

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

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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