June 17, 2022

Sturbridge Conservation Commission
c/o Ms. Rebecca Gendreau
Conservation Agent
Town of Sturbridge
301 Main Street
Sturbridge, MA 01566

RE: Peer Review of Notice of Intent Application and Habitat Evaluation
DEP File No. 300-1113
30 Main Street, Lot 3 (Parcels 415-03914-030 & 280-03534-020)
Sturbridge, MA

Dear Ms. Gendreau and Members of the Commission:

The Sturbridge Conservation Commission (SCC) has engaged Oxbow Associates, Inc. (OA) to review the Notice of Intent application and associated site plans submitted by the Applicant, Justin Stemlok, dated April 5, 2022, for the construction of a 55+ housing community and associated roadways, parking, and amenities, located on portions of two parcels adjoining properties at 30 Main Street and 20 Fiske Hill Road, in Sturbridge, MA (the "Site;" Assessors Parcels 280-03534-020 & 415-03914-030). Brian T. Madden of LEC Environmental Consultants, Inc. and Peter Engle, P.E. of McClure Engineering, Inc. are representing the Applicant.

A. Methodology

This report analyzes project information provided to the SCC, including proposed site plans titled "Special Permit and Site Plan" ("Site Plans"; Pages 1-30) dated April 1, 2022, and proposed impacts to observed onsite conditions. The purpose of this assessment is to evaluate the information submitted to the SCC complies with the MA Wetlands Protection Act (WPA; M.G.L. c. 131, s. 40, the "Act") and implementing Regulations (310 CMR 10.00), as well as the Town of Sturbridge Wetland Protection Bylaw (Chapter 286), and its Regulations (Chapter 365).

OA staff (specifically R. Strohsahl) reviewed the 41± acre Site on June 14, 2022. OA conducted meandering surveys throughout the proposed development area to document potential adverse impacts to the wetland systems and vernal pools and evaluate impacts to their respective buffer zones.

B. Observations

Wetlands Protection Act

The Wetland Protection Act Regulations provide protection to eight public interests as they relate to jurisdictional wetland resource areas. The interests include protection of public and private

water supply, protection of groundwater supply, flood control, prevention of storm damage, prevention of pollution, protection of land containing shellfish, protection of fisheries, and protection of wildlife habitat. The engineering review will provide guidance on the water protection and stormwater management. OA has focused on protection of wildlife habitat on the Site and the impacts to the vernal pools located within the wetland resource areas surrounding the property.

The presence of wildlife in a wetland resource area and buffer is not the sole factor in evaluating wildlife habitat value. Plant community composition and structure, hydrologic regime, or other characteristics providing “important” features for wildlife must be present. Specifically, it is habitat value and not a particular wildlife species (with the exception of rare species) that is protected by the Act. As habitat features within the proposed impact areas were observed, these same features were examined for indications of specific or general habitat for wildlife. Attributes such as burrows and cavities were actively searched for and the physiographic features of the proposed impact area and surrounding habitat were noted.

Habitat Continuity and Quality

The Site is located at the southern edge of a mostly contiguous zone of forested habitat encompassing approximately 2,000± acres that is generally located south of Route 20, west of the Southbridge Airport and east of Fiske Hill Road. Directly to the south of the site is Main Street, a highly developed roadway, while on either side to the east and west are housing subdivisions. The contiguous area appears to be generally composed of forested upland interspersed with small streams, wetland systems, a utility ROW, and sporadic housing. The lack of development north of the property allows wildlife such as small and large mammals, forest interior nesting birds, reptiles, amphibians, and invertebrates to move freely through the environment and without human disturbance from roads or highways, or other residential or commercial development.

Habitat on the Site is typical of a forested upland habitat with previous anthropogenic impacts due to logging. There is a hardwood tree community that has been selectively harvested, leaving various species of tree specimens at their natural height, a number of dead tree snags, as well as previously cleared areas that are currently exhibiting successional regrowth. OA noted that throughout the Site there were very few areas that do not have any vegetative cover.

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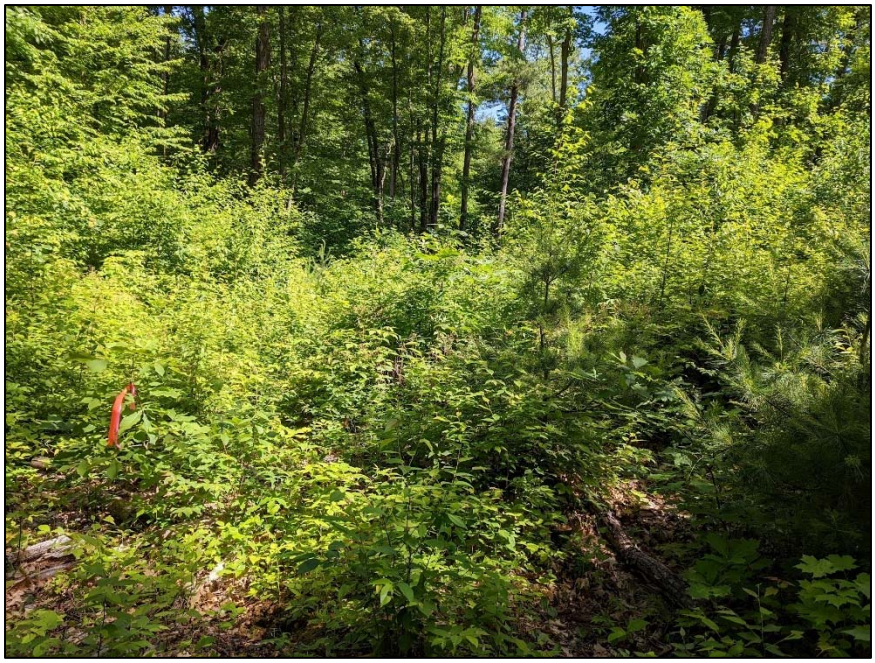

Photo: Successional growth in previously cleared timber harvesting area increases habitat diversity

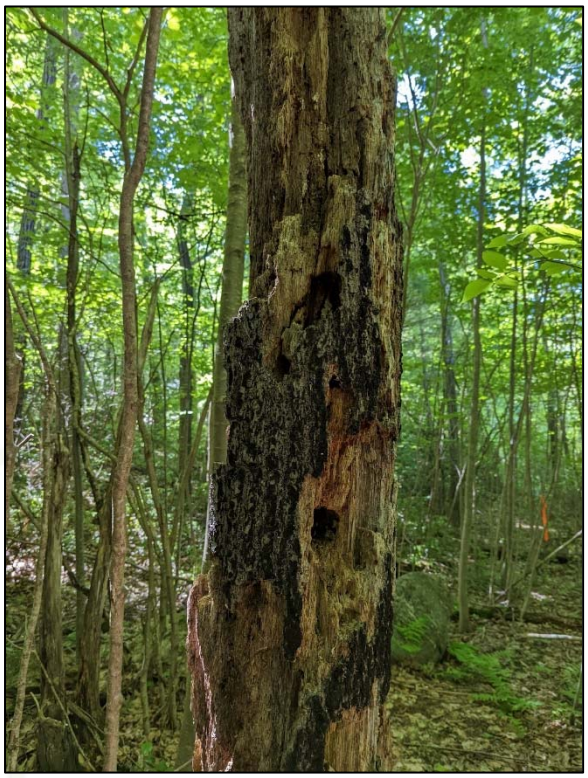

Photo: Tree cavities excavated and used by forest interior birds or small mammals

The diversity of different stages of successional growth throughout the property allows for a variety of habitat uses by more wildlife than that which would exist in a monoculture or single habitat (forested) community. The variety of different plants and shrubs create food and cover sources that would otherwise not exist within previously existing forest, providing more niches for

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a variety of wildlife to use. As a result, the diversity of wildlife on the Site has likely increased following the prior logging operations.

Following timber harvesting, and during primary successional growth it is typical to see various invasive plant species beginning to sprout along the borders of the cleared areas or along access roads. Invasive plants are typically transferred by human activity and machinery or deposited by birds as they occupy the fringe habitat between the forest and clearings. During our inspection OA observed that there were very few invasive plant species located on the Site. OA did not observe any Asiatic bittersweet (*Celastrus orbiculatus*), a common invasive throughout Massachusetts, and only documented 1-2 plants of Japanese barberry along a logging road. While OA did not fully explore the entirety of every logging road, the lack of readily observable invasive plants was noteworthy.

Wildlife Habitat

Within the 100-foot and 200-foot BVW buffer zones, including several areas proposed to be impacted, OA observed numerous standing dead trees that can serve as perches or can contain cavities for bird nesting and other wildlife use. In multiple locations throughout the property OA documented dead tree snags with cavities with evidence of animal use, either by bird species or small mammals. As some of the dead trees are greater than 50 feet in height it was difficult to observe all potential habitat features of the trees. As tree limbs break and deteriorate with the elements, they can create hollows in the limbs that are directed horizontally or vertically, and therefore not visible from the ground.

Photos: (L) dead standing tree that provides perching locations (R) tree cavities can be used by a variety of different species

The woody debris from slash piles and from fallen or damaged trees scattered throughout the Site can also provide cover for a variety of small mammals, reptiles and amphibians, and

invertebrates. OA documented a downed and cut tree trunk that contained a hollowed center that was being used by small mammals (either chipmunk [*Tamias striatusor*] or grey squirrel [*Sciurus carolinensis*]) to cache food. Under the same log OA documented a red-backed salamander (*Plethodon cinereus*) utilizing a network of tunnels created by a vole or small mammal, and multiple species of insects.


Photos: (L) Interior of hollow log showing food cache of small mammal (R) red-backed salamander under same log.

The access roads are also utilized by a variety of mammals, and evidence of white-tailed deer (*Odocoileus virginianus*), racoons (*Procyon lotor lotor*), beaver (*Castor canadensis*), and coyotes (*Canis latrans*) were numerous throughout the property.

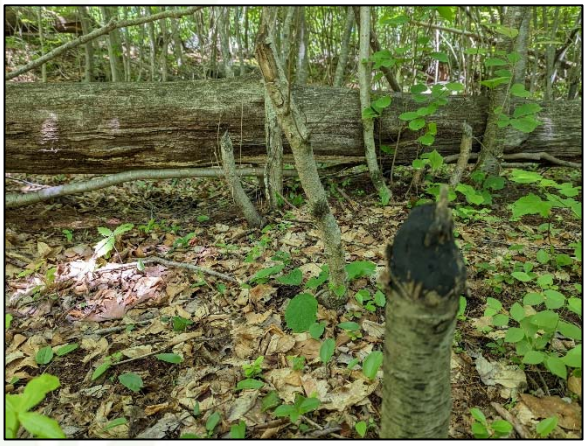
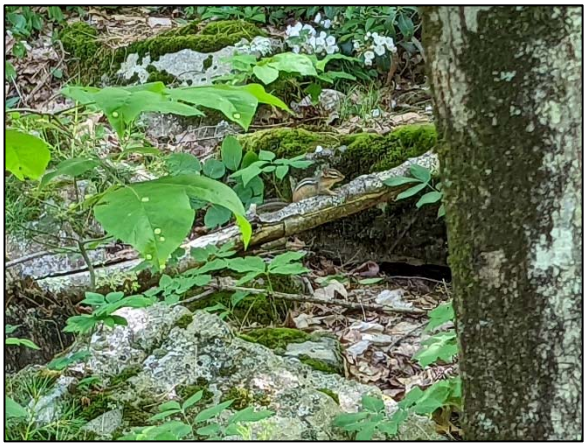

Photo: (L) Evidence of prior beaver activity near wetland series E. (R) chipmunk (center) utilizing slash remnants and rock crevices

Sturbridge Wetland Protection Bylaw

Under the Sturbridge Wetland Protection Bylaw, vernal pools are protected whether certified by the MA Natural Heritage and Endangered Species Program (NHESP) or not. The pools and the 100-foot buffer zone originating from the Mean-Annual High-Water line are considered resource areas as they provide critical, and often isolated, habitat for amphibian breeding. An additional 100-feet of buffer zone is regulated by the SCC to protect the resource area.

The Applicant's representatives have completed an inventory of the vernal pools on Site during the appropriate season and documented successful amphibian breeding. The physical attributes

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of the pools are suitable for successful breeding by mole salamanders and the adjoining dry, ledge, terrestrial forested landscape provides suitable non-breeding habitat to support the remainder of the life cycle.

A publication reviewing multiple studies of migratory trends among diverse Ambystomatid ("mole") salamanders concluded that 95% of mole salamanders generally reside and remain within a 540±-foot (164 m) area extending from the vernal pool edge (Semlitsch 1998). A New England based field study concluded only 82 percent of spotted salamanders are contained in the 164 m threshold. All vernal pool amphibians transport their biomass, derived from the vernal pool, into the surrounding terrestrial habitat. That process increases forest biomass in the vicinity of pools; all amphibians are predators and vernal pool species are also prey for diverse predators.

The Site currently has two vernal pools that are separated by approximately 450± horizontal feet. The current project design has a roadway and several dwellings designed to bisect the area between the vernal pools. The road and housing design would require clearing trees within the 200-foot buffer to each of the vernal pools. Rittenhouse et al. (2006) conducted a study on spotted salamanders (*Ambystoma maculatum*) to monitor salamander movement from forested habitat to an adjacent grassland. The results showed that the mole salamanders moved freely throughout the forested environment but avoided a habitat edge approaching the grassland and actively avoided the grassland environment.

Under Section 365-1.3A of the Bylaw, it states that there must be no significant adverse impacts on the resource areas. The tree clearing required for the roadway and housing development will impact connectivity between amphibian species utilizing the two vernal pools, isolating the existing populations and removing viable non-breeding season habitat used by species from both pools. Additionally, the roadway is a location for potential amphibian mortality, especially during migration events associated with breeding season. We recommend that the SCC explore methods that keep the connectivity of the pools intact, with wildlife barriers and open grate trenches beneath the road, or other wildlife crossing options. In addition, we recommend that the SCC request that the Applicant protect some of the existing trees specifically between the two vernal pools to prevent the habitat edge that prevents salamander movement.

C. Site Plans

In review of the Site Plans, OA noted some inaccuracies within the planting specimen species' list that should be remedied prior to the issuance of an Order of Conditions. The Site Plans reference a number of planting species that are non-native or invasive to Massachusetts. We have recommended similar species to the proposed that can be substituted in the table below.

	Proposed Species	**Recommended Species**
Roadways	Norway maple (*Acer platanoides*)	red maple (*Acer rubrum*) or sugar maple (*Acer saccharum*)
	silver linden (*Tilia tomentosa*)	American linden (*Tilia americana*)
	honey locust (*Gleditsia triacanthos*)	gray birch (*Betula populifolia*)
Rain gardens	bird's foot trefoil (*Lotus corniculatus*)	cinnamon fern (*Osmunda cinnamomea*)
	blue cardinal flower (*Lobelia siphilitica*)	cardinal-flower (*Lobelia cardinalis*)

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OA also recommends consideration to use the seed mix from New England Wetland Plants, Inc. specifically designed for detention/infiltration basins within the basins, as opposed to the Conservation/Wildlife mix currently proposed, produced by the same company.

OA recommends the SCC suggest incorporating an invasive species monitoring and treatment plan into the Operations and Maintenance Plan for the rain gardens, detention basins, and any other common areas.

D. Conclusions and Recommendations

The buffer zone surrounding the wetland resource areas provide abundant wildlife habitat opportunities to a variety of different species. The proposed development project will likely impact the connectivity of the wetland systems and vernal pools located on the Site. The SCC should consider methods to prevent isolating populations that use the adjacent vernal pool habitat.

Thank you for the opportunity to provide these comments. The Commission should feel free to contact me at 978-929-9058 ext. 107, with any questions regarding this review.

Sincerely,

Oxbow Associates, Inc.

Ronald H. Strohsahl

Ron Strohsahl, PWS
Senior Wetland Scientist

Citations

McDonough, C. and P. W. C. Paton. 2007. Salamander Dispersal Across a Forested Landscape Fragmented by a Golf Course. J. Wildlife Management. 71(4), 1163-1169.

Rittenhouse, T. A. G. and R. D. Semlitsch. (2006). Grasslands as movement barriers for a forest-associated salamander: Migration behavior of adult and juvenile salamanders at a distinct habitat edge. Biol. Cons. 131:14-22.

Semlitsch, R. D. (1998). Biological delineation of terrestrial buffer zones for pond-breeding salamanders. Conservation Biology 12(5), 1113-1119.

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