

OBSERVATIONS ON THE MICHIGAN FLORA, III¹ THE FLORA OF GREEN ISLAND (MACKINAC COUNTY)²

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Green Island is a heavily vegetated sand and gravel bar rising from the Straits of Mackinac about 400-500 yards from Pt. La Barbe, the nearest mainland (Mackinac County, Michigan). The island is approximately 600 meters long and varies from 30 to somewhat more than 80 meters in width. A curved arm to the north-eastward forms a bay facing to the west. (See map, Fig. 1).

The island may be seen on the charts covering the Straits of Mackinac prepared by the Survey of the Northern and Northwestern Lakes and on the advance sheet for the south half, St. Ignace-Moran Quadrangle, State of Michigan, pub-

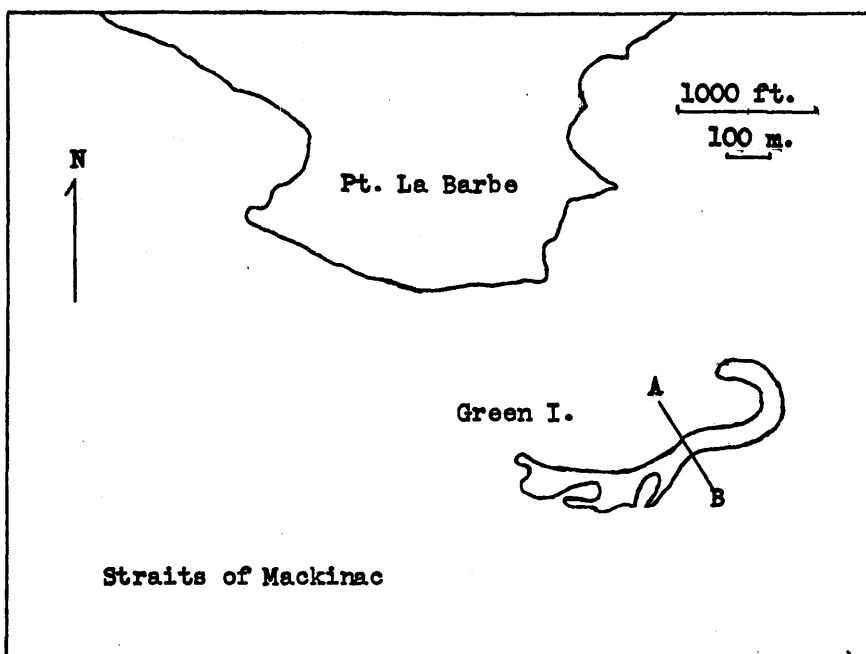


FIG. 1. Map showing Green Island and nearest mainland.

lished by the U. S. Geological Survey. The outline of the island on the latter map has been altered slightly in the preparation of Fig. 1. The "Official Map of Cheboygan County, Michigan" shows the island and names it, but gives no indication of its true shape. The detailed maps of Mackinac County distributed by the Michigan State Highway Department and the Conservation Department do not show Green Island.

The relative size of the island varies greatly as the level of the Straits of Mackinac goes up and down in the annual fluctuations of the Great Lakes. This

¹Cf. "Literature Cited" for I and II.

²Contribution from the Biological Station of the University of Michigan. Presented at the Botany Section, Michigan Academy of Science, Arts, and Letters, at Ann Arbor, March 24, 1950.

situation accounts for the varied shapes given the island on the few maps which do show it. It is actually a higher part of a large crescent-shaped shoal off Pt. La Barbe. Especially in low water years, other small islands occur on this shoal, but none approach Green Island in size.

Collecting trips to Green Island were made on June 30, 1947, August 20, 1948, June 4, 1949, June 16, 1949, and August 4, 1949, so a fair seasonal picture was obtained. On August 4, 1949, some effort was made to note ecological groupings, and the profile appearing in Fig. 2 was prepared.

Gulls and terns use the island extensively as a nesting site; other birds are frequently seen on it, and a few song birds nest there. Some seeds may have been brought by birds, but the proximity to the mainland suggests wind and waves as the principal sources of plants. Local residents report deer swimming to the island, and fresh tracks were seen on August 4, 1949.

Human visitations are frequent, with the assorted purposes of bird photography, bird banding, hunting, fishing, and picnicking. Until several years ago local Indians visited the island regularly to obtain some plant, the identity of which is not known.

Algae, lichens, fleshy fungi, and mosses occur on the island, but this report and list deal only with the vascular flora.

There is not room on Green Island for proper development of many ecological associations, although as the profile in Fig. 2 shows, there is a clear zonation of



FIG. 2. Profile of Green Island, with vegetation zones indicated (see text for description). The southeast end of the profile is at the left; northwest, at the right. Horizontal and vertical scales are the same.

vegetation. Line A-B on the map (Fig. 1) crosses the island where the profile was made. The letters A-M on the profile indicate rather well-marked zones as follows:

- A. Straits of Mackinac (rocky bottom).
- B. Shore practically all rocks (about 1 dm. in diam.). Occasional plants are invading from the center of the island, with *Polygonum lapathifolium*, *P. ramosissimum*, and *Potentilla anserina* the most abundant. This and the next zone would be submerged in high water years.
- C. Rocks with some sand. Vegetation predominantly composed of *Polygonum lapathifolium* and *P. ramosissimum*, with such plants as the following mixed in: *Artemisia caudata*, *Lycopus americanus*, *Potentilla anserina*, and *Verbascum thapsus*.
- D. Practically bare sand with a few rocks; beach of average high water years. A few invading runners of *Potentilla anserina* are the only vegetation.
- E. Sand, with pure growth of *Potentilla anserina*.
- F. Much bare sand showing. Plants almost entirely *Asclepias syriaca* and *Elymus canadensis*.
- G. Largely *Tanacetum huronense* growing in sand and somewhat shaded by *Cornus stolonifera*.
- H. At the height of the island, a thicket of *Cornus stolonifera*, shading *Poa compressa*.
- I. Sandy soil, with *Elymus canadensis*, *Poa compressa*, *Potentilla anserina*, and small *Cornus stolonifera* and *Populus balsamifera* most abundantly represented.
- J. Another mixed zone, with a dense growth of *Elymus canadensis*, *Juncus balticus* var. *littoralis*, *Lycopus americanus*, *Potentilla anserina*, and *Solidago altissima*.

- K. A very characteristic zone fringing the edge of normal wave action in high water years. *Aster junceus*, *Solidago altissima*, and *S. graminifolia* are the most conspicuous, with *Carex hystrix*, *Juncus balticus* var. *littoralis*, *Lobelia kalmii*, *Potentilla anserina*, and invaders from other zones.
- L. Broad rocky shore, with a great variety of plants. Among those observed were *Brassica kaber* var. *pinnatifida*, *Carex viridula*, *Cornus stolonifera* seedlings, *Epilobium glandulosum* var. *adenocaulon*, *Eupatorium perfoliatum*, *Impatiens capensis*, *Lobelia kalmii*, *Lycopus americanus*, *Medicago lupulina*, *Oenothera* sp., *Panicum capillare* as well as other invading grasses, *Polygonum convolvulus*, *P. lapathifolium*, *P. ramosissimum*, *Potentilla anserina*, *P. monspeliensis*, *Satureja glabella* var. *angustifolia*, *Trifolium hybridum*, *T. pratense*, and *Verbascum thapsus*. This list could be extended considerably by including species more than a meter or two from the line along which the profile was taken.
- M. Bare rocks, washed by waves in 1949.

It must be remembered that this profile represents only one typical cross section of the island, and those plants apparent in early August. Near the tip of the northeastern arm, aquatic associations would have been evident, with *Scirpus acutus* in the water along with *Sagittaria latifolia* f. *gracilis*; on a muddy shore *S. latifolia*, *Potamogeton gramineus* var. *typicus*, and *Scirpus americanus*; then a zone of *Polygonum lapathifolium*. On the comparatively flat top of this arm *Fragaria virginiana* is abundant, with various shrubs and plants characteristic of the Great Lakes beaches. Thicket-formers besides *Cornus stolonifera* in different parts of the island are *Populus tremuloides*, *Betula papyrifera*, and *Thuja occidentalis*.

On August 20, 1948, a few minutes were spent on a smaller (unnamed) island a short distance west of Green Island and a part of the same shoal. To general appearances the vegetation was much the same, although not so varied. On this smaller island the largest plant was a fairly good-sized *Fraxinus pennsylvanica* var. *lanceolata*—much larger than those on Green Island. *Cornus stolonifera* formed tall and very dense thickets on the small island, and among the herbaceous species *Asclepias syriaca*, *Epilobium glandulosum* var. *adenocaulon*, *Impatiens capensis*, and *Potentilla anserina* were the most striking. Low spots along the south shore had extensive growth of *Typha latifolia* and *Phragmites communis* var. *berlandieri*.

The following plants occurring on Green Island appear not to have been reported from elsewhere in Mackinac County (Cf. "Literature Cited" for sources of previous references). Those marked with an asterisk have been mentioned in a previous paper (Voss, 1949).

<i>Bidens frondosa</i>	* <i>Polygonum lapathifolium</i>
<i>Eleocharis acicularis</i>	<i>Potamogeton filiformis</i>
<i>Eleocharis elliptica</i>	<i>Prunus serotina</i>
<i>Equisetum variegatum</i>	* <i>Salix interior</i>
* <i>Eupatorium perfoliatum</i>	<i>Salix nigra</i>
<i>Phragmites communis</i> var. <i>berlandieri</i>	* <i>Satureja acinos</i>
	* <i>Scutellaria epilobiifolia</i>

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SUMMARY

1. Green Island, approximately 600 by 45 meters, lies in the Straits of Mackinac (Mackinac County, Michigan) within half a mile of Pt. La Barbe, the nearest mainland.

2. Five collecting trips to the island produced a list of the vascular flora numbering 138 species and varieties, 13 of which do not appear to have been reported

from the mainland or from Mackinac Island (although they undoubtedly occur there).

3. Birds may have brought some seeds to the island, but human activities, wind, and water would account for most of the plants.

4. There is in most places a distinct zonation of vegetation depending largely on high and low water levels in the Straits, but well-developed plant associations are not marked. *Potentilla anserina* is the most abundant and widely distributed herb.

ANNOTATED LIST OF THE VASCULAR FLORA OF GREEN ISLAND

The nomenclature of the list follows primarily the *Flora of Kalamazoo County, Michigan*,³ supplemented as necessary by the *Flora of Indiana*.⁴ Species listed in neither of these volumes are named as in Gray's *Manual*.⁵ The only exceptions to this system are indicated by reference either to literature or to the specialist who named the material.

Equisetaceae:

1. *Equisetum variegatum* Schleich.
One carpet of several square meters.

Pinaceae:

2. *Juniperus communis* L. var. *depressa* Pursh.
- ✓ 3. *Juniperus horizontalis* Moench.
4. *Larix laricina* (Du Roi) Koch.
Scarce, but one of the taller trees on the island.
5. *Picea glauca* (Moench) Voss.⁶
Several taller trees toward the west end of the island, and one small one at the east end.
6. *Thuja occidentalis* L.
Small trees frequent, forming conspicuous thickets in many places at the center of the island.

Typhaceae:

7. *Typha latifolia* L.
Not common.

Potamogetonaceae:

8. *Potamogeton filiformis* Pers.
In a pond at the southwestern edge of the island.
9. *Potamogeton gramineus* L. var. *typicus* Ogden.
On the edges of the pond at the southwestern edge and also on muddy shores in the bay formed by the northeastern arm of the island.
10. *Potamogeton gramineus* L. var. *myriophyllus* Robbins.
In the pond at the southwestern edge of the island.

Alismaceae:

11. *Sagittaria latifolia* Willd.
At the pond at the southwestern edge and on muddy shores in the northeastern bay. Form *gracilis* (Pursh) Rob. occurs in shallow water at the latter location.

Gramineae (Poaceae):

12. *Agropyron dasystachyum* (Hook.) Scribn.
In dryer spots; not common.
13. *Agrostis gigantea* Roth. (*A. alba*).
14. *Agrostis scabra* Willd.
15. *Elymus canadensis* L.
One of the commonest grasses on the island.

³Clarence R. and Florence N. Hanes, Schoolcraft, Michigan, 1947.

⁴Charles C. Deam, Indianapolis, 1940.

⁵Seventh edition, by Robinson & Fernald, 1908.

⁶Cf. *Rhodora*, 17: 59 (1915).

16. *Hordeum jubatum* L.
17. *Panicum capillare* L.
On rocky beaches; scarce.
18. *Phleum pratense* L.
19. *Phragmites communis* Trin. var. *berlandieri* (Fourn.) Fern.
Not common.
20. *Poa compressa* L.
Common in dryer places.
21. *Poa pratensis* L.
22. *Sphenopholis intermedia* (Rydb.) Rydb.
Around the pool at the southwestern edge.
23. *Phalaris arundinacea* L.

Cyperaceae:

24. *Carex garberi* Fern.
Common.
25. *Carex hystericina* Muhl.
Common.
26. *Carex stipata* Muhl.
Scarce.
27. *Carex substricta* (Kükenth.) Mack.
Very dense in some places along the shore.
28. *Carex viridula* Michx.
Common.
29. *Carex vulpinoidea* Michx. var. *pycnocephala* Hermann.
30. *Eleocharis acicularis* R. & S.
Forms small tufts on some of the sandy shores.
31. *Eleocharis elliptica* Kunth.
32. *Eleocharis palustris* (L.) R. & S.
33. *Scirpus acutus* Muhl.
Abundant in the pool at the southwestern edge and along the edge of the bay formed by the northeastern arm.
34. *Scirpus americanus* Pers.

Juncaceae:

35. *Juncus alpinus* Vill. var. *rariflorus* Hartm.
Common.
36. *Juncus balticus* Willd. var. *littoralis* Engelm.
Abundant.
37. *Juncus nodosus* L.
38. *Juncus tenuis* Willd. var. *dudleyi* (Wieg.) Hermann.
Scarce.

Liliaceae:

39. *Smilacina stellata* (L.) Desf.
One small patch.
40. *Zigadenus glaucus* Nutt.
Common in dry sand.

Iridaceae:

41. *Sisyrinchium montanum* Greene.⁷ (*S. angustifolium*).
42. *Iris versicolor* L.
Characters of both flowers and seeds place one clump of plants as this species.
43. *Iris virginica* L. var. *shrevei* (Small) Anderson.
Not common.

Salicaceae:

44. *Populus balsamifera* L.
Rather common.

⁷Cf. *Rhodora*, 48: 158 (1946).

45. *Populus tremuloides* Michx.

Small trees are common and conspicuous.

46. *Salix bebbiana* Sarg.47. *Salix bebbiana* × *candida*.

Determined by C. R. Ball.

48. *Salix cordata* Michx.⁸49. *Salix glaucophylloides* Fern. var. *brevifolia* (Bebb) Ball (ined.).

Named by C. R. Ball.

50. *Salix interior* Rowlee.

Very common, forming dense thickets of shoots.

51. *Salix lucida* Muhl.52. *Salix nigra* Marsh.

Abnormal growth, and possibly a hybrid. Determined by C. R. Ball.

Betulaceae:53. *Betula papyrifera* Marsh.

Several young trees.

Urticaceae:54. *Ulmus americana* L.

One small tree.

Santalaceae:55. *Comandra richardsoniana* Fern.

Not widespread, but rather common at the extreme eastern end of the island. The plants have deep rootstocks.

Polygonaceae:56. *Rumex crispus* L.57. *Polygonum ramosissimum* Michx.

In 1948, noticed only on a few sandy spots on the shore; in 1949, abundant on rocky shores as well.

58. *Polygonum convolvulus* L.59. *Polygonum lapathifolium* L.

Very common.

Chenopodiaceae:60. *Chenopodium album* L.

Found only near the water's edge in 1949, and apparently a new introduction to the island.

Caryophyllaceae:61. *Arenaria serpyllifolia* L.62. *Lychnis alba* Mill.**Ranunculaceae:**63. *Anemone cylindrica* Gray.

Scarce.

64. *Anemone multifida* Poir.

Common.

65. *Ranunculus acris* L.**Cruciferae (Brassicaceae):**66. *Barbarea vulgaris* R. Br.67. *Brassica kaber* (DC) Wheeler var. *pinnatifida* (Stokes) Wheeler.68. *Cakile edentula* (Bigel.) Hook.69. *Capsella bursa-pastoris* (L.) Medic.70. *Erucastrum gallicum* (Willd.) O. E. S.

Rather common along the shores. A re-examination of material indicates that this is the species previously reported for the county (Voss, 1948) as *Diplotaxis muralis* (L.) Dc. from the St. Ignace Causeway.

⁸*S. cordata* Michx. (not Muhl.) replaces *S. syrticola* Fern. and *S. adenophylla* Hook., according to C. R. Ball.

71. *Erysimum cheiranthoides* L.

Apparently a new introduction in 1949; a very few plants at the water's edge.

72. *Rorippa islandica* (Oeder) Borbas var. *fernaldiana* Butters & Abbe.⁹

Crassulaceae:

73. *Sedum acre* L.

Several patches.

Grossulariaceae:

74. *Grossularia cynosbati* (L.) Mill.

Rather common.

Rosaceae:

75. *Amelanchier arborea* (Mich. f.) Fern.

Two clumps are probably this species.

76. *Fragaria virginiana* Duchesne.

Common throughout.

77. *Geum* sp.

One large incomplete plant.

78. *Malus pumila* Mill.

A few trees.

79. *Physocarpus opulifolius* (L.) Maxim.

80. *Potentilla anserina* L.

Abundant, and occurring in all situations except the wettest.

81. *Potentilla monspeliensis* L.

Common.

82. *Potentilla fruticosa* L.

83. *Prunus pumila* L.

Common.

84. *Prunus serotina* Ehrh.

Scarce.

85. *Prunus virginiana* L.

Scarce.

86. *Rosa blanda* Ait.

A few small unarmed shrubs may be this species.

87. *Rubus strigosus* Michx.

Forming thickets in some places.

Leguminosae (Fabaceae):

88. *Lathyrus japonicus* Willd. var. *glaber* (Ser.) Fern.

Common throughout.

89. *Medicago lupulina* L.

Not common.

90. *Trifolium hybridum* L.

91. *Trifolium pratense* L.

92. *Trifolium procumbens* L.

93. *Trifolium repens* L.

Anacardiaceae:

94. *Rhus radicans* L.

In only a few places.

Balsaminaceae:

95. *Impatiens capensis* Meerb.¹⁰ (*I. biflora*).

Common in wet situations.

Hypericaceae:

96. *Hypericum perforatum* L.

Not common.

⁹Cf. *Rhodora*, 50: 100 (1948).

¹⁰Cf. *Rhodora*, 50: 205 (1948).

Eleagnaceae:

97. *Shepherdia canadensis* (L.) Nutt.
Scarce.

Onagraceae:

98. *Epilobium glandulosum* Lehm. var. *adenocaulon* (Haussk.) Fern.
Common.
99. *Oenothera* sp.
Numerous plants in the *biennis-muricata* alliance.

Umbelliferae (Ammiaceae):

100. *Cicuta bulbifera* L.
Scarce.
101. *Sium suave* Walt.
Scarce.

Cornaceae:

102. *Cornus stolonifera* Michx.
Very common. Perhaps brought by gulls; I have seen the birds eat the fruit from bushes on the shore of the Straits at Mackinaw City.

Oleaceae:

103. *Fraxinus pennsylvanica* Marsh. var. *lanceolata* (Borkh.) Sarg.
Not common, and small.

Asclepiadaceae:

104. *Asclepias syriaca* L.
Common throughout.

Labiatae (Lamiaceae):

105. *Lycopus americanus* Muhl.
Common in damper situations.
106. *Mentha arvensis* L.
Rather common. Some plants have pure white blossoms, although the majority have lilac ones.
107. *Nepeta cataria* L.
Scarce; one colony.
108. *Prunella vulgaris* L.
Two or three plants near the water line, 1949; evidently introduced that year.
109. *Satureja acinos* (L.) Scheele.
Several patches in dry, sandy ground.
110. *Satureja glabella* (Michx.) Briquet var. *angustifolia* (Torr.) Svenson.
Common along rocky shores.
111. *Scutellaria epilobiifolia* Hamil.
Not common.

Scrophulariaceae:

112. *Linaria vulgaris* Mill.
Common.
113. *Verbascum thapsus* L.
Rather common, and frequently very tall.
114. *Veronica americana* (Raf.) Schwein.
In damp sand; scarce.

Plantaginaceae:

115. *Plantago major* L.
A few plants on shore exposed in 1949, so probably came to the island that year.
Not noticed previously.

Caprifoliaceae:

116. *Sambucus pubens* Michx.
Several young plants, perhaps brought by birds which had eaten the fruit.

Campanulaceae:

117. *Campanula rotundifolia* L. var. *intercedens* (Witasek) Farw.
Not common.

Lobeliaceae:

118. *Lobelia kalmii* L.
Rather common in damp places.

Compositae:

119. *Achillea millefolium* L.
Common.
120. *Anaphalis margaritacea* (L.) B. & H. var. *intercedens* Hara.
121. *Artemisia caudata* Michx.
Common.
122. *Aster junceus* Ait.
Common.
123. *Aster lindleyanus* T. & G.
124. *Bidens frondosa* L.
Rather common on wet shores.
125. *Cirsium arvense* (L.) Scop.
Common.
126. *Cirsium pitcheri* (Torr.) T. & G.
127. *Erigeron philadelphicus* L.
128. *Eupatorium maculatum* L.
129. *Eupatorium perfoliatum* L.
130. *Chrysanthemum leucanthemum* L. var. *pinnatifidum* Lecoq & Lamotte.
Very common.
131. *Hieracium aurantiacum* L.
Common.
132. *Hieracium canadense* Michx.
Scarce.
133. *Hieracium florentinum* All.
Common.
134. *Solidago altissima* L.
Common.
135. *Solidago ohioensis* Riddell.
136. *Solidago graminifolia* (L.) Salisb.
Common.
137. *Tanacetum huronense* Nutt.
138. *Taraxacum officinale* Weber.

LITERATURE CITED

- All the species in the preceding list except the thirteen to which attention was previously called have been reported specifically for Mackinac County in one or more of the following publications. These include the major lists of Mackinac County plants and such other studies as cite Mackinac County specimens of species reported in this paper and not included in the major lists.
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