PENNSYLVANIA
WILDLIFE ACTION PLAN

Conservation Opportunity Area Tool Results

Project Name: Test run 1
Project Date: 1 September 2019
Project Area: 2,356.60 acres (279 planning units)

Counties: Centre County, Union County
Physiographic Provinces: Ridge and Valley
Ecoregions: Central Appalachian Forest
Major Drainage Basin (HUC8): Lower West Branch Susquehanna
Watershed (HUC12): Rapid Run, White Deer Creek-Lower West Branch Susquehanna River
Protected Land: Bald Eagle State Forest, Raymond B. Winter State Park, Halfway Run Natural Area
Note: At least one of the 10-acre planning units overlaps the above protected conservation land. Refer to the maps for more details.

PGC Region: Northcentral
PFBC Region: Northcentral

Species of Greatest Conservation Need

Species of Greatest Conservation Need are at-risk, threatened, or endangered species as well as common species of conservation concern for which Pennsylvania has stewardship responsibility.
Number of SGCN: 20
Number of Sensitive Species: 4 (3 PFBC; 1 PGC; 0 Invertebrates)

Sensitive species count included in total number of SGCN. Sensitive species may or may not be displayed in the table, subject to permissions. All projects should be entered into the Pennsylvania Conservation Explorer Environmental Review Tool to avoid and minimize sensitive species conflicts.

Results are organized by:

- Prioritization Category (e.g., Contribute to the conservation of globally or regionally important species), then within each category by:
  - Priority Score with highest priority SGCN (i.e., score 1, 2, or 3; 1 = highest) for each category noted first, followed by additional SGCN found in the Area of Interest that are not as high of a priority (i.e., score 4, 5, or 6; 6 = lowest). For more information about SGCN and prioritization categories, see the 2015 Pennsylvania Wildlife Action Plan, Chapter 1.

Contribute to the conservation of globally or regionally important species.

Focused attention on these species will contribute to range-wide conservation of the species.

No high priority SGCN are located in the Area of Interest for this category.

Prevent common species from becoming at-risk.

Proactive measures to enhance these populations could prevent further decline toward critical imperilment.

SGCN Name	SGCN Season	Priority Score	Occurrence[a]	Habitat Macrogroup(s)	Specific Habitat Requirements
Bird					
Ruffed Grouse *(Bonasa umbellus)*	Breeding	1	Known	Northern Hardwood & Conifer	Mosaic of age classes within a forested landscape, with early succession forest as 12-15 percent of total. Peak use by drummers occurs at years 6-18 of regrowth. Low moist bottomlands with herbaceous cover, as well as coarse woody debris, important as brood habitat.
Brown Creeper *(Certhia americana)*	Breeding	1	Known	Northern Hardwood & Conifer	Requires dead trees with loose bark for nesting in late-successional forest
Winter Wren *(Troglodytes hiemalis)*	Breeding	1	Known	Northern Hardwood & Conifer	High elevation, coniferous/mixed forests, with a substantial hemlock component. Nests often near water, particularly streams in hemlock ravines but sometimes near bogs or swamps; require substantial downed woody debris, standing dead trees, or large-diameter logs
Wood Thrush *(Hylocichla mustelina)*	Breeding	1	Known	Northern Hardwood & Conifer	Second-growth deciduous forest and forest-edge habitats; often with available fruit
Gray Catbird *(Dumetella carolinensis)*	Breeding	4	Known	Urban/Suburban Built	Dense, shrubby vegetation, including thickets, hedgerows, woodland edges, and regenerating clearcuts
Black-throated Green Warbler *(Setophaga virens)*	Breeding	1	Known	Northern Hardwood & Conifer	Large tracks of coniferous, deciduous, and mixed forests >984 feet (>300 meters) elevation

SGCN Name	SGCN Season	Priority Score	Occurrence[a]	Habitat Macrogroup(s)	Specific Habitat Requirements
Louisiana Waterthrush *(Parkesia motacilla)*	Breeding	1	Known	Northern Hardwood & Conifer	Mature, forested watersheds with med-high gradient headwater (1st-3rd order) streams, with well developed banks (ravines) and/or plentiful overturned trees with exposed root masses. High-quality stream indicator
Canada Warbler *(Cardellina canadensis)*	Breeding	1	Known	Northern Hardwood & Conifer	Hemlock-dominated ravines and wet sites in northern hardwood and mixed forest with a dense understory of shrubs such as rhododendron or hobblebush; higher elevations >1499 feet (>457 meters)
Scarlet Tanager *(Piranga olivacea)*	Breeding	1	Known	Northern Hardwood & Conifer	A wide variety of mature deciduous and mixed-deciduous forest types
Sharp-shinned Hawk *(Accipiter striatus)*	Migration	5	Known	Northern Hardwood & Conifer	Large, contiguous coniferous or mixed conifer/deciduous forests, away from suburban areas or areas of human consistent human activity. Migrants select large or contiguous forests >494 acres (>200 hectares) (Goodrich 2010) often near streams, rivers or wet thickets
Broad-winged Hawk *(Buteo platypterus)*	Migration	5	Known	Central Oak-Pine	Continuous deciduous or mixed deciduous forests with openings and water source nearby
Blackburnian Warbler *(Setophaga fusca)*	Migration	3	Known		Not very specific during migration. Any habitat with at least some woody vegetation may be used
Black-and-white Warbler *(Mniotilta varia)*	Breeding	1	Known	Northern Hardwood & Conifer	Reported by some as an area-sensitive forest breeder, although apparently accepts early-successional forest; most abundant in forest with dense understory, including scrubby barrens
Black-throated Blue Warbler *(Setophaga caerulescens)*	Breeding	1	Likely	Northern Hardwood & Conifer	Unfragmented mixed, coniferous forest with structural diversity, elevation >2624 feet (>800 meters)
Fish					
Brook Trout *(Salvelinus fontinalis)*	Year-round	2	Known	Headwaters and Creeks	Clear mountain streams at elevations from 1,500 to 2,000 feet (457 to 610 meters) with high-quality, moderate flow bordered by deeply undercut stream banks, exposed tree root balls, rock, brush piles, and greater than 75 percent ground cover
Invertebrate - Dragonflies and Damselflies					
Superb Jewelwing *(Calopteryx amata)*	Year-round	4	Known	Headwaters and Creeks	
Sensitive Species					

SGCN Name	SGCN Season	Priority Score	Occurrence[a]	Habitat Macrogroup(s)	Specific Habitat Requirements
Sensitive Species					Specific Habitat Requirements not listed due to species sensitivity.

Maintain rare native species.

Conservation actions benefiting these species will increase the likelihood of sustaining them in Pennsylvania.

SGCN Name	SGCN Season	Priority Score	Occurrence[a]	Habitat Macrogroup(s)	Specific Habitat Requirements
Invertebrate - Dragonflies and Damselflies					
Superb Jewelwing *(Calopteryx amata)*	Year-round	4	Known	Headwaters and Creeks	
Sensitive Species					
Sensitive Species					Specific Habitat Requirements not listed due to species sensitivity.

Reduce knowledge gaps to better assess conservation status of species.

More information on the distribution of these species is needed to evaluate their securement in the state.

No high priority SGCN are located in the Area of Interest for this category.

[a] Occurrence values are defined as follows: **Known** - The species has been documented within the area of interest; **Likely** - The species has not been documented within the area of interest, but species distribution models or other data sources indicate strong potential for its occurrence.

Habitat may also be present for the following SGCN, though surveys are needed to confirm their presence or absence: Red-headed Woodpecker *(Melanerpes erythrocephalus)*, Nashville Warbler *(Oreothlypis ruficapilla)*, Eastern Meadowlark *(Sturnella magna)*, Allegheny Woodrat *(Neotoma magister)*, Long Dash *(Polites mystic)*, Harris' Checkerspot *(Chlosyne harrisii)*, Eastern Whip-poor-will *(Antrostomus vociferus)*, Purple Martin *(Progne subis)*, Mulberry Wing *(Poanes massasoit)*, Broad-winged Skipper *(Poanes viator viator)*, West Virginia White *(Pieris virginiensis)*, Bog Copper *(Lycaena epixanthe)*, Baltimore *(Euphydryas phaeton)*, Virginia Rail *(Rallus limicola)*, Sora *(Porzana carolina)*, Northern Water Shrew *(Sorex palustris albibarbis)*, Dion Skipper *(Euphyes dion)*, Black Dash *(Euphyes conspicua)*.

Habitats

Habitats intersecting planning units within your area of interest are noted in the table below. Terrestrial and wetland habitats (i.e., ecological systems) are grouped by similarities (i.e., macrogroup). More information about habitats is available in the 2015 Pennsylvania Wildlife Action Plan, Chapter 2 and Appendices.

Terrestrial and Wetland Habitat[c]	Area(ac)
Water	
Open water	8.02
Urban/Suburban Built	
Developed	143.4
Central Oak-Pine	
Dry Oak-Pine Forest, Central Apps and Southern Piedmont	436.97
Northeastern Interior Dry-Mesic Oak Forest	878.25
Central Appalachian Pine-Oak Rocky Woodland	235.36
Northern Hardwood & Conifer	
Appalachian (Hemlock)-Northern Hardwood Forest	856.65
Agricultural	
Agriculture	1.34

[c] Note that due to data source and scale, not all features (eg. streams, wetlands, etc) observed on the ground will be documented in tables.

Stream and River Habitat	Length(mi)
High Gradient, Cold, Headwaters and Creeks	1.3
Missing, uninitialized in NHDPlusV1	0.2
Moderate Gradient, Cool, Headwaters and Creeks	2.4

Habitats Map

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Conservation Actions

Specific actions have been identified for Species of Greatest Conservation Need (SGCN) within your area of interest. Results are organized by standardized conservation action categories. Multiple SGCN may be associated with a common specific action.

Action Impact Score: Priority actions are highlighted by an Action Impact Score which is calculated as a function of SGCN priority, occurrence, and specific action priority for each species. For example, a top priority action for a high priority species that is known to occur within the area of interest is calculated to have a 'high' action impact score. Additional information regarding conservation actions for SGCN can be found in the Wildlife Action Plan species accounts (Appendix 1.4 - birds, mammals, amphibians, reptiles, fishes, federal or state listed mussels). It is possible that an action for one species may have unintended consequences for another. Contact a wildlife professional before planning your project.

Important: These results DO NOT satisfy or supplant regulatory review requirements and are NOT for Pennsylvania Natural Diversity Inventory (PNDI) project screening, protocols, and procedures. All projects should be entered into the Pennsylvania Conservation Explorer Environmental Review Tool to avoid and minimize sensitive species conflicts. (Conservation Opportunity Area Tool Terms and Conditions)

Action Impact Score: **High**

Recommended Conservation Actions	SGCN Benefiting
Create new habitat or natural processes	
· Identify areas of unnaturally acidified soils and restore using terrestrial lime application.	Ruffed Grouse, Wood Thrush
· Focus habitat restoration on sites with adequate calcium and/or buffering capacity.	Ruffed Grouse
· Conserve habitat and supporting landscapes within the core of the species' range to prevent conversion to non-suitable habitat.	Canada Warbler
· Actively manage habitat (e.g., controlled burns) to promote presence of the species.	Black-and-white Warbler
Land use planning	
· Cluster development, utilities, and associated infrastructure to reduce impacts to species.	Black-throated Green Warbler, Black-throated Blue Warbler
· Implement land use best management practices (e.g., riparian buffers) and erosion and sedimentation plans to protect water quality.	Louisiana Waterthrush
· Develop landscape-level planning agreements across ownerships in areas where species occurs.	Black-and-white Warbler, Brown Creeper, Winter Wren
· Place development and associated infrastructure on already disturbed sites.	Black-throated Blue Warbler
Conservation area designation	
· Conserve trees along streams and rivers, and around wetlands.	Louisiana Waterthrush
· Designate large blocks of mature conifer forest, including a 328 foot (100 meter) buffer, as a conservation area.	Winter Wren, Brown Creeper
· Develop best management practices for conserving large core areas of mature forest, including a 328 foot (100 meter) buffer.	Brown Creeper, Winter Wren
· Identify and conserve unprotected large >247 acres (>100 hectares) forest blocks.	Scarlet Tanager
Species and habitat management planning	

Action Impact Score: **High**

Recommended Conservation Actions	SGCN Benefiting
·Protect and enhance resilient landscapes.	Black-throated Green Warbler, Black-throated Blue Warbler
·Conduct species distribution and population surveys to support management decisions and conservation strategies.	Sensitive Species
·Manage deer for healthy and sustainable forest habitat.	Scarlet Tanager
Vegetation management	
·Reduce straight, 'hard edges' between field and forest by creating a young forest transition between the habitats.	Ruffed Grouse
·Cluster development, utilities, and associated infrastructure to reduce impacts to species.	Ruffed Grouse
Partner/stakeholder engagement	
·Increase awareness regarding impacts to ground-nesting birds from unleashed dogs and free-roaming cats.	Ruffed Grouse
Coordination and Administration	
·Coordinate planning of new roads, pipelines, and powerlines to avoid large forest blocks, or use existing corridors.	Black-and-white Warbler
Native species restoration	
·Reduce impacts of Brown Trout in areas managed for native Eastern Brook Trout.	Brook Trout

Action Impact Score: **Medium**

Recommended Conservation Actions	SGCN Benefiting
Vegetation management	
·Create patches of forest openings and young forest habitat (i.e., multiple age stands) through best management practices (e.g., controlled burns or timber harvest).	Blackburnian Warbler, Gray Catbird
·Conserve boreal conifer forests and swamps through land protection and developing and implementing best management practices.	Canada Warbler
Species and habitat management planning	
·Conduct species distribution and population surveys to support management decisions and conservation strategies.	Sensitive Species
Land use planning	
·Cluster development, utilities, and associated infrastructure to reduce impacts to species.	Blackburnian Warbler
·Create or maintain at least 150 feet (46 meters) of native vegetation uphill from wetlands.	Canada Warbler
State Regulations	
·Develop and implement best management practices related to lights, flares, and habitat restoration following disturbance.	Blackburnian Warbler
·Cluster development, utilities, and associated infrastructure to reduce impacts to species.	Scarlet Tanager

Action Impact Score: **Medium**

Recommended Conservation Actions	SGCN Benefiting
Environmental review	
· Work with developers and partners to minimize disturbances to habitats used by this species.	Superb Jewelwing
Conservation area designation	
· Identify regularly used large forest blocks within the migration corridor; designate these areas as important migratory stopover sites; use sustainable forestry practices; and limit development and human disturbance in these areas.	Broad-winged Hawk
· Limit high-volume roadways within migration corridor.	Broad-winged Hawk
· On public land, designate remaining large forest blocks as High Conservation Value Forests.	Black-throated Green Warbler
Incentives	
· Create or promote economic incentives to minimize high volume roads.	Sharp-shinned Hawk
· Create or promote economic incentives to encourage conservation of large forest blocks.	Sharp-shinned Hawk
· Create or maintain at least 150 feet (46 meters) of native vegetation uphill from wetlands.	Canada Warbler
Grazing/farm management	
· Implement land use best management practices (e.g., riparian buffers) and erosion and sedimentation plans to protect water quality.	Superb Jewelwing
Coordination and Administration	
· Promote low density, low impact land use at the municipal level where Species of Greatest Conservation Need occur.	Sharp-shinned Hawk
· Restore native vegetation to disturbed areas, such as pipelines and powerlines.	Canada Warbler
Living shorelines	
· Create or maintain riparian buffers using native vegetation.	Superb Jewelwing
Wildlife damage management	
· Manage deer for healthy and sustainable forest habitat.	Black-throated Green Warbler, Black-throated Blue Warbler
Technical assistance	
· Promote forestry practices that provide adequate nesting substrate and regenerate conifers.	Black-throated Green Warbler, Black-throated Blue Warbler
Private Sector Standards and Codes	
· Increase awareness of bird-window collision threat and mitigating solutions.	Blackburnian Warbler

Action Impact Score: **Low**

Recommended Conservation Actions	SGCN Benefiting
Create new habitat or natural processes	
· Expand remediation of mine reclamation discharges impacting native Eastern Brook Trout habitat.	Brook Trout

Action Impact Score: **Low**

Recommended Conservation Actions	SGCN Benefiting
· Conserve trees along streams and rivers, and around wetlands.	Brook Trout
Private Sector Standards and Codes	
· Promote "lights out" programs in cities during migration.	Blackburnian Warbler
· Restore or enhance natural habitat in areas that are heavily used during migration.	Blackburnian Warbler
Invasive species control	
· Assess potential loss of hemlock due to woolly adelgid aphid and proactively remediate impacts (e.g., replace dead stands with red spruce).	Brown Creeper, Winter Wren
· Manage deer for healthy and sustainable forest habitat.	Brown Creeper, Winter Wren, Wood Thrush
· Remove non-native or invasive vegetation.	Wood Thrush
· Educate private property owners and the public about what they can reduce disturbance to the species.	Wood Thrush
Land use planning	
· Implement land use best management practices (e.g., riparian buffers) and erosion and sedimentation plans to protect water quality.	Brook Trout
· Conserve trees along streams and rivers, and around wetlands.	Brook Trout
· Cluster development, utilities, and associated infrastructure to reduce impacts to species.	Wood Thrush
Technical assistance	
· Promote dynamic forest management on private and public lands to provide the appropriate habitat condition needed for the species.	Ruffed Grouse
· Encourage utility companies to create shrubby edges along edges of rights-of-way.	Gray Catbird
Wildlife disease management	
· Assess species vulnerability to West Nile Virus.	Ruffed Grouse
· Remove non-native or invasive vegetation.	Ruffed Grouse
Vegetation management	
· Conserve, large, contiguous forest blocks throughout migration corridor.	Sharp-shinned Hawk
Species and habitat management planning	
· Identify the most suitable sites for the species and develop or implement best management practices to continue site suitability.	Sensitive Species
Conservation area designation	
· Identify the most suitable sites for the species and develop or implement best management practices to continue site suitability.	Sensitive Species
· Identify regularly used large forest blocks within the migration corridor; designate these areas as important migratory stopover sites; use sustainable forestry practices; and limit development and human disturbance in these areas.	Broad-winged Hawk
Private lands agreements	

Action Impact Score: **Low**

Recommended Conservation Actions	SGCN Benefiting
· Conserve, large, contiguous forest blocks throughout migration corridor.	Broad-winged Hawk
Undefined	
· Work with willing dam-owners to remove dams, provide fishways if dam removal is not possible, and improve culverts to allow fish passage.	Brook Trout
State Regulations	
· Cluster development, utilities, and associated infrastructure to reduce impacts to species.	Louisiana Waterthrush
Water management	
· Develop best management practices for conserving large core areas of mature forest, including a 328 foot (100 meter) buffer.	Louisiana Waterthrush
Legislation	
· Monitor climate change indicators, such as water temperature and prey populations.	Louisiana Waterthrush
Wildlife damage management	
· Manage deer for healthy and sustainable forest habitat.	Black-and-white Warbler

Research and Survey Needs

Research and survey needs have been identified for the Species of Greatest Conservation Need (SGCN) within your area of interest. NOTE: Not all research and survey needs may be applicable to your project. Consult the Game Commission or Fish & Boat Commission prior to initiating a research or survey project. Additional information regarding research and survey needs for SGCN can be found in the Wildlife Action Plan species accounts (Appendix 1.4 - birds, mammals, amphibians, reptiles, fishes, federal or state listed mussels).

SGCN	Research Needs	Survey Needs
Sharp-shinned Hawk	• Define nesting and wintering range of Pennsylvania migrants. Similarly, map wintering and migration areas for Pennsylvania nesting birds. • Evaluate health and contaminant load of Pennsylvania migrants by partnering with banding stations to conduct blood and fat analyses for heavy metals and contaminants. • Evaluate Pennsylvania migrant population trends and improve our knowledge of migration corridors in the ridge and valley region, Appalachians, and near Lake Erie.	• Conduct 1-2 year counts of birds using key ridges in the Appalachian chain, besides Blue Mountain, and along Lake Erie shoreline or other potential concentration areas in spring and fall season. • Additional banding station on western Appalachians or Allegheny Front region to monitor migrants using those areas for health and to provide additional information on nesting and wintering population extent. Request banders in eastern and western ridges collect and report weight, sex/age ratios, fat levels on migrants to provide index to migrant health annually. • Encourage consistent migration counts at hawk count sites immediately south of Pennsylvania and during spring in Pennsylvania. Partner with HMANA to identify sites, possibly provide small grants to sustain operation and get each site's historical hourly data entered and part of the current long-term migration monitoring program particularly for PA spring migration sites (e.g. RPI).

SGCN	Research Needs	Survey Needs
Broad-winged Hawk	• Define nesting and wintering range of Pennsylvania migrants. Identify key stopover sites and their characteristics to inform conservation planning. • Evaluate Pennsylvania migrant population trends and improve our knowledge of migration corridors in the ridge and valley region, Appalachians, and near Lake Erie. • How far from migration routes do migrant broad-winged hawks travel to find stopover sites?	• Conduct 1-2 year counts of birds using key ridges in the Appalachian chain, besides Blue Mountain, and along Lake Erie shoreline or other potential concentration areas in spring and fall season. • Additional banding station on western Appalachians or Allegheny Front region to monitor migrants using those areas for health and to provide additional information on nesting and wintering population extent. Request banders in eastern and western ridges collect and report weight, sex/age ratios, fat levels on migrants to provide index to migrant health annually. • Partner with other conservation groups and state or federal agencies to implement trail or road surveys for Broadwings on the wintering grounds in South America. • Encourage consistent migration counts at hawk count sites immediately south of Pennsylvania and during spring in Pennsylvania. Partner with HMANA to identify sites, possibly provide small grants to sustain operation and get each site's historical hourly data entered and part of the current long-term migration monitoring program particularly for PA spring migration sites (e.g. RPI).
Ruffed Grouse	• Determine vulnerability and mortality rates of breeding ruffed grouse exposed to West Nile Virus. • Determine impact of changing spring weather conditions on juvenile production, obtain current survival rate estimates of juvenile grouse, and determine relative contributions of various mortality factors (disease, weather, predation) to juvenile mortality.	• Refine PGC Grouse Summer Sighting Survey to provide more reliable data on annual recruitment.

SGCN	Research Needs	Survey Needs
Brown Creeper	• Evaluate brown creeper response to varying levels of habitat damage by hemlock woolly adelgid. • Assess suitability of hemlock surrogates (e.g., Norway and red spruce, fir, larch) as brown creeper habitat to inform restoration efforts in areas hit hard by hemlock wooly adelgid. • Assess response of brown creeper to various timber management practices.	• Establish a simple state network of off-road point counts in large forest blocks. • Establish off-road point counts for boreal conifer forest guild species, similar to Mountain Birdwatch project.
Winter Wren	• Assess suitability of hemlock surrogates (e.g., Norway and red spruce, fir, larch) as winter wren habitat to inform restoration efforts in areas hit hard by hemlock wooly adelgid. • What are effects of energy and residential development on area-sensitive forest birds in the large forest blocks of the state? • Determine winter wren responses to silvicultural practices.	• Establish a simple state network of off-road point counts in large forest blocks. • Establish off-road point counts for boreal conifer forest guild species, similar to Mountain Birdwatch project.
Wood Thrush	• use Breeding Bird Atlas and LiDAR data to conduct analyses that improve our understanding of the relationship between forest structure and forest interior bird breeding densities. • Long-term studies of seasonal fecundity to identify source/sink populations throughout the state and investigate effects of forest age on nest success, adult survival, and return rates. • Investigate links between breeding demographics and non-breeding activities/migratory connectivity. • Long-term point count surveys and territory mapping of forest interior birds should be established to identify population change at a range of sites.	• Conduct off-road point count surveys and spot-mapping for forest interior birds to determine habitat requirements and association with current forest management practices. • Surveys to assess response of forest species to silviculture treatments and other management.

SGCN	Research Needs	Survey Needs
Gray Catbird	• What is Gray Catbird response to silviculture / young forest management in Pennsylvania? • What is Gray Catbird response to scrub barrens management in Pennsylvania?	• Conduct post-treatment surveys of silvicultural treatments to determine reaction of young forest and shrub species. • MAPS program for selected locations.
Black-throated Blue Warbler	• What are effects of energy and residential development on area-sensitive forest birds in the large forest blocks of the state? • What are the limiting factors for this species through its full life cycle? Is the long-distance migration and winter habitat important limiting factors? • Evaluate population response to habitat management prescriptions used to create, maintain or enhance breeding habitat of forest species.	• Conduct off-road point count surveys and spot-mapping for forest interior birds to determine habitat requirements and association with current forest management practices. • Establish off-road point counts for boreal conifer forest guild species, similar to Mountain Birdwatch project.
Black-throated Green Warbler	• What are effects of energy and residential development on area-sensitive forest birds in the large forest blocks of the state?	• Conduct off-road point count surveys and spot-mapping for forest interior birds to determine habitat requirements and association with current forest management practices. • Establish off-road point counts for boreal conifer forest guild species, similar to Mountain Birdwatch project.
Blackburnian Warbler	• What stopover habitats do migrant blackburnians use? • Where are the breeding grounds of blackburnian warblers that pass through Pennsylvania during migration? • Does the loss of hemlock have a negative effect on blackburnian warbler as a stopover passage migrant?	• Conduct off-road point count surveys and spot-mapping for forest interior birds to determine habitat requirements and association with current forest management practices. • Conduct mist netting and banding at heavily used migration sites to monitor frequency of this species and others.

SGCN	Research Needs	Survey Needs
Black-and-white Warbler	• Determine habitat correlates of nest success, abundance, and site fidelity to identify optimal habitat of black-and-white warblers in PA. • Evaluate population response to habitat management prescriptions, including silviculture, used to create, maintain or enhance breeding habitat of forest birds. • Determine the adequacy of USGS breeding bird surveys to monitor populations compared to off-road surveys	• Conduct off-road point count surveys and spot-mapping for forest interior birds to determine habitat requirements and association with current forest management practices.
Louisiana Waterthrush	• Effects of shale gas drilling activity. • Effects of disappearance of riparian hemlock stands. • Post-breeding habitat use.	• Monitoring of breeding densities, productivity and chemical residues in tissues in areas of high Marcellus Shale drilling activity. • Monitoring of breeding densities and productivity in hemlock dominated riparian areas with differing hemlock woolly adelgid infestation levels. • Conduct off-road point count surveys and spot-mapping for forest interior birds to determine habitat requirements and association with current forest management practices.
Canada Warbler	• What are effects of energy and residential development on area-sensitive forest birds in the large forest blocks of the state? • What is the species sensitivity to disturbance along the fringe of the habitat? How close can disturbance be to their breeding habitat without affecting breeding activities? • Following disturbance, what is the timeline for the return of a viable breeding population?	• Conduct off-road point count surveys and spot-mapping for forest interior birds to determine habitat requirements and association with current forest management practices. • Establish off-road point counts for boreal conifer forest guild species, similar to Mountain Birdwatch project. • MAPS program for selected locations.

SGCN	Research Needs	Survey Needs
Scarlet Tanager	• Determine key features of high quality breeding habitat (i.e., source habitat) for the Scarlet Tanager in Pennsylvania, particularly within fragmented landscapes. • Determine how forest management practices (e.g. timber harvest), natural forest maturation, and effects of deer over-browsing affect breeding habitat quality for tanagers. • Post-nesting dispersal and migration pattern to the wintering ground little known but may be consequential.	• No survey needs at this time.
Brook Trout	• Determine Brook Trout population movements in relation to barriers, including movements of individuals. • Develop a Brook Trout status and trends monitoring program, including review and analysis of PFBC data to guide sampling design. • Evaluate brook trout population genetics structure within major Pennsylvania drainages. Refine existing models that predict brook trout occurrence.	• Survey for Brook Trout through PFBC Unassessed Waters Program.

Want more information or have questions?

Additional information about the Species of Greatest Conservation Need and Conservation Actions in this report is available by contacting:

- Birds, Mammals, Terrestrial Invertebrates: Pennsylvania Game Commission Regional Wildlife Diversity Biologist

Northwest Regional Office 814.432.3187	Northcentral Regional Office 570.398.4744	Northeast Regional Office 570.675.1143
Southwest Regional Office 724.238.9523	Southcentral Regional Office 814.643.1831	Southeast Regional Office 610.926.3136

- Fish, Reptiles and Amphibians, Freshwater Mussels, Terrestrial Invertebrates: Pennsylvania Fish and Boat Commission Conservation Coordinator; RA-FBSWAP@pa.gov

- Federally Threatened or Endangered Species: U.S. Fish and Wildlife Service State College Field Office; 814.234.4090

For other inquires about this tool or the Pennsylvania Wildlife Action Plan, contact:

Game Commission
Wildlife Diversity Conservation
Planning Coordinator
PGCSWAP@pa.gov

Fish and Boat Commission
Conservation Coordinator
RA-FBSWAP@pa.gov

Thank you for your interest in the Pennsylvania Wildlife Action Plan! If you would like to receive an email notification when a section of the Plan has been updated, please provide your contact information through this form: Registration Form