

SECTION 9. UNUSUAL NATURAL AREAS:

The Maine Department of Agriculture, Conservation and Forestry – Maine Natural Areas Program (MNAP) to determine specific locations of any unusual natural areas within or adjacent to the proposed Project. The locations of botanical resources including rare, threatened, and endangered (RTE) plants and rare and exemplary natural communities in Maine are mapped by the MNAP. This information is used for status assessment, species management, and habitat conservation of rare plant species and rare and exemplary natural communities in Maine. According to the MNAP, “A natural community is an assemblage of interacting plants and animals and their common environment, recurring across the landscape, in which the effects of human intervention are minimal. A natural community includes all of the organisms (plant, animal, etc.) in a particular physical setting, as well as the physical setting itself” (MNAP 2004)

9.A Methods

9.A.1 Agency Correspondence

In a letter dated July 10, 2020, MNAP provided a list of rare or unique botanical features documented from the vicinity of the project. The list included information on features that have been known to occur historically in the area as well as recently field-verified information. MNAP specifically noted that the higher elevation areas in the southwestern corner of the Project include portions of a mapped Subalpine Fir Forest, a rare (state rank S3) forest type in Maine which includes balsam fir, or a mixtures of fir and heart-leaved paper birch, which form a dense canopy of somewhat stunted trees. Patches of heart-leaved paper birch and mountain ash are common where wind, fire, or landslides have created openings, along with a dense shrub layer of mountain ash, hobblebush, and regenerating fir.

Agency correspondence is provided in Appendix 9-1.

9.A.2 Landscape Analysis and Field Surveys

VHB’s investigation and analysis regarding rare, threatened, and endangered (“RTE”) plant and natural communities consisted of database review via a desktop survey as well as a two-staged field survey. In spring of 2020, VHB reviewed the publicly available “Beginning with Habitat” map database to determine if the MNAP had previously recorded known occurrences of RTE plants at the Project site. Additionally, VHB reviewed the RTE species known to associate with onsite or potentially occurring natural communities in order to determine the list of TE plants that would be targeted (habitats and survey windows) for onsite surveys. From initial review as informed by a 2019 walkover, there are approximately 10 natural community types that could be present within the Study Area, in a subset of which there are approximately 14 state TE plants which may associate with one or more types (MNAP 2004), and therefore suitable habitat for these species was a focus during onsite surveys.

Following this database review, VHB ecologists conducted an in-field general habitat assessment and floristic survey of the entire Study Area between June 8 and June 12 and June 22 through June 26, 2020.

In its July 10, 2020 letter, MNAP provided a listing of potential threatened or endangered plant species in the vicinity. After reviewing this list, VHB conducted targeted surveys within all portions of Subalpine Fir Forest (as provided by MNAP) that occur in our Study Area from August 8-10, 2020. The five targeted species are provided in the table below.

Scientific Name	Common Name(s)	Maine Threatened or Endangered (T, E)	Flowering/ Sporation Time
<i>Neottia auriculata (Wiegand) Szlach.</i>	Auricled Twayblade	T	July-August
<i>Pinguicula vulgaris L.</i>	common butterwort	E	June-July
<i>Arnica lanceolata Nutt.</i>	lanceleaf arnica	T	July-September
<i>Huperzia selago (L.) Bernh. ex Schrank & Mart.</i>	fir clubmoss	T	July-September
<i>Calamagrostis stricta (Timm) Koeler</i>	slimstem reedgrass	T	June-August

During this survey, VHB also assessed the suitability of onsite habitats for known occurrences of RTE within 4 miles of the project based on the listing provided by MNAP.

9.B Findings

Vegetative conditions within the Study Area generally consist of hardwood forest with smaller inclusions of mixed-wood forest at low and middle elevations, which grade into a softwood dominated forest cover (Subalpine Fir Forest community) at the highest elevations. Extensive logging has occurred recently on most of the forestland in the Study Area, which is the most evident and most significant observed disturbance. The residual stand conditions consist of pole- and small sawtimber sized trees, with dominant species including red maple, beech, paper and gray birch, with yellow birch and aspen. Logging activity removed a significant portion of the canopy, resulting in a thick, robust shrub and sapling layer of regenerating trees and early successional/disturbance-response shrubs and herbaceous plants. Vegetative conditions across the Study Area outside of the Subalpine Fir Forest are generally homogenous, with shifts in dominant species between upland forest and the scattered wetlands and riparian corridors as shown in VHB's natural resource map set. Because portions of the Study Area abut existing ski resort development such as condominium developments, roads, ski trails and other infrastructure, there are weedy plant species typical of human disturbances but these are limited to the immediate proximity of developed areas. Overall, the forest conditions in the context of previous forest management activity, outside of the Subalpine Fir Forest, are common across the surrounding landscape and do not represent any special, unique, or exemplary natural community occurrences.

9.B.1 RTE Plants

VHB assessed on-site habitats within the Study Area for the potential presence of RTE plant species that have been observed within a 4-mile radius according to information provided by MNAP. Of the list of known occurrences, there were some which did not have suitable on-site habitat and some occurrences did have suitable on-site habitat but were not observed during surveys. During the field surveys described above, VHB ecologists identified 208 plant species

within the Study Area. A list of all species identified during VHB's on-site general and targeted surveys is included as Appendix 9-2.

9.B.2 Natural Communities

MNAP specifically noted that the higher elevation areas in the southwestern corner of the Project include portions of a mapped Subalpine Fir Forest, a rare (state rank S3) forest type in Maine which is characteristically dominated by balsam fir with red spruce and sometimes black spruce and can include components paper and heart-leaved paper birch, which form a dense canopy of somewhat stunted trees. The Subalpine Fir Forest map shapefile provided by MNAP overlaps the southernmost portion of the Project Study Area, at elevations higher than approximately 2,550 feet. The MNAP polygon for this occurrence of Subalpine Fir Forest extends south beyond the study area, totaling 1,342.4 acres.

During VHB's natural resource field assessments, the presence of a Subalpine Fir Forest as mapped by MNAP was confirmed. The woody species composition, canopy structure, and herbaceous plants observed in the Subalpine Fir Forest in the Study Area during VHB's 2020 fieldwork are characteristic of those described in the MNAP publication *Natural Landscapes of Maine* (MNAP, 2018). A dense overstory dominated by balsam fir is present, with scattered red spruce, paper birch and heart leaved paper birch throughout. Where windthrow has created individual tree tip-ups and created increased light conditions at the forest floor, herbaceous plants are generally dense. Where closed canopy conditions occur, there is little herbaceous vegetation present, consisting generally of shade-tolerant species such as bluebead lily and small areas of clubmoss. Some of the canopy trees were noted for stunted or partially stunted growth form, however no strong/significant stunting is present; this is not surprising, given that the Study Area occurs at the northernmost extent, at the lowest elevation of this mapped community and not within the central core of the forest community block, which is located further south outside of the Project area and at higher elevations generally above 3,000 feet elevation.

It is also notable that the existing condition of the Subalpine Fir Forest community in the Study Area has been impacted by previous and ongoing disturbances. The MNAP polygon is drawn up to the edge of existing ski resort infrastructure and trail clearing, and so the edge effect from cleared areas along the Subalpine Fir Forest has altered the vegetation structure near the mapped boundary of the community within the Study Area. There was also scattered litter, assumed to be from ski resort users, observed in portions of the Subalpine Fir Forest in proximity to cleared/developed portions of the resort.

In April of 2021, MNAP provided mapping of the current extent of the Subalpine Fir Forest that intersects with West Mountain, based on mapping completed by MNAP biologists in the Fall of 2020. The 2020 ground truthing was only done for the area around the proposed ski trails, not the entirety of the larger polygon. This application's analysis and mapping utilizes this updated mapping.

9.C Potential Impacts and Mitigation

9.C.1 RTE Plants

Based on agency consultation and field surveys, no state-protected plants species have been documented in the vicinity of the proposed Project area. If an RTE plant species occurrence is observed during construction, the Project will consult with MNAP to identify the necessary impact avoidance, minimization, and mitigation measures.

9.C.2 Natural Communities

The Applicant has designed this Project so as to avoid and minimize impacts to the identified Subalpine Fir Forest habitat to the extent practical, given the Project's goals and existing conditions. This design effort focused on avoidance of this natural community as the primary means to minimize impacts, including clustering the proposed impact areas within a smaller area thereby maintaining contiguous blocks of undisturbed Subalpine Fir Forest that extends beyond the parcel and Project boundary. The Applicant also removed a trail from the Project design that

would have impacted Subalpine Fir Forest habitat and had initially been under consideration when consultations began.

MNAP mapping shows that the polygon of Subalpine Fir Forest within the vicinity of the Project is 1,342 acres. The clearing needed to accommodate the Project will impact approximately 7.02 acres of Subalpine Fir Forest habitat, which represents a small portion (0.5%) of the entire community in this area.

The Applicant is proposing to place a portion of their existing land, which is located at greater than 2,700 feet in elevation, into a permanent easement (see Figure 7-2). This easement would occupy an area of approximately 36 acres in an area that has experienced timber management activities and ATV uses in the past. The area is adjacent to the Appalachian Trail corridor, and therefore conserving this area would result in additional benefits by further minimizing development potential adjacent to recreational uses. There is known Subalpine Fir Forest directly to the north of this parcel and, as the cutoff line for the mapping appears to be based on the township boundary rather than a natural feature, it is reasonable to assume that the community extends to this parcel. However, the Applicant is also proposing that this area be utilized to provide habitat for the Bicknell's thrush, which is a disturbance-dependent species and has been known to use areas such as ski resorts and clear-cuts. Therefore, it is possible that MDIFW may consider allowing limited silvicultural management activities within this area.

APPENDIX 9-1
AGENCY CORRESPONDENCE



via electronic-mail

July 8, 2020

Lisa St. Hilaire
Maine Natural Areas Program
177 State House Station
Augusta, MA 04333-0093

**RE: Information Request for Boyne Resorts Sugarloaf West Mountain Project
Carrabassett Valley, Maine**

Dear Lisa:

Boyne Resorts, owner of Sugarloaf Mountain Ski Area, is considering a future mixed-use ski terrain/land development project at Sugarloaf Mountain in Carrabassett Valley, Maine that may require permit applications to the Maine Department of Environmental Protection, U.S. Army Corps of Engineers, and the local municipality. The project would consist of the development of a mixed-use ski facility in the currently undeveloped West Mountain portion of the resort lands to include ski trails, ski lift, skier services and residential real estate ("Project"). Please see the attached USGS map for the proposed project location. The final project layout would be informed by field assessments in order to avoid natural resources.

VHB is requesting, on behalf of Boyne Resorts, information and/or digital data, if available, regarding known locations of state-listed rare and endangered plant species, rare natural communities, unique areas and important natural features, and natural resource concerns known to exist at the proposed project area. If digital data are available, they should be e-mailed to LKeszey@vhb.com. Your information will be used to supplement initial natural resources fieldwork that has been completed to better understand existing conditions, and to understand if further surveys are necessary. Boyne Resorts is also requesting that if further surveys are not warranted, that written correspondence confirming this conclusion be provided. Your correspondence will likely be included in permit applications.

If you have any questions regarding this request, please do not hesitate to contact either of the undersigned by email at LKeszey@vhb.com/(757) 790-9832 or smurphy@vhb.com/(207) 400-6161. Thank you very much.

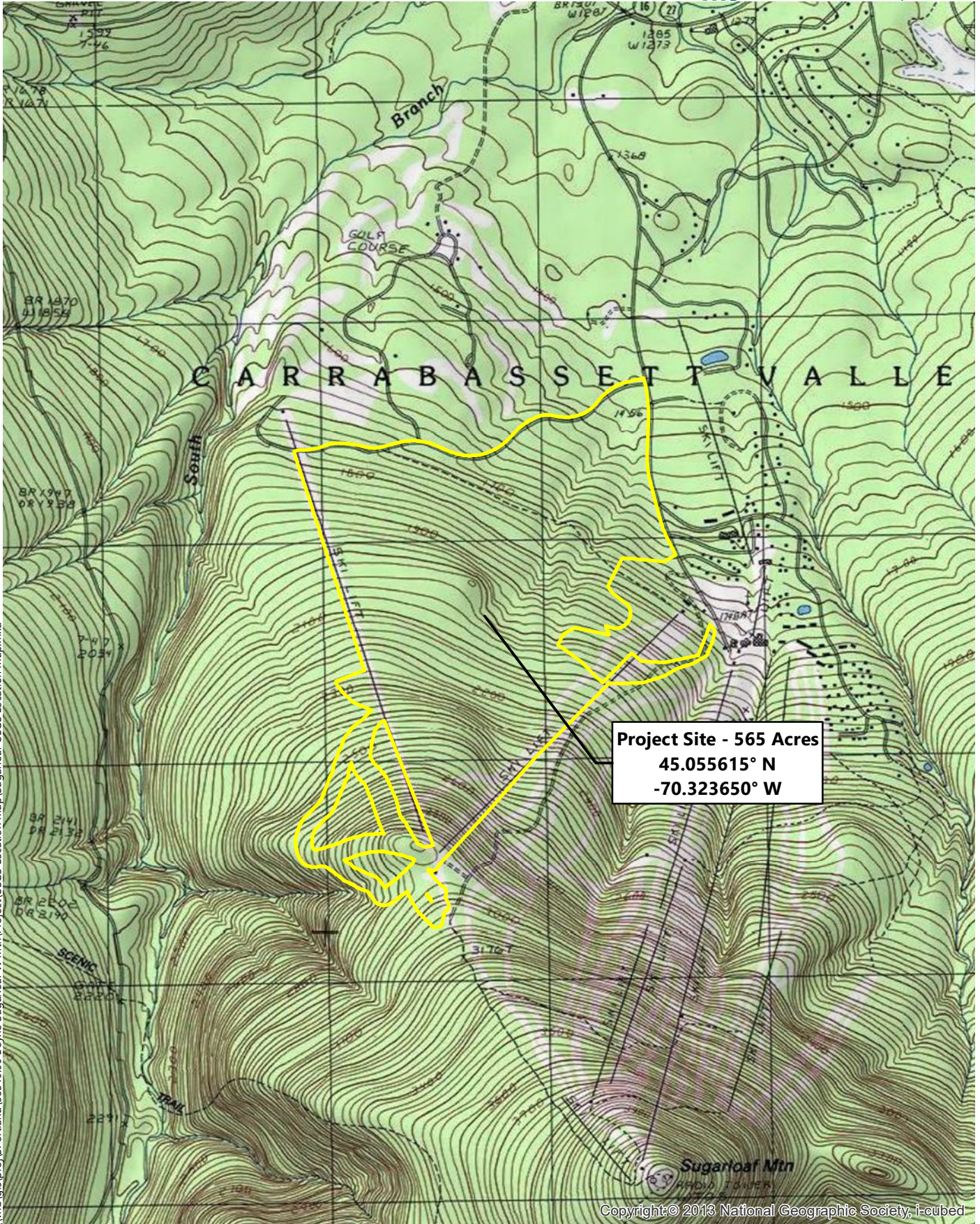
Sincerely,
Vanasse Hangen Brustlin, Inc.

Levi Keszey
Ecologist

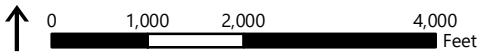
Sean Murphy
Senior Project Manager

Attachment – Site Location Map

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Sugarloaf West Mountain

Carrabassett Valley, Maine

Location Map

Project Area (VHB)

Sources:
USA Topo Basemap - Copyright: © 2013 National Geographic Society, i-cubed



STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY

177 STATE HOUSE STATION
 AUGUSTA, MAINE 04333

JANET T. MILLS
 GOVERNOR

AMANDA E. BEAL
 COMMISSIONER

July 10, 2020

Sean Murphy
 VHB
 500 Southborough Drive, Suite 105B
 South Portland, ME 04106

Via email: smurphy@vhb.com

Re: Rare and exemplary botanical features in proximity to: Proposed Boyne Resorts Sugarloaf West Mountain Project, Carrabassett Valley, Maine

I have searched the Maine Natural Areas Program’s Biological and Conservation Data System files in response to your request received July 8, 2020, with updated mapping for the project received January 30, 2020 for information on the presence of rare or unique botanical features documented from the vicinity of the project in Carrabassett Valley, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, the higher elevation areas in the southwestern corner of the project include portions of a mapped Subalpine Fir Forest, a rare forest type in Maine. Please see the attached map, shapefile included with the email response, and attached factsheet for more information about this Subalpine Fir Forest. MNAP recommends avoiding any additional cutting outside of previously cleared areas above 2700-foot elevation within this project area. If there is to be any clearing associated with the ski trails, ski lift, skier services, residential real estate, or any other aspect of this project within 250 feet of the mapped Subalpine Fir Forest, MNAP requests a more detailed site plan and a site visit so that we may better comment on how the proposed activities may affect the Subalpine Fir Forest at this location.

Feature	State Status	State Rank	Global Rank	Occurrence Rank	Site
Subalpine Fir Forest	N/A	S3	GNR	B Good	Sugarloaf Mountain

In addition, if a field survey of the project area is conducted, please refer to the enclosed supplemental information regarding rare and exemplary botanical features documented to occur in the vicinity of the project site. The list may include information on features that have been known to occur historically in the area as well as recently field-verified information. While historic records have not been documented in several years, they may persist in the area if suitable habitat exists. The enclosed list identifies features with potential to occur in the area,

MOLLY DOCHERTY, DIRECTOR
 MAINE NATURAL AREAS PROGRAM
 90 BLOSSOM LANE, DEERING BUILDING



PHONE: (207) 287-8044
 WWW.MAINE.GOV/DACF/MNAP

and it should be considered if you choose to conduct field surveys.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

The Maine Natural Areas Program (MNAP) is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. MNAP welcomes coordination with individuals or organizations proposing environmental alteration or conducting environmental assessments. If, however, data provided by MNAP are to be published in any form, the Program should be informed at the outset and credited as the source.

The Maine Natural Areas Program has instituted a fee structure of \$75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for \$150.00 for three hours of our services.



Thank you for using MNAP in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,



Kristen Puryear | Ecologist | Maine Natural Areas Program
207-287-8043 | kristen.puryear@maine.gov

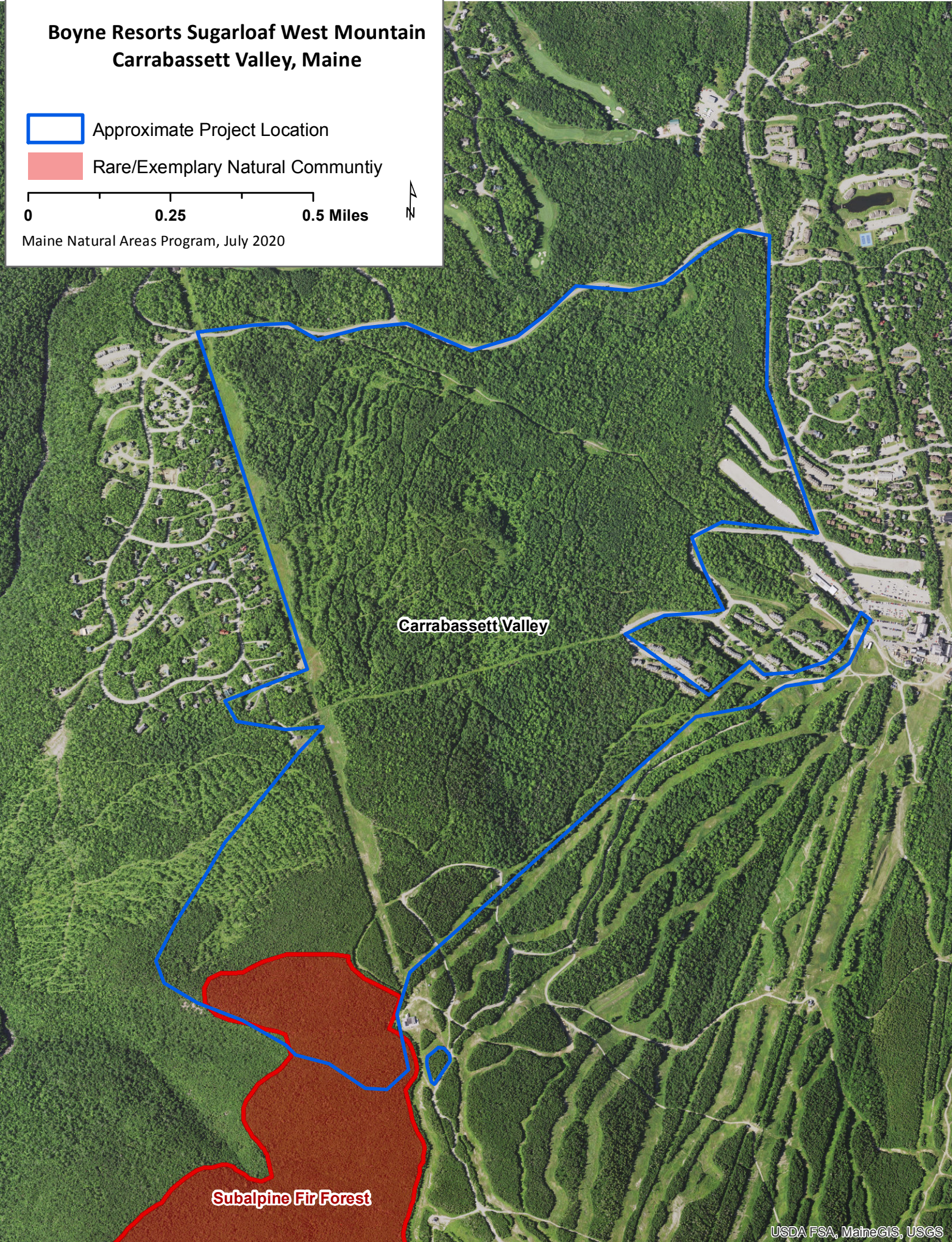
Boyer Resorts Sugarloaf West Mountain Carrabassett Valley, Maine

-  Approximate Project Location
-  Rare/Exemplary Natural Community

0 0.25 0.5 Miles



Maine Natural Areas Program, July 2020



Subalpine Fir Forest

Subalpine Fir Forest

State Rank S3

Community Description

Balsam fir, or mixtures of fir and heart-leaved birch, form a dense canopy of somewhat stunted trees. Patches of heart-leaved birch and mountain ash are common where wind, fire, or landslides have created openings, along with a dense shrub layer of mountain ash, hobblebush, and regenerating fir. Herbs may be sparse, or may form locally dense patches in openings; wood ferns and big-leaved aster in particular tend to be patchy. In some expressions of this type that have developed after fire, the canopy consists almost entirely of paper birch or heart-leaved birch. Fir waves, an unusual landscape pattern of linear bands of fir dieback and regeneration, are another variant of this community.

Soil and Site Characteristics

These forests are commonly found above 2700' on level ridgetops and steep, upper slopes. The mineral soil layer is thin, typically 10-30 cm, and rocky. Natural disturbances such as landslides, wind, fire, and spruce-budworm can exert lasting influences on community dynamics. Recurrent landslides can keep some areas in birch - mountain-ash dominance.



Fir Waves on Crocker Mountain

Diagnostics

Fir or heart-leaved birch (occasionally paper birch) are dominant in a subalpine setting.

Similar Types

One form of the Maritime Spruce - Fir Forest type is compositionally very similar but occurs at sea level in the extreme environment of the Downeast coast. Decreasing in elevation, this type can grade into Spruce - Fir - Wood-sorrel - Feather-moss Forest or Spruce - Fir - Broom-moss Forest, which are distinguished by their higher proportion of spruce in the canopy and by less stunted trees.

Conservation, Wildlife, and Management Considerations

Although subalpine forests are naturally dynamic as they cycle through periods



Subalpine Fir Forest

of weather and insect damage and regeneration, they appear to be relatively stable in overall extent and are extensive on Maine's higher mountains. Many major occurrences are well protected within public lands or private conservation lands. On the few remaining sites on private lands, timber harvesting, recreation, and windpower development could cause lasting impacts. At some sites, past harvesting has resulted in prolific growth of hay-scented and mountain wood fern, inhibiting tree regeneration.

This high-elevation forest community type may be used as nesting habitat by a number of high elevation and/or coniferous forest specialist bird species, such as the spruce grouse, dark-eyed junco, bay-breasted warbler, black-backed woodpecker, white-throated sparrow, and blackpoll warbler. The rare Bicknell's thrush inhabits structurally complex forests above 2500'. The rock vole and long-tailed shrew both inhabit cool moist crevices in rocky habitat at high elevations. Northern bog lemmings may inhabit wet sub-alpine spruce - fir forests in which peat moss is present.

Distribution

Western and central Maine westward (New England - Adirondack Province); likely extends northeasterly to the Gaspé Peninsula.

Landscape Pattern: Large Patch

Characteristic Plants

These plants are frequently found in this community type. Those with an asterisk are often diagnostic of this community.

Canopy

- Balsam fir*
- Heart-leaved paper birch
- Paper birch*
- Red spruce

Sapling/shrub

- Balsam fir*
- Black spruce*
- Heart-leaved paper birch*
- Mountain ash*
- Wild-raisin

Herb

- Balsam fir*
- Big-leaved aster*
- Bluebead lily
- Mountain wood fern*
- Northern wood-sorrel
- Spinulose wood fern*
- Starflower

Bryoid

- Common broom-moss
- Three-lobed bazzania

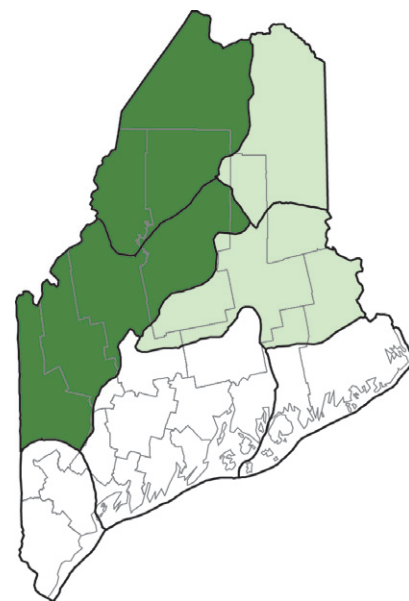
Associated Rare Plants

- Northern comandra

Examples on Conservation Lands You Can Visit

- Baxter State Park - Piscataquis Co.
- Big Squaw Mountain Public Lands - Piscataquis Co.
- Bigelow Preserve Public Lands - Somerset Co.
- Crocker Mountain, Appalachian Trail - Franklin Co.
- Mahoosuc Mountain, Mahoosuc Public Lands - Oxford Co.
- Sugarloaf Mountain, Appalachian Trail - Franklin Co.

Location Map



- Community is known from this Ecoregion
- Community may occur in this Ecoregion
- Bailey's Ecoregion
- County



Rare and Exemplary Botanical Features within 4 miles of Project: Boyne Resorts, Sugarloaf West Mountain Project, Carrabassett Valley, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Auricled Twayblade						
	T	S2	G3G4	1896-08-20	16	Non-tidal rivershore (non-forested, seasonally wet),Forested wetland
	T	S2	G3G4	1978	28	Non-tidal rivershore (non-forested, seasonally wet),Forested wetland
Bigelow's Sedge						
	SC	S2	G5	2010-10-28	6	Alpine or subalpine (non-forested, upland)
Black Sedge						
	SC	S2S3	G5	2001-08-14	25	Non-tidal rivershore (non-forested, seasonally wet),Alpine or subalpine (non-forested, upland)
	SC	S2S3	G5	2015-07-31	13	Non-tidal rivershore (non-forested, seasonally wet),Alpine or subalpine (non-forested, upland)
Broad Beech Fern						
	SC	S2	G5	1991-06	16	Hardwood to mixed forest (forest, upland)
Bulrush Sedge						
	SC	S2	G5	2001-08-14	9	Rocky summits and outcrops (non-forested, upland),Non-tidal rivershore (non-forested, seasonally wet)
	SC	S2	G5	2015-08-03	5	Rocky summits and outcrops (non-forested, upland),Non-tidal rivershore (non-forested, seasonally wet)
Circumneutral Outcrop						
	<null>	S2	GNR	2009	10	Rocky summits and outcrops (non-forested, upland)
	<null>	S2	GNR	2015-06-10	5	Rocky summits and outcrops (non-forested, upland)
	<null>	S2	GNR	2010-09-24	11	Rocky summits and outcrops (non-forested, upland)
Cold-air Talus Slope						
	<null>	S2	G3G5	2010-09-24	7	Rocky summits and outcrops (non-forested, upland)
Common Butterwort						
	E	S1	G5	2015-08-03	1	Rocky summits and outcrops (non-forested, upland)
Grassy Shrub Marsh						

Rare and Exemplary Botanical Features within 4 miles of Project: Boyne Resorts, Sugarloaf West Mountain Project, Carrabassett Valley, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Hairy Arnica	<null>	S5	GNR	1996-08-08	14	Open wetland, not coastal nor rivershore (non-forested, wetland), Coastal non-tidal wetland (non-forested, wetland)
Heath Alpine Ridge	T	S2	G3	1919-07-09	18	Alpine or subalpine (non-forested, upland), Non-tidal rivershore (non-forested, seasonally wet)
Lesser Wintergreen	<null>	S2	GNR	2010-10-28	8	Alpine or subalpine (non-forested, upland)
Mid-elevation Bald	SC	S2	G5	2016-07-03	10	Conifer forest (forest, upland)
Mountain Firmoss	SC	S2	G5	2011-08-21	2	Conifer forest (forest, upland)
Neglected Reed Grass	<null>	S3	G2G3	2010-10-28	16	Rocky summits and outcrops (non-forested, upland), Alpine or subalpine (non-forested, upland)
Northern Comandra	SC	S2	G5	2010-10-28	19	Rocky summits and outcrops (non-forested, upland), Alpine or subalpine (non-forested, upland)
Northern Firmoss	SC	S2	G5	2015-07-31	13	Rocky summits and outcrops (non-forested, upland), Alpine or subalpine (non-forested, upland)
Northern Hardwoods Forest	T	S2	G5T5	2001-08-14	10	Non-tidal rivershore (non-forested, seasonally wet)
	SC	S3	G5	1999-07-21	20	Coastal non-tidal wetland (non-forested, wetland), Alpine or subalpine (non-forested, upland)
	T	S2	G5	1999-07-21	3	Rocky summits and outcrops (non-forested, upland)
	T	S2	G5	2006-06-25	9	Rocky summits and outcrops (non-forested, upland)

Rare and Exemplary Botanical Features within 4 miles of Project: Boyne Resorts, Sugarloaf West Mountain Project, Carrabassett Valley, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
	<null>	S5	G3G5	2015-07-13	57	Hardwood to mixed forest (forest, upland)
Pale Green Orchis						
	SC	S2	G4?T4Q	1923-07	15	Non-tidal rivershore (non-forested, seasonally wet),Open wetland, not coastal nor rivershore (non-forested, wetland)
Spruce - Fir Krummholz						
	<null>	S3	GNR	2010-10-28	7	Alpine or subalpine (non-forested, upland)
Subalpine Fir Forest						
	<null>	S3	GNR	2012-09-11	15	Conifer forest (forest, upland),Hardwood to mixed forest (forest, upland)
	<null>	S3	GNR	2015-06-10	12	Conifer forest (forest, upland),Hardwood to mixed forest (forest, upland)
Subalpine Hanging Bog						
	<null>	S1	G3G5	2009	2	Alpine or subalpine (non-forested, upland)
	<null>	S1	G3G5	2009-06-18	1	Alpine or subalpine (non-forested, upland)

STATE RARITY RANKS

- S1** Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.
- S2** Imperiled in Maine because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- S3** Rare in Maine (20-100 occurrences).
- S4** Apparently secure in Maine.
- S5** Demonstrably secure in Maine.
- SU** Under consideration for assigning rarity status; more information needed on threats or distribution.
- SNR** Not yet ranked.
- SNA** Rank not applicable.
- S#?** Current occurrence data suggests assigned rank, but lack of survey effort along with amount of potential habitat create uncertainty (e.g. S3?).

Note: **State Rarity Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines State Rarity Ranks for animals.

GLOBAL RARITY RANKS

- G1** Critically imperiled globally because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extinction.
- G2** Globally imperiled because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- G3** Globally rare (20-100 occurrences).
- G4** Apparently secure globally.
- G5** Demonstrably secure globally.
- GNR** Not yet ranked.

Note: **Global Ranks** are determined by NatureServe.

STATE LEGAL STATUS

Note: State legal status is according to 5 M.R.S.A. § 13076-13079, which mandates the Department of Conservation to produce and biennially update the official list of Maine's **Endangered and Threatened** plants. The list is derived by a technical advisory committee of botanists who use data in the Natural Areas Program's database to recommend status changes to the Department of Conservation.

- E** ENDANGERED; Rare and in danger of being lost from the state in the foreseeable future; or federally listed as Endangered.
- T** THREATENED; Rare and, with further decline, could become endangered; or federally listed as Threatened.

NON-LEGAL STATUS

- SC** SPECIAL CONCERN; Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.
- PE** Potentially Extirpated; Species has not been documented in Maine in past 20 years or loss of last known occurrence has been documented.

ELEMENT OCCURRENCE RANKS - EO RANKS

Element Occurrence ranks are used to describe the quality of a rare plant population or natural community based on three factors:

- **Size**: Size of community or population relative to other known examples in Maine. Community or population's viability, capability to maintain itself.
- **Condition**: For communities, condition includes presence of representative species, maturity of species, and evidence of human-caused disturbance. For plants, factors include species vigor and evidence of human-caused disturbance.
- **Landscape context**: Land uses and/or condition of natural communities surrounding the observed area. Ability of the observed community or population to be protected from effects of adjacent land uses.

These three factors are combined into an overall ranking of the feature of **A**, **B**, **C**, or **D**, where **A** indicates an **excellent** example of the community or population and **D** indicates a **poor** example of the community or population. A rank of **E** indicates that the community or population is **extant** but there is not enough data to assign a quality rank. The Maine Natural Areas Program tracks all occurrences of rare (S1-S3) plants and natural communities as well as A and B ranked common (S4-S5) natural communities.

Note: **Element Occurrence Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines Element Occurrence ranks for animals.

Visit our website for more information on rare, threatened, and endangered species!
<http://www.maine.gov/dacf/mnap>

APPENDIX 9-2
FLORISTIC SURVEY LISTING

Species Checklist - Partial Floristic Inventory

Project: Sugarloaf West

Client: Boyne Resorts/Sugarloaf Mountain

Location: Carrabassett Valley, Maine

Surveyed By: VHB (C. Fenner, M. Jackman, L. Keszey)

Survey Date(s): June 8-12, 2020; June 22-26, 2020; August 8-10, 2020

Prepared By: VHB - August 15, 2020

Scientific Name ¹	Common Name(s)	Family	Federally Threatened or Endangered (T, E)	Maine Threatened or Endangered (T, E)	Maine Rare or Uncommon (R, U)
<i>Abies balsamea</i> (L.) Mill.	balsam fir	Pinaceae			
<i>Acer pensylvanicum</i> L.	striped maple	Aceraceae			
<i>Acer rubrum</i> L.	red maple	Aceraceae			
<i>Acer saccharum</i> Marshall	sugar maple	Aceraceae			
<i>Acer spicatum</i> Lam.	mountain maple	Aceraceae			
<i>Achillea millefolium</i> L.	common yarrow	Asteraceae			
<i>Actaea pachypoda</i> Elliott	white baneberry	Ranunculaceae			
<i>Agrostis gigantea</i> Roth	redtop	Poaceae			
<i>Agrostis scabra</i> Willd.	rough bentgrass	Poaceae			
<i>Agrostis stolonifera</i> L.	creeping bentgrass	Poaceae			
<i>Alnus incana</i> (L.) Moench	gray alder	Betulaceae			
<i>Amelanchier bartramiana</i> (Tausch) M. Roem.	oblongfruit serviceberry	Rosaceae			
<i>Anaphalis margaritacea</i> (L.) Benth.	western pearly everlasting	Asteraceae			
<i>Anthoxanthum odoratum</i> L.	sweet vernalgrass	Poaceae			
<i>Aquilegia canadensis</i> L.	red columbine	Ranunculaceae			
<i>Aralia nudicaulis</i> L.	wild sarsaparilla	Araliaceae			
<i>Arisaema triphyllum</i> (L.) Schott	Jack in the pulpit	Araceae			
<i>Asclepias incarnata</i> L.	swamp milkweed	Asclepiadaceae			
<i>Athyrium filix-femina</i> (L.) Roth ssp. <i>angustum</i> (Willd.) R.T. Clausen	subarctic ladyfern	Dryopteridaceae			
<i>Barbarea vulgaris</i> W.T. Aiton	garden yellowrocket	Brassicaceae			
<i>Betula alleghaniensis</i> Britton	yellow birch	Betulaceae			
<i>Betula cordifolia</i> Regel	Heart-leaved paper birch	Betulaceae			
<i>Betula papyrifera</i> Marshall	paper birch	Betulaceae			
<i>Betula populifolia</i> Marshall	gray birch	Betulaceae			
<i>Bromus inermis</i> Leyss.	smooth brome	Poaceae			
<i>Calamagrostis canadensis</i> (Michx.) P. Beauv.	bluejoint	Poaceae			
<i>Cardamine diphylla</i> (Michx.) Alph. Wood	crinkleroot	Brassicaceae			
<i>Cardamine pensylvanica</i> Muhl. ex Willd.	Pennsylvania bittercress	Brassicaceae			
<i>Carex blanda</i> Dewey	eastern woodland sedge	Cyperaceae			
<i>Carex communis</i> L.H. Bailey	fibrousroot sedge	Cyperaceae			
<i>Carex flava</i> L.	yellow sedge	Cyperaceae			
<i>Carex gracillima</i> Schwein.	graceful sedge	Cyperaceae			
<i>Carex gynandra</i> Schwein.	nodding sedge	Cyperaceae			
<i>Carex intumescens</i> Rudge	greater bladder sedge	Cyperaceae			
<i>Carex leptonevia</i> (Fernald) Fernald	nerveless woodland sedge	Cyperaceae			
<i>Carex lurida</i> Wahlenb.	shallow sedge	Cyperaceae			
<i>Carex pensylvanica</i> Lam.	Pennsylvania sedge	Cyperaceae			
<i>Carex rosea</i> Schkuhr ex Willd.	rosy sedge	Cyperaceae			
<i>Carex scoparia</i> Schkuhr ex Willd.	broom sedge	Cyperaceae			
<i>Carex stipata</i> Muhl. ex Willd.	awlfuit sedge	Cyperaceae			
<i>Carex tinctoria</i> (Fernald) Fernald	tinged sedge	Cyperaceae			
<i>Carex trisperma</i> Dewey	threeseeded sedge	Cyperaceae			
<i>Caulophyllum thalictroides</i> (L.) Michx.	blue cohosh	Berberidaceae			
<i>Cerastium arvense</i> L.	field chickweed	Caryophyllaceae			
<i>Chelone glabra</i> L.	white turtlehead	Scrophulariaceae			
<i>Chenopodium album</i> L.	lambquarters	Chenopodiaceae			
<i>Cinna arundinacea</i> L.	sweet woodreed	Poaceae			
<i>Clematis virginiana</i> L.	devil's darning needles	Ranunculaceae			
<i>Clintonia borealis</i> (Aiton) Raf.	bluebead	Liliaceae			
<i>Coptis trifolia</i> (L.) Salisb.	threeleaf goldthread	Ranunculaceae			
<i>Corallorhiza trifida</i> Chatelain	yellow coralroot	Orchidaceae			
<i>Cornus amomum</i> Mill.	silky dogwood	Cornaceae			
<i>Cornus canadensis</i> L.	bunchberry dogwood	Cornaceae			
<i>Cornus racemosa</i> Lam.	gray dogwood	Cornaceae			
<i>Corylus cornuta</i> Marshall	beaked hazelnut	Betulaceae			
<i>Dactylis glomerata</i> L.	orchardgrass	Poaceae			
<i>Danthonia spicata</i> (L.) P. Beauv. ex Roem. & Schult.	poverty oatgrass	Poaceae			
<i>Daucus carota</i> L.	Queen Anne's lace	Apiaceae			
<i>Dennstaedtia punctilobula</i> (Michx.) T. Moore	eastern hayscented fern	Dennstaedtiaceae			
<i>Deschampsia cespitosa</i> (L.) P. Beauv.	tufted hairgrass	Poaceae			

Scientific Name ¹	Common Name(s)	Family	Federally Threatened or Endangered (T, E)	Maine Threatened or Endangered (T, E)	Maine Rare or Uncommon (R, U)
<i>Deschampsia flexuosa</i> (L.) Trin.	wavy hairgrass	Poaceae			
<i>Diervilla lonicera</i> Mill.	northern bush honeysuckle	Caprifoliaceae			
<i>Drosera rotundifolia</i> L.	roundleaf sundew	Droseraceae			
<i>Dryopteris campyloptera</i> Clarkson	mountain woodfern	Dryopteridaceae			
<i>Dryopteris carthusiana</i> (Vill.) H.P. Fuchs	spinulose woodfern	Dryopteridaceae			
<i>Dryopteris intermedia</i> (Muhl. ex Willd.) A. Gray	intermediate woodfern	Dryopteridaceae			
<i>Dryopteris marginalis</i> (L.) A. Gray	marginal woodfern	Dryopteridaceae			
<i>Dulichium arundinaceum</i> (L.) Britton	three-way sedge	Cyperaceae			
<i>Eleocharis obtusa</i> (Willd.) Schult.	blunt spikerush	Cyperaceae			
<i>Epipactis helleborine</i> (L.) Crantz	broadleaf helleborine	Orchidaceae			
<i>Equisetum scirpoides</i> Michx.	dwarf scouringrush	Equisetaceae			
<i>Equisetum sylvaticum</i> L.	woodland horsetail	Equisetaceae			
<i>Erigeron annuus</i> (L.) Pers.	eastern daisy fleabane	Asteraceae			
<i>Erigeron philadelphicus</i> L.	Philadelphia fleabane	Asteraceae			
<i>Euthamia graminifolia</i> (L.) Nutt.	flat-top goldentop	Asteraceae			
<i>Eutrochium maculatum</i> (L.) E.E. Lamont	spotted joe pye weed	Asteraceae			
<i>Fagus grandifolia</i> Ehrh.	American beech	Fagaceae			
<i>Festuca subverticillata</i> (Pers.) Alexeev	nodding fescue	Poaceae			
<i>Fragaria vesca</i> L.	woodland strawberry	Rosaceae			
<i>Fraxinus americana</i> L.	white ash	Oleaceae			
<i>Fraxinus pennsylvanica</i> Marshall	green ash	Oleaceae			
<i>Galium aparine</i> L.	stickywilly	Rubiaceae			
<i>Galium mollugo</i> L.	false baby's breath	Rubiaceae			
<i>Galium palustre</i> L.	common marsh bedstraw	Rubiaceae			
<i>Glyceria melicaria</i> (Michx.) F.T. Hubbard	melic mannagrass	Poaceae			
<i>Glyceria striata</i> (Lam.) Hitchc.	fowl mannagrass	Poaceae			
<i>Gymnocarpium dryopteris</i> (L.) Newman	western oakfern	Dryopteridaceae			
<i>Hamamelis virginiana</i> L.	American witchhazel	Hamamelidaceae			
<i>Hepatica nobilis</i> Schreb. var. <i>obtusata</i> (Pursh) Steyerem.	roundlobe hepatica	Ranunculaceae			
<i>Hieracium aurantiacum</i> L.	orange hawkweed	Asteraceae			
<i>Hieracium caespitosum</i> Dumort.	meadow hawkweed	Asteraceae			
<i>Hieracium paniculatum</i> L.	Allegheny hawkweed	Asteraceae			
<i>Hieracium pilosella</i> L.	mouseear hawkweed	Asteraceae			
<i>Houstonia caerulea</i> L.	azure bluet	Rubiaceae			
<i>Hydrocotyle americana</i> L.	American marshpennywort	Apiaceae			
<i>Iris versicolor</i> L.	harlequin blueflag	Iridaceae			
<i>Juncus effusus</i> L.	common rush	Juncaceae			
<i>Juncus tenuis</i> Willd.	poverty rush	Juncaceae			
<i>Lactuca canadensis</i> L.	Canada lettuce	Asteraceae			
<i>Ledum groenlandicum</i> Oeder	bog Labrador tea	Ericaceae			
<i>Leontodon autumnalis</i> L.	fall dandelion	Asteraceae			
<i>Lonicera canadensis</i> W. Bartram ex Marshall	American fly honeysuckle	Caprifoliaceae			
<i>Lonicera morrowii</i> A. Gray	Morrow's honeysuckle	Caprifoliaceae			
<i>Lotus corniculatus</i> L.	bird's-foot trefoil	Fabaceae			
<i>Luzula multiflora</i> (Ehrh.) Lej.	common woodrush	Juncaceae			
<i>Lychnis flos-cuculi</i> L.	ragged robin	Caryophyllaceae			
<i>Lycopodium complanatum</i> L.	groundcedar	Lycopodiaceae			
<i>Lycopodium clavatum</i> L.	running clubmoss	Lycopodiaceae			
<i>Lycopodium lagopus</i> (Laest. ex Hartm.) Zinserl. ex Kuzen	one-cone clubmoss	Lycopodiaceae			
<i>Lycopus americanus</i> Muhl. ex W.P.C. Barton	American water horehound	Lamiaceae			
<i>Lycopus uniflorus</i> Michx.	northern bugleweed	Lamiaceae			
<i>Lysimachia ciliata</i> L.	fringed loosestrife	Primulaceae			
<i>Maianthemum canadense</i> Desf.	Canada mayflower	Liliaceae			
<i>Maianthemum racemosum</i> (L.) Link	feathery false lily of the valley	Liliaceae			
<i>Matteuccia struthiopteris</i> (L.) Todaro	ostrich fern	Dryopteridaceae			
<i>Medeola virginiana</i> L.	Indian cucumber	Liliaceae			
<i>Mitchella repens</i> L.	partridgeberry	Rubiaceae			
<i>Monotropa uniflora</i> L.	Indianpipe	Monotropaceae			
<i>Oclemena acuminata</i> (Michx.) Greene	whorled wood aster	Asteraceae			
<i>Oenothera perennis</i> L.	little evening primrose	Onagraceae			
<i>Onoclea sensibilis</i> L.	sensitive fern	Dryopteridaceae			
<i>Oryzopsis asperifolia</i> Michx.	roughleaf ricegrass	Poaceae			
<i>Osmunda cinnamomea</i> L.	cinnamon fern	Osmundaceae			
<i>Osmunda claytoniana</i> L.	interrupted fern	Osmundaceae			
<i>Ostrya virginiana</i> (Mill.) K. Koch	hophornbeam	Betulaceae			
<i>Oxalis acetosella</i> auct. non L.	OXMO	Oxalidaceae			
<i>Oxalis montana</i> Raf.	mountain woodsorrel	Oxalidaceae			
<i>Oxalis stricta</i> L.	common yellow oxalis	Oxalidaceae			

Scientific Name ¹	Common Name(s)	Family	Federally Threatened or Endangered (T, E)	Maine Threatened or Endangered (T, E)	Maine Rare or Uncommon (R, U)
<i>Packera aurea</i> (L.) Á. Löve & D. Löve	golden ragwort	Asteraceae			
<i>Phalaris arundinacea</i> L.	reed canarygrass	Poaceae			
<i>Phegopteris connectilis</i> (Michx.) Watt	long beechfern	Thelypteridaceae			
<i>Phleum pratense</i> L.	timothy	Poaceae			
<i>Picea mariana</i> (Mill.) Britton, Sterns & Poggenb.	black spruce	Pinaceae			
<i>Picea rubens</i> Sarg.	red spruce	Pinaceae			
<i>Plantago lanceolata</i> L.	narrowleaf plantain	Plantaginaceae			
<i>Poa saltuensis</i> Fernald & Wiegand	oldpasture bluegrass	Poaceae			
<i>Populus tremuloides</i> Michx.	quaking aspen	Salicaceae			
<i>Potentilla simplex</i> Michx.	common cinquefoil	Rosaceae			
<i>Prenanthes altissima</i> L.	tall rattlesnakeroot	Asteraceae			
<i>Prenanthes trifoliolata</i> (Cass.) Fernald	gall of the earth	Asteraceae			
<i>Prunus pensylvanica</i> L. f.	pin cherry	Rosaceae			
<i>Pteridium aquilinum</i> (L.) Kuhn	western brackenfern	Dennstaedtiaceae			
<i>Pyrola chlorantha</i> Sw.	greenflowered wintergreen	Pyrolaceae			
<i>Pyrola elliptica</i> Nutt.	waxflower shinleaf	Pyrolaceae			
<i>Ranunculus acris</i> L.	tall buttercup	Ranunculaceae			
<i>Ranunculus repens</i> L.	creeping buttercup	Ranunculaceae			
<i>Ranunculus recurvatus</i> Poir.	blisterwort	Ranunculaceae			
<i>Rhinanthus minor</i> L.	little yellow rattle	Scrophulariaceae			
<i>Ribes cynosbati</i> L.	eastern prickly gooseberry	Grossulariaceae			
<i>Ribes lacustre</i> (Pers.) Poir.	prickly currant	Grossulariaceae			
<i>Ribes triste</i> Pall.	red currant	Grossulariaceae			
<i>Rubus canadensis</i> L.	smooth blackberry	Rosaceae			
<i>Rubus flagellaris</i> Willd.	northern dewberry	Rosaceae			
<i>Rubus idaeus</i> L.	American red raspberry	Rosaceae			
<i>Rubus occidentalis</i> L.	black raspberry	Rosaceae			
<i>Rubus pubescens</i> Raf.	dwarf red blackberry	Rosaceae			
<i>Rudbeckia hirta</i> L.	blackeyed Susan	Asteraceae			
<i>Salix bebbiana</i> Sarg.	Bebb willow	Salicaceae			
<i>Salix discolor</i> Muhl.	pussy willow	Salicaceae			
<i>Salix lucida</i> Muhl.	shining willow	Salicaceae			
<i>Salix petiolaris</i> Sm.	meadow willow	Salicaceae			
<i>Sambucus nigra</i> L.	black elderberry	Caprifoliaceae			
<i>Scirpus atrovirens</i> Willd.	green bulrush	Cyperaceae			
<i>Scirpus cyperinus</i> (L.) Kunth	woolgrass	Cyperaceae			
<i>Scirpus microcarpus</i> J. Presl & C. Presl	panicked bulrush	Cyperaceae			
<i>Scutellaria</i> L.	skullcap	Lamiaceae			
<i>Sisyrinchium montanum</i> Greene	strict blue-eyed grass	Iridaceae			
<i>Solanum dulcamara</i> L.	climbing nightshade	Solanaceae			
<i>Solidago canadensis</i> L.	Canada goldenrod	Asteraceae			
<i>Solidago gigantea</i> Aiton	giant goldenrod	Asteraceae			
<i>Solidago macrophylla</i> Pursh	largeleaf goldenrod	Asteraceae			
<i>Solidago rugosa</i> Mill.	wrinkleleaf goldenrod	Asteraceae			
<i>Sorbus americana</i> Marshall	American mountain ash	Rosaceae			
<i>Sorghastrum nutans</i> (L.) Nash	Indiangrass	Poaceae			
<i>Spiraea alba</i> Du Roi	white meadowsweet	Rosaceae			
<i>Spiraea tomentosa</i> L.	steeplesh	Rosaceae			
<i>Streptopus lanceolatus</i> (Aiton) Reveal	twistedstalk	Liliaceae			
<i>Symphyotrichum cordifolium</i> (L.) G.L. Nesom	common blue wood aster	Asteraceae			
<i>Symphyotrichum lateriflorum</i> (L.) Á. Löve & D. Löve	calico aster	Asteraceae			
<i>Symphyotrichum puniceum</i> (L.) Á. Löve & D. Löve	purplestem aster	Asteraceae			
<i>Symphyotrichum undulatum</i> (L.) G.L. Nesom	wavyleaf aster	Asteraceae			
<i>Taraxacum officinale</i> F.H. Wigg.	common dandelion	Asteraceae			
<i>Thelypteris noveboracensis</i> (L.) Nieuwl.	New York fern	Thelypteridaceae			
<i>Thelypteris palustris</i> Schott	eastern marsh fern	Thelypteridaceae			
<i>Thuja occidentalis</i> L.	arborvitae	Cupressaceae			
<i>Tiarella cordifolia</i> L.	heartleaf foamflower	Saxifragaceae			
<i>Trientalis borealis</i> Raf.	starflower	Primulaceae			
<i>Trifolium pratense</i> L.	red clover	Fabaceae			
<i>Trifolium repens</i> L.	white clover	Fabaceae			
<i>Trillium erectum</i> L.	red trillium	Liliaceae			
<i>Trillium undulatum</i> Willd.	painted trillium	Liliaceae			
<i>Tsuga canadensis</i> (L.) Carrière	eastern hemlock	Pinaceae			
<i>Tussilago farfara</i> L.	coltsfoot	Asteraceae			
<i>Typha latifolia</i> L.	broadleaf cattail	Typhaceae			
<i>Uvularia sessilifolia</i> L.	sessileleaf bellwort	Liliaceae			
<i>Vaccinium angustifolium</i> Aiton	lowbush blueberry	Ericaceae			

Scientific Name ¹	Common Name(s)	Family	Federally Threatened or Endangered (T, E)	Maine Threatened or Endangered (T, E)	Maine Rare or Uncommon (R, U)
<i>Vaccinium myrtilloides</i> Michx.	velvetleaf huckleberry	Ericaceae			
<i>Vaccinium pallidum</i> Aiton	Blue Ridge blueberry	Ericaceae			
<i>Veratrum viride</i> Aiton	green false hellebore	Liliaceae			
<i>Veronica americana</i> Schwein. ex Benth.	American speedwell	Scrophulariaceae			
<i>Veronica serpyllifolia</i> L.	thymeleaf speedwell	Scrophulariaceae			
<i>Viburnum lantanoides</i> Michx.	hobblebush	Caprifoliaceae			
<i>Viburnum lentago</i> L.	nannyberry	Caprifoliaceae			
<i>Viburnum nudum</i> L.	possumhaw	Caprifoliaceae			
<i>Viburnum opulus</i> L.	European cranberrybush	Caprifoliaceae			
<i>Vicia cracca</i> L.	bird vetch	Fabaceae			
<i>Viola blanda</i> Willd.	sweet white violet	Violaceae			
<i>Viola sororia</i> Willd.	common blue violet	Violaceae			