

# Species Productivity Schedule:

## *Andromeda glaucophylla*/ Bog Rosemary

### Ethnobotanical Uses:

~Traditionally, fresh tips and young leaves were steeped in a cool brew by the Ojibwa to make a beverage tea~

Response to Disturbance (Taylor, 2007): Fire resistant, lives in bog where fire events occur in irregular patterns, insulating peat and moss will prevent damage to underground parts and plant will sprout “quickly and prolifically” from rhizomes

- SUMMER:**
- Blue/brown fruit maturation (late July to August)
  - Flower buds are set for the next summer season

- Fall/ Winter:**
- Leaves may remain green
  - Summer fruits may persist.



- SPRING:**
- Late spring shoot growth ( 2 month duration)
  - Blooming (May-June): white-pink, umbel-shaped clusters grow at ends of stems.
  - Flowering period lasts 2-3 weeks.

#### Pollination:

- Self-pollination after flowers newly expanded; Insects also pollinate flowers
- Primarily reproduces asexually

#### Habitat:

- Wet, strongly acidic soils of sphagnum bogs
- Spruce-tamarack swamps
- Floating mats of fens to the water's edge
- Spans from Greenland to southern Illinois to western regions of Saskatchewan

Rachael Gingerich

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Professors Scott Herron and Matt Pierle

### Species Productivity Schedule for *Andromeda glaucophylla*

#### Nomenclature:

Family: Ericaceae

Scientific Name: *Andromeda glaucophylla*

Common Name: Bog Rosemary

Anishinaabe name: bine' mucki (Swamp Partridge Berry)

#### Description:

Bog Rosemary is an evergreen perennial shrub which grows from about 304.8 millimeters to 914.4 millimeters tall and produces a blue or brown fruit (Lady Bird Johnson Wildflower Center, 2012). Leaves are alternating and narrow, having a leathery top and a coating of fine hairs of white or sometimes light green coloration underneath (GLIFWC, 1993). Also typical of the plant is its lateral "alligator" leaf venation and the rolled under leaf. Additionally, *A. glaucophylla* has conspicuous pale and blue-green leaves prior to maturation after which the leaves become a darker green (Michigan Flora Online 2012). Small and bell-shaped flowers (white and pink coloration) form an umbel cluster which hangs downwards at the ends of the stems. Flowers bloom from May to June and have five petals (typical of the heath family). This bloom is followed by the emergence of round, 5-6 mm fruits which are first blue and then turn brown during July-August (GLIFWC, 1993). The fruits have a vertical style which grows upwards and is the length of the fruit itself (Erichsen-Brown, 1979).



Figure 1: White, small, and bell-shaped flowers form a downward hanging umbel cluster



Figure 2: A depiction of the classic white leaf undersides, alternating foliage, and pink umbel clusters of Bog Rosemary.



Fig. 3 Alligator leaf venation is clear in the under-rolled leaves of Bog Rosemary.

**Life Cycle:** *A. glaucophylla* is a monoecious perennial plant which can reproduce both sexually (via self-pollination and insect pollination\*) and asexually. Asexual reproduction is this plant's primary mode of reproduction (Taylor, 2007). Rhizomes produce roots and above ground shoots from which Bog Rosemary sprouts. While sexual reproduction and seed dispersal is rare, successful germination requires the seed to be dormant underground for one year.

In the winter, the leaves of Bog Rosemary may remain green and this coloration can last for up to four years.

The summer's fruits may remain throughout the cold season. During early spring, the plant shoots emerge and flowers follow in bloom soon afterwards. Flowering typically occurs during a two to three week period around May-June. Later, in late July-August, it is typical that fruiting occurs during which fruits mature from blue to brown. During the summer, the plant produces flower buds for the sequential summer season (Taylor, 2007).

\*Pollinators include the bumblebees (Family: Apidae, *genus: Bombus*), honeybees (Family: Apidae, *genus: Apis*), syrphid flies (Family: Syrphidae), and butterflies.

**Habitat:** Bog rosemary dwells in the wet, strongly acidic soils of sphagnum bogs, in spruce-tamarack swamps (GLIFWC, 1993), and often in the floating mats of fens as far out as the water's edge (Voss, 1996). It has a part shade light requirement and thrives in organic peats, sands and mucks (Lady Bird Johnson Wildflower Center, 2012). *A. glaucophylla* commonly grows amongst conifers such as *Picea mariana* and *Larix laricina* and amongst Ericaceae such as *Chamaedaphne calyculata* and *Kalmia polifolia*. It can be found in the Platt River Plains of Benzie County which borders Lake Michigan and the heath bogs of Isle Royale (Taylor, 2007). Bog Rosemary is extremely rare and local to Michigan. On a larger scale, *A. glaucophylla* reaches from Greenland to the southern region of Illinois to the western regions of Saskatchewan. It is considered threatened in Connecticut and endangered in New Jersey and Rhode Island (United States Department of Agriculture, 2012).

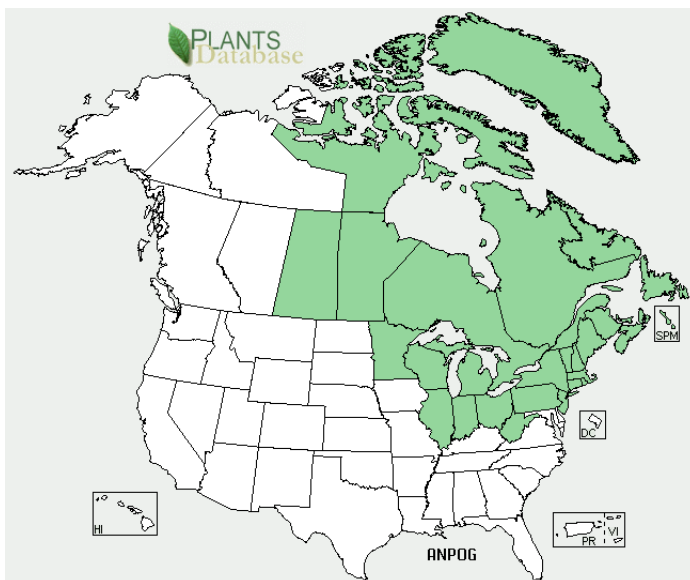


Fig. 4 (USDA 2012) Map of the current habitat of Bog Rosemary.

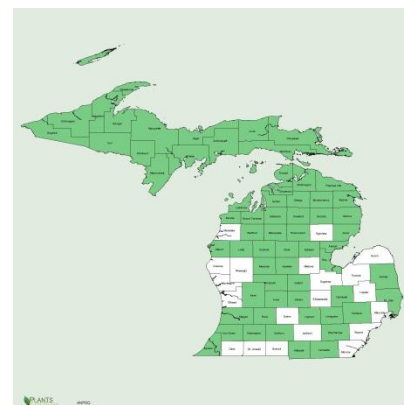


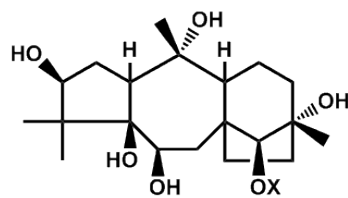
Fig. 5 (USDA 2012) Map of the current Michigan distribution of Bog Rosemary.

### Cultural Use:

The most common use of Bog Rosemary has been the boiling of the young leaves and tips (fresh or dried) by the Ojibwa for a beverage tea. Specifically, the Flambeau Ojibwa picked *A. glaucophylla* while hunting and either used it fresh or dried it for future steeping (Erichsen-Brown, 1979). According to the *Encyclopedia of Edible Plants*, the Ojibwa would prepare the tea by steeping the leaves in cold water as steeping the leaves and flowers in hot water releases grayanotoxin, a toxic glucoside. In large quantities, this chemical can cause drinkers to experience digestive, nervous, and respiratory problems and may act as a hypotensor (Couplan, 1998). Additionally, Couplan writes that inebriation may ensue, should a decoction of the fruits be ingested.

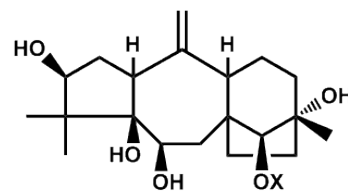
### Poisonous Nature:

Grayanotoxin, also known as andromedotoxin, acetylandromedol, and rhodotoxin can cause cattle, goats, sheep, and occasionally humans and horses to experience a myriad of digestive, nervous, and respiratory symptoms (Beasley, 1999). Plants within the Ericaceae family contain grayanotoxin which binds to sodium channels in cells and prevents the inactivation of these channels, leading to the depolarization of both nerve and muscle cells and allowing for calcium to flux into cells. These membrane effects explain the variety of skeletal, heart, muscle, and nervous system changes associated with grayanotoxin poisoning (FDA 2012). The FDA also states that grayanotoxin poisoning in humans is rare and mild (running its course over a twenty-four hour period) and is usually caused by the ingestion of honey which is sourced from the flowers of rhododendrons or from *Kalmia latifolia* or *Kalmia angustifolia*.



Grayanotoxin G I (X=Ac)

Grayanotoxin G III (X=H)



Grayanotoxin G II (X=H)

### Notes:

-Erichsen-Brown's *Usage of Plants for the Past 500 Years* utilizes two sources from the late 1800s which document the plant as being especially poisonous to sheep in both Europe and North America. To quote: "The leaves of the European and North American *Andromeda polifolia* are an acrid and dangerous narcotic and are said to kill sheep if browsed upon (pg. 199)."  
-There seems to be some conflict in the literature about how the tea was typically prepared. Couplan lists the leaves as being steeped in cold water during the preparation of a tea beverage but Erichsen-Brown writes that the beverage is prepared by boiling the leaves, as does GLIFWC in *Plants Used by the Great Lakes Ojibwa*.

Fig. 6 (Fry, 2012) Chemical structure of grayanotoxin, a potentially toxic chemical Heath (Ericaceae) family.

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