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-feet 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,

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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.

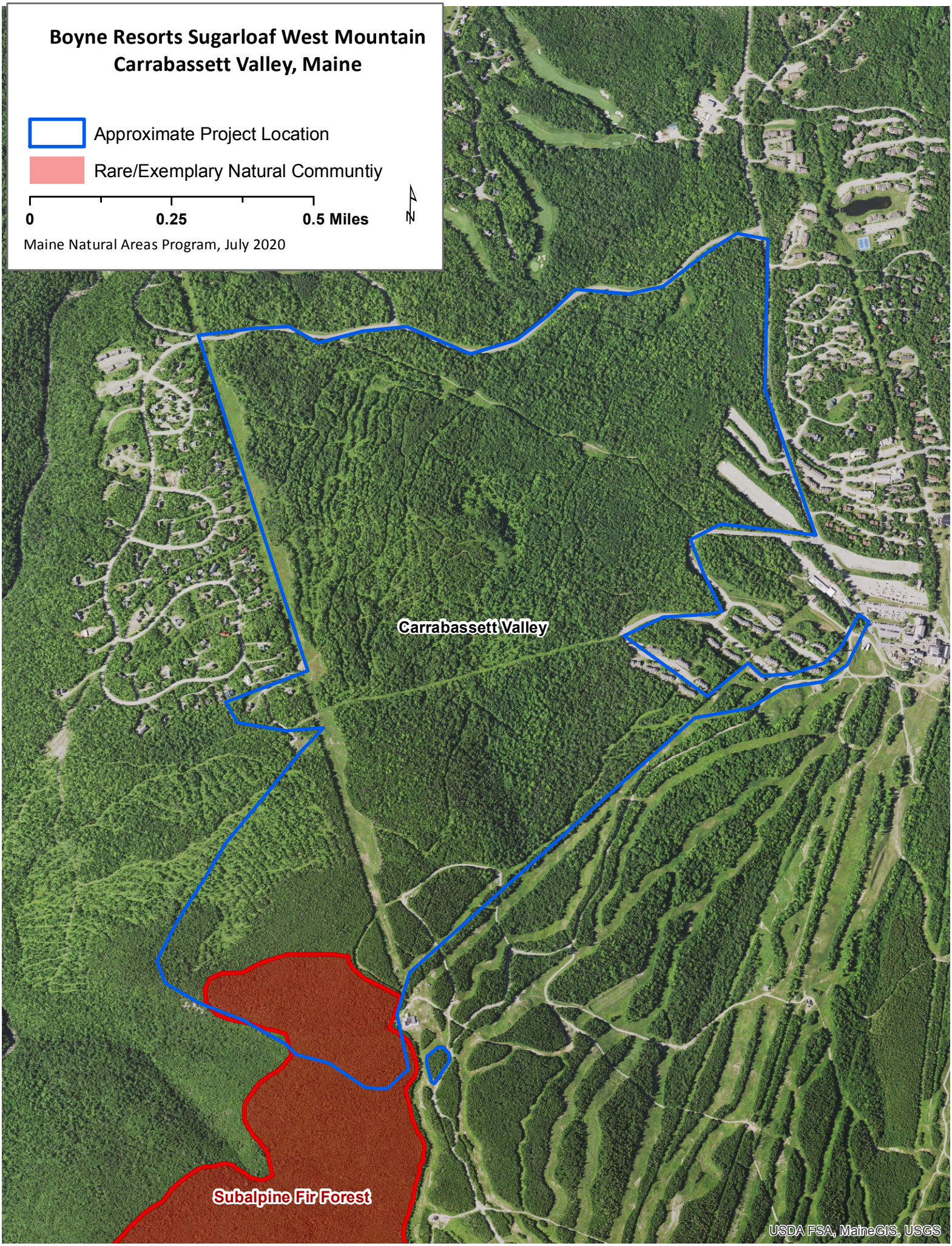
The Maine Natural Areas Program (MNAP) is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. MNAP welcomes coordination with individuals or organizations 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


Boyne Resorts Sugarloaf West Mountain
Carrabassett Valley, Maine
Approximate Project Location
Rare/Exemplary Natural Communtiy
0
0.25
0.5 Miles
N
Maine Natural Areas Program, July 2020
Carrabassett Valley
Subalpine Fir Forest
USDA FSA, MaineGIS, USGS

Subalpine Fir Forest

Fir - Heart-leaved Birch Subalpine 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

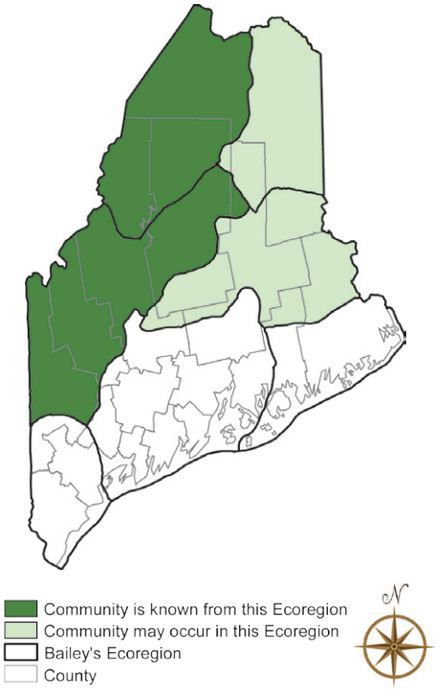
One form of the Maritime Spruce - Fir Forest type is compositionally very similar but occurs at sea level in the extreme environment of the Downeast coast. Decreasing in elevation, this type can grade into Spruce - Fir - Wood-sorrel - Feather-moss Forest or Spruce - Fir - Broom-moss Forest, which are 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 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.

Location Map



Distribution

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

Landscape Pattern: Large Patch

Subalpine Fir Forest

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.

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

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