

2015 SWAP Update

IUCN Threats & TRACS "Action Driver" Categories to be Addressed by New Jersey's Wildlife Action Plan:

Level 1	Level 2	Level 3	Threat or Action Driver	Description
1 Residential and Commercial Development				Threats to native habitat and wildlife associated with the conversion of natural land to development for residential, commercial and industrial or other non-agricultural land uses with a substantial footprint.
	1.1 Housing and Urban Areas			Expansion or development of new residential areas of cities, towns and settlements including non-housing development that is typically integrated with housing.
	1.1.1	Land conversion from natural habitat to urban and other residential areas (large and small scale)		Habitat loss, fragmentation, and degradation (including wildlife travel corridors) associated with habitat conversion to housing and associated infrastructure and traffic.
	1.1.2	Residential development using materials that cause collision hazards		Residential development that increases collision risk because of height, lighting scaffolding, and/or reflectance or transparency of materials used.
	1.2 Commercial and Industrial Areas			Commercial and non-extractive industrial development and operations.
	1.2.1	Land conversion from natural habitat to commercial or industrial areas (large and small scale)		Habitat loss, fragmentation, and degradation (including wildlife travel corridors) resulting from habitat conversion to commercial or industrial use and associated infrastructure and traffic (Note: The conversion of natural landscapes to structures and infrastructure within military bases are included within this category).
	1.2.2	Commercial development using materials that cause collision hazards		Commercial and industrial development that increases collision risk because of height, lighting scaffolding, and/or reflectance or transparency of materials used.
	1.3 Tourism and Recreational Areas			Tourism and recreation sites with a substantial footprint.
	1.3.1	Land conversion from natural habitat to recreation or tourism areas (large and small scale)		Conversion of significant natural habitats (including wildlife travel corridors) into active recreation parks (e. g., ball fields, camping areas, golf courses) (Note: The conversion of natural landscapes to recreational and/or outdoor training areas within military bases are included within this category).
2 Agriculture and Aquaculture				Threats to native habitat and/or fish/wildlife associated with the conversion of natural habitat to farming, ranching, silviculture, mariculture or aquaculture, including expansion and intensification and/or changes in practices.
	2.1 Annual and Perennial Crops (non-timber)			Planting and harvesting of crops planted for food, fodder, fiber, fuel or other uses.
	2.1.1	Shifting Agriculture		Changing the agricultural use of a land from one that can be beneficial to animals (e.g., hay fields, pastureland) if managed for target species to one of lesser or no use (e.g., intensive tree/shrub nurseries).
	2.1.2	Small-holder Farming		Small-scale and/or family farms, primarily for personal consumption or local markets, that causes habitat loss, degradation and/or fragmentation.
	2.1.3	Agro-industry		Industrial-scale agriculture, including new or expansion of existing facilities that causes habitat loss, degradation and/or fragmentation.

2.2 Wood and Pulp Plantations			Growing and harvesting trees and other woody vegetation for timber, fiber or fuel.
	2.2.1	Small Holder	Small-scale wood or pulp plantations and associated facilities or expansion of existing facilities that causes habitat loss, degradation and/or fragmentation.
	2.2.2	Agro-industry Plantations	Industrial-scale wood or pulp plantations and associated facilities or expansion of existing facilities that causes habitat loss, degradation and/or fragmentation.
2.3 Livestock Farming and Ranching			Raising of animals for human consumption of other human use.
	2.3.2	Small-holder Grazing	Small-scale and/or family farms, primarily for personal consumption or local markets, that use or converts natural habitat to facilities (including expansion of existing facilities), grazing land or other livestock farming.
	2.3.3	Agro-industry Grazing	Industrial-scale use or conversion of natural habitat to facilities (including expansion of existing facilities), grazing land or other livestock farming.
2.4 Marine and Freshwater Aquaculture			Propagation, rearing, and subsequent harvesting of aquatic organisms in controlled or selected environments, including interventions in the rearing process to increase production such as stocking, feeding, transplanting and providing for protection from predators.
	2.4.1	Subsistence/Artisinal Aquaculture	Small-scale aquaculture, primarily for personal consumption or local markets, that causes habitat loss or degradation.
	2.4.2	Industrial Aquaculture	Large-scale aquaculture, primarily for wholesale, that causes habitat loss or degradation.
3 Energy Production and Mining			Threats to native habitat and/or fish/wildlife associated with exploring for, developing, producing and distributing energy or geological resources.
3.1 Oil and Gas Drilling / Pipelines			Exploring for, developing, producing and distributing oil and natural gas.
	3.1.1	Drilling and distribution of petroleum and other liquid hydrocarbons	Exploration (and the associated activities) of and the placement of new facilities or expansion of existing facilities to develop, produce and/or distribute petroleum and other liquid hydrocarbons that causes habitat loss, degradation, and/or fragmentation.
	3.1.2	Hydrofracturing and other natural gas extraction and distribution processes	Exploration (and the associated activities) of and the placement of new facilities or expansion of existing facilities to develop, produce and/or distribute natural gas that causes habitat loss, degradation, and/or fragmentation.
3.2 Mining and Quarrying			Exploring for, developing, producing and distributing minerals and rocks.
	3.2.2	Surface Mining - Rock Quarry (this should also include sand quarries - Pinelands)	Placement of new facilities or expansion of existing facilities to develop, produce and/or distribute quarry products that causes habitat loss, degradation, and/or fragmentation.
	3.2.4	Sand Dredging (outside shipping lanes)	Dredging offshore sand (for placement on Atlantic coastal beaches) <u>from sensitive areas</u> that alters and/or degrades the natural, benthic habitat(s).
3.3 Renewable Energy			Exploring, developing, producing and distributing renewable energy.
	3.3.1	Wind Power	Placement of new facilities or expansion of existing facilities that causes habitat loss, degradation, and/or fragmentation and/or that leads to increased bird and bat fatalities within their movement corridors and foraging areas.

	3.3.2	Solar Power	Placement of new facilities or expansion of existing facilities that causes habitat loss, degradation, and/or fragmentation.
3.4 Conventional Power Plants			Placement of new facilities or expansion of existing facilities that causes impacts to groundwater hydrology and/or alters the water temperature and/or pH of aquatic systems.
4 Transportation and Service Corridors			
4.1 Roads and Railroads			Non-energy related transportation corridors on land.
	4.1.1	Land conversion from natural habitat to roads and railroads (large and small scale)	Placement of new roads that result in the degradation of habitat including pathways for invasive species, the fragmentation of habitat resulting in the loss of interior conditions for forest interior dwelling species, increased access by predators and parasites resulting in reduced breeding success, and increased access for people resulting in future development activities, and the implementation of physical barriers (e.g., residential curbs, "NJ Barriers") that disrupt wildlife movement corridors.
	4.1.2	Movement of cars and other vehicles on roads and railroads (large and small scale)	Vehicular traffic densities that increase wildlife mortality and disrupt movement corridors.
4.2 Utility and Service Lines			Distribution of energy & resources.
	4.2.1	Land conversion from natural habitat to utility and other service lines (large and small scale) or communication towers and associated access roads	Placement of new service lines and communication towers, their facilities and associated access roads that result in the degradation of habitat including pathways for invasive species, the fragmentation of habitat resulting in the disruption of movement corridors and/or loss of interior conditions for forest interior dwelling species, wildlife mortality through strikes or other contact with associated equipment (e.g., electrical lines, towers), increased access by predators and parasites resulting in reduced breeding success, and increased access for people resulting in future development activities.
	4.2.2	Management of rights-of-way or communication tower facilities and/or their associated access roads	Managing the vegetation within and adjacent to the rights-of-way, communication tower facilities and/or their associated access roads in a manner that results in direct mortality of wildlife (e.g., mowing during ground-nesting birds' or reptiles nesting season) or the creation of unsuitable habitat or conditions (e.g., herbiciding important food plants for invertebrates).
4.3 Shipping Lanes			Transportation on and in freshwater and ocean waterways.
	4.3.1	Movement of large ships in shipping lanes	Ship traffic densities that increase marine and freshwater species' mortality and/or disrupt movement corridors or migratory patterns.
	4.3.2	Dredging impacts	Placement of dredge spoil containment facilities that causes the alteration of natural habitats and/or the direct mortality of mussels in fresh tidal water.

4.4 Flight Paths		Transportation in air and space.
4.4.1	Airplane flight paths	Flight travel paths (for large and small aircraft) that conflict with and thereby increased fatalities of birds, bats and invertebrates, especially during migration, within migration corridors and concentration areas, and important foraging grounds.
5 Biological Resource Use		Threats to native habitat and/or fish/wildlife associated with overharvesting biological resources for commercial, recreation, subsistence, research or cultural purposes, including both deliberate and unintentional harvesting beyond sustainable levels, and actions of persecution or control of undesirable wildlife or plants.
5.1 Hunting and Collecting Terrestrial Animals		Overharvesting terrestrial wild animals or animal products; includes accidental mortality/bycatch.
5.1.1	Intentional Use	Excessive or illegal collection of butterflies and other insects, the illegal collection of reptiles and amphibians, and localized excessive beaver trapping.
5.1.2	Unintentional effects	Includes unintended impacts to non-target species such as, but not limited to, the bycatch of marshbirds in muskrat traps or the introduction of lead (ammunition) into the environment and in dead animals later scavenged.
5.1.3	Persecution/Control	Harming, killing or controlling the presence of species considered undesirable (e.g., snakes, bats, invertebrates) and similar-looking species (i.e., those species misidentified as an undesirable species).
5.2 Gathering Terrestrial Plants		Overharvesting plants, fungi (mushrooms) and other non-timber/non-animal species.
5.2.1	Intentional Use	Excessive collection of orchids and other wildflowers, and plants considered to have medicinal qualities.
5.2.2	Unintentional effects	Includes unintended impacts to non-target species through the trampling or other means of destruction of plants, fungi and/or ecological communities.
5.2.3	Control	Harming, killing or controlling the presence of plants and/or ecological communities considered undesirable (e.g., doesn't meet human's aesthetic desires or is a native, invasive plant that is taking over a local landscape).
5.3 Logging and Wood Harvesting		Harvesting trees and other woody vegetation for timber, fibre, or fuel.
5.3.1	Intentional Use (subsistence/small scale)	Harvesting trees and other woody vegetation from natural landscapes on public or private lands at a small-scale primarily for personal use or local markets, leading to the loss, fragmentation, degradation, and/or isolation of forested habitats and species.
5.3.2	Intentional Use (large scale)	Harvesting trees and other woody vegetation from natural landscapes on public or private lands on a large-scale for commercial markets, leading to loss, fragmentation, degradation, and isolation of forested habitats and species.
5.3.3	Unintentional effects (subsistence/small scale)	Includes unintended impacts to wildlife and/or their critical habitats as a result of small-scale/subsistence forestry practices.

5.3.4	Unintentional effects (large scale)	Includes unintended impacts to wildlife and/or their critical habitats as a result of commercial-scale forestry practices but also includes impacts to wildlife and/or their critical habitats as a result of a lack of forest management which may result in conditions of overstocked stands, excessive understory or stagnation at a particular forest stand condition.
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5.4 Fishing and Harvesting of Aquatic Resources		Harvesting aquatic wild animals or plants for commercial, recreation, subsistence, research, or cultural purposes including both deliberate and unintentional harvesting, and actions of persecution or control of undesirable animals or plants.
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5.4.1	Intentional Use (subsistence/small scale)	Excessive harvest of aquatic animals or plants from public or private "lands" (i.e., aquatic systems) at a small-scale primarily for personal use or local markets leading to the loss or degradation of aquatic habitats and/or decline of aquatic species.
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5.4.2	Intentional Use (large scale)	Excessive harvest of aquatic animals or plants from public or private "lands" (i.e., aquatic systems) at a large-scale for commercial markets that leads to the loss or degradation of aquatic habitats and/or decline of aquatic species (e.g., excessive horseshoe crab harvest).
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5.4.3	Unintentional effects (subsistence/small scale)	Includes unintended impacts to aquatic animals and/or vegetation as a result of small-scale/subsistence fishing/harvesting practices (e.g., diamond-backed terrapin by-catch within crab traps without excluder devices), the introduction of fishing-gear (e.g., line and hooks) into aquatic systems in which animals become entangled, injured or killed, the disruption of substrate/benthic habitat during trawling activities conducted as a result of product harvesting and/or scientific research.
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5.4.4	Unintentional effects (large scale)	Includes unintended impacts to aquatic animals and/or vegetation as a result of large-scale/commercial fishing/harvesting practices (e.g., diamond-backed terrapin by-catch within crab traps without excluder devices), the introduction of fishing-gear (e.g., abandoned long lines, nets and hooks) into aquatic systems in which animals become entangled, injured or killed, the disruption of substrate/benthic habitat during commercial trawling activities.
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5.4.5	Persecution/Control	Harming, killing or controlling the presence of aquatic animals and plants considered undesirable and similar-looking species (i.e., those species misidentified as an undesirable species).
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6 Human Intrusions and Disturbance		Threats to native habitat and/or fish/wildlife associated with non-consumptive uses of biological resources as a result of human activity.
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6.1 Recreational Activities		People spending time in nature or traveling (by foot or motorized machinery) outside of established transportation or shipping corridors, usually for recreational reasons.
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6.1.1	Off-road vehicles (motorized and non-motorized)	Vehicle use in natural landscapes that leads to the loss or degradation of habitat and/or aquatic systems and the decline of associated terrestrial and aquatic wildlife through habitat degradation and/or direct mortality (e.g., vehicles driving over dunes or through streams increase erosion and sediment threats degrading the habitat for beachnesting birds and aquatic wildlife, respectively, increase the spread of invasive plants which can alter the natural ecosystem, etc.).
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6.1.2	Boating	Recreational boating within sensitive wildlife areas that cause the disruption of waterbird colonies, other nesting habitats, or roosting areas.
6.1.3	Use of beaches	Pedestrian and dog activities within sensitive beach habitats that cause the disruption of nesting, roosting, foraging birds on beaches.
6.1.4	Exploration of caves/mines	Recreational activities within caves and mines that leads to the disruption of roosting or hibernating bats and other organisms (Note: the risk of spreading disease is categorized under threat 8).
6.1.5	Wildlife observation and photography	Wildlife and nature observation and photography that leads to the disruption of wildlife activities (e.g., breeding, foraging, mating, etc.).
6.1.6	Recreational use of cliffs, rocks and ridgelines	Recreational activities such as hang-gliding and rock climbing and scrambling that leads to the disruption of wildlife activities along mountain ridgelines and within rocky habitats.

6.2 Military Exercises		Actions by formal or paramilitary forces without a permanent footprint.
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6.2.1	Military exercises	Includes military-related activities and exercises at military bases.
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6.3 Work and Other Activities		People spending time or traveling in natural environments for reasons other than recreation or military activities, such as law enforcement, maintenance activities, research, etc.
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6.3.1	Unauthorized research projects at significant habitats	Includes excessive trampling impacts of rare natural communities, ground-nesting wildlife (birds, reptiles), and aquatic breeders such as amphibians, fish and mussels.
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6.3.2	Authorized research projects at significant habitats	Includes excessive trampling impacts of rare natural communities, ground-nesting wildlife (birds, reptiles), and aquatic breeders such as amphibians, fish and mussels, and also the impacts of sonar use on marine wildlife.
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6.3.3	Other "work" unrelated to research	Includes maintenance and construction activities of structures such as bridges and dams that disturb or otherwise impact wildlife species using the structure to fulfill part of their life history requirements (e.g., breeding, roosting, etc.).
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7 Natural Systems Modifications		Threats to native habitat and/or fish/wildlife associated with actions that convert or degrade habitat in service of "managing" natural or semi-natural systems, often to improve human welfare.
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7.1 Fire and Fire Suppression		Changing fire frequency and/or intensity outside of its natural range of variation.
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7.1.1	Increase in Fire Frequency/Intensity	Illegal and wild fires that result in the destruction or degradation of sensitive habitats and/or direct mortality of wildlife.
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7.1.2	Suppression of Fire Frequency/Intensity	Lack of fire in fire-dependent habitats resulting in the degradation or loss of native landscapes and associated wildlife.
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7.2 Dams and Water Management/Use		Changing water flow patterns from their natural range of variation either deliberately or as a result of other activities.
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7.2.1	Abstraction of Surface Water (domestic use)	Includes water diversion; ditching, impounding, and other marsh management techniques for mosquito control; stream channelization.
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7.2.2	Abstraction of Surface Water (commercial use)	Includes water diversion; ditching, impounding, and other marsh management techniques for mosquito control; stream channelization.
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7.2.3	Abstraction of Surface Water (agricultural use)	Includes stream ditching and channelization.
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7.2.5	Abstraction of Ground Water (domestic use)	Disrupting and/or permanently altering groundwater hydrology as a result of the construction of residential or commercial developments.
7.2.6	Abstraction of Ground Water (commercial use)	Disrupting and/or permanently altering groundwater hydrology as a result of mining operations, hydrofracturing or other commercial activities (excluding development).
7.2.7	Abstraction of Ground Water (agricultural use)	Disrupting and/or permanently altering groundwater hydrology as a result of pumping water for irrigation.
7.2.9	Small Dams	Altering the physical, biological and chemical environment of streams and rivers as a result of installing dams and/or conducting periodic dam-associated draw downs.
7.2.10	Large Dams	Altering the physical, biological and chemical environment of streams and rivers as a result of installing dams and/or conducting periodic dam-associated draw downs.
7.2.11	Dams (size unknown)	Altering the physical, biological and chemical environment of streams and rivers as a result of installing dams (of a size that does not qualify as "small" or "large") and/or conducting periodic dam-associated draw downs.
7.2.12	Culverts	Placement or improper management of culverts that create barriers to terrestrial and/or aquatic organisms rather than assist their safe dispersal.
7.2.13	Stream Burial	Loss of headwater and/or intermittent streams as a result of stream burial.
7.2.14	Impervious Surfaces	Conversion of the natural landscape to impervious surfaces (e.g., roads, driveways, walkways, etc.) that prohibit the absorption of rainwater and results in "flash" pulses of rainwater (and flash-floods), the loss of groundwater recharge areas, increased stream bank destabilization and degradation, the disruption and/or degradation of the stream bottom and benthic animals, etc.
7.2.15	Freshwater Tidal Water Management	Hydrological alterations to freshwater wetlands as a result of tide gate structures and/or management.
7.3 Other Ecosystem Modifications		Other actions that convert or degrade habitat in service of "managing" natural systems to improve human welfare.
7.3.1	Shoreline Stabilization	Installation of rip-rap, jetties, bulkheads, groins, etc. that alters the behavior of or otherwise impacts beach and marine wildlife.
7.3.2	Inappropriate timing of mowing	Managing roadsides, rights-of-way, hay and other fields, etc. through mowing at times that increase the risk of disturbance and/or direct mortality to ground nesting/breeding birds, reptiles, small mammals and invertebrates.
7.3.3	Removal of coarse woody debris (streams, forests, scrub-shrub habitats)	Removing woody debris that could otherwise provide shelter, nesting and foraging habitat for birds, reptiles and amphibians, and small mammals.
7.3.4	Lack of natural disturbance patterns or ecosystem functions due to species loss	Habitat alteration/shifting and/or species decline as a consequence of the loss of other plants and/or animals; e.g., bog turtle habitat overgrown with phragmites due to an absence of ungulates to manage the site resulting in a decline/loss of turtles.
7.3.5	Poor habitat management	Managing habitats and aquatic systems in a manner that is not beneficial to, and may cause harm and/decline of, the wildlife inhabitants and/or native plant communities.

8 Invasive and Other Problematic Species, Genes and Diseases		Threats to native habitat and/or fish/wildlife from non-native and native plants, animals, pathogens/microbes, or genetic materials that have or are predicted to have harmful effects on biodiversity following their introduction, spread and/or increase in abundance.
8.1 Invasive Non-native/ Alien Species/ Diseases		Harmful plants, animals and pathogens not originally found within the ecosystem(s) in question and directly or indirectly introduced into it and spread by human activities.
8.1.1	Unspecified Species	Includes threats to native plants and animals by undetermined causes or general categories (e.g., "pest damage" to trees), but that are suspected or predicted to be as a result of the introduction of non-native plants, animals or pathogens.
8.1.2	Invasive non-native aquatic animals	Non-native, aquatic animals that have a detrimental impact on the natural aquatic ecosystem by damaging or causing change in the native vegetation (and potential food source), hydrology and/or a decline of native aquatic animals. Examples include Japanese shore crab, mitten crab, Asian clam (<i>Corbicula</i>), Zebra mussels, Flathead catfish and northern snakehead.
8.1.3	Invasive non-native aquatic plants	Non-native, aquatic plants that have a detrimental impact on the natural aquatic ecosystem by damaging or causing change in the native vegetation (and potential food source), hydrology and/or a decline of native aquatic animals. Examples include Eurasian water-milfoil (<i>Myriophyllum spicatum</i>) and curly-leaf pondweed (<i>Potamogeton crispus</i>).
8.1.4	Invasive non-native terrestrial/wetland animals	Non-native, terrestrial and/or wetland-associated animals that have a detrimental impact on the natural ecosystem by damaging or causing change in the native vegetation (and potential food source), hydrology and/or a decline of native aquatic animals. Examples include feral cats, gypsy moth, Asian long-horned beetle (<i>Anoplophora glabripennis</i>), emerald ash borer (<i>Agrilus planipennis</i>), and hemlock woolly adelgid (<i>Adelges tsugae</i>), European starlings (<i>Sturnus vulgaris</i>) and house wrens.
8.1.5	Invasive non-native terrestrial/wetland plants	Non-native, terrestrial and/or wetland-associated plants that have a detrimental impact on the natural ecosystem by damaging or causing change in the native vegetation (and potential food source), hydrology and/or a decline of native aquatic animals. Examples include phragmites, Japanese barberry, multiflora rose, <i>Ailanthus</i> and garlic mustard.
8.1.6	Invasive non-native fungal/bacterial diseases	Non-native fungal and bacterial diseases that infect and have a detrimental impact on native wildlife and/or their habitats. Examples of such diseases include chytrid fungus (<i>Batrachochytrium dendrobatidis</i>) and <i>Pseudogymnoascus destructans</i> which causes White-nose Syndrome in bats.

8.2 Problematic Native Species/Diseases		Harmful plants, animals, pathogens and other microbes that are naturally found within the ecosystem(s) in question, but that have become out-of-balance or "released" directly or indirectly due to human activities.
8.2.1	Unspecified Species	Native species (plants, animals or pathogens) that are causing an imbalance in the natural ecosystem either through the destruction of habitat or intense predation/scavenging on other wildlife. This includes undetermined but suspected causes/species and broad, non-specific species categories such as "subsidized predators".
8.2.2	Named Species	Native species (plants, animals or pathogens) that are causing an imbalance in the natural ecosystem either through the destruction of habitat or intense predation/scavenging on other wildlife. This includes identified species as the cause of the impact such as white-tailed deer, beaver, fox, raccoon, crow and gull species, skunks, and raccoon roundworm.
8.3 Introduced Genetic Material		Human altered or transported organisms or genes that lead to the hybridization (and therefore, loss) of [true] native species.
8.3.1	Unspecified Species	Human-induced hybridization or genetic dilution through direct introduction of species from another region or indirect introduction from habitat modification creating interactions that would not have occurred naturally.
8.4 Problematic Species/Diseases of Unknown Origin		Harmful plants, animals, pathogens and other microbes that are currently found within or that pose a future risk to the ecosystem(s) in question but are of unknown or unconfirmed origin.
8.4.1	Unspecified Species	Problematic species/diseases including those that are currently unidentified or non-specific, causing or suspected to cause harm to native wildlife and/or their habitats.
8.4.2	Named Species	Identified problematic species/diseases causing or suspected to cause harm to native wildlife and/or their habitats but for which its origin is unknown or unconfirmed. Examples of such a species are <i>Ophidiomyces ophiodiicola</i> believed to be the source of snake fungal disease but has not been confirmed as a native or non-native fungus to New Jersey as with Ranavirus (infecting amphibians and turtles), also not confirmed as native or non-native to NJ.
8.5 Viral/Prion-induced Diseases		Harmful diseases caused by viruses or proteinaceous infectious particles (prions) that pose a threat to wildlife populations.
8.5.1	Unspecified Species (Disease)	Harm to wildlife caused by unidentified or unconfirmed diseases suspected to be caused by viruses or prions.
8.5.2	Named Species (Disease)	Includes West Nile Virus, ranavirus, sudden oak death, Avian Influenza.
8.6 Diseases of Unknown Cause		Diseases impacting habitat and/or fish/wildlife which have not been identified.

9 Pollution		Threats to native habitat and/or fish/wildlife from the introduction of exotic) and/or excess materials or energy from point and nonpoint sources.
9.1 Domestic and Urban Waste Water		Water-borne sewage and non-point runoff from housing and urban areas that include nutrients, toxic chemicals and/or sediments.
9.1.1	Sewage	Habitat is degraded and/or animals are harmed or killed as a result of leaking septic systems, discharge from municipal wastewater treatment plants, untreated sewage.
9.1.2	Run-off	Habitat is degraded and/or animals are harmed or killed as a result of runoff of oil and sediment from roads, chemicals from roads and lawns, road salt, golf course chemicals, etc. into adjacent aquatic and terrestrial habitats.
9.1.3	<i>Other</i>	Other domestic and urban waste water pollutants impacting habitat and/or animals which are not specifically captured under the classification scheme; identify type/source.
9.2 Industrial and Military Effluents		Water-borne pollutants from industrial and military sources including mining, energy production, and other resource extraction industries that include nutrients, toxic chemicals and/or sediments.
9.2.1	Oil Spills	Habitat is degraded and/or animals are harmed or killed as a result of terrestrial and aquatic leakage from fuel tanks and spills from pipelines, and from PCBs in river sediments and the subsequent impacts of bioaccumulation of PCBs in the food web.
9.2.2	Seepage from Mining	Includes acid mine drainage, mine tailings.
9.2.3	<i>Other</i>	Other industrial pollutants impacting habitat and/or animals which are not specifically captured under the classification scheme such as toxic chemicals from factories, illegal dumping of chemicals, other industrial effluent, ship waste discharge, etc.
9.2.4	Other: Hydrofracturing	The threat of future (and when/if appropriate, current) hydrofracturing-associated toxic spills from failure of wastewater ponds, failure of pipe casements, etc.
9.2.5	Other: Industrial toxic settling ponds	Harm or death to animals that enter or drink from toxic settling ponds.
9.3 Agricultural and Forestry Effluents		Water-borne pollutants from agricultural, silvicultural, and aquaculture systems that include nutrients, toxic chemicals and/or sediments including the effects of these pollutants on the site where they are applied.
9.3.1	Nutrient Loads	Aquatic and terrestrial environments become degraded or destroyed and/or animals are harmed as a result of nutrient loading from fertilizer run-off, manure from feedlots, nutrients from aquaculture, etc.
9.3.2	Soil Erosion and Sedimentation	Aquatic and terrestrial environments become degraded or destroyed and/or animals are harmed as a result of soil erosion from overgrazing, increased run-off and hence sedimentation due to the conversion of forests (or other natural landscapes) to agricultural lands, etc.
9.3.3	Herbicides and Pesticides	Herbicide, pesticides and fertilizer run-off from agricultural fields degrade or destroy adjacent aquatic and terrestrial habitats and/or cause harm to non-target species (plants and animals).

9.3.4	<i>Other</i>	Other agricultural and/or forestry management-related pollutants impacting habitat and/or animals which are not specifically captured under the classification scheme; identify type/source.
9.3.5	Control of insect pests and plants leading to mortality of non-target species not associated with agriculture	Herbicide and pesticides applied in environments through directional application (i.e., not aerial spraying) that lead to the harm of non-target species (plants and animals) such as the use of larvacides and adulticides for mosquito control that may harm amphibians and beneficial invertebrates.
9.4 Garbage and Solid Waste		Threats to native fish/wildlife as a result of rubbish and other solid materials.
9.4.1	Rubbish and other solid materials	Includes waste that can harm or kill wildlife by entanglement or strangling, leading to their predation, starvation or fatal injury, causing fatal blockages in their digestive systems when waste is mistakenly eaten, etc., including but not limited to municipal solid waste, litter from vehicles and boats, and construction debris.
9.5 Air-Bourne Pollutants		Atmospheric pollutants from point and nonpoint sources.
9.5.1	Acid Rain	Habitat and water quality degradation and/or the acidification of ocean water as a result of acid rain, excess nitrogen deposition, wind dispersion of pollutants or sediments, radioactive fallout, smoke from forest fires, etc.
9.5.2	Smog	Habitat and water quality degradation as a result of smog from vehicle emissions, smoke from forest fires, wind dispersion of pollutants or sediments, and in the future, potentially, hydrofracturing pollutants, etc.
9.5.3	Ozone	Impacts to habitat and water quality and animals as a result of ground-level ozone formed in association with vehicle emissions, factory smoke emissions, smoke from forest fires, wind dispersion of pollutants or sediments, etc.
9.5.4	<i>Other</i>	Other air-bourne pollutants impacting habitat and/or animals which are not specifically captured under the classification scheme; identify type/source.
9.5.5	Methane	Includes methane from hydrofracturing emissions.
9.5.6	Herbicides and Pesticides	Herbicide and pesticides applied to environments through aerial application that lead to the harm of non-target species (plants and animals) such as the aerial application of chemicals to control pests, such as gypsy moths, mosquitos.
9.6 Excess Energy		Inputs of heat, sound, or light that disturb or otherwise impact wildlife or ecosystems.
9.6.1	Light Pollution	Lighting that causes changes in animal behavior that may result in injury, death or failed reproduction such as lamps attracting insects, tower lights disorienting migrating birds, etc.
9.6.2	Thermal Pollution	Changes in water temperatures as a result of discharged heated water from power plants and impervious surfaces, damaging atmospheric radiation resulting from ozone holes, etc. that causes changes in animal behavior and may result in injury, death, failed reproduction, or detrimental shifts in migratory patterns.

9.6.3	Noise Pollution	Noise that causes changes in animal behavior that may result in injury, death, failed reproduction, or detrimental shifts in migratory patterns such as noise from highways or airplanes, sonar from submarines that disturb whales, the construction activities associated with offshore wind and other energy development, etc.
9.6.4	<i>Other</i>	Other energy sources impacting habitat and/or animals which are not specifically captured under the classification scheme; identify type/source.
11 Climate Change and Severe Weather		Threats to native habitat and/or fish/wildlife associated with long-term climatic changes or other severe weather that may eliminate or otherwise harm or degrade a vulnerable species or habitat, respectively.
11.1 Habitat Shifting or Alteration		Major changes in habitat composition and location not associated with sea-level rise.
11.2 Droughts		Periods in which rainfall falls below the normal range of variation.
11.2.1	Droughts	Increased periods and/or frequency of droughts leading to changes in the hydrology of aquatic systems and ground water and subsequent loss/alteration of aquatic and terrestrial habitats, the elimination of small wetlands and streams, etc., and subsequent impacts or loss of animals dependent on such habitat such as freshwater mussels.
11.3 Temperature Extremes		Periods in which temperatures exceed or go below the normal range of variation; includes heat waves, extreme cold spells, oceanic temperature changes, etc.
11.3.1	Temperature extremes	Periods of extreme temperature ranges (high or low) that lead to the loss of habitats, disrupts migratory patterns of both marine and terrestrial wildlife, reduces water flow in streams/rivers, increases water temperature and/or changes water pH which impacts aquatic animals, lowers the water level of wetlands, riverine, lacustrine and vernal pool habitats, and causes premature drying of vernal habitats.
11.4 Storms and Flooding		Extreme precipitation and/or wind events, including hurricanes, tornados, ice storms, excessive beach erosion.
11.4.1	Storms and flooding	Extreme flooding alters the hydrology of aquatic habitats and causes water quality degradation as a result of increased silt loads, stream bottom shifting and increased turbidity of streams and rivers. It also disrupts migratory patterns of both marine and terrestrial wildlife, and coastal flooding breaches existing natural sand berms along shores that normally limit tidal flooding events and cause conversion of "barrier wetlands" to open water or other natural communities.
11.4.2	Increased rainfall	Increased periods and frequency of rainfall saturates the ground and limits water recharge within watersheds, causes long-term increases in soil moisture.
11.5 Sea-level Rise		Habitat alterations, degradation and/or destruction and subsequent impacts on animals dependent on those habitats as a result of salt water intrusion such as existing tidal marshes converting to open water and adjacent uplands converting to tidal marshes.

11.6 Phenology Shifting or Alteration		Changes in the seasonal cycles of plants and animals that causes mismatched timing of life history requirements with food sources and/or alters the range of species leading to competition or hybridization.
11.6.1	Phenology shifts related to pollination ecology	Timing of host plant life history is mismatched with timing of wildlife life history, i.e., plants may bloom before required pollinators are present leading to failed foraging, decreased opportunity for pollination and thus, propagation within local ecological systems.
11.6.2	Phenology shifts related to predator-prey ecology	Mismatched timing of animal movements with their prey item's life cycle leading to a lack of food and subsequent illness, failed reproduction and/or death (e.g., migratory songbirds may not return in spring at time of maximum caterpillar emergence).
11.6.3	Phenology shifts related to species redistribution	Changes in species distribution driven by or related to interspecies competition.
12 Resource Management Needs		Need for information on fish/wildlife species, species suites and/or their habitats to inform future conservation efforts and management decisions.
12.1 Resource information collection needs		Need to collect information on fish and wildlife and/or their habitats.
12.1.1	Lack of initial baseline inventory	Need to gather baseline data regarding fish, wildlife populations and/or habitat status, availability and condition as part of long-term trend analysis.
12.1.2	Lack of up-to-date existing information	Need to conduct (routine, regular, ongoing) surveys/assessments to provide the up-to-date information regarding population trends or health, and/or status of fish, wildlife and/or their habitats.
12.1.3	Need to answer research question	Need to address unanswered or unresolved conservation question(s) regarding fish/wildlife species, species suites and/or their habitats that will inform future conservation efforts and management decisions.
12.1.4	Need to develop new technique	Need to develop and evaluate new species or habitat survey methods or techniques because current survey/assessment efforts fail to obtain the necessary data. Need to develop and evaluate new (species or habitat) management techniques.
14 Education/ Outreach Needs		Need to inform and educate the citizenry about species' habitats, natural histories, ecological roles and conservation challenges.
14.1 Education needs		Need to inform and educate the citizenry about species' habitats, natural histories, ecological roles and conservation challenges in order to foster interest and participation/cooperation in wildlife conservation.
14.1.1	Need for improved knowledge of fish and wildlife and their habitats	Education is needed to address a lack of general knowledge or understanding (ecological literacy) of fish and wildlife and habitat conservation.
14.2 Outreach needs		Need to engage the general public and constituent groups in understanding, supporting, and participating in wildlife conservation issues.
14.2.1	Need for improved understanding of agency/organization goals, objectives and ongoing wildlife conservation actions	Outreach is needed to develop greater understanding and support of agency's/organization's conservation work among the general public and constituent groups (i.e., conservation partners, government agencies, farmers, industry & commercial sectors, homeowners, and recreationists).