

2009 New Hampshire Joint Watershed Conference

“Environmental Characteristics Zoning –
Let’s Get Ready for Town Meeting”



Southern New Hampshire &
Planning Commission

November 20-21, 2009

Presenter: Jack Munn, AICP, Chief Planner

Innovative Land Use Techniques:

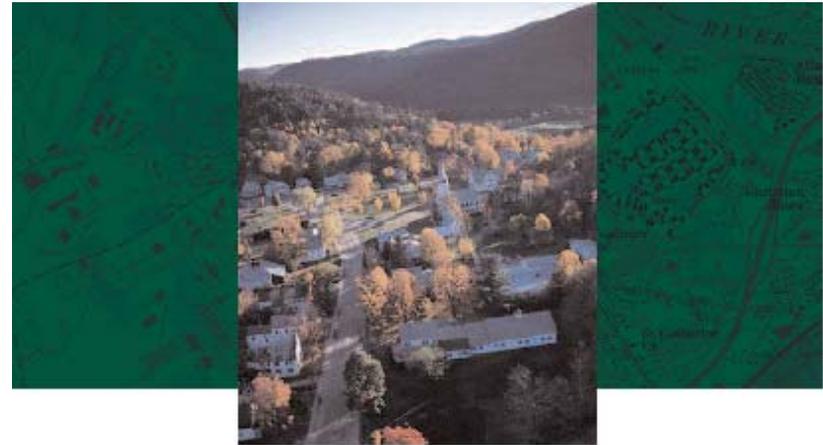
A Handbook for Sustainable Development

- Concept – provide guidance on 674:21
- ILU Handbook – use as reference tool
- Collaborative Effort



ILU Guide Contents

1. Multi-Density Zoning
2. Environmental Characteristics Zoning
3. Site-Level Design



INNOVATIVE Land Use Planning TECHNIQUES

A How-to Handbook for Sustainable Development

COMPILED BY
New Hampshire Department of Environmental Services
New Hampshire Association of Regional Planning Commissions
New Hampshire Office of Energy and Planning
New Hampshire Municipal Association

Environmental Characteristics Zoning

- Stormwater Management
- **Ridgeline/Steep Slopes Development**
- Wildlife Habitat Management
- Water Resources Protection:
 - Wetlands**
 - Drinking water**
 - Shoreline and Riparian areas**
 - Floodplains**
 - Erosion and sediment control**



Model Ordinances for Today

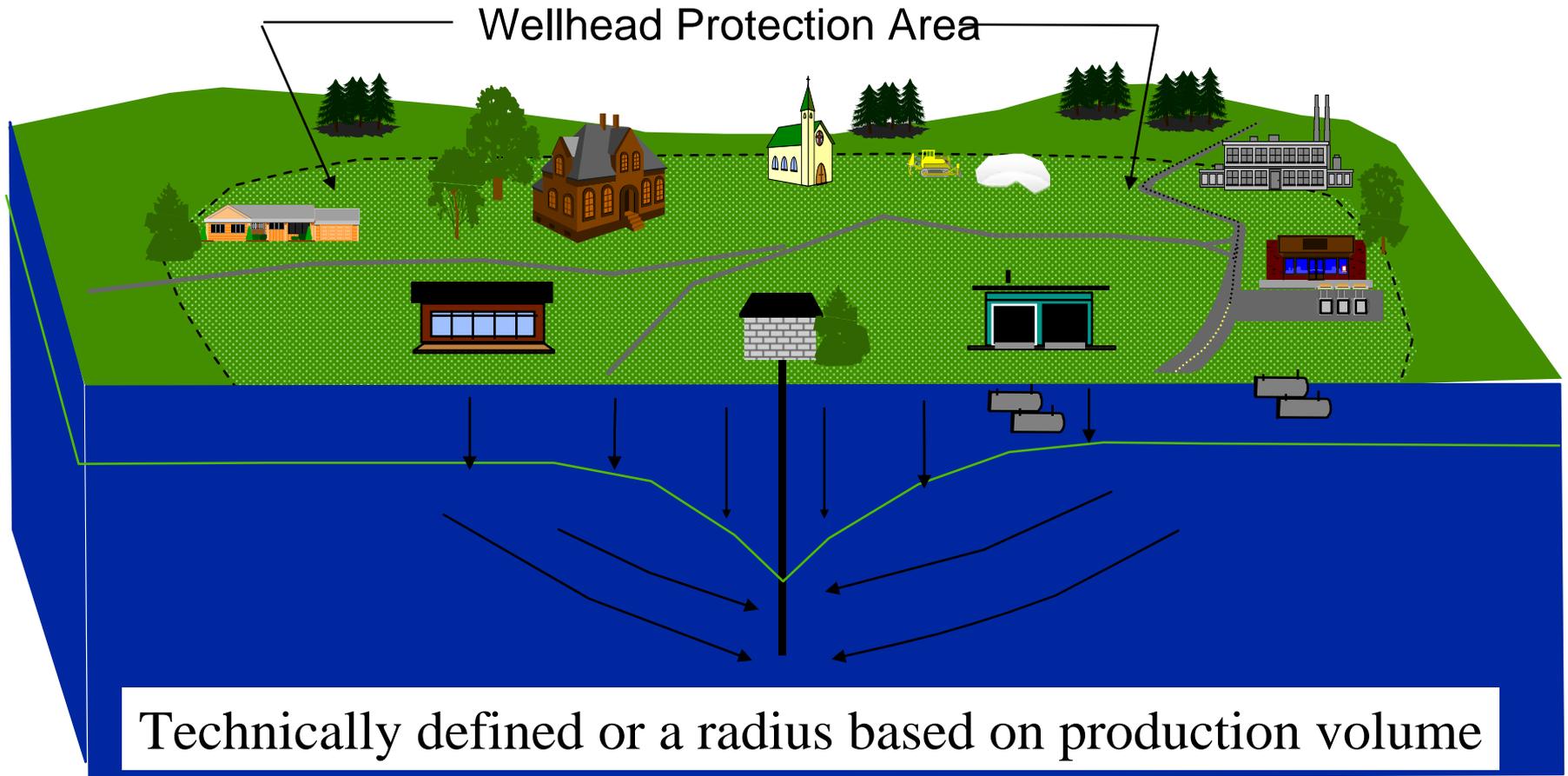
- Drinking Water Protection
 - Shoreland & Riparian Buffers
 - Wetlands Protection
 - Flood Hazard Area Zoning
 - Steep Slopes Protection
 - Erosion and Sedimentation Control
-

Model Drinking Water Protection Ordinance

Applies to the Protection of Surface Water Supply Areas and Drinking Water Sources and Other Surface Waters which are Hydrologically Connected



Wellhead Protection Area



Source: NH DES

Source Water Assessment Reports

Assessments of Public Water Supply Sources - FREEDOM

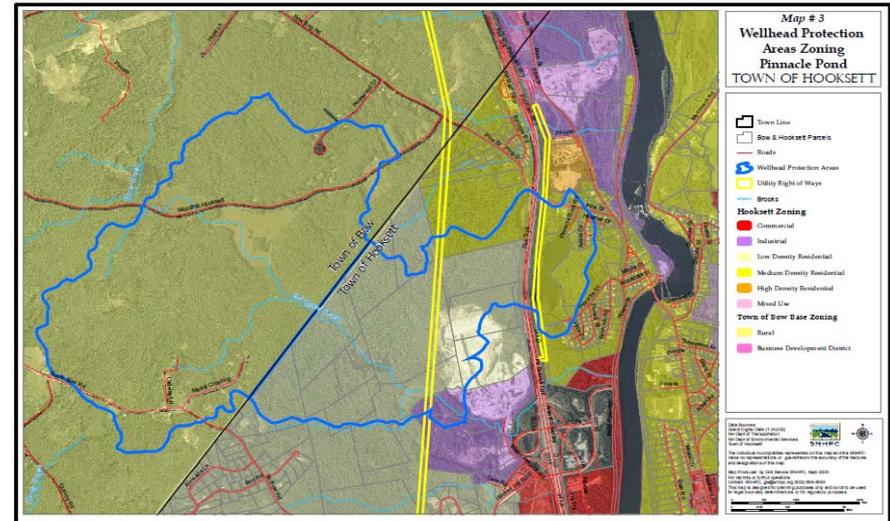
This report is a summary of NH Department of Environmental Services' assessments of the vulnerability of each source used by the public water system(s) located in this municipality. The sources listed here are grouped first by the type of public water system and then by the system itself. Each source was ranked according to a number of criteria; a vulnerability ranking is given for each criterion that applies to the source. *An explanation of each column in the report can be found on the last page.*

Source Number	Source Description	Source Type	Date Assessment Completed	Number of Vulnerability Rankings			Susceptibility Ranking Criteria											
				Highs	Mediums	Lows	Detects	Well/Intake	KCSs	PCCs	Highways/Rts	Pesticides	Septics	Urban Land Cover	Ag Land Cover	Animals	Lagoons	Dry discharges
System Type <input type="checkbox"/> C <input checked="" type="checkbox"/> P <input type="checkbox"/> N C=Community; P=Non-Transient, Non-Community; N=Transient																		
EPAID 0861010 System Name: FREEDOM WATER PRECINCT																		
002	GPW	G	09/01/2000	1	1	10	L	L	L	L	L	L	H	L	M	L	L	L
003	GPW	G	09/01/2000	1	1	10	L	L	L	L	L	L	H	L	M	L	L	L
EPAID 0862010 System Name: LOV WATER CO INC																		
001	GPW	G	01/11/2000	1	2	9	L	L	M	L	L	L	H	L	M	L	L	L
002	GPW	G	01/11/2000	1	2	9	L	L	M	L	L	L	H	L	M	L	L	L
003	GPW	G	01/11/2000	1	2	9	L	L	M	L	L	L	H	L	M	L	L	L
EPAID 0862020 System Name: PINE LANDING CONDO ASSOC																		
001	BRW	G	02/29/2000	2	3	7	H	L	L	L	L	L	M	H	M	L	L	M
002	GPW	G	02/29/2000	2	3	7	H	L	L	L	L	L	M	H	M	L	L	M
EPAID 0862030 System Name: FREEDOM VILLAGE CONDOS																		
003	BRW	G	04/12/2000	2	1	9	L	L	L	L	H	L	H	L	M	L	L	L
004	BRW	G	04/12/2000	2	1	9	L	L	L	L	H	L	H	L	M	L	L	L

The Concept...

Establish a **Drinking Water Protection "Overlay" District** in your community's zoning ordinance

Drinking Water District



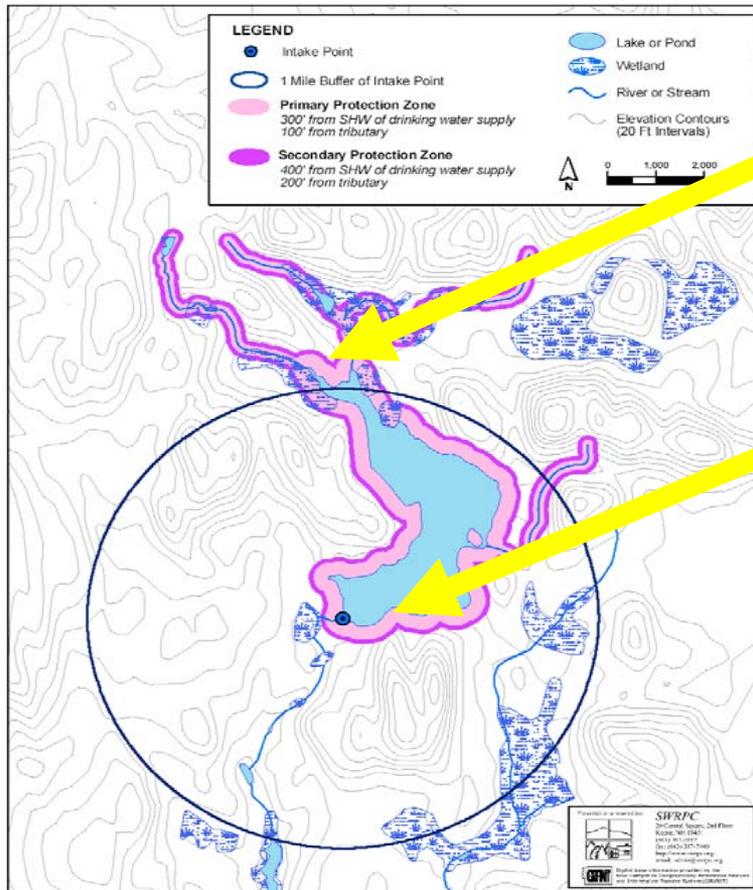
Drinking Water Source



Utilize a watershed approach to ensure that all surface waters, groundwater and recharge areas for your community's drinking water source are protected

Essential Elements

Develop Primary and Secondary Buffer Protection Zone Requirements within the Drinking Water Protection District



Primary Buffer Zone:

Area within 300' of seasonal high water mark of a waterbody actively used as a surface water supply and 100' of reference line of all its contributing perennial tributaries

Secondary Buffer Zone:

Area between 300-400' of seasonal high water mark of waterbody actively used as a surface water supply, and the area within 100-200' of the reference line of all contributing perennial tributaries

Establish Use Restrictions

On Surface Waters used for drinking water within the Drinking Water Protection District - prohibit:

- Gasoline powered boats, snowmobiles, ATVs, etc.
- Hazardous waste/regulated substances
- Dumping of trash, refuse, etc.

In the Primary and Secondary Buffer Zones:

- Prohibit – hazardous waste, solid waste or sludge facility; salvage yard; snow dumps; wastewater lagoons; animal feedlots; petroleum terminals, gas stations, sewage disposal, livestock, commercial application – pesticides, herbicide & fertilizers;
 - Permit – wildlife; outdoor recreation; bicycle paths/bridges; normal operation and maintenance of dams, etc.; agriculture, forestry, grazing, construction of wells, pipelines, etc.
-

Other Standards

- **Conditional Use Permit Required:**

Land disturbances >10,000 sq.ft.; enlargement nonconforming uses; storage/handling of regulated substances

- **Performance Standards Enforced Through:**

Stormwater Management Plan

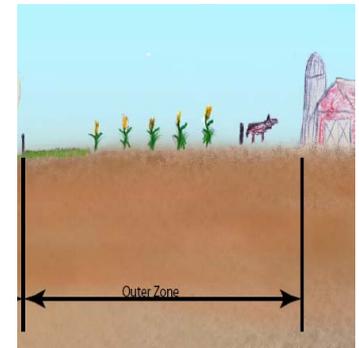
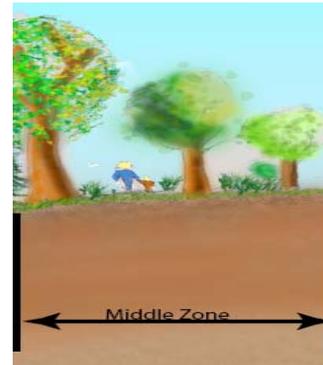
Erosion & Sedimentation Control Plan

Spill Prevention, Control and Countermeasure (SPCC) Plan

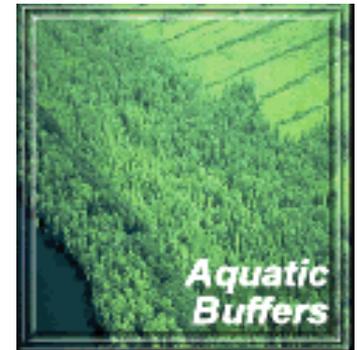
Conforming to NH DES: Model Rule for the Protection of Water Supply Watersheds (2000) and Model Groundwater Protection Ordinance (2006)



Model Ordinance for Shoreland & Riparian Area Protection



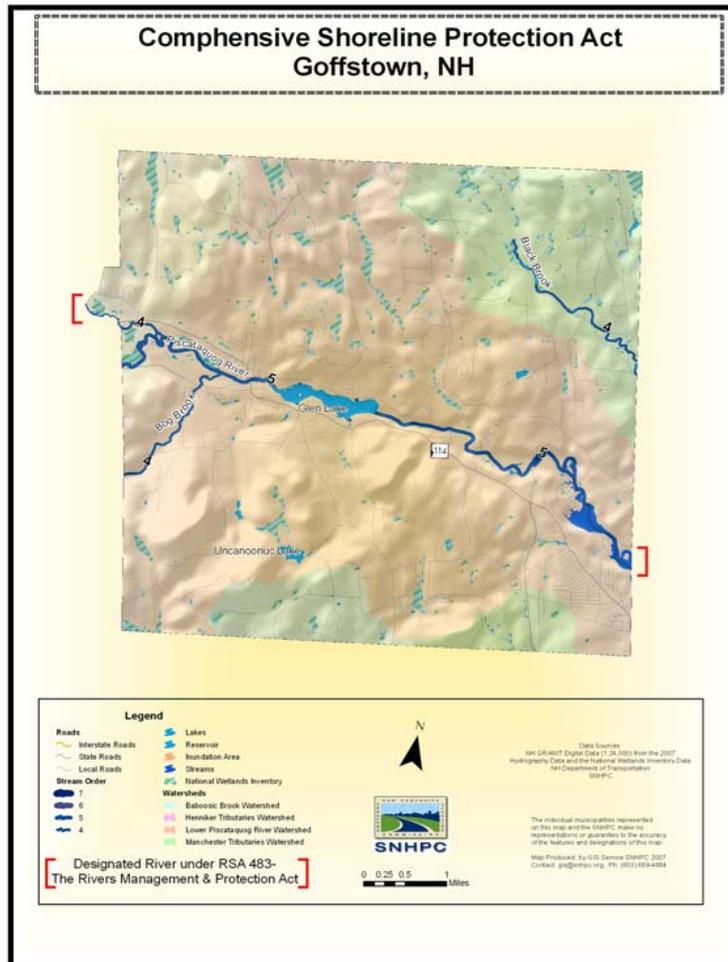
Municipalities Have a Choice in Shoreland Protection?



- Option 1:** Rely solely on the state's CSPA; or
- Option 2:** Extend the protection of the CSPA to the surface water bodies not covered under the CSPA; or
- Option 3:** Adopt more stringent regulations than the CSPA

*This model ordinance is designed to implement Option 3 as it includes provisions to protect **lower order streams** and expands upon the buffer requirements established by the CSPA.*

Where does the CSPA apply in your community?



CSPA applies to tidal ponds, all lakes and ponds on the NH DES Official List of Public Waters and > 4th Order Streams within your community

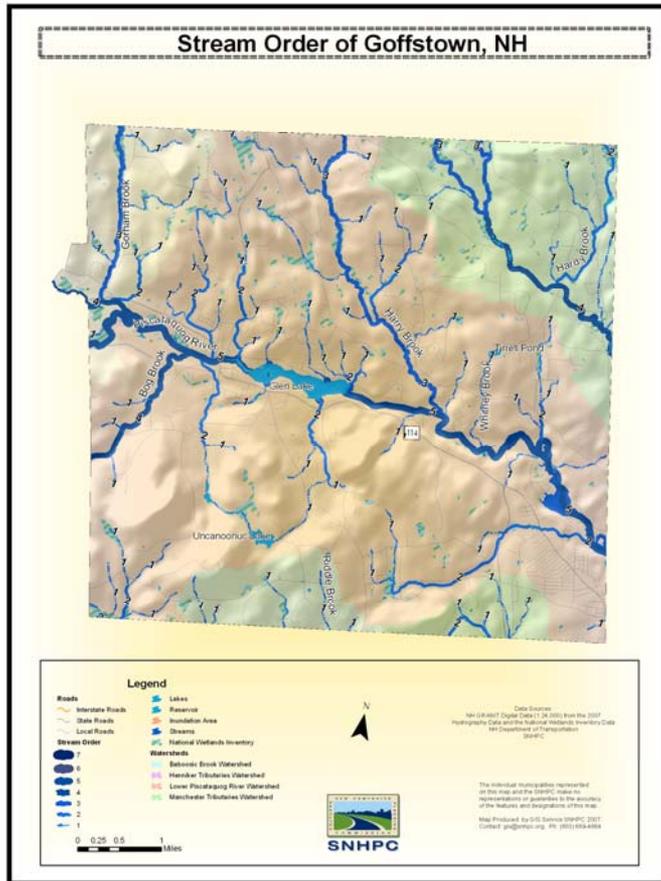
Contact NH DES Shoreland Protection or regional planning commission to prepare a map of the CSPA for your community

Three Basic Elements of Model Ordinance



- **Shoreland Protection Overlay District**
(Shown on an Official Shoreland Zoning Map)
 - **Shoreland Protection District Regulations**
 - **Riparian Buffer Standards**
-

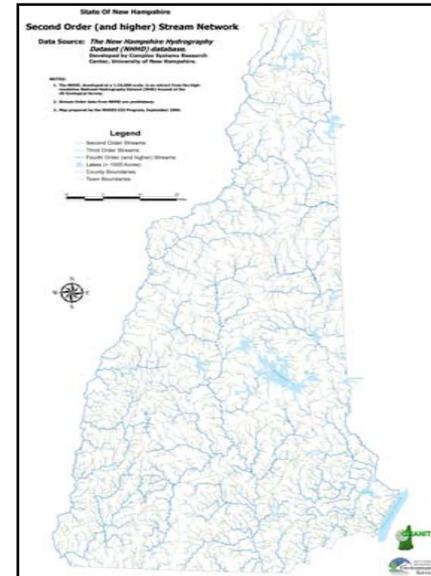
1st Step: Preparing Your Official Shoreland Zoning Map



Reliable source of stream location and stream order (1st, 2nd, 3rd, 4th, etc.) in your community is available from the NH DES Hydrography Dataset (NHDD) at GRANIT

Challenges: Defining 1st Order Streams

This Model Ordinance applies to both *intermittent* and *perennial* – communities may only wish to include perennial streams – if so; definition of 1st order streams will need changed and revisions to NHDD data will be required



2nd Step: Mapping Your Shoreland Protection District

Shoreland Protection District Boundaries:

- Applies to both sides of 1st, 2nd, 3rd and 4th order and higher streams and rivers and all natural or impounded lakes, ponds and coastal estuaries (if applicable) within your community
 - **150** feet from the “reference line” of 1st and 2nd order streams
 - **250** feet from the “reference line” all other water bodies
 - The reference line used is the same as defined in the CSPA
 - Does not apply to wetlands, ephemeral streams, beaver impoundments, fire ponds and farms
-

3rd Step: Apply Shoreland District Regulations: Key Provisions



Setbacks/Lot Coverage:

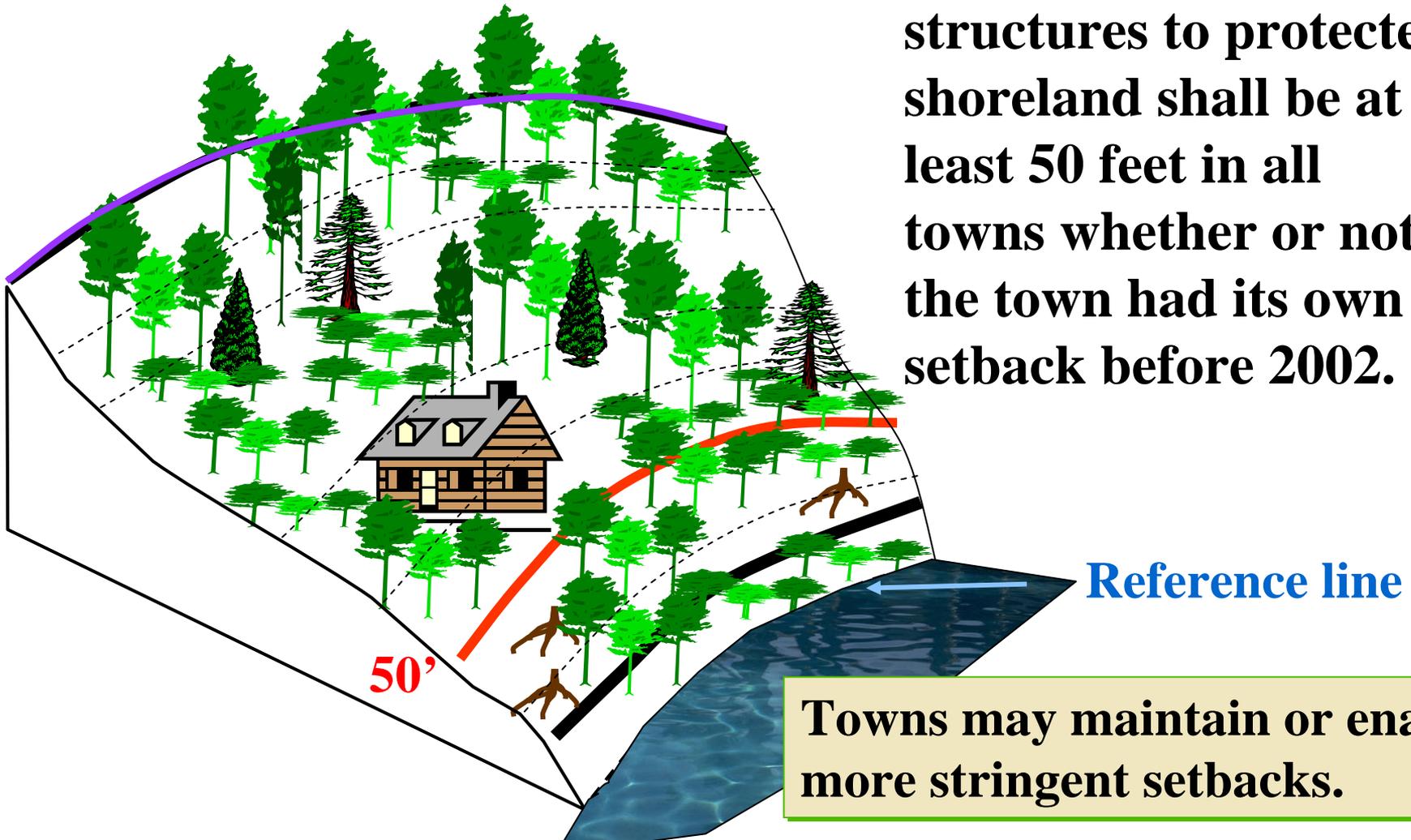
- **25 foot for primary structures** - 1st & 2nd order streams
- **50 foot for all other water bodies**
- **20 percent impervious surface limitation** for portion of any lot located within the Shoreland Protection District

Note: municipalities can also consider a 10 percent impervious limitation as recent studies indicate a level between 7 and 14 percent impervious at which water quality and wildlife habitat become affected by stormwater runoff

- Utilize a **Conditional Use Permit** for water-dependent structures such as docks, piers, breakwaters, boathouses, marinas, etc.
 - Require a **Stormwater Management Plan** for all earth moving activities on lots greater than 1 acre
 - Use a **Selected Clearing and Landscape Plan** to address scenic views and protection of buffer
-

CSPA: Primary Building Setback

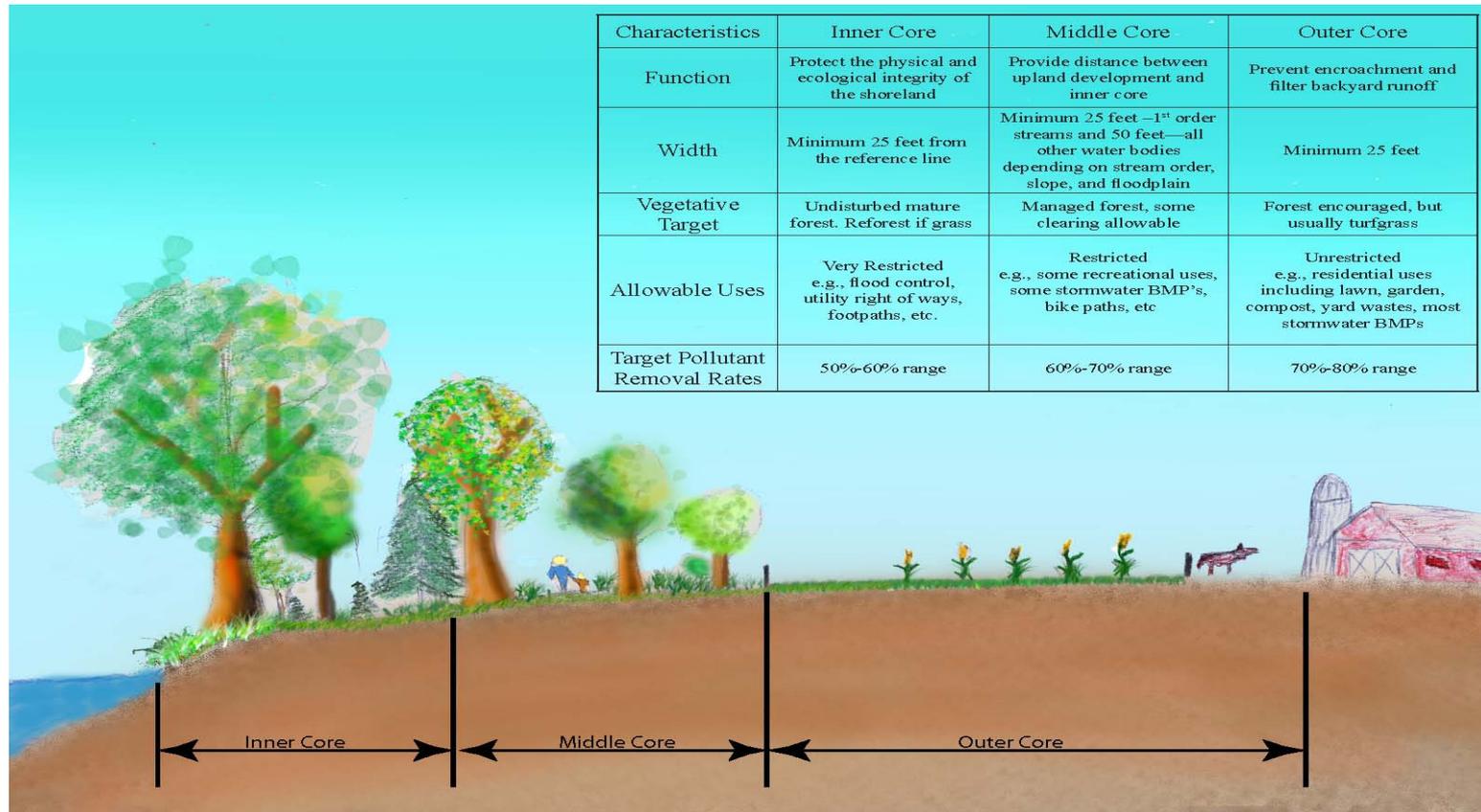
The setback for primary structures to protected shoreland shall be at least 50 feet in all towns whether or not the town had its own setback before 2002.



Towns may maintain or enact more stringent setbacks.

4th Step: Establish Riparian Buffer Standards

Utilize Management Zone Concept to Protect Water Quality and Manage Land Use



(modeled after the Center for Watershed Protection's Buffer Model Ordinance and Journal of Watershed Protection Techniques)

Questions?



**Jack Munn, Chief Planner
Southern New Hampshire
Planning Commission
(603) 669-4664**

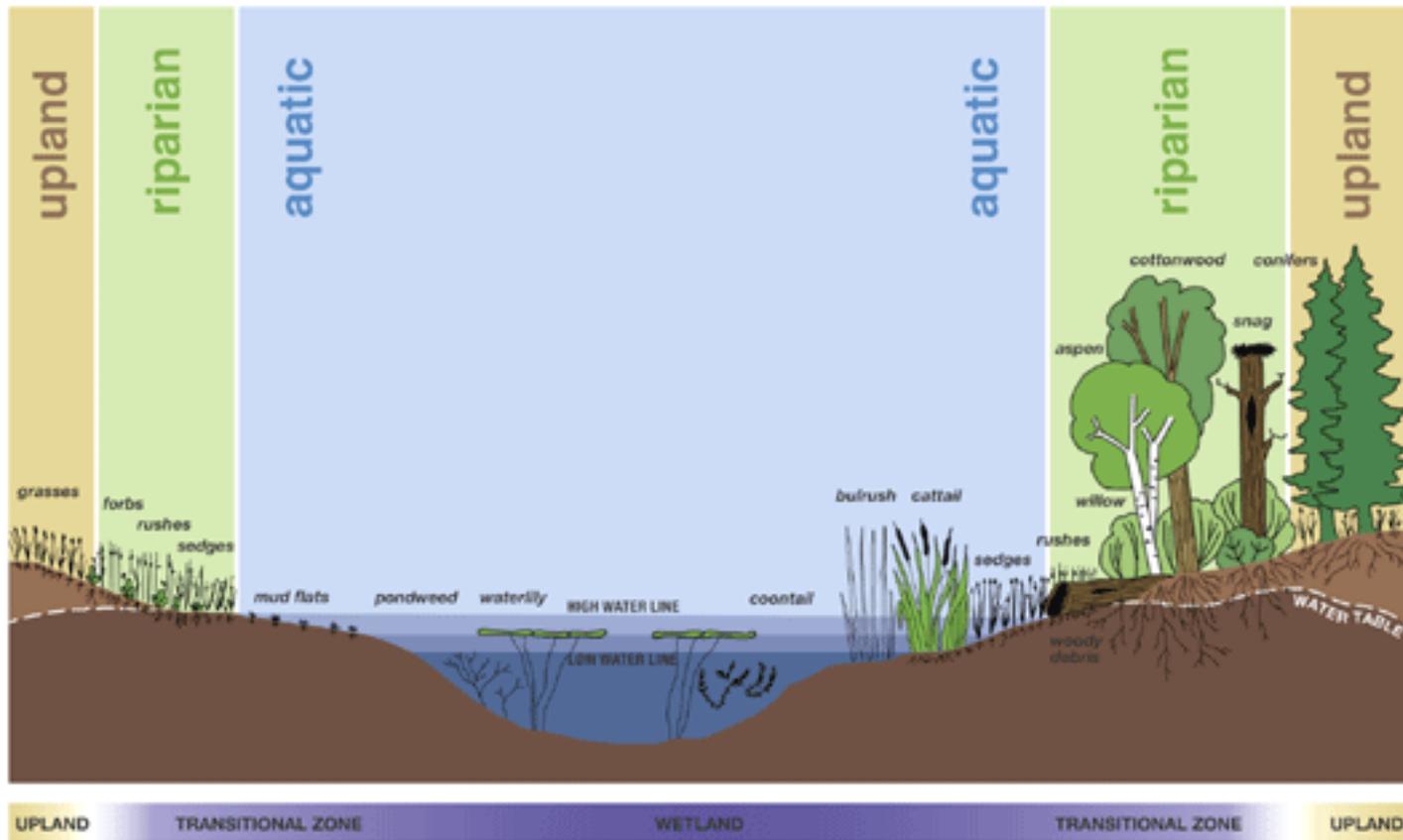
Wetlands Protection



Wetlands Defined

- Wetlands:
 - RSA 482-A:2.X – Area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal conditions does support, a prevalence of vegetation typically adapted for life in saturated conditions

Wetlands & Uplands



Benefits of Wetlands & Uplands

- **Habitat** – food, shelter, nurseries
- **Economics** – \$71 million, +1,400 jobs
- **Protect water quality** – bind pollutants, buffer surface water, allow groundwater recharge
- **Reduce floods** – nature's sponge
- **Estuaries** – ocean's nurseries

Buffer Benefits

- Protect wetland resources
- Filter nutrients & pollutants
- Moderate impacts from built environment
- Stabilize soil
- Habitat



Legal Basis in NH

- Regulating wetlands and buffers is authorized under:
 - RSA 674:16, the Zoning Grant of Power
 - RSA 674:21, Innovative Land Use Controls
 - 674:21, I (j), Environmental Characteristics Zoning
 - RSA 482-A, Wetlands Authority
 - NH DES Env-Wt 100-800
 - USACOE - Clean Water Act: Section 404

Wetlands Conservation Overlay District

- Review potential impacts to wetlands & uplands regardless of size
- Prevent **Cumulative Impacts**
- Prevent impacts to flooding, aquifers, water supplies
- Protect functions of ecosystem

Vegetated Wetland Buffers

- Buffer size to protect wetlands depends on function & site conditions
 - 100' = most contaminants & nutrients are removed
 - Wildlife supporting buffers larger

↑ Buffer = ↑ Water Quality



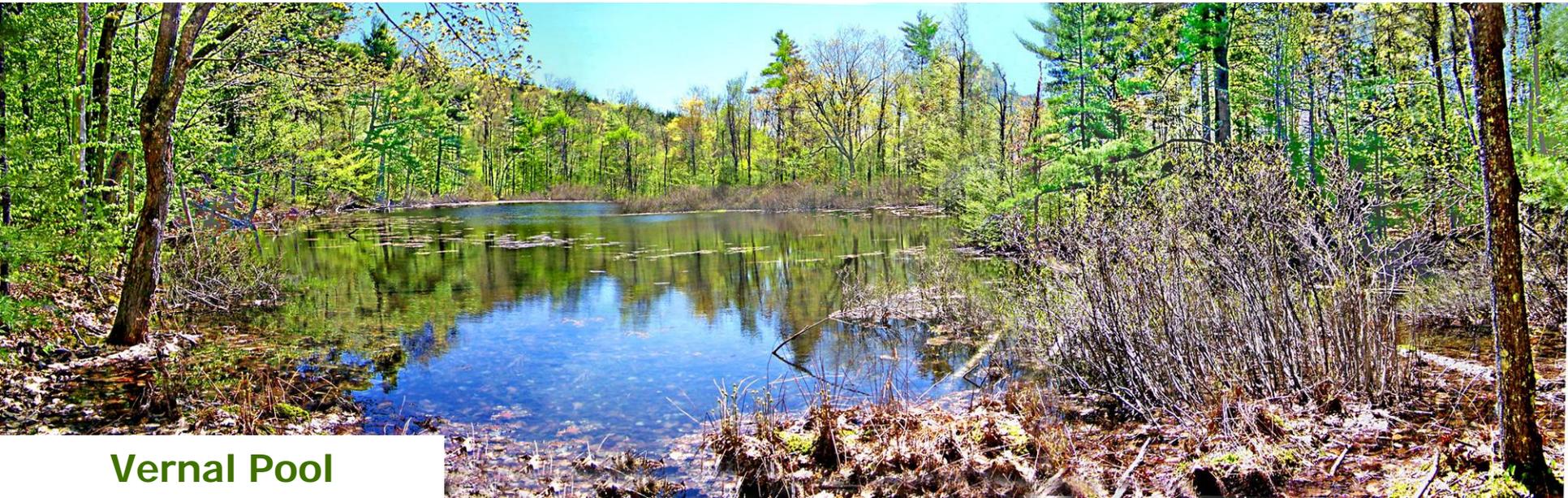
Vegetated Buffers



- Tiered Approach to Land Uses
 - 100' buffer allows agriculture, forestry, passive recreation – but no structures
 - 25' buffer – no vegetation removal
- Type of Wetland
 - 50' buffer around all wetlands
 - 100' buffer around peatlands or bogs or Prime Wetlands

Buffer Thresholds

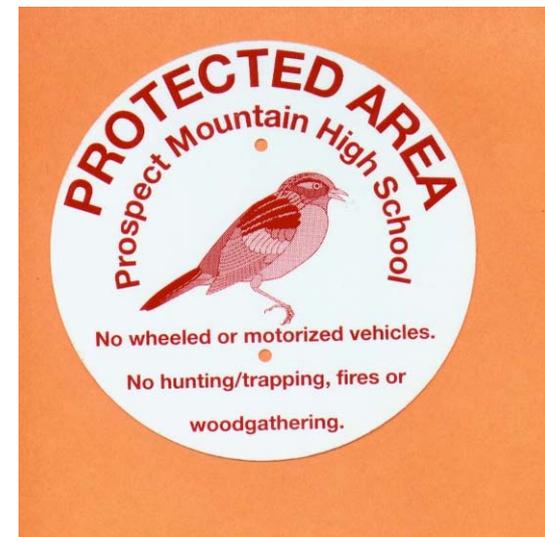
- May want to limit the applicability to larger wetlands for administrative efficiency
 - Wetlands of any size adjacent to surface water
 - Vernal pools over 500 square feet
 - All wetlands over 1,000 square feet



Vernal Pool

Local Considerations

- Review the DES Wetlands rules before proceeding with ordinance (Env-Wt 100-800)
- Ability to Implement & Enforce Ordinance
- Important to have a good Wetlands Map
 - National Wetlands Inventory
 - Soils Maps
- Tags to mark the Buffers



Reasons to protect Steep Slopes & Ridgelines



- Health and Safety
- Infrastructure
- Aesthetics
- **Water Quality**

Legal Basis in NH

- Regulating development on steep slopes is authorized under:
 - RSA 674:16, the Zoning Grant of Power
 - RSA 674:21, Innovative Land Use Controls
 - 674:21, I (j), Environmental Characteristics Zoning

Steep Slopes Model

Based on 3 Principles:

- Slope/Density Provisions
- Soil Overlays
- The Guiding Principles Approach

Why these Principles?

They reduce impacts of hillside development:

- Danger to public safety
- Expensive infrastructure
- Excessive cuts and fills
- Unattractive slope scars
- Erosion and drainage problems
- Inaccessible to Emergency Response
- **Cumulative Impact of Development**

Framework for regulating Steep Slopes and Ridgelines

Ohlshansky Principles

1. Topography
2. **Slope Stability**
3. **Drainage & Erosion**
4. Infrastructure
5. Access
6. **Aesthetics**
7. Natural Qualities
8. Fire Hazard
9. **Recreational Values**
10. Open Space

Slope Stability



- Effect of grading
- Potential for erosion/landslides

Drainage & Erosion



- Flood-prone areas
- Downstream structures
- Drainage patterns
- Soil types
- **Cumulative Impact of Development**

Aesthetics & Recreation



- Regional needs
- Trails and views
- Access points
- Symbolic peaks or hillsides
- Community values
- Map & photograph significant sites

Key Element

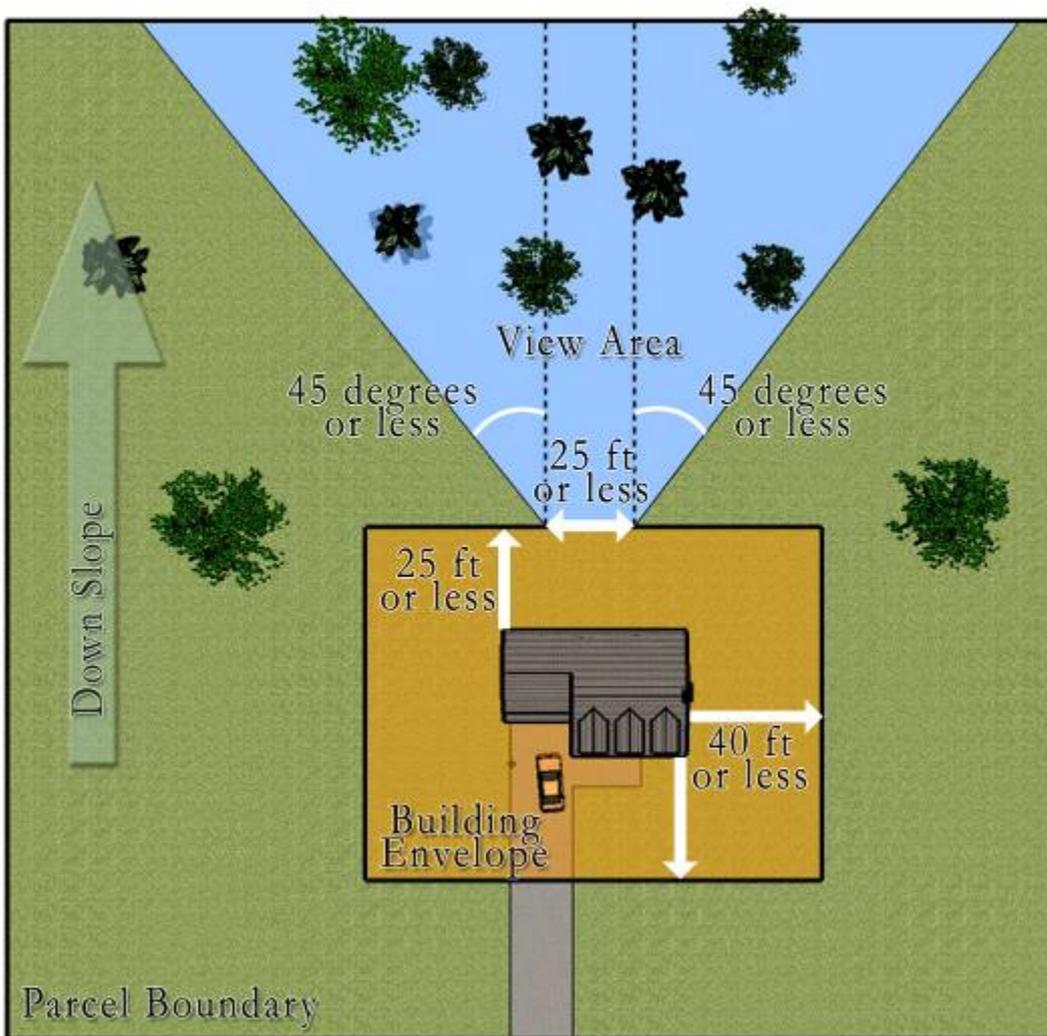
You need:

A Solid Justification for the Ordinance

Steep Slopes = Based on science and data

Ridgeline Protection/Viewshed = Based on
framework developed by the community

Steep Slopes Balance

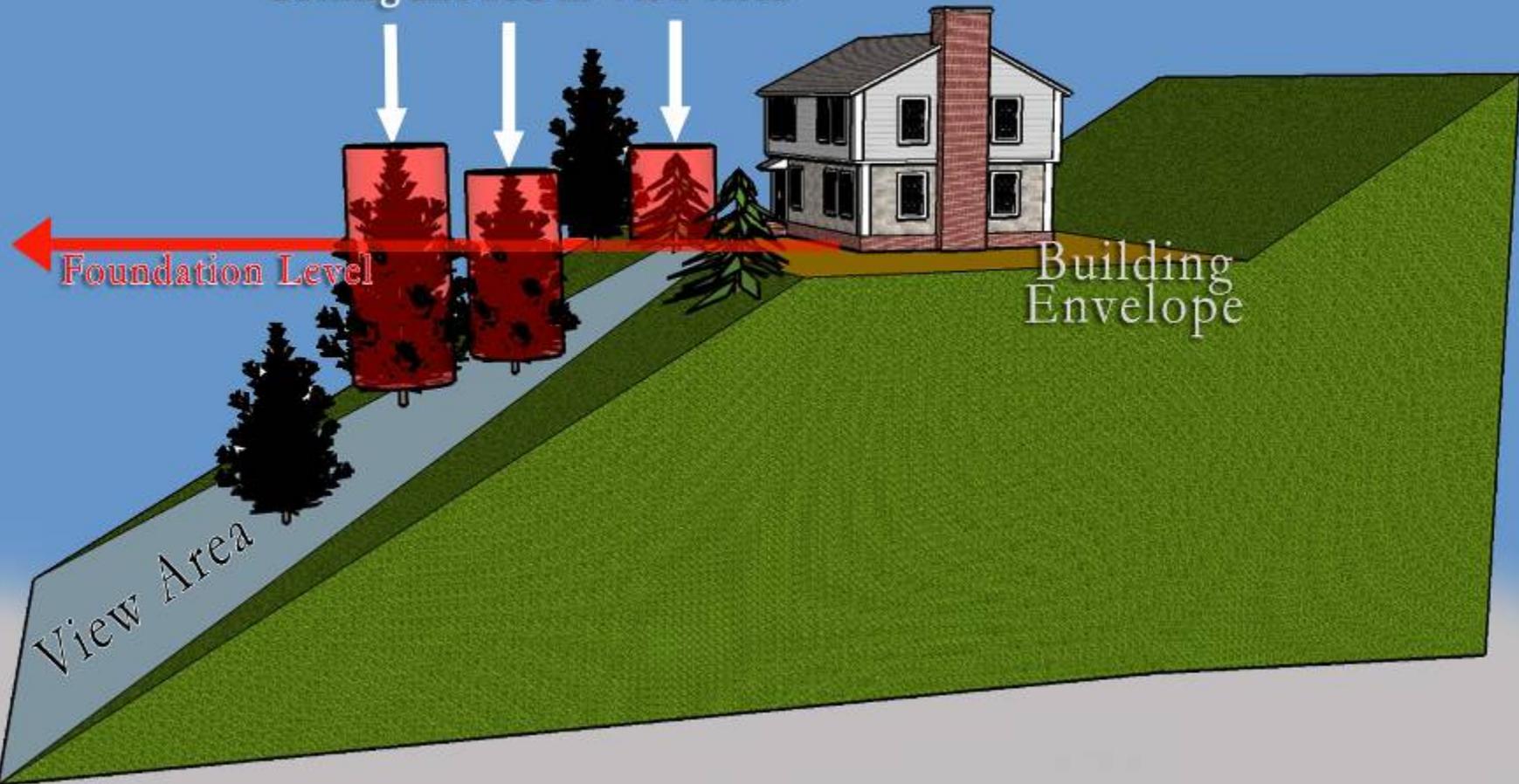


Impacts of Development

and

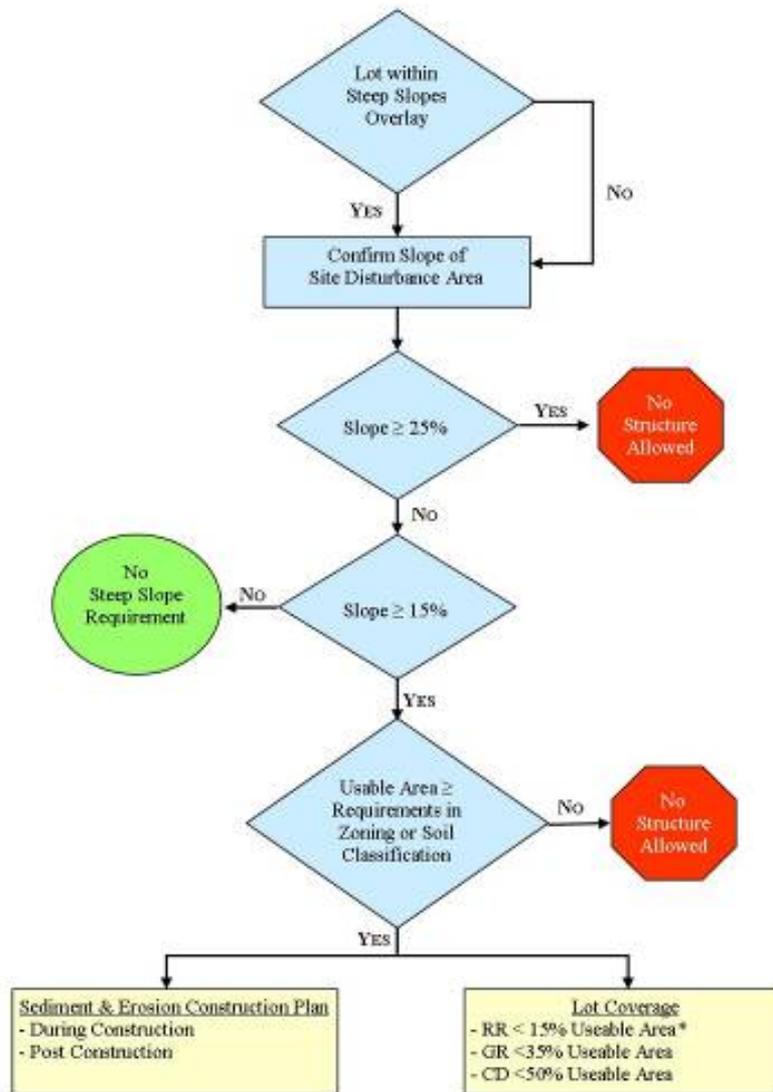
Landowner Needs

Cutting allowed in View Area



Steep Slopes Development Process & Design Requirements

Tool for Planning Boards and Applicants



*Useable Area = Total area excluding wetlands & slopes $\geq 25\%$

Development Criteria
Design Requirements

Questions?



Erica Anderson, AICP
Senior Planner
Lakes Region Planning Commission
(603) 279-8171
eanderson@lakesrpc.org

Flood Hazard Area Zoning



Photo by April-Lyn Caouette



Photo Courtesy of NHOEP

But I had insurance...



Photo by Jeff L Bruno

And...



Photo by Jeff L Bruno

The Town gave me a permit.



Photo by Matt M



Photo Courtesy of NHDES



Photo by Matt M



Photo by Matt M



Photo by Adam Franco



Photo by Jean



Photo by Tracy Lee Carroll



Photo Courtesy of NHDES

Fluvial Geomorphology

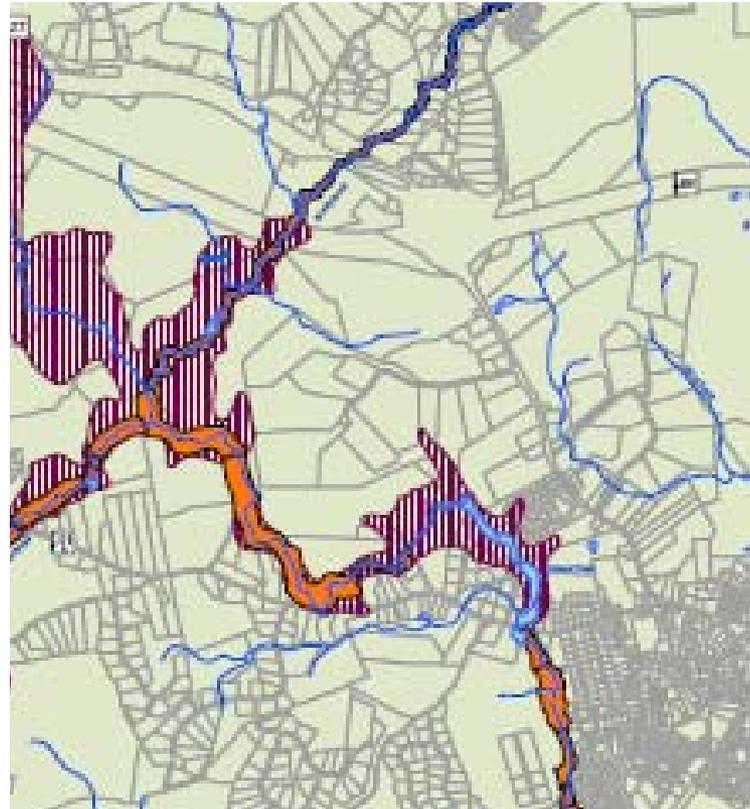




Photo by Matt M



Photo by Marc Nozell



Photo by John Martin



Photo by Matt M



Photo by Sgt Oscar Sanchez, US AF



Photo by aeminphilly



Photo by Sgt Jennifer D Atkinson



Photo Credit: National Guard



Photo by Jonathan Haugen, ND National Guard



Photo by Matt M



Photo by Wolfrage

Key Elements

- Permit compatible uses
- Prohibit certain uses
- Flexibility > Special Exceptions
- Development Standards
- Variance Requirements

Flexibility

- Additions/replacements
- Accessory structures
- One principal building if no developable land outside floodplain

Development Standards

- NFIP
- No increase in flood levels
- Freeboard
- No net loss

Variance – No increase in:

- Flood levels, flows, peaks or velocity
- Potential for flood damage to property
- Erosion/sedimentation
- Degradation of water quality
- Risk to public safety or emergency workers
- Cost to the public

Community Rating System:

- Floodplain conservation
- Higher construction standards
- Public education
- Better data
- Emergency preparedness

Global Warming

- More frequent severe storms

2006



Photo by Matt M

2007



Photo by Matt M



Photo by Ben McLeod



For more information:

Tara Bamford, North Country Council

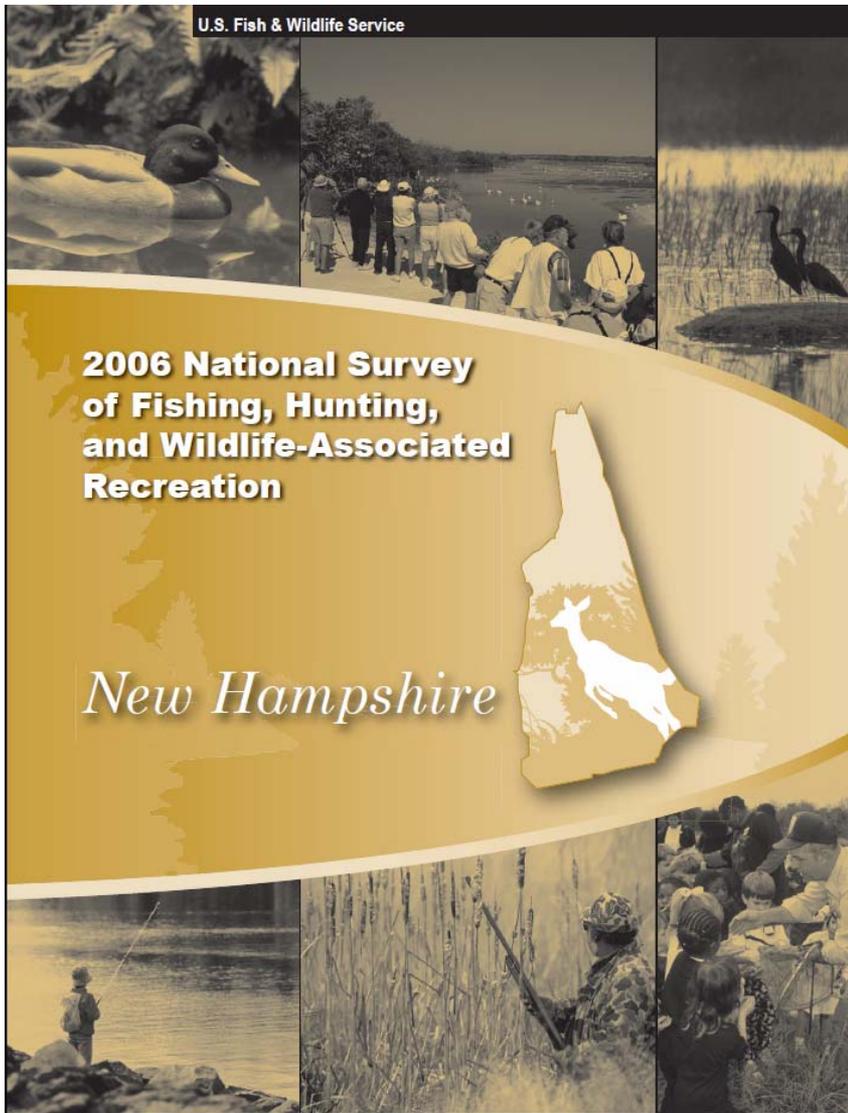
603-444-6303 or TBamford@NCCouncil.org

Habitat Protection



Public Benefits of Wildlife Habitat

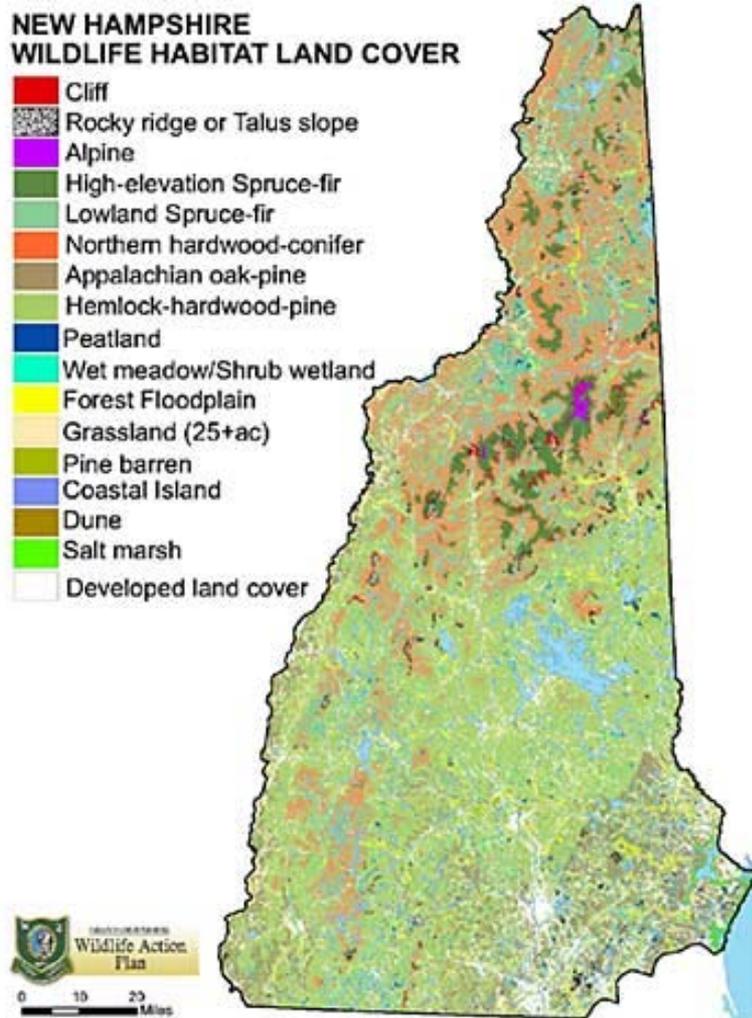
- Preservation of Rural Character
- Hunting, Fishing, and Recreational Economies
- Ecological Services
 - Flood Protection
 - Carbon Sequestration
 - Contaminant Filtration



- \$560 million spent in NH on wildlife recreation in 2006.
- Of the 839,000 participants enjoying wildlife-related activities, 85% were involved in non-consumptive wildlife watching activities.

Source: USFWS 2008

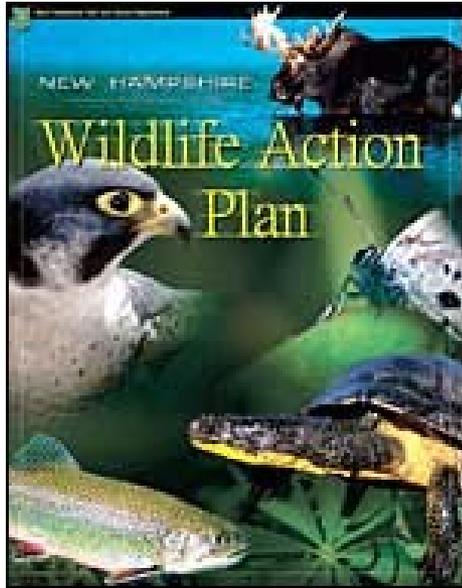
Scale of Protection



- Statewide
- Regional
- Town Master Planning
- Site Planning

Source: NHFGD

Habitat Protection Tools



Master Planning
Process:

Natural Resource
Inventory

Regulatory Measures:
Municipal Ordinance

Legal Basis in NH

- Protection of wildlife habitat authorized under:
 - RSA 674:21 Environmental Characteristics Zoning
 - RSA 674:21 Village Plan Alternative Subdivision
 - RSA 674:2 Master Plan Purpose and Description
 - RSA 674:36II(l) and (m) Subdivision Regulations
 - RSA 483-B:2 Comprehensive Shoreland Protection Act
 - RSA 483:6 Rivers Management and Protection Program

Purpose of Habitat Sensitive Design and Development

- Protect and maintain natural environment
- Provide adequate green spaces
- Provide wildlife habitat
- Minimize erosion, reduce air pollution, conserve energy, and protect groundwater
- Provide aesthetically pleasing developments
- Protect public benefits of natural habitats

Habitat Sensitive Design Goals

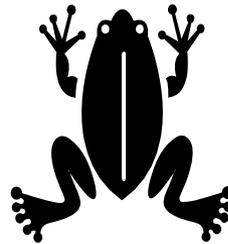
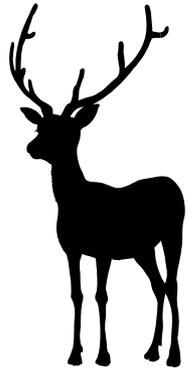
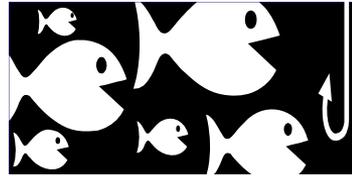
- Are **rare or outstanding features** preserved by directing development to other areas?
- Are **buffers** maintained between important habitat areas and developed areas?
- Are wildlife **movement corridors** preserved?
- Is the structure and function of **aquatic systems** preserved?
- Is clearing, grading, and compaction of **soil** during construction activities minimized?
- Is **vegetation** preserved during and after construction?
- Are features of the **local natural landscape** preserved?
- Are **human-wildlife conflicts** minimized?

Context for Use

- Educational Tool: Voluntary guidelines for developers
- Development Review Checklist: Design principles adopted by a town or board that are helpful in the planning stage.
- Zoning Ordinance: Performance standards that can be incorporated into site plan and subdivision ordinances

Ordinance Considerations

- Deer wintering areas
- Mast stands
- Riparian areas
- Vernal pools
- Wetlands



Ordinance Specifications



200 feet

Deer wintering areas



300 feet

Important mast stands



300 feet

Wetland and Riparian buffers *



400 feet

Vernal pools

Ordinance Specifications (cont.)



Avoid fragmentation of connecting areas



Mark buffers with *No cut / Do not Disturb* Vegetated Buffer Signage



Construct underpasses or tunnels at reptile, amphibian, or wildlife crossing sites



Utilize native, non-invasive landscaping species



Minimize effects on wildlife through homeowner's documents



Shield outdoor lighting and direct away from habitat areas



Questions?

**Minda Shaheen
Environmental Planner
Nashua Regional Planning
Commission
(603) 424-2240
mindas@nashuarpc.org**