



GOVE ENVIRONMENTAL SERVICES, INC.
AGENT

NATURAL RESOURCES PLAN
for
PROPOSED RESIDENTIAL SUBDIVISION

19 Watson Road
Map 336 Lot 26
Exeter, NH

August 19, 2021

Prepared By

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BASELINE DOCUMENTATION REPORT_LCHIP

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1.0 Introduction

The following document has been prepared in support of a proposed 12 lot subdivision located at 19 Watson Road, Map 33 Lot 26. This report is intended to meet the requirements of a Natural Resource Plan under Section 9.8.1 of the Exeter Site and Subdivision Regulations. The proposed subdivision will utilize approximately 24 acres of the approximately 98-acre lot with the remainder being designated as open space. Figures 1 and 2 depict the location and setting of the development area and the larger property. The following sections detail the natural resources present on the property and the relation to the proposed development. All figures referenced in the text are included in Appendix A. Appendix B includes several photographs of the property.

2.0 Natural Resources Present on the Site

The 98-acre property is an undeveloped and largely intact forest block containing a mix of uplands, small discrete wetlands, and a larger wetland system, a portion of which is a Prime Wetland. There are no structures or other types of development on the property. The only recognizable disturbance is a number of trails and small openings that appear to be the result of logging. Though logging apparently occurred across the site, it also appears to have been done in a selective and careful manner since the overall character of the site remains that of a largely intact mature forest. The following sections detail the natural resources present on the property and, when applicable, where they exist.

2.1 Topography and Soils

Topography of the property is complex with numerous, and sometimes steep grade changes, which results in a landscape of small hills, ridges, and basins which contain most of the wetland areas. Lower elevations and shallow grades generally exist only within the first 100-200 feet of the western end of the property along Watson Road. Elevations rise steeply to the east by approximately 40 feet to an area roughly in the middle of the site where topography is gentler. Further east, topography is more varied and steeper as overall elevation falls until reaching the large wetland complex that occupies the eastern end of the property. Similar to many nearby areas in Exeter, numerous boulders and apparent ledge outcrops are visible throughout the property.

A Site Specific Soil Map was prepared for the property as part of the State of NH Alteration of Terrain Permit application. Soils in the upland areas of the site were predominantly mapped as belonging to one of two *complexes* in which individual soil series are so closely intermingled that they are mapped together. These are the *Chatfield – Canton Complex* which occupies the steeper slopes on the property and *Chatfield*

Variant – Newfields Complex which occupies somewhat shallower slopes. The soils in these complexes range from moderately-well-drained to somewhat-excessively-drained. Timakwa and Scarboro muck, both of which are very poorly drained soils, were mapped within the largest wetlands on the property as well as some of wetland occupying the deepest basins within the sites varied topography. The soil in the wetlands occupying shallower basins which are not continually saturated or ponded were mapped as poorly drained Leicester soil series. The wetlands are described in more detail in Section 2.3.

Other than the very poorly drained soils, the majority soils on site are classified by the NRCS as Group 1B Forest soils. This Forrest Soil Group is only moderately less productive than Group 1A soils for tree growth, with succession trending toward hardwood growth stands. NRCS mapping indicates an area of Canton Fine Sandy Loam which is Farmland soil of Local Importance. However, the more detailed soil mapping indicates that the Canton soil series exists in a complex with Chatfield and is extremely rocky. The rockiness of the soil and highly variable topography on the property would almost certainly preclude agricultural use of the land.

2.2 Uplands

The upland areas of the property are wooded, predominantly by Appalachian Oak-Pine forest. This is among the most common type of forest in New Hampshire and also ubiquitous in Exeter. The dominant trees on the site are Red Oak (*Quercus rubra*), White Oak (*Quercus alba*), and eastern white pine (*Pinus strobus*). Lesser amounts of other hardwoods such as America beech (*Fagus grandifolia*), Black Birch (*Betula lenta*), Black Oak (*Quercus velutina*), and Red Maple (*Acer rubrum*) are distributed throughout the forest. Trees are mature but not particularly large or noteworthy. Most trees observed during site investigations appear to be less than 24-inches diameter at breast height (dbh). Very few trees, mostly White Pine and Red Oak, were observed with dbh approaching or exceeding 30-inches.

Sapling individuals of the primary tree species, Witch-hazel (*Hamamelis virginiana*), and Black Huckleberry (*Gaylussacia baccata*), are the prominent species making up a generally light understory. Prominent ground cover and herbaceous species include Lowbush Blueberry (*Vaccinium angustifolium*), Sheep Laurel (*Kalmia angustifolia*), Wintergreen (*Gaultheria procumbens*), Bracken Fern (*Pteridium aquilinum*), and Pennsylvania Sedge (*Carex pensylvanica*).

Limited areas of the site can be characterized as early successional, resulting from logging operations or other past disturbances. These areas are populated with pioneer species such as gray birch (*Betula populifolia*), Aspen (*Populus tremula*), and Raspberry/Blackberry bramble.

2.3 Watersheds

The entire property ultimately lies within the Exeter River watershed but drains through two different sub-watersheds. Most of the property drains to the Exeter River “proper” via the Little River—Scamen Brook sub-watershed. A small portion of the property in the southwest corner lies within the Squamscott River sub-watershed and drains to the Squamscott River via Norris Brook. The two sub-watersheds are depicted on Figure 3.

2.4 Wetland Resources

There are significant wetland resources on the property, ranging from small isolated vernal pools to a large marsh, shrub, and forested wetland complex. Figure 4 depicts these areas and the proposed subdivision. The most prominent wetland lies at the eastern end of the property and occupies approximately one quarter of the total area of the lot. This large wetland is a complex of emergent marsh (PEM1Fh) and scrub shrub (PSS1Eh) wetland with forested wetland (PFO1E) at its edges and extending up low areas in several places. The main body of this wetland complex has been designated as a Prime Wetland in Exeter. Historic USGS maps and even more recent watershed boundary data appear to indicate that this wetland system drained both south to Norris Brook and north to Bloody Brook. However, more recent drainage basin mapping (NH National Hydrography Dataset, GRANIT GIS 2019) clearly indicates that the wetland (and much of the property) lies within the Little River—Scamen Brook sub-watershed and drains north to Bloody Brook. This wetland, including its off-site area, comprises a significant portion of the Bloody Brook headwater area.

The presence or absence of drainage under the highway was not confirmed but it’s likely that the construction of the highway altered the drainage pattern in this wetland. This is observable in the fact that that southern half of the wetland is semi permanently flooded marsh with a number of standing dead trees indicative of a shift to wetter hydrology. This portion of the wetland is also given the “impounded” designation by the National Wetland Inventory mapping. A similar but separate marsh and scrub shrub wetland in the southwest corner of the property exhibits the same signs of impoundment at the highway. This wetland does, however, continue to drain south to Watson Brook and Norris Brook.

The remainder of the wetlands on the property are forested (PFO1E) and situated in small basins or valleys within the complex topography of the site. They are dominated by red maple (*Acer rubrum*), Black Tupelo (*Nyssa sylvatica*), Highbush Blueberry (*Vaccinium corymbosum*), and Winterberry (*Ilex verticillata*). Several of these are strictly isolated pools while others are ultimately connected to the large eastern wetland described above through narrow vegetated wetland connections or intermittent streams. These intermittent streams represent the only surface water on the property.

2.4.1 Vernal Pools

A comprehensive vernal pool investigation was conducted on this site in 2020. This investigation was limited to the western half of the property, corresponding the general area where a subdivision was contemplated. A total of 12 vernal pools were identified in this area by the presence of obligate vernal pool species including fairy shrimp and egg masses of Yellow Spotted Salamander and Wood Frog. The productivity of pools ranges from high to low. The two well defined pools on the northern boundary of the property contained over 100 egg masses each while the pool adjacent to Watson Road and the pool in the southeast corner of the property contained less than 20 egg masses.

2.5 Drinking Water Resources

The property lies outside the Aquifer protection district as identified in the Exeter Zoning Ordinance and outside the Source Water Protection Areas for the Exeter and Piscassic Rivers as mapped by NHDDES and reported in the 2012 Exeter Natural Resources Inventory. The 2012 Natural Resource Inventory does indicate that a small portion of a well head protection district originating from the Oak Hill Lane area overlaps the northern edge of the property. No other drinking water resources were identified.

2.6 Wildlife Habitat

The habitat value of the property is relatively significant. This is reflected on the most recent NH Fish & Game Wildlife Action Plan map, and on the earlier in the 2011 Exeter Natural Resource Inventory, though less broadly. The recent NH Wildlife Action Plan map showing the ranking is included as Figure 5. Two of the primary characteristics contributing to the habitat value indicated on these maps, and observed during this analysis are, 1) its inclusion in a large block of intact forest, and 2) significant wetland resources including a Prime Wetland and a number of vernal pools.

The property is part of an unfragmented forest block of nearly 1000 acres, much of which is permanently protected. Though connectivity to habitat areas outside this block is severally limited to the south by Route 101 and to some lesser degree by residential development on all other sides, the complex of wetland and upland on the property likely contributes significantly to the free movement of wildlife to a variety of available habitat. This habitat function would be most important within the eastern portion if the property which lies closer to the Prime Wetland and, unlike the western end, is less constrained by the residential development to the north.

The network of vernal pools on the property provides specific habitat for obligate vernal pool breeding species which rely solely on these resources for reproduction. These species then relay on the largely undisturbed upland forest and wetlands outside the limits of the pools to meet habitat needs outside of the spring breeding season. The vernal

pools also indirectly support a number of other amphibians and mammals that may use the pools for food, movement, or cover. These habitat functions are further elevated by the close proximity of the pools to one another and to other larger habitat areas.

3.0 Relation to the Proposed Development

The primary natural resources identified on the property are wetlands and wildlife habitat. Separate but closely related resources include the watersheds in which the property lies and the steep slopes that are present. Protection of these resources was an important consideration during planning of the project, and this is reflected in the design in several ways.

Wetlands

Avoidance of wetland and wetland buffer impacts was a paramount concern during the planning of the project, which has been designed to avoid direct wetland impacts entirely and substantially limit wetland buffer impact. Nearly all proposed buffer impact is associated with grading for the access road and will be revegetated. The potential for this impact to negatively impact the adjacent wetlands can be further mitigated by revegetating these areas with native restoration seed mix designed to provide both slope stability and other buffer functions. A small portion of buffer impact is, by necessity, associated with the rip rap outfall protection for the infiltration basin near Watson Road.

The proposed subdivision has been located close to Watson Road leaving the eastern end of the property undisturbed and more than 300 feet from the Prime Wetland. This large undisturbed buffer and the fact that no drainage is being directed east of the subdivision will afford maximum protection for the Prime Wetland.

The lots have also been configured to exclude larger and more sensitive wetland areas, including vernal pools, to the maximum extent practicable. Since there are no wetland crossings and the open space surrounds the subdivision, continuity between wetlands (and uplands) is maintained to the maximum extent practicable.

Vernal Pools

Only minor impacts are proposed within the 100-foot vernal pool buffer of two of the pools, for grading associated with the access road. The 100-foot buffer or *vernal pool envelope* is the most critical zone of the upland habitat surrounding vernal pools but supporting habitat can extend much further into the adjacent, primarily forested areas or *terrestrial habitat*.

The potential impact of the development on the vernal pools has been minimized in several ways. First, as described above in the Wetlands Section, the lots have been configured so that all vernal pools are located in the open space and not within the

boundaries of the proposed lots. This minimizes the potential future impact of tree clearing within the terrestrial habitat on individual lots and other proximity impacts such as light, dumping, and runoff from fertilized lawns.

Excluding the pools from the proposed lots also maintains habitat continuity between individual vernal pools, other wetland habitat, and uplands within the open space on the rest of the property. For all but 3 of the pools, including the most productive pools at the northeast corner of the subdivision, this continuity is unconstrained and does not rely on narrow areas of preserved forest. The pool between Lots 2 and 4 will remain connected to adjacent upland and wetland habitat on Lot 2 and to the rest of the open space, including other vernal pools and larger wetland areas, by approximately 200-foot wide forested corridor. The pool at the northwest corner of the property represents only a portion of the pool and wetland which continues off the property. A 100-foot wide connection between this pool and other habitat areas in the open space will be maintained on this property but additional habitat and connectivity also exists off the property for this pool.

The greatest potential effect due to habitat segmentation may exist at the pool adjacent to Watson Road and the proposed subdivision road. This pool will remain connected to the larger open space habitat by a 100-foot wide corridor to the north but is constrained to west by Watson Road and will be constrained to the south by the proposed road. This pool is, however, also the least ecologically intact on the property. Its 100-foot buffer is already compromised by Watson Road, and it appears to have a relatively short hydroperiod. It contained only 14 Wood Frog egg masses during the 2020 survey. Given its relatively lower overall value and the fact that the subdivision has been responsibly located in this area to avoid numerous other high value resources to the east, the proposed avoidance and accommodations for this vernal pool are reasonable.

Wildlife Habitat

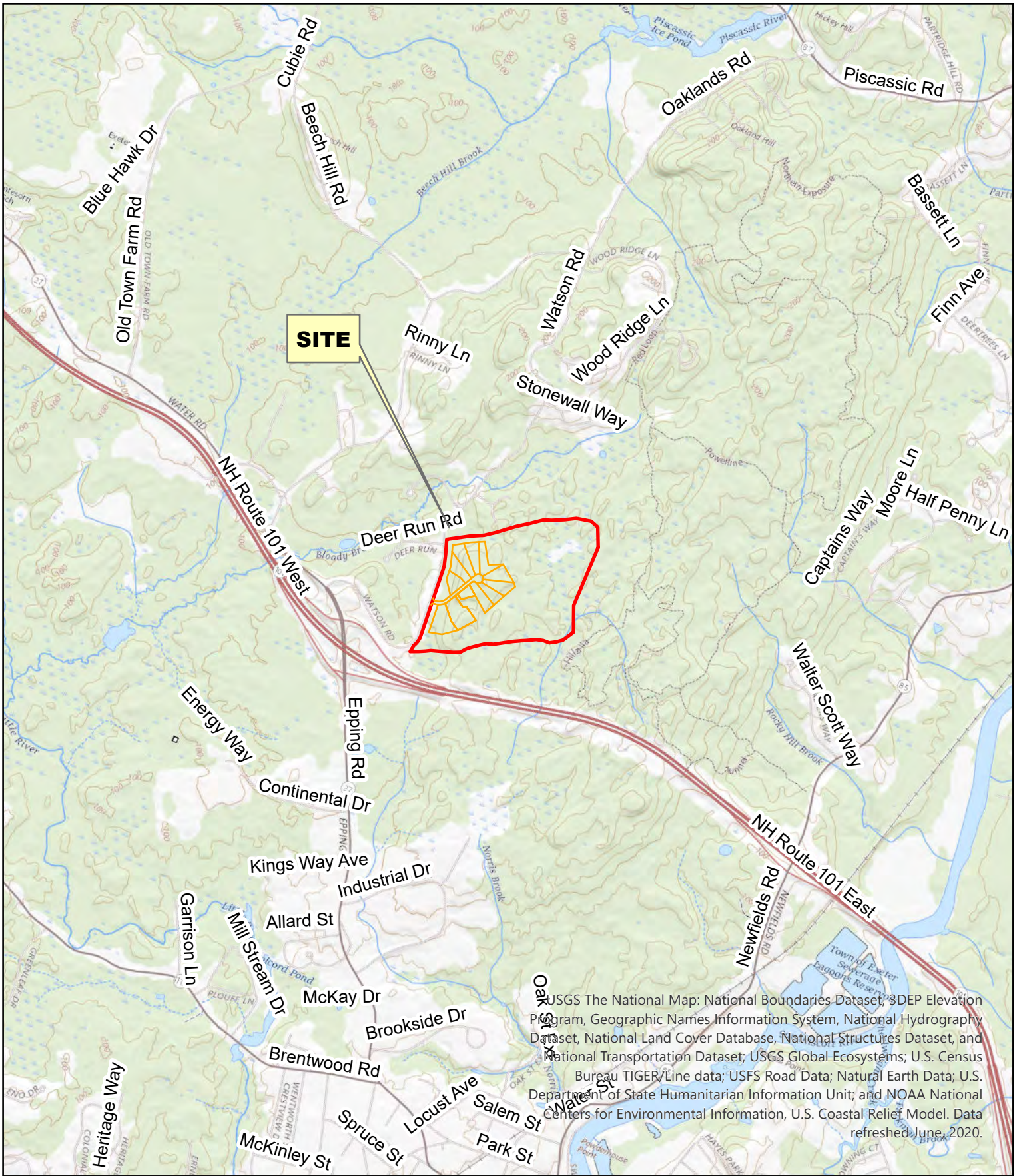
The wildlife habitat value of the property will be protected in many of the same ways wetlands and vernal pools are being protected. The orientation of the proposed lots utilizes area that is largely already constrained to the north by residential development and preserves the core area of the unfragmented forest surrounding the Prime Wetland. A wide area of connectivity will also be preserved south of the subdivision to the highway which represents the southern limit of the large forest block. The open space to the north of the proposed lots is narrower but will maintain connectivity between habitat in this area and off site.

Steep Slopes

To a large extent, the protection of steep slopes relates to the protection of water resources which can be impacted by runoff and erosion from disturbance or development of steep slopes. Protection of steep slopes can also be viewed as a means of minimizing overall development footprint since wider grading profiles are often needed to build in

these areas. This problem is most acute in wetland crossings (of which the project has none) but also applies to overall clearing of naturally vegetated areas. Due to the steep grades along most of the western side of the property just east of Watson Road, some grading on steep slopes is unavoidable for the construction of the subdivision road. This has been designed to be minimal and to minimize wetland buffer impact as described above. This road alignment also allows a relatively direct route into the central portion of the property where the proposed lots have been configured to utilize the relatively the gentler in that area. This allows many of the lots to be developed with no or minimal grading and prevents additional impacts from roadway grading.

Appendix A
Figures



1:24,000



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Figure 1--Locus Map

Map 33 Lot 26
19 Watson Road
Exeter, NH



1:12,000

Figure 2--Aerial Overview

Map 33 Lot 26
19 Watson Road
Exeter, NH



1:12,000

Figure 3-- Watersheds

Map 33 Lot 26
 19 Watson Road
 Exeter, NH

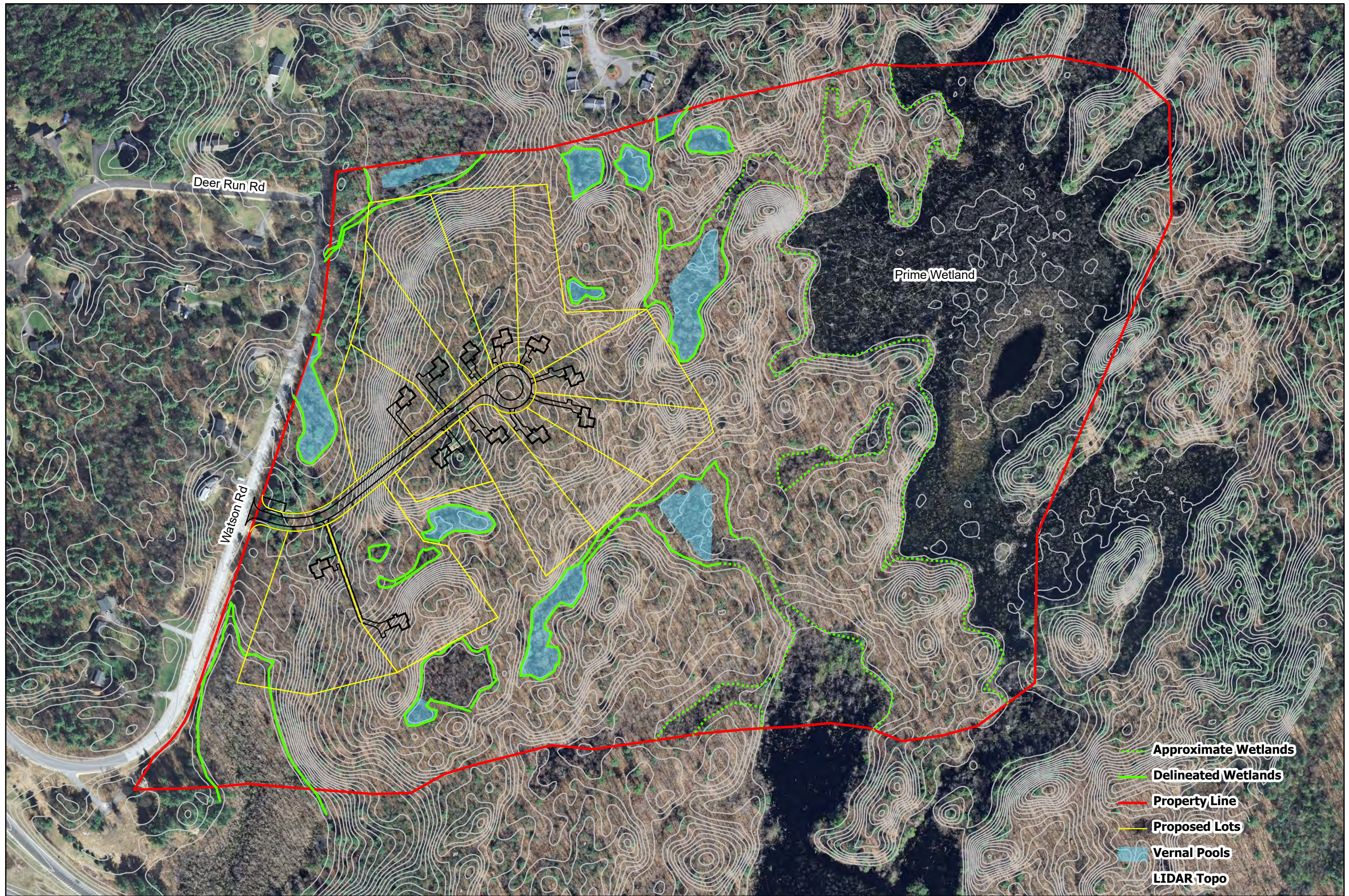
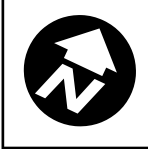


Figure 4

**19 Watson Road
Exeter, New Hampshire**

Wetlands & Topography



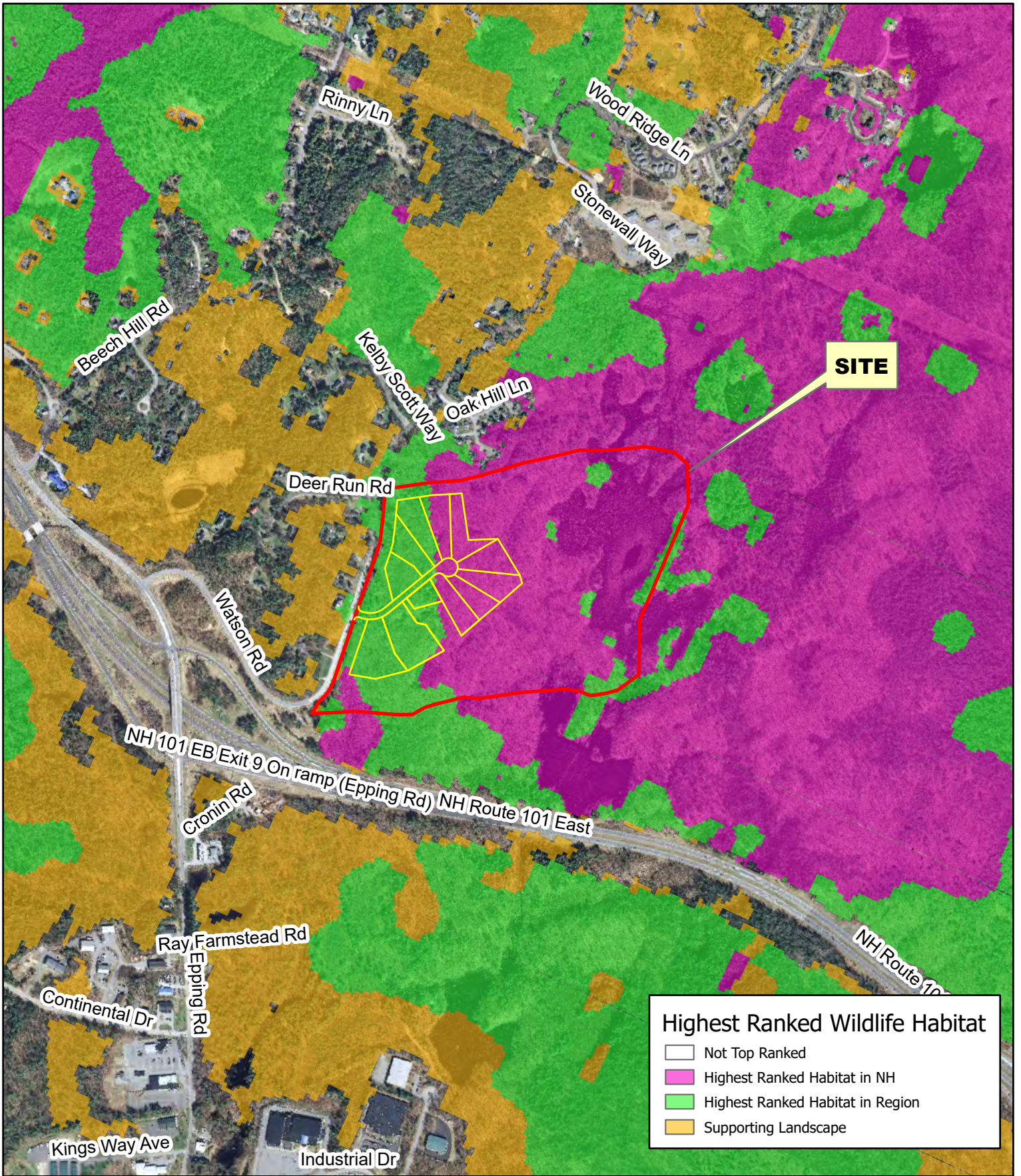


Figure 5--Wildlife Action Plan Ranking Map



1:12,000

Map 33 Lot 26
19 Watson Road
Exeter, NH

Appendix B
Photos

**Natural Resource Plan
Residential Subdivision
19 Watson Road
Exeter, NH**



Typical view of uplands roughly in the center of the proposed lots



Early successional growth west end of property by Watson Road

**Natural Resource Plan
Residential Subdivision
19 Watson Road
Exeter, NH**



A few of many boulders throughout the site



Red Oak typical of the larger trees on the property



Prime Wetland at the eastern end of property



One of the drier small basins in the property's varied topography

**Natural Resource Plan
Residential Subdivision
19 Watson Road
Exeter, NH**



Vernal Pools along the northern property line





Typical forested wetland on the property

