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Forestry Services ~ Wetland Impact Assessments

Wetland Delineations and Permitting ~ E&S/Site Monitoring

Wetland Function & Value Assessments

8/11/2022

Provost & Rovero Inc.
57 East Main Street
Moosup, CT. 06354

Attn: David Held

Re: Wetland function & value and impact assessment report for the proposed site development for the Archambault property, 109R and 131 Clark Lane, Waterford, Connecticut.

Dear Mr. Held,

At your request, I have reviewed the submitted preliminary site plan for the proposed 47-unit housing development project and I inspected the above referenced properties for the purposes of assessing the wetland functions and values and potential impacts to the inland wetlands and watercourses in proximity to the proposed development.

The wetland function and value assessment was conducted on March 30, 2022.

Existing Conditions

The properties total 16.06 acres in size and are located on the east side of Clark Lane in Waterford CT.

The 4.33-acre parcel and the western portion of the 11.73-acre parcel are heavily vegetated, upland abandoned field areas with nearly level topography and well drained soils.

The eastern portion of the 11.73-acre property is occupied mostly by a palustrine forested wetland and intermittent watercourses.

Upland Review Areas

The 50- foot upland review areas adjacent to the various inland wetlands and watercourses are vegetated in the overstory with mixed hardwoods in the sawtimber and polewood size classes. Species observed included: red maple, black oak hickory, and black cherry.

The diversely vegetated understories are comprised of polewood and saplings in these species as well as shrub species such as ironwood, spicebush, and winterberry. Vine species included poison ivy, grape vines, Virginia creeper, round leaf green briar, bittersweet and Japanese honeysuckle.

Herbaceous vegetation observed included numerous fern species, goldenrod, mugwort, black raspberry, milkweed, and miscellaneous grasses such as sedges, foxtail and reed canary grass.

Invasives noted included autumn olive, Japanese barberry, multiflora rose, Asiatic bittersweet, mugwort, winged euonymus, garlic mustard, and Japanese honeysuckle.

Wetlands

A large palustrine forested wetland is located in the eastern portion of the 11.73-acre parcel, and extends through the adjacent property to the north.

The seasonally high water tables in these wetlands break out and create shallow ponded areas in the numerous depressions in the topography. These areas drain to the east either sheet flowing downslope or they form small narrow intermittent watercourses. No significant watercourses were found extending directly into Fenger Brook.

Inland wetlands also extended into the abandoned early successional field areas in the central portion of the property. These wetlands would be classified as scrub-shrub wetlands due to the majority of the vegetation is comprised of herbaceous, shrub and sapling vegetation.

Fenger Brook extends from north to south in the eastern portion of the forested wetland near the eastern property boundary.

This watercourse is bordered on its eastern and western sides by the large forested wetlands which contribute hydrology to the Brook. The gently sloping topography adjacent to the stream channel allows flows from groundwater breakout and surface flows during significant storm events to enter the Brook.

The Brook was observed on 8/11/2022 and no stream flows were noted, however this Brook flows with significant velocities, as evidenced by its eroded streambanks and numerous exposed stones and boulders throughout its entire length.

The majority of the forested wetlands are vegetated with red maple, white ash, and elm in the overstory, and in the understory saplings and typical wetland shrub species such as highbush blueberry, arrowwood, multiflora rose, Japanese barberry, speckled alder, winterberry and spicebush. Other species included, black raspberry, grapevines, bittersweet, greenbrier, poison ivy and Virginia creeper.

Herbaceous vegetation included wood, lady & cinnamon ferns, tussock sedges, rushes, skunk cabbage, jack- in- the- pulpit, jewelweed, goldenrod, various mosses and miscellaneous grasses.

Wildlife tracks/sign found or directly observed in and adjacent to the wetland/watercourse included mammals and bird species such as: white tailed deer, eastern coyote, red fox, raccoon, red tailed hawk, American crow, and numerous songbird species.

No amphibians were observed although undoubtedly, this wetland complex serves as habitat to numerous reptile and amphibian species.

Wetland Functions and Values

The forested wetlands and watercourse(s), were inspected to determine wetland functions and values utilizing the Army Corps. Of Engineers methodology as outlined in "The Highway Methodology Workbook Supplement". This methodology recognizes eight categories of wetland functions and six categories of wetland values.

The 8 wetland functions include: groundwater recharge/discharge, floodflow alteration/storage, fish/shellfish habitat, sediment/toxicant/pathogen retention, nutrient removal/retention/transformation, production export, sediment/shoreline stabilization and wildlife habitat.

The 6 wetland values include: recreational value, educational/scientific value, uniqueness/heritage value, visual quality/aesthetics, threatened/endangered species habitat and marine fish & shellfish habitat.

Palustrine forested /scrub-shrub wetlands & watercourse functions:

The following is a list of the wetland *functions* exhibited by these wetlands and watercourses and their rationale/qualifiers:

Ground water recharge/discharge: The wetland is associated with intermittent watercourses; signs of groundwater recharge and discharge are present and the quality of the water associated with this wetland is high.

Sediment/toxicant retention: Potential sources of sediments/toxicants are present in the watershed above this wetland, mineral, fine grained and organic soils are present, the wetland edge is broad and intermittently anerobic. (The lack of oxygen allows for the transformation and binding of toxicants). This wetland is associated with intermittent watercourses, and no indicators of erosive forces or high water velocities are present.

Nutrient removal/retention: This wetland is large relative to the size of its watershed, (its size allows for significant storage/retention capacity), an overall potential for nutrient removal and retention exists in the wetland, potential sources of nutrients exist, and the wetland is saturated for most of the season creating anerobic conditions. The slowly drained mineral and organic soils which are present in these anerobic conditions harbor nitrogen fixing bacteria which provide the opportunity for nutrient attenuation. The dense herbaceous vegetation utilizes nitrogen, phosphorus and potassium and water moves slowly through this wetland which increases the available period of time for removal and retention.

Production export: Wildlife food sources grow within the wetland which provide food for wildlife and humans. Detritus development is present creating fertile organic soils. There is

evidence of wildlife use in this wetland and high vegetation density is present providing food and cover for wildlife. The wetland contains flowering plants that are used by nectar gathering insects, and indications of export are present such as deer browse.

Sediment & shoreline stabilization: Roots from herbaceous grasses and plants, shrub species and trees found in these wetlands bind and stabilize soils which helps prevent erosion from stream flows along edges of watercourses & wetlands.

Wildlife habitat: The water quality associated with the wetlands and watercourses is high because the wetland is not fragmented or polluted by development. The wetland is contiguous with other wetland systems creating an overall larger wetland habitat area. This also allows wildlife overland access to other wetlands without intrusive development encroachments. Wildlife food sources are present throughout the wetland. The dominant wetland class includes a wooded swamp which provides a diversity of habitat and cover. Numerous animal signs such as tracks and scat were observed. Wildlife habitat is the primary function of this wetland.

Wetland *functions* not present:

The forested/ emergent wetlands and intermittent watercourses did not exhibit the wetland functions of floodflow alteration, or fish habitat due to the lack of flood storage capacity, the presence of the watercourses transporting flood flows and a lack of significant deep water habitat areas capable of sustaining fish.

Palustrine forested/scrub-shrub wetlands & watercourse values

The following wetland *values* were exhibited by this wetland/watercourse:

Educational/scientific value: Little disturbance has occurred within this wetland, off-road parking at this potential educational site is suitable for school bus access and site is immediately adjacent to the Clark Lane Middle School.

Wetland *values* not present:

This wetland did not exhibit the wetland values of recreation, uniqueness/heritage value, visual quality/aesthetics value, endangered species habitat or fish and shellfish habitat (marine). These values were not exhibited due to the lack of public access, and fishing and hunting opportunities. There are no historic features associated with the wetland, high noise levels are present, there is a lack of scenic views, and the property and surrounding area are not shown within the shaded areas on the D.E.E.P. Natural Diversity Database mapping for state or federal listed threatened or endangered species.

Summary:

Overall, the wetland function and value assessment indicates that the wetlands exhibit six significant wetland functions: groundwater recharge/discharge, sediment/toxicant retention,

nutrient removal/retention, production export, sediment & shoreline stabilization and wildlife habitat, and one value, (wildlife value).

Potential wetland impacts

The project plans and site were reviewed to assess the potential impacts to the wetlands and watercourses from the proposed development.

On this parcel, a 47-unit housing development is proposed which includes a private access road, stormwater treatment system consisting of a system of catch basins, a hydrodynamic separator, a bioretention basin, and detention basin. Other features include a wood chip walking trail which is proposed around the perimeter of the water quality basins and a gazebo.

To construct these features, no direct wetland disturbance is proposed, and the only disturbance proposed within the 50-foot upland review area is for the construction of the standpipe outlet and rip-rap scour hole associated with the detention basin.

Stormwater treatment system:

To collect, attenuate, treat, and infiltrate/discharge the stormwater flows from the pervious and non-pervious portions of the site a comprehensive stormwater management system was developed.

This system incorporates catch basins with sumps to collect stormwater and a hydrodynamic separator and stormwater quality/detention basin to treat, infiltrate and/or discharge treated stormwater. This system is designed to meet the 2004 Connecticut Dept. of Environmental Protection Stormwater Quality Manual, and is designed to handle up to a 100-year storm event. The Project Engineer has designed the system such that there will be no increases in peak flows discharging from the system.

Direct wetland impacts:

No direct impacts are proposed with the design of the project or will occur as a result of the construction of the housing development or stormwater quality system.

Potential indirect impacts:

The potential short-term impacts associated with the initial land clearing, stumping, top soil stripping and construction would include potential sediment discharges during significant storm events if the E&S measures breach.

I have provided E&S control recommendations to the project engineer which have been incorporated into the plan sets and E&S control narrative.

It is my opinion, provided that the E&S measures are correctly implemented and maintained throughout the project timeframe, the E&S inspections are conducted as proposed and no significant discharges of sediments reach the wetlands or watercourses, the disturbance associated with the construction adjacent to the wetlands will not significantly impact the wetlands or their existing functions due to erosion and sedimentation.

Once the disturbed areas are re-vegetated and stabilized, the well- to moderately well-drained soils will allow for good infiltration of storm water runoff both during and after construction.

The nearly level topography of the site and gentle proposed slopes adjacent to the wetlands will help prevent erosion.

The quick and permanent establishment of vegetation in the disturbed areas is crucial to the prevention of post-construction erosion.

Wetland Hydrology

I see no direct or indirect impacts to the wetland/watercourse hydrology as a result of the proposed development. The storm water quality basins are designed to attenuate, treat, infiltrate and discharge the treated stormwater.

The impervious surfaces of the paved roads, roof areas and pervious surface infiltration will be a significant input to the existing hydrology, through some minor overland flow, as ground water recharge or as direct discharge during significant storm events. It is my professional opinion that these inputs will augment and improve the existing hydrology of the wetlands and watercourses. These added inputs will allow for increased seasonal inundation in depressed areas in the wetlands and will provide a better diversity in wildlife habitat as well.

Water Quality:

The only potential direct impact to water quality in the wetlands and watercourses would be due to the direct discharge of stormwater associated with stormwater system.

As the stormwater system is designed remove 80% solids to CT. D.E.E.P. standards, and will attenuate, treat, infiltrate and discharge only treated stormwater, I see no significant impacts to the water quality in the wetlands and watercourses, provided that the two- bay water quality bioretention/detention basins and deep sump catch basins are constructed as designed, and are inspected and maintained. The discharge point does not directly discharge into any intermittent watercourses, or adjacent wetlands. These limited discharges will enter uplands, and infiltrate in the well- drained soil types and/or travel as sheet flow into the wetlands.

Due to the design of the level spreader, gently sloping topography and significant overall distance of the basin outlet from Fenger Brook, it is my opinion that no channelized direct discharges will reach Fenger Brook.

Water temperature impacts:

The proposed stormwater quality system is primarily designed to attenuate, hold and infiltrate stormwater into the water table. Discharges will only occur during significant storm events after the “first flush” of storm water is treated, and the discharge point does not directly discharge into any intermittent watercourses, or adjacent wetlands. These limited discharges will enter uplands, and infiltrate in the well- drained soil types and/or travel as sheet flow into the wetlands.

For these reasons, I see no significant or adverse impacts to the existing water temperatures of these watercourses from the infiltration and discharge of stormwater from the site.

Adjacent Upland Wildlife Habitat Impacts:

The clearing of vegetation and development outside the 50-foot upland review area adjacent to the wetlands and watercourses will force wildlife into the vegetated corridor in and around the adjacent wetlands and watercourses, during and after the construction timeframe, and into other areas where the uplands are not disturbed.

The existing 50 foot and greater zones adjacent to the wetlands will serve as an adequate wildlife corridor and riparian zone.

I would also recommend the posting of the 50-foot upland review areas with permanent signage to help prevent future encroachments or cutting of vegetation. Signs are usually attached to trees, metal or pressure treated posts, at eye level, at an approximate spacing of 25 feet for good visibility.

In summary, I see no direct or adverse impacts to the existing wetlands, watercourses or their functions and values.

This is provided that the recommended erosion and sedimentation control features are implemented, maintained and monitored throughout the construction and post construction timeframe.

If you have any questions concerning the site assessment or this report, please feel free to contact me.

Sincerely,

Joseph R. Theroux

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