

Addressing Wildlife Habitat and Natural Resource Protection In Municipal Land Use Documents: Ideas for New Hampshire Municipalities



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NEW HAMPSHIRE
**Wildlife Action
Plan**



Municipal Land Use Documents: Master Plan, Zoning Ordinances, Subdivision and Site Plan Review Regulations

Land use regulations provide New Hampshire municipalities with a number of tools for natural resource and wildlife habitat protection. New Hampshire land use law designates the Master Plan as the basis for all municipal land use regulations. The Master plan must identify important resources and issues and articulate policies to address them. Towns may then enact ordinances, regulations, and codes to implement the policies. We have identified 25 topics that New Hampshire towns might consider addressing in their land use documents in order to protect their community's natural resources and rural character. Some topics are interrelated and provide alternate strategies for protecting a given resource or addressing a particular problem, such as sprawl.

This document provides information to help towns consider the benefits and begin to draft policies regarding each of the 25 topics. Information on each topic includes a brief description, a discussion of potential treatment in a Master Plan, where to find a sample zoning ordinance and, in some cases, sample subdivision and site plan review regulations, and where appropriate, sample application plan requirement checklist items. These documents are intended to provide municipal Planning Boards with ideas for possible revisions of land use planning documents. Legal review of proposed revisions is always advisable.

Natural Resources Topics discussed:

Agriculture
Energy Efficiency

Erosion Control

Floodplains

Forestry

Forests

Greenfield Development

Green Infrastructure

Groundwater

Growth Management

Impervious Surfaces

Landscaping

Light Pollution

Natural Hazards

Natural Services Network

Natural Vegetation

Ridgelines

**Shorelands, Surface Waters, and
Wetlands**

Sprawl

Steep Slopes

Stormwater Runoff

Terrain Alteration

Urban Growth Boundary

Watersheds

Wildlife Habitat

HOW TO CONDUCT THE AUDIT

Assemble your town's master plan, zoning and site and subdivision ordinance and regulations.

Master Plan:

1. Review the vision, goals and objectives for overall attention to natural resources. Keep the list of topics in front of you so you can see what is covered.
2. Review the Natural Resources chapter for references to each topic. Evaluate how each are covered.
3. Review the Land Use chapter for references to each topic. Evaluate how each are covered.
4. Then review the other chapters – energy, historical and cultural resources, transportation, housing economic growth and recreation may have references that affect natural resources as well.

Keep in mind that some topics are interrelated and provide alternate strategies for protecting a given resource or addressing a particular problem, such as sprawl.

Zoning Ordinances:

How do the ordinances protect the natural resources?

Are there specific overlays or districts that specifically reference natural resources?

Are there barriers to protecting natural resources?

Subdivision and Site Plan Regulations:

Are there regulations regarding the identification and protection of natural resources in these regulations? How are they protected? Is it adequate? What is missing?

Do you require pre-application consultations to identify natural resources and address other town needs prior to the applicant submitting a design for approval? Is the conservation commission a part of this process?

Other Helpful Resources:

The Innovative Land Use Planning Techniques Handbook produced by the NH Department of Environmental Services has model ordinances and regulations on many topics. It can be downloaded from http://des.nh.gov/organization/divisions/water/wmb/repp/innovative_land_use.htm.

The Land Conservation Plan for New Hampshire's Coastal Watersheds has model ordinances in the appendix. It can be downloaded from <http://www.rpc-nh.org/coastal-conservation.htm>.

Agriculture

Agriculture is an important component of New Hampshire's economy and environment, and makes vital contributions to the State's food supply. Agricultural lands are important to native wildlife by providing breeding habitat for grassland birds, migration stopover habitat for waterfowl, and wintering habitat for wild turkeys.

Master Plan

In order to enact ordinances and regulations designed to promote agriculture, a municipality must address this topic in the Master Plan with a description of agriculture's role in the community and inclusion of goal or objective statements pertaining to agriculture. Economic Development, Land Use, and Natural Resources chapters of a Master Plan all provide opportunities to discuss the role of agriculture in the community. Sample Master Plan goals/objectives pertinent to agriculture include:

- Promote the protection of remaining agricultural lands within the Town.
- Provide incentives to local farmers to maintain agricultural activities as a viable means of self-employment.
- Review local ordinances and regulations to ensure that opportunities exist for economically viable agriculture.
- Encourage the continuation of working farms within the Town.

Zoning Ordinance

In order to enact regulations designed to promote agriculture, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include maintaining rural character may provide justification for regulations pertaining to agriculture. The "Agricultural Incentive Zoning" chapter of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for an Agricultural Conservation District Ordinance and examples of agricultural zoning in New Hampshire municipalities.

Subdivision and Site Plan Review Regulations

The "Agricultural Incentive Zoning" chapter of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model performance standards for agricultural zones.

Sample application plan requirement checklist items pertaining to agriculture include:

Pre-application checklist

- Active or recently active agricultural lands
- Soils categorized as Prime farmland, Farmland of statewide importance, or Farmland of local importance

Application Checklist

- Protected agricultural lands

Energy Efficiency

Energy efficient design of neighborhoods and buildings has long-term economic benefits for residents and taxpayers as well as environmental benefits of resource conservation and reduced pollution. Energy efficiency benefits wildlife by decreasing the habitat loss and degradation associated with producing electricity and the global impacts of burning fossil fuels.

Master Plan

In order to enact ordinances and regulations designed to promote energy efficiency, a municipality must address this topic in the Master Plan and include goal or objective statements pertaining to energy efficiency. Economic Development and Land Use chapters of a Master Plan provide opportunities to discuss a community's desire to encourage energy efficiency. Sample Master Plan goals/objectives pertinent to energy efficiency include:

- Review and revise local ordinances, regulations, and codes to promote energy efficient design of neighborhoods and buildings.
- Encourage landscaping designs that reduce heating and cooling costs.
- Assess currently available bicycle and pedestrian opportunities within the Town, including access to local facilities and businesses as well as recreational opportunities.
- Develop and implement a bicycle and pedestrian plan for the Town.

Zoning Ordinance

In order to enact regulations designed to promote energy efficiency, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include conserving natural resources, protecting property values, and preventing damage to the environment or adverse environmental impacts may provide justification for regulations pertaining to energy efficiency. The "Energy Efficient Development" chapter of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for a zoning ordinance article that addresses energy efficient development.

Subdivision and Site Plan Review Regulations

The "Energy Efficient Development" chapter of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides a list of fundamental concepts to address energy efficiency in design standards of subdivision and site plan review regulations.

Sample application plan requirement checklist items pertaining to energy efficiency include:

Application checklist

- Note regarding proposed building performance standards (e.g., Energy Star, LEED, 2030 Challenge)
- Road layout
- Building orientation

Building Codes

The "Energy Efficient Development" chapter of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model construction standards for building codes that address energy efficiency.

Erosion Control

Erosion control prevents damage to private property and public investments such as roadways, conserves the productivity of upland soils, and prevents the degradation of wetlands and surface waters. Erosion control benefits wildlife by preventing degradation of upland and aquatic habitats.

Master Plan

In order to enact ordinances and regulations designed to promote erosion control, a municipality must address this topic in the Master Plan and include goal or objective statements pertaining to erosion control. Land Use and Natural Resources chapters of a Master Plan provide opportunities to discuss the importance of erosion control to the community. Sample Master Plan goals/objectives pertinent to erosion control include:

- Review and revise local policies and regulations to minimize erosion during construction activities.
- Review and revise local policies and regulations to ensure that future development will minimize erosion potential.
- Review and revise local ordinances to ensure that all subdivision and site plan proposals minimize erosion potential.

Zoning Ordinance

In order to enact regulations designed to promote erosion control, a municipality should include language in the zoning ordinance that authorizes the adoption of stormwater regulations during construction based on NH RSA 674:16 (Grant of Power), RSA 674:17 (Purposes of Zoning Ordinance), and RSA 674:21 (Innovative Land use Controls, Environmental Characteristics).

Subdivision and Site Plan Review Regulations

The “Erosion and Sediment Control During Construction” chapter of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model subdivision and site plan regulations to address erosion control, including design standards and construction practices.

Sample application plan requirement checklist items pertaining to erosion control include:

Application checklist

- Culvert crossings
- Drainage, existing and proposed
- Drainage culvert trench detail
- Drainage structures
- Erosion and sedimentation control devices
- Landscaping detail
- Stormwater basin detail
- Swales detail
- Underdrain detail
- Design calculations for detention/retention facilities
- Design calculations for drainage improvements
- Drainage calculations, pre- and post-construction

Floodplains

Floodplains are low-lying lands where water spreads out after overflowing the banks of streams and rivers during periods of snowmelt or heavy precipitation. In addition to providing critical storage areas for floodwaters, they provide the surface over which a river's meanders can shift over time. Floodplain development results in damage to private property and public investments such as roads and utilities, risks to public health and safety, and increased flooding downstream. Floodplains provide important habitat for furbearing mammals, a number of amphibians, several species of turtles, and numerous breeding and migrating birds.

Master Plan

In order to enact ordinances and regulations designed to protect floodplains, a municipality must address this topic in the Master Plan, with a discussion of floodplain locations and extent and inclusion of goal or objective statements pertaining to floodplains. Land Use and Natural Resources chapters of a Master Plan provide opportunities to discuss the importance of protecting floodplains in the community. Sample Master Plan goals/objectives pertinent to floodplains include:

- Identify local priorities for open space protection that include floodplains.
- Adopt a floodplain overlay district.
- Create a comprehensive map of floodplains within the Town, including floodplains of low order streams.

Zoning Ordinance

In order to enact regulations designed to protect floodplains, a municipality should include provisions for floodplain protection in the zoning ordinance. The Lyme, NH zoning ordinance includes a Flood Prone Area Conservation District (Article 3.27.5), which provides one model for addressing this issue (www.lymenh.gov/Public_Documents/LymeNH_Regs/regs/ZoneOrd.doc). The Concord, NH zoning ordinance includes a Flood Hazard Overlay District (chapter 28, Article 28-3-2), which provides another approach (<http://www.municode.com/RESOURCES/gateway.asp?PID=10210&SID=29>).

Subdivision and Site Plan Review Regulations

Sample application plan requirement checklist items pertaining to floodplains include:

Site & Lot Characteristics Details

- Soils subject to frequent or occasional flooding
- Lands below the 1% flood frequency (100-year flood) elevation

Forestry

Forestry is a significant component of New Hampshire's economy, providing fuel, fiber, and solid wood products to state, regional, national, and international markets. Harvesting patterns contribute to the diversity of forest age classes, species compositions, and structures on the New Hampshire landscape, providing diverse habitats for native wildlife.

Master Plan

In order to enact ordinances and regulations designed to promote forestry, a municipality must address this topic in the Master Plan with a description of forestry's role in the community and inclusion of goal or objective statements pertaining to forestry. Economic Development, Land Use, and Natural Resources chapters of a Master Plan all provide opportunities to discuss the role of forestry in the community. Sample Master Plan goals/objectives pertinent to forestry include:

- Identify local priorities for open space protection that include large blocks of contiguous forest land.
- Acquire and manage town forests to provide forest products and recreational opportunities.
- Promote the protection of remaining large blocks of contiguous forest land within the Town.
- Provide incentives to local forest landowners to maintain forest management as an economically viable activity.
- Review local ordinances and regulations to ensure that opportunities exist for economically viable forestry.

Zoning Ordinance

In order to enact regulations designed to promote forestry, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. New Hampshire law includes forestry in the definition of agriculture (NH RSA 21:34-a). Purposes of a Zoning Ordinance that include conserving natural resources and maintaining rural character may provide justification for regulations pertaining to forestry. The Lyme, NH zoning ordinance includes a Mountain and Forest Conservation District, which could provide a model for other municipalities to adapt.

(www.lymenh.gov/Public_Documents/LymeNH_Regs/regs/ZoneOrd.doc)

Subdivision and Site Plan Review Regulations

Sample application plan requirement checklist items pertaining to forestry include:

Pre-application checklist

- Contiguous forest area exceeding 50 acres pre- and post-development

Application checklist

- Access to post-development forest lands

Forests

Forests provide the natural vegetation for most of New Hampshire's landscape. They play important roles in providing clean air and water, and opportunities for recreation; moderating climate; protecting watersheds; and contributing to aesthetic values and rural character. Forests provide essential habitat for the majority of New Hampshire's wildlife species.

Master Plan

In order to enact ordinances and regulations designed to protect forests, a municipality must address this topic in the Master Plan with inclusion of goal or objective statements pertaining to forests. Land Use and Natural Resources chapters of a master plan provide opportunities to discuss the importance of forests to the community. Sample master plan goals/objectives pertinent to forests include:

- Protect large blocks of contiguous forest to provide timber and fuel sources, watershed protection, climate moderation, air quality protection, wildlife habitat, recreation sites, and education opportunities.
- Maintain and protect urban forests to provide climate moderation, air quality protection, and wildlife habitat.

Zoning Ordinance

In order to enact regulations pertaining to forests, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include conserving natural resources and maintaining rural character, may provide justification for regulations pertaining to forests. The Lyme, NH zoning ordinance includes a Mountain and Forest Conservation District, which could provide a model for other municipalities to adapt.

(www.lymenh.gov/Public_Documents/LymeNH_Regs/regs/ZoneOrd.doc)

Subdivision and Site Plan Review Regulations

Sample application plan requirement checklist items pertaining to forests include:

Pre-application checklist

- Size class and species composition of current forest cover
- Contiguous forest area

Application checklist

- Forest area maintained as open space

Greenfield Development

Greenfield development refers to conversion of agricultural or forest land to developed uses. Such development contributes to sprawl and loss of rural character, and results in loss, fragmentation, and degradation of wildlife habitat. Regulation of greenfield development can minimize its impacts on important natural resource values.

Master Plan

In order to enact ordinances and regulations designed to regulate greenfield development, a municipality must address this topic in the Master Plan with inclusion of goal or objective statements pertaining to greenfield development. Economic Development, Land Use, and Natural Resources chapters of a Master Plan all provide opportunities to discuss policies regarding greenfield development in the community. Sample Master Plan goals/objectives pertinent to greenfield development include:

- Create and adopt performance standards for greenfield development.
- Develop and adopt standards for open space protection in greenfield developments.
- Develop and implement policies to protect important natural resources in greenfield developments.

Zoning Ordinance

In order to enact regulations pertaining to greenfield development, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include conserving natural resources and maintaining rural character may provide justification for regulations pertaining to greenfield development.

Subdivision and Site Plan Review Regulations

Most of the sample application plan requirement checklist items in this document pertain to greenfield development.

Green Infrastructure

Green Infrastructure consists of the network of undeveloped lands and waters that support human life and economic activity as well as native wildlife. Green infrastructure provides the essential services, including solar energy conversion, nutrient cycling, air and water purification, and climate moderation, that enable ecosystems to function and support life. At a local scale, the presence of green infrastructure enhances human quality of life, contributes to property values, and provides wildlife habitat.

Master Plan

In order to enact ordinances and regulations designed to protect green infrastructure, a municipality must address this topic in the Master Plan with inclusion of goal or objective statements pertaining to green infrastructure.

Land Use and Natural Resources chapters of a Master Plan provide opportunities to discuss the importance of green infrastructure to the community. Sample Master Plan goals/objectives pertinent to green infrastructure include:

- Develop and adopt a green infrastructure plan for the Town.
- Identify and map critical green infrastructure within the Town.
- Review and revise local policies and regulations to support protection of critical green infrastructure.

Zoning Ordinance

In order to enact regulations pertaining to green infrastructure, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include conserving natural resources and maintaining rural character may provide justification for regulations pertaining to green infrastructure.

Sample ordinance purposes pertaining to green infrastructure include:

- Maintain the Town's green infrastructure for future generations;
- Protect and maintain a green infrastructure network within the Town;
- Protect green infrastructure within the Town to maintain essential ecological services.

Subdivision and Site Plan Review Regulations

Sample application plan requirement checklist items pertaining to green infrastructure include:

Pre-application checklist

- Existing vegetation
- Existing hydrologic features

Application checklist

- Natural vegetation features to be retained
- Landscaping detail
- Swales detail

Groundwater

Groundwater includes water stored in stratified drift (i.e., sand and gravel) aquifers and in bedrock (i.e., deep or artesian) aquifers, and is the most common source of drinking water in New Hampshire. Potable groundwater is a critical resource for New Hampshire communities. Groundwater is important to wildlife as the source of springs and seeps which provide water in upland areas and feed surface waters and wetlands.

Master Plan

In order to enact ordinances and regulations designed to protect groundwater, a municipality must address this topic in the Master Plan with a description of the community's groundwater resources and inclusion of goal or objective statements pertaining to groundwater. Land Use and Natural Resources chapters of a Master Plan provide opportunities to discuss the importance of groundwater to the community. Sample Master Plan goals/objectives pertinent to groundwater include:

- Develop/maintain/implement a wellhead protection plan.
- Adopt an aquifer protection ordinance to ensure adequate recharge and prevent contamination of important aquifers.
- Review and revise the Town's aquifer protection regulations based on the State's most recent stratified drift aquifer maps.
- Develop a groundwater quality map for the town.

Zoning Ordinance

In order to enact regulations designed to protect groundwater, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include conserving natural resources, protecting property values, promoting public health and safety, and preventing damage to the environment or adverse environmental impacts may provide justification for regulations pertaining to groundwater. The NH Department of Environmental Services has published a Model Groundwater Protection Ordinance ([www.des.nh.gov/DWSP/pdf/ModelOrdinance.pdf](http://www.des.nh.gov/DWSP/ModelOrdinance.pdf)). The "Protection of Groundwater and Surface Water for Drinking Water Supply" chapter of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides information about existing groundwater protection ordinances in New Hampshire.

Subdivision and Site Plan Review Regulations

Sample application plan requirement checklist items pertaining to groundwater include:

- Pre-application checklist
 - Favorable gravel well analysis

Growth Management

Growth management includes a variety of techniques and strategies intended to encourage orderly growth and development in areas appropriate for development, protect important natural resources, and discourage sprawl. Growth management helps to prevent deterioration of human quality of life and property values and loss and degradation of wildlife habitat that result from uncontrolled growth.

Master Plan

In order to enact ordinances and regulations designed to implement growth management, a municipality must address this topic in the Master Plan with inclusion of goal or objective statements pertaining to growth management. Economic Development, Land Use, and Natural Resources chapters of a Master Plan provide opportunities to discuss growth management. Sample Master Plan goals/objectives pertinent to growth management include:

- Explore the desirability of adopting growth management practices such as urban growth boundaries, village districts, or natural resource overlay districts.
- Adopt growth management strategies to protect natural resources, maintain rural character, and prevent scattered development and sprawl.
- Encourage development in designated areas (i.e., within Village District or Urban Growth Boundary) to prevent scattered development and sprawl.

Zoning Ordinance

In order to enact regulations pertaining to growth management, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. The “Growth Management,” “Urban Growth Boundary and Urban Service District,” “Village Plan Alternative,” “Feature-based Density,” “Lot Size Averaging – One Size Does Not Fit All,” chapters of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provide model language for zoning ordinance articles that address growth management and information about existing growth management ordinances in New Hampshire.

Subdivision and Site Plan Review Regulations

Pertinent application plan requirement checklist items will depend on the particular growth management strategies adopted. Refer to the *Innovative Land Use Planning Techniques* chapters listed above for ideas.

Impervious Surfaces

Impervious surfaces include buildings, exposed rock, concrete, and other materials through which water cannot move. Impervious surfaces increase run-off of precipitation, potentially leading to erosion, sedimentation, flooding, and reduced groundwater supplies which are detrimental to both humans and wildlife. Impervious surfaces also contribute to heat island effects and reduce air quality.

Master Plan

In order to enact ordinances and regulations designed to minimize impervious surfaces, a municipality must address this topic in the Master Plan with inclusion of goal or objective statements pertaining to impervious surfaces. Economic Development, Land Use, and Transportation chapters of a Master Plan provide opportunities to discuss policies regarding impervious surfaces in the community.

Sample Master Plan goals/objectives pertinent to impervious surfaces include:

- Encourage appropriate road sizes within subdivisions that minimize paving while ensuring adequate and safe access for emergency response vehicles.
- Review and revise local policies and regulations to minimize impervious surfaces.

Zoning Ordinance

In order to enact regulations pertaining to impervious surfaces, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include conserving natural resources, maintaining rural character, and preventing damage to the environment or adverse environmental impacts may provide justification for regulations pertaining to impervious surfaces. The “Permanent (Post-construction) Stormwater Management” chapter of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for a zoning ordinance article that addresses impervious surfaces in the context of stormwater management and includes information about existing stormwater management ordinances in New Hampshire.

Subdivision and Site Plan Review Regulations

Sample application plan requirement checklist items pertaining to impervious surfaces include:

Application checklist

- Curbing detail
- Driveway detail
- Sidewalk detail
- Road layout
- Pavement widths

Landscaping

Landscaping refers to visible, human-modified features of a plot of land, including vegetation, water features, shape of terrain, fences and other material objects. Landscaping contributes to the aesthetics of neighborhoods and communities, enhances property values, improves urban air quality, and can reduce heating and cooling costs. Landscaping benefits wildlife by providing backyard habitat.

Master Plan

In order to enact ordinances and regulations pertaining to landscaping, a municipality must address this topic in the Master Plan with goal or objective statements pertaining to landscaping. Economic Development, Land Use, and Natural Resources chapters of a Master Plan all provide opportunities to discuss the importance of landscaping in the community. Sample Master Plan goals/objectives pertinent to landscaping include:

- Review and revise local policies and regulations to minimize destruction of natural vegetation during construction activities.
- Review and revise local policies and regulations to encourage the use of native species in landscaping.
- Review and revise local policies and regulations to discourage the use of plants that require significant inputs of water and nutrients in landscaping.
- Encourage landscaping designs that reduce heating and cooling costs.

Zoning Ordinance

In order to enact regulations pertaining to landscaping, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include maintaining rural character and protecting property values may provide justification for regulations pertaining to landscaping. The “Landscaping” chapter of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for a zoning ordinance article that addresses landscaping and information about existing landscaping ordinances in New Hampshire.

Subdivision and Site Plan Review Regulations

The “Landscaping” chapter of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for subdivision and site plan review regulations pertaining to landscaping.

Sample application plan requirement checklist items pertaining to landscaping include:

Pre-application checklist

- Existing vegetation

Application checklist

- Natural vegetation features to be retained
- Landscaping detail
- Swales detail

Light Pollution

Light pollution includes any adverse effects of artificial light, including sky glow, glare, light trespass, decreased night visibility and energy waste. Controlling light pollution conserves energy and resources, saves money, and prevents public health and safety hazards and nuisances. Controlling light pollution can avoid negative impacts of artificial light on wildlife, particularly on migratory birds.

Master Plan

In order to enact ordinances and regulations designed to prevent light pollution, a municipality must address this topic in the Master Plan with inclusion of goal or objective statements pertaining to dark sky preservation or control of light pollution. Community Facilities, Economic Development, Housing, Land Use, Natural Resources, and Transportation chapters of a Master Plan all provide opportunities to discuss desired policies toward light pollution in the community. Sample Master Plan goals/objectives pertinent to light pollution include:

- Review and revise local policies and regulations to prevent light trespass.
- Review and revise local policies and regulations to encourage dark sky preservation.

Zoning Ordinance

In order to enact regulations designed to control light pollution, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include maintaining rural character, protecting property values, and preventing damage to the environment or adverse environmental impacts may provide justification for regulations pertaining to lighting. The New England Light Pollution Advisory Group (NELPAG) provides model language for an outdoor lighting ordinance to address light pollution, based on successful ordinances in Kennebunkport, ME and Tucson, AZ. (www.cfa.harvard.edu/nelpag/ordbylaw.html)

Subdivision and Site Plan Review Regulations

The International Dark Sky Association provides simple guidelines that could serve as design standards in subdivision and site plan regulations. (www.darksky.org/programs/simple-guidelines-for-lighting-ordinances.php)

Sample application plan requirement checklist items pertaining to light pollution include:

- Application checklist
 - Outdoor lighting fixtures and locations

Natural Hazards

New Hampshire's most common natural hazard is flooding. Forest fires are infrequent in the State, and are usually controlled before spreading very far. Landslides are most likely in mountainous areas, but can occur locally anywhere slopes occur. Land use practices can mitigate or exacerbate the risks of natural hazards. Development that reduces infiltration and storage of precipitation can exacerbate downstream flooding. Scattered residential development in extensive forests both increases the risk of forest fires and makes fighting them more difficult and dangerous.

Increased weight above a steep slope (from new buildings), increased water within the soils of a steep slope (from precipitation or leach fields), vibration of soils on a steep slope (from construction or traffic), and undercutting at the foot of a steep slope all can trigger slope failure. Climate change may alter the frequency of all these hazards if precipitation events become more sporadic and intense. Natural hazards can threaten human health and safety, damage public and private property, and degrade or destroy wildlife habitat.

Master Plan

In order to enact ordinances and regulations designed to address natural hazards, a municipality must address this topic in the Master Plan with inclusion of pertinent goal or objective statements and a discussion of the types and locations of natural hazards within the Town. The Land Use chapter of a Master Plan provides an opportunity to discuss natural hazards in the community. Sample Master Plan goals/objectives pertinent to natural hazards include:

- Create a map of natural hazards in the Town.
- Review and revise local policies and regulations to minimize development in areas vulnerable to natural hazards.
- Review and revise local policies and regulations to minimize structure vulnerability to forest fires.
- Review and revise local policies to ensure that development does not increase risks from natural hazards.

Zoning Ordinance

In order to enact regulations pertaining to natural hazards, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include protecting property values, promoting public health and safety, and preventing damage to the environment or adverse environmental impacts may provide justification for regulations pertaining to natural hazards. Many New Hampshire towns use a Floodplain Development Ordinance or a Flood Hazard Overlay District (e.g., www.lymenh.gov/Public_Documents/LymeNH_Regs/regs/ZoneOrd.doc; www.ci.concord.nh.us/codeadmin/) to address flood hazards.

Subdivision and Site Plan Review Regulations

Sample application plan requirement checklist items pertaining to natural hazards include:

Pre-application checklist

- Soils subject to frequent or occasional flooding
- Lands below the 1% flood frequency (100-year flood) elevation
- Excessively drained soils

Application checklist

- Driveway length
- Fire protection plan

Natural Services Network

The New Hampshire Natural Services Network is a GIS-based tool identifying lands that provide important ecological services that are difficult and expensive to replicate. Loss of these services affects human health, safety, quality of life, and economic opportunity. Created by a collaborative of planning and natural resource professionals, this tool can be adapted for use at multiple scales and refined to incorporate additional data. Base maps for this network consist of four components: water supply lands, flood storage lands, productive soils, and important wildlife habitat.

- **Water supply lands** include highly transmissive aquifers identified by the US Geological Survey and favorable gravel well sites identified by NH DES.
- **Flood storage lands** include 100-year floodplains identified by FEMA and lacustrine (associated with lakes), riverine (associated with rivers), and palustrine (other non-tidal) wetlands identified by the USFWS National Wetlands Inventory.
- **Productive soils** include prime farmland and farmland of statewide importance identified by the Natural Resource Conservation Service.
- **Important wildlife habitat** includes habitat of statewide priority and habitat of eco-regional priority identified by the NH Fish & Game Department Wildlife Action Plan.

Master Plan

In order to enact ordinances and regulations designed to address natural hazards, a municipality must address this topic in the Master Plan with inclusion of pertinent goal or objective statements and a discussion of the composition and extent of natural services network lands within the Town. The Land Use and Natural Resources chapters of a master plan provide opportunities to discuss the importance of a natural services network to the community. Sample master plan goals/objectives pertinent to natural services networks include:

- Maintain a natural services network map for the Town.
- Adopt regulations and policies to protect the Town's natural services network.
- Review and revise the Town's Open Space Plan to ensure adequate protection of essential ecological services.
- Well-planned development will not adversely impact important natural resources and ecological services.

Zoning Ordinance

In order to enact regulations pertaining to the Natural Services Network, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include conserving natural resources, maintaining rural character, protecting property values, promoting public health and safety, and preventing damage to the environment or adverse environmental impacts may provide justification for regulations pertaining to the Natural Services Network. Towns might use conservation overlay districts to address individual components of the natural services network or the network as a whole.

Subdivision and Site Plan Review Regulations

Sample application plan requirement checklist items pertaining to the Natural Services Network include:

Pre-application checklist

- Location with respect to Natural Services Network
- Underlying components of the Natural Services Network

Natural Vegetation

Natural vegetation includes the native trees, shrubs, wildflowers, grasses, ferns, and mosses that grow on a land parcel before it is cleared for development. Maintaining as much natural vegetation on a development site as practical prevents erosion, mediates microclimate, contributes to human quality of life and property values, and saves the time, cost, and risks of installing new plantings. Natural vegetation provides higher wildlife habitat value than new plantings.

Master Plan

In order to enact ordinances and regulations pertaining to natural vegetation, a municipality must address this topic in the Master Plan with goal or objective statements pertaining to natural vegetation. The Land Use, Housing, Community Facilities, and Economic Development chapters of a Master Plan all provide opportunities to discuss the importance of natural vegetation in the community. Sample Master Plan goals/objectives pertinent to natural vegetation include:

- Review and revise local policies and regulations to minimize destruction of natural vegetation during construction activities.
- Review and revise local policies and regulations to encourage protection of natural vegetation during construction activities.

Zoning Ordinance

In order to enact regulations pertaining to natural vegetation, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include conserving natural resources, maintaining rural character, protecting property values, and preventing damage to the environment or adverse environmental impacts may provide justification for regulations pertaining to natural vegetation. The “Landscaping” chapter of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for a zoning ordinance article that addresses landscaping and information about existing landscaping ordinances in New Hampshire. This model ordinance includes a Special Provision that calls for minimizing site disturbance and retaining existing vegetation whenever possible.

Subdivision and Site Plan Review Regulations

Sample application plan requirement checklist items pertaining to include:

Pre-application checklist

- Existing vegetation

Application checklist

- Natural vegetation features to be retained

Ridgelines

Ridgelines form the boundary between watersheds, and land uses in these sensitive areas can have negative impacts for great distances downstream. Ridgeline development is also visible over large areas and affects community aesthetics and rural character. Many ridgelines have shallow soils that support mast-bearing trees, such as oaks, hickories, and beech, which provide important food sources for wildlife. Ridgeline protection benefits wildlife by protecting these food sources and important travel routes for large mammals.

Master Plan

In order to enact ordinances and regulations designed to protect ridgelines, a municipality must address this topic in the Master Plan with a discussion of the location and extent of ridgelines in the community and inclusion of goal or objective statements pertaining to ridgeline protection. Land Use and Natural Resources chapters of a Master Plan provide opportunities to discuss the importance of protecting ridgelines in the community. Sample Master Plan goals/objectives pertinent to ridgelines include:

- Identify local priorities for open space protection that include undisturbed ridgelines.
- Protect downstream areas from excessive flooding and degraded water quality by restricting ridgeline development.
- Protect scenic resources by restricting ridgeline development.

Zoning Ordinance

In order to enact regulations designed to promote energy efficiency, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include conserving natural resources, maintaining rural character, protecting property values, promoting public health and safety, and preventing damage to the environment or adverse environmental impacts may provide justification for regulations pertaining to

The “Steep Slope and Ridgeline Protection” chapter of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides a model ordinance for ridgeline protection and information about existing ridgeline protection ordinances in New Hampshire.

Subdivision and Site Plan Review Regulations

Sample application plan requirement checklist items pertaining to ridgelines include:

- Pre-application checklist
 - Mapped ridgelines

Shorelands, Surface Waters, and Wetlands

Shorelands, surface waters, and wetlands comprise the visible part of the land's hydrological network. These resources govern the quality and availability of water for human and livestock consumption, recreational activities, industrial uses, and wildlife habitat.

Master Plan

In order to enact ordinances and regulations designed to protect shorelands, surface waters, and wetlands, a municipality must address this topic in the Master Plan with a discussion of the locations of these resources in the community and inclusion of goal or objective statements pertaining to their protection. Land Use and Natural Resources chapters of a Master Plan provide opportunities to discuss the importance of protecting shorelands, surface waters, and wetlands in the community. Sample Master Plan goals/objectives pertinent to shorelands, surface waters, and wetlands include:

- Protect the Town's water resources.
- Protect the Town's natural resources, including water, agricultural, forest, wildlife, and geologic resources.

Zoning Ordinance

In order to enact regulations pertaining to landscaping, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include conserving natural resources, maintaining rural character, protecting property values, promoting public health and safety, and preventing damage to the environment or adverse environmental impacts may provide justification for regulations pertaining to

The "Shoreland Protection" chapter of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for a zoning ordinance article that addresses shorelands, surface waters, and wetlands and information about existing shoreland protection ordinances in New Hampshire.

Subdivision and Site Plan Review Regulations

Sample application plan requirement checklist items pertaining to shorelands, surface waters and wetlands include:

- Pre-application checklist
 - Hydrologic features
- Application checklist
 - Vegetated buffers detail

Sprawl

Sprawl refers to dispersed, automobile-dependent development that segregates residential, commercial, industrial, and business uses. Sprawl contributes to air pollution and inefficient use of time and resources, which has negative impacts on human health, economic well-being, and quality of life. The inefficient use of land associated with sprawl results in excessive loss and degradation of wildlife habitat.

Master Plan

In order to enact ordinances and regulations designed to prevent sprawl, a municipality must address this topic in the Master Plan with goal or objective statements pertaining to sprawl prevention. Economic Development and Land Use chapters of a Master Plan provide opportunities to discuss the importance of limiting sprawl in the community. Sample Master Plan goals/objectives pertinent to sprawl include:

- Review and revise zoning ordinances to ensure that they do not inadvertently encourage sprawl.
- Adopt innovative land use techniques to avoid sprawl.

Zoning Ordinance

In order to enact regulations pertaining to landscaping, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include conserving natural resources, maintaining rural character, and preventing damage to the environment or adverse environmental impacts may provide justification for regulations pertaining to sprawl. The “Growth Management,” “Urban Growth Boundary and Urban Service District,” “Village Plan Alternative,” “Feature-based Density,” “Lot Size Averaging – One Size Does Not Fit All,” chapters of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provide model language for zoning ordinance articles that address sprawl and information about pertinent existing ordinances in New Hampshire.

Subdivision and Site Plan Review Regulations

Pertinent application plan requirement checklist items will depend on the particular growth management strategies adopted. Refer to the *Innovative Land Use Planning Techniques* chapters listed above for ideas.

Steep Slopes

Steep slopes are often defined as grades equal to or exceeding 15%, i.e., areas where the elevation increases 15 feet in 100 feet of horizontal distance. Protecting steep slopes prevents environmental damage such as erosion, sedimentation, and drainage problems; excessive cuts and fills, and unsightly slope scars. Protection of steep slopes benefits wildlife by preventing habitat degradation of uplands, wetlands, and surface waters.

Master Plan

In order to enact ordinances and regulations designed to protect steep slopes, a municipality must address this topic in the Master Plan with a discussion of the location and extent of steep slopes in the community and inclusion of goal or objective statements pertaining to steep slope protection. Land Use and Natural Resources chapters of a Master Plan provide opportunities to discuss the importance of protecting steep slopes in the community. Sample Master Plan goals/objectives pertinent to steep slopes include:

- Review and revise local policies and regulations to ensure protection of steep slopes.
- Protect water quality by regulating development on steep slopes.

Zoning Ordinance

In order to enact regulations designed to promote energy efficiency, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include conserving natural resources, maintaining rural character, protecting property values, promoting public health and safety, and preventing damage to the environment or adverse environmental impacts may provide justification for regulations pertaining to

The “Steep Slope and Ridgeline Protection” chapter of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides a model ordinance for steep slope protection and information about existing steep slope ordinances in New Hampshire.

Subdivision and Site Plan Review Regulations

Sample application plan requirement checklist items pertaining to include:

Pre-application checklist

- Slopes in excess of 15(20)(25)(30) %

Stormwater Runoff

Stormwater runoff refers to precipitation that cannot soak into the ground and subsequently ponds or flows over the earth's surface. Runoff can cause land erosion, water pollution, and flooding, damaging public and private property and degrading water quality and wildlife habitat.

Master Plan

In order to enact ordinances and regulations designed to control stormwater runoff, a municipality must address this topic in the Master Plan with inclusion of goal or objective statements pertaining to stormwater management. Land Use and Natural Resources chapters of a Master Plan provide opportunities to discuss the importance of stormwater management to the community. Sample Master Plan goals/objectives pertinent to stormwater management include:

- Review and revise local policies and regulations to minimize stormwater runoff from developed lands.
- Review and revise local policies and regulations to ensure that future development will minimize stormwater runoff.
- Review and revise local ordinances to ensure that all subdivision and site plan proposals minimize stormwater runoff.

Zoning Ordinance

In order to enact regulations pertaining to landscaping, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include conserving natural resources, protecting property values, promoting public health and safety, and preventing damage to the environment or adverse environmental impacts may provide justification for regulations pertaining to stormwater management. The "Permanent (Post-construction) Stormwater Management" chapter of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for a zoning ordinance article that addresses stormwater management and information about pertinent existing ordinances in New Hampshire.

Subdivision and Site Plan Review Regulations

Sample application plan requirement checklist items pertaining to stormwater include:

Pre-application checklist

- Existing drainage patterns on and adjacent to site

Application checklist

- Culvert crossings
- Application of Low Impact Development practices
- Drainage structures
- Erosion and sedimentation control devices
- Stormwater basin detail
- Swales detail
- Underdrain detail
- Design calculations for detention/retention facilities
- Design calculations for drainage improvements
- Drainage calculations, pre- and post-construction

Terrain Alteration

Terrain alteration refers to earth-moving operations, including cut and fill, that reshape the topography of the land. State law requires a permit from the Department of Environmental Services for activities that disturb more than 100,000 square feet of terrain (50,000 square feet within protected shorelands), but municipalities may adopt more stringent regulations. Terrain alteration can result in soil erosion and increased stormwater runoff, leading to water pollution and damage to public and private property damage. Terrain alteration results in direct and indirect loss of wildlife habitat.

Master Plan

In order to enact ordinances and regulations designed to limit terrain alteration, a municipality must address this topic in the Master Plan with inclusion of pertinent goal or objective statements. Land Use and Natural Resources chapters of a Master Plan provide opportunities to discuss the desired policies regarding terrain alteration to the community. Sample Master Plan goals/objectives pertinent to terrain alteration include:

- Encourage development that is sensitive to the natural environment.
- Adopt regulations to minimize the extent of terrain alteration associated with development in order to maintain natural hydrologic patterns, maintain rural character, and protect property and public safety.

Zoning Ordinance

In order to enact regulations pertaining to terrain alteration, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include conserving natural resources, maintaining rural character, protecting property values, and preventing damage to the environment or adverse environmental impacts may provide justification for regulations pertaining to terrain alteration.

Subdivision and Site Plan Review Regulations

Sample application plan requirement checklist items pertaining to terrain alteration include:

Pre-application checklist

- Existing topography (two foot contour interval)

Application checklist

- Post-construction topography
- Cut and fill volumes

Urban Growth Boundary

An urban growth boundary is a mapped line that separates land where infrastructure, such as public water and sewer, can support dense development from land designated for lower density development. This planning tool provides economic benefits by concentrating services and infrastructure needs and helps to prevent sprawl. Urban growth boundaries benefit wildlife by concentrating development on the landscape, resulting in larger contiguous areas of undeveloped land.

Master Plan

In order to adopt an urban growth boundary, a municipality must address this topic in the Master Plan with inclusion of pertinent goal or objective statements. Economic Development and Land Use chapters of a Master Plan provide opportunities to discuss the role of an urban growth boundary in the community. Sample Master Plan goals/objectives pertinent to urban growth boundaries include:

- Adopt an urban growth boundary to concentrate development and prevent sprawl.

Zoning Ordinance

In order to enact regulations pertaining to landscaping, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include conserving natural resources and maintaining rural character may provide justification for adopting an urban growth boundary. The “Urban Growth Boundary and Urban Service District” chapter of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for a zoning ordinance article that creates an urban growth boundary and information about pertinent existing ordinances in New Hampshire.

Sample application plan requirement checklist items pertaining to urban growth boundaries include:

Pre-application checklist

- Location with respect to Urban Growth Boundary

Watersheds

A watershed is the area of land that drains into a particular water body. The cumulative effects of land uses within a watershed can lead to problems with water quality and flooding, and their associated negative impacts on humans and wildlife.

Master Plan

In order to adopt policies pertaining to watersheds, a municipality must address this topic in the Master Plan with inclusion of pertinent goal or objective statements. Land Use and Natural Resources chapters of a Master Plan provide opportunities to discuss the relationships of watersheds to the community. Sample Master Plan goals/objectives pertinent to watersheds include:

- Review and revise zoning ordinances to consider the position of land within its watershed.
- Adopt land use policies that manage cumulative impacts of land use within a watershed.

Zoning Ordinance

In order to enact regulations pertaining to landscaping, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include conserving natural resources, maintaining rural character, protecting property values, promoting public health and safety, and preventing damage to the environment or adverse environmental impacts may provide justification for regulations pertaining to watersheds.

Watershed associations exist in many parts of New Hampshire and provide opportunities for towns to work together in protecting watersheds. The “Shoreland Protection” and “Permanent (Post-construction) Stormwater Management” chapters of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for zoning ordinance articles that help to protect watersheds and information about pertinent existing ordinances in New Hampshire.

Subdivision and Site Plan Review Regulations

The “Erosion and Sediment Control During Construction” chapter of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model subdivision and site plan regulations to address erosion control, including design standards and construction practices.

Sample application plan requirement checklist items pertaining to watersheds include:

- Pre-application checklist
 - Location within HUC 12 watershed

Wildlife Habitat

Wildlife habitat includes the resources that native species need to survive: food, water, shelter, including safe places to produce young. Wildlife habitat contributes to human amenities such as clean water, clean air, recreation opportunities, aesthetic values, and rural character.

Master Plan

In order to enact ordinances and regulations designed to protect wildlife habitat, a municipality must address this topic in the Master Plan with inclusion of goal or objective statements pertaining to wildlife habitat protection. Land Use and Natural Resources chapters of a Master Plan provide opportunities to discuss the importance of wildlife habitat to the community. Sample Master Plan goals/objectives pertinent to wildlife habitat include:

- Promote development that protects important wildlife habitat and travel corridors.
- Identify local priorities for open space protection that include core areas of important wildlife habitat.

Zoning Ordinance

In order to enact regulations pertaining to wildlife habitat, a municipality should include language in the zoning ordinance that authorizes the adoption of such regulations. Purposes of a Zoning Ordinance that include conserving natural resources, maintaining rural character, and preventing adverse environmental impacts may provide justification for regulations pertaining to wildlife habitat. The “Growth Management,” “Feature-based Density,” “Lot Size Averaging – One Size Does Not Fit All,” and “Shoreland Protection” chapters of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for zoning ordinance articles that provide opportunities to protect wildlife habitat during development and information about pertinent existing ordinances in New Hampshire.

Subdivision and Site Plan Review Regulations

The “Wildlife Habitat Management” chapter of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for subdivision and site plan review regulations pertaining to wildlife habitat and a comprehensive application checklist.

Sample application plan requirement checklist items pertaining to wildlife habitat include:

Pre-application checklist

- Existing habitat types (per NHFG Wildlife Action Plan)
- Deer wintering areas
- Vernal pools
- Wetlands
- Surface waters
- Headwater streams
- Mast stands
- Location relative to high quality habitat for state and ecologic region

Application checklist

- Habitat areas to be protected