



New Hampshire Natural Heritage Bureau

Division of Forests & Lands - DNCR
172 Pembroke Road, Concord, NH 03301
(603) 271-2214 <https://www.nh.gov/nhdfl/>



www.mooseplate.gov

To: Commissioner Sarah L. Stewart
Via: Patrick Hackley, Director Forests & Lands
From: Sabrina Stanwood, Administrator
Date: December 28, 2022
Subject: Rare plant observations in 2022 at Mount Sunapee Resort

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. NHB's database contains information on over 7500 native plants, wildlife and exemplary natural communities in New Hampshire. NHB develops recommendations for the protection, conservation, enhancement and management of NH's native plants and natural communities ([RSA 217-A](#)) and NHB's [Administrative Rules Ncr 300 – Ncr 312](#)). NHB's research and work on Mt. Sunapee state park is supported by a portion of Conservation License plate (Mooseplate) funds. www.mooseplate.com

Following the discovery of the state-threatened greater fringed-gentian (*Gentianopsis crinita*) at the Mt. Sunapee ski resort in 2015, staff of the New Hampshire Natural Heritage Bureau (NHB) began annual monitoring of this population in 2017. The purpose of this monitoring was to gain a better understanding of the size and scope of the population, and to provide recommendations on management to protect and maintain this species at the site. In the course of these annual surveys, NHB staff have discovered two additional state-rare plant species that co-occur with the greater fringed-gentian: Loesel's wide-lipped orchid (*Liparis loeselii*) and northern tubercled bog-orchid (*Platanthera flava* variety (var.) *herbiola*). Both of these species will also be incorporated into annual monitoring activities at Mt. Sunapee. Refer to Map 1, Rare plant locations on pg. 6.

This report summarizes surveys of rare plant populations at the Mt. Sunapee ski area conducted in 2022 by NHB staff on two dates: July 6 and October 6.



New Hampshire Natural Heritage Bureau

Division of Forests & Lands - DNCR
172 Pembroke Road, Concord, NH 03301
(603) 271-2214 <https://www.nh.gov/nhdfl/>



www.mooseplate.gov

Greater Fringed-Gentian

The annual monitoring of the population of greater fringed-gentian (*Gentianopsis crinita*) has occurred



since it was first documented at Mt. Sunapee in 2015. The number of flowering stems has varied greatly between years, increasing from 11 in 2019 to 185 in 2020, and then decreasing to 77 in 2021.

The October 6, 2022 survey searched the Pipeline and Jet Stream ski trails from the base of the slope up to about 70 meters. Approximately 731 flowering stems were found in three areas: a ditch at the base of the Pipeline trail (97 stems), along an ATV trail under the lift (127), and throughout the Jet Stream ski trail, which is where the majority

of plants were found (507).

NHB was able to relocate greater fringed gentian plants at the ditch at the base of the Pipeline ski trail going upslope along the northeast part of the trail. This area was not in the recommended area to delayed mowing. It was mowed this year and some of the gentian plants were cut while they were in flower, not allowing seed to set. NHB recommends adding this part of Pipeline ski trail to the areas that should have a late season (Oct. 25 or later) mowing schedule (see map 2 on page 7). NHB staff spoke with two Mt. Sunapee Resort employees working on the chairlift about the importance of avoiding mowing in the area until after seed-set. They were aware of the plants and management regime and offered to pass the message on to Mt. Sunapee Resort employees that mow the ski slopes.

The reason for the large fluctuations in the flowering stem count is uncertain, however it is likely related to the plant's life cycle. Greater fringed-gentian is a biennial species, meaning that plants generally live for two years. In the first year after germination, the plants typically occur as a low rosette of leaves, inconspicuous among other vegetation. In the second year, the plant sends up a flowering stalk, producing one or more blooms. After the flowering period is complete, numerous tiny seeds are released, and the plant dies. Because of this two-year cycle, it is possible that large numbers of flowering plants are only visible every other year, but further surveys will need to be conducted to confirm this pattern. If this hypothesis is correct, there should be a decrease in the number of flowering stems next year; however, there appears to be an overall positive trend in population growth.

As noted in previous reports, because greater fringed-gentian is not a perennial species, it requires that plants disperse seeds in order for the population to persist at a given location. Because this species flowers so late in the season, the seeds are typically not mature until at least mid-October.



New Hampshire Natural Heritage Bureau

Division of Forests & Lands - DNCR

172 Pembroke Road, Concord, NH 03301

(603) 271-2214 <https://www.nh.gov/nhdfl/>



www.mooseplate.gov

Loesel's Wide-Lipped Orchid



The July 6 survey searched for Loesel's wide-lipped orchid (*Liparis loeselii*), a state-threatened herbaceous plant. This species was first documented at Mt. Sunapee in 1998, when 17 plants were found growing in seepy conditions near the base of the Jet Stream ski slope just west of the Spruce Triple Chair Lift. Subsequent visits were not successful in relocating the rare plant until surveys in 2019 expanded the search area and found a single flowering individual near the base of Elliot Slope, east of the initial observation. NHB staff were unable to relocate the rare plant at Elliot Slope in 2021. However, the July 8, 2021 survey did find three flowering stems and one vegetative plant by

the second tower of the Spruce Triple Chair Lift on the Jet Stream ski trail, near the 1998 observation. A subsequent survey on September 28, 2021 found 9 fruiting stems and 1 vegetative plant at 3 separate points on the slope.

In 2022, the July 6 survey searched the two areas and were still unable to relocate the orchid at the base of Elliot Slope. NHB staff did find the population on the Jet Stream ski trail which consisted of 16 flowering stems and 4 vegetative stems at three separate points on the slope.

The late-season mowing [recommended for greater fringed-gentian (*Gentianopsis crinita*)] has likely been beneficial to the growth of Loesel's wide-lipped orchid by keeping the small herbaceous plant from being overcrowded by vegetation. At Elliot Slope, NHB recommends instituting **early-season (May-early June) mowing** to reduce competition for the rare orchid. The overgrowth on that slope may be limiting the orchid's ability to grow and mowing could aid the population in that area if it is still present.



New Hampshire Natural Heritage Bureau

Division of Forests & Lands - DNCR
172 Pembroke Road, Concord, NH 03301
(603) 271-2214 <https://www.nh.gov/nhdfl/>



www.mooseplate.gov

Northern Tubercled Bog-Orchid



During the July survey for Loesel's wide-lipped orchid, northern tubercled bog-orchid (*Platanthera flava* var. *herbiola*) was found on the Jet Stream ski trail. This state-threatened species had not previously been documented at Mt. Sunapee. Approximately 15 flowering stems were found in a two square meter area about 40 meters above the base of the slope. A specimen was collected in the field and identified by NHB staff post-field.

Future surveys at Mt. Sunapee should actively search for northern tubercled bog-orchid to gain a better understanding of the extent of this population. NHB staff believes that the late season mowing may be benefitting this species and should continue in the area of this rare plant to aid in its proliferation.

Invasive Species

During both surveys, NHB staff noted an abundance of an invasive plant called brown knapweed (*Centaurea jacea*), which was growing in a dense patch on the Pipeline ski slope. Rare plants were not found among the knapweed, and it is unknown if the invasive plant is outcompeting rare plants or if their populations are separate due to preferred soil conditions.

Autumn-olive (*Elaeagnus umbellata* var. *parvifolia*) was another invasive plant species observed during surveys. The autumn olive was not as abundant as the brown knapweed, but several stems occurred throughout the Pipeline and Jet Stream ski trails, some reaching nearly five feet.

The presence of invasive plants in the habitat of multiple rare plants is problematic because these invasive species may outcompete the native plants and lead to population decline. NHB will continue to monitor the spread of these populations.



New Hampshire Natural Heritage Bureau

Division of Forests & Lands - DNCR
172 Pembroke Road, Concord, NH 03301
(603) 271-2214 <https://www.nh.gov/nhdfl/>



www.mooseplate.gov

Mowing Recommendations

Thank you for adhering to NHB's past recommendations regarding mowing regimens, this has provided favorable conditions for the rare plants. [NH Department of Transportation's \(NHDOT's\) 2018 Best Management Practices for the Control of Invasive and Noxious Plant Species](#) states that "Invasive plant seeds and fragments can hitch a ride on equipment and clothing. Avoid unintentionally transporting them by cleaning equipment and clothing before leaving a site." NHB recommends that all mowing equipment be cleaned **before and after** its use to aid in preventing the spread of invasive plants to other parts of the mountain and to/from other ski areas. Please refer to fact sheets on pgs. 7-8 for best management practices for the mowing of invasive species.

For this upcoming season, NHB recommends **late season mowing** (after Oct. 24) on Jet Stream and Pipeline trails in the areas outlined in **red** on page 7 of this report (Map 2). Please note that this area has expanded to include the Pipeline ski trail where greater fringed gentian has expanded (97 flowering stems observed in 2022).

NHB recommends **early season (May 1 through June 20) mowing** occur at Elliot Slope in the areas outlined in **blue** on page 7 of this report (Map 2). This is a change from a prior management recommendation. We are requesting early season timing on mowing due to the overgrowth of taller plants around the smaller rare plants.

Next Steps:

NHB will continue to collaborate with Mt. Sunapee resort to manage the state park in a way that both benefits the rare plants and allows for the effective and efficient management of the ski area.



New Hampshire Natural Heritage Bureau

Division of Forests & Lands - DNCR

172 Pembroke Road, Concord, NH 03301

(603) 271-2214 <https://www.nh.gov/nhdfl/>



www.mooseplate.gov



Map 1. Rare plant population locations.



New Hampshire Natural Heritage Bureau

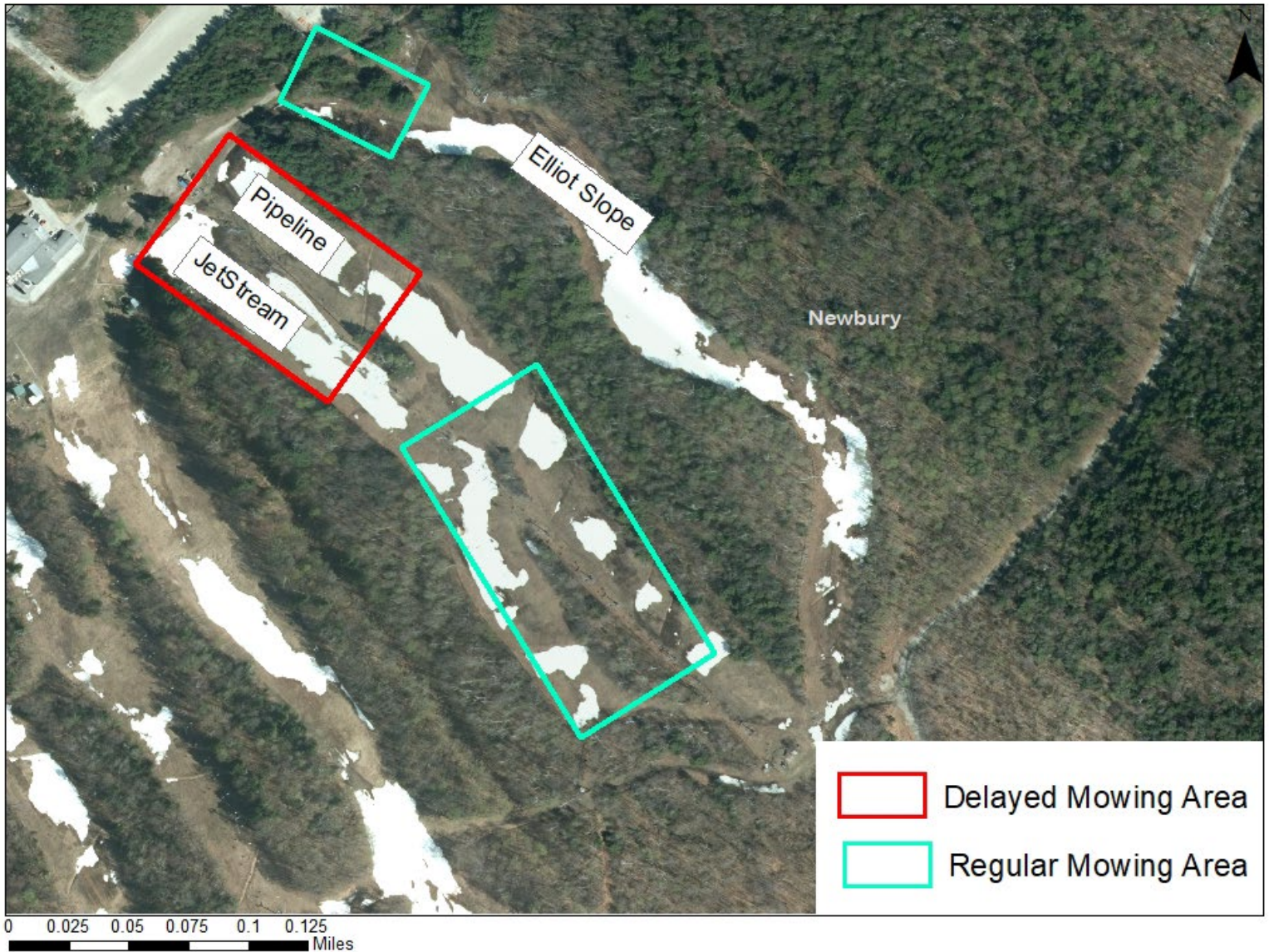
Division of Forests & Lands - DNCR

172 Pembroke Road, Concord, NH 03301

(603) 271-2214 <https://www.nh.gov/nhdfl/>



www.mooseplate.gov



Map 2. Mowing regime area outlines.



New Hampshire Natural Heritage Bureau

Division of Forests & Lands - DNCR

172 Pembroke Road, Concord, NH 03301

(603) 271-2214 <https://www.nh.gov/nhdfl/>



www.mooseplate.gov

For more information please visit:

<https://www.nh.gov/dot/org/projectdevelopment/environment/units/program-management/invasivespecies.htm>

Invasive Plant Fact Sheet #1

Best Management Practices for MOWING



It is the goal of the NH Department of Transportation to avoid spreading invasive plants to new sites during its maintenance and construction activities. Mowing can spread invasive plants by spreading seeds and other plant material. This fact sheet describes Best Management Practices that can prevent the spread of invasive plants during mowing operations. The Department's *Best Management Practices for Roadside Invasive Plants* contains additional information on invasive plants. Please contact the NHDOT Bureau of Environment for more information (271-3226) or visit www.nh.gov/dot/org/projectdevelopment/environment/units/technicalservices/invasivespecies.

To avoid spreading invasive plants when mowing, invasive plant seeds and other plant material must be removed from mowing equipment.

- **Equipment must be cleaned at least daily, as well as prior to transport.** This can be done with a brush or broom at the mowing site. Water should not be used unless a portable wash station is utilized.

Some invasive plants can sprout from small fragments of stem. Japanese knotweed is one of these plants. In fact, this is one of the primary ways that knotweed spreads along our roadways. Mowing knotweed should be avoided whenever possible. Each fragment of stem created by mowing knotweed has the potential to sprout, and these fragments are often transported to new sites by mowing equipment.

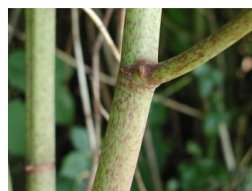
- **If knotweed is not causing safety concerns, it should not be mowed.** Mow around knotweed when mowing the right-of-way. Mowing alone will typically not eradicate knotweed.

If knotweed is causing safety concerns (blocking signs or sight distance, or encroaching on the roadway or shoulders), it should be removed using one of these methods:

- **Whenever possible, knotweed should be cut with loppers, scythe, or line trimmer ("weed whacker").**
 - Whole, intact stems can be left at the site of infestation, or
 - Stems can be:
 - bagged in heavy-duty trash bags and allowed to rot in the bags prior to disposal;
 - burned off-site;
 - buried at least 5 feet below grade.
- **If knotweed patches are too large to manage by hand, knotweed can be mowed but equipment MUST BE CLEANED THOROUGHLY before leaving the site of infestation.** Mowing should be limited to only the portion of the patch that is impacting safety.



Leaves



Stem



Typical patch