

MEMORANDUM

Maine Natural Areas Program

Department of Agriculture, Conservation and Forestry
State House Station #177, Augusta, Maine 04333

Date: April 21, 2021

To: Debra Kaczowski, LUPC

From: Kristen Puryear, Ecologist

Re: Rare and exemplary botanical features, DP-3639-F, Redevelopment of Big Moose Mountain Ski Resort, including ski lift installation, Base Lodge, Tap House, Hotel, Event Pavilion/Pool, Zipline, and Site Infrastructure Improvements, Big Moose Twp, Maine.

I have searched the Maine Natural Areas Program's Biological and Conservation Data System files for rare or unique botanical features in the vicinity of the proposed site in response to your request received March 25, 2021 for our agency's comments on the project.

According to the information currently in our Biological and Conservation Data System files, the project area includes an exemplary and rare Subalpine Fir Forest at Big Moose Mountain. The proposed summit lift station is within an already cleared area, and there appears to be a current structure at that location. However, the proposed zip line summit station is within an intact vegetated area that buffers part of the mapped Subalpine Fir Forest. MNAP recommends no additional clearing upslope of the location of the zip line summit station indicated in the submitted plans in order to protect the nearby rare natural community type. Please see the table below, attached map, and attached factsheet that are all included in the attached response to Sewall for more information about the Subalpine Fir Forest at Big Moose Mountain.

Feature	State Status	State Rank	Global Rank	Occurrence Rank	Notes
Subalpine Fir Forest	N/A	S3	GNR	B - Good	Big Moose Mountain

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. You may want to have the site inventoried by a qualified field biologist to ensure that no undocumented rare features are inadvertently harmed.

The Maine Natural Areas Program is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We welcome the contribution of any information collected if a site survey is performed.

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



STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY

177 STATE HOUSE STATION
 AUGUSTA, MAINE 04333

JANET T. MILLS
 GOVERNOR

AMANDA E. BEAL
 COMMISSIONER

April 21, 2021

Jodi O’Neal
 Sewall
 PO Box 433
 Old Town, ME 04468

Via email: jodi.oneal@sewall.com

Re: Rare and exemplary botanical features in proximity to: #85716E, Moosehead Lake Ski Resort, Big Moose Twp, Maine

Dear Ms. O’Neal:

I have searched the Maine Natural Areas Program’s Biological and Conservation Data System files in response to your request received March 16, 2021 and shapefiles received March 23, 2021, for information on the presence of rare or unique botanical features documented from the vicinity of the project in Big Moose Twp, 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 project area includes an exemplary and rare Subalpine Fir Forest at Big Moose Mountain. The proposed summit lift station is within an already cleared area, and there appears to be a current structure at that location. However, the proposed zip line summit station is within an intact vegetated area that buffers part of the mapped Subalpine Fir Forest. MNAP recommends no additional clearing upslope of the location of the zip line summit station indicated in the submitted plans in order to protect the nearby rare natural community type. Please see the table below, attached map, and attached factsheet for more information about the Subalpine Fir Forest at Big Moose Mountain.

Feature	State Status	State Rank	Global Rank	Occurrence Rank	Notes
Subalpine Fir Forest	N/A	S3	GNR	B Good	Big Moose Mountain

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

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



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

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, 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.

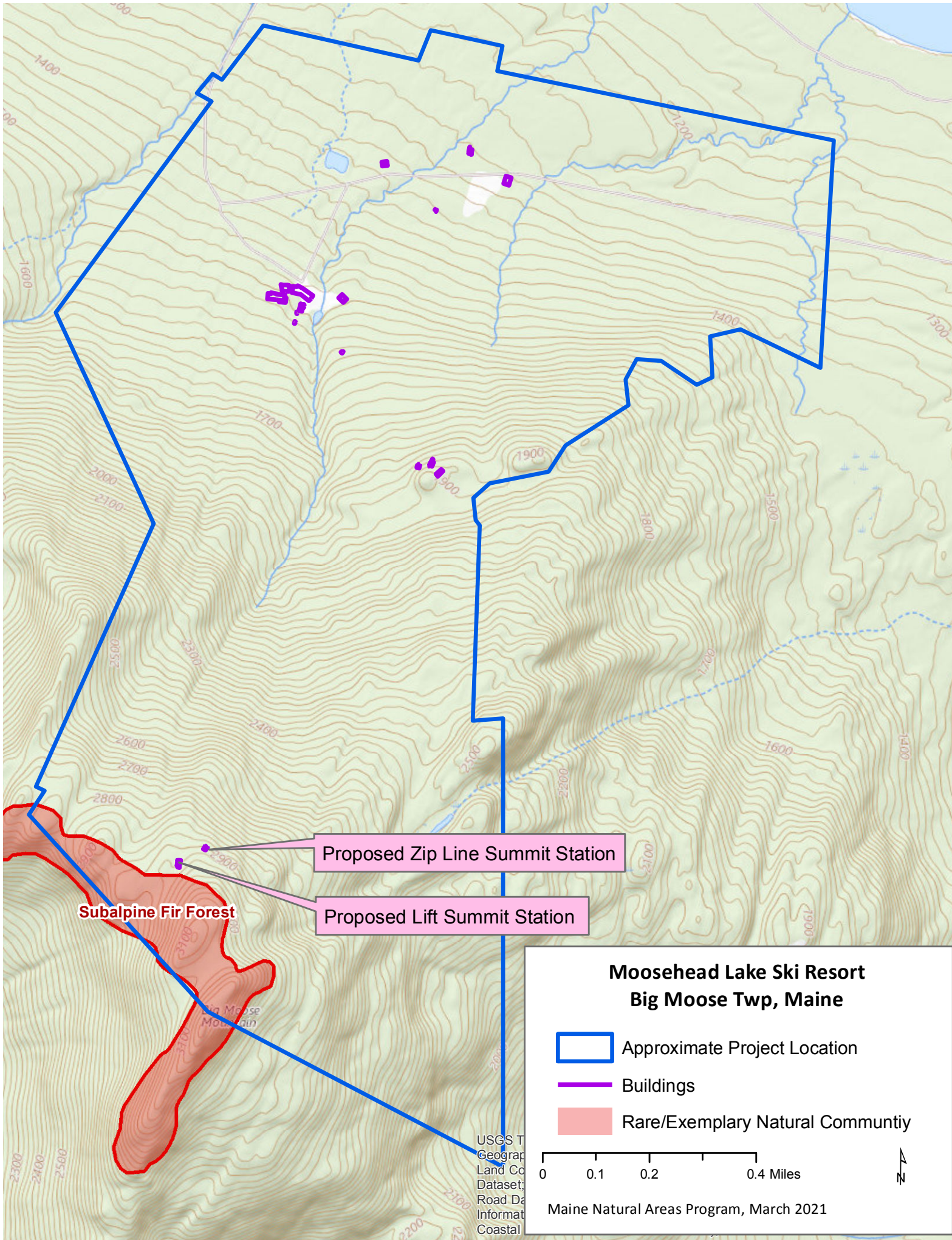
The Maine Natural Areas Program has instituted a fee structure of \$75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for \$225.00 for three hours of our services.

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



Proposed Zip Line Summit Station

Proposed Lift Summit Station

Subalpine Fir Forest

Big Moose Mountain

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

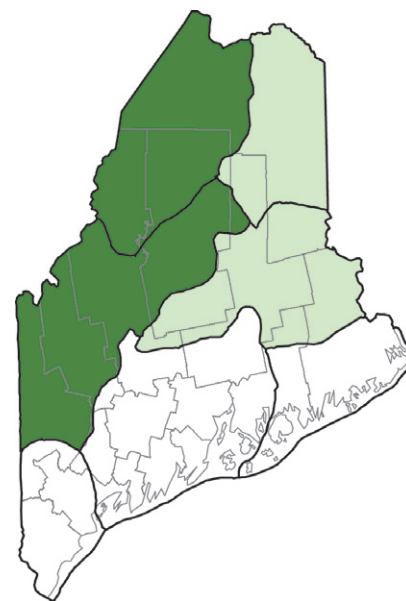
Associated Rare Plants

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: #85716E, Moosehead Lake Ski Resort, Big Lake Development Co., Big Moose Twp,
 Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Adder's Tongue Fern						
	SC	S1	G5	1992-07	5	Non-tidal rivershore (non-forested, seasonally wet),Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
Appalachian - Acadian Basin Swamp Ecosystem						
	<null>	S4	GNR	2011-08-14	18	Forested wetland
Fragrant Wood Fern						
	SC	S3	G5	2001-07-26	39	Rocky summits and outcrops (non-forested, upland),Alpine or subalpine (non-forested, upland)
Lesser Wintergreen						
	SC	S2	G5	2006-07-19	16	Conifer forest (forest, upland)
Long-leaved Bluet						
	SC	S2S3	G5TNR	ND	6	Non-tidal rivershore (non-forested, seasonally wet)
Lower-elevation Spruce - Fir Forest						
	<null>	S5	GNR	2013-09-17	16	Conifer forest (forest, upland)
	<null>	S5	GNR	2013-10-16	15	Conifer forest (forest, upland)
Northern Hardwoods Forest						
	<null>	S5	G3G5	2013-09-17	18	Hardwood to mixed forest (forest, upland)
	<null>	S5	G3G5	2013-10-16	17	Hardwood to mixed forest (forest, upland)
Showy Lady's-slipper						
	SC	S3	G4G5	2011-07-14	78	Forested wetland,Open wetland, not coastal nor rivershore (non-forested, wetland)
Sparse-flowered Sedge						
	SC	S3	G5	2011-07-14	32	Forested wetland,Open wetland, not coastal nor rivershore (non-forested, wetland)
Spruce - Fir - Northern Hardwoods Ecosystem						

Rare and Exemplary Botanical Features within 4 miles of

Project: #85716E, Moosehead Lake Ski Resort, Big Lake Development Co., Big Moose Twp,
Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
	<null>	S5	GNR	2013-10-29	1	Conifer forest (forest, upland),Hardwood to mixed forest (forest, upland)
	<null>	S5	GNR	2008-11-03	8	Conifer forest (forest, upland),Hardwood to mixed forest (forest, upland)
Subalpine Fir Forest						
	<null>	S3	GNR	2013-09-17	10	Conifer forest (forest, upland),Hardwood to mixed forest (forest, upland)
Swamp Honeysuckle						
	SC	S3	G5	2009-06-04	23	Forested wetland,Open wetland, not coastal nor rivershore (non-forested, wetland)
	SC	S3	G5	2011-06-09	48	Forested wetland,Open wetland, not coastal nor rivershore (non-forested, wetland)
White Cedar Woodland						
	<null>	S2	GNR	2001-07-26	4	Conifer forest (forest, upland),Dry barrens (partly 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>