New Hampshire Natural Heritage Bureau

Division of Forests & Lands - DNCR
172 Pembroke Road, Concord, NH 03301
(603) 271-2214 NHB website

October 6, 2022

Wayne Presby
c/o Earl Duval, esq.
Mount Washington Cog Railway
3168 Base Station Road
Mount Washington, NH 03589
eduval@thecog.com

RE: Natural Heritage Bureau vegetation survey of the proposed Lizzie's Station development

Dear Wayne and Earl:

Thank you for contacting the NH Natural Heritage Bureau to conduct vegetative surveys in and around Lizzie's station area. NHB provides information on native plants and natural communities to assist landowners and land managers. The ecologists and botanists in NHB analyze data on the status, location and distribution of rare or declining native plant species and natural communities to protect NH's biodiversity. Our database contains information on over 7500 native plants, wildlife and exemplary natural communities in New Hampshire. We develop recommendations for the protection, conservation, enhancement and management of NH's native plants and natural communities (RSA 217-A).

In early 2022, the Mount Washington Cog Railway announced plans to construct a new facility called Lizzie's Station within the railway right-of-way and adjacent to Mount Washington State Park. This proposed development would include the installation of new spur tracks on either side of the existing line, which would be occupied seasonally by 18 anchored rail cars.

Mount Washington State Park and the Cog Railway are situated in the center of the Presidential Range of the White Mountains, which supports 7.5 square miles of alpine tundra, the largest expanse of this habitat in the eastern United States. As defined by NatureServe, this Northern Appalachian Alpine Tundra system is ranked G3, or globally vulnerable.

According to *The Nature of New Hampshire*, there are 63 rare alpine/subalpine plant species in New Hampshire, three of which are endemic/near endemic species. Mount Washington, which is the proposed site of Lizzie's Station, is home to more than half of these rare plant species, making this specific area important to conserve.

The biodiversity of plants is not the only conservation value the alpine tundra system holds. The White mountain arctic (*Oeneis melissa semidea*) is a state threatened (S2) butterfly that is found in the **sedge – rush – heath meadow** natural community, and is known only from the Presidential Range of the White Mountains.. These butterflies rely on **Bigelow's sedge** (*Carex bigelowii*) as

their primary host plant, making the conservation efforts of the butterfly strongly linked to the conservation of this plant.

On August 3, 2022, staff from the New Hampshire Natural Heritage Bureau (NHB) conducted a site visit to the proposed location of the Lizzie's Station development in order to identify the plant species in the proposed area of impact, and to assess the condition of the alpine tundra system.

The proposed station would occupy an area approximately 100' wide (the full width of the railway right-of-way), and 500' long, extending downslope from the point where the right-of-way abuts Mount Washington State Park. These boundaries were not indicated on the ground by any markers, so the site extent was estimated using GIS software tools (ArcGIS) to draw a polygon delineating the impact area based on the site description in the proposal. This polygon was uploaded to a GPS unit, which was used in the field to ensure that the surveyors were within the proposed project extent.

To assess the condition of the site, NHB staff took notes on vegetation density and species composition, as well as notes on disturbance from the railway and other anthropogenic sources. To evaluate the condition of the alpine tundra system, six vegetation plots were sampled, three on each side of the tracks (**Map 1**). These plots were spaced out with one near each end of the project area, and a third roughly halfway between the plots on either end. Each plot was a 5x5 meter square, with all observed plant species noted, and percent cover for each species estimated within the plot.

NHB's finding identified that the proposed Lizzie's Station would eliminate approximately 35,500 ft^2 of intact alpine tundra. This excludes the existing railroad line and the associated disturbed areas on the east side of the tracks. The following findings are based on NHB's inventory and observations. State conservation ranks [S1-S5] indicate the relatively rarity of both species and natural communities. S1 indicates the rarest or most imperiled species and communities, while S5 are the most common and secure:

Natural Communities Observed

The alpine tundra system within the survey area was a mix of two different natural communities, **sedge – rush – heath meadow** (S1) and **felsenmeer barren** (S2).

- The **sedge – rush – heath meadow** (Photo 1) is an alpine meadow community dominated by a mix of Bigelow's sedge (*Carex bigelowiii*), highland rush (*Juncus trifidus*), and dwarf shrubs. The dwarf shrub diapensia (*Diapensia lapponica*) was present in most of the plots, and abundant in one. This community is ranked G2 (globally imperiled) by NatureServe.

- **Felsenmeer barrens** are characterized by masses of lichen-encrusted rocks, with very sparse cover of vascular plants. This community is ranked G3 (globally vulnerable) by NatureServe.

State Threatened (S2) Species Observed

The vascular plants within the survey area included a number of state threatened alpine species. The rare plant species observed during the survey were:

- Bigelow's sedge (*Carex bigelowii*)
    - Bigelow's sedge is one of the dominant plant species within the survey area, and can be found in dense patches across the site. Bigelow's sedge is notable as the host plant for the White Mountain Arctic, a species of butterfly endemic to the alpine zone of the Presidential Range. Recent studies have indicated that populations of this butterfly are concentrated in a few locations within the Presidential Range, including the north side of the Mount Washington summit.

- Diapensia (*Diapensia lapponica*)
    - Diapensia is a cushion plant that tends to grow on the most exposed portions of the alpine environment. During the survey, it was found in 4 of the 6 plots, and occurred as scattered patches across the rest the study area.

- Mountain firmoss (*Huperzia appressa*) (Photo 2)
    - Mountain firmoss is a small, spore-bearing plant that occurs on exposed summits and ridges at high elevations. It is known from several locations in the White Mountains and north country of New Hampshire, but this is the first formally documented occurrence of this species in the Presidential Range.

- Lapland rosebay (*Rhododendron lapponicum*)
    - Lapland rosebay is a low-growing, heath-family shrub that can form large colonies in the alpine tundra. While frequent in portions of the Presidential Range, the only other known location for this species in New England is on Mt. Katahdin in Maine. It was not common in the study area, occurring in only 1 of the 6 plots.

- Dwarf blueberry (*Vaccinium cespitosum*)
    - Dwarf blueberry is found primarily on high summits and ridges, but can also occur at lower elevations along moderate and high-gradient river shores. Although this species did not occur in any of the plots within the study area, a few plants were observed between the plots.

State Endangered (S1) Species Observed

The vascular plants within the survey area included three state endangered alpine species. The rare plant species observed during the survey were:

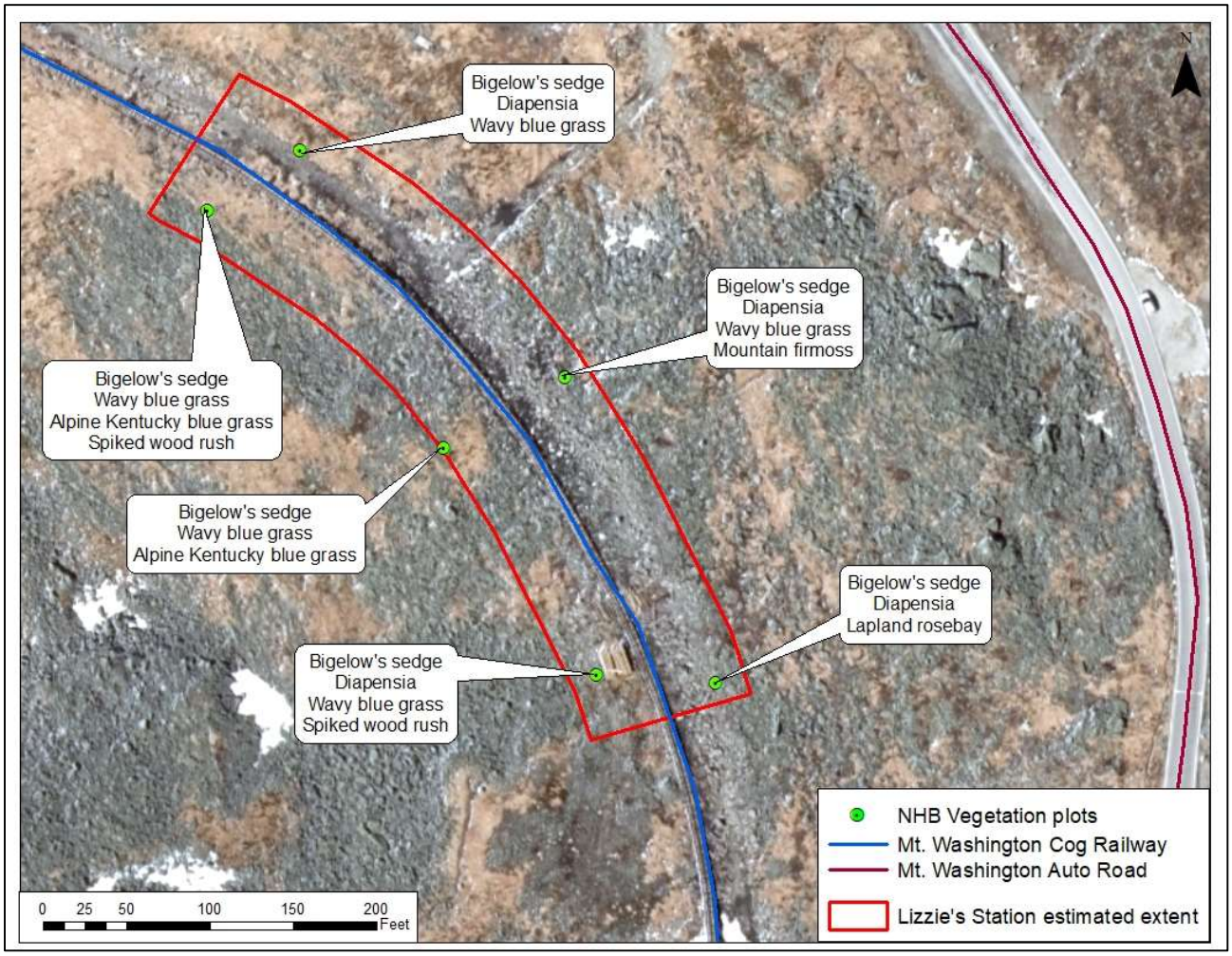
- Spiked wood rush (*Luzula spicata*)
    - Spiked wood rush has been documented at several locations in alpine habitat in the White Mountains, but most of these occurrences are considered historic (not observed in the past 20 years). In the Presidential Range, this species seems to be in greatest abundance near the summit of Mt. Washington. During the survey, it was found in 2 of the 6 plots, and scattered elsewhere in the study area.

- Wavy blue grass (*Poa laxa* ssp. *fernaldiana*)
    - Wavy blue grass has been documented at locations throughout the Presidential Range and along Franconia Ridge, although most of these occurrences are considered historic. While not forming dense patches, it was frequent throughout the study area, occurring in 5 of the 6 plots.

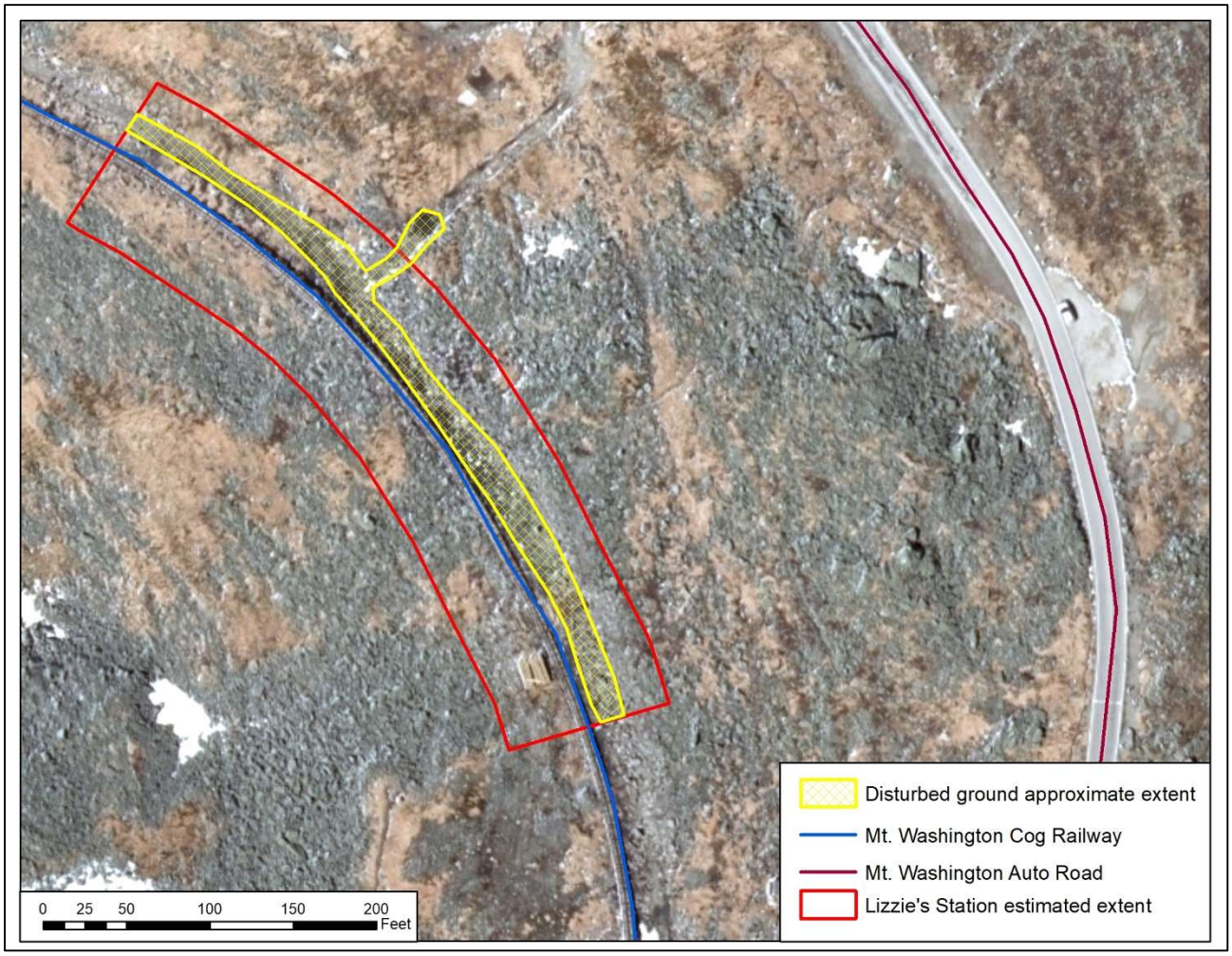
- Alpine Kentucky blue grass (*Poa pratensis* ssp. *alpigena*)
    - Alpine Kentucky blue grass is a native subspecies of the common, non-native Kentucky blue grass of lower elevations. The summit and ravines of Mt. Washington are the only known locations for this species in New England. Within the study area, this species was observed in 2 of the 6 plots.

Nearby Areas

The area immediately adjacent to the tracks on the east and north side of the rail line was heavily disturbed (Photo 3). Much of the site within 25' of the tracks on this side of the line has a worn-in track that is presumably the result of maintenance activities associated with the railway (Map 2). This area includes a variety of debris, including wood, metal, trash, and coal residue. The coal residue includes both lumps of solid coal and a fine-grained sediment that in some places forms deposits several inches deep (Photo 4). Some of these coal sediment deposits appear to have smothered patches of vegetation and in at least one location, seem to extend beyond the railway right-of-way onto White Mountain National Forest land.



Map 1. Location of NHB vegetation plots and associated rare plant species within Lizzie's Station project area.



Map 2. Approximate extent of heavily disturbed ground within Lizzie's Station project area.

Photo 1. ***Sedge – rush – heath meadow*** community.

Photo 2. Previously undocumented occurrence of mountain firmoss (*Huperzia appressa*).

Photo 3. Disturbed swath just east of cog railway tracks (yellow hatching).

Photo 4. Hand excavating to determine depth of coal sediment deposit.

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The alpine zone of the Presidential Range is a significant resource in state and global conservation. Given the importance of this habitat, NHB recommends avoiding impacts to global and state endangered and threatened species and natural communities including:

- NHB recommends concentrating project impacts and ground disturbance within the area that contains the coal deposits and other debris (see Map 2 and Photo 3, areas in yellow).

- Collaborate with NHB and other Summit Partners to assist in the development of an invasive species control plan, including Early Detection and Rapid Response protocols for high-risk non-native plant species, which is 25 times more cost effective than post-invasion management.

    - In May 2022, Bill Nichols, State Botanist with NHB, presented to the Mount Washington Commission his research that discovered that NH's alpine summits contain the most non-native plant species known worldwide per unit area. This includes 58 non-native plant species detected at 30 sites since 1874 and includes the vicinity around Mount Washington State Park. Of the 58 non native plant species, 14 are of high concern based on the capacity to spread in the alpine region. The high number of non-native plants in NH's alpine region relates most to the long history in the region of distburance and recreation.

Thank you for the opportunity to provide this information, NHB is available to provide information and assistance, please feel free to contact me.

Sincerely,

Sabrina Stanwood

Sabrina Stanwood, NHB Administrator
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cc:
Sarah Stewart, Commissioner, DNCR
Patrick Hackley, Director, Division of Forests & Lands
Patrick Hummel, Park manager, Mt. Washington State Park