

**The Effect of Increased Activities and Change
in Mode of Transportation upon the Distribution
of Introduced Species in the Vicinity of Douglas
Lake, Michigan. (+)**

by

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**(+) Contribution from the Biological Station of the
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The studies were made under the direction and
supervision of Professor F. C. Gates during the
summer of 1928.

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During the summer of 1914 a study of the introduced species of settled areas in the vicinity of Douglas Lake, Cheboygan County, Michigan, was made by Gleason and McFarland⁽¹⁾ and continued in 1917 by Gleason⁽²⁾. Since the time these two studies were made auto traffic to the lake has replaced horse drawn vehicles, most of the resorts have been extended and activities of the University Camps increased. To note the effect of these changes upon the introduced flora, studies were made during the summer of 1928 of introduced plants of Douglas Lake resorts, Northwoods Camp, the University of Michigan Engineers' Camp, the University Biological Station, and roads through uninhabited aspen growth.⁽³⁾ Species listed in this study are those which are considered introduced according to Gray⁽⁴⁾, together with certain weeds and such other species as are obviously introduced into this region.

Biological Station

A total of 28 introduced species occur at the site of the Biological Station, which comprises a group of about 50 buildings, stretching for more than a third of a mile along the shore of Douglas Lake. The two original laboratories are log buildings, a part of a construction camp that existed years before the station was established.

The introduced species listed in 1914 were believed to be chiefly a relic of introduced vegetation of the construction camp.⁽¹⁾ Traffic to the station was entirely by horse until after

1914. Gradually autos have replaced the use of horses except during the fall and winter. In 1926 the sand between cottages and laboratories was seeded.

Conringia orientalis, *Vaccaria vaccaria*, *Cerastium vulgatum* and *Polygonum convolvulus*, probably introduced in feed, were found in and near pens where parasitologists kept a few animals and birds for experimental purposes. Still other plants have been brought to the station by members of the station staff such as:

1. *Aquilegia canadensis*
2. *Bromus japonicus*
3. *Campanula rotundifolia*
4. *Cereopsis lanceolata*
5. *Iris lacustris*
6. *Keeleria cristata*
7. *Lathyrus maritimus*
8. *Rudbeckia hirta*
9. *Sedum acre*
10. *Viola pedata*

Of the 300 plants of *Sedum acre* set out in 1927, 5 were surviving in 1928. *Hieracium aurantiacum* transplanted near one of the buildings in 1926 had diminished in 1928.

There were surprisingly few introduced species near the ice house and kitchen, and all of these were found at other places on the station site.

A complete list of introduced species of the Biological

Station are:

1. *Agropyron repens*
2. *Agrostis palustris*
3. *Bromus japonicus*
4. *Cerastium vulgatum*
5. *Chenopodium album*
6. *Conringia orientalis*
7. *Heiracium aurantiacum*
8. *Hordeum jubatum*
9. *Koeleria cristata*
10. *Lepidum virginicum*
11. *Lychnis alba*
12. *Malva rotundifolia*
13. *Phleum pratense*
14. *Poa annua*
15. *Poa compressa*
16. *Poa palustris*
17. *Poa pratensis*
18. *Polygonum convolvulus*
19. *Rudbeckia hirta*
20. *Rumex acetosella*
21. *Sedum acre*
22. *Taraxacum vulgare*
23. *Trifolium hybridum*
24. *Trifolium pratense*
25. *Trifolium repens*
26. *Tridicum aestivum*
27. *Vaccaria vaccaria*
28. *Verbascum thapsus*

Species present in 1914⁽¹⁾

1. *Achillea millifolium*
2. *Agropyron repens*
3. *Agrostis palustris*
4. *Avena sativa*
5. *Brassica arvensis*
6. *Bursa bursa-pastoris*
7. *Cerastium vulgatum*
8. *Chenopodium album*
9. *Lepidium virginicum*
10. *Phleum pratense*
11. *Poa compressa*
12. *Poa pratensis*
13. *Polygonum convolvulus*
14. *Rumex acetosella*
15. *Rumex elongatus*
16. *Satureja acinos*

17. *Secale cereale*
18. *Setaria virides*
19. *Silene noctiflora*
20. *Taraxacum vulgare*
21. *Verbascum thapsus*

Camp Davis

On the southern shore of Douglas Lake, adjacent to the Biological Station, is Camp Davis. The camp is laid out with two rows of houses facing a central road. Brush and shrubs have been well cleared out and the grass along the road and between the houses is short. A caretaker who lives at the Camp keeps horses in an old barn. Here *Cerastium vulgatum*, *Poa palustris*, *Poa pratensis*, *Poa compressa*, *Agrostis palustris* and *Trifolium hybridum* grew on the dirt floor. Horse feed might be the source of these particular species. Most of the introduced plants were found along roadways, near the barn, and around the mess hall, rather than between the houses or in the two flower gardens which are kept weeded. The introduced species are:

1. *Achillea millefolium*
2. *Agropyron repens*
3. *Agrostis palustris*
4. *Amaranthus hybridus*
5. *Arctium minus*
6. *Arenaria serpyllifolia*
7. *Bursa bursa-pastoris*
8. *Cerastium vulgatum*
9. *Chenopodium album*
10. *Chenopodium capitatum*
11. *Chenopodium vulgare*
12. *Chrysanthemum leucanthemum*

13. *Lepidium virginicum*
 14. *Lychnis dioica*
 15. *Medicago lupulina*
 17. *Plantago major* ^{16, *Melilotus alba*}
 18. *Plantago lanceolata*
 19. *Poa pratensis*
 20. *Poa palustris*
 21. *Poa compressa*
 22. *Polygonum aviculare*
 23. *Polygonum convolvulus*
 24. *Potentilla monspeliensis*
 25. *Potentilla recta*
 26. *Phleum pratense*
 27. *Ranunculus acris*
 28. *Radicula obtusa*
 29. *Rumex acetosella*
 30. *Rumex elongatus*
 31. *Silene noctiflora*
 32. *Silene latifolia*
 33. *Sisymbrium altissimum*
 34. *Solanum nigrum*
 35. *Taraxacum officinale* *vulgare*
 36. *Trifolium hybridum*
 37. *Trifolium pratense*
 38. *Trifolium repens*
 39. *Verbascum thapsus*
 40. *Veronica arvensis*

aspen?
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Aspens

To determine the number of introduced species in the roadways through typical aspen growth, and the distance these species have spread into the aspen association, contiguous quadrats one square meter in size were taken on lines perpendicular to three roadways. All three situations were in an aspen area ~~where the three situations were in an aspen area~~ where the trees were young, frequently in clumps interspersed with open meadow like patches of grasses, chiefly

Poa pratensis.

Set 1. -- The road used for the first of the aspen sets (abandoned since 1927), extended from the Base Line northeast of the Biological Station east to the State Road. Though there is no dense growth of grass the road is well covered with mosses between clumps of vegetation. The total number of introduced species in the road was 13. Of these, *Trifolium repens* occurs only once, *Trifolium pratense* twice, and there were six individual plants of *Verbascum thapsus*. On both sides of the road near its eastern end, *Chrysanthemum leucanthemum pinnatifidum* dominates open spaces and is spreading rapidly.

South from the road and beginning 30 meters from each end, five quadrant lines 35 meters apart were taken making a total of 10 lines. Introduced species were fewer in number and disappeared in the first and second quadrants on the lines of the western part of the road. In this section there was more brush from fires that have burned over the area, and here a greater number of young aspens and birches are becoming established than near the eastern part of the road. Where there are a few young aspens, the plant life is predominantly that of the ground flora of the aspen association. The greater frequency and extent of the introduced species to 21 meters south from the road is no doubt influenced by the State Road to the east.

In Set 1. *Poa pratensis*, *Rumex acetosella*, and *Poa compressa* were most frequently listed of the introduced species. 7 of the 13 species were found on the road.

Introduced flora of Set 1.

Road-	Quadrats excluding road.
1. <i>Achillea millefolium</i>	
2. <i>Agrostis palustris</i> -----)	*
3. <i>Cerastium vulgatum</i>	
4. <i>Chrysanthemum leucanthemum</i> -----	*
5. <i>Lepidium virginicum</i>	
6. <i>Phleum pratense</i>	
7. <i>Poa compressa</i> -----	*
8. <i>Poa pratensis</i> -----	*
9. <i>Rumex acetosella</i> -----	#
10. <i>Taraxacum vulgare</i>	
11. <i>Trifolium pratense</i> (2 plants)	
12. <i>Trifolium repens</i> (1 plant)	
13. <i>Verbascum thapsus</i> (6 plants) -----	*

Set 2. -- In the aspens, three quadrat lines were taken on each side of a short section on the Pellston road, south of the Biological Station between the six corners and the four corners. This is a sandy, well traveled road, used by autos in the summer and by horses bringing wood and supplies to the Biological Station and Camp Davis in the fall, winter and early spring. Vegetation on the road is sparse, yet introduced species are limited to the road. Of the three aspen sets, this has the larger trees, which explains the scarcity of the ground plants. Only where there are open spaces was any introduced flora found. Then *Rumex acetosella*, *Poa compressa*, and *Poa pratensis* are most abundant of the four species found in the quadrats, excluding the quadrats taken in the road. Both sides of the road are flanked by young trees with dense foliage, and this has checked the spread of introduced species from the road into the aspens.

Introduced flora of Set 2.

Road-

Quadrats excluding road.

- | | |
|------------------------------------|---|
| 1. <i>Agrostis palustris</i> | # |
| 2. <i>Lepidium virginicum</i> | |
| 3. <i>Phleum pratense</i> | |
| 4. <i>Poa compressa</i> | # |
| 5. <i>Poa palustris</i> | # |
| 6. <i>Poa pratensis</i> | # |
| 7. <i>Polygonum convolvulus</i> | |
| 8. <i>Rumex acetosella</i> | |

Set 3.- An infrequently used road extending from the lower Cheboygan Road toward Reese's Bog was the location of the third set of quadrat lines. Six lines were taken north from the road, 35 meters apart, the first one 30 meters from the intersection of the two roads. The first three lines were in very open area where *Poa compressa* extended in places to the Cheboygan Road. Farther west there were clumps of small trees and the number of plants spreading in from the road was fewer. The road itself was well sodded, with *Trifolium pratense* and *Trifolium hybridum* abundant in several places. There was a total of 13 species in the road, 6 species net in the road, and 7 in quadrats^{only} in the road.

Introduced flora of Set 3.

Road-

Quadrats excluding road.

- | | |
|-------------------------------------|----------------------|
| 1. <i>Agrostis palustris</i> | |
| 2. <i>Chenopodium album</i> | |
| 3. <i>Lepidium virginicum</i> | # |
| 4. <i>Phleum pratense</i> | # |
| 5. | <i>Poa compressa</i> |
| 6. <i>Poa palustris</i> | |
| 7. <i>Poa pratensis</i> | # |
| 8. <i>Potentilla recta</i> | |
| 9. <i>Rumex acetosella</i> | # |
| 10. <i>Taraxacum vulgare</i> | |
| 11. <i>Trifolium hybridum</i> | # |
| 12. <i>Trifolium pratense</i> | |
| 13. <i>Trifolium repens</i> | |

14. *Verbascum thapsus*

Introduced flora of the three aspen: sets, 1928.

1. *Achillea millefolium*
2. *Agrostis palustris*
3. *Cerastium vulgatum*
4. *Chenopodium album*
5. *Chrysanthemum leucanthemum pinnatifidum*
6. *Lepidium virginicum*
7. *Phleum pratense*
8. *Poa compressa*
9. *Poa palustris*
10. *Poa pratensis*
11. *Polygonum convolvulus*
12. *Potentilla recta*
13. *Rumex acetosella*
14. *Taraxacum vulgare*
15. *Trifolium hybridum*
16. *Trifolium repens*
17. *Trifolium pratense*
18. *Verbascum thapsus*

Introduced flora in aspens.

1914

1917

- | | |
|---|-------------------------|
| 1. <i>Agrostis palustris</i> ----- | * |
| 2. <i>Agropyron repens</i> ----- | * |
| 3. <i>Avena sativa</i> | |
| 4. <i>Achillea millefolium</i> ----- | * |
| 5. <i>Arenaria serpyllifolia</i> | |
| 6. <i>Chrysanthemum leucanthemum pin.</i> | |
| 7. <i>Cerastium vulgatum</i> | |
| 8. <i>Cirsium lanceolatum</i> | |
| 9. <i>Dactylis glomerata</i> ----- | * |
| 10. ----- | <i>Erigeron ramosus</i> |
| 11. <i>Lepidium virginicum</i> ----- | * |
| 12. <i>Poa compressa</i> ----- | * |
| 13. <i>Poa pratensis</i> ----- | * |
| 14. <i>Phleum pratense</i> ----- | * |
| 15. <i>Polygonum aviculare</i> | |
| 16. <i>Rumex acetosella</i> ----- | * |
| 17. <i>Secale cereale</i> | |
| 18. <i>Taraxacum vulgare</i> | |
| 19. <i>Trifolium repens</i> ----- | * |
| 20. <i>Trifolium pratense</i> ----- | * |
| 21. <i>Trifolium hybridum</i> ----- | * |
| 22. <i>Verbascum thapsus</i> ----- | * |

Bryant's Resort

The largest group of cottages of any resort at Douglas Lake is in the vicinity of Bryant's Hotel on the south shore of the lake. Auto traffic during the resort season has almost entirely replaced that of horses. Roads and paths lead from the hotel in which there is a store to the cottages, making a natural stopping place for the resorters. In 1914, 24 species of introduced plants were listed from the yards surrounding the hotel and nearby cottages. This had increased in 1917 to 42 species. The number remained the same in 1928 though the species varied.

There was a marked difference in number of plants near the cottages to the west and to the east of the hotel. Cottages to the west have been built more recently, tree growth is denser, the ground is covered with a mat of pine needles and here introduced plants were neither numerous in number or species, but no new species were found. Most of the cottages to the east of the hotel are in a more open situation and have been influenced longer by the introduced vegetation in the immediate vicinity of the hotel. The following species occurred in 1928:

1. *Achillea millefolium*
2. *Agropyron repens*
3. *Agrostis palustris*
4. *Amaranthus retroflexus*
5. *Arenaria serpyllifolia*
6. *Bursa bursa-pastoris*
7. *Cerastium vulgatum*
8. *Chenopodium album*
9. *Chenopodium capitatum*
10. *Chrysanthemum leucanthemum*
11. *Dactylis glomerata*
12. *Erysimum cheiranthoides*
13. *Euphorbia cyparissias*
14. *Fagopyron esculentum*
15. *Lappula lappula*
16. *Lepidium virginicum*
17. *Malva rotundifolia*
18. *Melilotus alba*
19. *Nepeta cataria*
20. *Phleum pratense*

21. *Plantago lanceolata*
22. *Plantago major*
23. *Poa annua*
24. *Poa compressa*
25. *Poa pratensis*
26. *Poa palustris*
27. *Polygonum aviculare*
28. *Polygonum convolvulus*
29. *Polygonum persicaria*
30. *Polygonum ramosissimum*
31. *Potentilla recta*
32. *Rumex acetosella*
33. *Rumex elongatus*
34. *Rumex obtusifolius*
35. *Sedum acre*
36. *Silene noctiflora*
37. *Sisymbrium altissimum*
38. *Solanum nigrum*
39. *Taraxacum vulgare*
40. *Trifolium hybridum*
41. *Trifolium repens*
42. *Veronica arvensis*

Introduced species present in 1914⁽¹⁾

1. *Achillea millefolium*
2. *Agrostis alba*
3. *Amaranthus retroflexus*
4. *Anthemis cotula*
5. *Cerastium vulgatum*
6. *Chenopodium album*
7. *Chenopodium hybridum*
8. *Lepidium virginicum*
9. *Malva rotundifolia*
10. *Nepeta cataria*
11. *Phleum pratense*
12. *Plantago major*
13. *Poa annua*
14. *Poa compressa*
15. *Poa pratensis*
16. *Polygonum aviculare*
17. *Polygonum convolvulus*
18. *Polygonum persicaria*
19. *Rumex acetosella*
20. *Rumex elongatus*
21. *Taraxacum officinale*
22. *Trifolium hybridum*
23. *Trifolium repens*
24. *Verbascum thapsus*

Species added in 1917.⁽²⁾

1. *Ambrosia artemisiifolia*

2. *Arenaria serpyllifolia*
 3. *Brassica alba*
 4. *Bursa bursa-pastoris*
 5. *Dactylis glomerata*
 6. *Chrysanthemum leucathemum*
 7. *Galeopsis tetrahit*
 8. *Lychnis alba*
 9. *Polygonum erectum*
 10. *Rumex obtusifolius*
 11. *Dedum aere*
 12. *Sisymbrium altissimum*
 13. *Trifolium pratense*
 14. *Veronica arvensis*
- (Also 8 other unlisted species)

(2)

The following species had disappeared by 1917

1. *Amaranthus retroflexus*
2. *Anthemis cotula*
3. *Chenopodium hybridum*
4. *Polygonum persicaria*

Northwood's Camp.

A few metres beyond the cottage east of Bryant's resort is Wayside Inn, a guest house used by Northwood's Camp, a camp for girls on the point known as Bogardus Point. There were 8 introduced species found here. In the yards of the buildings of Northwood's Camp and a grassy area adjacent, 19 species occurred. Around the tents the species, *Poa compressa*, *Poa pratensis* and *Lepidium virginicum* were the only introduced plants. The small number of introduced plants in the entire area owned by the camp might be explained by the constant cutting, raking and burning of grass and weeds.

In 1926 a tennis court was made on the camp property near Bryant's Bog. Aspens and undergrowth had to be cleared for the court and clay hauled in for its surface, but at present five species occur around it. Bogardus Point has been the site of a

camp since 1925. Riding horses from Ingleside were brought to the camp two days a week during the camping season of 1926 and 1927. This (1928) is the first season horses have been kept at Northwood's Camp. A new road around the east side of the tennis court connecting the camp with Bryant's to Cheboygan road was built in 1927 and is used as the main entrance to the camp. The constant use of all roads in the vicinity as bridle paths is destroying vegetation in the center of the road, yet in time may add new introduced species to these roadsides.

A total of 21 species are found at Wayside Inn, Northwood's Camp and the tennis court, 19 of which occur at the Northwood's Camp.

Tennis Court

1. *Agrostis palustris*
2. *Lepidum virginicum*
3. *Poa compressa*
4. *Poa pratensis*
5. *Taraxacum vulgare*

Northwood's Camp

1. *Achillea millefolium*
2. *Agropyron repens*
3. *Agrostis palustris*
4. *Chenopodium album*
5. *Cirsium arvense*
6. *Phleum pratense*
7. *Plantago major*
8. *Poa annua*
9. *Poa compressa*
10. *Poa palustris*
11. *Poa pratensis*
12. *Polygonum convolulus*
13. *Polygonum persicaria*
14. *Rumex acetosella*
15. *Rumex elongatus*
16. *Rumex obtusifolius*
17. *Taraxacum vulgare*
18. *Trifolium hybridum*
19. *Trifolium repens*

Wayside Inn - Northwood's Camp Guest House.

1. Agrostis palustris
2. Chrysanthemum leucanthemum
3. Phleum pratense
4. Poa compressa
5. Poa pratensis
6. Rumex acetosella
7. Taraxacum vulgare
8. Trifolium hybridum

Indian Hut.

A small clearing in the aspens near a bog about a quarter of a mile from Bryant's Hotel marks the site of an old Indian hut. There is no longer any trace of this hut, which for years stood as an abandoned dwelling. Nine species of introduced plants now occur in this area, while in 1914 the number was 15. *Rhus glabra* and *Rubus allegheniensis* from the aspens surrounding the clearing have spread rapidly in the past two or three years. As the clearing gives way to aspen growth, there may be a further reduction in the number of the introduced plants. A road adjacent to the clearing is used chiefly by auto traffic.

Bryant's Indian Hut

2. Agrostis palustris
1. Achillea millefolium
3. Phleum pratense
4. Poa compressa
5. Poa palustris
6. Poa pratensis
7. Rumex acetosella
8. Taraxacum officinale *vulgare*
9. Trifolium hybridum

Fairy Island

Fairy Island extends for half a mile north from Bryant's

Resort and is connected with the main land by a narrow sand bar which is covered by water during the spring. Five cottages and an old ice house are the only buildings on the island. The stony beach on the west side of the island is wide enough at time of low water for the teams bringing building material to the island. In order to get from the main land to the island, boats are used more frequently than the three paths extending the length of the island. A mixture of Thuja, Pinus and Betula covers the island and there is no other place in the vicinity of Douglas Lake where Taxus grows more abundantly. Introduced species are most numerous around the cottages at the northern end of the island, but are nowhere abundant and except for the grasses are absent from the paths. The introduced species on the island are:

1. *Achillea millefolium*
2. *Agrostis palustris*
3. *Alsine media*
4. *Cerastium vulgatum*
5. *Chenopodium capitatum*
6. *Chrysanthemum leucanthemum*
7. *Cirsium arvense*
8. *Dactylis glomerata*
9. *Erigeron canadensis*
10. *Euphorbia cyparissias*
11. *Lepidium virginicum*
12. *Lychnis alba*
13. *Phleum pratense*
14. *Poa compressa*
15. *Poa palustris*
16. *Poa pratensis*
17. *Polygonum amphibium hartwrightii*
18. *Polygonum persicaria*
19. *Polygonum convolvulus*
20. *Sedum acre*
21. *Taraxacum vulgare*
22. *Trifolium hybridum*
23. *Verbascum thapsus*
24. *Vicia villosa*

Silver Strands.

A half mile west from Ingleside is a group of less than a dozen summer cottages which for the seasons 1927 and 1928 have been unoccupied. Land to the north is part of a bog area which was burned in 1919 and 1923 and subsequent fires endangering the cottages have left this an unattractive part of the shore line. There is marl with the sand of the narrow beach line on which *Scirpus americanus* is spreading.

A soft muck and marl path leading around Marl bay to Ingleside, isolation from the main highway and other resorts of the lake because of poor roads, many mosquitoes and abundance of poison ivy have been the chief reasons for resorters deserting this section of the shore.

The caretaker of the Silver Strand cottages, although not living at the lake, keeps a few pigs in a small pen near a neglected vegetable garden. It was near this pen and garden where most of the species in 1928 were found.

Behind the cottages is a small meadow of *Agropyron repens* and *Rudbeckia hirta*. *Chrysanthemum leucanthemum* was entirely lacking in cottage yards and nearby meadow.

The following species were found at Silver Strands.

1. *Achillea millefolium*
2. *Agropyron repens*
3. *Agrostis palustris*
4. *Amaranthus retroflexus*
5. *Chenopodium album*
6. *Cirsium arvense*
7. *Lepidium virginicum*
8. *Phleum pratense*
9. *Poa compressa*
10. *Poa pratensis*
11. *Polygonum convolvulus*
12. *Rumex acetosella*
13. *Rumex elongatus*
14. *Taraxacum vulgare*

12. *Rudbeckia hirta*

- 15¹⁶. *Trifolium hybridum*
 16¹⁷. *Verbascum thapsus*

Ingleside.

At Ingleside, one of the oldest resort areas on Douglas Lake, occurred a greater variety of introduced species than in any other settled area of the lake. The resort includes a group of cottages and a hotel which is also the Post Office and store. More of the natural vegetation has been cleared for this resort than for Bryant's. Locations of most of the introduced species in and near Ingleside were a vegetable garden at the hotel; the road leading from the hotel behind the cottages to a farm house (the last building in this group); a lane from the farm house to the Ingleside road; and barnyard and chicken coop. Two plants of particular interest were *Iva xanthifolia*, found only at the chicken coop near the farm house, and probably introduced in the chicken feed, and *Euphorbia cyparissias* in the barn yard between the barn and the lake.

1. *Achillea millefolium*
2. *Agropyron repens*
3. *Agropyron tenerum*
4. *Agrostis palustris*
5. *Alsine media*
6. *Alyssum alyssoides*
7. *Amaranthus retroflexus*
8. *Ambrosia psilostachya*
9. *Anthemis cotula*
10. *Arctium minus*
11. *Arenaria serpyllifolia*
12. *Avena sativa*
13. *Brassica nigra*
14. *Bursa bursa-pastoris*
15. *Calmagrostis canadensis*
16. *Cerastium vulgatum*
17. *Chenopodium album*
18. *Chrysanthemum balsamitae tanacetoides*
19. *Chrysanthemum leucanthemum*
20. *Cirsium arvense*
21. *Cirsium lanceolatum*
22. *Clinopodium vulgare*

23. *Cynoglossum officinale*
 * 24. *Dactylis glomerata*
 * 25. *Erysimum cheiranthoides*
 * 24. *Euphorbia cyparissias*
 * 25. *Heiracium auranthiacum*
 26. *Iva xanthifolia*
 27. *Lappula lappula*
 28. *Lepidum virginicum*
 29. *Lychnis alba*
 30. *Malva rotundifolia*
 31. *Medicago lupulina*
 32. *Melilotus alba*
 33. *Nepta cataria*
 34. *Pastinaca sativa*
 35. *Phleum pratense*
 36. *Plantago lanceolata*
 37. *Plantago major*
 38. *Poa annua*
 39. *Poa compressa*
 40. *Poa palustris*
 41. *Poa pratensis*
 42. *Polygonum amphibium hartwrightii*
 43. *Polygonum aviculare*
 44. *Polygonum convolvulus*
 45. *Polygonum pennsylvanicum*
 46. *Polygonum tomentosum incanum*
 47. *Portulaca oleracea*
 48. *Radicula armorica*
 49. *Radicula hispida*
 50. *Rumex acetosella*
 51. *Rumex elongatus*
 52. *Rumex obtusifolius*
 53. *Saponaria officinale*
 54. *Silene latifolia*
 55. *Silene noctiflora*
 56. *Sisymbrium altissimum*
 57. *Sisymbrium officinale*
 58. *Taraxacum vulgare*
 59. *Trifolium hybridum*
 60. *Trifolium pratense*
 61. *Trifolium repens*
 62. *Verbascum thapsus*
 63. *Vicia villosa*

48. *Potentilla monspeliensis*
 ←
 Renumerate
 from here

* - Error in numbering. No's. go to 65 instead of 63.

Introduced plants at Ingleside - 1914 ⁽¹⁾

1. Agropyron repens
2. Achillea millefolium
3. Agrostis alba *palustris*
4. Amaranthus retroflexus
5. Ambrosia artemisifolia
6. Anthemis cetula
7. Arctium minus
8. Arenaria serpyllifolia
9. Brassica arvensis
10. Bromus secalinus
11. Bursa bursa-pastoris
12. Cerastium vulgatum
13. Chenopodium album
14. Chrysanthemum balsamitae tanacetoides
15. Cynoglossum officinale
16. Eupherbia Cyparissias
17. Iva xanthifolia
18. Lappula deflexa
19. Lepidium virginicum
20. Lychinis alba
21. Malva rotundifolia
22. Nepeta cataria
23. Phleum pratense
24. Plantago lanceolata
25. Plantago major
26. Poa compressa
27. Poa pratensis
28. Polygonum aviculare
29. Polygonum convolvulus
30. Polygonum persicaria
31. Rumex elongatus
32. Setaria viridis
33. Sedum acre
34. Silene noctiflora
35. Sisymbrium altissimum
36. Sisymbrium officinale var. leiocarpum
37. Solanum nigrum
38. Taraxacum officinale *vulgare*
39. Trifolium hybridum
40. Trifolium pratense
41. Trifolium repens
42. Verbascum thapsus

Nutting's Bay.

About half a mile east of Ingleside between Bentley's and a farm at Nutting's Bay is a group of cottages. The number of species has been reduced since 1914 from 26 to 16. In 1914 the land on which some of the cottages are located was gravelly pastured land. There is now no evidence of the field being used as pasture and this is probably the chief reason for the absence of introduced species. Boats are still used as means of transportation to Ingleside although the sandy road behind the cottages is used by autos.

Cerastium vulgatum was the most abundant plant in this area. In 1914 there were 26 species present while in 1928 the number had been reduced to 16.

For the past two or three seasons there has been no attempt to cultivate a farm at Nutting's Bay and no livestock has been kept at the farm. However, part of the farm home is occupied (1928) and there is a small neglected flower garden near the house. The number of introduced species in the barn yard, around the house and in the roadway exceeds the number present at the cottages of Nutting's Bay. This difference can be expected, due to the previous cultivation of the farm and the former care of livestock on the farm.

Nutting's Bay - 1928.

1. *Agrostis palustris*
2. *Cerastium vulgatum*
3. *Chenopodium album*
4. *Chrysanthemum leucanthemum*
5. *Euphorbia cyparissias*
6. *Lepidium virginicum*
7. *Phleum pratense*
8. *Plantago major*
9. *Poa compressa*
10. *Poa palustris*
11. *Poa pratensis*
12. *Polygonum convolvulus*

13. Rumex acetosella
14. Rumex elongatus
15. Taraxacum officinale *vulgare*
16. Verbascum thapsus

Nutting's Bay - 1914 (1)

1. Agrostis alba *palustris*
2. Arenaria serpyllifolia
3. Bursa bursa-pastoris
4. Chrysanthemum leucanthemum *pinnatifidum*
5. Cirsium lanceolatum
6. Cynoglossum officinale
7. Lappula deflexa
8. Lepidium virginicum
9. Nepeta cataria
10. Phleum pratense
11. Plantago lanceolata
12. Plantago major
13. Poa compressa
14. Poa pratensis
15. Polygonum convolvulus
16. Rumex acetosella
17. Rumex elongatus
18. Setaria viridis
19. Silene noctiflora
20. Sisymbrium officinale *leiocarpum*
21. Sisymbrium altissimum
22. Taraxacum officinale
23. Trifolium hybridum
24. Trifolium pratense
25. Trifolium repens
26. Verbascum thapsus

Nutting's Bay Farmyard - 1928

1. Achillea millefolium
2. Agropyron repens
3. Agrostis palustris
4. Arenaria serpyllifolia
5. Bursa bursa-pastoris
6. Cerastium vulgatum
7. Chrysanthemum balsamita *tanacetoides*
8. Chrysanthemum leucanthemum
9. Cirsium arvense
10. Cynoglossum officinale
11. ^{pp}Lappula ~~echinata~~ *Lappula*
12. Lepidium virginicum

13. *Malva rotundifolia*
14. *Nepeta cataria*
15. *Poa compressa*
16. *Poa pratensis*
17. *Polygonum aviculare*
18. *Polygonum convolvulus*
19. *Rumex acetosella*
20. *Rumex elongatus*
21. *Rumex obtusifolius*
22. *Silene noctiflora*
23. *Taraxacum vulgare*
24. *Trifolium hybridum*
25. *Trifolium pratense*
26. *Trifolium repens*
27. *Verbascum thapsus*

Bentley's Point

On a bluff northwest of Robert's Point is the Bentley summer home, built in 1925. No attempt has been made to preserve any natural flora. All underbrush has been cleared away, the bank stripped of vegetation and sodded, and most of the trees between the house and lake removed, leaving as the lawn, grasses common to aspen areas. Future plans for this land include extensive landscaping but as yet there are only a few beds of cultivated flowers. Most of the introduced species were found in and near these flower beds.

The introduced flora are as follows.

1. *Achillea millefolium*
2. *Agrostis palustris*
3. *Alsine media*
4. *Arenaria serpyllifolia*
5. *Cerastium vulgatum*
6. *Chenopodium album*
7. *Chrysanthemum leucanthemum*
8. *Erigeron ramosus*
9. *Lepidium virginicum*
10. *Malva rotundifolia*
11. *Phleum pratense*
12. *Poa compressa*
13. *Poa pratensis*
14. *Poa palustris*
15. *Polygonum convolvulus*
16. *Ranunculus acris*
17. *Solanum nigrum*
18. *Taraxacum vulgare*
19. *Trifolium hybridum*
20. *Trifolium repens*
21. *Verbascum thapsus*

Robert's Point

At Robert's Point (towards Ingleside from Kentucky Cottage) are two cottages where there is now no effort being made either to bring in cultivated plants nor to preserve the natural vegetation. The yards at the rear of these cottages are low and rather moist. Most of the introduced species were in the roadway and near the garage. *Alsine media* and *Cerastium vulgatum* were rather abundant near the porches and foundations of the cottages.

The introduced flora are as follows.

1. *Agrostis palustris*
2. *Alsine media*
3. *Cerastium vulgatum*
4. *Chenopodium album*
5. *Phleum pratense*
6. *Plantago major*
7. *Poa compressa*
8. *Poa palustris*
9. *Poa pratensis*
10. *Rumex acetosella*
11. *Rumex elongatus*
12. *Rumex obtusifolius*
13. *Sedum acre*
14. *Taraxacum vulgare*
15. *Trifolium hybridum*
16. *Verbascum thapsus*

Kentucky Cottage

A mile east from Ingleside and extending about a quarter of a mile along the shore is a group of five cottages where in 1914 there were only two cottages. One of the cottages farthest east has not been occupied for several seasons. Adjacent to it is Kentucky Cottage, one of the two original cottages of this group. In an attempt to make the yard surrounding Kentucky Cottage attractive there has been a conscious effort while clearing underbrush, to disturb the natural vegetation as little as possible. There is no garden of cultivated flowers. *Chrysanthemum leucanthemum*, transplanted near the porch and present in 1914 was the only introduced species that year. It has spread very little. *Sedum acre*, transplanted at the top of the bank near the path leading to the beach, is spreading down the bank. *Lepidium virginicum* and *Cerastium vulgatum* were found in pebbles left from a pile of stones brought in ^{to} the cottage in 1927 for a fireplace. Near the same place was a small group of *Rudbeckia laciniata* which had been seen first in 1927 and ^{was} were probably introduced in the material for the fireplace. *Lepidium virginicum* was present also among the stones of the path leading from the house to the beach. Near the ice house were *Rumex acetosella*, *Bursa bursa-pastoris*, *Polygonum convolvulus*, and *Plantago major* which were found in no other place near the cottage.

Although Kentucky, Robert's and Bentley cottages are fairly close to each other, three distinct attitudes are shown by the cottagers towards the natural vegetation: 1- an effort to preserve the natural flora, 2- an indifference towards preservation, 3- an effort to replace the natural vegetation with cultivated. For the twenty years Kentucky cottage has been occupied there are fewer plants than are found at Bentley's. Point in the three years since the vegetation was disturbed. Of those at Kentucky several have been brought in just recently with material for a new fireplace and sawdust for the ice house. In 1914, species in the roadway behind the cottage numbered 19. This has been reduced to 10.

Introduced species at Kentucky Cottage and nearby road.

1. *Agrostis palustris*
2. *Bursa bursa-pastoris*
3. *Cerastium vulgatum*
4. *Chenopodium album*
5. *Chrysanthemum leucanthemum*
7. *Cynoglossum officinale*
8. *Erigeron ramosus*
9. *Lepidium virginicum*
10. *Phleum pratense*
11. *Plantago major*
12. *Poa compressa*
13. *Poa pratensis*
14. *Polygonum convolvulus*
15. *Polygonum aviculare*
16. *Rumex acetosella*
17. *Sedum acre*
18. *Taraxacum officinale vulgare*
19. *Verbascum thapsus*

+ 6. *Cirsium arvense*

Reeses' Clearing

A number of introduced species occur in a clearing in Raeses Bog where for a number of years there was a small dwelling. Dr Gleason, in his paper of 1914⁽¹⁾, reported there were no introduced species in the clearing until 1912 and believed those had come in with packing material when a small cottage was built. The building was abandoned a few years ago and now no part of the building remains. Growth of *Nepeta cataria* marks the line of the foundation of one side of the house. Between the site of the house and the creek was a patch of cultivated raspberries which is spreading. Across the creek, in the field that is now^{was} cultivated, is a meadow of *Elymus canadensis* and *Agropyron Smithii*, but no introduced species are present.

1. *Achillea millefolium*
2. *Agropyron tenerum*
3. *Agrostis alba palustris*
4. *Arctium minus*
5. *Bursa bursa-pastoris*
6. *Cerastium vulgatum*
7. *Chenopodium album*
8. *Chrysanthemum leucanthemum*
9. *Cirsium lanceolatum*
10. *Clinopodium acinos*
11. *Dactylis glomerta*
12. *Lepidum virginicum*
13. *Lychnis alba*
14. *Melilotus alba*
15. *Nepeta cataria*
16. *Phelum pratense*
17. *Plantago major*
18. *Poa compressa*
19. *Poa palustris*
20. *Poa pratensis*
21. *Polygonum aviculare*
22. *Polygonum convolvulus*
23. *Potentilla monspeliensis*
24. *Potentilla recta*
25. *Rumex acetosella*
26. *Rumex elongatus*

- 27. *Silene latifolia*
- 28. *Sisymbrium altissimum*
- 29. *Taraxacum vulgare*
- 30. *Trifolium hybridum*
- 31. *Trifolium pratense*
- 32. *Trifolium repens*

New Reeses Bog Road

In an attempt to extend the resort area at the northern end of Burt Lake and to make the shore more accessible to main roads, a road was begun in 1926 parallel to the beach and perpendicular to the road leading from the State Road through Reeses Bog to the lake. Clearing for the new road extended through the bog area for more than a half mile on each side of the established road. Construction of the road ceased as soon as it was observed that the western part was being cut through the University property. Where sand and clay had been hauled in to fill the spaces between the felled trees used as foundation of the new roadway, introduced plants were found. In 1928 the sand and clay of the abandoned road had settled sufficiently so that in places the road bed was wet and some of the bog plants were again becoming established. Introduced species, particularly *Rumex acetosella*, *Verbascum thapsus*, and *Taraxacum vulgare*, were abundant in the dry, sandy places. In the clearing to the west beyond the point where the roadway had been filled in with sand and clay, bog vegetation had been undisturbed. Seeds of introduced species established in the clearing for the new roadway have been brought in with sand and the horse's feed or have blown in and found the sand and clay a favorable place for germination. A list of the introduced species follows.

New Road - Reese's Bog.

1. *Agrostis alba palustris*
2. *Cerastium vulgatum*
3. *Chenopodium album*
4. *Chrysanthemum leucanthemum*
- * 5. *Cirsium lanceolatum*
7. *Lepidium virginicum*
8. *Oenothera biennis*
9. *Phleum pratense*
10. *Poa compressa*
11. *Poa pratensis*
12. *Polygonum convolvulus*
13. *Potentilla recta*
14. *Rumex acetosella*
15. *Silene noctiflora*
16. *Taraxacum officinale vulgare*
17. *Trifolium hybridum*
18. *Trifolium pratense*
19. *Trifolium repens*
- * 6. *Fragaria vesca*
20. *Verbascum thapsus*

Pellston

A mill yard at Pellston, a few miles west from Douglas Lake, was the only area in Emmet County in which a list of introduced species was made. Here occurred a greater variety of introduced plants than were recorded for most other locations in the vicinity of the lake. Some of these may have been brought in with the horse feed, others, with the lumber brought to the saw mill from stands near Pellston, or with logs shipped to the Pellston saw mill from the Upper Peninsula of Michigan. Since 1919, the Upper Peninsula has been the source of practically all the logs sawed at the mill. The introduced species at Pellston millyard represented a great variety, though the individual species were neither abundant nor evenly distributed. They are as follows:

1. *Achillea millefolium*
2. *Agropyron repens*
3. *Alsine media*

4. *Amaranthus blitoides*
5. *Amaranthus retroflexus*
6. *Ambrosia elatior*
7. *Ambrosia psilostachya*
8. *Avena byzantina*
9. *Brassica juncea*
10. *Brassica nigra*
11. *Bursa bursa-pastoris*
12. *Cerastium vulgatum*
13. *Chaetochloa viridis*
14. *Chenopodium album*
15. *Chenopodium capitatum*
16. *Chrysanthemum leucanthemum pinnatifidum*
17. *Cirsium arvense*
18. *Cirsium lanceolatum*
19. *Cynoglossum officinale*
20. *Erigeron ramosus*
21. *Heracleum jubatum*
22. *Iva xanthifolia*
23. *Lappula lappula*
24. *Leonurus cardica*
25. *Lepidium virginicum*
26. *Linaria linaria*
27. *Lychnis dioica*
28. *Malva rotundifolia*
29. *Medicago lupulina*
30. *Medicago sativa*
31. *Melilotus alba*
32. *Nepeta cataria*
33. *Phleum pratense*
34. *Physalis heterophylla*
35. *Plantago major*
36. *Poa compressa*
37. *Poa pratensis*
38. *Polygonum convolvulus*
39. *Polygonum persicaria*
40. *Portulaca oleracea*
41. *Potentilla recta*
42. *Radicula sp.*
43. *Ranunculus acris*
44. *Rumex acetosella*
45. *Rumex elongatus*
46. *Rumex obtusifolius*
47. *Salsola pestifer*
48. *Silene noctiflora*
49. *Sisymbrium altissimum*
50. *Sisymbrium officinale*
51. *Solanum nigrum*
52. *Syntherisma sanguinalis*
53. *Taraxacum vulgare*
54. *Tragopogon pratensis*
55. *Trifolium hybridum*
56. *Trifolium pratense*
57. *Trifolium repens*
58. *Verbascum thapsus*

The accompanying table was compiled, using all the locations studied in 1928 and comparing with these (where same areas were mentioned), the number of species recorded in Gleason's papers of 1914⁽¹⁾ and 1918.⁽²⁾ It may be noted that where the number of introduced species of 1928 exceeds that of other years, ~~that~~ the areas are inhabited and ~~that~~ the land is either partly cultivated or ~~that~~ there has been an increase in the number of buildings. The Reese's Clearing is one of the exceptions to the above statement. Though the number of species in 1928 exceeded that of 1917, some species have disappeared, while others have immigrated. The other exception is Nutting's Bay. Even though a few cottages have been built at the Bay, natural flora has been little disturbed. The fact that for the last few years there has been no livestock and no cultivation of the property would tend to lessen the number of introduced species.

TABLE OF INTRODUCED SPECIES

Locations		1914	1917	1928
Douglas Lake				
1. Biological Station	*	21	-	28
2. Camp Davis	*	-	-	40
3. Aspens		21	14	18
4. Bryant's				
(a) Hotel & Cottages	*	24	-	42
(b) Northwoods Camp	*	-	-	21
(c) Indian Hut		15	9	9
(d) Fairy Island	*	-	-	24
5. Silver Strands		-	-	17 ¹⁷
6. Ingleside	*	42	-	65 ⁶⁶
7. Nuttings Bay	*	26	-	16
8. Nutting's Bay Farmyard		-	-	27
9. Bentley's	*	-	-	21
10. Robert's Point	*	20	-	16
11. Kentucky Cottage	*	-	-	19
Burt Lake				
12. Reese's Clearing		24	32	32
13. New Reese's Bog Road		-	-	26
Pellston				
14. Millyard	*	-	-	58

* Inhabited

	1.	2	3	4	5	6	7	8	9	10	11	12	13	14
<i>Chrysanthemum balsamita</i> <i>tanacetoides</i>						+		+						
<i>Chrysanthemum leucanthemum</i> <i>pinnatifidum</i>	+	+		ab d		+	+	+	+		+	+	+	+
<i>Cirsium arvense</i>				bd	+	+		+			+			+
<i>Cirsium lanceolatum</i>						+						+	+	+
<i>Clinopodium acinos</i>												+		
<i>Clinopodium vulgare</i>		+				+								
<i>Conringia orientalis</i>	+													
<i>Cynoglossum officinale</i>						+		+			+			+
<i>Dactylis glomerata</i>				ad		+						+		
<i>Erigeron ramosus</i>									+		+			+
<i>Erigeron canadensis</i>				d										
<i>Erysimum cheiranthoides</i>				a		+								
<i>Euphorbia cyparissias</i>				ad		+		+						
<i>Fagopyron esculentum</i>				a										
<i>Fragaria vesca</i>														+
<i>Hæeracium aurantiacum</i>	+					+								
<i>Hordeum jubatum</i>	+													+
<i>Iva xanthifolia</i>						+								+
<i>Koeleria cristata</i>	+													
<i>Lappula lappula</i>				a		+		+						+
<i>Leonurus cardiaca</i>														+
<i>Lepidium virginicum</i>	+	+	+	ab d	+	+	+	+	+		+	+	+	+
<i>Linaria linaria</i>														+
<i>Lychnis alba</i>	+			d		+						+		
<i>Lychnis dioica</i>		+												+
<i>Malva rotundifolia</i>	+			a		+		+	+					+

Summary

1. On roads through aspen growth, there has been a reduction in number of introduced species since auto traffic has become established.

2. There is a diminution in number of introduced species with increasing distance from roads through the aspens.

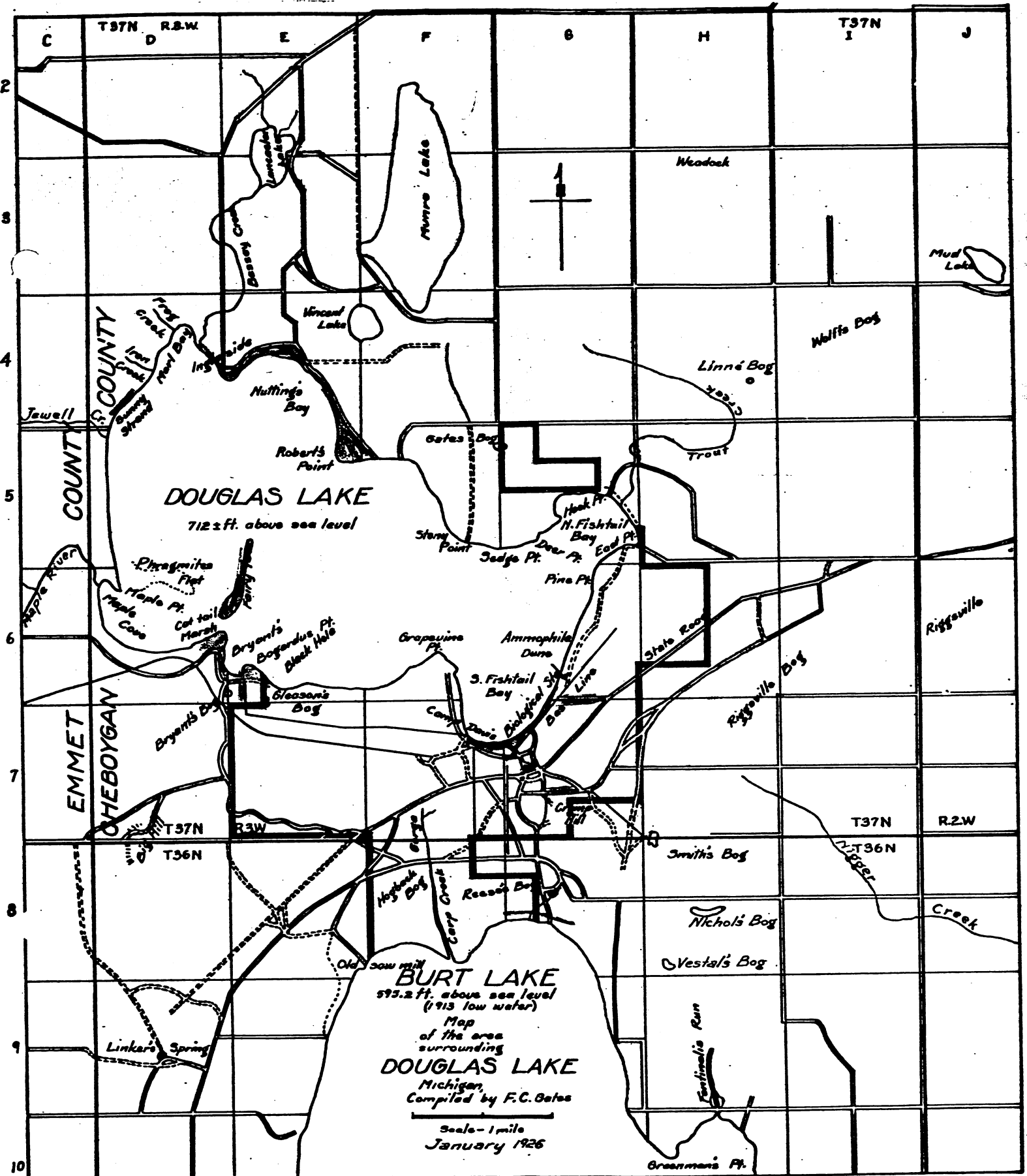
3. Construction of new buildings, bringing a greater number of people to the lake, has been accompanied by an increase of introduced vegetation in the inhabited areas. This however has not increased the introduced element along roads.

4. Areas abandoned show varying reduction in the number of introduced species.

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Plant Succession about Douglas Lake, Cheyboygan
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4. Robinson and Fernald
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Areas Studied -



Plants (weeds) collected by Helen R. Coburn and Doris Dean in the
Douglas Lake Region, ^{Michigan}~~Minnesota~~, 1928

- 1. *Poa compressa* L. Aspens set I, July 11, 1928
- 2. *Agrostis palustris* Huds. "
- 3. *Agrostis hyemalis* (Walt.) B.S.P. "
- 4. *Poa palustris* L. "
- 5. *Poa pratensis* L. "
- 6. *Phleum pratense* L. "
- 7. *Trifolium pratense* L. Camp Davis, July 17, 1928
- 8. *Trifolium hybridum* L. "
- 9. *Rumex acetosella* L. "
- 10. *Verbascum thapsus* L. "
- 11. *Ambrosia elatior* L. "
- 12. *Lychnis alba* Mill. "
- 13. *Aster macrophyllus* L. "
- 14. *Melilotus alba* Desv. "
- 15. *Bursa bursa-pastoris* (L.) Britt. "
- 16. *Amaranthus retroflexus* L. form bushy "
- 17. *Aquilegia canadensis* L. "
- 18. *Chenopodium album* L. "
- 19. *Potentilla monspeliensis* L. "
- 20. *Potentilla recta* L. "
- 21. *Polygonum convolvulus* L. "
- 22. *Anemone cylindrica* A. Gray "
- 23. *Achillea millefolium* L. "
- 24. *Plantago lanceolata* L. "
- 25. *Plantago major* L. "
- 26. *Ranunculus acris* L. "
- 27. *Poa palustris* L. "
- 28. *Chenopodium capitatum* (L.) Ashe "
- 29. *Cerastium vulgatum* L. "
- 30. *Clinopodium vulgare* L. "
- 31. *Medicago lupulina* L. "
- 32. *Silene noctiflora* L. "
- 33. *Cirsium arvense* (L.) Scop. "
- 34. *Galium circaezans* Michx. "
- 35. *Polygonum aviculare* L. "
- 35a. *Polygonum ramosissimum* Michx. "
- 36. *Arenaria leptocladus* Reichenb. "
- 37. *Brassica campestris* L. var. "
- 38. *Sisymbrium altissimum* L. "
- 39. *Silene latifolia* (Mill.) Britten & Rendle "
- 40. *Veronica* (closest to *arvensis* L.) "
- 41. *Andropyron caninum* (L.) R. & G. Reeses Bog Reese's Bog - Hut - July 29, 1928
- 42. *Lychnis alba* Mill.
- 43. *Achillea millefolium* L.
- 44. *Clinopodium acinos* (L.) Kuntze
- 45. *Lepidium virginicum* L.
- 46. *Potentilla monspeliensis* L.
- 47. *Rumex elongatus* Guss.
- 48. *Agropyron smithii* Rydb.
- 49. *Taraxacum vulgare*. Weber.
- 50. *Cirsium lanceolatum* (L.) Hill
- 51. *Arctium minus* Schk.
- 52. *Cerastium vulgatum* L.
- 53. *Rumex acetosella* L.
- 54. *Silene latifolia* (Mill.) Britten & Rendle
- 55. *Geum strictum* Ait.
- 56. *Trifolium pratense* L.

Reese's Bog - Hut - July 29, 1928

- 57. *Trifolium hybridum* L.
- 58. *Plantago major* L.
- 60. *Bursa bursa-pastoris* (L.) Britt.
- 61. *Polygonum convolvulus* L.
- 62. *Chenopodium album* L. (shaded)
- 63. *Ambrosia elatior* L.
- 64. *Cirsium arvense* (L.) Scop.
- 65. *Agrostis palustris* Huds.
- 66. *Poa compressa* L.
- 67. *Poa pratensis* L.
- 68. *Melilotus officinalis* L.
- 69. *Sisymbrium altissimum* L.
- 70. *Agrostis capillaris* (L.)
- 71. *Nepeta cataria* L.
- 72. *Clinopodium acinos* (L.) Kuntze
- 73. *Polygonum* (probably *ramosissimum*)
- 74. *Sedum acre* L.
- 75. *Rumex obtusifolius* L.
- 76. *Agrostis palustris* Huds. var.
- 77. *Poa palustris* L.
- 78. *Veronica arvensis* L. closest to
- 79. *Arabis* sp.?
- 80. *Silene noctiflora* L.
- 81. *Rumex obtusifolius* L.
- 82. *Galeopsis tetrahit* L.
- 83. *Chenopodium capitatum* (L.) Ashe.
- 84. *Polygonum aviculare* L.
- 85. *Agropyron repens*. var.
- 86. *Agropyron repens*
- 87. *Solanum nigrum* L.
- 88. *Malva rotundifolia* L.
- 89. *Potentilla recta* L.
- 90. *Fagopyrum fagopyrum* (L.) Karst.
- 91. *Galeopsis tetrahit* L.
- 92. *Nepeta cataria* L.
- 93. *Polygonum hydropiperoides* Michx.
- 94. *Lychnis alba* Mill.
- 95. *Rumex patientia* L.
- 96. *Lycopus uniflorus* Michx.
- 95. *Rumex*
- 97. *Lycopus uniflorus* Michx.
- 98. *Elymus canadensis* L.
- 99. *Arabis* sp.?
- 100. *Calamagrostis canadensis* (Michx.) Beauv. Ingleside July 25, 1928
- 101. *Medicago lupulina* L.
- 102. *Cheirinia cheiranthoides* (L.) Link.
- 103. *Polygonum tomentosum incanum* (Schmidt) Gurke.
- 104. *Bursa bursa-pastoris* (L.) Britt.
- 105. *Polygonum aviculare* L.
- 106. *Lychnis alba* (?)
- 107. *Lychnis alba* (?)
- 108. *Clinopodium vulgare* L.
- 109. *Agropyron* (*caninum* ?
(*repens* ?
- 110. *Radicula hispida* (Desv.) Britt.
- 111. *Alyssum alyssoides* L.
- 112. *Amaranthus retroflexus* L.
- 113. *Bursa bursa-pastoris* (L.) Britt.

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114. *Brassica arvensis* (L.) Kuntze Ingleside July 25, 1928

115. *Chrysanthemum balsamita tanacetoides* Boiss.

116. *Tithymalus cyparissias* (L.) Hill.

117. *Iva xanthifolia* Nutt.

118. *Anthemis cotula* L.

119. *Polygonum amphibium* land form

120. *Pastinaca sativa* L.

121. *Dactylis glomerata* L.

122. *Sisymbrium altissimum* L.

123. *Lappula lappula* (L.) Karst

124. *Brassica arvensis* (L.) Kuntze

125. *Sisymbrium altissimum* L.

126. *Elymus canadensis* L.

127. *Ambrosia psilostachya* DC. Ingleside, Aug. 1, 1928

128. *Vicia villosa* Roth.

129. *Alsine media* L.

130. *Agropyron repens* (L.) Beauv.

131. *Dactylis glomerata* L.

132. *Avena byzantina*

133. *Sisymbrium officinale leio/carpum* (DC.)

134. *Chenopodium album* L.

135. *Amaranthus retroflexus* L. ^{but} presume _{small}

136. *Helianthus tuberosus* L.

137. *Portulacca oleracea* L.

138. *Rumex altissimus* Wood.

139. *Polygonum aviculare* L.

140. *Anthemis cotula* L.

141. *Chenopodium album* L.

142. *Polygonum* (maybe *persicaria*)

143. *Amaranthus retroflexus* L.

144. *Malva frondifolia*

145. *Geranium robertianum* L. Millyard, Pellston, July 28, 1928

146. *Salsola pestifer* A. Nelson

147. *Iva xanthifolia* Nutt.

148. *Polygonum cilinode* Michx.

149. *Syntherisma sanguinalis* (L.) Dulac.

150. *Cynoglossum officinale* L.

151. *Chenopodium album* var.

152. *Trifolium repens* L.

153. *Erysimum cheiranthoides* L.

154. *Lychnis alba* *Silene noctiflora*

155. *Sisymbrium officinale* (L.) Scop.

156. *Cerastium vulgatum* L. Nutting's Bay, Farmyard Aug. 1, 1928

157. *Erysimum cheiranthoides* L.

158. *Veronica serpyllifolia* L.

159. *Polygonum convolvulus* L.

160. *Chamaesyce serpyllifolia* (Pers.) Small

161. *Arenaria leptoclados* Reichb.

162. *Lappula* (too young)

163. *Agropyron repens* (L.) Beauv.

164. *Agropyron repens* (L.) Beauv.

165. *Ranunculus abortivus* L. Robert's Point, Aug. 1, 1928

166. *Cerastium vulgatum* L.

167. *Elymus canadensis* L.

168. *Ranunculus pennsylvanicus* L.f.

169. *Rumex obtusifolius* L.

170. *Alsine medea* L.

Robert's Point, Aug. 1, 1928
Bentley's Point, Aug. 1, 1928

- 171. Polygonum (no flowers)
- 172. Hystrix hystrix (L.) Millsp.
- 173. Arabis brachycarpa (T.&G.) Britton
- 174. Melica purpurascens (Torr.) Hitchc.
- 175. Elymus canadensis L.
- 176. Arenaria leptocladus Reichb.
- 177. Erigeron canadensis L.
- 178. Chamaesyce serpyllifolia (Pers.) Small
- 179. Polygonum (probably convolvulus)
- 180. Corylus rostrata Ait.
- 181. Polygonum aviculare L.
- 182. Cerastium vulgatum L. & (poor specimen)
 Alsine medsa L.
- 183. Veronica anagallis-aquatica L.
- 184. Erigeron ramosus (Walt.) B.S.P. Road between Kentucky cottage and Bentley's
- 185. Polygonum convolvulus L.
- 186. Rudbeckia laciniata cultivated Kentucky Cottage, Aug. 1, 1928
- 187. Ribes cynosbati L (with nearly smooth fruit)
- 188. Lonicera hirsuta Eaton
- 189. Melica purpurascens (Torr.) Hitchc.)
- 190. Agropyron repens (L.) Beauv. Biological Station, West end July 17, 1928
- 191. Poa palustris L. " "
- 192. Agrostis palustris Huds. " "
- 193. Poa compressa L. " "
- 194. Vaccaria vaccaria (L.) Britton " "
- 195. Agropyron repens (L.) Beauv. " Bird pens
- 196. Elymus canadensis L. " "
- 197. Conringia orientalis (L.) Dumort " "
- 198. Triticum aestivum L. " "
- 199. Poa palustris L. " "
- 200. Cerastium vulgatum L. " "
- 201. Agrostis hyemalis (Walt.) B.S.P. " "
- 202. Erigeron canadensis L. " Baseline road
- 203. Chenopodium album L. " "
- 204. Polygonum convolvulus L. " Bird pen
- 205. Hordeum jubatum L. " "
- 300. (Poac.) Fairy Island, Aug. 5, 1928
- 301. Polygonum tomentosum Schrank.
- 302. Polygonum amphibium L.
- 211. Chenopodium capitatum (L.) Ashe Millyard at Pellston, July 28, 1928
- 212. Iva xanthifolia Nutt.
- 213. Lappula lappula (L.) Karst.
- 214. Siymbrium altissimum L.
- 215. Achillea millefolium L.
- 216. Verbascum thapsus L.
- 217. Cynoglossum officinale L.
- 218. Nepeta cataria L.
- 219. Rumex elongatus Guss.
- 220. Chrysanthemum leucanthemum pinnatifidum Lecog. & Lamotte. "
 Aug 5, 1928
- 221. Hordeum jubatum L.
- 222. Polygonum hydropiperoides Michx.
- 223. Arctium minus L.
- 224. Leonurus cardiaca L.
- 225. Rumex obtusifolius L.
- 226. Lappula (young)
- 227. Solanum nigrum L.
- 228. Malva (borealis
 rotundifolia

Aug 5

- 229. *Physalis heterophylla ambigua* (A. Gray) Rydb. Millyard at Pellston, July 28, 1928
- 230. *Potentilla argentea* L.
- 231. *Potentilla recta* L.
- 232. *Rumex acetosella* L.
- 233. *Trifolium pratense* L.
- 234. *Setaria viridis* (L.) Beauv.
- 235. *Taraxacum vulgare* Weber
- 236. *Ambrosia elatior* L.
- 237. *Erigeron canadense* L.
- 238. *Asclepias syriaca* L.
- 239. *Medicago lupulina* L.
- 240. *Lepidium virginicum* L.
- 241. *Tragopogon pratensis* L.
- 242. *Plantago major* L.
- 243. *Amaranthus graecizans* L.
- 244. *Linaria linaria* (L.) Karst.
- 245. *Avena byzantina*
- 246. *Syntherisma sanguinalis* (L.) Dulac
- 247. *Salsola pestifer* A. Nelson

300.

(Poac.)

Fairy Island Aug. 5, 1928

- 301. *Polygonum tomentosum* Schrank.
- 302. *Polygonum amphibium* L.