Wildlife Inventory and Habitat Analysis
of Plouffe Lane Natural Area

Prepared for the Charlotte Conservation Commission

May, 2005

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Introduction

The Town of Charlotte is perched between the foothills of the Green Mountains and Lake Champlain where low ridges and rolling terrain create small watersheds rich with meandering streams and wetlands. As such, the town boasts a wide diversity of wildlife utilizing these wetlands and corridors as places to feed and rear young. Mink and otters seek out prey such as steelhead, leopard frogs and young mallards. Mammals with larger home ranges such as bear and moose also come down from the mountains to the Champlain Valley to eat early spring shoots and buds. The Plouffe Lane Natural Area, which contains a beautiful hemlock-lined stretch of the LaPlatte River, fits into this regional context by providing habitat features for many of Vermont’s native species.

Plouffe Lane Natural Area is a 75.5 acre town owned property located off Carpenter Road in the Northeast corner of the Town of Charlotte. The regional bedrock is Shelburne Marble and on the site it is overlain by ice proximal sediments (deposited by the receding glacier ~ 13,000 years ago) grading from cobble and gravel to fine sands and clays. These sediments set the stage for the human land use that followed, including commercial extraction of sand and gravel and the filling and capping of the old landfill. When the Town of Shelburne bought the property from the Plouffe family in 1965, gravel extraction had been going on for a number of years. At this time, the Plouffe family was given a lease to continue to extract gravel and timber from the property. The Town of Charlotte bought the property in 1985 and operated a landfill there until 1993.

Today the site contains a diverse mosaic of habitats and natural communities. Based on wildlife patterns and specific habitat features, we found it useful to divide the site into 5 habitat types (Figure 1): LaPlatte River and River Corridor, Hemlock Forest, Field/Shrubland, Rich Northern Hardwood Forest (early successional), Gravel Pit and Landfill Area (topographically altered with heavy human impact). Additionally, we considered natural community designations as they relate to vegetation patterns on the site. We found 3 natural communities: Rich Northern Hardwood Forest, Hemlock Forest and Rivershore Grassland.
Currently the Charlotte Conservation Commission and the Trails Committee are exploring alternative uses that make the most of the natural features and rewilding of this property including the establishment of recreational trails. Our role in this process has been to assess the wildlife habitat, natural communities and ecological values of the site and formulate initial management recommendations.

Figure 1: Habitat types of Plouffe Lane Natural Area
Topography

The Plouffe Lane Natural Area varies in elevation from to 260 feet to 370 feet. Much of this change occurs precipitously along the river’s edge. From a trails perspective, steep riverside slopes and a fragile knife ridge are very vulnerable to erosion. Where the marble bedrock is exposed to the west of the landfill, trails may increase the size of these exposed outcrops as traffic removes mosses and grasses. Otherwise, the sandy, gravelly substrate seems well suited to foot and even bike traffic. Additionally, the predominance of well-drained soils will minimize issues related to wet and muddy trails.

Flora

The Plouffe Lane Natural Area is a dynamic mosaic of natural communities, where calcium rich bedrock and soils and a long history of disturbance (windthrow, beaver, floods, ice scour, logging, and gravel extraction) set the stage for a diverse flora. In the northwestern part of the property, a field is giving way to a shrubland as quaking aspen, raspberry bushes and sumac creating an ecotone between the young Rich Northern Hardwoods Forest and the field of goldenrod, queen anne’s lace and milkweed. This shrubland habitat has the potential to provide habitat for shrubland songbirds which are declining throughout the Northeast.
The Rich Northern Hardwood stands have spring ephemerals like trillium, wild leeks, and blue cohosh. The steep riverbanks are shaded by Hemlock Forests that grow right to the river’s edge in certain areas. Along the river, Rivershore Grasslands are transitioning toward Floodplain Forests as ostrich ferns and spring ephemerals colonize the more tranquil bankside edges. Rare members of the Rivershore Grassland Communities could include: obedience (Physostegia virginiana), great St. John’s-wort (Hypericum pyramidatum), Canada burnet (Sanguisorba canadensis), wild chives (Allium schoenoprasum). If trails are designed to drop down to the river’s edge, additional searches to determine the presence, location and abundance of these species may be in order.

Additionally, protection of this riverside vegetation creates a buffer which provides certain ecological functions including run-off and stream filtration (which improve water quality downstream) and needed habitat connectivity for many wildlife species.

**Wildlife**

Exploring a landscape through multiple seasons provides an opportunity to view animal behavior and habitat use as it shifts through time. Between January and May, 2005 we visited Plouffe Lane Natural Area 10 times to inventory and document mammal, herpetofauna and bird species. Broadly speaking, we found that the river corridor experiences the heaviest use by the greatest number of both mammal and amphibian species throughout the seasons, while bird species seem to be spread more evenly throughout the site.

Also of interest is the regional context where wild (undeveloped) stretches of river shore are uncommon. Many agricultural fields and personal residences encroach upon the river’s edge.
Mammals

The winter months offered an intimate and in depth look into the lives of many of Vermont's mammal species. The snow-covered landscape provided a wonderful canvas for wildlife stories, including a group of coyotes who regularly travel the LaPlatte River corridor, male and female mink traveling together along the riverbank engaged in courtship rituals, and two skunks cached in the snow presumably by a great horned owl. We documented the presence of 22 mammal species including moose, mink, and beaver (see Appendix A for a complete list and additional information). Additionally, we documented the presence of a coyote den in the upland hardwoods, as well as, a well-used river otter crossing in the uplands. The LaPlatte River is a central habitat feature of this site – providing food, water, a travel corridor, and sometimes shelter for many of the mammals utilizing this area. Similar sized patches of forest in the Champlain Valley without a river running through them generally lack the diversity and density of species seen here.

Herpetofauna

As spring arrived in Charlotte, we expanded our exploration to include the reemerging herpetofauna. To inventory amphibians, we relied on active searches, egg-mass searches, and vocalizations. We concentrated our search along the LaPlatte and surrounding upland forest areas. In addition, previous explorations of the site suggested the possibility of upland vernal pools based on wetland...
vegetation and topography. However, due to the surficial characteristics of the site including sand and gravel substrate and shallow to bedrock soil depth, all upland pools dried out by mid-April and could not support breeding populations of amphibian species. Despite the lack of vernal pools on site, the LaPlatte River provides breeding habitat for Green Frogs, Leopard Frogs, American Toads, Dusky Salamanders, Two-lined Salamanders (and potentially American Bullfrogs and Gray Treefrogs though they were not seen or heard as of late May). The upland forest also provides habitat for Red-backed salamanders and the surrounding open areas could be great habitat for various snake species.

**Birds**

An ideal bird inventory would cover the month of June in order to fully document the nesting bird species. However, our spring inventory suggests that the mosaic of habitats present at Plouffe Lane Natural Area hosts a broad range of bird species from those associated with wet shrublands (Yellow Warbler and Common Yellowthroat) to rocky grassland (Killdeer) to hemlock forests (Black-throated Green Warbler, Blackburnian Warbler). See Appendix B for a list of bird species present.
Trails Discussion

The Plouffe Lane Natural Area contains many areas suitable for recreational trails. A long history of human land use has altered the natural character of over a fifth of the site in such a way that trails would create little additional impact. Also, roadbeds from logging and gravel extraction criss-cross certain areas. However, the wildest part of the site – the LaPlatte River and River Corridor – is the most beautiful and vulnerable feature.

In assessing the appropriateness and vulnerability of different potential trail routes, we have tried to consider the level of impact on different areas within the site taking into consideration erosion potential, wildlife use and rare flora. The following is an attempt to broadly rank the impacts of potential trails on different areas of the site according to the above criteria in descending order from least vulnerable to most vulnerable.

Areas Where Trails Would Create the Lowest Impact

The Gravel Pit and Landfill Area

Years of human disturbance combined with sandy and gravelly soils make these areas the lowest impact sites from an ecological perspective.

The Field/Shrubland

The edges where raspberry is growing in is excellent habitat for certain shrubland bird species (common yellowthroat, chestnut-sided warbler). Trails will have the least impact if they can be routed away from these areas.

Rich Northern Hardwood Forest

Well-drained substrate, existing roadbeds, and gentle slopes will minimize impacts in these areas.

Areas Where Trails Could Create a Higher Impact

Hemlock Forest

The steepness of many of these slopes (averaging > 30% grade and ranging up to sheer drops to the river) poses serious questions about erosion of topsoil.
Additionally, beaver, mink, coyote, deer, and otter range into these riverside forests on a regular basis. Running trails along the river poses the risk of disturbing and/or displacing these mammals.

LaPlatte River and River Corridor

The river poses a trail paradox – while trails down to and along the river pose the greatest erosional risk, would intrude on the wildest part of the landscape, have the greatest potential to displace mammals and may impact on rare plants – the river is one of the most beautiful features on the site.
Conclusion

The Plouffe Lane Natural Area is a place that begs the question of first impressions. Beyond the history of human disturbance – the brush piles, the gravel pit, the logging, and the landfill – is a site that is rich in both ecological and aesthetic value. The LaPlatte River Corridor offers the magic of close encounters with beavers and unfolding stories of coyote mischief. Hemlock Forests sweep gracefully down to the water. Maiden Hair Fern unfurls in the understory of the Rich Northern Hardwoods. The Town of Charlotte owns a landscape full of possibilities for human recreation, reconnection and education, as well as a place for wild plants and animals to thrive. It has been a pleasure to be part of a larger effort to respect and celebrate the landscape in the context of designing trails for this property. It is our hope that this report will provide the Conservation Commission and the Trails Committee with a strong foundation from which they might continue to make decisions that strike a balance between the human impacts on the landscape and the ecological functions and health of the inhabitants of the site itself.
Appendix A: Mammal Species Recorded at Plouffe Lane Natural Area

- Shrew spp.
- Hairy-tailed Mole (killed by Eastern Coyote)
- Eastern Coyote (group of 4 pass through in regular intervals, den found along northern edge of property)
- Domestic Dog (daily concentrated usage of southwestern portion of dump – sighted domestic dog scat with wild mammal hair)
- Fisher
- Long-tailed Weasel
- Mink (heavy daily usage of river corridor)
- River Otter (presence recorded on over half of our visits – using river corridor and upland trail)
- Striped Skunk (possible winter den site nearby – two killed likely by a Great Horned Owl)
- Raccoon (using river corridor)
- Bobcat (though we did not find tracks or sign, Greg Beldock told us a story of his dogs chasing off a bobcat just at the edge of the property)
- Domestic Cat
- White-tailed Deer (limited usage in the winter – more tracks and sign seen in spring)
- Moose (along southern edge of property)
- Beaver (lodge exists on site in riverbank)
- Eastern Chipmunk
- Red Squirrel
- Gray Squirrel
- Deer and/or White-footed Mouse spp.
- Red-backed Vole
- Meadow Vole
- Muskrat
- Eastern Cottontail (heavy usage of early succession shrubland – cottontail remains found – likely killed by Red-tailed Hawk)
# Appendix B: Bird Species Recorded at Plouffe Lane Natural Area

<table>
<thead>
<tr>
<th>Great Blue Heron (fly over)</th>
<th>Tufted Titmouse (likely nesting)</th>
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<tbody>
<tr>
<td>Mallard</td>
<td>Red-breasted Nuthatch (likely nesting)</td>
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<tr>
<td>Common Merganser</td>
<td>White-breasted Nuthatch (likely nesting)</td>
</tr>
<tr>
<td>Turkey Vulture (fly over)</td>
<td>Brown Creeper (likely nesting)</td>
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<tr>
<td>Cooper's Hawk (fly over)</td>
<td>Golden-crowned Kinglet (possible nesting)</td>
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<tr>
<td>Northern Goshawk (fly over)</td>
<td>Ruby-crowned Kinglet (in migration)</td>
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<tr>
<td>Red-shouldered Hawk (fly over)</td>
<td>Veery (possible nesting)</td>
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<tr>
<td>Broad-winged Hawk (fly over)</td>
<td>Hermit Thrush (possible nesting)</td>
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<tr>
<td>Red-tailed Hawk (active hunting)</td>
<td>Wood Thrush (possible nesting)</td>
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<tr>
<td>Peregrine Falcon (fly over)</td>
<td>American Robin (likely nesting)</td>
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<td>Ruffed Grouse (drumming)</td>
<td>Gray Catbird (nesting)</td>
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<td>Wild Turkey (possible nesting)</td>
<td>European Starling</td>
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<td>Killdeer (nesting)</td>
<td>Cedar Waxwing (winter feeding)</td>
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<td>Sandpiper sp. (in migration)</td>
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<td>Herring Gull</td>
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<td>Rock Pigeon (fly over)</td>
<td>Magnolia Warbler (possible nesting)</td>
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<td>Mourning Dove (likely nesting)</td>
<td>Black-throated Green Warbler (possible nesting)</td>
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<td>Great Horned Owl (active hunting)</td>
<td>Blackburnian Warbler (possible nesting)</td>
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<td>Belted Kingfisher (likely nesting)</td>
<td>Black-and-white Warbler (possible nesting)</td>
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<td>Common Yellowthroat (likely nesting)</td>
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<td>White-throated Sparrow (in migration)</td>
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<td>Northern Cardinal (likely nesting)</td>
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<td>Blue Jay (likely nesting)</td>
<td>Baltimore Oriole (possible nesting)</td>
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<td>American Crow</td>
<td>House Finch (possible nesting)</td>
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<td>Common Raven</td>
<td>American Goldfinch (possible nesting)</td>
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<td>Bank Swallow (nesting)</td>
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<tr>
<td>Black-capped Chickadee (nesting)</td>
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Appendix C: Minimizing Impacts on Wildlife


**Harassment**
Harassment is the most common impact that recreational activities impose on wildlife populations. The Endangered Species Act of 1973 defines harassment as “An intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, feeding or sheltering.” While “annoying” an animal may not sound like a serious concern, the stress caused by disrupting normal behavior patterns in animals can be serious enough to threaten an animal’s survival. Often habitat is affected simply by the placement of trails. Recreational uses localize activity around existing trail systems. Therefore, trail design that does not take wildlife habitat into account can indirectly impact wildlife populations. For example, if high-use trails are routed near critical habitat features, the frequent, high-intensity harassment resulting from trail traffic may force wildlife to abandon a limited resource. On the other hand, well-designed trails keep traffic away from wildlife or habitat that is especially sensitive to harassment and provide transportation corridors to larger animals.

**Harassment and Dogs**
Dogs off-leash create perhaps the most damaging form of harassment. One study on mountain sheep showed that a human with a domestic dog inflicted twice as much physiological stress as a human alone (MacArthur, Geist, and Johnston 1982 cited Liddle 1997 p.461). When allowed off-leash to track and pursue wild animals beyond the trail corridor, dogs can generate significant levels of wildlife harassment.

**Harassment and Winter Recreation**
Recreational activities such as skiing, snowshoeing and snowmobiling are particularly dangerous to wildlife because they take place during the winter when the balance of energy is all the more precarious for an animal. All winter recreational activities provide an impact on small mammals that live under the snow layer such as mice, voles and shrews. The compaction of snow created by winter recreation traffic diminishes its critical role as insulator for these species, and often creates a barrier between the burrowing animal and a valuable resource, such as water.

**References**