

**Vermont Agency of Natural Resources
Department of Environmental Conservation
Watershed Management Division**

**Class I Determination Rulemaking Decision
Issued Pursuant to Section 7 of the Vermont Wetland Rules**

In the matter of:

Ripton Conservation Commission
**Petition for the reclassification of the Beaver Meadows Wetland Complex
from Class II to Class I with a 400-foot buffer zone.**
Located off FR 90C off Upper Notch Road in Ripton, Vermont

File #: 2017-396.P

The Secretary may, upon a petition or on his or her own motion, determine whether any wetland is a Class I wetland, pursuant to 29 V.S.A. § 410. The Secretary may establish the necessary width of a buffer zone of any Class I wetland as part of any wetland determination pursuant to the Vermont Wetland Rules. Section 4.2 of the VWR

As required under 29 V.S.A. § 410 and Section 7 VWR, this wetland determination is based on an evaluation of the extent to which the wetland serves the functions and values of Rules, is **exceptional or irreplaceable in its contribution to Vermont's natural heritage** and, therefore, merits the highest level of protection. Public notice of this wetland determination has been given in accordance with Section 8.3 of the VWR.

Petition

1. A complete petition was received from the Ripton Conservation Commission for a Wetland Determination 2016-396.P on 9/18/2017 (Attachment 1). The Wetland Determination was put on notice from 10/26/2017 until 12/11/2017.
2. The subject wetland is located at a height of land located within the towns of Ripton and Bristol, wholly within the Green Mountain National Forest (GMNF) at the intersection of the Ripton, Bristol and Middlebury town lines. The site can be accessed from GMNF road FR 90C, which is off Upper Notch Road in Ripton. A map showing the approximate location of the Class I wetland is attached (Attachment 2).
3. The Beaver Meadows wetland complex occupies a narrow valley that sits on a high plateau above the steep western escarpment of the Green Mountains. The complex is approximately 66 acres in size and consists of a mosaic of wetland types. Examples of natural communities include dwarf shrub bog, Black Spruce Woodland Bog, Emergent/Shrub Marsh, Hardwood/Shrub Swamp, and a forest seepage swamp. Beaver

- Brook serves as the complex's main hydrological influence. Beaver Meadows drains to the northeast into the Middlebury River and southwest into the New Haven River watershed.
4. Julie Follensbee, Charlie Hohn, and Zapata Courage visited the wetland on September 13, 2016.
 5. The wetland in question is currently identified as a Class II wetland on the Vermont Significant Wetlands Inventory (VSWI) map. The petition is to reclassify this wetland from Class II to Class I, and to update the VSWI map to define the general location of the Class I wetland. A map of the proposed Class I wetland boundary and associated 400-foot buffer zone is provided as Attachment 3.
 6. In brief, the wetland in question is described as a complex that is approximately 66 acres in size and comprises multiple natural wetland community types, including Black Spruce Woodland Bog, Emergent/Shrub Marsh, and Hardwood/Shrub Swamp. These wetlands are associated with Beaver Brook. The Beaver Brook Meadows wetland is part of, and surrounded by, the Green Mountain National Forest (GMNF), which is an intact and unfragmented landscape along the spine of the Green Mountains.
 7. Beaver Meadows occupies a narrow valley that sits on a high plateau above the steep western escarpment of the Green Mountains. It is approximately 66 acres with additional wetland areas connected via stream hydrology draining in three directions. Middlebury River in particular has high flood risk and is protected in part by this headwater wetland. Beaver activity has provided natural damming to hold back water from storms and snow melt. The deep peaty muck and surrounding wetlands allow for the absorption and slow release of water which reduces flooding potential downstream and helps to off-set or delay drought conditions. The thick layer of peat and living vegetation in the wetland complex also provide long-term carbon storage, playing an important role in mitigating climate change.
 8. This wetland is a dynamic system offering a variety of habitats for different wetland-dependent species and supports several rare, threatened or endangered species. Numerous wildlife surveys over the decades has provided a unique baseline dataset.
 9. The US Forest Service already recognizes the area as being worthy of protection and recognition. They have designated the area as an Ecological Special Area within the Green Mountain National Forest Land and Resources Management Plans in 1986 and in 2006 (Attachment 1 – Appendices J & K).
 10. Public comments were received from during the public comment period. A responsiveness summary is provided as Attachment 4 which includes a summary of comments and Agency responses. Letters of support were received from the Town of Ripton and a resident of Ripton.

Findings

As required by 10 V.S.A. § 914 and Section 8 of the VWR, this wetland determination is based on an evaluation of the functions and values of the subject wetland as described in Section 5 of the VWR. Section 5 provides that in evaluating whether a wetland is a Class II or a Class I

wetland, the Secretary shall evaluate the functions that the wetland serves both as a discrete wetland and in conjunction with other wetlands by considering detailed functional criteria. Consideration shall be given to the number of and/or extent to which protected functions and values are provided by a wetland or wetland complex.

1. The protected functions of the Beaver Meadows wetland complex include the following: water storage for flood water and storm runoff as described in Section 5.1 of the VWR; surface and groundwater protection (Section 5.2); fisheries habitat (Section 5.3); wildlife and migratory bird habitat (Section 5.4); exemplary wetland natural community (Section 5.5); rare, threatened and endangered species habitat (Section 5.6); education and research in natural science (Section 5.7); recreational value and economic benefits (Section 5.8); open space and aesthetics (Section 5.9); and erosion control through binding and stabilizing the soil (Section 5.10).
2. The following protected functions are considered exemplary or irreplaceable: water storage for flood water and storm runoff as described in Section 5.1 of the VWR; exemplary wetland natural community (Section 5.5); and education and research in natural science (Section 5.7).
3. **Water Storage for Flood Water and Storm Runoff**

Wetlands that provide for the temporary storage of floodwater or stormwater runoff to the extent that they make an important contribution to reducing risks to public safety, reducing damage to public or private property reducing downstream erosion or enhancing the stability of habitat for aquatic life are significant wetlands.

The wetland is significant for the water storage for flood water and storm runoff function due to its ability to retain and slowly release water from its headwater location to two downstream receiving waters, and as demonstrated in Section 6 of the petition and as confirmed through a site visit by Agency staff.

The Beaver Meadows complex is an assortment of different natural wetland community types, including bogs, deep and shallow emergent marshes, and scrub-shrub swamps that contribute to this functions to retain waters. This large wetland complex has physical space for floodwater storage and dense, persistent and woody vegetation that slows down floodwaters, releases it slowly or facilitates water removal by evaporation and transpiration. The wetlands of the complex are important for the retention and slow release of floodwater going to the flood prone Middlebury River. Beaver Meadows is a high elevation wetland complex that drains into both New Haven and Middlebury Rivers. Middlebury River in particular has high flood risk and is protected in part by this wetland. Beaver activity has provided natural damming to hold back water from storms and snow melt. The deep peaty muck and surrounding wetlands allow for the absorption and slow release of water which reduces flooding potential downstream and helps to off-set or delay drought conditions.

For these reasons, the Beaver Meadows wetland complex is exceptional and irreplaceable for the storage of floodwater and storm water runoff.

4. **Surface and Ground Water Protection**

Wetlands that make an important contribution to the protection or enhancement of the quality of surface or of ground water are significant wetlands.

The wetland is a headwater wetland with high amounts of microtopography and springs that contribute to this function. The wetland is significant for the surface and ground water function as demonstrated in Section 7 of the petition and as confirmed through a site visit by Agency staff.

5. **Fish Habitat**

Wetlands that are used for spawning by northern pike or that are important for providing fish habitat are significant wetlands.

The wetland contains woody vegetation that overhangs banks of a stream, providing refuges and food sources for instream fish, as well as providing cold water recharge to downstream fisheries. The wetland is significant for the fish habitat function as demonstrated in Section 8 of the petition and as confirmed through a site visit by Agency staff.

6. **Wildlife Habitat**

Wetlands that support a significant number of breeding waterfowl, including all species of ducks, geese and swans, or broods of waterfowl or that provide important habitat for other wildlife and migratory birds are significant wetlands.

The wetland is a large complex of varying wetland types including surface waters with the habitats to support numerous wetland dependent species from birds to mammals to amphibians. Additionally, several wetland dependent species have been documented by various State, Federal and conservation entities. The wetland is significant for the wildlife habitat function as demonstrated in Section 9 of the petition and as confirmed through a site visit by Agency staff.

7. **Exemplary Wetland Natural Community**

Wetlands that make an important contribution to Vermont's natural heritage are significant wetlands. These include wetlands that are identified as high-quality examples of one of Vermont's recognized natural community types.

The wetland complex includes documented wetland natural communities. The wetland is significant for the exemplary wetland natural community function as demonstrated in Section 10 of the petition and as confirmed through a site visit by Agency staff.

According to ANRs Natural Heritage Inventory Project, Beaver Brook Meadows has at least four community types present including: Dwarf shrub bog, Black Spruce Woodland Bog, Emergent/Shrub Marsh, and Hardwood/Shrub Swamp (Attachment 1 – Appendix I). Only one state significant natural community, dwarf shrub bog, is currently documented on the Natural Heritage Information Project, though the black spruce woodland bog likely would be state significant if surveyed. There is a seepage forest in north end of the complex that is a type not yet described by the Natural Heritage Information Project but has exemplary qualities. As described in “Wetland, Woodland, Wildland-A Guide to the Natural Communities of Vermont”, by E.H. Thompson and E. R. Sorenson "*Dwarf shrub bogs are considered rare in Vermont, both because there are relatively few sites known and the total acreage of bogs in the state is low.*(pg. 316)” (Attachment 1 – Appendix M)

The Beaver Brook Meadows wetland complex is exceptional and irreplaceable for the exemplary wetland natural community function.

8. Rare, Threatened, and Endangered Species Habitat

Wetlands that contain rare, threatened, or endangered species of plants or animals are significant wetlands.

The presence of several rare species has been documented in the wetland complex. The wetland is significant for the rare, threatened and endangered species habitat function as demonstrated in Section 11 of the petition and as confirmed through a site visit by Agency staff.

9. Education and Research in Natural Sciences

Wetlands that provide or are likely to provide valuable resources for education or scientific research are significant wetlands.

The wetland complex is located on federal land and has a history of being used for research studies. The wetland is significant for the education and research in natural sciences function as demonstrated in Section 12 of the petition and as confirmed through a site visit by Agency staff.

Under management prescription -8.1 in the GMNF plan (Attachment 1 – Appendix), Beaver Meadows and Abbey Pond was designated a Special Area. In 1989, Beaver Meadows and Abbey Pond was considered for the designation of it being a Research Natural Area by the Natural Heritage Program and an Establishment Record was drafted (Attachment - Appendix N). In this draft document the wetland complex is described as an important natural area of state and national significance; it was later decided that it did not meet all the criteria for that federal designation; although data and information still support the areas as an Ecological Special Area. In the 2006 GMNF Land and Resources Management Plan, Beaver Meadows and Abbey Pond are designated as an Ecological Special Area (Section 8.7) identifying the wetland complex, pond, rare plants and heron rookeries as the special values. Numerous surveys have been conducted in Beaver

Meadows including "Keeping Track Surveys" for mammal usage, amphibian and reptile surveys, and RTE surveys. Some of the data from these surveys may serve as baseline monitoring data to help monitor for population changes; therefore, this wetland complex is considered irreplaceable for this function. At the time of the amphibian and reptile studies in the 1990's, it was only one of three locations in the GMNF where amphibian populations were being monitored and was the only site in the GMNF that had a reptilian inventory
Attachment 1 – Appendix J.

The Beaver Meadows wetland complex is exceptional for education and research in natural sciences.

10. **Recreational Value and Economic Benefits**

Wetlands that provide substantial recreational values or economic benefits are significant wetlands.

The wetland complex is remote, but has reasonable access on public land for recreation, as well as a history of use for such. The wetland is significant for the recreational value and economic benefits function as demonstrated in Section 13 of the petition and as confirmed through a site visit by Agency staff.

11. **Open Space and Aesthetics**

Wetlands that contribute substantially to the open-space and aesthetic character of the landscape are significant wetlands.

The wetland is a distinct and public feature on the landscape that is significant for the open space and aesthetics function as demonstrated in Section 14 of the petition and as confirmed through a site visit by Agency staff.

12. **Erosion Control through Binding and Stabilizing Soil**

Wetlands that are important for erosion control are significant wetlands. Such wetlands are typically located along stream, river, pond or lake shorelines, where erosive forces are present.

The wetland complex contains sinuous streams that are flanked by dense vegetation that reduces the actual and potential streambank erosion, as well as downstream erosion. The wetland is significant for the erosion control through binding and stabilizing soil function as demonstrated in Section 15 of the petition and as confirmed through a site visit by Agency staff.

The Secretary shall also determine whether the wetland is exceptional or irreplaceable based on an evaluation of the extent to which the wetland contributes to Vermont's natural heritage. In determining whether a wetland is exceptional and/or irreplaceable in its contribution to

Vermont's natural heritage the Secretary shall, at a minimum, consider the whether the wetland is categorized as one or more of the following:

13. The exceptional or irreplaceable characteristics of the wetland include the following: Representative Example of Wetland Type; Rare Community Type; Community Assemblage/Wetland Complex; and Landscape Association.

14. **Representative Example of Wetland Type**

Wetlands that are considered exceptional for this criterion exhibit a reference condition for the wetland type(s) with minimal evidence of human disturbance. Based on size, condition, quality and function, these wetlands represent a reference condition for wetland type, and are therefore exceptional.

The wetland is a representative example of a dwarf shrub bog and is in reference condition. The wetland complex is 66 acres, 3-4 of which are dwarf shrub bog and ranks high on the VRAM with very little human disturbance.

The Beaver Meadows wetland complex is representative of a dynamic system influenced by beaver activity and the natural succession that takes place after beaver have left an area. The complex contains several wetland community types, each representative of the community type based on species present; including the dwarf shrub bog, as described below. It is dominated by leatherleaf and contains peat at depths between 3 and over 15 feet. The Dwarf shrub bog has been identified by the VT NHIP. As described in "Wetland, Woodland, Wildland-A Guide to the Natural Communities of Vermont" by E.H. Thompson and E. R. Sorenson, a dwarf shrub bog as contains tall hummocks and moist hollows. The text lists dominant vegetation, many of which were documented within the Beaver Brook Meadows wetland community during site visits. The related communities to the dwarf shrub bog were also described in the book, including the black spruce woodland bog "Dwarf shrub bogs often grade into black spruce woodland bogs...within the cooler regions of Vermont" (pgs. 314-319). Beaver Meadows contains a black spruce bog area and it is representative of that community type.

15. **Rare Community Type**

Wetlands that are considered irreplaceable for this criterion contain unique or rare wetland community type(s) which may be slow-forming or near the extent of its natural range.

The wetland complex contains dwarf shrub bog and black spruce woodland bog that are uncommon and slow forming. The wetland complex is large with small bog inclusions and ranks high on the Vermont Rapid Assessment Methodology (VRAM) with very little human disturbance.

Dwarf Shrub bog is an S2 community type as identified by the VT Natural Heritage Inventory Program. The Beaver Meadows wetland complex contains approximately a 3-4-acre dwarf shrub bog community. It is dominated by leatherleaf and contains peat at depths between 3 and over 15 feet. Although not listed as rare, it also contains a small black

spruce swamp. As described in Wetland, Woodland, Wildland-A Guide to the Natural Communities of Vermont by E.H. Thompson and E. R. Sorenson "Dwarf shrub bogs are considered rare in Vermont, both because there are relatively few sites known and the total acreage of bogs in the state is low" (pg. 316). In addition, "Black spruce woodland bogs are rare in Vermont and most of the examples are small" (pg. 318).

16. **Community Assemblage/Wetland Complex**

Wetlands that are considered exceptional for this criterion are larger wetland complexes usually associated with, multiple wetland community types and bodies of water, which have high species diversity and function. These provide exceptional function and value.

The wetland complex comprises several representative wetland types as listed below and is in reference condition. The wetland is 66 acres in size and ranks very high on the VRAM with very little human disturbance.

The Beaver Meadows wetland complex occupies a narrow valley that sits on a high plateau above the steep western escarpment of the Green Mountains. The valley drains in three directions. While Abbey Pond has its own drainage, Beaver Meadows drain to the northeast and southwest; into the Middlebury River and New Haven River watersheds. The wetland is underlain by metamorphosed sedimentary rocks. Thick layers of peat, hydric soils and in some locations a layer of grey sand were documented. The wetland communities within the Beaver Meadows complex include dwarf shrub bog, Black Spruce Woodland Bog, Emergent/Shrub Marsh, Hardwood/Shrub Swamp, and a forest seepage swamp. Specific species lists for plants, birds, amphibians/reptiles and mammals are provided as supplemental materials with the Petition. A draft map of community types has also been provided with the Petition to show approximations of community types and location within the wetland complex (Attachment 1 – Appendix D).

17. **Landscape Association**

These wetlands are irreplaceable because of the critical nature of their landscape position, and the corresponding functions in that landscape. They are often exceptional because of their size, function and value.

The wetland is a large headwater complex that occupies a unique and important place on the landscape. The wetland is 66 acres in size and ranks extremely high on the Vermont Rapid Assessment Methodology with very little human disturbance.

The Beaver Meadows wetland complex occupies a narrow valley that sits on a high plateau above the steep western escarpment of the Green Mountains. Beaver Meadows drain to the northeast and southwest; into the Middlebury River and New Haven River watersheds; thus, its function for providing water storage and water quality is critical in relation to its landscape position as a large headwaters wetland although not located at the highest elevation on the landscape.

In addition to the above criteria, when determining whether a wetland is exceptional and/or irreplaceable in its contribution to Vermont's natural heritage the Secretary may also consider the following qualities, functions and values that would contribute to a wetland being exceptional and irreplaceable:

18. Undisturbed Condition

Those wetlands in a relatively undisturbed condition.

The wetland is recovered and undisturbed as demonstrated by a VRAM score of 100 out of 100.

Historic data indicates that this area had undergone land clearing, pasturing and then subsequent logging. However, in the last 50 to 75 years, little to no human activity has occurred, allowing the land to succeed to a regenerated forested landscape. The wetland complex has been influenced by beaver activity which is part of its natural regime. There are no known invasive species present in the complex. Continued ownership and management by the USFS, as well as the remote location, has resulted in the wetland remaining in an overall undisturbed condition.

19. Intact Landscape

Those wetlands that are part of an intact and unfragmented landscape.

The wetland is within a landscape which is intact and in a high-quality condition. The Beaver Meadows wetland is part of, and surrounded by, the Green Mountain National Forest, which is an intact and unfragmented landscape along the spine of the Green Mountains. On a broad scale this is a very large habitat block that includes Abbey Pond and Elephant Mountain, with a diversity of habitat types including old-growth hemlock forest, some very good condition seepage swamps, and beaver meadows. The Robert Frost Mountain area contains 8,000 acres of mostly undisturbed, intact and unfragmented landscape. The Beaver Meadows wetland is part of this larger intact landscape.

20. Connectivity

Those wetlands that serve as important wildlife or waterfowl corridors, connecting natural areas and/or serving in migration.

The wetland is used as a corridor connecting habitat blocks. The Beaver Meadows wetland is part of and surrounded by the Green Mountain National Forest, which is an intact and unfragmented landscape along the spine of the Green Mountains. On a broad scale this is a very large habitat block that includes Abbey Pond and Elephant Mountain, with a diversity of habitat types including old-growth hemlock forest, some very good condition seepage swamps and beaver meadows. This habitat block, inclusive of the large 66-acre Beaver Meadows complex, provides good connectivity to the greater Green Mountain National Forest habitat blocks.

Determination of Wetland Classification

Based on the petition dated September 18, 2017, information obtained during a site visit by Wetlands Program staff, comments received during the public notice period and an evaluation of the functions and values of the wetland and the natural heritage value of the wetland, the Secretary has determined that the wetland under consideration is a Class II wetland.

Required Buffer Zone

In order to protect the functions that make the wetland exceptional or irreplaceable, the Secretary has determined that a 400-foot buffer zone is required for the wetland.

Based on the review of the 2007 management comments for the wetland by NHIP (Attachment 1 – Appendix L), a minimum of a 400-foot buffer was recommended to maintain at least a 75% canopy, in order to maximize the protection of the ecological integrity of this very significant peatland complex and the wildlife habitat it provides, and to minimize adverse effects on the quality of surface water entering the wetland. Recommendations for a larger 600-900-foot buffer to provide a protected suitable habitat for foraging and overwintering by reptiles and amphibians as well as maintaining water quality were included within a report by Jim Andrews at Middlebury College (Attachment 1 – Appendix K). Given the historic data available, lack of invasive species, and public ownership, this complex has high value as a reference site for future studies. Preserving the intact nature of the wetland and therefore buffer is critical to its utility as a reference site. For these reasons, a 400 ft. buffer is proposed to protect the intact nature of the natural communities and functions of the wetland.

Effect of Class I Wetland Determination

Activity in a Class I wetland or its associated buffer zone is prohibited unless it is an allowed use under the VWR, or unless it is authorized by a permit, conditional use determination or order issued by the Secretary. The Secretary may impose any permit conditions as necessary to achieve the purposes of the VWR. Section 9.1 of the VWR. This Determination does not relieve the petitioner or any other person of the responsibility to comply with all other applicable federal, state or local laws.

Attachments

- Petition and Petition Appendices (Attachment 1)
- Location Map (Attachment 2)
- Class I Boundary Map (Attachment 3)
- Public Comment Responsiveness Summary (Attachment 4)

Other Reference Documents as Appendices to Petition in Attachment 1

- Functions and Values Checklist (Attachment 1 - Petition)
- Heritage/F&W Surveys (Petition Appendices F, H, I, L, N)
- Photos (Petition – Appendix B)
- VRAM (Petition – Appendix S)
- Abutter Map and List (Petition Form)