

February 5, 2022

To: Burlington Conservation Board via Zoe Richards, Chair.

From: Kate Kruesi  
77 Oakcrest Drive  
Burlington VT 05408

**Concern: beach grading along the Appletree Bay shoreline, Burlington, VT.**

The beach owners along Burlington's Appletree Bay shoreline should check with the DEC Chittenden County District Wetland Ecologist, Tina Heath, for wetland jurisdiction before doing any beach grading or ditching. It appears most, if not all, is protected Class II wetland. The New North End's sand and silt delta soils absorb annual precipitation which seeps year-round through the soils and this beach zone into the lake. This wet Lake Sand Beach Natural Community is rare and several state-level rare plants, one of which is globally rare (G1, Critically Imperiled), are found the length of this beach: *Eleocharis diandra* (G1, S1), *Schoenoplectiella smithii*, *Eragrostis hypnoides*, *Eleocharis intermedia*, *Cyperus squarrosus* and *Cyperus erythrorhizos*, among others. All are obligate wetland species. [FYI, I live in the Lakewood neighborhood and am a Plant Conservation Volunteer. I do rare plant surveys for the state and Native Plant Trust, observing these populations annually as they respond to seasonally changing lake levels.]

After Marla Emery observed beach grading and ditching at Killarney Beach and the Elks Club Beach, Assistant State Botanist, Aaron Marcus contacted Tina Heath to check wetland status (see email conversation below). Ms. Heath visited the Killarney Beach area, August 19, 2021. I asked her to check Lakewood's beach as well to demonstrate that the conditions continue up the beach. (I've observed beach grading further north along this beach over the years.)

**Conservation Board and Municipal actions to consider:**

1. I believe the only access for heavy equipment to do work on sea walls and beach grading is through Leddy Park. If this is true, these businesses likely require a permit from BPRW to access the beach, correct? This permit should require that the wetland status of the beach property be determined before heavy equipment work.
2. The city should ask Tina Heath to assess wetland jurisdiction at Leddy Beach, to classify Class II wetlands further north along the bay. (Note that beach raking is allowed in the attached documents.)
3. There are rumors of the Elks Club Beach changing ownership. New owners need to be reminded of the Class II wetland classification as well as the legally protected plant species here: *Equisetum palustre* and *Lathyrus maritimus*, (both coded T-threatened), should shoreline protection or other changes come before the board.

Thanks for your attention and all the volunteer work that you do!

**See references and list of attachments on next page.**

**Attachments:**

2021-370 Wetland Classification Report.pdf  
2021-370\_KDIBeach\_Wetlands.pdf

**Email, 4/29/2021, from Tina Heath, VT's District Wetland Ecologist:**

**Heath, Tina** <[Tina.Heath@vermont.gov](mailto:Tina.Heath@vermont.gov)>

to [sarajbarsotti@gmail.com](mailto:sarajbarsotti@gmail.com), me, [marla.r.emery@gmail.com](mailto:marla.r.emery@gmail.com), Aaron

*Good morning,*

*I was contacted by Aaron Marcus to look into the beach grading proposal and whether wetland jurisdiction may be triggered. Based on Aaron's description, although temporal, the beach area (when exposed) is likely wetland. This means that the area has a predominance of wetland vegetation (which includes RTE species), hydric soils, and hydrology to "qualify" it as a wetland. It is likely jurisdictional as well ("Class II") and would have a 50-foot protected buffer zone.*

*If these wet areas have been regularly maintained by hand or use of rakes, then that is fine to continue to do. However, if a more substantial alteration is proposed such as mechanical grading, then this would require wetland permitting. It would likely be difficult to approve, as we'd be looking for alternatives that have a more minimal effect (such as raking) on the wetland and its plant communities.*

*Please let me know if you have any questions, I could also come out to the site to have a closer look.*

*Best,  
Tina*

*Due to the coronavirus (COVID-19), the Agency of Natural Resources is taking additional safety measures to protect our employees, partners and customers. We anticipate we will be working remotely until a least March 31, 2021 and encourage you to communicate electronically or via phone to the greatest extent possible. Thank you for your patience and understanding that responses may occasionally be delayed.*

**Tina Heath** | District Wetland Ecologist – Chittenden County  
Vermont Department of Environmental Conservation  
Watershed Management Division  
Wetlands Program  
111 West Street  
Essex Junction, Vermont 05452  
802-490-6202  
<https://dec.vermont.gov/watershed/wetlands>

September 7, 2021

*Sent Via Email*

**re: Killarney Drive Beach, Wetland Project 2021-370**

Dear Killarney Drive Inc./ Homeowner's Association, c/o Marla Emery:

Thank you for meeting with me on August 19, 2021, to review the subject property/beach for wetlands and to discuss a complaint regarding machine grading and alteration.

**Please be advised there is a Class II wetland on the property with SPAN ID 114-035-13304, located just south of 277 Killarney Drive, Burlington. Attached to this letter is a Wetland Classification Report for your records.**

The subject wetland is not mapped on the Vermont Significant Wetland Inventory maps, but meet the presumptions listed in Section 4.6 of the Vermont Wetland Rules. Any activity that is not an allowed use designated in Section 6 of the VWR will require a State Wetland Permit. In addition, the U.S. Army Corps of Engineers (Corps) regulates discharge of dredge and fill material and mechanized land clearing in wetlands. For detailed information on Corps permits and regulations call (802)872-2893. In addition, your town may have local regulations regarding wetland protection.

Back in April 2021 the Wetlands Program received a complaint regarding the use of a machine to grade and alter the beach. These types of activities require a state wetland permit if within a Class II wetland or its 50-foot buffer zone. Based on the August 19, 2021 site visit, it appears this work was done within the wetland.

In order to be issued a permit the applicant needs to demonstrate that wetland impacts are unavoidable and have been minimized and mitigated such that there are no undue adverse impacts to the wetland or its functions and values. In this situation, the use of a machine to grade and alter the wetland can cause undue adverse harm to the wetland and permitting is unlikely.

Less impactful maintenance activities such as hand raking can be done, so long the wetland's vegetation and hydrology remains intact.

If you have any questions or concerns, please contact me at 802-490-6202.

Sincerely,



Tina Heath  
District Wetland Ecologist

# #2021-370 Wetland Classification Report

Tuesday, September 7, 2021 8:35 AM

[Please add this document to your land records for reference](#)

**Wetland is Class II:** Please be advised that I have confirmed that one or more wetlands on your property has characteristics that make it a Class II significant wetland. Class II significant wetlands and their 50 ft buffers are protected under the Vermont Wetland Rules (VWR). This report outlines the reasons for this decision, and serves as notice that any activity in the wetland or 50ft buffer zone may need a Vermont wetland permit before you start work. If you disagree with this decision you can petition for a formal wetland classification determination of Class III as outlined under the petition section of this report. The following table(s) document the reasons for this decision.

Wetland Name:	1
Wetland Location:	South of 277 Killarney Drive, Burlington. Beachfront on Lake Champlain.
Desktop Review Only?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Site Visit Date:	8/19/2021
People Present:	Tina Heath; Marla Emery; Kate Kruesj; Danielle Campbell; Leah Israel
Wetland is Mapped:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland is contiguous to mapped wetland:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland was found to meet the following presumption(s) of significance:	<input type="checkbox"/> Presumptions have not been assessed. Wetland meets classification by other means. <input checked="" type="checkbox"/> §4.6(a) over half an acre in size; <input type="checkbox"/> §4.6(b) contains woody vegetation and is adjacent to a stream, river, or open body of water; <input type="checkbox"/> §4.6(c) contains dense, persistent non-woody vegetation and is adjacent to a stream, river, or open body of water; <input type="checkbox"/> §4.6(d) is a vernal pool that provides amphibian breeding habitat; <input type="checkbox"/> §4.6(e) is a headwater wetland; <input type="checkbox"/> §4.6(f) adjacent to impaired waters and the impairment is related to wetland water quality functions; <input type="checkbox"/> §4.6(g) the wetland contains a species that appears in the NNHP database as rare, threatened, endangered or uncommon; or is a natural community type that is rare or uncommon; <input type="checkbox"/> §4.6(h) has been previously designated as a significant wetland.
Presumption Description:	Temporal wetland dependent upon water levels of Lake Champlain. Wetland appears to continue off property for quite a ways north and south along Apple Tree Bay. Several rare and uncommon species are mapped in and within 50-feet of the wetland.

Sketch Map of general wetland area (not a delineation):

[Mapped wetland in teal, hydric soils in orange, advisory wetlands in green, wetland sketch in light blue, area reviewed in yellow]



Photo:

Preliminary Classification:

- Class II
- Class III

Class III justification:

## Wetlands Determination Petition Process

If you disagree with this report, you may request a formal determination of wetland classification, pursuant to Section 8 of the VWR. To request a §8 formal determination of wetland classification, please fill out and submit the petition form located on the Vermont Wetlands Program’s website “Permit Information” page. Formal determinations are appealable pursuant to 10 V.S.A. § 917.

Pursuant to 10 V.S.A. chapter 220, any appeal of a formal wetland determination decision must be filed with the clerk of the Environmental Division of the Superior Court within 30 days of the date of the decision. The Notice of Appeal must specify the parties taking the appeal and the statutory provision under which each party claims party status; must designate the act or decision appealed from; must name the Environmental Division; and must be signed by the appellant or their attorney.

In addition, the appeal must give the address or location and description of the property, project, or facility with which the appeal is concerned; the name of the permittee; and any permit involved in the appeal. The appellant must also serve a copy of the Notice of Appeal in accordance with Rule 5(b)(4)(B) of the Vermont Rules for Environmental Court Proceedings. For further information, see the Vermont Rules for Environmental Court

Proceedings, available on line at [www.vermontjudiciary.org](http://www.vermontjudiciary.org). The address for the Environmental Division is: 32 Cherry Street, 2nd Floor, Suite 303, Burlington, VT 05401 (Tel. # 802-951-1740).



## More Information is Available on the Wetlands Program Website

For more on state wetland permitting and how to apply for a permit visit the [Wetlands Permit Information Page](http://dec.vermont.gov/watershed/wetlands/jurisdictional/permit-info), at <http://dec.vermont.gov/watershed/wetlands/jurisdictional/permit-info>

For more on wetland classifications visit the [Jurisdictional Wetland Page](http://dec.vermont.gov/watershed/wetlands/jurisdictional) at <http://dec.vermont.gov/watershed/wetlands/jurisdictional>

For more about Allowed Uses visit the [Allowed Uses Page](http://dec.vermont.gov/watershed/wetlands/bmps) at <http://dec.vermont.gov/watershed/wetlands/bmps>

For more on wetland classification petitions and forms visit the [Wetlands Permit Information Page](http://dec.vermont.gov/watershed/wetlands/jurisdictional/permit-info), at <http://dec.vermont.gov/watershed/wetlands/jurisdictional/permit-info>

To find a wetland consultant to help with applying for a permit or petitioning see our [Wetland Consultant List Page](http://dec.vermont.gov/watershed/wetlands/what/id/wetland-consultant-list) at <http://dec.vermont.gov/watershed/wetlands/what/id/wetland-consultant-list>

## Other Wetland Permit Obligations

In addition, the U.S. Army Corps of Engineers ([Corps](#)) regulates the discharge of dredged and/or fill material, including mechanized land clearing and grading, in all waters of the United States, including inland rivers, lakes, streams and wetlands. For detailed information on Corps permits and regulations call (802) 872-2893. It is the applicants responsibility to determine if your project also requires an Corps permit. In addition, your town may have local regulations regarding wetland protection. Please call your town clerk to verify any local regulations.

[Please add this document to your land records for reference](#)



## Department of Fish and Wildlife

Natural Heritage Inventory  
5 Perry Street, Suite 40  
Barre, VT. 05641

11 Feb 2022

Dear Scott:

I am contacting you in regard to the proposed acquisition of a portion of the Elk's Lodge property by a private entity. While I am sure that you are aware of the recreational and educational value of the parcel to the City, I would like to emphasize its ecological value.

The parcel contains one of the largest and least disturbed Lake Sand Beach examples in the state in addition to a number of rare and/or state threatened plants. The state threatened plants include the following:

- marsh horsetail (*Equisetum palustre*)
- beach pea (*Lathyrus japonicus* var. *maritimus*)
- Muhlenberg's sedge (*Carex muehlenbergii*)

In addition the following rare, but not legally listed plants are known from the site:

- Wright's spike-rush (*Eleocharis diandra*) a globally rare for which this is one of the largest populations
- water hemp (*Amaranthus tuberculatus*) a plant that is rare throughout New England
- red-root flat-sedge (*Cyperus erythrorhizos*)
- Smith's bulrush (*Schoenoplectiella smithii*)

Regardless of the outcome of this proposed land change, we urge you and the board to consider the value of the rare plants and significant natural community at the site. Any future management by any party would need to avoid any impact to the legally protected, state listed species on the site.

Please let me know if I can provide any further information.

Sincerely,

Robert Popp  
Program Botanist  
(802) 476-0127

## Statement to the Conservation Board, Burlington, VT

February 7, 2022

Dear Mr. Gustin and members of the Conservation Board,

I am writing to express my concern with the potential transfer of shoreline property from the Elks Club to KDI. For both educational access and for general access by our wider community, I would like to encourage the Conservation Board to act to protect this educational and ecological resource.

The parcel in question, a piece of shoreline on Lake Champlain with the exposed geologic feature of the Champlain Thrust Fault, is a valuable educational resource for the city and for the many students who study here. In the courses I teach at UVM, I have often accessed this amazing resource to help students understand the geologic history and how this connects to our environment today. (I have attached the lab outline that I use). It would be a great loss of this tremendous resource to place it in the private hands of ~40 households of KDI, rather than to hold it with the city or a land trust and continue to allow diverse, inclusive access to students and others who can learn from it and enjoy it.

In addition, careful stewardship of this parcel contributes to the health of Lake Champlain. The wetlands located on the property play a likely small but important role in shoreline structure and function. Again, caring for this area should be in the public interest, rather than private hands.

In addition to educational access, it also seems to me that as we as a city consider how to encourage access to natural areas for all, not just a privileged few, that we should prefer Burlington as a whole to hold rights to this special area. If the section of beach and geologic feature are transferred to the limited population of KDI, many fewer of our community will be able to visit, enjoy, and protect this special area. Rather, keeping it held for the public along with the surrounding area being transferred shares this resource more widely for all.

I believe that the remainder of the Elks Club parcel being sold will ultimately be moved to the City of Burlington. It is my sincere hope that this remarkable piece of shoreline can also be held by the city, or a land trust that could preserve the ecological and educational value and maintain public access.

Thank you,

Laura Yayac

38 Pitkin Street  
Burlington, VT 05401

## NR 9 Fall Lab 3: Killarney Beach and Arms Forest

12:15-4:15pm

Primary related objectives:

Natural history	Students will be able to demonstrate skills of sustained, in-depth attention, observation, and description. They will be able to identify patterns and trends through observation.
Geology	Students will be able to describe how major geologic processes formed (and continue to form) Vermont's landscape, with a focus on plate tectonics, glaciers, and erosion.
Geology	Students will be able to explain how soils differ depending on location, topography, etc, and will be able to explain how geological, surficial, and land-use histories influence these differences.
Natural history	Students will be able to identify, describe, and articulate basic life histories of 20 woody plants, 10 herbaceous plants, and 10 birds.

### Supplies

- Forest Trees of Maine
- Shovels
- pH test kit
- ages of rock, maps of area with bedrock and surficial geology
- permission from Elks Club
- Rock Jokes

### Schedule

**12:15** Meet in front of Aiken, board bus, take attendance, depart for Elks Club parking lot (Killarney Beach)

**12:35** Arrive Elks Club

**12:35** Introduction to lab, "Bringing Our Minds Together – Rock Jokes

**12:45**

- Arrive at Monarch Meadows, have students spend some time individually exploring and investigating the visible landform. Then reconvene in separate lab groups and discuss:
  - Why is the land shaped the way it is? What makes a flat landscape? What makes a hilly landscape?
  - Why is there a meadow here (it is actively managed for monarch butterflies!)

**1:00 – Rotation Stop 1: Reading the Landscape –**

- Walk into forest along trail at SW corner of Monarch Meadow. Stop at first trail intersection. You are standing in a grove of red and white pine trees. To your left is a rock outcrop full of hardwoods. To your right is a ravine full of hemlocks. **Teach White and Red Pine species ID, and Hemlock ID**
- **Pieces, Patterns & Process:** Split the group into teams of 3 or 4 students. Send equal numbers of groups to explore: 1)the ravine, 2) the flat area, 2) the rock outcrop. Each of the groups explores the area, identifying the pieces and patterns they identify (landform, topography, geology, trees, vegetation, etc.) Each group should also discuss potential "processes" that caused the pieces to be arranged into the patterns they notice. Examples of pieces/patterns and potential processes (in parentheses).

- -Landform is arranged in rocky outcrops (formed by Taconic orogeny), flat bench (delta), and ravine (eroded by a tributary).
- -Hemlocks found only on the sloping ravine (slope aspect, soil acidity, drainage)
- -Pines only really found on the flats (soil drainage, human planting?)
- -Trees on the outcrops are different than on the flats/ravine (different soil richness/depth).
- -Shrubby vegetation much denser on the outcrops (same as above).
- Groups reconvene and share the pieces/patterns/processes they identified. Wrap up: Emphasize relationship between geology, surficial geology, topography, and ecology. Perhaps extend this to humans: how would Vermont farmers have used this site?

### 1:45- Rotation Stop 2: Bedrock Geology

- Return to Monarch Meadow, then head across bike path, down stairs to Killarney Beach. Continue along beach until bedrock outcrop. Have students break into their groups again and **investigate the outcrop**. Students will be able to walk up a trail to the contact between the Iberville and Dunham layers. Have each group work together to answer some questions:
  - How many types of rock are there? (2)
  - What color is each type?
  - How hard is each type?
  - Describe the layering in each rock type. Suggest some processes that caused layering (*i.e. layers formed by sediment collecting over time. Warping in the Iberville caused by the pressure of the Dunham deforming it*).
  - brainstorm and propose a “depositional environment” for each of these layers (*deep, dark ocean versus near-shore, coral reef ocean*).
- Groups reconvene and share what they found.
  - Reveal the age of the two rock layers here. Ask groups to propose a process to explain this (the thrust fault!). Explain that the Dunham Dolostone used to be 35 miles west and about 6,000 feet down.
  - Discuss the idea of “original horizontality” and “law of superposition” in geology (*i.e. rock deposits in horizontal layers, and younger rocks sit above older rocks*).
  - Explain that the Dunham Dolostone is made up of a mixture of sands, silts, and calcite (*a.k.a. decomposed critters*).
  - Optional: Explain that the dark color and “lamination” layering is explained by the high density of clay in the shale, clay particles being flat disks.

### 2:30 Rotation Stop 3: Surficial Geology

- Walk over to base of sandy embankment.
- The students’ job is to figure out what happened here. (*This area is a landslide from 2011 (in the incredibly wet spring). The sand is classic Winooski River/Champlain Sea delta (160 ft above sea level)*).
  - In partners- explore the area and figure out what’s going on. *\*Safety\** - *be aware of loose sand, rocks, etc.* - **What is the surficial geology here?**
  - Reconvene as a group- have students report on what’s going on.

- They'll likely figure out that it was a *landslide*.
- When? How can we deduce this? (*2011, plants*)
- Why did this landslide happen? If you have time and inclination, use a shovel and a soil probe to dig down and reveal a *core of silt/clay*. *Rainwater draining through sand stopped and formed a lubricating layer atop clay/silt upon which the delta sands slid off.*
- Where did it come from?: Lake Vermont/Champlain Sea bottom sediment.

**3:15** walk back to Elks Club parking lot.

**3:30** On-the-bus reflection: How does bedrock and surficial geology shape the physical landscape? How do these geologies affect other pieces of the landscape: i.e. water, plants, wildlife, human use, etc.?

**3:45** Depart

**4:15** Return to Aiken