

# Protocol for Assessment of Impacts of Proposed Development on Significant Wildlife Habitat in Charlotte, Vermont

The following three-part protocol is a tool for the orderly assessment of potential impacts of proposed development, taking into account information about these resources in the Town Plan and associated documents (specifically the Significant Wildlife Habitat Map and database). Impact assessment using this protocol provides important relevant information for preparation and review of subdivision and other Town permit applications.

Protocol questions are best addressed using maps, photos, site assessments *etc.* The base reference map is the Significant Wildlife Habitat Map, and the baseline reports about each area are accessed through the database associated with the map. These are available through the Town Planning and Zoning Office and Town website [www.charlottevt.com](http://www.charlottevt.com). The minimum set of background materials is: a printout of the Significant Wildlife Habitat Map for the property in question and surrounding area, and a printout of the associated database reports for that area

## Part I: General Site and Habitat Description

Significant Wildlife Habitat in Charlotte is described in four broad habitat types: forest, persistent shrubland, aquatic, and linkage (as described in the legend of the Significant Wildlife Habitat Map). The Map delineates these at a 1:5000 scale which is somewhat coarse; evaluation of specific locations may require field checking.

- A. Using a copy of the Significant Wildlife Habitat Map as a base, identify the habitat types mapped on the property and surrounding area.
- B. Based on site visits, refine the location (if necessary) and describe the condition of the above listed habitat types on the property.
- C. Overlay on the map and describe the proposed location of building envelopes, driveways, septic systems, and any other associated land disturbances connected to the development proposal.
- D. Describe recent past and current land use on the property. Map the location and indicate the timing, frequency and intensity of current land use. These may include (but are not limited to) maintenance of open areas (lawns, regularly brush-hogged meadows *etc.*), woodlot management (timber or firewood extraction, thinning, forest roads *etc.*), agricultural activities (grazing, hayfield, row crops); or other current activities.
- E. Describe anticipated changes in land use associated with the proposed development. Indicate the location, timing, frequency and intensity of the changed land use pattern, for example increases or decreases in open space maintained, recreational activity (location and intensity), fencing, or agricultural activity.

## Part II: Additional Site-Level Details

Significant Wildlife Habitat in Charlotte has been identified and mapped using a mix of remote sources (*i.e.* aerial imagery, wetlands maps, and other desktop assessments) and field-based assessments. While remote sources are generally comprehensive in their coverage, additional field-based assessments and site visits are crucial to locate many important small-scale habitats and features that are not readily interpreted from remote sources. The following set of questions provides a framework to ensure detection of these small-scale habitats and features.

- A. The database associated with the Significant Wildlife Habitat Map includes confirmed wildlife observations. List any additional wildlife or wildlife sign observed during site visits.
- B. Based on site visits, describe and map the location of any of the following small-scale habitats or features on the property. Use the Significant Wildlife Habitat Map as the base map.

**Small-Scale Habitats and Features:**

- Rare, threatened, or endangered species occurrences
  - Vernal pools
  - Seeps
  - Ephemeral or other unmapped streams
  - Forest patches or portions of forest patches that exhibit characteristics of late successional forest
  - Areas of soft or hard mast producing vegetation
  - Snags greater than 16 inches in diameter
  - Trees with exfoliating bark (primarily shagbark hickory and black locust, but may also include sugar maple and butternut) greater than 16 inches in diameter
  - Raptor nests
  - Live or dead trees greater than 16 inches in diameter with cavities or splits
  - Trees that extend above the main canopy (high perches)
  - Active or inactive dens
  - Caves, ledges, or large bedrock fissures
  - Bedrock outcrops
- C. Overlay on this map the location of the proposed building envelopes, driveways, septic systems, and any other associated land disturbances connected to the development proposal.

**Part III: Ecological Principles Involved**

Designation of an area as Significant Wildlife Habitat is based on one or more of the following seven widely acknowledged ecological principles relevant to wildlife habitat and its conservation. The database associated with the map indicates which ecological principles were detected (and how) in each mapped area<sup>1</sup>.

**Ecological Principle #1 Core Habitat: Maintain large, intact patches of native vegetation.**

The Vermont Biodiversity Project definition of core habitat<sup>2</sup> provides a clear set of physical parameters that can be used to identify areas of intact vegetation. These blocks are the limited amount of habitat in Charlotte that is generally free of anthropogenic edge effects.

- A. If the proposed development site is located in or adjacent to an area designated as significant wildlife habitat supporting Ecological Principle #1, a site assessment should address the following:
- i. On a map, overlay core habitat and the proposed location of building envelopes, driveways, septic systems, and any other associated land disturbances connected to the development proposal.
  - ii. Will the proposed development cause fragmentation or perforation of the significant wildlife habitat area?
  - iii. Will the proposed development cause increases in “edge effect” of the significant wildlife habitat area?

- iv. Are there alternate sites where development could occur on the property and/or that could minimize or mitigate impacts associated with fragmentation, perforation, or edge effects?
- v. Are there alternate site configurations that could minimize impacts associated with fragmentation, perforation, or edge effects?
- vi. Are there actions that could be taken to minimize or mitigate impacts associated with fragmentation, perforation, or edge effects?

**Ecological Principle #2 Priority Species Habitat: Protect habitats that are key the distribution and abundance of priority species (priority species and priority species habitats are based on the 2006 Vermont Wildlife Action Plan).**

The Vermont Wildlife Action Plan provides clear direction regarding conservation priority species and their associated habitats. The locations of these habitats and species are based on local field/desktop assessments, the Vermont Non-Game and Natural Heritage Program Biotics Database and the VTrans/Department of Fish and Wildlife Linkage Habitat datasets.

- B. If the proposed development site is located in or adjacent to an area designated as significant wildlife habitat supporting Ecological Principle #2, a site assessment should address the following :
  - i. On a map, overlay priority species habitats (or features associated with priority species habitats) and the proposed location of building envelopes, driveways, septic systems, and any other associated land disturbances connected to the development proposal.
  - ii. What priority species habitats are entirely and/or partially within the significant wildlife habitat area?
  - iii. How will the proposed development affect the distribution of these habitats?
  - iv. How will the proposed development affect the food, cover, water, and space associated with these habitats?
  - v. Are there alternate sites where development could occur on the property that would minimize any impacts these habitats?
  - vi. Are there alternate site configurations that would minimize any impacts on these habitats?
  - vii. Are there actions that could be taken to minimize or mitigate the impacts of development these habitats?

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<sup>1</sup> For details see *Technical Guide to Classifying, Identifying and Justifying Significant Wildlife Habitat in Charlotte, Vermont* in the Significant Wildlife Habitat database.

<sup>2</sup> The Vermont Biodiversity Project defines core habitat as areas "at least 100 meters distant from a zone of human disturbance. Human disturbance zones were defined as developed, industrial, or residential areas, agricultural openings, and roads".

**Ecological Principle # 3 Rare Landscape Features: Protect exemplary natural communities and aquatic features.**

The Vermont Nongame and Natural Heritage Program and, to a lesser degree, the Vermont Biodiversity Project, have developed rigorous criteria to evaluate and identify rare, significant and exemplary natural communities and aquatic features. The locations of these rare landscape features are generally derived from the Nongame and Natural Heritage Program Biotics database, the Vermont Biodiversity Project Exemplary Aquatic Features dataset and local assessments

If the proposed development site is located in or adjacent to an area designated as significant wildlife habitat supporting Ecological Principle #3, a site assessment should address the following:

- viii. On a map, overlay exemplary natural communities and aquatic features and the proposed location of building envelopes, driveways, septic systems, and any other associated land disturbances connected to the development proposal.
- ix. What rare natural communities or exemplary aquatic features are present in the significant wildlife habitat area?
- x. How will the proposed development directly affect these rare landscape features and any species associated with them? Direct impacts may include, but are not limited to, land clearing and conversion; habitat perforation and fragmentation; disruption of hydrologic flow regimes; or alteration of species composition and structure.
- xi. How will the proposed development indirectly affect these rare landscape elements and any species associated with them? Indirect impacts may include, but are not limited to, altered water quantity and quality flowing in and out of the unit; increased noise, air and light pollution; increased area of impermeable surfaces adjacent to the unit; decrease in predators that may limit prey populations; additional human use, increased presence of domestic animals (including pets) use of an area, or increased presence of exotics adjacent to the unit.
- xii. Are there alternate sites where development could occur on the property that would minimize any impacts on rare landscape features and any species associated with them?
- xiii. Are there alternate site configurations that would minimize any impacts on rare landscape features and any species associated with them?
- xiv. Are there actions that could be taken to minimize or mitigate the impacts of development on the rare landscape features and any species associated with them?

**Ecological Principle #4 Connectivity: Maintain connections among wildlife habitats for movement and gene flow.**

In Charlotte, there have been multiple studies identifying movement corridors and other important elements of habitat connectivity. These studies take one of two forms: predictive studies where physical parameters, such as housing and road density, forest cover, and land use are analyzed to identify areas that represent a significant barrier to wildlife movement and areas that are relatively free of those barriers; or observation studies where actual wildlife movement or signs of are analyzed to identify concentrated movement areas. The location of these connectivity elements are based on tracking data gathered by the Lewis Creek Association, the Lewis Creek and LaPlatte River contiguous habitat study conducted by the Vermont Department of Fish and Wildlife<sup>3</sup>, and bobcat movement data gathered by the University of Vermont and Vermont Department of Fish and Wildlife as part of the Champlain Valley bobcat study<sup>4</sup>.

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<sup>3</sup> Contiguous Wildlife Habitat – Lewis Creek and LaPlatte River Watershed Region: Landscape Level Identification of Contiguous Wildlife Habitat and Connecting Corridors for the Lewis Creek and LaPlatte River Watersheds and Adjoining Lands (Royar et al., 2003).

<sup>4</sup> An Evaluation of Bobcat Habitat Use and Movements in Northwestern and Central Vermont.

- C. If the proposed development site is located in or adjacent to an area designated as significant wildlife habitat supporting Ecological Principle #4, a site assessment should address the following:
- i. On a map, overlay elements of connectivity and the proposed location of building envelopes, driveways, septic systems, and any other associated land disturbances connected to the development proposal.
  - ii. What species (consider mammals, birds and herpetofauna) use or could use the movement corridor(s) or other elements of connectivity represented in the significant wildlife habitat area?
  - iii. How would the proposed development affect the movement of those species?
  - iv. How would the proposed development affect the quality of the movement corridor, or linkage habitat?
  - v. Are there alternate sites where development could occur on the property that would minimize the impacts on the movement corridor and/or habitat connectivity?
  - vi. Are there alternate sites configurations that would minimize the impacts on the movement corridor and/or habitat connectivity?
  - vii. Are there actions that could be taken to minimize or mitigate the impacts of development on the movement corridor and/or habitat connectivity?

**Ecological Principle #5 Maintenance of Ecological Processes: Maintain significant ecological processes, such as wetlands and floodplains recharging groundwater and filtering surface water.**

Ecological processes are important for creation, maintenance and viability of wildlife habitats, but few processes are readily mapped and even fewer have been well documented in Charlotte. To date, the locations of the documented processes are based on the Charlotte Wetlands Inventory, ANR Groundwater and Source Protection Areas, Vermont Hydrography Dataset, FEMA Flood Prone Areas, local geomorphic assessments, and local interpretations of riparian forest cover and elevation.

- D. If the proposed development site is located in or adjacent to an area designated as significant wildlife habitat supporting Ecological Principle #5, a site assessment should address the following:
- i. On a map, overlay documented ecological processes (or the features that support those processes) and the proposed location of building envelopes, driveways, septic systems, and any other associated land disturbances connected to the development proposal.
  - ii. What ecological processes and services (habitat creation, water quality improvement, nutrient cycling) are currently supported by, or have the ability to occur within the current significant wildlife habitat polygon and what wildlife species rely on these processes?
  - iii. How would the proposed development affect these ecological processes and services?
  - iv. Are there alternate sites where development could occur on the property that would minimize impacts on these processes and the wildlife species associated with them?
  - v. Are there alternate site configurations that would minimize impacts on these processes and the wildlife species associated with them?
  - vi. Are there actions that could be taken to minimize or mitigate the impacts of development on these processes and services and the wildlife species associated with them?

**Ecological Principle #6 Rare Species Protection: Contribute to the regional persistence of rare species by protecting their habitat and occurrences locally**

The Federal Endangered Species Act and the national network of natural heritage programs have developed rigorous criteria to evaluate and identify rare species. The location of these species are based on the Vermont Nongame and Natural Heritage Program Biotics database, which draws on, but sometimes may lag behind, information collected by Fish and Wildlife staff, the Vermont Breeding Bird Atlas, the Vermont Reptile and Amphibian Atlas, and local assessments.

- E. If the proposed development site is located in or adjacent to an area designated as significant wildlife habitat supporting Ecological Principle #6, a site assessment should address the following:
- i. On a map, overlay documented rare species occurrences and the proposed location of building envelopes, driveways, septic systems, and any other associated land disturbances connected to the development proposal.
  - ii. What rare species at the state or regional scale are supported by the significant wildlife habitat area?
  - iii. What is the global, state, and regional distribution of these species and their associated habitat?
  - iv. Are there portions of the significant habitat area that may play a greater role in supporting the species presence?
  - v. How would the proposed development affect the habitat of these species?
  - vi. Are there alternate sites where development could occur on the property that would minimize impacts on these habitats and the species associated with them?
  - vii. Are there alternate site configurations that would minimize impacts on these habitats and the species associated with them?
  - viii. Are there actions that could be taken to minimize or mitigate the impacts of development on these habitats and the species associated with them?

**Ecological Principle #7 Representation: Ensure that the full range of native biological diversity is maintained by protecting a representation of all ecosystems found in Charlotte and the greater Champlain Valley.**

Analysis conducted during the 2006-08 Charlotte Significant Wildlife Habitat Map Update Project revealed that ecosystems found on the Glacial Lake/Marine Plain and the Gently Rolling (till-derived) Hill Land Type Associations are poorly represented in Charlotte<sup>5</sup>. While the Glacial Lake/Marine Plain and the Gently Rolling (till-derived) Hill Land Type Associations cover 73% and 9% of the Town, respectively, they have very limited natural/semi-natural vegetation cover at this time. In Charlotte, the locations of these Land Type Associations are based on a Champlain Valley-wide mapping effort conducted by The Nature Conservancy and should, therefore, be supplemented with a few site-specific considerations during use of this protocol.

- F. If the proposed development site is located in or adjacent to an area designated as significant wildlife habitat supporting Ecological Principle #7, a site assessment should address the following:
- i. On a map, overlay poorly represented land type associations (or the features associated with the land type associations) and the proposed location of building envelopes, driveways, septic systems, and any other associated land disturbances connected to the development proposal.
  - ii. Based on the Champlain Valley-wide dataset, what poorly-represented Land Type Associations are present in the significant wildlife habitat area?
  - iii. Based on site-specific considerations, does the proposed development involve clearing or impacting natural/semi-natural vegetation cover on:

- a. Attributes associated with the Glacial Lake/Marine Plain Land Type Association: All soils of Glacio-lacustrine parent material. In Charlotte, this includes Vergennes, Covington, Livingston, Belgrade, Eldridge, Enosburg, Whatley, Hinesburg, Munson, and Scantic soils.
  - b. Attributes associated with the Gently Rolling (till-derived) Hills: Soils of till parent material on gently sloping terrain (less than 25% slope) without extensive outcrops and generally greater than 20 inches to bedrock. These attributes are most easily recognized as, but not limited to, till-derived soils with a prime agriculture classification. In Charlotte this can include Stockbridge, Nellis, Palantine, Georgia, Massena and deeper units of Farmington soils.
- iv. How would the proposed development affect vegetation cover on the poorly represented Land Type Associations?
  - v. Are there alternate sites where development could occur on the property that would minimize any impacts to natural/semi-natural vegetation cover on the poorly represented Land Type Associations?
  - vi. Are there additional actions that would minimize or mitigate any impacts to natural/semi-natural vegetation cover on the poorly represented Land Type Associations?

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<sup>5</sup> Analysis conducted using Land Type Associations described by Ferree and Thompson (in progress). Land Type Associations are ecological groupings of land units based on similarities in geomorphic process, geologic rock types, soil complexes, stream types, lakes, wetlands, and natural vegetation (National Hierarchical Framework of Ecological Units, 1997).

# Charlotte Forest Habitat Report

Site Code

Acres

Field Checkers

Desktop Assessment By  Last Visit Date

Habitat Type  Site Name

Site Location

Other Information Sources

Other Information Sources Continued

## Habitat Description

Dominant Cover Type

- | Wetlands                       | ☐ |
|--------------------------------|---|
| RedMaple-BlackAshSwamp         | ☐ |
| RedOrSilverMaple-GreenAshSwamp | ☐ |
| WoodlandSeep                   | ☐ |
| VernalWoodlandPool             | ☐ |
| ShrubSwamp                     | ☐ |
| WetClayplain                   | ☐ |
| ShallowEmergentMarsh           | ☐ |
| CattailMarsh                   | ☐ |
| DeepBroadleafMarsh             | ☐ |
| DeepBulrushMarsh               | ☐ |
| SedgeMeadow                    | ☐ |
| RiverineFloodplainForest       | ☐ |
| HemlockSwamp                   | ☐ |
| NorthernWhiteCedarSwamp        | ☐ |
| LakeSideFloodplainForest       | ☐ |

- | Forest Communities         | ☐ |
|----------------------------|---|
| NorthernHardwood           | ☐ |
| RichNorthernHardwood       | ☐ |
| RedOakNorthernHardwood     | ☐ |
| MesicMapleAshOakHickory    | ☐ |
| DryOakHickoryHophornbeam   | ☐ |
| Hemlock                    | ☐ |
| WhitePine-NorthernHardwood | ☐ |
| DryOakForest/Woodland      | ☐ |
| RedPineForest/Woodland     | ☐ |
| MesicClayplain             | ☐ |
| HemlockNorthernHardwood    | ☐ |
| SandOverClay-Clayplain     | ☐ |

- | Rocky Communities                | ☐ |
|----------------------------------|---|
| ShaleTalus                       | ☐ |
| TemperateOutcrop                 | ☐ |
| TemperateCliff                   | ☐ |
| NorthernHardwoodTalusWoodland    | ☐ |
| TransitionHardwoodsTalusWoodland | ☐ |
| RiversideOutcrop                 | ☐ |
| LakeBluffCedar-PineForest        | ☐ |

- | Lakeside or Rivershore Communities | ☐ |
|------------------------------------|---|
| LakeOrRiverSandBeach               | ☐ |
| LakeOrRiverShale/CobbleBeach       | ☐ |
| LakeOrRiverShoreGrassland          | ☐ |
| RiverMudShore                      | ☐ |
| RiversideSeep                      | ☐ |

- | Cultural Vegetation                 | ☐ |
|-------------------------------------|---|
| White Pine                          | ☐ |
| Early Successional Hardwoods Forest | ☐ |
| Early Successional Cedar            | ☐ |
| Exotic Plantings                    | ☐ |
| Buckthorn                           | ☐ |
| Orchard                             | ☐ |
| Pasture                             | ☐ |
| Crop Field                          | ☐ |

Vegetation Comments

Vegetation Continued



# Charlotte Forest Habitat Report

## Ecological Principles For Detection of Significant Habitat

*Core Habitat*

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*Priority Species Habitat*

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*Rare Landscape Feature*

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*Connectivity*

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*Ecological Process*

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*Rare Species Protection*

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*Representation*

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## Wildlife Findings

*Reported Wildlife*

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*Reported Wildlife Cont*

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*Confirmed Wildlife*

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*Confirmed Wildlife Cont*

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Site Code

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