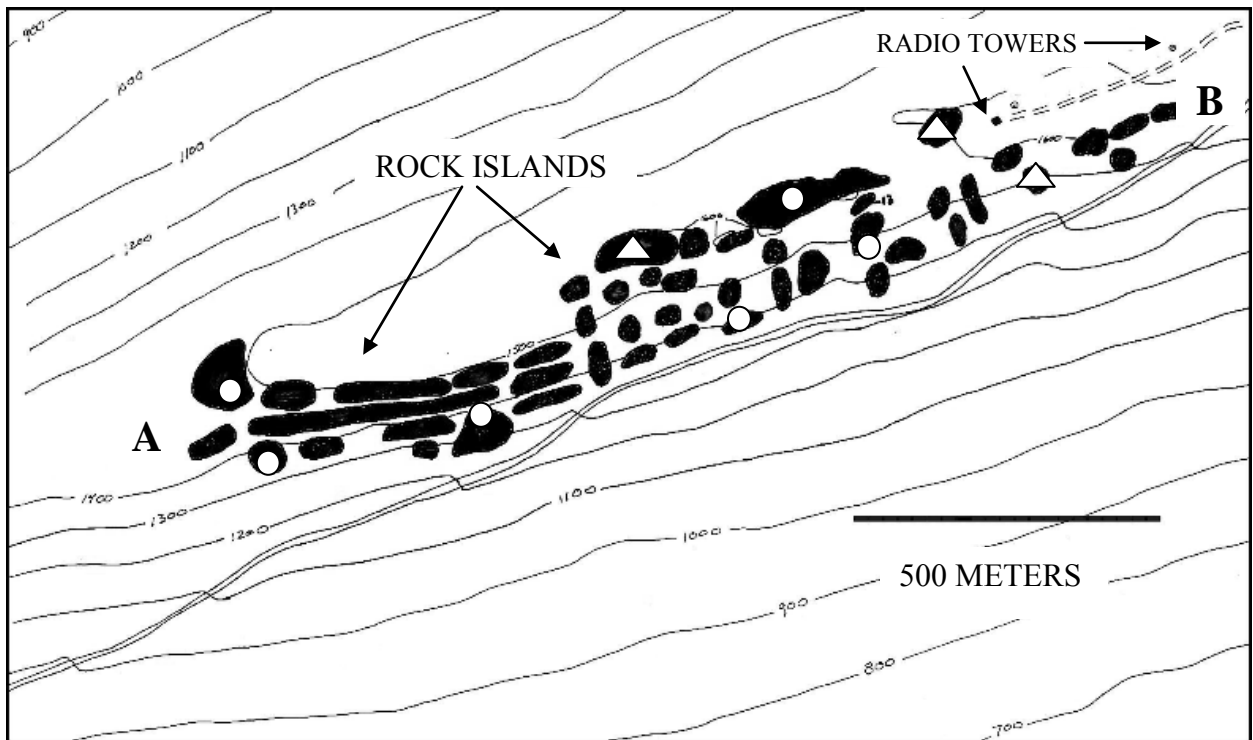
should not overlap. Establish up to 10 Activity Centers and/or PACs for every 1 km of Habitat Site length.

- Step 1: Starting at either end of the Habitat Site's "longest length," look for the closest Activity Center or Potential Activity Center. GPS the Activity Center or PAC.
- Step 2: Tally all toilet areas and midden-caches within 15m of the GPSed spot. Also note the rock type (Appendix 2) within and the tree canopy coverage over-top the Activity Center or PAC.
- Step 3: Look for the next closest, non-overlapping (≥ 30 m from nearest other Activity Center or PAC) Activity Center or PAC and continue in the fashion until no more qualifying Activity Center or PACs exist on the Habitat Site. Note, for every 1 km of Habitat Site length, the Centers (from 1 to 10) can be: 1) all Activity Centers with fresh and/or old signs of woodrat activity; **or** they can be: 2) all Potential Activity Centers with qualifying surface rock but no sign of ever being used by woodrats, **or** 3) very likely they will be a combination of 1 and 2. Ten is the maximum number of Centers to GPS within any 1 km stretch of Habitat Site.

Midden-cache contents: List by indicated category. Be as specific as possible, i.e. sassafras leaves, blackberry twigs, tulip poplar fruits, hay-scented ferns. If you are not sure of the identity of an item, collect it and have it identified.

Vegetation: Be specific. Note anything that is exceptionally abundant such as large patches of fern or blueberries.

Figure 1. Example: The Ellendale Towers Habitat Site.



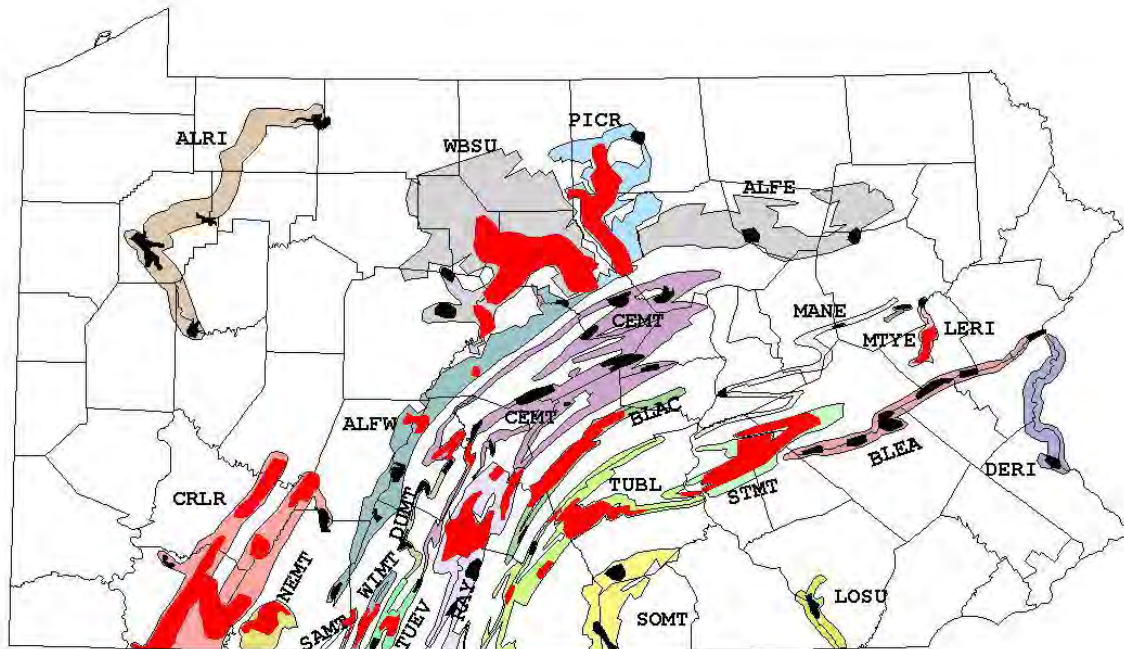
○ = Activity Center with fresh and/or old woodrat sign

△ = Potential Activity Center with "good" rock

Explanation:

- Ellendale Towers (the Habitat Site Name) is a cluster of rock islands treated as a single Habitat Site because each island is within 200 m of one or more adjacent islands.
- The Habitat Site Length is measured from A to B.
- Proceeding from A towards B, 7 Activity Centers and 1 Potential Activity Center were GPSed in the first kilometer. Two Activity Centers and 2 Potential Activity Centers were GPSed in the next 500 meters.

Figure 2. A 2006 map illustrating 23 Conservation Management Units and 78 Metapopulation Areas.



- Metapopulation Areas**
- Active (N=29)
 - Inactive (N=49)
 - PA Countys
- Conservation Management Areas**
- ALFE=Allegheny Front East
 - ALFW=Allegheny Front West
 - ALRI=Allegheny River
 - BLAC=Blacklog Mountain
 - BLEA=Blue Mountain East
 - CEMT=Central Mountains
 - CRLR=Chestnut/Laurel Ridges
 - DERI=Delaware River
 - DUMT=Dunning Mountain
 - LERI=Lehigh River
 - LOSU=Lower Susquehanna R.
 - MANE=Mahantango/Nescopck Mt.
 - MTYE=Mount Yerger
 - NEMT= Negro Mountain
 - PICR=Pine Creek
 - RAYS=Raystown Branch
 - SAMT=Savage Mountain
 - SOMT=South Mountain
 - STMT=Stony Mountain
 - TUBL=Tuscarora/Blue Mts.
 - TUEV=Tussey/Evitts Mts.
 - WBSU=W. Br. Susquehanna
 - WIMT=Wills Mountain

Table 1. Classification of surface rock habitat.

Enter as a three digit code from the following table.

<u>HABITAT TYPE</u>	<u>QUALITY OF HABITAT</u>	<u>SIZE OF ROCK</u>
1 talus	11 bare rock, deep interstices	111 blocks less than 1 meter
		112 blocks 1-3 meters
		113 blocks 3-5 meters
	12 bare rock, shallow interstices	121 blocks less than 1 meter
		122 blocks 1-3 meters
		123 blocks 3-5 meters
	13 rock covered by organic material including humus, leaves, moss, with deep interstices	131 blocks less than 1 meter
		132 blocks 1-3 meters
		133 blocks 3-5 meters
	14 rock covered by organic material including humus, leaves, moss, with shallow interstices	141 blocks less than 1 meter
		142 blocks 1-3 meters
		143 blocks 3-5 meters
2 rock city, large float blocks	21 numerous overhangs, crevices, and "caves"	211 blocks 5-10 meters
	22 few or no overhangs, crevices, and "caves"	212 blocks 10 meters+
3 cliffs, rock outcrops	31 numerous overhangs, crevices, and "caves"	221 blocks 5-10 meters
	32 few or no overhangs, crevices, and "caves"	222 blocks 10 meters+
4 Cave or mine entrance zone	41 rarely visited, may be gated	311 less than 3 meters high
	42 occasionally visited	312 3+ meters high
Quarry or mine pit	51 highwall with numerous crevices, boulders, etc.	321 less than 3 meters high
	52 highwall with few or no crevices, boulders, etc.	322 3+ meters high
6 Other man made rocky habitat such as stone walls, railroad and road cuts, buildings, etc.	61 few or no suitable crevices, overhangs, or other interstices	411 entrance 0-2 meters
	62 numerous suitable crevices, overhangs, or other interstices	412 entrance 2+ meters
		421 entrance 0-2 meters
		422 entrance 2+ meters
		431 entrance 0-2 meters
		432 entrance 2+ meters
		511 less than 3 meters high
		512 3+ meters high
		521 less than 3 meters high
		522 3+ meters high
		611 less than 3 meters high
		612 3+ meters high
		621 less than 3 meters high
		622 3+ meters high

Table 2. Anderson Level III Land-cover Codes Pertinent To Woodrat Habitat

4 Forest Land	41 deciduous forest	411 sapling stage: shrub land layer moderate to dense 412 sapling stage: grazed and/or shrub layer sparse 413 pole stage: shrub layer moderate to dense 414 pole stage: grazed and/or shrub layer sparse 415 mature stage shrub layer moderate to dense 416 mature stage: grazed and/or shrub layer sparse
	42 evergreen forest land	421 sapling stage: shrub land layer moderate to dense 422 sapling stage: grazed and/or shrub layer sparse 423 pole stage: shrub layer moderate to dense 424 pole stage: grazed and/or shrub layer sparse 425 mature stage shrub layer moderate to dense 426 mature stage: grazed and/or shrub layer sparse
	43 mixed forest land	431 sapling stage: shrub land layer moderate to dense 432 sapling stage: grazed and/or shrub layer sparse 433 pole stage: shrub layer moderate to dense 434 pole stage: grazed and/or shrub layer sparse 435 mature stage shrub layer moderate to dense 436 mature stage: grazed and/or shrub layer sparse
7 Barren land	74 bare exposed rock 75 strip mines, quarries and grade pits 76 transitional areas 77 mixed barren land	740 bare exposed rock 750 strip mines, quarries and grade pits 760 transitional areas 770 mixed barren land

Table 3. Classification of Habitat Disturbance.

Use the category(s) that best defines the site:

Code Number	PROXIMITY OF DISTURBANCE	Code Letter	TYPE OF DISTURBANCE
1	On-site	A	Dumping
2	<100m	B	Party spot
3	100m to 500m	C	Buildings
4	>500m to 1km	D	Agriculture
5	>1km to 2km	E	Utility rights-of-way
6	No significant disturbance	F	Railroad rights-of-way
		G	Improved roads
		H	Unimproved roads
		I	Recreation area
		J	Mining
		K	Fire
		L	Main logging haul road
		M	Concentrated tree mortality
		N	No significant disturbance

Example 1: Pastureland approximately 600 meters from suitable rocky habitat would be coded as **4D**.

Example 2: A rock outcrop/cliff used for beer parties would be coded **1B**.

Example 3: Excellent rocky habitat surrounded by uninterrupted forest for 2 or more kilometers in every direction would be coded **6N**.

Example 4: A main logging haul road and log loading site within 300 meters of the edge of the Habitat Site would be coded **3L**.

PROTOCOL FOR ASSESSING BAT USE OF POTENTIAL HIBERNACULA

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 >50°F (10°C) for first 2 hours of sampling and must not fall below 35°F (1.7°C) 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

ATTACHMENT 3

Allegheny Woodrat
(*Neotoma magister*)
Conservation Plan

Pennsylvania Pipeline Project

Prepared for:

Sunoco Logistics, L.P.

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Sinking Spring, PA 19608

Prepared by:

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January 2016

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Appendix C	DCNR Bureau of Forestry – Wood Rat Habitat Plan Parameters

LIST OF ACRONYMS and ABBREVIATIONS

ACRONYM	MEANING
AC	Activity Center
ATWS	Additional Temporary Workspaces
BMP's	Best Management Practices
ft	Foot or Feet
G3	Global Vulnerable
HDD	Horizontal Directional Drill
LOD	Limit of Disturbance
LE	Federal Listed Endangered
m	Meter
NGL	Natural Gas Liquid
PA	Pennsylvania
PAC	Potential Activity Center
PGC	Pennsylvania Game Commission
PNDI	Pennsylvania Natural Diversity Inventory
PNHP	Pennsylvania Natural Heritage Program
Project	Pennsylvania Pipeline Project
PPP	Pennsylvania Pipeline Project
PT	Pennsylvania Threatened
ROW	Right-of-Way
S2	State Imperiled
SPLP	Sunoco Pipeline, L.P.
Tetra Tech	Tetra Tech Inc.
Wildlife Specialists	Wildlife Specialists, Inc.

1.0 INTRODUCTION

On behalf of Sunoco Pipeline L.P. (SPLP), Tetra Tech, Inc. (Tetra Tech) has prepared this Allegheny woodrat (*Neotoma magister*) Conservation Plan for the Pennsylvania Pipeline Project (PPP or Project). This plan will be used to provide and implement the measures that are necessary to avoid, minimize, and mitigate for potential impacts to the Allegheny woodrat which is protected as a threatened species under the Game and Wildlife Code (PGC 2010). This plan was developed based on correspondence with the Pennsylvania Game Commission (PGC) and information regarding the biology and habitat preferences of the Allegheny woodrat. In addition, special provisions for woodrat habitat occurring on the Tuscarora State Forest are also provided. This plan describes the project, survey results, impacted habitat within the project area, and discusses the avoidance, minimization, and mitigation measures that will be used to conserve the Allegheny Woodrat.

1.1 PROJECT DESCRIPTION

SPLP proposes to construct and operate the Pennsylvania Pipeline Project to expand existing pipeline systems and provide natural gas liquid (NGL) transportation of up to 350,000 barrels per day. The Project involves the phased installation of approximately 561 miles of two parallel pipelines within a 306-mile, 50-foot-wide right-of-way (ROW) from Houston, Washington County, Pennsylvania to SPLP's Twin Oaks facility in, Delaware County, Pennsylvania with the purpose of interconnecting with existing SPLP Mariner East pipelines. Initially, a 20-inch diameter pipeline would be installed within the ROW from Houston, PA to the Twin Oaks facility (306 miles) and a second, up to 20-inch diameter pipeline, is proposed be installed in the same ROW. The second line is proposed to be installed from SPLP's Delmont Station, Westmoreland County, Pennsylvania to the Twin Oaks facility, paralleling the initial line for approximately 255 miles. This plan has been written for the 255 mile portion of the proposed line between Delmont and the Twin Oaks Facility. The Project location is shown on Figure 1.

The Project will provide transportation service for up to 700,000 barrels of NGL per day from the Utica and Marcellus Shale formations for both domestic and international markets. The Project will transport propane, butane, and ethane across Pennsylvania. SPLP's upstream customers currently extract natural gas in the form of methane from the aforementioned geologic formations for distribution to the community. The natural gas extracted for this Project will provide fuel that is used for power generation, heating, and cooking. NGLs are separated from the natural gas stream before it is shipped on the natural gas piping network. Upstream shippers are currently limited by the shortage of NGL transport systems. In addition, the Project will provide along its route across Pennsylvania various exit points for the supply of desperately needed propane, at affordable prices to local distributors. This is especially helpful during peak demand periods when there would otherwise be a shortage of supplies. Finally, upon completion, the Pennsylvania Pipeline Project will promote sustained economic development and jobs-creation throughout Pennsylvania.

1.2 LAND REQUIREMENTS

The proposed Project would result in temporary access during the construction period of proposed facilities. Construction of the pipeline would require a 75-foot wide Right-of-Way (ROW) that would contain a 50-foot wide post-construction ROW that is permanently maintained and a 25-foot wide temporary workspace that would be used to facilitate the installation of the pipelines. Following installation, the 25-foot temporary workspace unit would be restored and allowed to return to its pre-construction state unless it is within an existing, permanently maintained ROW. Additional temporary work space (ATWS) would also be needed at some areas to facilitate construction. Sizes of these workspaces would depend on site-specific requirements. All Workspaces would be clearly defined within project mapping and within agency and municipality applications. Following construction, ATWS's would be restored and allowed to return their pre-construction state unless they are within an existing, permanently maintained ROW.

Construction of the Project's aboveground facilities and the use of non-public access roads would have land requirements. New pump stations would generally require 3-4 acres of land and modifications to existing pump stations would require 2-3 acres of additional land. Support sites, such as pipe/contractor yards, are to be sited on previously disturbed areas and generally range from 5-15 acres in size. Temporary use would primarily be limited to existing non-public roads, driveways, and farm lanes that may require improvements. Permanent access roads to stations or valve settings may also be required. All proposed temporary and permanent access roads would be clearly defined within project mapping and within agency and municipality applications. Following construction, temporary work spaces would be restored and allowed to return their pre-construction state unless they are within an existing, permanently maintained ROW.

2.0 ALLEGHENY WOODRAT BIOLOGY AND HABITAT PREFERENCES

The Allegheny woodrat is a solitary, nocturnal mammal measuring about 255-millimeters (mm) in length (Newcombe 1930, Poole 1940, Manjerovic 2004, Castelberry et al. 2006). It is mostly an herbivorous species but will occasionally incorporate fruit into its diet (Castleberry et al. 2002a, 2002b). The woodrat has brown-gray fur on its back and white hair on the underside which extends to the end of its tail that is also fur-covered (Poole 1940, Castelberry et al. 2006).

The Allegheny woodrat is globally ranked as G3 (Global Vulnerable), state ranked as S2 (State Imperiled), and its Pennsylvania status is Pennsylvania Threatened (PT) (Pennsylvania Natural Heritage Program [PNHP] 2015). Allegheny woodrats are found throughout the Appalachian Mountains ranging south to Alabama, west to Tennessee, east to North Carolina, and north to New Jersey (Godwin 1932, Poole 1940, Castelberry et al. 2006, Wright 2008). The current distribution in Pennsylvania is not fully understood as the Allegheny woodrat is found in metapopulations throughout the state that may vary between years (Butchkoski 2003, Castelberry et al. 2006, Butchkoski 2012). The Allegheny woodrat can normally be found in rocky habitats on very steep slopes that have cliffs, large rocks, caves, and rocky outcrops (Newcombe 1930, Poole 1940, PGC 2010). Vegetation surroundings may be coniferous, deciduous, or a mixture and mast-producing trees are an important source of food (PGC 2010).

3.0 HABITAT SURVEYS AND RESULTS

In a March 14, 2014 response to a Large Project Pennsylvania Natural Diversity Inventory (PNDI) request for the PPP (Appendix A), the PGC identified 16 areas where suitable rocky habitat exists in mountainous areas of Indiana, Cambria, Blair, Huntingdon, Perry, and Cumberland Counties. After that correspondence, the Altoona Bypass in Cambria and Blair counties represented a large reroute of the Project and potential habitat surveys were conducted along this entire rerouted section. Based on this correspondence with the PGC, Tetra Tech contracted Wildlife Specialists, Inc. (Wildlife Specialists) to complete detailed Allegheny woodrat habitat surveys within the survey areas identified by the PGC and along the entire Altoona Bypass. The purpose of the field surveys was to refine the general surveys areas into woodrat habitat polygons and identify specific sites within those areas with woodrat sign or with specific characteristics. A report of the 2014 and 2015 surveys for the Project was previously provided to the PGC for review and is included as Appendix B. Wildlife Specialists' biologists conducted the field surveys between June 23 and July 24, 2014 and April 15-28, 2015 and in accordance with PGC's *Neotoma magister* (=NEMA) *Habitat Site Survey Code Manual* (Revision date 02/20/2009).

Field surveys were performed in the 16 survey areas identified by the PGC and along the entire Altoona Bypass reroute within a 200-meter (m) buffer centered on the proposed pipeline centerline and wherever the Project limits of disturbance (LOD) extended beyond that buffer. The LOD included all proposed workspaces involving new land disturbances, including the permanent ROW, temporary workspaces, access roads, pump stations, and staging areas. Surveyed area characteristics varied from rocky, mature deciduous forest with high canopy closure to open talus slopes. During this effort the survey areas were refined and redefined to focus the search for Activity Centers (ACs), defined as site locations with recent (past 5 years) woodrat latrine sites, food caches, and/or nests, and for Potential Activity Centers (PACs) defined as site locations with typical Activity Center characteristics, however no recent field sign was identified. All Allegheny woodrat habitat polygons and ACs and PACs site locations were mapped and any observed evidence of woodrat occurrence was recorded. More specific information on the identification of ACs and PACs can be found in the in the *Neotoma magister* (=NEMA) *Habitat Site Survey Code Manual*.

Field surveys identified that each of the 16 survey areas identified by the PGC contained at least one habitat polygon and one PAC. In addition, two woodrat habitat polygons and 2 PAC were located along the Altoona Bypass reroute. However, evidence of woodrat occupation within the past 5 years including an old-midden cache, old caches, fresh caches, latrines, and nests were limited to four habitat areas containing a total of eight ACs. These four woodrat habitat areas included Jacks Mountain 2, Jacks Mountain 3, Blacklog Mountain, and Bowers Mountain 2. (Figures 2-1 to 2-4). Specific evidence of woodrat presence observed during the survey effort and site characterizations can be found in Wildlife Specialists' Allegheny Woodrat and Eastern Small-footed Bat Habitat Survey Report (Appendix B).

4.0 MITIGATION MEASURES

SPLP utilized the PGC's Best Management Practices (BMP's) for Occupied Woodrat Habitat to assist with development of this Conservation Plan. The following sections outline SPLP's pre-construction and post-construction avoidance, minimization, and mitigation measures to minimize impacts to this species.

4.1 PRE-CONSTRUCTION

From the onset of the Project, SPLP has instructed project designers to consider environmental impacts in regard to all aspects of the proposed Project and to avoid and minimize wherever possible while allowing safe installation. Pipeline engineers were provided a large list of restrictions, recommendations, and requirements to consider during the design phase. Major considerations, where co-location with existing utility corridors, limiting the construction corridor to the minimum amount practicable, use of Horizontal Directional Drilling (HDD) technology, and avoidance and minimization at sensitive habitats.

SPLP has co-located the project alignment with an existing SPLP ROW for approximately 80% of the route so that this existing ROW could be utilized as workspace. With the use of portions of the existing ROW for construction, this is a major means for avoiding new impacts to sensitive resources (i.e., forested wetlands, forest areas, streams) and for minimizing environmental impacts for the entire Project. SPLP has also co-located with foreign utility lines whenever possible when routing pulls away from the existing SPLP ROW. In addition, SPLP has implemented a number of route variations through environmental feedback, both minor and major, to further reduce the impacts associated with the Project. Many of these route variations are driven by environmental factors such as avoidance of forested wetlands or areas occupied by sensitive species.

In general, the construction ROW is limited to 75-ft in most areas. This is comprised of a 50-ft-wide permanent easement and 25-ft of temporary workspace required to facilitate construction. In some areas, additional temporary workspace is required to facilitate construction. The industry standard for installation of this size of pipe is 100-ft. Restricting construction to 75-ft significantly reduces impacts to the landscape including a large reduction in impacts to forested areas. Instead of continuing through the wetlands/streams with the 75-ft-wide construction ROW, SPLP has narrowed the construction ROW to 50-ft for all wetland/stream crossings thus minimizing temporary impacts to these resources during construction. This narrow construction corridor, along with co-location efforts has greatly minimized fragmentation of habitat impacts.

As stated in the PGC's BMP's for Occupied Woodrat Habitat, the criteria used to determine if it is appropriate to create woodrat habitat are: the area is in a forest interior setting with acorn producing species present, the area is within 3 miles of an active woodrat population that is connected to the creation site by a travel corridor, the area has a steep slope with supporting talus slopes and rock outcrops immediately adjacent to the site, or no forest fragmentation (highways, developments, etc.) is within 1.25 miles. The woodrat habitat areas that were found to contain a total of eight ACs were Jacks Mountain 2, Jacks Mountain 3, Blacklog Mountain, and Bowers Mountain 2. These areas contained 1.7, 0.8, 0.1, and 2.7 acres of identified habitat, respectively, within the proposed LOD. These four survey areas meet the aforementioned criteria stated in the PGC's BMP's for Occupied Woodrat Habitat and will be impacted as result of the Project. Post-construction related mitigation procedures for these areas are described in section 4.2.

4.2 POST-CONSTRUCTION

Following construction, SPLP will restore habitat in temporary workspaces and create new potential woodrat habitat in the form of rock structures at the four survey areas containing AC's following the criteria stated in the PGC's BMPs. Five rock structures are proposed to be built within the four areas containing delineated woodrat habitat and ACs. The structures will be constructed along temporary ROW's, access roads, or workspaces, or in areas adjacent to these spaces based on an evaluation of the impacted landscape. The proposed locations of these rock structures are shown on Figures 2-1 to 2-4. The structures to be created will contain boulders at least 3-ft in diameter that will be arranged to maximize the amount of openings present. If possible, underground openings will be utilized to create

the deepest caverns possible. Using flat rocks, as many flat ledges as possible will be created to be used for latrines and food caches. Smaller boulders will also be placed around the edges of the core habitat. The construction of these structures will be overseen by a trained biologist who has performed woodrat surveys and is familiar with their habitat characteristics and needs.

The Bowers Mountain 2 habitat area and associated ACs occur on the Pennsylvania Department of Natural Resources administrated Tuscarora State Forest. The DCNR has requested additional measures at this location as outlined in the provided DCNR Bureau of Forestry – Wood Rat Habitat Plan Parameters (Appendix C). SPLP will implement this plan in coordination with the DCNR.

A report thoroughly documenting these mitigation efforts will be prepared and submitted to the PGC within three months following construction of the habitat structures.

5.0 CONCLUSION

This Allegheny Woodrat Conservation Plan for the Pennsylvania Pipeline Project provides SPLP's commitment to mitigation measures to prevent permanent impacts to the woodrat within the Project area. SPLP has conducted extensive background and field survey to identify Allegheny woodrat occurrence and habitats within and adjacent to all Project work areas. These surveys provided the foundation for the development of this plan.

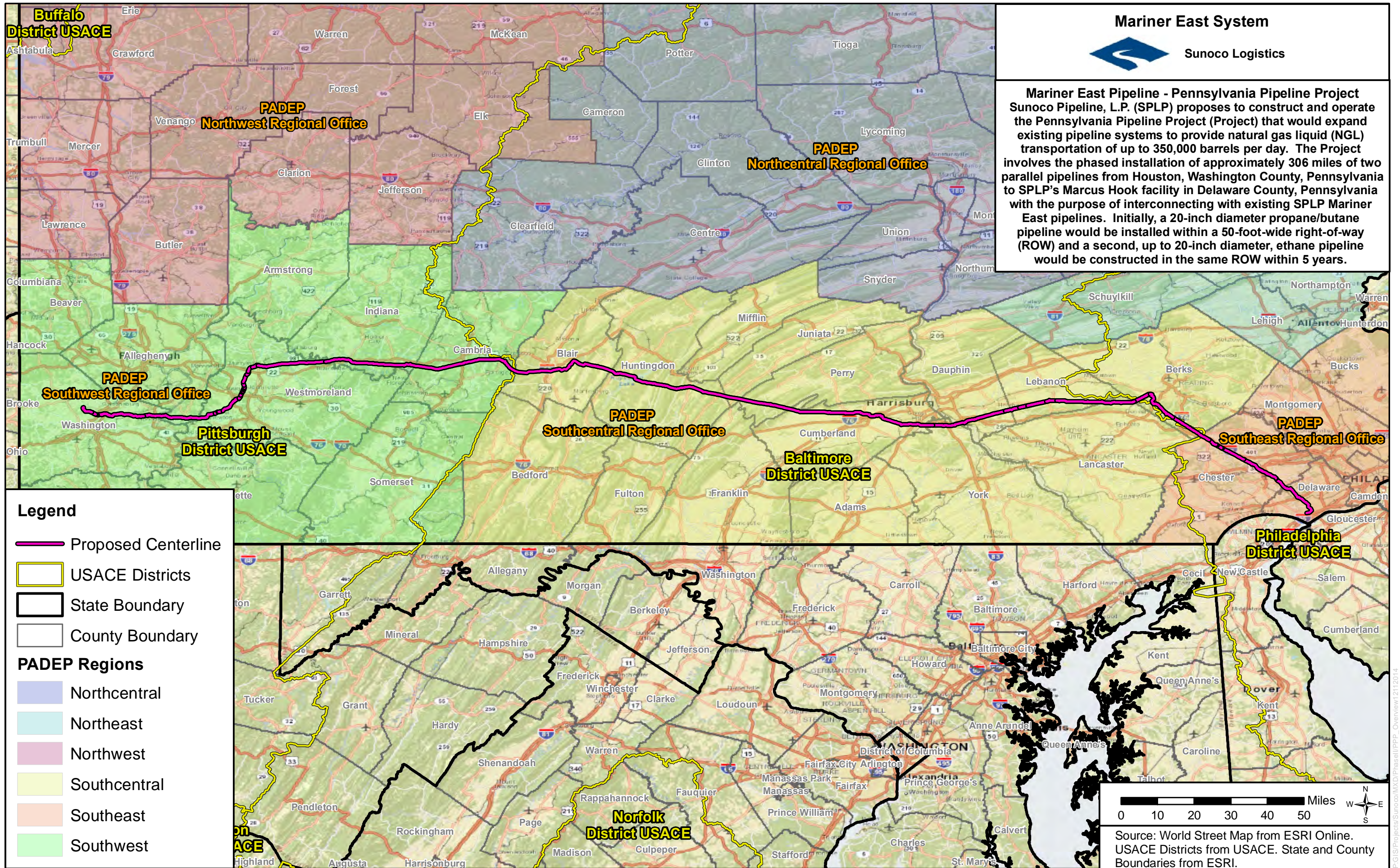
SPLP has implemented several measures as a standard practice to reduce impacts to sensitive resources including those to Allegheny woodrat habitat. These include co-locating the project alignment with an existing SPLP ROW for approximately 80% of the route and limiting the construction ROW to 75-ft in most areas. This narrow construction corridor, along with co-location efforts has greatly minimized the fragmentation of habitats. SPLP is also committed to mitigating for unavoidable impacts to Allegheny woodrat habitat by creating five new habitat structures along temporary ROW's, access roads, or workspaces, or in areas adjacent to these spaces along the PPP. In addition, SPLP will implement the DCNR's Wood Rat Habitat Plan Parameters provide in Appendix C at the Bowers Mountain 2 habitat area.

Based on SPLP's commitments to the protection and conservation of the Allegheny woodrat and what is known about the presence and/or potential presence of the species in the vicinity of the Project area, we conclude that the PPP is not likely to impact the Allegheny woodrat.

6.0 REFERENCES

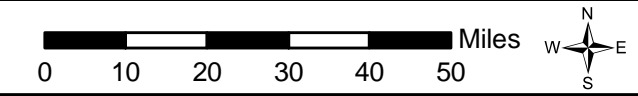
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FIGURES

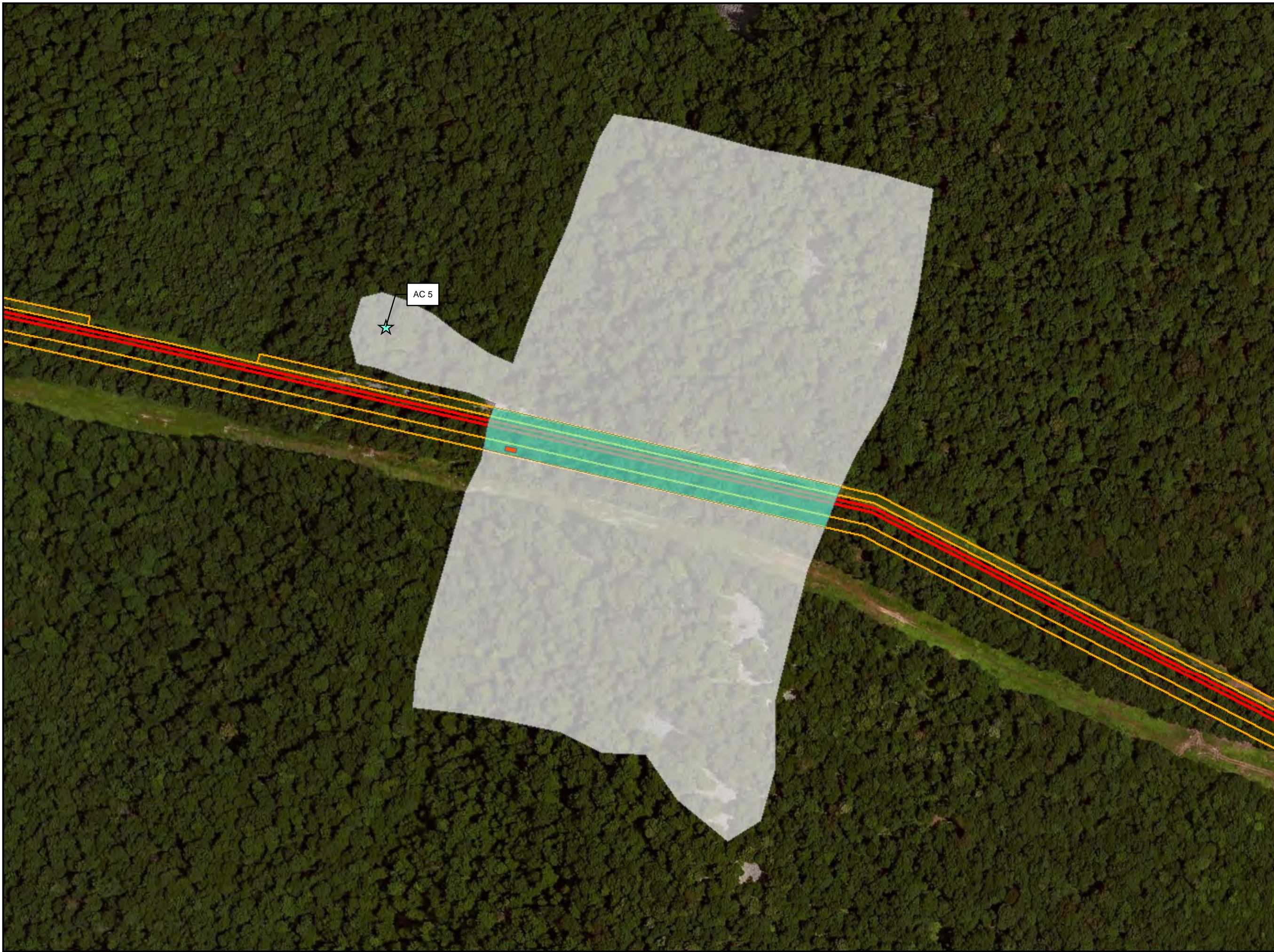











Mariner East Pipeline - Pennsylvania Pipeline Project
 Sunoco Pipeline, L.P. (SPLP) proposes to construct and operate the Pennsylvania Pipeline Project (Project) that would expand existing pipeline systems to provide natural gas liquid (NGL) transportation of up to 350,000 barrels per day. The Project involves the phased installation of approximately 306 miles of two parallel pipelines from Houston, Washington County, Pennsylvania to SPLP's Marcus Hook facility in Delaware County, Pennsylvania with the purpose of interconnecting with existing SPLP Mariner East pipelines. Initially, a 20-inch diameter propane/butane pipeline would be installed within a 50-foot-wide right-of-way (ROW) and a second, up to 20-inch diameter, ethane pipeline would be constructed in the same ROW within 5 years.

- Legend**
- Proposed Centerline
 - USACE Districts
 - State Boundary
 - County Boundary
- PADEP Regions**
- Northcentral
 - Northeast
 - Northwest
 - Southcentral
 - Southeast
 - Southwest

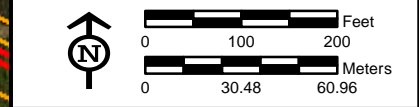
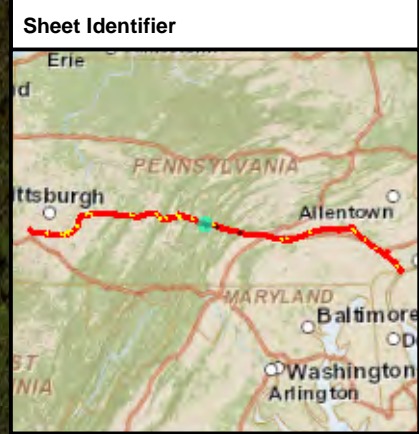


Source: World Street Map from ESRI Online.
 USACE Districts from USACE. State and County Boundaries from ESRI.



- Legend**
-  Activity Center
 -  Proposed Habitat Structure
 -  Woodrat Impacted Habitat
 -  Woodrat Non-impacted Habitat
 -  Access Road
 -  Alignment Centerline
 -  Limit of Disturbance
 -  ATWS
 -  Block Valve Site

AC 5












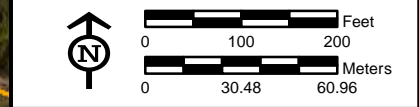
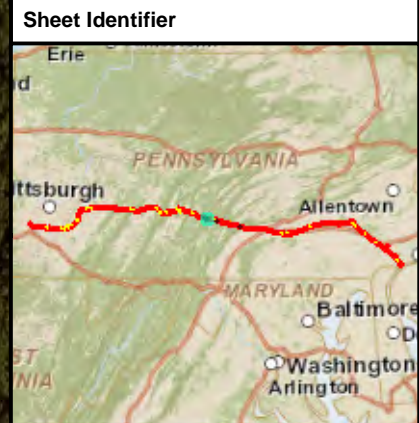
**FIGURE 2-1
JACKS MOUNTAIN 2 HABITAT AREA**
PENNSYLVANIA PIPELINE PROJECT
DECEMBER 2, 2015 ALIGNMENT
SUNOCO LOGISTICS, L.P.
HUNTINGDON COUNTY, PA



Notes:
1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2011 ESRI and its data suppliers).



- Legend**
-  Activity Center
 -  Proposed Habitat Structure
 -  Woodrat Impacted Habitat
 -  Woodrat Non-impacted Habitat
 -  Access Road
 -  Alignment Centerline
 -  Limit of Disturbance
 -  ATWS
 -  Block Valve Site

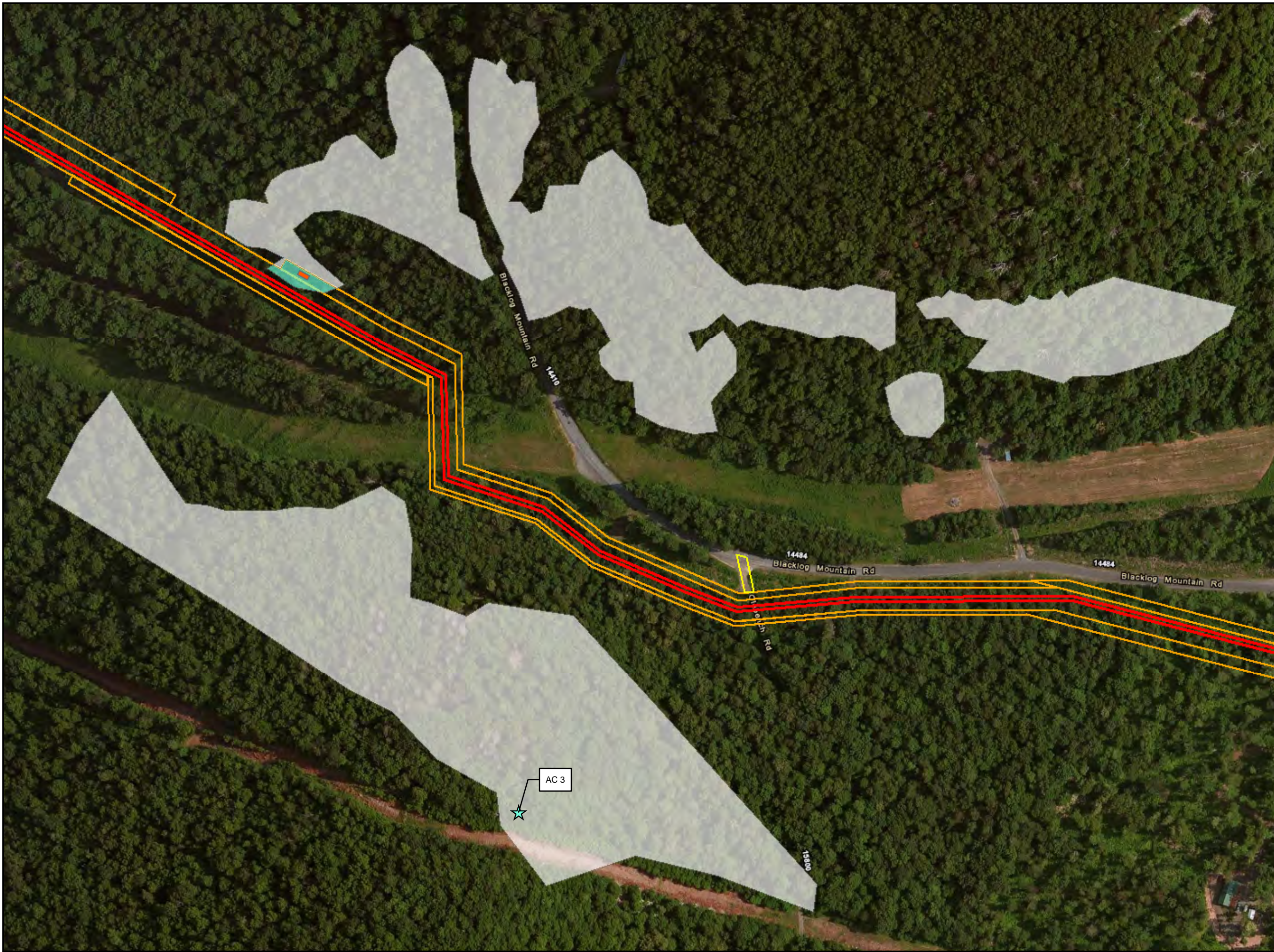











**FIGURE 2-2
JACKS MOUNTAIN 3 HABITAT AREA**
PENNSYLVANIA PIPELINE PROJECT
DECEMBER 2, 2015 ALIGNMENT
SUNOCO LOGISTICS, L.P.
HUNTINGDON COUNTY, PA



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- Legend**
-  Activity Center
 -  Proposed Habitat Structure
 -  Woodrat Impacted Habitat
 -  Woodrat Non-impacted Habitat
 -  Access Road
 -  Alignment Centerline
 -  Limit of Disturbance
 -  ATWS
 -  Block Valve Site

Sheet Identifier

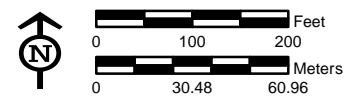
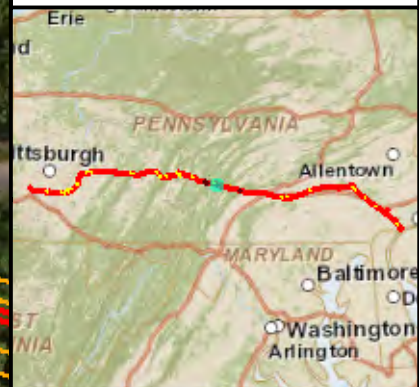
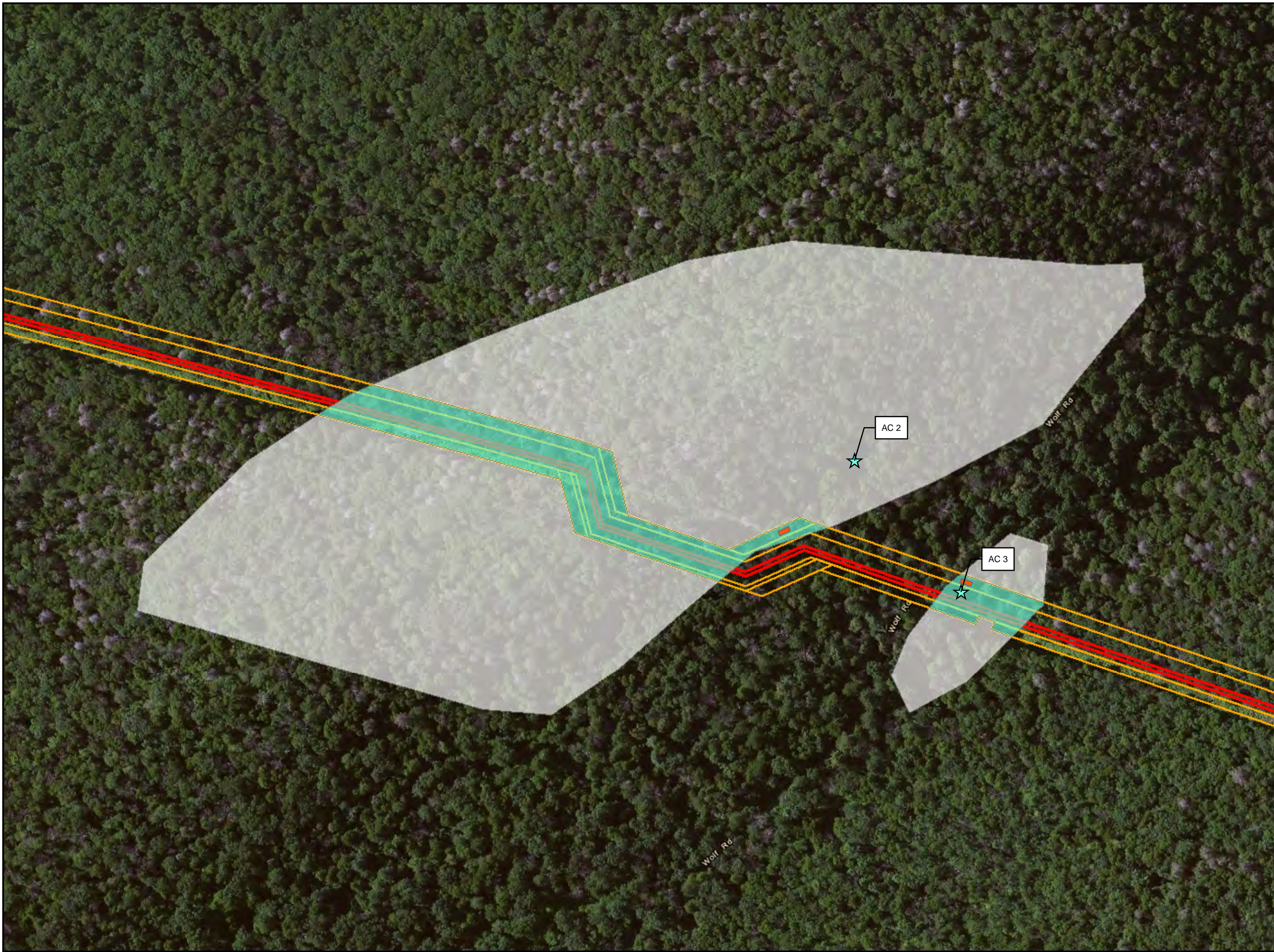











FIGURE 2-3
BLACKLOG MOUNTAIN HABITAT AREA
 PENNSYLVANIA PIPELINE PROJECT
 DECEMBER 2, 2015 ALIGNMENT
 SUNOCO LOGISTICS, L.P.
 HUNTINGDON COUNTY, PA



Notes:
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- Legend**
-  Activity Center
 -  Proposed Habitat Structure
 -  Woodrat Impacted Habitat
 -  Woodrat Non-impacted Habitat
 -  Access Road
 -  Alignment Centerline
 -  Limit of Disturbance
 -  ATWS
 -  Block Valve Site

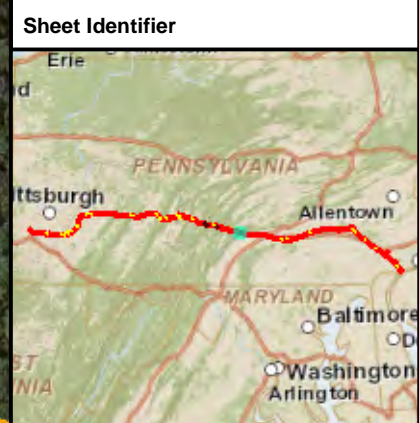


FIGURE 2-4
BOWERS MOUNTAIN 2 HABITAT AREA
 PENNSYLVANIA PIPELINE PROJECT
 DECEMBER 2, 2015 ALIGNMENT
 SUNOCO LOGISTICS, L.P.
 PERRY COUNTY, PA



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APPENDIX A

Agency Coordination

From: [Taucher, John](#)
To: [Smith, Preston](#)
Subject: RE: Pennsylvania Pipeline Project
Date: Tuesday, October 27, 2015 8:40:46 AM
Attachments: [2014 Eastern Small-footed Bat Roost Structures and Examples_081214.pdf](#)

Preston,

Attached, please find a guidance for the alternate roost structures for small-footed bats and some example photographs. Please note that the size of each structure is flexible, it should fit into the area and be constructed properly with adequate sun exposure. Generally these should be constructed as close to the actual impacts as possible, however they can be aggregated in some instances. Based on the shapefiles that delineated the small-footed habitat, it appears 1.7 acres of suitable habitat will be impacted. A mitigation rate of 3:1 will be implemented which yields 5 acres. Four structures are to be constructed per acre of impact which leaves a total of 20 structures for the project.

In addition, monitoring will be required for replacement structures in the form of emergence counts. Three years of monitoring or until small-footed bat use is documented, whichever comes first (i.e. if bats are found using it the first year, no further monitoring is required).

Regarding the woodrat, constructing habitat similar to the small-footed bat roost structures (just with larger crevices) and/or supplemental plantings would be sufficient for mitigation.

John

From: Smith, Preston [mailto:Preston.Smith@tetrattech.com]
Sent: Monday, October 26, 2015 2:53 PM
To: Taucher, John <jotaucher@pa.gov>
Subject: RE: Pennsylvania Pipeline Project

Hi John,

Thanks for sending this. Do you have any examples of approved mitigation plans for small-footed bats or Allegheny woodrats that I could use as a guide?

I also got your letter for the mussels, fish, and redbelly turtle.

Thanks again,

Preston

Preston Smith | Manager, Wetlands and Ecological Services Department

Direct: 412.921.8167 | Main: 412.921.7090 | Cell: 724.516.6842 | Fax: 412.921.4040

preston.smith@tetrattech.com

Tetra Tech, Inc. | Appalachian Basin Oil and Gas Services

661 Andersen Drive Foster Plaza No. 7 | Pittsburgh, PA 15220 | www.tetrattech.com



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From: Taucher, John [<mailto:jotaucher@pa.gov>]
Sent: Monday, October 26, 2015 1:45 PM
To: Smith, Preston <Preston.Smith@tetrattech.com>
Subject: Pennsylvania Pipeline Project

Preston,

I am working on updating the PGC's PNDI response letter regarding the Pennsylvania Pipeline Project based on the small-footed bat and woodrat information you provided. Regarding the eastern small-footed bats, suitable bat roosting habitat was identified and delineated within the proposed project.

From here there are two options:

- 1) Small-footed bat use can be assumed, in which case there will be a seasonal restriction on the suitable habitat and any impacts to the habitat will need to be mitigated for.
- 2) Verify small-footed bat use at suitable habitat through emergence counts. Seasonal restriction and mitigation will be required for any habitat that small-footed bat use is verified only. All other areas there will be no restrictions or mitigation.

Regarding Allegheny woodrats, mitigation will only be required for impacts to sites where woodrat sign was found. Woodrat sign was found at four locations along the proposed pipeline. One location is located on State Forest property which will require coordination with DCNR.

A mitigation plan for both small-footed bats and woodrats will need to be submitted and approved by the PGC prior to issuing a resolution letter. If you have any questions, please do not hesitate to contact me.

Thanks,

John Taucher

Pennsylvania Game Commission

Bureau of Wildlife Habitat Management

Division of Environmental Planning & Habitat Protection

2001 Elmerton Avenue

Harrisburg, PA 17110

717-787-4250 ext. 3632

Fax 717-787-6957

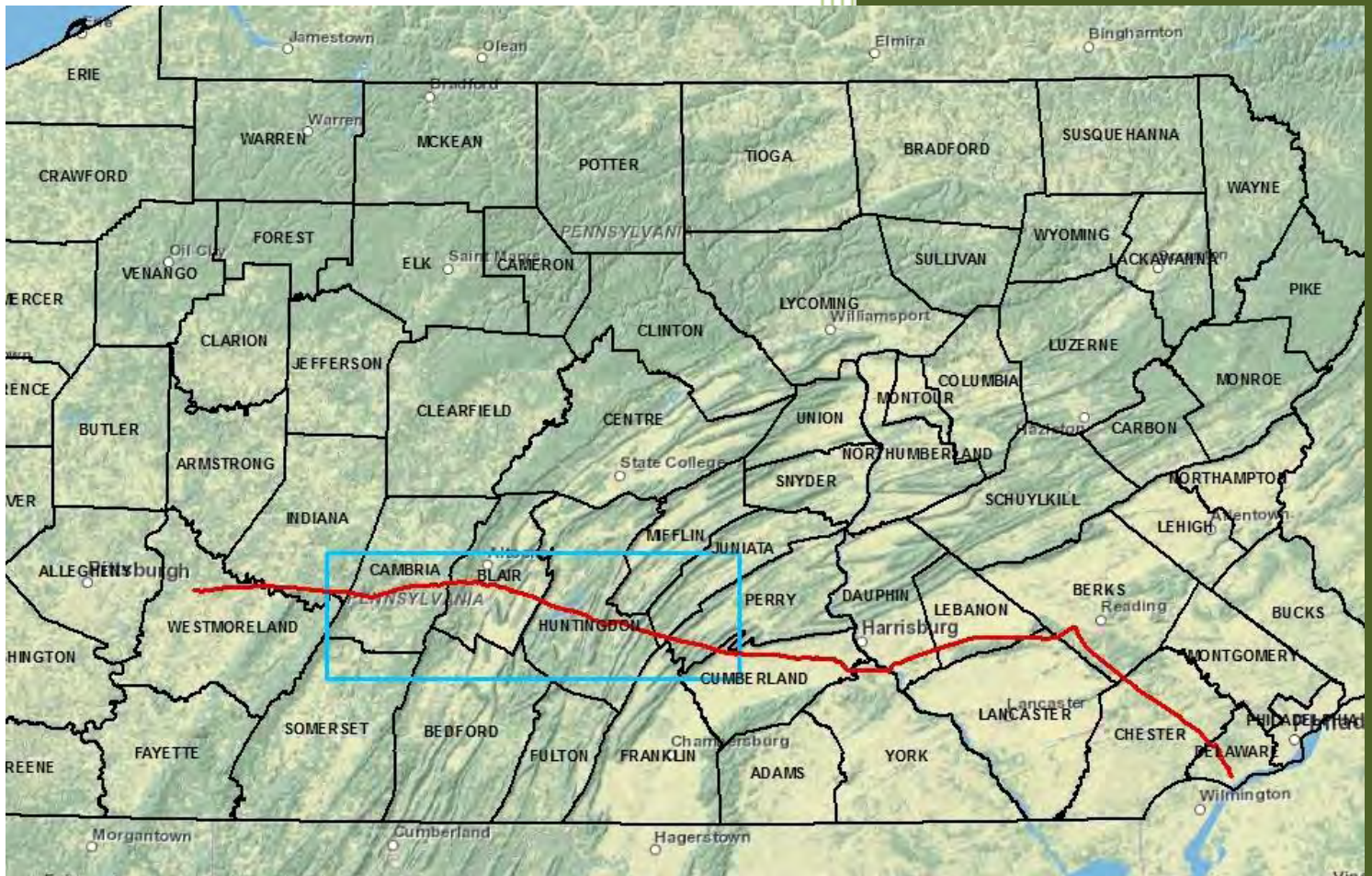
APPENDIX B
Allegheny Woodrat and Eastern Small-Footed Bat Survey
Report

Allegheny Woodrat and Eastern Small-footed Bat Habitat Survey Report

Pennsylvania Pipeline Project

for

Sunoco Pipeline, LP



Prepared By:

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2785 Hills Creek Rd.

Wellsboro, PA 16901

570-376-2255

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May 2015





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Executive Summary

This report is submitted to Sunoco Pipeline, LP (Sunoco) for habitat surveys for Allegheny woodrat (*Neotoma magister*—PA Threatened) and Eastern small-footed bat (*Myotis leibii*—PA Threatened) at the proposed Pennsylvania Pipeline Project. Following a Pennsylvania Natural Diversity Inventory (PNDI) Large Project review (PGC ID Number: 201312180001, Dated March 14, 2014—App. I), the Pennsylvania Game Commission (PGC) identified a potential impact from this project on these species and requested surveys for habitat within 17 areas (10 woodrat only, 1 small-footed bat only and 6 woodrat and small-footed bat) along the proposed pipeline corridor located within parts of Indiana, Cambria, Blair, Huntingdon, Perry, and Cumberland Counties in Pennsylvania. In addition, Wildlife Specialists surveyed for woodrat and small-footed bat habitat along the Altoona Bypass portion of the proposed pipeline.

Between June 23 and July 24, 2014 and April 15-28, 2015, Wildlife Specialists, LLC conducted surveys for suitable Allegheny woodrat and Eastern small-footed bat habitat in the above-mentioned areas identified by PGC, including a 200-meter buffer on the proposed/potential limits of disturbance (LOD). Wildlife Specialists, LLC followed the PGC NEOTOMA MAGISTER (=NEMA) HABITAT SITE SURVEY CODE MANUAL (Revision Date 02/20/2009). Habitat within the survey areas varied from mature deciduous forest with high canopy closure and various rocky habitat types to large open talus slopes.

Suitable woodrat habitat was found within all of the completed habitat areas with 4 of the 17 containing evidence of occupation by woodrats within the past five years. Evidence of woodrat occupation included new and old midden-caches, latrines and nests. All of the completed areas contained suitable small-footed bat roosting habitat, and one small-footed bat was observed flying out from under a rock along the pipeline right-of-way on Shade Mountain. In addition, two potential woodrat habitat areas (Altoona Bypass 1 & Altoona Bypass 2) and numerous potential small-footed bat roosting habitat was observed along the Altoona Bypass portion of the proposed pipeline.

Introduction

Sunoco is in the planning and routing stage for its proposed Pennsylvania Pipeline Project (Project), a natural gas pipeline that would stretch from Westmoreland County in western Pennsylvania to Delaware County in the east. Wildlife Specialists, LLC was contracted to complete surveys for suitable rocky habitat for Allegheny woodrat (*Neotoma magister*—PA Threatened) and/or Eastern small-footed bat (*Myotis leibii*—PA Threatened) within 17 areas along the proposed Project corridor that were identified by PGC in their March 14, 2014 Pennsylvania Natural Diversity Inventory (PNDI) Large Project review response (PGC ID Number: 201403110501) (App. I). The Allegheny woodrat and Eastern small-footed bat survey areas were concentrated in the mountainous areas of Indiana, Cambria, Blair, Huntingdon, Perry, and Cumberland Counties crossing through the *Allegheny Mountain* and *Allegheny Front Sections* of the *Appalachian Plateaus Physiographic Province* and the *Appalachian Mountain Section of the Ridge and Valley Physiographic Province* (Figs. 1 & 2). In addition, due to subsequent route changes, Wildlife Specialists was also asked to complete surveys along the entire Altoona Bypass portion of the proposed pipeline. We conducted surveys following PGC protocols and guidance between June 23 and July 24, 2014 and April 15-28, 2015.

Although species surveys were conducted concurrently and there is much overlap between the potential woodrat and small-footed bat habitat, this document is divided into separate reports for each species. Each report is organized by survey area and findings beginning at the westernmost survey area for each species (Laurel Ridge 2 for woodrats and Laurel Ridge 3 for small-footed bats) and proceeding to the easternmost survey area for each species (Blue Mountain for woodrats and Conococheague Mountain for small-footed bats).

Survey Goals

The goal of these surveys was to search the areas identified through Environmental Review along the proposed Project for potential *Neotoma magister* habitat and *Myotis leibii* summer roosting habitat to document any such occurrences so that impacts to these resources can be avoided, minimized, or mitigated for in accordance with requirements of the Pennsylvania Game Commission.

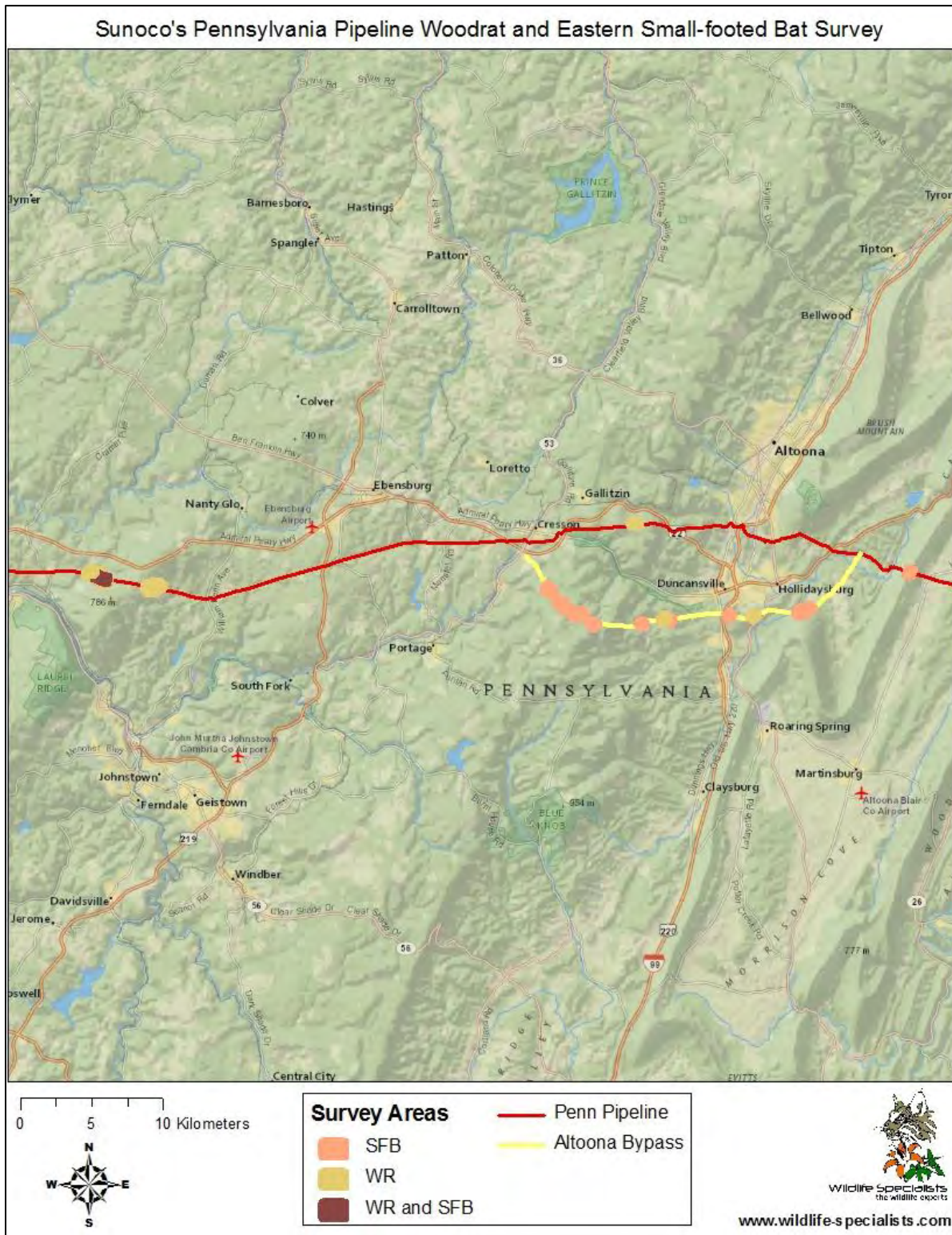


Figure 1. Location of Sunoco's proposed Pennsylvania Pipeline Project (east end), Indiana, Cambria, and Blair Counties, Pennsylvania, showing the locations of Allegheny woodrat (*Neotoma magister*) and Eastern small-footed bat (*Myotis leibii*) survey areas.



Figure 2. Location of Sunoco's proposed Pennsylvania Pipeline Project (west end), Huntingdon, Perry, and Cumberland Counties, Pennsylvania, showing locations of Allegheny woodrat (*Neotoma magister*) and Eastern small-footed bat (*Myotis leibii*) survey areas.

Allegheny Woodrat Habitat Survey Report

The Pennsylvania Game Commission identified 16 areas of concern for Allegheny woodrats along the proposed Project (Table 1). These survey areas are predominantly mature forested ridge/valley-side habitats within the Ridge and Valley Province (n=14) or Appalachian Plateaus Province (n=4). In addition to these requested habitat areas, Wildlife Specialists was also contracted to survey the Altoona Bypass portion of the proposed pipeline. All of the completed survey areas contained suitable woodrat habitat as well as two areas along the Altoona Bypass survey corridor portion of the proposed pipeline. Of the total areas surveyed, four contained evidence of occupation by woodrats within the past 5 years.

Table 1. Summary of Allegheny woodrat (*Neotoma magister*) survey areas along Sunoco’s proposed Pennsylvania Pipeline Project, identified in the Pennsylvania Game Commission’s Large Project Environmental Review response letter, dated March 14, 2014.

Survey Area ID	County	Physiographic Province^a	Woodrat Conservation Management Unit
Laurel Ridge 2	Indiana	AMAP	Chestnut/Laurel Ridges (CRLR)
Laurel Ridge 3	Cambria	AMAP	Chestnut/Laurel Ridges (CRLR)
Laurel Ridge 1	Cambria	AMAP	Chestnut/Laurel Ridges (CRLR)
Altoona Bypass 1	Blair	AFAP	Allegheny Front West (ALFW)
Altoona Bypass 2	Blair	AFAP	Allegheny Front West (ALFW)
Jacks Mountain 1	Huntingdon	APRV	Allegheny Front East (ALFE)
Jacks Mountain 2	Huntingdon	APRV	Allegheny Front East (ALFE)
Jacks Mountain 3	Huntingdon	APRV	Allegheny Front East (ALFE)
Blacklog Mountain	Huntingdon	APRV	Blacklog Mountain (BLAC)
Shade Mountain	Huntingdon	APRV	Raystown Branch (RAYS)
Tuscarora Mountain	Perry	APRV	Tuscarora/Blue Mts. (TUBL)
Conococheague Mountain	Perry	APRV	Tuscarora/Blue Mts. (TUBL)
Bowers Mountain 1	Perry	APRV	Tuscarora/Blue Mts. (TUBL)
Bowers Mountain 2	Perry	APRV	Tuscarora/Blue Mts. (TUBL)
Middle Ridge	Perry	APRV	Tuscarora/Blue Mts. (TUBL)
Blue Mountain	Perry, Cumberland	APRV	Tuscarora/Blue Mts. (TUBL)

^a AMAP = Allegheny Mountain Section of Appalachian Plateau Physiographic Province

AFAP = Allegheny Front Section of Appalachian Plateau Physiographic Province

APRV = Appalachian Mountain Section of Ridge and Valley Physiographic Province

Survey Methods and Findings

We conducted Allegheny woodrat surveys following the guidance of the PGC's *NEOTOMA MAGISTER (=NEMA) HABITAT SITE SURVEY CODE MANUAL* (Revision Date 02/20/2009). We completed *ALLEGHENY NEMA HABITAT SITE SURVEY (FORM PGC 4150 wdrat)* for any occurrence of suitable habitat (App. II). We searched rock habitat features for woodrat latrine (toilet) sites, food caches, and nests. Allegheny woodrat *Activity Centers (AC's)* or *Potential Activity Centers (PACs)*, as defined in the *NEOTOMA MAGISTER (=NEMA) HABITAT SITE SURVEY CODE MANUAL*, were GPS'd and any observed woodrat sign was recorded. Digital photographs were taken of all ACs and PACs as well as representative habitat throughout the survey area (App. III). ACs and PACs are numbered to coincide with the survey area and row on page 3 of the corresponding data form (FORM PGC 4150 wdrat-App. II). Detailed information on topographic and vegetative characteristics of each survey area and potential habitat was also recorded.

Laurel Ridge 2

The Laurel Ridge 2 survey area is a 34.5 ac (13.9 ha) area of mostly mature forest. The site is located on the south-east facing side of Laurel Ridge. The survey corridor is approximately 0.75mi (1.2 km) north of the Findley Run Reservoir with central coordinates at 78°57'27.1"W, 40°25'51.2"N. Elevations within the site range from approximately 1,660ft – 1,680ft (506m-512m) above mean sea level. The survey area is found within the Chestnut/Laurel Ridges (CRLR) Woodrat Conservation Management Unit. Tree and sapling species include black birch (*Betula lenta*), chestnut oak (*Quercus montana*), red maple (*Acer rubrum*), and hemlock (*Tsuga canadensis*). The understory is dominated by greenbriar (*Smilax rotundifolia*), lowbush blueberry (*Vaccinium angustifolium*, *V. pallidum*), black huckleberry (*Gaylussacia baccata*), scrub oak (*Quercus ilicifolia*), rhododendron (*Rhododendron* ssp.), bracken fern (*Pteridium gloditsch*), woodfern (*Dryopteris* spp.), hay-scented fern (*Dennstaedtia punctilobula*), sedges (*Carex* ssp.) and grasses. Canopy cover throughout most of the survey area was 75% or greater.

Findings

A small portion of the Laurel Ridge 2 site (2.8 ac) was considered potential woodrat habitat. The habitat was comprised of outcrops with deep crevices (2-5m) with numerous overhangs, crevices, and "caves" (App. III, Photo Map 1). One PAC was identified based on overall quality of rocky habitat; however no sign of woodrat presence was observed (Fig. 3).

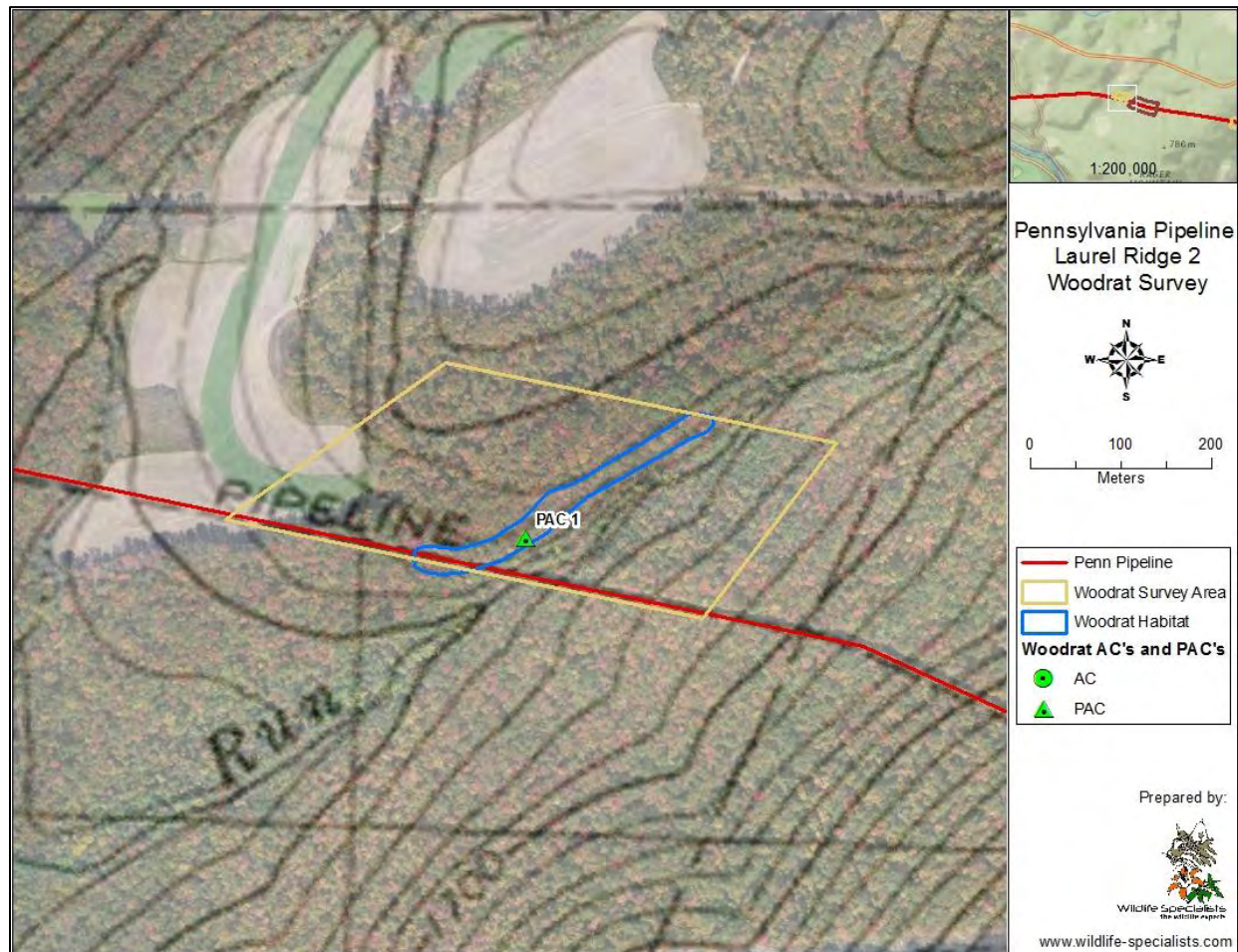


Figure 3. Location of rocky habitats, and Allegheny woodrat Potential Activity Centers (PACs) at the Laurel Ridge 2 survey area along the proposed Pennsylvania Pipeline Project, East Wheatfield Twp., Indiana County Pennsylvania, July, 2014.

Laurel Ridge 3

The Laurel Ridge 3 survey area is 120 ac (48 ha) of mostly mature forest located on the north facing side of Laurel Ridge. The survey corridor is approximately 1.3 km south of US Route 22 with central coordinates at 78°56'49.93"W, 40°25'39.77"N. Elevations within the site range from approximately 1,800ft – 2,140ft above mean sea level. The survey area is found within the Chestnut/Laurel Ridges (CRLR) Woodrat Conservation Management Unit. Tree and sapling species include black birch, red (*Quercus rubra*) and chestnut oak, red maple, sugar maple, hemlock, sassafras (*Sassafras albidum*), black cherry (*Prunus serotina*), black gum (*Nyssa sylvatica*), yellow birch (*Betula allegheniensis*), and white ash (*Fraxinus americana*). The understory is dominated by lowbush blueberry, black huckleberry, witch-hazel (*Hamamelis virginiana*), greenbriar, rhododendron, striped maple (*Acer pensylvanicum*), blackberry (*Rubus allegheniensis*), mountain laurel (*Kalmia latifolia*), wood fern, hay-scented fern,

bracken fern, teaberry (*Gaultheria procumbens*), sedges and grasses. Canopy cover throughout most of the survey area was 75% or greater, except for the small portion of survey area within the power line right-of-way (ROW).

Findings

Approximately 16 ac (6 ha) of the Laurel Ridge 3 survey area was considered potential woodrat habitat. Much of the habitat was considered high potential, and comprised of large boulders and outcrops with deep crevices (App. III, Photo Maps 2-3). Primary rocky habitat types consisted of outcrops and cliffs (2-7m) with numerous overhangs and crevices, and talus (1-5m) with deep interstices. Flora found on the site produce ideal food sources of hard and soft mast. Four PACs were identified based on overall quality of rocky habitat; however no sign of woodrat presence was observed (Fig. 4).

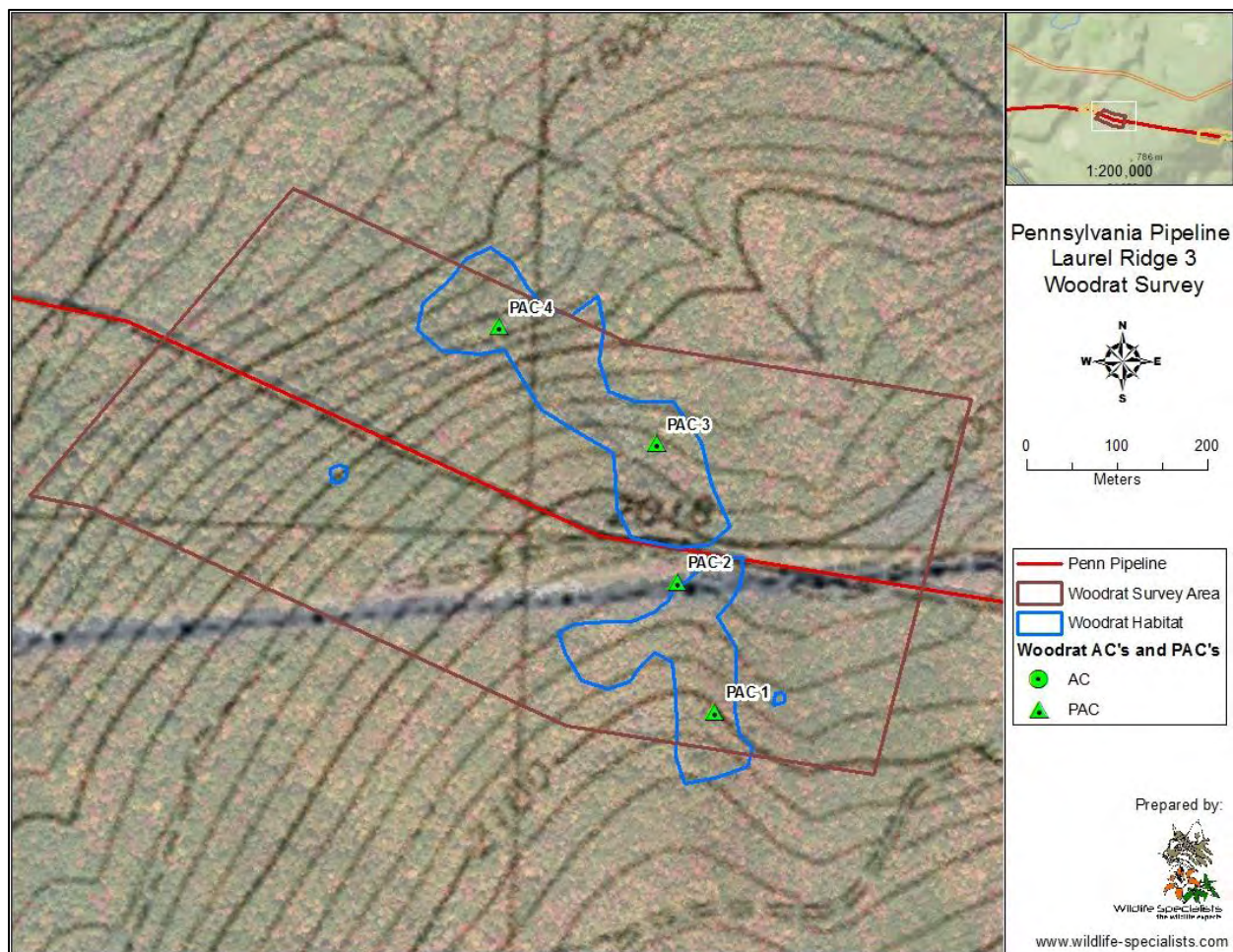


Figure 4. Locations of rocky habitats, and Allegheny woodrat Potential Activity Centers (PACs) at the Laurel Ridge 3 survey area along the proposed Pennsylvania Pipeline Project, Jackson Twp., Cambria County Pennsylvania, July, 2014.

Laurel Ridge 1

The Laurel Ridge 1 survey area is 123 ac (49 ha) of mostly mature forest located on the southeast facing side of Laurel Ridge. The survey corridor is approximately 1.4 km south of US Route 22 with central coordinates at 78°54'18.58"W, 40°25'20.97"N. Elevations within the site range from approximately 1990ft – 2,280ft above mean sea level. The survey area is found within the Chestnut/Laurel Ridges (CRLR) Woodrat Conservation Management Unit. Tree species include black birch, red oak, red maple, and sugar maple. The understory is dominated by witch-hazel, mountain laurel, woodfern, hay-scented fern, greenbriar, blackberry, striped maple, and teaberry. The survey area was intersected by the pipeline corridor and bordered a dirt road to the east. The survey area also contained two deer enclosure fences. Canopy cover throughout most of the survey area was 85% or greater.

Findings

Approximately 15.5 ac (6 ha) of the Laurel Ridge 1 survey area was considered potential woodrat habitat. Much of the habitat was comprised of large boulders and outcrops with deep crevices and considered high potential (App. III, Photo Maps 4-5). Primary rocky habitat types consisted of outcrops and cliffs (2-7m) with numerous overhangs, crevices, and “caves”; and talus (1-5+m) with deep interstices. Flora found on the site produce ideal food sources of hard and soft mast. Four (4) PACs were identified based on overall quality of rocky habitat; however no sign of woodrat presence was observed (Fig. 5).

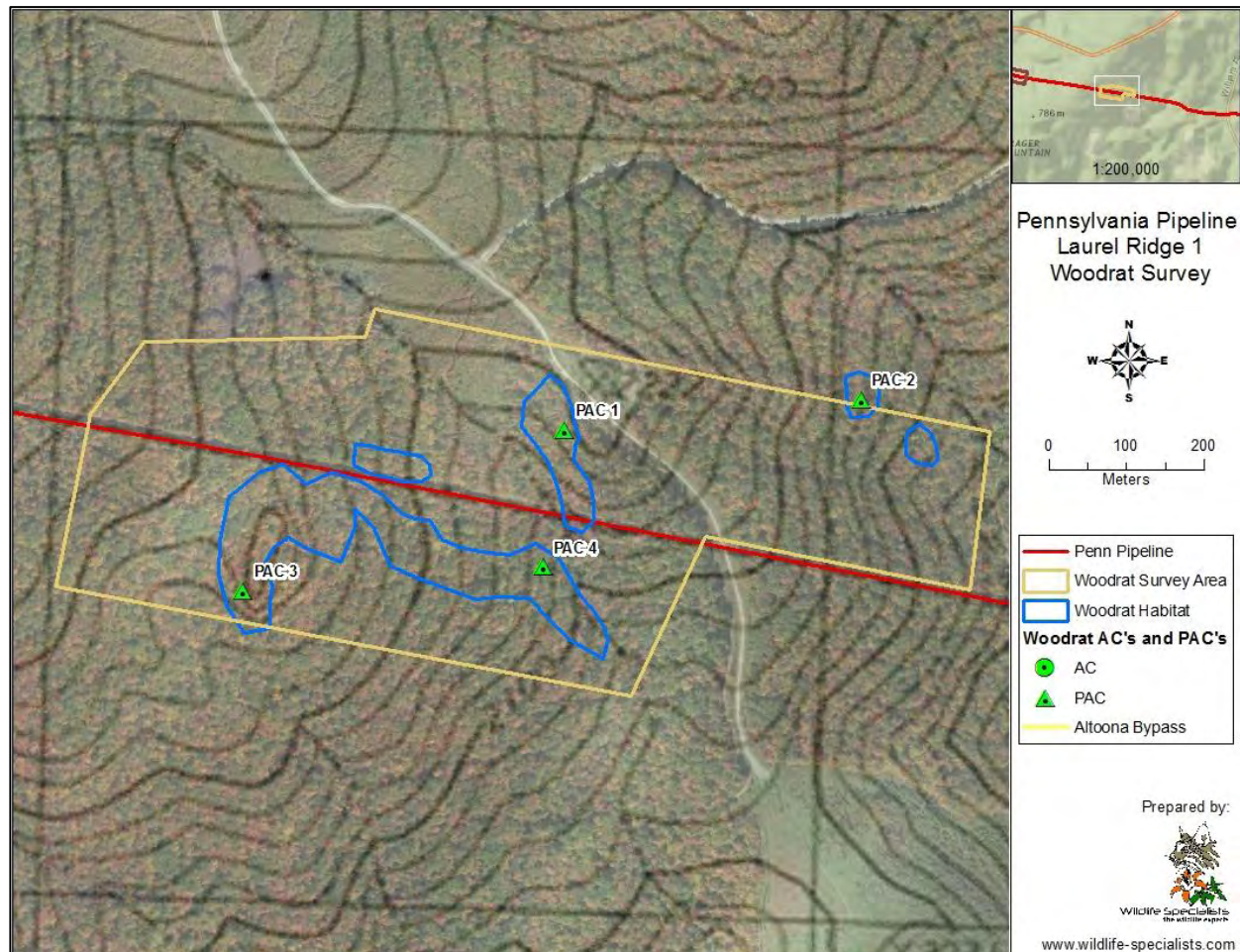


Figure 5. Locations of rocky habitats and Allegheny woodrat Potential Activity Centers (PACs) at the Laurel Ridge 1 survey area along the proposed *Pennsylvania Pipeline Project*, Jackson Twp., Cambria County, Pennsylvania, July, 2014.

Altoona Bypass

The Altoona Bypass survey area is a 17.4mi long corridor of a variety of mostly mountainous forestland and agricultural areas north and south of and including existing pipeline and power line corridors. Approximate coordinates of the Altoona Bypass are 41°26'40.741"N , 78°35'56.516"W (west end) and 40°26'52.046"N, 78°19'17.613"W (east end). Elevations within the site range from approximately 900ft – 2,640ft above mean sea level.

Findings

Altoona Bypass 1

The Altoona Bypass 1 habitat area (Fig. 6) is 0.12 ac of mostly mature forest adjacent to and north of the pipeline corridor. The site is located on the steep east facing side of a tributary of Dry Run. The habitat area is approximately 1.8 km west of the town of Foot of Ten with central coordinates at 78°29'4.06"W, 40°24'18.91"N. Elevations within the site range from approximately 1,500ft – 1,520ft above mean sea level. The habitat area is found within the Allegheny Front West (ALFW) Woodrat Conservation Management Unit. Tree and sapling species include black cherry, red oak, red maple, and white ash. The understory is dominated by Virginia creeper (*Parthenocissus quinquefolia*), lowbush blueberry, grape vine (*Vitis* spp.), woodfern, polypody fern (*Polypodium virginianum*), greenbriar, white wood aster (*Eurybia divaricata*), false solomon's seal (*Maianthemum racemosum*), goldenrod (*Solidago* spp.), grass species, and hay-scented fern. Canopy cover was 100% throughout most of the habitat area.

Surface rock consisted mainly of shaded rock outcrops that ranged in size from 1-3 m in height with few "caves" or crevices (App. III, Photo Map 6). Due to the lack of sun exposure and the relatively few crevices or deep interstices, the Altoona Bypass 1 habitat area was considered low potential woodrat habitat.

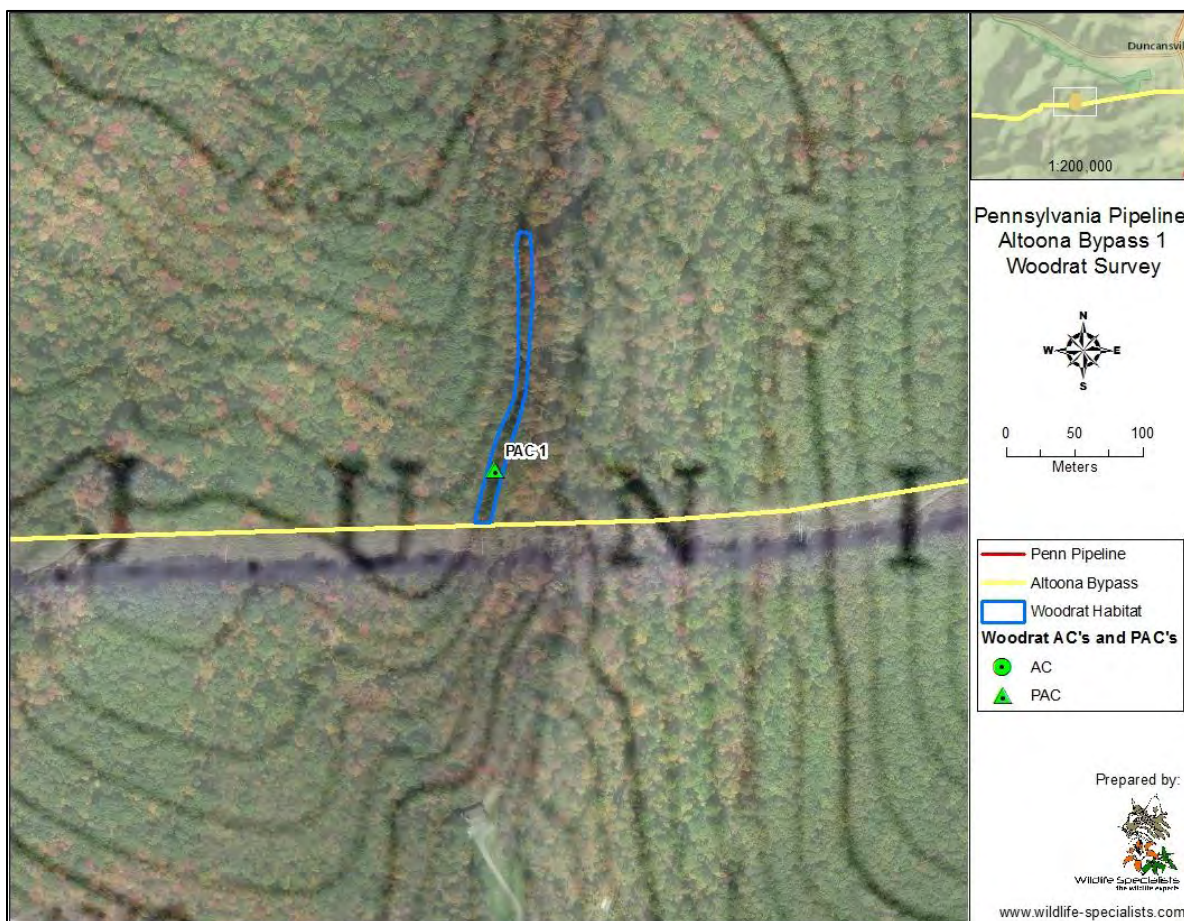


Figure 6. Locations of rocky habitat and Allegheny woodrat Potential Activity Centers (PACs) at the Altoona Bypass 1 habitat area along the proposed Pennsylvania Pipeline Project, Blair Twp., Blair County, Pennsylvania, July, 2014.

Altoona Bypass 2

The Altoona Bypass 2 habitat area is a 0.4 ac area of mostly mature forest adjacent to the pipeline corridor and located on a north northeast facing point of Catfish Ridge (Fig. 7). The habitat area is approximately 0.9 km south of the town of Duncansville with central coordinates at 78°24'37.97"W, 40°24'29.86"N. Elevations within the site range from approximately 1,340ft – 1,380ft above mean sea level. The habitat area is found within the Allegheny Front West (ALFW) Woodrat Conservation Management Unit. Tree and sapling species include red maple and American basswood (*Tilia americana*). The understory is dominated by Virginia creeper, tartarian honeysuckle (*Lonicera tatarica*), poison ivy (*Toxicodendron radicans*), white baneberry (*Actaea pachypoda*) and grasses. Canopy cover throughout most of the habitat area was 100%.

Surface rock consisted of shaded boulders with few “caves” or crevices and was considered low potential woodrat habitat. The size of the boulders was generally 0.5 to 3m in diameter (App. III, Photo Map 6).

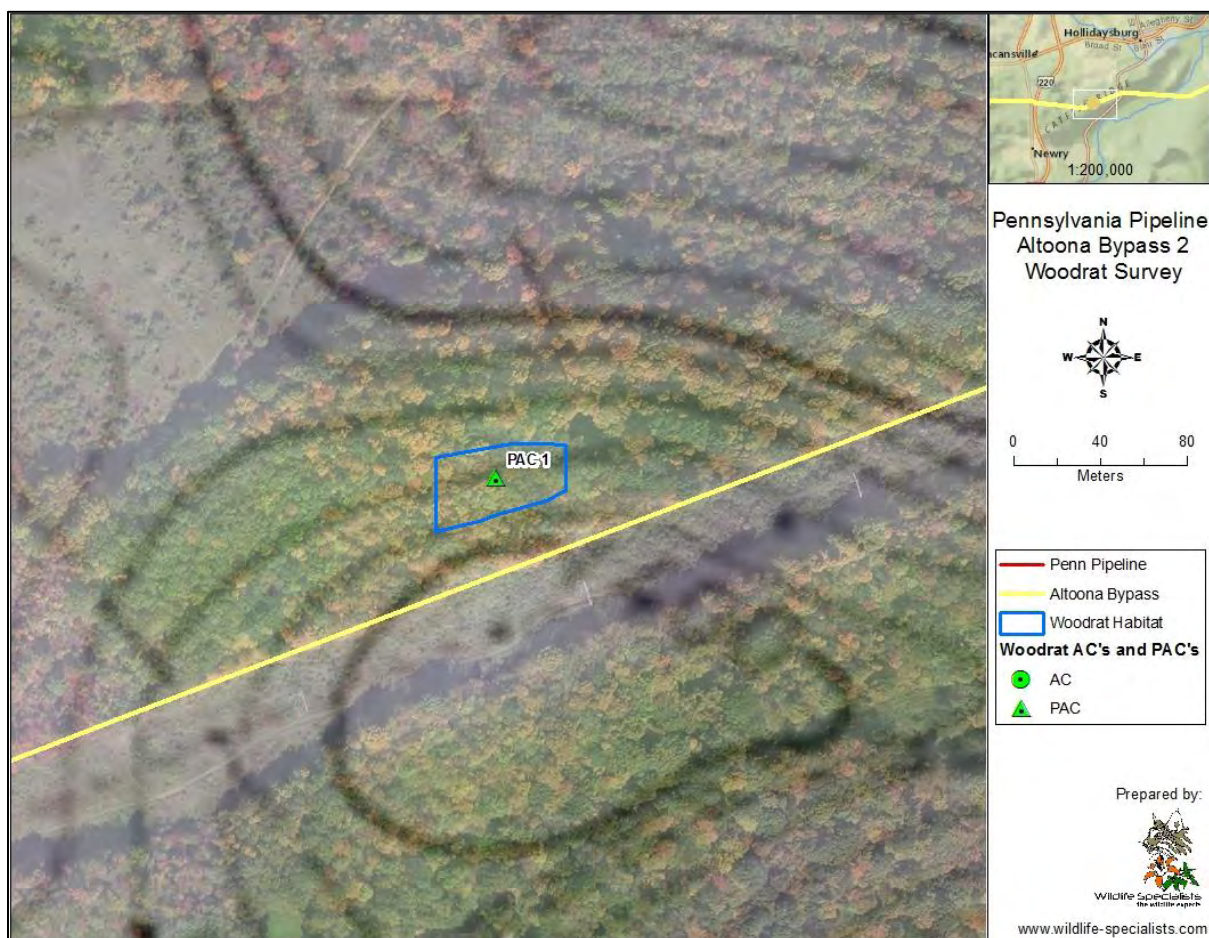


Figure 7. Locations of rocky habitat and Allegheny woodrat Potential Activity Centers (PACs) at the Altoona Bypass 2 habitat area along the proposed *Pennsylvania Pipeline Project*, Juniata Twp., Blair County, Pennsylvania, July, 2014.

Jacks Mountain 1

The Jack's Mountain 1 survey area is a 64 ac (25 ha) area of mostly mature forest, with two pipeline corridors running through it. The site is located on the steep west facing side of Jack's Mountain. The survey corridor is approximately 0.2 km east of Route 655 with central coordinates at 77°58'0.86"W, 40°21'0.97"N. Elevations within the site range from approximately 820ft – 940ft above mean sea level. The survey area is found within the Allegheny Front East (ALFE) Woodrat Conservation Management Unit. Tree and sapling species include black birch, red oak, chestnut oak, red maple, white oak (*Quercus alba*), sugar maple, and white pine (*Pinus strobus*). The understory is dominated by saplings of tree species, striped maple, greenbriar, lowbush blueberry, woodfern and polypody fern. The survey area was bordered to the north by a logging operation. Canopy cover throughout most of the survey area was 85% or greater.

Findings

A 10.3 ac (4 ha) area of the Jack's Mountain 1 survey area was considered potential woodrat habitat (App. III, Photo Map 7). The habitat was considered high potential because of the presence of large boulders and outcrops with deep crevices. Primary rocky habitat types consisted of outcrops and cliffs (2-5m) with numerous overhangs, crevices, and "caves"; and talus (1-5m) with deep interstices. Flora found on the site produce ideal food sources of hard and soft mast. Three (3) Potential Activity Centers were identified based on overall quality of rocky habitat; however no sign of woodrat presence was observed (Fig. 8).

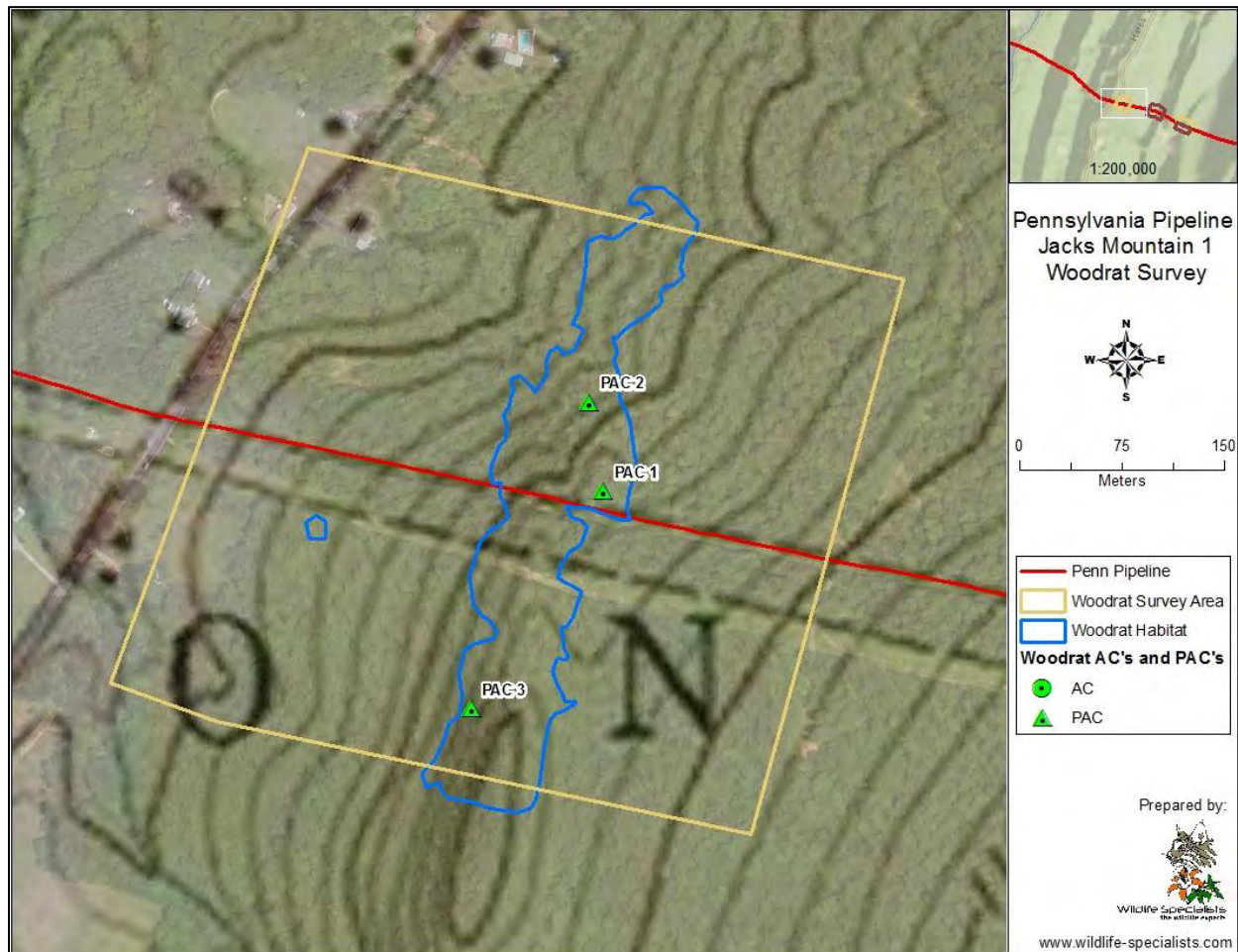


Figure 8. Locations of rocky habitats and Allegheny woodrat Potential Activity Centers (PACs) at the Jacks Mountain 1 survey area along the proposed *Pennsylvania Pipeline Project*, Union Twp., Huntingdon County Pennsylvania, July, 2014.

Jacks Mountain 2

The Jack's Mountain 2 survey area is a 71 ac (28 ha) area of mostly mature forest, with a pipeline corridor running through it. The site is located on the steep west facing side of Jacks Mountain. The survey corridor is approximately 1.1 km east of Route 655 with central coordinates at 77°57'19.28"W, 40°20'50.23"N. Elevations within the site range from approximately 1,300ft – 1,660ft above mean sea level. The survey area is found within the Allegheny Front East (ALFE) Woodrat Conservation Management Unit. Tree and sapling species include black birch, red oak, chestnut oak, red maple, and sugar maple. The understory is dominated by grape vine, blackberry and striped maple. Rocky habitat consisting of shaded and exposed boulders covered most of the survey corridor. Canopy cover throughout most of the survey area was 50%.

Findings

A 7 ac (2 ha) section of the Jacks Mountain 2 survey area was considered potential woodrat habitat. Primary rocky habitat types consisted of shaded and exposed boulders and slabs (1-3m) with numerous overhangs, crevices, and “caves”. Flora found on the site produce ideal food sources of hard and soft mast. Four (4) Potential Activity Centers were identified within the survey area based on overall quality of rocky habitat (Fig. 9). One Activity Center that contained an old midden-cache was found just northwest of the survey area. The midden-cache was found under a large slab surrounded by boulders and talus and contained acorns and Virginia creeper vines (App. III, Photo Maps 8-9).

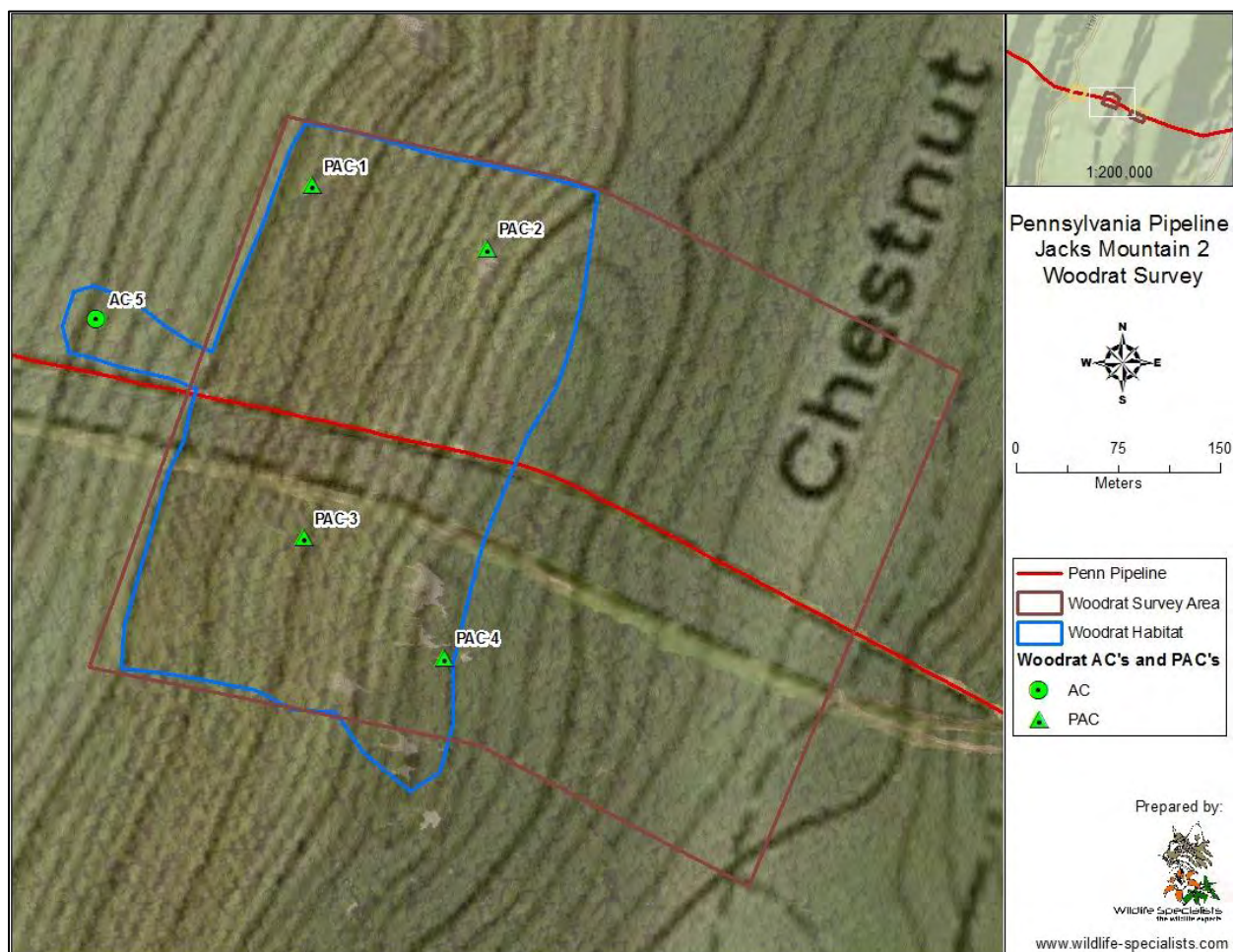


Figure 9. Locations of rocky habitats and Activity Centers (ACs) and Potential Activity Centers (PACs) at the Jacks Mountain 2 survey area along the proposed *Pennsylvania Pipeline Project*, Union Twp., Huntingdon County Pennsylvania, July, 2014.

Jacks Mountain 3

The Jack's Mountain 3 survey area is a 69 ac (27 ha) area of mostly mature forest located on the steep south facing side of Jack's Mountain. The survey corridor is approximately 2.4 km east of Route 655 with central coordinates at 77°56'34.47"W, 40°20'37.07"N. Elevations within the site range from approximately 1560ft – 1,640ft above mean sea level. The survey area is found within the Allegheny Front East (ALFE) Woodrat Conservation Management Unit and a small portion of the survey area appeared to be enhanced for woodrat habitat. Tree and sapling species include black birch, red oak, chestnut oak, red maple, and white pine. The understory is dominated by Virginia creeper, blackberry, grape vine, mountain laurel, and polypody fern. Canopy cover in approximately half of the survey area was 60%, with the remaining portions being 90% or greater.

Findings

A 13.8 ac (5 ha) section of the Jack's Mountain 3 survey area was considered high potential woodrat habitat (App. III, Photo Maps 10-11). Primary rocky habitat types consisted of shaded and open boulders (1-5m) with numerous overhangs, crevices, and "caves" and flora found on the site produce ideal food sources of hard and soft mast. Four (4) activity centers (Fig. 10) were identified that contained either an old cache, latrine, or nest. Three food caches, one toilet, and three nests were located within the survey area (App. III). Caches were found in talus consisting of 1-5m blocks and contained ferns, seeds and sticks. No fresh sign of woodrat presence was observed, but food caches and the toilet seemed to be active within the last year.

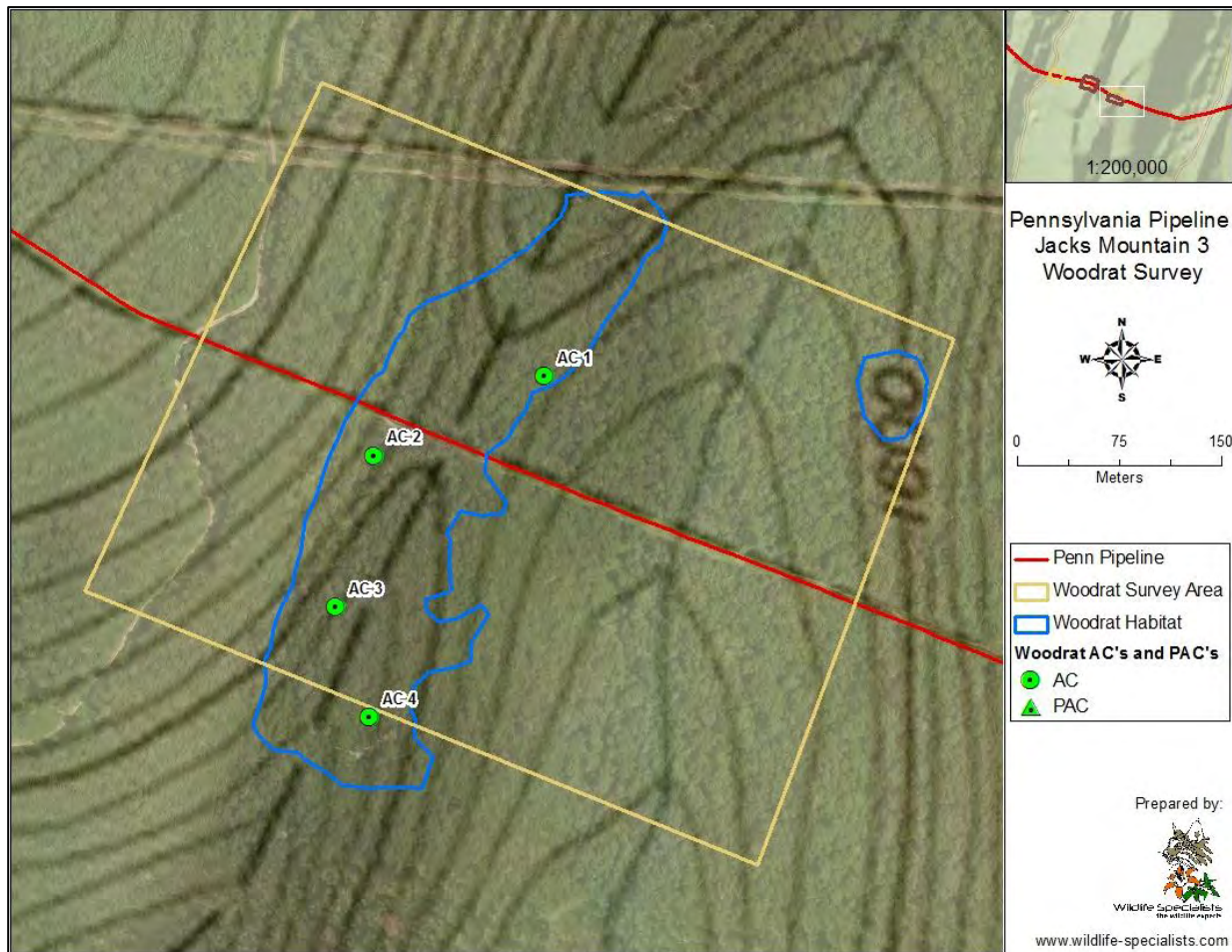


Figure 10. Rocky habitats and Allegheny woodrat Activity Centers (ACs) at the proposed Pennsylvania Pipeline Project, Jacks Mountain 3 survey area, Union and Shirley Twps., Huntingdon County Pennsylvania, July, 2014.

Blacklog Mountain

The Blacklog Mountain survey area is a 97 ac (39 ha) area of mostly mature forest located on the steep south and north facing sides of Blacklog Mountain. The survey corridor is approximately 8.6 km southeast of the town of Mt. Union with central coordinates at 77°48'34.07"W, 40°19'22.59"N. Elevations within the site range from approximately 1,300ft – 1,650ft above mean sea level. The survey area is found within the Blacklog Mountain (BLAC) Woodrat Conservation Management Unit. Tree and sapling species include black birch, red oak, red maple, sassafras, witch-hazel, chestnut oak, and white pine. The understory contains Virginia creeper, greenbriar, blackberry, polypody and marginal wood fern, grapevine, grasses, black raspberry (*Rubus occidentalis*), and mountain laurel. Canopy cover averaged 80% throughout the survey area except for the pipeline corridor and the area along Blacklog

Mountain Road.

Findings

Thirty-seven acres (14 ha) of the survey area was considered high potential woodrat habitat and comprised of large boulders with deep crevices (App. III, Photo Maps 12-14). Eight (8) PACs were identified based on the overall quality of rocky habitat (Fig. 10). One AC (Fig. 11) containing an old food cache with an accordion-style folded fern was found within a large pile of boulders and slabs, but no fresh sign of woodrat presence was observed.

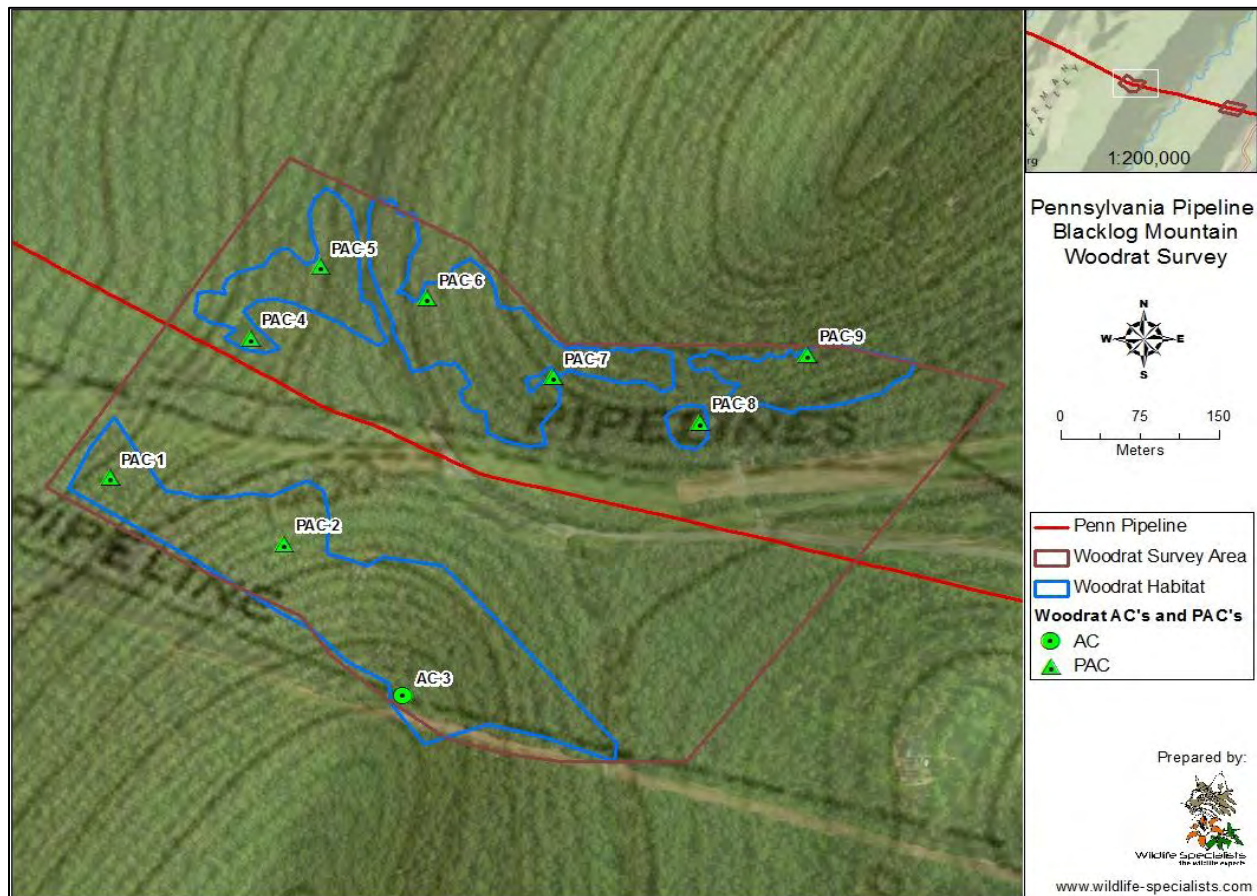


Figure 11. Rocky habitats and Allegheny woodrat Activity Centers (ACs) and Potential Activity Centers (PACs) at the proposed *Pennsylvania Pipeline Project* Blacklog Mountain survey area Shirley Twp., Huntingdon Co, Pennsylvania, July, 2014.

Shade Mountain

The Shade Mountain survey area is a 94 ac (38 ha) area of mostly mature forest located primarily on the steep east and somewhat on the west facing side of Shade Mountain. The survey corridor is

approximately 7.2 km southwest of the town of Cross Keys with central coordinates at 77°46'5.87"W, 40°19'1.93"N. Elevations within the site range from approximately 940ft – 1,780ft above mean sea level. The survey area is found within the Raystown Branch (RAS) Woodrat Conservation Management Unit. Tree and sapling species include black birch, red oak, red maple, sassafras, witch-hazel, tulip poplar (*Liriodendron tulipifera*), and basswood. The understory contains Virginia creeper, greenbriar, blackberry, polypody and marginal wood fern, striped maple, grape vine, grasses, white baneberry, and poison ivy. Canopy cover ranged from 0% within the many open talus slides to 100% in forested areas. Rocky habitat consisting primarily of open and shaded talus covered much of the southeastern portion of the survey corridor.

Findings

Fifty-six acres (22 ha) of the survey area was considered high potential woodrat habitat, and was comprised of large boulders and talus with deep crevices suitable for woodrat nesting habitat (App. III, Photo Maps 15-16). Habitat was located within shaded boulders and within large open talus slides. Primary rocky habitat types consisted primarily of shaded and open boulders and talus (1-5m) with numerous overhangs, crevices, and “caves”. Flora found on the site produces ideal food sources of hard and soft mast. Five (5) PAC’S were identified based on quality of rocky habitat; however no sign of woodrat presence was observed (Fig. 12).

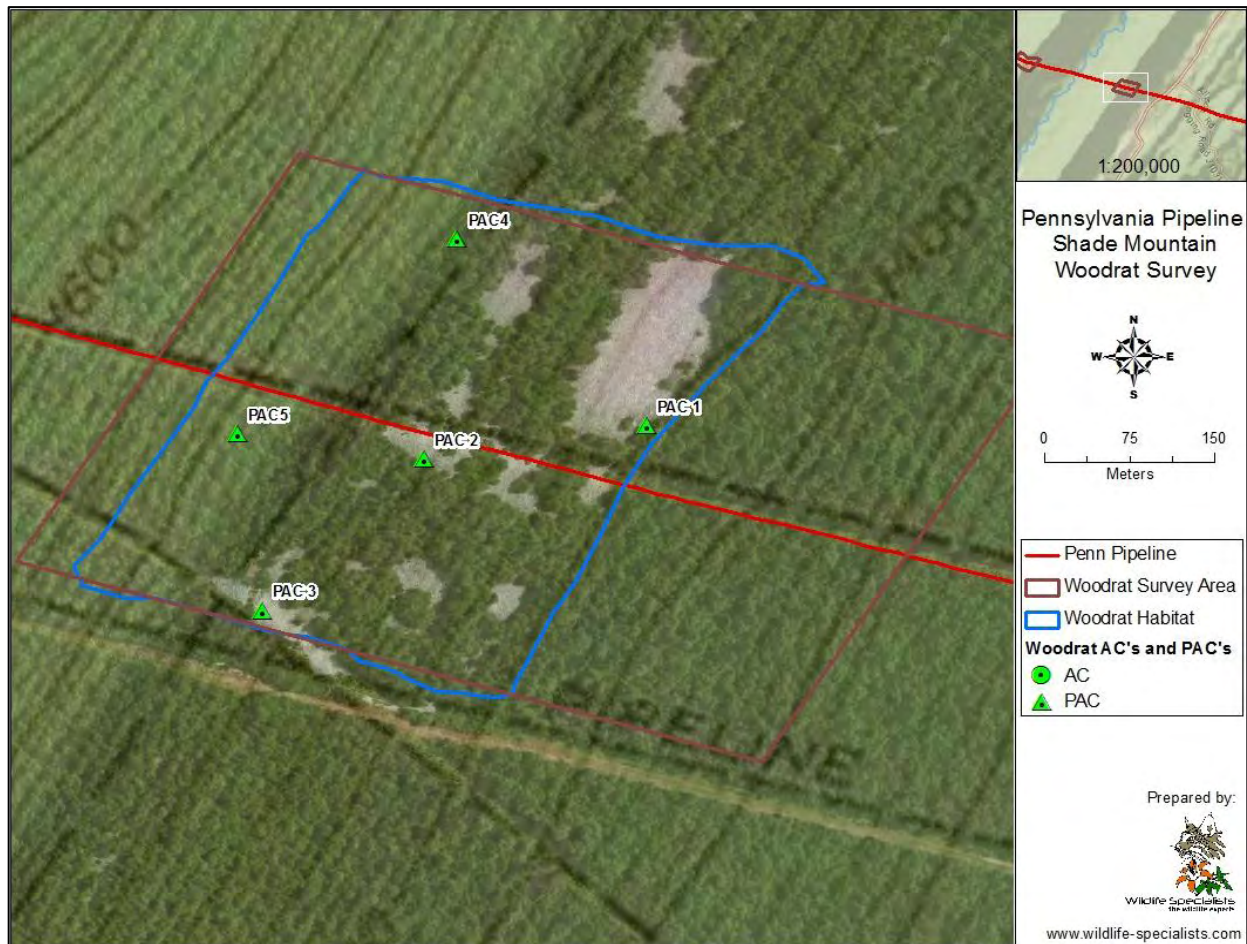


Figure 12. Rocky habitats and Allegheny woodrat Potential Activity Centers (PACs) at the proposed *Pennsylvania Pipeline Project*, Shade Mountain survey area, Shirley and Tell Twps., Huntingdon Co, Pennsylvania, July, 2014.

Tuscarora Mountain

The Tuscarora Mountain survey area is a 106 ac (42 ha) area of mostly mature deciduous forest located primarily on the steep southeast and northwest facing sides of Tuscarora Mountain (App. III, Photo Map 17-18). The survey corridor is approximately 8.2 km southwest of the town of New Germantown with central coordinates at 77°39'55.27"W, 40°17'45.42"N. Elevations within the site range from approximately 1,400ft – 1,920ft above mean sea level. The survey area is found within the Tuscarora/Blue Mts. (TUBL) Woodrat Conservation Management Unit. An existing pipeline ROW crosses the entire length of the survey area. Tree and sapling species include black birch, red oak, white oak, chestnut oak, red maple, striped maple, sassafras, witch-hazel, tulip poplar, and mostly degraded eastern hemlocks. The understory contains mountain laurel, Virginia creeper, greenbriar, Allegheny blackberry, hayscented fern, marginal wood fern, striped maple, and grasses. Canopy cover ranged

from 0% within the existing pipeline ROW to 90% in the forested area. Rocky habitat comprised of shaded boulders and talus covered much of the southeastern portion of the survey corridor.

Findings

Thirty-four (34) acres (13 ha) of the survey area on the steep southeast facing slope was considered potential woodrat habitat, and was comprised of large boulders and talus with deep crevices suitable for woodrat nesting. Habitat was located within shaded boulders and talus slides. Primary rocky habitat types consisted of shaded and exposed boulders and talus slabs (1-5m) with overhangs, crevices, and “caves”. Flora found on the site produce food sources of hard and soft mast. Five PACs were identified based on quality of rocky habitat (Fig. 13); however, no sign of woodrat presence was observed.

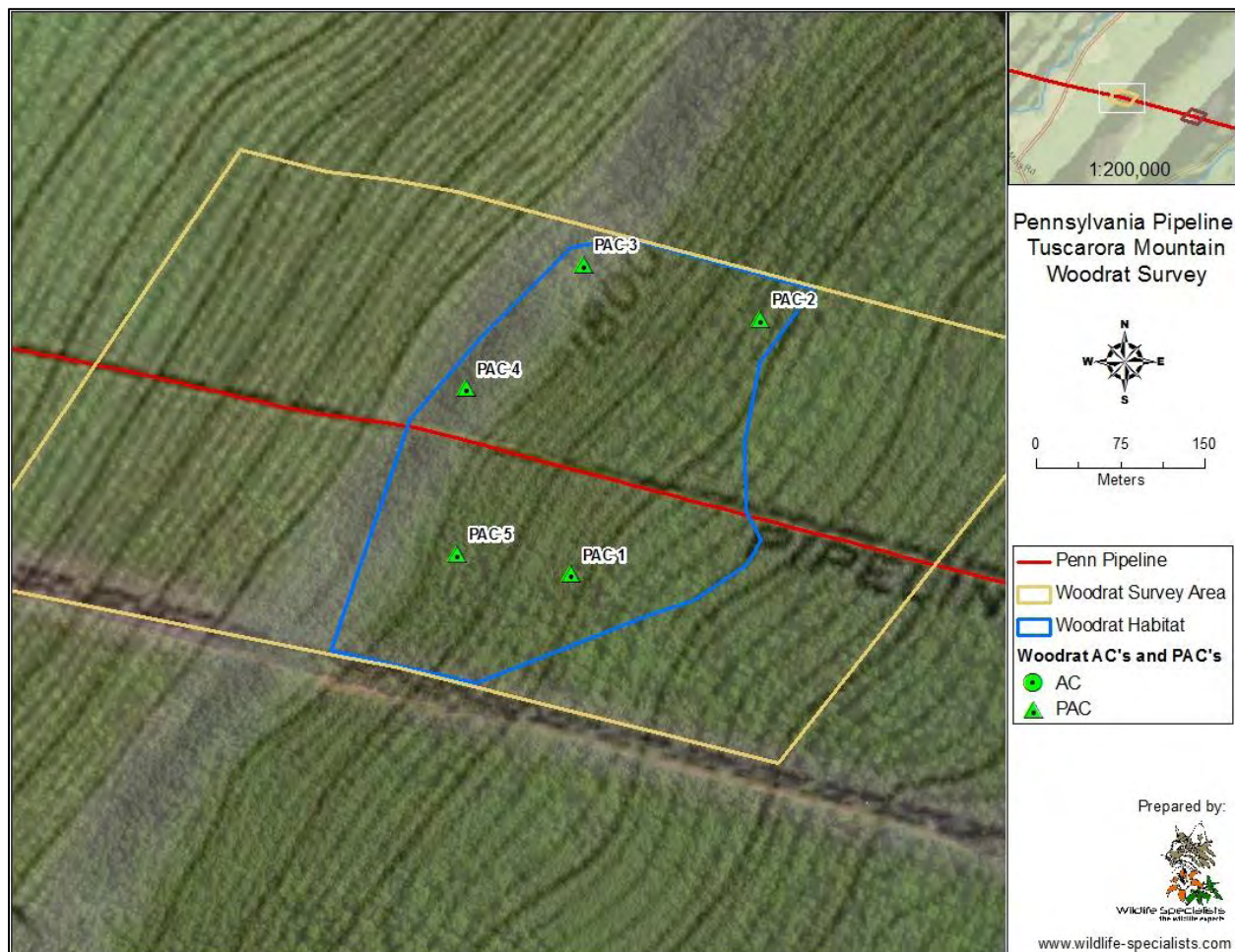


Figure 13. Rocky habitats and Allegheny woodrat Potential Activity Centers (PACs) at the proposed *Pennsylvania Pipeline Project*, Tuscarora Mountain survey area, Lack and Toboyne Twps., Juniata and Perry Counties, Pennsylvania, July, 2014.

Conococheague Mountain

The Conococheague Mountain survey area is a 59 ac (24 ha) area of primarily mature deciduous forest located on the moderate northwest facing and steep southeast facing slopes of Conococheague Mountain. The survey corridor is approximately 0.5 km north and 7.0 km east of Blairs Mills with central coordinates at 40°17'23.659"N, 77°38'88.071". Elevations within the site range from 1,440ft - 1,840ft above mean sea level. The survey area is found within the Tuscarora/Blue Mts. (TUBL) Woodrat Conservation Management Unit. The site consists of mostly mature deciduous forest and mixed forest with a well-developed understory throughout most of the survey area. An existing pipeline right-of-way crosses the entire vertical length and Concord Road crosses the entire horizontal width of the survey area.

The majority of the southeast facing slope was covered with talus and boulders with particularly dense rock at the higher elevations and slightly more scattered rock at lower elevations. Some scattered boulders and associated talus were present within and south of the ROW on the northwest facing slope. Canopy cover ranged from 0-30% within the pipeline ROW and small open areas to 75 to 90% throughout the rest of the survey area. Dominant overstory species included red and chestnut oak, red maple, and black birch. Shrub and herbaceous species included mountain laurel, witch hazel, green briar, blackberry, low-bush blueberry, grapevine, goldenrod, ferns and grasses.

Findings

Most of the survey area, particularly the southeast facing slope, was considered excellent potential woodrat habitat (App. III, Photo Map 19 & 20). The entire slope is covered with piled boulders and talus ranging in size from 1-5 meters with some larger float blocks up to 10 meters. Numerous interstices and deep crevices are present throughout the rocky habitat. Seven PACs were chosen based on the size and presence of rock and crevices, though PACs could have been placed in many locations along the southeast facing slope based on the overall quality of the rocky habitat (Fig. 14). Canopy cover over the selected PACs ranged from 70-80%. Flora found on the site produce food sources of hard and soft mast, however no sign of woodrat presence was observed.

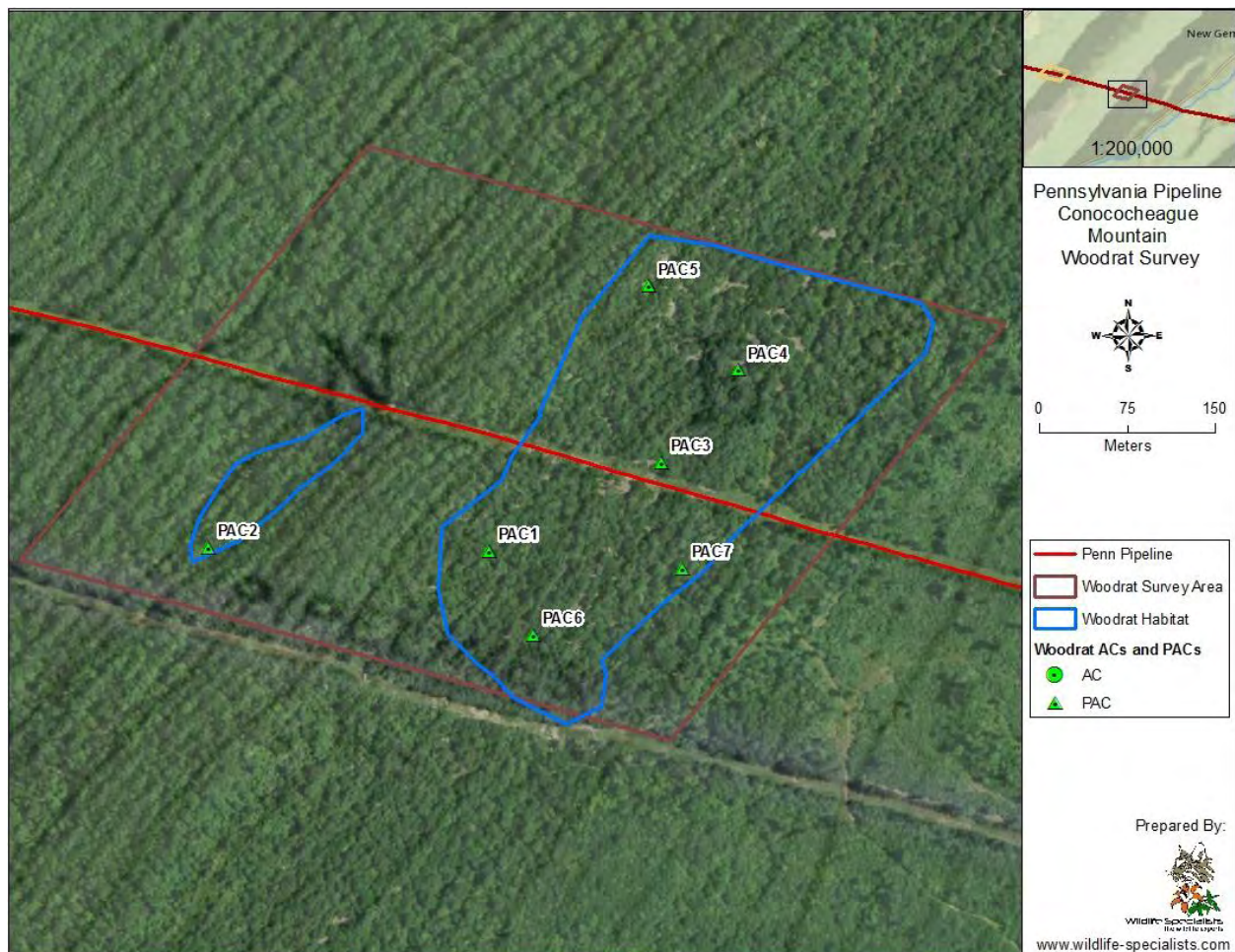


Figure 14. Rocky habitats and Allegheny woodrat Potential Activity Centers (PACs) at the proposed *Pennsylvania Pipeline Project*, Conococheague Mountain survey area, Toboyne Twp., Perry County, Pennsylvania, April, 2015.

Bowers Mountain 2

The Bowers Mountain 2 survey area is a 30 ac (12 ha) area of primarily mature deciduous forest located on the steep southeast and northwest facing sides of Bowers Mountain. The survey corridor is approximately 27.8 km northwest of the city of Carlisle with central coordinates at 40°16'10.69"N, 77°31'2.95"W. Elevations within the site range from approximately 1,500ft – 1,990ft above mean sea level. The survey area is found within the Tuscarora/Blue Mts. (TUBL) Woodrat Conservation Management Unit. The site consists of mostly mature deciduous forest and mixed forest with a well-developed understory in some areas and sparse understory elsewhere. An existing pipeline right-of-way crosses the entire vertical length of the survey area. A fairly expansive area of rocky habitat including open and shaded surface and subsurface talus of varying size exists throughout most of the central portion of the survey area. Overstory canopy cover ranged from 10 to 75%. Talus was particularly

dense on the steep southeast facing slope in the eastern portion of the survey area. Dominant rock types were open talus (1-5m) with several small overhangs, crevices and small caves. Other rock habitat included some small areas of bare rock talus with moderately deep interstices. Dominant overstory species include black birch, red maple, red oak, chestnut oak, sugar maple, witch-hazel, and eastern hemlock. Understory and herbaceous species include mountain laurel, Virginia creeper, woodfern, sweet fern, New York fern, hay-scented fern and a scattering of flowering plants.

Findings

A 40.9 ac (16 ha) portion of the Bowers Mountain 2 survey area was considered excellent potential woodrat habitat (App. III, Photo Map 21). The best potential woodrat habitat area was concentrated on the steeper southeast facing slope in the higher elevations of the survey area at approximately 1,620ft (493.78m) to 1,940ft (591.31m) of elevation above mean sea level and was approximately 287m long by 612m wide. Primary rocky habitat types were talus (1-5m) with deep and shallow interstices. Two ACs were identified that contained either fresh or old caches or latrines (Fig. 15). Five food caches and three toilets were located within the survey area (App. III). Caches were found in talus consisting of 1-5m blocks and contained leaves, ferns, acorns, fungi and sticks. Flora found on the site produces ideal food sources of hard and soft mast. In addition, 5 Potential Activity Centers based on overall quality of rocky habitat were identified (Fig. 15). The PACs primarily consisted of 1-5m talus with deep interstices. Canopy cover throughout most of the potential woodrat habitat area was 10-70%. The remainder of the survey area to the southeast and northwest consisted of small and scattered talus with shallow crevices and areas of non-rock habitat.

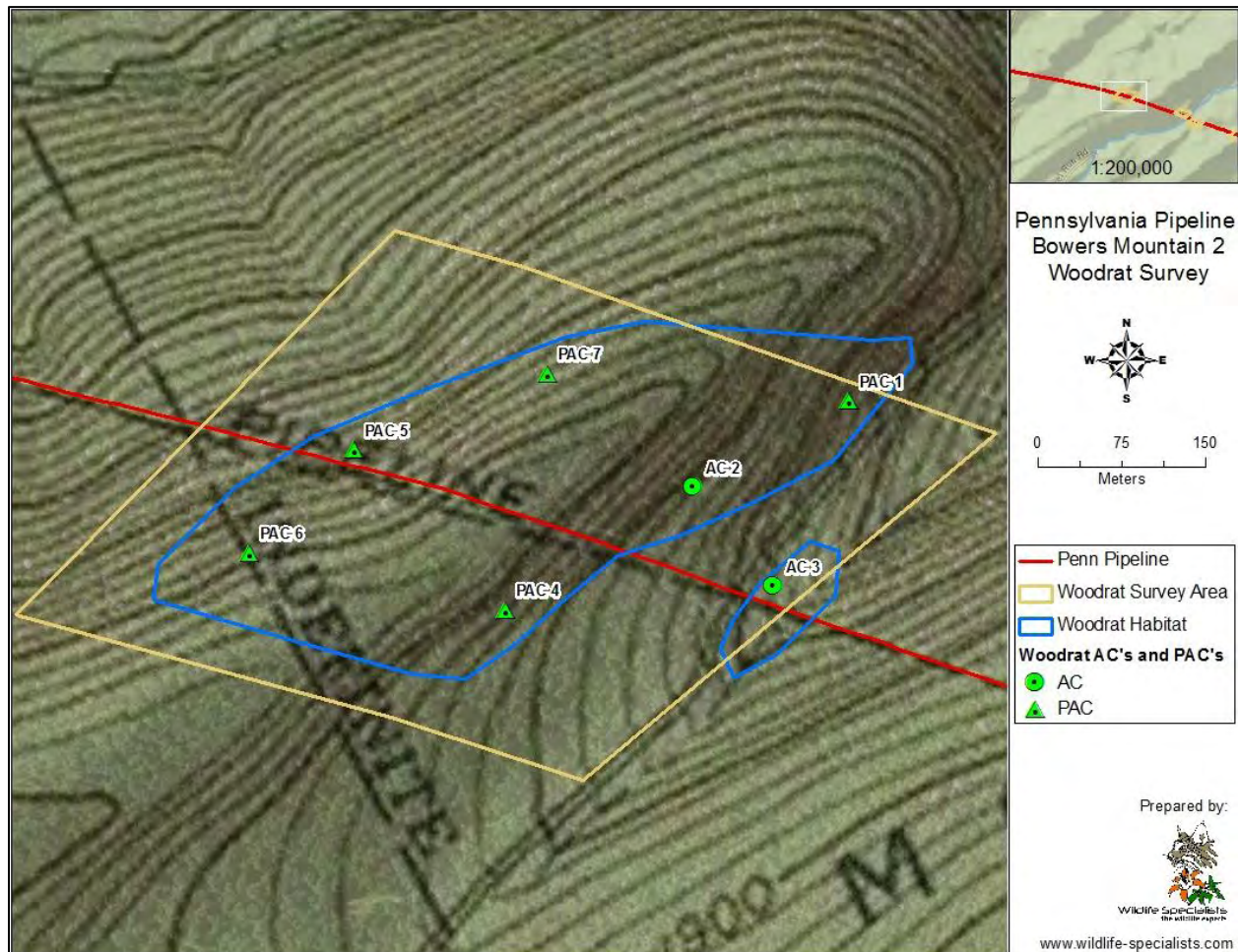


Figure 15. Rocky habitats and Allegheny woodrat Activity Centers (ACs) and Potential Activity Centers (PACs) at the proposed Pennsylvania Pipeline Project Bowers Mountain 2 survey area, Toboyne and Jackson Twps., Perry Co., Pennsylvania, July, 2014.

Bowers Mountain 1

The Bowers Mountain 1 survey area is a 23 ac (9 ha) area of mature and regenerating deciduous forest located on the steep southeast facing slope near the base of Bowers Mountain. The survey area is approximately 9.5 km south and 2.4 km east of Andersonburg with central coordinates at 40°15'50.767"N, 77°29'39.145"W. Elevations within the site range from approximately 1,150ft – 1,450ft above mean sea level. The survey area is found within the Tuscarora/Blue Mts. (TUBL) Woodrat Conservation Management Unit. The site consists of mature deciduous forest on the steep slope in the bottom half of the survey area and the gentle slope in the top quarter of the survey area with regenerating forest with little to no overstory cover in between. Understory is mostly sparse except near the top of the steep slope and within the regenerating portion of the survey area. Dominant overstory species consisted of red and chestnut oak, red maple, and black birch with some hickory. Shrub and

understory species consisted of witch hazel, black birch, mountain laurel, blackberry, and blueberry. Canopy cover ranged from 0% in regenerating areas to 50-90% throughout the rest of the survey area. Rocky habitat was limited to a row of talus and boulders on the gentle slope near the top of the survey area and one small outcrop with associated talus at the top of the steep slope.

Findings

A small line of boulders/talus and one smaller outcrop were considered marginal woodrat habitat (Fig. 16). The line of boulders and talus is located on the gentle slope between approximately 1,360ft and 1,380ft elevation under 50% to 75% canopy cover. Primary rocky habitat types consisted of talus 1-3m with shallow and deep interstices (App III; Photo Map 22). The small outcrop is less than 3 meters high and located at approximately 1,350ft elevation under 25% canopy cover. Good food sources of hard and soft mass were found at the site. We identified 3 PACs based on overall quality of rocky habitat but found no evidence of occupation by woodrats.

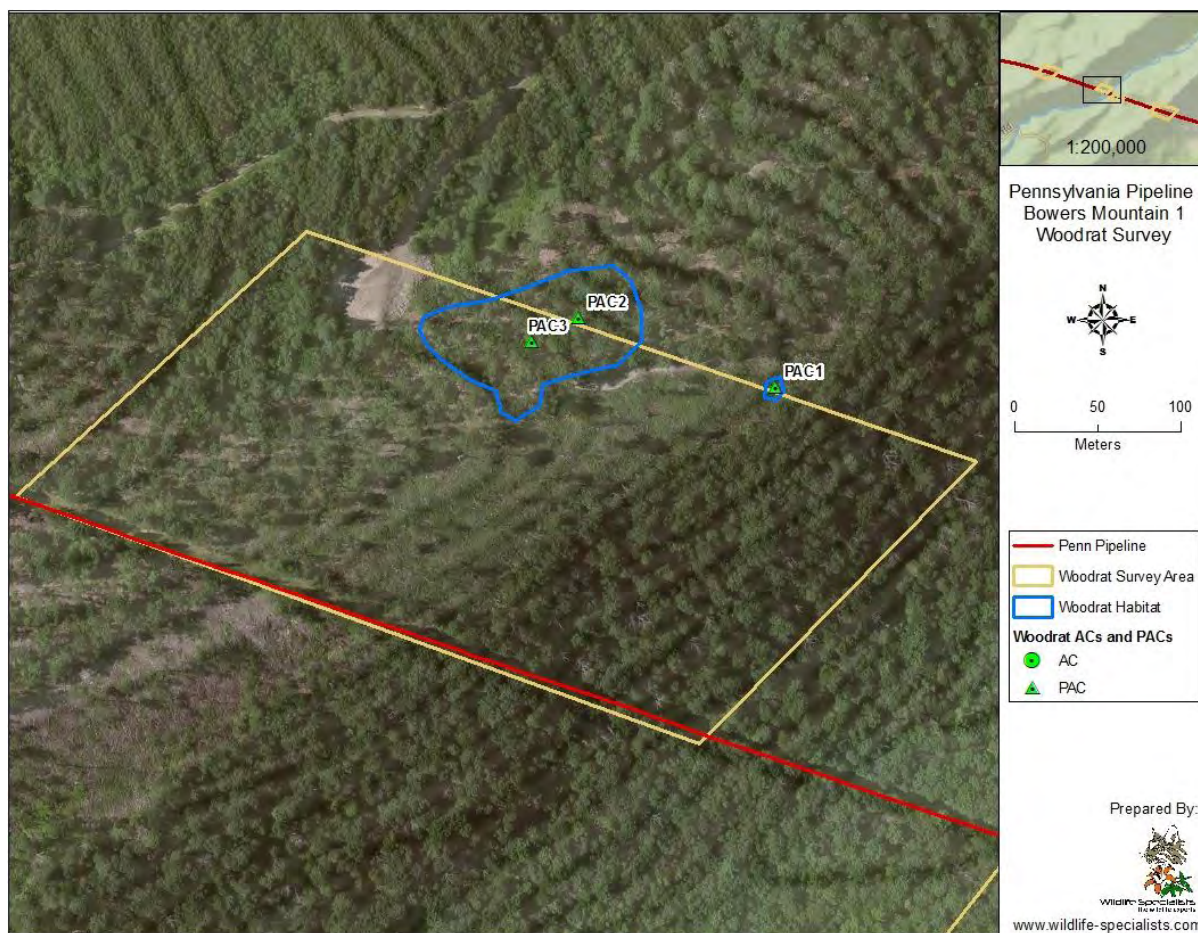


Figure 16. Rocky habitats and Allegheny woodrat Potential Activity Centers (PACs) at the proposed *Pennsylvania Pipeline Project*, Bowers Mountain 1 survey area, Lack and Jackson Twps., Perry County, Pennsylvania, April 2015.

Middle Ridge

The Middle Ridge Survey area is a 21 ac (8 ha) area of mixed forest located at the base of Middle Ridge. The survey area is approximately 9.8 km south and 2.0 km west of Andersonburg with central coordinates at 40°15'39.316"N, 77°29'21.167"W. Elevations within the site range from approximately 1,000ft to 1,300ft above mean sea level. The survey area is found within the Tuscarora/Blue Mts (TUBL) Woodrat Conservation Management Unit. The site consists of mature mixed forest with little understory. Dominant overstory species consisted of eastern hemlock, white pine, red and chestnut oaks, red maple, and black birch. Shrub and herbaceous species included black and red raspberry, green briar, mountain laurel, colt's foot, trailing arbutus, and Canada mayflower. Canopy cover ranged from 50-75%. Rocky habitat consisted of talus 1-5 meters with deep interstices and some larger float blocks 10+ meters with numerous overhangs, crevices, and caves.

Findings

A 5.6 ac (2.3 ha) area of the Middle Ridge survey area was considered potential woodrat habitat (App. III, Photo Map 23 & 24). Primary rocky habitat types consisted of talus and boulders (1-5m) and talus (1-5m) with deep interstices and some float blocks (+10m) with numerous overhangs, crevices, and "caves" Flora found on the site produce ideal food sources of hard and soft mast. Seven (7) PACs were identified based on overall quality of rocky habitat; however no sign of woodrat presence was observed (Fig. 17).



Figure 17. Rocky habitats and Allegheny woodrat Potential Activity Centers (PACs) at the proposed *Pennsylvania Pipeline Project*, Middle Ridge survey area, Jackson Twp., Perry County, Pennsylvania, April 2015.

Blue Mountain

The Blue Mountain survey area is a 100 ac (40 ha) area of mature and regenerating deciduous forest located on the steep southeast and northwest facing sides of Blue Mountain. The survey corridor is approximately 2.2 km northwest of the village of McCrea with central coordinates at 77°28'11.56"W, 40°15'24.85"N. Elevations within the site range from approximately 1,130ft – 1,780ft above mean sea level. The survey area is found within the Tuscarora/Blue Mts. (TUBL) Woodrat Conservation Management Unit. The site consists of mature and pole stage second growth deciduous forest and mixed forest with a well-developed understory in some areas and sparse understory elsewhere. An existing pipeline right-of-way crosses the entire vertical length of the survey area. Fairly expansive areas of rocky habitat including surface and subsurface talus of varying size, and a few small outcrops exist throughout much of the southeastern portion of the survey area. Rocky terrain was primarily shaded by

an approximate 85% overstory canopy. The surface rock transitioned from smaller scattered scree and talus in the southeastern portion of the survey area at lower elevations to fairly dense talus rock in the northwestern portion of the survey area at higher elevations. Dominant rock types were talus (1-3m) partially embedded or covered with humus and leaves, and small outcrops with several small overhangs, crevices and small caves. Other rock habitat included some small areas of bare rock talus with moderately deep interstices. Dominant overstory species include red oak, chestnut oak, black birch, red maple, sugar maple, witch-hazel, sassafras and striped maple. Understory and herbaceous species include striped maple, mountain laurel, Virginia creeper, gooseberry, grapevine, lowbush blueberry, black huckleberry, various brambles (*Rubus* spp.), teaberry, seedlings and saplings of overstory species, and greenbriar, as well as woodfern (*Dryopteris* spp.), hay-scented fern and Japanese stiltgrass.

Findings

A 27.45 ac (11.11 ha) portion of the Blue Mountain survey area was considered marginal potential woodrat habitat (App. III, Photo Map 25). The potential woodrat habitat area was concentrated on the steeper slope in the higher elevations of the survey area at approximately 1,500ft (457.20m) to 1,700ft (518.16m) of elevation above mean sea level and was approximately 350m long by 370m wide. Primary rocky habitat types were talus (1-5m) with deep interstices; and small (<3m) outcrops with few overhangs, crevices, and “caves”. We found no evidence of woodrat occupation (no food caches or toilets were observed). We identified 3 PACs based on overall quality of rocky habitat (Fig. 18). The PACs primarily consisted of 1-3m talus with deep interstices. Canopy cover throughout most of the potential woodrat habitat area was 80% or greater with a few areas under a reduced canopy of approximately 60% cover. The remainder of the survey area to the southeast and northwest consisted of small and scattered talus with shallow crevices and areas of non-rock habitat.

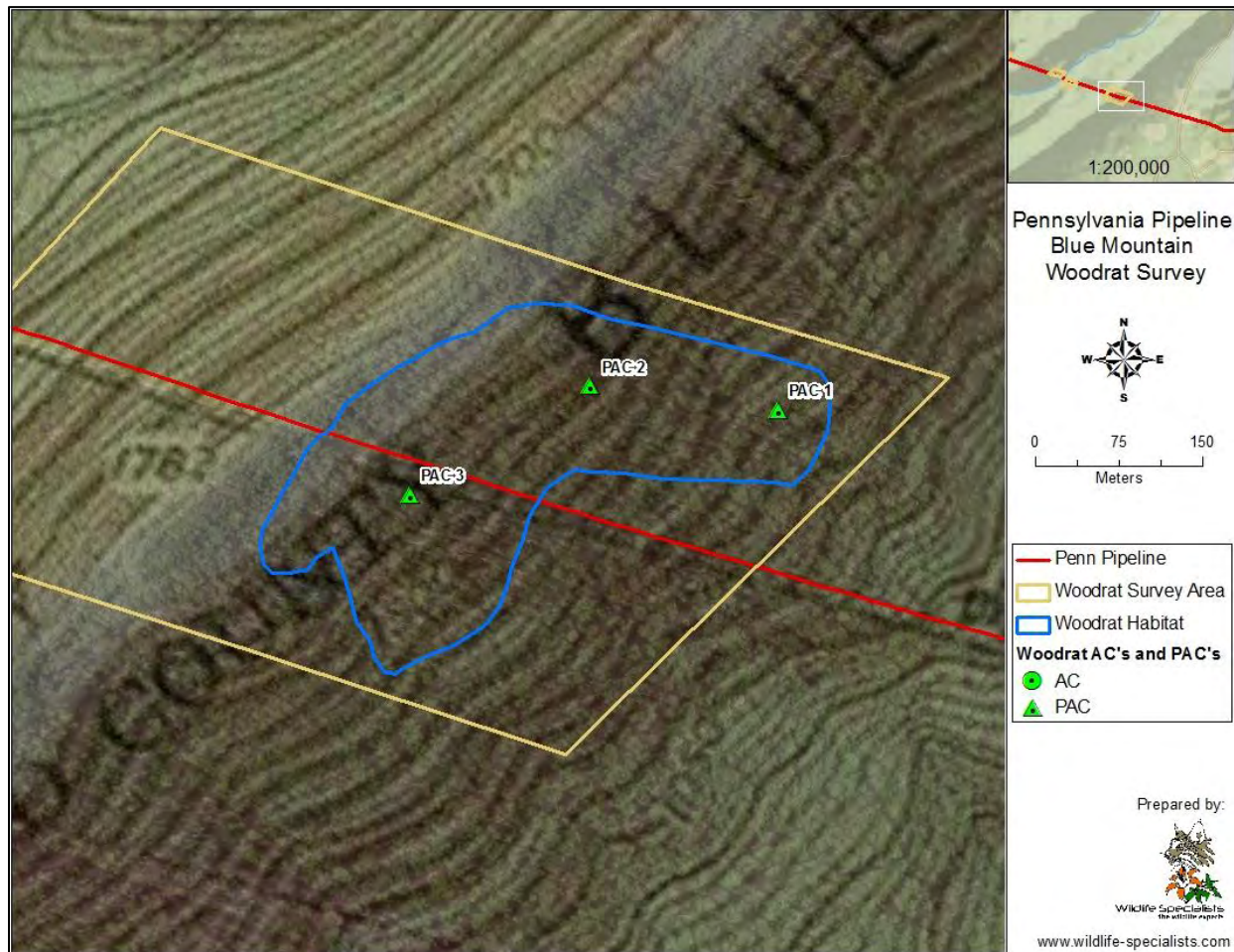


Figure 18. Rocky habitats and Allegheny woodrat Potential Activity Centers (PACs) at the proposed *Pennsylvania Pipeline Project* Blue Mountain survey area, Jackson and lower Mifflin Twps., Perry and Cumberland Counties, Pennsylvania, July, 2014.

Eastern Small-footed Bat Summer Roost Habitat Survey Report

The Pennsylvania Game Commission identified seven (7) areas of concern for Eastern Small-footed Bat along the proposed *Pennsylvania Pipeline Project* (Table 2). In addition, Wildlife Specialists surveyed the entire Altoona Bypass portion of the proposed pipeline. These survey areas are predominantly mature or regenerating forested ridge/valley-side habitats within the Ridge and Valley Province (n=6) or Appalachian Plateaus Province (n=2). Of the 7 Eastern Small-footed Bat survey areas identified by PGC, one was not completed (Conococheague) due to lack of property access and one did not contain any habitat (Lock Mountain) in the area that was surveyed. Note that a portion of the Lock Mountain survey area (western portion) was not completed in an area that is no longer in consideration for Project routing and due to lack of property access. Habitat was observed at all of the remaining survey areas as well as along the Altoona Bypass.

Table 2. Summary of Eastern small-footed bat (*Myotis leibii*) survey areas and findings along Sunoco’s proposed *Pennsylvania Pipeline Project*, identified in the Pennsylvania Game Commission’s Large Project Environmental Review response letter, dated March 14, 2014.

Survey Area ID	County	Physiographic Province^a	Potential Habitat (Yes/No)
Laurel Ridge 3	Cambria	AMAP	Yes
Altoona Bypass	Blair	AFAP	Yes
Lock Mountain	Blair	AMRV	No (Not Completed)
Jacks Mountain 2	Huntingdon	AMRV	Yes
Jacks Mountain 3	Huntingdon	AMRV	Yes
Blacklog Mountain	Huntingdon	AMRV	Yes
Shade Mountain	Huntingdon	AMRV	Yes
Conococheague Mountain	Perry	AMRV	Yes (Not Completed)

^a AMAP = Allegheny Mountain Section of Appalachian Plateau Physiographic Province

AFAP = Allegheny Front Section of Appalachian Plateau Physiographic Province

AMRV = Appalachian Mountain Section of Ridge and Valley Physiographic Province

Survey Methods and Findings

It should be noted that use of summer habitats by *Myotis leibii* is generally considered to be poorly understood at this time, with few supporting publications or affirmed conclusions to enable detailed assessment. Additionally, no formal species habitat assessment protocols have been implemented at the federal or state level. Thus, the assessment of potential habitat for this species relies heavily on the documented findings of others (e.g., Johnson et al. 2008; Johnson et al. 2011), interpretation of species-specific considerations, and best professional judgment.

We assessed potential summer roosting habitat for *Myotis leibii* through a walk over of the site to observe habitat characteristics and species-specific considerations. Habitat assessment was focused more toward talus/scree and rock outcrops that provide relatively stable and permanent shelter structure. Evaluation of features providing potential habitat included factors affecting protection and

shelter, and thermal regulation. Factors evaluated that affect thermal regulation included solar aspect and exposure/canopy cover. Consideration was also given to proximity of water and potential foraging areas. Through evaluation of the referenced factors and considerations, and using best professional judgment, a subjective assessment of the potential habitat to serve as summer roosting habitat for the Eastern small-footed bat was made.

Laurel Ridge 3

The Laurel Ridge 3 survey area is 120 ac (49 ha) of mostly mature forest located on the north facing side of Laurel Ridge (Fig. 19). The survey corridor is approximately 1.3 km south of US Route 22 with central coordinates at 78°56'49.93"W, 40°25'39.77"N. Elevations within the site range from approximately 1,800ft – 2,140ft above mean sea level. Tree and sapling species include black birch (*Betula lenta*), red (*Quercus rubra*) and chestnut (*Q. montana*) oak, red maple (*Acer rubrum*), sugar maple (*A. saccharum*), hemlock (*Tsuga canadensis*), sassafras (*Sassafras albidum*), black cherry (*Prunus serotina*), black gum (*Nyssa sylvatica*), yellow birch (*Betula allegheniensis*), and white ash (*Fraxinus americana*). The understory is dominated by lowbush blueberry (*Vaccinium angustifolium*, *V. pallidum*), black huckleberry (*Gaylussacia baccata*), witch-hazel (*Hamamelis virginiana*), greenbriar (*Smilax rotundifolia*), rhododendron (*Rhododendron* ssp.), striped maple (*A. pensylvanicum*), blackberry (*Rubus allegheniensis*), mountain laurel (*Kalmia latifolia*), wood fern (*Dryopteris* spp.), hay-scented fern (*Dennstaedtia punctilobula*), bracken fern (*Pteridium gleditsch*), teaberry (*Gaultheria procumbens*), sedges (*Carex* spp.) and grasses. Canopy cover throughout most of the survey area was 75% or greater, except for the small portion of survey area within the power line right-of-way.

Findings

The rock located within the power line and pipeline right-of-way (ROW) and a small area of exposed outcrops north of the power line (1.1 ac) was considered high quality Eastern Small-footed Bat roosting habitat (0% canopy cover). Surface rock consisted of boulders, outcrops, rock slabs and talus 1 to 5m in diameter with many small crevices that could be utilized by bats for summer roosting (App. IV, Photo Map 1). Other rocky portions of the survey area were not considered daytime roost habitats due to high canopy closure (App. IV, Photo Map 2).

Table 3. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Laurel Ridge 3 survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
LR-ESFB-1	1	40	5	few	small-medium	Y	Boulders and rock slabs along edge of existing pipeline ROW with crevices
LR-ESFB-2	1	35	6	moderate	Small-medium	Y	Boulders and rock slabs along edge of existing pipeline ROW with crevices
LR-ESFB-3	1	35	6	few	large	Y	Rock slab along edge of pipeline ROW with tapering large crevice

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
LR-ESFB-4	1	30	7	few	small	Y	Rock piles and slabs along edge of pipeline and power line ROW
LR-ESFB-5	1	30-50	6-8	many	small-large	Y	Powerline ROW lined with numerous 3-4 ft rock slabs in large piles
LR-ESFB-6	1	20-50	6-8	many	small-large	Y	Powerline ROW lined with numerous 3-4 ft rock slabs in large piles
LR-ESFB-7	1	45	5	few	small-medium	Y	Pipeline ROW with scattered rock slabs and boulders along edge
LR-ESFB-8	1	20-40	5-7	few	Small-medium	Y	Flat slab rocks on top of large outcrops with flat tops that receive direct sun

^a **Few, Moderate, Many**

^b **Small—(1/4-3/4-inch), Medium—(3/4-2-inch), Large—(>2-inch)**

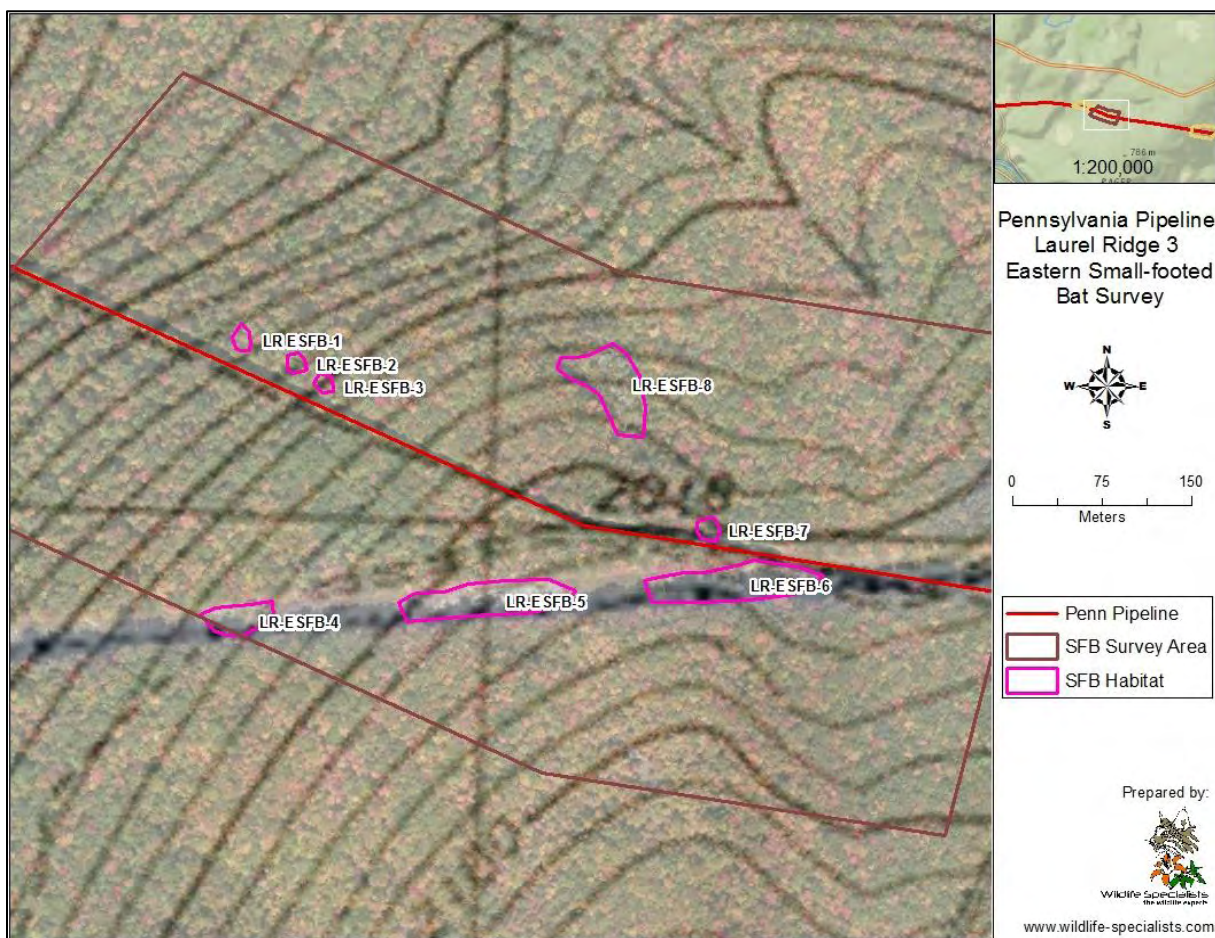


Figure 19. Locations of potential Eastern small-footed bat summer roosting habitat at the Laurel Ridge 3 survey area along the proposed Pennsylvania Pipeline Project, Jackson Twp., Cambria County, Pennsylvania, July 2014.

Altoona Bypass

The Altoona Bypass survey area is a 17.4mi long corridor of a variety of mostly forestland and agricultural areas north and south of, and including the pipeline corridor (Figs. 20-27). Approximate coordinates of the bypass are at 41°26'40.741"N , 78°35'56.516"W (west end) and 40°26'52.046"N, 78°19'17.613"W (east end). Elevations within the site range from approximately 900ft – 2,640ft above mean sea level.

Findings

A total of 54 habitat polygons were identified along the Altoona Bypass. For organizational purposes these habitat polygons were grouped into 8 different habitat areas (AB-ESFB-1 through AB-ESFB-8) based on location. The majority of the habitat was located within an existing pipeline ROW corridor with canopy cover ranging from 0-30%. Specific descriptions of each habitat can be found in Tables 4-11 and Photo Maps 3-8.

AB-ESFB-01

Table 4. Descriptive characteristics of Eastern small-footed bat (*Myotis leibii*) potential summer roosting habitat at the Altoona Bypass survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-1a	3	5	8+	few	small	N	Row of boulders in pipeline ROW going across pipeline
AB-ESFB-1b	3	5	8+	few	small	N	Row of boulders in pipeline ROW going across pipeline
AB-ESFB-1c	3	5	8+	few	small	N	Row of boulders in pipeline ROW going across pipeline
AB-ESFB-1d	3	30	8	few	large	N	Row of boulders in pipeline ROW, south edge of pipeline
AB-ESFB-1e	3	5	8+	few	small	N	Row of boulders in pipeline ROW going across pipeline
AB-ESFB-1f	3	30	8	many	large	N	Bed of scree in pipeline ROW, north edge of pipeline

^a **Few, Moderate, Many**

^b **Small**—(1/4-3/4-inch), **Medium**—(3/4-2-inch), **Large**—(>2-inch)

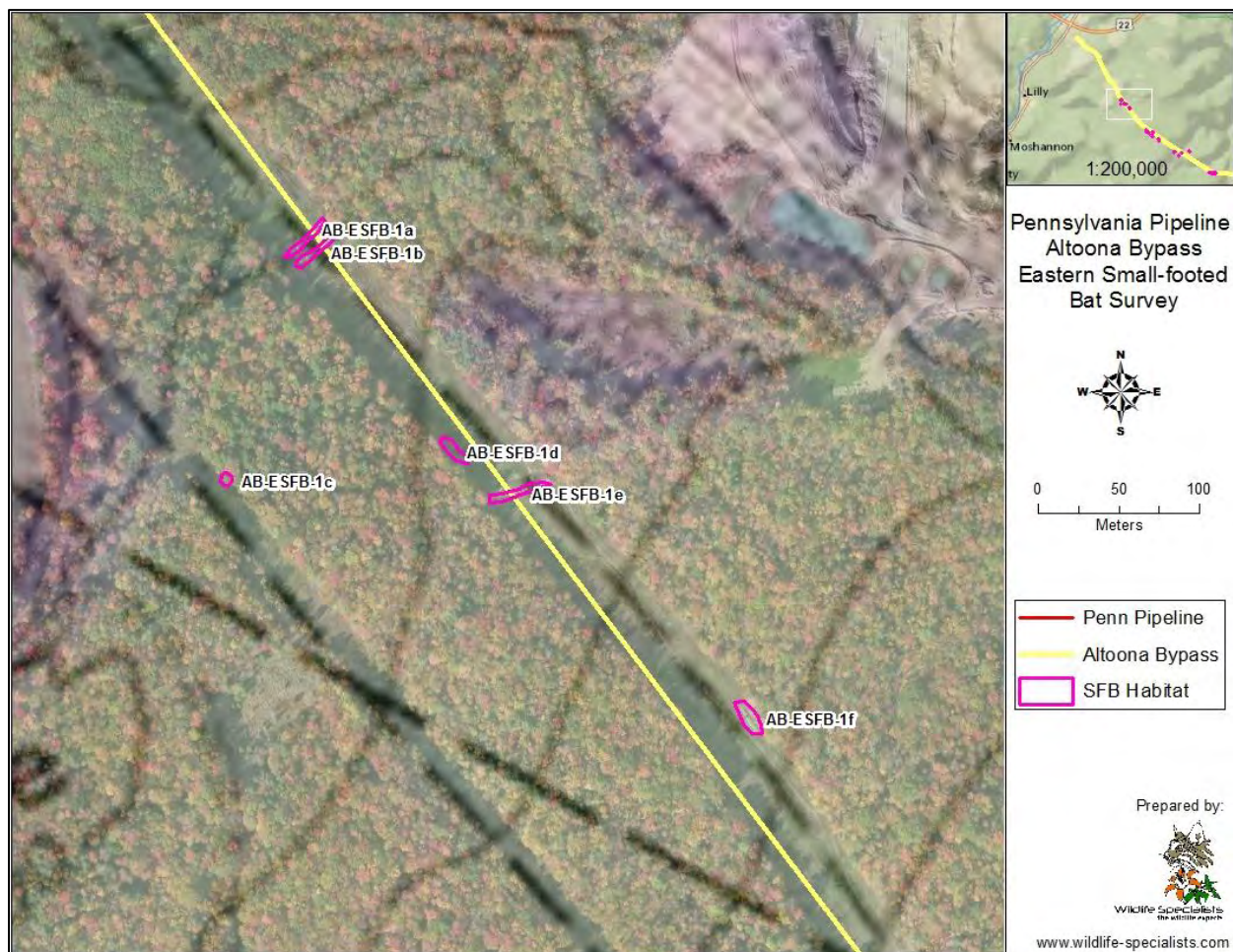


Figure 20. Locations of potential Eastern small-footed bat summer roosting habitat at the Altoona Bypass survey area along the proposed *Pennsylvania Pipeline Project*, Cresson Twp., Cambria County, Pennsylvania, July 2014.

AB-ESFB-02

Table 5. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Altoona Bypass survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-2a	3	5	8+	Few	small-medium	N	Row of boulders in pipeline ROW crossing pipeline
AB-ESFB-2b	4	5	8+	Few	small-medium	N	Row of boulders in pipeline ROW crossing pipeline
AB-ESFB-2c	4	35	7	Few	small-medium	N	Boulders and rock slabs along south edge of existing pipeline ROW



Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-2d	4	30	8	Few	small-medium	N	Boulders and rock slabs along north edge of existing pipeline
AB-ESFB-2e	4	35	7	Few	small-medium	N	Boulders and rock slabs along south edge of existing pipeline ROW
AB-ESFB-2f	4	30	8	Few	small-medium	N	Boulders and rock slabs along north edge of existing pipeline ROW
AB-ESFB-2g	3	30	8	Few	small-medium	N	Boulders and rock slabs along north edge of existing pipeline ROW
AB-ESFB-2h	4	35	7	Few	small-medium	N	Boulders and rock slabs along south edge of existing pipeline ROW
AB-ESFB-2i	4	35	7	Few	small-medium	N	Boulders and rock slabs along south edge of existing pipeline ROW
AB-ESFB-2j	4	5	8+	Few	small-medium	N	Row of boulders in pipeline ROW crossing pipeline
AB-ESFB-2k	4	5	8+	Few	small-medium	N	Row of boulders in pipeline ROW crossing pipeline

^a **Few, Moderate, Many**

^b **Small**—(1/4-3/4-inch), **Medium**—(3/4-2-inch), **Large**—(>2-inch)

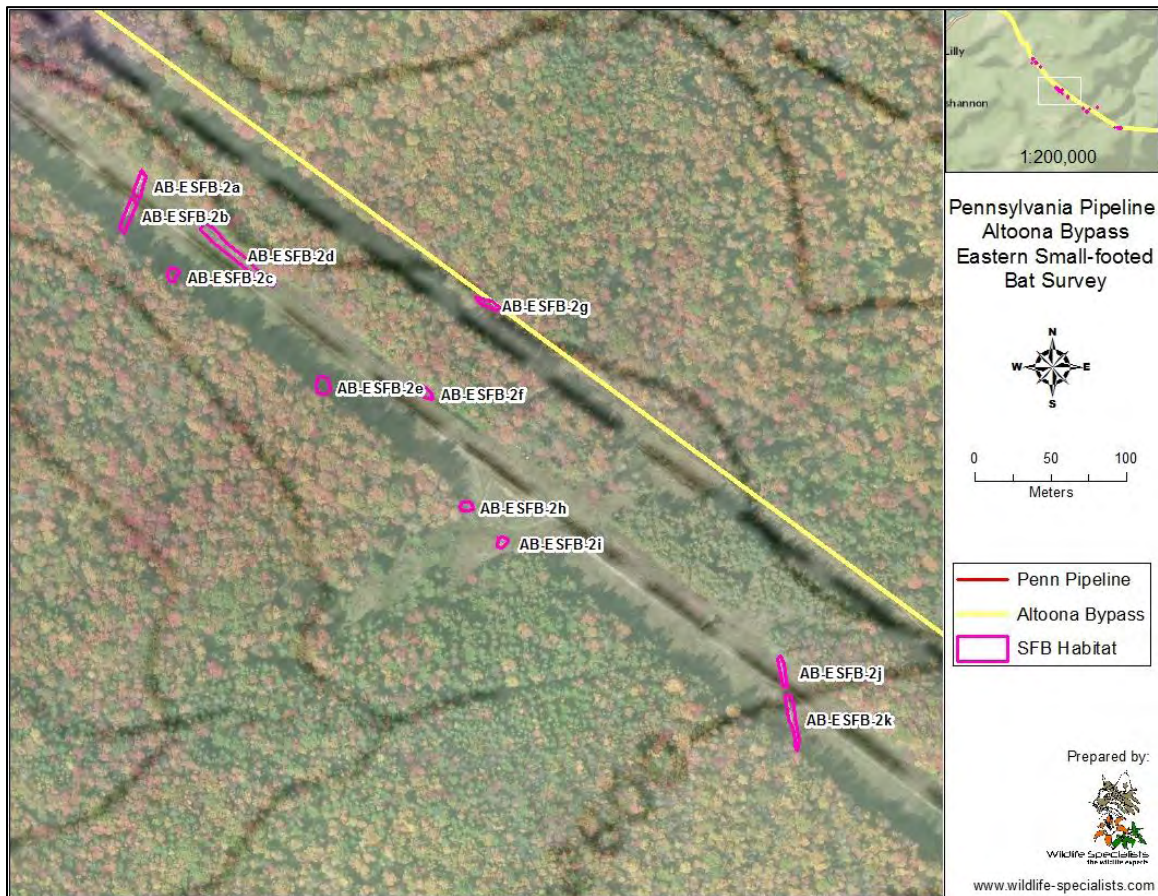


Figure 21. Locations of potential Eastern small-footed bat summer roosting habitat at the Altoona Bypass survey area along the proposed *Pennsylvania Pipeline Project*, Washington Twp., Cambria County, Pennsylvania, July 2014.

AB-ESFB-03

Table 6. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Altoona Bypass survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-3a	4	5	8+	Few	Small-Medium	Y	Row of boulders in pipeline ROW going across pipeline
AB-ESFB-3b	4	45	7-8	Few	Small-Medium	Y	Boulders and rock slabs along south edge of existing pipeline ROW
AB-ESFB-3c	5	25	8+	Few	Small-Medium	Y	Boulders and rock slabs along north edge of existing pipeline ROW
AB-ESFB-3d	5	30	8	Few	Large	N	Row of boulders in pipeline ROW on north edge of pipeline

^a Few, Moderate, Many

^b Small—(1/4-3/4-inch), Medium—(3/4-2-inch), Large—(>2-inch)

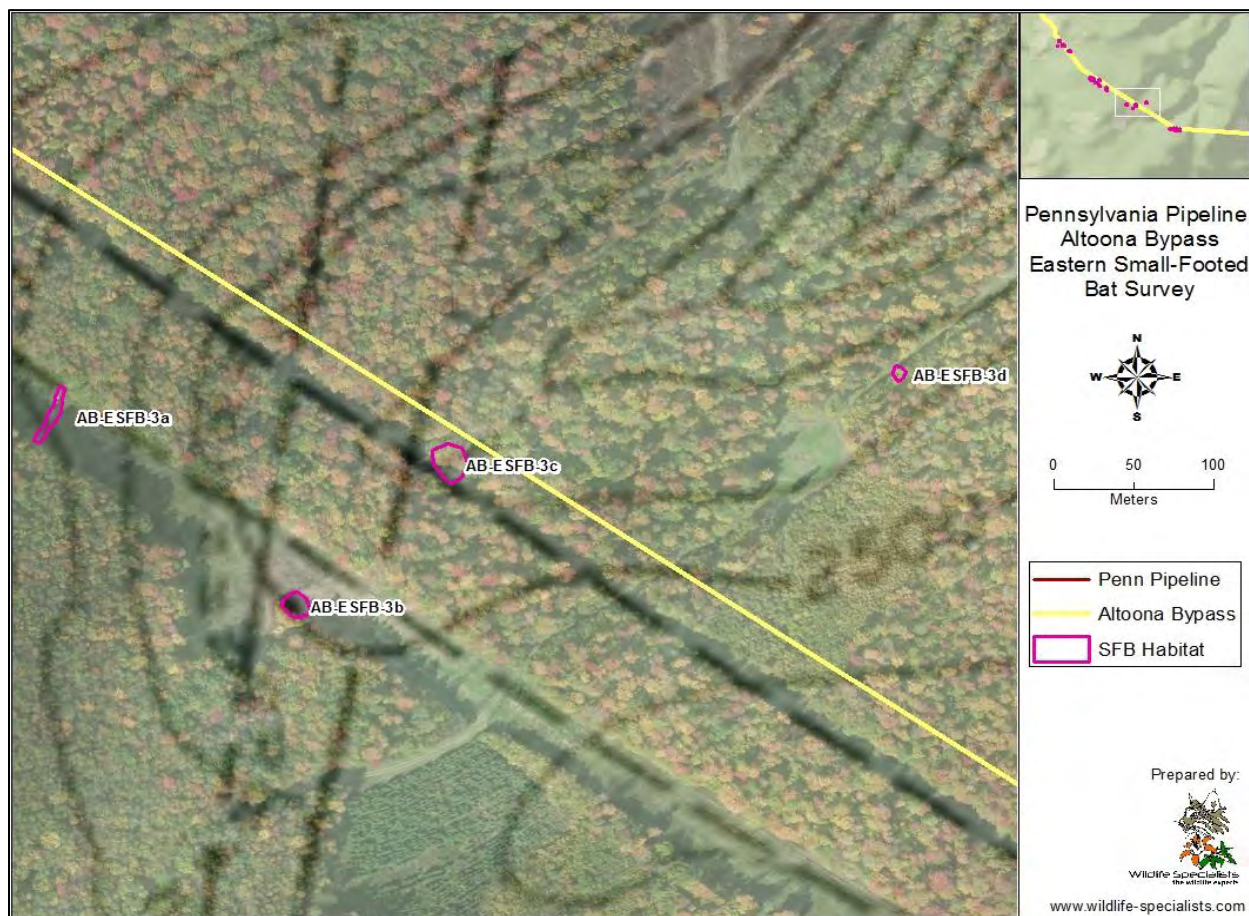


Figure 22. Locations of potential Eastern small-footed bat summer roosting habitat at the Altoona Bypass survey area along the proposed *Pennsylvania Pipeline Project*, Washington Twp., Cambria County, Pennsylvania, July 2014.

AB-ESFB-04

Table 7. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Altoona Bypass survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-4a	5	10	8+	few	medium-large	Y	Small boulders and rock slabs along north edge of existing power line
AB-ESFB-4b	5	10	8+	many	medium-large	Y	Boulders and rock slabs along north edge of existing power line ROW
AB-ESFB-4c	5	10	8+	many	medium-large	Y	Boulders and rock slabs along north edge of existing power line ROW
AB-ESFB-4d	5	10	8+	many	medium-large	Y	Boulders and rock slabs along north edge of existing power line ROW

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-4e	5	10	8+	few	small-medium	Y	Boulders and rock slabs along north edge of existing power line ROW
AB-ESFB-4f	5	0	8+	many	small-large	Y	Boulders and rock slab piles along north edge of existing power line

^a **Few, Moderate, Many**

^b **Small**—(1/4-3/4-inch), **Medium**—(3/4-2-inch), **Large**—(>2-inch)

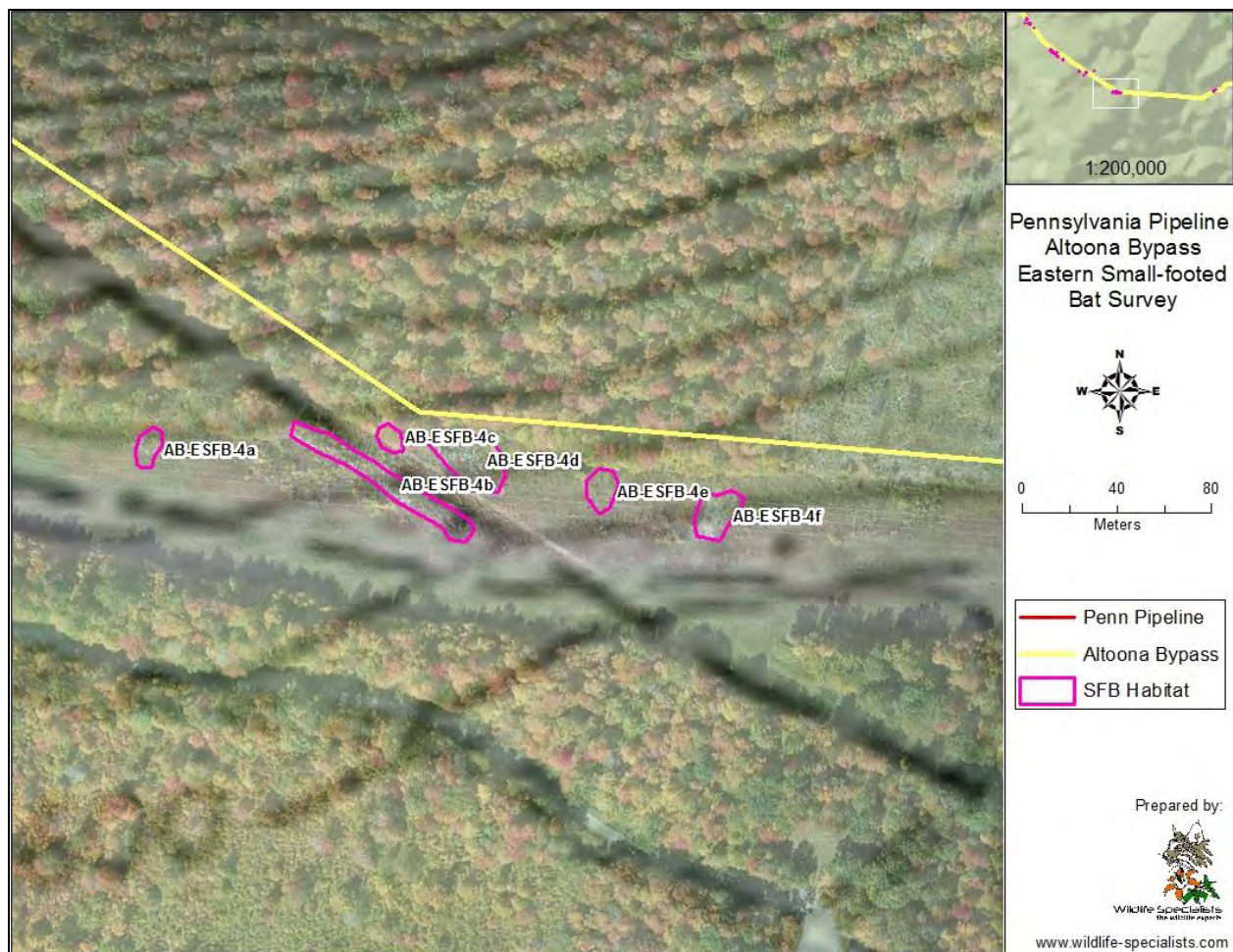


Figure 23. Locations of potential Eastern small-footed bat summer roosting habitat at the Altoona Bypass survey area along the proposed Pennsylvania Pipeline Project, Juniata Twp., Blair County, Pennsylvania, July 2014.

AB-ESFB-05

Table 8. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Altoona Bypass survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-5a	6	0	13	many	small	N	Rock slab pile on ROW comprised of small, 10-12 inch flat slabs
AB-ESFB-5b	6	0	13	many	small-medium	N	Boulders and rock slabs with crevices on existing pipeline ROW

^a **Few, Moderate, Many**

^b **Small**—(1/4-3/4-inch), **Medium**—(3/4-2-inch), **Large**—(>2-inch)



Figure 24. Locations of potential Eastern small-footed bat summer roosting habitat at the Altoona Bypass survey area along the proposed Pennsylvania Pipeline Project, Juniata Twp., Blair County, Pennsylvania, July 2014.

AB-ESFB-06

Table 9. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Altoona Bypass survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-6a	6	15	8+	few	small	Y	Scattered 1-2 ft boulders with crevices on north side of ROW
AB-ESFB-6b	6	15	8+	few	small	Y	Boulders and slabs 2-5 ft in diameter on north side of ROW
AB-ESFB-6c	6	25	8	many	small-medium	N	Pile of 1-4 ft boulders and slabs on south side of pipeline ROW
AB-ESFB-6d	6	25	8	many	small-medium	N	Pile of 1-4 ft boulders and slabs on south side of pipeline ROW
AB-ESFB-6e	6	25	8	few	small	Y	Scattered 1-3 ft boulders with crevices on south side of ROW

^a **Few, Moderate, Many**

^b **Small**—(1/4-3/4-inch), **Medium**—(3/4-2-inch), **Large**—(>2-inch)

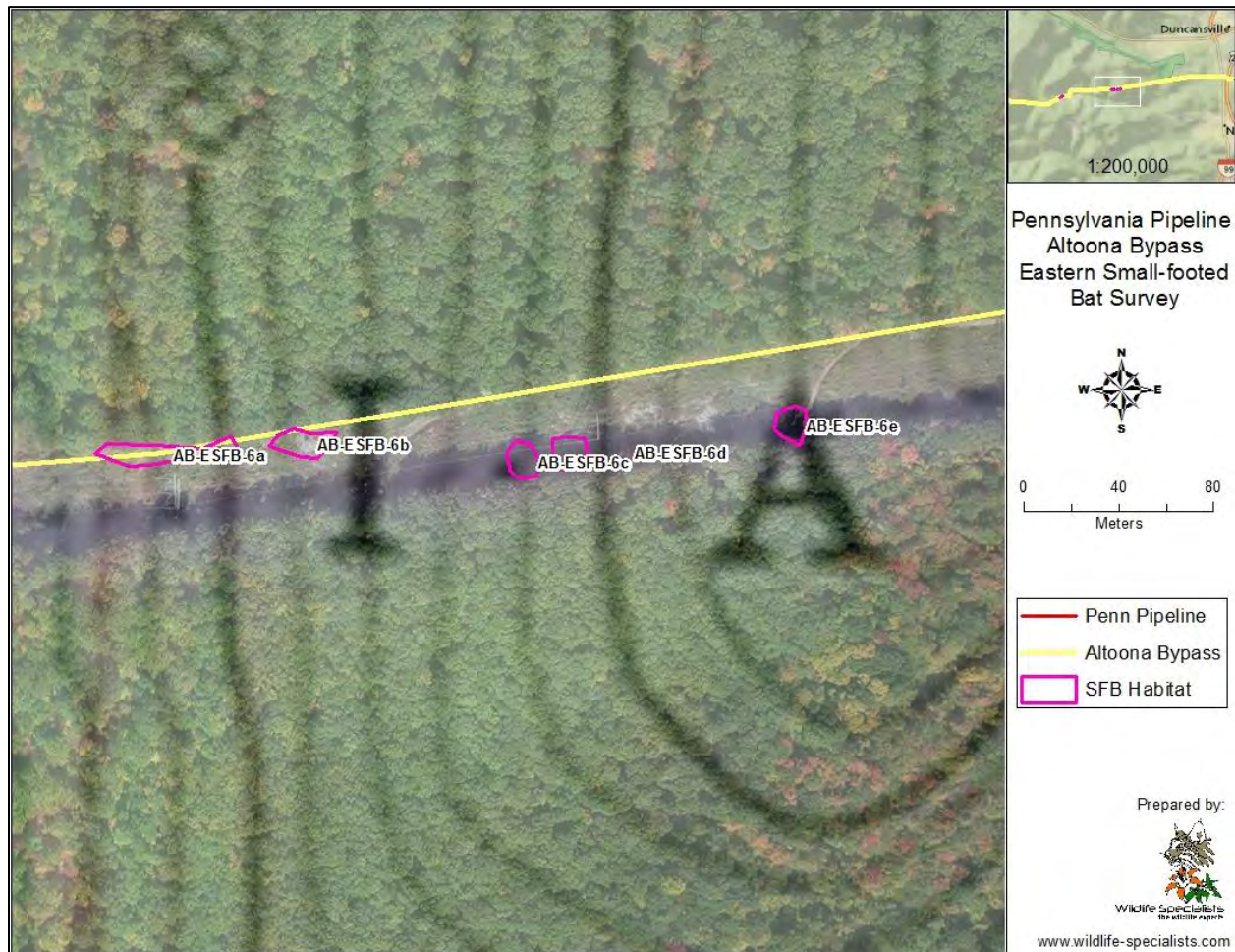


Figure 25. Locations of potential Eastern small-footed bat summer roosting habitat at the Altoona Bypass survey area along the proposed Pennsylvania Pipeline Project, Washington Twp., Blair County Pennsylvania, July 2014.

AB-ESFB-07

Table 10. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Altoona Bypass survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-7a	7	25	8+	Few	Small	Y	Rock slab pile on south side of ROW comprised of small slabs
AB-ESFB-7b	7	50	7	Few	Small	Y	Boulders and rock slabs with crevices on north side of ROW

^a Few, Moderate, Many

^b Small—(1/4-3/4-inch), Medium—(3/4-2-inch), Large—(>2-inch)

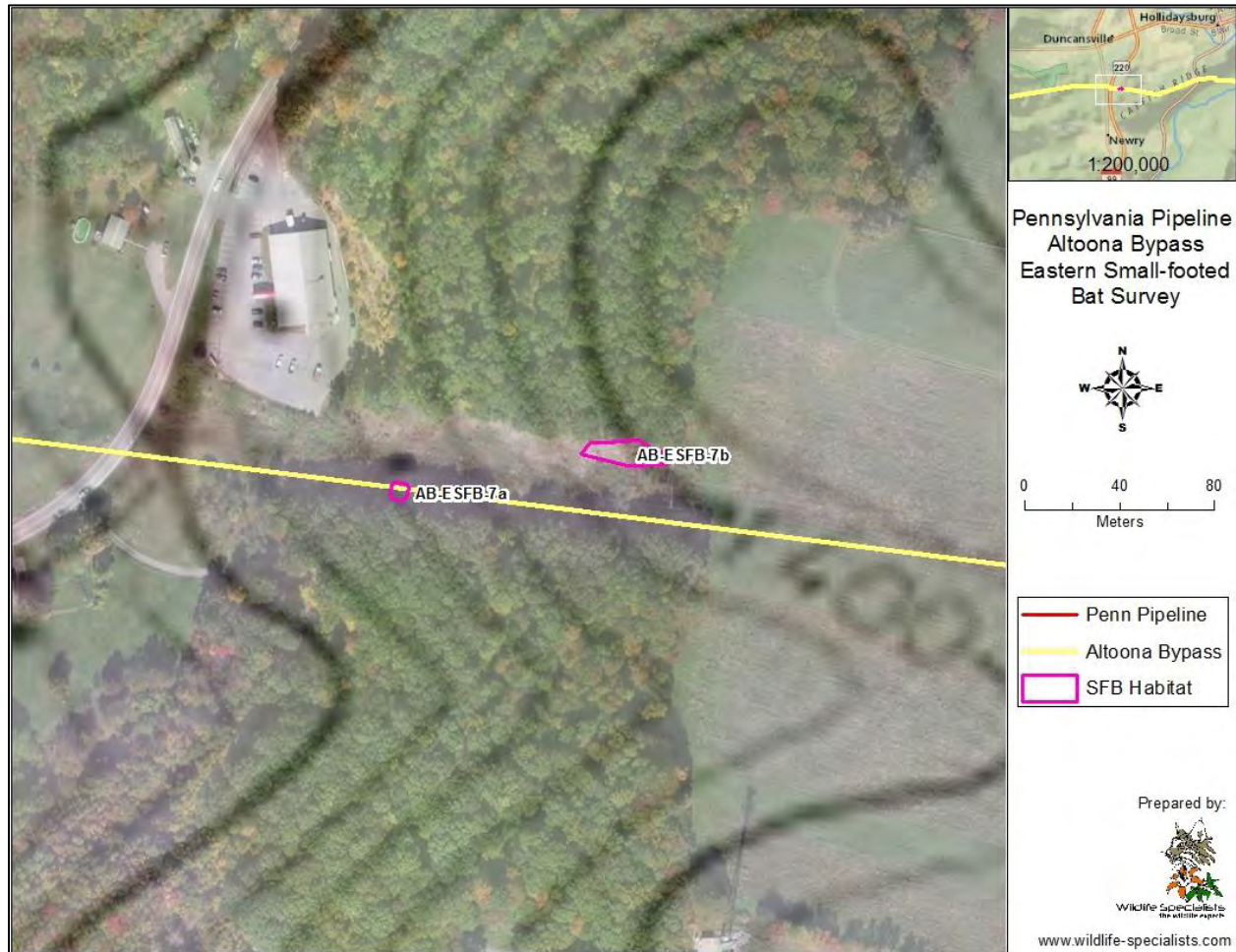


Figure 26. Locations of potential Eastern small-footed bat summer roosting habitat at the Altoona Bypass survey area along the proposed *Pennsylvania Pipeline Project*, Blair Twp., Blair County Pennsylvania, July 2014.

AB-ESFB-08

Table 11. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Altoona Bypass survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-8a	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8b	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8c	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8d	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8e	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8f	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW 1 to 4 ft diameter rocks and crevices
AB-ESFB-8g	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8h	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW 1 to 4 ft diameter rocks and crevices
AB-ESFB-8i	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8j	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8k	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8l	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8m	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8n	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8o	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8p	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8q	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices

^a Few, Moderate, Many

^b Small—(1/4-3/4-inch), Medium—(3/4-2-inch), Large—(>2-inch)

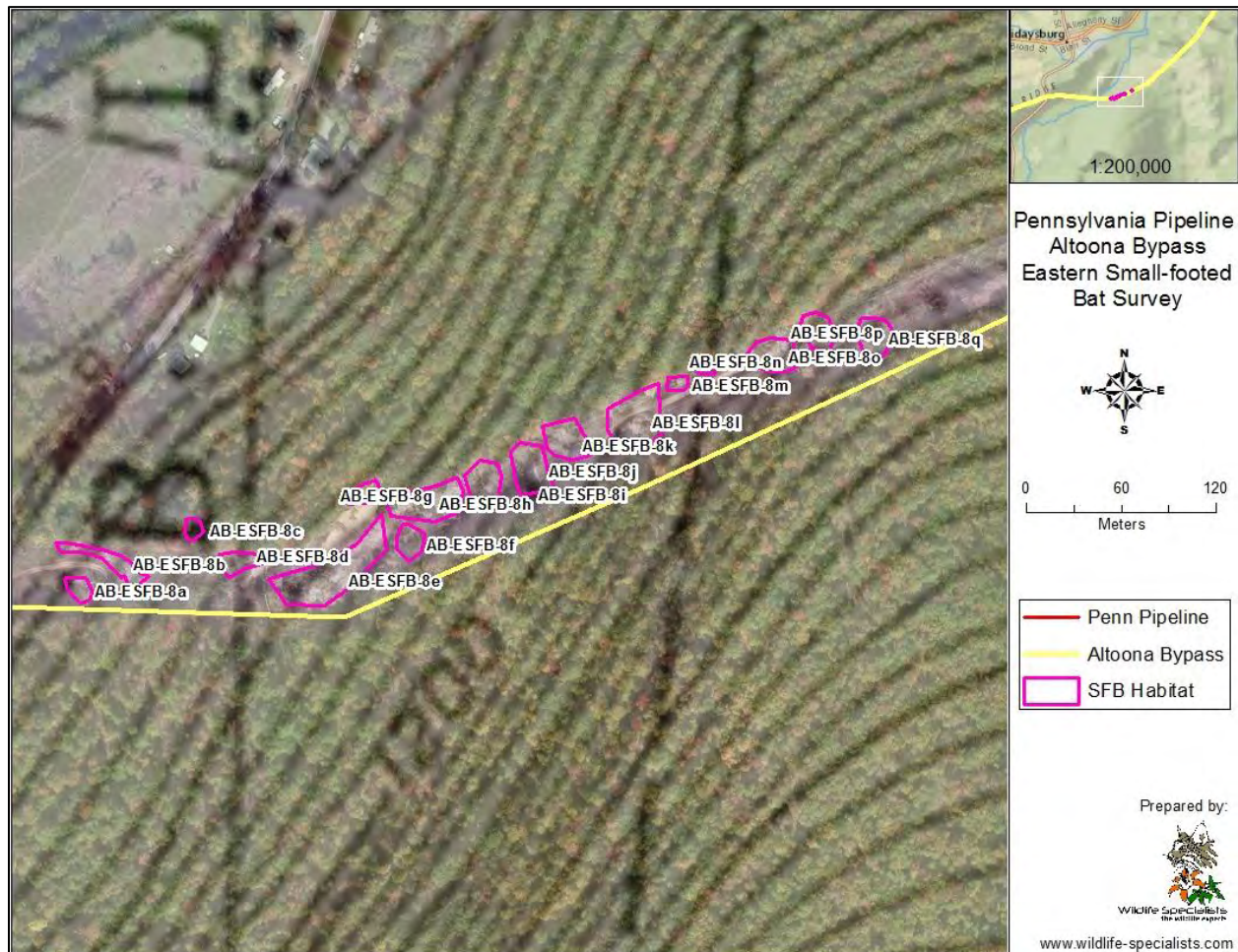


Figure 27. Locations of potential Eastern small-footed bat summer roosting habitat at the Altoona Bypass survey area along the proposed Pennsylvania Pipeline Project, Blair and Frankstown Twps., Blair County, Pennsylvania, July 2014.

Lock Mountain 1 & 2

The Lock Mountain survey area is a 23 ac (9 ha) area and the Lock Mountain 2 survey area is a 319 ac (129 ha) area both consisting of mature and regenerating deciduous and mixed forest located on the steep southeast and northwest facing sides of Lock Mountain (Fig. 28). The survey areas primarily focused on the proposed limits of disturbance (LOD) and a 300 foot buffer surrounding the LOD. The survey corridors are approximately 8.1 km and 7.6 km northeast of the town of Hollidaysburg with central coordinates at 78°16'54.72"W, 40°26'10.83"N (Lock Mountain 1) and 78°17'24.94"W, 40°25'56.42"N (Lock Mountain 2). Elevations within the site range from approximately 1,922ft – 900ft above mean sea level. Most of the survey area is crossed by an existing pipeline ROW. A cabin and a game lands road are also located within the Lock Mountain 2 survey area. The site consists of mature and pole stage second growth deciduous forest and mixed forest with a well-developed understory in

some areas and sparse understory elsewhere. Tree and sapling species include black birch, red oak, white pine, pitch pine, tulip poplar, white oak, black cherry, basswood, tree-of-heaven, sassafras, chestnut oak, red maple, sugar maple, striped maple and witch-hazel. Understory and herbaceous species include striped maple, mountain laurel, Virginia creeper, gooseberry, grapevine, crown vetch, various brambles (*Rubus* spp.), teaberry, seedlings and saplings of overstory species; greenbriar, deer tongue, woodfern (*Dryopteris* spp.), hay-scented fern, christmas fern, switch grass and Japanese stiltgrass. Canopy cover ranged from 15% within the existing pipeline ROW and open talus slides to 90% within the forested areas. A large amount of rocky habitat consisting of open (exposed to direct sunlight) and shaded talus and scree, and open and shaded outcrops and boulders covered much of the central portion of the Lock Mountain 2 survey corridor; especially near the crest of the steep northwest facing slope.

Findings

Some scattered rocky habitat consisting of outcrops, boulders and talus covered small portions of the southeastern portion of the Lock Mountain 1 survey corridor but was too shaded to be considered suitable habitat (Photo Map 9). In the Lock Mountain 2 survey area, a combined 2.6 acres (8 habitat polygons) consisted of open rocky features, some of which were considered prime small-footed bat habitat (0-25% canopy cover) for summer roosting (Table 12, Fig. 28, Photo Map 23 & 24). The best habitat consisted of several small to medium sized open talus/scree slides as well as talus and boulders (1-4ft across) along the existing pipeline right-of-way. Canopy cover ranged from 50% near the edges of the habitat polygons to 0% within the central portions of the larger talus slides. Many small to large crevices were present within all the habitat polygons. Sparse amounts of organic material consisting primarily of dried leaf litter, duff and soil can be observed within some of the crevices. The rock habitats will receive approximately 4-8 hours of direct sunlight. The boulders and talus observed in the wooded portions of the survey area were considered to be too shaded (80-90% canopy cover) to be utilized for summer roosting

Table 12. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Lock Mountain 2 survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
LM2-ESFB-1	23	35-40	4	Few	Small-Large	Y	Scattered boulders and talus next to pipeline ROW, 1 to 6 ft diameter
LM2-ESFB-2	23	35-40	4	Few	Small-Large	Y	Scattered boulders and talus next to pipeline ROW, 1 to 6 ft diameter
LM2-ESFB-3	23	35-40	4	Few	Small-Large	Y	Scattered boulders and talus on pipeline ROW, 1 to 4 ft diameter
LM2-ESFB-4	23	35-40	4	Few	Small-Large	Y	Scattered boulders and talus on pipeline ROW, 1 to 5 ft diameter
LM2-ESFB-5	23	25	6	Many	Small-Large	Y	Talus/scree slide on pipeline ROW, 1 to 4 ft diameter rocks
LM2-ESFB-6	24	15	6-7	Many	Small-Large	Y	Talus/scree slide on pipeline ROW, 1 to 4 ft diameter rocks
LM2-ESFB-7	24	15	6-7	Many	Small-Large	Y	Talus/scree slide south of pipeline ROW, 1 to 4 ft diameter rocks
LM2-ESFB-8	24	15	6-7	Many	Small-Large	Y	Talus/scree slide on pipeline ROW, 1 to 4 ft diameter rocks

^a **Few, Moderate, Many**

^b **Small**—(1/4-3/4-inch), **Medium**—(3/4-2-inch), **Large**—(>2-inch)

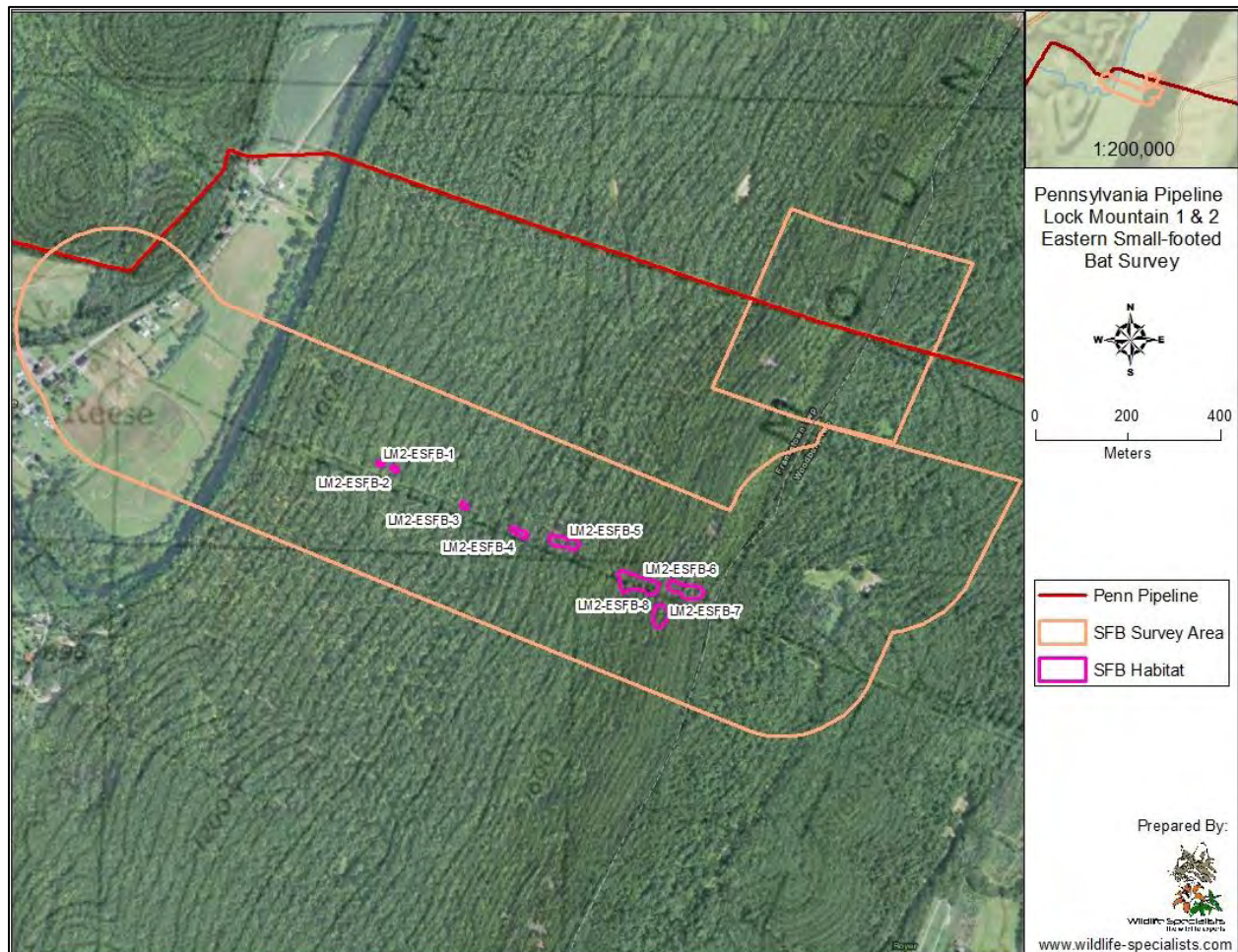


Figure 28. Lock Mountain 1 & 2 survey areas along the proposed *Pennsylvania Pipeline Project*, Frankstown and Woodbury Twps., Blair County, Pennsylvania, July 2014.

Jacks Mountain 2

The Jack's Mountain 2 survey area is a 71 ac (29 ha) area of mostly mature forest, with a pipeline corridor running through it. The site is located on the steep west facing side of Jack's Mountain. The survey corridor is approximately 1.1 km east of Route 655 with central coordinates at 77°57'19.28"W, 40°20'50.23"N. Elevations within the site range from approximately 1,300ft – 1,660ft above mean sea level. Tree and sapling species include black birch, red oak, chestnut oak, red maple, and sugar maple. The understory is dominated by grape vine, blackberry and striped maple. Rocky habitat consisting of shaded and exposed boulders covered most of the survey corridor. Canopy cover throughout most of the survey area was 50% with the exception of the pipeline right-of-way and open talus slides.

Findings

A combined 3.5 acres (12 habitat polygons) consisted of open rocky features and was considered prime habitat (0% canopy cover) by bats for summer roosting (Table 13, Fig. 29, Photo Maps 10-11). The habitat consisted of several small open talus slides as well as talus and boulders (1-3m across) along the existing pipeline right-of-way. Canopy cover ranged from 50% near the edges of the habitat polygons to 0% within the larger talus slides. Many small to large crevices were present within all the habitat polygons. Sparse amounts of organic material consisting primarily of dried leaf litter, duff and soil can be observed within some of the crevices. The rock habitats will receive approximately 4-8 hours of direct sunlight. The boulders and talus observed in the wooded portions of the survey area was considered to be too shaded (80-90% canopy cover) to be utilized for summer roosting (Appendix IV, Photo Map 12).

Table 13. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Jacks Mountain 2 survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
JM2-ESFB-1 &	10, 11	30-50	4-6	many	small-large	N	Piled talus and 1-4m boulders along existing pipeline ROW
JM2-ESFB-3	10	20-50	4-6	many	large	N	Small talus slide with 1-4m boulders on side of mountain at ~ 1580ft
JM2-ESFB-4	10	0-50	4-8	many	large	N	Large talus slide on side of mountain at ~ 1760ft, boulders 1-3m
JM2-ESFB-5	10	30-60	4	many	small-large	Y	Small pile of 1-3m boulders on top of mountain
JM2-ESFB-6	11	0-20	8	many	medium-large	Y	Open talus slide near mtn. top with 1-3m boulders and tapering crevices
JM2-ESFB-7	11	5	8+	many	medium-large	Y	Large open talus slide with 1-3m diameter boulders and slabs
JM2-ESFB-8	10	10	8+	many	medium-large	Y	Large open talus slide with 1-4m diameter boulders near mtn. top
JM2-ESFB-9	10	11	8+	many	medium-large	Y	Large open talus slide with 1-4m diameter boulders and crevices
JM2-ESFB-10	10	11	8+	many	medium-large	Y	Large open talus slide with 1-4m diameter boulders and crevices
JM2-ESFB-11	10	11	8+	many	medium-large	Y	Large open talus slide with 1-4m diameter boulders and crevices
JM2-ESFB-12	10	11	8+	many	medium-large	Y	Large open talus slide with 1-4m diameter boulders and crevices

^a **Few, Moderate, Many**

^b **Small**—(1/4-3/4-inch), **Medium**—(3/4-2-inch), **Large**—(>2-inch)

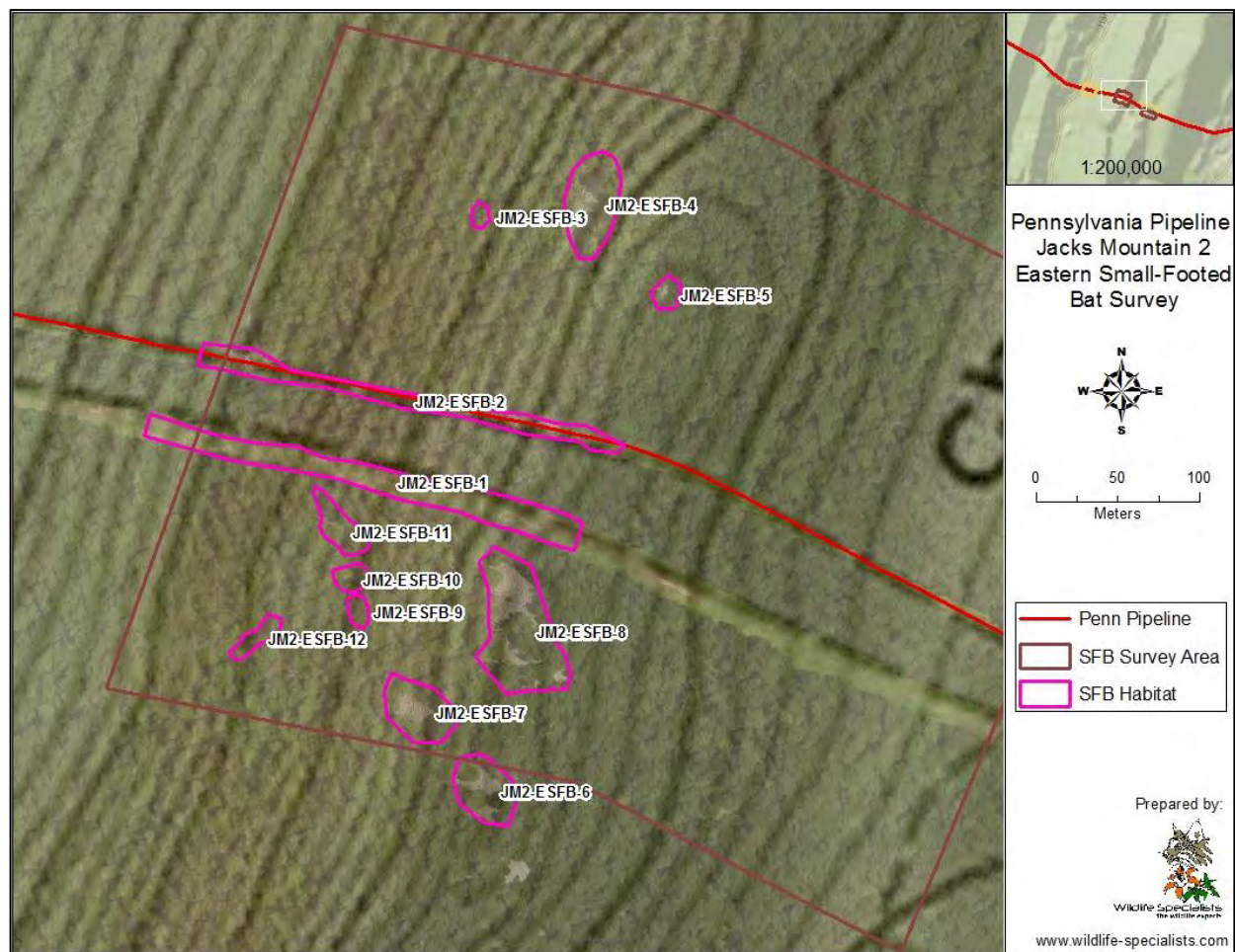


Figure 29. Locations of potential Eastern small-footed bat summer roosting habitat at the Altoona Bypass survey area along the proposed Pennsylvania Pipeline Project, Union Twp., Huntingdon County Pennsylvania, July 2014.

Jacks Mountain 3

The Jack's Mountain 3 survey area is a 69 ac (28 ha) area of mostly mature forest located on the steep south facing side of Jack's Mountain (Fig. 30). The survey corridor is approximately 2.4 km east of Route 655 with central coordinates at 77°56'34.47"W, 40°20'37.07"N. Elevations within the site range from approximately 1,560ft – 1,640ft above mean sea level. Tree and sapling species include black birch, red oak, chestnut oak, red maple, and white pine. The understory is dominated by Virginia creeper, blackberry, grape vine, mountain laurel, and polypody fern. Canopy cover in approximately half of the survey area was 60%, with the remaining portions being 90% or greater.

Findings

Potential Eastern Small-footed Bat habitat was identified within the Jack’s Mountain 3 survey area (Fig. 30, Table 14, Appendix IV, Photo Map 13). An area of 0.09 ha (0.22 ac) of the rock features that were observed within the survey corridor had low canopy cover, and were considered prime habitat for summer roosting by bats. The habitat consisted of several small open talus slides as well as talus and boulders (1-3m across) along the existing pipeline right-of-way. Canopy cover ranged from 50% near the edges of the habitat polygons to 0% within the larger talus slides. Many small to large crevices were present within all the habitat polygons. Sparse amounts of organic material consisting primarily of dried leaf litter, duff and soil can be observed within some of the crevices. The rock habitats will receive approximately 4-8 hours of direct sunlight. The boulders and talus observed in the wooded portions of the survey area were considered to be too shaded (80-90% canopy cover) to be utilized for summer roosting (Appendix IV, Photo Map 14).

Table 14. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Jacks Mountain 3 survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
JM3-ESFB-1	13	20	7-8	many	Medium-large	Y	Talus slide on slope with 1-3m boulders and tapering crevices
JM3-ESFB-2	13	35	6-8	many	Medium-large	Y	Talus slide on side of mountain with 1-4m boulders and tapering crevices
JM3-ESFB-3	13	25	8	many	small-large	Y	Talus with some large crevices and boulders on northwest slope
JM3-ESFB-4	13	20-50	6-8	many	small-large	N	Talus slide on side of mountain at ~ 1,560 ft
JM3-ESFB-5	13	50	6	moderate	small-large	Y	Talus within the existing pipeline ROW
JM3-ESFB-6	13	50	6	few	small	Y	Small talus within the pipeline ROW

^a Few, Moderate, Many

^b Small—(1/4-3/4-inch), Medium—(3/4-2-inch), Large—(>2-inch)

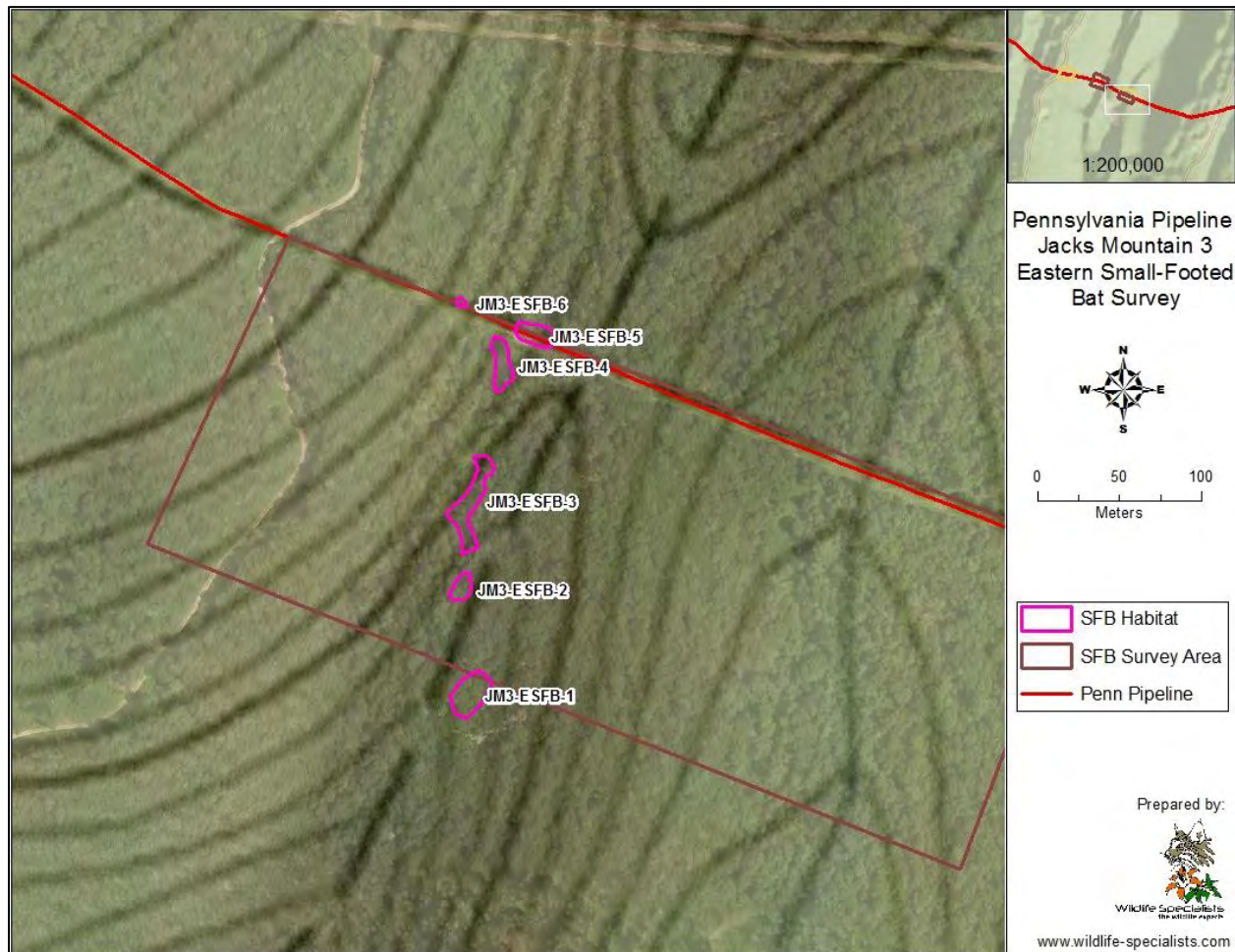


Figure 30. Locations of potential Eastern small-footed bat summer roosting habitat at the Jacks Mountain 3 survey area along the proposed *Pennsylvania Pipeline Project*, Union and Shirley Twps., Huntingdon County Pennsylvania, July 2014.

Blacklog Mountain

The Blacklog Mountain survey area is a 97 ac (39 ha) area of mostly mature forest located on the steep south and north facing sides of Blacklog Mountain (Fig. 31). The survey corridor is approximately 8.6 km southeast of the town of Mt. Union with central coordinates at 77°48'34.07"W, 40°19'22.59"N. Elevations within the site range from approximately 1,300ft – 1,650ft above mean sea level. Tree and sapling species include black birch, red oak, red maple, sassafras, witch-hazel, chestnut oak, and white pine. The understory contains Virginia creeper, greenbriar, blackberry, polypody and marginal wood fern, grapevine, grasses, black raspberry (*Rubus occidentalis*), and mountain laurel. Canopy cover averaged 80% throughout the survey area except with the pipeline corridor and along Blacklog Mountain Road.

Findings

Three (3) areas of potential small-footed bat roosting habitat were located (Fig. 31, Table 15, Appendix IV; Photo Map 15). The combined areas measured approximately 800 square feet. Rock was free of canopy cover and had deep crevices. The potential roosting habitat was comprised of small to large rock piles along the edges of an existing pipeline ROW with boulders averaging 1-3m in diameter. Sparse amounts of organic material consisting primarily of dried leaf litter, duff and soil can be observed within some of the crevices. The rock habitats will receive approximately seven (7) hours of direct sunlight. Medium sized crevices were identified within the boulder piles. The boulders and talus observed in the wooded portions of the survey area were considered to be too shaded (80-90% canopy cover) to be utilized for summer roosting (Appendix IV, Photo Map 16).

Table 15. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Blacklog Mountain survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
BM-ESFB-1	15	30-40	7	moderate	medium	N	Piled boulders along pipeline ROW
BM-ESFB-2	15	30	7	moderate	medium	Y	Pipeline ROW, some soil between rocks when line was back-filled
BM-ESFB-3	15	30	7	few	medium	Y	Pipeline ROW, some soil between rocks when line was back-filled

^a **Few, Moderate, Many**

^b **Small**—(1/4-3/4-inch), **Medium**—(3/4-2-inch), **Large**—(>2-inch)

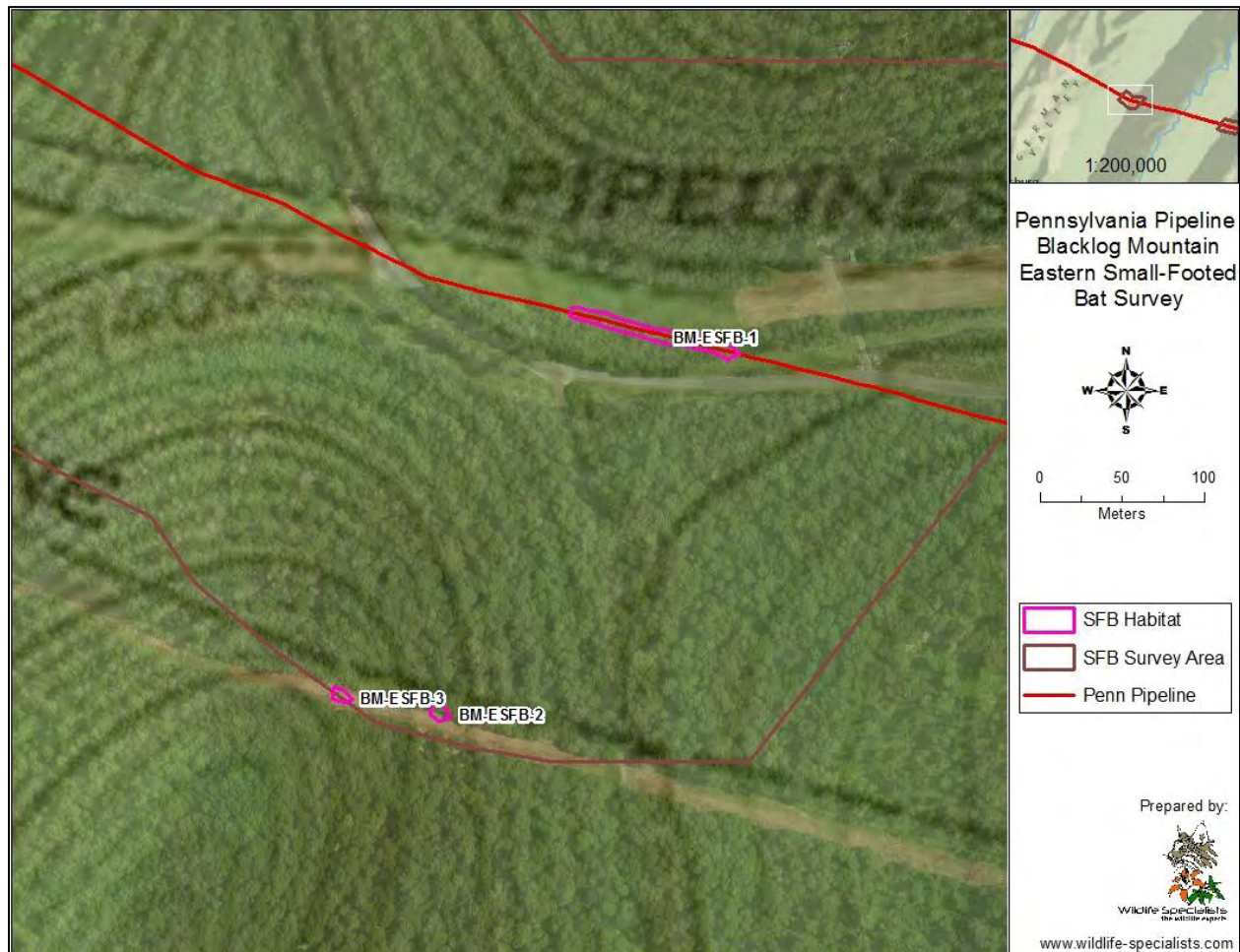


Figure 31. Locations of potential Eastern small-footed bat summer roosting habitat at the Blacklog Mountain survey area along the proposed Pennsylvania Pipeline Project, Shirley Twp., Huntingdon County Pennsylvania, July 2014.

Shade Mountain

The Shade Mountain survey area is a 94 ac (38 ha) area of mostly mature forest located primarily on the steep east and somewhat on the west facing side of Shade Mountain (Fig. 32). The survey corridor is approximately 7.2 km southwest of the town of Cross Keys with central coordinates at 77°46'5.87"W, 40°19'1.93"N. Elevations within the site range from approximately 940ft – 1,780ft above mean sea level. Tree and sapling species include black birch, red oak, red maple, sassafras, witch-hazel, tulip poplar (*Liriodendron tulipifera*), and basswood. The understory contains Virginia creeper, greenbriar, blackberry, polypody and marginal wood fern, striped maple, grape vine, grasses, white baneberry, and poison ivy. Canopy cover ranged from 0% within the many open talus slides to 100% in forested areas.

Findings

Many areas of high potential Eastern Small-footed Bat roosting habitat were located (Table 16, Appendix IV, Photo Maps 17-18). The combined areas measured 5.13 ha (12.7 ac), approximately 13.35% of the entire survey area. Rock was free of canopy cover and had deep crevices, ideal for small-footed bat summer roosting. The habitat consisted of several small to extremely large open talus slides as well as talus and boulders (1-5m across) along the existing pipeline right-of-way and beyond. Canopy cover ranged from 50% near the edges of the habitat polygons to 0% within the larger talus slides. Many small to large crevices were present within all the habitat polygons. Sparse amounts of organic material consisting primarily of dried leaf litter, duff and soil can be observed within some of the crevices. The rock habitats will receive approximately 4-8+ hours of direct sunlight. The boulders and talus observed in the wooded portions of the survey area were considered to be too shaded (80-90% canopy cover) to be utilized for summer roosting (Appendix IV, Photo Map 19).

Table 16. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Shade Mountain survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices^a	Size of Crevices^b	Organic Mat, Soil, Water (Y/N)	Comments
SM-ESFB-1	18	30	5-7	many	medium-large	Y	Piled talus and 1-3m boulders along existing pipeline ROW
SM-ESFB-2	18	30	5-7	many	medium-large	Y	Piled talus and 1-3m boulders along existing pipeline
SM-ESFB-3	18	5	8+	many	medium-large	Y	Large open talus slide on side of mountain with 1-3 m boulders
SM-ESFB-4	18	10	8+	many	medium-large	Y	Large open talus slide on side of mountain, boulders 1-3m
SM-ESFB-5	18	20	8+	many	medium-large	Y	Open talus slide on side of mountain, boulders 1-3m with many crevices
SM-ESFB-6	18	5	8+	many	medium-large	Y	Open talus slide with 1-3m diameter boulders and slabs
SM-ESFB-7	18	5	8+	many	medium-large	Y	Large open talus slide with 1-4m diameter boulders and crevices
SM-ESFB-8	18	15	8+	many	medium-large	Y	Large open talus slide with 1-4m diameter boulders and crevices
SM-ESFB-9	17, 18	5	8+	many	medium-large	Y	Large open talus side with 1-4m boulders on side of mountain
SM-ESFB-10	18	5	8+	many	medium-large	Y	Large open talus slide with 1-4m boulders on side of mountain
SM-ESFB-11	18	5	8+	many	medium-large	Y	Large open talus slide on side of mountain, boulders 1-4m
SM-ESFB-12	18	5	8+	many	medium-large	Y	Large open talus slide on side of mountain with 1-4m boulders



Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
SM-ESFB-13	17	25	7	many	small-large	Y	Piled talus and 1-3m boulders along existing pipeline ROW
SM-ESFB-14	17	25	7	many	small-large	Y	Piled talus and 1-3m boulders along existing pipeline ROW
SM-ESFB-15	18	25	7+	many	small-large	Y	Piled talus and 1-3m boulders along existing pipeline ROW
SM-ESFB-16	18	20	7+	many	medium-large	Y	Open talus slide with 1-3m diameter boulders and crevices near mtn. top
SM-ESFB-17	17	2	8+	many	medium-large	Y	Large open talus slide with 1-3m boulders and crevices on mtn. side
SM-ESFB-18	17	15	8+	many	medium-large	Y	Open talus slide with 1-3m diameter boulders and numerous crevices
SM-ESFB-19	18	15	8+	many	medium-large	Y	Open talus slide with 1-3m diameter boulders and crevices on mtn. side
SM-ESFB-20	17	2	8+	many	medium-large	Y	Expansive open talus slide with 1-5m boulders and numerous crevices

^a **Few, Moderate, Many**

^b **Small**—(1/4-3/4-inch), **Medium**—(3/4-2-inch), **Large**—(>2-inch)

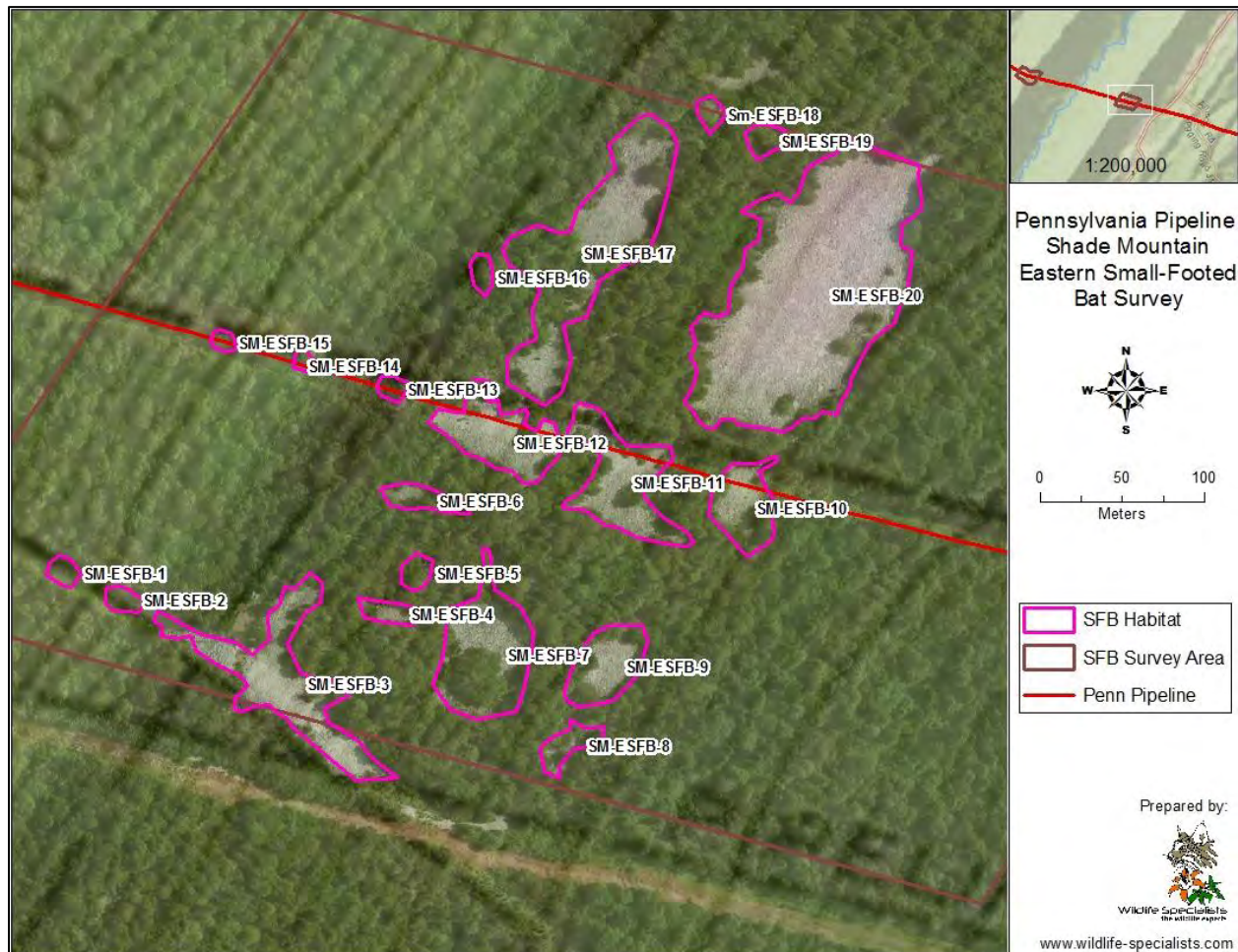


Figure 32. Locations of potential Eastern small-footed bat summer roosting habitat at the Shade Mountain survey area along the proposed Pennsylvania Pipeline Project, Shirley and Tell Twps., Huntingdon County, Pennsylvania, July 2014.

Conococheague Mountain

The Conococheague Mountain survey area is a 59 ac (24 ha) area of primarily mature deciduous forest located on the moderate northwest facing and steep southeast facing slopes of Conococheague Mountain (Fig. 33). The survey corridor is approximately 0.5 km north and 7.0 km east of Blairs Mills with central coordinates at 40°17'23.659"N, 77°38'88.071". Elevations within the site range from 1,440ft - 1,840ft above mean sea level. The site consists of mostly mature deciduous forest and mixed forest with a well-developed understory throughout most of the survey area. An existing pipeline right-of-way crosses the entire vertical length and Concord Road crosses the entire horizontal width of the survey area.

The majority of the southeast facing slope was covered with talus and boulders with particularly dense rock at the higher elevations and slightly more scattered rock at lower elevations. Some scattered

boulders and associated talus were present within and south of the ROW on the northwest facing slope. Canopy cover ranged from 0-50% within the pipeline ROW and small open areas to 75 to 90% throughout the rest of the survey area. Dominant overstory species included red and chestnut oak, red maple, and black birch. Shrub and herbaceous species included mountain laurel, witch hazel, green briar, blackberry, low-bush blueberry, grapevine, goldenrod, ferns and grasses.

Findings

Most of the survey area particularly the southeast facing slope was covered with dense boulders and talus ranging in size from 1-5 meters with some larger float blocks up to 10 meters. Numerous small to large interstices and deep crevices are present throughout the rocky habitat. Fourteen (14) areas with sufficient sun exposure to be considered potential small-footed bat roosting habitat were located within the survey area (Fig. 33, Table 17, Appendix IV; Photo Map 20 & 21). Organic material consisting primarily of dried leaf litter, duff and soil was observed within some of the crevices. Sun exposure ranges from 4 hours in the smaller areas to 8+ hours within the large open area on the ROW. The boulders and talus observed throughout the rest of the survey area was considered to be too shaded (75-90% canopy cover) to be utilized for summer roosting (Appendix IV, Photo Map 22).

Table 17. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Conococheague Mountain survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
SFB-Con-1	20	30-50	4-5	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-2	20	0-20	8+	Many	Small-Large	Y	Dense boulder/talus slide on ROW, 10 ft diameter and smaller rocks
SFB-Con-3	20	30-50	4-5	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-4	20	30-50	4-5	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-5	20	30-50	4-5	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-6	21	30-50	4-5	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-7	21	30-50	4-5	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-8	21	20-50	4-6	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-9	21	30-50	4-5	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-10	20	30-50	4-5	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
SFB-Con-11	21	20-50	4-6	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 5ft and smaller rocks
SFB-Con-12	21	20-50	4-6	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-13	21	20-50	4-6	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-14	21	30-50	4-6	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks

^a **Few, Moderate, Many**

^b **Small—(1/4-3/4-inch), Medium—(3/4-2-inch), Large—(>2-inch)**

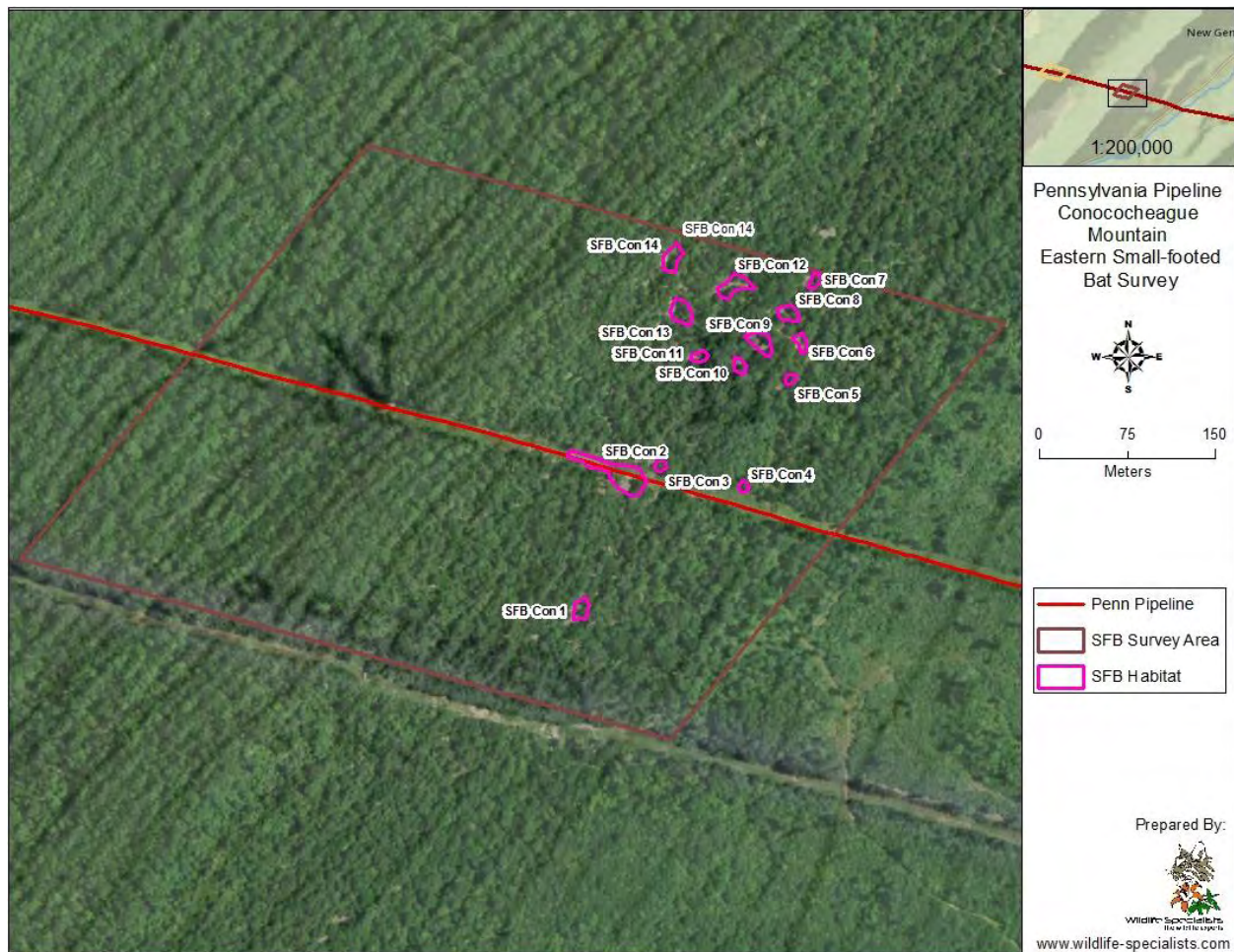


Figure 33. Locations of potential Eastern small-footed bat summer roosting habitat at the Conococheague Mountain survey area along the proposed Pennsylvania Pipeline Project, Toboyne Twp., Perry County, Pennsylvania, April 2015.

Appendix I. The Pennsylvania Game Commission’s Pennsylvania Natural Diversity Inventory (PNDI) Large Project Environmental Review response for Sunoco’s proposed Pennsylvania Pipeline Project.



Division of Environmental
Planning and Habitat
Protection
717-783-5957

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

2001 ELMERTON AVENUE
HARRISBURG, PA 17110-9797

“To manage all wild birds, mammals and their habitats
for current and future generations.”

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www.pgc.state.pa.us

March 14, 2014

PGC ID Number: 201312180001

Mr. Preston Smith
Tetra Tech
661 Anderson Drive, Foster Plaza
Pittsburgh, Pa 15220
preston.smith@tetratech.com

Re: Sunoco Pipeline, LP – Pennsylvania Pipeline Project
State Game Lands Nos. 46, 52, 71, 118, 147, 153, 198, 220, and 276
Large Project PNDI Review
Washington, Westmoreland, Indiana, Cambria, Blair, Huntingdon, Perry, Cumberland, Lebanon,
Lancaster, Berks, and Chester Counties, PA

Dear Mr. Smith,

Thank you for submitting your Pennsylvania Natural Diversity Inventory (PNDI) Large Project Environmental Review request. The Pennsylvania Game Commission (PGC) screened this project, including the requested 1500-foot buffer, for potential impacts to species and resources of concern under PGC responsibility, which includes birds and mammals only.

Potential Impact Anticipated

PNDI records indicate species or resources of concern are located in the vicinity of the project. The PGC has received and thoroughly reviewed the information that you provided to this office as well as PNDI data, and has determined that potential impacts to threatened, endangered, and species of special concern may be associated with your project. Therefore, additional measures are necessary to avoid potential impacts to the species listed below:

Scientific Name	Common Name	PA Status	Federal Status
<i>Myotis sodalis</i>	Indiana Bat	ENDANGERED	ENDANGERED
<i>Neotoma magister</i>	Allegheny Woodrat	THREATENED	
<i>Myotis leibii</i>	Eastern Small-footed Bat	THREATENED	
<i>Circus cyaneus</i>	Northern Harrier	THREATENED	
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	SPECIAL CONCERN	
<i>Lasionycteris noctivagans</i>	Silver-haired Bat	SPECIAL CONCERN	
<i>Haliaeetus leucocephalus</i>	Bald Eagle		

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Next Steps

Indiana Bat

Indiana bats are a federally listed endangered species under the jurisdiction of the U.S. Fish and Wildlife Service. As a result, our agency defers comments on potential impacts to Indiana bats to the U.S. Fish and Wildlife Service.

Allegheny Woodrat

The PGC has identified portions of the proposed project where potential Allegheny woodrat habitat may exist, and could be impacted by the proposed project. The PGC is requesting that Allegheny woodrat surveys be completed within the Allegheny Woodrat Survey Areas (see Maps 1-7 attached). The surveys should be completed by a qualified biologist and follow protocols found in the attached *PGC Allegheny Woodrat* guidance document. Please be sure that the following information, at a minimum, is provided for further review and comment by the PGC:

- a 1:24,000 scale copy of a USGS topo map and a GIS shapefile illustrating the locations (i.e. points) of all woodrat activity centers and potential activity centers, as well as the limits (i.e. polygons) of all woodrat habitat sites (central point locations with average width and length measurements will not be accepted to illustrate the habitat sites)
- color photographs, keyed to a location and orientation map, of any woodrat habitat sites, activity centers, potential activity centers, or woodrat sign that are identified during the surveys
- a Woodrat Habitat Site Survey form for each habitat site identified during the survey

The survey report should be submitted to the PGC no later than December 31st of the year it is completed.

Eastern Small-footed Bat

The PGC has identified portions of the project where potential eastern small-footed bat day roost habitat may exist, and could be impacted by the proposed project. The PGC is requesting that all potential eastern small-footed bat day roost habitat be assessed and delineated by a qualified biologist within the Small-footed Bat Survey Areas (see Maps 1-7 attached). Please be sure that the following information, at a minimum, is provided for further review and comment by the PGC:

- a 1:24,000 scale copy of a USGS topo map and a GIS shapefile illustrating the limits of all potential small-footed bat day roost habitat that is identified
- a GIS shapefile illustrating the proposed limits of tree clearing throughout the Small-footed Bat Survey Areas
- a GIS shapefile illustrating the proposed limits of earthwork, including any proposed grubbing or erosion and sedimentation pollution controls, throughout the Small-footed Bat Survey Areas
- representative color photographs of all surface rock encountered during the assessment and delineation regardless of whether the rock is considered to be potential eastern small-footed bat day roost habitat or not (numerous photos for each area of surface rock are strongly recommended)

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- a narrative or table detailing the following information for each area of surface rock that is encountered during the assessment and delineation to support or refute the rock's potential as eastern small-footed bat day roost habitat:
 - the estimated canopy cover over the rock
 - anticipated solar exposure of the rock
 - amount and size of crevices available for roost sites
 - presence of organic material, soil, or water within those crevices
 - other details as necessary that cannot be adequately conveyed via the photos provided
- a narrative detailing the reason(s) for any surface rock encountered not being considered potential small-footed myotis day roost habitat;
- and a photo location and orientation map for all photos provided.

The survey report should be submitted to the PGC no later than December 31st of the year it is completed.

Northern Harrier

The PGC is requesting that all site preparation, construction, reclamation, and future maintenance mowing within the Northern Harrier Restriction Area (see Map 8 attached) avoid the period between April 15 and August 31 to minimize potential impacts to northern harriers and their habitat during the breeding and nesting season.

The PGC is also recommending that Sunoco use the following seed mix within this section of the project area to ensure the establishment of beneficial herbaceous habitat for grassland species post-construction.

Species	Common Name	Seed/Acre	Percent Live Seed
<i>Avena sativa – spring planting</i>	annual oats	30lb	
<i>Lolium multiflorum- fall planting</i>	annual ryegrass	10lb	
<i>Schizachyrium scoparium</i>	little bluestem	4 lbs	10-67
<i>Sorghastrum nutans</i>	indian-grass	2 lbs	10-50
<i>Bouteloua curtipendula</i>	side-oats grama	1 lb	5-25
<i>Panicum virgatum</i>	switchgrass	1 lb	10-12
<i>Rudbeckia triloba plus another*</i>	black-eyed susan	¼ lb	1-5, each
<i>Coreopsis tripteris</i>	tall tickseed	1 oz	1-5
<i>Chasmanthium latifolium</i>	sea-oats	1lb	1-30
Straw Mulch – NO HAY			

Furthermore, when plans are developed illustrating the specific location and extent of any proposed permanent facilities (e.g. access roads, extra work spaces, launcher/receiver sites, meter sites, compressor stations, etc.) within this section of the project area, please provide a copy of those plans to this office for further review and written comment so that any permanent impacts to northern harriers can be considered. Every effort should be made to avoid and minimize permanent impacts to northern harrier habitat as these plans are developed, and depending on the nature and extent of any such impacts, habitat assessments, species surveys and/or mitigation may be necessary.

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Northern Long-eared Bats and Silver-haired Bats

Northern long-eared bats and silver-haired bats are species of special concern, and therefore, not target species for additional surveys. However, because of their ecological significance, all trees or dead snags greater than 5 inches in diameter at breast height that need to be harvested to facilitate the project (including any access roads or off-ROW work spaces) should be cut between November 1st and March 31st.

Bald Eagle

In January 2014, the PGC Board of Commissioners approved the removal of bald eagles from the state-listed endangered and threatened list. This status change will be reflected in an upcoming edition of the Pennsylvania Bulletin. Bald eagles are now classified as a Pennsylvania "protected" species. As the name implies, bald eagle will continue to enjoy protections provided by the Federal Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, and the Lacey Act. As a result, the PGC defers comments on potential impacts to bald eagles to the U.S. Fish and Wildlife Service.

The Bald and Golden Eagle Protection Act protects eagles from various forms of take, including disturbance. Please refer to the U.S. Fish and Wildlife Service's National Bald Eagle Management Guidelines (<http://www.fws.gov/migratorybirds/baldeagle.htm>) for specific measures that should be taken to ensure bald eagles are not disturbed. If you have questions about when and how to obtain a federal permit because you believe your proposed project will disturb bald eagles, and you are not able to implement measures to avoid disturbance, please contact the Fish and Wildlife Service's Pennsylvania Field Office at 814-234-4090.

For additional information on bald eagles and bald eagle nest etiquette refer to the "Bald Eagle Watching in Pennsylvania" link on the PGC's website (www.pgc.state.pa.us), under the Wildlife tab and then by clicking on Birding and Bird Conservation.

Wetlands

National Wetland Inventory Mapping (NWI) and/or aerial photos suggest that wetlands are located within the requested review area along the Little Conemaugh River, the Raystown Branch Juniata River, Marsh Creek, and Middle Creek. The PGC is requesting that the final project avoid, or at least minimize to the greatest practical extent, any adverse impacts to these resources and their associated wildlife habitat.

Potential Bat Hibernacula

In addition, the PA Department of Environmental Protection's *Abandoned Mine Land (AML) Inventory Points* from www.pasda.psu.edu indicates abandoned mine features within the requested review area. These mine features have the potential to connect to abandoned deep mine workings that can serve as hibernacula for a variety of cave bat species. These AML openings and any undocumented openings and caves located along the proposed alignment and within the review buffer must be assessed following the attached *PGC Protocol for Assessing Bat Use of Potential Hibernacula*. Any features having potential as bat hibernacula will need to be surveyed to determine the presence or absence of bat species. A special use permit will need to be obtained by the consultant in order to conduct such surveys that involve the handling of bats.

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State Game Lands

Portions of the proposed project are located on State Game Lands Nos. 46, 52, 71, 118, 147, 198, and 276 and adjacent to State Game Lands Nos. 153 and 220. Please contact Mr. Travis Anderson, Southwest Region Land Management Supervisor, at 724-238-9523 to discuss and coordinate the project on SGL 153 and 276, Mr. Robert Einodshofer, Southcentral Region Land Management Supervisor, at 814-643-1831 to discuss and coordinate the project on SGL 71, 118, 147, and 198, and Mr. Bruce Metz, Southeast Region Land Management Supervisor, at 610-926-3136 to discuss and coordinate the project on SGL 46, 52, and 220.

This response represents the most up-to-date summary of the PNDI data files and is valid for two (2) years from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on site. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

Should the proposed work continue beyond the period covered by this letter, please resubmit the project to the PGC at the following address as an "Update" (including an updated PNDI receipt, project narrative and accurate map):

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning & Habitat Protection
2001 Elmerton Avenue
Harrisburg, PA 17110-9797

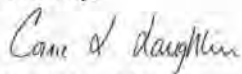
If the proposed work has not changed and no additional information concerning listed species is found, the project will be cleared for PNDI requirements by the PGC for an additional 2 years.

This finding applies to impacts to birds and mammals only. To complete your review of state and federally-listed threatened and endangered species and species of special concern, please be sure that the U.S. Fish and Wildlife Service, the PA Department of Conservation and Natural Resources, and/or the PA Fish and Boat Commission have been contacted regarding this project as directed by the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Please be sure to include the above-referenced PGC ID Number on any future correspondence with the PGC regarding this project.

If you have any questions regarding this letter, or any future review requests for this or any other projects, please contact John Taucher at 717-787-4250, extension 3632 or via e-mail at jotaucher@pa.gov.

Sincerely,



Corrie Laughlin
Division of Environmental Planning & Habitat Protection
Bureau of Wildlife Habitat Management
Phone: 717-787-4250, Extension 3634
Fax: 717-787-6957
e-Mail: claughlin@pa.gov

Mr. Preston Smith

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March 14, 2014

A PNHP Partner



Pennsylvania Natural Heritage Program

CLL/jwt

Enclosures:

Project Overview Map
Maps 1-8
PGC Allegheny Woodrat guidance document
PGC Protocol for Assessing Bat Use of Potential Hibernacula

cc: W. Anderson
Myers
Grohol
Trusso
Vreeland
Morgan
T. Anderson
Einodshofer
Metz
DuBrock
Brauning
Butchkoski
Turner
Gross
Barber
DiMatteo
Havens
Taucher
Librandi Mumma
Ms. Jennifer Siani, U.S. Fish and Wildlife Service
Ms. Pamela Shellenberger, U.S. Fish and Wildlife Service
H:\OIL&GAS_PNDI_Reviews\Statewide & Multi-Region Projects
F:\OILGASMINERALSS\46
F:\OILGASMINERALSS\52
F:\OILGASMINERALSS\71
F:\OILGASMINERALSS\118
F:\OILGASMINERALSS\147
F:\OILGASMINERALSS\153
F:\OILGASMINERALSS\198
F:\OILGASMINERALSS\220
F:\OILGASMINERALSS\276

Appendix II. ALLEGHENY NEMA HABITAT SITE SURVEY (FORM PGC 4150 wdrat) forms for Sunoco's proposed Pennsylvania Pipeline Project, Cambria, Blair, Huntingdon, Perry, and Cumberland Counties, Pennsylvania, June 23-July 24, 2014.

FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Laurel Ridge 2 Trap-site Number: _____ Date: 6/25/2014

Ownership (circle one): Public, Private, Both Access (Name, Address Telephone): _____

Location: _____ N or 5.1km S and _____ E or 4.0 W of: Vintondale

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km - 2km; >2km

Surveyors: Stan Boder, Brian Benner, Phil Dunning, Dave Scopaz, Justin Collins

Effort: # of surveyors x survey minutes = 120 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): CRLR Habitat Site Code (if known): _____

County: Indiana Quadrangle: Vintondale Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 5 Average Width: _____ Width range: 337

Activity Extent (m): Longest Length: _____ Average Width: _____ Width range: _____
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 25 ' 51.2 " & Longitude W78 ° 57 ' 27.1 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1660 to 1680 Slope Range (%): 25 to 30

Aspects (degrees): southerly aspects: _____ % _____ ° northerly aspects: _____ % _____ °
(135°-225°) (315°-45°)
easterly aspects: 120 % 100 ° westerly aspects: _____ % _____ °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge/valley side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 312 % 100, 2) Code # _____ % _____,
3) Code # _____ % _____, 4) Code # _____ % _____

Geological formation: Allegheny

Nearest mapped water: Name: Findley Run Distance to: 31 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 5 Two-digit Habitat Disturbance code: 1E 3D 5C

Anderson Level III cover code on site: 415 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 75 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): _____

Black Birch, Red Maple, Hemlock, Chestnut Oak

Shrub, Vine and Briar (Rubus) Species: Green Briar, Low bush blueberry, Huckleberry, Scrub oak,
Rhododendron

Herbaceous Species: Marginal Wood Fern, Hay scented fern, Bracken fern, sedges and grasses

General Description of Surrounding Habitat (>100m & <500m): Mature mixed forest,

Pipeline crosses the habitat.

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

9 rattlesnakes nearby on powerline



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	N40 25'49.48"	W78 57'29.56"	0	0	0	0	0	0	312	75
2										
3										
4										
5										
6										
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21										
22										
23										
24										
25										
TOTAL =										



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Laurel Ridge 3 Trap-site Number: _____ Date: 6/25/2014

Ownership (circle one): Public, Private, Both Access (Name, Address Telephone): _____

Location: _____ N or ^{5.5km} S and _____ E or ^{3.2km} W of: Vintondale

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km - 2km; >2km

Surveyors: Stan Boder, Brian Benner, Phil Dunning, Dave Scopaz, Justin Collins

Effort: # of surveyors x survey minutes = ⁶⁰⁰ minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): CRLR Habitat Site Code (if known): _____

County: Cambria Quadrangle: Vintondale Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 336 Average Width: _____ Width range: 721

Activity Extent (m): Longest Length: _____ Average Width: _____ Width range: _____
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 25' 39.77 " & Longitude W78 ° 56 ' 49.93 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1800 to 2140 Slope Range (%): 25 to 30

Aspects (degrees): southerly aspects: _____ % _____ ° northerly aspects: 100 % 350 °
(135°-225°) (315°-45°)
easterly aspects: _____ % _____ ° westerly aspects: _____ % _____ °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge top

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 312 % 73
- 2) Code # 133 % 25
- 3) Code # _____ % _____
- 4) Code # 112 % 2

Geological formation: Allegheny, Pottsville

Nearest mapped water: Name: Findley Run tributary Distance to: 250 m



FORM PGC 4150 wdrat

Forest Fragmentation Code: 5 Two-digit Habitat Disturbance code: 1E 5D 5C

Anderson Level III cover code on site: 415 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 75 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): _____

Black Birch, Red Maple, Sugar Maple, Hemlock, Chestnut Oak, Red Oak, Black Cherry,

Black Gum, Sassafras, Yellow Birch, White Ash

Shrub, Vine and Briar (Rubus) Species: Green Briar, Low bush blueberry, Huckleberry,

Rhododendron, Witch-hazel, Mountain Laurel, Striped Maple, Blackberry

Herbaceous Species: Marginal Wood Fern, Hay scented fern, Bracken fern, sedges and grasses

Teaberry,

General Description of Surrounding Habitat (>100m & <500m): Mature mixed forest,

Pipeline and powerline crosses the habitat.

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

9 rattlesnakes on powerline



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	N40 25'32.15"	W78 56'46.10"	0	0	0	0	0	0	312	95
2	N40 25'36.77"	W78 56'47.95"	0	0	0	0	0	0	112	95
3	N40 25'42.64"	W78 56'42.64"	0	0	0	0	0	0	312	95
4	N40 25'45.79"	W78 56'56.44"	0	0	0	0	0	0	133	95
5										
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19										
20										
21										
22										
23										
24										
25										
TOTAL =										



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Laurel Ridge 1 Trap-site Number: _____ Date: 6/24/2014

Ownership (circle one): Public **Private** Both Access (Name, Address Telephone): _____

Location: _____ N or ^{6.0Km} S and _____ E or _____ W of: Vintondale

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km - 2km; **>2km**

Surveyors: Stan Boder, Brian Benner

Effort: # of surveyors x survey minutes = 360 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): CRLR Habitat Site Code (if known): _____

County: Cambria Quadrangle: Vintondale Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 501 Average Width: _____ Width range: 870

Activity Extent (m): Longest Length: _____ Average Width: _____ Width range: _____
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 25 ' 20.97 " & Longitude W78 ° 54 ' 18.58 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1990 to 2280 Slope Range (%): 10 to 25

Aspects (degrees): southerly aspects: 5 % 200 ° northerly aspects: _____ % _____ °
(135°-225°) (315°-45°)

easterly aspects: 95 % 120 ° westerly aspects: _____ % _____ °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge top

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- | | |
|----------------------------------|----------------------------------|
| 1) Code # <u>312</u> % <u>75</u> | 2) Code # <u>211</u> % <u>15</u> |
| 3) Code # <u>132</u> % <u>5</u> | 4) Code # <u>133</u> % <u>5</u> |

Geological formation: Allegheny, Pottsville

Nearest mapped water: Name: Laurel Run tributary Distance to: 40 m



FORM PGC 4150 wdrat

Forest Fragmentation Code: 5 Two-digit Habitat Disturbance code: 1E 2H 3G

Anderson Level III cover code on site: 415 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 85 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): _____

Black Birch, Red Maple, Sugar Maple, Red Oak

Shrub, Vine and Briar (RUBUS) Species: Green Briar, Blackberry,

Mountain Laurel, Striped Maple, Witch hazel

Herbaceous Species: Marginal Wood Fern, Teaberry, Hay scented fern,

General Description of Surrounding Habitat (>100m & <500m): Mature forest with thick underbrush
Pipeline splits the habitat.

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	N40 25'23.36"	W78 54'19.82"	0	0	0	0	0	0	312	95
2	N40 25'24.79"	W78 54'3.59"	0	0	0	0	0	0	312	100
3	N40 25'16.44"	W78 54'37.35"	0	0	0	0	0	0	312	95
4	N40 25'17.6"	W78 54'20.9"	0	0	0	0	0	0	142	100
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
TOTAL =										



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Altoona Bypass 1 Trap-site Number: _____ Date: 7/24/2014

Ownership (circle one): Public **Private** Both Access (Name, Address Telephone): _____

Location: _____ N or 2.5km S and _____ E or 8.1km W of: Hollidaysburg

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km-2km; **>2km**

Surveyors: Brian Benner

Effort: # of surveyors x survey minutes = 30 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): RAYS Habitat Site Code (if known): _____

County: Blair Quadrangle: Hollidaysburg Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 200m Average Width: 30m Width range: 10-30m

Activity Extent (m): Longest Length: NA Average Width: NA Width range: NA
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 24 ' 18.91 " & Longitude W78 ° 29 ' 4.06 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1500ft to 1520ft Slope Range (%): 25 to 30

Aspects (degrees): southerly aspects: _____ % _____ ° northerly aspects: _____ % _____ °
(135°-225°) (315°-45°)
easterly aspects: 100 % 95 ° westerly aspects: _____ % _____ °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge/valley- side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 321 % 100 , 2) Code # _____ % _____ ,
3) Code # _____ % _____ , 4) Code # _____ % _____

Geological formation: Foreknobs Formation

Nearest mapped water: Name: Dry Run Tributary Distance to: 46 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 5 Two-digit Habitat Disturbance code: 1E 4G 5D

Anderson Level III cover code on site: 415 and adjacent to site: 760

Tree canopy coverage overtop Habitat Site: 100 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): Red Oak, Red Maple, Black Cherry,
White ash

Shrub, Vine and Briar (Rubus) Species: Low Bush Blueberry, Green Briar, Grapevine,
Virginia Creeper

Herbaceous Species: Marginal Wood Fern, Polypody Fern, Grass spp., Hay scented fern,
Goldenrod, Whitewood aster, False Solomon's Seal

General Description of Surrounding Habitat (>100m & <500m): Mature forest with thick underbrush
Powerline adjacent to the south, site is on top of steep ravine

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

At least 1 porcupine den was located, few cracks in rock



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40° 24' 18.91"	78° 29' 4.06'	0	0	0	0	0	0	321	100
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
TOTAL =										



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Altoona Bypass 2 Trap-site Number: _____ Date: 7/25/2014

Ownership (circle one): Public, Private, Both Access (Name, Address Telephone): _____

Location: _____ N or ^{0.9km} S and _____ E or _____ W of: Duncansville

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km - 2km; >2km

Surveyors: Brian Benner

Effort: # of surveyors x survey minutes = 30 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): RAYS Habitat Site Code (if known): _____

County: Blair Quadrangle: Hollidaysburg Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 100m Average Width: 35m Width range: _____

Activity Extent (m): Longest Length: _____ Average Width: _____ Width range: _____
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 24 ' 29.86 " & Longitude W78 ° 24 ' 37.97 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1340ft to 1380ft Slope Range (%): 20 to 35

Aspects (degrees): southerly aspects: _____ % _____ ° northerly aspects: 20 % 100 °
(135°-225°) (315°-45°)

easterly aspects: _____ % _____ ° westerly aspects: _____ % _____ °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge top

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 141 % 60
- 2) Code # 142 % 40
- 3) Code # _____ % _____
- 4) Code # _____ % _____

Geological formation: Keyser and Tonoloway Formations

Nearest mapped water: Name: Beaverdam Branch Tributary Distance to: 439 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 3 Two-digit Habitat Disturbance code: 2E 4C 4G

Anderson Level III cover code on site: 416 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 100 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): Red Maple, Basswood

Shrub, Vine and Briar (Rubus) Species: Tartarian honeysuckle, Virginia Creeper

Herbaceous Species: Grass spp., Poison Ivy, White baneberry

General Description of Surrounding Habitat (>100m & <500m): Mature forest with thick underbrush

Powerline adjacent to the south

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

Chipmunk activity



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40° 24' 29.86"	78° 24' 37.97"	0	0	0	0	0	0	142	100
2										
3										
4										
5										
6										
7										
8										
9										
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15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
TOTAL =										



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Jack's Mountain 1 Trap-site Number: _____ Date: 6/23/2014

Ownership (circle one): Public, **Private**, Both Access (Name, Address Telephone): _____

Location: _____ N or 2.1km S and _____ E or 8.0km W of: Allenport

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; **>1km - 2km**; >2km

Surveyors: Stan Boder, Brian Benner, Phil Dunning, Dave Scopaz, Justin Collins

Effort: # of surveyors x survey minutes = 600 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): _____ Habitat Site Code (if known): _____

County: Huntingdon Quadrangle: Butler Knob Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 400 Average Width: 400 Width range: _____

Activity Extent (m): Longest Length: _____ Average Width: _____ Width range: _____
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 21 ' 0.97 " & Longitude W77 ° 58 ' 0.86 " , ,
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 820 to 940 Slope Range (%): 10 to 25

Aspects (degrees): southerly aspects: _____ % _____ ° northerly aspects: _____ % _____ °
(135°-225°) (315°-45°)
easterly aspects: _____ % _____ ° westerly aspects: 285 % 100 °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge/valley side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 312 % 50 , 2) Code # 133 % 25 ,
- 3) Code # 132 % 25 , 4) Code # _____ % _____

Geological formation: Onodaga/ Old Port, Hamilton

Nearest mapped water: Name: Hares Valley Creek Distance to: 474 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 3 Two-digit Habitat Disturbance code: 1E 3G 3C

Anderson Level III cover code on site: 416 and adjacent to site: 416

Tree canopy coverage overtop Habitat Site: 85 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): _____

Chestnut Oak, Black Birch, Red Oak, Red Maple, White Oak, Sugar Maple, White Pine

Shrub, Vine and Briar (Rubus) Species: Green Briar, Low bush blueberry,

Striped Maple, Sapplings of trees

Herbaceous Species: Marginal Wood Fern, Polypody Fern,

General Description of Surrounding Habitat (>100m & <500m): Mature mixed forest,

Pipeline and powerline crosses the habitat.

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

Pipeline splits habitat, logging to the north adjacent to habitat.



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	N40 21'0.98"	W77 57'58.34"	0	0	0	0	0	0	133	80
2	N40 21'3.09"	W77 57'58.79"	0	0	0	0	0	0	133	90
3	N40 20'55.79"	77 58'2.44"	0	0	0	0	0	0	133	95
4										
5										
6										
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16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
TOTAL =										



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Jack's Mountain 2 Trap-site Number: _____ Date: 6/23/2014

Ownership (circle one): Public, **Private**, Both Access (Name, Address Telephone): _____

Location: _____ N or 2.3km S and _____ E or 7km W of: Allenport

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; **>1km - 2km**; >2km

Surveyors: Stan Boder, Brian Benner

Effort: # of surveyors x survey minutes = 90 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): _____ Habitat Site Code (if known): _____

County: Huntingdon Quadrangle: Butler Knob Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 427m Average Width: _____ Width range: 300m

Activity Extent (m): Longest Length: _____ Average Width: _____ Width range: _____
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 20 ' 50.23 " & Longitude W77 ° 57 ' 19.28 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1300 to 1660 Slope Range (%): 20 to 30

Aspects (degrees): southerly aspects: _____ % _____ ° northerly aspects: _____ % _____ °
(135°-225°) (315°-45°)

easterly aspects: _____ % _____ ° westerly aspects: 280 % 100 °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge/valley side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

1) Code # 132 % 65 , 2) Code # 112 % 35 ,

3) Code # _____ % _____ , 4) Code # _____ % _____

Geological formation: Tuscarora, Cinton

Nearest mapped water: Name: Hares Valley Creek tributary Distance to: 1000 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 7 Two-digit Habitat Disturbance code: 1E 5G 5C

Anderson Level III cover code on site: 416 and adjacent to site: 416

Tree canopy coverage overtop Habitat Site: 50 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): _____

Black Birch, Red Oak, Chestnut Oak, Sugar Maple, Red Maple

Shrub, Vine and Briar (Rubus) Species: Grapevine, Blackberry,

Striped Maple

Herbaceous Species: Virginia Creeper

General Description of Surrounding Habitat (>100m & <500m): Mature forest, shaded talus

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

Three porcupine dens located, one rattlesnake observed.



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	N40 20'51.337"	W77 57'19.402"	0	0	0	0	0	0	112	0
2	N40 20'48.483"	W77 57'14.987"	0	0	0	0	0	0	112	0
3	N40 20.996'	W77 57.319'	0	0	0	0	0	0	111,12	10
4	N40 20.971'	W77 57.228'	0	0	0	0	0	0	111,12	0
5	N40 20'56.6"	W77 57'26.4"	0	0	0	1	0	0	111,12	100
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
TOTAL =			0	0	0	1	0	0		



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	Acorns
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	Virginia Creeper vines were cached.
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Jack's Mountain 3 Trap-site Number: _____ Date: 6/23/2014

Ownership (circle one): Public, Private, Both Access (Name, Address Telephone): _____

Location: _____ N or 3.0km S and _____ E or 5.9km W of: Allenport

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km - 2km; >2km

Surveyors: Stan Boder, Brian Benner

Effort: # of surveyors x survey minutes = 270 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): _____ Habitat Site Code (if known): _____

County: Huntingdon Quadrangle: Butler Knob Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 128 Average Width: _____ Width range: 486

Activity Extent (m): Longest Length: 108 Average Width: _____ Width range: 284
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 20 ' 37.07 " & Longitude W77 ° 56 ' 34.47 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1560 to 1640 Slope Range (%): 20 to 30

Aspects (degrees): southerly aspects: _____ % _____ ° northerly aspects: _____ % _____ °
(135°-225°) (315°-45°)
easterly aspects: 95 % 50 ° westerly aspects: 5 % 270 °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge/valley side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 132 % 40
- 2) Code # 133 % 40
- 3) Code # 112 % 20
- 4) Code # _____ % _____

Geological formation: Tuscarora

Nearest mapped water: Name: Singer's Gap tributary Distance to: 88 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 6 Two-digit Habitat Disturbance code: 1E 5G 5C

Anderson Level III cover code on site: 415 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 60 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): _____

Black Birch, Chestnut Oak, Red Maple, Red oak, White Pine

Shrub, Vine and Briar (Rubus) Species: Blackberry, Virginia Creeper, Mountain Laurel, Grapevine

Herbaceous Species: Wood Fern, Polypody Fern

General Description of Surrounding Habitat (>100m & <500m): Deciduous mature forest

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

Pipeline splits habitat, known WR trapping site, 2 rattlesnakes in habitat, habitat enhancement previously performed.



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	N40 20' 39.08"	W77 56' 32.53"	0	0	0	1	0	0	112	85
2	N40 20' 37.16"	W77 56' 37.78"	0	0	0	1	0	1	112	0
3	N40 20' 33.55"	W77 56' 38.99"	0	0	0	0	0	1	112	50
4	N40 20' 30.92"	W77 56' 37.91"	0	1	0	1	0	1	112	40
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
TOTAL =			0	1	0	3	0	3		

FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	Very few green ferns
Ferns	Present
Hard Mast	
Soft Mast	
Other Seeds	Present
Fungi & Lichens	
Misc. (Sticks etc.)	Present
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Blacklog Mountain Trap-site Number: _____ Date: 7/22/2014

Ownership (circle one): Public, Private, Both Access (Name, Address Telephone): _____

Location: _____ N or 7.1km S and 5.7km E or _____ W of: Mount Union

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km-2km; >2km

Surveyors: Brian Benner, Rob Schwartz

Effort: # of surveyors x survey minutes = 720 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): RAYS Habitat Site Code (if known): _____

County: Huntington Quadrangle: Aughwick Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 565m Average Width: 155m Width range: _____

Activity Extent (m): Longest Length: 10m Average Width: 10m Width range: _____
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 19 ' 22.59 " & Longitude W77 ° 48 ' 34.07 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1300ft to 1650ft Slope Range (%): 10 to 35

Aspects (degrees): southerly aspects: 25 % 180 ° northerly aspects: 20 % 360 °
(135°-225°) (315°-45°)
easterly aspects: 5 % 50 ° westerly aspects: 50 % 315 °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge/valley- side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 132 % 50 , 2) Code # 112 % 40 ,
- 3) Code # 111 % 5 , 4) Code # 121 % 5 ,

Geological formation: Tuscarora, Juniata, Clinton Formations

Nearest mapped water: Name: Fort Run Distance to: 1600 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 4 Two-digit Habitat Disturbance code: 1E 1H 1G

Anderson Level III cover code on site: 415 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 50-100 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): Red Oak, Red Maple, Black Birch,
Witch Hazel, Chestnut Oak, Sassafras, White Pine

Shrub, Vine and Briar (Rubus) Species: Low Bush Blueberry, Blackberry, Green Briar, Grapevine,
Mountain Laurel

Herbaceous Species: Marginal Wood Fern, Polypody Fern, Grass spp., Virginia Creeper,
Black Raspberry

General Description of Surrounding Habitat (>100m & <500m): Mature forest with thick underbrush

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

At least 4 porcupine dens were located, Black rat snake observed, fox or coyote den observed



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40° 19' 29.79"N	77° 48' 45.93"W	0	0	0	0	0	0	112	90
2	40° 19' 27.6"N	77° 48' 38.90"W	0	0	0	0	0	0	112	90
3	40° 19' 22.62"N	77° 48' 34.15"W	0	0	0	1	0	0	112	75
4	40° 19' 34.37"N	77° 48' 40.215"W	0	0	0	0	0	0	112	80
5	40° 19' 36.8"N	77° 48' 37.5"W	0	0	0	0	0	0	112	90
6	40° 19' 35.8"N	77° 48' 33.1"W	0	0	0	0	0	0	112	90
7	40° 19' 33.2"N	77° 48' 28.1"W	0	0	0	0	0	0	112	80
8	40° 19' 31.7"N	77° 48' 22.1"W	0	0	0	0	0	0	112	90
9	40° 19' 33.98"N	77° 48' 17.89"W	0	0	0	0	0	0	111	90
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
TOTAL =			0	0	0	1	0	0		



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	1 fern bent in an accordion style ball
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	A few sticks and old goldenrod stems
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Shade Mountain Trap-site Number: _____ Date: 7/21/2014

Ownership (circle one): Public **Private** Both Access (Name, Address Telephone): _____

Location: _____ N or 2.6km S and 8.2km E or _____ W of: Augwick

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km-2km; **>2km**

Surveyors: Brian Benner

Effort: # of surveyors x survey minutes = 450 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): RAYS Habitat Site Code (if known): _____

County: Huntington Quadrangle: Aughwick Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 395m Average Width: 450m Width range: _____

Activity Extent (m): Longest Length: _____ Average Width: _____ Width range: _____
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 19 ' 1.93 " & Longitude W77 ° 46 ' 5.87 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1480ft to 1780ft Slope Range (%): 0 to 35

Aspects (degrees): southerly aspects: _____ % _____ ° northerly aspects: _____ % _____ °
(135°-225°) (315°-45°)
easterly aspects: 65 % 100 ° westerly aspects: 35 % 280 °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge/valley- side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 112 % 85
- 2) Code # 111 % 10
- 3) Code # 113 % 3
- 4) Code # 132 % 2

Geological formation: Tuscarora, Juniata, Clinton Formations

Nearest mapped water: Name: Cherry Hollow Distance to: 2572 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 4 Two-digit Habitat Disturbance code: 1C 1E 1H

Anderson Level III cover code on site: 415 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 0-100 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): Black Birch, Red Maple, Sassafras,
Witch Hazel, Red Oak, Tulip Poplar, Basswood

Shrub, Vine and Briar (Rubus) Species: Blackberry, Green Briar, Virginia Creeper, Grapevine,
Poison Ivy, Striped Maple

Herbaceous Species: Polypody Fern, Marginal Wood Fern, Grass spp., White Baneberry

General Description of Surrounding Habitat (>100m & <500m): Woods with utility lines, unimproved
trail, mostly untouched beyond this

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

At least 3 porcupine dens were located, timber rattlesnake and eastern garter snake

observed, coyote droppings observed.



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40° 19' 1.41"	77° 45' 59.30"	0	0	0	0	0	0	112	10
2	40° 19' 0.43"	77° 46' 7.63"	0	0	0	0	0	0	112	10
3	40° 18' 56.02"	77° 46' 13.68"	0	0	0	0	0	0	112	0
4	40° 19' 6.84"	77° 46' 6.39"	0	0	0	0	0	0	112	80
5	40° 19' 1.16"	77° 46' 14.61"	0	0	0	0	0	0	112	50
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19										
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23										
24										
25										
TOTAL =										



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Tuscarora Mountain Trap-site Number: _____ Date: 11/14/2014

Ownership (circle one): Public, Private, Both Access (Name, Address Telephone): Unknown

Location: _____ N or 1.2km S and _____ E or 8.2km W of: New Germantown

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km-2km; >2km

Surveyors: J. Collins, P. Dunning, S. Boder, D. Scopaz

Effort: # of surveyors x survey minutes = 720 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): TUBL Habitat Site Code (if known): _____

County: Perry Quadrangle: Blairs Mills Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 700 Average Width: 400 Width range: 350-400

Activity Extent (m): Longest Length: 500 Average Width: 300 Width range: 200-400
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude 40 ° 17 ' 46.7 " & Longitude 77 ° 39 ' 50.4 " ,
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1500 to 1920 Slope Range (%): 18 to 28

Aspects (degrees): southerly aspects: 60 % 230 ° northerly aspects: 10 % 340 °
(135°-225°) (315°-45°)
easterly aspects: 30 % 120 ° westerly aspects: _____ % _____ °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): Ridge-top, valley side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 112 % 55 , 2) Code # 113 % 20 ,
- 3) Code # 122 % 15 , 4) Code # 123 % 10 ,

Geological formation: Tuscarora Formation/ Juniata, Bald Eagle Undivided

Nearest mapped water: Name: Unnamed intermittent stream Distance to: 1.2m SE m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 1 Two-digit Habitat Disturbance code: 1E 3H 4C

Anderson Level III cover code on site: 414 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 50-90 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): Red Oak, White Oak, Chestnut Oak,
Black Birch, Yellow Poplar, Striped Maple, Red Maple, Eastern Hemlock

Shrub, Vine and Briar (Rubus) Species: Virginia Creeper, Witch Hazel, Mountain Laurel
Greenbriar, Allegheny Blackberry

Herbaceous Species: Hayscented Fern, unidentified ferns and forbs

General Description of Surrounding Habitat (>100m & <500m): Mostly deciduous forest with some
degraded hemlocks

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

Mostly from disease to hemlocks, possible fire in the future and renovation of current pipeline.



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40° 17' 41.63"N	77° 39' 51.86"W	0	0	0	0	0	0	112	90
2	40° 17' 49.03"N	77° 39' 44.70"W	0	0	0	0	0	0	111	90
3	40° 17' 50.61"N	77° 39' 51.37"W	0	0	0	0	0	0	112	90
4	40° 17' 47.04"N	77° 39' 55.87"W	0	0	0	0	0	0	112	80
5	40° 17' 42.23"N	77° 39' 56.15"W	0	0	0	0	0	0	112	80-90
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19										
20										
21										
22										
23										
24										
25										
TOTAL =			0	0	0	0	0	0		



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	
Raccoon Feces	

FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying Neotoma magister Survey Code Booklet to complete this form.

Habitat Site Name: Conococheague Trap-site Number: NA Date: 4/16/2015

Ownership (circle one): Public Private, Both Access (Name, Address Telephone): _____
DCNR- Tuscarora State Forest

Location: 0.5km N or S and 7.0km E or W of: Blairs Mills

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km-2km; >2km

Surveyors: J. Hart, B. Benner, T. Crumb, D. Wanke and C. Comacho

Effort: # of surveyors x survey minutes = 450 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): TUBL Habitat Site Code (if known): NA

County: Perry Quadrangle: Blairs Mills Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 450 Average Width: 375 Width range: 300

Activity Extent (m): Longest Length: NA Average Width: NA Width range: NA
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude 40 ° 17 ' 23.6 " & Longitude 77 ° 38 ' 08.5 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1420 to 1840 Slope Range (%): 16 to 18

Aspects (degrees): southerly aspects: 15 % 224 ° northerly aspects: 20 % 43 °
(135°-225°) (315°-45°)
easterly aspects: 60 % 106 ° westerly aspects: 5 % 284 °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge/valley- side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

1) Code # 112 % 30 , 2) Code # 113 % 30 ,
3) Code # 133 % 25 , 4) Code # 211 % 15 ,

Geological formation: Martinsburg, Juniata Fm and Bald Eagle Fm undivided, Tuscarora

Nearest mapped water: Name: To the northwest-Horse Valley Run Distance to: 1700 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 5 Two-digit Habitat Disturbance code: 1E 2H 5D

Anderson Level III cover code on site: 415 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 70-80% %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): Red and Chestnut oaks, black birch, red maple, witch hazel.

Shrub, Vine and Briar (Rubus) Species: Low Bush Blueberry, Green Briar, Grapevine, Virginia Creeper

Herbaceous Species: Marginal Wood Fern, Polypody Fern, Grass spp., Hay scented fern, Goldenrod

General Description of Surrounding Habitat (>100m & <500m): Mature forest with moderate underbrush

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

NA

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

Although some porcupine sign was noted, it wasn't too prevalent.

Rattlesnakes are known to occur on this site.



FORMPGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40° 17' 20.7"	77° 38' 8.9"	0	0	0	0	0	0	113	75
2	40° 17' 20.8"	77° 38' 19.2"	0	0	0	0	0	0	112	75
3	40° 17' 23.1"	77° 38' 2.8"	0	0	0	0	0	0	112	<50
4	40° 17' 25.6"	77° 37' 59.9"	0	0	0	0	0	0	112	<50
5	40° 17' 27.9"	77° 38' 3.2"	0	0	0	0	0	0	113	<75
6	40° 17' 18.3"	77° 38' 7.5"	0	0	0	0	0	0	133	<75
7	40° 17' 20.0"	78° 29' 2.0"	0	0	0	0	0	0	211	<50
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24										
25										
TOTAL =			0	0	0	0	0	0		

FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	NA
Ferns	NA
Hard Mast	NA
Soft Mast	NA
Other Seeds	NA
Fungi & Lichens	NA
Misc. (Sticks etc.)	NA
Raccoon Feces	None noted within the survey area.



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Bowers Mountain #2 Trap-site Number: NA Date: 11/10/2014

Ownership (circle one): Public, Private, Both Access (Name, Address Telephone): DCNR
Tuscarora State Forest

Location: 8.2km N or S and E or 27.8km W of: Carlisle

Nearest other active or inactive (?) habitat site (circle one): 200-500m >500m-1km; >1km-2km; >2km

Surveyors: Jim Hart, S. Boder, J. Collins, P. Dunning, J. Treaster

Effort: # of surveyors x survey minutes = 720 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): TUBL Habitat Site Code (if known):

County: Perry Quadrangle: Blain Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 500 Average Width: 600 Width range: 300-500

Activity Extent (m): Longest Length: 300 Average Width: 150 Width range: 100-300
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude 40 ° 16 ' 12.0 " & Longitude 77 ° 31 ' 4.5 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1620 to 1940 Slope Range (%): 20 to 30

Aspects (degrees): southerly aspects: 35 % 140 ° northerly aspects: 30 % 325 °
(135°-225°) (315°-45°)
easterly aspects: 20 % 65 ° westerly aspects: 15 % 240 °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): Ridge/valley side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 112 % 55
- 2) Code # 113 % 25
- 3) Code # 122 % 10
- 4) Code # 123 % 10

Geological formation: Tuscarora, Juniata and Bald Eagle Undivided

Nearest mapped water: Name: Bull Run Distance to: 650 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 1 Two-digit Habitat Disturbance code: 1E H3

Anderson Level III cover code on site: 414 and adjacent to site: 414

Tree canopy coverage overtop Habitat Site: 10-70 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): black birch, red maple,
many dead hemlocks, some scattered oaks, witch hazel

Shrub, Vine and Briar (Rubus) Species: Mountain laurel, VA creeper

Herbaceous Species: mostly ferns with a scattering of flowering plants

General Description of Surrounding Habitat (>100m & <500m): Very comparable to what
is on site except for more oak species such as chestnut and red.

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

Pipeline runs through center of surveyed area and an upgraded pipeline is proposed for this site. There is a moderate amount of hemlock mortality in the area from wooley adelgid.



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40-16-12.9	77-30-50.5							113	50
2	40-16-10.5	77-30-55.6	2		3	1			113	50
3	40-16-7.5	77-30-53.3		1		1			112	25
4	40-16-9.4	77-31-1.4							112	25
5	40-16-11.5	77-31-9.3							112	25
6	40-16-8.5	77-31-13.2							122	50
7	40-16-13.7	77-31-1.9							122	50
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TOTAL =			2	1	3	2				

FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	Oak leaves, maple leaves and stems, sweet fern
Ferns	New York, Hay scented (a few), some wood fern
Hard Mast	Old hulls of acorns
Soft Mast	
Other Seeds	
Fungi & Lichens	Some fungi but very little lichen.
Misc. (Sticks etc.)	Many old sticks that may have been dragged in for creating a hutch
Raccoon Feces	None noted anywhere on site.

FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Bowers Mountain #1 Trap-site Number: NA Date: 4/15/2015

Ownership (circle one): Public, Private, Both Access (Name, Address Telephone): DCNR
Tuscorora State Forest

Location: 9.5km N or S and 2.4km E or W of: Andersonburg

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km-2km; >2km

Surveyors: J. Hart, C. Camacho, B. Benner, T. Crumb, D. Wanke

Effort: # of surveyors x survey minutes = 300 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): TUBL Habitat Site Code (if known): NA

County: Perry Quadrangle: Andersonburg Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 130m Average Width: 35m Width range: 20-40m

Activity Extent (m): Longest Length: NA Average Width: NA Width range: NA
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude 40 ° 15 ' 50.7 " & Longitude 77 ° 29 ' 33.0 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1350' to 1400' Slope Range (%): 18.5 to 21.5

Aspects (degrees): southerly aspects: 35 % 180 ° northerly aspects: 15 % 48 °
(135°-225°) *(315°-45°)*
easterly aspects: 40 % 90 ° westerly aspects: 10 % 230 °
(45°-135°) *(225°-315°)*

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): Valley side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

1) Code # 132 % 35 2) Code # 142 % 30
3) Code # 122 % 25 4) Code # 311 % 10

Geological formation: Tuscorora Group overlaying the Clinton Formation

Nearest mapped water: Name: Laurel Run Distance to: 200m S m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 8 Two-digit Habitat Disturbance code: 1N 4H 5N

Anderson Level III cover code on site: 413 and adjacent to site: 413

Tree canopy coverage overtop Habitat Site: 50-75% %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): _____

Chestnut oak, Red oak, a few hickory and red maple

Shrub, Vine and Briar (Rubus) Species: Mostly witch hazel, black raspberry

Herbaceous Species: Some blueberry

General Description of Surrounding Habitat (>100m & <500m): The above mentioned species along with many downed snags.

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

A single black rat snake (*Pantherophis alleghaniensis*)

porcupine droppings scattered throughout the rocks

Gray squirrels (*Sciurus carolinensis*)



FORMPGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40-15-52.7	77-29-31.9	0	0	0	0	0	0	311	25%
2	40-15-54.1	77-29-36.9	0	0	0	0	0	0	122	<50%
3	40-15-53.6	77-29-38.2	0	0	0	0	0	0	122	<50%
4										
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22										
23										
24										
25										
TOTAL =			0	0	0	0	0	0		

FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	NA
Ferns	NA
Hard Mast	NA
Soft Mast	NA
Other Seeds	NA
Fungi & Lichens	NA
Misc. (Sticks etc.)	NA
Raccoon Feces	NA

FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Middle Ridge Trap-site Number: NA Date: 4/15/2015

Ownership (circle one): Public, Private, Both Access (Name, Address Telephone): DCNR
Bureau of Forestry

Location: 9.8km N or S and 2.0km E or W of: Andersonburg

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km-2km; >2km

Surveyors: Jim Hart, Brian Benner

Effort: # of surveyors x survey minutes = 180 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): TUBL Habitat Site Code (if known): _____

County: Perry Quadrangle: Andersonburg Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 160 Average Width: 165 Width range: 40-180

Activity Extent (m): Longest Length: NA Average Width: NA Width range: NA
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude 40 ° 15 ' 39.9 " & Longitude 77 ° 29 ' 20.6 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1000' to 1280 Slope Range (%): 7 to 25

Aspects (degrees): southerly aspects: 10 % 142 ° northerly aspects: 327 % 60 °
(135°-225°) *(315°-45°)*
easterly aspects: 20 % 54 ° westerly aspects: 233 % 10 °
(45°-135°) *(225°-315°)*

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): Ridge-top, Valley side along ROW

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

1) Code # 113 % 30 , 2) Code # 112 % 40 ,
3) Code # 132 % 15 , 4) Code # 212 % 15 ,

Geological formation: Tuscarora Fm/ Clinton Group

Nearest mapped water: Name: Laurel Run Distance to: 350 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 6 Two-digit Habitat Disturbance code: 1N 2J 2H

Anderson Level III cover code on site: 434 and adjacent to site: 435

Tree canopy coverage overtop Habitat Site: 50-75 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): 60' hemlock (mostly w/ wooley adelgid), white pine, red and chestnut oak, red maple, black birch, some witch hazel

Shrub, Vine and Briar (Rubus) Species: black and red raspberry, green briar

Herbaceous Species: Canada Mayflower, trailing arbutus, colt's foot,

General Description of Surrounding Habitat (>100m & <500m): The area is characterized by steeply incised valleys with steep, narrow mountains.

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

NA

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

Many dead and dying hemlocks showing evidence of infestation with wooley adelgid, porcupine population in line mostly with forested habitat and not overly populace. No timber rattlesnakes have been noted at this site.



FORMPGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40° 15' 40.3"	77° 29' 12.3"	0	0	0	0	0	0	112	<25
2	40° 15' 39.9"	77° 29' 16.2"	0	0	0	0	0	0	112	<50
3	40° 15' 40.6"	77° 29' 17.6"	0	0	0	0	0	0	113	<50
4	40° 15' 38.8"	77° 29' 14.6"	0	0	0	0	0	0	112	75
5	40° 15' 37.5"	77° 29' 16.7"	0	0	0	0	0	0	132	75
6	40° 15' 35.8"	77° 29' 21.1"	0	0	0	0	0	0	212	<50
7	40° 15' 37.3"	77° 29' 26.4"	0	0	0	0	0	0	112	<50
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
TOTAL =			0	0	0	0	0	0		

FORM PGC 4150-wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	NA
Ferns	NA
Hard Mast	NA
Soft Mast	NA
Other Seeds	NA
Fungi & Lichens	NA
Misc. (Sticks etc.)	NA
Raccoon Feces	NA

Although this is good habitat and there are active sites to the north on Bowers Mountain, no sign was located at this site.



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Blue Mountain Trap-site Number: _____ Date: 6/18/2014

Ownership (circle one): Public, Private, Both Access (Name, Address Telephone): _____

Location: 1.3km N or _____ S and _____ E or 1.6km W of: McCrea

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km-2km; >2km

Surveyors: Philip R. Dunning, Justin M. Collins

Effort: # of surveyors x survey minutes = 300 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): TUBL Habitat Site Code (if known): _____

County: Cumberland Quadrangle: Andersonburg Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 1000ft Average Width: 600ft Width range: 400-800ft

Activity Extent (m): Longest Length: _____ Average Width: _____ Width range: _____
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 15 ' 23.59 " & Longitude W77 ° 28 ' 6.215 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1500ft to 1700ft Slope Range (%): 30 to 40

Aspects (degrees): southerly aspects: 60 % 145 ° northerly aspects: _____ % _____ °
(135°-225°) (315°-45°)

easterly aspects: 40 % 120 ° westerly aspects: _____ % _____ °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge/valley- side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

1) Code # 112 % 65 , 2) Code # 111 % 15 ,

3) Code # 132 % 10 , 4) Code # 113 % 5 ,

Geological formation: Juniata and Bald Eagle Formations

Nearest mapped water: Name: Unnamed tributary to Doubling Gap Distance to: 300 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 4 Two-digit Habitat Disturbance code: 3H 1E 4D

Anderson Level III cover code on site: 415 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 90 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): red oak, red maple, black birch,
witch hazel, chestnut oak, sassafras, striped maple

Shrub, Vine and Briar (Rubus) Species: low bush blueberry, blackberry, green briar, grapevine,
mountain laurel, virginia creeper

Herbaceous Species: hay-scented fern

General Description of Surrounding Habitat (>100m & <500m): Mature forest with moderate
shrub cover

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

Timber rattlesnakes observed. Porcupine sign throughout.



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40°15'24.89" N	77°27'54.31" W	0	0	0	0	0	0	112	90
2	40°15'25.64" N	77°28'1.38" W	0	0	0	0	0	0	112	90
3	40°15'22.53" N	77°28'8.30" W	0	0	0	0	0	0	112	90
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
TOTAL =										



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	
Raccoon Feces	

Appendix III. Detailed location maps and photographs of Allegheny Woodrat (*Neotoma magister*) Habitat Sites, Activity Centers (ACs) and Potential Activity Centers (PACs) identified during habitat surveys of the proposed Pennsylvania Pipeline Project, Indiana, Cambria, Blair, Huntingdon, Perry, and Cumberland Counties, Pennsylvania, June 23-July 24, 2014.

Photo Map 1 - Laurel Ridge 2 - Allegheny woodrat habitat



Pennsylvania Pipeline Laurel Ridge 2 Woodrat Survey



Photo Map 2 - Laurel Ridge 3 - Allegheny woodrat habitat

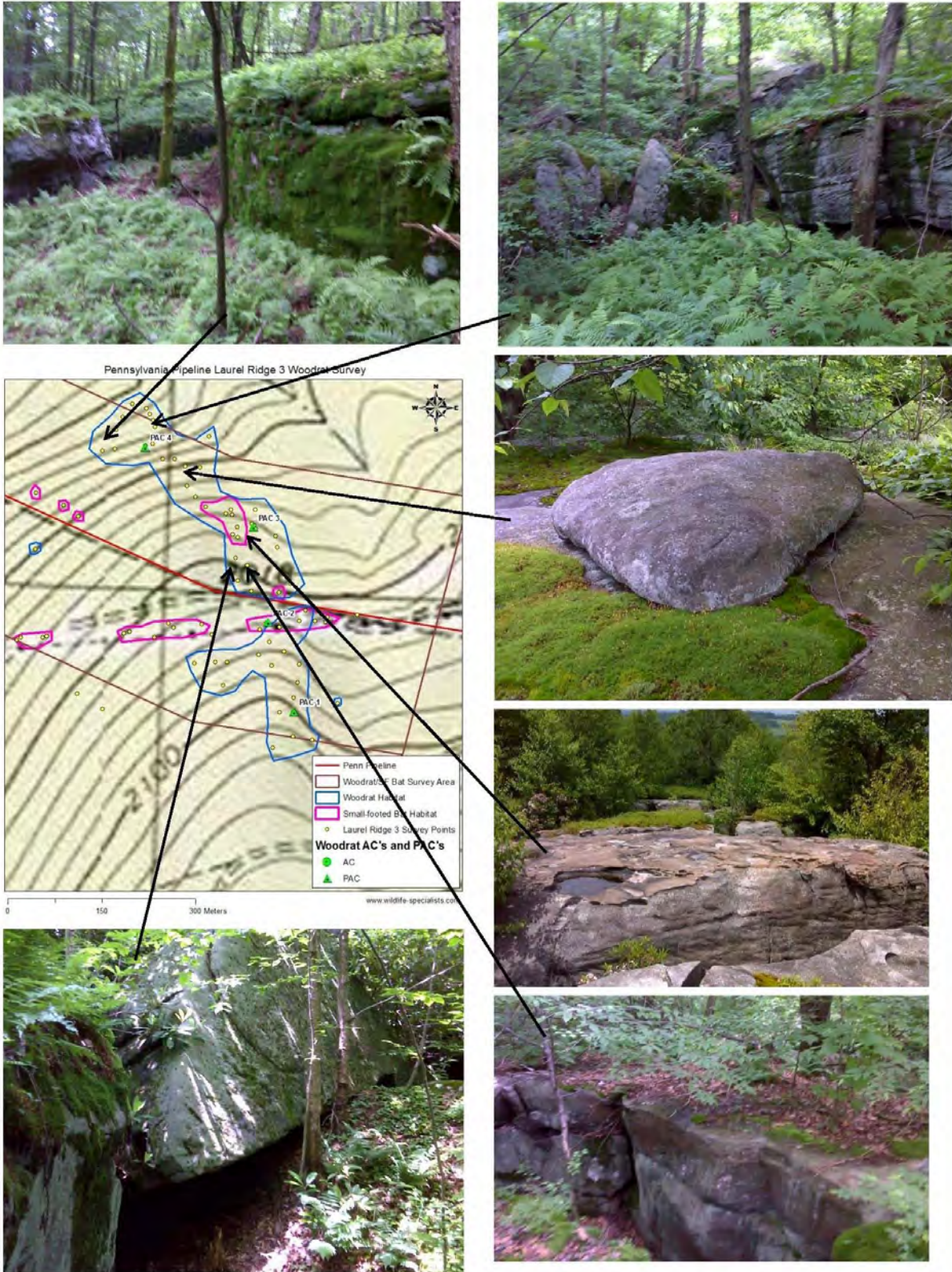


Photo Map 3 - Laurel Ridge 3 - Allegheny woodrat habitat

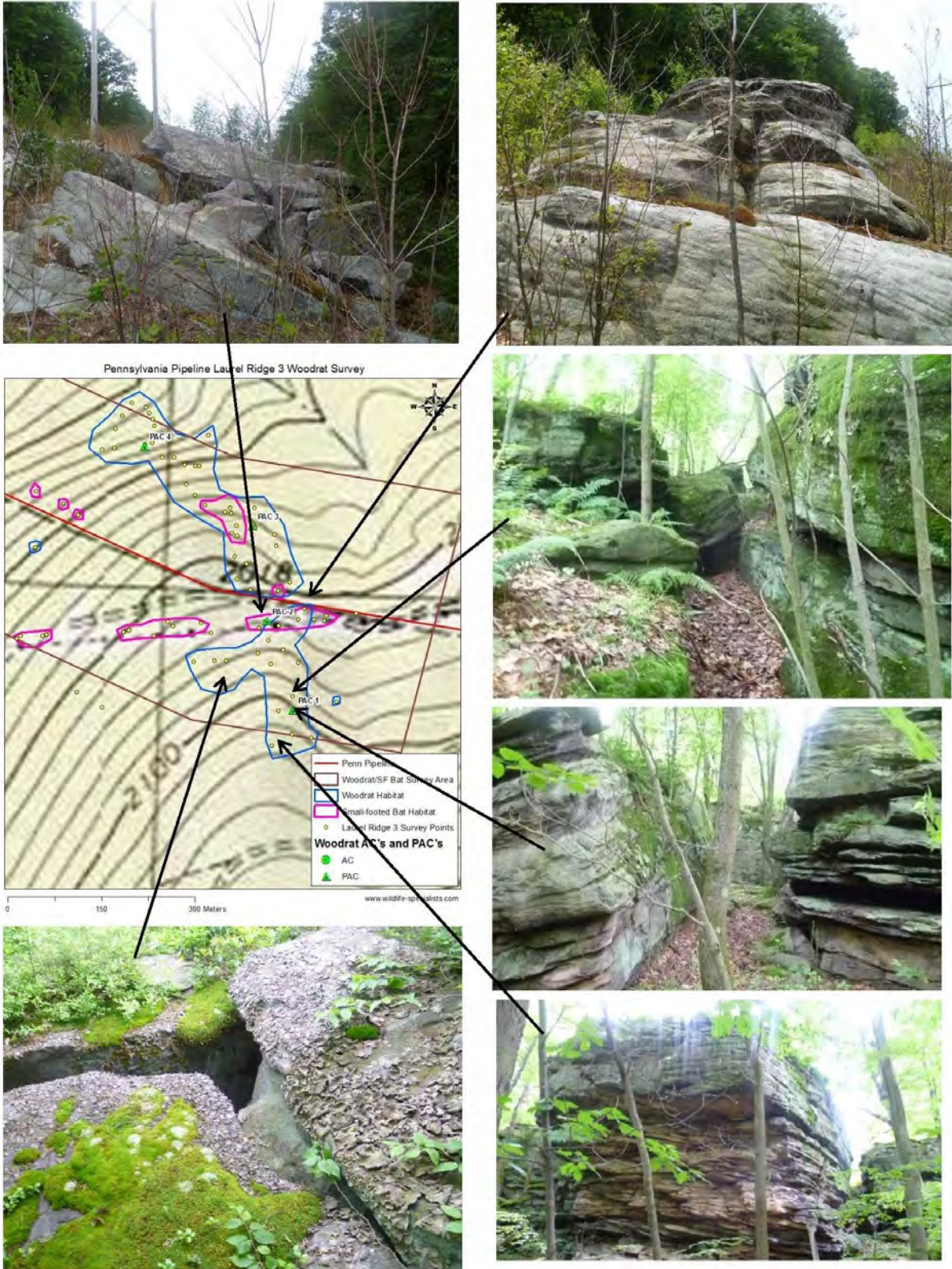


Photo Map 4 - Laurel Ridge 1 - Allegheny woodrat habitat



Pennsylvania Pipeline Laurel Ridge 1 Woodrat Survey

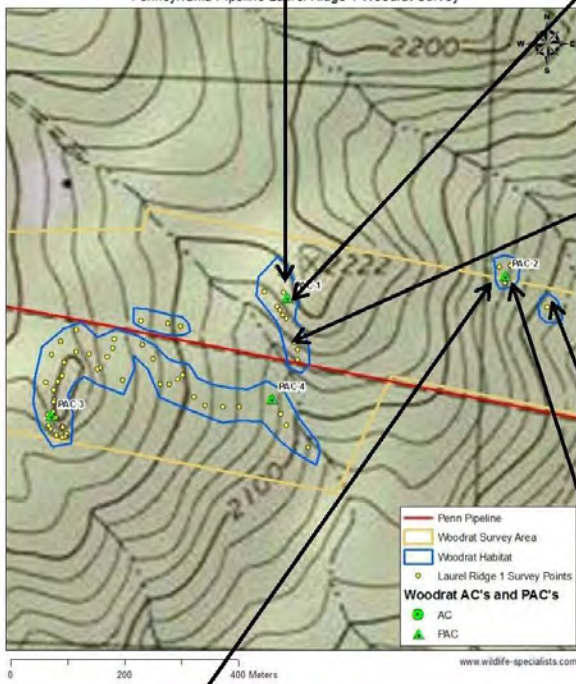


Photo Map 5 - Laurel Ridge 1 - Allegheny woodrat habitat



Pennsylvania Pipeline Laurel Ridge 1 Woodrat Survey

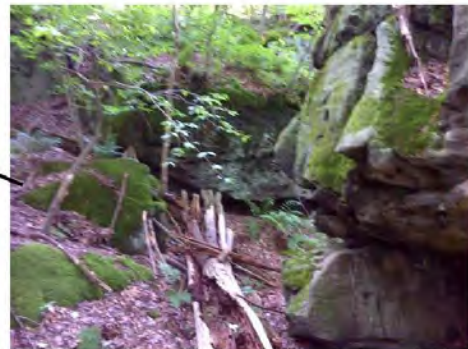
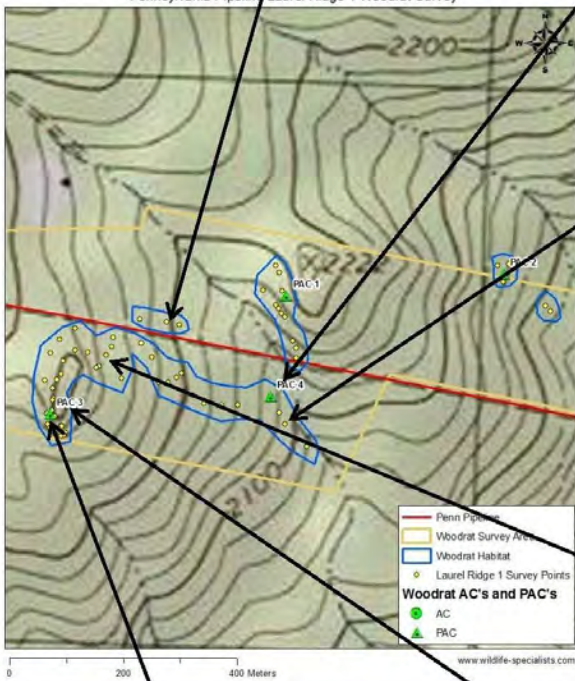


Photo Map 6 - Altoona Bypass 1 and 2 - Allegheny woodrat habitat



Photo Map 7 - Jacks Mountain 1 - Allegheny woodrat habitat

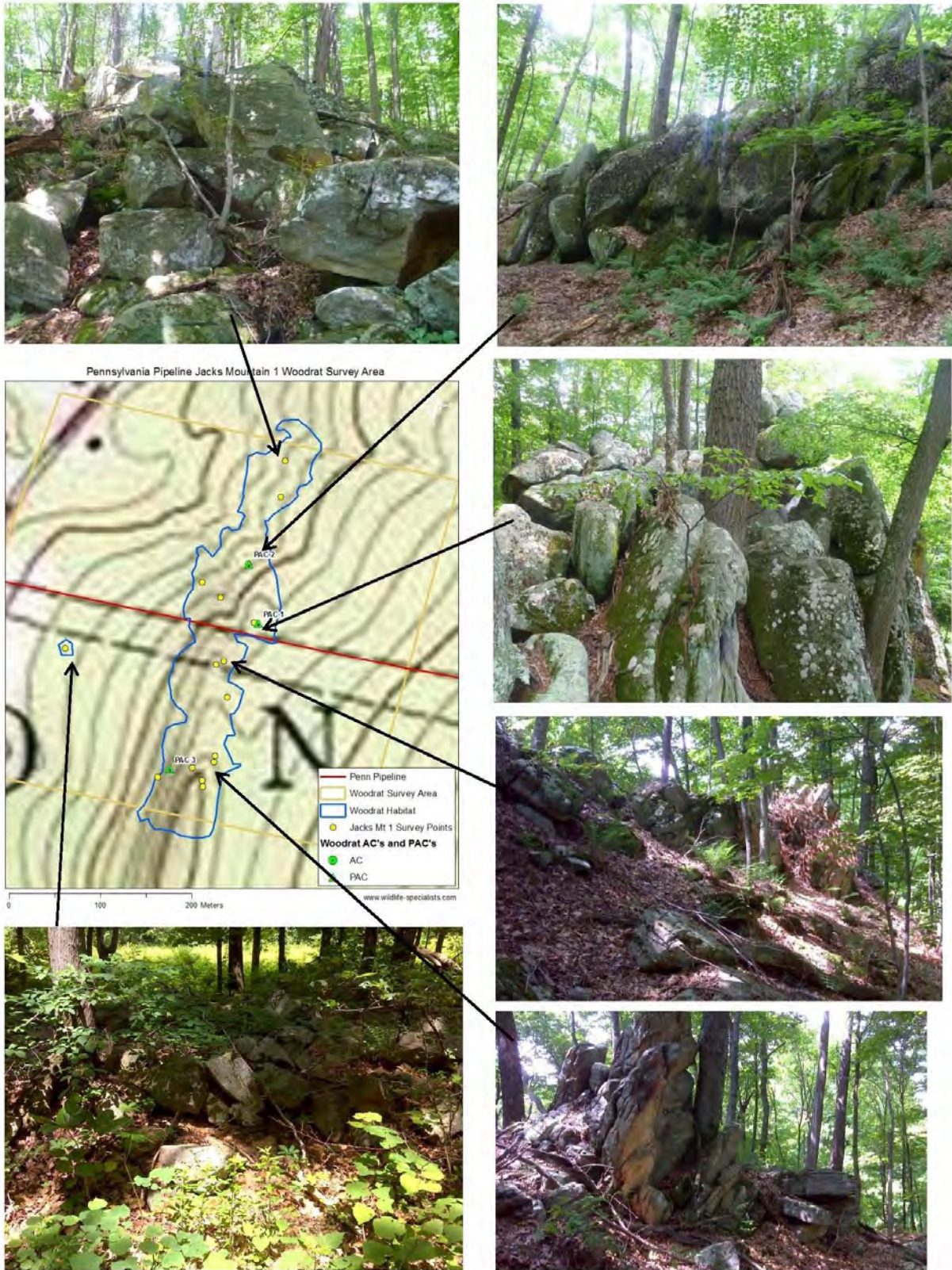


Photo Map 8 - Jacks Mountain 2 - Allegheny woodrat habitat and sign

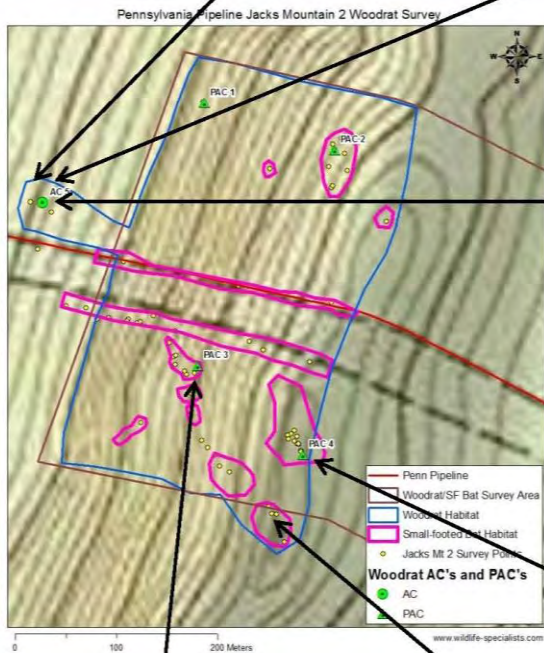


Photo Map 9 - Jacks Mountain 2 - Allegheny woodrat habitat

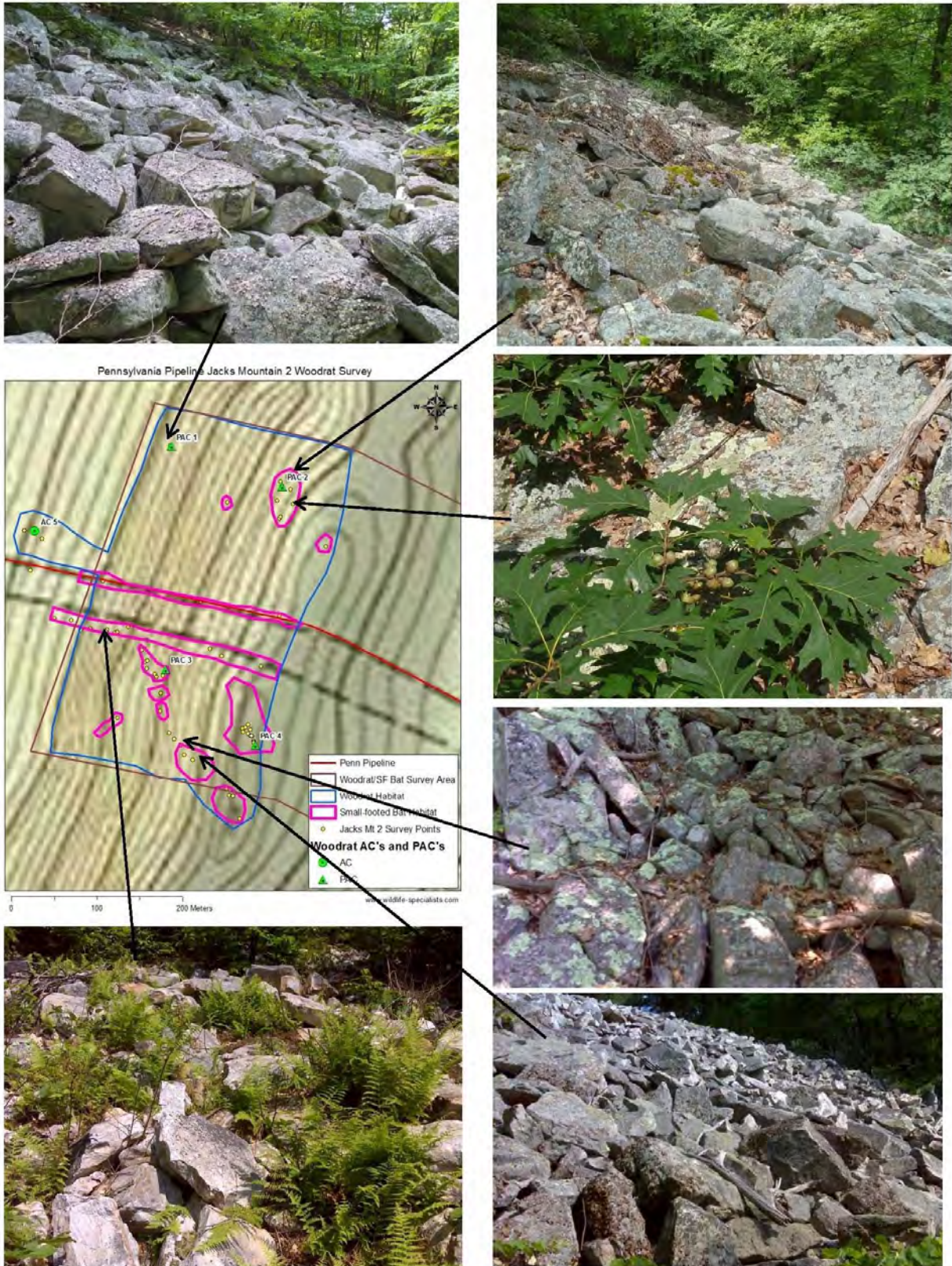


Photo Map 10 - Jacks Mountain 3 - Allegheny woodrat habitat and sign

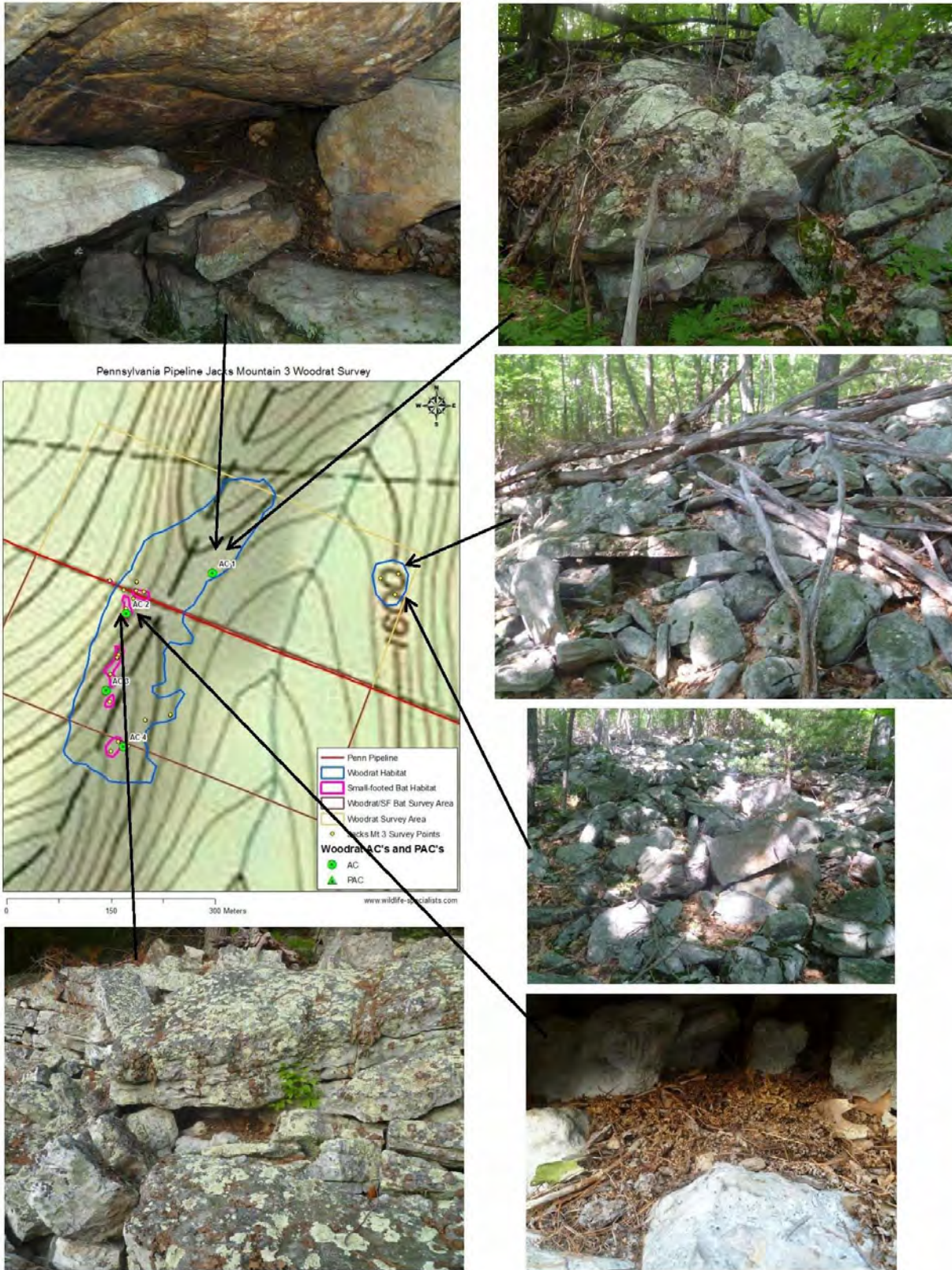


Photo Map 11 - Jacks Mountain 3 - Allegheny woodrat habitat and sign

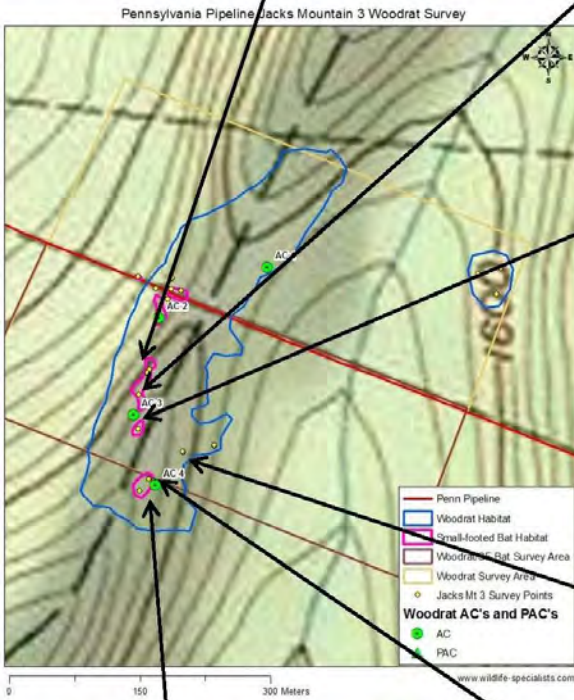


Photo Map 12 - Blacklog Mountain - Allegheny woodrat habitat

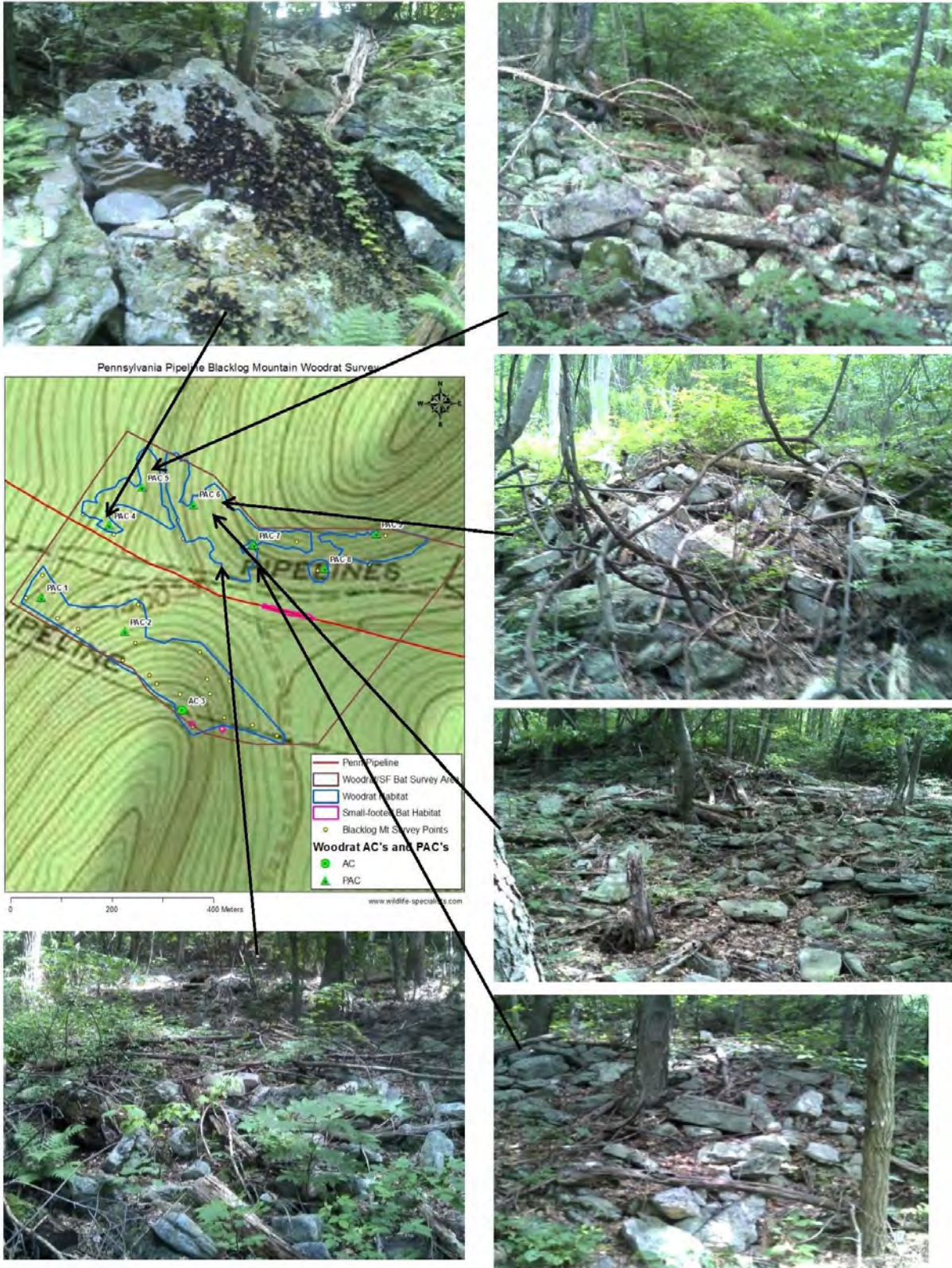


Photo Map 13 - Blacklog Mountain - Allegheny woodrat habitat and sign

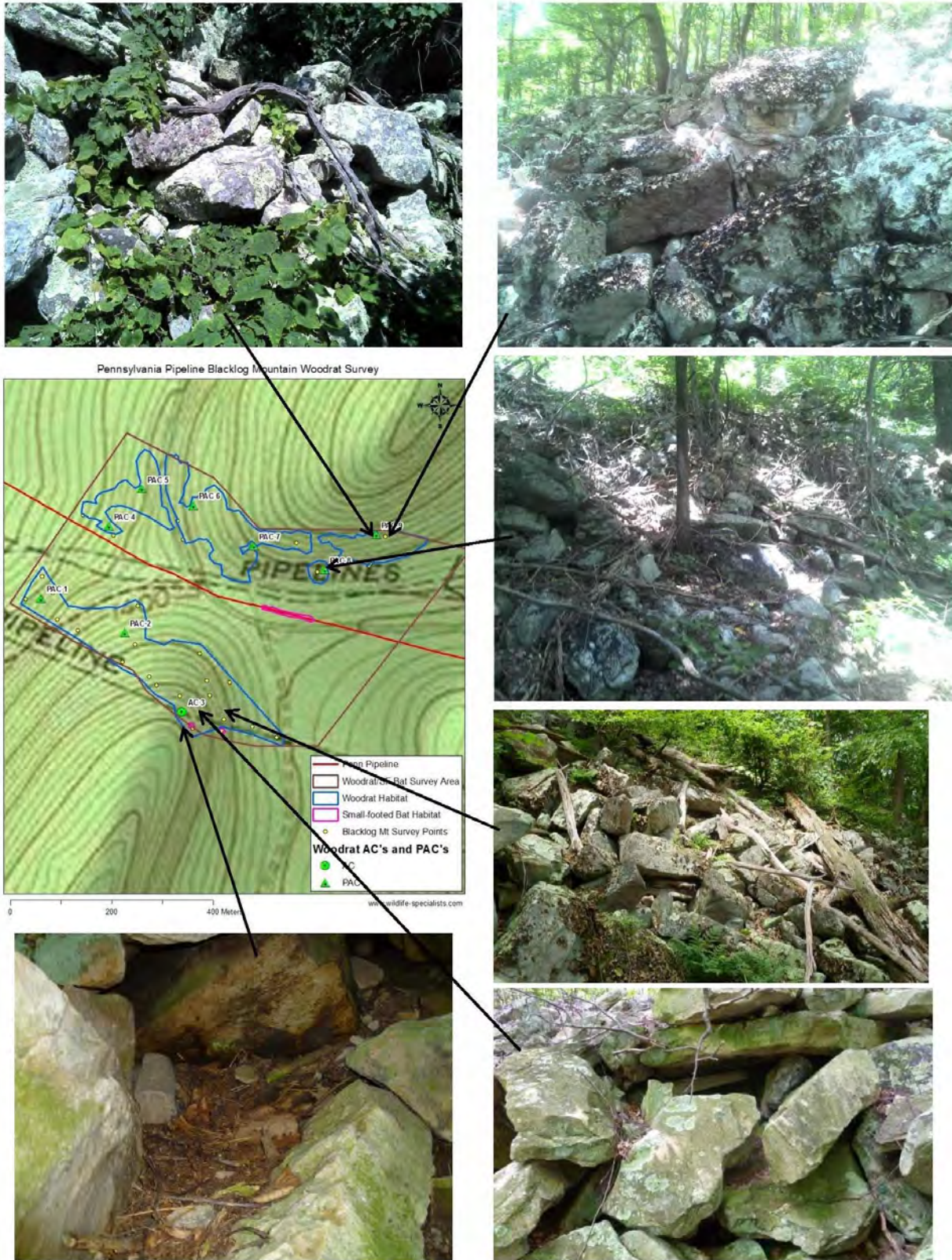


Photo Map 14 - Blacklog Mountain - Allegheny woodrat habitat

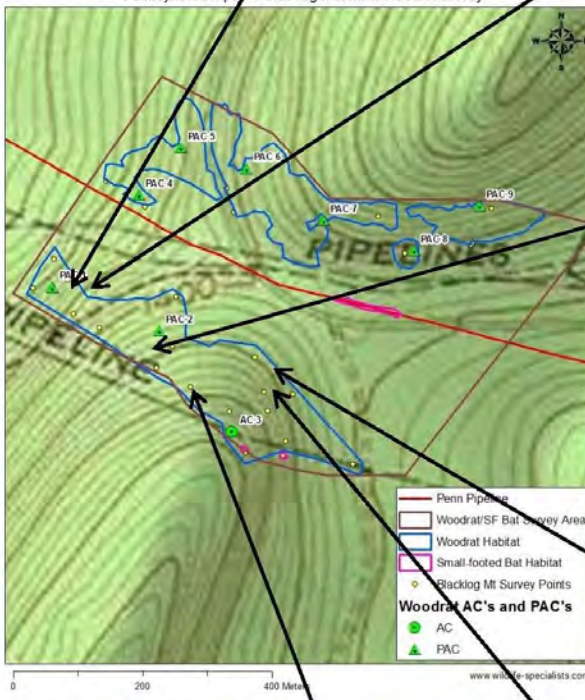


Photo Map 15 - Shade Mountain - Allegheny woodrat habitat

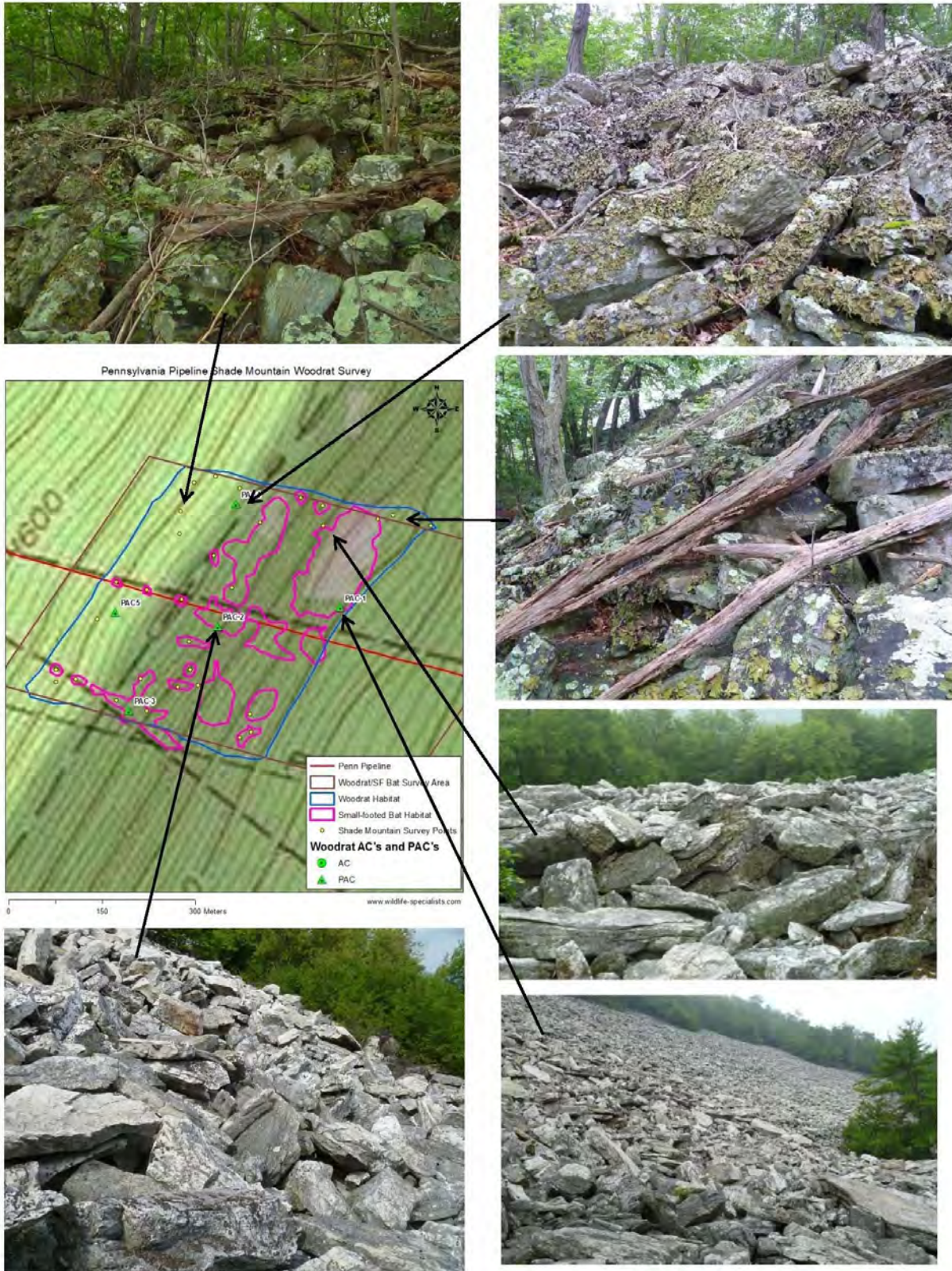


Photo Map 16 - Shade Mountain - Allegheny woodrat habitat

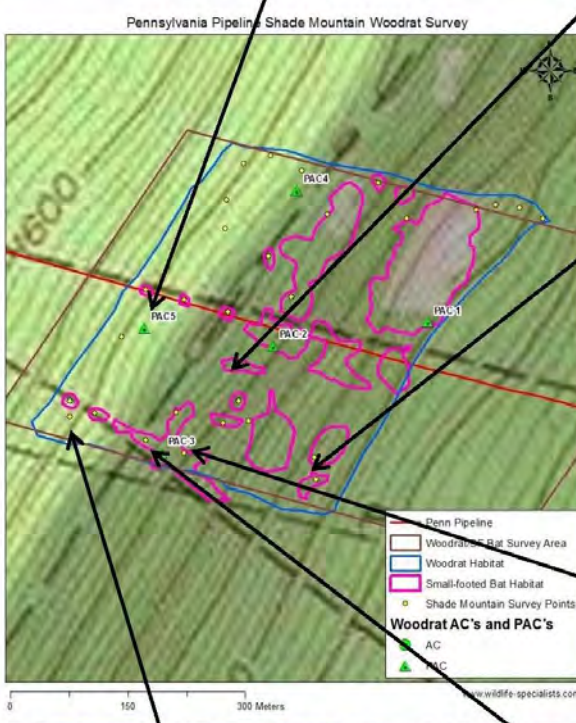


Photo Map 17 - Tuscarora Mountain Allegheny woodrat habitat

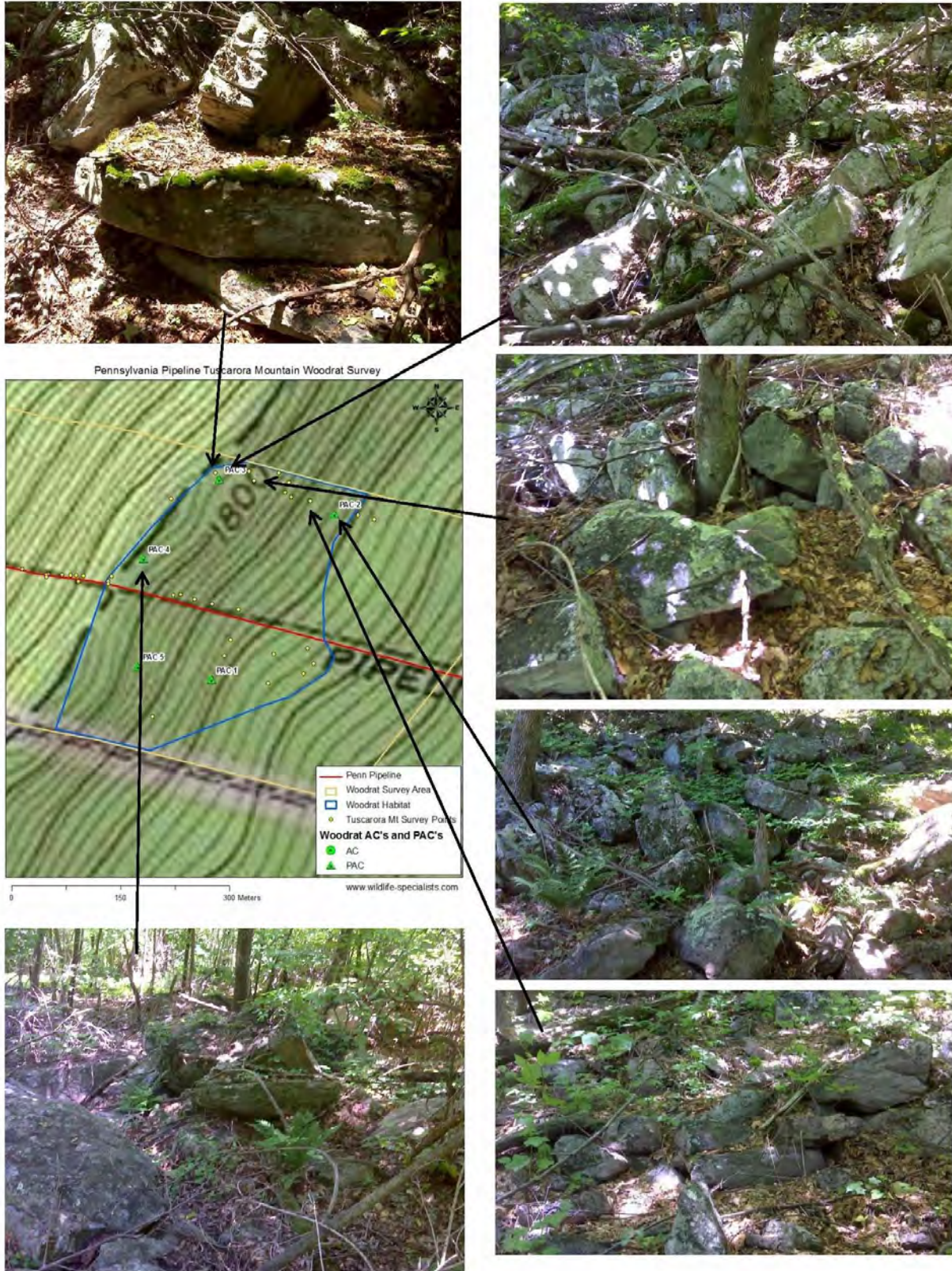


Photo Map 18 - Tuscarora Mountain Allegheny woodrat habitat



Pennsylvania Pipeline Tuscarora Mountain Woodrat Survey

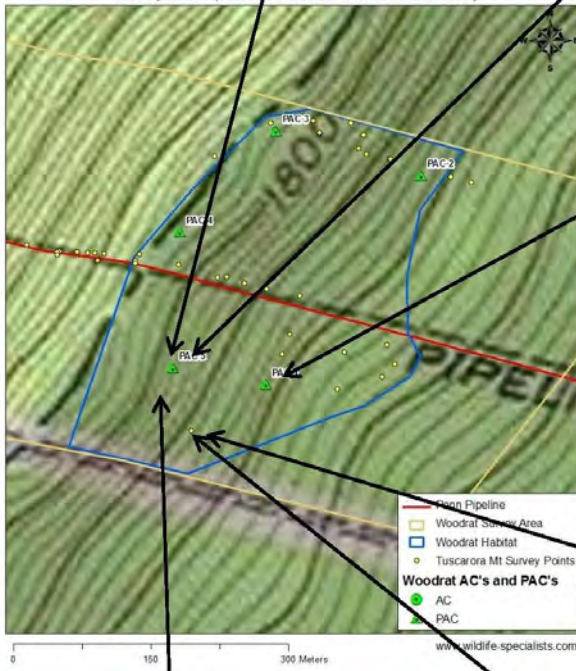


Photo Map 19 – Conococheague Mountain Allegheny woodrat habitat and sign

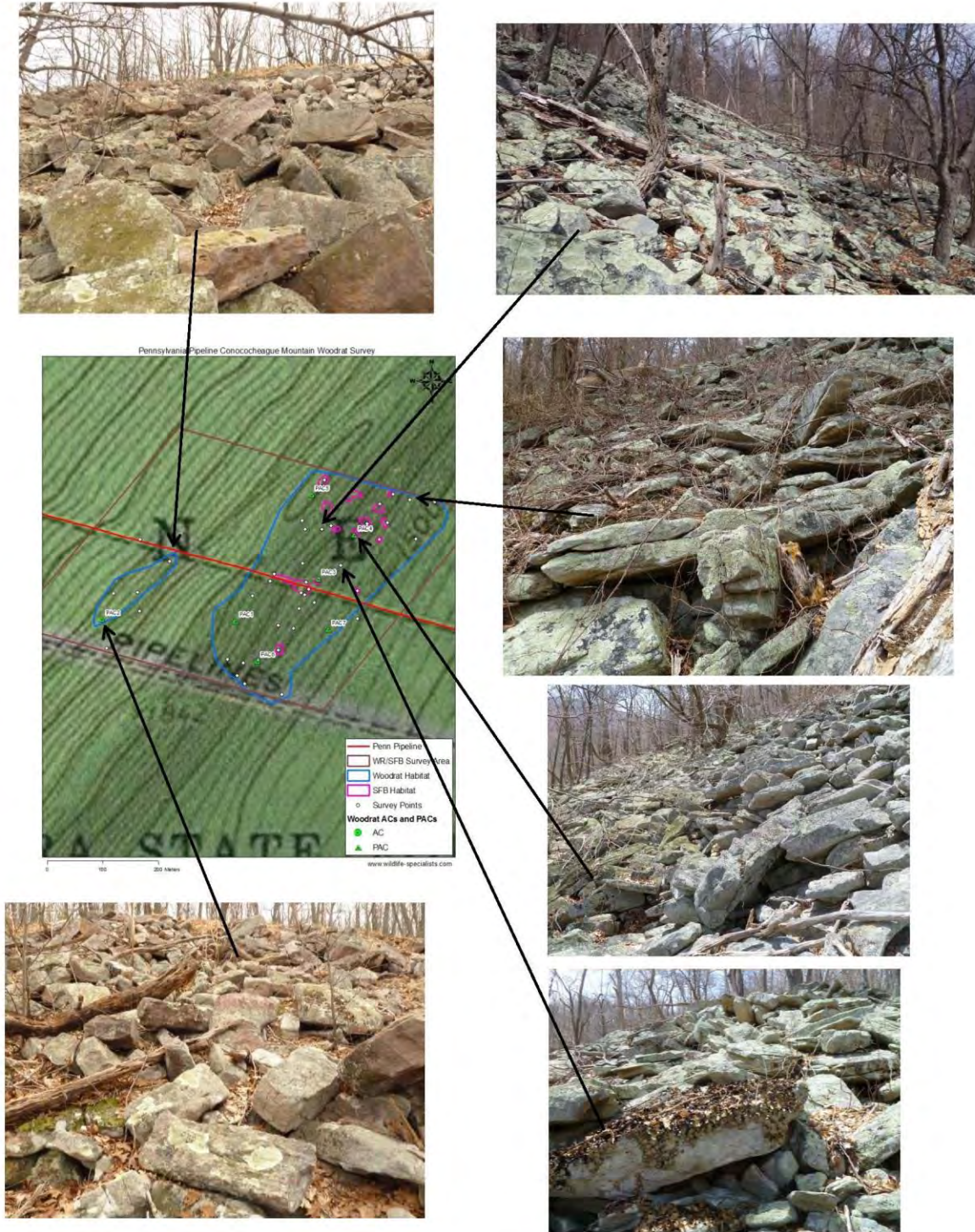


Photo Map 20 – Conococheague Mountain Allegheny woodrat habitat and sign

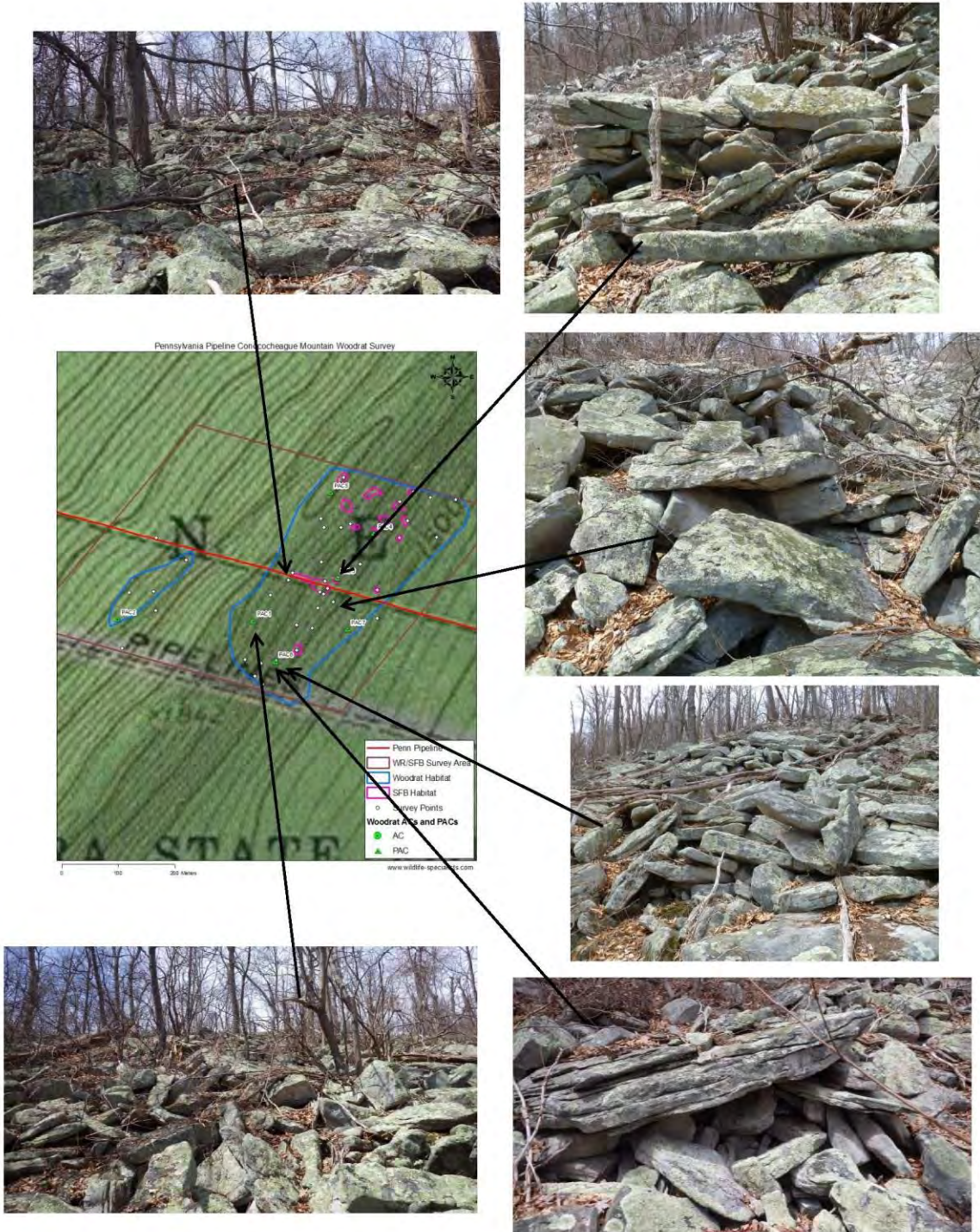


Photo Map 21 - Bowers Mountain 2 Allegheny woodrat habitat and sign



Pennsylvania Pipeline Bowers Mountain 2 Woodrat Survey



Photo Map 22 - Bowers Mountain 1 Allegheny woodrat habitat and sign

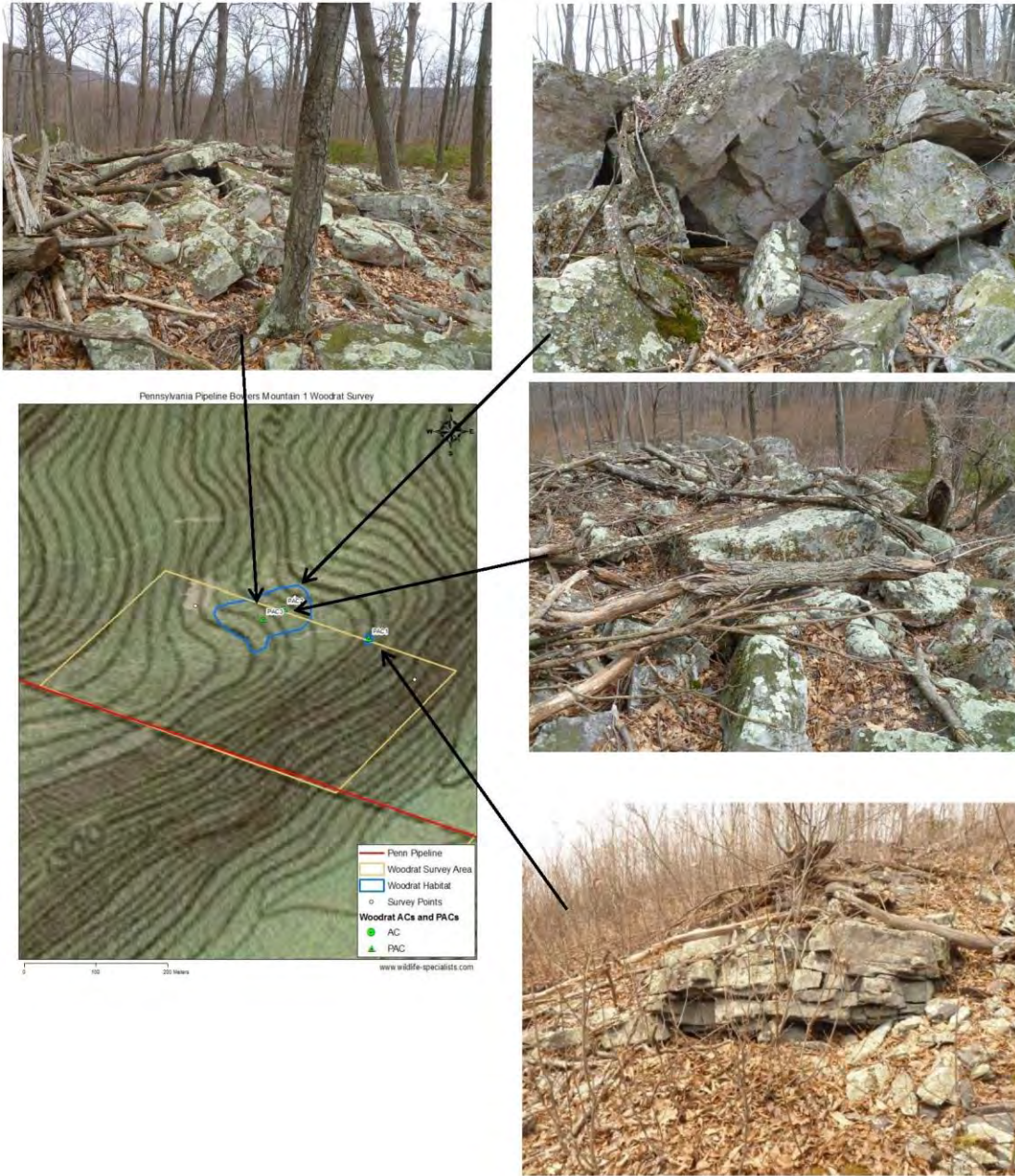


Photo Map 23 - Middle Ridge Allegheny woodrat habitat and sign



Photo Map 24 – Middle Ridge Allegheny woodrat habitat and sign

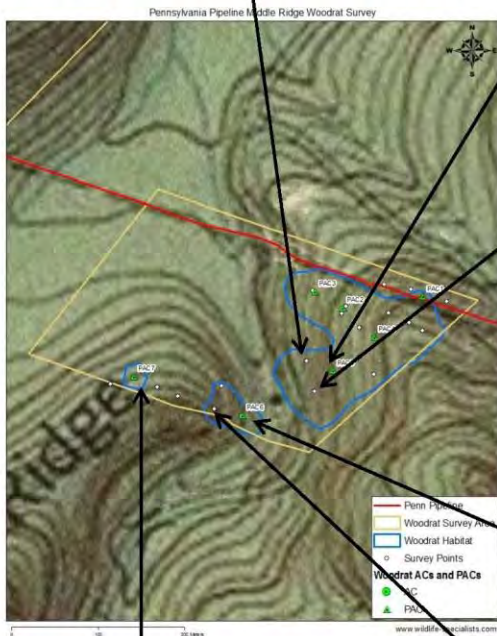


Photo Map 25 - Blue Mountain Allegheny woodrat habitat



Pennsylvania Pipeline Blue Mountain Woodrat Survey Area



Appendix IV. Detailed location maps and photographs of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat as well as shaded rocky areas considered non-habitat identified during habitat surveys of the proposed Pennsylvania Pipeline Project, Indian, Cambria, Blair, Huntingdon, Perry and Cumberland Counties, Pennsylvania, June 23-July 24, 2014.

Photo Map 1 - Laurel Ridge 3 - Eastern small-footed bat survey area – suitable habitat

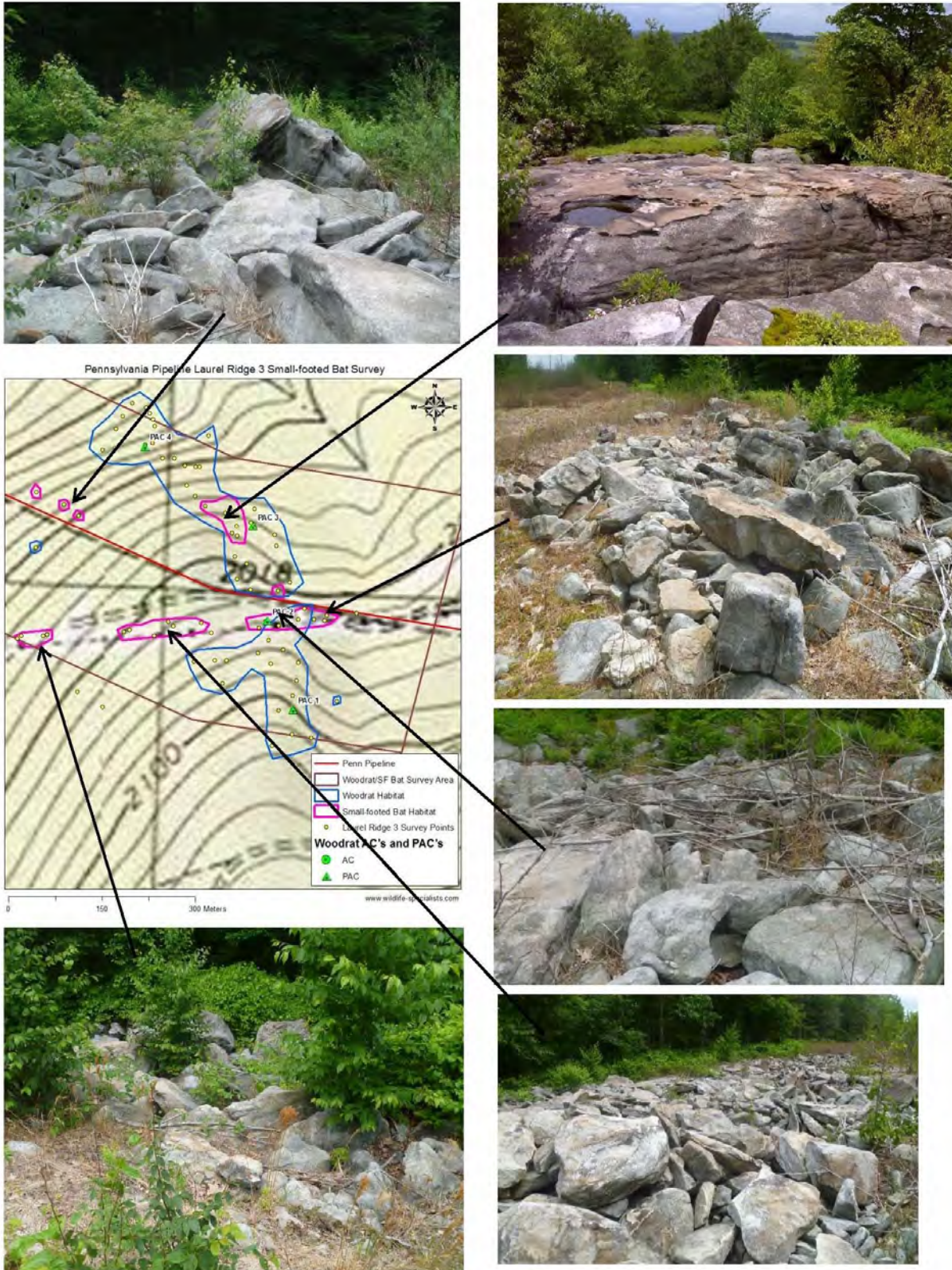


Photo Map 2 - Laurel Ridge 3 - Eastern small-footed bat survey area - non-suitable habitat

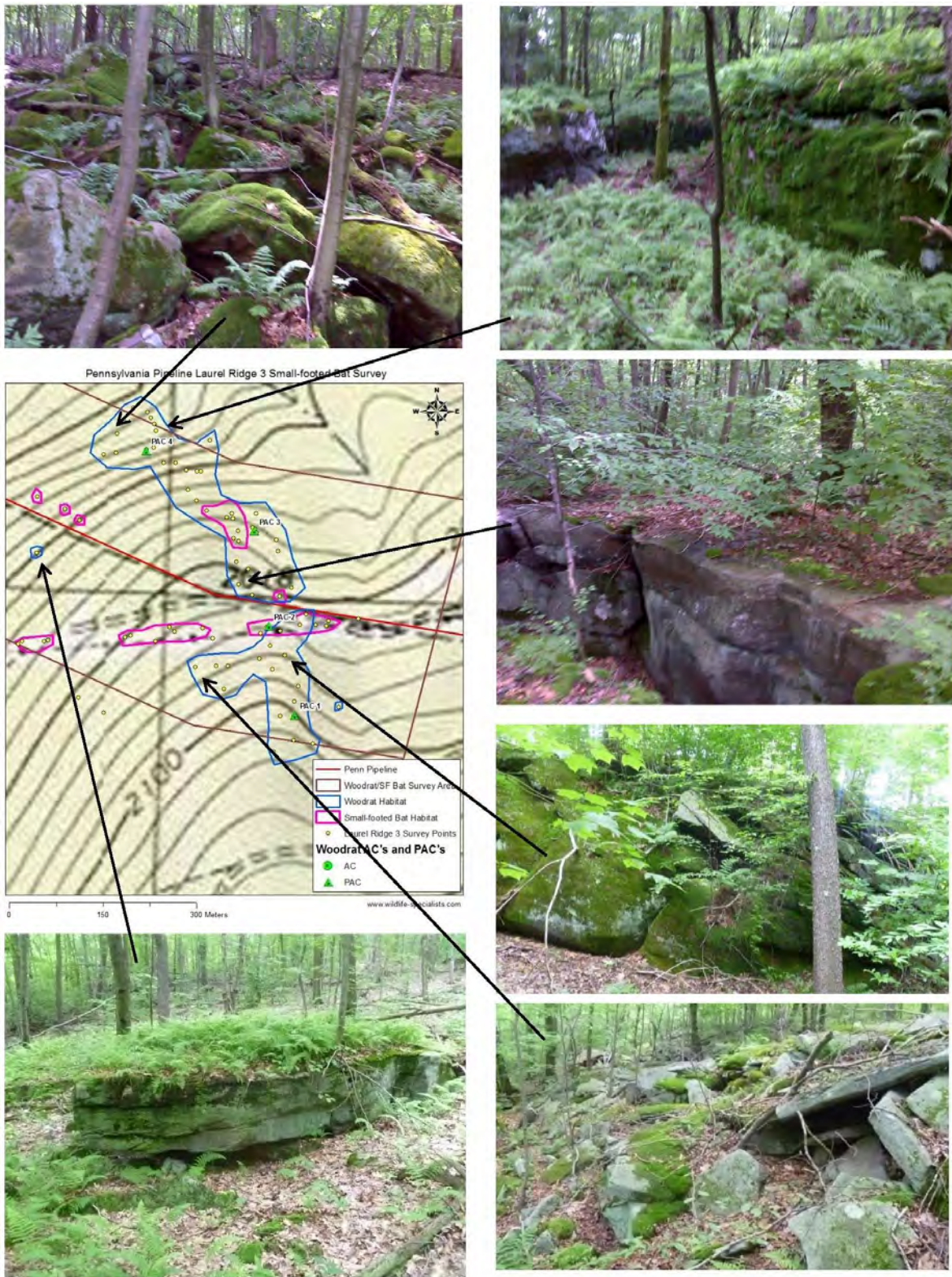


Photo Map 3 - Altoona Bypass - Eastern small-footed bat survey area - suitable habitat

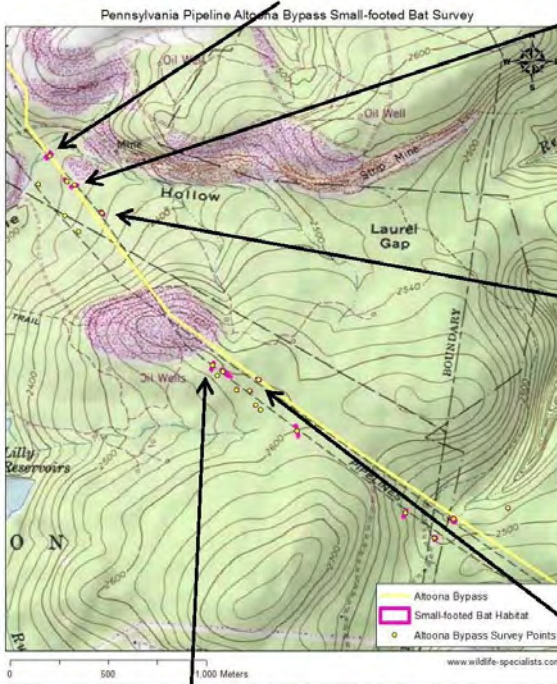


Photo Map 4 - Altoona Bypass - Eastern small-footed bat survey area - suitable habitat

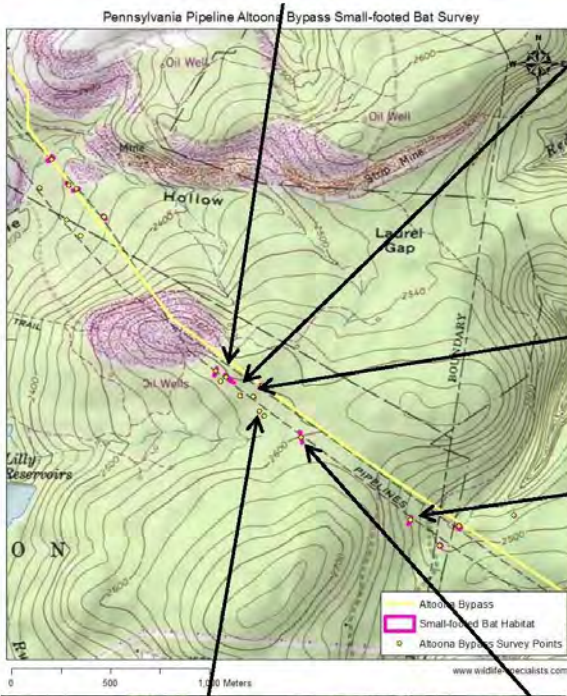


Photo Map 5 - Altoona Bypass - Eastern small-footed bat survey area - suitable habitat



Photo Map 6 - Altoona Bypass - Eastern small-footed bat survey area - suitable habitat



Pennsylvania Pipeline Altoona Bypass Small-footed Bat Survey

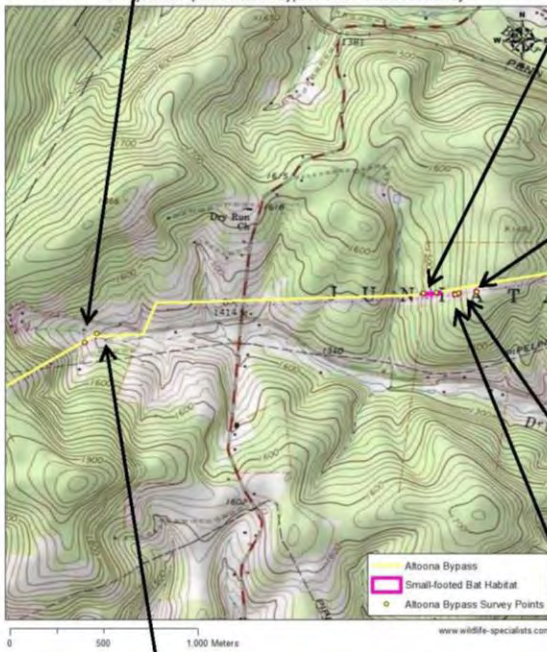


Photo Map 7 - Altoona Bypass - Eastern small-footed bat survey area - suitable habitat

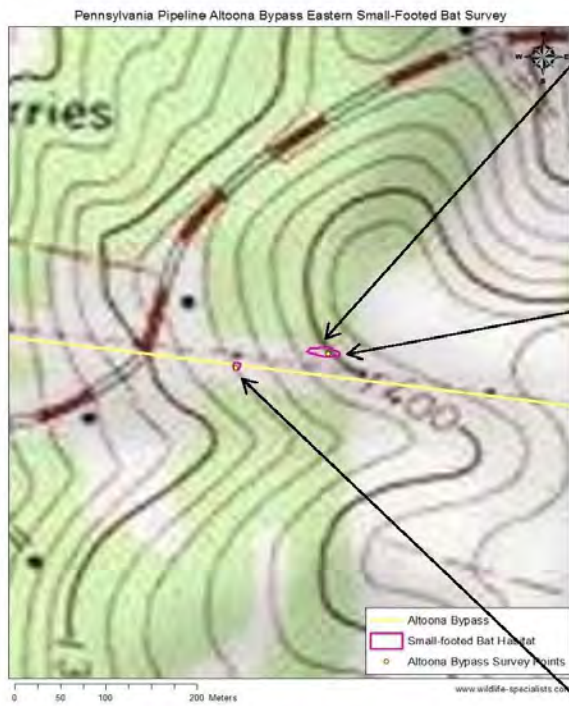


Photo Map 8 - Altoona Bypass - Eastern small-footed bat survey area - suitable habitat

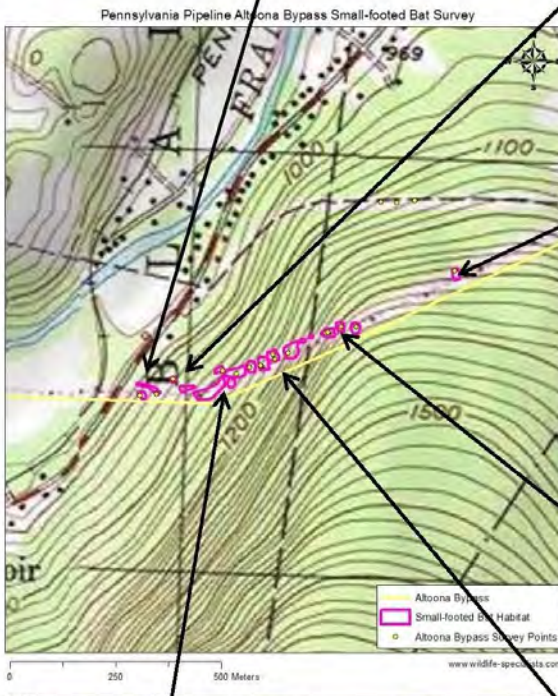


Photo Map 9 - Lock Mountain - Eastern small-footed bat survey area - non-suitable habitat



Pennsylvania Pipeline Lock Mountain Small-footed Bat Survey

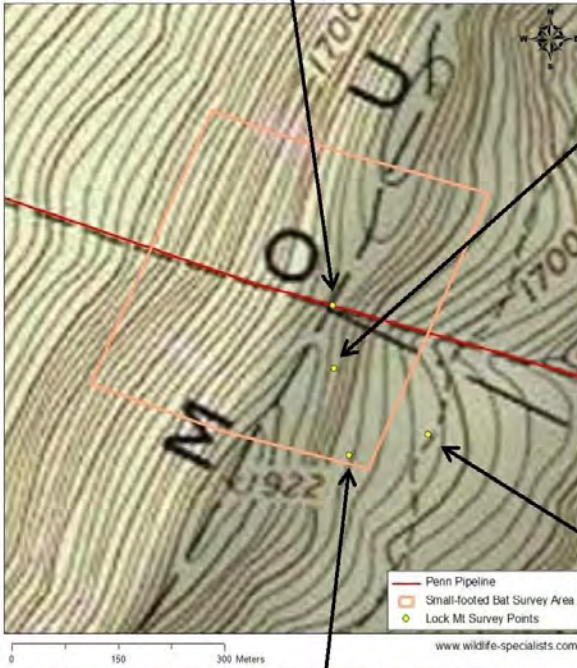


Photo Map 10 - Jacks Mountain 2 - Eastern small-footed bat survey area - suitable habitat

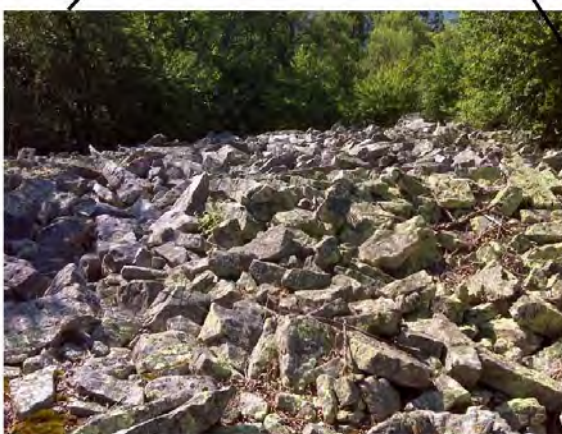


Photo Map 11 - Jacks Mountain 2 - Eastern small-footed bat survey area - suitable habitat

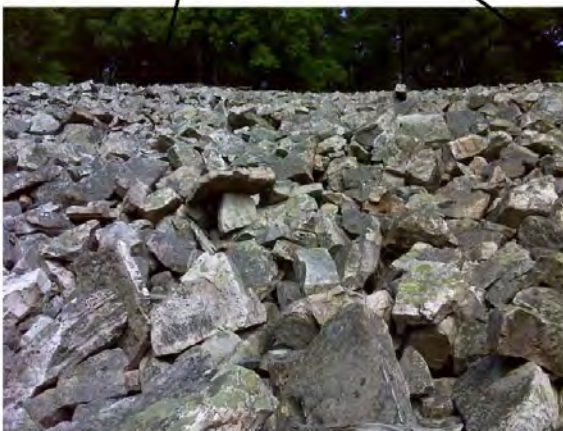
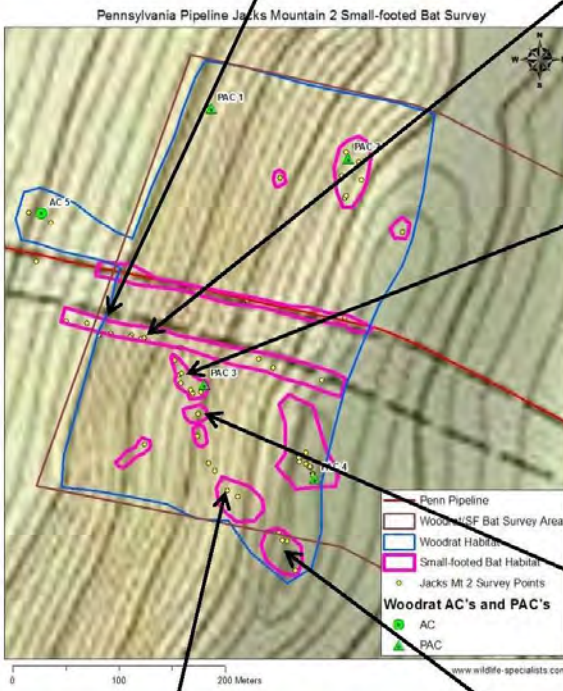


Photo Map 12 - Jacks Mountain 2 - Eastern small-footed bat survey area - non-suitable habitat

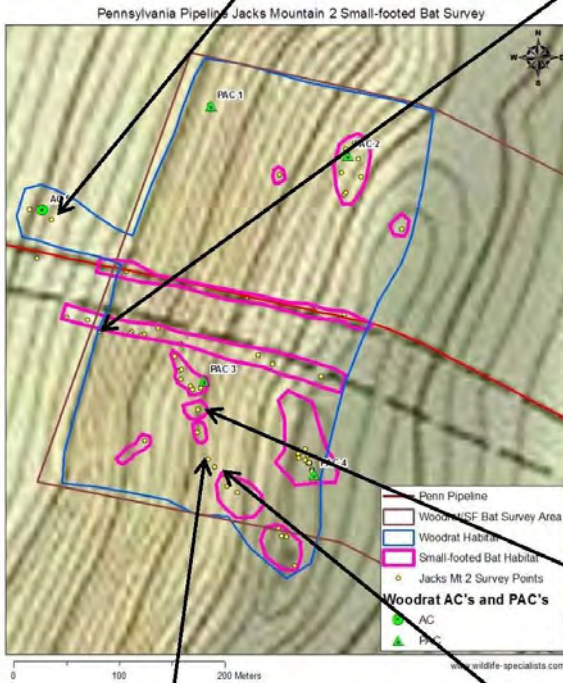


Photo Map 13 - Jacks Mountain 3 Eastern small-footed bat survey area - suitable habitat

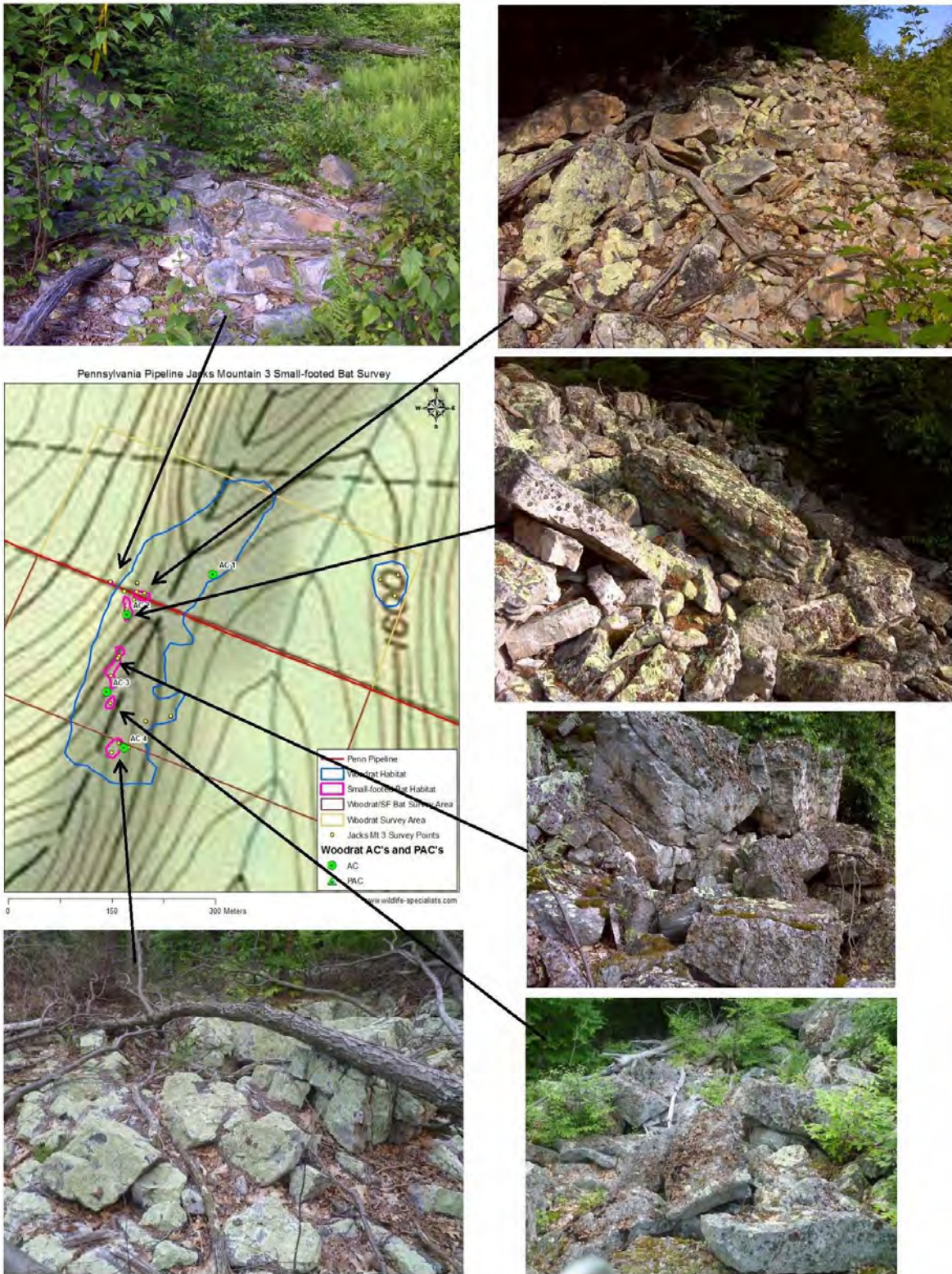


Photo Map 14 - Jacks Mountain 3 - Eastern small-footed bat survey area - non-suitable habitat

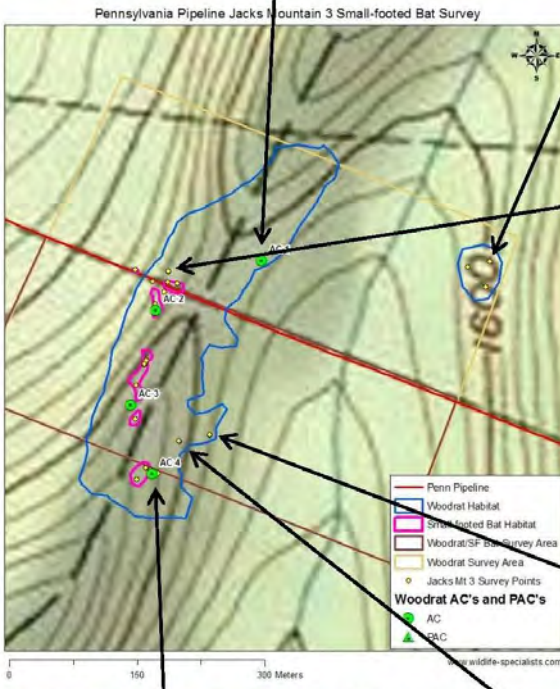


Photo Map 15 - Blacklog Mountain - Eastern small-footed bat survey area - suitable habitat



Pennsylvania Pipeline Blacklog Mountain Small-footed Bat Survey

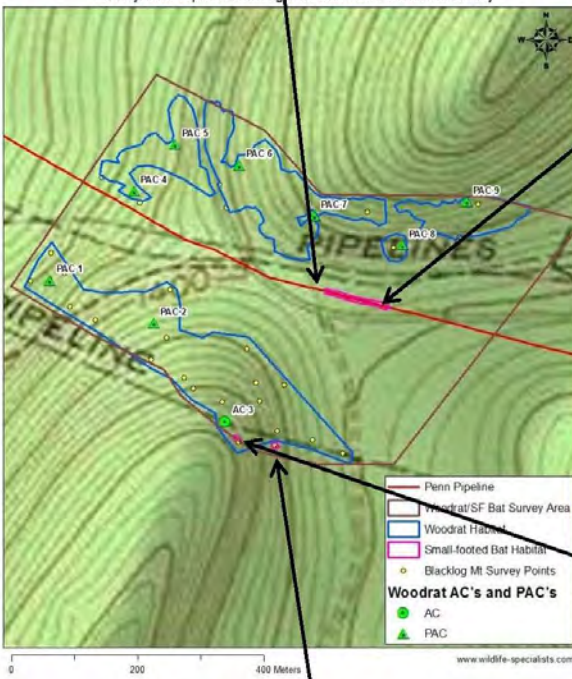


Photo Map 16 - Blacklog Mountain Eastern Small-footed Bat survey area - non-suitable habitat

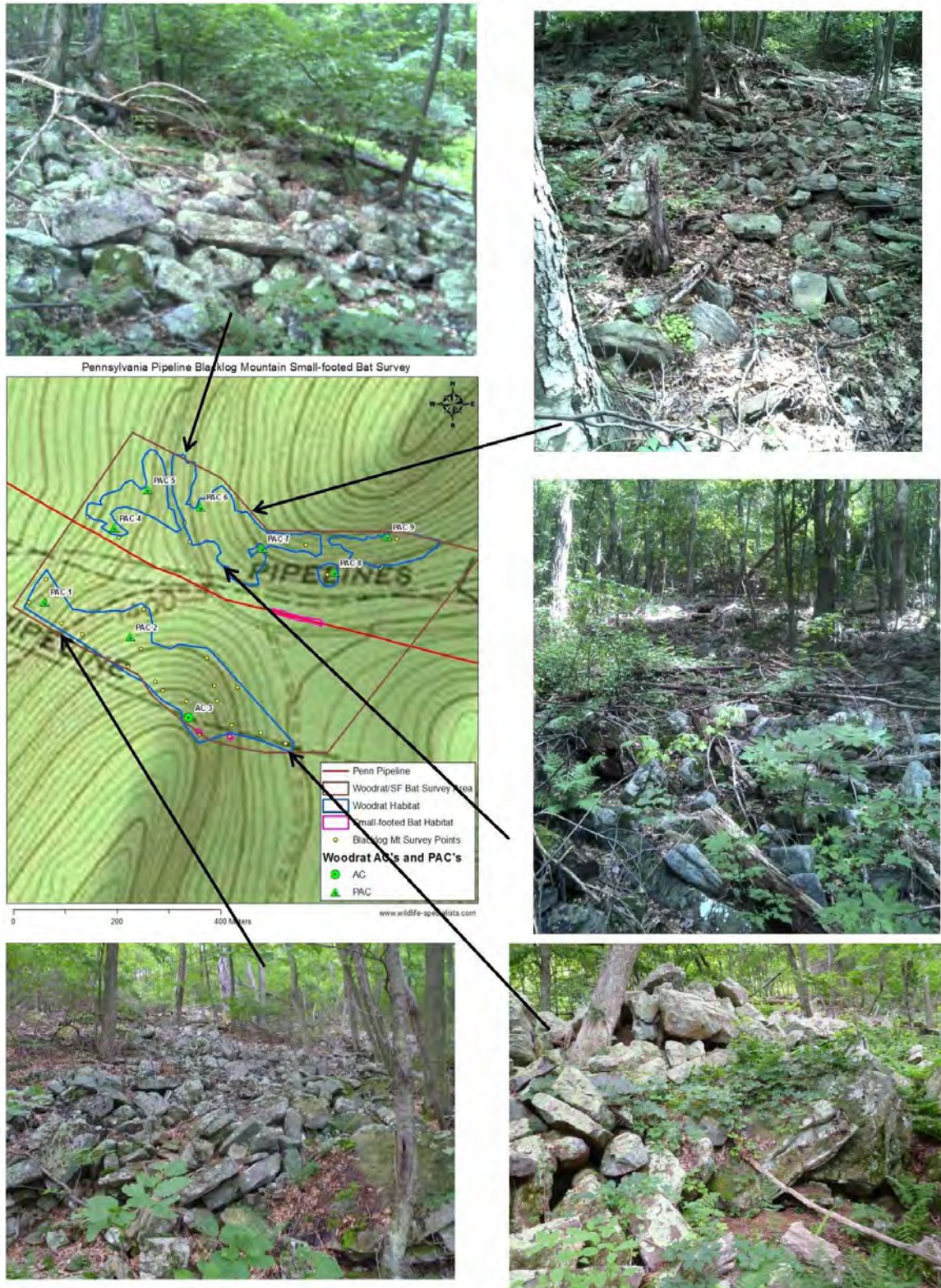


Photo Map 17 - Shade Mountain Eastern Small-footed Bat survey area - suitable habitat

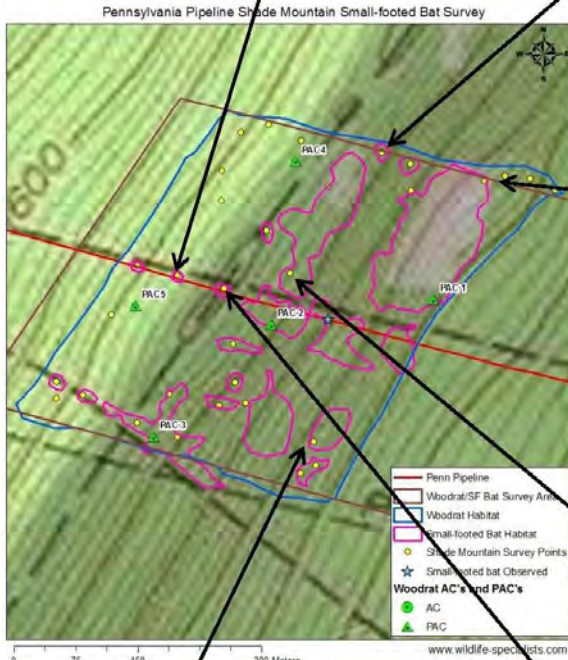


Photo Map 18 - Shade Mountain Eastern Small-footed Bat survey area - suitable habitat

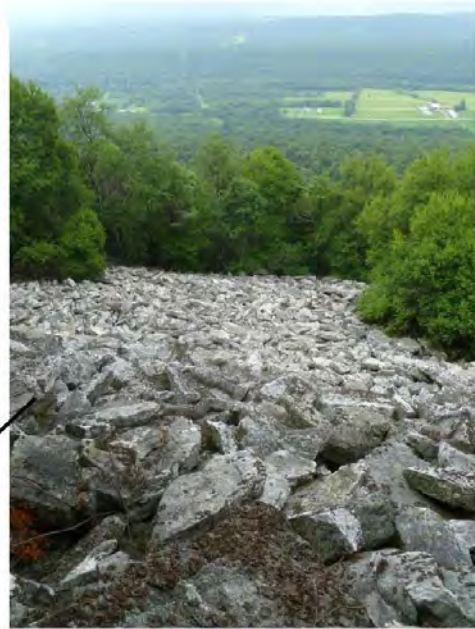


Photo Map 19 - Shade Mountain Eastern Small-footed Bat survey area - non-suitable habitat



Photo Map 20 - Conococheague Mountain Eastern Small-footed Bat survey area - Suitable habitat

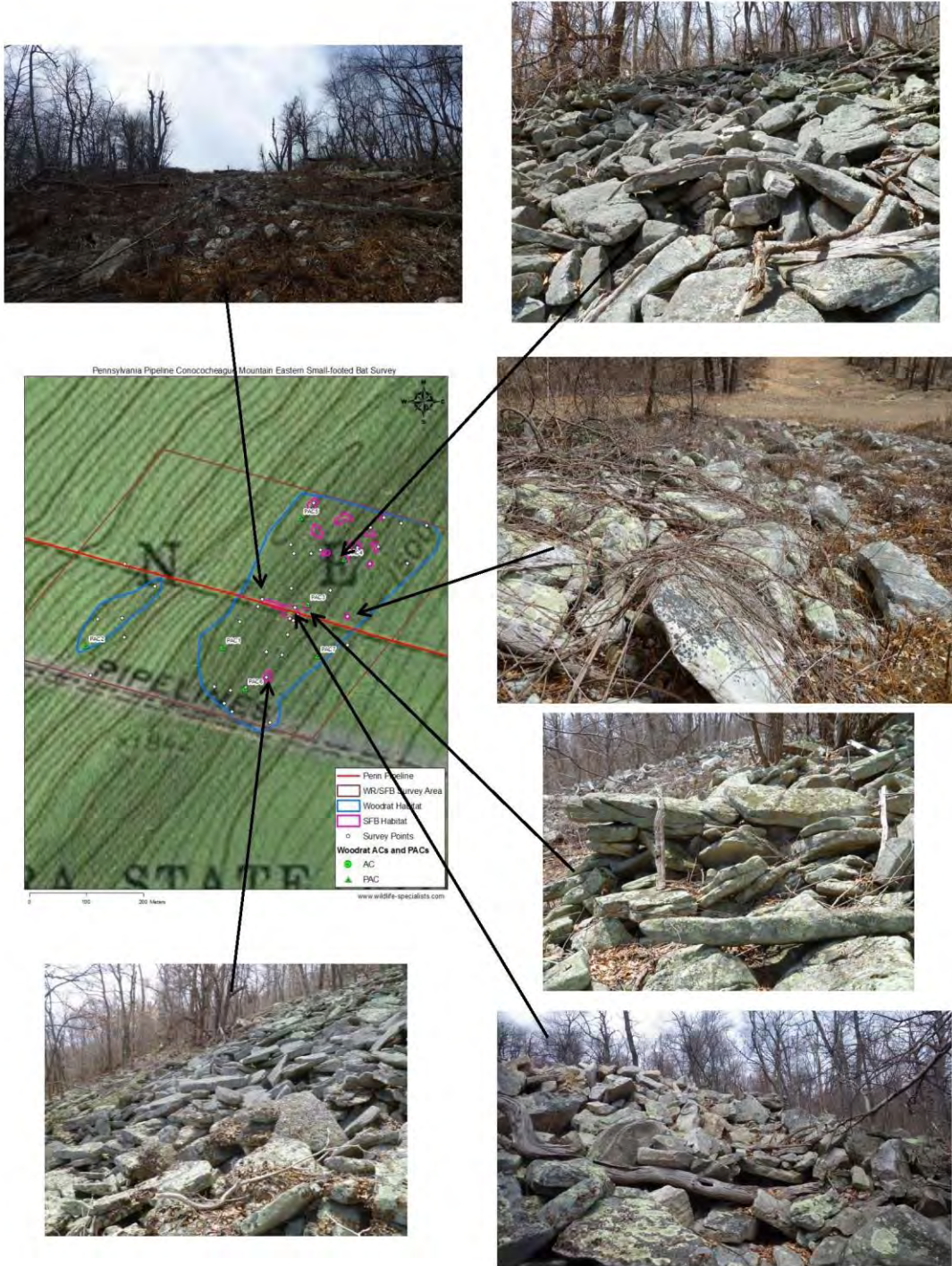


Photo Map 21 - Conococheague Mountain Eastern Small-footed Bat survey area - Suitable habitat



Photo Map 22 - Conococheague Mountain Eastern Small-footed Bat survey area - Non-suitable habitat



Photo Map 23 - Lock Mountain 2 Eastern Small-footed Bat survey area - Suitable habitat

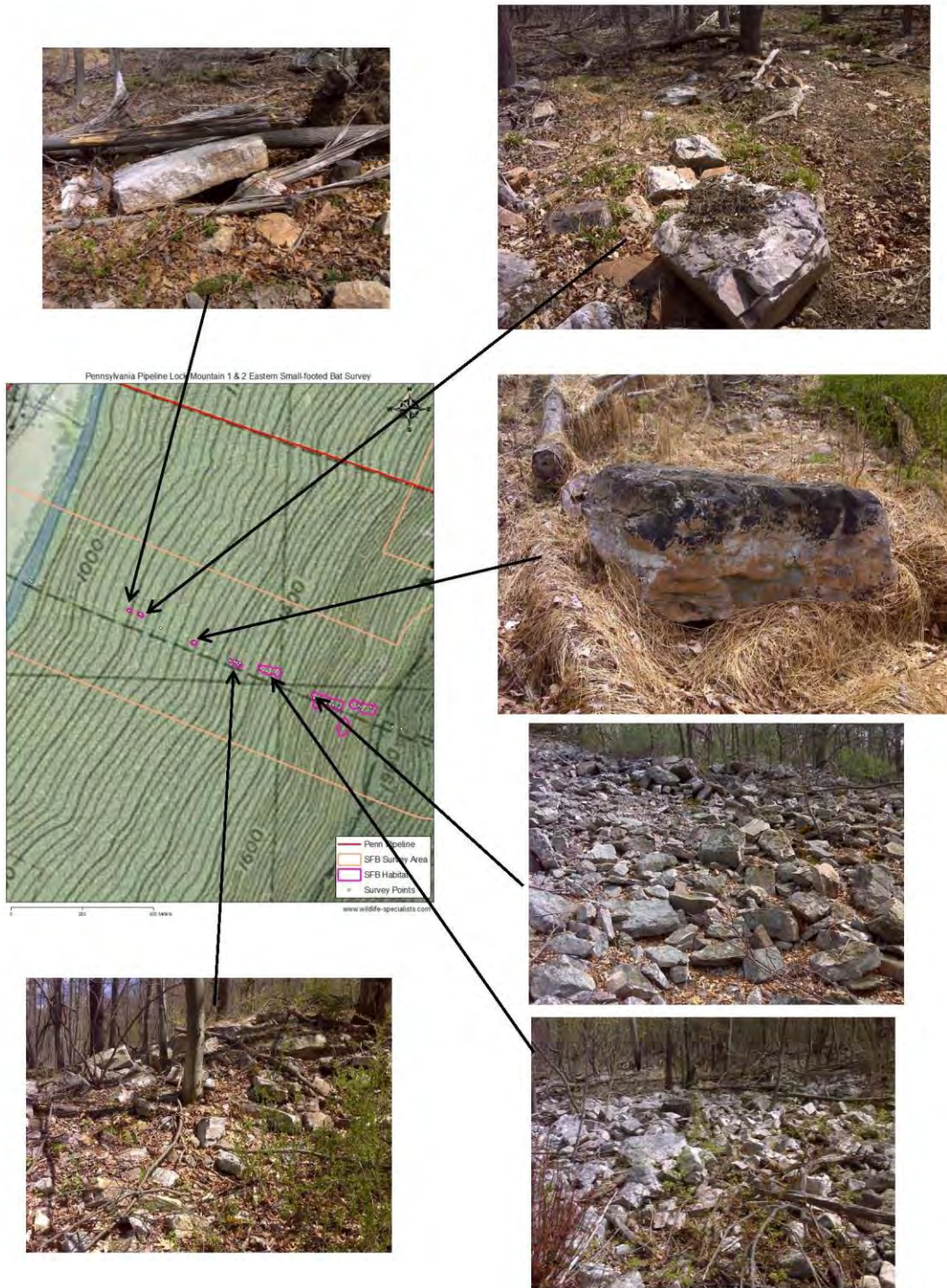
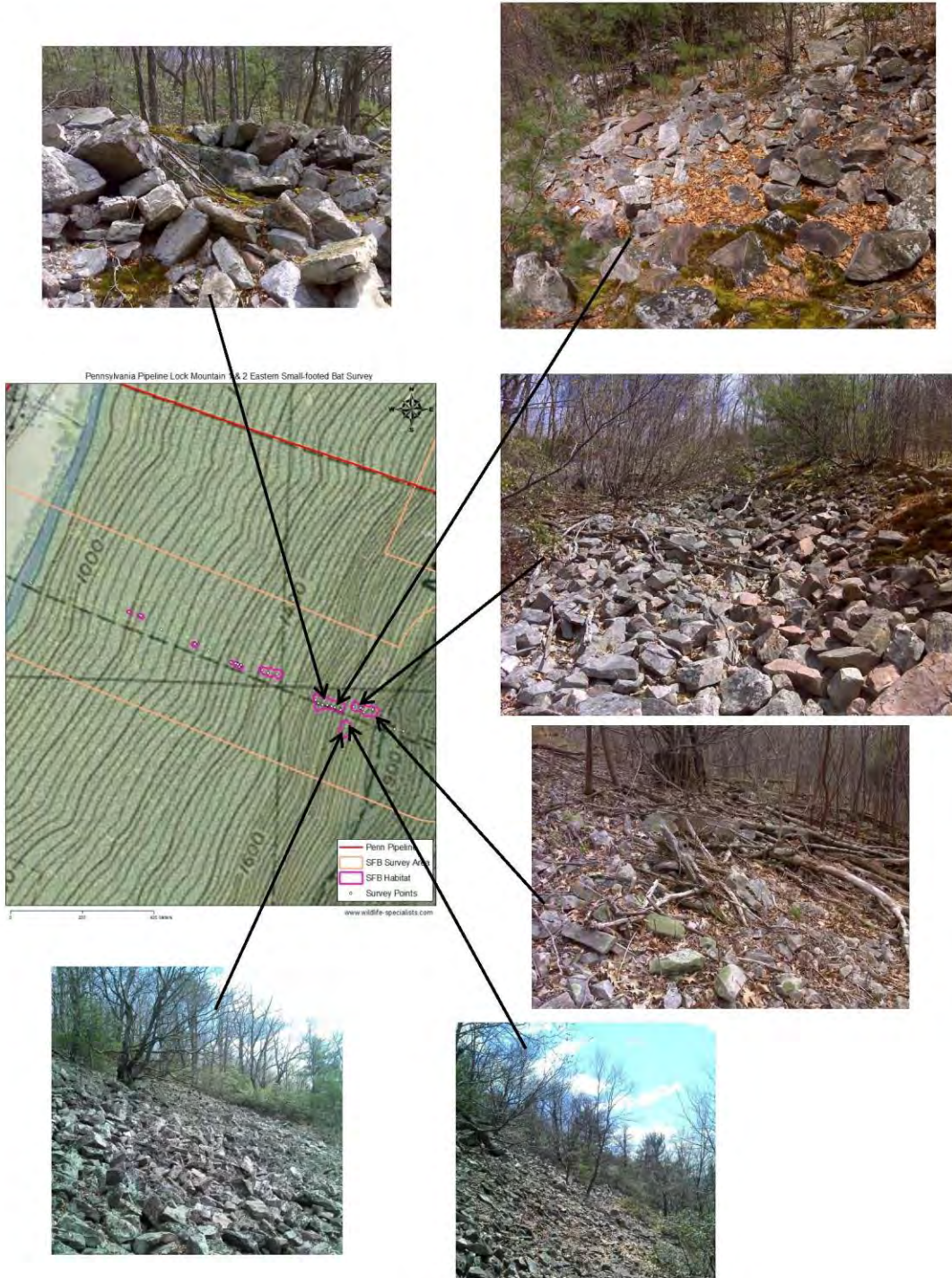


Photo Map 24 - Lock Mountain 2 Eastern Small-footed Bat survey area - Suitable habitat



APPENDIX C

DCNR Bureau of Forestry – Wood Rat Habitat Plan Parameters

DCNR Bureau of Forestry - Wood Rat Habitat Plan Parameters

ME II PA PIPELINE PROJECT – SUNOCO PIPELINE L.P.

Tuscarora State Forest

Tobyne Township, Perry County

1. Enhance Existing Habitat

Sunoco will be expected to cut undesirable trees (birch - *Betula lenta*; and all maple to include- striped maple-*Acer pensylvanicum*, red maple-*Acer rubrum*) immediately adjacent to the rocky habitat followed by planting of mast producing trees: Hawthorn-*Crataegus sp.*, black oak-*Quercus velutina*, scrub oak-*Quercus ilicifolia*, and American mountain ash-*Sorbus americana*.

2. Temporary Workspace Adjacent to Existing Habitat

- a. Sunoco will be expected to re-vegetate temporary workspace areas adjacent to the existing wood rat habitat with mast producing species: Sassafras-*Sassafras albidum*, grape-*Vitis spp.*, black gum-*Nyssa sylvatica*, sumac-*Rhus typhina*, hawthorn, and pitch pine-*Pinus rigida* and scrub oak-*Quercus ilicifolia* – at least on the upper slope portion of temporary workspace of the right of way near the wood rat habitat.
- b. Sunoco will be expected to pile any rocks that are un-earthed during the pipeline construction in the temporary workspace adjacent to the existing habitat to provide additional cover. These rock piles will be 15 feet wide by 5 feet in height. Any exposed soil around the created rock piles shall be planted with either grape or Virginia creeper-*Parthenocissus quinquefolia*.
- c. DCNR Bureau of Forestry would rather have the two new pipelines re-route to site on the south side of the existing right of way in a co-location or parallel manner, not south of and into the forested interior stand as proposed.

3. Food Plot Area

- a. Sunoco will be expected to cut undesirable vegetation (all birch, maple and dead eastern hemlock-*Tsuga canadensis*) in a ¼ acre area on the south side of the existing ROW at a location as designated by the District Forester. Sunoco must retain other species such as black gum-*Nyssa sylvatica* and basswood-*Tilia Americana*.
- b. Sunoco will need not till or utilize heavy equipment, only remove tree boles and tops in the newly created food plot.
 - Stumps may remain
 - Remove the tops to clear a space for planting the trees and shrubs.
- c. Once the undesirable vegetation is cut, Sunoco will follow up next with diverse plantings of desirable mast producing vegetation: Grey dogwood-*Cornus racemosa*, arrowwood viburnum-*Viburnum*

dentatum, nannyberry-*Viburnum lentago*, maple-leaf viburnum-*Viburnum acerifolium*, black-haw-*Viburnum prunifolium*, hawthorn, and beaked hazelnut-*Corylus cornuta*.

Also plant: Scrub oak, black oak, flowering dogwood-*Cornus florida*, silky dogwood-*Cornus amomum*, chokeberry-*Aronia melanocarpa*, American mountain ash-*Sorbus americana*, and hybrid chestnuts if available. Rubus is a desirable species that is expected to volunteer and is not necessary to plant.

Spacing Requirements:

Scrub oak should be placed 3 feet apart.

Shrub species must be planted close together.

- d. Sunoco will be expected to install woven wire fencing around the perimeter of the food plot and related access gates. Access would need created to the food plot and an access barricade installed - a steel gate. The area to-be-fenced and the number, location, and type of access gate(s) will be determined by the District Forester. Preliminary the scope of work expected includes: installing a man gate and a vehicle gate within or as a part of the woven wire fence; creating access from the Wolf Road and installing a standard steel gate that meet the specifications to be issued by the District Forester. The new steel gate will serve as access for both the new food plot and future access to the right of way.

4. Right of Way Maintenance

- a. Sunoco must allow vegetation in the pending legal right of way corridor width adjacent to the existing habitat to grow as long as it does not pose a risk to pipeline integrity or the operational maintenance of the right of way corridor such as to interfere with aerial inspection.
- b. Sunoco must maintain the rocky substrate on pipeline right of way as it exists. The existing right of way has a rocky surface that provides cover for woodrats.
- c. Sunoco must seed with a native warm-season mix (DCNR native seed mix attached.)

5. Plantings in General

- a. Sunoco will need to provide for adequate spacing for tree plantings. Spacing will vary with the species e.g. 12X12 for chestnut, 8X8 for hawthorn, 3X3 for small shrubs such as arrowwood, grey dogwood, silky dogwood, scrub oak, etc. One primary goal of the habitat enhancement effort is to achieve a closed canopy to provide some protection for the woodrats when they forage rather than an open orchard type of structure. Shrubs could be planted close to the chestnut.
- b. A 75% survival of plantings over 2 growing seasons will be a requirement.
- c. If tree planting mortality exceeds 25%, Sunoco will need to replant trees and shrubs
- d. **No blasting near woodrat habitat.**
- e. Sunoco will need to submit a copy of the woodrat conservation plan to the DCNR Bureau of Forestry for review; written approval of the plan must be obtained from the DCNR Bureau of Forestry prior to Sunoco's implantation.

ATTACHMENT 4

Eastern Small-footed Bat (*Myotis leibii*) Conservation Plan

Pennsylvania Pipeline Project

Prepared for:

Sunoco Logistics, L.P.

525 Fritztown Road
Sinking Spring, PA 19608

Prepared by:

Tetra Tech, Inc.

661 Anderson Drive
Pittsburgh, Pennsylvania 15220
(412) 921-7090
Fax (412) 921-4040

Submitted to:

Pennsylvania Game Commission

2001 Elmerton Avenue
Harrisburg, PA 17110

January 2016

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LIST OF ACRONYMS and ABBREVIATIONS

ACRONYM	MEANING
ATWS	Additional Temporary Workspaces
ft	Foot or Feet
G3	Global Vulnerable
HDD	Horizontal Directional Drill
LOD	Limit of Disturbance
LE	Federal Listed Endangered
m	Meter
mm	Millimeter
NGL	Natural Gas Liquid
PA	Pennsylvania
PGC	Pennsylvania Game Commission
PNDI	Pennsylvania Natural Diversity Inventory
PNHP	Pennsylvania Natural Heritage Program
Project	Pennsylvania Pipeline Project
PPP	Pennsylvania Pipeline Project
PT	Pennsylvania Threatened
ROW	Right-of-Way
S2	State Imperiled
SPLP	Sunoco Pipeline, L.P.
Tetra Tech	Tetra Tech Inc.
Wildlife Specialists	Wildlife Specialists, Inc.

1.0 INTRODUCTION

On behalf of Sunoco Pipeline L.P. (SPLP), Tetra Tech, Inc. (Tetra Tech) has prepared this Eastern small-footed bat (*Myotis leibii*) Conservation Plan for the Pennsylvania Pipeline Project (PPP or Project). This plan will be used to provide and implement the measures that are necessary to mitigate for potential impacts to the Eastern small-footed bat which is protected under the Game and Wildlife Code (PGC 2014). This plan was developed based on correspondence with the Pennsylvania Game Commission (PGC) and information regarding the biology and habitat preferences of the Eastern small-footed bat. This plan describes the project, survey results, impacted habitat within the project area, and discusses the mitigation measures that will be used to conserve the Eastern small-footed bat.

1.1 PROJECT DESCRIPTION

SPLP proposes to construct and operate the Pennsylvania Pipeline Project to expand existing pipeline systems and provide natural gas liquid (NGL) transportation of up to 350,000 barrels per day. The Project involves the phased installation of approximately 561 miles of two parallel pipelines within a 306-mile, 50-foot-wide right-of-way (ROW) from Houston, Washington County, Pennsylvania to SPLP's Twin Oaks facility in, Delaware County, Pennsylvania with the purpose of interconnecting with existing SPLP Mariner East pipelines. Initially, a 20-inch diameter pipeline would be installed within the ROW from Houston, PA to the Twin Oaks facility (306 miles). A second, up to 20-inch diameter pipeline, is proposed be installed in the same ROW from SPLP's Delmont Station, Westmoreland County, Pennsylvania to the Twin Oaks facility, paralleling the initial line for approximately 255 miles. This conservation plan has been written for the 255 mile portion of the proposed line between Delmont and the Twin Oaks Facility. The Project location is shown on Figure 1.

The Project will provide transportation service for up to 700,000 barrels of NGL per day from the Utica and Marcellus Shale formations for both domestic and international markets. The Project will transport propane, butane, and ethane across Pennsylvania. SPLP's upstream customers currently extract natural gas in the form of methane from the aforementioned geologic formations for distribution to the community. The natural gas extracted for this Project will provide fuel that is used for power generation, heating, and cooking. NGLs are separated from the natural gas stream before it is shipped on the natural gas piping network. Upstream shippers are currently limited by the shortage of NGL transport systems. In addition, the Project will provide along its route across Pennsylvania various exit points for the supply of desperately needed propane, at affordable prices to local distributors. This is especially helpful during peak demand periods when there would otherwise be a shortage of supplies. Finally, upon completion, the Pennsylvania Pipeline Project will promote sustained economic development and jobs-creation throughout Pennsylvania.

1.2 LAND REQUIREMENTS

The proposed Project would result in temporary access during the construction period of proposed facilities. Construction of the pipeline would require a 75-foot wide Right-of-Way (ROW) that would contain a 50-foot wide post-construction ROW that is permanently maintained and a 25-foot wide temporary workspace that would be used to facilitate the installation of the pipelines. Following installation, the 25-foot temporary workspace unit would be restored and allowed to return to its pre-construction state unless it is within an existing, permanently maintained ROW. Additional temporary work space (ATWS) would also be needed at some areas to facilitate construction. Sizes of these workspaces would depend on site-specific requirements. All workspaces would be clearly defined within project mapping and within agency and municipality applications. Following construction, ATWS's would be restored and allowed to return their pre-construction state unless they are within an existing, permanently maintained ROW.

Construction of the Project's aboveground facilities and the use of non-public access roads would have land requirements. New pump stations would generally require 3-4 acres of land and modifications to existing pump stations would require an additional 2-3 acres of land. Support sites, such as

pipe/contractor yards, are to be sited on previously disturbed areas and generally range from 5-15 acres in size. Temporary use would primarily be limited to existing non-public roads, driveways, and farm lanes that may require improvements. Permanent access roads to stations or valve settings may also be required. All proposed temporary and permanent access roads would be clearly defined within project mapping and within agency and municipality applications. Following construction, temporary work spaces would be restored and allowed to return their pre-construction state unless they are within an existing, permanently maintained ROW.

2.0 EASTERN SMALL-FOOTED BAT BIOLOGY AND HABITAT PREFERENCES

The Eastern small-footed bat is about 73-82-millimeters (mm) in length and weighs between 5 and 7 grams (Kurta 1995). Eastern small-footed bats have a golden-brown coat of fur on their head and back (Kurta 1995). It can be distinguished from its congeners by its small feet, black face, and keeled calcar (Kurta 1995, Reid 2006).

The Eastern small-footed bat is globally ranked as G3 (Global Vulnerable), state ranked as S2 (State Imperiled), and its Pennsylvania status is Pennsylvania Threatened (PT) (Pennsylvania Natural Heritage Program [PNHP] 2015). Eastern small-footed bats are found throughout the eastern United States and Canada ranging from Oklahoma southeast to Georgia and Northeast to Quebec (Natureserve 2015). Small-footed bats feed mostly on soft-bodied prey species such as flies, beetles, leafhoppers, and flying ants (Moosman et al. 2007). Summer roosting habitat includes caves and mines, tree hollows, exfoliating bark, cracks and crevices in rock walls, and ridge top talus fields (PGC 2014).

3.0 HABITAT SURVEYS AND RESULTS

In the March 14, 2014 response to a Large Project Pennsylvania Natural Diversity Inventory (PNDI) request for the PPP (Appendix A), the PGC identified 7 areas where rocky habitat exists in mountainous areas of Indiana, Cambria, Blair, Huntingdon, Perry, and Cumberland Counties. Additionally, surveys were performed along the entire Altoona Bypass portion of the proposed Project. Based on project correspondence with the PGC (Appendix A), on behalf of SPLP, Tetra Tech contracted Wildlife Specialists, Inc. (Wildlife Specialists) to complete Eastern small-footed bat surveys across Pennsylvania where potential habitat had been identified. A report of the 2014 and 2015 surveys for the Project was previously provided to the PGC for review and is included as Appendix B. The results of the 2014 and 2015 survey activities for the PPP are described below.

Wildlife Specialists biologists conducted Eastern small-footed bat surveys between June 23 and July 24, 2014 and April 15-28, 2015. Field surveys were performed in the 7 areas of potential habitat identified by the PGC within the Project's proposed Limit of Disturbance (LOD) and a 200-meter (m) buffer, as well as, the entire Altoona Bypass portion of the PPP. The LOD included all proposed workspaces involving new land disturbances, including the permanent ROW, temporary workspaces, access roads, pump stations, and staging areas. Surveyed areas varied from mature deciduous forest with high canopy closure and various rocky habitats to open talus slopes. During the survey effort, trained Wildlife Specialists biologists searched rocky habitat features for potential Eastern small-footed bat summer roosting habitat. It should be noted that there is no formal protocol for surveying for Eastern small-footed bat habitat and that these surveys were performed while relying on previous findings, species specific considerations, and best professional judgement.

Field surveys identified that 6 of the 7 areas identified by the PNDI, as well as portions of the Altoona Bypass area contained potential Eastern small-footed bat summer roosting habitat. The Lock Mountain survey area was the only area surveyed where no potential habitat was identified. A total of 1.7 acres of potential Eastern small-footed bat habitat was delineated within the LOD among the 7 identified areas and Altoona Bypass survey area. Additionally, at the time of the surveys, a small-footed bat was observed flying at Shade Mountain.

4.0 MITIGATION MEASURES

Through correspondence with the PGC and use of their *Pennsylvania Game Commission Eastern Small Footed Bat (Myotis leibii) Environmental Review Roost Structure Guidance Document* (August, 2014 Revision), SPLP developed this Eastern Small-Footed Bat Conservation Plan. The following sections outline SPLP's pre-construction and post-construction mitigation measures to minimize and mitigate for impacts to this species.

4.1 PRE-CONSTRUCTION

From the onset of the Project, SPLP has instructed project designers to consider environmental impacts in regard to all aspects of the proposed Project and to avoid and minimize wherever possible while allowing safe installation. Pipeline engineers were provided a large list of restrictions, recommendations, and requirements to consider during the design phase. Major considerations, where co-location with existing utility corridors, limiting the construction corridor to the minimum amount practicable, use of Horizontal Directional Drilling (HDD) technology, and avoidance and minimization at sensitive habitats.

SPLP has co-located the project alignment with an existing SPLP ROW for approximately 80% of the route so that this existing ROW could be utilized as workspace. With the use of portions of the existing ROW for construction, this is a major means for avoiding new impacts to sensitive resources (i.e., forested wetlands, forest areas, streams) and for minimizing environmental impacts for the entire Project. SPLP has also co-located with foreign utility lines whenever possible when routing pulls away from the existing SPLP ROW. In addition, SPLP has implemented a number of route variations through environmental feedback, both minor and major, to further reduce the impacts associated with the Project. Many of these route variations are driven by environmental factors such as avoidance of forested wetlands or areas occupied by sensitive species.

In general, the construction ROW is limited to 75-ft in most areas. This is comprised of a 50-ft-wide permanent easement and 25-ft of temporary workspace required to facilitate construction. In some areas, additional temporary workspace is required to facilitate construction. The industry standard for installation of this size of pipe is 100-ft. Restricting construction to 75-ft significantly reduces impacts to the landscape including a large reduction in impacts to forested areas. Instead of continuing through the wetlands/streams with the 75-ft-wide construction ROW, SPLP has narrowed the construction ROW to 50-ft for all wetland/stream crossings thus minimizing temporary impacts to these resources during construction. This narrow construction corridor, along with co-location efforts has greatly minimized fragmentation of habitat impacts.

Finally, SPLP will prevent small-footed bats from accessing summer roosting habitat identified within the Project limits of disturbance to avoid any chance of incidental take that could occur during construction activities. Prior to emergence from hibernation (March 31), SPLP will seal off these areas with a geotextile material such as silt fencing, mesh screening, or other appropriate materials. If mesh screening is used, a maximum size of 2 mesh/inch will be installed to ensure that no bats can access entrances. Cover materials will completely seal off all entrances, cracks, and crevices to these potential roosting sites thereby preventing the entry of small-footed bats. This conservation measure ensure that no harm to or incidental take of this species will occur during construction activities in the identified habitat areas.

4.2 POST-CONSTRUCTION

Following the completion of construction, SPLP will construct roosting structures as close to the areas of impacted habitat as possible. Using a mitigation rate of 3:1, which yields 5 acres, and a rate of four structures per acre, SPLP will construct twenty new roosting structures. The goal will be for these structures to be created in areas of temporary disturbance such as along the temporary ROW, temporary workspaces, or in areas adjacent to these spaces. The final location of the structures will also be dictated by land availability.

In accordance with the *Pennsylvania Game Commission Eastern Small Footed Bat (Myotis leibii) Environmental Review Roost Structure Guidance Document* (August, 2014 Revision), newly created roosting structures will have an inner core that is approximately 10-ft wide and 5ft tall. The core will then be covered by multiple layers of large, flat rocks of varying sizes. These rocks will maximize cracks and crevices that contain 1-2-inch openings with some openings as narrow as ¼-inch to provide protection from predators such as snakes. The outer rocks and caps will be shingled to ensure that precipitation does not enter the structure. All rocks used in construction will be cleaned of dirt and other organic materials. Limestone rocks will not be used unless working in karst areas.

Structures will be arranged so that they are oriented southeast to west (135° to 270°) to receive the greatest amount of sunlight exposure during the day. Rock piles will be placed in close proximity to forested or early successional habitat to provide bats with cover from predators and travel corridors. If possible, structures will be placed in close proximity to perennial sources of water such as wetlands, streams, and other riparian areas. Multiple rock piles constructed in the same area will be spaced and grouped appropriately following an evaluation of the impacted landscape.

Upon the completion of these structures, emergence surveys will be performed by an experienced bat biologist during the summer months to monitor their usage. Emergence surveys will be performed for a three year period, or until bats are seen emerging from the structures. Three surveys will be performed at each structure to obtain 3 separate nights of data from different parts of the survey season. The first survey will be performed during the second or third week of June. The second survey will be performed during the second week of July and the final survey will be performed during the last week of July.

5.0 CONCLUSION

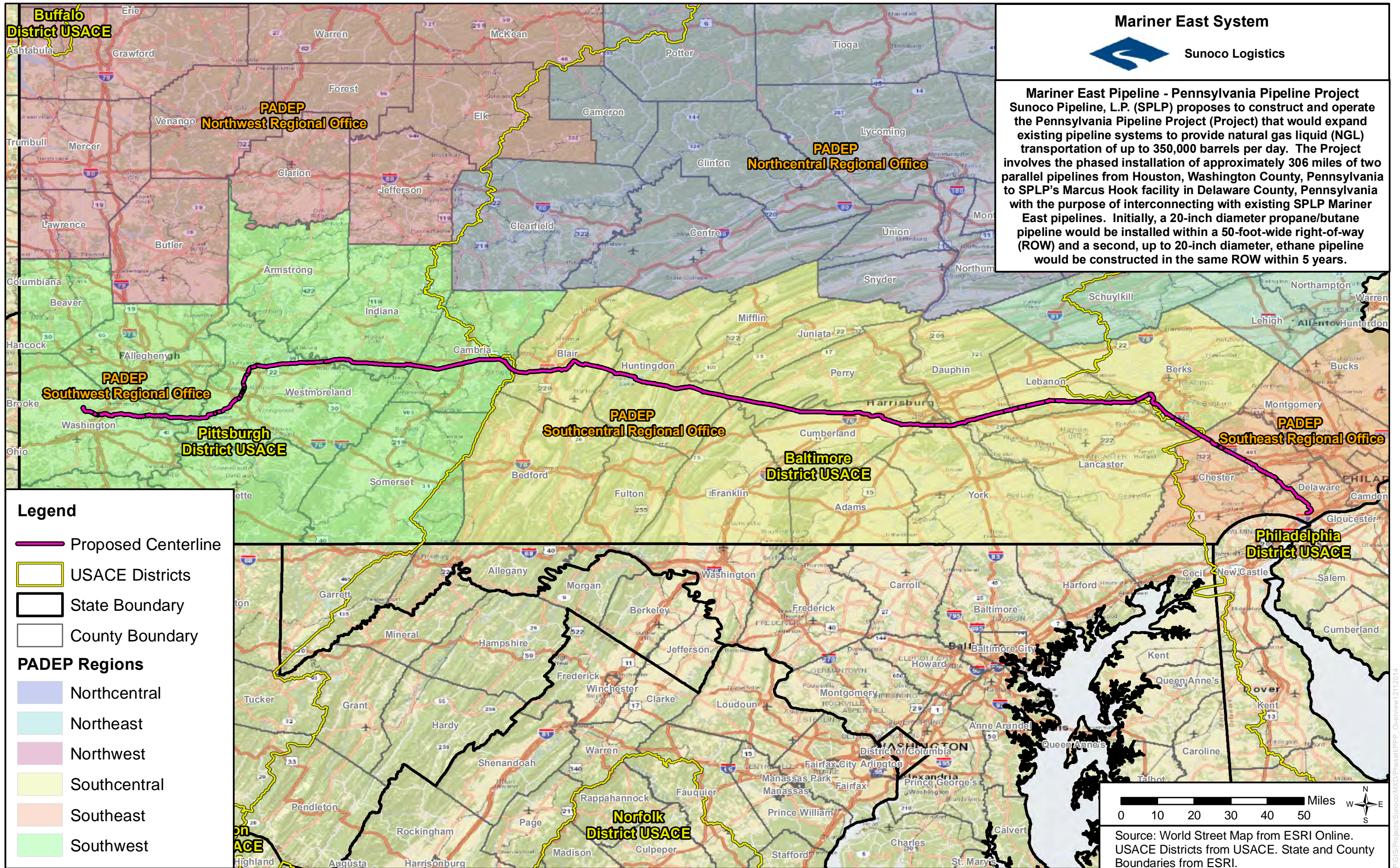
This Eastern small-footed bat Conservation Plan for the Pennsylvania Pipeline Project provides SPLP's commitment to mitigation measures to prevent permanent impacts to the small-footed bat within the Project area. SPLP has conducted extensive background and field surveys to identify Eastern small-footed bat habitats within and adjacent to all Project work areas. These surveys provided the foundation for the development of this plan.

SPLP has implemented several measures as a standard practice to reduce impacts to sensitive resources including those to Eastern small-footed bat habitat. These include co-locating the project alignment with an existing SPLP ROW for approximately 80% of the route and limiting the construction ROW to 75-ft in most areas. This narrow construction corridor, along with co-location efforts has greatly minimized fragmentation of habitat impacts. SPLP is also committed to preventing impacts to Eastern small-footed bats by sealing off entrances, cracks, and crevices to potential summer roosting sites prior to emergence from hibernation (March 31). Additionally, SPLP will mitigate by creating new roosting structures following the completion of construction. Based on SPLP's commitments to the protection and conservation of the Eastern small-footed bat and what is known about the presence and/or potential presence of the species in the vicinity of the Project area, we conclude that the PPP is not likely to impact the Eastern small-footed bat.

6.0 REFERENCES

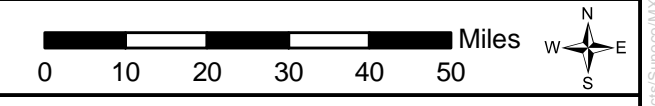
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FIGURES

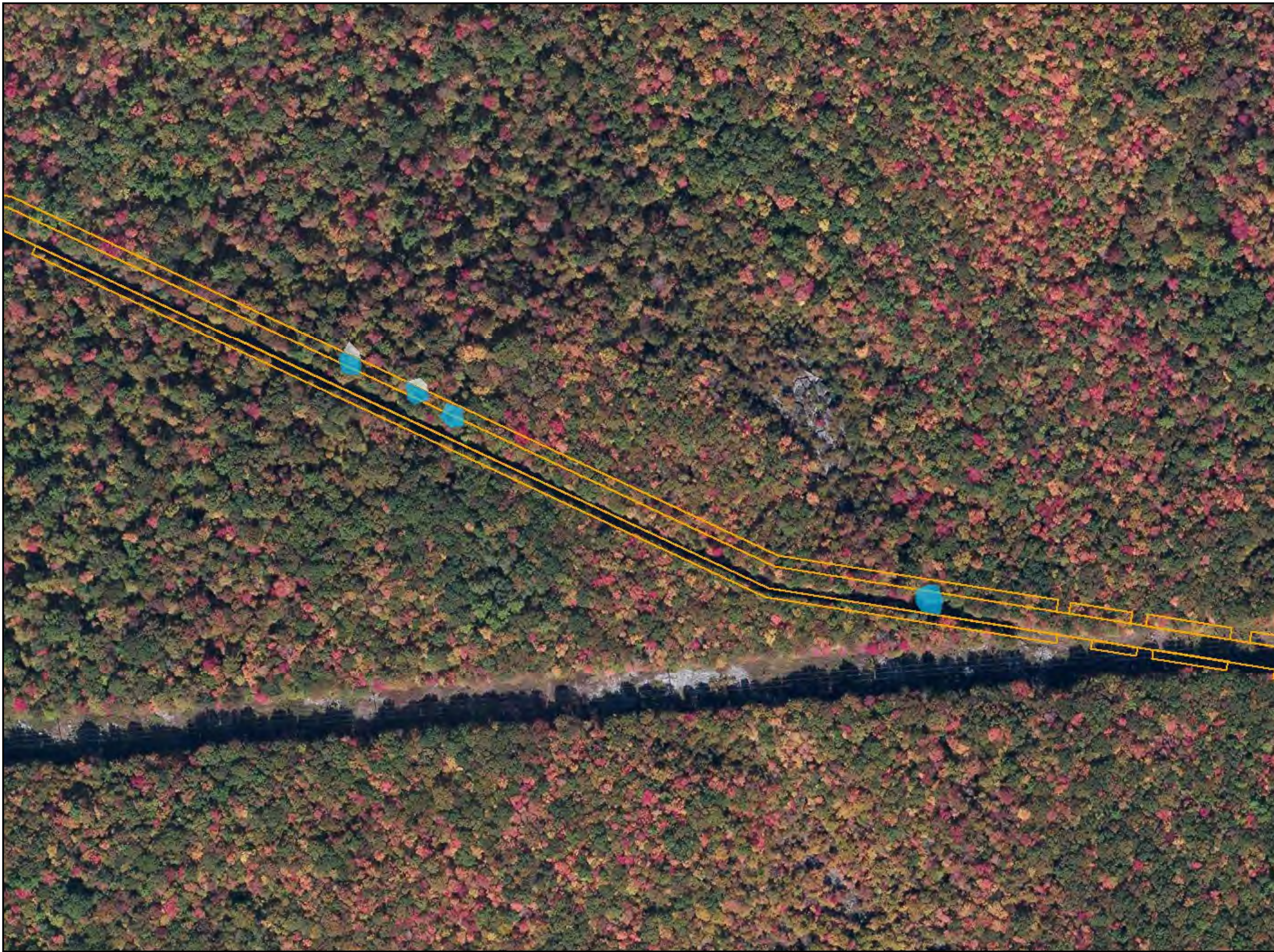


Mariner East Pipeline - Pennsylvania Pipeline Project
 Sunoco Pipeline, L.P. (SPLP) proposes to construct and operate the Pennsylvania Pipeline Project (Project) that would expand existing pipeline systems to provide natural gas liquid (NGL) transportation of up to 350,000 barrels per day. The Project involves the phased installation of approximately 306 miles of two parallel pipelines from Houston, Washington County, Pennsylvania to SPLP's Marcus Hook facility in Delaware County, Pennsylvania with the purpose of interconnecting with existing SPLP Mariner East pipelines. Initially, a 20-inch diameter propane/butane pipeline would be installed within a 50-foot-wide right-of-way (ROW) and a second, up to 20-inch diameter, ethane pipeline would be constructed in the same ROW within 5 years.

- Legend**
- Proposed Centerline
 - USACE Districts
 - State Boundary
 - County Boundary
- PADEP Regions**
- Northcentral
 - Northeast
 - Northwest
 - Southcentral
 - Southeast
 - Southwest

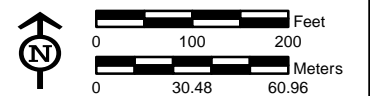


Source: World Street Map from ESRI Online.
 USACE Districts from USACE. State and County Boundaries from ESRI.



- Legend**
- Eastern Small-Footed Bat Impacted Area
 - Eastern Small-Footed Bat Non-Impacted Area
 - Access Road
 - ATWS
 - Limit of Disturbance

Sheet Identifier



**FIGURE 2-1
EASTERN SMALL-FOOTED BAT**
PENNSYLVANIA PIPELINE PROJECT
NOVEMBER 20, 2015 ALIGNMENT
SUNOCO LOGISTICS, L.P.
CAMBRIA COUNTY, PA



Notes:
1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2011 ESRI and its data suppliers).



- Legend**
- Eastern Small-Footed Bat Impacted Area
 - Eastern Small-Footed Bat Non-Impacted Area
 - Access Road
 - ATWS
 - Limit of Disturbance

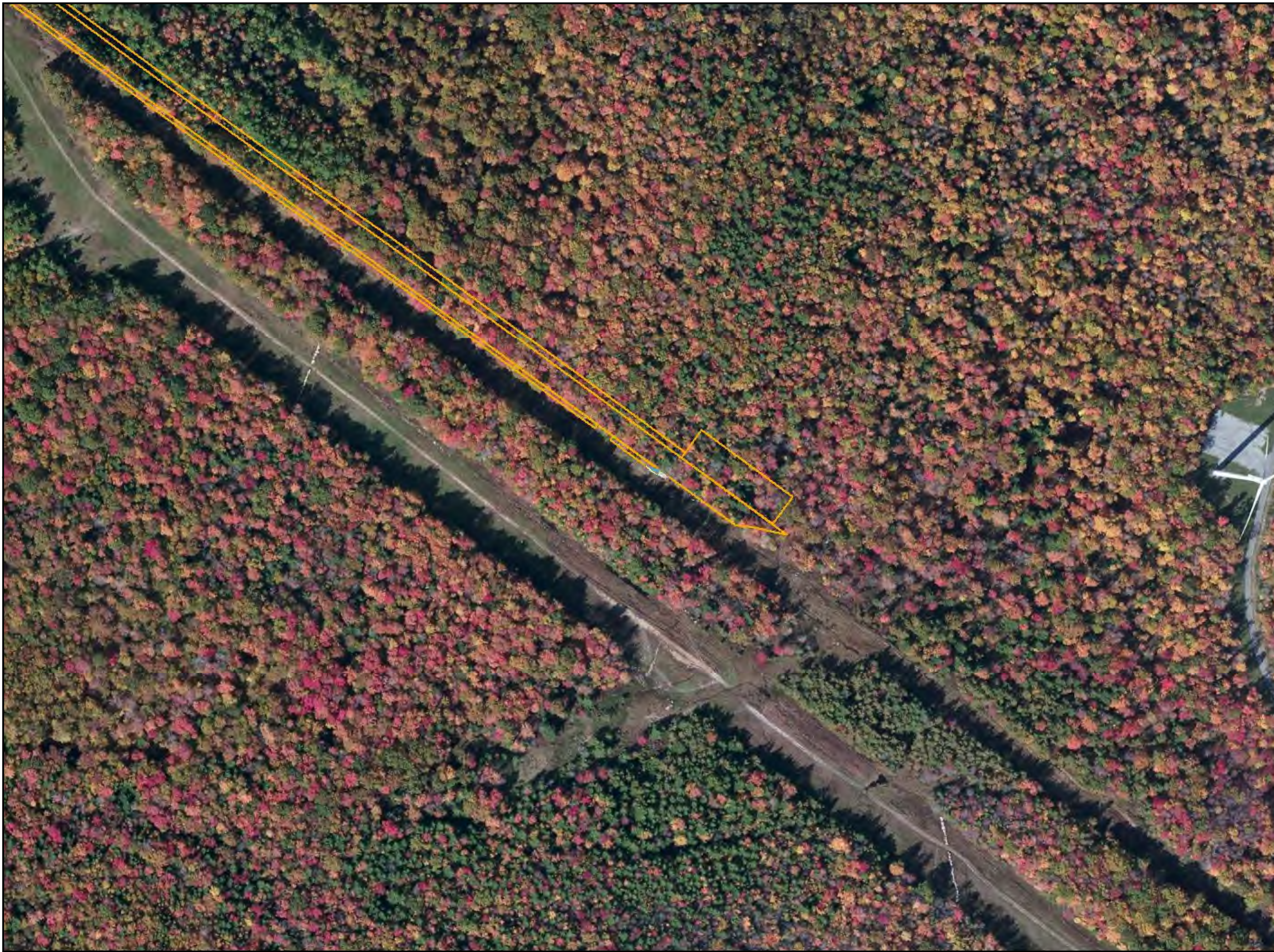
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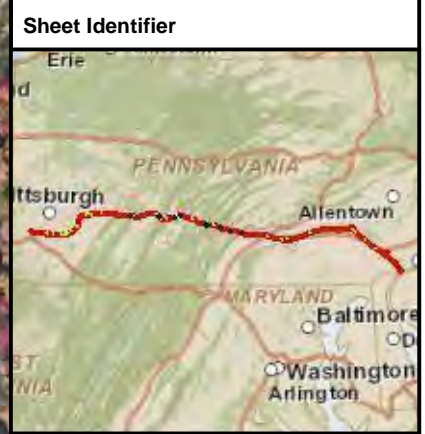
**FIGURE 2-2
EASTERN SMALL-FOOTED BAT**
PENNSYLVANIA PIPELINE PROJECT
NOVEMBER 20, 2015 ALIGNMENT
SUNOCO LOGISTICS, L.P.
CAMBRIA COUNTY, PA



Notes:
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- Legend**
- Eastern Small-Footed Bat Impacted Area
 - Eastern Small-Footed Bat Non-Impacted Area
 - Access Road
 - ATWS
 - Limit of Disturbance



**FIGURE 2-3
EASTERN SMALL-FOOTED BAT**

**PENNSYLVANIA PIPELINE PROJECT
NOVEMBER 20, 2015 ALIGNMENT
SUNOCO LOGISTICS, L.P.
CAMBRIA COUNTY, PA**



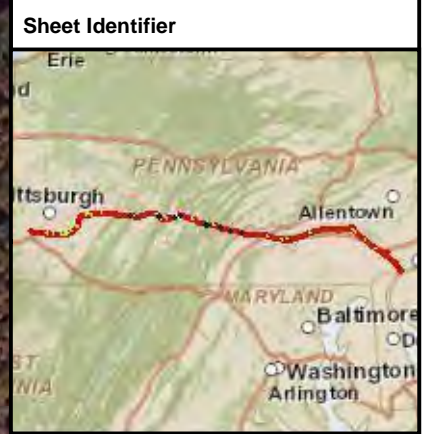
Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2011 ESRI and its data suppliers).

PGH_P015\SUNOCO\MARINER EAST 2\MXD\PENNSYLVANIA_PIPELINE_ESMALLFOOTEDBAT.MXD 01/06/16 GIS



Legend

- Eastern Small-Footed Bat Impacted Area
- Eastern Small-Footed Bat Non-Impacted Area
- Access Road
- ATWS
- Limit of Disturbance



**FIGURE 2-4
EASTERN SMALL-FOOTED BAT**

**PENNSYLVANIA PIPELINE PROJECT
NOVEMBER 20, 2015 ALIGNMENT
SUNOCO LOGISTICS, L.P.
BLAIR COUNTY, PA**



Notes:
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- Legend**
- Eastern Small-Footed Bat Impacted Area
 - Eastern Small-Footed Bat Non-Impacted Area
 - Access Road
 - ATWS
 - Limit of Disturbance

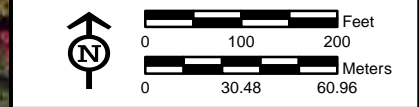


FIGURE 2-5
EASTERN SMALL-FOOTED BAT
 PENNSYLVANIA PIPELINE PROJECT
 NOVEMBER 20, 2015 ALIGNMENT
 SUNOCO LOGISTICS, L.P.
 BLAIR COUNTY, PA



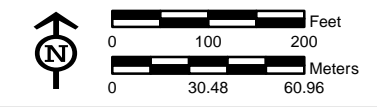
Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2011 ESRI and its data suppliers).



Legend

- Eastern Small-Footed Bat Impacted Area
- Eastern Small-Footed Bat Non-Impacted Area
- Access Road
- ATWS
- Limit of Disturbance

Sheet Identifier



**FIGURE 2-6
EASTERN SMALL-FOOTED BAT**
PENNSYLVANIA PIPELINE PROJECT
NOVEMBER 20, 2015 ALIGNMENT
SUNOCO LOGISTICS, L.P.
HUNTINGDON COUNTY, PA



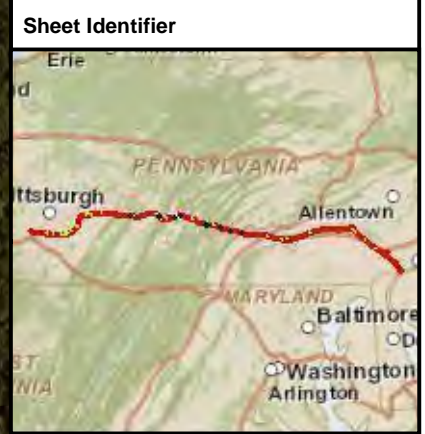
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PGH_P015\SUNOCO\MARINER EAST 2\MXD\PENNSYLVANIA_PIPELINE_ESMALLFOOTEDBAT.MXD 01/06/16 GIS



Legend

- Eastern Small-Footed Bat Impacted Area
- Eastern Small-Footed Bat Non-Impacted Area
- Access Road
- ATWS
- Limit of Disturbance

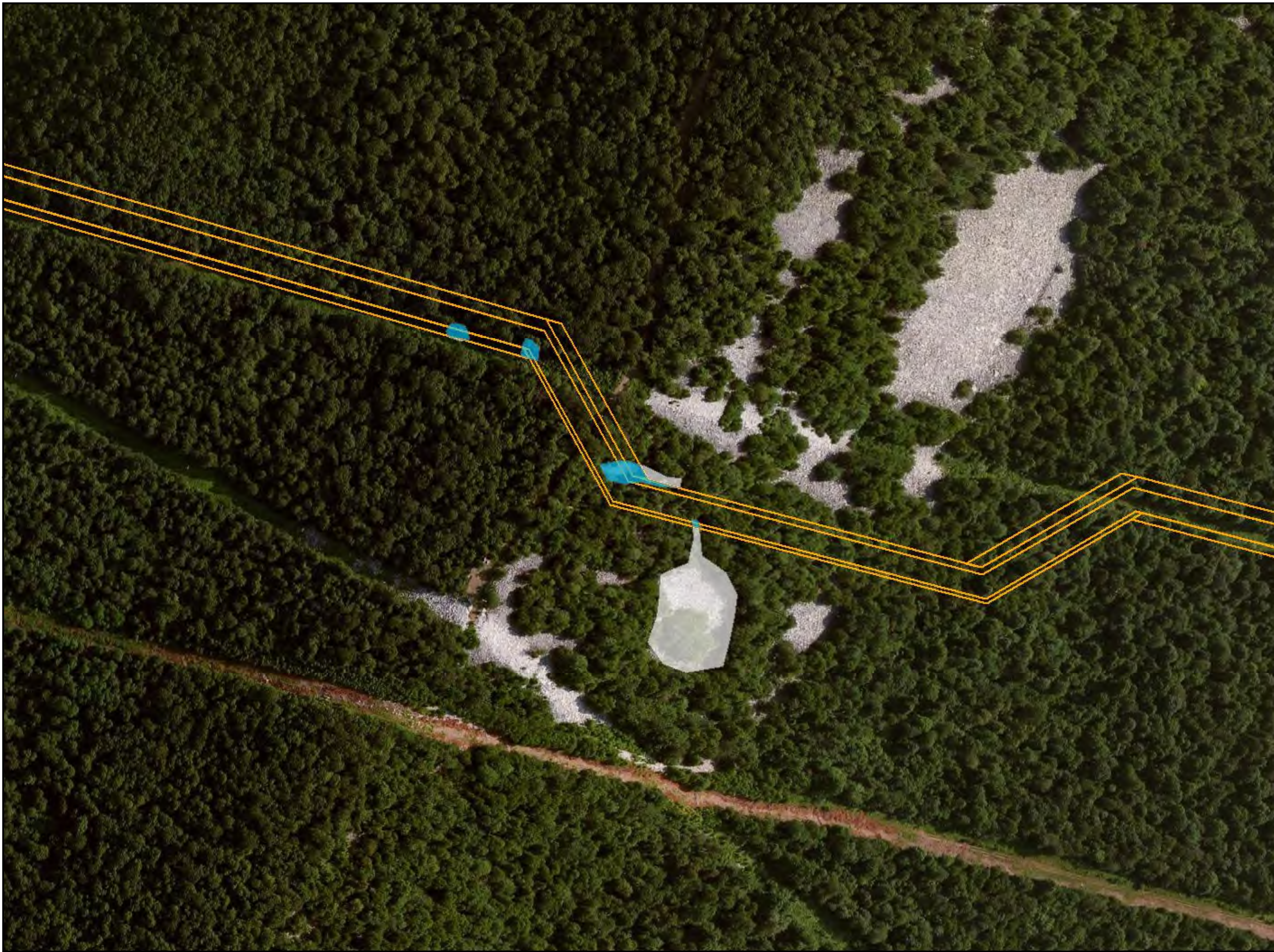


**FIGURE 2-7
EASTERN SMALL-FOOTED BAT**
PENNSYLVANIA PIPELINE PROJECT
NOVEMBER 20, 2015 ALIGNMENT
SUNOCO LOGISTICS, L.P.
HUNTINGDON COUNTY, PA



Notes:
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Legend

- Eastern Small-Footed Bat Impacted Area
- Eastern Small-Footed Bat Non-Impacted Area
- Access Road
- ATWS
- Limit of Disturbance

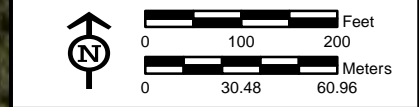


FIGURE 2-8
EASTERN SMALL-FOOTED BAT
 PENNSYLVANIA PIPELINE PROJECT
 NOVEMBER 20, 2015 ALIGNMENT
 SUNOCO LOGISTICS, L.P.
 HUNTINGDON COUNTY, PA



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Legend

- Eastern Small-Footed Bat Impacted Area
- Eastern Small-Footed Bat Non-Impacted Area
- Access Road
- ATWS
- Limit of Disturbance

Sheet Identifier

Feet
 0 100 200

Meters
 0 30.48 60.96

FIGURE 2-9
EASTERN SMALL-FOOTED BAT
 PENNSYLVANIA PIPELINE PROJECT
 NOVEMBER 20, 2015 ALIGNMENT
 SUNOCO LOGISTICS, L.P.
 PERRY COUNTY, PA



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 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2011 ESRI and its data suppliers).

PGH_P015\SUNOCO\MARINER_EAST_2M\XDIPENPIPELINE_ESMALLFOOTEDBAT.MXD 01/06/16 GIS



Legend

- Eastern Small-Footed Bat Impacted Area
- Eastern Small-Footed Bat Non-Impacted Area
- Access Road
- ATWS
- Limit of Disturbance



**FIGURE 2-10
EASTERN SMALL-FOOTED BAT**
PENNSYLVANIA PIPELINE PROJECT
NOVEMBER 20, 2015 ALIGNMENT
SUNOCO LOGISTICS, L.P.
PERRY COUNTY, PA



Notes:
1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2011 ESRI and its data suppliers).

APPENDIX A

Agency Coordination

From: [Taucher, John](#)
To: [Smith, Preston](#)
Subject: RE: Pennsylvania Pipeline Project
Date: Tuesday, October 27, 2015 8:40:46 AM
Attachments: [2014 Eastern Small-footed Bat Roost Structures and Examples_081214.pdf](#)

Preston,

Attached, please find a guidance for the alternate roost structures for small-footed bats and some example photographs. Please note that the size of each structure is flexible, it should fit into the area and be constructed properly with adequate sun exposure. Generally these should be constructed as close to the actual impacts as possible, however they can be aggregated in some instances. Based on the shapefiles that delineated the small-footed habitat, it appears 1.7 acres of suitable habitat will be impacted. A mitigation rate of 3:1 will be implemented which yields 5 acres. Four structures are to be constructed per acre of impact which leaves a total of 20 structures for the project.

In addition, monitoring will be required for replacement structures in the form of emergence counts. Three years of monitoring or until small-footed bat use is documented, whichever comes first (i.e. if bats are found using it the first year, no further monitoring is required).

Regarding the woodrat, constructing habitat similar to the small-footed bat roost structures (just with larger crevices) and/or supplemental plantings would be sufficient for mitigation.

John

From: Smith, Preston [mailto:Preston.Smith@tetrattech.com]
Sent: Monday, October 26, 2015 2:53 PM
To: Taucher, John <jotaucher@pa.gov>
Subject: RE: Pennsylvania Pipeline Project

Hi John,

Thanks for sending this. Do you have any examples of approved mitigation plans for small-footed bats or Allegheny woodrats that I could use as a guide?

I also got your letter for the mussels, fish, and redbelly turtle.

Thanks again,

Preston

Preston Smith | Manager, Wetlands and Ecological Services Department

Direct: 412.921.8167 | Main: 412.921.7090 | Cell: 724.516.6842 | Fax: 412.921.4040

preston.smith@tetrattech.com

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From: Taucher, John [<mailto:jotaucher@pa.gov>]
Sent: Monday, October 26, 2015 1:45 PM
To: Smith, Preston <Preston.Smith@tetrattech.com>
Subject: Pennsylvania Pipeline Project

Preston,

I am working on updating the PGC's PNDI response letter regarding the Pennsylvania Pipeline Project based on the small-footed bat and woodrat information you provided. Regarding the eastern small-footed bats, suitable bat roosting habitat was identified and delineated within the proposed project.

From here there are two options:

- 1) Small-footed bat use can be assumed, in which case there will be a seasonal restriction on the suitable habitat and any impacts to the habitat will need to be mitigated for.
- 2) Verify small-footed bat use at suitable habitat through emergence counts. Seasonal restriction and mitigation will be required for any habitat that small-footed bat use is verified only. All other areas there will be no restrictions or mitigation.

Regarding Allegheny woodrats, mitigation will only be required for impacts to sites where woodrat sign was found. Woodrat sign was found at four locations along the proposed pipeline. One location is located on State Forest property which will require coordination with DCNR.

A mitigation plan for both small-footed bats and woodrats will need to be submitted and approved by the PGC prior to issuing a resolution letter. If you have any questions, please do not hesitate to contact me.

Thanks,

John Taucher

Pennsylvania Game Commission

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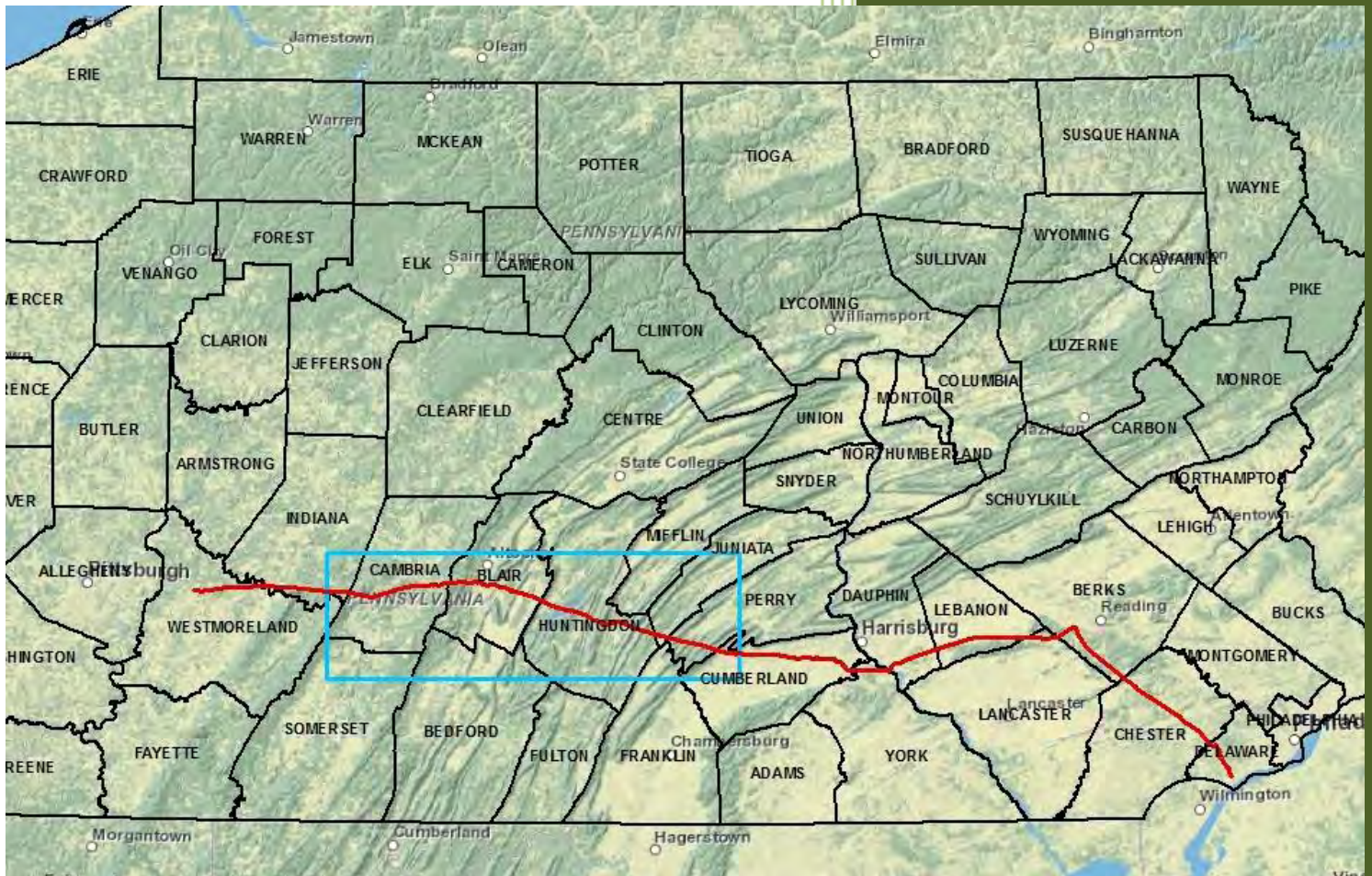
APPENDIX B
Allegheny Woodrat and Eastern Small-Footed Bat Survey
Report

Allegheny Woodrat and Eastern Small-footed Bat Habitat Survey Report

Pennsylvania Pipeline Project

for

Sunoco Pipeline, LP



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Executive Summary

This report is submitted to Sunoco Pipeline, LP (Sunoco) for habitat surveys for Allegheny woodrat (*Neotoma magister*—PA Threatened) and Eastern small-footed bat (*Myotis leibii*—PA Threatened) at the proposed Pennsylvania Pipeline Project. Following a Pennsylvania Natural Diversity Inventory (PNDI) Large Project review (PGC ID Number: 201312180001, Dated March 14, 2014—App. I), the Pennsylvania Game Commission (PGC) identified a potential impact from this project on these species and requested surveys for habitat within 17 areas (10 woodrat only, 1 small-footed bat only and 6 woodrat and small-footed bat) along the proposed pipeline corridor located within parts of Indiana, Cambria, Blair, Huntingdon, Perry, and Cumberland Counties in Pennsylvania. In addition, Wildlife Specialists surveyed for woodrat and small-footed bat habitat along the Altoona Bypass portion of the proposed pipeline.

Between June 23 and July 24, 2014 and April 15-28, 2015, Wildlife Specialists, LLC conducted surveys for suitable Allegheny woodrat and Eastern small-footed bat habitat in the above-mentioned areas identified by PGC, including a 200-meter buffer on the proposed/potential limits of disturbance (LOD). Wildlife Specialists, LLC followed the PGC NEOTOMA MAGISTER (=NEMA) HABITAT SITE SURVEY CODE MANUAL (Revision Date 02/20/2009). Habitat within the survey areas varied from mature deciduous forest with high canopy closure and various rocky habitat types to large open talus slopes.

Suitable woodrat habitat was found within all of the completed habitat areas with 4 of the 17 containing evidence of occupation by woodrats within the past five years. Evidence of woodrat occupation included new and old midden-caches, latrines and nests. All of the completed areas contained suitable small-footed bat roosting habitat, and one small-footed bat was observed flying out from under a rock along the pipeline right-of-way on Shade Mountain. In addition, two potential woodrat habitat areas (Altoona Bypass 1 & Altoona Bypass 2) and numerous potential small-footed bat roosting habitat was observed along the Altoona Bypass portion of the proposed pipeline.

Introduction

Sunoco is in the planning and routing stage for its proposed Pennsylvania Pipeline Project (Project), a natural gas pipeline that would stretch from Westmoreland County in western Pennsylvania to Delaware County in the east. Wildlife Specialists, LLC was contracted to complete surveys for suitable rocky habitat for Allegheny woodrat (*Neotoma magister*—PA Threatened) and/or Eastern small-footed bat (*Myotis leibii*—PA Threatened) within 17 areas along the proposed Project corridor that were identified by PGC in their March 14, 2014 Pennsylvania Natural Diversity Inventory (PNDI) Large Project review response (PGC ID Number: 201403110501) (App. I). The Allegheny woodrat and Eastern small-footed bat survey areas were concentrated in the mountainous areas of Indiana, Cambria, Blair, Huntingdon, Perry, and Cumberland Counties crossing through the *Allegheny Mountain* and *Allegheny Front Sections* of the *Appalachian Plateaus Physiographic Province* and the *Appalachian Mountain Section of the Ridge and Valley Physiographic Province* (Figs. 1 & 2). In addition, due to subsequent route changes, Wildlife Specialists was also asked to complete surveys along the entire Altoona Bypass portion of the proposed pipeline. We conducted surveys following PGC protocols and guidance between June 23 and July 24, 2014 and April 15-28, 2015.

Although species surveys were conducted concurrently and there is much overlap between the potential woodrat and small-footed bat habitat, this document is divided into separate reports for each species. Each report is organized by survey area and findings beginning at the westernmost survey area for each species (Laurel Ridge 2 for woodrats and Laurel Ridge 3 for small-footed bats) and proceeding to the easternmost survey area for each species (Blue Mountain for woodrats and Conococheague Mountain for small-footed bats).

Survey Goals

The goal of these surveys was to search the areas identified through Environmental Review along the proposed Project for potential *Neotoma magister* habitat and *Myotis leibii* summer roosting habitat to document any such occurrences so that impacts to these resources can be avoided, minimized, or mitigated for in accordance with requirements of the Pennsylvania Game Commission.



Figure 1. Location of Sunoco's proposed Pennsylvania Pipeline Project (east end), Indiana, Cambria, and Blair Counties, Pennsylvania, showing the locations of Allegheny woodrat (*Neotoma magister*) and Eastern small-footed bat (*Myotis leibii*) survey areas.



Figure 2. Location of Sunoco's proposed Pennsylvania Pipeline Project (west end), Huntingdon, Perry, and Cumberland Counties, Pennsylvania, showing locations of Allegheny woodrat (*Neotoma magister*) and Eastern small-footed bat (*Myotis leibii*) survey areas.

Allegheny Woodrat Habitat Survey Report

The Pennsylvania Game Commission identified 16 areas of concern for Allegheny woodrats along the proposed Project (Table 1). These survey areas are predominantly mature forested ridge/valley-side habitats within the Ridge and Valley Province (n=14) or Appalachian Plateaus Province (n=4). In addition to these requested habitat areas, Wildlife Specialists was also contracted to survey the Altoona Bypass portion of the proposed pipeline. All of the completed survey areas contained suitable woodrat habitat as well as two areas along the Altoona Bypass survey corridor portion of the proposed pipeline. Of the total areas surveyed, four contained evidence of occupation by woodrats within the past 5 years.

Table 1. Summary of Allegheny woodrat (*Neotoma magister*) survey areas along Sunoco’s proposed Pennsylvania Pipeline Project, identified in the Pennsylvania Game Commission’s Large Project Environmental Review response letter, dated March 14, 2014.

Survey Area ID	County	Physiographic Province^a	Woodrat Conservation Management Unit
Laurel Ridge 2	Indiana	AMAP	Chestnut/Laurel Ridges (CRLR)
Laurel Ridge 3	Cambria	AMAP	Chestnut/Laurel Ridges (CRLR)
Laurel Ridge 1	Cambria	AMAP	Chestnut/Laurel Ridges (CRLR)
Altoona Bypass 1	Blair	AFAP	Allegheny Front West (ALFW)
Altoona Bypass 2	Blair	AFAP	Allegheny Front West (ALFW)
Jacks Mountain 1	Huntingdon	APRV	Allegheny Front East (ALFE)
Jacks Mountain 2	Huntingdon	APRV	Allegheny Front East (ALFE)
Jacks Mountain 3	Huntingdon	APRV	Allegheny Front East (ALFE)
Blacklog Mountain	Huntingdon	APRV	Blacklog Mountain (BLAC)
Shade Mountain	Huntingdon	APRV	Raystown Branch (RAYS)
Tuscarora Mountain	Perry	APRV	Tuscarora/Blue Mts. (TUBL)
Conococheague Mountain	Perry	APRV	Tuscarora/Blue Mts. (TUBL)
Bowers Mountain 1	Perry	APRV	Tuscarora/Blue Mts. (TUBL)
Bowers Mountain 2	Perry	APRV	Tuscarora/Blue Mts. (TUBL)
Middle Ridge	Perry	APRV	Tuscarora/Blue Mts. (TUBL)
Blue Mountain	Perry, Cumberland	APRV	Tuscarora/Blue Mts. (TUBL)

^a AMAP = Allegheny Mountain Section of Appalachian Plateau Physiographic Province

AFAP = Allegheny Front Section of Appalachian Plateau Physiographic Province

APRV = Appalachian Mountain Section of Ridge and Valley Physiographic Province

Survey Methods and Findings

We conducted Allegheny woodrat surveys following the guidance of the PGC's NEOTOMA MAGISTER (=NEMA) HABITAT SITE SURVEY CODE MANUAL (Revision Date 02/20/2009). We completed ALLEGHENY NEMA HABITAT SITE SURVEY (FORM PGC 4150 wdrat) for any occurrence of suitable habitat (App. II). We searched rock habitat features for woodrat latrine (toilet) sites, food caches, and nests. Allegheny woodrat *Activity Centers* (AC's) or *Potential Activity Centers* (PACs), as defined in the NEOTOMA MAGISTER (=NEMA) HABITAT SITE SURVEY CODE MANUAL, were GPS'd and any observed woodrat sign was recorded. Digital photographs were taken of all ACs and PACs as well as representative habitat throughout the survey area (App. III). ACs and PACs are numbered to coincide with the survey area and row on page 3 of the corresponding data form (FORM PGC 4150 wdrat-App. II). Detailed information on topographic and vegetative characteristics of each survey area and potential habitat was also recorded.

Laurel Ridge 2

The Laurel Ridge 2 survey area is a 34.5 ac (13.9 ha) area of mostly mature forest. The site is located on the south-east facing side of Laurel Ridge. The survey corridor is approximately 0.75mi (1.2 km) north of the Findley Run Reservoir with central coordinates at 78°57'27.1"W, 40°25'51.2"N. Elevations within the site range from approximately 1,660ft – 1,680ft (506m-512m) above mean sea level. The survey area is found within the Chestnut/Laurel Ridges (CRLR) Woodrat Conservation Management Unit. Tree and sapling species include black birch (*Betula lenta*), chestnut oak (*Quercus montana*), red maple (*Acer rubrum*), and hemlock (*Tsuga canadensis*). The understory is dominated by greenbriar (*Smilax rotundifolia*), lowbush blueberry (*Vaccinium angustifolium*, *V. pallidum*), black huckleberry (*Gaylussacia baccata*), scrub oak (*Quercus ilicifolia*), rhododendron (*Rhododendron* ssp.), bracken fern (*Pteridium gloditsch*), woodfern (*Dryopteris* spp.), hay-scented fern (*Dennstaedtia punctilobula*), sedges (*Carex* ssp.) and grasses. Canopy cover throughout most of the survey area was 75% or greater.

Findings

A small portion of the Laurel Ridge 2 site (2.8 ac) was considered potential woodrat habitat. The habitat was comprised of outcrops with deep crevices (2-5m) with numerous overhangs, crevices, and "caves" (App. III, Photo Map 1). One PAC was identified based on overall quality of rocky habitat; however no sign of woodrat presence was observed (Fig. 3).

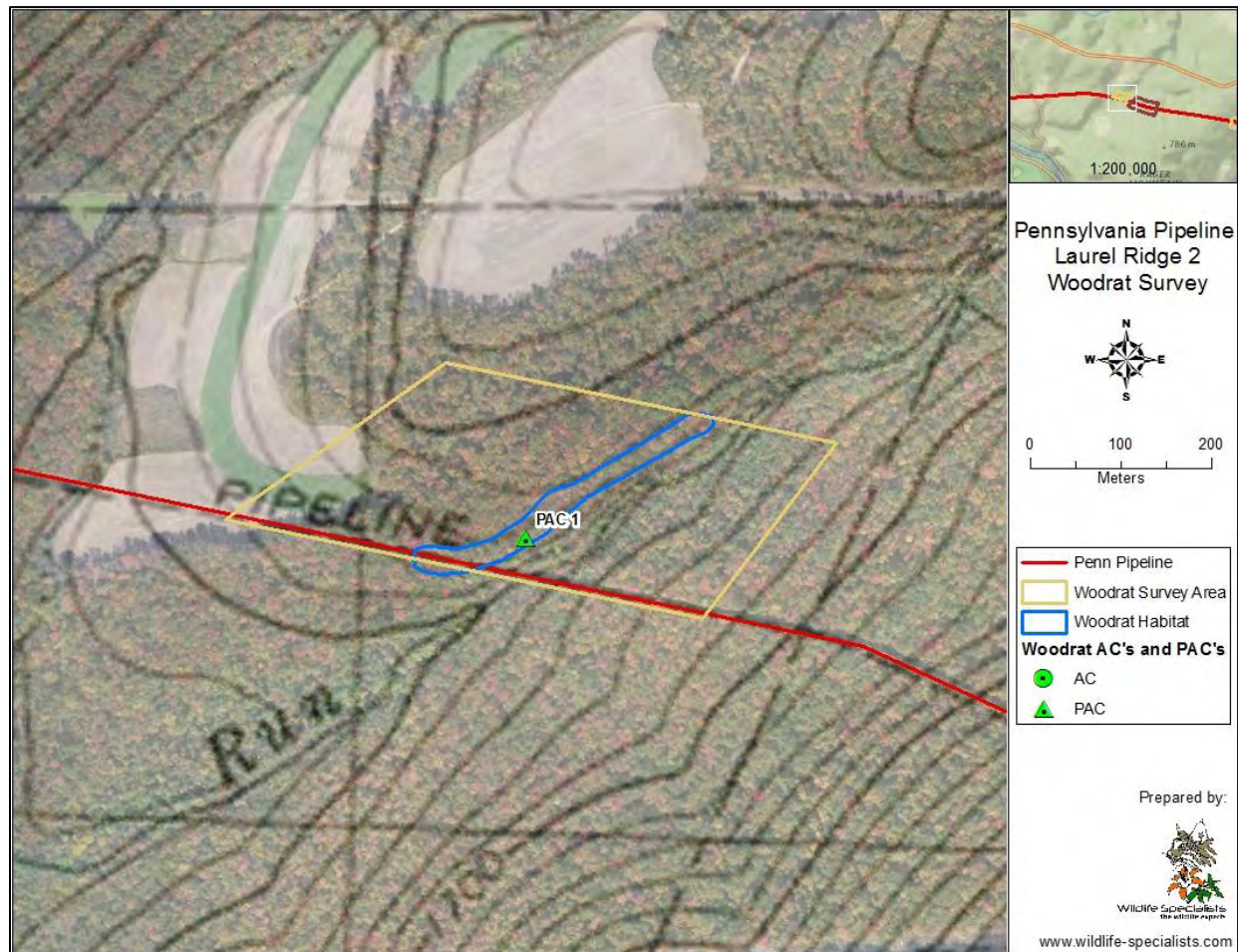


Figure 3. Location of rocky habitats, and Allegheny woodrat Potential Activity Centers (PACs) at the Laurel Ridge 2 survey area along the proposed Pennsylvania Pipeline Project, East Wheatfield Twp., Indiana County Pennsylvania, July, 2014.

Laurel Ridge 3

The Laurel Ridge 3 survey area is 120 ac (48 ha) of mostly mature forest located on the north facing side of Laurel Ridge. The survey corridor is approximately 1.3 km south of US Route 22 with central coordinates at 78°56'49.93"W, 40°25'39.77"N. Elevations within the site range from approximately 1,800ft – 2,140ft above mean sea level. The survey area is found within the Chestnut/Laurel Ridges (CRLR) Woodrat Conservation Management Unit. Tree and sapling species include black birch, red (*Quercus rubra*) and chestnut oak, red maple, sugar maple, hemlock, sassafras (*Sassafras albidum*), black cherry (*Prunus serotina*), black gum (*Nyssa sylvatica*), yellow birch (*Betula allegheniensis*), and white ash (*Fraxinus americana*). The understory is dominated by lowbush blueberry, black huckleberry, witch-hazel (*Hamamelis virginiana*), greenbriar, rhododendron, striped maple (*Acer pensylvanicum*), blackberry (*Rubus allegheniensis*), mountain laurel (*Kalmia latifolia*), wood fern, hay-scented fern,

bracken fern, teaberry (*Gaultheria procumbens*), sedges and grasses. Canopy cover throughout most of the survey area was 75% or greater, except for the small portion of survey area within the power line right-of-way (ROW).

Findings

Approximately 16 ac (6 ha) of the Laurel Ridge 3 survey area was considered potential woodrat habitat. Much of the habitat was considered high potential, and comprised of large boulders and outcrops with deep crevices (App. III, Photo Maps 2-3). Primary rocky habitat types consisted of outcrops and cliffs (2-7m) with numerous overhangs and crevices, and talus (1-5m) with deep interstices. Flora found on the site produce ideal food sources of hard and soft mast. Four PACs were identified based on overall quality of rocky habitat; however no sign of woodrat presence was observed (Fig. 4).

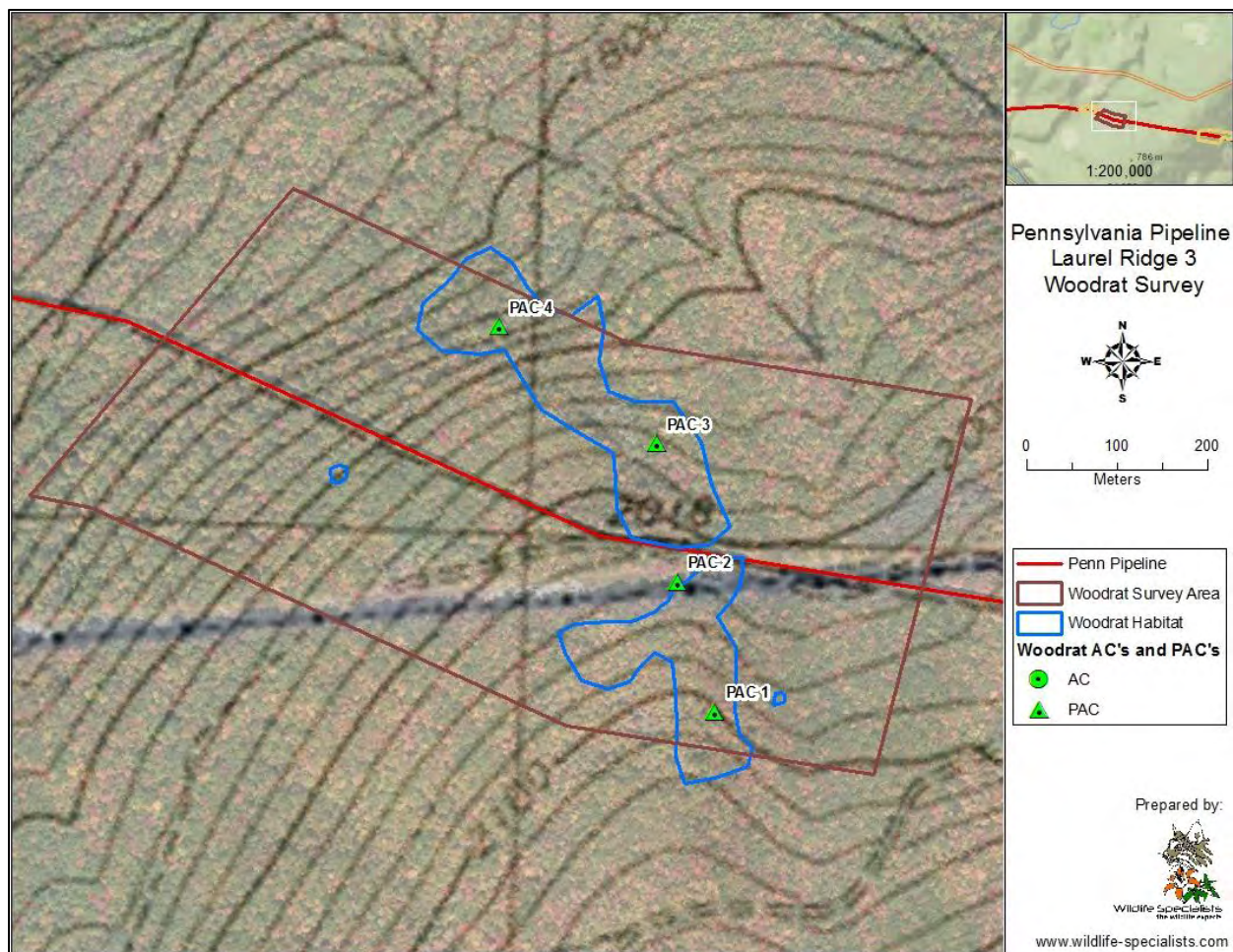


Figure 4. Locations of rocky habitats, and Allegheny woodrat Potential Activity Centers (PACs) at the Laurel Ridge 3 survey area along the proposed Pennsylvania Pipeline Project, Jackson Twp., Cambria County Pennsylvania, July, 2014.

Laurel Ridge 1

The Laurel Ridge 1 survey area is 123 ac (49 ha) of mostly mature forest located on the southeast facing side of Laurel Ridge. The survey corridor is approximately 1.4 km south of US Route 22 with central coordinates at 78°54'18.58"W, 40°25'20.97"N. Elevations within the site range from approximately 1990ft – 2,280ft above mean sea level. The survey area is found within the Chestnut/Laurel Ridges (CRLR) Woodrat Conservation Management Unit. Tree species include black birch, red oak, red maple, and sugar maple. The understory is dominated by witch-hazel, mountain laurel, woodfern, hay-scented fern, greenbriar, blackberry, striped maple, and teaberry. The survey area was intersected by the pipeline corridor and bordered a dirt road to the east. The survey area also contained two deer enclosure fences. Canopy cover throughout most of the survey area was 85% or greater.

Findings

Approximately 15.5 ac (6 ha) of the Laurel Ridge 1 survey area was considered potential woodrat habitat. Much of the habitat was comprised of large boulders and outcrops with deep crevices and considered high potential (App. III, Photo Maps 4-5). Primary rocky habitat types consisted of outcrops and cliffs (2-7m) with numerous overhangs, crevices, and “caves”; and talus (1-5+m) with deep interstices. Flora found on the site produce ideal food sources of hard and soft mast. Four (4) PACs were identified based on overall quality of rocky habitat; however no sign of woodrat presence was observed (Fig. 5).

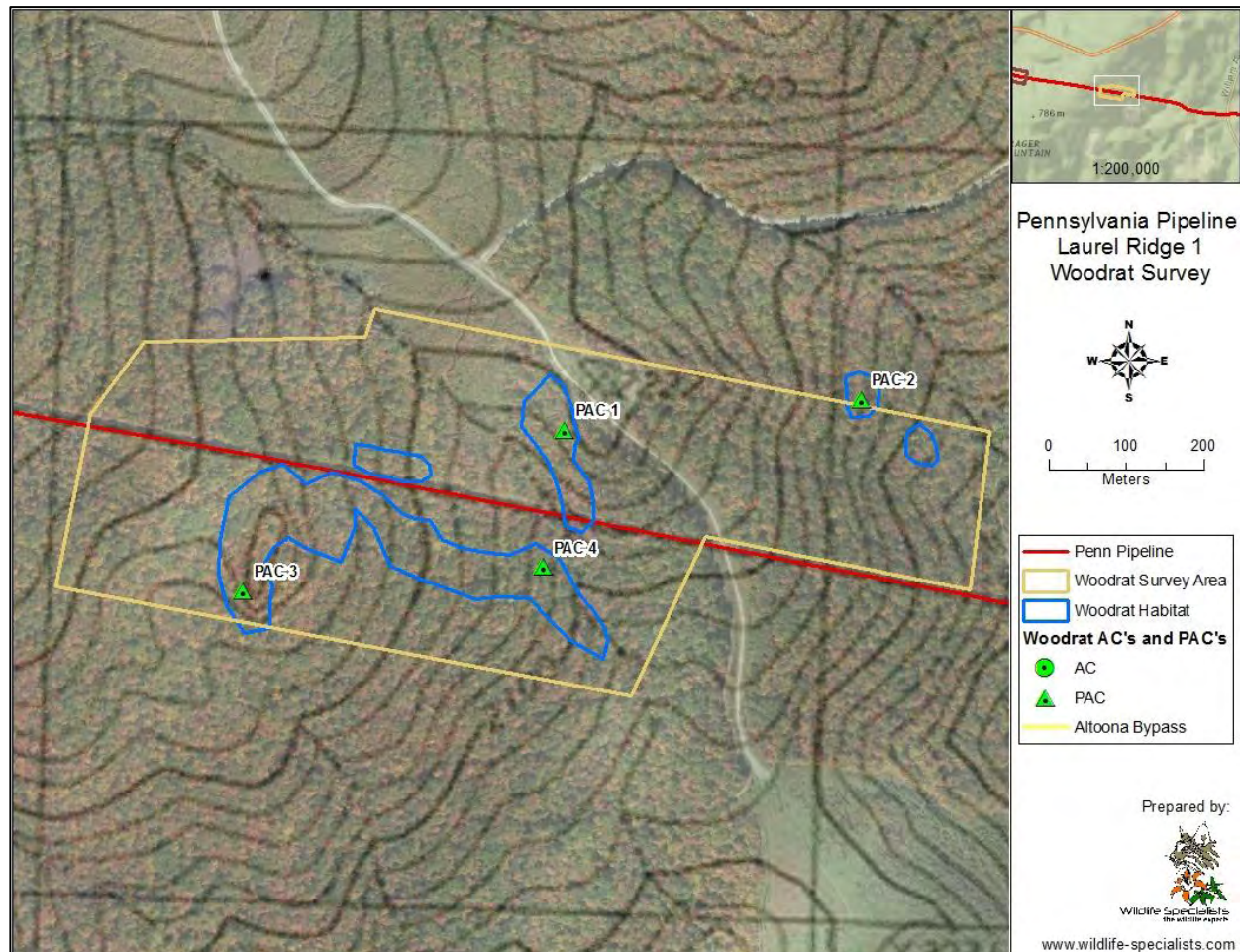


Figure 5. Locations of rocky habitats and Allegheny woodrat Potential Activity Centers (PACs) at the Laurel Ridge 1 survey area along the proposed *Pennsylvania Pipeline Project*, Jackson Twp., Cambria County, Pennsylvania, July, 2014.

Altoona Bypass

The Altoona Bypass survey area is a 17.4mi long corridor of a variety of mostly mountainous forestland and agricultural areas north and south of and including existing pipeline and power line corridors. Approximate coordinates of the Altoona Bypass are 41°26'40.741"N , 78°35'56.516"W (west end) and 40°26'52.046"N, 78°19'17.613"W (east end). Elevations within the site range from approximately 900ft – 2,640ft above mean sea level.

Findings

Altoona Bypass 1

The Altoona Bypass 1 habitat area (Fig. 6) is 0.12 ac of mostly mature forest adjacent to and north of the pipeline corridor. The site is located on the steep east facing side of a tributary of Dry Run. The habitat area is approximately 1.8 km west of the town of Foot of Ten with central coordinates at 78°29'4.06"W, 40°24'18.91"N. Elevations within the site range from approximately 1,500ft – 1,520ft above mean sea level. The habitat area is found within the Allegheny Front West (ALFW) Woodrat Conservation Management Unit. Tree and sapling species include black cherry, red oak, red maple, and white ash. The understory is dominated by Virginia creeper (*Parthenocissus quinquefolia*), lowbush blueberry, grape vine (*Vitis* spp.), woodfern, polypody fern (*Polypodium virginianum*), greenbriar, white wood aster (*Eurybia divaricata*), false solomon's seal (*Maianthemum racemosum*), goldenrod (*Solidago* spp.), grass species, and hay-scented fern. Canopy cover was 100% throughout most of the habitat area.

Surface rock consisted mainly of shaded rock outcrops that ranged in size from 1-3 m in height with few "caves" or crevices (App. III, Photo Map 6). Due to the lack of sun exposure and the relatively few crevices or deep interstices, the Altoona Bypass 1 habitat area was considered low potential woodrat habitat.

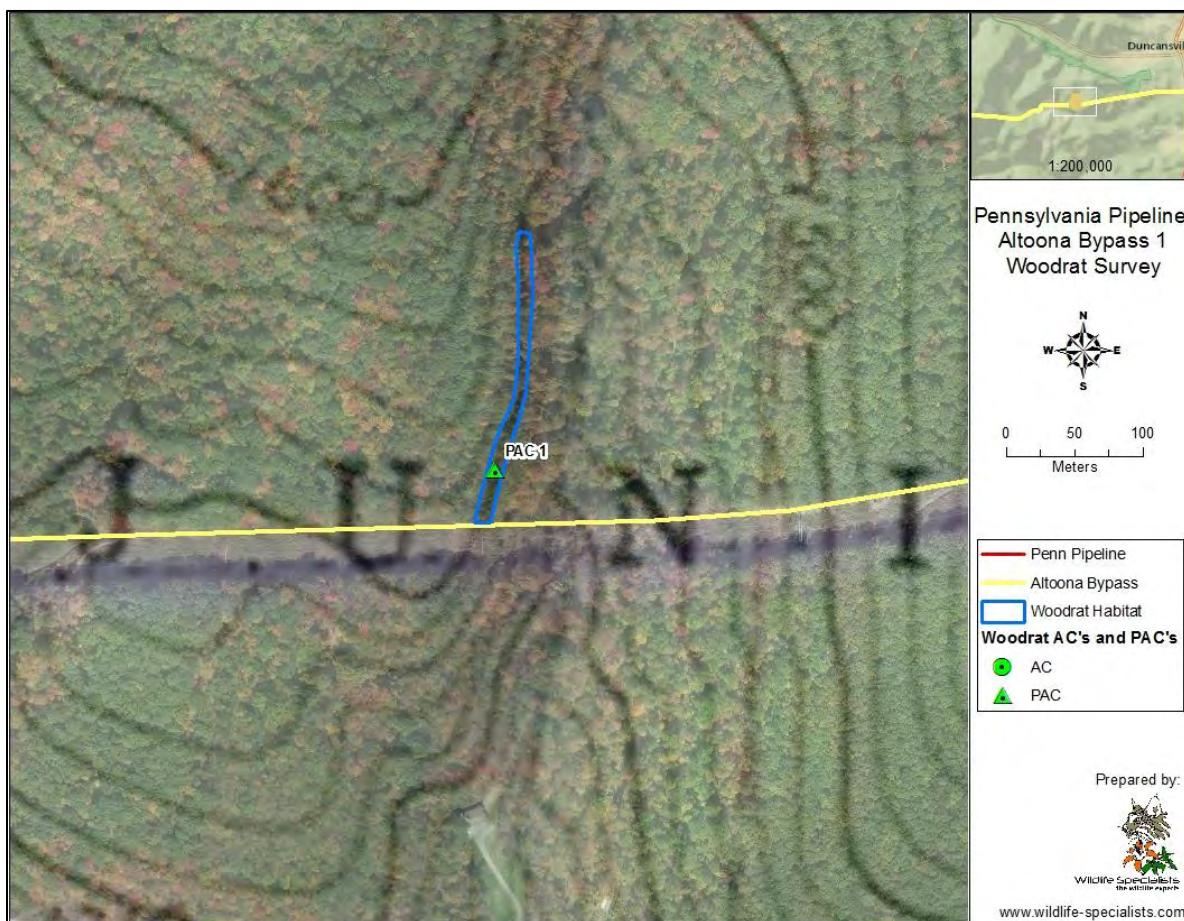


Figure 6. Locations of rocky habitat and Allegheny woodrat Potential Activity Centers (PACs) at the Altoona Bypass 1 habitat area along the proposed Pennsylvania Pipeline Project, Blair Twp., Blair County, Pennsylvania, July, 2014.

Altoona Bypass 2

The Altoona Bypass 2 habitat area is a 0.4 ac area of mostly mature forest adjacent to the pipeline corridor and located on a north northeast facing point of Catfish Ridge (Fig. 7). The habitat area is approximately 0.9 km south of the town of Duncansville with central coordinates at 78°24'37.97"W, 40°24'29.86"N. Elevations within the site range from approximately 1,340ft – 1,380ft above mean sea level. The habitat area is found within the Allegheny Front West (ALFW) Woodrat Conservation Management Unit. Tree and sapling species include red maple and American basswood (*Tilia americana*). The understory is dominated by Virginia creeper, tartarian honeysuckle (*Lonicera tatarica*), poison ivy (*Toxicodendron radicans*), white baneberry (*Actaea pachypoda*) and grasses. Canopy cover throughout most of the habitat area was 100%.

Surface rock consisted of shaded boulders with few “caves” or crevices and was considered low potential woodrat habitat. The size of the boulders was generally 0.5 to 3m in diameter (App. III, Photo Map 6).

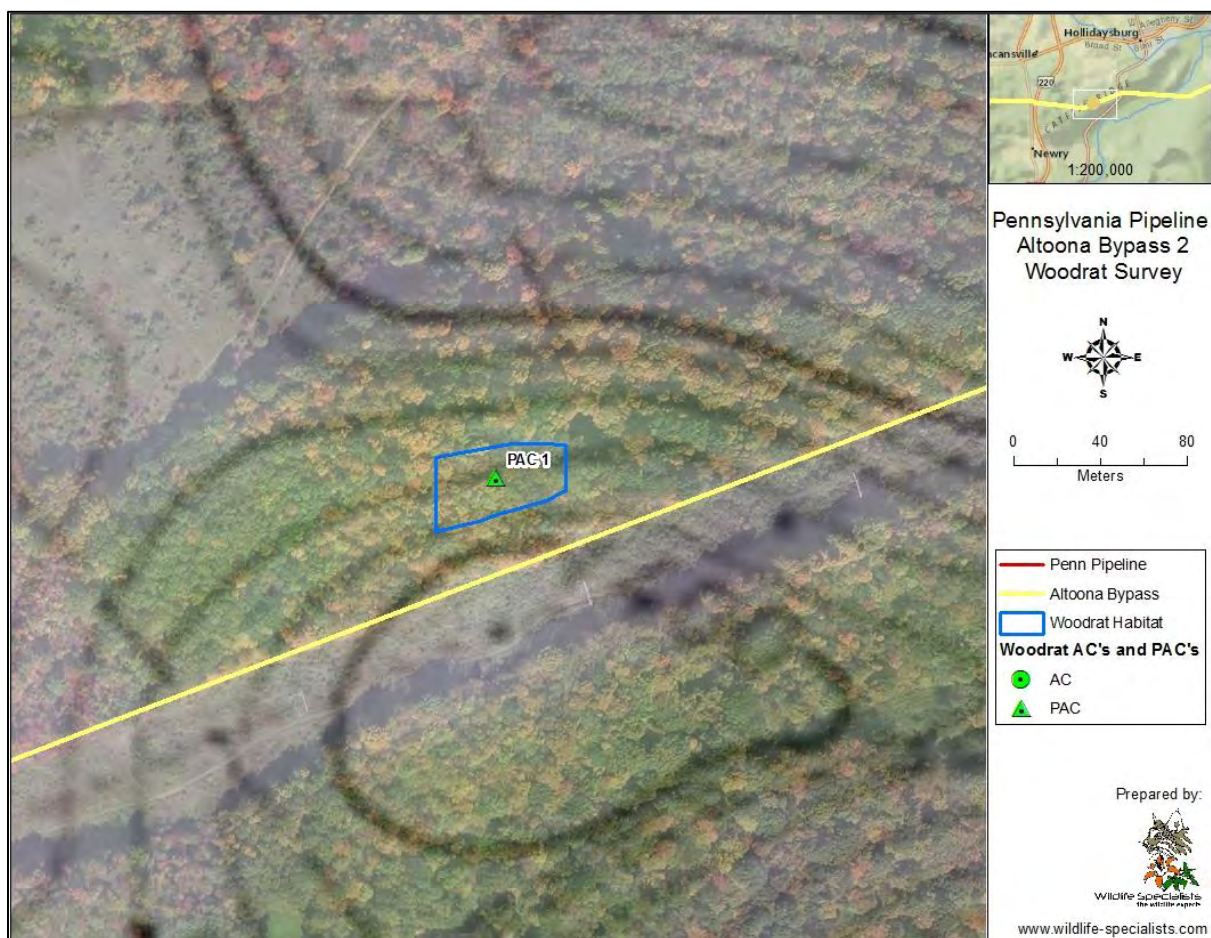


Figure 7. Locations of rocky habitat and Allegheny woodrat Potential Activity Centers (PACs) at the Altoona Bypass 2 habitat area along the proposed *Pennsylvania Pipeline Project*, Juniata Twp., Blair County, Pennsylvania, July, 2014.

Jacks Mountain 1

The Jack's Mountain 1 survey area is a 64 ac (25 ha) area of mostly mature forest, with two pipeline corridors running through it. The site is located on the steep west facing side of Jack's Mountain. The survey corridor is approximately 0.2 km east of Route 655 with central coordinates at 77°58'0.86"W, 40°21'0.97"N. Elevations within the site range from approximately 820ft – 940ft above mean sea level. The survey area is found within the Allegheny Front East (ALFE) Woodrat Conservation Management Unit. Tree and sapling species include black birch, red oak, chestnut oak, red maple, white oak (*Quercus alba*), sugar maple, and white pine (*Pinus strobus*). The understory is dominated by saplings of tree species, striped maple, greenbriar, lowbush blueberry, woodfern and polypody fern. The survey area was bordered to the north by a logging operation. Canopy cover throughout most of the survey area was 85% or greater.

Findings

A 10.3 ac (4 ha) area of the Jack's Mountain 1 survey area was considered potential woodrat habitat (App. III, Photo Map 7). The habitat was considered high potential because of the presence of large boulders and outcrops with deep crevices. Primary rocky habitat types consisted of outcrops and cliffs (2-5m) with numerous overhangs, crevices, and "caves"; and talus (1-5m) with deep interstices. Flora found on the site produce ideal food sources of hard and soft mast. Three (3) Potential Activity Centers were identified based on overall quality of rocky habitat; however no sign of woodrat presence was observed (Fig. 8).

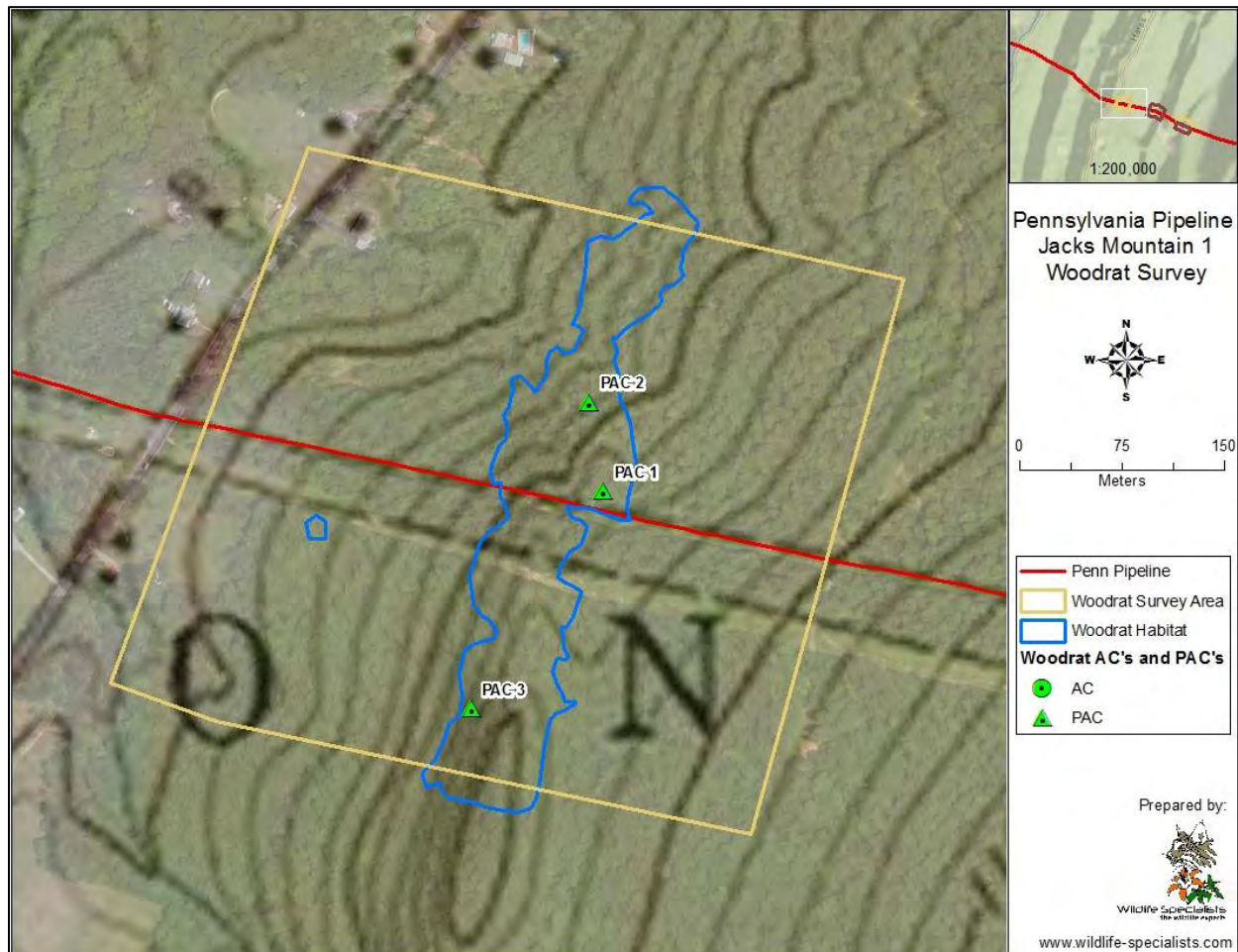


Figure 8. Locations of rocky habitats and Allegheny woodrat Potential Activity Centers (PACs) at the Jacks Mountain 1 survey area along the proposed *Pennsylvania Pipeline Project*, Union Twp., Huntingdon County Pennsylvania, July, 2014.

Jacks Mountain 2

The Jack's Mountain 2 survey area is a 71 ac (28 ha) area of mostly mature forest, with a pipeline corridor running through it. The site is located on the steep west facing side of Jacks Mountain. The survey corridor is approximately 1.1 km east of Route 655 with central coordinates at 77°57'19.28"W, 40°20'50.23"N. Elevations within the site range from approximately 1,300ft – 1,660ft above mean sea level. The survey area is found within the Allegheny Front East (ALFE) Woodrat Conservation Management Unit. Tree and sapling species include black birch, red oak, chestnut oak, red maple, and sugar maple. The understory is dominated by grape vine, blackberry and striped maple. Rocky habitat consisting of shaded and exposed boulders covered most of the survey corridor. Canopy cover throughout most of the survey area was 50%.

Findings

A 7 ac (2 ha) section of the Jacks Mountain 2 survey area was considered potential woodrat habitat. Primary rocky habitat types consisted of shaded and exposed boulders and slabs (1-3m) with numerous overhangs, crevices, and “caves”. Flora found on the site produce ideal food sources of hard and soft mast. Four (4) Potential Activity Centers were identified within the survey area based on overall quality of rocky habitat (Fig. 9). One Activity Center that contained an old midden-cache was found just northwest of the survey area. The midden-cache was found under a large slab surrounded by boulders and talus and contained acorns and Virginia creeper vines (App. III, Photo Maps 8-9).

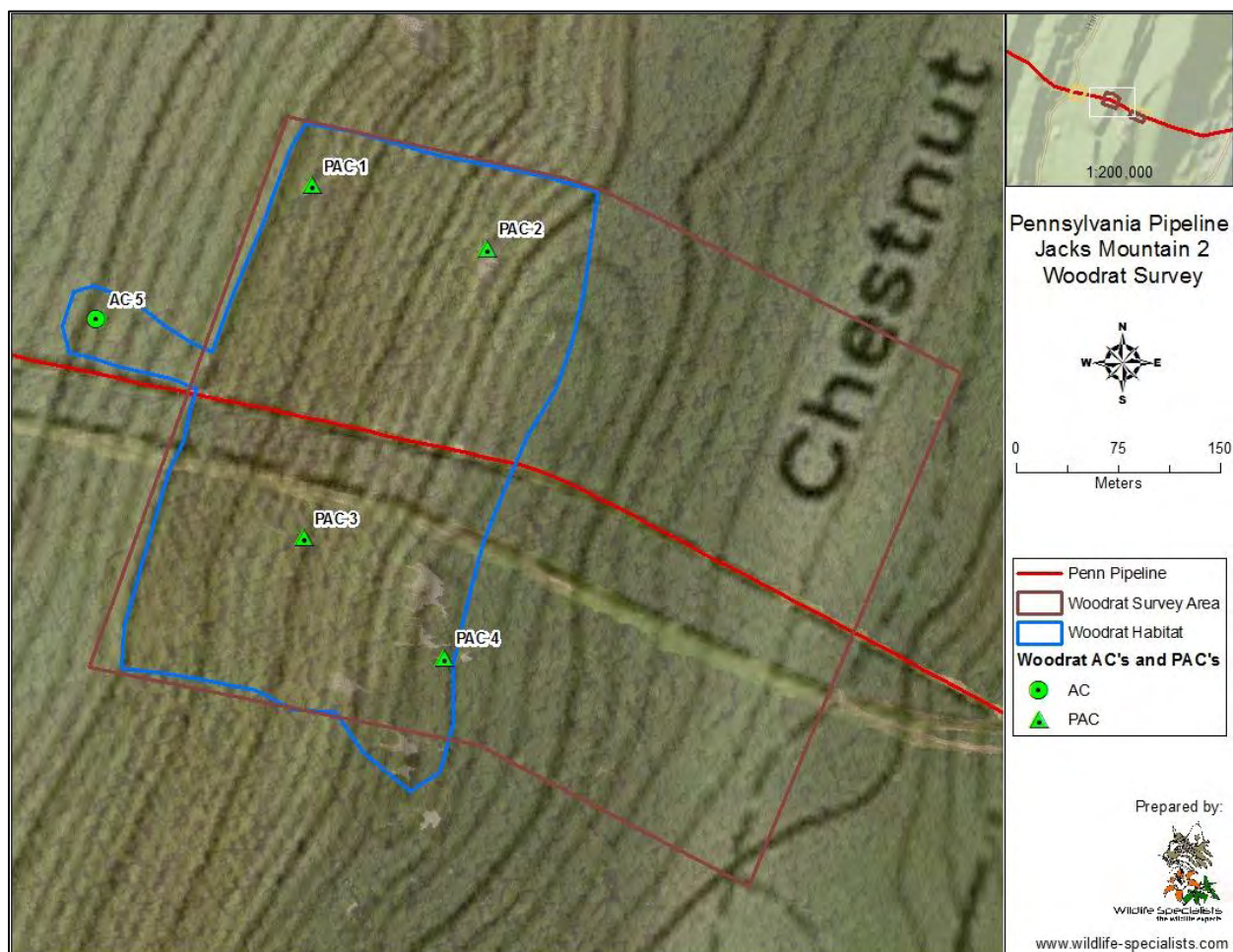


Figure 9. Locations of rocky habitats and Activity Centers (ACs) and Potential Activity Centers (PACs) at the Jacks Mountain 2 survey area along the proposed *Pennsylvania Pipeline Project*, Union Twp., Huntingdon County Pennsylvania, July, 2014.

Jacks Mountain 3

The Jack's Mountain 3 survey area is a 69 ac (27 ha) area of mostly mature forest located on the steep south facing side of Jack's Mountain. The survey corridor is approximately 2.4 km east of Route 655 with central coordinates at 77°56'34.47"W, 40°20'37.07"N. Elevations within the site range from approximately 1560ft – 1,640ft above mean sea level. The survey area is found within the Allegheny Front East (ALFE) Woodrat Conservation Management Unit and a small portion of the survey area appeared to be enhanced for woodrat habitat. Tree and sapling species include black birch, red oak, chestnut oak, red maple, and white pine. The understory is dominated by Virginia creeper, blackberry, grape vine, mountain laurel, and polypody fern. Canopy cover in approximately half of the survey area was 60%, with the remaining portions being 90% or greater.

Findings

A 13.8 ac (5 ha) section of the Jack's Mountain 3 survey area was considered high potential woodrat habitat (App. III, Photo Maps 10-11). Primary rocky habitat types consisted of shaded and open boulders (1-5m) with numerous overhangs, crevices, and "caves" and flora found on the site produce ideal food sources of hard and soft mast. Four (4) activity centers (Fig. 10) were identified that contained either an old cache, latrine, or nest. Three food caches, one toilet, and three nests were located within the survey area (App. III). Caches were found in talus consisting of 1-5m blocks and contained ferns, seeds and sticks. No fresh sign of woodrat presence was observed, but food caches and the toilet seemed to be active within the last year.

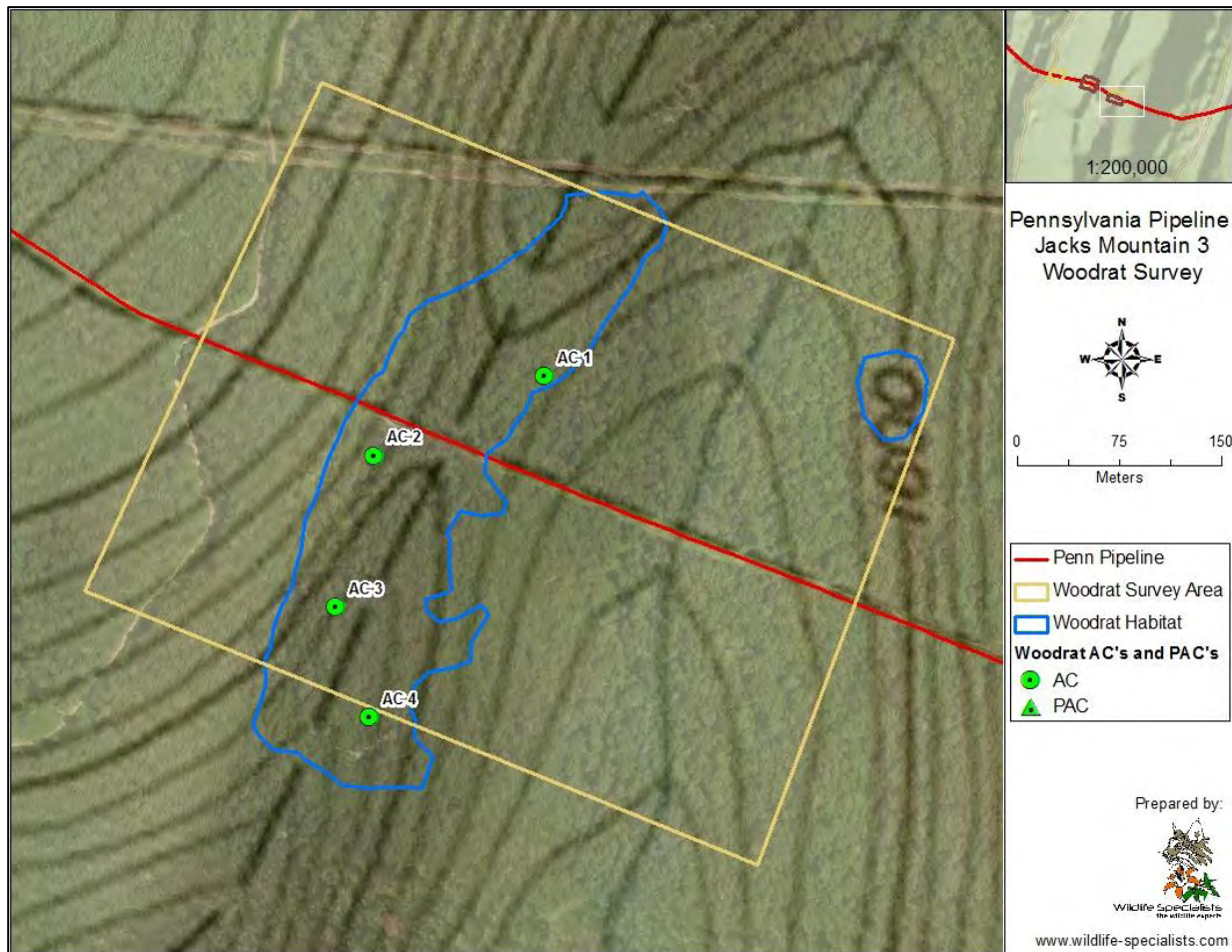


Figure 10. Rocky habitats and Allegheny woodrat Activity Centers (ACs) at the proposed Pennsylvania Pipeline Project, Jacks Mountain 3 survey area, Union and Shirley Twps., Huntingdon County Pennsylvania, July, 2014.

Blacklog Mountain

The Blacklog Mountain survey area is a 97 ac (39 ha) area of mostly mature forest located on the steep south and north facing sides of Blacklog Mountain. The survey corridor is approximately 8.6 km southeast of the town of Mt. Union with central coordinates at 77°48'34.07"W, 40°19'22.59"N. Elevations within the site range from approximately 1,300ft – 1,650ft above mean sea level. The survey area is found within the Blacklog Mountain (BLAC) Woodrat Conservation Management Unit. Tree and sapling species include black birch, red oak, red maple, sassafras, witch-hazel, chestnut oak, and white pine. The understory contains Virginia creeper, greenbriar, blackberry, polypody and marginal wood fern, grapevine, grasses, black raspberry (*Rubus occidentalis*), and mountain laurel. Canopy cover averaged 80% throughout the survey area except for the pipeline corridor and the area along Blacklog

Mountain Road.

Findings

Thirty-seven acres (14 ha) of the survey area was considered high potential woodrat habitat and comprised of large boulders with deep crevices (App. III, Photo Maps 12-14). Eight (8) PACs were identified based on the overall quality of rocky habitat (Fig. 10). One AC (Fig. 11) containing an old food cache with an accordion-style folded fern was found within a large pile of boulders and slabs, but no fresh sign of woodrat presence was observed.

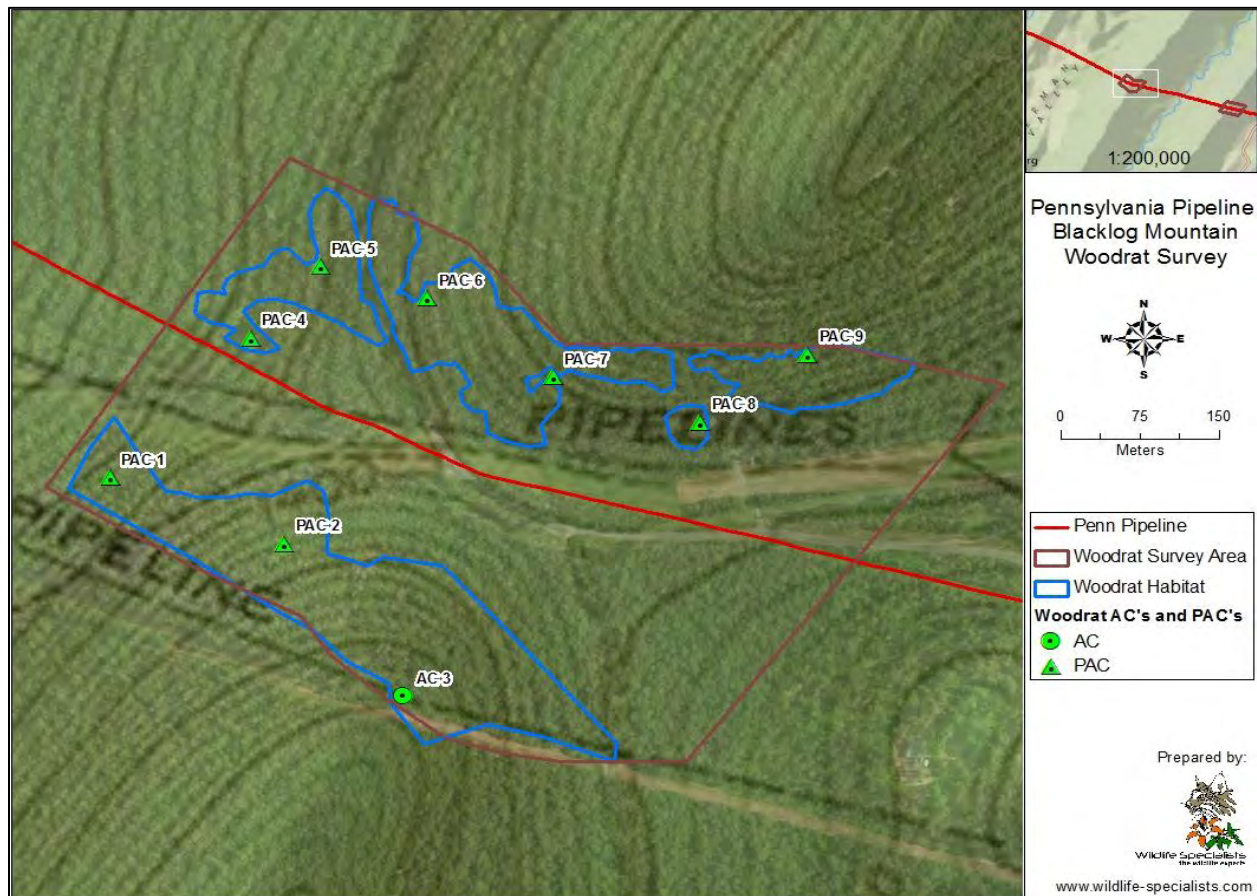


Figure 11. Rocky habitats and Allegheny woodrat Activity Centers (ACs) and Potential Activity Centers (PACs) at the proposed *Pennsylvania Pipeline Project* Blacklog Mountain survey area Shirley Twp., Huntingdon Co, Pennsylvania, July, 2014.

Shade Mountain

The Shade Mountain survey area is a 94 ac (38 ha) area of mostly mature forest located primarily on the steep east and somewhat on the west facing side of Shade Mountain. The survey corridor is

approximately 7.2 km southwest of the town of Cross Keys with central coordinates at 77°46'5.87"W, 40°19'1.93"N. Elevations within the site range from approximately 940ft – 1,780ft above mean sea level. The survey area is found within the Raystown Branch (RAS) Woodrat Conservation Management Unit. Tree and sapling species include black birch, red oak, red maple, sassafras, witch-hazel, tulip poplar (*Liriodendron tulipifera*), and basswood. The understory contains Virginia creeper, greenbriar, blackberry, polypody and marginal wood fern, striped maple, grape vine, grasses, white baneberry, and poison ivy. Canopy cover ranged from 0% within the many open talus slides to 100% in forested areas. Rocky habitat consisting primarily of open and shaded talus covered much of the southeastern portion of the survey corridor.

Findings

Fifty-six acres (22 ha) of the survey area was considered high potential woodrat habitat, and was comprised of large boulders and talus with deep crevices suitable for woodrat nesting habitat (App. III, Photo Maps 15-16). Habitat was located within shaded boulders and within large open talus slides. Primary rocky habitat types consisted primarily of shaded and open boulders and talus (1-5m) with numerous overhangs, crevices, and “caves”. Flora found on the site produces ideal food sources of hard and soft mast. Five (5) PAC’S were identified based on quality of rocky habitat; however no sign of woodrat presence was observed (Fig. 12).

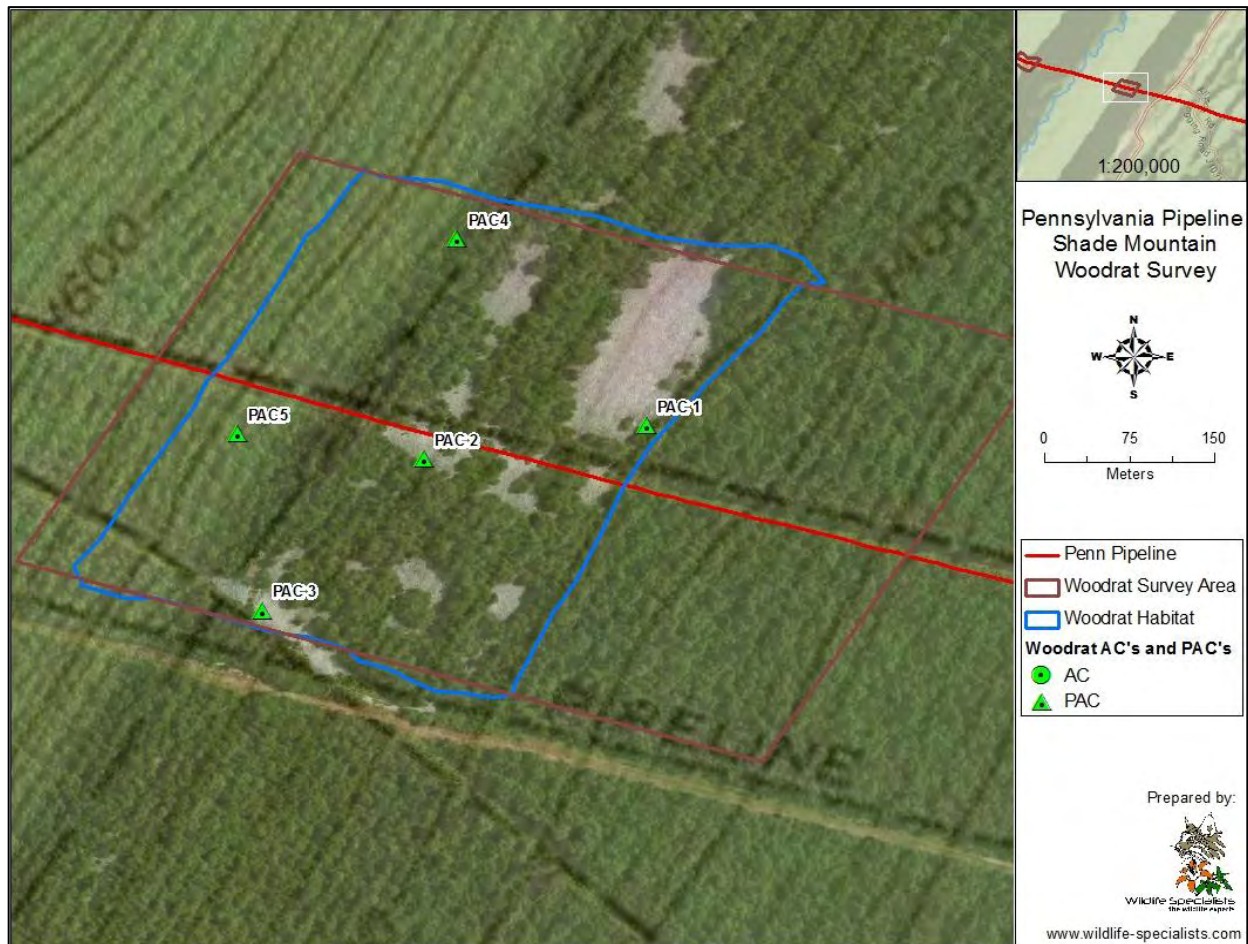


Figure 12. Rocky habitats and Allegheny woodrat Potential Activity Centers (PACs) at the proposed *Pennsylvania Pipeline Project*, Shade Mountain survey area, Shirley and Tell Twps., Huntingdon Co, Pennsylvania, July, 2014.

Tuscarora Mountain

The Tuscarora Mountain survey area is a 106 ac (42 ha) area of mostly mature deciduous forest located primarily on the steep southeast and northwest facing sides of Tuscarora Mountain (App. III, Photo Map 17-18). The survey corridor is approximately 8.2 km southwest of the town of New Germantown with central coordinates at 77°39'55.27"W, 40°17'45.42"N. Elevations within the site range from approximately 1,400ft – 1,920ft above mean sea level. The survey area is found within the Tuscarora/Blue Mts. (TUBL) Woodrat Conservation Management Unit. An existing pipeline ROW crosses the entire length of the survey area. Tree and sapling species include black birch, red oak, white oak, chestnut oak, red maple, striped maple, sassafras, witch-hazel, tulip poplar, and mostly degraded eastern hemlocks. The understory contains mountain laurel, Virginia creeper, greenbriar, Allegheny blackberry, hayscented fern, marginal wood fern, striped maple, and grasses. Canopy cover ranged

from 0% within the existing pipeline ROW to 90% in the forested area. Rocky habitat comprised of shaded boulders and talus covered much of the southeastern portion of the survey corridor.

Findings

Thirty-four (34) acres (13 ha) of the survey area on the steep southeast facing slope was considered potential woodrat habitat, and was comprised of large boulders and talus with deep crevices suitable for woodrat nesting. Habitat was located within shaded boulders and talus slides. Primary rocky habitat types consisted of shaded and exposed boulders and talus slabs (1-5m) with overhangs, crevices, and “caves”. Flora found on the site produce food sources of hard and soft mast. Five PACs were identified based on quality of rocky habitat (Fig. 13); however, no sign of woodrat presence was observed.

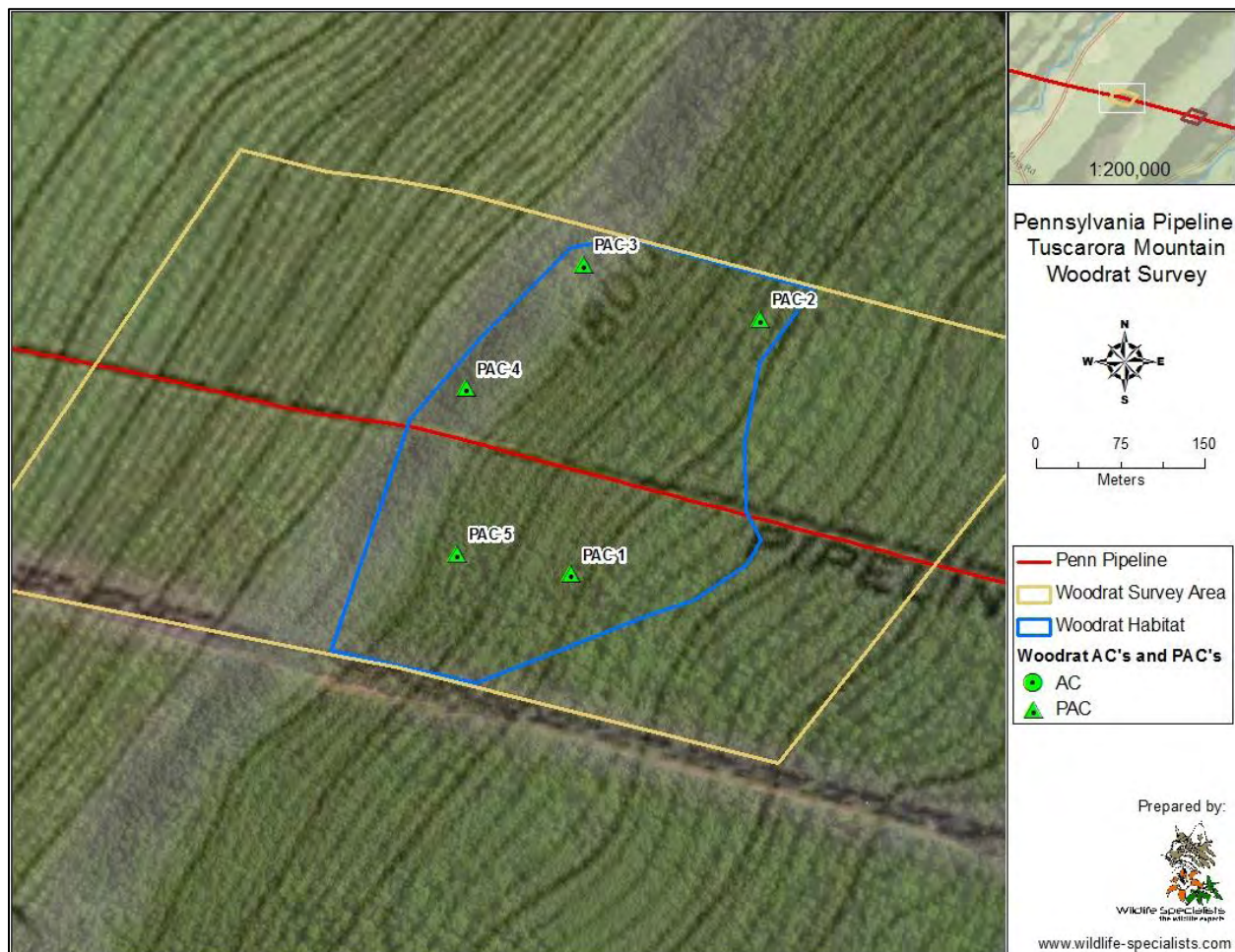


Figure 13. Rocky habitats and Allegheny woodrat Potential Activity Centers (PACs) at the proposed *Pennsylvania Pipeline Project*, Tuscarora Mountain survey area, Lack and Toboyne Twps., Juniata and Perry Counties, Pennsylvania, July, 2014.

Conococheague Mountain

The Conococheague Mountain survey area is a 59 ac (24 ha) area of primarily mature deciduous forest located on the moderate northwest facing and steep southeast facing slopes of Conococheague Mountain. The survey corridor is approximately 0.5 km north and 7.0 km east of Blairs Mills with central coordinates at 40°17'23.659"N, 77°38'88.071". Elevations within the site range from 1,440ft - 1,840ft above mean sea level. The survey area is found within the Tuscarora/Blue Mts. (TUBL) Woodrat Conservation Management Unit. The site consists of mostly mature deciduous forest and mixed forest with a well-developed understory throughout most of the survey area. An existing pipeline right-of-way crosses the entire vertical length and Concord Road crosses the entire horizontal width of the survey area.

The majority of the southeast facing slope was covered with talus and boulders with particularly dense rock at the higher elevations and slightly more scattered rock at lower elevations. Some scattered boulders and associated talus were present within and south of the ROW on the northwest facing slope. Canopy cover ranged from 0-30% within the pipeline ROW and small open areas to 75 to 90% throughout the rest of the survey area. Dominant overstory species included red and chestnut oak, red maple, and black birch. Shrub and herbaceous species included mountain laurel, witch hazel, green briar, blackberry, low-bush blueberry, grapevine, goldenrod, ferns and grasses.

Findings

Most of the survey area, particularly the southeast facing slope, was considered excellent potential woodrat habitat (App. III, Photo Map 19 & 20). The entire slope is covered with piled boulders and talus ranging in size from 1-5 meters with some larger float blocks up to 10 meters. Numerous interstices and deep crevices are present throughout the rocky habitat. Seven PACs were chosen based on the size and presence of rock and crevices, though PACs could have been placed in many locations along the southeast facing slope based on the overall quality of the rocky habitat (Fig. 14). Canopy cover over the selected PACs ranged from 70-80%. Flora found on the site produce food sources of hard and soft mast, however no sign of woodrat presence was observed.

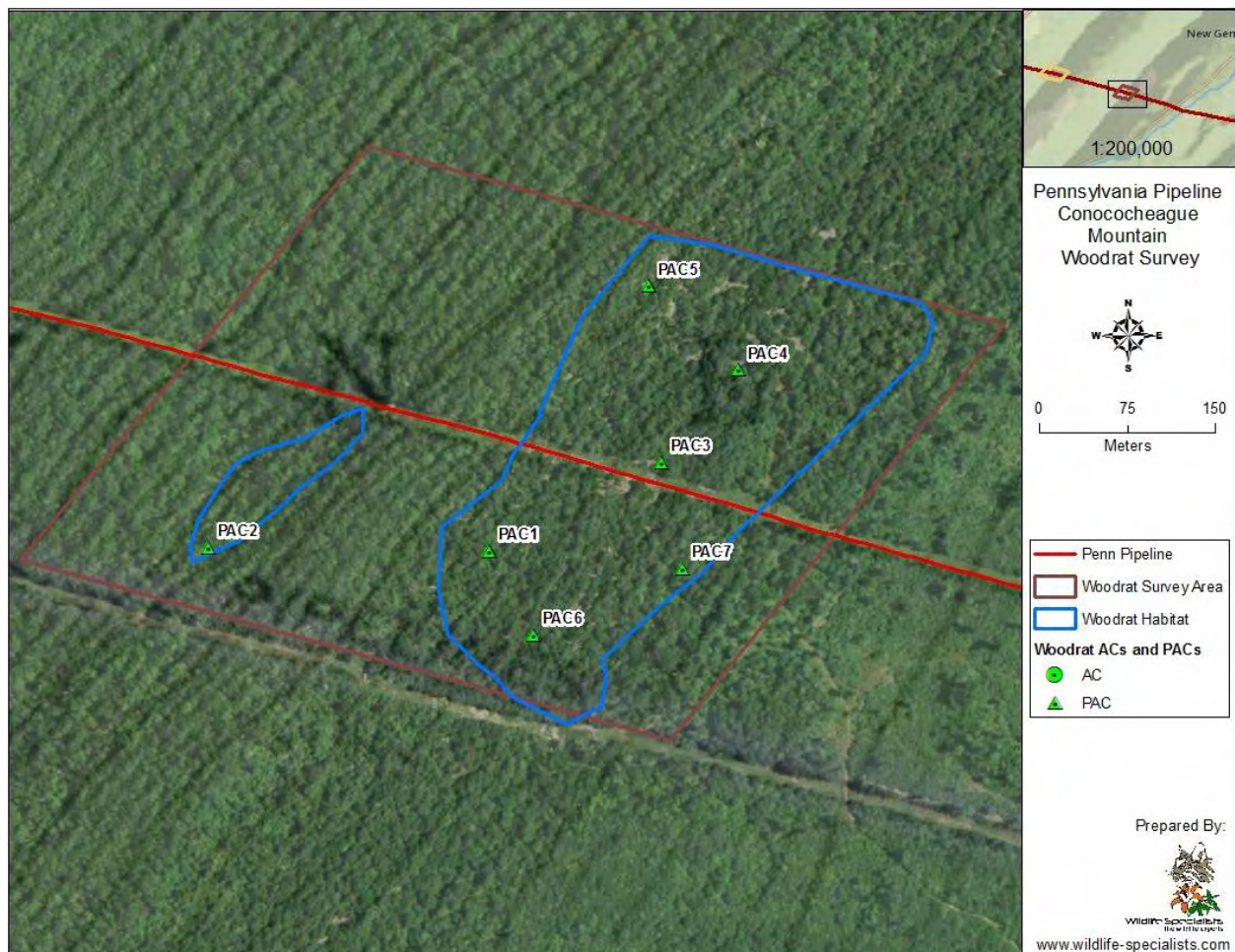


Figure 14. Rocky habitats and Allegheny woodrat Potential Activity Centers (PACs) at the proposed *Pennsylvania Pipeline Project*, Conococheague Mountain survey area, Toboyne Twp., Perry County, Pennsylvania, April, 2015.

Bowers Mountain 2

The Bowers Mountain 2 survey area is a 30 ac (12 ha) area of primarily mature deciduous forest located on the steep southeast and northwest facing sides of Bowers Mountain. The survey corridor is approximately 27.8 km northwest of the city of Carlisle with central coordinates at 40°16'10.69"N, 77°31'2.95"W. Elevations within the site range from approximately 1,500ft – 1,990ft above mean sea level. The survey area is found within the Tuscarora/Blue Mts. (TUBL) Woodrat Conservation Management Unit. The site consists of mostly mature deciduous forest and mixed forest with a well-developed understory in some areas and sparse understory elsewhere. An existing pipeline right-of-way crosses the entire vertical length of the survey area. A fairly expansive area of rocky habitat including open and shaded surface and subsurface talus of varying size exists throughout most of the central portion of the survey area. Overstory canopy cover ranged from 10 to 75%. Talus was particularly

dense on the steep southeast facing slope in the eastern portion of the survey area. Dominant rock types were open talus (1-5m) with several small overhangs, crevices and small caves. Other rock habitat included some small areas of bare rock talus with moderately deep interstices. Dominant overstory species include black birch, red maple, red oak, chestnut oak, sugar maple, witch-hazel, and eastern hemlock. Understory and herbaceous species include mountain laurel, Virginia creeper, woodfern, sweet fern, New York fern, hay-scented fern and a scattering of flowering plants.

Findings

A 40.9 ac (16 ha) portion of the Bowers Mountain 2 survey area was considered excellent potential woodrat habitat (App. III, Photo Map 21). The best potential woodrat habitat area was concentrated on the steeper southeast facing slope in the higher elevations of the survey area at approximately 1,620ft (493.78m) to 1,940ft (591.31m) of elevation above mean sea level and was approximately 287m long by 612m wide. Primary rocky habitat types were talus (1-5m) with deep and shallow interstices. Two ACs were identified that contained either fresh or old caches or latrines (Fig. 15). Five food caches and three toilets were located within the survey area (App. III). Caches were found in talus consisting of 1-5m blocks and contained leaves, ferns, acorns, fungi and sticks. Flora found on the site produces ideal food sources of hard and soft mast. In addition, 5 Potential Activity Centers based on overall quality of rocky habitat were identified (Fig. 15). The PACs primarily consisted of 1-5m talus with deep interstices. Canopy cover throughout most of the potential woodrat habitat area was 10-70%. The remainder of the survey area to the southeast and northwest consisted of small and scattered talus with shallow crevices and areas of non-rock habitat.

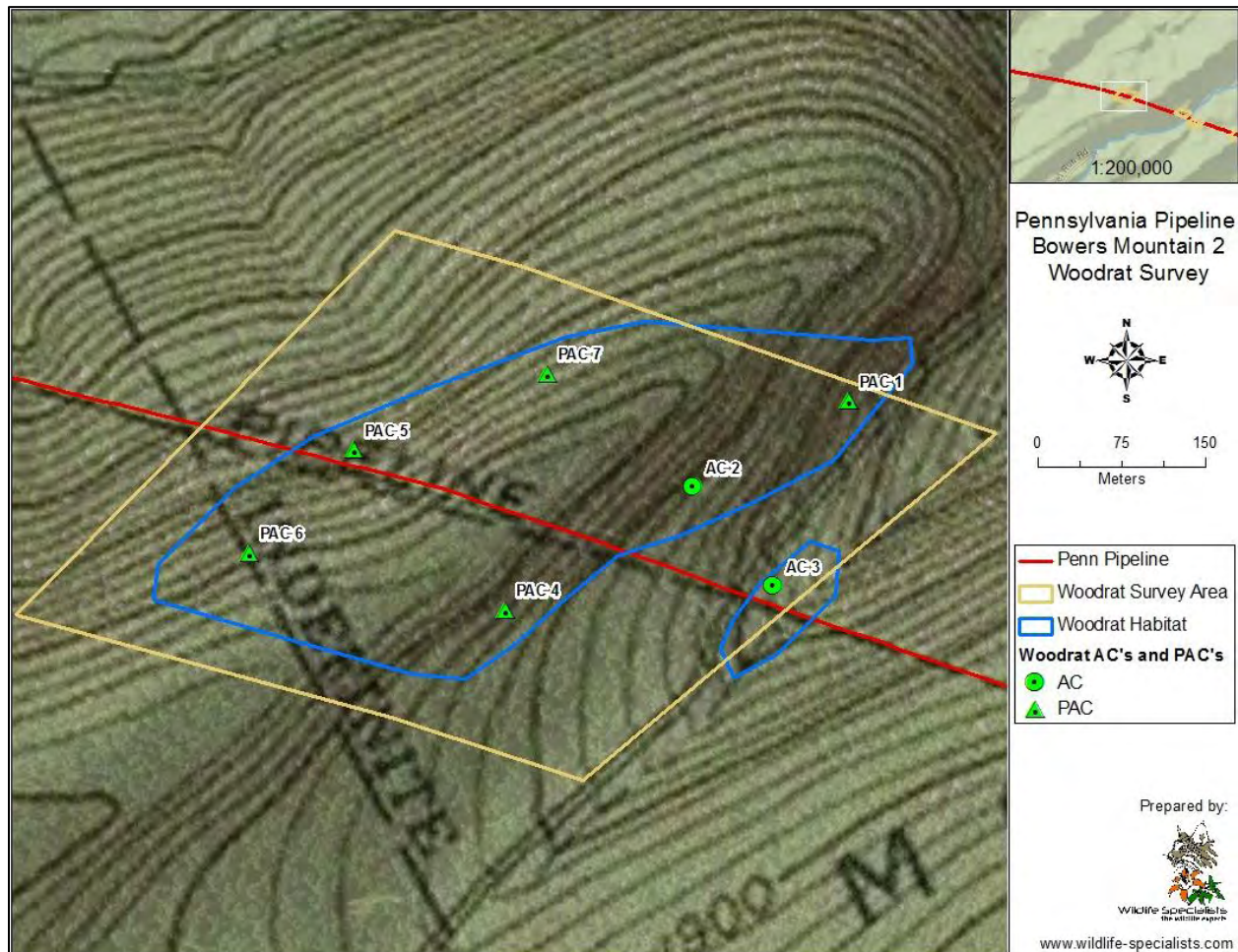


Figure 15. Rocky habitats and Allegheny woodrat Activity Centers (ACs) and Potential Activity Centers (PACs) at the proposed Pennsylvania Pipeline Project Bowers Mountain 2 survey area, Toboyne and Jackson Twps., Perry Co., Pennsylvania, July, 2014.

Bowers Mountain 1

The Bowers Mountain 1 survey area is a 23 ac (9 ha) area of mature and regenerating deciduous forest located on the steep southeast facing slope near the base of Bowers Mountain. The survey area is approximately 9.5 km south and 2.4 km east of Andersonburg with central coordinates at 40°15'50.767"N, 77°29'39.145"W. Elevations within the site range from approximately 1,150ft – 1,450ft above mean sea level. The survey area is found within the Tuscarora/Blue Mts. (TUBL) Woodrat Conservation Management Unit. The site consists of mature deciduous forest on the steep slope in the bottom half of the survey area and the gentle slope in the top quarter of the survey area with regenerating forest with little to no overstory cover in between. Understory is mostly sparse except near the top of the steep slope and within the regenerating portion of the survey area. Dominant overstory species consisted of red and chestnut oak, red maple, and black birch with some hickory. Shrub and

understory species consisted of witch hazel, black birch, mountain laurel, blackberry, and blueberry. Canopy cover ranged from 0% in regenerating areas to 50-90% throughout the rest of the survey area. Rocky habitat was limited to a row of talus and boulders on the gentle slope near the top of the survey area and one small outcrop with associated talus at the top of the steep slope.

Findings

A small line of boulders/talus and one smaller outcrop were considered marginal woodrat habitat (Fig. 16). The line of boulders and talus is located on the gentle slope between approximately 1,360ft and 1,380ft elevation under 50% to 75% canopy cover. Primary rocky habitat types consisted of talus 1-3m with shallow and deep interstices (App III; Photo Map 22). The small outcrop is less than 3 meters high and located at approximately 1,350ft elevation under 25% canopy cover. Good food sources of hard and soft mass were found at the site. We identified 3 PACs based on overall quality of rocky habitat but found no evidence of occupation by woodrats.

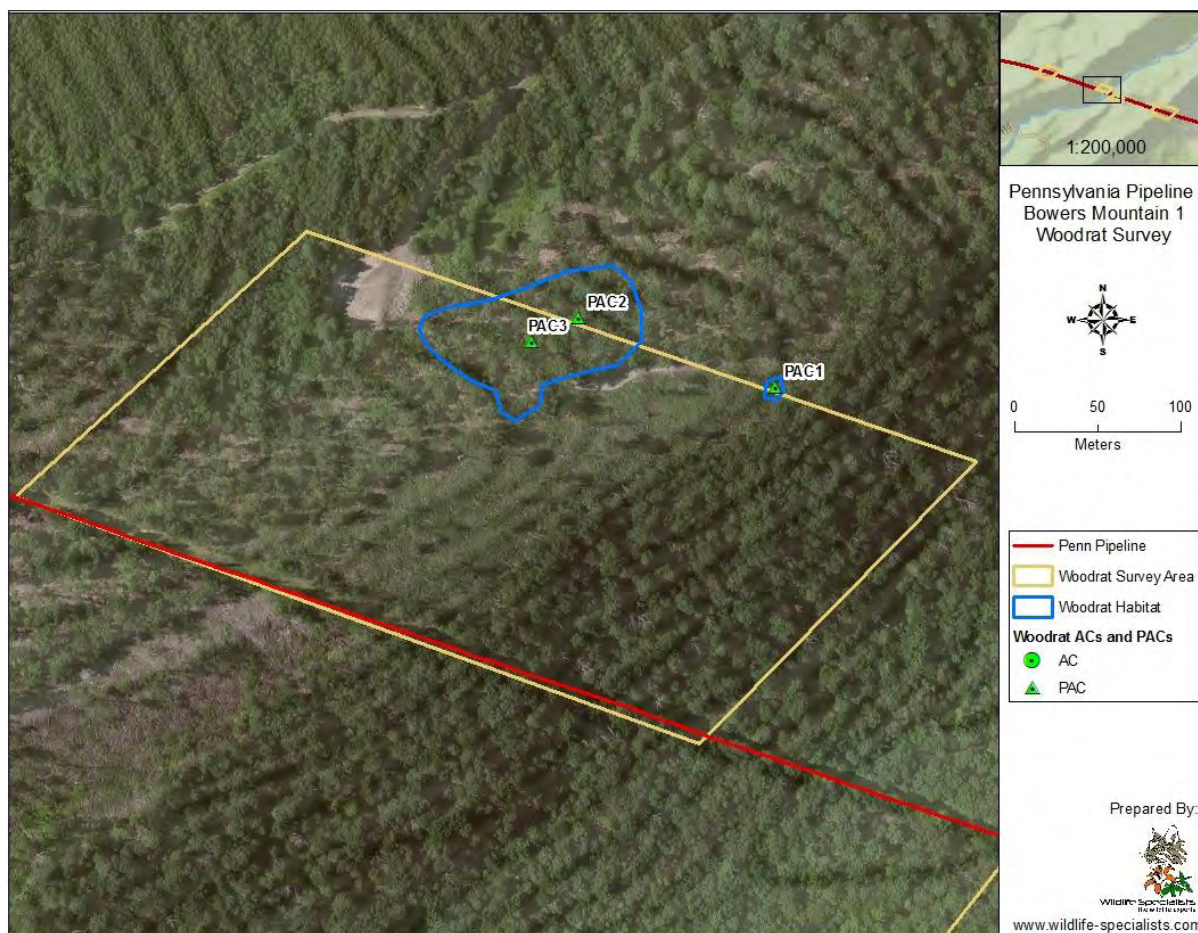


Figure 16. Rocky habitats and Allegheny woodrat Potential Activity Centers (PACs) at the proposed *Pennsylvania Pipeline Project*, Bowers Mountain 1 survey area, Lack and Jackson Twps., Perry County, Pennsylvania, April 2015.

Middle Ridge

The Middle Ridge Survey area is a 21 ac (8 ha) area of mixed forest located at the base of Middle Ridge. The survey area is approximately 9.8 km south and 2.0 km west of Andersonburg with central coordinates at 40°15'39.316"N, 77°29'21.167"W. Elevations within the site range from approximately 1,000ft to 1,300ft above mean sea level. The survey area is found within the Tuscarora/Blue Mts (TUBL) Woodrat Conservation Management Unit. The site consists of mature mixed forest with little understory. Dominant overstory species consisted of eastern hemlock, white pine, red and chestnut oaks, red maple, and black birch. Shrub and herbaceous species included black and red raspberry, green briar, mountain laurel, colt's foot, trailing arbutus, and Canada mayflower. Canopy cover ranged from 50-75%. Rocky habitat consisted of talus 1-5 meters with deep interstices and some larger float blocks 10+ meters with numerous overhangs, crevices, and caves.

Findings

A 5.6 ac (2.3 ha) area of the Middle Ridge survey area was considered potential woodrat habitat (App. III, Photo Map 23 & 24). Primary rocky habitat types consisted of talus and boulders (1-5m) and talus (1-5m) with deep interstices and some float blocks (+10m) with numerous overhangs, crevices, and "caves" Flora found on the site produce ideal food sources of hard and soft mast. Seven (7) PACs were identified based on overall quality of rocky habitat; however no sign of woodrat presence was observed (Fig. 17).

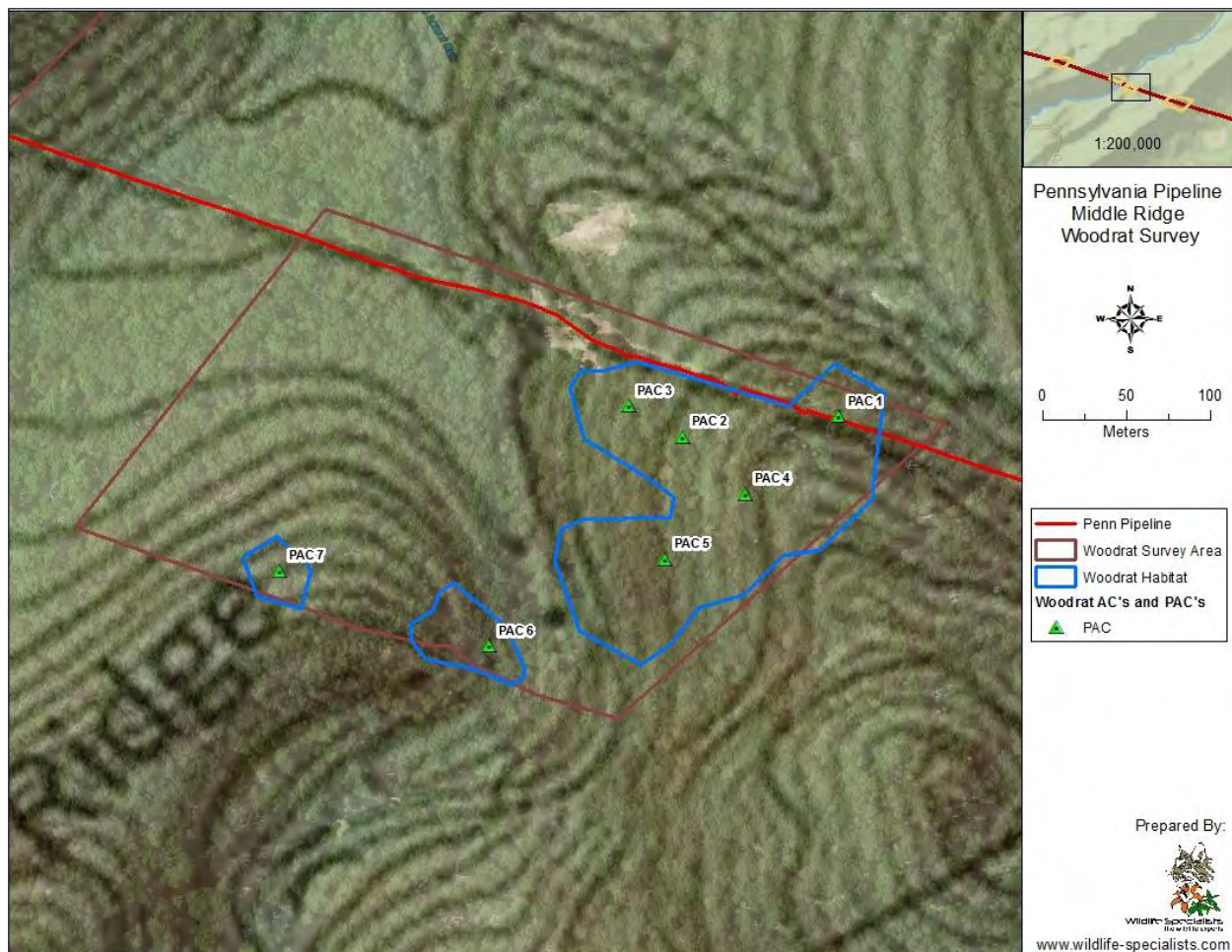


Figure 17. Rocky habitats and Allegheny woodrat Potential Activity Centers (PACs) at the proposed *Pennsylvania Pipeline Project*, Middle Ridge survey area, Jackson Twp., Perry County, Pennsylvania, April 2015.

Blue Mountain

The Blue Mountain survey area is a 100 ac (40 ha) area of mature and regenerating deciduous forest located on the steep southeast and northwest facing sides of Blue Mountain. The survey corridor is approximately 2.2 km northwest of the village of McCrea with central coordinates at 77°28'11.56"W, 40°15'24.85"N. Elevations within the site range from approximately 1,130ft – 1,780ft above mean sea level. The survey area is found within the Tuscarora/Blue Mts. (TUBL) Woodrat Conservation Management Unit. The site consists of mature and pole stage second growth deciduous forest and mixed forest with a well-developed understory in some areas and sparse understory elsewhere. An existing pipeline right-of-way crosses the entire vertical length of the survey area. Fairly expansive areas of rocky habitat including surface and subsurface talus of varying size, and a few small outcrops exist throughout much of the southeastern portion of the survey area. Rocky terrain was primarily shaded by

an approximate 85% overstory canopy. The surface rock transitioned from smaller scattered scree and talus in the southeastern portion of the survey area at lower elevations to fairly dense talus rock in the northwestern portion of the survey area at higher elevations. Dominant rock types were talus (1-3m) partially embedded or covered with humus and leaves, and small outcrops with several small overhangs, crevices and small caves. Other rock habitat included some small areas of bare rock talus with moderately deep interstices. Dominant overstory species include red oak, chestnut oak, black birch, red maple, sugar maple, witch-hazel, sassafras and striped maple. Understory and herbaceous species include striped maple, mountain laurel, Virginia creeper, gooseberry, grapevine, lowbush blueberry, black huckleberry, various brambles (*Rubus* spp.), teaberry, seedlings and saplings of overstory species, and greenbriar, as well as woodfern (*Dryopteris* spp.), hay-scented fern and Japanese stiltgrass.

Findings

A 27.45 ac (11.11 ha) portion of the Blue Mountain survey area was considered marginal potential woodrat habitat (App. III, Photo Map 25). The potential woodrat habitat area was concentrated on the steeper slope in the higher elevations of the survey area at approximately 1,500ft (457.20m) to 1,700ft (518.16m) of elevation above mean sea level and was approximately 350m long by 370m wide. Primary rocky habitat types were talus (1-5m) with deep interstices; and small (<3m) outcrops with few overhangs, crevices, and “caves”. We found no evidence of woodrat occupation (no food caches or toilets were observed). We identified 3 PACs based on overall quality of rocky habitat (Fig. 18). The PACs primarily consisted of 1-3m talus with deep interstices. Canopy cover throughout most of the potential woodrat habitat area was 80% or greater with a few areas under a reduced canopy of approximately 60% cover. The remainder of the survey area to the southeast and northwest consisted of small and scattered talus with shallow crevices and areas of non-rock habitat.

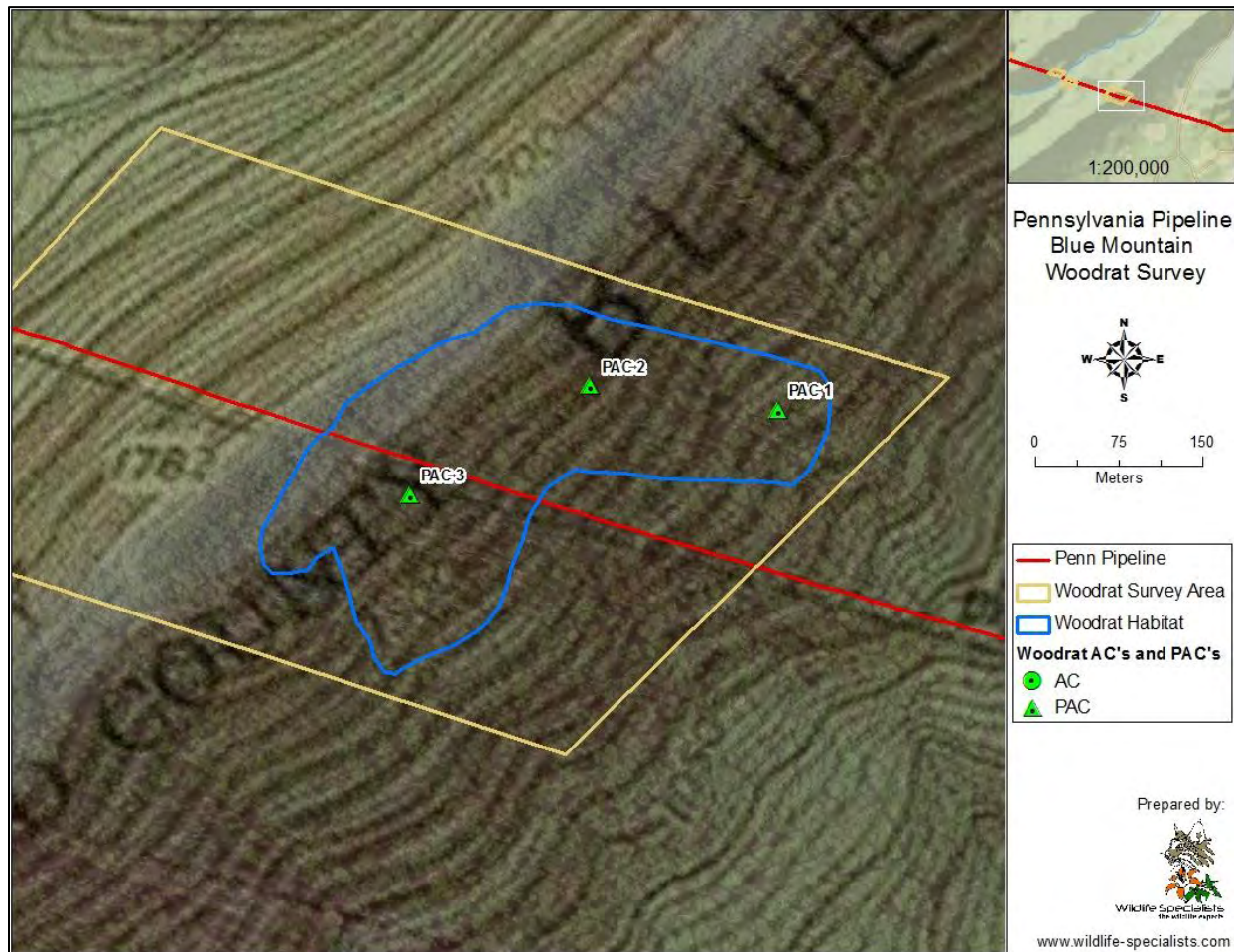


Figure 18. Rocky habitats and Allegheny woodrat Potential Activity Centers (PACs) at the proposed *Pennsylvania Pipeline Project* Blue Mountain survey area, Jackson and lower Mifflin Twps., Perry and Cumberland Counties, Pennsylvania, July, 2014.

Eastern Small-footed Bat Summer Roost Habitat Survey Report

The Pennsylvania Game Commission identified seven (7) areas of concern for Eastern Small-footed Bat along the proposed *Pennsylvania Pipeline Project* (Table 2). In addition, Wildlife Specialists surveyed the entire Altoona Bypass portion of the proposed pipeline. These survey areas are predominantly mature or regenerating forested ridge/valley-side habitats within the Ridge and Valley Province (n=6) or Appalachian Plateaus Province (n=2). Of the 7 Eastern Small-footed Bat survey areas identified by PGC, one was not completed (Conococheague) due to lack of property access and one did not contain any habitat (Lock Mountain) in the area that was surveyed. Note that a portion of the Lock Mountain survey area (western portion) was not completed in an area that is no longer in consideration for Project routing and due to lack of property access. Habitat was observed at all of the remaining survey areas as well as along the Altoona Bypass.

Table 2. Summary of Eastern small-footed bat (*Myotis leibii*) survey areas and findings along Sunoco’s proposed *Pennsylvania Pipeline Project*, identified in the Pennsylvania Game Commission’s Large Project Environmental Review response letter, dated March 14, 2014.

Survey Area ID	County	Physiographic Province^a	Potential Habitat (Yes/No)
Laurel Ridge 3	Cambria	AMAP	Yes
Altoona Bypass	Blair	AFAP	Yes
Lock Mountain	Blair	AMRV	No (Not Completed)
Jacks Mountain 2	Huntingdon	AMRV	Yes
Jacks Mountain 3	Huntingdon	AMRV	Yes
Blacklog Mountain	Huntingdon	AMRV	Yes
Shade Mountain	Huntingdon	AMRV	Yes
Conococheague Mountain	Perry	AMRV	Yes (Not Completed)

^a AMAP = Allegheny Mountain Section of Appalachian Plateau Physiographic Province

AFAP = Allegheny Front Section of Appalachian Plateau Physiographic Province

AMRV = Appalachian Mountain Section of Ridge and Valley Physiographic Province

Survey Methods and Findings

It should be noted that use of summer habitats by *Myotis leibii* is generally considered to be poorly understood at this time, with few supporting publications or affirmed conclusions to enable detailed assessment. Additionally, no formal species habitat assessment protocols have been implemented at the federal or state level. Thus, the assessment of potential habitat for this species relies heavily on the documented findings of others (e.g., Johnson et al. 2008; Johnson et al. 2011), interpretation of species-specific considerations, and best professional judgment.

We assessed potential summer roosting habitat for *Myotis leibii* through a walk over of the site to observe habitat characteristics and species-specific considerations. Habitat assessment was focused more toward talus/scree and rock outcrops that provide relatively stable and permanent shelter structure. Evaluation of features providing potential habitat included factors affecting protection and

shelter, and thermal regulation. Factors evaluated that affect thermal regulation included solar aspect and exposure/canopy cover. Consideration was also given to proximity of water and potential foraging areas. Through evaluation of the referenced factors and considerations, and using best professional judgment, a subjective assessment of the potential habitat to serve as summer roosting habitat for the Eastern small-footed bat was made.

Laurel Ridge 3

The Laurel Ridge 3 survey area is 120 ac (49 ha) of mostly mature forest located on the north facing side of Laurel Ridge (Fig. 19). The survey corridor is approximately 1.3 km south of US Route 22 with central coordinates at 78°56'49.93"W, 40°25'39.77"N. Elevations within the site range from approximately 1,800ft – 2,140ft above mean sea level. Tree and sapling species include black birch (*Betula lenta*), red (*Quercus rubra*) and chestnut (*Q. montana*) oak, red maple (*Acer rubrum*), sugar maple (*A. saccharum*), hemlock (*Tsuga canadensis*), sassafras (*Sassafras albidum*), black cherry (*Prunus serotina*), black gum (*Nyssa sylvatica*), yellow birch (*Betula allegheniensis*), and white ash (*Fraxinus americana*). The understory is dominated by lowbush blueberry (*Vaccinium angustifolium*, *V. pallidum*), black huckleberry (*Gaylussacia baccata*), witch-hazel (*Hamamelis virginiana*), greenbriar (*Smilax rotundifolia*), rhododendron (*Rhododendron* ssp.), striped maple (*A. pensylvanicum*), blackberry (*Rubus allegheniensis*), mountain laurel (*Kalmia latifolia*), wood fern (*Dryopteris* spp.), hay-scented fern (*Dennstaedtia punctilobula*), bracken fern (*Pteridium gleditsch*), teaberry (*Gaultheria procumbens*), sedges (*Carex* spp.) and grasses. Canopy cover throughout most of the survey area was 75% or greater, except for the small portion of survey area within the power line right-of-way.

Findings

The rock located within the power line and pipeline right-of-way (ROW) and a small area of exposed outcrops north of the power line (1.1 ac) was considered high quality Eastern Small-footed Bat roosting habitat (0% canopy cover). Surface rock consisted of boulders, outcrops, rock slabs and talus 1 to 5m in diameter with many small crevices that could be utilized by bats for summer roosting (App. IV, Photo Map 1). Other rocky portions of the survey area were not considered daytime roost habitats due to high canopy closure (App. IV, Photo Map 2).

Table 3. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Laurel Ridge 3 survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
LR-ESFB-1	1	40	5	few	small-medium	Y	Boulders and rock slabs along edge of existing pipeline ROW with crevices
LR-ESFB-2	1	35	6	moderate	Small-medium	Y	Boulders and rock slabs along edge of existing pipeline ROW with crevices
LR-ESFB-3	1	35	6	few	large	Y	Rock slab along edge of pipeline ROW with tapering large crevice

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
LR-ESFB-4	1	30	7	few	small	Y	Rock piles and slabs along edge of pipeline and power line ROW
LR-ESFB-5	1	30-50	6-8	many	small-large	Y	Powerline ROW lined with numerous 3-4 ft rock slabs in large piles
LR-ESFB-6	1	20-50	6-8	many	small-large	Y	Powerline ROW lined with numerous 3-4 ft rock slabs in large piles
LR-ESFB-7	1	45	5	few	small-medium	Y	Pipeline ROW with scattered rock slabs and boulders along edge
LR-ESFB-8	1	20-40	5-7	few	Small-medium	Y	Flat slab rocks on top of large outcrops with flat tops that receive direct sun

^a **Few, Moderate, Many**

^b **Small—(1/4-3/4-inch), Medium—(3/4-2-inch), Large—(>2-inch)**

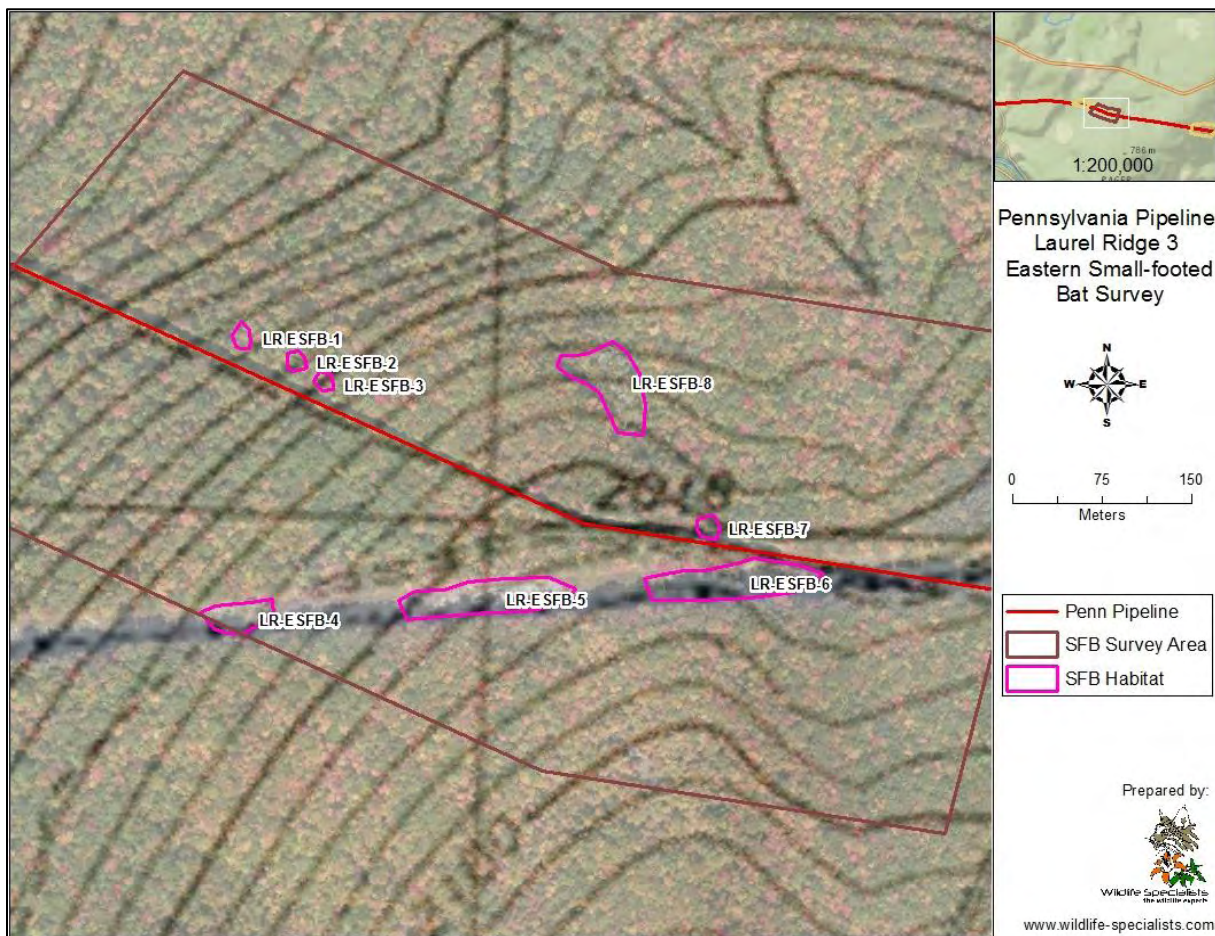


Figure 19. Locations of potential Eastern small-footed bat summer roosting habitat at the Laurel Ridge 3 survey area along the proposed Pennsylvania Pipeline Project, Jackson Twp., Cambria County, Pennsylvania, July 2014.

Altoona Bypass

The Altoona Bypass survey area is a 17.4mi long corridor of a variety of mostly forestland and agricultural areas north and south of, and including the pipeline corridor (Figs. 20-27). Approximate coordinates of the bypass are at 41°26'40.741"N , 78°35'56.516"W (west end) and 40°26'52.046"N, 78°19'17.613"W (east end). Elevations within the site range from approximately 900ft – 2,640ft above mean sea level.

Findings

A total of 54 habitat polygons were identified along the Altoona Bypass. For organizational purposes these habitat polygons were grouped into 8 different habitat areas (AB-ESFB-1 through AB-ESFB-8) based on location. The majority of the habitat was located within an existing pipeline ROW corridor with canopy cover ranging from 0-30%. Specific descriptions of each habitat can be found in Tables 4-11 and Photo Maps 3-8.

AB-ESFB-01

Table 4. Descriptive characteristics of Eastern small-footed bat (*Myotis leibii*) potential summer roosting habitat at the Altoona Bypass survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-1a	3	5	8+	few	small	N	Row of boulders in pipeline ROW going across pipeline
AB-ESFB-1b	3	5	8+	few	small	N	Row of boulders in pipeline ROW going across pipeline
AB-ESFB-1c	3	5	8+	few	small	N	Row of boulders in pipeline ROW going across pipeline
AB-ESFB-1d	3	30	8	few	large	N	Row of boulders in pipeline ROW, south edge of pipeline
AB-ESFB-1e	3	5	8+	few	small	N	Row of boulders in pipeline ROW going across pipeline
AB-ESFB-1f	3	30	8	many	large	N	Bed of scree in pipeline ROW, north edge of pipeline

^a **Few, Moderate, Many**

^b **Small**—(1/4-3/4-inch), **Medium**—(3/4-2-inch), **Large**—(>2-inch)

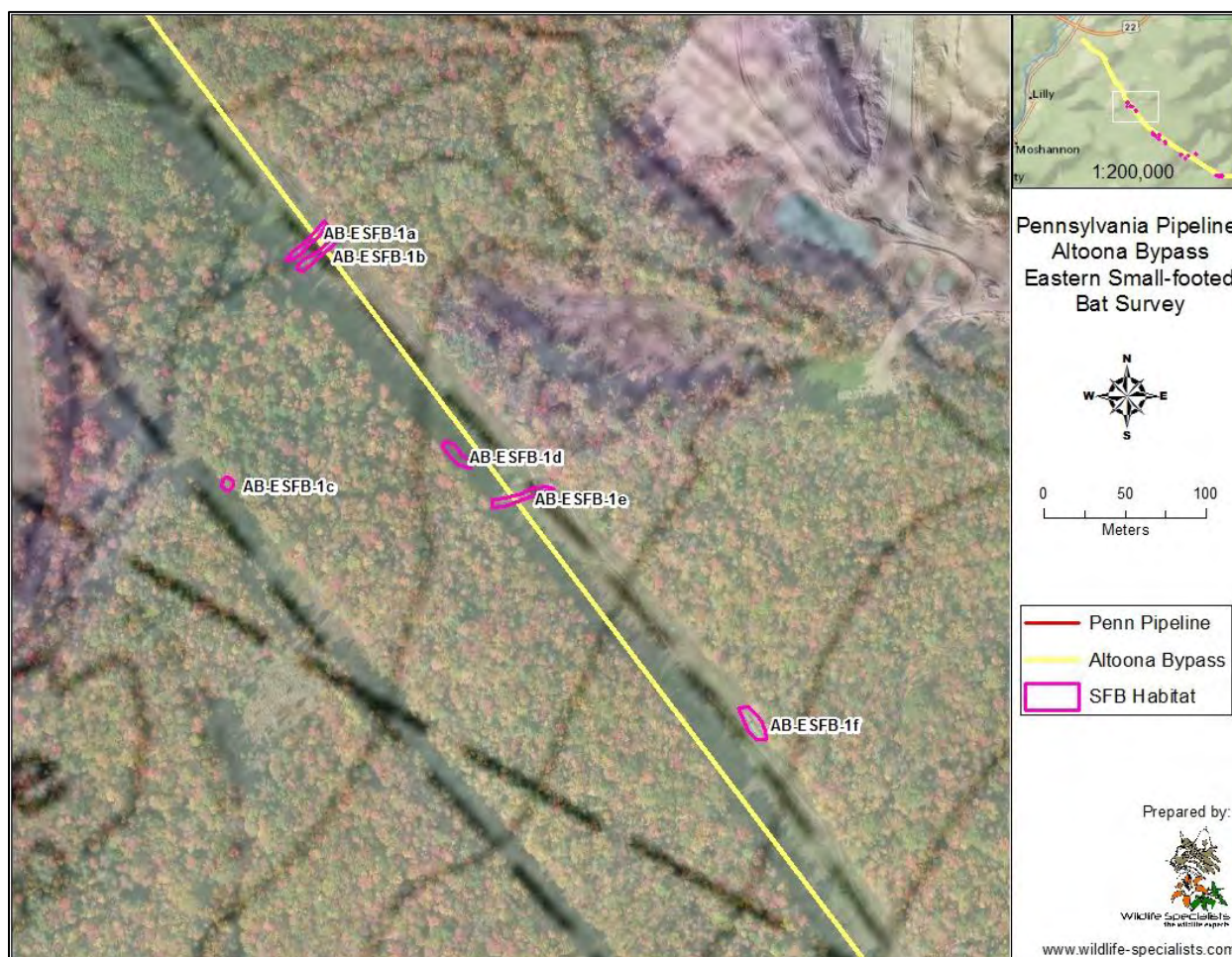


Figure 20. Locations of potential Eastern small-footed bat summer roosting habitat at the Altoona Bypass survey area along the proposed *Pennsylvania Pipeline Project*, Cresson Twp., Cambria County, Pennsylvania, July 2014.

AB-ESFB-02

Table 5. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Altoona Bypass survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-2a	3	5	8+	Few	small-medium	N	Row of boulders in pipeline ROW crossing pipeline
AB-ESFB-2b	4	5	8+	Few	small-medium	N	Row of boulders in pipeline ROW crossing pipeline
AB-ESFB-2c	4	35	7	Few	small-medium	N	Boulders and rock slabs along south edge of existing pipeline ROW



Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-2d	4	30	8	Few	small-medium	N	Boulders and rock slabs along north edge of existing pipeline
AB-ESFB-2e	4	35	7	Few	small-medium	N	Boulders and rock slabs along south edge of existing pipeline ROW
AB-ESFB-2f	4	30	8	Few	small-medium	N	Boulders and rock slabs along north edge of existing pipeline ROW
AB-ESFB-2g	3	30	8	Few	small-medium	N	Boulders and rock slabs along north edge of existing pipeline ROW
AB-ESFB-2h	4	35	7	Few	small-medium	N	Boulders and rock slabs along south edge of existing pipeline ROW
AB-ESFB-2i	4	35	7	Few	small-medium	N	Boulders and rock slabs along south edge of existing pipeline ROW
AB-ESFB-2j	4	5	8+	Few	small-medium	N	Row of boulders in pipeline ROW crossing pipeline
AB-ESFB-2k	4	5	8+	Few	small-medium	N	Row of boulders in pipeline ROW crossing pipeline

^a **Few, Moderate, Many**

^b **Small—(1/4-3/4-inch), Medium—(3/4-2-inch), Large—(>2-inch)**

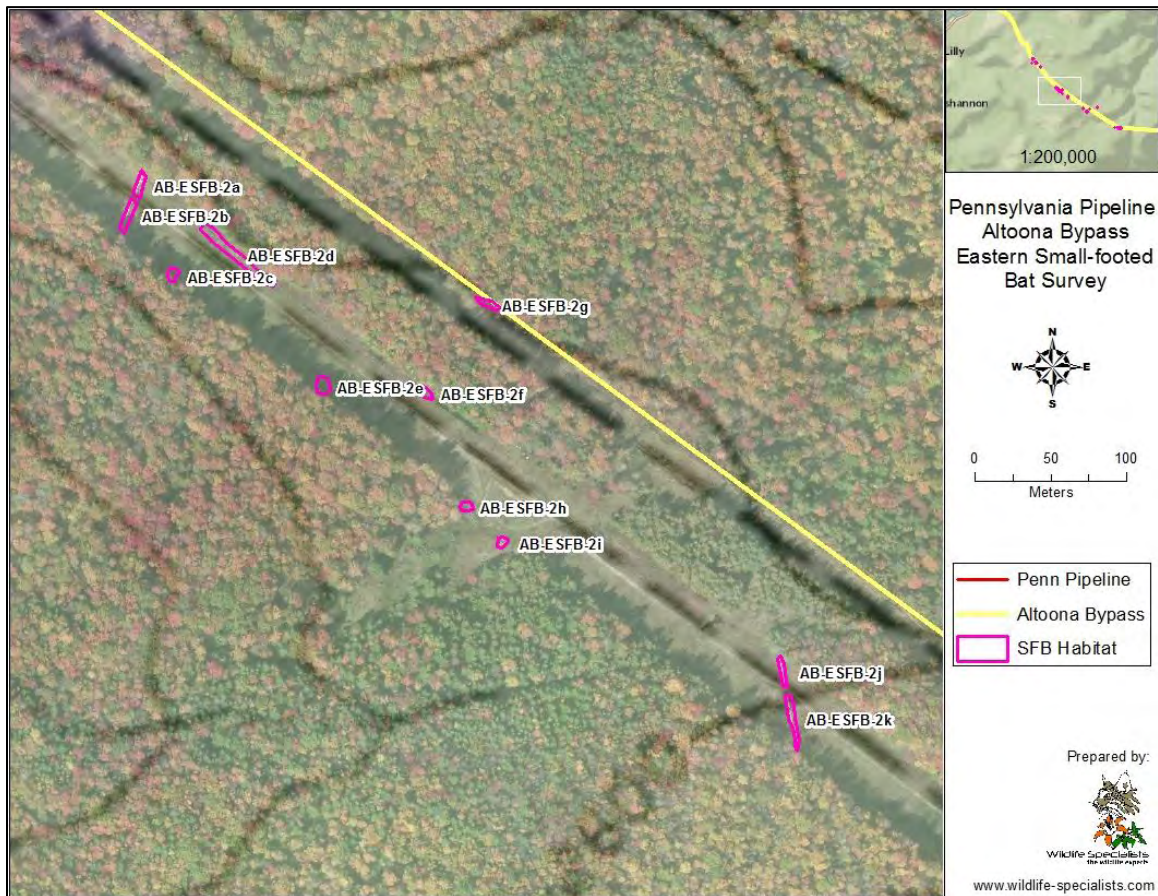


Figure 21. Locations of potential Eastern small-footed bat summer roosting habitat at the Altoona Bypass survey area along the proposed *Pennsylvania Pipeline Project*, Washington Twp., Cambria County, Pennsylvania, July 2014.

AB-ESFB-03

Table 6. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Altoona Bypass survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-3a	4	5	8+	Few	Small-Medium	Y	Row of boulders in pipeline ROW going across pipeline
AB-ESFB-3b	4	45	7-8	Few	Small-Medium	Y	Boulders and rock slabs along south edge of existing pipeline ROW
AB-ESFB-3c	5	25	8+	Few	Small-Medium	Y	Boulders and rock slabs along north edge of existing pipeline ROW
AB-ESFB-3d	5	30	8	Few	Large	N	Row of boulders in pipeline ROW on north edge of pipeline

^a Few, Moderate, Many

^b Small—(1/4-3/4-inch), Medium—(3/4-2-inch), Large—(>2-inch)

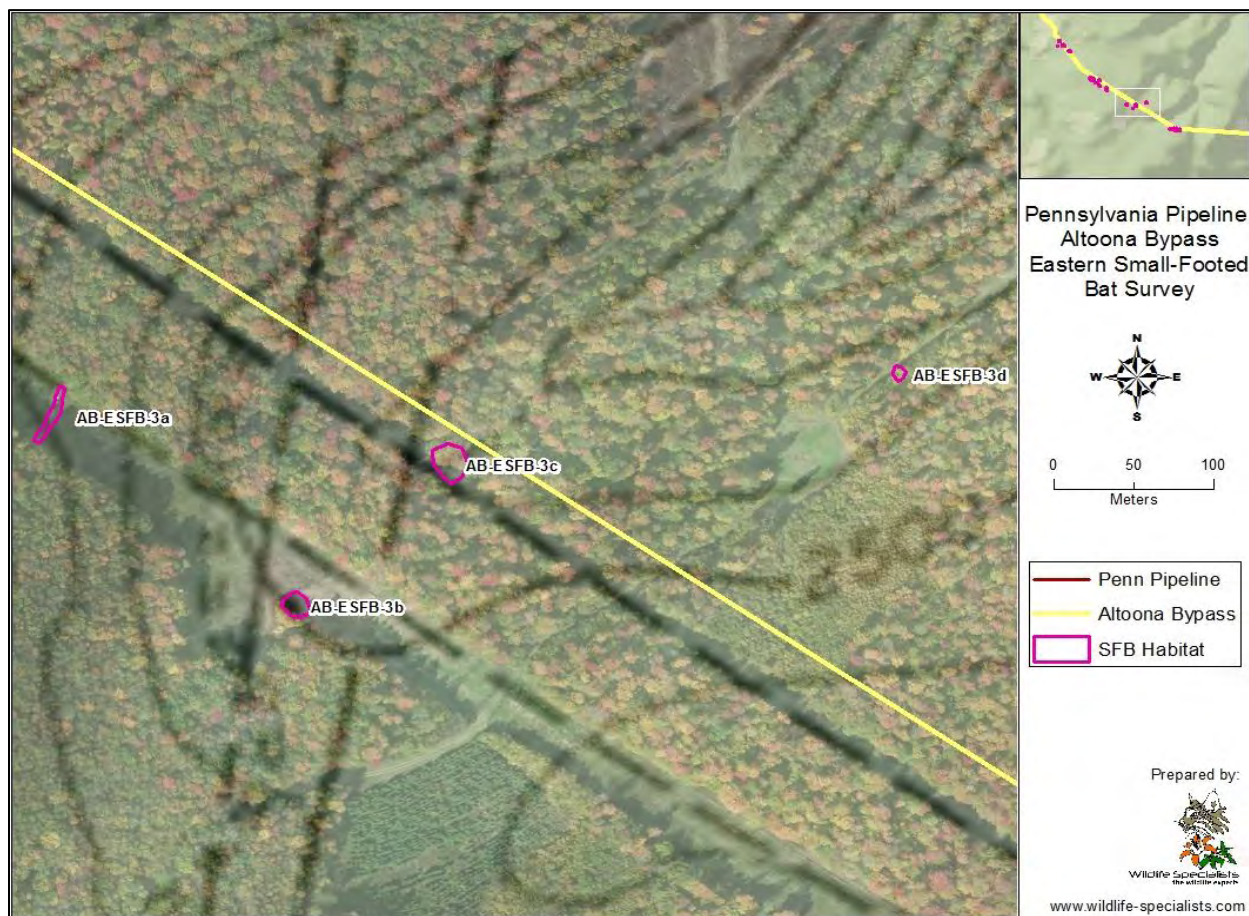


Figure 22. Locations of potential Eastern small-footed bat summer roosting habitat at the Altoona Bypass survey area along the proposed *Pennsylvania Pipeline Project*, Washington Twp., Cambria County, Pennsylvania, July 2014.

AB-ESFB-04

Table 7. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Altoona Bypass survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-4a	5	10	8+	few	medium-large	Y	Small boulders and rock slabs along north edge of existing power line
AB-ESFB-4b	5	10	8+	many	medium-large	Y	Boulders and rock slabs along north edge of existing power line ROW
AB-ESFB-4c	5	10	8+	many	medium-large	Y	Boulders and rock slabs along north edge of existing power line ROW
AB-ESFB-4d	5	10	8+	many	medium-large	Y	Boulders and rock slabs along north edge of existing power line ROW

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-4e	5	10	8+	few	small-medium	Y	Boulders and rock slabs along north edge of existing power line ROW
AB-ESFB-4f	5	0	8+	many	small-large	Y	Boulders and rock slab piles along north edge of existing power line

^a **Few, Moderate, Many**

^b **Small**—(1/4-3/4-inch), **Medium**—(3/4-2-inch), **Large**—(>2-inch)

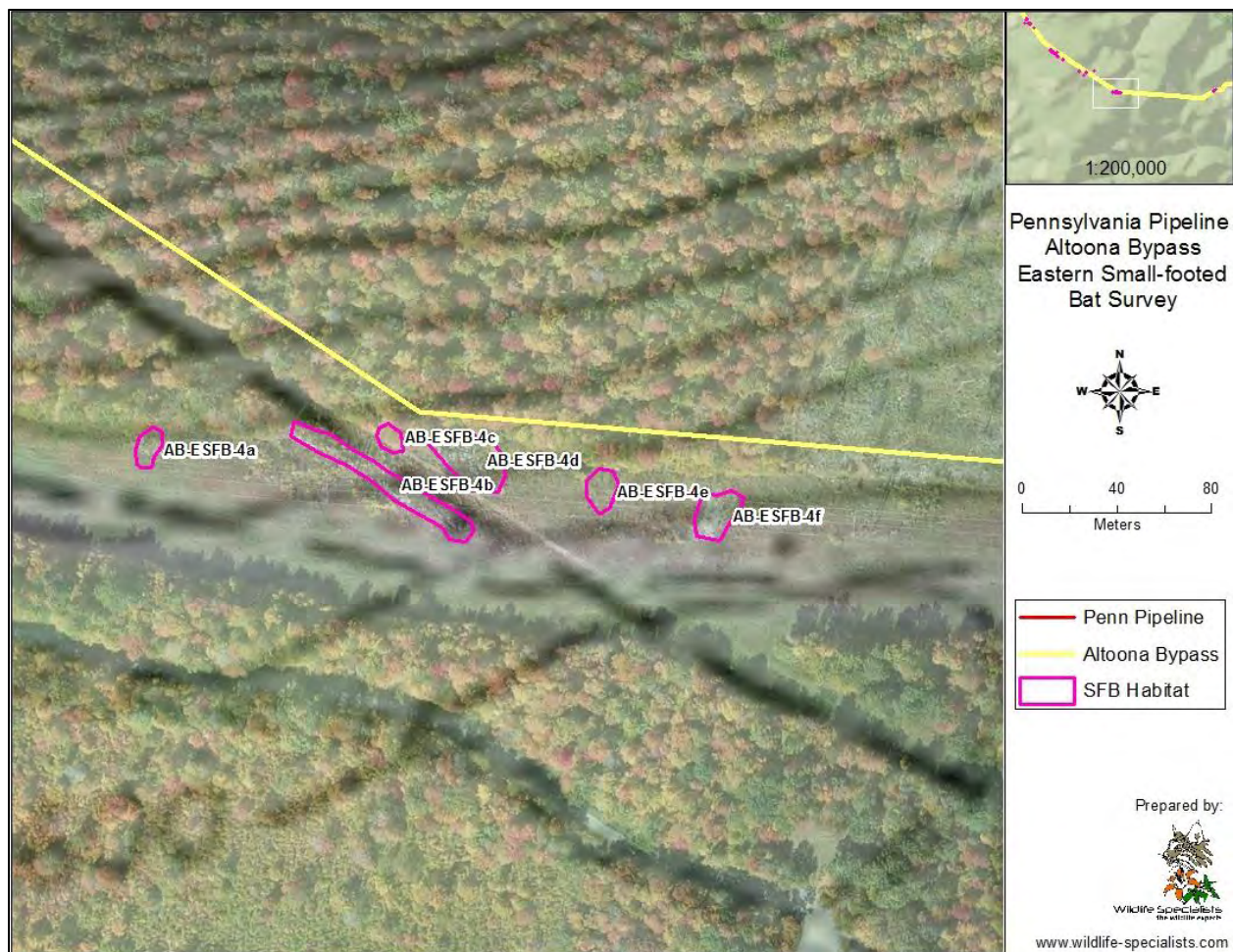


Figure 23. Locations of potential Eastern small-footed bat summer roosting habitat at the Altoona Bypass survey area along the proposed Pennsylvania Pipeline Project, Juniata Twp., Blair County, Pennsylvania, July 2014.

AB-ESFB-05

Table 8. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Altoona Bypass survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-5a	6	0	13	many	small	N	Rock slab pile on ROW comprised of small, 10-12 inch flat slabs
AB-ESFB-5b	6	0	13	many	small-medium	N	Boulders and rock slabs with crevices on existing pipeline ROW

^a **Few, Moderate, Many**

^b **Small**—(1/4-3/4-inch), **Medium**—(3/4-2-inch), **Large**—(>2-inch)



Figure 24. Locations of potential Eastern small-footed bat summer roosting habitat at the Altoona Bypass survey area along the proposed Pennsylvania Pipeline Project, Juniata Twp., Blair County, Pennsylvania, July 2014.

AB-ESFB-06

Table 9. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Altoona Bypass survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-6a	6	15	8+	few	small	Y	Scattered 1-2 ft boulders with crevices on north side of ROW
AB-ESFB-6b	6	15	8+	few	small	Y	Boulders and slabs 2-5 ft in diameter on north side of ROW
AB-ESFB-6c	6	25	8	many	small-medium	N	Pile of 1-4 ft boulders and slabs on south side of pipeline ROW
AB-ESFB-6d	6	25	8	many	small-medium	N	Pile of 1-4 ft boulders and slabs on south side of pipeline ROW
AB-ESFB-6e	6	25	8	few	small	Y	Scattered 1-3 ft boulders with crevices on south side of ROW

^a **Few, Moderate, Many**

^b **Small**—(1/4-3/4-inch), **Medium**—(3/4-2-inch), **Large**—(>2-inch)

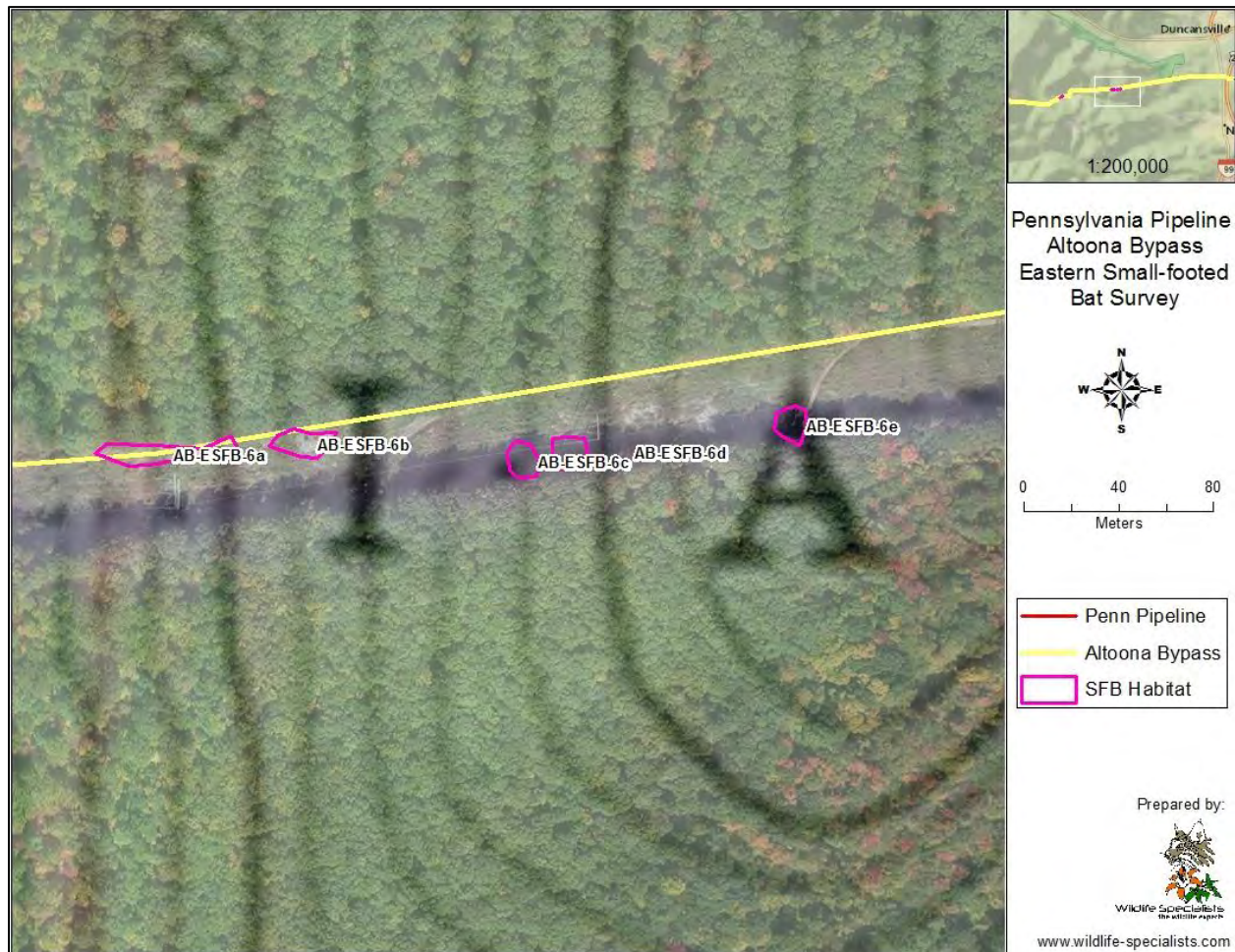


Figure 25. Locations of potential Eastern small-footed bat summer roosting habitat at the Altoona Bypass survey area along the proposed Pennsylvania Pipeline Project, Washington Twp., Blair County Pennsylvania, July 2014.

AB-ESFB-07

Table 10. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Altoona Bypass survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-7a	7	25	8+	Few	Small	Y	Rock slab pile on south side of ROW comprised of small slabs
AB-ESFB-7b	7	50	7	Few	Small	Y	Boulders and rock slabs with crevices on north side of ROW

^a Few, Moderate, Many

^b Small—(1/4-3/4-inch), Medium—(3/4-2-inch), Large—(>2-inch)

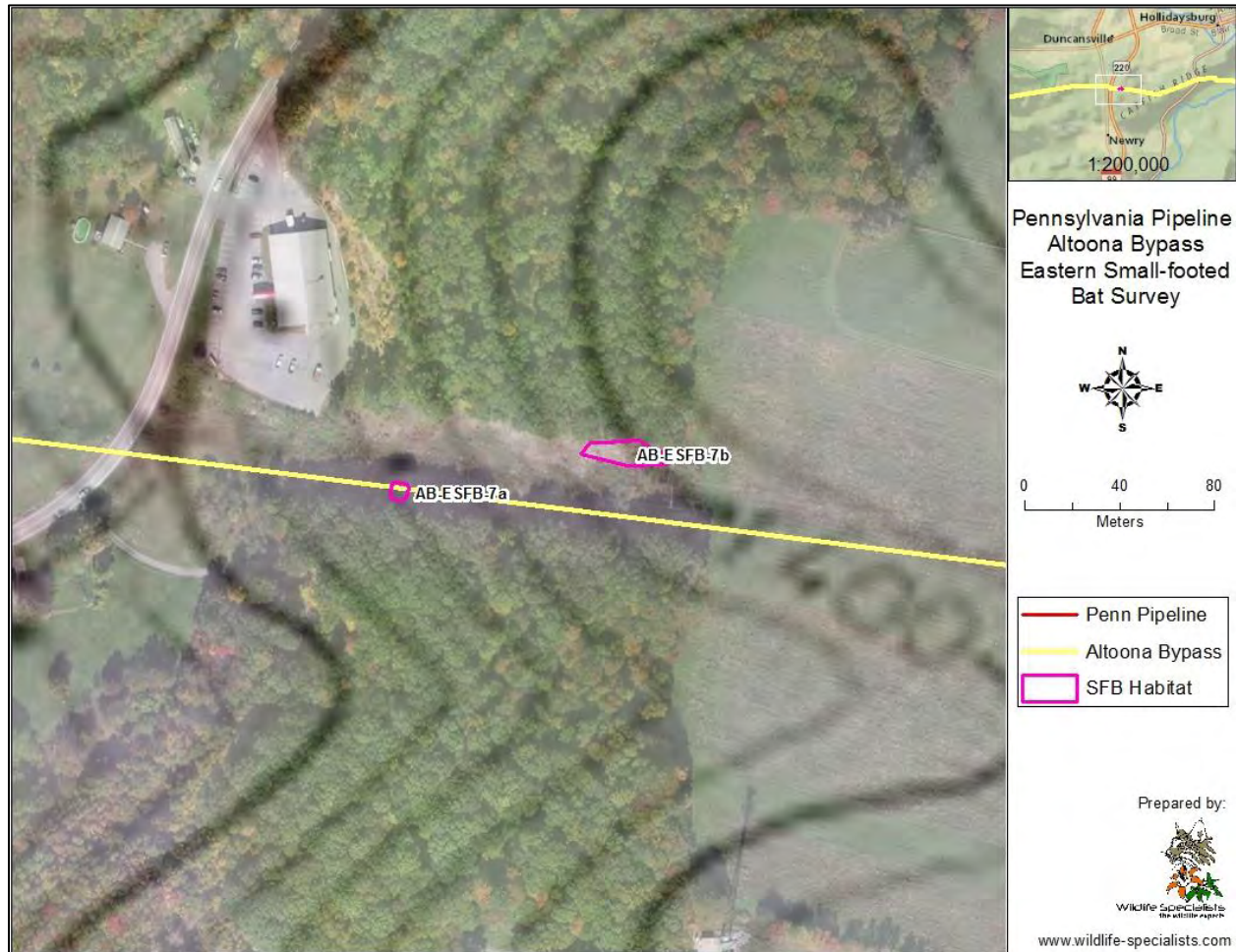


Figure 26. Locations of potential Eastern small-footed bat summer roosting habitat at the Altoona Bypass survey area along the proposed *Pennsylvania Pipeline Project*, Blair Twp., Blair County Pennsylvania, July 2014.

AB-ESFB-08

Table 11. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Altoona Bypass survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
AB-ESFB-8a	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8b	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8c	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8d	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8e	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8f	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW 1 to 4 ft diameter rocks and crevices
AB-ESFB-8g	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8h	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW 1 to 4 ft diameter rocks and crevices
AB-ESFB-8i	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8j	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8k	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8l	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8m	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8n	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8o	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8p	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices
AB-ESFB-8q	8	5	8+	Many	Small-Large	Y	Rock slab piles on power line ROW, 1 to 4 ft diameter rocks and crevices

^a Few, Moderate, Many

^b Small—(1/4-3/4-inch), Medium—(3/4-2-inch), Large—(>2-inch)

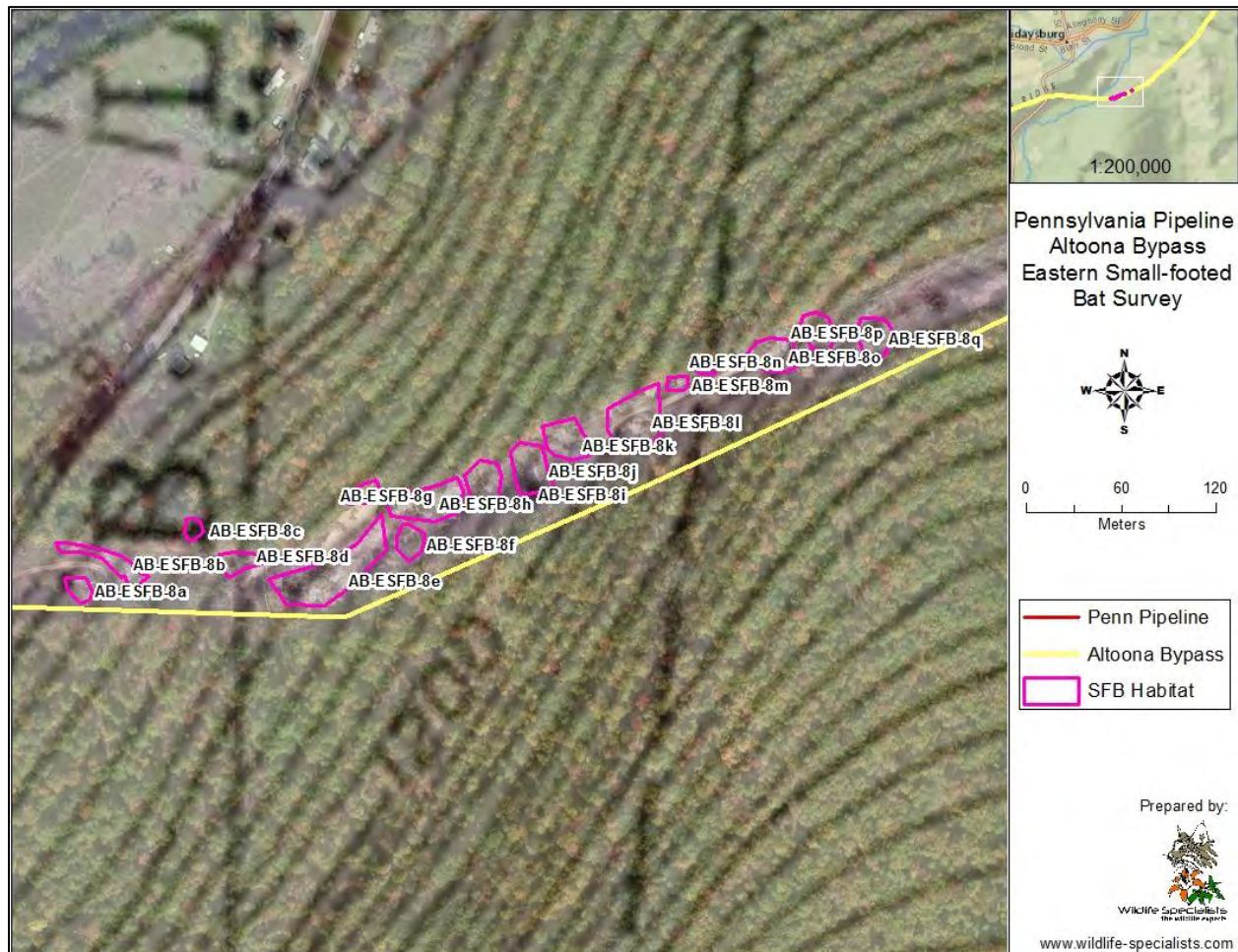


Figure 27. Locations of potential Eastern small-footed bat summer roosting habitat at the Altoona Bypass survey area along the proposed Pennsylvania Pipeline Project, Blair and Frankstown Twps., Blair County, Pennsylvania, July 2014.

Lock Mountain 1 & 2

The Lock Mountain survey area is a 23 ac (9 ha) area and the Lock Mountain 2 survey area is a 319 ac (129 ha) area both consisting of mature and regenerating deciduous and mixed forest located on the steep southeast and northwest facing sides of Lock Mountain (Fig. 28). The survey areas primarily focused on the proposed limits of disturbance (LOD) and a 300 foot buffer surrounding the LOD. The survey corridors are approximately 8.1 km and 7.6 km northeast of the town of Hollidaysburg with central coordinates at 78°16'54.72"W, 40°26'10.83"N (Lock Mountain 1) and 78°17'24.94"W, 40°25'56.42"N (Lock Mountain 2). Elevations within the site range from approximately 1,922ft – 900ft above mean sea level. Most of the survey area is crossed by an existing pipeline ROW. A cabin and a game lands road are also located within the Lock Mountain 2 survey area. The site consists of mature and pole stage second growth deciduous forest and mixed forest with a well-developed understory in

some areas and sparse understory elsewhere. Tree and sapling species include black birch, red oak, white pine, pitch pine, tulip poplar, white oak, black cherry, basswood, tree-of-heaven, sassafras, chestnut oak, red maple, sugar maple, striped maple and witch-hazel. Understory and herbaceous species include striped maple, mountain laurel, Virginia creeper, gooseberry, grapevine, crown vetch, various brambles (*Rubus* spp.), teaberry, seedlings and saplings of overstory species; greenbriar, deer tongue, woodfern (*Dryopteris* spp.), hay-scented fern, christmas fern, switch grass and Japanese stiltgrass. Canopy cover ranged from 15% within the existing pipeline ROW and open talus slides to 90% within the forested areas. A large amount of rocky habitat consisting of open (exposed to direct sunlight) and shaded talus and scree, and open and shaded outcrops and boulders covered much of the central portion of the Lock Mountain 2 survey corridor; especially near the crest of the steep northwest facing slope.

Findings

Some scattered rocky habitat consisting of outcrops, boulders and talus covered small portions of the southeastern portion of the Lock Mountain 1 survey corridor but was too shaded to be considered suitable habitat (Photo Map 9). In the Lock Mountain 2 survey area, a combined 2.6 acres (8 habitat polygons) consisted of open rocky features, some of which were considered prime small-footed bat habitat (0-25% canopy cover) for summer roosting (Table 12, Fig. 28, Photo Map 23 & 24). The best habitat consisted of several small to medium sized open talus/scree slides as well as talus and boulders (1-4ft across) along the existing pipeline right-of-way. Canopy cover ranged from 50% near the edges of the habitat polygons to 0% within the central portions of the larger talus slides. Many small to large crevices were present within all the habitat polygons. Sparse amounts of organic material consisting primarily of dried leaf litter, duff and soil can be observed within some of the crevices. The rock habitats will receive approximately 4-8 hours of direct sunlight. The boulders and talus observed in the wooded portions of the survey area were considered to be too shaded (80-90% canopy cover) to be utilized for summer roosting

Table 12. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Lock Mountain 2 survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
LM2-ESFB-1	23	35-40	4	Few	Small-Large	Y	Scattered boulders and talus next to pipeline ROW, 1 to 6 ft diameter
LM2-ESFB-2	23	35-40	4	Few	Small-Large	Y	Scattered boulders and talus next to pipeline ROW, 1 to 6 ft diameter
LM2-ESFB-3	23	35-40	4	Few	Small-Large	Y	Scattered boulders and talus on pipeline ROW, 1 to 4 ft diameter
LM2-ESFB-4	23	35-40	4	Few	Small-Large	Y	Scattered boulders and talus on pipeline ROW, 1 to 5 ft diameter
LM2-ESFB-5	23	25	6	Many	Small-Large	Y	Talus/scree slide on pipeline ROW, 1 to 4 ft diameter rocks
LM2-ESFB-6	24	15	6-7	Many	Small-Large	Y	Talus/scree slide on pipeline ROW, 1 to 4 ft diameter rocks
LM2-ESFB-7	24	15	6-7	Many	Small-Large	Y	Talus/scree slide south of pipeline ROW, 1 to 4 ft diameter rocks
LM2-ESFB-8	24	15	6-7	Many	Small-Large	Y	Talus/scree slide on pipeline ROW, 1 to 4 ft diameter rocks

^a **Few, Moderate, Many**

^b **Small**—(1/4-3/4-inch), **Medium**—(3/4-2-inch), **Large**—(>2-inch)

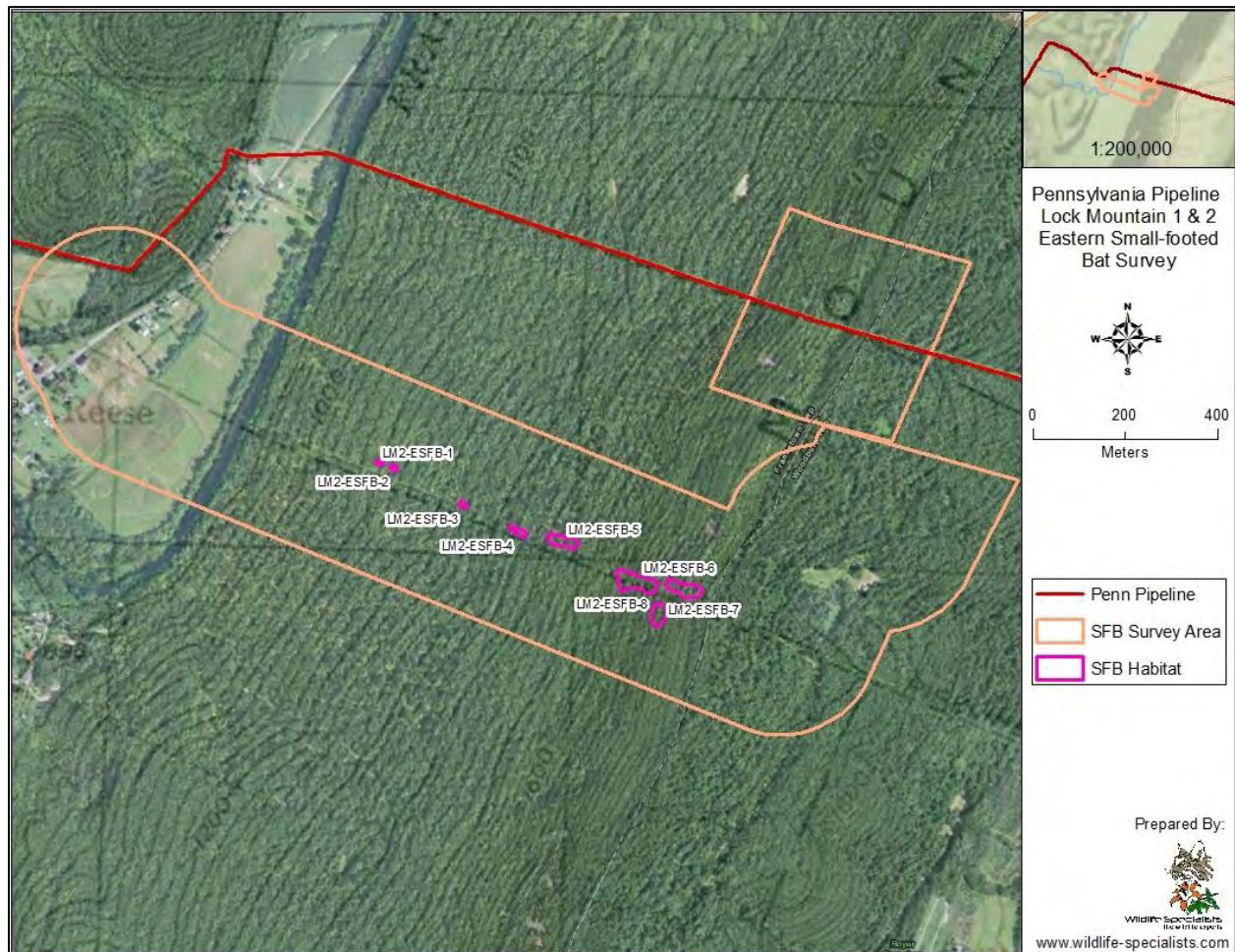


Figure 28. Lock Mountain 1 & 2 survey areas along the proposed Pennsylvania Pipeline Project, Frankstown and Woodbury Twps., Blair County, Pennsylvania, July 2014.

Jacks Mountain 2

The Jack's Mountain 2 survey area is a 71 ac (29 ha) area of mostly mature forest, with a pipeline corridor running through it. The site is located on the steep west facing side of Jack's Mountain. The survey corridor is approximately 1.1 km east of Route 655 with central coordinates at 77°57'19.28"W, 40°20'50.23"N. Elevations within the site range from approximately 1,300ft – 1,660ft above mean sea level. Tree and sapling species include black birch, red oak, chestnut oak, red maple, and sugar maple. The understory is dominated by grape vine, blackberry and striped maple. Rocky habitat consisting of shaded and exposed boulders covered most of the survey corridor. Canopy cover throughout most of the survey area was 50% with the exception of the pipeline right-of-way and open talus slides.

Findings

A combined 3.5 acres (12 habitat polygons) consisted of open rocky features and was considered prime habitat (0% canopy cover) by bats for summer roosting (Table 13, Fig. 29, Photo Maps 10-11). The habitat consisted of several small open talus slides as well as talus and boulders (1-3m across) along the existing pipeline right-of-way. Canopy cover ranged from 50% near the edges of the habitat polygons to 0% within the larger talus slides. Many small to large crevices were present within all the habitat polygons. Sparse amounts of organic material consisting primarily of dried leaf litter, duff and soil can be observed within some of the crevices. The rock habitats will receive approximately 4-8 hours of direct sunlight. The boulders and talus observed in the wooded portions of the survey area was considered to be too shaded (80-90% canopy cover) to be utilized for summer roosting (Appendix IV, Photo Map 12).

Table 13. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Jacks Mountain 2 survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
JM2-ESFB-1 &	10, 11	30-50	4-6	many	small-large	N	Piled talus and 1-4m boulders along existing pipeline ROW
JM2-ESFB-3	10	20-50	4-6	many	large	N	Small talus slide with 1-4m boulders on side of mountain at ~ 1580ft
JM2-ESFB-4	10	0-50	4-8	many	large	N	Large talus slide on side of mountain at ~ 1760ft, boulders 1-3m
JM2-ESFB-5	10	30-60	4	many	small-large	Y	Small pile of 1-3m boulders on top of mountain
JM2-ESFB-6	11	0-20	8	many	medium-large	Y	Open talus slide near mtn. top with 1-3m boulders and tapering crevices
JM2-ESFB-7	11	5	8+	many	medium-large	Y	Large open talus slide with 1-3m diameter boulders and slabs
JM2-ESFB-8	10	10	8+	many	medium-large	Y	Large open talus slide with 1-4m diameter boulders near mtn. top
JM2-ESFB-9	10	11	8+	many	medium-large	Y	Large open talus slide with 1-4m diameter boulders and crevices
JM2-ESFB-10	10	11	8+	many	medium-large	Y	Large open talus slide with 1-4m diameter boulders and crevices
JM2-ESFB-11	10	11	8+	many	medium-large	Y	Large open talus slide with 1-4m diameter boulders and crevices
JM2-ESFB-12	10	11	8+	many	medium-large	Y	Large open talus slide with 1-4m diameter boulders and crevices

^a **Few, Moderate, Many**

^b **Small**—(1/4-3/4-inch), **Medium**—(3/4-2-inch), **Large**—(>2-inch)

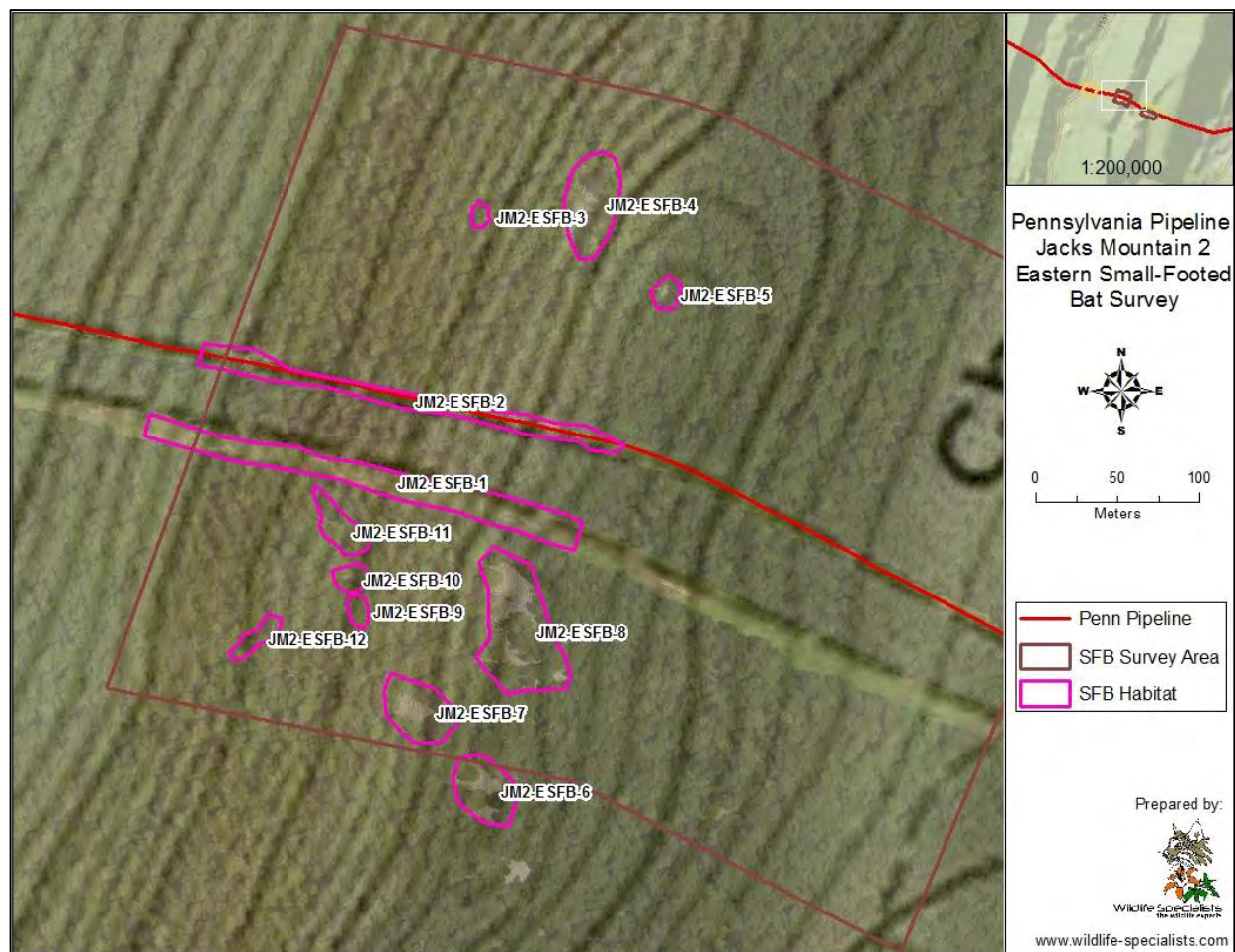


Figure 29. Locations of potential Eastern small-footed bat summer roosting habitat at the Altoona Bypass survey area along the proposed Pennsylvania Pipeline Project, Union Twp., Huntingdon County Pennsylvania, July 2014.

Jacks Mountain 3

The Jack's Mountain 3 survey area is a 69 ac (28 ha) area of mostly mature forest located on the steep south facing side of Jack's Mountain (Fig. 30). The survey corridor is approximately 2.4 km east of Route 655 with central coordinates at 77°56'34.47"W, 40°20'37.07"N. Elevations within the site range from approximately 1,560ft – 1,640ft above mean sea level. Tree and sapling species include black birch, red oak, chestnut oak, red maple, and white pine. The understory is dominated by Virginia creeper, blackberry, grape vine, mountain laurel, and polypody fern. Canopy cover in approximately half of the survey area was 60%, with the remaining portions being 90% or greater.

Findings

Potential Eastern Small-footed Bat habitat was identified within the Jack’s Mountain 3 survey area (Fig. 30, Table 14, Appendix IV, Photo Map 13). An area of 0.09 ha (0.22 ac) of the rock features that were observed within the survey corridor had low canopy cover, and were considered prime habitat for summer roosting by bats. The habitat consisted of several small open talus slides as well as talus and boulders (1-3m across) along the existing pipeline right-of-way. Canopy cover ranged from 50% near the edges of the habitat polygons to 0% within the larger talus slides. Many small to large crevices were present within all the habitat polygons. Sparse amounts of organic material consisting primarily of dried leaf litter, duff and soil can be observed within some of the crevices. The rock habitats will receive approximately 4-8 hours of direct sunlight. The boulders and talus observed in the wooded portions of the survey area were considered to be too shaded (80-90% canopy cover) to be utilized for summer roosting (Appendix IV, Photo Map 14).

Table 14. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Jacks Mountain 3 survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
JM3-ESFB-1	13	20	7-8	many	Medium-large	Y	Talus slide on slope with 1-3m boulders and tapering crevices
JM3-ESFB-2	13	35	6-8	many	Medium-large	Y	Talus slide on side of mountain with 1-4m boulders and tapering crevices
JM3-ESFB-3	13	25	8	many	small-large	Y	Talus with some large crevices and boulders on northwest slope
JM3-ESFB-4	13	20-50	6-8	many	small-large	N	Talus slide on side of mountain at ~ 1,560 ft
JM3-ESFB-5	13	50	6	moderate	small-large	Y	Talus within the existing pipeline ROW
JM3-ESFB-6	13	50	6	few	small	Y	Small talus within the pipeline ROW

^a Few, Moderate, Many

^b Small—(1/4-3/4-inch), Medium—(3/4-2-inch), Large—(>2-inch)

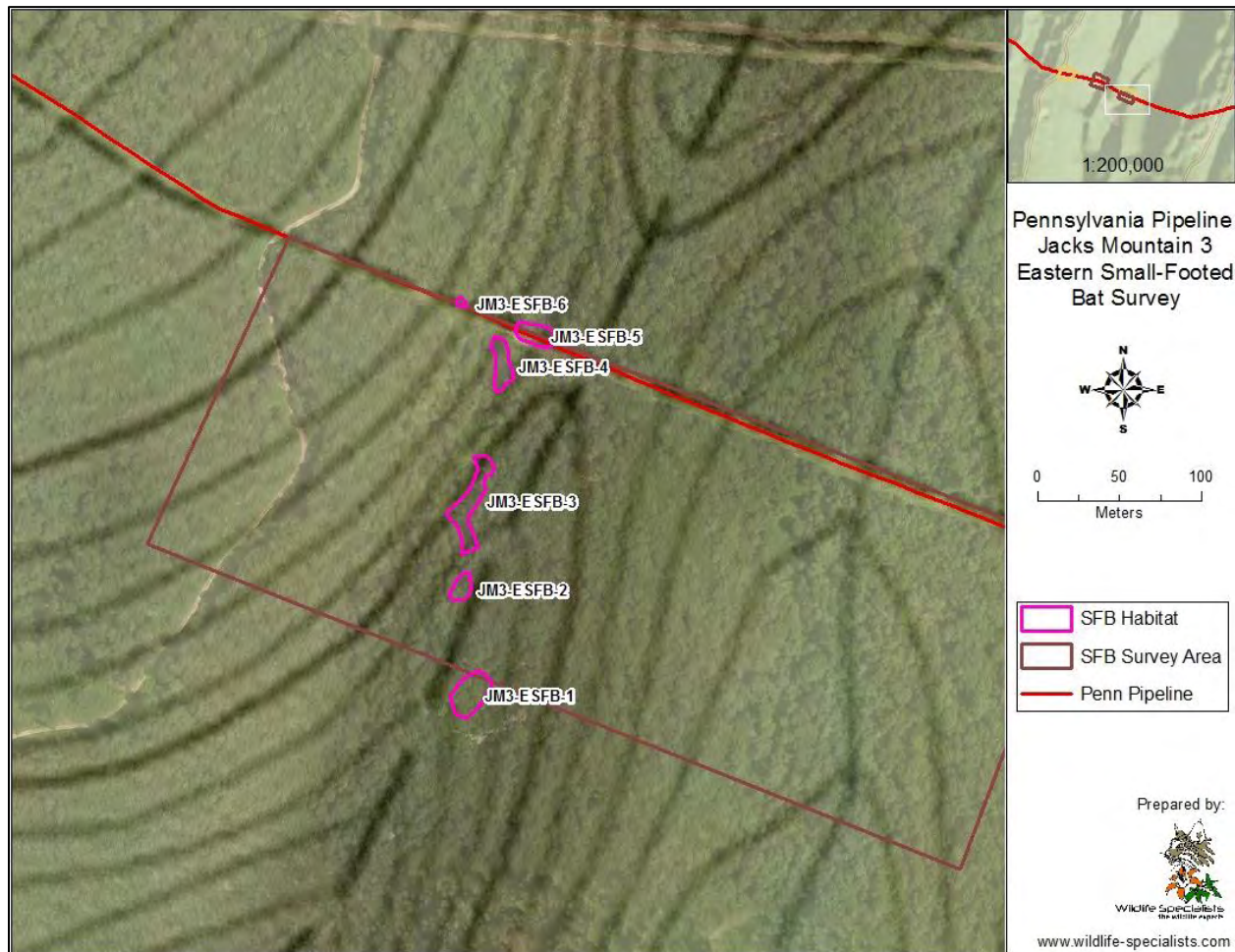


Figure 30. Locations of potential Eastern small-footed bat summer roosting habitat at the Jacks Mountain 3 survey area along the proposed *Pennsylvania Pipeline Project*, Union and Shirley Twps., Huntingdon County Pennsylvania, July 2014.

Blacklog Mountain

The Blacklog Mountain survey area is a 97 ac (39 ha) area of mostly mature forest located on the steep south and north facing sides of Blacklog Mountain (Fig. 31). The survey corridor is approximately 8.6 km southeast of the town of Mt. Union with central coordinates at 77°48'34.07"W, 40°19'22.59"N. Elevations within the site range from approximately 1,300ft – 1,650ft above mean sea level. Tree and sapling species include black birch, red oak, red maple, sassafras, witch-hazel, chestnut oak, and white pine. The understory contains Virginia creeper, greenbriar, blackberry, polypody and marginal wood fern, grapevine, grasses, black raspberry (*Rubus occidentalis*), and mountain laurel. Canopy cover averaged 80% throughout the survey area except with the pipeline corridor and along Blacklog Mountain Road.

Findings

Three (3) areas of potential small-footed bat roosting habitat were located (Fig. 31, Table 15, Appendix IV; Photo Map 15). The combined areas measured approximately 800 square feet. Rock was free of canopy cover and had deep crevices. The potential roosting habitat was comprised of small to large rock piles along the edges of an existing pipeline ROW with boulders averaging 1-3m in diameter. Sparse amounts of organic material consisting primarily of dried leaf litter, duff and soil can be observed within some of the crevices. The rock habitats will receive approximately seven (7) hours of direct sunlight. Medium sized crevices were identified within the boulder piles. The boulders and talus observed in the wooded portions of the survey area were considered to be too shaded (80-90% canopy cover) to be utilized for summer roosting (Appendix IV, Photo Map 16).

Table 15. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Blacklog Mountain survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
BM-ESFB-1	15	30-40	7	moderate	medium	N	Piled boulders along pipeline ROW
BM-ESFB-2	15	30	7	moderate	medium	Y	Pipeline ROW, some soil between rocks when line was back-filled
BM-ESFB-3	15	30	7	few	medium	Y	Pipeline ROW, some soil between rocks when line was back-filled

^a **Few, Moderate, Many**

^b **Small**—(1/4-3/4-inch), **Medium**—(3/4-2-inch), **Large**—(>2-inch)

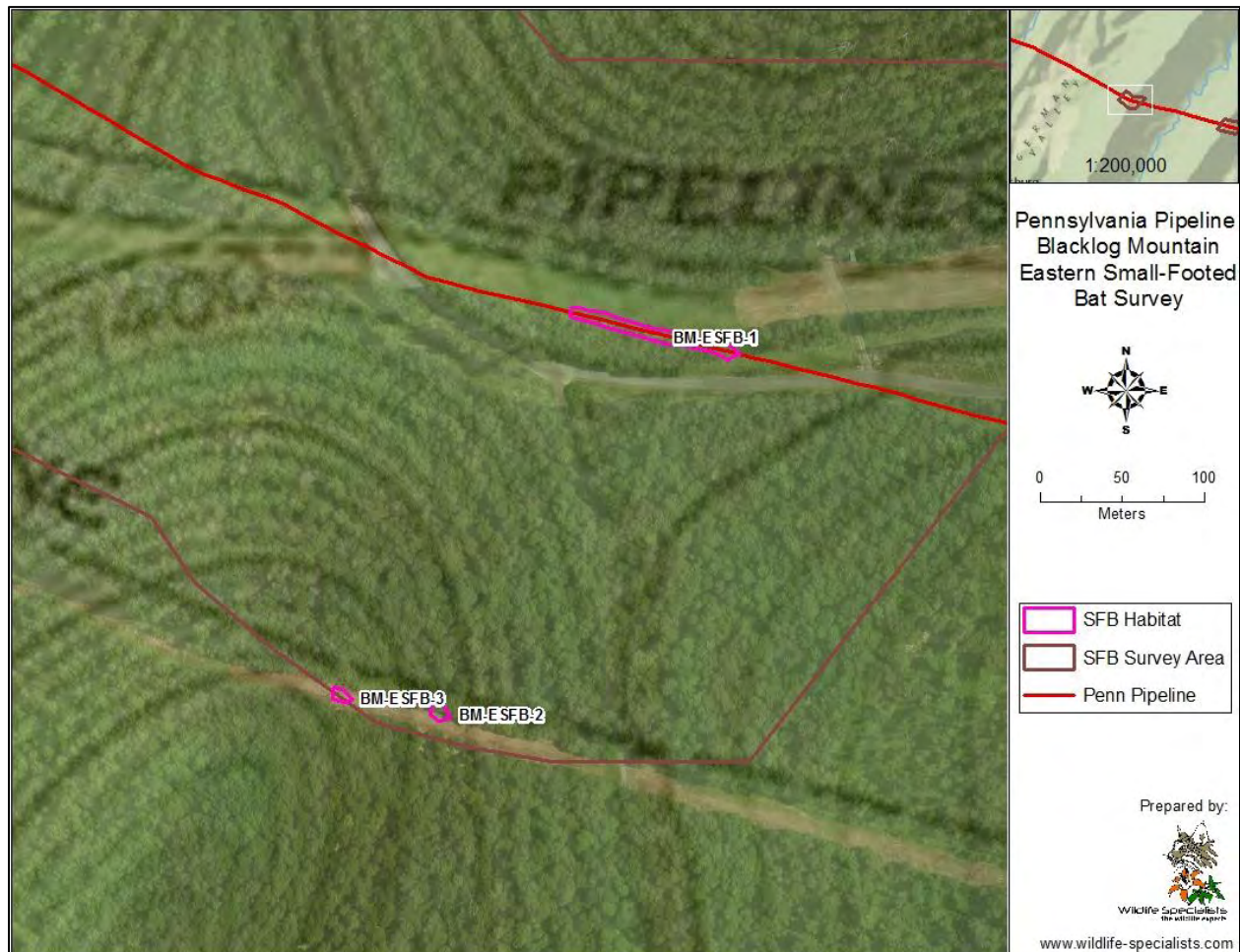


Figure 31. Locations of potential Eastern small-footed bat summer roosting habitat at the Blacklog Mountain survey area along the proposed Pennsylvania Pipeline Project, Shirley Twp., Huntingdon County Pennsylvania, July 2014.

Shade Mountain

The Shade Mountain survey area is a 94 ac (38 ha) area of mostly mature forest located primarily on the steep east and somewhat on the west facing side of Shade Mountain (Fig. 32). The survey corridor is approximately 7.2 km southwest of the town of Cross Keys with central coordinates at 77°46'5.87"W, 40°19'1.93"N. Elevations within the site range from approximately 940ft – 1,780ft above mean sea level. Tree and sapling species include black birch, red oak, red maple, sassafras, witch-hazel, tulip poplar (*Liriodendron tulipifera*), and basswood. The understory contains Virginia creeper, greenbriar, blackberry, polypody and marginal wood fern, striped maple, grape vine, grasses, white baneberry, and poison ivy. Canopy cover ranged from 0% within the many open talus slides to 100% in forested areas.

Findings

Many areas of high potential Eastern Small-footed Bat roosting habitat were located (Table 16, Appendix IV, Photo Maps 17-18). The combined areas measured 5.13 ha (12.7 ac), approximately 13.35% of the entire survey area. Rock was free of canopy cover and had deep crevices, ideal for small-footed bat summer roosting. The habitat consisted of several small to extremely large open talus slides as well as talus and boulders (1-5m across) along the existing pipeline right-of-way and beyond. Canopy cover ranged from 50% near the edges of the habitat polygons to 0% within the larger talus slides. Many small to large crevices were present within all the habitat polygons. Sparse amounts of organic material consisting primarily of dried leaf litter, duff and soil can be observed within some of the crevices. The rock habitats will receive approximately 4-8+ hours of direct sunlight. The boulders and talus observed in the wooded portions of the survey area were considered to be too shaded (80-90% canopy cover) to be utilized for summer roosting (Appendix IV, Photo Map 19).

Table 16. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Shade Mountain survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices^a	Size of Crevices^b	Organic Mat, Soil, Water (Y/N)	Comments
SM-ESFB-1	18	30	5-7	many	medium-large	Y	Piled talus and 1-3m boulders along existing pipeline ROW
SM-ESFB-2	18	30	5-7	many	medium-large	Y	Piled talus and 1-3m boulders along existing pipeline
SM-ESFB-3	18	5	8+	many	medium-large	Y	Large open talus slide on side of mountain with 1-3 m boulders
SM-ESFB-4	18	10	8+	many	medium-large	Y	Large open talus slide on side of mountain, boulders 1-3m
SM-ESFB-5	18	20	8+	many	medium-large	Y	Open talus slide on side of mountain, boulders 1-3m with many crevices
SM-ESFB-6	18	5	8+	many	medium-large	Y	Open talus slide with 1-3m diameter boulders and slabs
SM-ESFB-7	18	5	8+	many	medium-large	Y	Large open talus slide with 1-4m diameter boulders and crevices
SM-ESFB-8	18	15	8+	many	medium-large	Y	Large open talus slide with 1-4m diameter boulders and crevices
SM-ESFB-9	17, 18	5	8+	many	medium-large	Y	Large open talus side with 1-4m boulders on side of mountain
SM-ESFB-10	18	5	8+	many	medium-large	Y	Large open talus slide with 1-4m boulders on side of mountain
SM-ESFB-11	18	5	8+	many	medium-large	Y	Large open talus slide on side of mountain, boulders 1-4m
SM-ESFB-12	18	5	8+	many	medium-large	Y	Large open talus slide on side of mountain with 1-4m boulders



Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
SM-ESFB-13	17	25	7	many	small-large	Y	Piled talus and 1-3m boulders along existing pipeline ROW
SM-ESFB-14	17	25	7	many	small-large	Y	Piled talus and 1-3m boulders along existing pipeline ROW
SM-ESFB-15	18	25	7+	many	small-large	Y	Piled talus and 1-3m boulders along existing pipeline ROW
SM-ESFB-16	18	20	7+	many	medium-large	Y	Open talus slide with 1-3m diameter boulders and crevices near mtn. top
SM-ESFB-17	17	2	8+	many	medium-large	Y	Large open talus slide with 1-3m boulders and crevices on mtn. side
SM-ESFB-18	17	15	8+	many	medium-large	Y	Open talus slide with 1-3m diameter boulders and numerous crevices
SM-ESFB-19	18	15	8+	many	medium-large	Y	Open talus slide with 1-3m diameter boulders and crevices on mtn. side
SM-ESFB-20	17	2	8+	many	medium-large	Y	Expansive open talus slide with 1-5m boulders and numerous crevices

^a **Few, Moderate, Many**

^b **Small**—(1/4-3/4-inch), **Medium**—(3/4-2-inch), **Large**—(>2-inch)

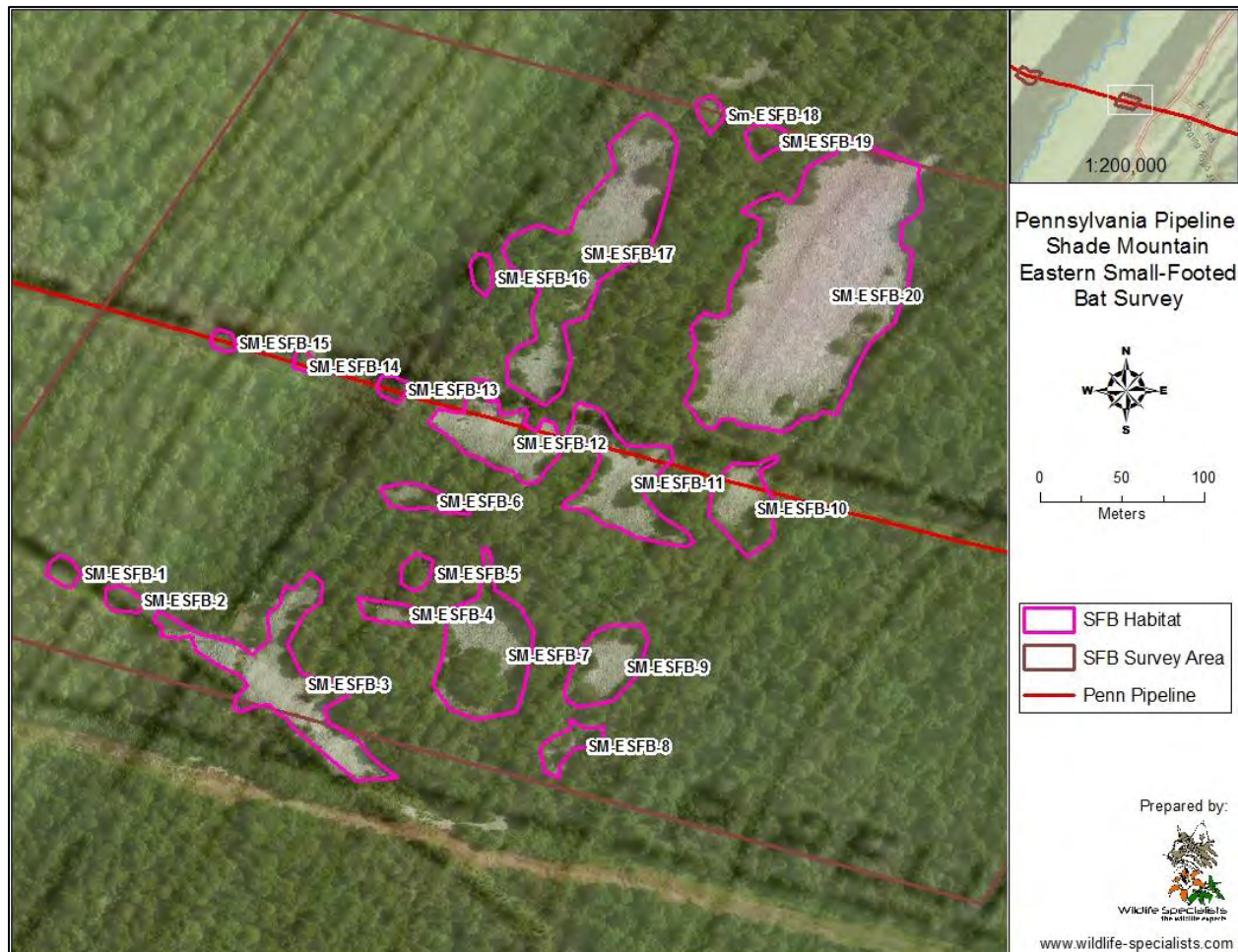


Figure 32. Locations of potential Eastern small-footed bat summer roosting habitat at the Shade Mountain survey area along the proposed Pennsylvania Pipeline Project, Shirley and Tell Twps., Huntingdon County, Pennsylvania, July 2014.

Conococheague Mountain

The Conococheague Mountain survey area is a 59 ac (24 ha) area of primarily mature deciduous forest located on the moderate northwest facing and steep southeast facing slopes of Conococheague Mountain (Fig. 33). The survey corridor is approximately 0.5 km north and 7.0 km east of Blairs Mills with central coordinates at 40°17'23.659"N, 77°38'88.071". Elevations within the site range from 1,440ft - 1,840ft above mean sea level. The site consists of mostly mature deciduous forest and mixed forest with a well-developed understory throughout most of the survey area. An existing pipeline right-of-way crosses the entire vertical length and Concord Road crosses the entire horizontal width of the survey area.

The majority of the southeast facing slope was covered with talus and boulders with particularly dense rock at the higher elevations and slightly more scattered rock at lower elevations. Some scattered

boulders and associated talus were present within and south of the ROW on the northwest facing slope. Canopy cover ranged from 0-50% within the pipeline ROW and small open areas to 75 to 90% throughout the rest of the survey area. Dominant overstory species included red and chestnut oak, red maple, and black birch. Shrub and herbaceous species included mountain laurel, witch hazel, green briar, blackberry, low-bush blueberry, grapevine, goldenrod, ferns and grasses.

Findings

Most of the survey area particularly the southeast facing slope was covered with dense boulders and talus ranging in size from 1-5 meters with some larger float blocks up to 10 meters. Numerous small to large interstices and deep crevices are present throughout the rocky habitat. Fourteen (14) areas with sufficient sun exposure to be considered potential small-footed bat roosting habitat were located within the survey area (Fig. 33, Table 17, Appendix IV; Photo Map 20 & 21). Organic material consisting primarily of dried leaf litter, duff and soil was observed within some of the crevices. Sun exposure ranges from 4 hours in the smaller areas to 8+ hours within the large open area on the ROW. The boulders and talus observed throughout the rest of the survey area was considered to be too shaded (75-90% canopy cover) to be utilized for summer roosting (Appendix IV, Photo Map 22).

Table 17. Descriptive characteristics of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat at the Conococheague Mountain survey area.

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
SFB-Con-1	20	30-50	4-5	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-2	20	0-20	8+	Many	Small-Large	Y	Dense boulder/talus slide on ROW, 10 ft diameter and smaller rocks
SFB-Con-3	20	30-50	4-5	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-4	20	30-50	4-5	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-5	20	30-50	4-5	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-6	21	30-50	4-5	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-7	21	30-50	4-5	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-8	21	20-50	4-6	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-9	21	30-50	4-5	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-10	20	30-50	4-5	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks

Habitat ID	Photo Map	Canopy Cover (%)	Solar Exposure (Hr)	# of Crevices ^a	Size of Crevices ^b	Organic Mat, Soil, Water (Y/N)	Comments
SFB-Con-11	21	20-50	4-6	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 5ft and smaller rocks
SFB-Con-12	21	20-50	4-6	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-13	21	20-50	4-6	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks
SFB-Con-14	21	30-50	4-6	Many	Small-Large	Y	Dense boulder/talus slide in small opening, 8ft and smaller rocks

^a **Few, Moderate, Many**

^b **Small—(1/4-3/4-inch), Medium—(3/4-2-inch), Large—(>2-inch)**

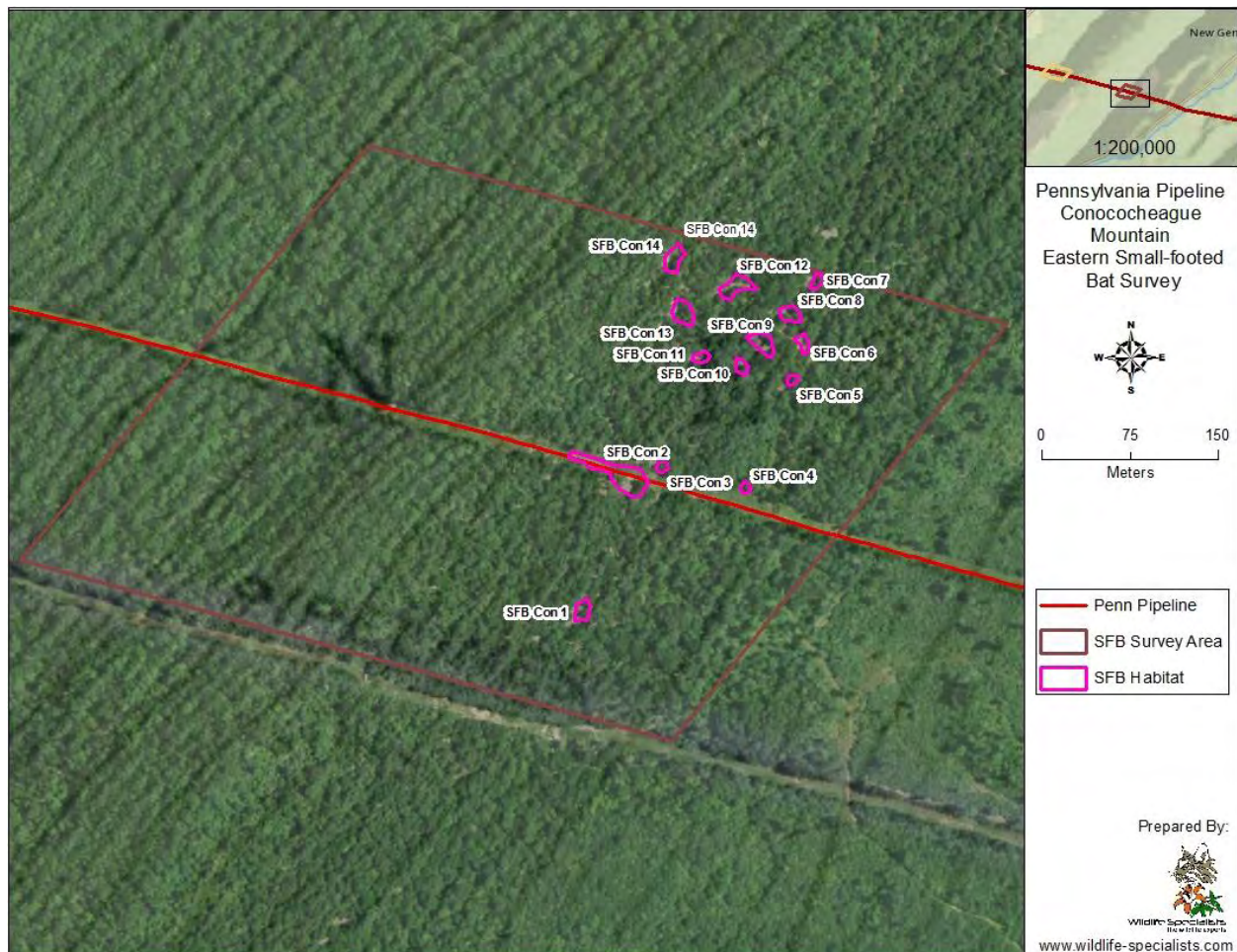


Figure 33. Locations of potential Eastern small-footed bat summer roosting habitat at the Conococheague Mountain survey area along the proposed Pennsylvania Pipeline Project, Toboyne Twp., Perry County, Pennsylvania, April 2015.

Appendix I. The Pennsylvania Game Commission’s Pennsylvania Natural Diversity Inventory (PNDI) Large Project Environmental Review response for Sunoco’s proposed Pennsylvania Pipeline Project.



Division of Environmental
 Planning and Habitat
 Protection
 717-783-5957

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

2001 ELMERTON AVENUE
 HARRISBURG, PA 17110-9797

*“To manage all wild birds, mammals and their habitats
 for current and future generations.”*

ADMINISTRATIVE BUREAUS:

ADMINISTRATION.....717-787-5670
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 FISCAL MANAGEMENT.....717-787-7314
 CONTRACTS AND
 PROCUREMENT.....717-787-6594
 LICENSING.....717-787-2084
 OFFICE SERVICES.....717-787-2116
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 WILDLIFE HABITAT
 MANAGEMENT.....717-787-6818
 REAL ESTATE DIVISION.....717-787-6568
 AUTOMATED TECHNOLOGY
 SERVICES.....717-787-4076

www.pgc.state.pa.us

March 14, 2014

PGC ID Number: 201312180001

Mr. Preston Smith
 Tetra Tech
 661 Anderson Drive, Foster Plaza
 Pittsburgh, Pa 15220
preston.smith@tetrattech.com

Re: Sunoco Pipeline, LP – Pennsylvania Pipeline Project
 State Game Lands Nos. 46, 52, 71, 118, 147, 153, 198, 220, and 276
 Large Project PNDI Review
 Washington, Westmoreland, Indiana, Cambria, Blair, Huntingdon, Perry, Cumberland, Lebanon,
 Lancaster, Berks, and Chester Counties, PA

Dear Mr. Smith,

Thank you for submitting your Pennsylvania Natural Diversity Inventory (PNDI) Large Project Environmental Review request. The Pennsylvania Game Commission (PGC) screened this project, including the requested 1500-foot buffer, for potential impacts to species and resources of concern under PGC responsibility, which includes birds and mammals only.

Potential Impact Anticipated

PNDI records indicate species or resources of concern are located in the vicinity of the project. The PGC has received and thoroughly reviewed the information that you provided to this office as well as PNDI data, and has determined that potential impacts to threatened, endangered, and species of special concern may be associated with your project. Therefore, additional measures are necessary to avoid potential impacts to the species listed below:

Scientific Name	Common Name	PA Status	Federal Status
<i>Myotis sodalis</i>	Indiana Bat	ENDANGERED	ENDANGERED
<i>Neotoma magister</i>	Allegheny Woodrat	THREATENED	
<i>Myotis leibii</i>	Eastern Small-footed Bat	THREATENED	
<i>Circus cyaneus</i>	Northern Harrier	THREATENED	
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	SPECIAL CONCERN	
<i>Lasionycteris noctivagans</i>	Silver-haired Bat	SPECIAL CONCERN	
<i>Haliaeetus leucocephalus</i>	Bald Eagle		

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Next Steps

Indiana Bat

Indiana bats are a federally listed endangered species under the jurisdiction of the U.S. Fish and Wildlife Service. As a result, our agency defers comments on potential impacts to Indiana bats to the U.S. Fish and Wildlife Service.

Allegheny Woodrat

The PGC has identified portions of the proposed project where potential Allegheny woodrat habitat may exist, and could be impacted by the proposed project. The PGC is requesting that Allegheny woodrat surveys be completed within the Allegheny Woodrat Survey Areas (see Maps 1-7 attached). The surveys should be completed by a qualified biologist and follow protocols found in the attached *PGC Allegheny Woodrat* guidance document. Please be sure that the following information, at a minimum, is provided for further review and comment by the PGC:

- a 1:24,000 scale copy of a USGS topo map and a GIS shapefile illustrating the locations (i.e. points) of all woodrat activity centers and potential activity centers, as well as the limits (i.e. polygons) of all woodrat habitat sites (central point locations with average width and length measurements will not be accepted to illustrate the habitat sites)
- color photographs, keyed to a location and orientation map, of any woodrat habitat sites, activity centers, potential activity centers, or woodrat sign that are identified during the surveys
- a Woodrat Habitat Site Survey form for each habitat site identified during the survey

The survey report should be submitted to the PGC no later than December 31st of the year it is completed.

Eastern Small-footed Bat

The PGC has identified portions of the project where potential eastern small-footed bat day roost habitat may exist, and could be impacted by the proposed project. The PGC is requesting that all potential eastern small-footed bat day roost habitat be assessed and delineated by a qualified biologist within the Small-footed Bat Survey Areas (see Maps 1-7 attached). Please be sure that the following information, at a minimum, is provided for further review and comment by the PGC:

- a 1:24,000 scale copy of a USGS topo map and a GIS shapefile illustrating the limits of all potential small-footed bat day roost habitat that is identified
- a GIS shapefile illustrating the proposed limits of tree clearing throughout the Small-footed Bat Survey Areas
- a GIS shapefile illustrating the proposed limits of earthwork, including any proposed grubbing or erosion and sedimentation pollution controls, throughout the Small-footed Bat Survey Areas
- representative color photographs of all surface rock encountered during the assessment and delineation regardless of whether the rock is considered to be potential eastern small-footed bat day roost habitat or not (numerous photos for each area of surface rock are strongly recommended)

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- a narrative or table detailing the following information for each area of surface rock that is encountered during the assessment and delineation to support or refute the rock's potential as eastern small-footed bat day roost habitat:
 - the estimated canopy cover over the rock
 - anticipated solar exposure of the rock
 - amount and size of crevices available for roost sites
 - presence of organic material, soil, or water within those crevices
 - other details as necessary that cannot be adequately conveyed via the photos provided
- a narrative detailing the reason(s) for any surface rock encountered not being considered potential small-footed myotis day roost habitat;
- and a photo location and orientation map for all photos provided.

The survey report should be submitted to the PGC no later than December 31st of the year it is completed.

Northern Harrier

The PGC is requesting that all site preparation, construction, reclamation, and future maintenance mowing within the Northern Harrier Restriction Area (see Map 8 attached) avoid the period between April 15 and August 31 to minimize potential impacts to northern harriers and their habitat during the breeding and nesting season.

The PGC is also recommending that Sunoco use the following seed mix within this section of the project area to ensure the establishment of beneficial herbaceous habitat for grassland species post-construction.

Species	Common Name	Seed/Acre	Percent Live Seed
<i>Avena sativa – spring planting</i>	annual oats	30lb	
<i>Lolium multiflorum- fall planting</i>	annual ryegrass	10lb	
<i>Schizachyrium scoparium</i>	little bluestem	4 lbs	10-67
<i>Sorghastrum nutans</i>	indian-grass	2 lbs	10-50
<i>Bouteloua curtipendula</i>	side-oats grama	1 lb	5-25
<i>Panicum virgatum</i>	switchgrass	1 lb	10-12
<i>Rudbeckia triloba plus another*</i>	black-eyed susan	¼ lb	1-5, each
<i>Coreopsis tripteris</i>	tall tickseed	1 oz	1-5
<i>Chasmanthium latifolium</i>	sea-oats	1lb	1-30
Straw Mulch – NO HAY			

Furthermore, when plans are developed illustrating the specific location and extent of any proposed permanent facilities (e.g. access roads, extra work spaces, launcher/receiver sites, meter sites, compressor stations, etc.) within this section of the project area, please provide a copy of those plans to this office for further review and written comment so that any permanent impacts to northern harriers can be considered. Every effort should be made to avoid and minimize permanent impacts to northern harrier habitat as these plans are developed, and depending on the nature and extent of any such impacts, habitat assessments, species surveys and/or mitigation may be necessary.

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March 14, 2014

Northern Long-eared Bats and Silver-haired Bats

Northern long-eared bats and silver-haired bats are species of special concern, and therefore, not target species for additional surveys. However, because of their ecological significance, all trees or dead snags greater than 5 inches in diameter at breast height that need to be harvested to facilitate the project (including any access roads or off-ROW work spaces) should be cut between November 1st and March 31st.

Bald Eagle

In January 2014, the PGC Board of Commissioners approved the removal of bald eagles from the state-listed endangered and threatened list. This status change will be reflected in an upcoming edition of the Pennsylvania Bulletin. Bald eagles are now classified as a Pennsylvania "protected" species. As the name implies, bald eagle will continue to enjoy protections provided by the Federal Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, and the Lacey Act. As a result, the PGC defers comments on potential impacts to bald eagles to the U.S. Fish and Wildlife Service.

The Bald and Golden Eagle Protection Act protects eagles from various forms of take, including disturbance. Please refer to the U.S. Fish and Wildlife Service's National Bald Eagle Management Guidelines (<http://www.fws.gov/migratorybirds/baldeagle.htm>) for specific measures that should be taken to ensure bald eagles are not disturbed. If you have questions about when and how to obtain a federal permit because you believe your proposed project will disturb bald eagles, and you are not able to implement measures to avoid disturbance, please contact the Fish and Wildlife Service's Pennsylvania Field Office at 814-234-4090.

For additional information on bald eagles and bald eagle nest etiquette refer to the "Bald Eagle Watching in Pennsylvania" link on the PGC's website (www.pgc.state.pa.us), under the Wildlife tab and then by clicking on Birding and Bird Conservation.

Wetlands

National Wetland Inventory Mapping (NWI) and/or aerial photos suggest that wetlands are located within the requested review area along the Little Conemaugh River, the Raystown Branch Juniata River, Marsh Creek, and Middle Creek. The PGC is requesting that the final project avoid, or at least minimize to the greatest practical extent, any adverse impacts to these resources and their associated wildlife habitat.

Potential Bat Hibernacula

In addition, the PA Department of Environmental Protection's *Abandoned Mine Land (AML) Inventory Points* from www.pasda.psu.edu indicates abandoned mine features within the requested review area. These mine features have the potential to connect to abandoned deep mine workings that can serve as hibernacula for a variety of cave bat species. These AML openings and any undocumented openings and caves located along the proposed alignment and within the review buffer must be assessed following the attached *PGC Protocol for Assessing Bat Use of Potential Hibernacula*. Any features having potential as bat hibernacula will need to be surveyed to determine the presence or absence of bat species. A special use permit will need to be obtained by the consultant in order to conduct such surveys that involve the handling of bats.

Mr. Preston Smith

-5-

March 14, 2014

State Game Lands

Portions of the proposed project are located on State Game Lands Nos. 46, 52, 71, 118, 147, 198, and 276 and adjacent to State Game Lands Nos. 153 and 220. Please contact Mr. Travis Anderson, Southwest Region Land Management Supervisor, at 724-238-9523 to discuss and coordinate the project on SGL 153 and 276, Mr. Robert Einodshofer, Southcentral Region Land Management Supervisor, at 814-643-1831 to discuss and coordinate the project on SGL 71, 118, 147, and 198, and Mr. Bruce Metz, Southeast Region Land Management Supervisor, at 610-926-3136 to discuss and coordinate the project on SGL 46, 52, and 220.

This response represents the most up-to-date summary of the PNDI data files and is valid for two (2) years from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on site. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

Should the proposed work continue beyond the period covered by this letter, please resubmit the project to the PGC at the following address as an "Update" (including an updated PNDI receipt, project narrative and accurate map):

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning & Habitat Protection
2001 Elmerton Avenue
Harrisburg, PA 17110-9797

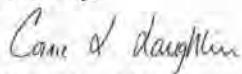
If the proposed work has not changed and no additional information concerning listed species is found, the project will be cleared for PNDI requirements by the PGC for an additional 2 years.

This finding applies to impacts to birds and mammals only. To complete your review of state and federally-listed threatened and endangered species and species of special concern, please be sure that the U.S. Fish and Wildlife Service, the PA Department of Conservation and Natural Resources, and/or the PA Fish and Boat Commission have been contacted regarding this project as directed by the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Please be sure to include the above-referenced PGC ID Number on any future correspondence with the PGC regarding this project.

If you have any questions regarding this letter, or any future review requests for this or any other projects, please contact John Taucher at 717-787-4250, extension 3632 or via e-mail at jotaucher@pa.gov.

Sincerely,



Corrie Laughlin
Division of Environmental Planning & Habitat Protection
Bureau of Wildlife Habitat Management
Phone: 717-787-4250, Extension 3634
Fax: 717-787-6957
e-Mail: claughlin@pa.gov

Mr. Preston Smith

-6-

March 14, 2014

A PNHP Partner



Pennsylvania Natural Heritage Program

CLL/jwt

Enclosures:

Project Overview Map
Maps 1-8
PGC Allegheny Woodrat guidance document
PGC Protocol for Assessing Bat Use of Potential Hibernacula

cc: W. Anderson
Myers
Grohol
Trusso
Vreeland
Morgan
T. Anderson
Einodshofer
Metz
DuBrock
Brauning
Butchkoski
Turner
Gross
Barber
DiMatteo
Havens
Taucher
Librandi Mumma
Ms. Jennifer Siani, U.S. Fish and Wildlife Service
Ms. Pamela Shellenberger, U.S. Fish and Wildlife Service
H:\OIL&GAS_PNDI_Reviews\Statewide & Multi-Region Projects
F:\OILGASMINERALSS\46
F:\OILGASMINERALSS\52
F:\OILGASMINERALSS\71
F:\OILGASMINERALSS\118
F:\OILGASMINERALSS\147
F:\OILGASMINERALSS\153
F:\OILGASMINERALSS\198
F:\OILGASMINERALSS\220
F:\OILGASMINERALSS\276



Appendix II. ALLEGHENY NEMA HABITAT SITE SURVEY (FORM PGC 4150 wdrat) forms for Sunoco's proposed Pennsylvania Pipeline Project, Cambria, Blair, Huntingdon, Perry, and Cumberland Counties, Pennsylvania, June 23-July 24, 2014.

FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying Neotoma magister Survey Code Booklet to complete this form.

Habitat Site Name: Laurel Ridge 2 Trap-site Number: _____ Date: 6/25/2014

Ownership (circle one): Public, Private, Both Access (Name, Address Telephone): _____

Location: _____ N or 5.1km S and _____ E or 4.0 W of: Vintondale

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km - 2km; >2km

Surveyors: Stan Boder, Brian Benner, Phil Dunning, Dave Scopaz, Justin Collins

Effort: # of surveyors x survey minutes = 120 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): CRLR Habitat Site Code (if known): _____

County: Indiana Quadrangle: Vintondale Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 5 Average Width: _____ Width range: 337

Activity Extent (m): Longest Length: _____ Average Width: _____ Width range: _____
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 25 ' 51.2 " & Longitude W78 ° 57 ' 27.1 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1660 to 1680 Slope Range (%): 25 to 30

Aspects (degrees): southerly aspects: _____ % _____ ° northerly aspects: _____ % _____ °
(135°-225°) (315°-45°)
easterly aspects: 120 % 100 ° westerly aspects: _____ % _____ °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge/valley side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 312 % 100
- 2) Code # _____ % _____
- 3) Code # _____ % _____
- 4) Code # _____ % _____

Geological formation: Allegheny

Nearest mapped water: Name: Findley Run Distance to: 31 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 5 Two-digit Habitat Disturbance code: 1E 3D 5C

Anderson Level III cover code on site: 415 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 75 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): _____

Black Birch, Red Maple, Hemlock, Chestnut Oak

Shrub, Vine and Briar (Rubus) Species: Green Briar, Low bush blueberry, Huckleberry, Scrub oak,
Rhododendron

Herbaceous Species: Marginal Wood Fern, Hay scented fern, Bracken fern, sedges and grasses

General Description of Surrounding Habitat (>100m & <500m): Mature mixed forest,

Pipeline crosses the habitat.

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

9 rattlesnakes nearby on powerline



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	N40 25'49.48"	W78 57'29.56"	0	0	0	0	0	0	312	75
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
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13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
TOTAL =										



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Laurel Ridge 3 Trap-site Number: _____ Date: 6/25/2014

Ownership (circle one): Public, Private, Both Access (Name, Address Telephone): _____

Location: _____ N or ^{5.5km} S and _____ E or ^{3.2km} W of: Vintondale

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km - 2km; >2km

Surveyors: Stan Boder, Brian Benner, Phil Dunning, Dave Scopaz, Justin Collins

Effort: # of surveyors x survey minutes = ⁶⁰⁰ minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): CRLR Habitat Site Code (if known): _____

County: Cambria Quadrangle: Vintondale Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 336 Average Width: _____ Width range: 721

Activity Extent (m): Longest Length: _____ Average Width: _____ Width range: _____
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 25 ' 39.77 " & Longitude W78 ° 56 ' 49.93 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1800 to 2140 Slope Range (%): 25 to 30

Aspects (degrees): southerly aspects: _____ % _____ ° northerly aspects: 100 % 350 °
(135°-225°) (315°-45°)
easterly aspects: _____ % _____ ° westerly aspects: _____ % _____ °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge top

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 312 % 73
- 2) Code # 133 % 25
- 3) Code # _____ % _____
- 4) Code # 112 % 2

Geological formation: Allegheny, Pottsville

Nearest mapped water: Name: Findley Run tributary Distance to: 250 m



FORM PGC 4150 wdrat

Forest Fragmentation Code: 5 Two-digit Habitat Disturbance code: 1E 5D 5C

Anderson Level III cover code on site: 415 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 75 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): _____

Black Birch, Red Maple, Sugar Maple, Hemlock, Chestnut Oak, Red Oak, Black Cherry,

Black Gum, Sassafras, Yellow Birch, White Ash

Shrub, Vine and Briar (Rubus) Species: Green Briar, Low bush blueberry, Huckleberry,

Rhododendron, Witch-hazel, Mountain Laurel, Striped Maple, Blackberry

Herbaceous Species: Marginal Wood Fern, Hay scented fern, Bracken fern, sedges and grasses

Teaberry,

General Description of Surrounding Habitat (>100m & <500m): Mature mixed forest,

Pipeline and powerline crosses the habitat.

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

9 rattlesnakes on powerline



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	N40 25'32.15"	W78 56'46.10"	0	0	0	0	0	0	312	95
2	N40 25'36.77"	W78 56'47.95"	0	0	0	0	0	0	112	95
3	N40 25'42.64"	W78 56'42.64"	0	0	0	0	0	0	312	95
4	N40 25'45.79"	W78 56'56.44"	0	0	0	0	0	0	133	95
5										
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21										
22										
23										
24										
25										
TOTAL =										



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Laurel Ridge 1 Trap-site Number: _____ Date: 6/24/2014

Ownership (circle one): Public **Private** Both Access (Name, Address Telephone): _____

Location: _____ N or ^{6.0Km} S and _____ E or _____ W of: Vintondale

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km-2km; **>2km**

Surveyors: Stan Boder, Brian Benner

Effort: # of surveyors x survey minutes = 360 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): CRLR Habitat Site Code (if known): _____

County: Cambria Quadrangle: Vintondale Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 501 Average Width: _____ Width range: 870

Activity Extent (m): Longest Length: _____ Average Width: _____ Width range: _____
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 25 ' 20.97 " & Longitude W78 ° 54 ' 18.58 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1990 to 2280 Slope Range (%): 10 to 25

Aspects (degrees): southerly aspects: 5 % 200 ° northerly aspects: _____ % _____ °
(135°-225°) (315°-45°)

easterly aspects: 95 % 120 ° westerly aspects: _____ % _____ °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge top

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- | | |
|----------------------------------|----------------------------------|
| 1) Code # <u>312</u> % <u>75</u> | 2) Code # <u>211</u> % <u>15</u> |
| 3) Code # <u>132</u> % <u>5</u> | 4) Code # <u>133</u> % <u>5</u> |

Geological formation: Allegheny, Pottsville

Nearest mapped water: Name: Laurel Run tributary Distance to: 40 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 5 Two-digit Habitat Disturbance code: 1E 2H 3G

Anderson Level III cover code on site: 415 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 85 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): _____

Black Birch, Red Maple, Sugar Maple, Red Oak

Shrub, Vine and Briar (RUBUS) Species: Green Briar, Blackberry,

Mountain Laurel, Striped Maple, Witch hazel

Herbaceous Species: Marginal Wood Fern, Teaberry, Hay scented fern,

General Description of Surrounding Habitat (>100m & <500m): Mature forest with thick underbrush

Pipeline splits the habitat.

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	N40 25'23.36"	W78 54'19.82"	0	0	0	0	0	0	312	95
2	N40 25'24.79"	W78 54'3.59"	0	0	0	0	0	0	312	100
3	N40 25'16.44"	W78 54'37.35"	0	0	0	0	0	0	312	95
4	N40 25'17.6"	W78 54'20.9"	0	0	0	0	0	0	142	100
5										
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11										
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15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
TOTAL =										



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Altoona Bypass 1 Trap-site Number: _____ Date: 7/24/2014

Ownership (circle one): Public **Private** Both Access (Name, Address Telephone): _____

Location: _____ N or 2.5km S and _____ E or 8.1km W of: Hollidaysburg

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km-2km; **>2km**

Surveyors: Brian Benner

Effort: # of surveyors x survey minutes = 30 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): RAYS Habitat Site Code (if known): _____

County: Blair Quadrangle: Hollidaysburg Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 200m Average Width: 30m Width range: 10-30m

Activity Extent (m): Longest Length: NA Average Width: NA Width range: NA
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 24 ' 18.91 " & Longitude W78 ° 29 ' 4.06 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1500ft to 1520ft Slope Range (%): 25 to 30

Aspects (degrees): southerly aspects: _____ % _____ ° northerly aspects: _____ % _____ °
(135°-225°) (315°-45°)
easterly aspects: 100 % 95 ° westerly aspects: _____ % _____ °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge/valley- side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 321 % 100 , 2) Code # _____ % _____ ,
3) Code # _____ % _____ , 4) Code # _____ % _____

Geological formation: Foreknobs Formation

Nearest mapped water: Name: Dry Run Tributary Distance to: 46 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 5 Two-digit Habitat Disturbance code: 1E 4G 5D

Anderson Level III cover code on site: 415 and adjacent to site: 760

Tree canopy coverage overtop Habitat Site: 100 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): Red Oak, Red Maple, Black Cherry,
White ash

Shrub, Vine and Briar (RUBUS) Species: Low Bush Blueberry, Green Briar, Grapevine,
Virginia Creeper

Herbaceous Species: Marginal Wood Fern, Polypody Fern, Grass spp., Hay scented fern,
Goldenrod, Whitewood aster, False Solomon's Seal

General Description of Surrounding Habitat (>100m & <500m): Mature forest with thick underbrush
Powerline adjacent to the south, site is on top of steep ravine

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

At least 1 porcupine den was located, few cracks in rock



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40° 24' 18.91"	78° 29' 4.06'	0	0	0	0	0	0	321	100
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
TOTAL =										



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Altoona Bypass 2 Trap-site Number: _____ Date: 7/25/2014

Ownership (circle one): Public, Private, Both Access (Name, Address Telephone): _____

Location: _____ N or ^{0.9km} S and _____ E or _____ W of: Duncansville

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km-2km; >2km

Surveyors: Brian Benner

Effort: # of surveyors x survey minutes = 30 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): RAYS Habitat Site Code (if known): _____

County: Blair Quadrangle: Hollidaysburg Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 100m Average Width: 35m Width range: _____

Activity Extent (m): Longest Length: _____ Average Width: _____ Width range: _____
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 24 ' 29.86 " & Longitude W78 ° 24 ' 37.97 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1340ft to 1380ft Slope Range (%): 20 to 35

Aspects (degrees): southerly aspects: _____ % _____ ° northerly aspects: 20 % 100 °
(135°-225°) (315°-45°)

easterly aspects: _____ % _____ ° westerly aspects: _____ % _____ °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge top

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 141 % 60
- 2) Code # 142 % 40
- 3) Code # _____ % _____
- 4) Code # _____ % _____

Geological formation: Keyser and Tonoloway Formations

Nearest mapped water: Name: Beaverdam Branch Tributary Distance to: 439 m



FORM PGC 4150 wdrat

Forest Fragmentation Code: 3 Two-digit Habitat Disturbance code: 2E 4C 4G

Anderson Level III cover code on site: 416 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 100 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): Red Maple, Basswood

Shrub, Vine and Briar (Rubus) Species: Tartarian honeysuckle, Virginia Creeper

Herbaceous Species: Grass spp., Poison Ivy, White baneberry

General Description of Surrounding Habitat (>100m & <500m): Mature forest with thick underbrush

Powerline adjacent to the south

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

Chipmunk activity



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40° 24' 29.86"	78° 24' 37.97"	0	0	0	0	0	0	142	100
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
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13										
14										
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19										
20										
21										
22										
23										
24										
25										
TOTAL =										



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Jack's Mountain 1 Trap-site Number: _____ Date: 6/23/2014

Ownership (circle one): Public, **Private**, Both Access (Name, Address Telephone): _____

Location: _____ N or 2.1km S and _____ E or 8.0km W of: Allenport

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; **>1km - 2km**; >2km

Surveyors: Stan Boder, Brian Benner, Phil Dunning, Dave Scopaz, Justin Collins

Effort: # of surveyors x survey minutes = 600 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): _____ Habitat Site Code (if known): _____

County: Huntingdon Quadrangle: Butler Knob Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 400 Average Width: 400 Width range: _____

Activity Extent (m): Longest Length: _____ Average Width: _____ Width range: _____
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 21 ' 0.97 " & Longitude W77 ° 58 ' 0.86 " , ,
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 820 to 940 Slope Range (%): 10 to 25

Aspects (degrees): southerly aspects: _____ % _____ ° northerly aspects: _____ % _____ °
(135°-225°) (315°-45°)

easterly aspects: _____ % _____ ° westerly aspects: 285 % 100 °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge/valley side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 312 % 50 , 2) Code # 133 % 25 ,
- 3) Code # 132 % 25 , 4) Code # _____ % _____

Geological formation: Onodaga/ Old Port, Hamilton

Nearest mapped water: Name: Hares Valley Creek Distance to: 474 m



FORM PGC 4150 wdrat

Forest Fragmentation Code: 3 Two-digit Habitat Disturbance code: 1E 3G 3C

Anderson Level III cover code on site: 416 and adjacent to site: 416

Tree canopy coverage overtop Habitat Site: 85 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): _____

Chestnut Oak, Black Birch, Red Oak, Red Maple, White Oak, Sugar Maple, White Pine

Shrub, Vine and Briar (Rubus) Species: Green Briar, Low bush blueberry,

Striped Maple, Sapplings of trees

Herbaceous Species: Marginal Wood Fern, Polypody Fern,

General Description of Surrounding Habitat (>100m & <500m): Mature mixed forest,

Pipeline and powerline crosses the habitat.

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

Pipeline splits habitat, logging to the north adjacent to habitat.



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	N40 21'0.98"	W77 57'58.34"	0	0	0	0	0	0	133	80
2	N40 21'3.09"	W77 57'58.79"	0	0	0	0	0	0	133	90
3	N40 20'55.79"	77 58'2.44"	0	0	0	0	0	0	133	95
4										
5										
6										
7										
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16										
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18										
19										
20										
21										
22										
23										
24										
25										
TOTAL =										



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Jack's Mountain 2 Trap-site Number: _____ Date: 6/23/2014

Ownership (circle one): Public, **Private**, Both Access (Name, Address Telephone): _____

Location: _____ N or 2.3km S and _____ E or 7km W of: Allenport

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; **>1km - 2km**; >2km

Surveyors: Stan Boder, Brian Benner

Effort: # of surveyors x survey minutes = 90 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): _____ Habitat Site Code (if known): _____

County: Huntingdon Quadrangle: Butler Knob Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 427m Average Width: _____ Width range: 300m

Activity Extent (m): Longest Length: _____ Average Width: _____ Width range: _____
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 20 ' 50.23 " & Longitude W77 ° 57 ' 19.28 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1300 to 1660 Slope Range (%): 20 to 30

Aspects (degrees): southerly aspects: _____ % _____ ° northerly aspects: _____ % _____ °
(135°-225°) (315°-45°)
easterly aspects: _____ % _____ ° westerly aspects: 280 % 100 °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge/valley side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 132 % 65
- 2) Code # 112 % 35
- 3) Code # _____ % _____
- 4) Code # _____ % _____

Geological formation: Tuscarora, Cinton

Nearest mapped water: Name: Hares Valley Creek tributary Distance to: 1000 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 7 Two-digit Habitat Disturbance code: 1E 5G 5C

Anderson Level III cover code on site: 416 and adjacent to site: 416

Tree canopy coverage overtop Habitat Site: 50 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): _____

Black Birch, Red Oak, Chestnut Oak, Sugar Maple, Red Maple

Shrub, Vine and Briar (Rubus) Species: Grapevine, Blackberry,

Striped Maple

Herbaceous Species: Virginia Creeper

General Description of Surrounding Habitat (>100m & <500m): Mature forest, shaded talus

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

Three porcupine dens located, one rattlesnake observed.



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	N40 20'51.337"	W77 57'19.402"	0	0	0	0	0	0	112	0
2	N40 20'48.483"	W77 57'14.987"	0	0	0	0	0	0	112	0
3	N40 20.996'	W77 57.319'	0	0	0	0	0	0	111,12	10
4	N40 20.971'	W77 57.228'	0	0	0	0	0	0	111,12	0
5	N40 20'56.6"	W77 57'26.4"	0	0	0	1	0	0	111,12	100
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
TOTAL =			0	0	0	1	0	0		



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	Acorns
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	Virginia Creeper vines were cached.
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Jack's Mountain 3 Trap-site Number: _____ Date: 6/23/2014

Ownership (circle one): **Public**, Private, Both Access (Name, Address Telephone): _____

Location: _____ N or 3.0km S and _____ E or 5.9km W of: Allenport

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; **>1km - 2km**; >2km

Surveyors: Stan Boder, Brian Benner

Effort: # of surveyors x survey minutes = 270 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): _____ Habitat Site Code (if known): _____

County: Huntingdon Quadrangle: Butler Knob Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 128 Average Width: _____ Width range: 486

Activity Extent (m): Longest Length: 108 Average Width: _____ Width range: 284
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 20 ' 37.07 " & Longitude W77 ° 56 ' 34.47 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1560 to 1640 Slope Range (%): 20 to 30

Aspects (degrees): southerly aspects: _____ % _____ ° northerly aspects: _____ % _____ °
(135°-225°) (315°-45°)
easterly aspects: 95 % 50 ° westerly aspects: 5 % 270 °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge/valley side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 132 % 40
- 2) Code # 133 % 40
- 3) Code # 112 % 20
- 4) Code # _____ % _____

Geological formation: Tuscarora

Nearest mapped water: Name: Singer's Gap tributary Distance to: 88 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 6 Two-digit Habitat Disturbance code: 1E 5G 5C

Anderson Level III cover code on site: 415 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 60 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): _____

Black Birch, Chestnut Oak, Red Maple, Red oak, White Pine

Shrub, Vine and Briar (Rubus) Species: Blackberry, Virginia Creeper, Mountain Laurel, Grapevine

Herbaceous Species: Wood Fern, Polypody Fern

General Description of Surrounding Habitat (>100m & <500m): Deciduous mature forest

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

Pipeline splits habitat, known WR trapping site, 2 rattlesnakes in habitat, habitat enhancement previously performed.



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	N40 20' 39.08"	W77 56' 32.53"	0	0	0	1	0	0	112	85
2	N40 20' 37.16"	W77 56' 37.78"	0	0	0	1	0	1	112	0
3	N40 20' 33.55"	W77 56' 38.99"	0	0	0	0	0	1	112	50
4	N40 20' 30.92"	W77 56' 37.91"	0	1	0	1	0	1	112	40
5										
6										
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21										
22										
23										
24										
25										
TOTAL =			0	1	0	3	0	3		



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	Very few green ferns
Ferns	Present
Hard Mast	
Soft Mast	
Other Seeds	Present
Fungi & Lichens	
Misc. (Sticks etc.)	Present
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Blacklog Mountain Trap-site Number: _____ Date: 7/22/2014

Ownership (circle one): Public, Private, Both Access (Name, Address Telephone): _____

Location: _____ N or 7.1km S and 5.7km E or _____ W of: Mount Union

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km-2km; >2km

Surveyors: Brian Benner, Rob Schwartz

Effort: # of surveyors x survey minutes = 720 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): RAYS Habitat Site Code (if known): _____

County: Huntington Quadrangle: Aughwick Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 565m Average Width: 155m Width range: _____

Activity Extent (m): Longest Length: 10m Average Width: 10m Width range: _____
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 19 ' 22.59 " & Longitude W77 ° 48 ' 34.07 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1300ft to 1650ft Slope Range (%): 10 to 35

Aspects (degrees): southerly aspects: 25 % 180 ° northerly aspects: 20 % 360 °
(135°-225°) (315°-45°)
easterly aspects: 5 % 50 ° westerly aspects: 50 % 315 °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge/valley- side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 132 % 50 , 2) Code # 112 % 40 ,
- 3) Code # 111 % 5 , 4) Code # 121 % 5 ,

Geological formation: Tuscarora, Juniata, Clinton Formations

Nearest mapped water: Name: Fort Run Distance to: 1600 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 4 Two-digit Habitat Disturbance code: 1E 1H 1G

Anderson Level III cover code on site: 415 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 50-100 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): Red Oak, Red Maple, Black Birch,
Witch Hazel, Chestnut Oak, Sassafras, White Pine

Shrub, Vine and Briar (Rubus) Species: Low Bush Blueberry, Blackberry, Green Briar, Grapevine,
Mountain Laurel

Herbaceous Species: Marginal Wood Fern, Polypody Fern, Grass spp., Virginia Creeper,
Black Raspberry

General Description of Surrounding Habitat (>100m & <500m): Mature forest with thick underbrush

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

At least 4 porcupine dens were located, Black rat snake observed, fox or coyote den observed



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40° 19' 29.79"N	77° 48' 45.93"W	0	0	0	0	0	0	112	90
2	40° 19' 27.6"N	77° 48' 38.90"W	0	0	0	0	0	0	112	90
3	40° 19' 22.62"N	77° 48' 34.15"W	0	0	0	1	0	0	112	75
4	40° 19' 34.37"N	77° 48' 40.215"W	0	0	0	0	0	0	112	80
5	40° 19' 36.8"N	77° 48' 37.5"W	0	0	0	0	0	0	112	90
6	40° 19' 35.8"N	77° 48' 33.1"W	0	0	0	0	0	0	112	90
7	40° 19' 33.2"N	77° 48' 28.1"W	0	0	0	0	0	0	112	80
8	40° 19' 31.7"N	77° 48' 22.1"W	0	0	0	0	0	0	112	90
9	40° 19' 33.98"N	77° 48' 17.89"W	0	0	0	0	0	0	111	90
10										
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14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
TOTAL =			0	0	0	1	0	0		



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	1 fern bent in an accordion style ball
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	A few sticks and old goldenrod stems
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Shade Mountain Trap-site Number: _____ Date: 7/21/2014

Ownership (circle one): Public **Private** Both Access (Name, Address Telephone): _____

Location: _____ N or 2.6km S and 8.2km E or _____ W of: Augwick

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km-2km; **>2km**

Surveyors: Brian Benner

Effort: # of surveyors x survey minutes = 450 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): RAYS Habitat Site Code (if known): _____

County: Huntington Quadrangle: Aughwick Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 395m Average Width: 450m Width range: _____

Activity Extent (m): Longest Length: _____ Average Width: _____ Width range: _____
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 19 ' 1.93 " & Longitude W77 ° 46 ' 5.87 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1480ft to 1780ft Slope Range (%): 0 to 35

Aspects (degrees): southerly aspects: _____ % _____ ° northerly aspects: _____ % _____ °
(135°-225°) (315°-45°)
easterly aspects: 65 % 100 ° westerly aspects: 35 % 280 °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge/valley- side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 112 % 85
- 2) Code # 111 % 10
- 3) Code # 113 % 3
- 4) Code # 132 % 2

Geological formation: Tuscarora, Juniata, Clinton Formations

Nearest mapped water: Name: Cherry Hollow Distance to: 2572 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 4 Two-digit Habitat Disturbance code: 1C 1E 1H

Anderson Level III cover code on site: 415 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 0-100 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): Black Birch, Red Maple, Sassafras,
Witch Hazel, Red Oak, Tulip Poplar, Basswood

Shrub, Vine and Briar (Rubus) Species: Blackberry, Green Briar, Virginia Creeper, Grapevine,
Poison Ivy, Striped Maple

Herbaceous Species: Polypody Fern, Marginal Wood Fern, Grass spp., White Baneberry

General Description of Surrounding Habitat (>100m & <500m): Woods with utility lines, unimproved
trail, mostly untouched beyond this

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

At least 3 porcupine dens were located, timber rattlesnake and eastern garter snake
observed, coyote droppings observed.



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40° 19' 1.41"	77° 45' 59.30"	0	0	0	0	0	0	112	10
2	40° 19' 0.43"	77° 46' 7.63"	0	0	0	0	0	0	112	10
3	40° 18' 56.02"	77° 46' 13.68"	0	0	0	0	0	0	112	0
4	40° 19' 6.84"	77° 46' 6.39"	0	0	0	0	0	0	112	80
5	40° 19' 1.16"	77° 46' 14.61"	0	0	0	0	0	0	112	50
6										
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17										
18										
19										
20										
21										
22										
23										
24										
25										
TOTAL =										



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	
Raccoon Feces	



FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Tuscarora Mountain Trap-site Number: _____ Date: 11/14/2014

Ownership (circle one): Public, **Private**, Both Access (Name, Address Telephone): Unknown

Location: _____ N or 1.2km S and _____ E or 8.2km W of: New Germantown

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km-2km; **>2km**

Surveyors: J. Collins, P. Dunning, S. Boder, D. Scopaz

Effort: # of surveyors x survey minutes = 720 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): TUBL Habitat Site Code (if known): _____

County: Perry Quadrangle: Blairs Mills Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 700 Average Width: 400 Width range: 350-400

Activity Extent (m): Longest Length: 500 Average Width: 300 Width range: 200-400
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude 40 ° 17 ' 46.7 " & Longitude 77 ° 39 ' 50.4 " ,
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1500 to 1920 Slope Range (%): 18 to 28

Aspects (degrees): southerly aspects: 60 % 230 ° northerly aspects: 10 % 340 °
(135°-225°) (315°-45°)
easterly aspects: 30 % 120 ° westerly aspects: _____ % _____ °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): Ridge-top, valley side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 112 % 55 , 2) Code # 113 % 20 ,
- 3) Code # 122 % 15 , 4) Code # 123 % 10 ,

Geological formation: Tuscarora Formation/ Juniata, Bald Eagle Undivided

Nearest mapped water: Name: Unnamed intermittent stream Distance to: 1.2m SE m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 1 Two-digit Habitat Disturbance code: 1E 3H 4C

Anderson Level III cover code on site: 414 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 50-90 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): Red Oak, White Oak, Chestnut Oak,
Black Birch, Yellow Poplar, Striped Maple, Red Maple, Eastern Hemlock

Shrub, Vine and Briar (Rubus) Species: Virginia Creeper, Witch Hazel, Mountain Laurel
Greenbriar, Allegheny Blackberry

Herbaceous Species: Hayscented Fern, unidentified ferns and forbs

General Description of Surrounding Habitat (>100m & <500m): Mostly deciduous forest with some
degraded hemlocks

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

Mostly from disease to hemlocks, possible fire in the future and renovation of current pipeline.



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ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40° 17' 41.63"N	77° 39' 51.86"W	0	0	0	0	0	0	112	90
2	40° 17' 49.03"N	77° 39' 44.70"W	0	0	0	0	0	0	111	90
3	40° 17' 50.61"N	77° 39' 51.37"W	0	0	0	0	0	0	112	90
4	40° 17' 47.04"N	77° 39' 55.87"W	0	0	0	0	0	0	112	80
5	40° 17' 42.23"N	77° 39' 56.15"W	0	0	0	0	0	0	112	80-90
6										
7										
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21										
22										
23										
24										
25										
TOTAL =			0	0	0	0	0	0		



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	
Raccoon Feces	

FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Conococheague Trap-site Number: NA Date: 4/16/2015

Ownership (circle one): Public Private, Both Access (Name, Address Telephone): _____
DCNR- Tuscarora State Forest

Location: 0.5km N or S and 7.0km E or W of: Blairs Mills

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km-2km; >2km

Surveyors: J. Hart, B. Benner, T. Crumb, D. Wanke and C. Comacho

Effort: # of surveyors x survey minutes = 450 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): TUBL Habitat Site Code (if known): NA

County: Perry Quadrangle: Blairs Mills Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 450 Average Width: 375 Width range: 300

Activity Extent (m): Longest Length: NA Average Width: NA Width range: NA
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude 40 ° 17 ' 23.6 " & Longitude 77 ° 38 ' 08.5 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1420 to 1840 Slope Range (%): 16 to 18

Aspects (degrees): southerly aspects: 15 % 224 ° northerly aspects: 20 % 43 °
(135°-225°) (315°-45°)
easterly aspects: 60 % 106 ° westerly aspects: 5 % 284 °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge/valley- side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 112 % 30, 2) Code # 113 % 30,
3) Code # 133 % 25, 4) Code # 211 % 15

Geological formation: Martinsburg, Juniata Fm and Bald Eagle Fm undivided, Tuscarora

Nearest mapped water: Name: To the northwest-Horse Valley Run Distance to: 1700 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 5 Two-digit Habitat Disturbance code: 1E 2H 5D

Anderson Level III cover code on site: 415 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 70-80% %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): Red and Chestnut oaks, black birch, red maple, witch hazel.

Shrub, Vine and Briar (Rubus) Species: Low Bush Blueberry, Green Briar, Grapevine, Virginia Creeper

Herbaceous Species: Marginal Wood Fern, Polypody Fern, Grass spp., Hay scented fern, Goldenrod

General Description of Surrounding Habitat (>100m & <500m): Mature forest with moderate underbrush

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

NA

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

Although some porcupine sign was noted, it wasn't too prevalent.

Rattlesnakes are known to occur on this site.



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ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40° 17' 20.7"	77° 38' 8.9"	0	0	0	0	0	0	113	75
2	40° 17' 20.8"	77° 38' 19.2"	0	0	0	0	0	0	112	75
3	40° 17' 23.1"	77° 38' 2.8"	0	0	0	0	0	0	112	<50
4	40° 17' 25.6"	77° 37' 59.9"	0	0	0	0	0	0	112	<50
5	40° 17' 27.9"	77° 38' 3.2"	0	0	0	0	0	0	113	<75
6	40° 17' 18.3"	77° 38' 7.5"	0	0	0	0	0	0	133	<75
7	40° 17' 20.0"	78° 29' 2.0"	0	0	0	0	0	0	211	<50
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20										
21										
22										
23										
24										
25										
TOTAL =			0	0	0	0	0	0		

FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	NA
Ferns	NA
Hard Mast	NA
Soft Mast	NA
Other Seeds	NA
Fungi & Lichens	NA
Misc. (Sticks etc.)	NA
Raccoon Feces	None noted within the survey area.

FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Bowers Mountain #2 Trap-site Number: NA Date: 11/10/2014

Ownership (circle one): Public, Private, Both Access (Name, Address Telephone): DCNR

Tuscarora State Forest

Location: 8.2km N or S and E or 27.8km W of: Carlisle

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km-2km; >2km

Surveyors: Jim Hart, S. Boder, J. Collins, P. Dunning, J. Treaster

Effort: # of surveyors x survey minutes = 720 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): TUBL Habitat Site Code (if known):

County: Perry Quadrangle: Blain Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 500 Average Width: 600 Width range: 300-500

Activity Extent (m): Longest Length: 300 Average Width: 150 Width range: 100-300
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude 40 ° 16 ' 12.0 " & Longitude 77 ° 31 ' 4.5 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1620 to 1940 Slope Range (%): 20 to 30

Aspects (degrees): southerly aspects: 35 % 140 ° northerly aspects: 30 % 325 °
(135°-225°) (315°-45°)
easterly aspects: 20 % 65 ° westerly aspects: 15 % 240 °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): Ridge/valley side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

- 1) Code # 112 % 55 , 2) Code # 113 % 25 ,
3) Code # 122 % 10 , 4) Code # 123 % 10 ,

Geological formation: Tuscarora, Juniata and Bald Eagle Undivided

Nearest mapped water: Name: Bull Run Distance to: 650 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 1 Two-digit Habitat Disturbance code: 1E H3

Anderson Level III cover code on site: 414 and adjacent to site: 414

Tree canopy coverage overtop Habitat Site: 10-70 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): black birch, red maple,
many dead hemlocks, some scattered oaks, witch hazel

Shrub, Vine and Briar (Rubus) Species: Mountain laurel, VA creeper

Herbaceous Species: mostly ferns with a scattering of flowering plants

General Description of Surrounding Habitat (>100m & <500m): Very comparable to what
is on site except for more oak species such as chestnut and red.

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

Pipeline runs through center of surveyed area and an upgraded pipeline is proposed for this site. There is a moderate amount of hemlock mortality in the area from wooley adelgid.



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ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40-16-12.9	77-30-50.5							113	50
2	40-16-10.5	77-30-55.6	2		3	1			113	50
3	40-16-7.5	77-30-53.3		1		1			112	25
4	40-16-9.4	77-31-1.4							112	25
5	40-16-11.5	77-31-9.3							112	25
6	40-16-8.5	77-31-13.2							122	50
7	40-16-13.7	77-31-1.9							122	50
8										
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24										
25										
TOTAL =			2	1	3	2				

FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	Oak leaves, maple leaves and stems, sweet fern
Ferns	New York, Hay scented (a few), some wood fern
Hard Mast	Old hulls of acorns
Soft Mast	
Other Seeds	
Fungi & Lichens	Some fungi but very little lichen.
Misc. (Sticks etc.)	Many old sticks that may have been dragged in for creating a hutch
Raccoon Feces	None noted anywhere on site.

FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Bowers Mountain #1 Trap-site Number: NA Date: 4/15/2015

Ownership (circle one): Public, Private, Both Access (Name, Address Telephone): DCNR
Tuscorora State Forest

Location: 9.5km N or S and 2.4km E or W of: Andersonburg

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km-2km; >2km

Surveyors: J. Hart, C. Camacho, B. Benner, T. Crumb, D. Wanke

Effort: # of surveyors x survey minutes = 300 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): TUBL Habitat Site Code (if known): NA

County: Perry Quadrangle: Andersonburg Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 130m Average Width: 35m Width range: 20-40m

Activity Extent (m): Longest Length: NA Average Width: NA Width range: NA
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude 40 ° 15 ' 50.7 " & Longitude 77 ° 29 ' 33.0 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1350' to 1400' Slope Range (%): 18.5 to 21.5

Aspects (degrees): southerly aspects: 35 % 180 ° northerly aspects: 15 % 48 °
(135°-225°) *(315°-45°)*
easterly aspects: 40 % 90 ° westerly aspects: 10 % 230 °
(45°-135°) *(225°-315°)*

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): Valley side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

1) Code # 132 % 35 2) Code # 142 % 30
3) Code # 122 % 25 4) Code # 311 % 10

Geological formation: Tuscorora Group overlaying the Clinton Formation

Nearest mapped water: Name: Laurel Run Distance to: 200m S m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 8 Two-digit Habitat Disturbance code: 1N 4H 5N

Anderson Level III cover code on site: 413 and adjacent to site: 413

Tree canopy coverage overtop Habitat Site: 50-75% %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): _____

Chestnut oak, Red oak, a few hickory and red maple

Shrub, Vine and Briar (Rubus) Species: Mostly witch hazel, black raspberry

Herbaceous Species: Some blueberry

General Description of Surrounding Habitat (>100m & <500m): The above mentioned species along with many downed snags.

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

A single black rat snake (*Pantherophis alleghaniensis*)

porcupine droppings scattered throughout the rocks

Gray squirrels (*Sciurus carolinensis*)



FORMPGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40-15-52.7	77-29-31.9	0	0	0	0	0	0	311	25%
2	40-15-54.1	77-29-36.9	0	0	0	0	0	0	122	<50%
3	40-15-53.6	77-29-38.2	0	0	0	0	0	0	122	<50%
4										
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22										
23										
24										
25										
TOTAL =			0	0	0	0	0	0		

FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	NA
Ferns	NA
Hard Mast	NA
Soft Mast	NA
Other Seeds	NA
Fungi & Lichens	NA
Misc. (Sticks etc.)	NA
Raccoon Feces	NA

FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Middle Ridge Trap-site Number: NA Date: 4/15/2015

Ownership (circle one): Public, Private, Both Access (Name, Address Telephone): DCNR
Bureau of Forestry

Location: 9.8km N or S and 2.0km E or W of: Andersonburg

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km-2km; >2km

Surveyors: Jim Hart, Brian Benner

Effort: # of surveyors x survey minutes = 180 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): TUBL Habitat Site Code (if known): _____

County: Perry Quadrangle: Andersonburg Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 160 Average Width: 165 Width range: 40-180

Activity Extent (m): Longest Length: NA Average Width: NA Width range: NA
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude 40 ° 15 ' 39.9 " & Longitude 77 ° 29 ' 20.6 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1000' to 1280 Slope Range (%): 7 to 25

Aspects (degrees): southerly aspects: 10 % 142 ° northerly aspects: 327 % 60 °
(135°-225°) *(315°-45°)*
easterly aspects: 20 % 54 ° westerly aspects: 233 % 10 °
(45°-135°) *(225°-315°)*

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): Ridge-top, Valley side along ROW

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

1) Code # 113 % 30 , 2) Code # 112 % 40 ,
3) Code # 132 % 15 , 4) Code # 212 % 15 ,

Geological formation: Tuscarora Fm/ Clinton Group

Nearest mapped water: Name: Laurel Run Distance to: 350 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 6 Two-digit Habitat Disturbance code: 1N 2J 2H

Anderson Level III cover code on site: 434 and adjacent to site: 435

Tree canopy coverage overtop Habitat Site: 50-75 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): 60' hemlock (mostly w/ wooley adelgid), white pine, red and chestnut oak, red maple, black birch, some witch hazel

Shrub, Vine and Briar (Rubus) Species: black and red raspberry, green briar

Herbaceous Species: Canada Mayflower, trailing arbutus, colt's foot,

General Description of Surrounding Habitat (>100m & <500m): The area is characterized by steeply incised valleys with steep, narrow mountains.

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

NA

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

Many dead and dying hemlocks showing evidence of infestation with wooley adelgid, porcupine population in line mostly with forested habitat and not overly populace. No timber rattlesnakes have been noted at this site.



FORMPGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40° 15' 40.3"	77° 29' 12.3"	0	0	0	0	0	0	112	<25
2	40° 15' 39.9"	77° 29' 16.2"	0	0	0	0	0	0	112	<50
3	40° 15' 40.6"	77° 29' 17.6"	0	0	0	0	0	0	113	<50
4	40° 15' 38.8"	77° 29' 14.6"	0	0	0	0	0	0	112	75
5	40° 15' 37.5"	77° 29' 16.7"	0	0	0	0	0	0	132	75
6	40° 15' 35.8"	77° 29' 21.1"	0	0	0	0	0	0	212	<50
7	40° 15' 37.3"	77° 29' 26.4"	0	0	0	0	0	0	112	<50
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23										
24										
25										
TOTAL =			0	0	0	0	0	0		

FORM PGC 4150-wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	NA
Ferns	NA
Hard Mast	NA
Soft Mast	NA
Other Seeds	NA
Fungi & Lichens	NA
Misc. (Sticks etc.)	NA
Raccoon Feces	NA

Although this is good habitat and there are active sites to the north on Bowers Mountain, no sign was located at this site.

FORM PGC 4150 wdrat

PENNSYLVANIA GAME COMMISSION

Revision Date: 2-20-09

ALLEGHENY NEMA HABITAT SITE SURVEY

Use the accompanying *Neotoma magister* Survey Code Booklet to complete this form.

Habitat Site Name: Blue Mountain Trap-site Number: _____ Date: 6/18/2014

Ownership (circle one): Public, Private, Both Access (Name, Address Telephone): _____

Location: 1.3km N or _____ S and _____ E or 1.6km W of: McCrea

Nearest other active or inactive (?) habitat site (circle one): 200-500m; >500m-1km; >1km-2km; >2km

Surveyors: Philip R. Dunning, Justin M. Collins

Effort: # of surveyors x survey minutes = 300 minutes. Was the site(s) previously surveyed? Yes No

Conservation Mgmt. Area (4 letters, see Appendix 1): TUBL Habitat Site Code (if known): _____

County: Cumberland Quadrangle: Andersonburg Map Photocopy attached? Yes No

Habitat Site Size (m): Longest Length: 1000ft Average Width: 600ft Width range: 400-800ft

Activity Extent (m): Longest Length: _____ Average Width: _____ Width range: _____
(Estimate the length & width of rectangle that would include all Activity Centers within Habitat Site)

Latitude N40 ° 15 ' 23.59 " & Longitude W77 ° 28 ' 6.215 "
(Center of Habitat Site in Degrees, Minutes and Seconds, NAD27)

Elevation Range: 1500ft to 1700ft Slope Range (%): 30 to 40

Aspects (degrees): southerly aspects: 60 % 145 ° northerly aspects: _____ % _____ °
(135°-225°) (315°-45°)

easterly aspects: 40 % 120 ° westerly aspects: _____ % _____ °
(45°-135°) (225°-315°)

Topography (ridge/valley-side, ridge top, river gorge, water gap, etc.): ridge/valley- side

Surface Rock Habitat Types: List the four most common surface rock habitat types (and estimate the percent coverage of each) starting with the most common:

1) Code # 112 % 65 , 2) Code # 111 % 15 ,

3) Code # 132 % 10 , 4) Code # 113 % 5 ,

Geological formation: Juniata and Bald Eagle Formations

Nearest mapped water: Name: Unnamed tributary to Doubling Gap Distance to: 300 m

FORM PGC 4150 wdrat

Forest Fragmentation Code: 4 Two-digit Habitat Disturbance code: 3H 1E 4D

Anderson Level III cover code on site: 415 and adjacent to site: 415

Tree canopy coverage overtop Habitat Site: 90 %

Vegetation on and within 100 meters of the Habitat Site:

Trees Species (list most common first and least common last): red oak, red maple, black birch,
witch hazel, chestnut oak, sassafras, striped maple

Shrub, Vine and Briar (Rubus) Species: low bush blueberry, blackberry, green briar, grapevine,
mountain laurel, virginia creeper

Herbaceous Species: hay-scented fern

General Description of Surrounding Habitat (>100m & <500m): Mature forest with moderate
shrub cover

If applicable: this Habitat Site replaces (merges) the following Sites (enter the Site names):

Comments, e.g. threats to site, unusual tree mortality, large population of porcupines (tally number of dens), snake species observed, droppings of predators noted etc.

Timber rattlesnakes observed. Porcupine sign throughout.



FORM PGC 4150 wdrat

ACTIVITY CENTERS or POTENTIAL ACTIVITY CENTERS (circles with a 15m radius)										
<i>Establish up to 5 ACs and/or PACs for every 1 km of Habitat Site length.</i>										
No.	GPS Latitude	GPS Longitude	# Toilet Areas		# Midden-caches		# Nests/Hutches		Rock Code	% Canopy Coverage
			Fresh	Old	Fresh	Old	Fresh	Old		
1	40°15'24.89" N	77°27'54.31" W	0	0	0	0	0	0	112	90
2	40°15'25.64" N	77°28'1.38" W	0	0	0	0	0	0	112	90
3	40°15'22.53" N	77°28'8.30" W	0	0	0	0	0	0	112	90
4										
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17										
18										
19										
20										
21										
22										
23										
24										
25										
TOTAL =										



FORM PGC 4150 wdrat

MIDDEN-CACHE CONTENTS COMBINED FOR ALL ACTIVITY CENTERS	
Green Vegetation & Buds	
Ferns	
Hard Mast	
Soft Mast	
Other Seeds	
Fungi & Lichens	
Misc. (Sticks etc.)	
Raccoon Feces	

Appendix III. Detailed location maps and photographs of Allegheny Woodrat (*Neotoma magister*) Habitat Sites, Activity Centers (ACs) and Potential Activity Centers (PACs) identified during habitat surveys of the proposed Pennsylvania Pipeline Project, Indiana, Cambria, Blair, Huntingdon, Perry, and Cumberland Counties, Pennsylvania, June 23-July 24, 2014.

Photo Map 1 - Laurel Ridge 2 - Allegheny woodrat habitat

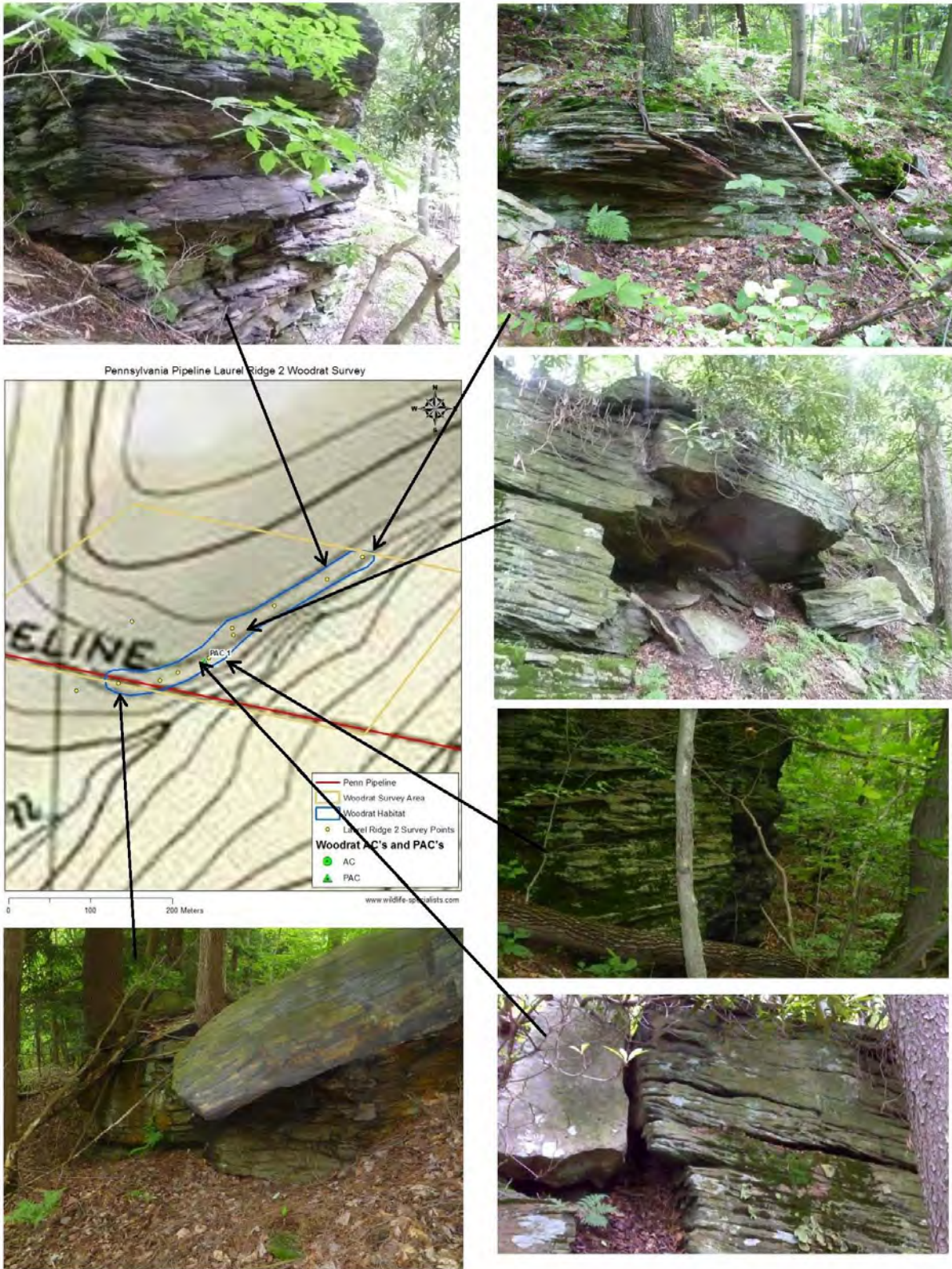


Photo Map 2 - Laurel Ridge 3 - Allegheny woodrat habitat

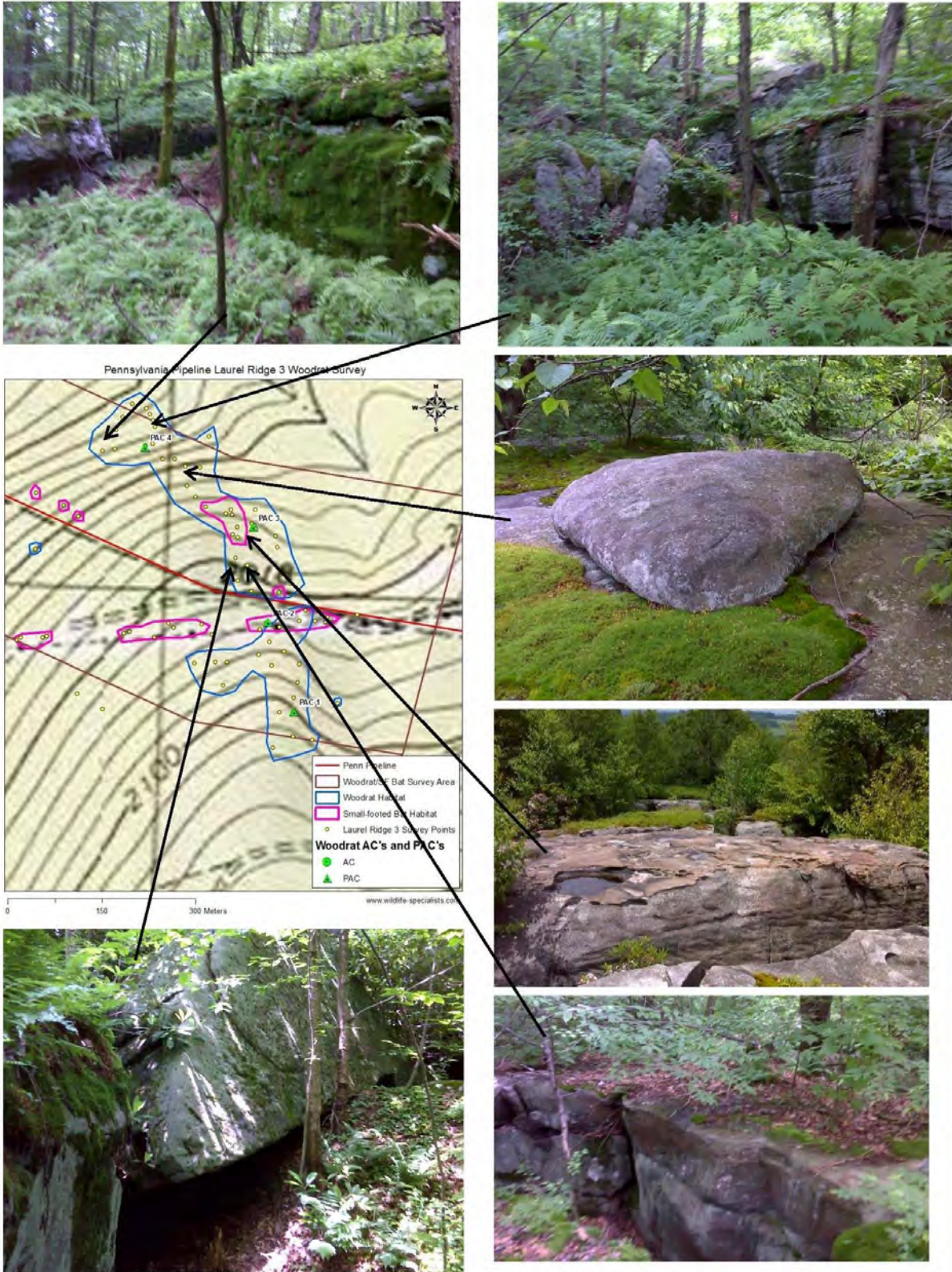


Photo Map 3 - Laurel Ridge 3 - Allegheny woodrat habitat

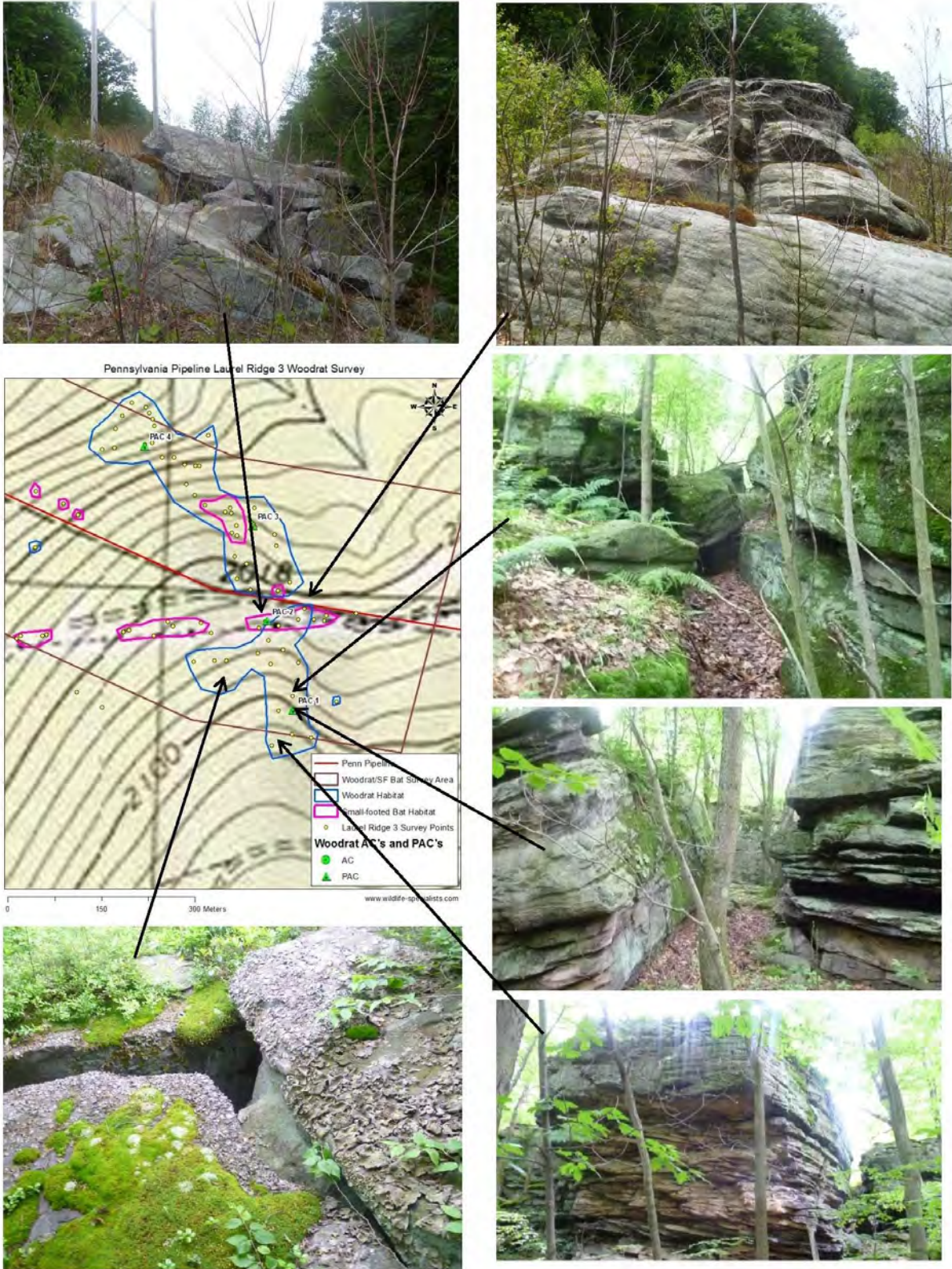


Photo Map 4 - Laurel Ridge 1 - Allegheny woodrat habitat



Pennsylvania Pipeline Laurel Ridge 1 Woodrat Survey

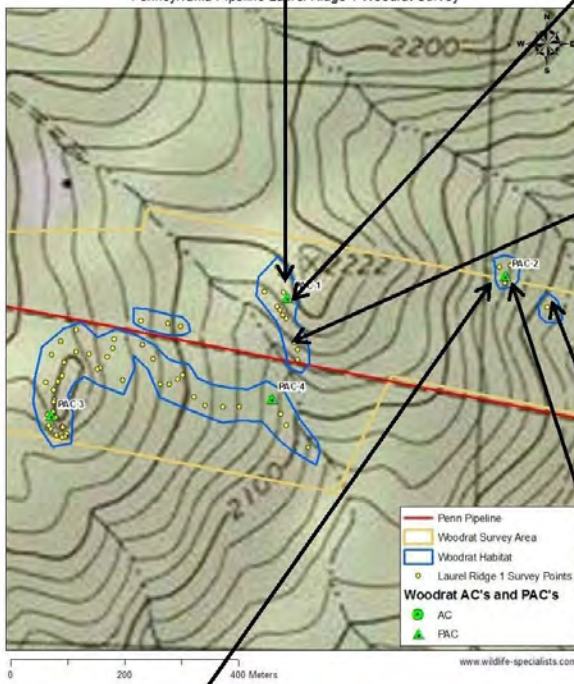


Photo Map 5 - Laurel Ridge 1 - Allegheny woodrat habitat

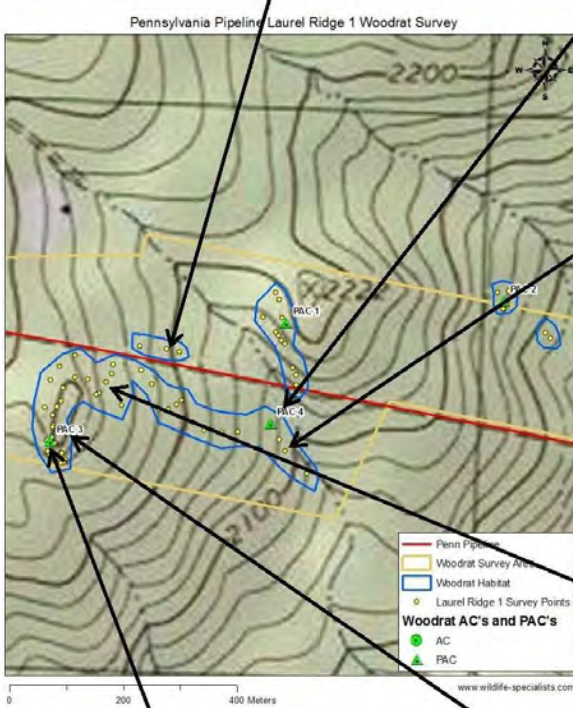


Photo Map 6 - Altoona Bypass 1 and 2 - Allegheny woodrat habitat



Photo Map 7 - Jacks Mountain 1 - Allegheny woodrat habitat

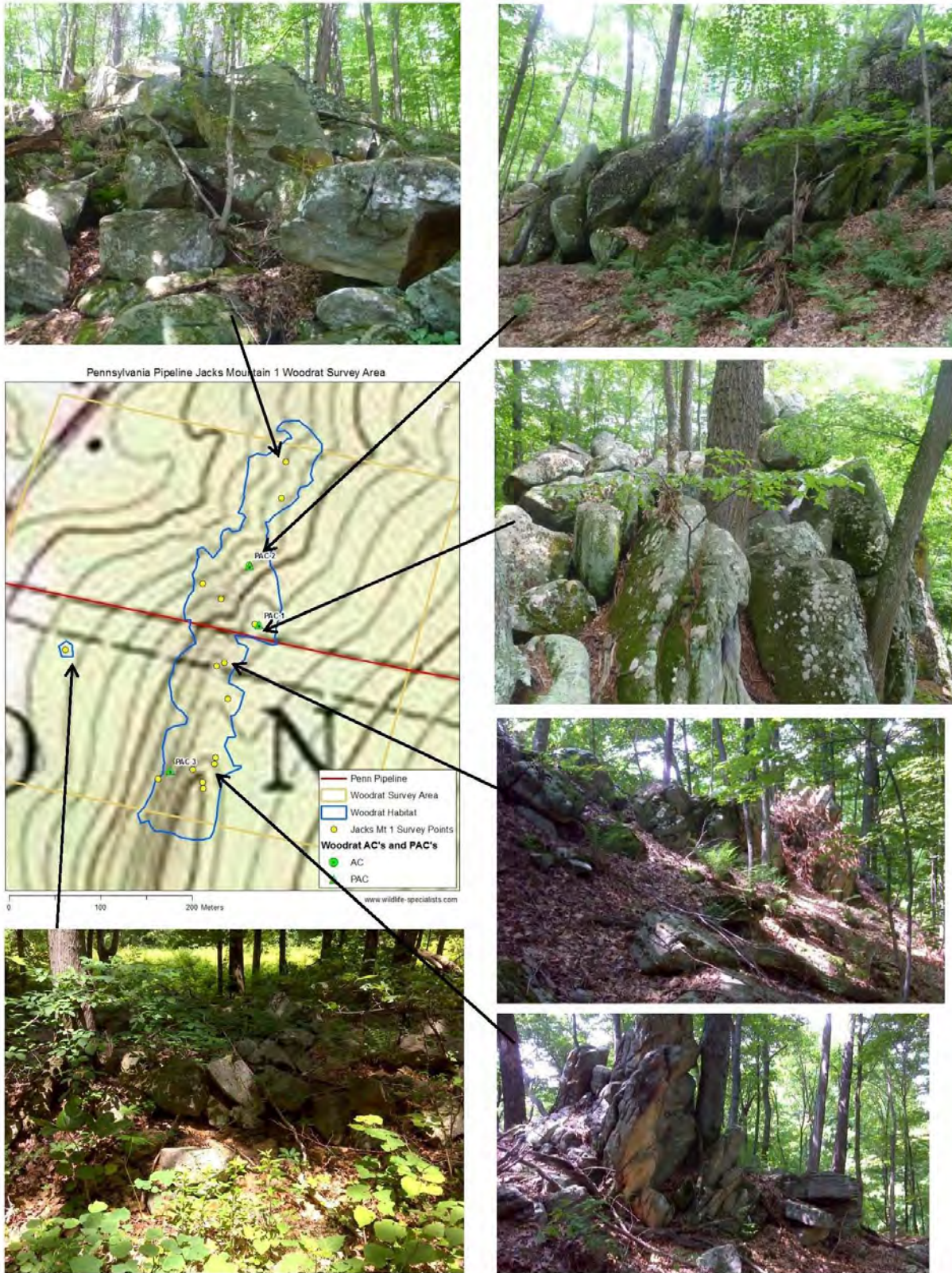


Photo Map 8 - Jacks Mountain 2 - Allegheny woodrat habitat and sign

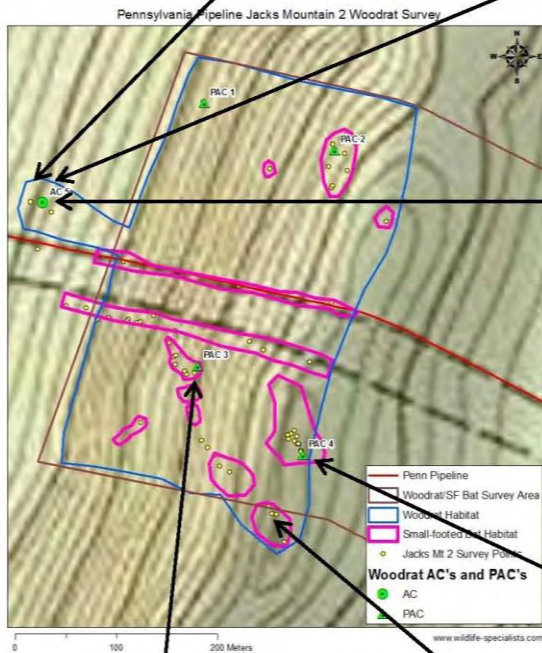


Photo Map 9 - Jacks Mountain 2 - Allegheny woodrat habitat

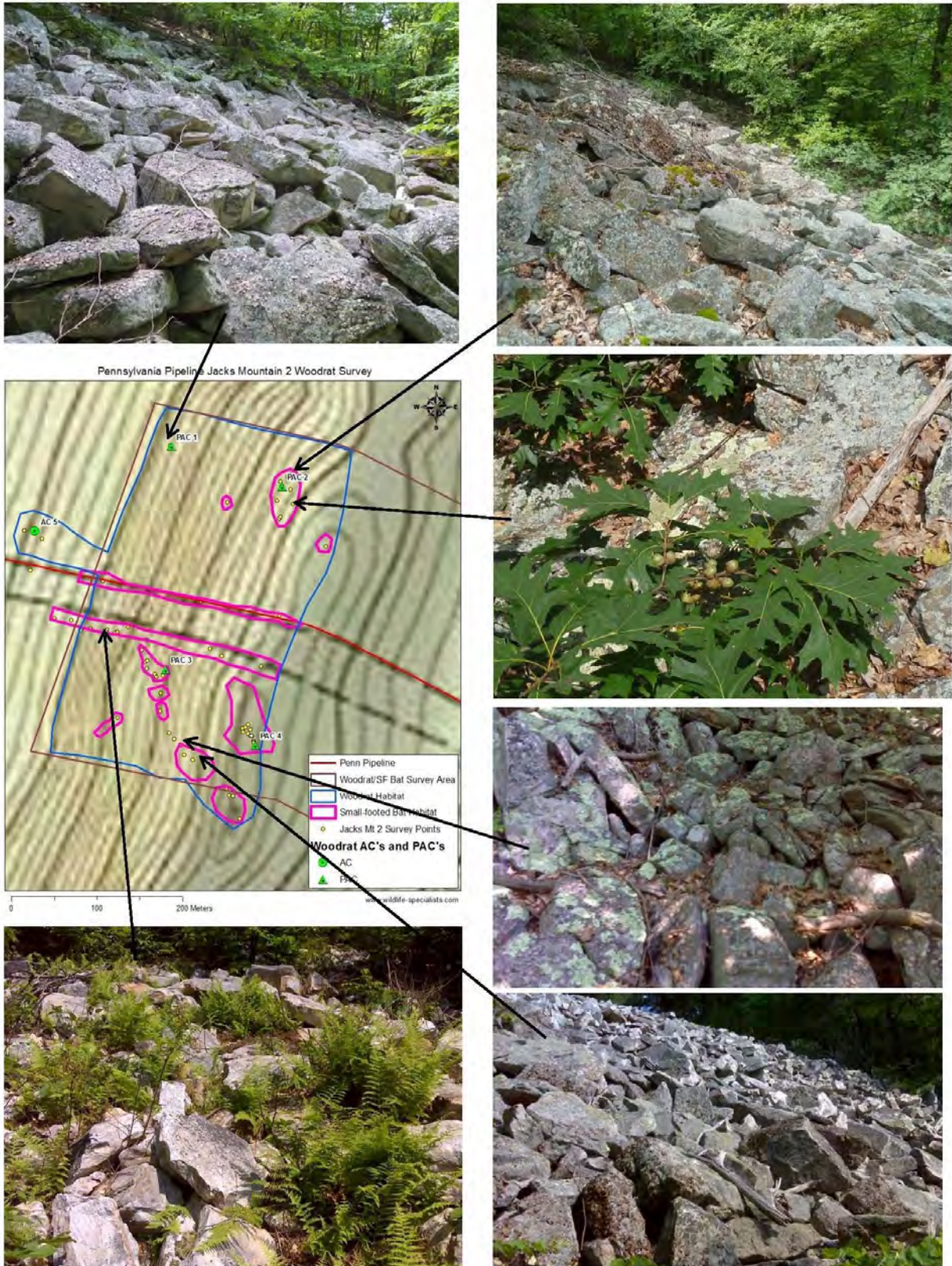


Photo Map 10 - Jacks Mountain 3 - Allegheny woodrat habitat and sign

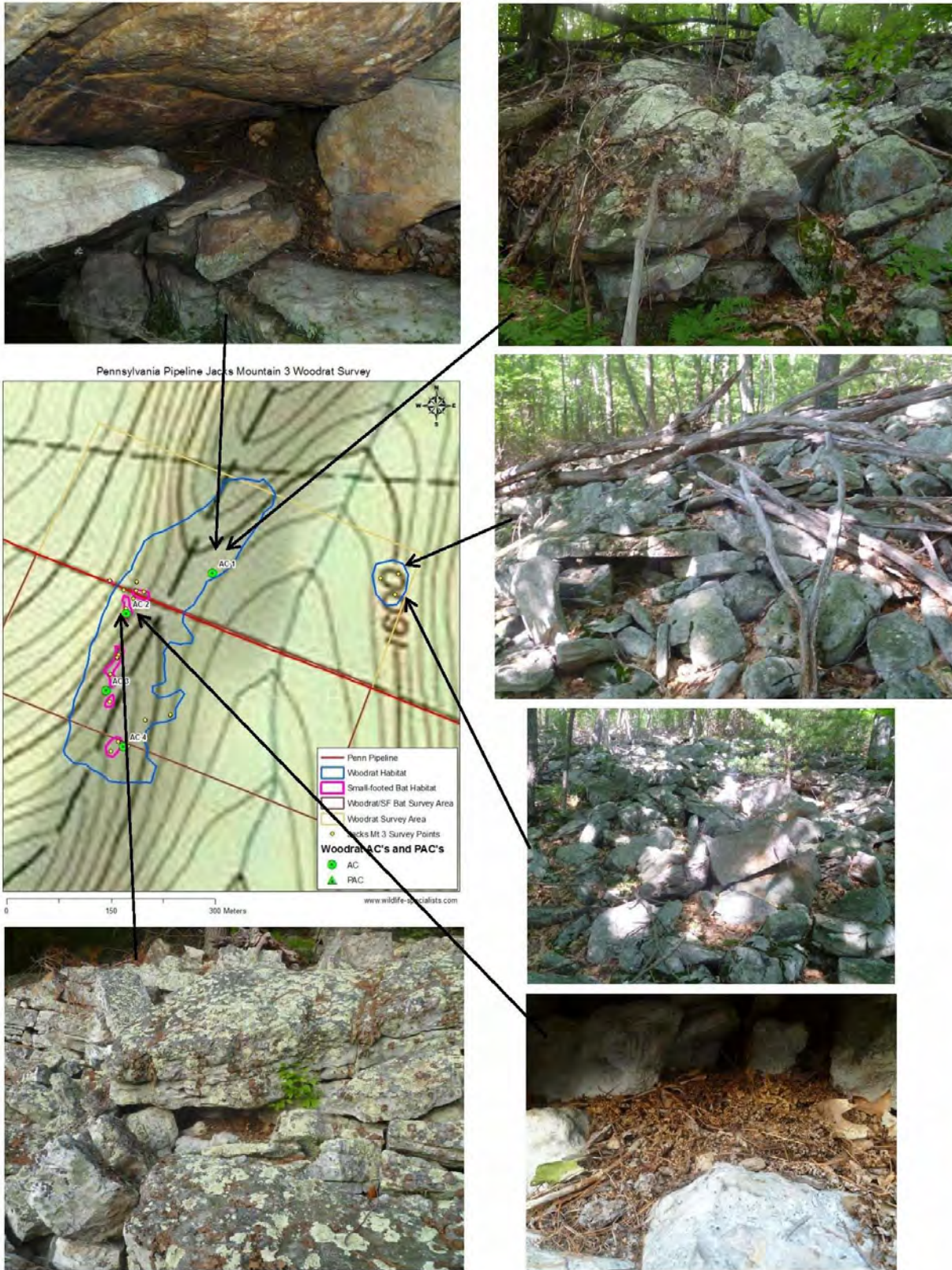


Photo Map 11 - Jacks Mountain 3 - Allegheny woodrat habitat and sign

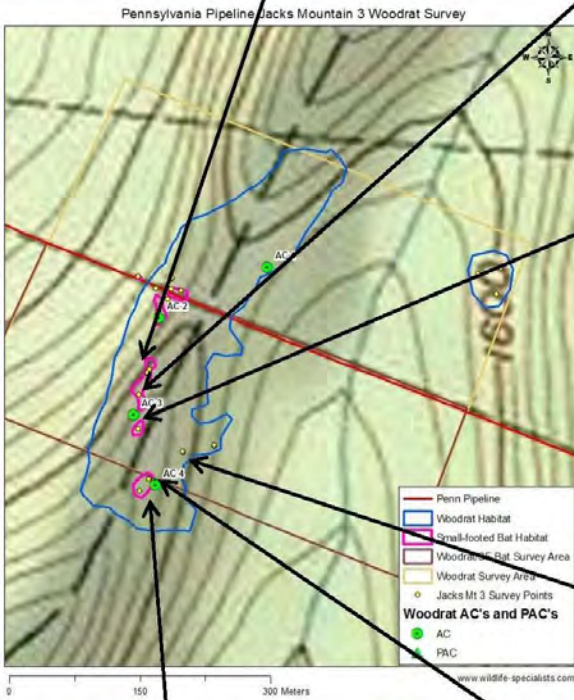


Photo Map 12 - Blacklog Mountain - Allegheny woodrat habitat

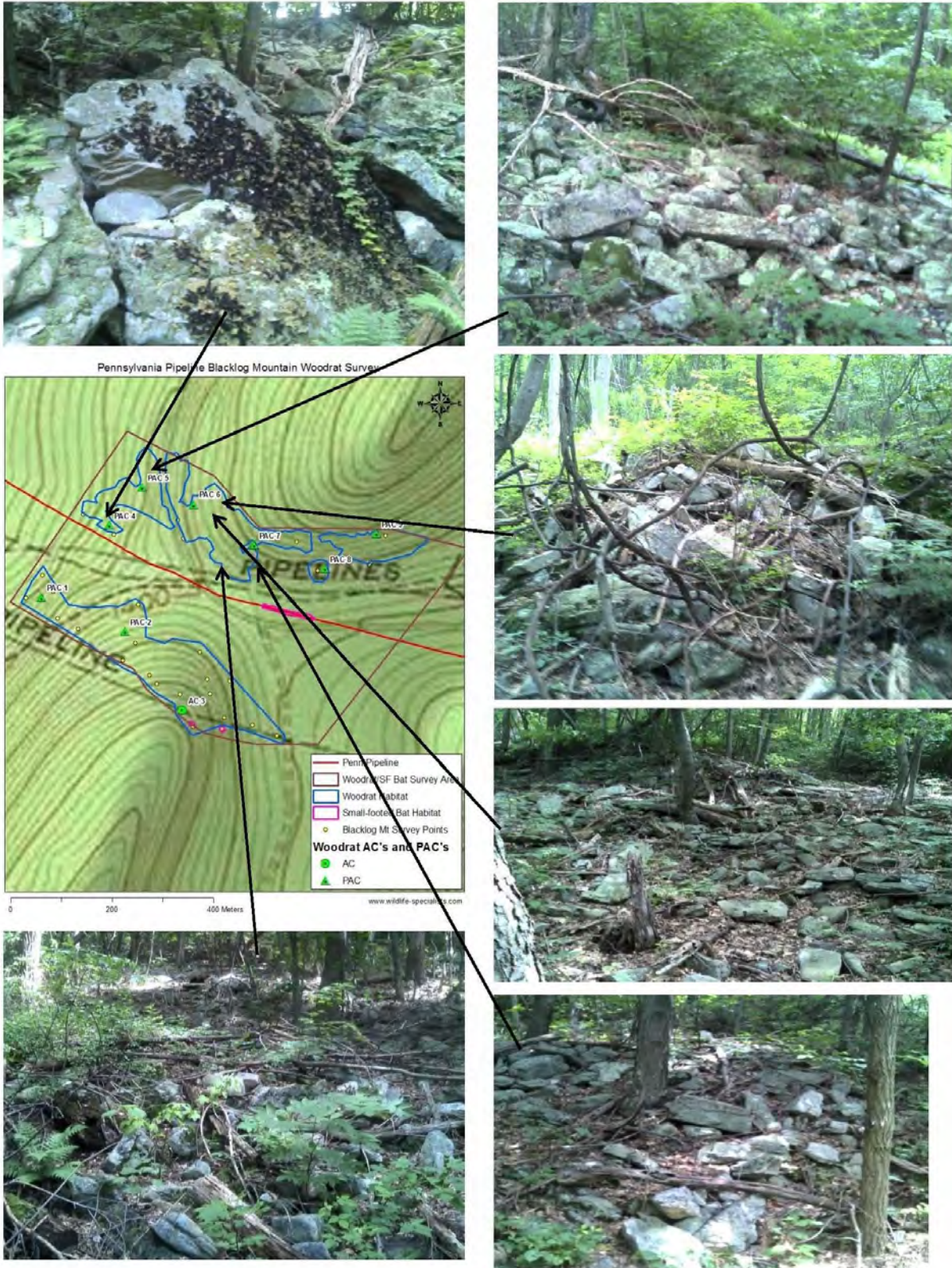


Photo Map 13 - Blacklog Mountain - Allegheny woodrat habitat and sign

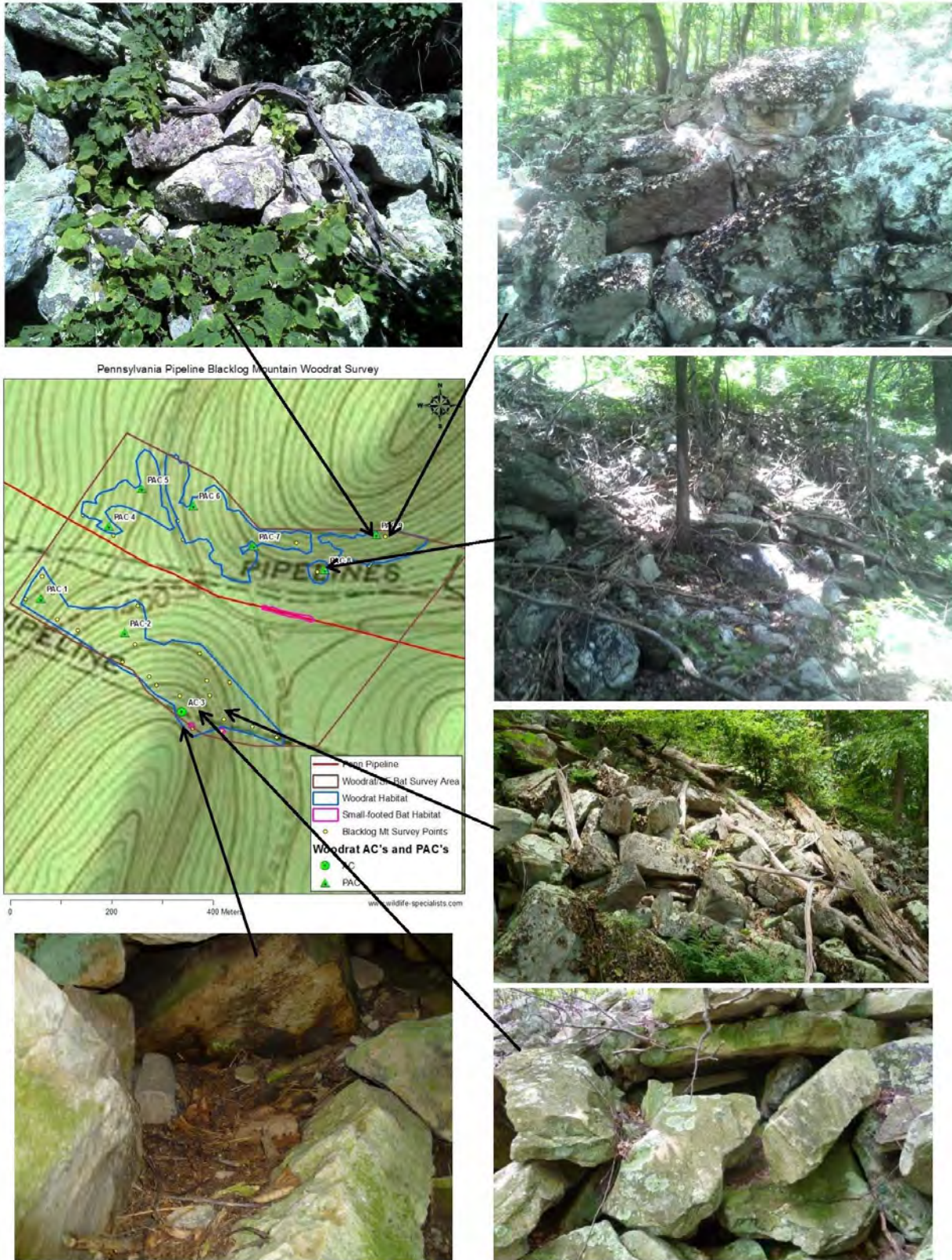


Photo Map 14 - Blacklog Mountain - Allegheny woodrat habitat

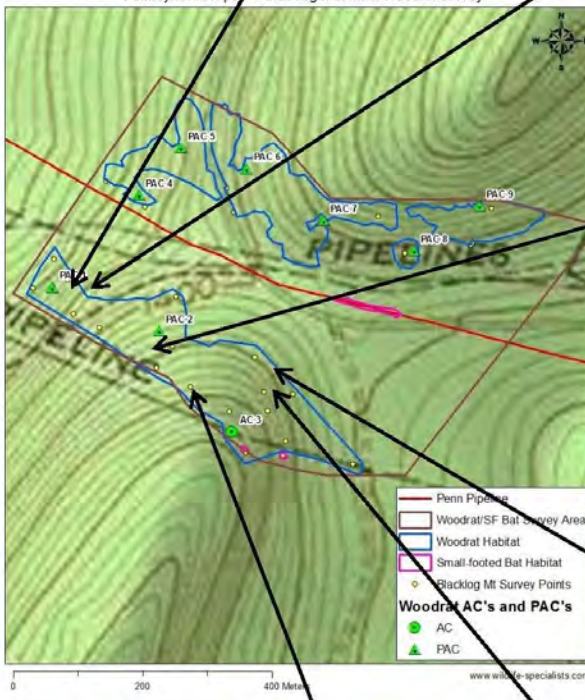


Photo Map 15 - Shade Mountain - Allegheny woodrat habitat

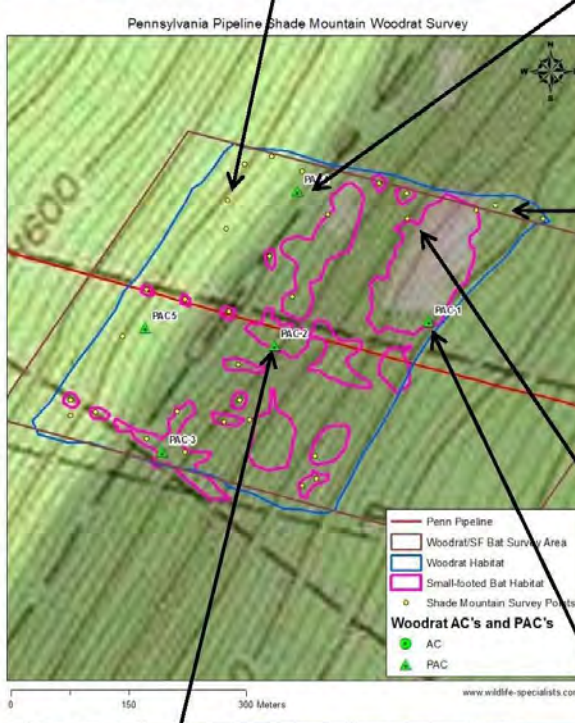


Photo Map 16 - Shade Mountain - Allegheny woodrat habitat

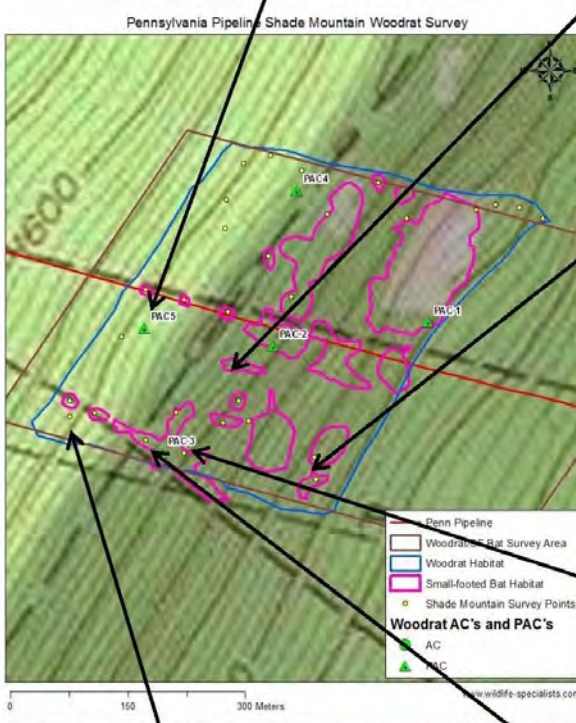


Photo Map 17 - Tuscarora Mountain Allegheny woodrat habitat



Pennsylvania Pipeline Tuscarora Mountain Woodrat Survey

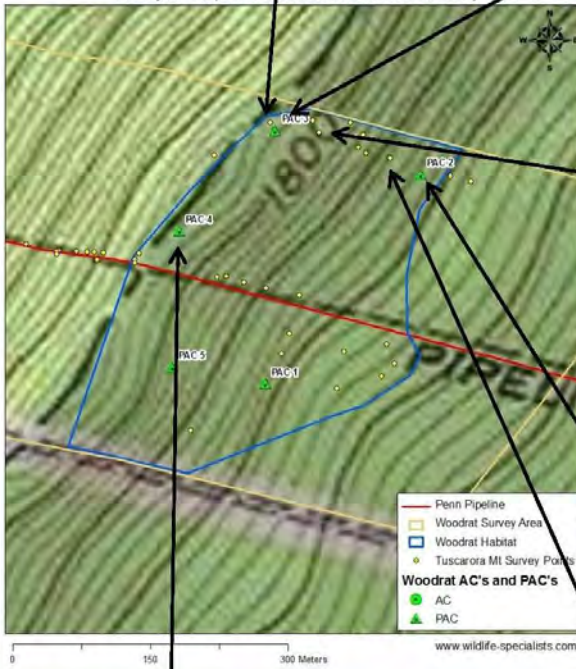


Photo Map 18 - Tuscarora Mountain Allegheny woodrat habitat



Pennsylvania Pipeline Tuscarora Mountain Woodrat Survey

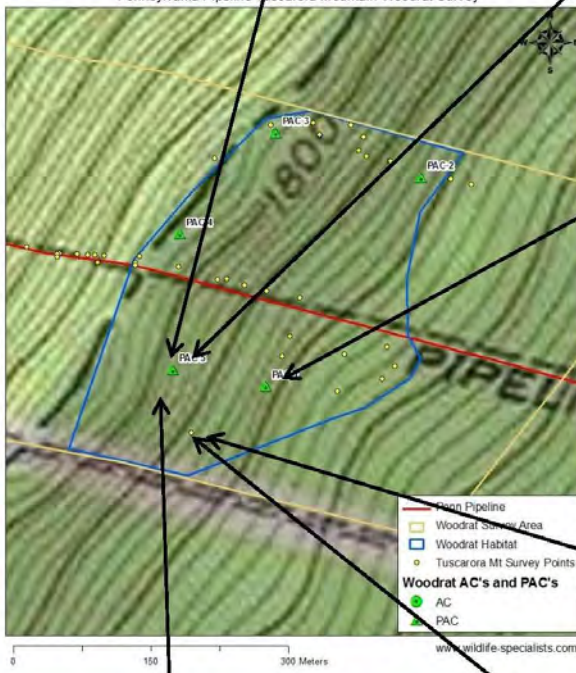


Photo Map 19 – Conococheague Mountain Allegheny woodrat habitat and sign

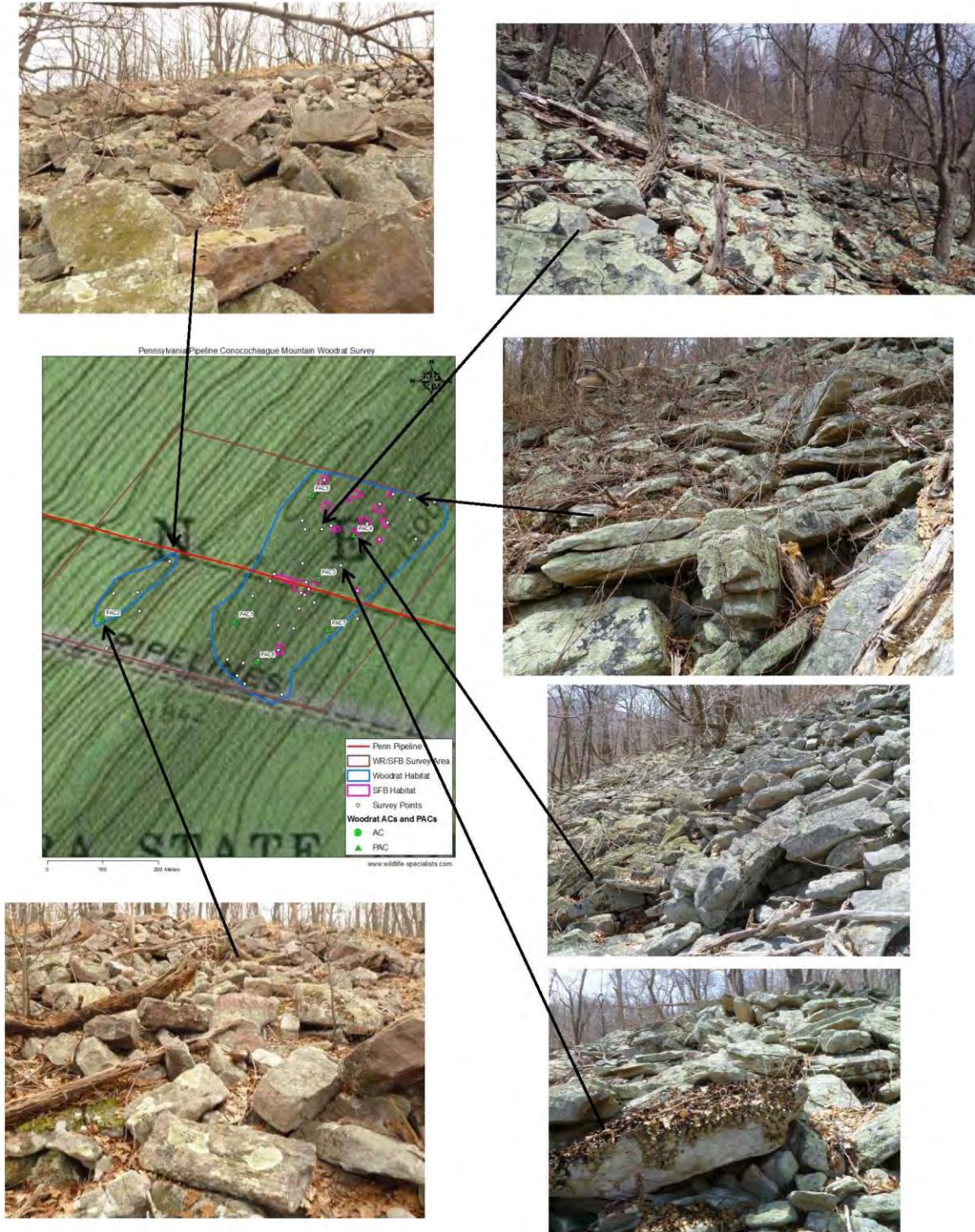


Photo Map 20 – Conococheague Mountain Allegheny woodrat habitat and sign

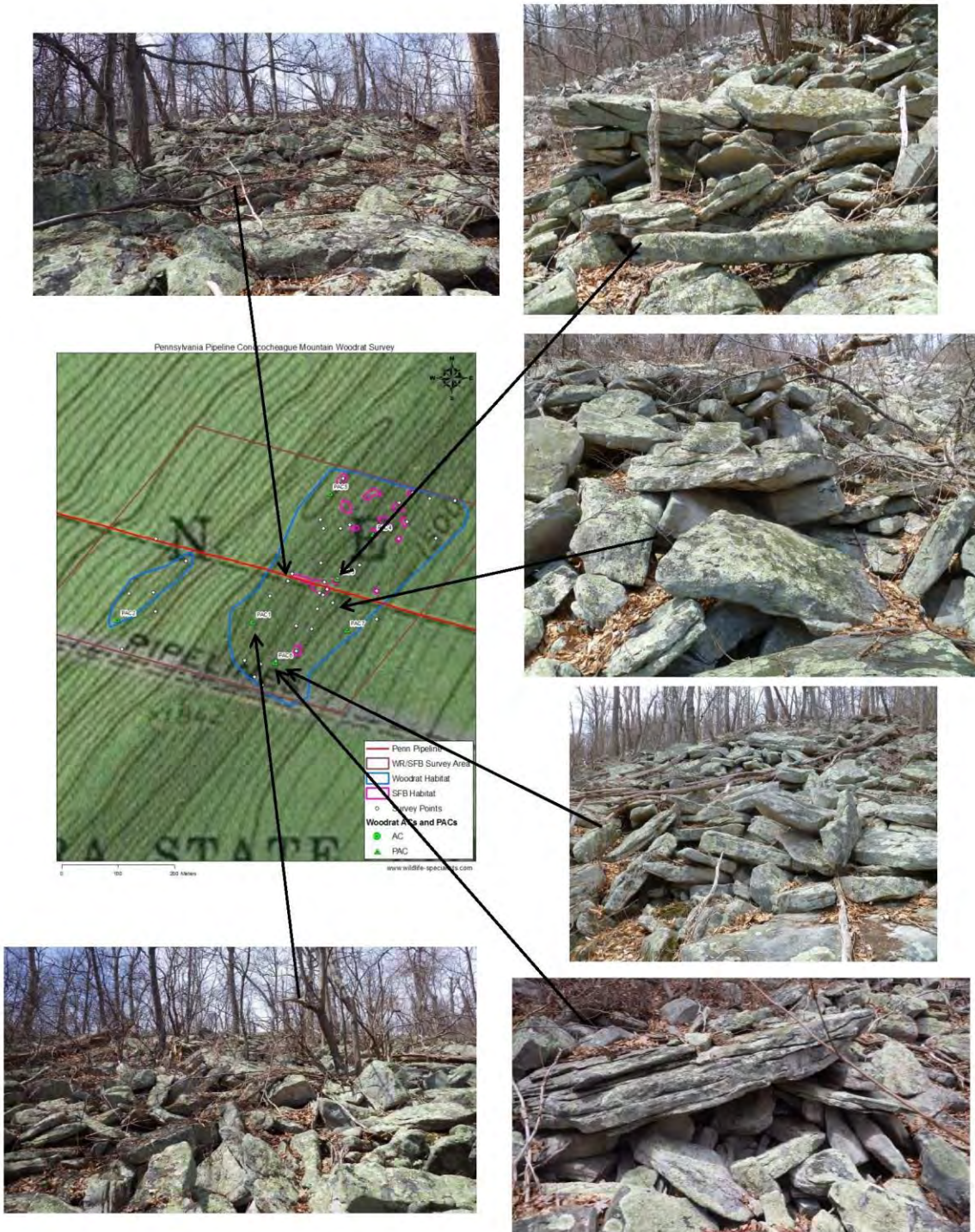


Photo Map 21 - Bowers Mountain 2 Allegheny woodrat habitat and sign



Pennsylvania Pipeline Bowers Mountain 2 Woodrat Survey

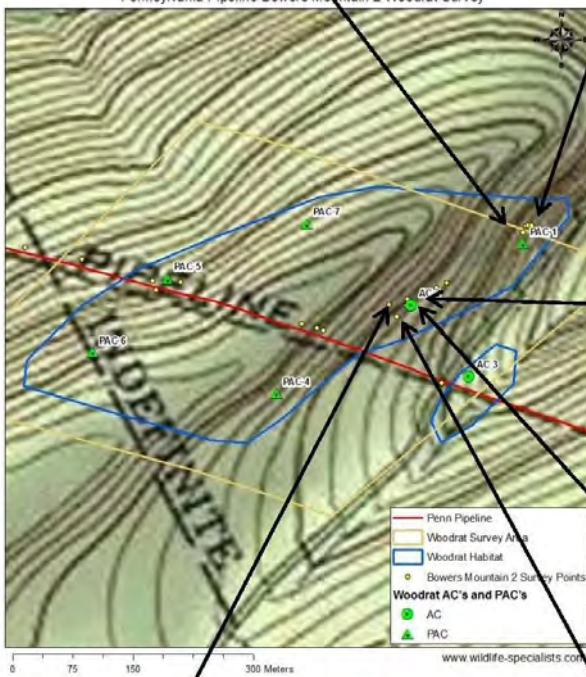


Photo Map 22 - Bowers Mountain 1 Allegheny woodrat habitat and sign

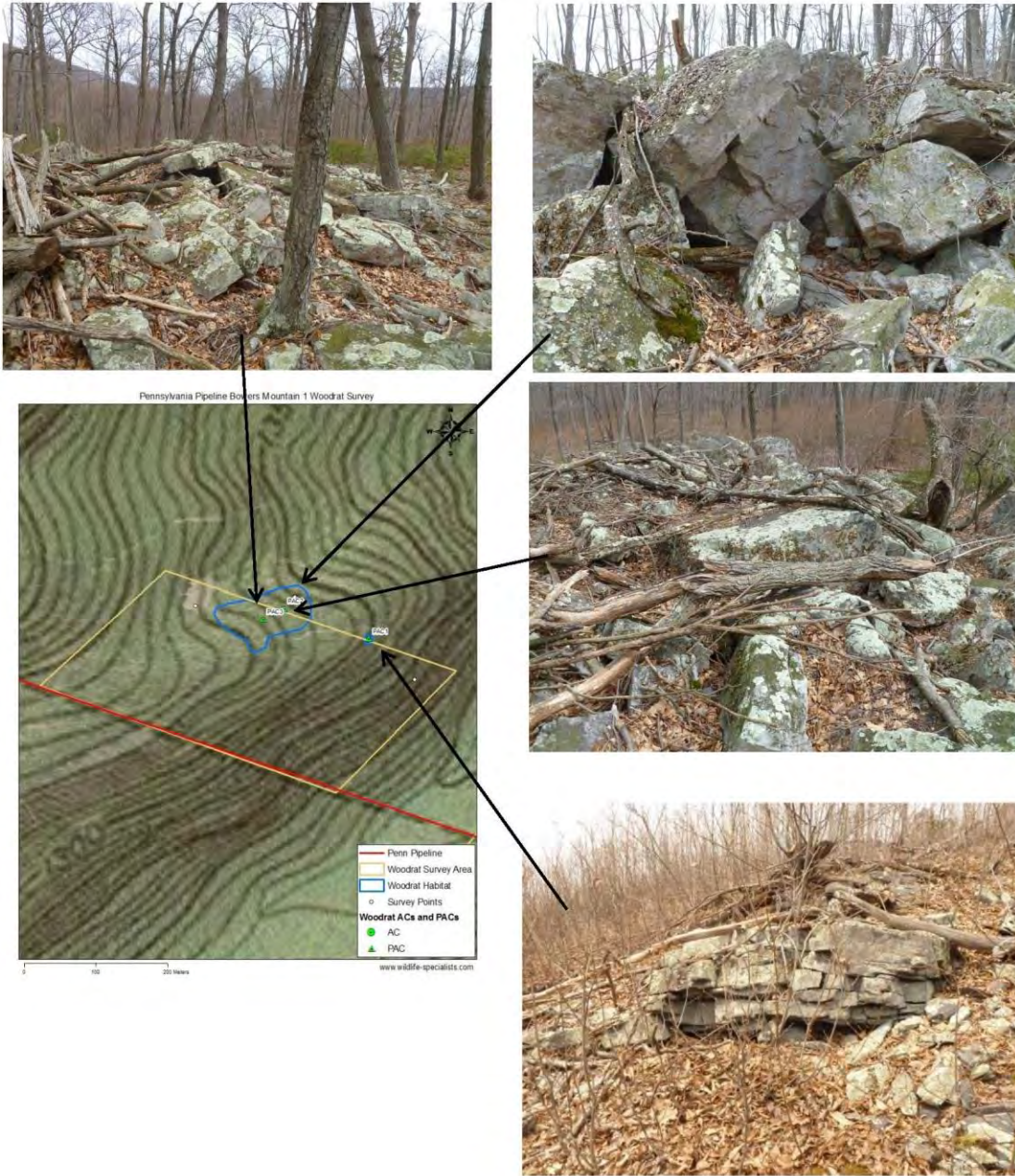


Photo Map 23 - Middle Ridge Allegheny woodrat habitat and sign



Photo Map 24 – Middle Ridge Allegheny woodrat habitat and sign



Photo Map 25 - Blue Mountain Allegheny woodrat habitat



Pennsylvania Pipeline Blue Mountain Woodrat Survey Area



Appendix IV. Detailed location maps and photographs of Eastern Small-footed Bat (*Myotis leibii*) potential summer roosting habitat as well as shaded rocky areas considered non-habitat identified during habitat surveys of the proposed Pennsylvania Pipeline Project, Indian, Cambria, Blair, Huntingdon, Perry and Cumberland Counties, Pennsylvania, June 23-July 24, 2014.

Photo Map 1 - Laurel Ridge 3 - Eastern small-footed bat survey area – suitable habitat



Photo Map 2 - Laurel Ridge 3 - Eastern small-footed bat survey area - non-suitable habitat

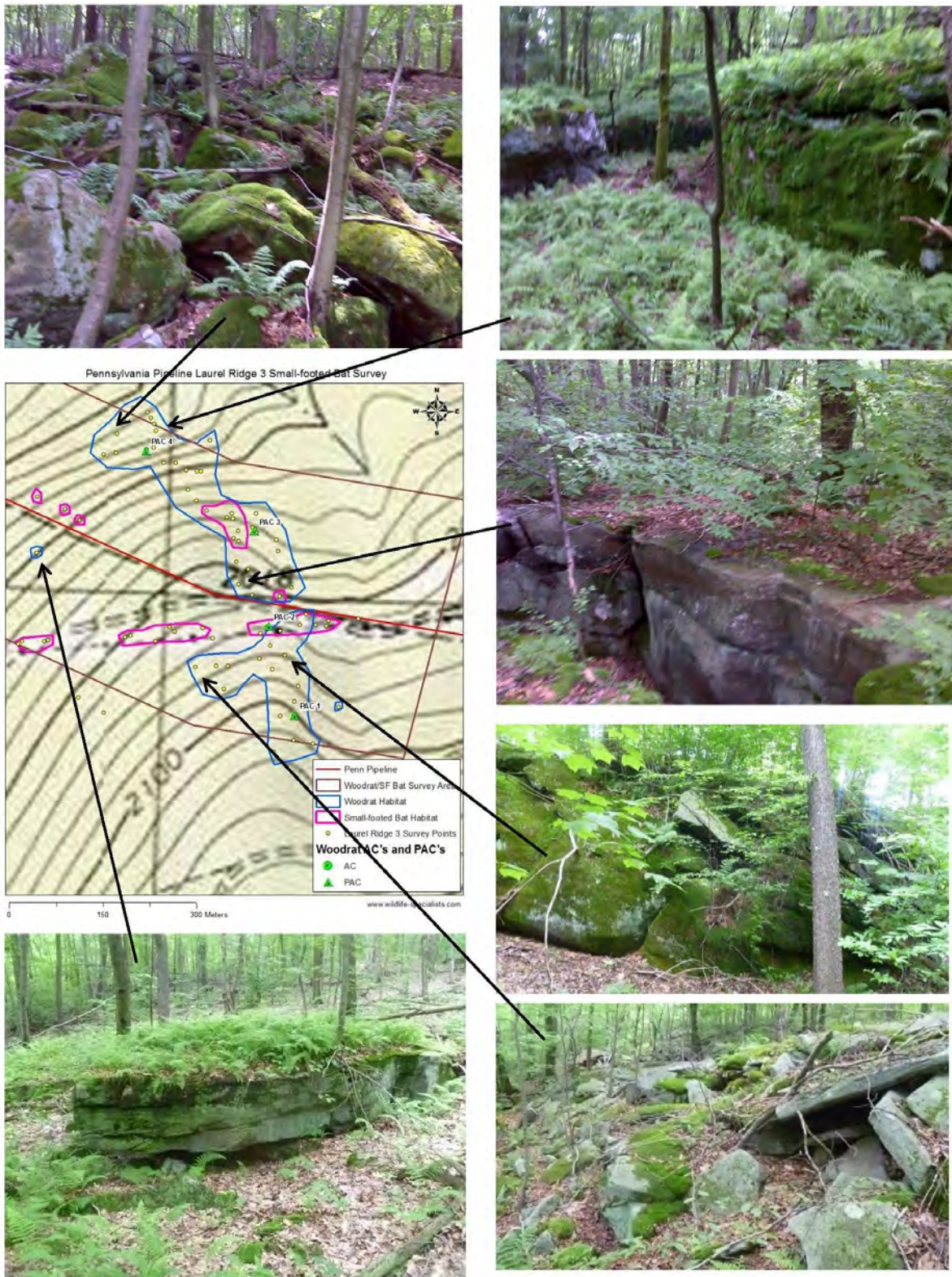


Photo Map 3 - Altoona Bypass - Eastern small-footed bat survey area - suitable habitat

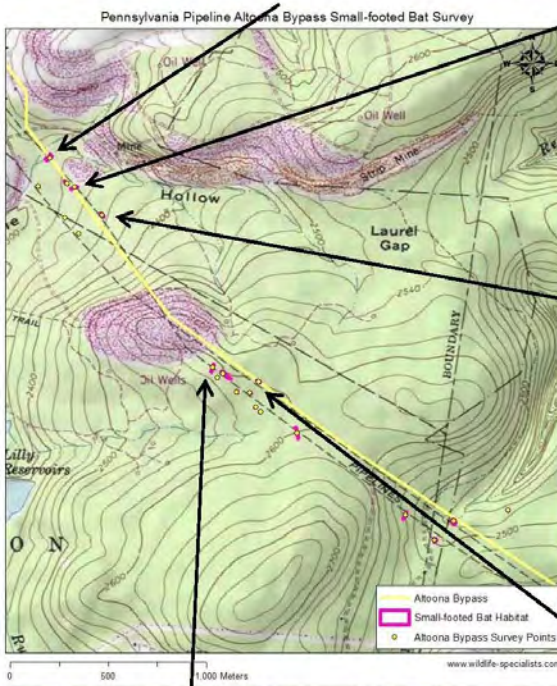


Photo Map 4 - Altoona Bypass - Eastern small-footed bat survey area - suitable habitat

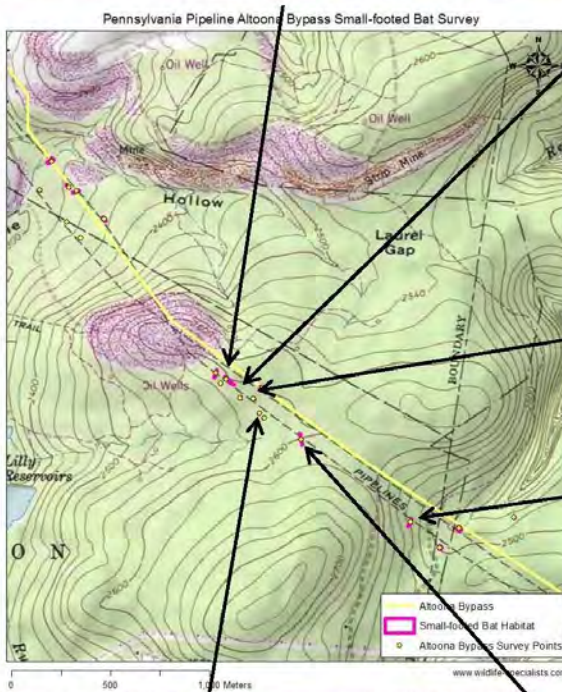


Photo Map 5 - Altoona Bypass - Eastern small-footed bat survey area - suitable habitat

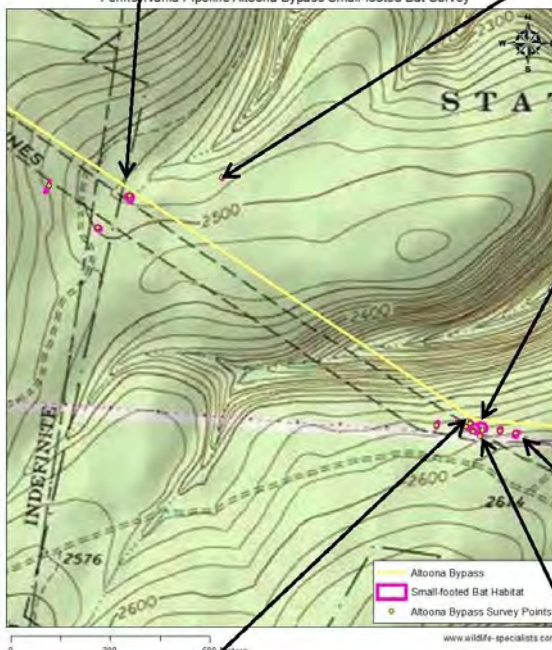


Photo Map 6 - Altoona Bypass - Eastern small-footed bat survey area - suitable habitat



Pennsylvania Pipeline Altoona Bypass Small-footed Bat Survey

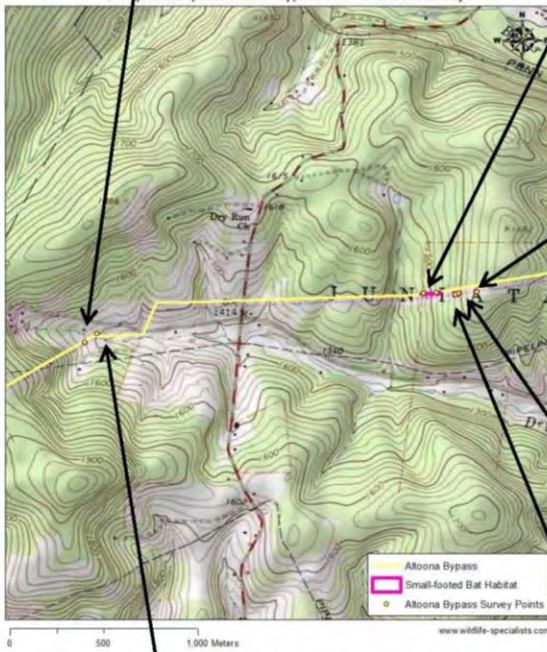


Photo Map 7 - Altoona Bypass - Eastern small-footed bat survey area - suitable habitat

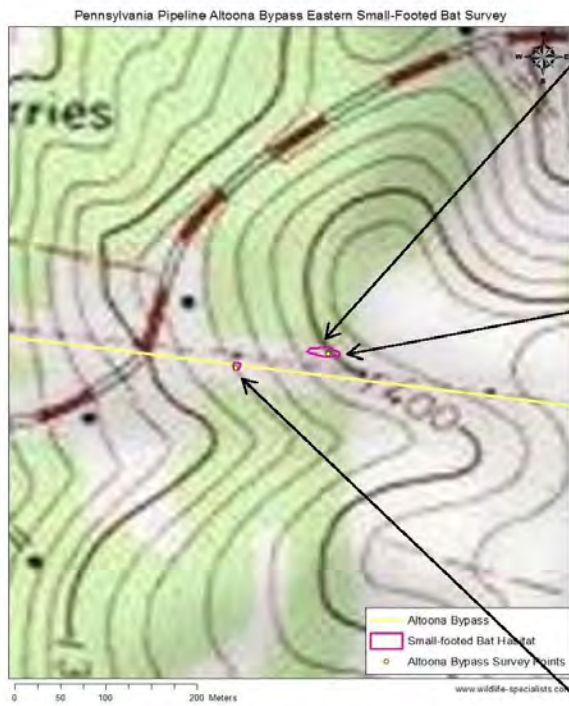


Photo Map 8 - Altoona Bypass - Eastern small-footed bat survey area - suitable habitat

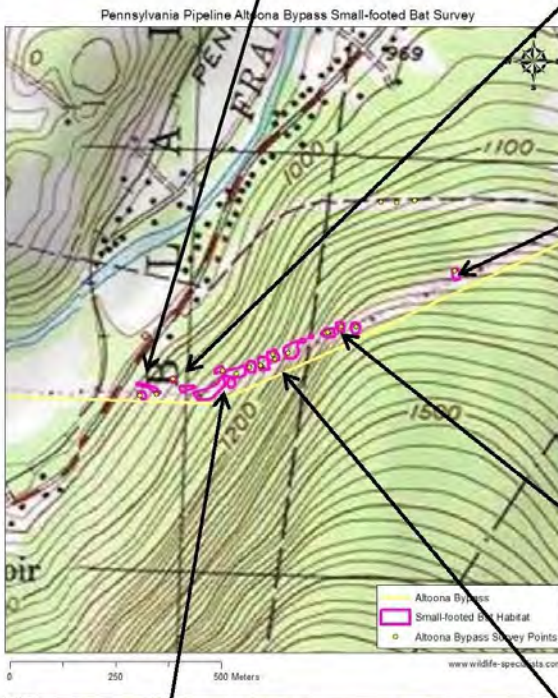


Photo Map 9 - Lock Mountain - Eastern small-footed bat survey area - non-suitable habitat



Pennsylvania Pipeline Lock Mountain Small-footed Bat Survey

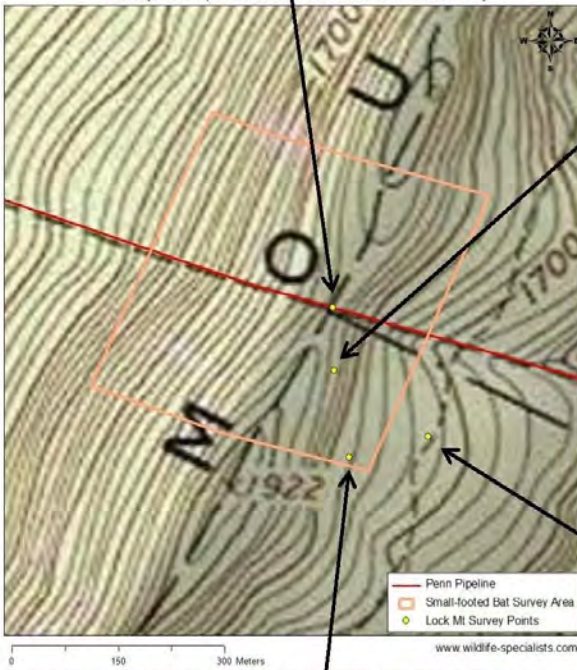


Photo Map 10 - Jacks Mountain 2 - Eastern small-footed bat survey area - suitable habitat

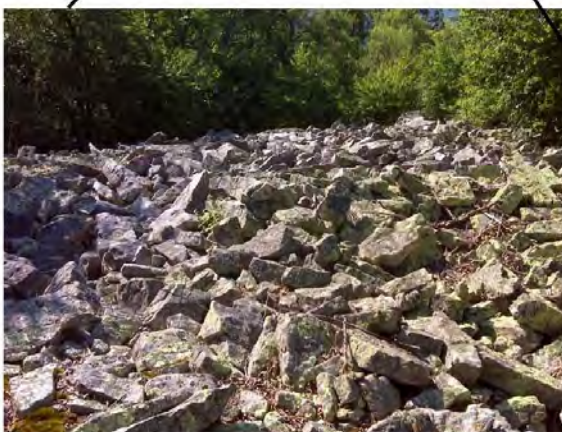


Photo Map 11 - Jacks Mountain 2 - Eastern small-footed bat survey area - suitable habitat

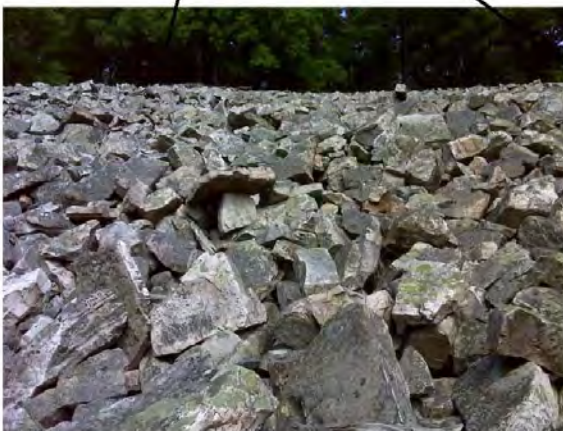
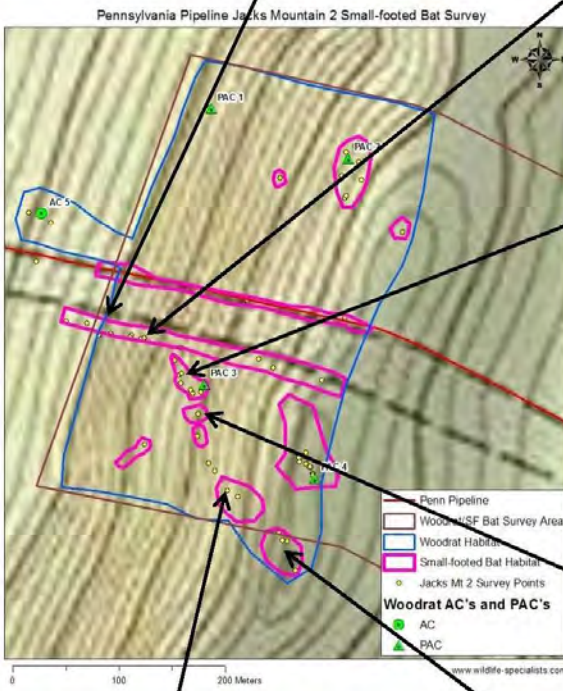


Photo Map 12 - Jacks Mountain 2 - Eastern small-footed bat survey area - non-suitable habitat



Photo Map 13 - Jacks Mountain 3 Eastern small-footed bat survey area - suitable habitat

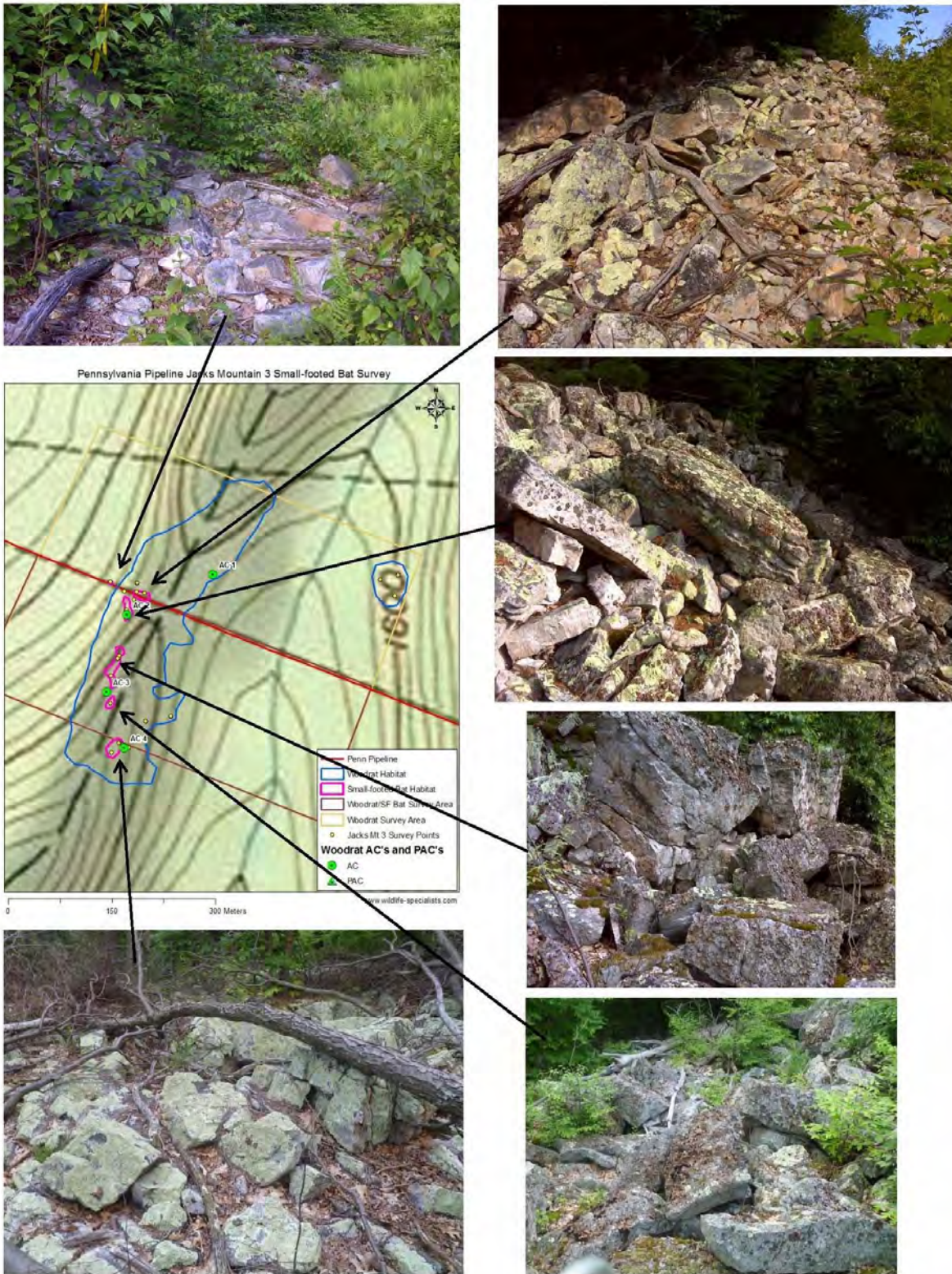


Photo Map 14 - Jacks Mountain 3 - Eastern small-footed bat survey area - non-suitable habitat

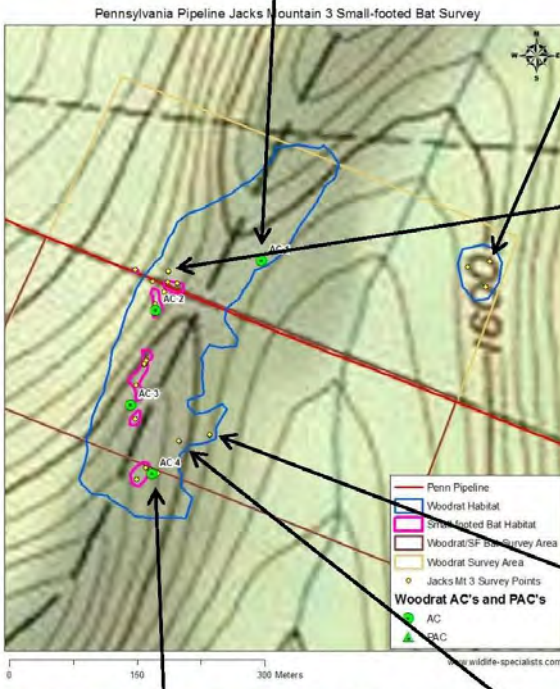


Photo Map 15 - Blacklog Mountain - Eastern small-footed bat survey area - suitable habitat



Pennsylvania Pipeline Blacklog Mountain Small-footed Bat Survey

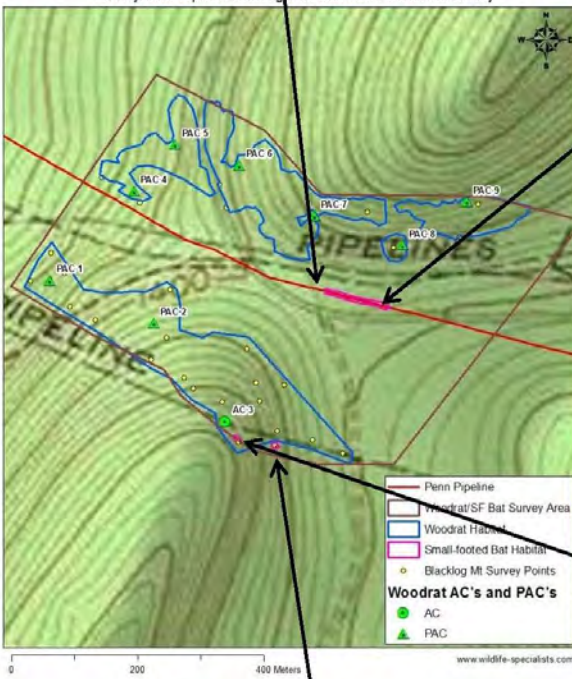


Photo Map 16 - Blacklog Mountain Eastern Small-footed Bat survey area - non-suitable habitat

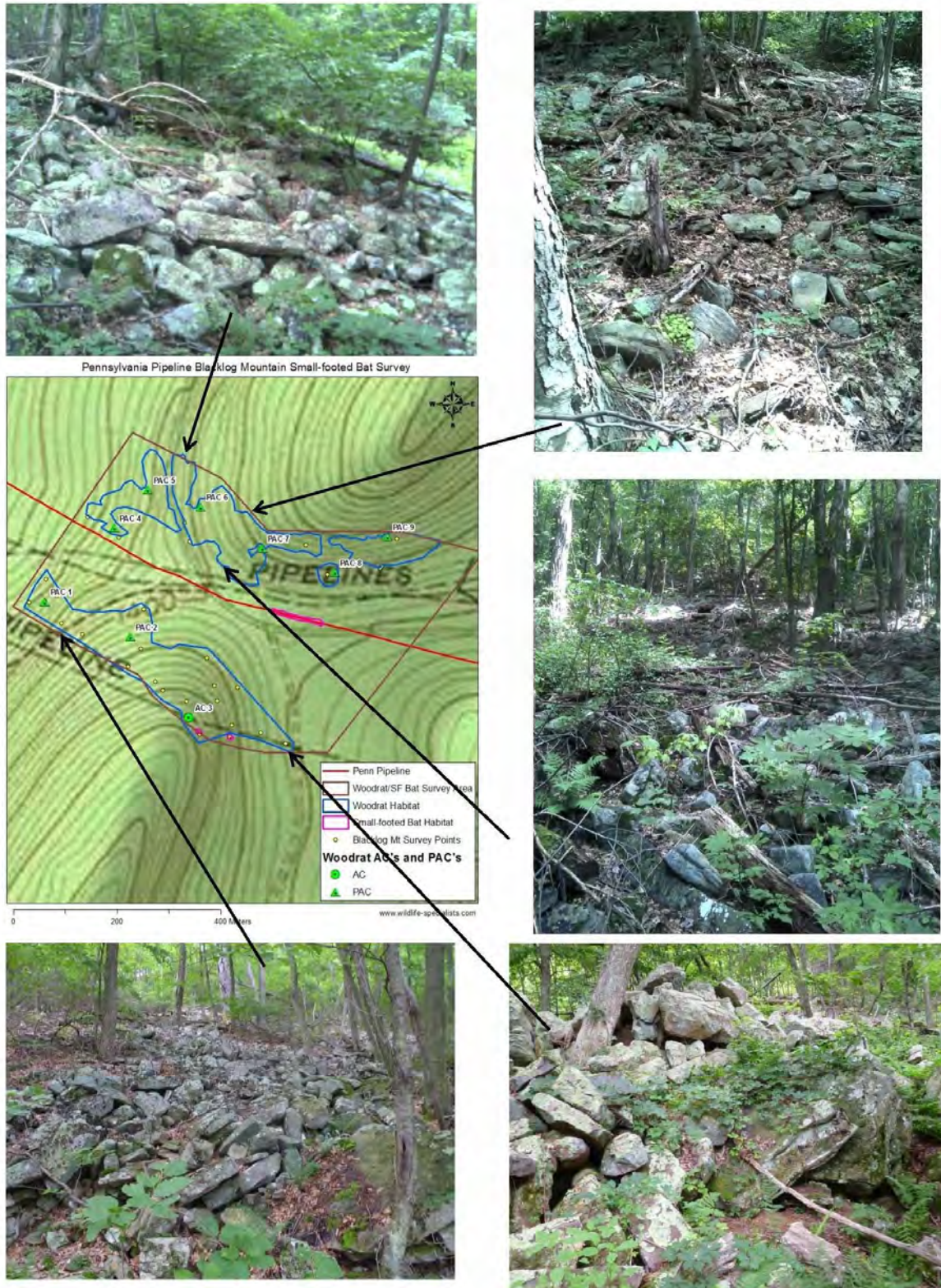


Photo Map 17 - Shade Mountain Eastern Small-footed Bat survey area - suitable habitat

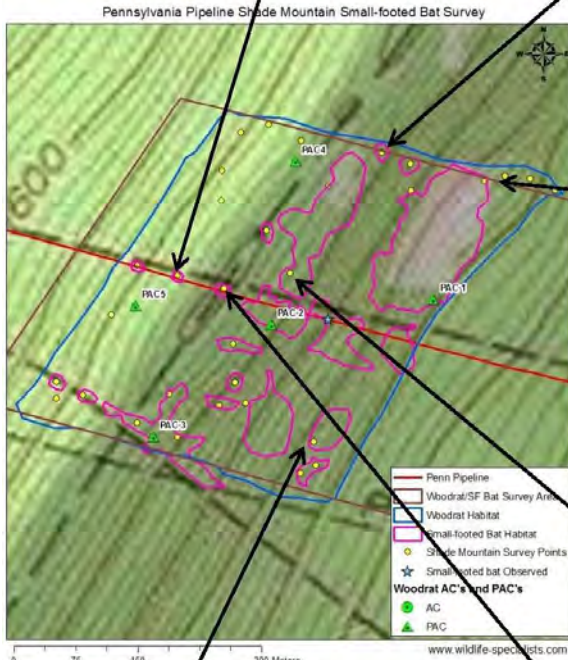


Photo Map 18 - Shade Mountain Eastern Small-footed Bat survey area - suitable habitat

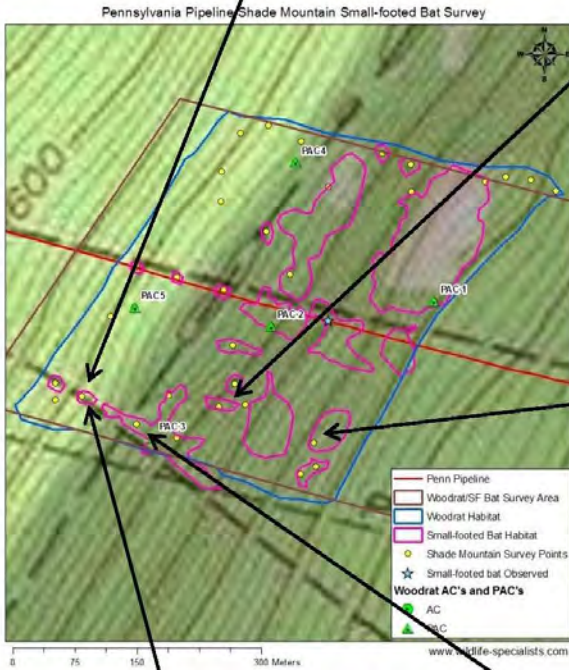
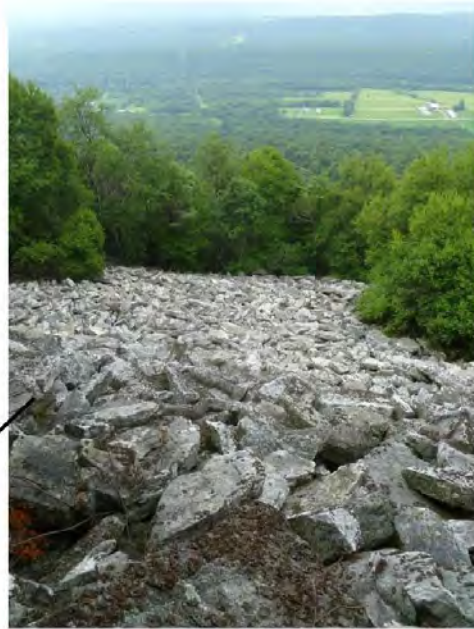


Photo Map 19 - Shade Mountain Eastern Small-footed Bat survey area - non-suitable habitat



Photo Map 20 - Conococheague Mountain Eastern Small-footed Bat survey area - Suitable habitat

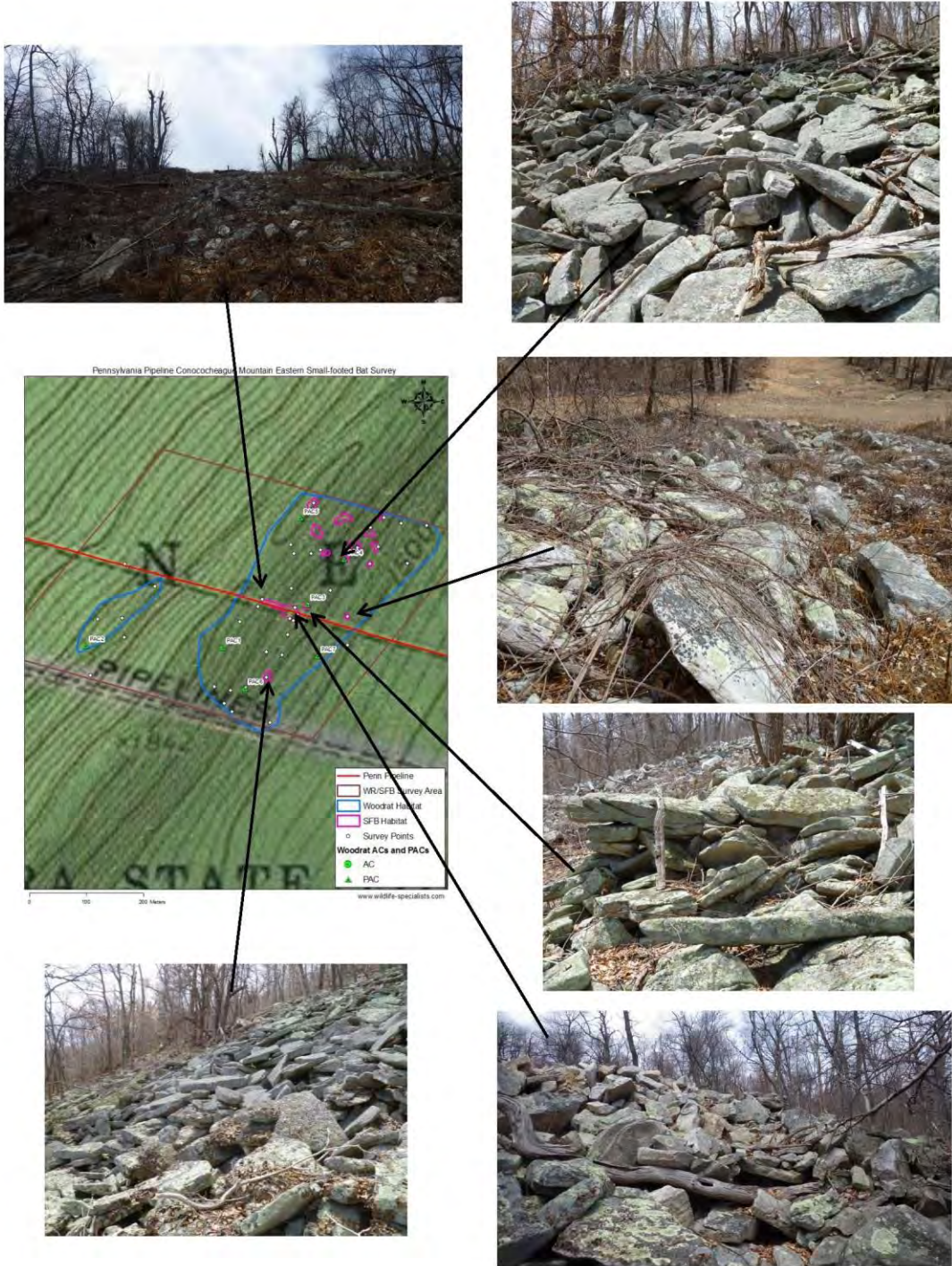


Photo Map 21 - Conococheague Mountain Eastern Small-footed Bat survey area - Suitable habitat



Photo Map 22 - Conococheague Mountain Eastern Small-footed Bat survey area - Non-suitable habitat

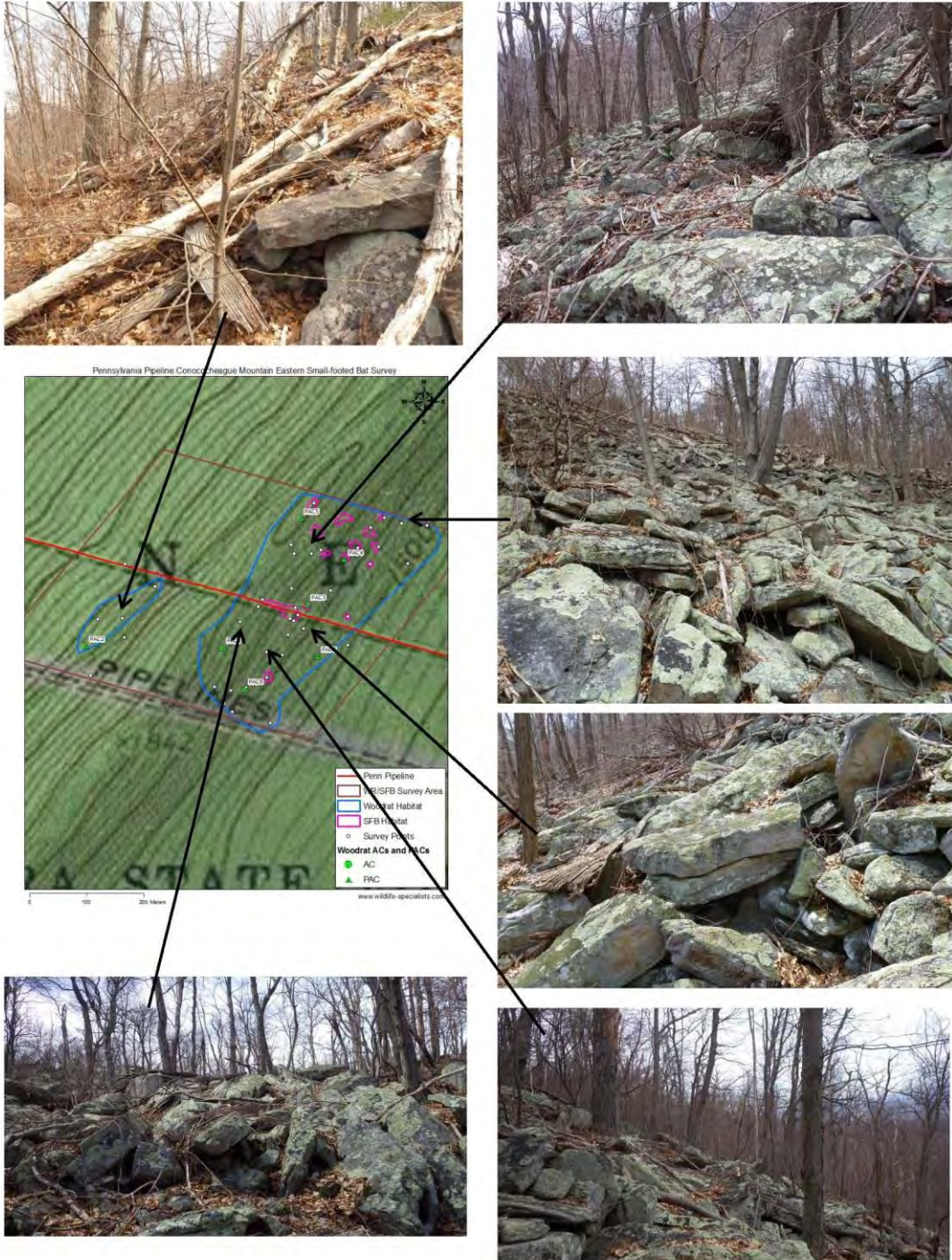


Photo Map 23 - Lock Mountain 2 Eastern Small-footed Bat survey area - Suitable habitat

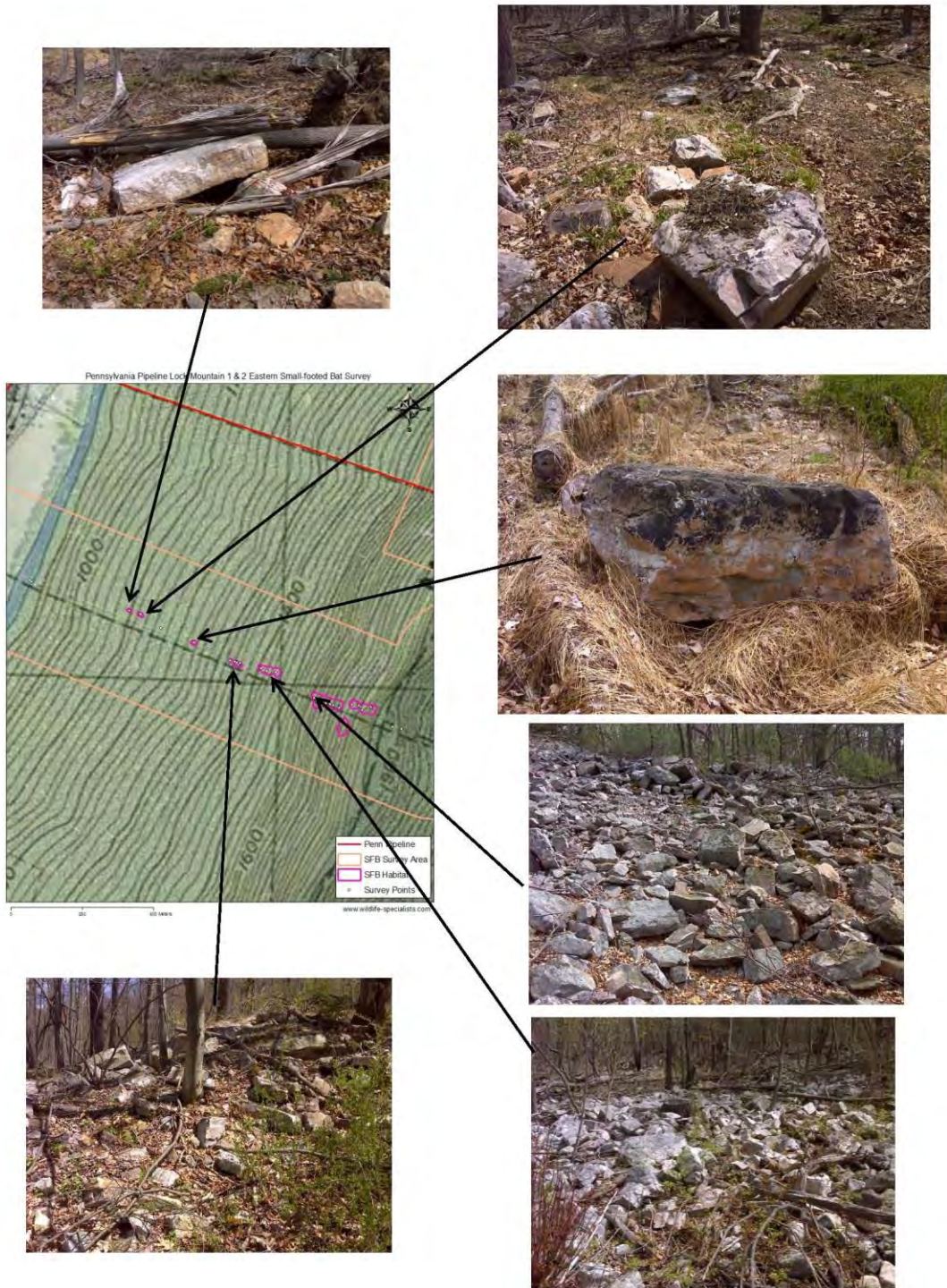


Photo Map 24 - Lock Mountain 2 Eastern Small-footed Bat survey area - Suitable habitat

