



Terrestrial Fish and Wildlife Habitat Management Tier 2 Worksheet



Community Environmental Management

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Community Environmental Management

- Terrestrial Fish and Wildlife Habitat Management Tier II Worksheet-

Overview

Terrestrial fish and wildlife habitat encompasses many different types of natural features, including forests, shrublands, grasslands, vernal pools, wetlands, early successional areas, and unique natural areas. Terrestrial habitat is not only important to the fish and wildlife that inhabit them, but also to the people around them. The health of this habitat has a real impact on the quality of life, recreational value, and economic benefits in your community. As a result, it is important to maintain necessary habitats in order to maintain individual species, ecosystems, and biodiversity.

In the past century, we have seen a decline in the amount and quality of fish and wildlife habitat. Land use changes are limiting the area available to support populations of species. Human population growth has increased the demand for open, forested or agricultural land to be converted to residential, commercial and industrial uses. As a result, fish and wildlife populations inhabiting these areas have had to move, adapt to the changes, or die out. The lack of understanding of ecosystem function, poor planning, and general indifference have allowed the demand for land use changes to jeopardize this resource.

The Clean Water Act (CWA) (in various sections) directs us to "...restore and maintain the chemical, physical, and biological integrity of our nation's waters," and "to provide for the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water." In the recent past, we have seen many management plans and practices developed to curb water quality impacts. Too often, those plans and practices focused on the chemical integrity of water, and not the physical (habitat) and biological integrity. Looking at resources in a more holistic manner allows integration of the physical and biological quality of water resources. Management plans and practices need to look at the core issue, not symptoms. For example, nuisance wildlife is a problem in many areas. In the case of large animals like deer and bear, the hunting season can be lengthened or the number of hunting permits increased. The expanded hunting does not solve the problem, but rather puts a band-aid on a symptom. Humans feeding wildlife, disrupting the carrying capacity formula may cause the increase in population. Increased sightings may be a result of development infringing on previously undisturbed habitat. Resolving the core issue by restoring and protecting contiguous areas of habitat and educating citizens is what is needed.

It is also important for municipalities to monitor and assess planning, protection, and restoration actions. Too often we make the mistake of doing something on the ground that looks good on paper and then never following through to learn what works, and what doesn't work. Strategies should be implemented holistically on a landscape scale, across political boundaries, if possible. The CEM Assessment process helps you examine not only what is going on in your community, but also in other communities around you that may have an impact on your resources. CEM encourages communities to work together on these issues whenever possible, because fish and wildlife do not recognize intermunicipal borders.

The biggest piece of the habitat management puzzle is the individual people living, working or recreating in your community. People are directly linked to and a part of the natural environment. There needs to be a shift from emphasizing resource management to educating people how their actions have a direct impact on the world around them. Simple backyard conservation techniques can enhance and protect terrestrial fish and wildlife habitat. Many times, these techniques can save the homeowner money and increase their property values, but they need to be made aware of them in order to reap the benefits.

In New York State, local governments through their planning and regulatory functions, have the principle responsibility for controlling development activities. This role carries with it the responsibility for ensuring that development activities are undertaken with public health and safety of future inhabitants in mind, and in a manner that is compatible with the protection and enhancement of natural resources, including terrestrial fish and wildlife habitat.

The purpose of this worksheet is to assess the nature of habitat loss and degradation in your community and to evaluate the capacity your community has to remediate degraded or lost habitat and to prevent further loss or degradation. The following is intended to provide insight into the evolving subject of terrestrial fish and wildlife habitat management.

Summary of Terrestrial Fish and Wildlife Habitat Management Practices

The New York State Department of Environmental Conservation's Division of Fish, Wildlife and Marine Resources has developed a framework to address terrestrial fish and wildlife habitat issues that integrates planning and implementation to form a cohesive and effective unit. It can be used to address these issues across the landscape using the policy and decision making process. Habitat management is a complex issue, with many factors contributing to the problem. The following framework outlines the main strategies and management options you can use to minimize impacts to terrestrial fish and wildlife habitat in you community:

1. Protect Terrestrial Fish and Wildlife Habitat

These management options can be performed on a community-wide or project level and are mainly nonstructural measures. They aim to guide policy and protect the structural integrity as well as the quality of the habitat.

2. Restore Terrestrial Fish and Wildlife Habitat

These management options are both structural and nonstructural measures that serve to mitigate problems that already exist, as well as prevent new problems in the future.

3. Manage Terrestrial Fish and Wildlife Habitat

These management practices cover five main topics:

- Forests
- Agricultural Land
- Municipally-owned land
- Highways and rights-of-way
- Nuisance wildlife

They aim to educate stakeholders in each of these areas about wise habitat management through both structural and nonstructural measures.

How this Worksheet Can Assist your Community in Protecting Terrestrial Fish and Wildlife Habitat

This worksheet can be used to help your community to:

1. More fully understand terrestrial fish and wildlife habitat management concepts,
2. Assess where your community stands relative to education and land use laws that provide for the protection of terrestrial fish and wildlife habitat.
3. Identify terrestrial fish and wildlife habitat management needs, and
4. Begin to map out a terrestrial fish and wildlife habitat management strategy for the future.

Step 5

DRAFT

Last Modified 1/2004

For help in filling out this worksheet and technical assistance on terrestrial fish and wildlife habitat, it is recommended that you contact your County Soil and Water Conservation District, New York State Department of Environmental Conservation Regional Office or your area's United States Department of Agriculture Natural Resources Conservation Service Conservationist. Most communities do not have a terrestrial fish and wildlife habitat management plan. This worksheet can help your community determine its terrestrial fish and wildlife habitat management needs.

Technical references available for communities in New York State to learn more about terrestrial fish and wildlife habitat are listed below.

- The New York State Department of Environmental Conservation's Division of Fish, Wildlife and Marine Resources includes:

Bureaus

- Fish and Wildlife Services
- Fisheries
- Habitat
- Marine Resources and
- Wildlife

Division Programs

- Hudson River Estuary Program
- Hudson River National Estuarine Research Reserve
- New York Natural Heritage Program

They are in the process of incorporating and emphasizing a holistic, landscape scale program to deliver Division efforts. They strive to work with other Divisions within the Department of Environmental Conservation as well as other agencies, non-governmental agencies and partners to protect, maintain and restore fish and wildlife habitat across New York State. They look beyond political boundaries to deliver their programs on a landscape scale, such as basins and ecoregions across the State. Their web site can be found at: <http://www.dec.state.ny.us/website/dfwmr/index.html>, or by contacting the New York State Department of Environmental Conservation, Division of Fish, Wildlife and Marine Resources, Bureau of Habitat, 625 Broadway, Fifth Floor, Albany, NY 12233-4756, Phone: (518) 402-8151

- The New York Natural Heritage Program maintains databases on the known and potential locations of rare plants and animals, including those listed by New York State as endangered or threatened, and of significant habitats and vegetation types. For a list of those plants, animals, and habitats, which are documented for your assessment area in the Natural Heritage Program's databases, please contact the Information Resources Coordinator, NY Natural Heritage Program, NYS DEC, 625 Broadway, Albany, NY, 12233-4757.



Part 2- Community Problem & Needs Assessment

Part 2 of this assessment will help to determine how extensive **terrestrial fish and wildlife habitat management issues** are in your community and what is your community's capacity for addressing them.

Issues Associated with Terrestrial Fish and Wildlife Habitat Management	Causes	Impacts	Remedial & Preventative Strategies
Loss of or degraded terrestrial fish and wildlife habitat			
<p>We have problems with nuisance wildlife <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Do you have any of the following: <input type="checkbox"/> Deer eating crops and plantings <input type="checkbox"/> Deer/car collisions <input type="checkbox"/> Beaver causing flooding <input type="checkbox"/> Numerous geese <input type="checkbox"/> Turkey eating crops <input type="checkbox"/> Habituated Bear <input type="checkbox"/> Coyotes <input type="checkbox"/> Pigeons <input type="checkbox"/> Mute swans</p> <p>Do you have health concerns about: <input type="checkbox"/> Lyme disease <input type="checkbox"/> West Nile Virus <input type="checkbox"/> Rabies <input type="checkbox"/> Chronic Wasting Disease</p>	<ol style="list-style-type: none"> 1. Poorly planned development 2. Consolidation/loss of farmland 3. Road construction 4. Decrease in or limited access for hunting and trapping 5. Human population increase 	<p>Check those impacts that apply:</p> <p><input type="checkbox"/> Decline in wildlife population</p> <p><input type="checkbox"/> Decline in forest health (see also the Urban and Community Forestry worksheet)</p> <p><input type="checkbox"/> Increased economic loss (e.g. livestock, crops, property)</p> <p><input type="checkbox"/> Disease</p> <p><input type="checkbox"/> Decline in quality of life</p>	<p>Strategy: Protect terrestrial fish and wildlife habitat</p> <hr/> <p>Strategy: Restore terrestrial fish and wildlife habitat</p> <hr/> <p>More Strategies can be found on the following page</p>

Step 5

DRAFT

Last Modified 1/2004

In order to assess the status of wildlife habitat within the assessment area, please indicate what types have been degraded (D) or lost (L):

- Forests
- Shrublands
- Grasslands
- Vernal pools¹

- Unique natural areas
- Early successional areas
- Wetlands¹

Management Options (Indicate with a “√” if community has implemented or use a “?” if community is interested)	Barriers To Implementation	Community Assistance Needs ²
<p>Options:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Inventory and map natural resources, including natural heritage elements, wetlands and streams (see also the Aquatic Fish and Wildlife Habitat Management Worksheet) (preferably electronically and in GIS) <input type="checkbox"/> Develop an open space plan to guide protection and acquisition and include a component that focuses on natural communities and habitats <input type="checkbox"/> Make provisions for conservation easements to protect important habitat <input type="checkbox"/> Encourage clustering to maintain habitat and avoid fragmentation, and reduce the potential for nuisance wildlife problems <input type="checkbox"/> Develop standards for environmental review of site plans <input type="checkbox"/> Indicate the presence of wetlands and streams (see also the Aquatic Fish and Wildlife Habitat Management Worksheet) on site plans <input type="checkbox"/> Avoid sensitive and/or important areas during the site planning process <input type="checkbox"/> Contemplate land use decisions in a landscape context <input type="checkbox"/> Assess and consider cumulative impacts of development on terrestrial resources <input type="checkbox"/> Provide tax incentives for habitat conservation practices <input type="checkbox"/> Avoid building new roads that increase roadkill and create barriers to wildlife movement 		
<p>Options:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Develop partnerships to restore natural resources <input type="checkbox"/> Promote/advocate/facilitate restoration of native habitats (e.g. stream corridors, grasslands, mowing regimes, eliminate exotics/invasives) – <input type="checkbox"/> Reestablish connectivity and reduce hard abrupt edges between habitat types <input type="checkbox"/> Restore large patches of habitat 		

¹ Please see the Aquatic Fish and Wildlife Habitat Management Worksheet to address these needs.

² List type of assistance needed: information/education; assessment/planning; BMP design/implementation; regulatory options; project funding; etc.

Issues Associated with Terrestrial Fish and Wildlife Habitat Management	Causes	Impacts	Remedial & Preventative Strategies
Loss of or degraded terrestrial fish and wildlife habitat, continued			
We have problems with nuisance wildlife, continued			Strategy: Manage terrestrial fish and wildlife habitat

Management Options (Indicate with a "✓" if community has implemented or use a "?" if community is interested)	Barriers To Implementation	Community Assistance Needs³
<p>Options:</p> <ul style="list-style-type: none"> ___ Manage municipal lands with habitat considerations in mind <ul style="list-style-type: none"> ○ Minimize the edge to interior ratio for forest and grassland interior species⁴ (e.g. clear cuts, agricultural fields) ○ Park land vs. natural habitat (e.g. leave understory) ___ Manage municipal highways and rights-of-way with habitat considerations in mind (see also the Highway Maintenance worksheet) <ul style="list-style-type: none"> ○ Place culverts to avoid beaver problems ○ ___ Manage nuisance wildlife in collaboration with DEC <ul style="list-style-type: none"> ○ Use and keep current information on individuals licensed to handle nuisance wildlife ○ Deal with nuisance deer/deer damage by encouraging the public to apply for available permits through NYSDEC⁵ ○ Encourage local communities to work with NYSDEC to organize a Citizen Task Force (CTF) to set deer population level objectives 		
<p>We suggest you also complete the CEM Highway Maintenance, and Aquatic Fish and Wildlife Resource Management Worksheets to further assess the issues in your community. Agricultural issues may be addressed by using AEM Worksheets.</p>		

³ List type of assistance needed: information/education; assessment/planning; BMP design/implementation; regulatory options; project funding; etc.

⁴ The best way to do this is by increasing the size of natural areas or by minimizing the linear shape of human-created habitats. Small patches typically have a higher ratio of edge to interior habitat than very large patches with the same shape. Conversely, linear patches have a much higher proportion of edge to interior habitat than patches with the same area but more compact shape. Small or more highly dissected patches may provide little or no interior habitat.

⁵ Deer Management Permits (DMPs) are used to manage deer in large geographic areas during deer hunting seasons. Deer Management Assistance Program (DMAP) permits are used to manage deer in small geographic areas, individual properties, or cooperatives during deer hunting season. Nuisance Deer Permits (NDPs) are used to reduce damage problems on individual properties while damage is occurring.

Issues Associated with Terrestrial Fish and Wildlife Habitat Management	Causes	Impacts	Remedial & Preventative Strategies
Loss of or degraded terrestrial fish and wildlife habitat			
<p>Loss of recreational land and/or access (e.g. hunting, fishing, trapping, hiking, viewsheds) ___ Yes ___ No</p>	<ol style="list-style-type: none"> 1. Poorly planned development 2. Loss of habitat 3. Changing attitudes about hunting, fishing and trapping (i.e. increase in posting of land) 4. Human population increase 	<ol style="list-style-type: none"> 1. Loss of revenue associated with recreational activities 2. Diminished quality of life 3. Disease 	<p>Strategy: Protect terrestrial fish and wildlife habitat</p> <hr/> <p>Strategy: Restore terrestrial fish and wildlife habitat</p> <hr/> <p>More Strategies can be found on the following page</p>

Management Options (Indicate with a "✓" if community has implemented or use a "?" if community is interested)	Barriers To Implementation	Community Assistance Needs⁶
<p>Options:</p> <ul style="list-style-type: none"> ___ Inventory and map natural resources, including natural heritage elements, wetlands and streams (see also the Aquatic Fish and Wildlife Habitat Management Worksheet) (preferably electronically and in GIS) ___ Develop an open space plan to guide protection and acquisition and include a component that focuses on natural communities and habitats ___ Make provisions for conservation easements to protect important habitat ___ Work with land trusts ___ Adapt taxing policies to promote land conservation ___ Buy land ___ Develop, implement and enforce buffer regulations for local, State, and Federal wetlands and hydrologically isolated wetlands (e.g. vernal pools) ___ Encourage clustering to maintain habitat and avoid fragmentation, and reduce the potential for nuisance wildlife problems ___ Develop overlay zones with corresponding natural resource protection/limitations on uses within the zones ___ Indicate the presence of wetlands and streams (see also the Aquatic Fish and Wildlife Habitat Management Worksheet) on site plans ___ Avoid sensitive and/or important areas during the site planning process ___ Contemplate land use decisions in a landscape context ___ Assess and consider cumulative impacts of development on terrestrial resources ___ Provide tax incentives for habitat conservation practices 		
<p>Options:</p> <ul style="list-style-type: none"> ___ Develop partnerships to restore natural resources ___ Promote/advocate/facilitate restoration of native habitats (e.g. stream corridors (see aquatic worksheet), grasslands, mowing regimes, eliminate exotics/invasives) ___ Reestablish connectivity and reduce hard abrupt edges between habitat types ___ Restore large patches of habitat 		

⁶ List type of assistance needed: information/education; assessment/planning; BMP design/implementation; regulatory options; project funding; etc.

Issues Associated with Terrestrial Fish and Wildlife Habitat Management	Causes	Impacts	Remedial & Preventative Strategies
Loss of or degraded terrestrial fish and wildlife habitat, continued			
<p>Loss of recreational land and/or access (e.g. hunting, fishing, trapping, hiking, viewsheds), continued</p>			<p>Strategy: Manage terrestrial fish and wildlife habitat</p>

Management Options (Indicate with a "✓" if community has implemented or use a "?" if community is interested)	Barriers To Implementation	Community Assistance Needs⁷
<p>Options:</p> <ul style="list-style-type: none"> ___ Implement BMPs for forest practices to benefit fish and wildlife (see also the Urban and Community Forestry worksheet) ___ Implement BMPs on agricultural lands to benefit fish and wildlife (see also the Farmland Protection worksheet, or the AEM program) ___ Manage municipal lands with habitat considerations in mind <ul style="list-style-type: none"> o Minimize the edge to interior ratio for forest and grassland interior species⁸ (e.g. clear cuts, agricultural fields) o Park land vs. natural habitat (e.g. leave understory) o Presence of rare species (plant and animal) o Presence of rare communities o Maintain riparian buffers o Manage for and plant native species ___ Manage municipal highways and rights-of-way with habitat considerations in mind (see also the Highway Maintenance worksheet) <ul style="list-style-type: none"> o Provide herpetological tunnels o Control invasives along roads o Erect nest boxes 		
<p>We suggest you also complete the CEM Highway Maintenance, and Aquatic Fish and Wildlife Resource Management Worksheets to further assess the issues in your community. Agricultural issues may be addressed by using AEM Worksheets.</p>		

⁷ List type of assistance needed: information/education; assessment/planning; BMP design/implementation; regulatory options; project funding; etc.

⁸ The best way to do this is by increasing the size of natural areas or by minimizing the linear shape of human-created habitats. Small patches typically have a higher ratio of edge to interior habitat than very large patches with the same shape. Conversely, linear patches have a much higher proportion of edge to interior habitat than patches with the same area but more compact shape. Small or more highly dissected patches may provide little or no interior habitat.

Issues Associated with Terrestrial Fish and Wildlife Habitat Management	Causes	Impacts	Remedial & Preventative Strategies
Loss of or degraded terrestrial fish and wildlife habitat			
<p>Invasive species are crowding out native species (e.g. Asian Longhorn Beetle, Phragmites, Purple Loosetrife, Japanese Knotweed, Mute Swans) ___Yes ___No</p>	<ol style="list-style-type: none"> 1. Planting or releasing non-native species 2. Lack of invasive species management 3. Poor construction practices (e.g. soil transport brings in seeds and roots of invasives) 	<ol style="list-style-type: none"> 1. Decline in native populations 2. Decline in native species 3. Decline in forest health (see Silviculture Worksheet) 4. Decrease in biodiversity 5. Change in community composition 6. Disease 	<p>Strategy: Protect terrestrial fish and wildlife habitat</p> <hr/> <p>Strategy: Restore terrestrial fish and wildlife habitat</p> <hr/> <p>Strategy: Manage terrestrial fish and wildlife habitat</p>

Management Options (Indicate with a "✓" if community has implemented or use a "?" if community is interested)	Barriers To Implementation	Community Assistance Needs⁹
Options: ___ Prevent the establishment of invasive species during the site planning and construction process		
Options: ___ Develop partnerships to restore natural resources ___ Promote/advocate/facilitate restoration of native habitats (e.g. stream corridors (see aquatic worksheet), grasslands, mowing regimes, eliminate exotics/invasives)		
Options: ___ Implement BMPs for forest practices to benefit fish and wildlife (see also the Urban and Community Forestry worksheet) ___ Implement BMPs on agricultural lands to benefit fish and wildlife (see also the Farmland Protection worksheet, or the AEM program) ___ Manage municipal lands with habitat considerations in mind <ul style="list-style-type: none"> ○ Minimize the edge to interior ratio for forest and grassland interior species¹⁰ (e.g. clear cuts, agricultural fields) ○ Park land vs. natural habitat (e.g. leave understory) ○ Presence of rare species (plant and animal) ○ Presence of rare communities ○ Manage for and plant native species ___ Manage municipal highways and rights-of-way with habitat considerations in mind (see also the Highway Maintenance worksheet) <ul style="list-style-type: none"> ○ Control invasives along roads 		
<p style="text-align: center;">We suggest you also complete the CEM Highway Maintenance Worksheet to further assess the issues in your community. Agricultural issues may be addressed by using AEM Worksheets.</p>		

⁹ List type of assistance needed: information/education; assessment/planning; BMP design/implementation; regulatory options; project funding; etc.

¹⁰ The best way to do this is by increasing the size of natural areas or by minimizing the linear shape of human-created habitats. Small patches typically have a higher ratio of edge to interior habitat than very large patches with the same shape. Conversely, linear patches have a much higher proportion of edge to interior habitat than patches with the same area but more compact shape. Small or more highly dissected patches may provide little or no interior habitat.

Issues Associated with Terrestrial Fish and Wildlife Habitat Management	Causes	Impacts	Remedial & Preventative Strategies
Loss of Biodiversity Leads to a Homogenized Landscape			
<p>Loss of types and number of species due to habitat loss and degradation¹¹ ___ Yes ___ No</p> <p>Have you noticed a loss of: ___ Area sensitive species (wildlife that live in specific habitats, such as grasslands, interior forests, etc. Examples include the savannah sparrow, bobolink; ovenbird, wood thrush)</p> <p>___ Loss or decline of amphibians</p> <p>___ Loss of rare, threatened and/or endangered species</p> <p>Locations (List): _____ _____</p>	<ol style="list-style-type: none"> 1. Poorly planned development 2. Loss of travel corridors 3. Fragmentation of habitat types 4. Reduction of patch size area 5. Abrupt edges 6. Road construction 7. Insensitive agricultural and silvicultural practices 8. Poor construction practices 9. Human population increase 	<p>Check those impacts that apply:</p> <p>___ Loss of species</p> <p>___ Decline in wildlife populations</p> <p>___ Disease</p> <p>___ Decrease in biodiversity</p> <p>___ Change in community composition</p> <p>___ Diminished quality of life</p>	<p>Strategy: Protect terrestrial fish and wildlife habitat</p> <hr/> <p>Strategy: Restore terrestrial fish and wildlife habitat</p> <hr/> <p>More Strategies can be found on the following page</p>

¹¹ Degraded habitat includes abrupt edges between habitat types, fragmentation of habitat types, reduction of patch size area, and loss of travel corridors.

Management Options (Indicate with a"√ " if community has implemented or use a "?" if community is interested)	Barriers To Implementation	Community Assistance Needs¹²
<p>Options:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Inventory and map natural resources, including natural heritage elements, wetlands and streams (see also the Aquatic Fish and Wildlife Habitat Management Worksheet) (preferably electronically and in GIS) <input type="checkbox"/> Develop an open space plan to guide protection and acquisition and include a component that focuses on natural communities and habitats <input type="checkbox"/> Make provisions for conservation easements to protect important habitats <input type="checkbox"/> Work with land trusts <input type="checkbox"/> Adapt taxing policies to promote land conservation <input type="checkbox"/> Use innovative acquisition approaches, such as buying less than fee title (e.g. conservation easements or other development rights, negotiating bargain sales or County tax sales) <input type="checkbox"/> Buy land <input type="checkbox"/> Develop, implement and enforce buffer regulations for local, State and Federal wetlands and hydrologically isolated wetlands (e.g. vernal pools) <input type="checkbox"/> Encourage clustering to maintain habitat and avoid fragmentation, and reduce the potential for nuisance wildlife problems <input type="checkbox"/> Develop overlay zones with corresponding natural resource protection/limitations on uses within the zones <input type="checkbox"/> Develop standards for environmental review of site plans <input type="checkbox"/> Conduct environmental review surveys at the appropriate time <input type="checkbox"/> Indicate the presence of wetlands and streams (see also the Aquatic Fish and Wildlife Habitat Management Worksheet) on site plans <input type="checkbox"/> Avoid sensitive and/or important areas during the site planning process <input type="checkbox"/> Contemplate land use decisions in a landscape context <input type="checkbox"/> Assess and consider cumulative impacts of development on terrestrial resources <input type="checkbox"/> Provide tax incentives for habitat conservation practices <input type="checkbox"/> Avoid building new roads that increase roadkill and create barriers to wildlife movement 		
<p>Options:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Develop partnerships to restore natural resources <input type="checkbox"/> Promote/advocate/facilitate restoration of native habitats (e.g. stream corridors (see aquatic worksheet), grasslands, mowing regimes, eliminate exotics/invasives) <input type="checkbox"/> Reestablish connectivity and reduce hard abrupt edges between habitat types <input type="checkbox"/> Restore large patches of habitat 		

¹² List type of assistance needed: information/education; assessment/planning; BMP design/implementation; regulatory options; project funding; etc.

Issues Associated with Terrestrial Fish and Wildlife Habitat Management	Causes	Impacts	Remedial & Preventative Strategies
Loss of Biodiversity Leads to a Homogenized Landscape, continued			
Loss of types and number of species due to habitat loss and degradation, continued			Strategy: Manage terrestrial fish and wildlife habitat

Management Options (Indicate with a "√" if community has implemented or use a "?" if community is interested)	Barriers To Implementation	Community Assistance Needs¹³
<p>Options:</p> <ul style="list-style-type: none"> ___ Implement BMPs for forest practices to benefit fish and wildlife (see also the Urban and Community Forestry worksheet) ___ Implement BMPs on agricultural lands to benefit fish and wildlife (see also the Farmland Protection worksheet, or the AEM program) ___ Manage municipal lands with habitat considerations in mind <ul style="list-style-type: none"> ○ Minimize the edge to interior ratio for forest and grassland interior species¹⁴ (e.g. clear cuts, agricultural fields) ○ Mowing regimes that balance grassland bird nesting with recreation and agricultural needs ○ Park land vs. natural habitat (e.g. leave understory) ○ Presence of rare species (plant and animal) ○ Presence of rare communities ○ Maintain riparian buffers ○ Manage for and plant native species ___ Manage municipal highways and rights-of-way with habitat considerations in mind (see also the Highway Maintenance worksheet) <ul style="list-style-type: none"> ○ Provide herpetological tunnels ○ Mow narrow road shoulders ○ Erect nest boxes ○ Store salt and de-icing materials properly ○ Segregate waste, spoil and storage piles from wetland areas to make sure wetlands are not filled 		
<p>We suggest you also complete the CEM Highway Maintenance, and Aquatic Fish and Wildlife Resource Management Worksheets to further assess the issues in your community. Agricultural issues may be addressed by using AEM Worksheets.</p>		

¹³ List type of assistance needed: information/education; assessment/planning; BMP design/implementation; regulatory options; project funding; etc.

¹⁴ The best way to do this is by increasing the size of natural areas or by minimizing the linear shape of human-created habitats. Small patches typically have a higher ratio of edge to interior habitat than very large patches with the same shape. Conversely, linear patches have a much higher proportion of edge to interior habitat than patches with the same area but more compact shape. Small or more highly dissected patches may provide little or no interior habitat.

Issues Associated with Terrestrial Fish and Wildlife Habitat Management	Causes	Impacts	Remedial & Preventative Strategies
Loss of Biodiversity Leads to a Homogenized Landscape			
<p>Loss of connectivity necessary to maintain metapopulations¹⁵ <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Do you have: <input type="checkbox"/> Loss of patch connections and travel corridors for wildlife <input type="checkbox"/> Fragmentation</p> <p>Locations (List): _____ _____</p>	<ol style="list-style-type: none"> 1. Poorly planned development 2. Loss of travel corridors 3. Road construction 4. Human population increase 5. Insensitive agricultural and silvicultural practices 	<p>Check those impacts that apply:</p> <p><input type="checkbox"/> Loss of species</p> <p><input type="checkbox"/> Decline in populations</p> <p><input type="checkbox"/> Disease</p> <p><input type="checkbox"/> Diminished quality of life</p> <p><input type="checkbox"/> Change in community composition</p> <p><input type="checkbox"/> Decrease in biodiversity</p>	<p>Strategy: Protect terrestrial fish and wildlife habitat</p> <hr/> <p>Strategy: Restore terrestrial fish and wildlife habitat</p> <hr/> <p>More Strategies can be found on the following page</p>

¹⁵ Loss of connectivity impairs the ability of wildlife to travel between subpopulations in order to maintain the size and genetic diversity of the breeding population.

Management Options (Indicate with a "✓" if community has implemented or use a "?" if community is interested)	Barriers To Implementation	Community Assistance Needs¹⁶
<p>Options:</p> <ul style="list-style-type: none"> ___ In Inventory and map natural resources, including natural heritage elements, wetlands and streams (see also the Aquatic Fish and Wildlife Habitat Management Worksheet) (preferably electronically and in GIS) ___ Develop an open space plan to guide protection and acquisition and include a component that focuses on natural communities and habitats ___ Make provisions for conservation easements to protect important habitats ___ Work with land trusts ___ Buy land ___ Develop, implement and enforce buffer regulations for local, State and Federal wetlands and hydrologically isolated wetlands (e.g. vernal pools) ___ Encourage clustering to maintain habitat and avoid fragmentation, and reduce the potential for nuisance wildlife problems ___ Develop overlay zones with corresponding natural resource protection/limitations on uses within the zones ___ Conduct environmental review surveys at the appropriate time ___ Indicate the presence of wetlands and streams (see also the Aquatic Fish and Wildlife Habitat Management Worksheet) on site plans ___ Avoid sensitive and/or important areas during the site planning process ___ Contemplate land use decisions in a landscape context ___ Assess and consider cumulative impacts of development on terrestrial resources ___ Provide tax incentives for habitat conservation practices ___ Avoid building new roads that increase roadkill and create barriers to wildlife movement 		
<p>Options:</p> <ul style="list-style-type: none"> ___ Develop partnerships to restore natural resources ___ Promote/advocate/facilitate restoration of native habitats (e.g. stream corridors (see aquatic worksheet), grasslands, mowing regimes, eliminate exotics/invasives) ___ Reestablish connectivity and reduce hard abrupt edges between habitat types ___ Restore large patches of habitat 		

¹⁶ List type of assistance needed: information/education; assessment/planning; BMP design/implementation; regulatory options; project funding; etc.

Issues Associated with Terrestrial Fish and Wildlife Habitat Management	Causes	Impacts	Remedial & Preventative Strategies
Loss of Biodiversity Leads to a Homogenized Landscape, continued			
<p>Loss of connectivity necessary to maintain metapopulations, continued</p>			<p>Strategy: Manage terrestrial fish and wildlife habitat</p>

<p align="center">Management Options (Indicate with a "√" if community has implemented or use a "?" if community is interested)</p>	<p align="center">Barriers To Implementation</p>	<p align="center">Community Assistance Needs¹⁷</p>
<p>Options:</p> <ul style="list-style-type: none"> ___ Implement BMPs for forest practices to benefit fish and wildlife (see also the Urban and Community Forestry worksheet) ___ Implement BMPs on agricultural lands to benefit fish and wildlife (see also the Farmland Protection worksheet, or the AEM program) ___ Manage municipal lands with habitat considerations in mind <ul style="list-style-type: none"> ○ Presence of rare species (plant and animal) ○ Presence of rare communities ○ Maintain riparian buffers ___ Manage municipal highways and rights-of-way with habitat considerations in mind (see also the Highway Maintenance worksheet) <ul style="list-style-type: none"> ○ Provide herpetological tunnels ○ Erect nest boxes 		
<p>We suggest you also complete the CEM Highway Maintenance, and Aquatic Fish and Wildlife Resource Management Worksheets to further assess the issues in your community. Agricultural issues may be addressed by using AEM Worksheets.</p>		

¹⁷ List type of assistance needed: information/education; assessment/planning; BMP design/implementation; regulatory options; project funding; etc.

Issues Associated with Terrestrial Fish and Wildlife Habitat Management	Causes	Impacts	Remedial & Preventative Strategies
Loss of Biodiversity Leads to a Homogenized Landscape			
<p>Loss of ecosystem function¹⁸ ___Yes ___No</p>	<ol style="list-style-type: none"> 1. Poorly planned development 2. Loss of travel corridors 3. Loss of habitat 4. Introduction of exotic and invasive species 5. Increase in human population 	<p>Check those impacts that apply:</p> <p>___Loss of species</p> <p>___Decline in wildlife populations</p> <p>___Disease</p> <p>___Decrease in biodiversity</p> <p>___Change in community composition</p> <p>___Diminished quality of life</p>	<p>Strategy: Protect terrestrial fish and wildlife habitat</p> <hr/> <p>Strategy: Restore terrestrial fish and wildlife habitat</p> <hr/> <p>More Strategies can be found on the following page</p>

¹⁸ Loss of ecosystem function creates problems associated with the loss of services that wildlife provide (e.g. pollination, decomposers, soil development, predator/prey relationships, insect control) for ecosystems and humans.

Management Options (Indicate with a "√" if community has implemented or use a "?" if community is interested)	Barriers To Implementation	Community Assistance Needs¹⁹
<p>Options:</p> <ul style="list-style-type: none"> ___ Inventory and map natural resources, including natural heritage elements, wetlands and streams (see also the Aquatic Fish and Wildlife Habitat Management Worksheet) (preferably electronically and in GIS) ___ Develop an open space plan to guide protection and acquisition and include a component that focuses on natural communities and habitats. ___ Make provisions for conservation easements to protect important habitats ___ Buy land ___ Develop, implement and enforce buffer regulations for local, State and Federal wetlands and hydrologically isolated wetlands (e.g. vernal pools) ___ Develop overlay zones with corresponding natural resource protection/limitations on uses within the zones ___ Conduct environmental review surveys at the appropriate time ___ Indicate the presence of wetlands and streams (see also the Aquatic Fish and Wildlife Habitat Management Worksheet) on site plans ___ Avoid sensitive and/or important areas during the site planning process ___ Prevent the establishment of invasive species during the site planning and construction process ___ Contemplate land use decisions in a landscape context ___ Assess and consider cumulative impacts of development on terrestrial resources ___ Avoid building new roads that increase roadkill and create barriers to wildlife movement 		
<p>Options:</p> <ul style="list-style-type: none"> ___ Develop partnerships to restore natural resources ___ Promote/advocate/facilitate restoration of native habitats (e.g. stream corridors (see aquatic worksheet), grasslands, mowing regimes, eliminate exotics/invasives) ___ Reestablish connectivity and reduce hard abrupt edges between habitat types ___ Restore large patches of habitat 		

¹⁹ List type of assistance needed: information/education; assessment/planning; BMP design/implementation; regulatory options; project funding; etc.

Issues Associated with Terrestrial Fish and Wildlife Habitat Management	Causes	Impacts	Remedial & Preventative Strategies
Loss of Biodiversity Leads to a Homogenized Landscape, continued			
Loss of ecosystem function, continued			<p>Strategy: Manage terrestrial fish and wildlife habitat</p>

Management Options (Indicate with a "√" if community has implemented or use a "?" if community is interested)	Barriers To Implementation	Community Assistance Needs²⁰
<p>Options:</p> <ul style="list-style-type: none"> ___ Implement BMPs for forest practices to benefit fish and wildlife (see also the Urban and Community Forestry worksheet) ___ Implement BMPs on agricultural lands to benefit fish and wildlife (see also the Farmland Protection worksheet, or the AEM program) ___ Manage municipal lands with habitat considerations in mind <ul style="list-style-type: none"> ○ Minimize the edge to interior ratio for forest and grassland interior species²¹ (e.g. clear cuts, agricultural fields) ○ Mowing regimes ○ Park land vs. natural habitat (e.g. leave understory) ○ Presence of rare species (plant and animal) ○ Presence of rare communities ○ Maintain riparian buffers ○ Manage for and plant native species ___ Manage municipal highways and rights-of-way with habitat considerations in mind (see also the Highway Maintenance worksheet) <ul style="list-style-type: none"> ○ Provide herpetological tunnels ○ Mow narrow road shoulders ○ Control invasives along roads ○ Erect nest boxes ○ Store salt and de-icing materials properly ○ Segregate waste, spoil and storage piles from wetland areas to make sure wetlands are not filled 		
<p>We suggest you also complete the CEM Highway Maintenance, and Aquatic Fish and Wildlife Resource Management Worksheets to further assess the issues in your community.</p>		

²⁰ List type of assistance needed: information/education; assessment/planning; BMP design/implementation; regulatory options; project funding; etc.

²¹ The best way to do this is by increasing the size of natural areas or by minimizing the linear shape of human-created habitats. Small patches typically have a higher ratio of edge to interior habitat than very large patches with the same shape. Conversely, linear patches have a much higher proportion of edge to interior habitat than patches with the same area but more compact shape. Small or more highly dissected patches may provide little or no interior habitat.

Issues Associated with Terrestrial Fish and Wildlife Habitat Management	Causes	Positive Benefits	Remedial & Preventative Strategies
<p>Our municipality is concerned about (please check all that apply):</p> <p><input type="checkbox"/> How to best protect the highest quality terrestrial habitat before it gets degraded.</p> <p><input type="checkbox"/> How to prioritize terrestrial resources for protection.</p> <p><input type="checkbox"/> How to get the community and decision makers to recognize that high quality terrestrial resources provide quality of life, recreational and economic benefits to the community and take steps to preserve and protect them (e.g. hunting, birding, fishing, silviculture, clean water, wild plant collecting, community interactions and character, aesthetic intrinsic values).</p> <p><input type="checkbox"/> How to receive and provide the best information and training to people who make decisions about development and terrestrial resources in our community (e.g. contractors, engineers, municipal officials).</p> <p><input type="checkbox"/> There is confusion over local authority to address terrestrial resource concerns.</p> <p><input type="checkbox"/> How to explain the beneficial services different terrestrial ecosystems provide (e.g. pollination, climate control, flood attenuation, soil development, clean air/water, erosion control, limit spread of disease, keep invasives at bay).</p>	<p>1. At present community is not implementing a terrestrial natural resource management program and its associated plan.</p> <p>2. The community is experiencing development pressure, but is having difficulty balancing economic development and growth and natural resource protection needs.</p> <p>3. Community does not have adequate resources to enforce land use.</p>	<p>Check those impacts that apply:</p> <p><input type="checkbox"/> The preservation and enhancement of terrestrial resources has a positive effect on the local economy and property values.</p> <p><input type="checkbox"/> High quality of life.</p> <p><input type="checkbox"/> The preservation and enhancement of terrestrial resources positively impacts fish and wildlife, decreasing the need for costly restoration and remediation.</p> <p><input type="checkbox"/> Protection and enhancement of terrestrial resources perpetuates beneficial ecosystem services.</p>	<p>Strategy: Protect terrestrial fish and wildlife habitat</p> <hr/> <p>Strategy: Restore terrestrial fish and wildlife habitat</p> <hr/> <p>More Strategies can be found on the following page</p>

Management Options (Indicate with a "✓" if community has implemented or use a "?" if community is interested)	Barriers To Implementation	Community Assistance Needs²²
<p>Options:</p> <ul style="list-style-type: none"> ___ Inventory and map natural resources, including natural heritage elements, wetlands and streams (see also the Aquatic Fish and Wildlife Habitat Management Worksheet) (preferably electronically and in GIS) ___ Develop an open space plan to guide acquisition and include a component that focuses on natural communities and habitats. ___ Make provisions for conservation easements to protect important habitat ___ Work with land trusts ___ Adapt taxing policies to promote land conservation ___ Use innovative acquisition approaches, such as buying less than fee title (e.g. conservation easements or other development rights, negotiating bargain sales or County tax sales) ___ Buy land ___ Develop, implement and enforce buffer regulations for local, State and Federal wetlands and hydrologically isolated wetlands (e.g. vernal pools) ___ Encourage clustering to maintain habitat and avoid fragmentation, and reduce the potential for nuisance wildlife problems ___ Develop overlay zones with corresponding natural resource protection/limitations on uses within the zones ___ Develop standards for environmental review of site plans ___ Conduct environmental resource surveys at the appropriate time ___ Indicate the presence of wetlands and streams (see also the Aquatic Fish and Wildlife Habitat Management Worksheet) on site plans ___ Avoid sensitive and/or important areas during the site planning process ___ Prevent the establishment of invasive species during the site planning and construction process ___ Contemplate land use decisions in a landscape context ___ Assess and consider cumulative impacts of development on aquatic resources ___ Provide tax incentives for habitat conservation practices ___ Avoid building new roads that increase roadkill and create barriers to wildlife movement 		
<p>Options:</p> <ul style="list-style-type: none"> ___ Develop partnerships to restore natural resources ___ Promote/advocate/facilitate restoration of native habitats (e.g. stream corridors (see aquatic worksheet), grasslands, mowing regimes, eliminate exotics/invasives) ___ Reestablish connectivity and reduce hard abrupt edges between habitat types ___ Restore large patches of habitat 		

²² List type of assistance needed: information/education; assessment/planning; BMP design/implementation; regulatory options; project funding; etc.

Issues Associated with Terrestrial Fish and Wildlife Habitat Management	Causes	Positive Benefits	Remedial & Preventative Strategies
<p>Our municipality is concerned about ____, continued</p>			<p>Strategy: Manage terrestrial fish and wildlife habitat</p>

Management Options (Indicate with a "\/ " if community has implemented or use a "?" if community is interested)	Barriers To Implementation	Community Assistance Needs²³
<p>Options:</p> <ul style="list-style-type: none"> ___ Implement BMPs for forest practices to benefit fish and wildlife (see also the Urban and Community Forestry worksheet) ___ Implement BMPs on agricultural lands to benefit fish and wildlife (see also the Farmland Protection worksheet, or the AEM program) ___ Manage municipal lands with habitat considerations in mind <ul style="list-style-type: none"> o Minimize the edge to interior ratio for forest and grassland interior species²⁴ (e.g. clear cuts, agricultural fields) o Mowing regimes that balance grassland bird nesting with recreation and agricultural needs o Park land vs. natural habitat (e.g. leave understory) o Presence of rare species (plant and animal) o Presence of rare communities o Maintain riparian buffers o Manage for and plant native species ___ Manage municipal highways and rights-of-way with habitat considerations in mind (see also the Highway Maintenance worksheet) <ul style="list-style-type: none"> o Provide herpetological tunnels o Place culverts to avoid beaver problems o Mow narrow road shoulders o Control invasives along roads o Erect nest boxes o Store salt and de-icing materials properly o Segregate waste, spoil and storage piles from wetland areas to make sure wetlands are not filled ___ Manage nuisance wildlife in collaboration with New York State Department of Environmental Conservation (NYSDEC) <ul style="list-style-type: none"> o Use and keep current information on individuals licensed to handle nuisance wildlife o Deal with nuisance deer/deer damage by encouraging the public to apply for available permits through NYSDEC²⁵ o Encourage local communities to work with NYSDEC to organize a Citizen Task Force (CTF) to set deer population level objectives 		
<p>We suggest you also complete the CEM Highway Maintenance, Aquatic Fish and Wildlife Resource Management, and Land Use Planning Needs Worksheets to further assess the issues in your community. Agricultural issues may be addressed by using AEM Worksheets.</p>		

²³ List type of assistance needed: information/education; assessment/planning; BMP design/implementation; regulatory options; project funding; etc.

²⁴ The best way to do this is by increasing the size of natural areas or by minimizing the linear shape of human-created habitats. Small patches typically have a higher ratio of edge to interior habitat than very large patches with the same shape. Conversely, linear patches have a much higher proportion of edge to interior habitat than patches with the same area but more compact shape. Small or more highly dissected patches may provide little or no interior habitat.

²⁵ Deer Management Permits (DMPs) are used to manage deer in large geographic areas during deer hunting seasons. Deer Management Assistance Program (DMAP) permits are used to manage deer in small geographic areas, individual properties, or cooperatives during deer hunting season. Nuisance Deer Permits (NDPs) are used to reduce damage problems on individual properties while damage is occurring.

Community Environmental Management

TIER III: TERRESTRIAL FISH AND WILDLIFE HABITAT MANAGEMENT STRATEGY DEVELOPMENT

Terrestrial fish and wildlife habitat management is a complex issue, with many factors contributing to the topic. The following are three strategies for managing terrestrial fish and wildlife habitat and preventing damage to it in communities.

STRATEGY – Protect terrestrial fish and wildlife habitat

Community-Wide

- Inventory and map natural resources, including natural heritage elements, wetlands and streams (see also the Aquatic Fish and Wildlife Habitat Management Worksheet) (preferably electronically and in GIS)
- Develop an open space plan to guide protection and acquisition and include a component that focuses on natural communities and habitats
- Make provisions for conservation easements to protect important habitat
- Work with land trusts
- Adapt taxing policies to promote land conservation
- Use innovative acquisition approaches, such as buying less than fee title (e.g. conservation easements or other development rights, negotiating bargain sales or County tax sales)
- Buy land
- Develop, implement and enforce buffer regulations for local, State and Federal wetlands and hydrologically isolated wetlands (e.g. vernal pools)
- Develop overlay zones with corresponding natural resource protection/limitations on uses within the zones
- Contemplate land use decisions in a landscape context
- Assess and consider cumulative impacts of development on terrestrial resources

Project Level

- Encourage clustering to maintain habitat and avoid fragmentation, and reduce the potential for nuisance wildlife problems
- Develop standards for environmental review of site plans
- Conduct environmental resource surveys at the appropriate time
- Indicate the presence of wetlands and streams (see also the Aquatic Fish and Wildlife Habitat Management Worksheet) on site plans
- Avoid sensitive and/or important areas during the site planning process
- Prevent the establishment of invasive species during the site planning and construction process
- Provide tax incentives for habitat conservation practices
- Avoid building new roads that increase roadkill and create barriers to wildlife movement

STRATEGY – Restore terrestrial fish and wildlife habitat

- Develop partnerships to restore natural resources
- Promote/advocate/facilitate restoration of native habitats (e.g. stream corridors (see aquatic worksheet), grasslands, mowing regimes, eliminate exotics/invasives)
- Reestablish connectivity and reduce hard abrupt edges between habitat types
- Restore large patches of habitat

STRATEGY – Manage terrestrial fish and wildlife habitat

- Implement BMPs for forest practices to benefit fish and wildlife (see also the Urban and Community Forestry worksheet)
- Implement BMPs on agricultural lands to benefit fish and wildlife (see also the Farmland Protection worksheet, or the AEM program)
- Manage municipal lands with habitat considerations in mind
 - Minimize the edge to interior ratio for forest and grassland interior species²⁶ (e.g. clear cuts, agricultural fields)
 - Mowing regimes that balance grassland bird nesting with recreation and agricultural needs
 - Park land vs. natural habitat (e.g. leave understory)
 - Presence of rare species (plant and animal)
 - Presence of rare communities
 - Maintain riparian buffers
 - Manage for and plant native species
- Manage municipal highways and rights-of-way with habitat considerations in mind (see also the Highway Maintenance worksheet)
 - Provide herpetological tunnels
 - Place culverts to avoid beaver problems
 - Mow narrow road shoulders
 - Control invasive species along roads
 - Erect nest boxes
 - Store salt and de-icing materials properly
 - Segregate waste, spoil and storage piles from wetland areas to make sure wetlands are not filled
- Manage nuisance wildlife in collaboration with New York State Department of Environmental Conservation (NYSDEC)
 - Use and keep current information on individuals licensed to handle nuisance wildlife
 - Deal with nuisance deer/deer damage by encouraging the public to apply for available permits through NYSDEC²⁷
 - Encourage local communities to work with NYSDEC to organize a Citizen Task Force (CTF) to set deer population level objectives

²⁶ The best way to do this is by increasing the size of natural areas or by minimizing the linear shape of human-created habitats. Small patches typically have a higher ratio of edge to interior habitat than very large patches with the same shape. Conversely, linear patches have a much higher proportion of edge to interior habitat than patches with the same area but more compact shape. Small or more highly dissected patches may provide little or no interior habitat.

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