

A Summer Study of the Birds of Wilderness Park

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Introduction

Wilderness State Park, located in Emmet County of northwestern Lower Michigan, is an area of 7,800 acres comprising extensive forests, four small ponds, several marshes, and approximately 30 miles of the Lake Michigan shore. Included in the area are Waugoshance Point and outlying Waugoshance Island which separate Cecil and Sturgeon Bays. The Park was purchased by the State of Michigan as a game refuge in 1921 and placed under the administration of the Game Division. Five years later the Park Division took over its administration. Since that time several roads have been built through the area while in its northeastern section public picnic and camp areas have been established. Despite the fact that ^{about} 40,000 people visited the Park in 1949, much of it still remains undeveloped as a natural wilderness and refuge for wildlife. By virtue of the Park's northern location (Lat. 45° 44'), nearness to Lake Michigan, and varied biotic communities still undisturbed, its birdlife warrants careful investigation.

For two weeks in 1948 (August 16-26) and six weeks in 1949 (June 9-July 25) we undertook a study of the birds, paying particular attention to their distribution, breeding status, and relative abundance. We chose for our study area a section of about eight square miles (5,000 acres) extending from Waugoshance Island inland to Big Stone Creek and the marshy area encompassing the Creek. (See Map).

Methods of Study

Over 400 hours were spent in field work. We set up camp in the Park so that no time would be lost in unnecessary travel.

We covered the area on foot. Usually the day's tramping began between 5:00 and 6:30 a.m. and ended about sundown. Sack breakfasts and lunches were usually taken in order to make an early start and to save time.

Each day a definite part of our study area was explored. Points near camp were usually covered in the evening or whenever a few minutes were available. Ordinarily we followed along roads and trails. However, a few exploratory trips were made through untraveled areas in the hope of finding such habitats as cat-tail marshes or meadows, neither of which occur in any size in the Park. We devoted considerable time to investigating areas adjacent to Swamp Trail.

Notes were kept on all species encountered. We were careful to record numbers of individuals observed, where and when they were seen, and their activities.

White cloth markers were hung near nests or places of special interest, such as localities where the rarer birds were seen or where some nesting activity was witnessed, so that the spots could be quickly found and checked when revisited.

An effort was made to find either a nest of each species or some reliable evidence of breeding. We did not entirely succeed in this, though data were obtained for most birds in our study area.

Special effort was made to revisit all parts of our study area at least once, and preferably two or more times in especially productive regions, in order to check nests or continue searching for those still undiscovered.

Data for each nest were filed on a 3"x5" record card. Field notes were recorded periodically in a notebook, one page devoted to a species. Thus all information pertaining to one species was kept in one place and could quickly be checked.

Acknowledgments

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The Study Area

History: Geological--Waugoshance Point was one of the last parts of the Lower Peninsula to be uncovered by ice from the receding glacier and by the waters of Lake Nipissing. It belongs to the Northern Upland Physiographic Province, an area of great accumulation showing extensive moraines, till plains and great sand plains.¹ The surface is Port Huron Interlobate morain; the bedrock Dundee Limestone.² The present topography is due partly to the position of the ice lobes and channels of glacial drainage but mostly to the distribution of drift and the working

of the waters of Lake Algonquin on this material.³

History:Recent--The last commercial lumbering in the Park occurred around 1840 when the town of Cecil (of which no trace now remains) on Cecil Bay was a lumber town of 2,000 people.

The last big burn in the area was around 1890. By 1911, according to Dr. F. C. Gates, much of the area was in small aspens which have since been supplanted by conifers.

About 1933 the Civilian Conservation Corps established camp in the park and constructed the roads, cabins and buildings (except for the residence of the Superintendent), and camp ground facilities. The Big Stone Creek Dam, creating Big Stone Creek Pond was built at that time. In 1940 the University of Michigan Geography Camp was established in the vacated C.C.C. camp.

Climate--The climate of the area is cool, the average temperature in June being 61°F and in July, 65°F. The rainfall averages about two inches in June and three inches in July. There is an average of 30 inches of rain annually.

Drainage--The area is now drained by three small streams-- Big Stone Creek emptying into Big Stone Bay, and Big and Little Sucker Creeks emptying into Sturgeon Bay. The water table is high (although the elevation is 600-700 feet) and much of the area, especially the stream valleys, are swampy or boggy.

There are four small ponds in the park--Big Stone Creek Pond ("Geography Pond"), two ponds on the southern boundary, and a small pond formed by a beaver dam on Little Sucker Creek.

Biotic Communities

Classification of biotic communities in an area with so much variation is difficult but an attempt is made below to give the types which occur in greatest abundance and which seem to have distinctive characteristics.

Coniferous Communities--By far the most abundant of tree growths in the Park are the conifers. Four general types of coniferous communities are recognizable.

1. Sandy Upland Pine Woods. This has mainly red pines (*Pinus resinosa*) and white pines (*P. strobus*) with smaller spruce (*Picea sp.*) and an occasional white birch (*Betula Papyrifera*) with an understory of blueberry (*Vaccinium canadense*) and bracken (*Pteris aquilina*). It is chiefly found along the southern two-thirds of the shore of Sturgeon Bay and spottily along the park's northernmost edge of trees. Pine Warblers are abundant in such areas. Nashville and Myrtle Warblers, Hermit Thrushes, and Whip-poor-wills are common.
2. Cedar Woods. Dense stands of white cedar (*Thuja occidentalis*), none of which cover vast areas, form a very important element of cover. Such growths are scattered throughout northwestern two-thirds of the park, and with them are associated Golden-crowned Kinglets, Veerys, Blue-headed Vireos, Black-throated Green Warblers, and Winter Wrens.
3. Tamarack-Black Spruce Bogs. Open stands of *Larix laricina* and *Picea mariana* in which Magnolia Warblers, Canada,

and Nashville Warblers were commonly seen, are found in the south central part of the park in the valleys of Big and Little Sucker Creeks.

4. Coniferous Shrub Areas. These are cut-over places which now have a bushy (3-14') growth of balsam (Abies balsamea), spruce (Picea sp.) and raspberries (Rubus sp.), with a few large poplars (Populus sp.) or white birches. Such places are especially attractive to warblers such as the Canada, Magnolia, and Mourning, and to White-throated Sparrows and Olive-sided Flycatchers. These areas are not large, but many small ones occur along Swamp Trail near the Sucker Creeks and on the east side of the trail.

Mixed Coniferous-Deciduous Communities. These are found on the well-drained ridges inland and contain many of the elements of the upland pine woods though there is a higher percentage of deciduous trees, aspens, birches, and red maples (Acer rubrum) with scattered ashes (Fraxinus sp.) and rarely oaks (Quercus rubra). In some areas deciduous trees predominate and in others, coniferous. The ground cover is bracken, blueberry, striped maple (Acer pennsylvanicum), and bunch berry (Cornus canadensis). There is an extensive growth in the Park along the road paralleling the north shore. Here are found Olive-backed Thrushes, Myrtle, Blackburnian, and Black-throated Blue Warblers, Wood Pewees, and other more versatile species such as Oven-birds, Redstarts, Flickers, and Black-capped Chickadees.

Deciduous Communities. Though the deciduous communities are giving way to the coniferous, three types of deciduous growth remain.

1. Aspen woods. Populus sp. is widely scattered in the Park. One area in the center three miles long and a half mile wide is almost entirely aspen. The under-growth is bracken. Red-eyed Vireos, Ovenbirds, and Least Flycatchers are the chief residents.
2. Deciduous Shrub Areas. These consist of small aspens and red osier (Cornus stolonifera) found near the edges of clearings. Indigo Buntings, Red-eyed Towhees, Cat-birds, Chestnut-sided Warblers, and Northern Yellowthroats were seen in these places.
3. Alder (Alnus sp.) areas. Alders grew in very damp places in the center of the Park and along the creeks. Alder Flycatchers, Goldfinches, and Northern Yellowthroats were usually seen.

Marsh Communities. A large part of the Point is bulrush (Scirpus acutus and Scirpus americana) marsh. There is a large marsh of Scirpus americana below Big Stone Creek Pond and others on Big Sucker Creek, all formed by beaver dams. Many stubs of trees killed by the inundation remain standing in these areas providing hollows for cavity-nesting birds, namely, Flickers, Bluebirds, House Wrens, and Tree Swallows. Sora and Virginia Rails, American Bitterns, and Short-billed Marsh Wrens were found in the areas where Scirpus americana was growing.

Sand Flats Communities. The Point has a large barren sandy area sparsely covered with shrubby cinquefoil (Potentilla fruticosa) and painted cup (Castilleja sp.) which is the only place in the Park where Vesper Sparrows were found.

Mammals

Mammals observed during the survey included: White-tailed Deer, Odocoileus virginianus; Porcupine, Erethizon dorsatum; Coon, Procyon lotor; Badger, Taxidea taxus; Snowshoe Hare, Lepus americanus; Woodchuck, Marmota monax; Red Squirrel, Tamiasciurus hudsonicus; Striped Ground Squirrel, Citellus tridecemlineatus; Chipmunk, Tamias striatus; Meadow Vole, Microtus pennsylvanicus; White-footed Mouse, Peromyscus sp.; Meadow Jumping Mouse, Zapus hudsonius; and Short-tailed Shrew, Blarina brevicauda.

Predation

During the summer some observations regarding predation were made. Several nests under observation were broken up, though only rarely was the act witnessed.

The Park has a high population of Red Squirrels and we believe this species to be responsible in many cases of nest predation, especially in the case of birds such as the thrushes which build conspicuous nests. Often eggs were known to be removed singly over a period of days until the entire clutch was taken.

One redwing nest with eggs appeared to have been trampled by deer.

Garter snakes (Thamnophis sp.) were numerous and were seen even in the woods. These snakes were seen eating the young in the nest of a White-throated Sparrow and in the nest of a Magnolia Warbler.

Annotated List of Species

In the list that follows, the dates refer to the year 1949, unless otherwise stated; and unless credit is otherwise given the nests mentioned were found by the investigators.

Gavia immer. Loon. Only a single pair seen during the summer, on June 12. Single birds on June 9, 10, 20, and July 23. All in the Straits off Station Point.

Colymbus grisegena. Holboell's Grebe. We found an extremely decayed body of this species on the north shore on July 29.

Ardea herodias. Great Blue Heron. Single birds were seen throughout the summer. We found no rookery, but there is a sufficient population to indicate its possible presence in the Park. On July 22, 24, 25, 26, young birds were seen about the beach pools along the north shore.

Nycticorax nycticorax. Black-crowned Night Heron. On July 23, Tordoff collected one of two birds of the year seen in the edge of Scirpus marsh along Big Stone Creek, south of Big Stone Creek pond.

Botaurus lentiginosus. American Bittern. Though apparently suitable marshes for this species were extensive, very few individuals were seen. A nest with two eggs on June 15, and one with three eggs on June 16, in dense Scirpus growths on the Point.

Branta canadensis. Canada Goose. A single pair have been known to nest in the park since 1936, on Big Stone Creek Pond. This year the young were half grown, when found on June 19, and gained adult-like plumage by July 17.

Anas platyrhynchos. A pair on the pond of Little Sucker Creek and three (2 males, 1 female) were seen June 13, on Sturgeon Bay.

Anas rubripes. Black Duck. Single individuals were seen occasionally on three of the parks' four ponds. Two adults, and three partly feathered young unable to fly were seen on Big Stone Creek Pond, June 24.

Anas discors. Blue-winged Teal. A single male was seen on Big Stone Creek Pond, June 24.

Aix sponsa. Wood Duck. Two individuals, probably females seen on Big Stone Creek Pond, Aug. 2, by Dr. O. S. Pettingill, Jr. and the Elementary Ornithology Class.

Aythya affinis. Lesser Scaup. One seen off sandspits Aug. 2, by Dr. O. S. Pettingill, Jr. and the Elementary Ornithology Class.

Loophodytes cuculatus. Hooded Merganser. On August 17, and 23, 1948, we saw a female with seven downy young on the sandspits along the north shore.

Mergus merganser. American Merganser. Several times during June we saw a group of about twenty males on the sandspits at the tip of the Point. A brood of seven downy young, and another of nine, appeared on the north shore gravel spits, June ~~15~~¹⁵ and ~~17~~¹⁶. Females were seen flying into the woods daily during June, singly, or occasionally in twos.

Accipiter striatus. Sharp-shinned Hawk. Rare except in late summer when birds were seen regularly over much of the Park's woods. One seen on July 5 in large coniferous woods on east side of Swamp Trail.

Buteo platypterus. Broad-winged Hawk. Uncommon, except in late summer (after July) when birds appear, hunting over the woods and marshes, often in pairs. We saw an immature bird being harassed by Robins, Bluejays and Flickers in large conifers. An adult seen June 27, also in coniferous woods.

Haliaeetus leucocephalus. Bald Eagle. Though we found no nest, two pair of adults and two immatures were seen regularly during the summer. On June 10, as we waded across a large sedge marsh bounded by dense conifers, an adult soared above us emitting a loud "klack" repeatedly. South of Big Stone Creek Pond, a nest was known to be in use several consecutive years until the nest tree fell several years ago.

Circus cyaneus. Marsh Hawk. Uncommon except in late summer. In spite of much suitable habitat, the species was not encountered until July 12. After this from one to three individuals were seen regularly in open marsh and woods edge.

Pandion haliaetus. Osprey. A single bird was seen flying over deep water marsh surrounded by dense conifers, south of Big Stone Creek Pond, on June 10.

Bonasa umbellus. Ruffed Grouse. Seen regularly, usually in mixed or coniferous woods; many with chicks after the middle of June.

Rallus elegans. King Rail. An adult with three young was seen in the marsh south of Big Stone Creek Pond by Miss Elsie Townsend, and Miss Virginia Linck, on June 19.

Rallus limicola. Virginia Rail. This is the common rail of the park. We saw it nearly every time we entered the Point marshes. Tordoff collected a male in breeding condition on June 20. A nest with seven eggs found. The eggs hatched on July 23.

Porzana carolina. Sora Rail. Single birds seen twice June 15 and 17 in the Scirpus marshes on Point.

Charadrius melodus. Piping Plover. At least a dozen pairs nesting on the north shore sandspits. One nest of four eggs hatched June 9.

Charadrius vociferus. Killdeer. Abundant on barren flat area of the Point, and on Waugoschance Island. Many young birds seen after July 13.

Philohela minor. Woodcock. Usually one or two flushed from Alnus swales early in summer.

Capella gallinago. Wilson's Snipe. Usually found in flat marshy areas on the Point. We observed the courtship flight often between June 15 and July 13.

Actitis macularia. Spotted Sandpiper. Common on the Point, and along all shores. A nest with four eggs on June 12. Three newly hatched young were found on the Point, July 16.

Totanus flavipes. Lesser Yellow-legs. On July 29, a single bird, undoubtedly a transient was seen along a beach pool on Point.

Erolia fuscicollis. White-rumped Sandpiper. On July 14, Tordoff and R. Graber identified a single transient on a gravel spit along the north shore of the Point.

Erolia bairdii. Baird's Sandpiper. Two seen with two Least Sandpipers and one Red-backed Sandpiper on the north shore of the Point, July 27.

Erolia minutilla. Least Sandpiper. Small groups of from 2 to 7 individuals appeared on the Point shores in the last two weeks of July. The first group was seen on July 14.

Erolia alpina. Red-backed Sandpiper. One seen with a small group of Least and Baird's Sandpipers on the north shore of the Point, July 27.

Ereunetes pusillus. Semi-palmated Sandpiper. A group of five birds were seen on the shore at intervals throughout the summer. R. Graber collected a male on June 16.

Crocethia alba. Sanderling. A group of 14 and one single were seen on July 29. Dr. George M. Sutton collected five (3 males and 2 females) of the group.

Larus argentatus. Herring Gull. Seen throughout the summer singly, and in groups of 15 to 20, along the shore and sandspits.

Larus delawarensis. Ring-billed Gull. Even more common than the above species. We first saw immature birds of the year on July 18, along the north shore.

Sterna hirundo. Common Tern. Common along the shore, especially about the ^{gravel} sandspits. On June 12, we found two nests with broken eggs on the north shore spit. Eight active nests were found here between June 17 and 20. Hatching began July 12. The birds also bred on the spits at the tip of the Point. On one of these we found a late nest with three eggs on August 17, 1948. The eggs were destroyed, probably by gulls, the following day.

Hydroprogne caspia. Caspian Tern. Seen singly and in pairs along the north shore, the gravel spits, and the tip of the Point.

Chlidonias niger. Black Tern. On July 18, we saw a bird hunting along the Sturgeon Bay shore. Three times it carried food inland, flying across the park boundary perhaps to O'Neal Lakes or other inland lakes or marshes.

Zenaidura macroura. Mourning Dove. Uncommon, though a few were seen regularly in cutover and other open areas. A nest with a broken egg and a family group of three birds were found July 5.

Coccyzus americanus. Yellow-billed Cuckoo. Single birds seen only three times, each time in open shrubby areas.

Coccyzus erythrophthalmus. Black-billed Cuckoo. We encountered this species only three times (June 19, July 10 and 13) in coniferous woods edge. ?

Otus asio. Screech Owl. Heard on July 1. Seen and heard in the early morning of July 7 in a large, rather open pine woods.

Bubo virginianus. Great Horned Owl. This is the commonest of the owls in the Park. Only one special effort was made to locate members of this group. On June 27, a short night trip was made and three of this species were heard in the upland conifers along the southern boundary of the park.

Asio otus. Long-eared Owl. We found the wings and pectoral girdle of an individual of this species on June 12, on the beach near the end of the Point.

Aegolius acadica. Saw-whet Owl. On July 23, an immature male in juvenal plumage was collected in a dense Thuja thicket. No obvious molt was in process. The bird was quite tame, but could fly well. The record is good evidence of the breeding of the species in the park.

Caprimulgus vociferus. Whip-poor-will. Common. Encountered usually on sandy ridges which supported open stands of red pine, birch, and maple. No nest was found, though on July 20 two were flushed in the above-mentioned habitat, one of which injury-feigned slightly and remained close by as we searched for a nest.

Chordeiles minor. Nighthawk. Common. On the day of our arrival, June 9, we heard Nighthawks zooming over the drier, open areas on the Point. On June 23, Mr. Walter Nickell found a nest with two eggs in a very rocky area in the above mentioned habitat. As late as July 20, birds were still zooming and a nest with a newly laid egg was found in open, mixed pine-maple woods.

Chaetura pelagica. Chimney Swift. Commonly seen flying in different areas of the park. No nests of the species were found. Nearly all park buildings have guarded chimneys and so it must nest in hollow trees in some areas.

Archilochus colubris. Ruby-throated Hummingbird. Fairly common, becoming more so in late summer when young birds were found feeding about sapsucker wells and flowers such as the Lobelias in both coniferous and deciduous woods.

Megaceryle alcyon. Belted Kingfisher. At the ponds and occasionally at the Sucker Creek bridges, a Kingfisher was seen frequently during the summer. There are no good banks available in most of these places, so nests are probably located in tree cavities.

Colaptes auratus. Flicker. This species was encountered in nearly every type of habitat, commonly along roadsides. Several nests were found. The first on June 10 contained eggs. The

birds became especially abundant about July 1 when many young had left the nest.

Hylatomus pileatus. Pileated Woodpecker. Encountered a dozen times during the summer, and the evidence of its presence was seen often in coniferous and deciduous woods.

Sphyrapicus varius. Yellow-bellied Sapsucker. Encountered frequently along roadsides in poplars, birches and cedar woods often in swampy shrub grown areas with many broken stubs. Three nests were found, all in live poplars 15 to 20 feet up. The first, found on June 14, had eggs.

Dendrocopus villosus. Hairy Woodpecker. Seen regularly during the summer, most commonly in mixed woods in which a high proportion of the trees were conifers. On June 10, a male was seen carrying food and entering a hole in a large birch. Family groups encountered commonly in the first two weeks of July.

Dendrocopus pubescens. Downy Woodpecker. This species encountered no more often than that above, but seemed to have a greater habitat range, being seen occasionally in open shrubby areas. Young birds and family groups encountered after the first of July.

Tyrannus tyrannus. Eastern Kingbird. Abundant on the Point. Six nests. One nest on Waugoschance Island. All nests were in Thuja from three to twelve feet above ground with an average height of about five feet.

Myiarchus crinitus. Crested Flycatcher. Common in edge of woods and in slash and burnt over areas. One nest near pond on Little Sucker Creek.

Sayornis phoebe. Eastern Phoebe. One pair in Camp Grounds. A nest with two eggs, June 21, on buildings there.

Empidonax traillii. Alder Flycatcher. Moderately common in marshy areas with standing dead timber such as is to be found along the streams in the Park.

Empidonax minimus. Least Flycatcher. Moderately common in hardwood areas. Two nests were found, one of which was being built June 21.

Contopus virens. Wood Pewee. Seen in hardwood areas especially in Fraxinus around small marshy areas. One nest in Camp Grounds had eggs which hatched around July 10.

Nuttalornis borealis. Olive-sided Flycatcher. Seen in six different places in the park; usually in slash areas where Thuja and small spruces furnished cover. One clutch of four eggs hatched June 30.

Iridoprocne bicolor. Tree Swallow. Nesting in cavities in dead trees near the Big Stone Creek and Little Sucker Creek Ponds. One nest of five eggs hatched about June 24.

Hirundo rustica. Barn Swallow. Two or three seen near LaWay's barn, and some seen flying over the marshes of the Point.

Progne subis. Purple Martin. Seen at martin houses at LaWay's settlement.

Cyanocitta cristata. Blue Jay. Moderately common in areas in which deciduous trees predominate. Seen feeding young out of nest June 22.

Corvus brachyrhynchos. Crow. Usually seen near shore on Point and on Waugoshance Island. Bird seen feeding full-grown young out of nest July 14.

Parus atricapillus. Black-capped Chickadee. Common. One nest found with young July 10. At about that time the first small groups were seen wandering about the woods.

Sitta carolinensis. White-breasted Nuthatch. One pair found nesting in a red oak in Camp Grounds. They were carrying food into nests July 11.

Sitta canadensis. Red-breasted Nuthatch. Scattered pairs in coniferous woods. Young left nest June 24.

Certhia familiaris. Brown Creeper. Seen seven times during summer, always in coniferous woods or coniferous woods mixed with poplars and birches. A nest found June 29 in a large poplar had nearly fully fledged young.

Troglodytes aedon. House Wren. Found commonly in burned or cut over areas where dead timber provides nesting sites. Several nests were found in such places. One pair observed building on June 14. They were also seen in the larger cedar woods on the Point and Island.

Troglodytes troglodytes. Winter Wren. Heard frequently in all areas that were well wooded with conifers. Favorite habitat seemed to be Thuja, or young spruce-balsam woods.

Cistothorus platensis. Short-billed Marsh Wren. Common in the inland Scirpus marshes, less so in the Point marshes. A nest found June 24, with three fully fledged young.

Dumetella carolinensis. Catbird. We saw only two during the summer. One in small open roadside conifers; and on July 6, adults were seen feeding two large juveniles in growth of Alnus.

Toxostoma rufum, Brown Thrasher. Seen regularly in open shrubby areas, and edges of both deciduous and coniferous woods. Very common in the small groves of Thuja, which are scattered among the Point marshes. A nest on July 4 with three eggs. At this time family groups with large young were already moving about.

Turdus migratorius. Robin. Truly an abundant summer resident in nearly every habitat except the marshes and shore. At our arrival on June 10, we encountered well grown juveniles several days out of the nest.

Hylocichla mustelina. Wood Thrush. An adult and juvenile just out of the nest in upland mixed woods were encountered on July 6. The birds were within a few feet of the nest, located 15 feet up in a white pine. This was our only observation of the species.

Hylocichla guttata. Hermit Thrush. We saw birds frequently in the sandy upland woods, and occasionally even in low shrubby areas.

Hylocichla ustulata. Olive-backed Thrush. This was perhaps the commonest thrush in the Park, being heard more often than both Hermit Thrush and Veery, though it seems to be more strictly confined to the coniferous woods. A newly completed nest was found on June 20 by Toróoff and another on June 26 by Nickell. Both nests were deserted after full clutches were removed from the nests. This predation, though it was not witnessed, was possibly by Red Squirrels.

Hylocichla fuscescens. Veery. Common in both coniferous and deciduous woods and woods edges, its favorite haunt being dense, damp Thuja thickets.

Sialia sialis. Bluebird. Encountered in nearly every sizable open area such as the edges of marshes and ponds, and shrubby areas. Nesting sites were plentiful. Four active nests were found. One three feet from the ground with three eggs on June 10.

Regulus satrapa. Golden-crowned Kinglet. Moderately common. Adults seen feeding short-tailed young June 19.

Bombycilla cedrorum. Cedar Waxwing. Abundant. Nine nests found, the first just completed June 10.

Sturnus vulgaris. Starling. Only one ever seen during the study, near cabin on Sturgeon Bay.

Vireo solitarius. Blue-headed Vireo. Three pairs observed. A nest was found on Swamp Trail in 1947 by Dr. O. S. Pettingill, Jr.

Vireo olivaceus. Red-eyed Vireo. Abundant in deciduous areas (aspens). Found nest in Thuja with three downy young July 7.

Vireo gilvus. Warbling Vireo. Heard only once on Swamp Trail about a quarter of a mile from the camp grounds.

Mniotilta varia. Black and White Warbler. Encountered daily in both coniferous and deciduous woods, especially common in stands of cedar, even those about the Point marshes. Family groups with full grown juveniles became numerous in the last week of July.

Vermivora ruficapilla. Nashville Warbler. Rather spottily distributed, being common in dry sandy rather open coniferous woods, especially where the big red pines. Birds were also seen uncommonly in the tamarack-spruce bogs and coniferous woods edges.

After the first week in July, family groups were seen occasionally. On the 5th of July a male was seen feeding two very stub-tailed birds which could fly quite well.

Parula americana. Parula Warbler. Rather uncommon but conspicuous, usually found in rather open situations in pine-spruce woods near the north shore. Four active nests. One found June 28 with half grown young; three others found July 11-12 were being built and later had eggs.

Dendroica petechia. Yellow Warbler. Encountered commonly in its rather restricted habitat. Nearly all the Park's population is to be found among the Thuja growths about the Point and Island marshes. In such places the birds abound. Four nests were found ^{June} July 15, two being built and two with incomplete clutches. All nests in Thuja, four feet or less from the ground. A nest found July 4 had two eggs; another was being built July 14, both in typical habitat.

Dendroica magnolia. Magnolia Warbler. Rather uncommon, showing definite habitat preference. Birds were seen regularly in young stands of balsam and spruce (7' to 10' high) along the woods edges or roadsides. A nest in a small balsam found June 23 had four half-grown young, one of which was killed by a garter snake which climbed to the nest June 26.

Dendroica caerulescens. Black-throated Blue Warbler. Seen only a dozen times during the summer in dry or slightly moist coniferous or coniferous mixed woods. A good understory of bracken or striped maple seemed to be important in its habitat. On June 26 we found a pair feeding three young just out of the nest. Very stub-tailed young were seen on three later dates, the last July 13.

Dendroica coronata. Myrtle Warbler. Seen commonly in a variety of habitats, most often in dry woods, in the Thuja clumps on the Point and in slash areas. A nest with three nearly fully feathered young was found June 28.

Dendroica virens. Black-throated Green Warbler. One of the commonest warblers in the Park. Its song was heard as often as that of the Redstart and Oven-bird, though its habitat was more restricted. It seemed to be confined to coniferous or mixed (mainly coniferous) woods of large size, commonly along the woods edge. On June 19 we collected one of three juveniles just out of the nest. A nest with four downy young was found in a large Thuja on July 7.

Dendroica fusca. Blackburnian Warbler. Common though less so than the above. It was found regularly in coniferous or mixed woods of any size. A juvenile female just out of the nest was collected on June 28.

Dendroica pennsylvanica. Chestnut-sided Warbler. For the abundance of suitable habitat covered, this species was seen very irregularly. Along Swamp Trail there was much semi-marshy area with clusters of Alnus and other water-loving shrubs. In such places a few were seen, but nowhere were there many.

Dendroica pinus. Pine Warbler. Commonly seen in its restricted habitat of open large red pine woods along the sandy ridges not far inland from the shore of Sturgeon Bay. On July 18 a male was seen feeding a very stub-tailed bird.

Seiurus aurocapillus. Oven-bird. Common in nearly all dry woodlands, especially along roadsides. On June 24, adults were seen feeding four rather large juveniles out of the nest. A nest of

four eggs was found in the camp grounds July 8.

Oporornis philadelphia. Mourning Warbler. No more than ten singing males were encountered during the summer. All were found in similiar situations, i.e., dense growths of coniferous shrub. Whiting found a nest with ^{two} fully feathered young on July 3, on the ground in this type of cover.

Geothlypis trichas. Northern Yellowthroat. In its habitat, a very abundant warbler in the Park. In every open, slightly moist or wet shrubby area, the birds were conspicuous. On June 16, a nest with four eggs was found in the base of a three foot Thuja at the edge of a large Scirous marsh near the tip of the Point.

Wilsonia canadensis. Canada Warbler. Fairly common in the edges or open places in the coniferous woods. Open slash area with small conifers, moist or even boggy, were found to have one or more pairs of Canada Warblers. No nest was found, though birds were often seen carrying food after July 1.

Setophaga ruticilla. Redstart. The Park's commonest warbler, found in nearly every biotic community, except marsh and shore. Of eight active nests found, two were only three feet above the ground. All were under six feet. Juveniles out of the nest were first seen on June 29.

Agelaius phoenicius. Redwing. Common in marshes on the Point. A nest with four young almost ready to leave was discovered June 17.

Icterus galbula. Baltimore Oriole. Three pairs seen. Whiting reported seeing a juvenile, July 8, near the cabin on Sturgeon Bay. An old nest was found in a tall poplar a quarter of a mile from the camp grounds on Swamp Trail.

Quiscalus quiscula. Bronzed Grackle. A few seen near the ponds. Adults feeding stub-tailed young out of the nest around the first of July.

Molothrus ater. Cowbird. Seen three times in the Camp grounds of the Park. In examining the nests of 20 species likely to be parasitized, not one Cowbird egg or young was found, nor was any bird seen feeding a young Cowbird.

Piranga olivacea. Scarlet Tanager. Saw two pair, one of which was carrying food. We did not see the young or find a nest. These birds were found in the mixed deciduous and coniferous woods along the road half way between LaWay's Settlement and the parking lot on the Point.

Passerina cyanea. Indigo Bunting. One male was singing twice near LaWay's Settlement in the brushy edge of mixed woods.

Carpodacus purpureus. Purple Finch. Moderately common. Saw an adult feeding a large juvenile out of the nest June 23.

Spinus tristis. Goldfinch. Common. Found a nest with two eggs July 20, in an Alnus at the edge of a Scirpus marsh.

Pipilo erythrophthalmus. Towhee. Common on the southern boundary of the park. Watched adults feeding young out of the nest July 1.

Pooecetes gramineus. Vesper Sparrow. A few seen on the sparsely covered sand flats of the Point. Observed two juveniles just learning to fly July 4.

Spizella passerina. Chipping Sparrow. Found in small conifers at edges of clearings. Nest with three young birds which were still downy but with quills showing through, June 10.

Spizella pusilla. Field Sparrow. A long-tailed juvenile collected July 20 in a open area on the high sandy ridges in the southern part of the Park. Another seen July 15 at the tip of the Point.

Zonotrichia albicolis. White-throated Sparrow. Abundant on Swamp Trail. One nest with two eggs found June 24 . Three of the eggs had hatched by July 7, on which day Whiting saw a garter snake invade the nest. By July 10, the nest was empty.

Melospiza georgiana. Swamp Sparrow. Found in the inland marshes. Four nearly fully feathered young were in a nest found in the marsh south of Big Stone Creek Pond, June 10.

Melospiza melodia. Song Sparrow. Noted everywhere in the Park except in deep forest. Much of the Park area was brushy and near water, thus providing good habitat for these birds. Five nests were found (the earliest June 10 had four eggs) and many birds were seen feeding young out of the nest.

Foot Notes

1

Scott, I. D.

Inland Lakes of Michigan, 1921:12, 13, 15, 18-20.

2

Leverett, Frank and Taylor, Frank B.

Pleistocene of Indiana and Michigan and History of the
Great Lakes, U. S. Geo. Survey Monograph 53, 1915.

Maps II, VII, XXXII.

3

Scott, I. D.

Inland Lakes of Michigan, 1921:20



Female.



Male.

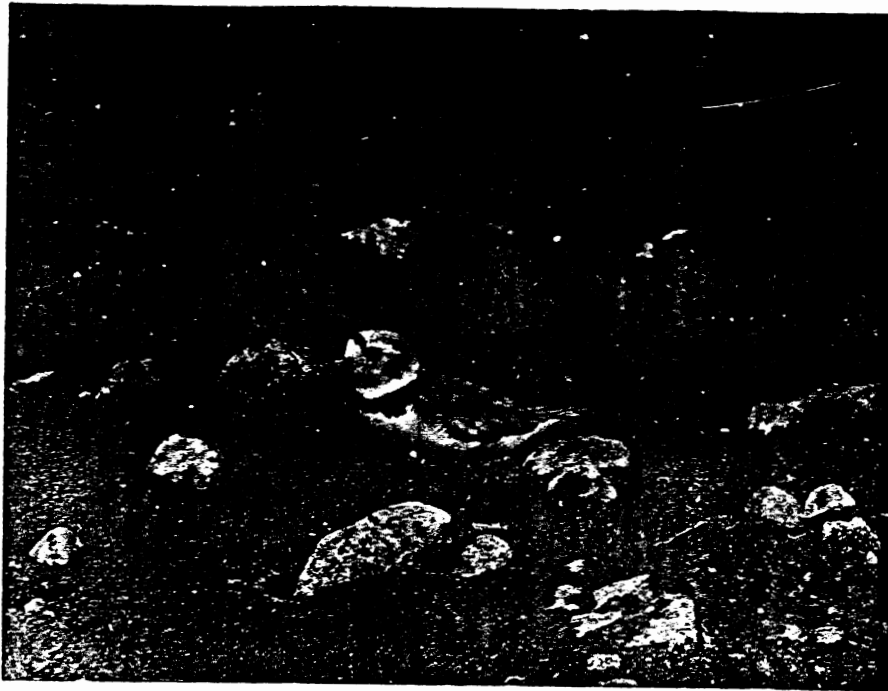
Magnolia Warblers with Young.



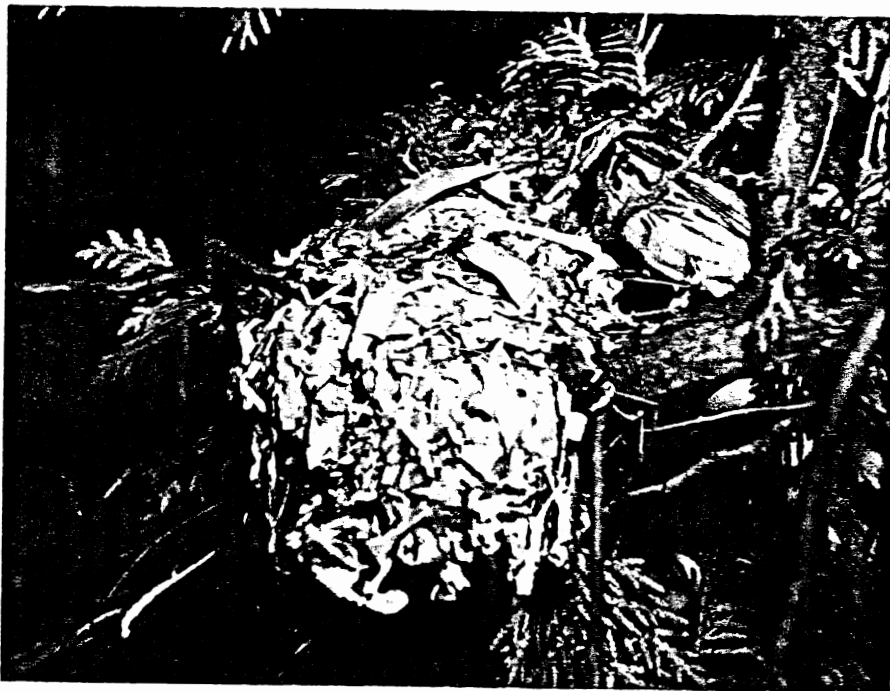
Black-throated Blue Warbler
with young.



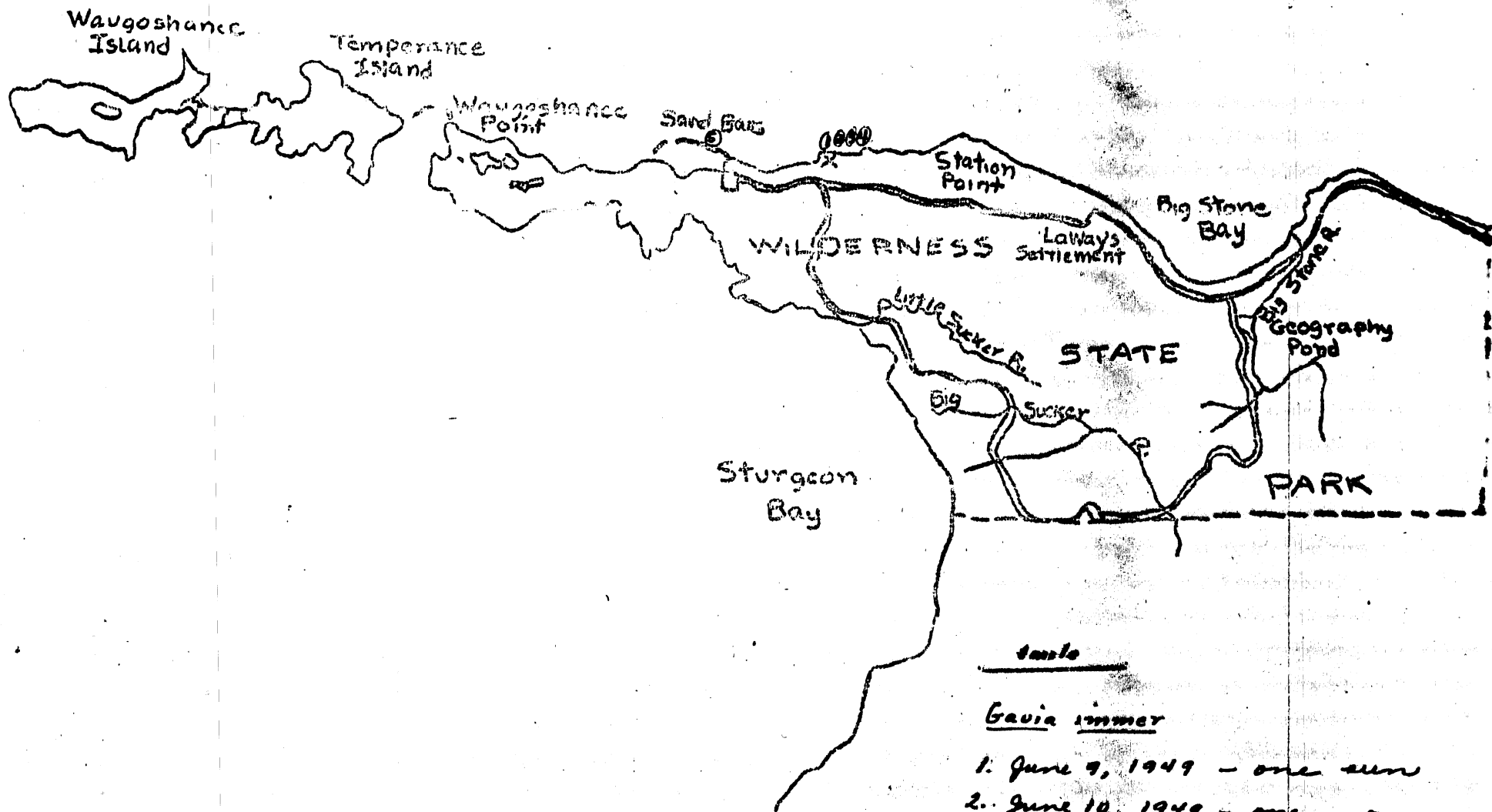
Young Myrtle Warblers.



Piping Plover



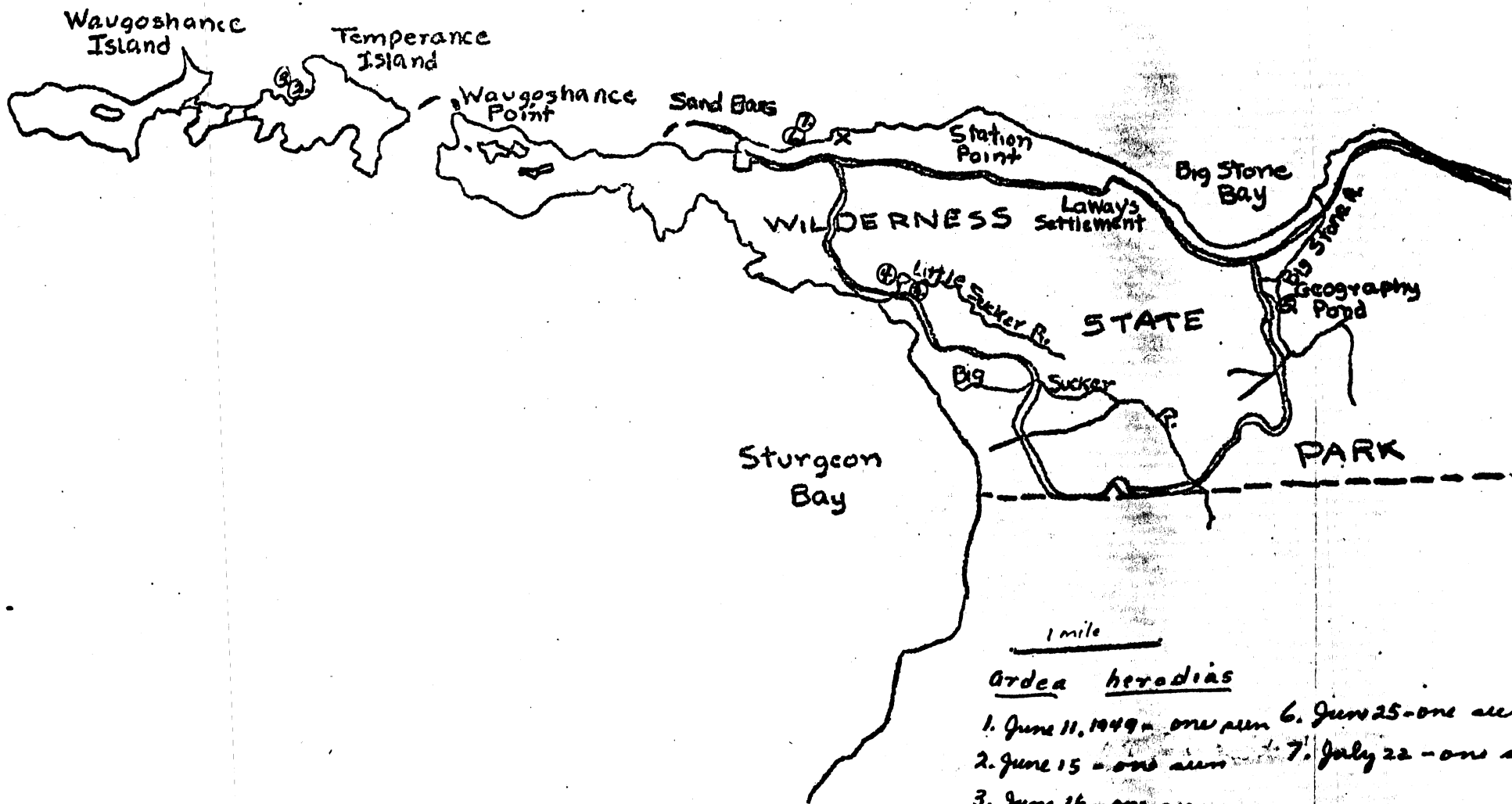
Nest of Black-throated Green
Warbler.

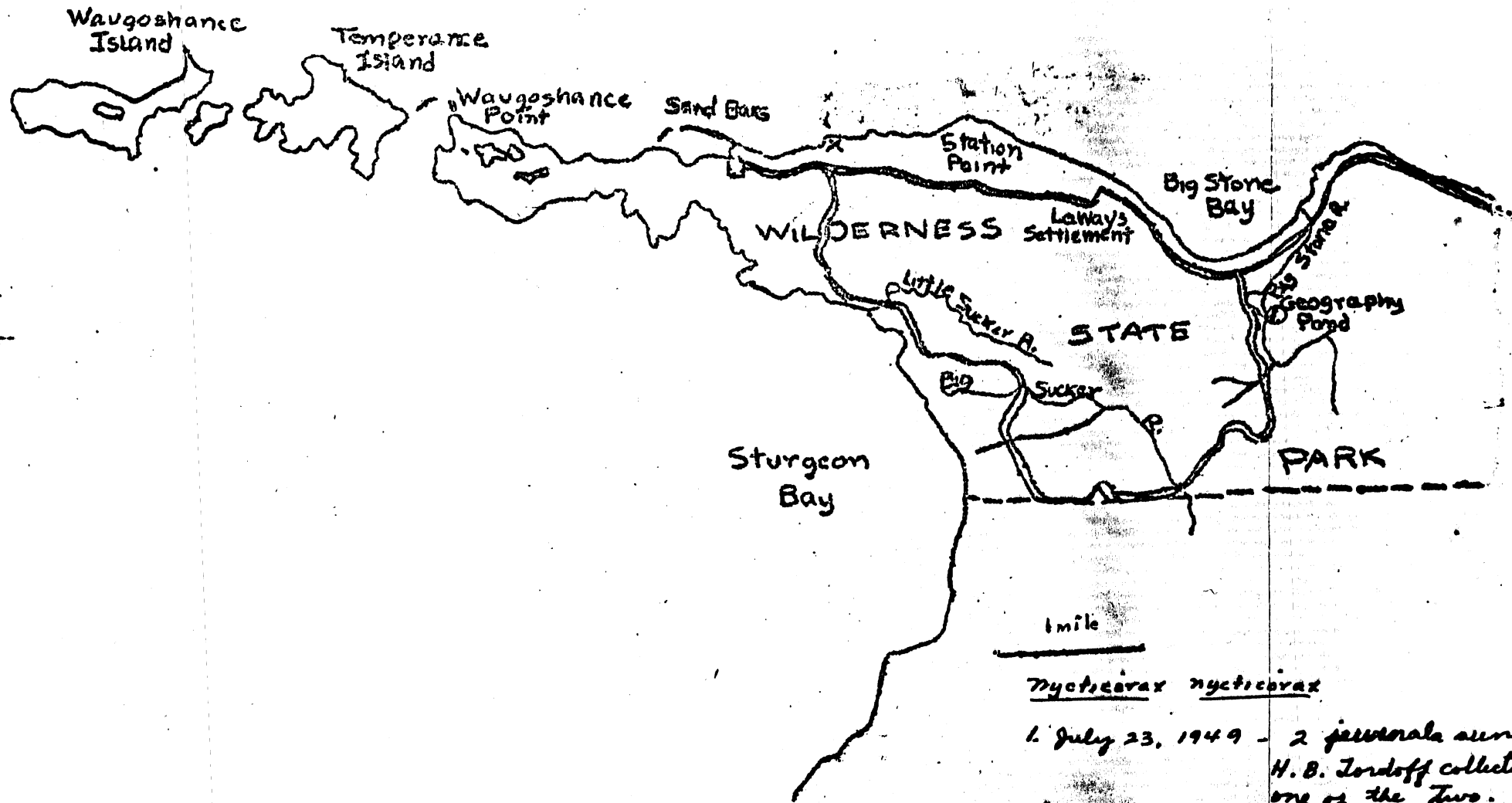


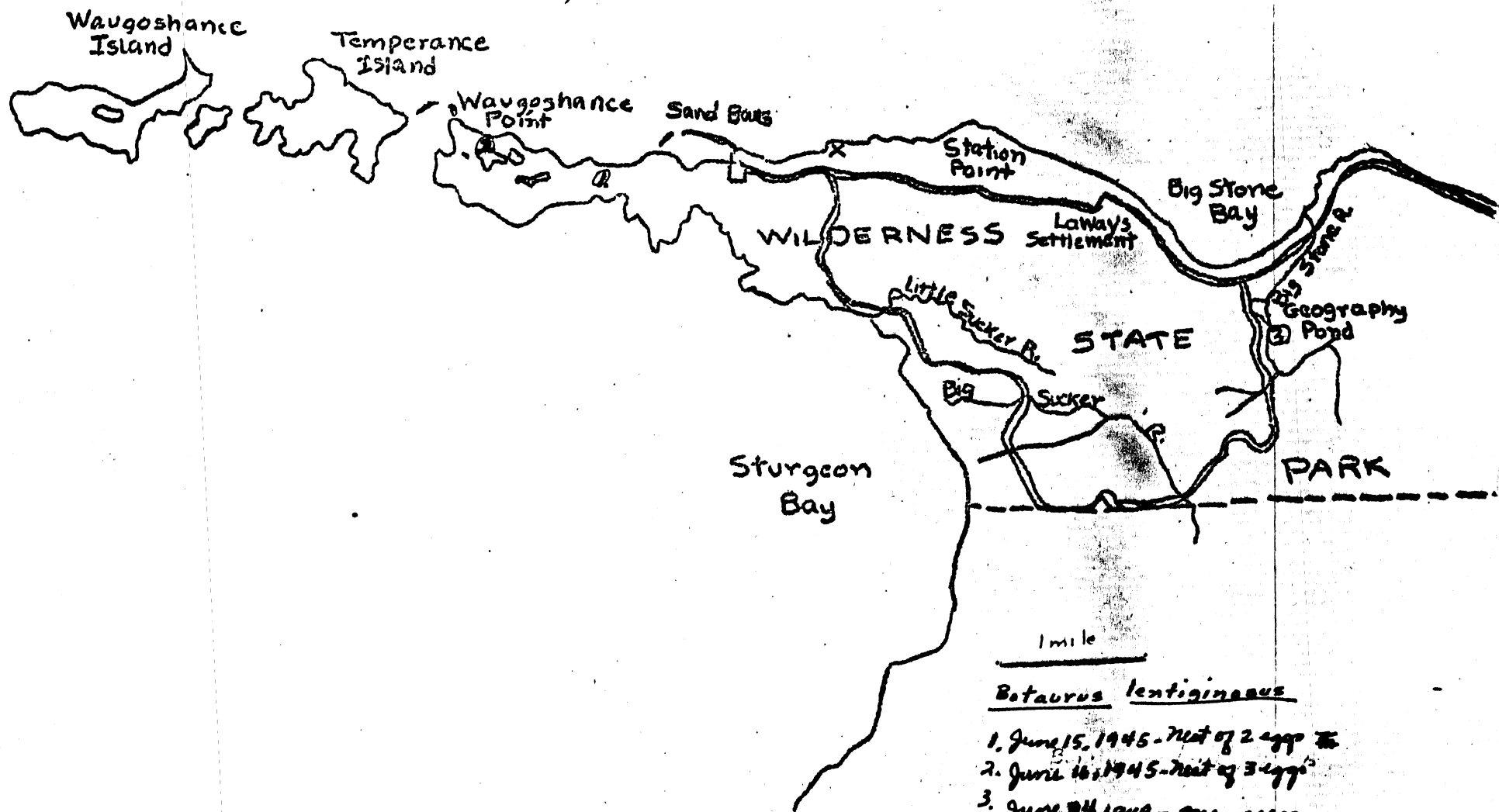
sands

Gavia immer

1. June 9, 1949 - one seen
2. June 10, 1949 - one "
3. June 12, 1949 - 2 "
4. June 20, 1949 - one "
5. June 27, 1949

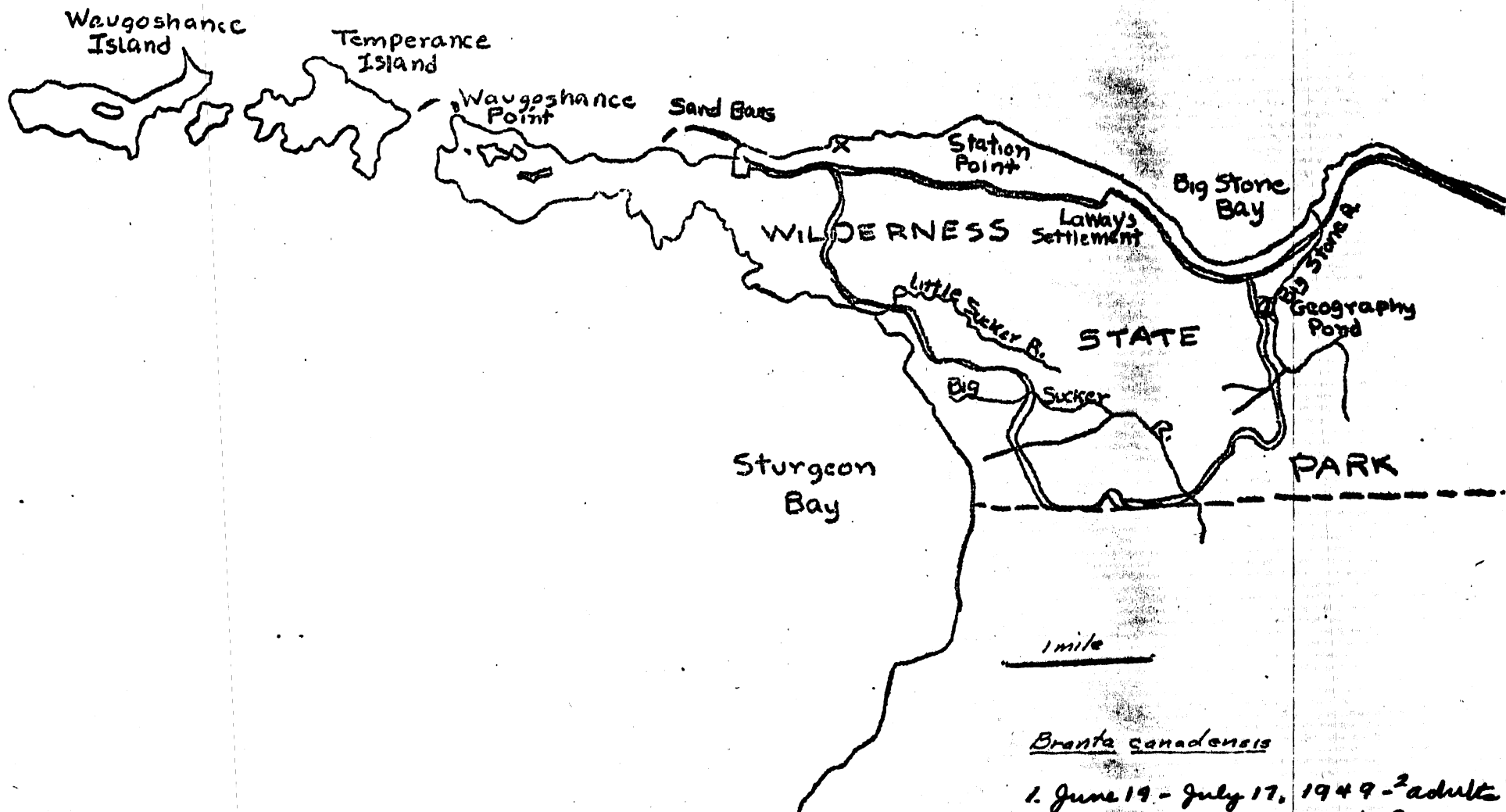






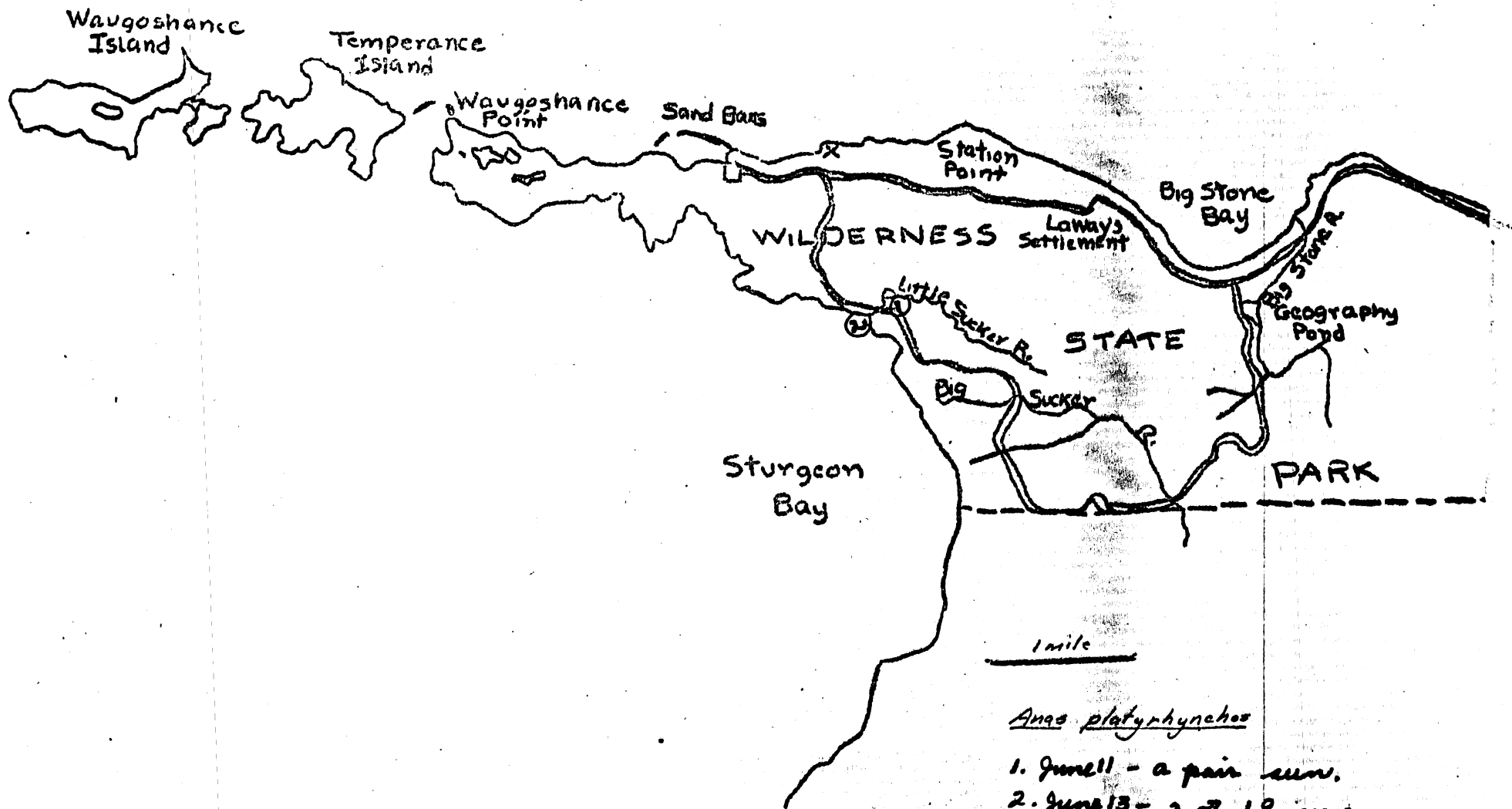
Botaurus lentiginosus

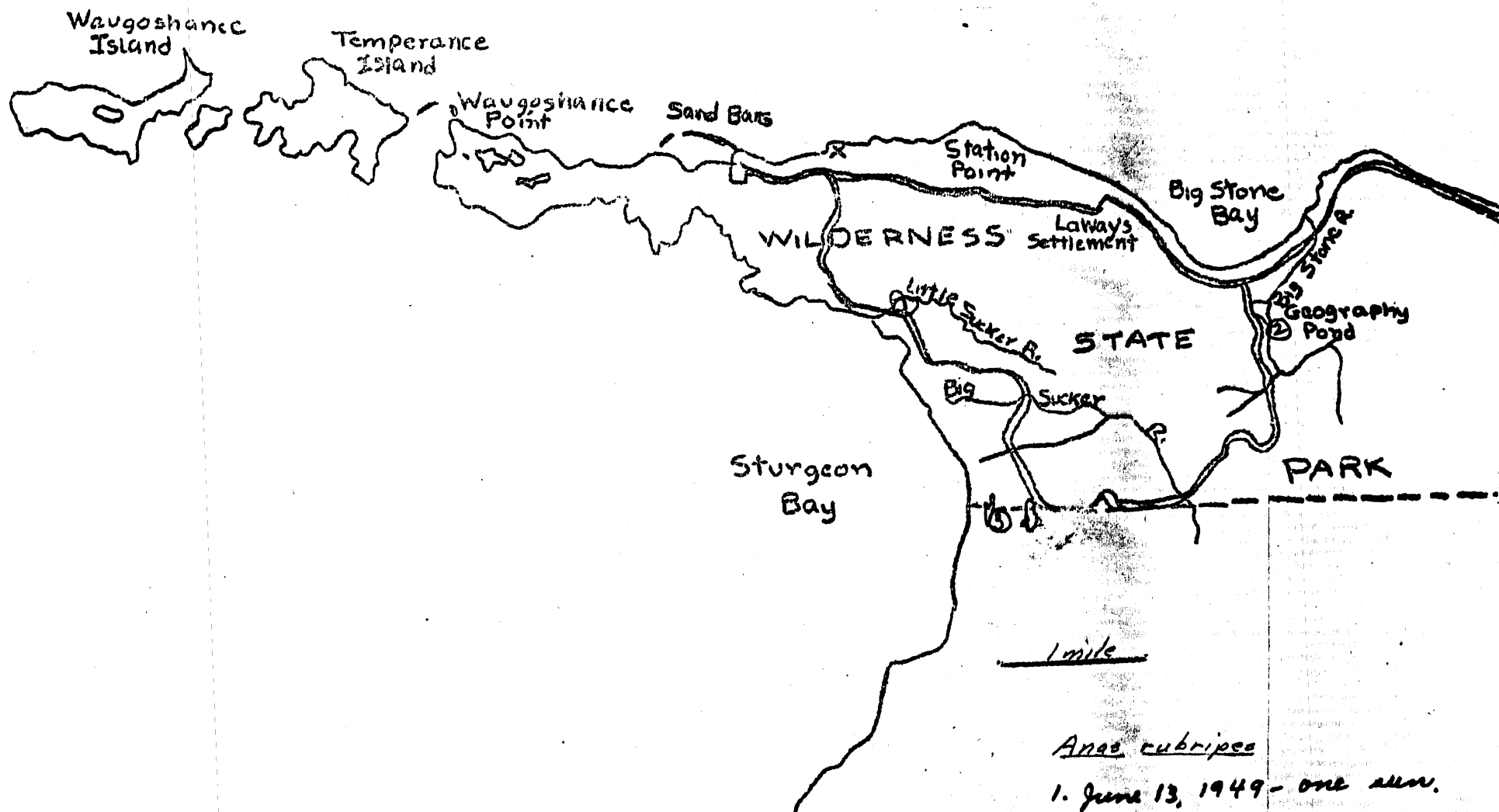
1. June 15, 1945 - Nest of 2 eggs
2. June 16, 1945 - Nest of 3 eggs
3. June 24, 1949 - one seen.
- ~~4. June 27, 1949 -~~
- ~~5. June 29, 1949 -~~
- ~~6. July 13, 1949 -~~



Branta canadensis

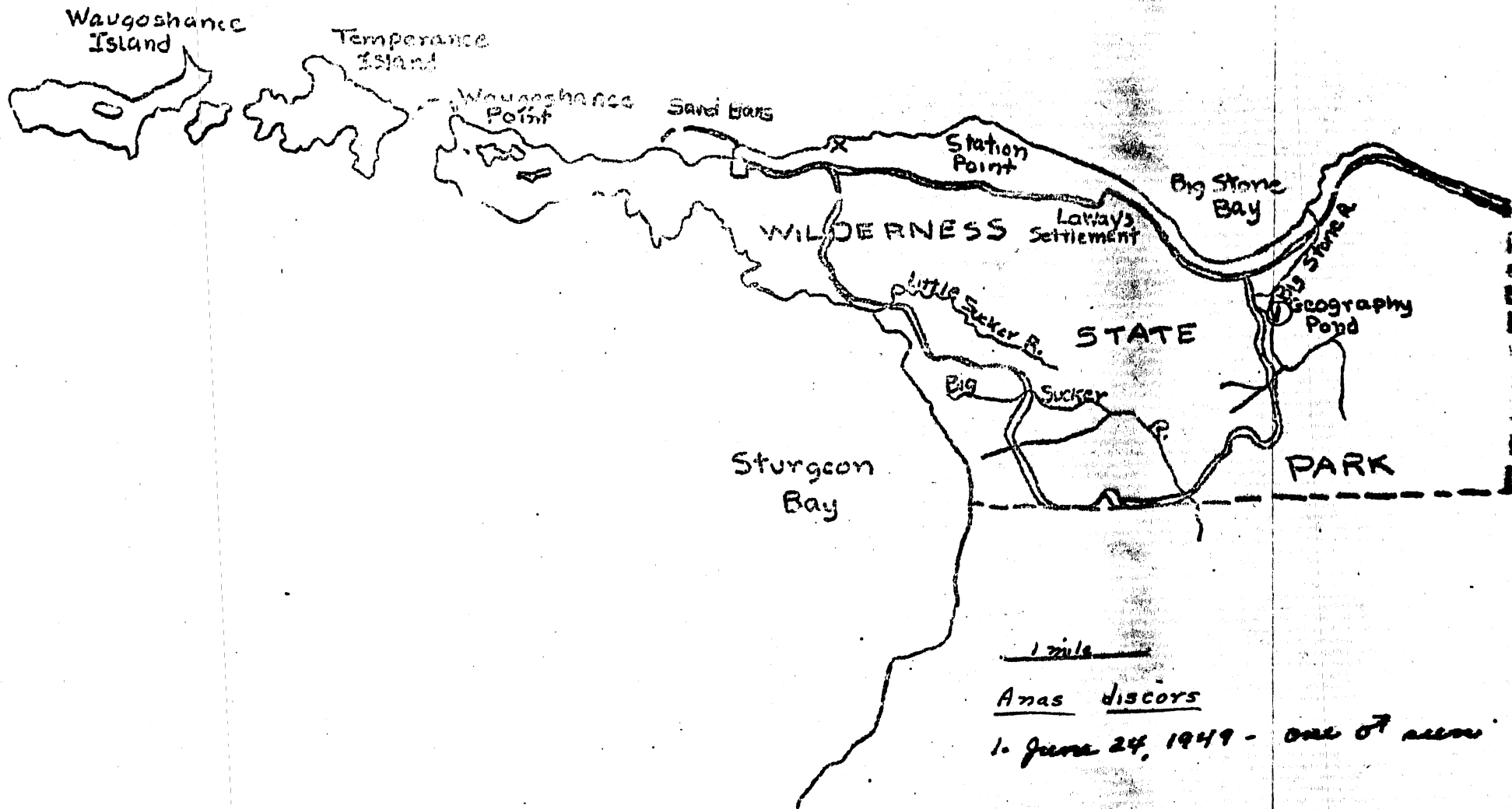
1. June 19 - July 17, 1949 - 2 adults and 3 young seen.

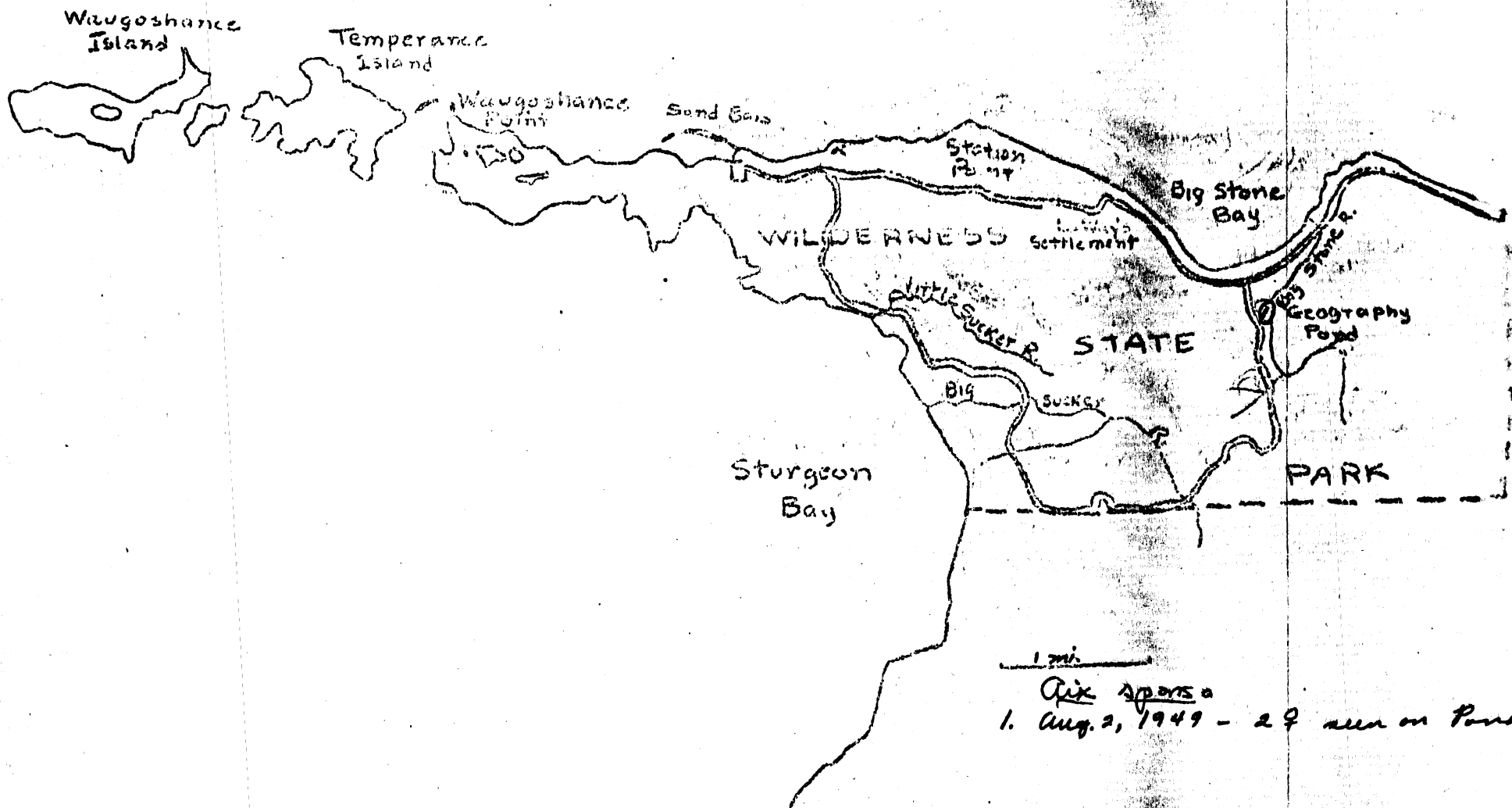




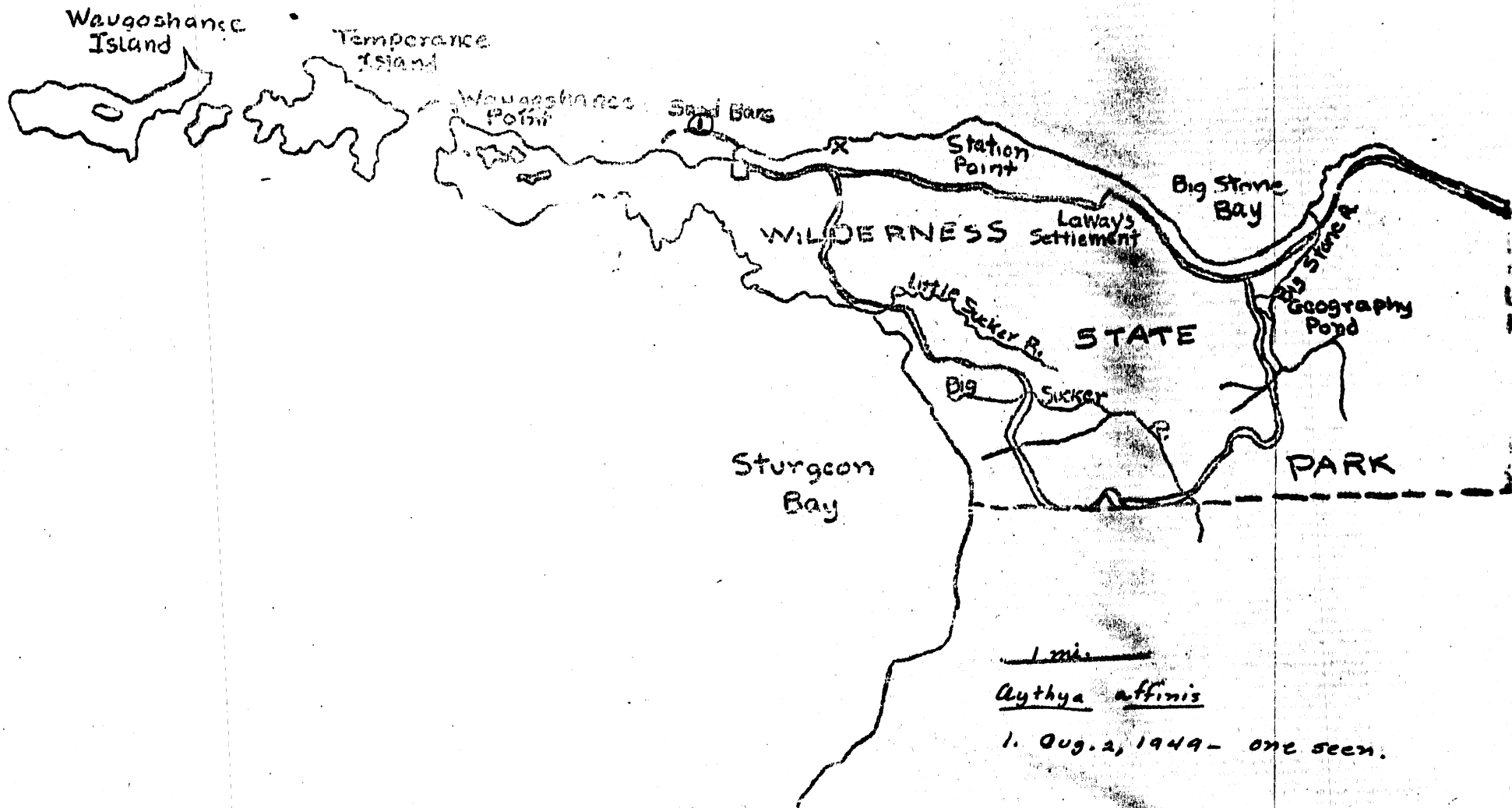
Anas tubripes

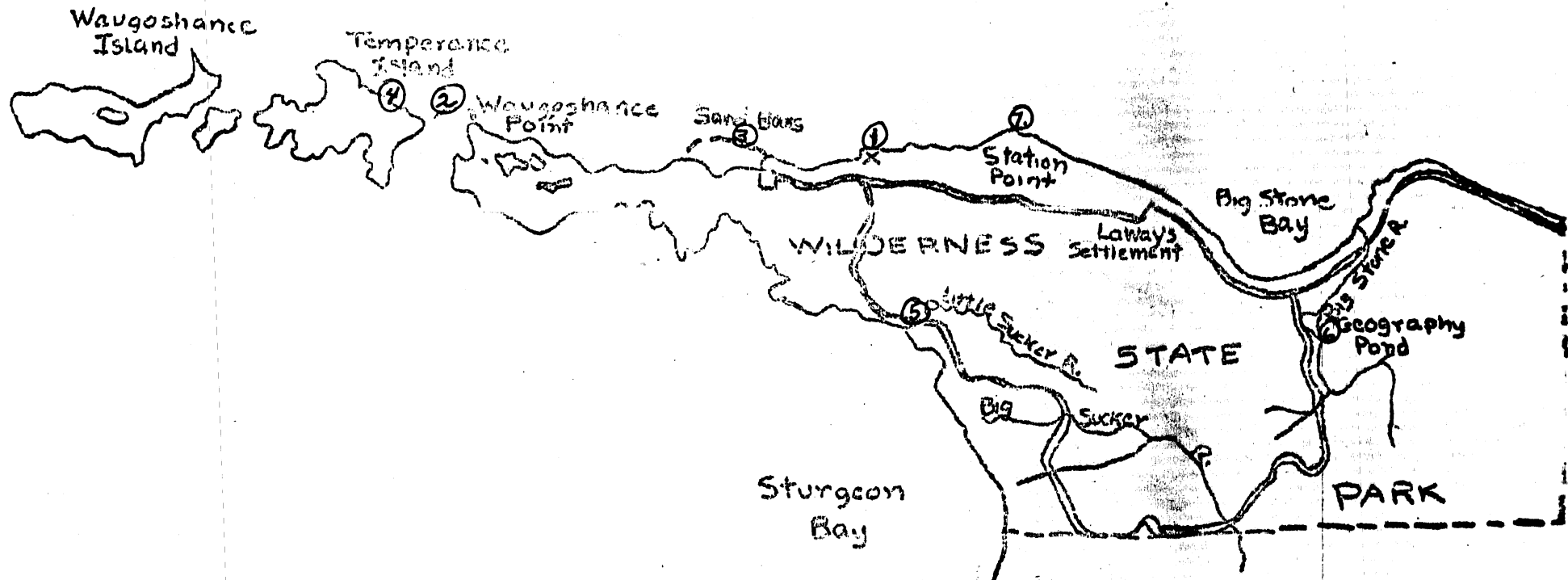
1. June 13, 1949 - one seen.
2. June 24, 1949 - ♀ with 3 half-grown young
3. July 19, 1949 - one seen.



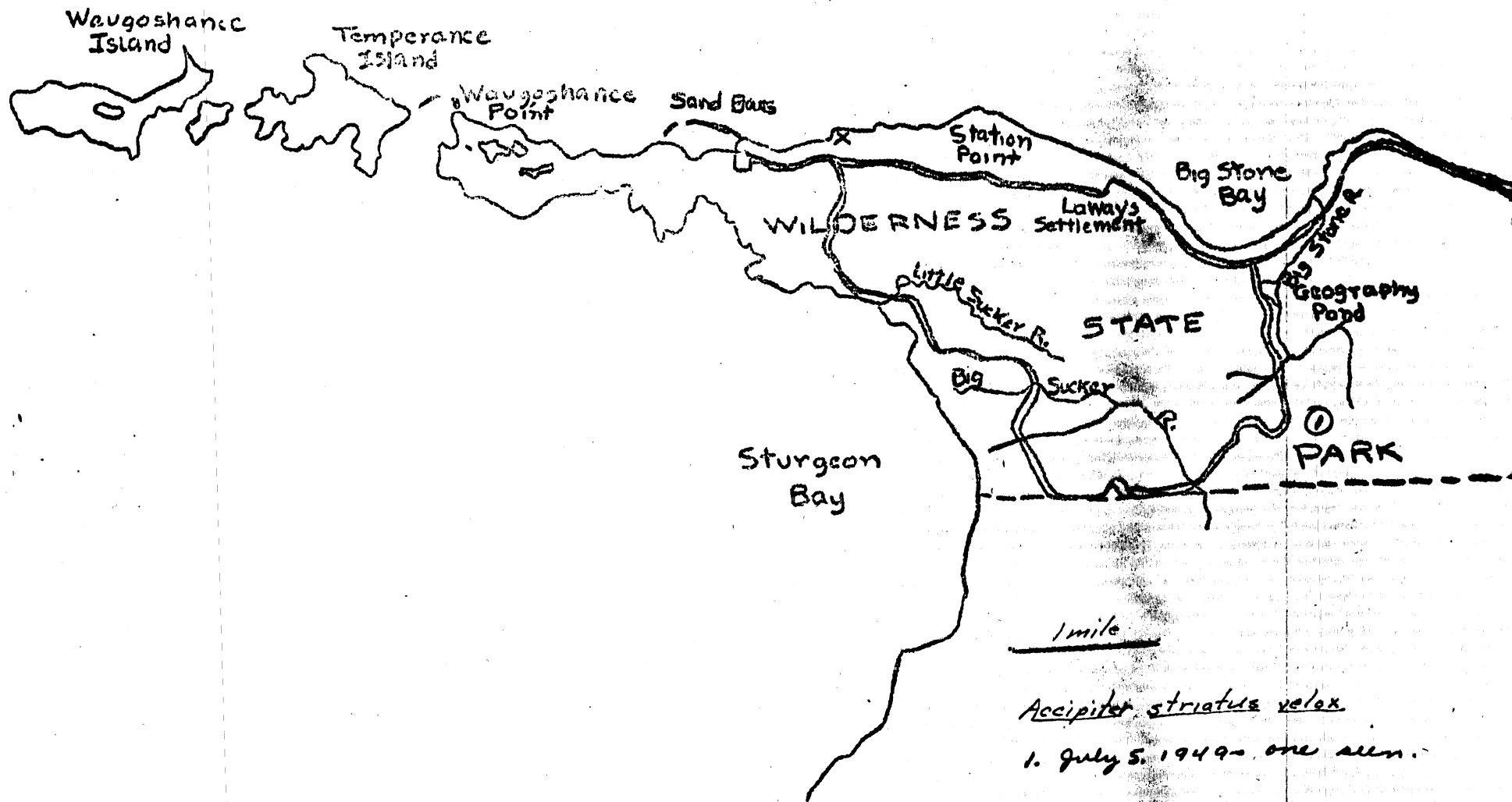


1 mi.
Aix sparsa
1. Aug. 2, 1949 - 2 ♀ seen on Pond.



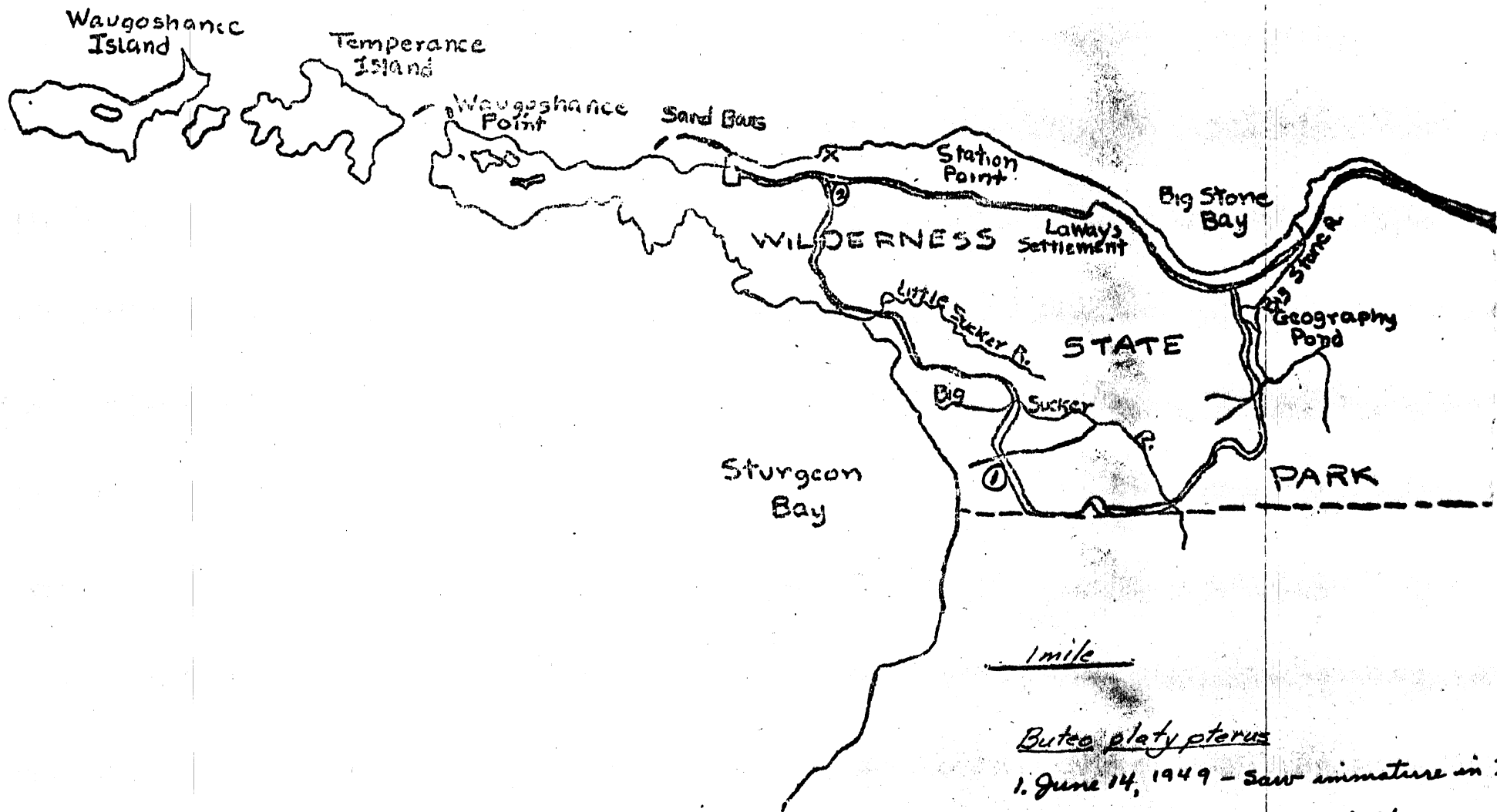


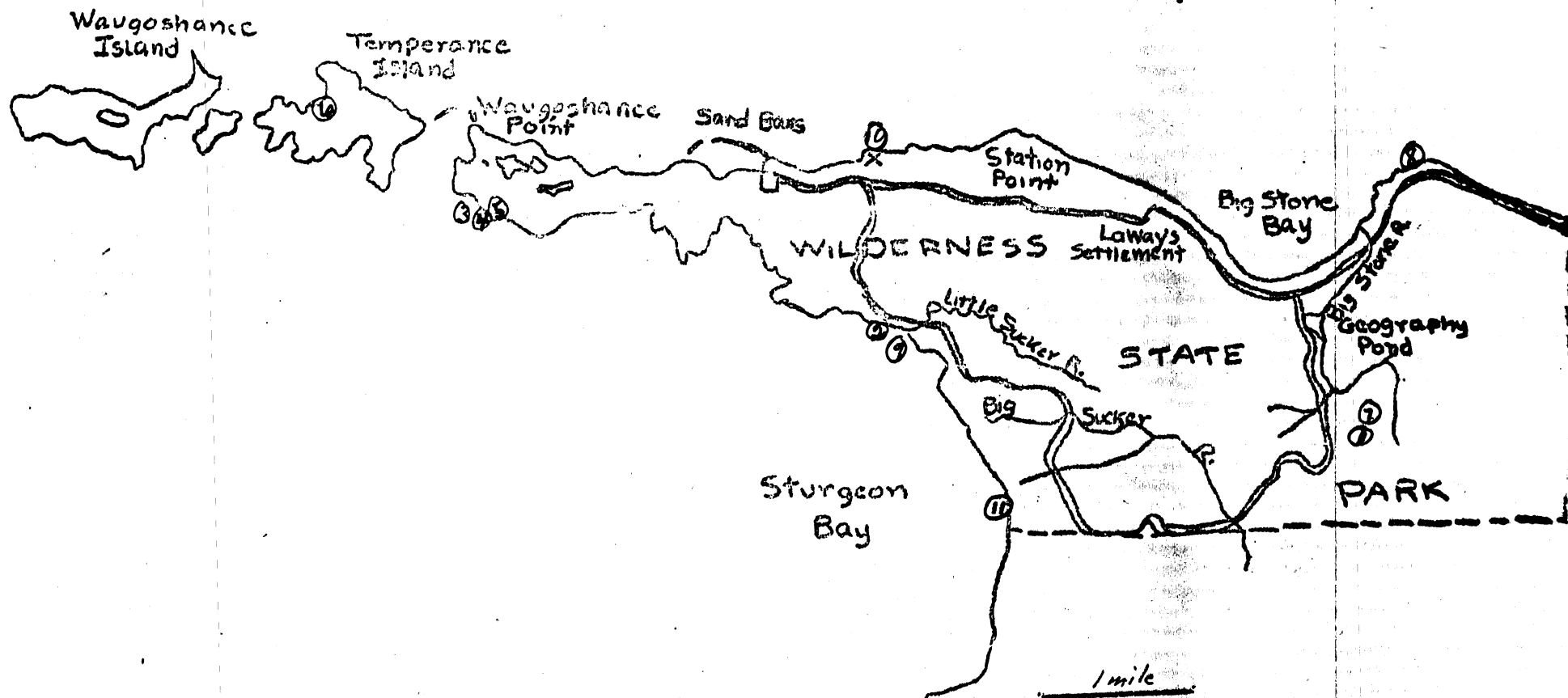
- 1 mi.
- mergus merganser americanus
1. June 10, 1949 - ♀♀ flying over.
 2. June 15, 1949 - 15 ♂ and 2 ♀ seen.
 3. June 15, 1949 - ♀ with 7 young seen.
 4. June 16, 1949 - ♀ with 9 young seen.
 5. June 21, 1949 - ♀ flying over.
 6. June 24, 1949 - 2 ♀♀ flying over.



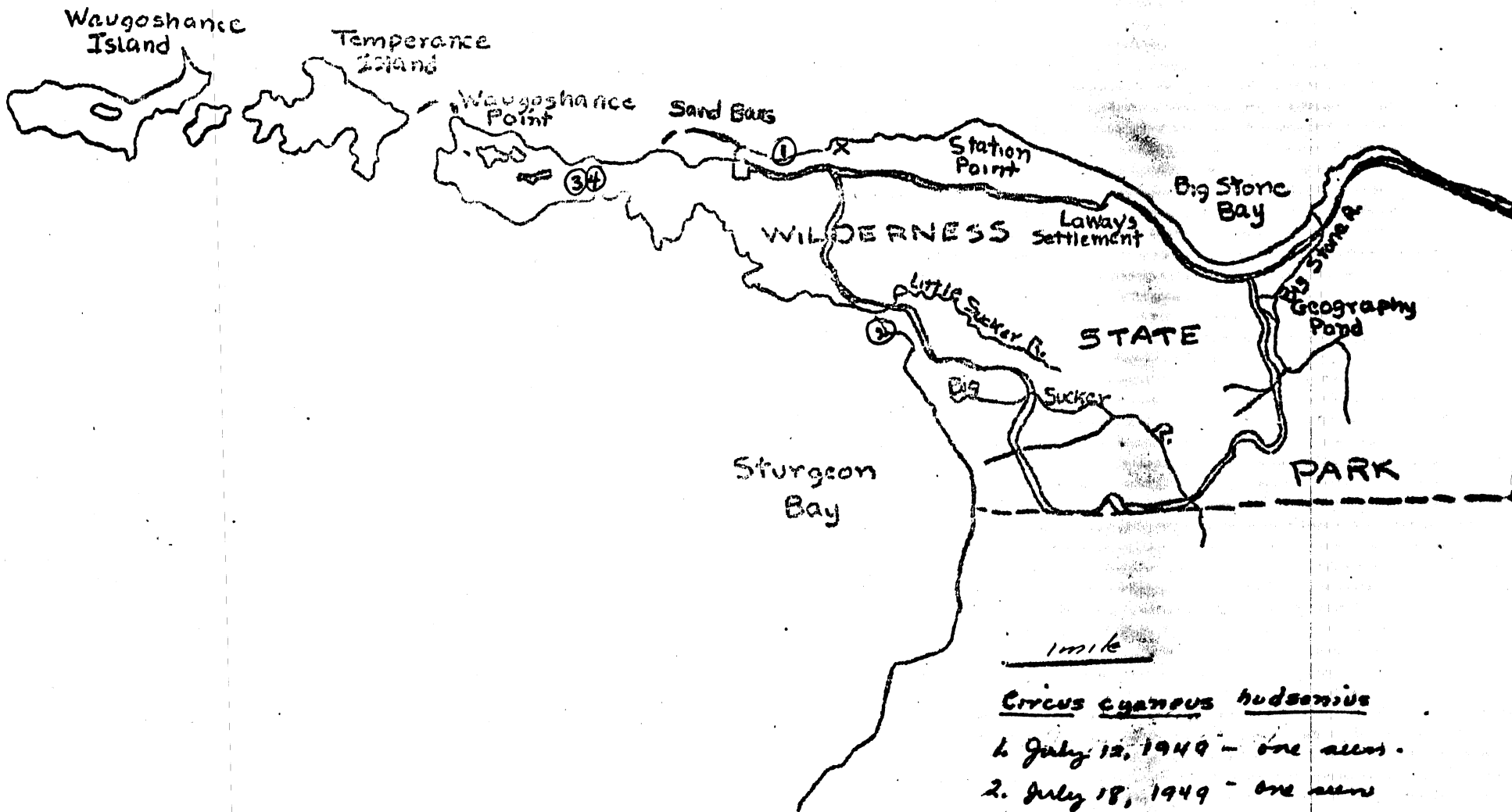
Accipiter striatus velox

1. July 5, 1949 - one seen.



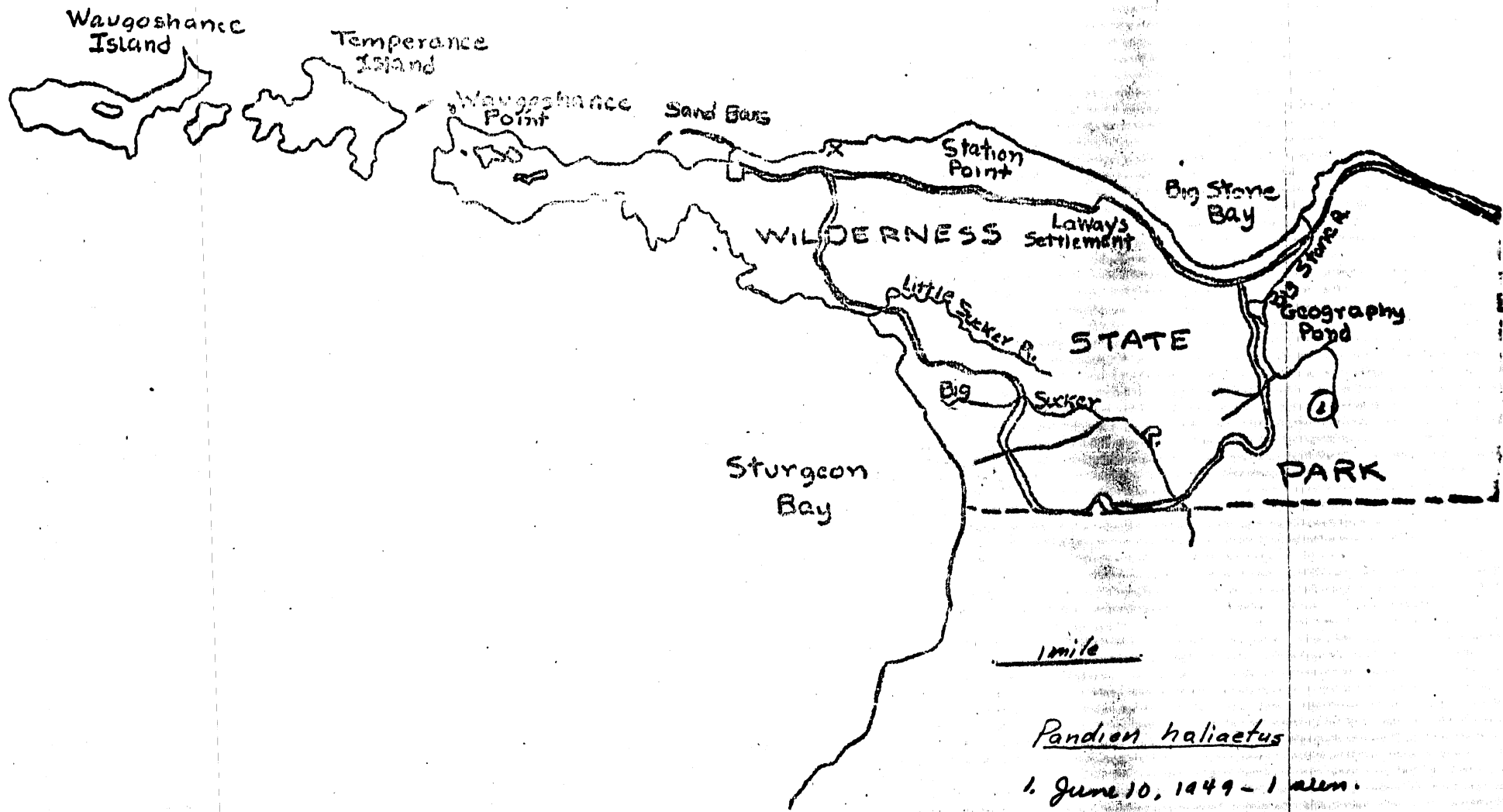


- Haliaeetus leucocephalus*
- | | |
|-----------------------------------|-----------------------------------|
| 1. June 10, 1949 - adult seen. | 6. June 16, 1949 - 1 immat. seen. |
| 2. June 11, 1949 - 2 immat. seen. | 7. July 1, 1949 - 1 adult seen. |
| 3. June 12, 1949 - 2 immat. seen. | 8. July 4, 1949 - 1 immat. seen. |
| 4. June 13, 1949 - 1 immat. seen. | 9. July 19, 1949 - 2 immat. seen. |
| 5. June 15, 1949 - 2 adults seen. | 10. July 23, 1949 - adult seen. |
| | 11. Aug 4, 1949 - adult seen. |



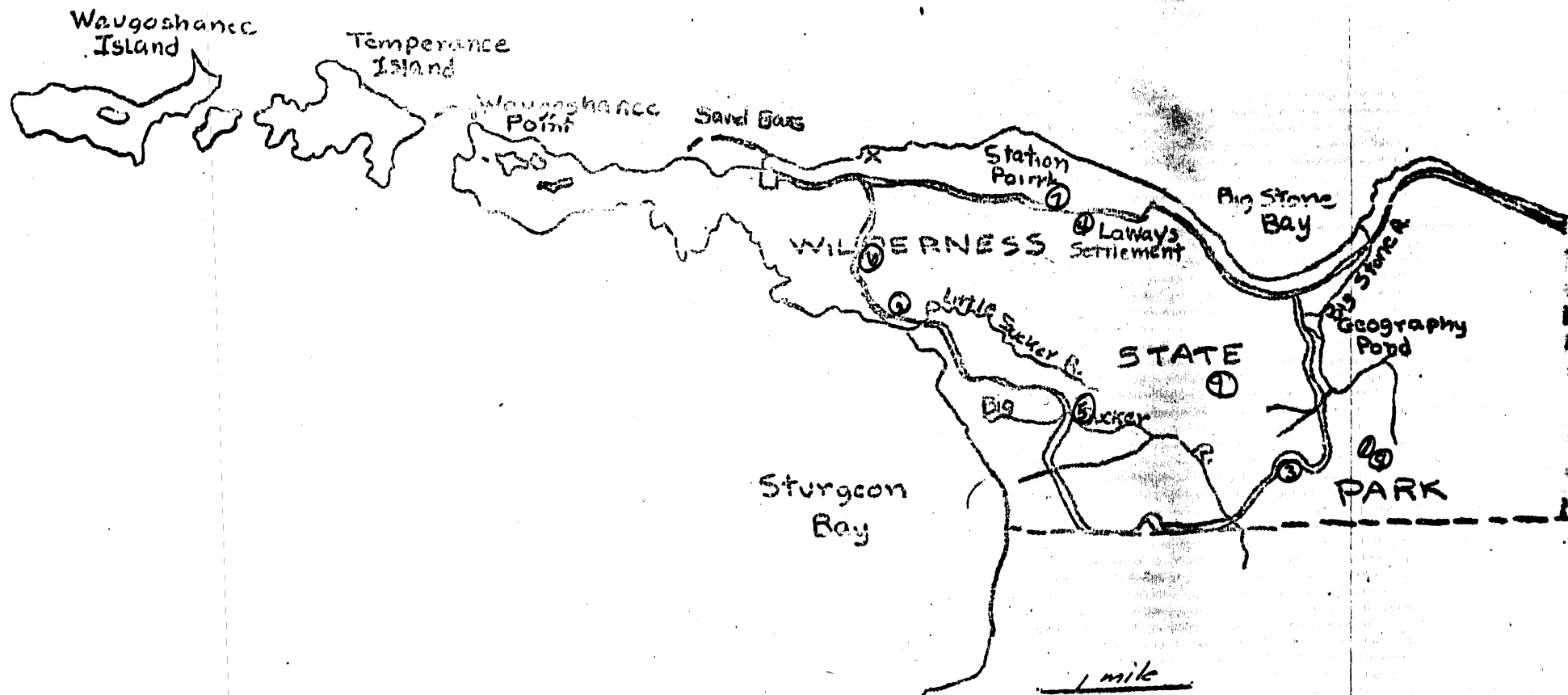
Circus cyaneus hudsonius

1. July 12, 1949 - one seen.
2. July 18, 1949 - one seen
3. July 23, 1949 - 3 seen.
4. July 29, 1949 - 3-4 seen.



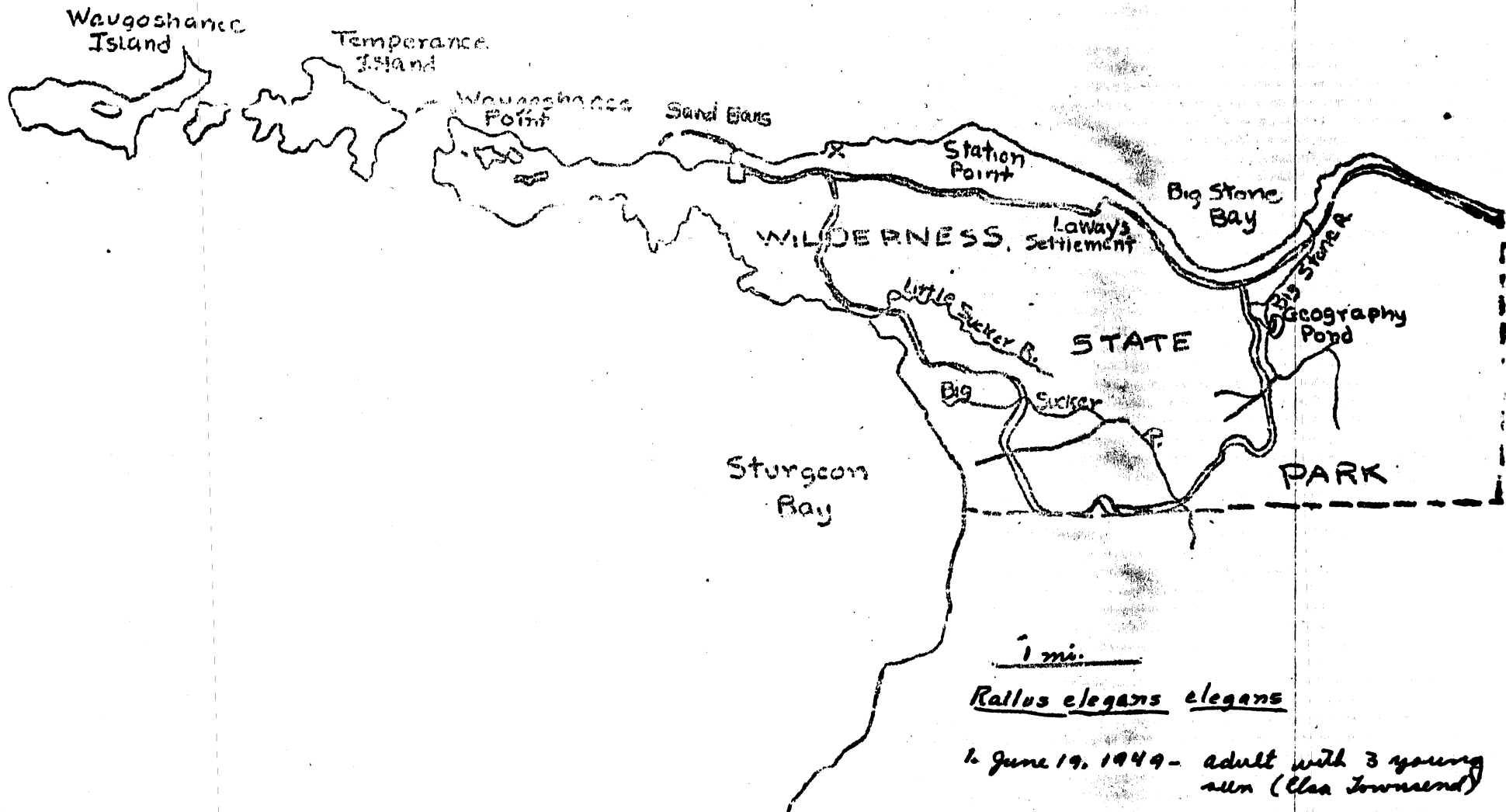
Pandion haliaetus

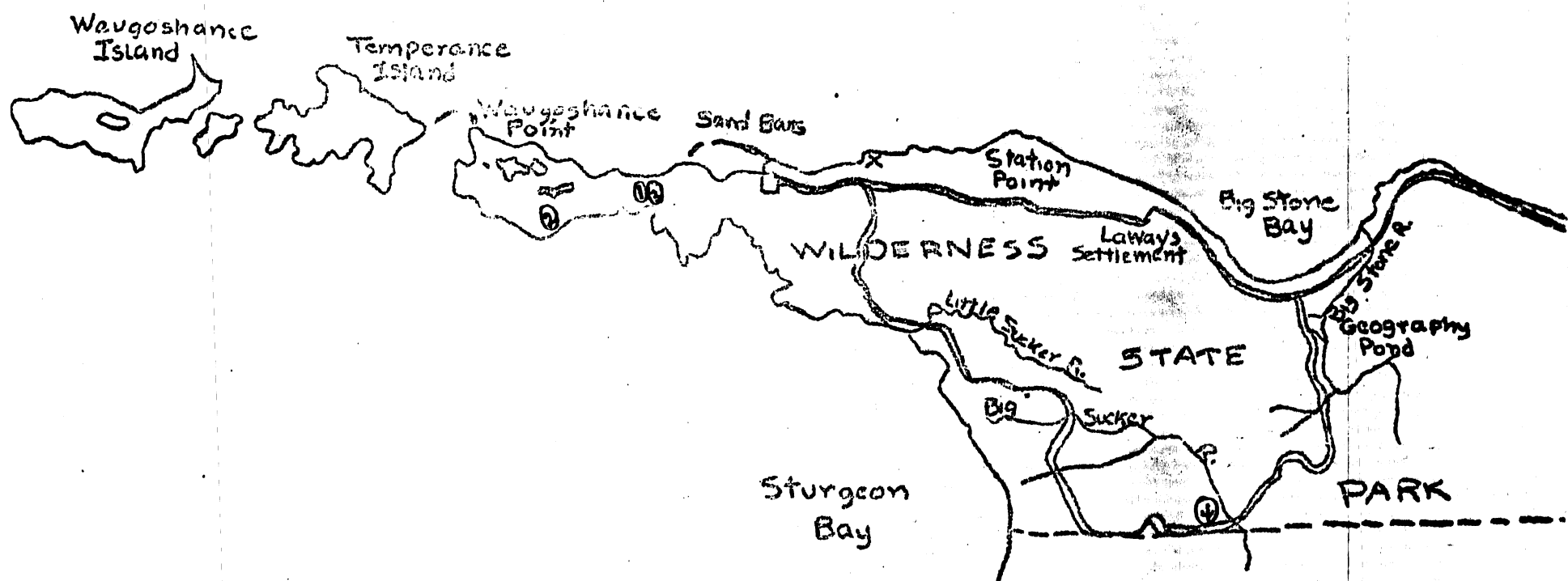
1. June 10, 1949 - 1 seen.



Bonasa umbellus

- | | |
|------------------------------------|--------------------------------------|
| 1. June 10, 1949 - Heard drumming. | 7. June 30, 1949 - Saw 2-3. |
| 2. June 16, 1949 - Saw one. | 8. July 5, 1949 - adult with 6 young |
| 3. June 19, 1949 - ♀ with chicks | 9. July 20, 1949 - Heard 2 take off. |
| 4. June 21, 1949 - ♀ with chicks | |
| 5. June 23, 1949 - ♀ with chicks | |
| 6. June 23, 1949 - ♂ with chicks | |



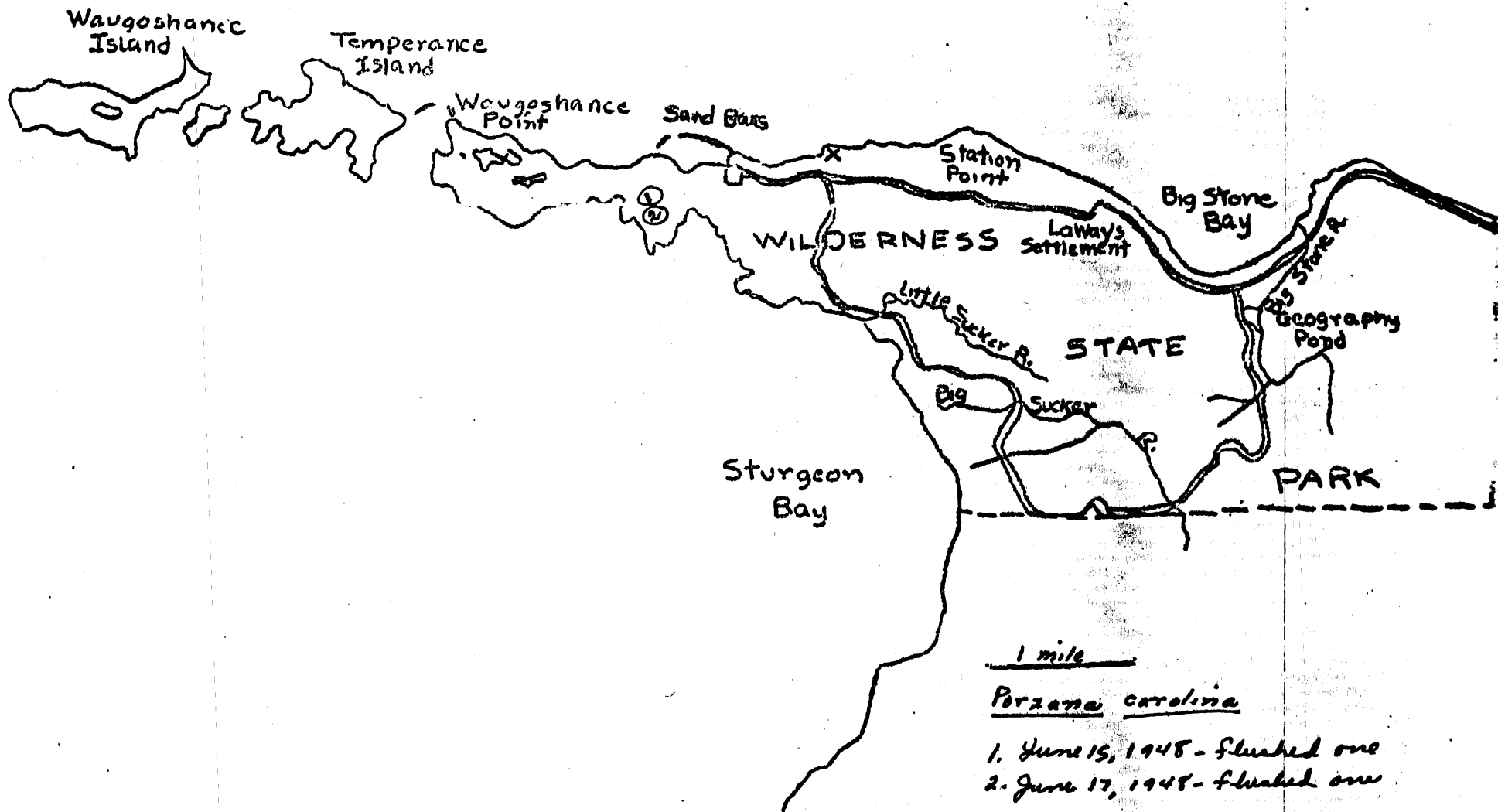


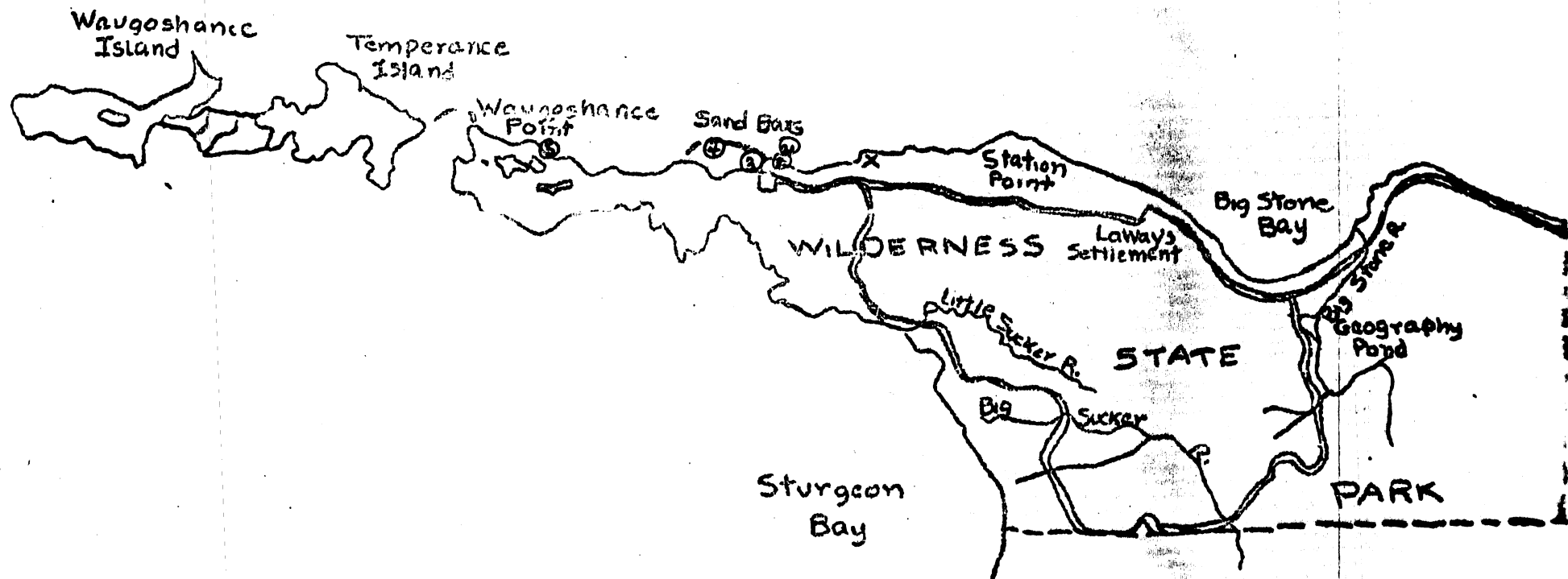
1 mile

Rallus limicola limicola

W.S. Jordoff

1. June 20, 1949 - Collected an adult ♂
2. July 13, 1949 - found nest of 7 eggs
3. July 14, 1949 - flushed one
4. Aug. 4, 1949 - flushed one

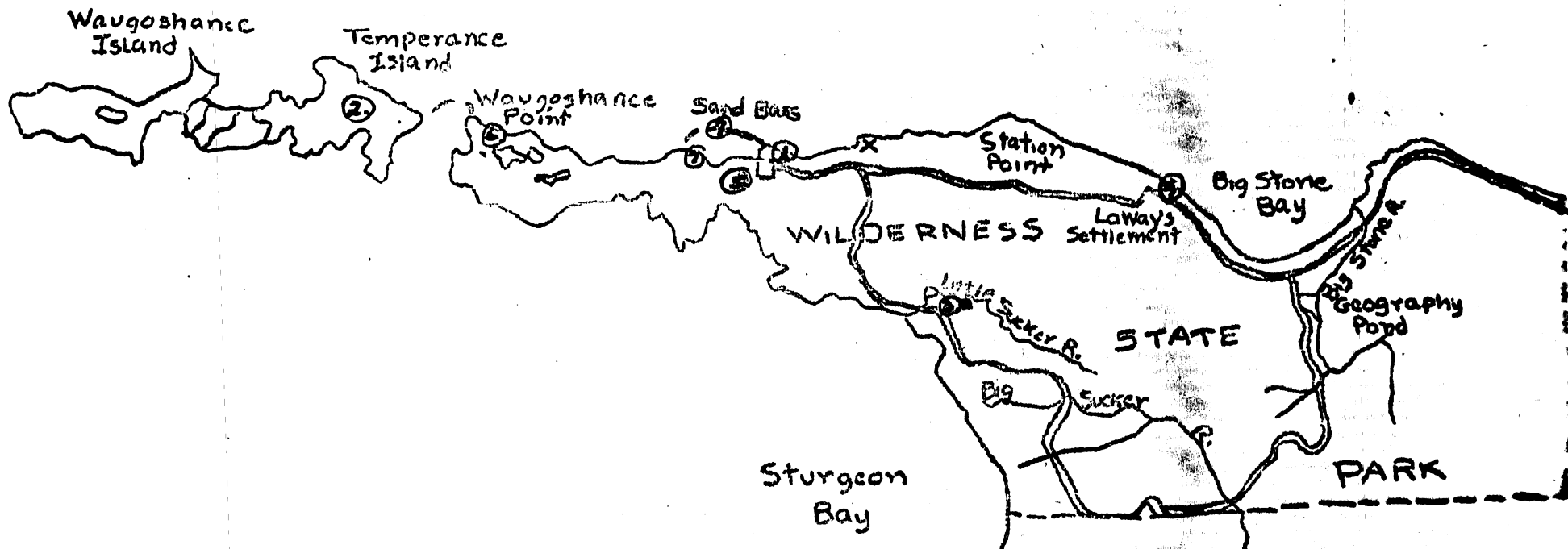




1 mile

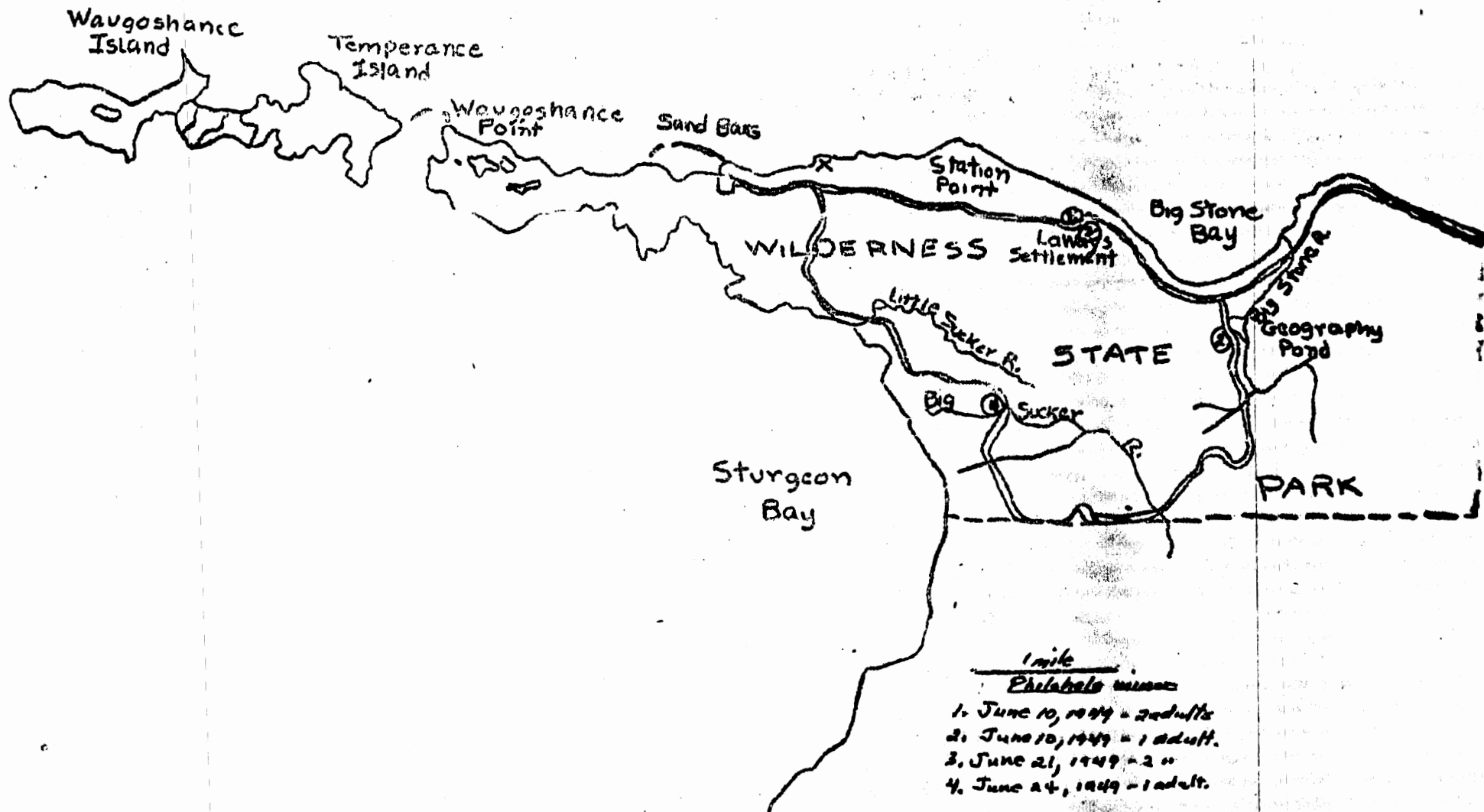
Charadrius melodus

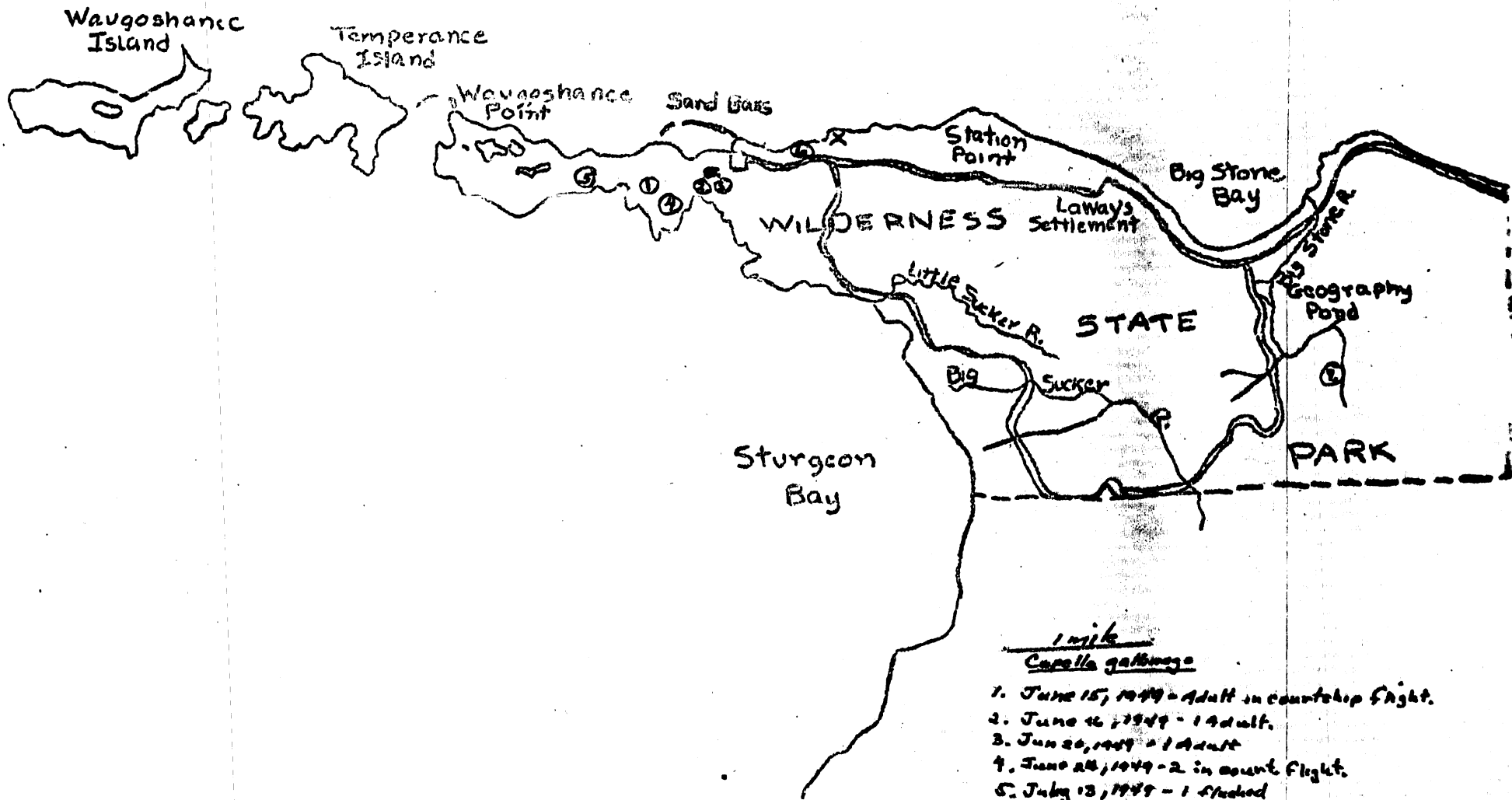
1. June 9, 1949 - 5 adults & 2 chicks of various ages.
2. June 9, 1949 - 1 nest & 3 young and 1 egg.
3. June 9, 1949 - pair with 1 chick.
4. June 17, 1949 - pair with 2 chicks.
5. July 29, 1949 - 2 adults & 3 nearly fully grown young seen.



Charadrius vociferans

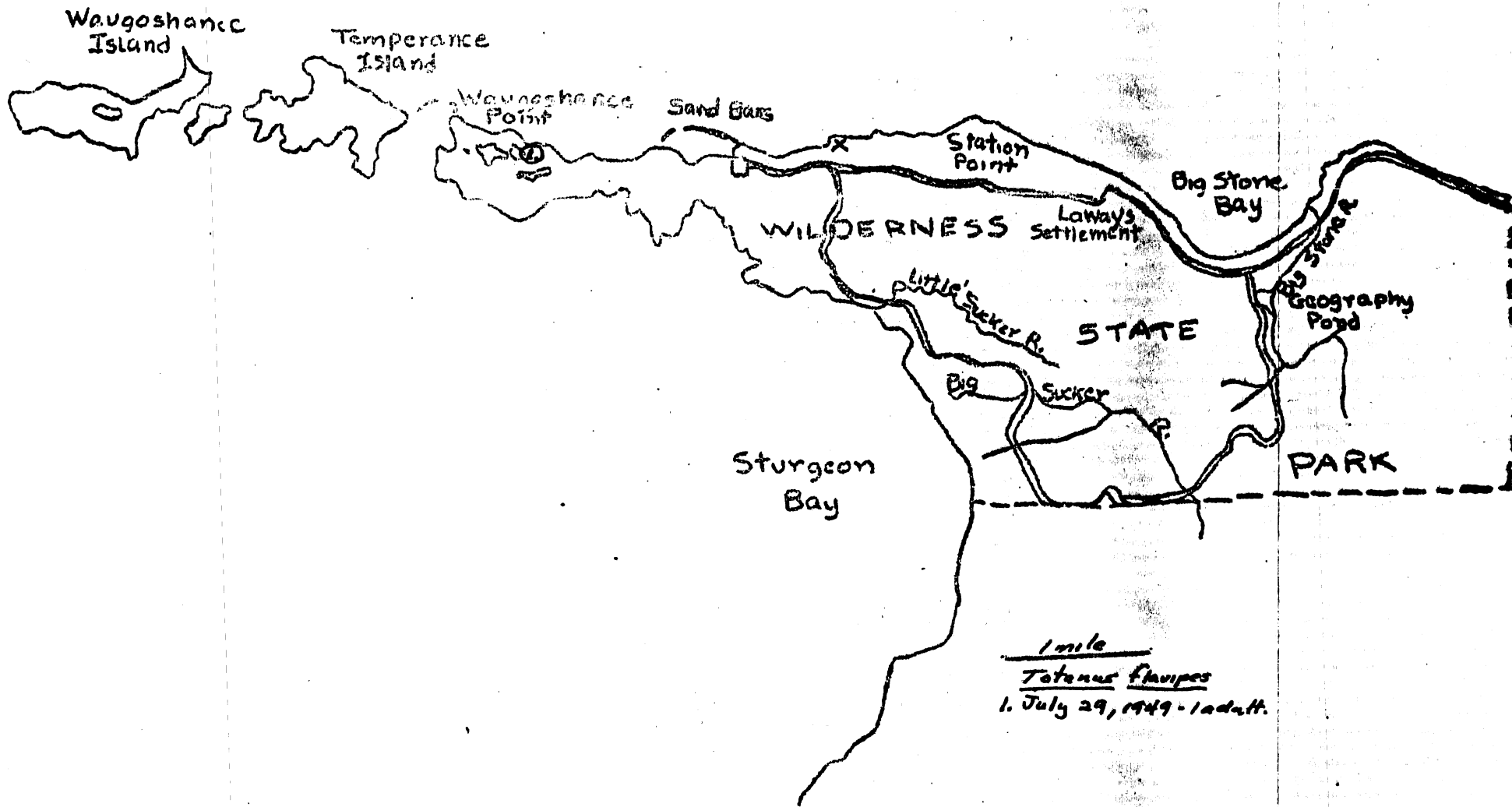
1. June 9, 1949 in jury finding adults.
2. June 15, 1949 adults & young
3. June 23, " " adults
4. June 24, 1949 adults
5. July 8, 1949 3 young, out of nest.
6. July 23, 1949 many adults
7. July 29, 1949 many family groups.



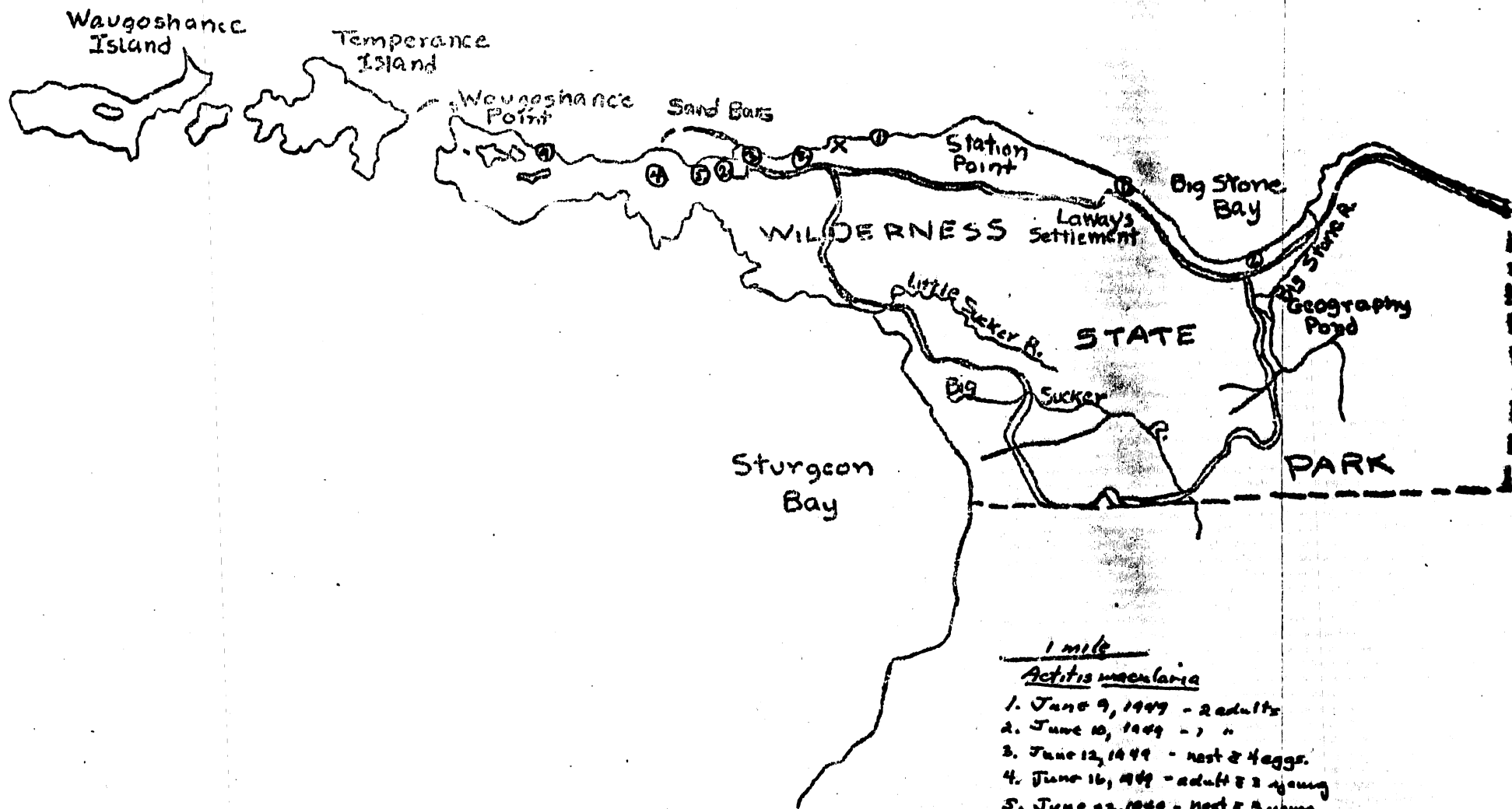


1 mile
Capella galbana

1. June 15, 1949 - Adult in courtship flight.
2. June 16, 1949 - 1 Adult.
3. June 20, 1949 - 1 Adult
4. June 24, 1949 - 2 in court flight.
5. July 13, 1949 - 1 Staked
6. July 18, 1949 - 1 Court. flight.
7. June 20, 1949 - 1 Court flight

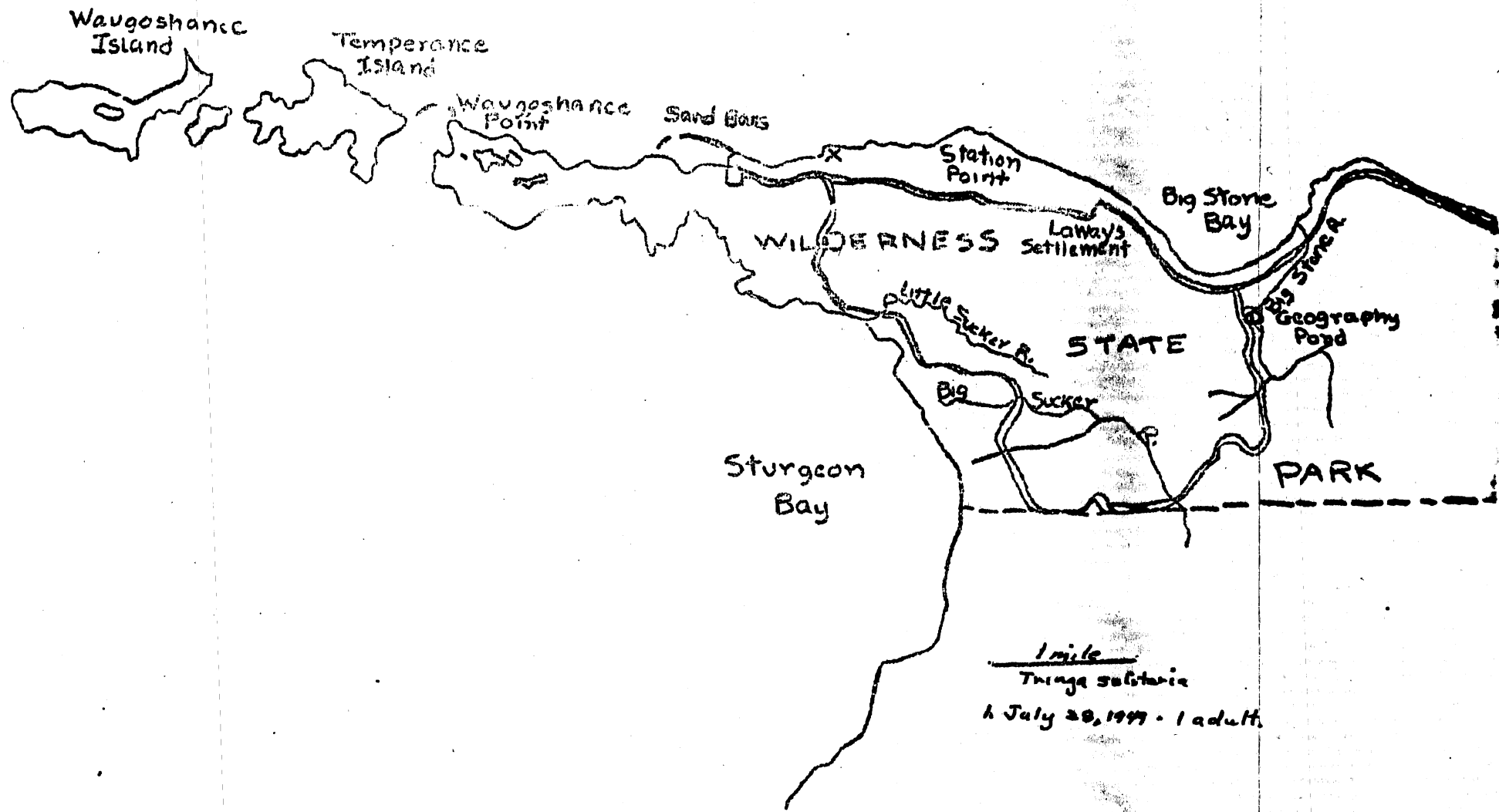


1 mile
Totanus flavipes
1. July 29, 1949 - 1 adult.

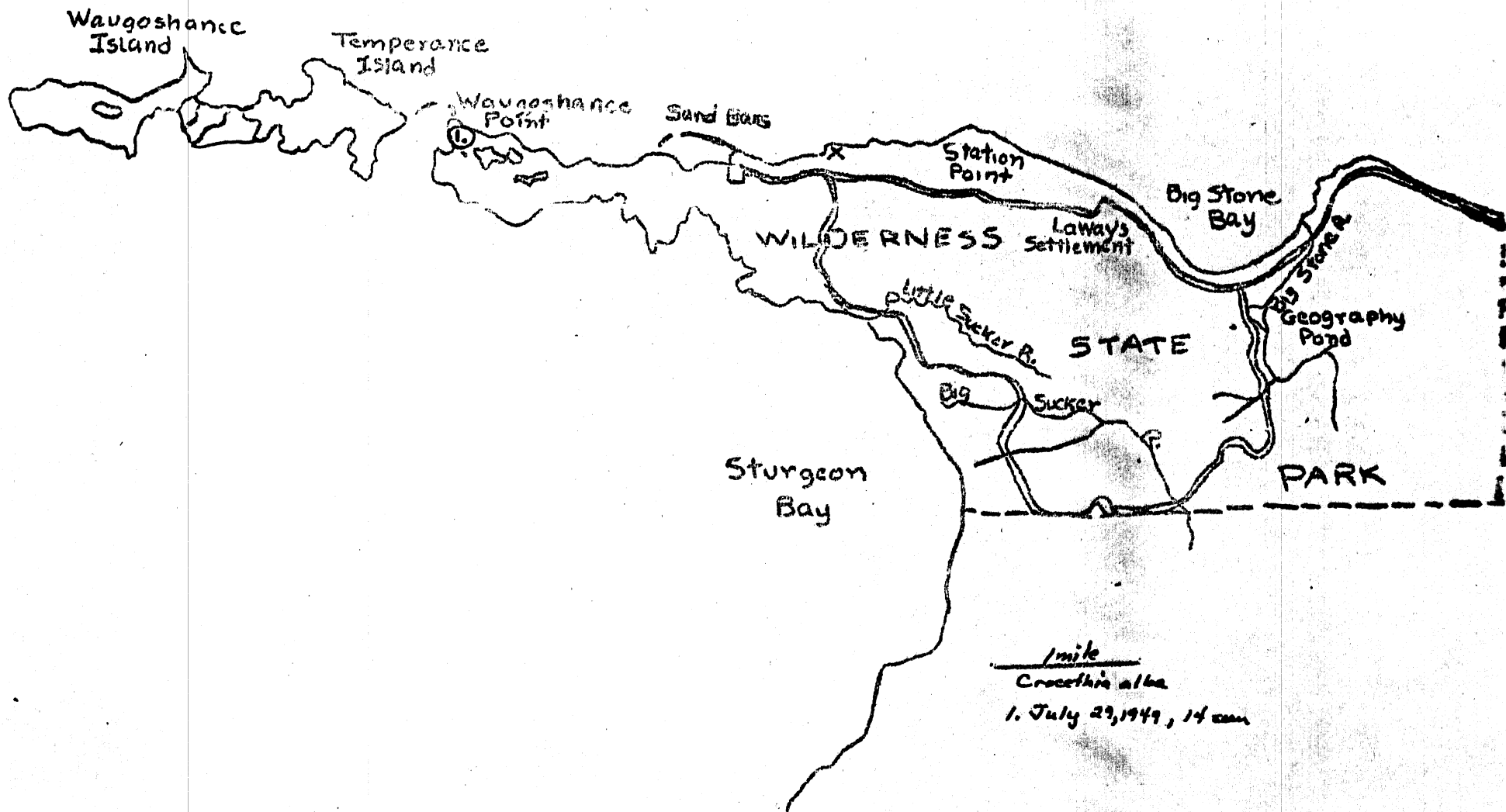


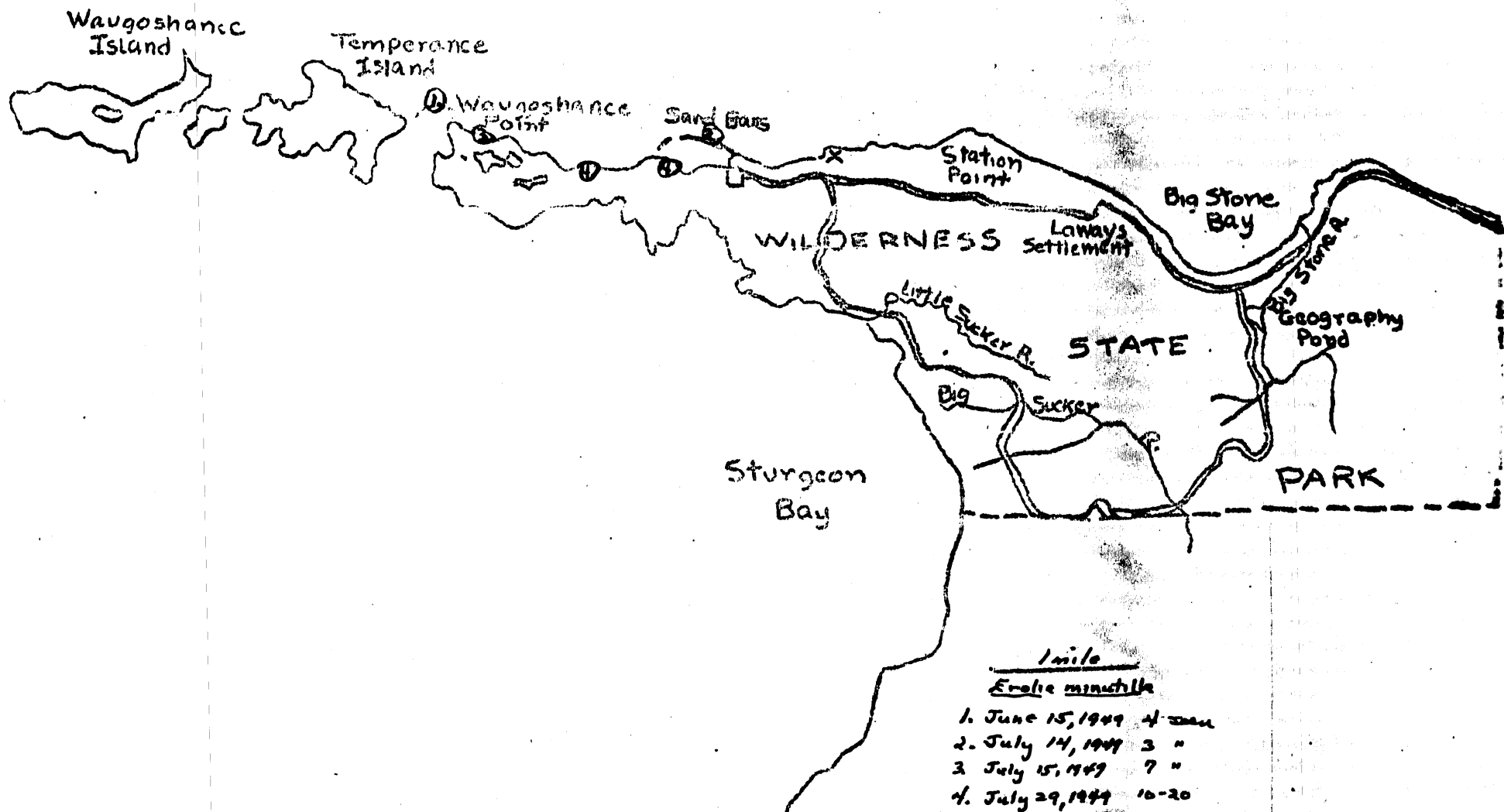
Actitis macularia

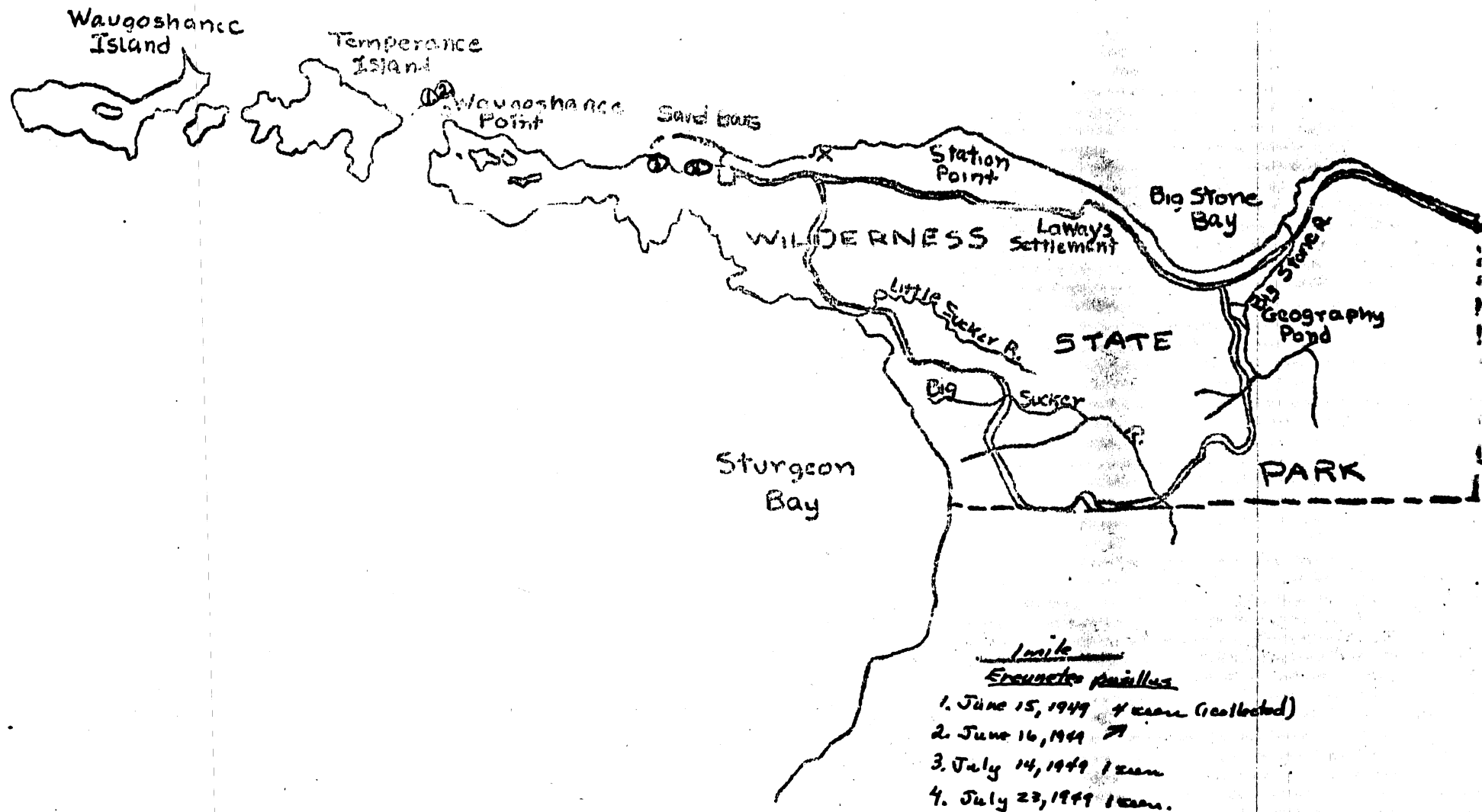
1. June 9, 1949 - 2 adults
2. June 10, 1949 - 1 "
3. June 12, 1949 - nest & 4 eggs.
4. June 16, 1949 - adult & 2 young
5. June 22, 1949 - nest & 5 young
6. June 24, 1949 - adult.
7. June 27, 1949 - "
8. July 26, 1949 2 adults
9. July 29, 1949 adult & 2 young.

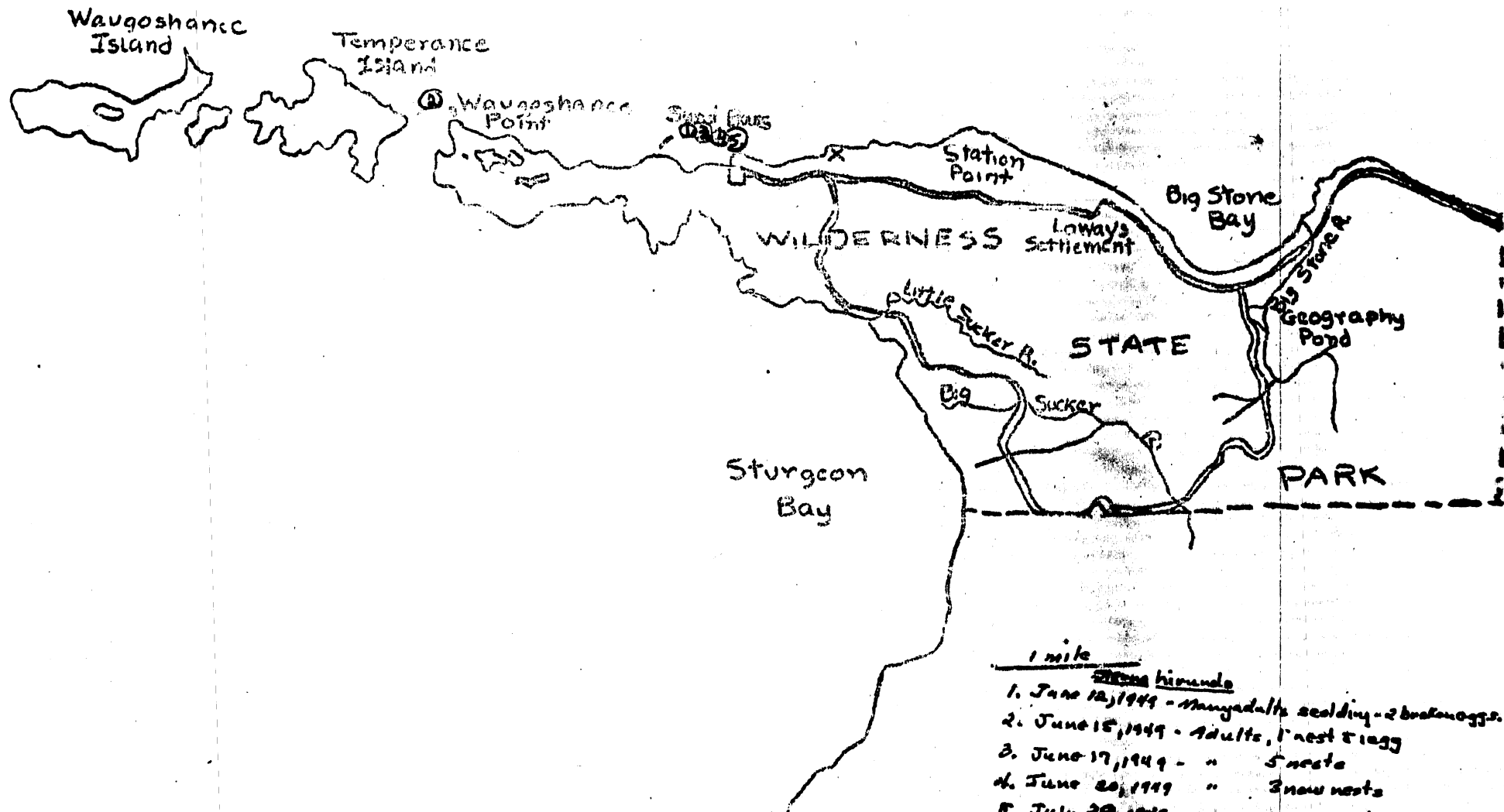


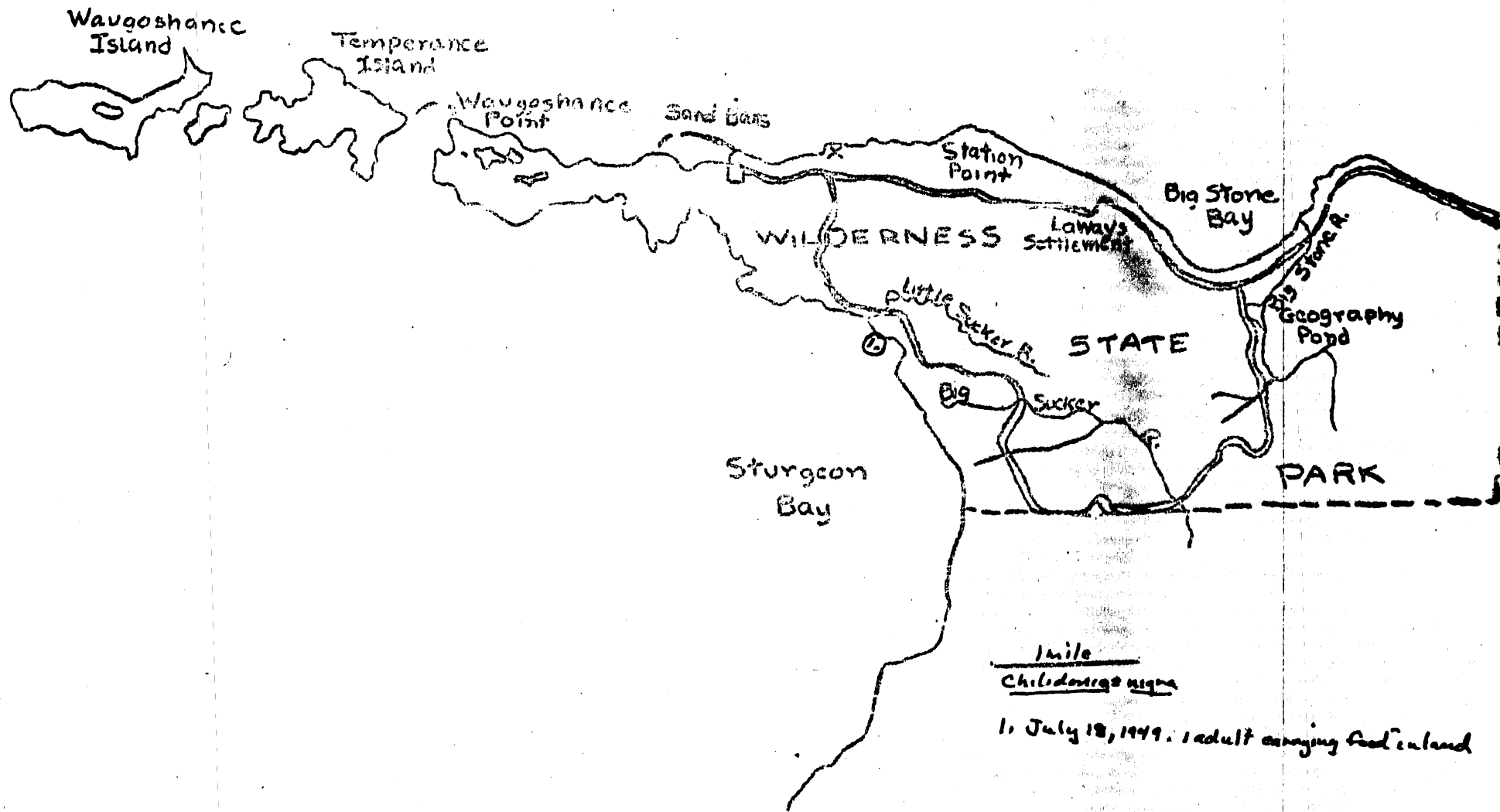
1 mile
Thinga solitaria
1 July 20, 1999 - 1 adult.

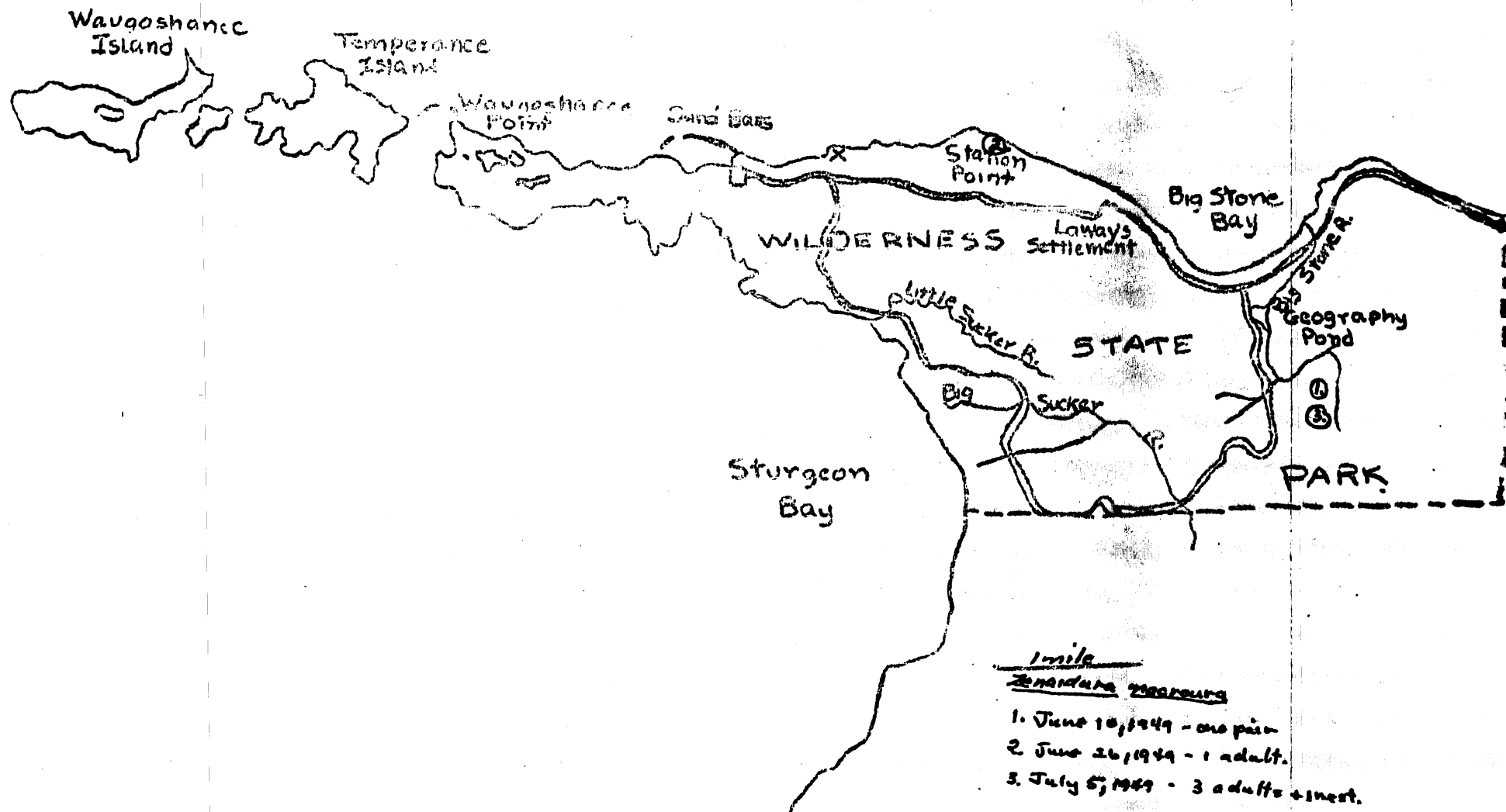


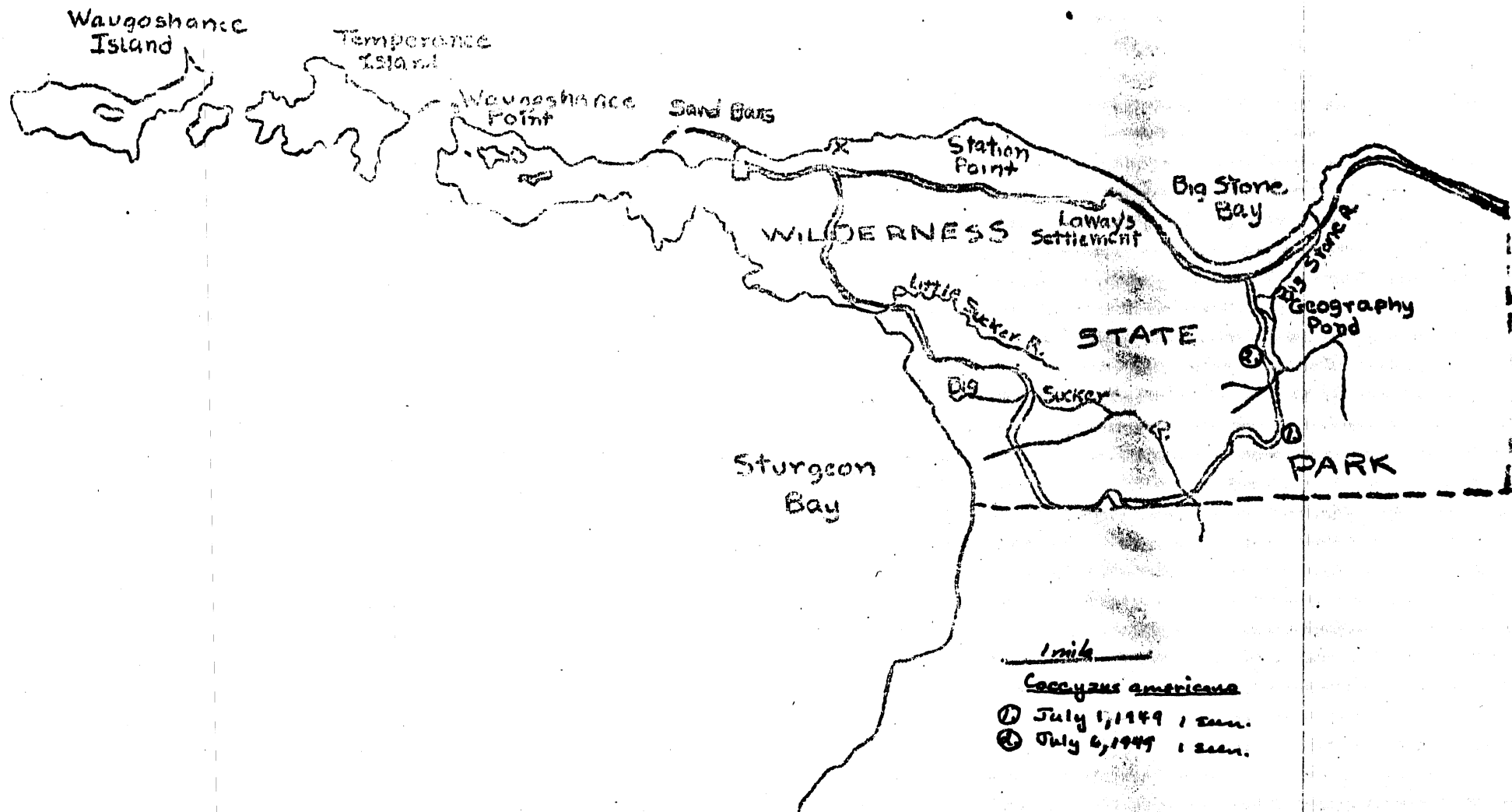


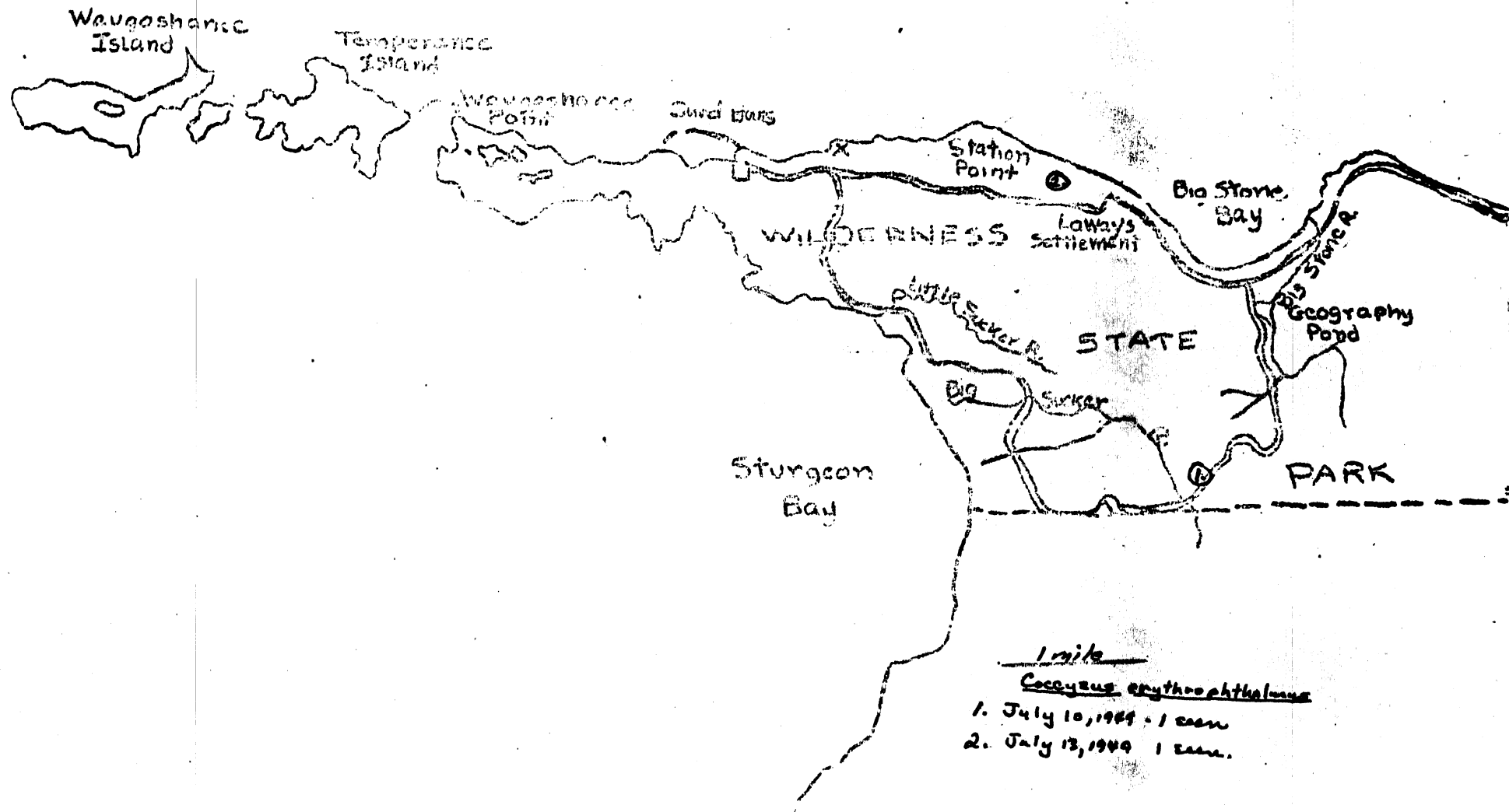


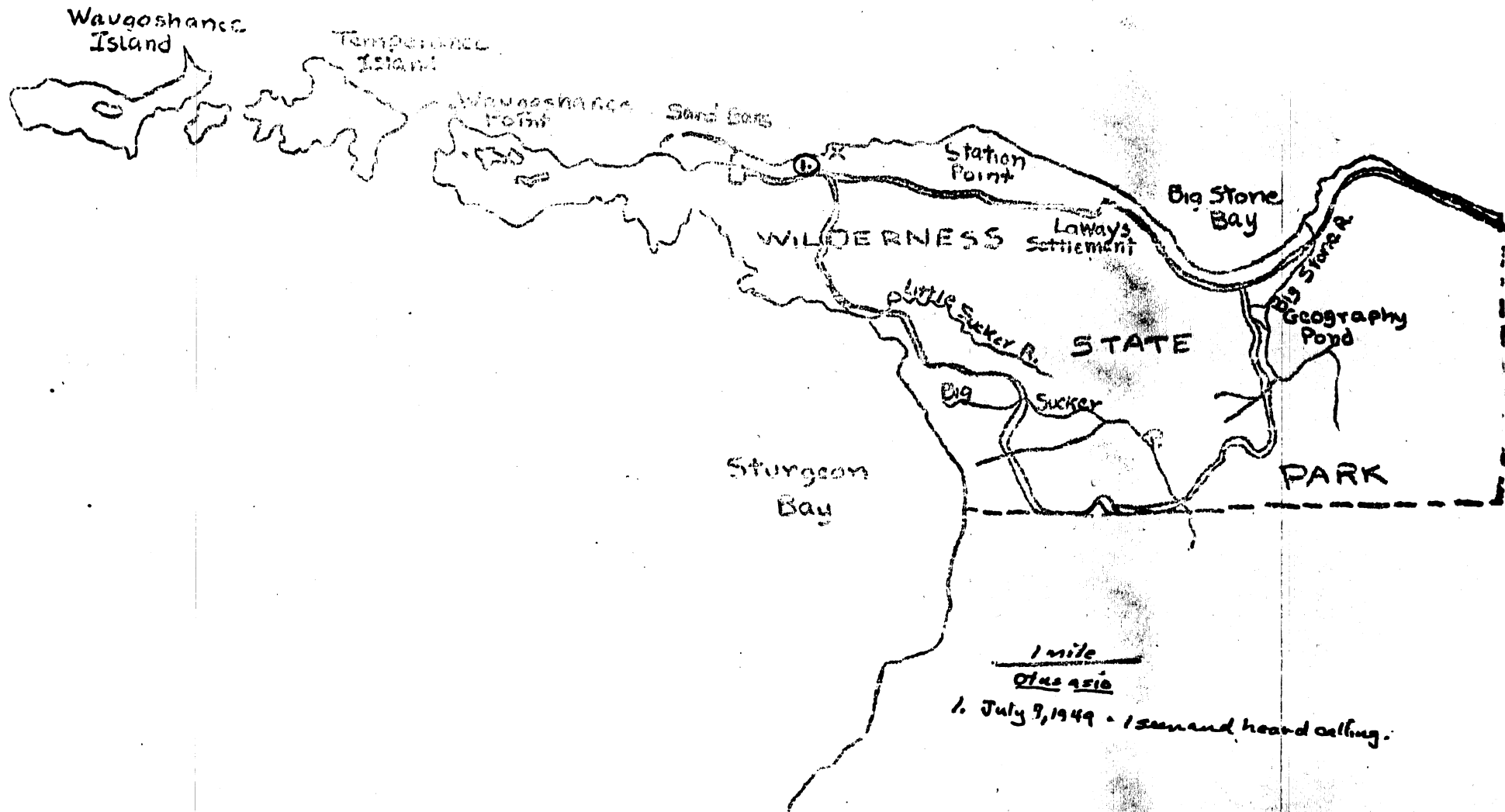


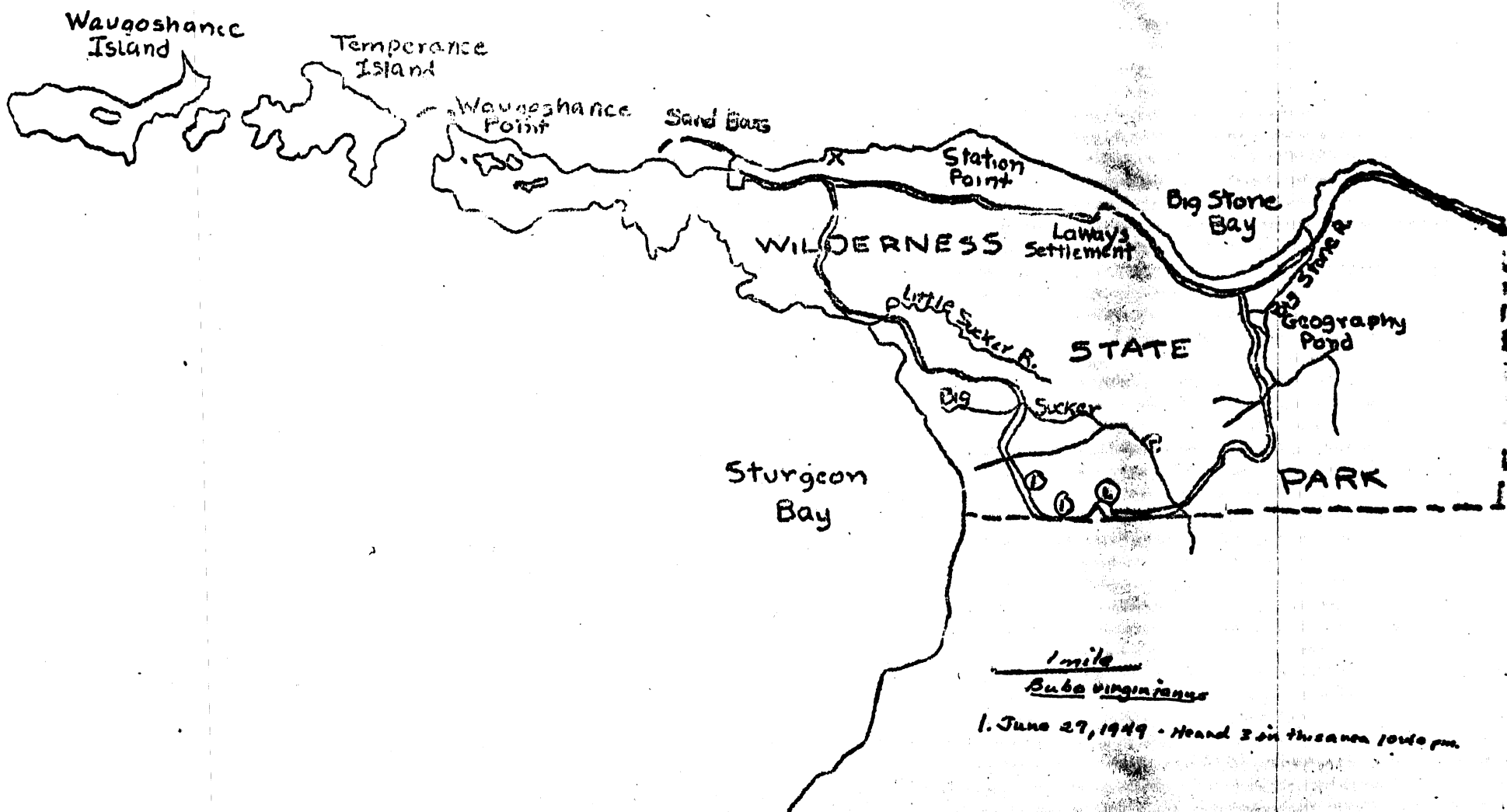




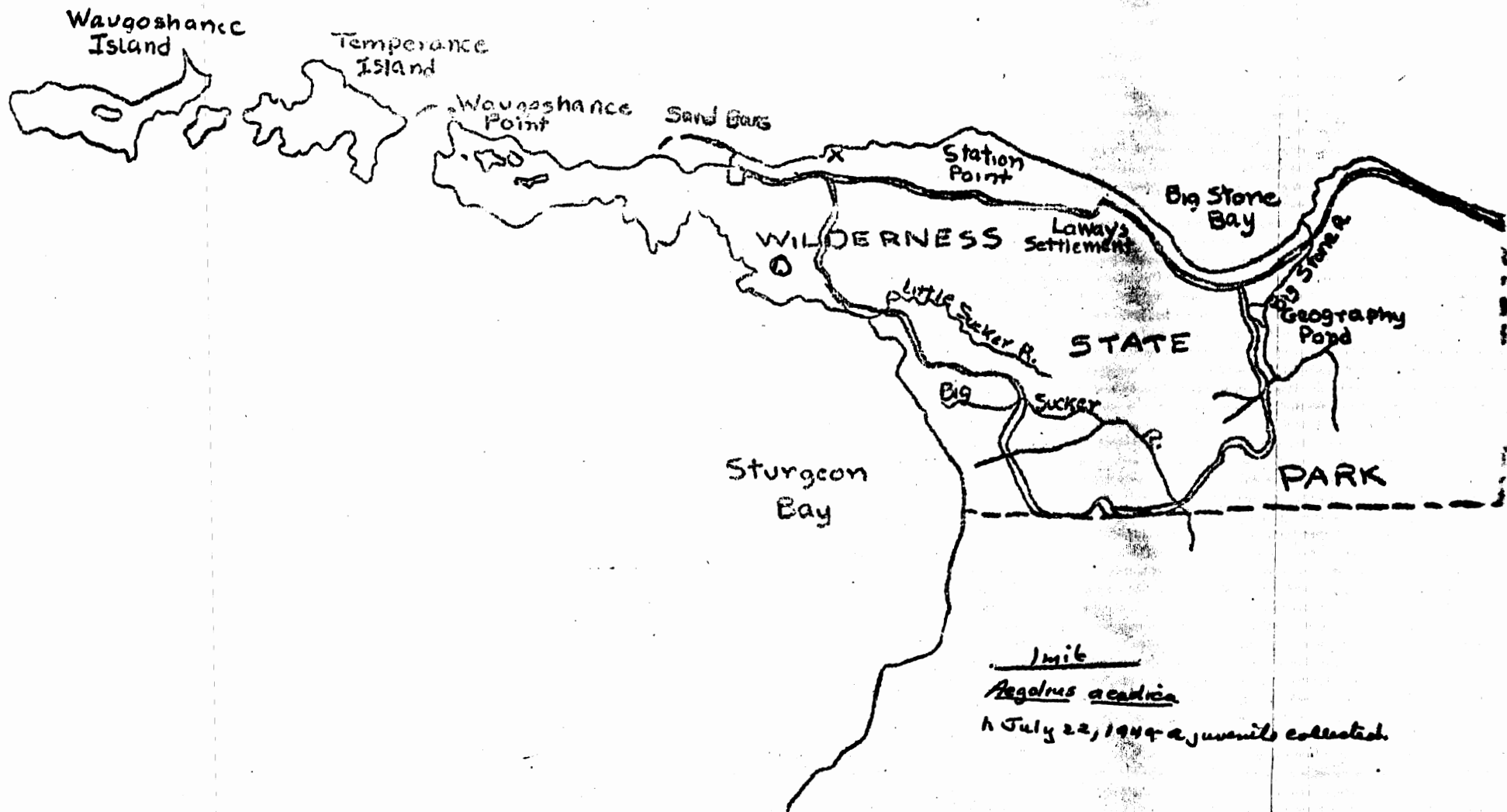


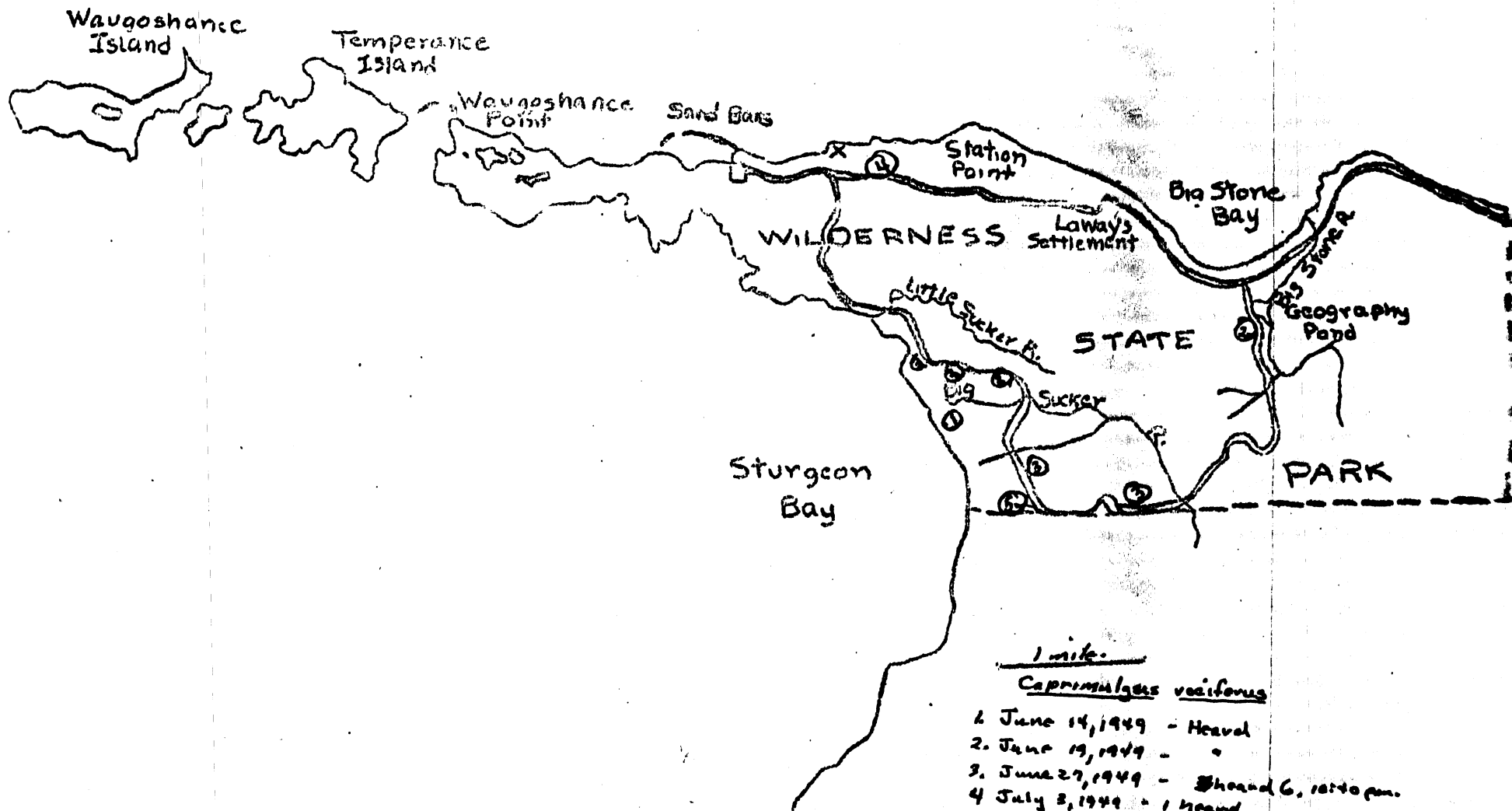






1 mile
Bubo virginianus
 1. June 29, 1949 - Heard 3 in this area 10:40 pm.

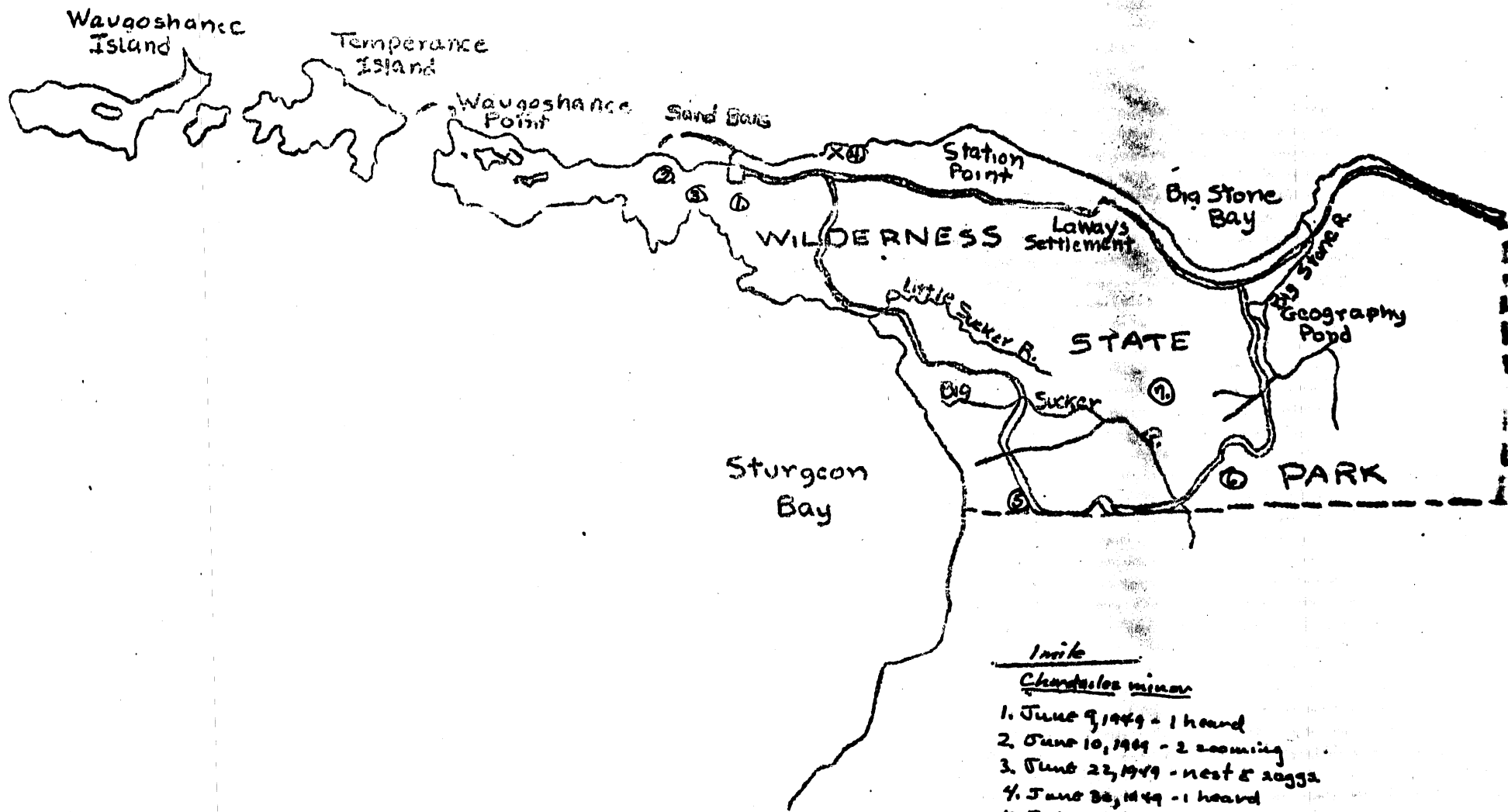




1 mile.

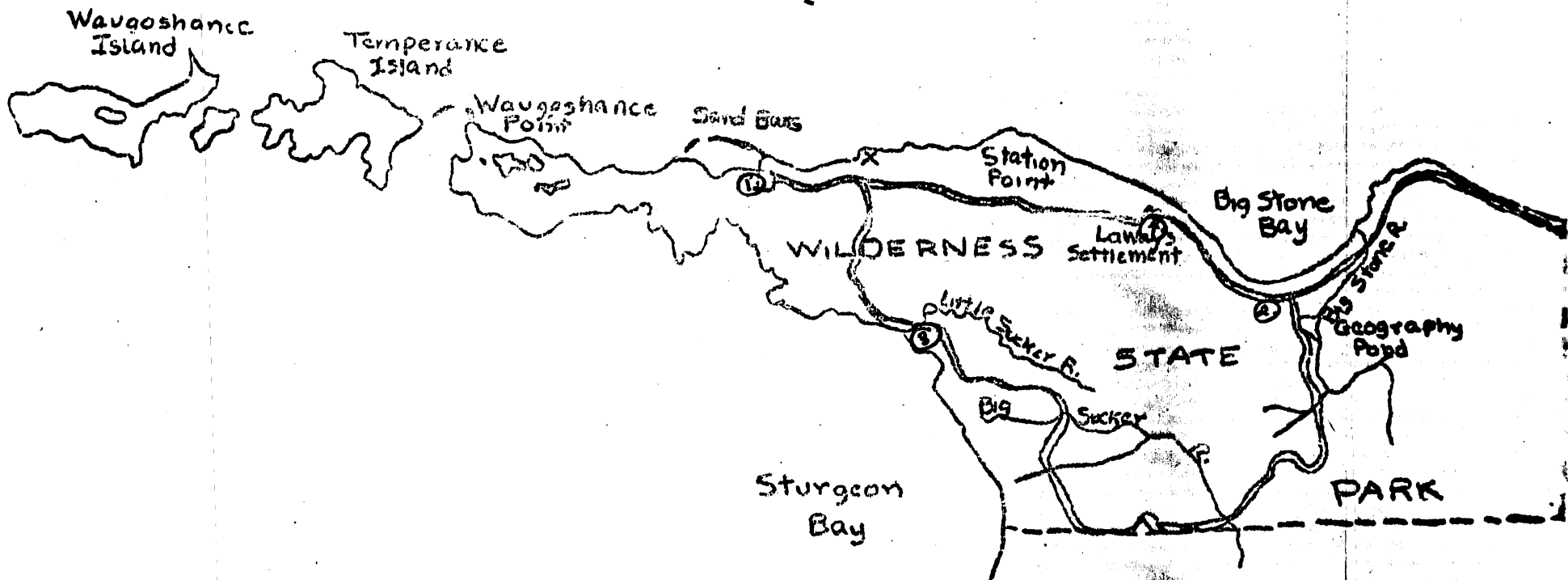
Caprimulgus vociferus

1. June 14, 1949 - Heard
2. June 19, 1949 - "
3. June 27, 1949 - Heard G. 10:40 pm.
4. July 3, 1949 - 1 heard
5. July 20, 1949 - 2 seen together on ground.



1 mile
Chordeiles minor

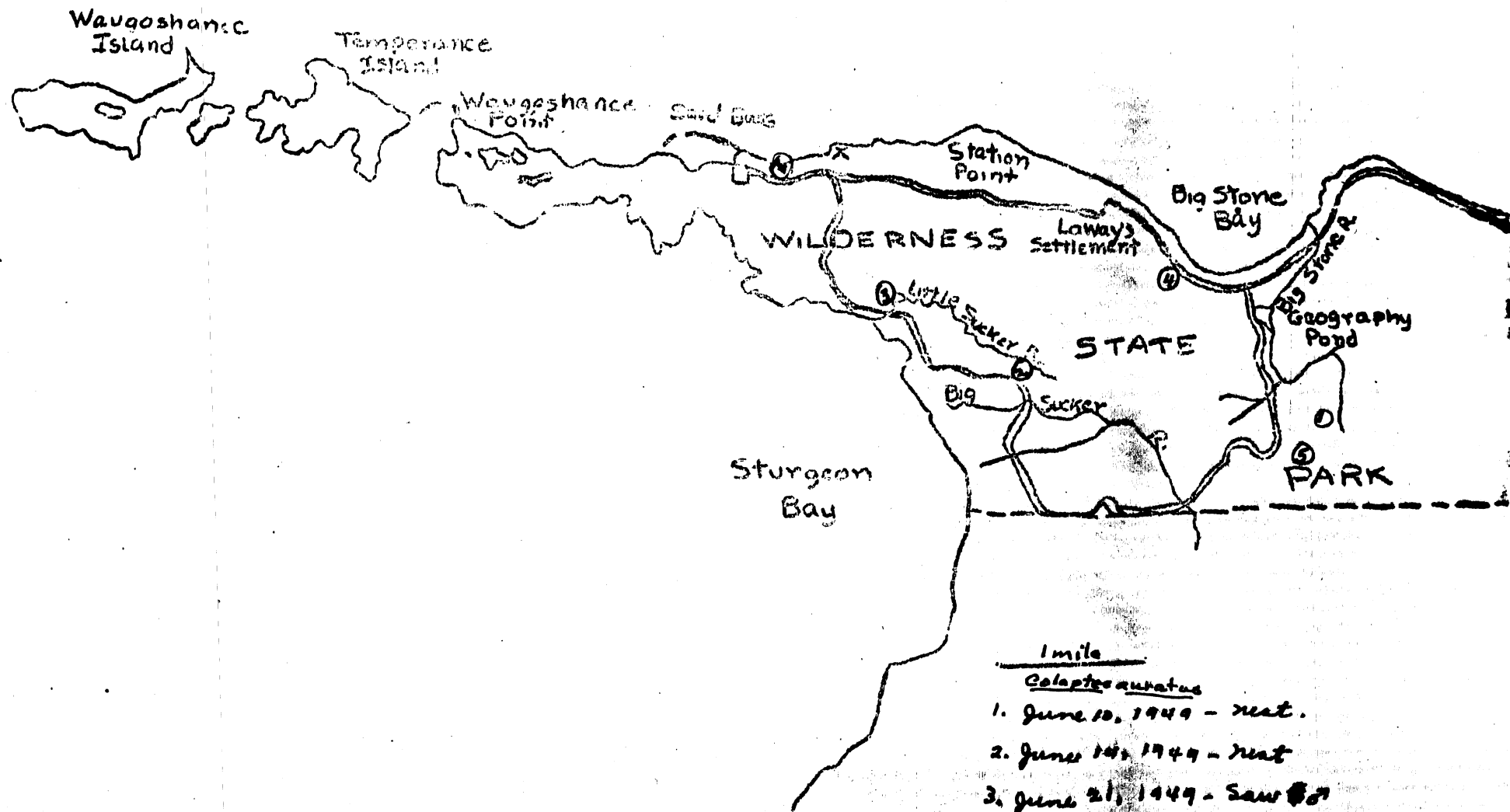
1. June 9, 1949 - 1 heard
2. June 10, 1949 - 2 swimming
3. June 23, 1949 - nest & eggs
4. June 28, 1949 - 1 heard
5. July 4, 1949 - 4 flying + swimming
6. July 6, 1949 - 1 seen
7. July 20, 1949 - nest & eggs.



1 mi/k

Chaetura pelagica

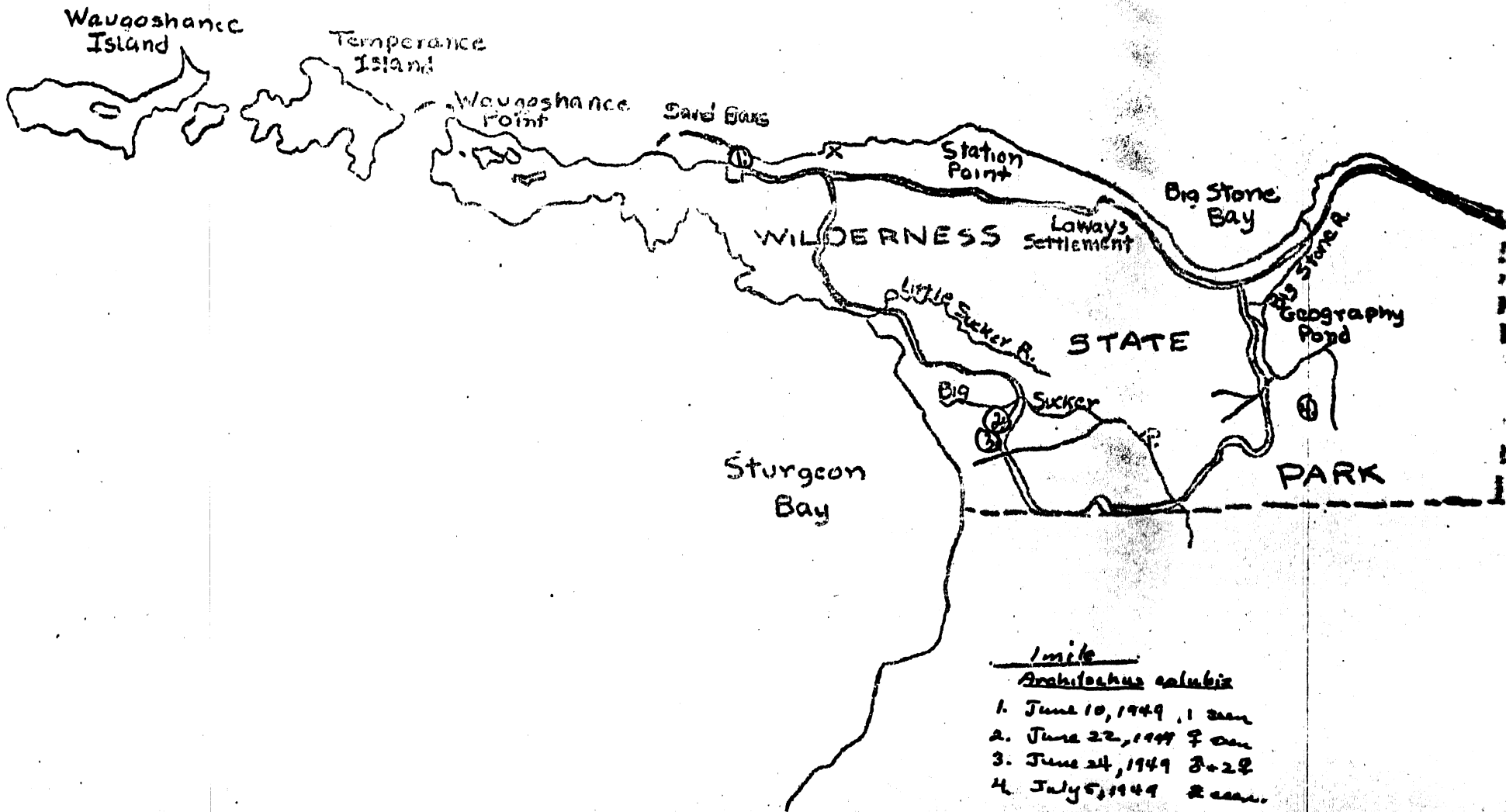
1. June 10, 1949 - 1 seen
2. June 21, 1949 - 2 seen
3. June 24, 1949 - 4 seen
4. June 30, 1949 - 1.



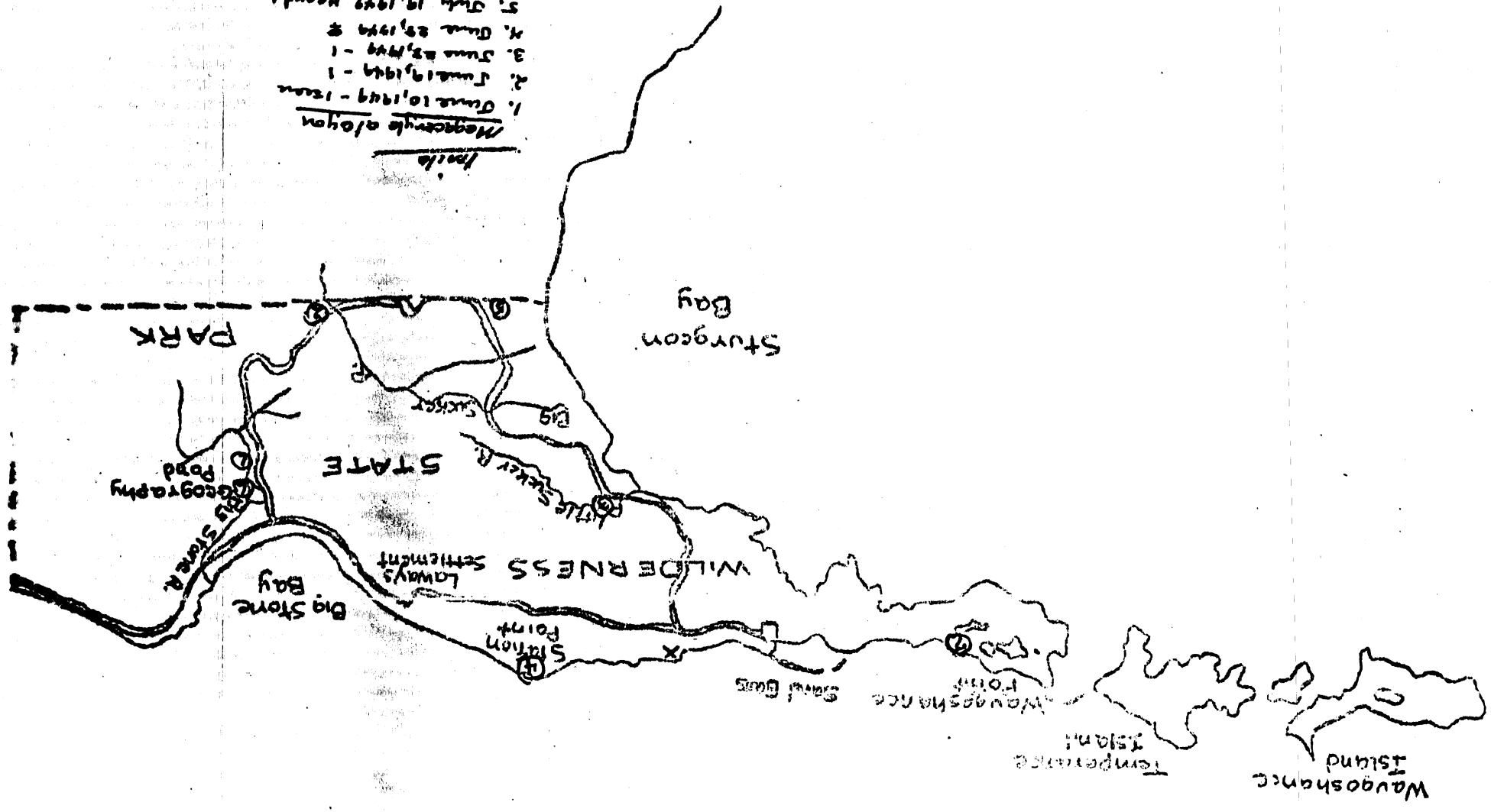
1 mile

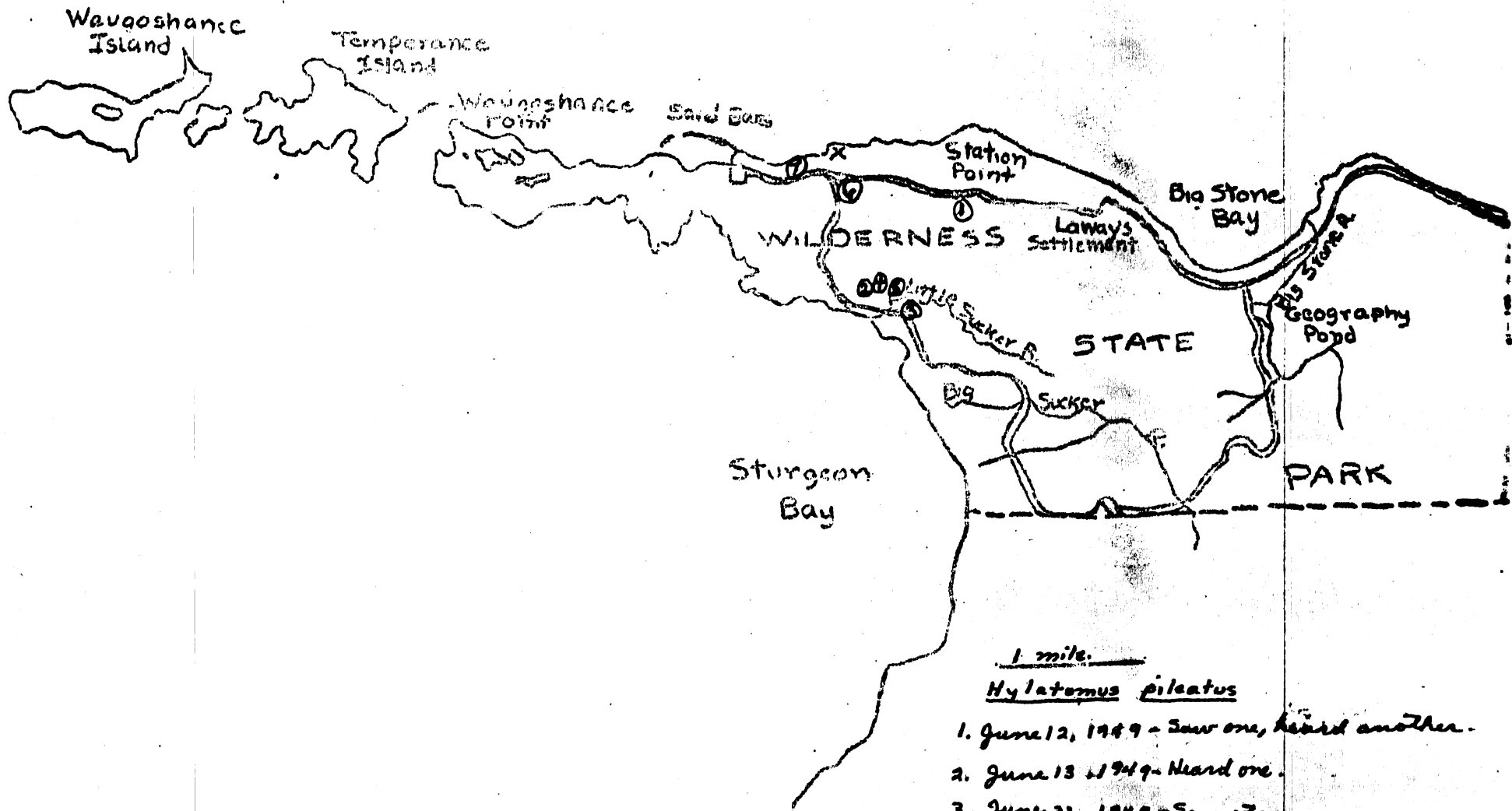
Colaptes auratus

1. June 10, 1949 - nest.
2. June 14, 1949 - nest
3. June 21, 1949 - Saw ♂
4. June 21, 1949 - Saw ♂
5. July 1, 1949 - Saw one
6. Aug. 4, 1949 - found nest.



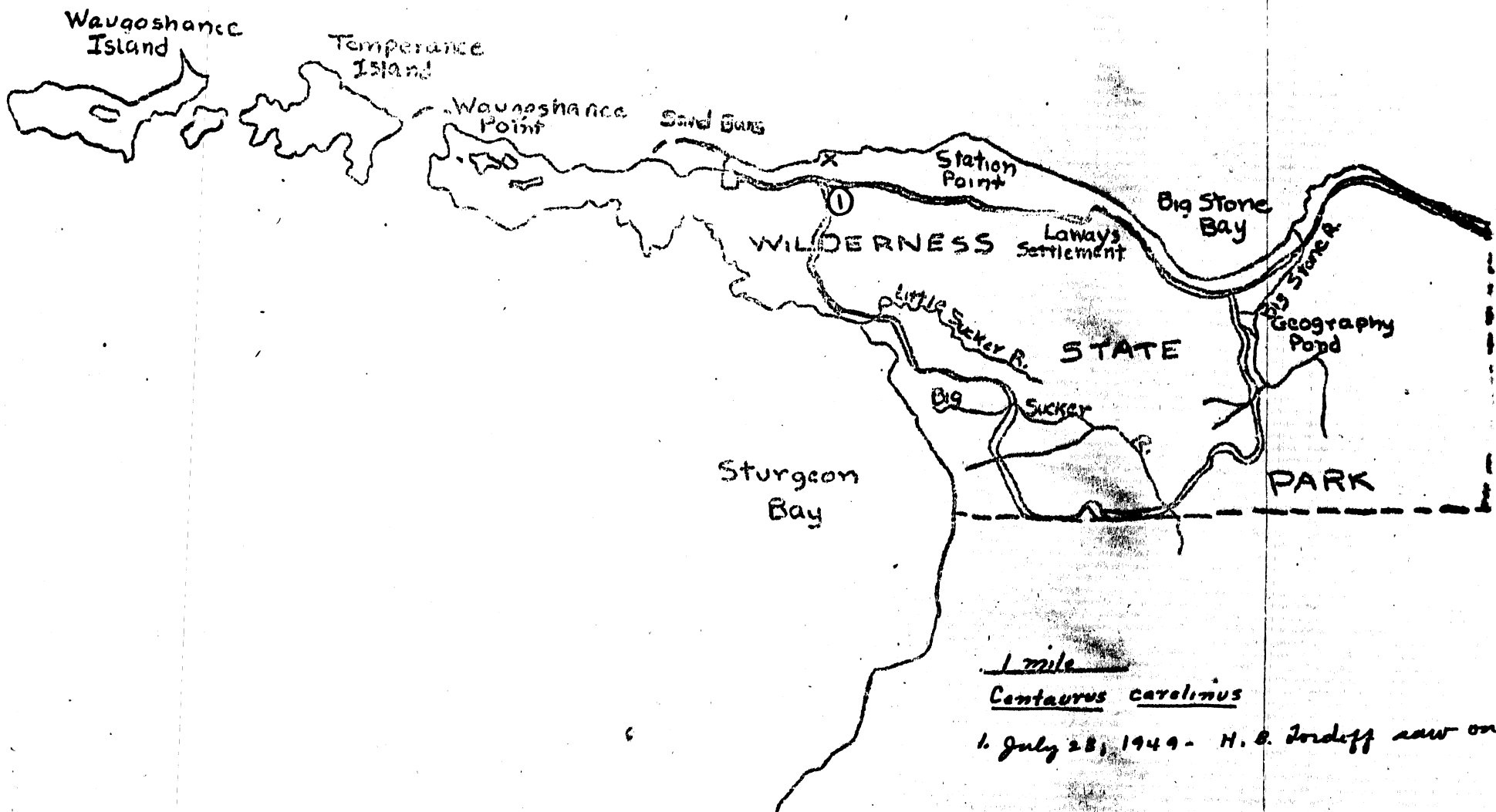
- Megascops asio
paths
1. June 10, 1949 - 1 year
 2. June 19, 1949 - 1
 3. June 25, 1949 - 1
 4. June 25, 1949 - 2
 5. July 19, 1949 head 1
 6. July 25, 1949 1 year
 7. July 25, 1949 1 year





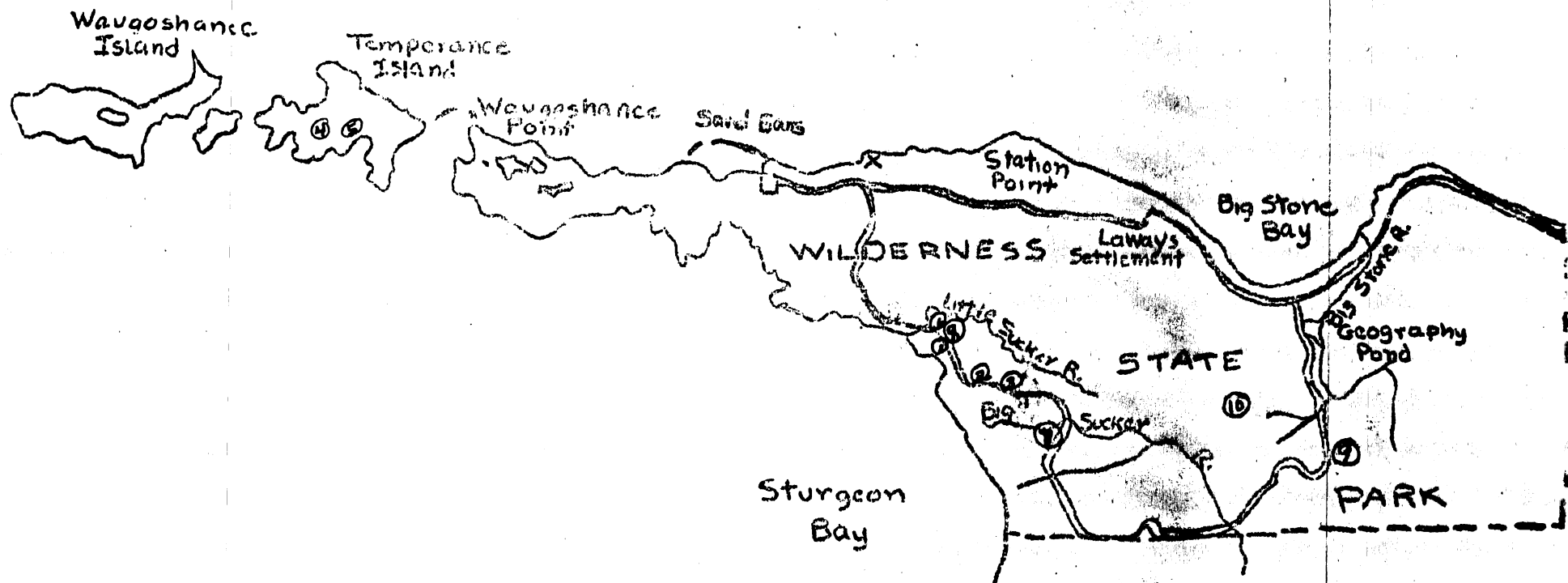
Hylatomus pileatus

1. June 12, 1949 - Saw one, heard another.
2. June 13, 1949 - Heard one.
3. June 22, 1949 - Saw 07.
4. June 24, 1949 - Saw one.
5. June 29, 1949 - Heard.
6. July 23, 1949 - Saw 3.
7. July 25, 1949 - Heard.



1 mile
Centaurus carolinus

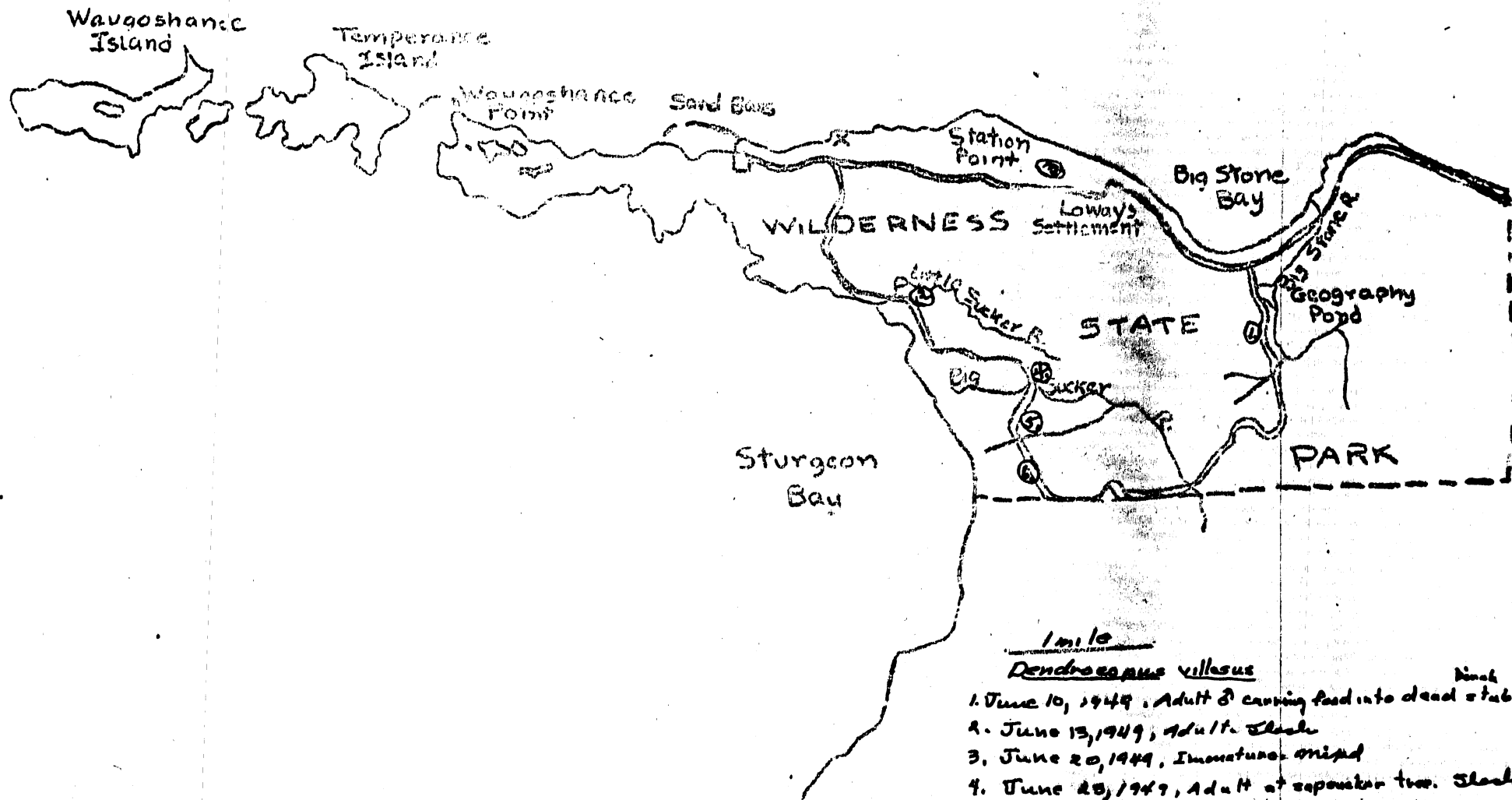
1. July 28, 1949 - H. B. Jordiff saw one.



1 mile

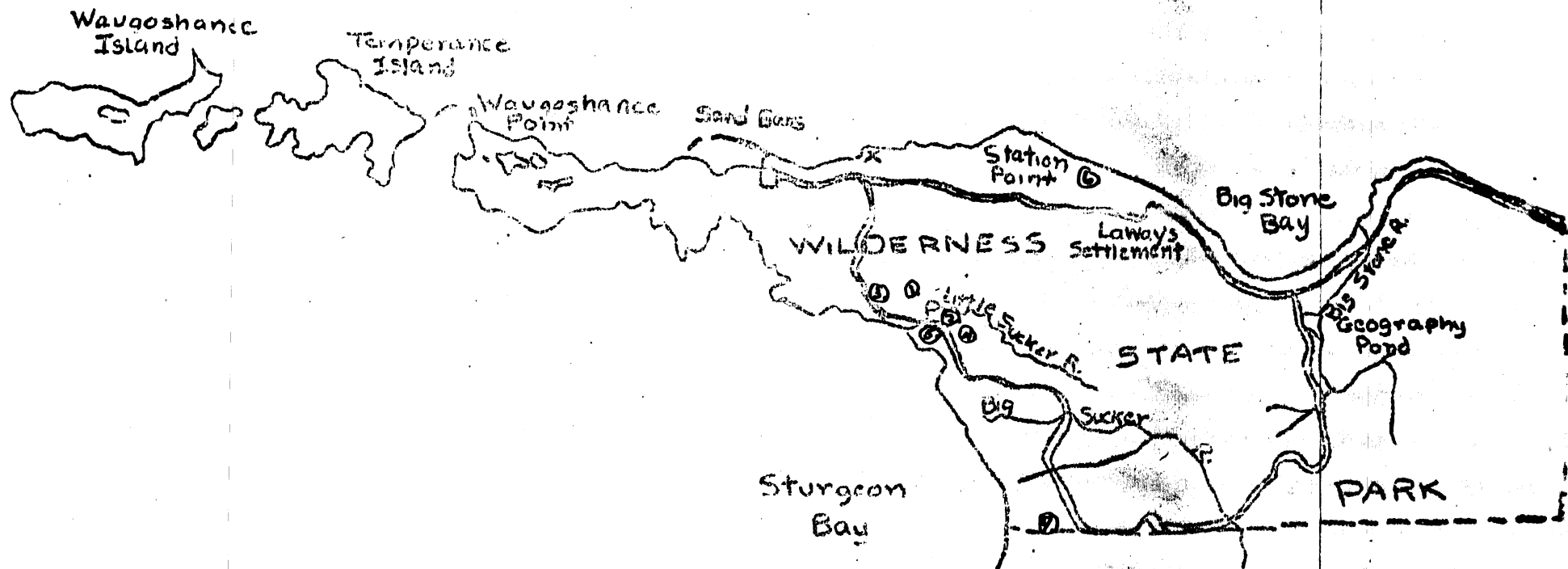
Sphyrapicus varius varius

- | | |
|-------------------------------------|------------------------------|
| 1. June 14, 1949 - Saw ♂. | 8. June 27, 1949 - nest |
| 2. June 14, 1949 - nest. | 9. July 1, 1949 - nest |
| 3. June 14, 1949 - nest. | 10. July 20, 1949 - saw one. |
| 4. June 16, 1949 - Saw evidence of. | |
| 5. June 16, 1949 - Saw evidence of. | |
| 6. June 20, 1949 - Saw one. | |
| 7. June 24, 1949 - saw ♂ and ♀ | |



Dendroscopus villosus

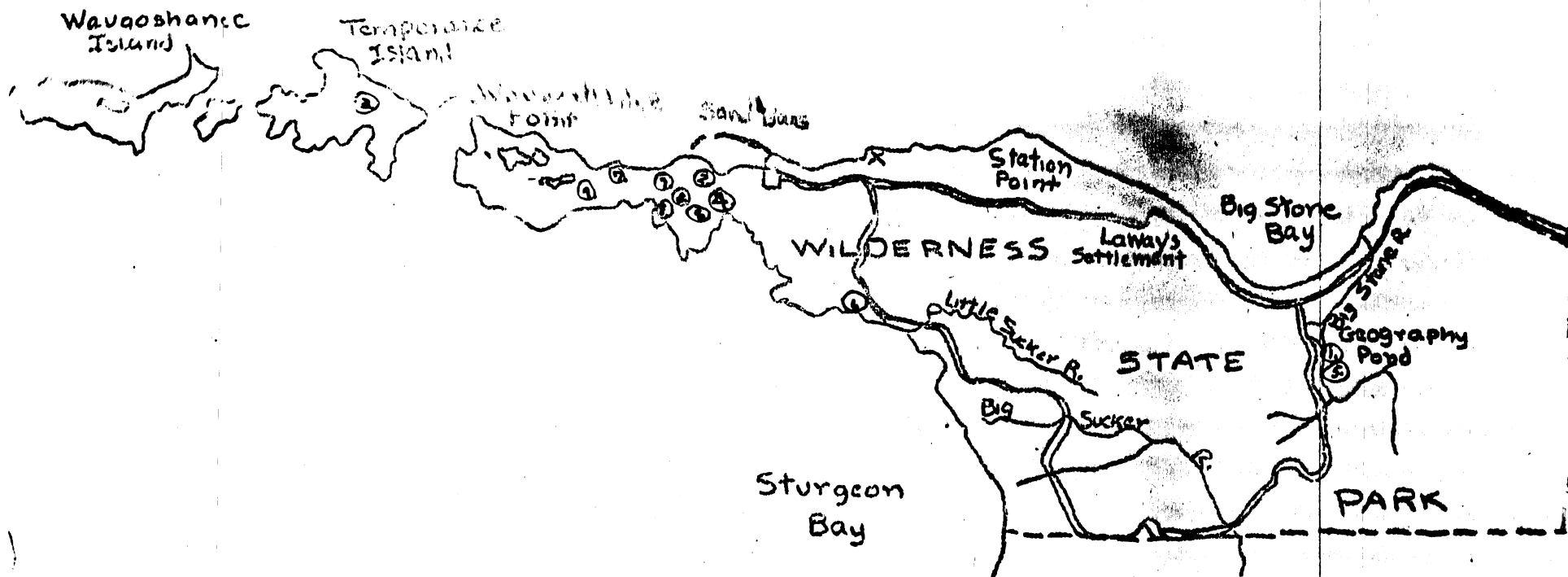
1. June 10, 1949, Adult ♂ carrying food into dead stub, ^{nest} midstream
2. June 13, 1949, Adult ♀, Slack
3. June 20, 1949, Immature, ^{nest} midstream
4. June 25, 1949, Adult ♂ copulating tree, Slack
5. June 24, 1949, 1 Adult, Slack
6. July 4, 1949, 2 adults, ^{nest} common weed.



1 mile

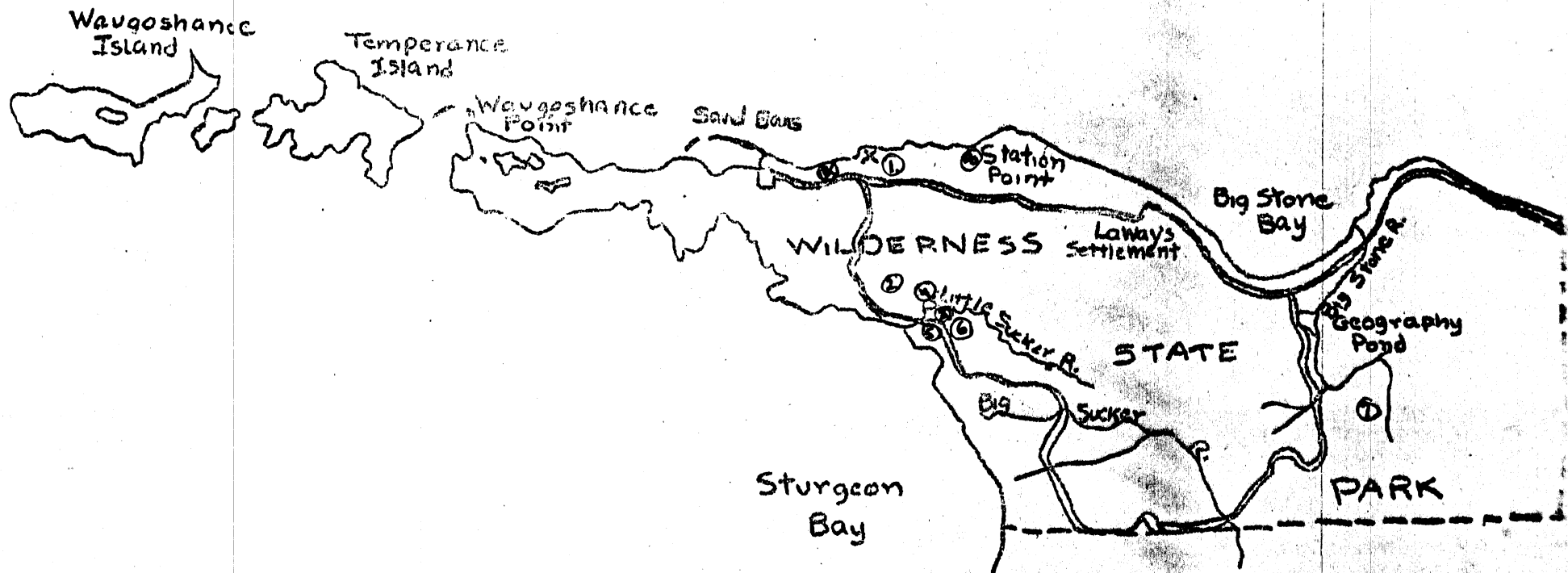
Ondrocopus pubescens

1. June 13, 1949, 1 adult. Slacks.
2. June 13, 1949, 1 adult. Slacks.
3. June 14, 1949, adult ♀. Coniferous woods.
4. June 22, 1949, 1 adult. Slacks.
5. June 24, 1949, ♂ at aspen tree. Slacks.
6. July 13, 1949, Family group. Mired.
7. July 19, 1949, juvenile. Coniferous.



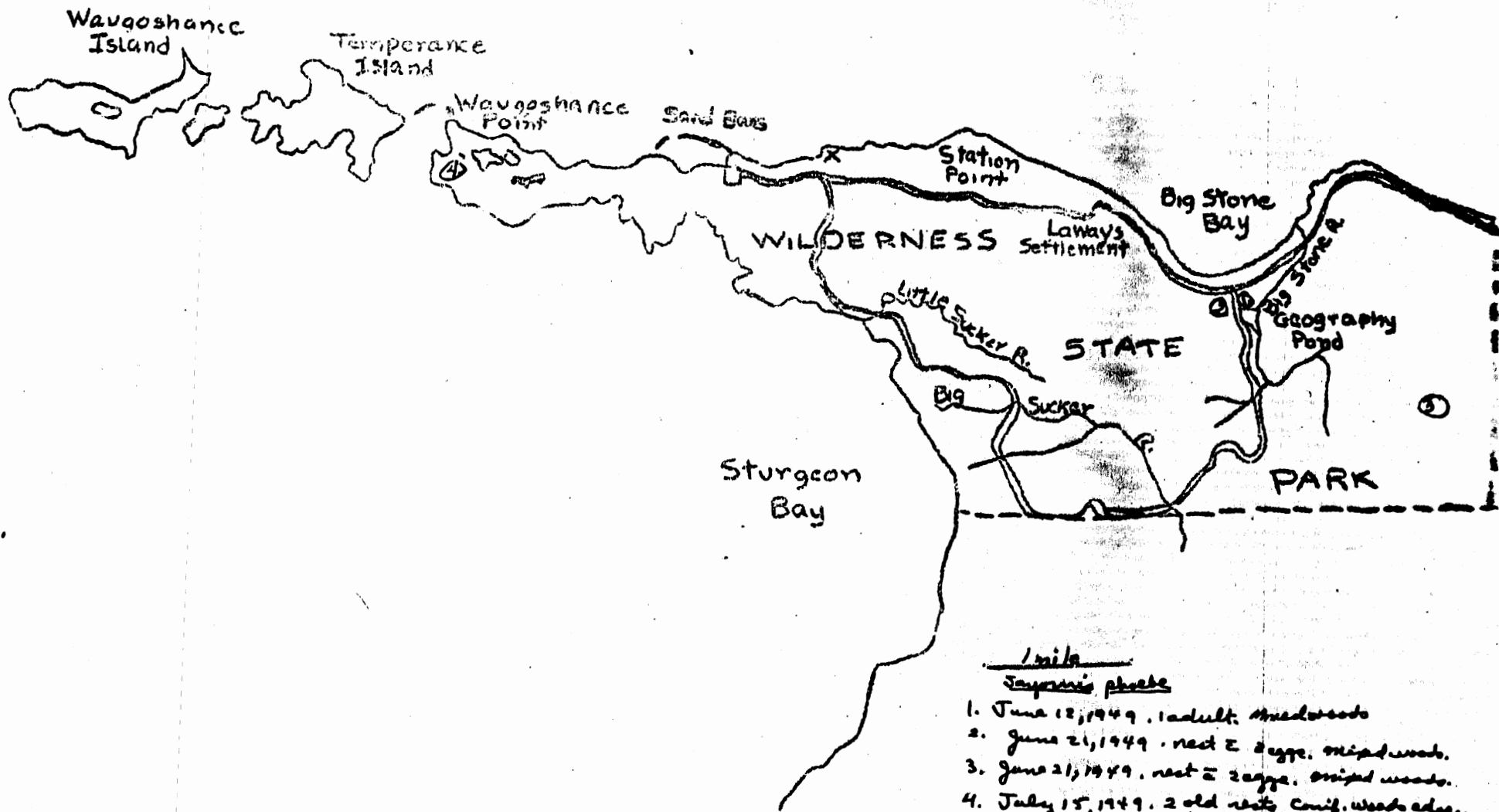
1 mile
Tyrannus tyrannus

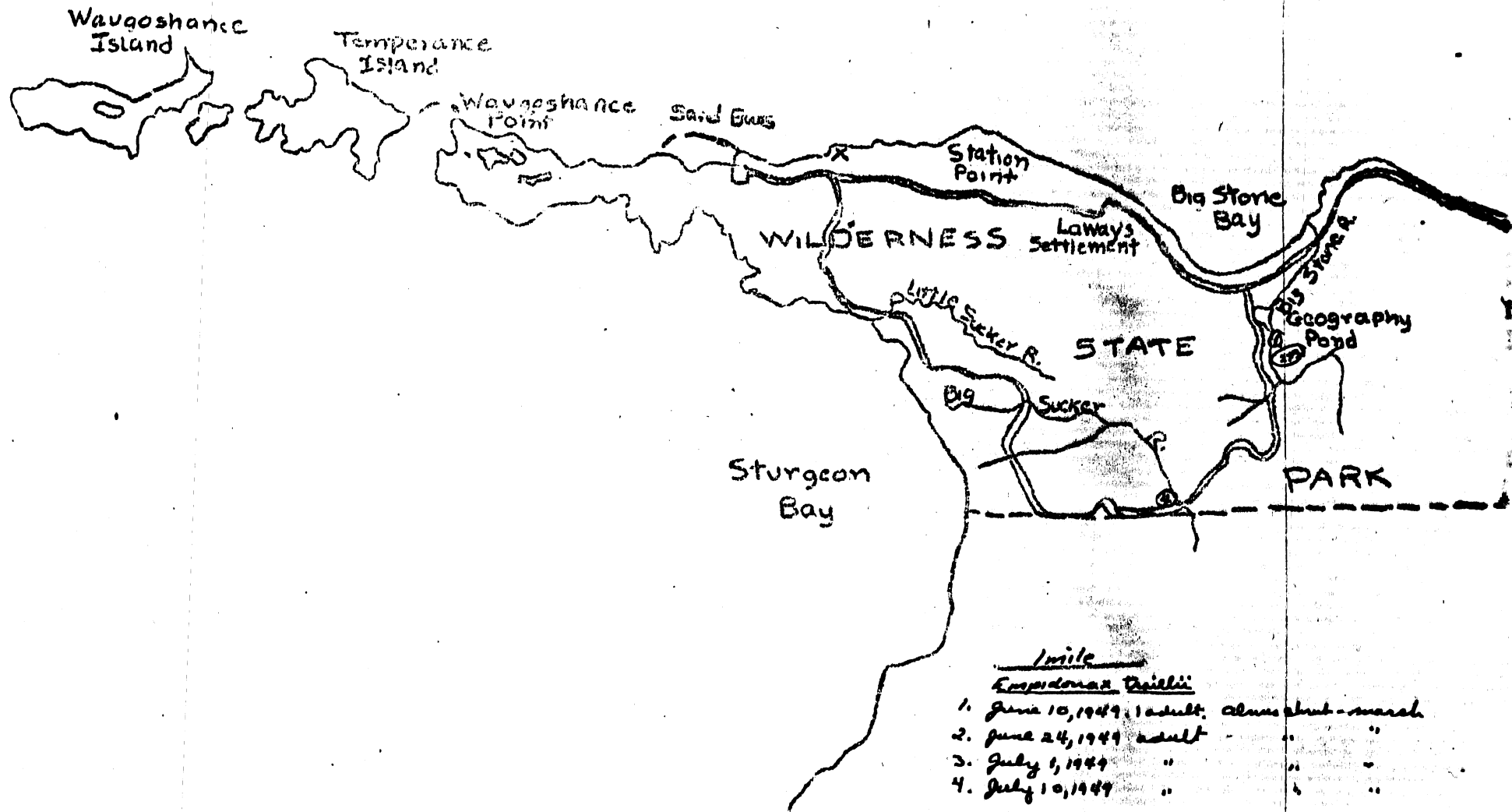
1. June 10, 1949 1 Adult. Almas-shok
2. June 15, 1949 1 Adult. Thaja-mash
3. June 19, 1949 nest E eggs Thaja-mash =
4. June 20, 1949 nest 2 eggs =
5. June 24, 1949 pair. Almas-shok
6. July 11, 1949 1 Adult.
7. July 13, 1949 nest Thaja-mash =
8. July 14, 1949 nest =
9. July 15, 1949 nest =

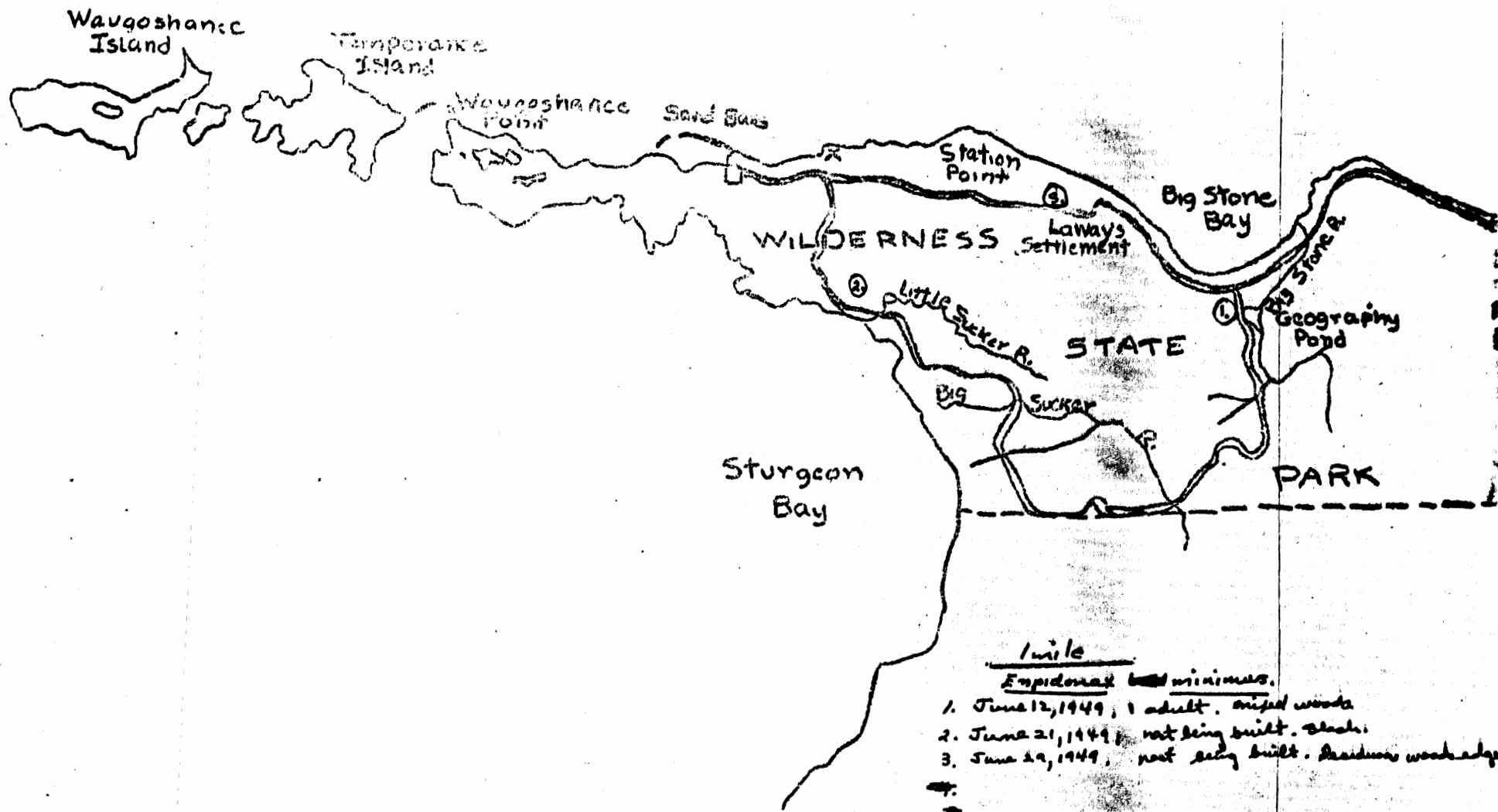


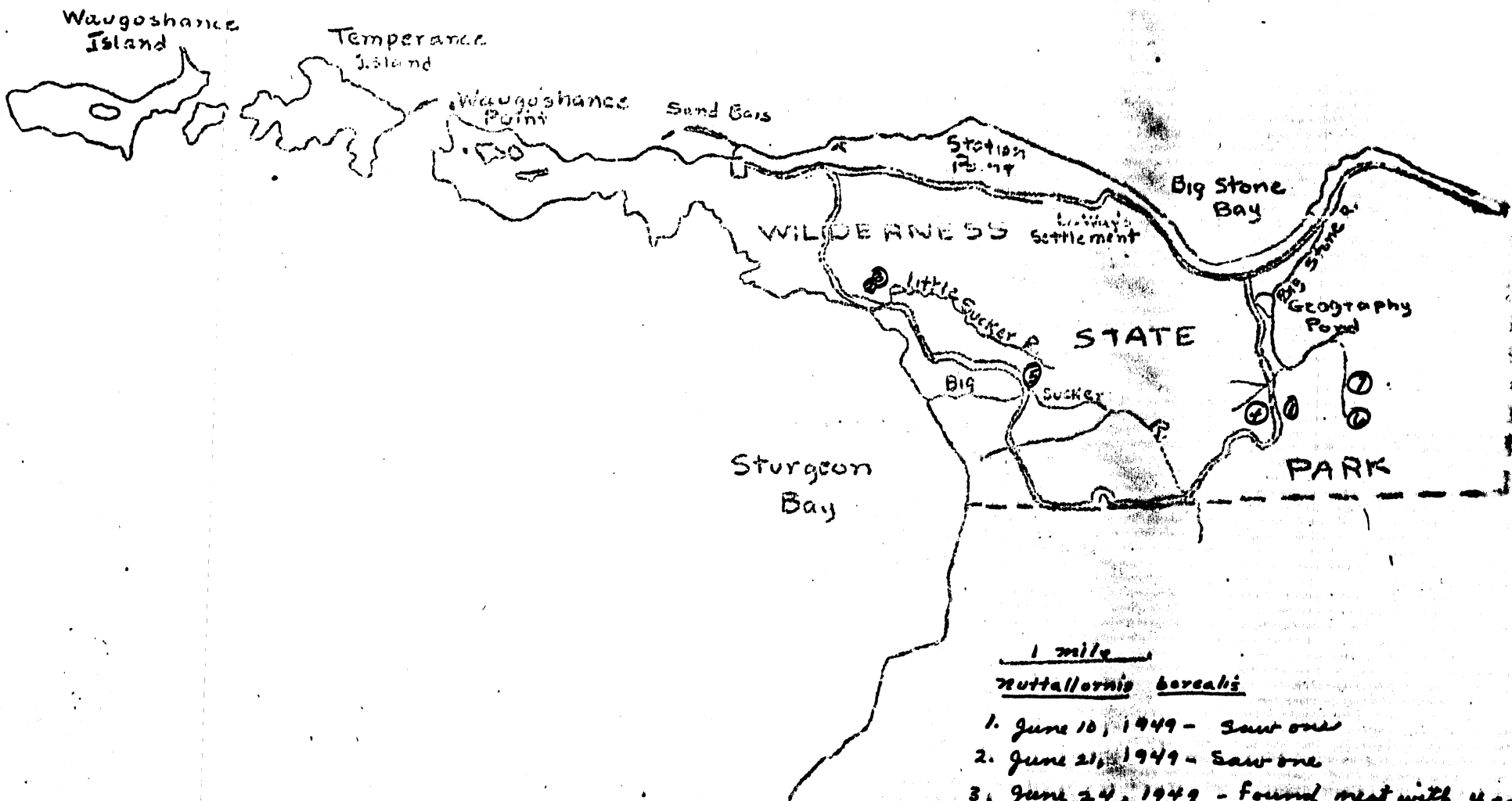
1 mile
Myiarchus cinerascens

1. June 13, 1949. 1 adult. mixed woods.
2. June 13, 1949. pr. of nest. slash.
3. June 13, 1949. 1 adult. slash.
4. June 16, 1949. adult. slash.
5. June 21, 1949. adult. slash.
6. June 22, 1949. adult at sapwood tree.
7. July 5, 1949. 1 adult.
8. July 7, 1949. 1 adult.









Mutallornis borealis

1. June 10, 1949 - Saw one
2. June 21, 1949 - Saw one
3. June 24, 1949 - Found nest with 4 eggs
4. July 1, 1949 - Saw one
5. July 4, 1949 - Heard
6. July 5, 1949 - Saw one carrying nesting material
7. July 5, 1949 - Heard



*The Summer Birds of
Wilderness State Park, Michigan*

by
Olin Sewall Pettingill, Jr.
Richard R. Graber, and
Jean W. Graber

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Contribution from The University of Michigan Biological Station



OLIVE-SIDED FLYCATCHER NESTING IN WILDERNESS STATE PARK

Photographed by Olin Sewall Pettingill, Jr.

*The Summer Birds of Wilderness State Park, Michigan**

*by Olin Sewall Pettingill, Jr.,
Richard R. Graber, and
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INTRODUCTION

Since 1909, when the University of Michigan Biological Station in northern Lower Michigan began operation, the staff and students at that summer institution have undertaken innumerable field studies in its vicinity. During the early years they directed their attention mainly to places near Douglas Lake, Cheboygan County, where the Station is located, but later, as roads and other transportation facilities improved, they gradually started working at points farther away. By the 1920's they were finding the area in Emmet County that is now Wilderness State Park, about 25 miles from the Station in extreme northwestern Lower Michigan, exceptionally interesting, unusually productive, and worthy of continued investigation.

Ornithologically, there is much that Wilderness Park has to offer. Extending into Lake Michigan, whose cool surface in the summer moderates the adjacent climate, the area supports extensive coniferous woods which in turn hold several bird species of northern affinities. Its varied environment — woods together with shrubby areas, ponds, marshes, sand flats, beaches, and Lake Michigan itself — provides different bird habitats and a consequent diversity of bird species. And finally, its situation with relation to the vast expanse of Lake Michigan to the north and northwest makes it "first land" to many south-bound birds crossing Lake Michigan; thus in the late summer and early fall it teems with such migrants as thrushes, vireos, warblers, and fringillids.

This treatise is an inventory of data accumulated by Station personnel combined with a report on an original study made by Richard R. Graber and Jean W. (Mrs. Richard R.) Graber as a requirement for their course work at the Station.

Data gathered by Station personnel have in a few instances been published, but most of the material has remained on file in Blanchard Laboratory. The senior author has reviewed all of this information and prepared the summaries herein presented. A large proportion of the observations on occurrence of species were obtained during ornithology class trips led by Frank N. Blanchard (in 1922-27, 1929-37), S. Charles Kendeigh (1946), and the senior author (1938-45, 1947-56). Theodora Nelson, class assistant on many of these trips (1925-1940) and an investigator at the Station since, played an important role in the gathering of records. Because the Station has held its summer session each year from late June through mid-August, most of the information has been obtained only during that period. The main exceptions are those records by personnel who have arrived at the Station in advance of the session or stayed after it.

For two weeks in 1948 (August 16-26) and six weeks in 1949 (June

*Contribution from The University of Michigan Biological Station

9-July 25) the junior authors undertook a study of the summer birds of Wilderness Park, paying special attention to relative abundance, ecological distribution, and breeding status. The results of their work, incorporated in this treatise, were first summarized in a report, "A Summer Study of the Birds of Wilderness Park," submitted on August 13, 1949, as a course requirement at the Station.

The Grabers chose for their study area in the Park a section of about eight square miles (5,000 acres), extending from Waugoshance Island inland to and including the immediate vicinity of Big Stone Creek (see map). They set up camp in the Park to avoid loss of time in travel between the Park and the Station. During over 400 hours of field work, they explored systematically their entire study area, usually covering a new part each day, and made return visits to spots that were especially rewarding. They kept notes on all species encountered, recording dates and numbers of individuals seen, kinds of habitats in which the various species were found, and observations on breeding activities. White cloth markers were hung near active nests or the sites of prospective nests so that they could be easily found for checking on any subsequent nesting events. A concerted effort was made to secure substantial evidence of breeding of every species believed to be a permanent or a summer resident in the Park. The Grabers also mapped out the principal bird habitats in their study area. The distribution of bird habitats shown on the map is based largely on their findings.

The senior author wrote the final draft of this treatise and he alone is responsible for its style, wording, and accuracy.

We are grateful to the Department of Conservation of Michigan, particularly to Grant Wykhuis, Superintendent of Wilderness Park until recently, who gave us the use of numerous facilities and provided valuable information relative to the Park. We are also indebted to the following persons who helped variously: Andrew J. Berger, Walter P. Nickell, and Robert A. Whiting for the use of Park breeding records; George Miksch Sutton and Harrison B. Tordoff for assistance in the collection and preparation of specimens; and Theodora Nelson for advice and suggestions with regard to the summarization of records.

THE PARK AREA

Wilderness State Park, which includes Waugoshance Point and outlying Waugoshance Island, is an area of 8,035 acres comprising approximately 30 miles of Lake Michigan shore, three small streams, four small ponds, several marshes, open sand flats and dunes, and extensively wooded land. The Point, a small peninsula, extends about three miles westward into Lake Michigan from the Park proper and separates Big Stone Bay on the north from Sturgeon Bay on the south. Between the Point and Island is a channel, the Big Cut, in which there is a tiny gravel-sand bar named Temperence (*sic*) Island.

Topography

The shore of Lake Michigan within the boundaries of the Park ranges from broad to narrow and is variously sandy, gravelly, bouldery, and marshy. On the north, from the eastern boundary to the end of Waugoshance Point and from the eastern to western tips of Waugoshance Island, the shore is a gravel-sand beach gradually decreasing in breadth, with a few sand spits at

widely spaced intervals. Just off shore, running for several hundred yards eastward from the Boat Landing (see map) and parallel to the shore, is a series of gravel-sand bars (some are slightly submerged) which serve to form, between them and the shore, an almost separate body of water with the general appearance of a lagoon. The beach, for nearly all its length, is backed by dunes; most are rather low and all are partially "captured" by a scanty growth of plants. Inland from the dunes, between the Boat Landing and the end of the Point, are three beach pools. The easternmost is less than an acre in extent, but the other two are larger and together cover several acres. On the south side of the Park, the shore of Lake Michigan from the southern boundary to the western tip of Waugoshance Island is generally low and wet, in places decidedly marshy. Boulders are numerous; though mainly scattered, they are almost continuous along a few stretches of shore.

Waugoshance Island and Point have a low-lying terrain, with the dunes along their northern shores giving the only relief. Eastward from the base of the Point the terrain rises gradually and becomes gently rolling, owing in part to many dunes which have long since been completely captured by vegetation. The highest point in the Park, reached on Mt. Nebo in the northeastern part, is about 655 feet above sea level and 75 feet above the surface of Lake Michigan.

The three small streams in the Park are Big Stone Creek, flowing north into Big Stone Bay, and Big and Little Sucker Creeks emptying into Sturgeon Bay. Along their courses swampy or boggy conditions prevail, largely as a result of numerous beaver dams that have slowed the water flow. All four small ponds are shallow. Big Stone Pond, the largest (covering three to four acres), is artificial, made by the damming of Big Stone Creek not far inland from its mouth on Big Stone Bay. It has a soft bottom while its shore is marshy and vegetated abundantly. The other ponds are considerably smaller. One, Little Sucker Pond, is an interruption of Little Sucker Creek formed by a beaver dam. The remaining two, unnamed, lie on the Park's southern boundary.

Climate

The summer climate of the Park is moderately cool, the average temperature being 65.7° F. in July and 65.6° F. in August. Rainfall averages 2.09 inches in July, 1.84 inches in August, and 30.65 inches annually.

RECENT HISTORY

The original forests of the Park area were subjected to extensive lumbering and severe fires, with the result that no virgin stands of trees remain. The last commercial lumbering occurred about 1840 and the last big fire about 1890.

In 1921, most of the area which now constitutes the Park was purchased by the state of Michigan as a game refuge and placed under the administration of the Game Division of the Department of Conservation. Five years later the administration was taken over by the Park Division and a resident superintendent was soon placed in charge. Never acquired by the state is the so-called Laway Settlement fronting on Big Stone Bay. This little area, with its cultivated land and buildings belonging to several families, exists as an en-

clave of private properties within the Park.

Among the first structures to be erected in the Park area were a home for the superintendent, and maintenance buildings. During the early 1930's the Civilian Conservation Corps established its camp, which included nearly a dozen buildings, and constructed roads and trails together with public camping, picnicking, and parking facilities and four overnight cabins in remote parts of the Park. The C.C.C. also built the dam across Big Stone Creek, creating Big Stone Pond. In later years the camp buildings vacated by the C.C.C., but still known as the Old C.C.C. Camp, were used successively as a summer camp by the Department of Geography of the University of Michigan (1940-1951) and as a year-round camp for state prisoners (1951-1956). The public camping grounds set up by the C.C.C. (now called the Old Camp Grounds) were abandoned recently when newer and more commodious camping grounds (called simply Camp Grounds) were made available on Big Stone Bay.

BIRD HABITATS

The principal bird habitats in Wilderness Park are outlined below as a guide to the distribution of birds in the area. The order in which the habitats are taken up is purely arbitrary, there being no attempt to demonstrate ecological succession.

Pine Woods. Stands of red pine (*Pinus resinosa*) and white pine (*P. strobus*) with some intermingling of spruce (*Picea* sp.), balsam-fir (*Abies balsamea*), white cedar (*Thuja occidentalis*), aspen (*Populus* sp.), and white birch (*Betula* sp.) and a ground cover of blueberry (*Vaccinium myrtilloides*) and bracken (*Pteridium aquilina*); primarily a forest-edge habitat situated along the north shore of Waugoshance Point between Station Point and the Boat Landing, and along the south shore of Waugoshance Point between the southern boundary of the Park and Goose Bay (a subdivision of Sturgeon Bay). The breeding birds most typical of this habitat are the Parula Warbler and Pine Warbler. Among the other breeding species to be found commonly here are the Whip-poor-will and Hermit Thrush.

Aspen Woods. Almost pure stands of aspen with a ground cover mainly of bracken. Vast but discontinuous tracts of aspens are a noticeable feature of the drier uplands of the Park's interior. The largest, about three miles long and a half mile wide, lies across the north-central part of the Park. Although there are no breeding birds to be thought of as typical of the aspen woods, the Least Flycatcher and Red-eyed Vireo are commoner in this habitat than in any other.

Coniferous-Deciduous Woods. The same plant elements of the aforementioned pine woods, together with red maple (*Acer rubrum*), scattered ash (*Fraxinus* sp.), and occasional red oak (*Quercus rubra*), and a ground cover that also includes striped maple (*Acer pensylvanicum*) and bunchberry (*Cornus canadensis*). In some parts of this habitat coniferous trees predominate, in others deciduous. The most extensive coniferous-deciduous woods with the biggest trees are directly inland from the pine woods with which they blend. The breeding birds most regularly associated with this particular environment are the Solitary Vireo, Black and White Warbler, and Black-throated Blue Warbler. The Red-breasted Nuthatch, Brown Creeper, Olive-

backed Thrush, Black-throated Green Warbler, and Blackburnian Warbler are present where the trees are mainly coniferous, the Pileated Woodpecker (occasionally), Hairy Woodpecker, and Eastern Wood Pewee where the trees are mainly deciduous.

Shrubby Areas. Mixed growths of red osier (*Cornus stolonifera*) and raspberry (*Rubus* sp.) with scattered low aspen, birch, balsam-fir, and spruce, also an occasional tall tree (usually an aspen or birch) or a dead stub. This kind of habitat has developed extensively in the north-central and southwestern parts of the Park where the timber has been cut rather recently. Characteristic breeding birds of these cut-over areas include the Mourning Dove, Olive-sided Flycatcher, House Wren (where there is considerable slash), Brown Thrasher, Mourning Warbler, Rufous-sided Towhee, White-throated Sparrow, and Song Sparrow.

Cedar Woods. Pure stands of white cedar, with the ground below so greatly shaded as to discourage any appreciable cover. Although cedars sometimes reach heights of 50 feet or more, ordinarily they are much lower. On Waugoshance Point and Island cedars flourish in dense, almost impenetrable clumps, the taller trees in the center, the lower massed around the edge. Over many acres elsewhere in the Park cedars grow abundantly, but in somewhat more open stands. The cedar woods are a habitat for a surprisingly wide variety of breeding birds that includes the Saw-whet Owl, Winter Wren, Brown Thrasher, Veery, Golden-crowned Kinglet, Black and White Warbler, and Yellow Warbler.

Spruce-Tamarack Bogs. Usually a mixture of black spruce (*Picea mariana*) and tamarack (*Larix laricina*) in company with alder (*Alnus* sp.) and a few balsam-fir and white cedar; the trees often widely spaced so as to permit a rich ground cover of sedges, rushes, and other herbaceous plants, but now and then standing close together with only a spare assortment of mosses and other small plants below them. Most all the large bogs lie along the three creeks; the others are not far away in lowlands where the drainage is poor. Prominent in the breeding avifauna of these moist places are the Red-breasted Nuthatch, Winter Wren, Golden-crowned Kinglet, Nashville Warbler, and Canada Warbler (usually near the edges).

Alder Thickets. Pure stands of alder growing densely, generally on the wet periphery of bogs and marshes. The Woodcock, Traill's Flycatcher, Chestnut-sided Warbler, and Yellow-throat are the breeding species most frequently associated with this habitat.

Bulrush Marshes. The dominant vegetation mainly two species of bulrushes (*Scirpus acutus* and *S. americanus*) with scattered patches of cattails (*Typha latifolia*); near the edges in shallower water, sedges and other emergent aquatic plants are common. The larger marshes are on Waugoshance Point and Island. The only marsh of any noteworthy size in the Park proper is south of Big Stone Pond. This has the peculiar feature of many high stubs, remnants of woods that preceded the formation of the marsh. Bird species definitely known to breed regularly in the Park marshes are the American Bittern, Virginia Rail, Short-billed Marsh Wren, Red-wing, and Swamp Sparrow. Others that presumably breed regularly are the Marsh Hawk, Sora, and Wilson's Snipe.

Ponds. Among the four ponds, only Big Stone Pond has been given any careful attention by the authors and other Station personnel. The Spotted Sandpiper nests regularly near its margin and possibly the Pied-billed Grebe has bred occasionally on the pond itself. The Great Blue Heron, Black Duck, Blue-winged Teal, Wilson's Snipe, and several species of transient shore birds frequently visit its marshy edges for feeding purposes.

Sand Flats. Wide-level stretches of sand and loose stones, usually dry and generally barren except for a scanty growth of such herbaceous plants as grasses, shrubby cinquefoil (*Potentilla fruticosa*), and painted-cup (*Castilleja* sp.). All such areas are confined to the outer parts of Waugoshance Point and to Waugoshance Island. Three bird species are known to breed here, namely, the Killdeer, Common Nighthawk, and Vesper Sparrow.

Beach Pools. Shallow, with a thin fringe of bulrushes and a few other marsh plants. The three beach pools are of ornithological interest mainly as feeding and loitering areas for a few ducks and shore birds.

Gravel-Sand Beaches and Bars. Generally devoid of vegetation. The Piping Plover nests on the open beaches and bars, the Spotted Sandpiper back from the beaches where there is plant cover. Besides being feeding grounds for the Killdeer and many species of transient shore birds, these places also serve as loitering areas for mergansers and large numbers of Herring Gulls, Ring-billed Gulls, Common Terns, and Caspian Terns.

The Lagoon. For the most part shallow, with marshy edges. Great Blue Herons and maturing broods of mergansers are the birds that most frequently feed in this partially land-locked body of water.

OUTSTANDING PLACES FOR BIRD FINDING

In the judgment of the senior author who has led class groups in the Park for 18 summers the places indicated below are the most productive for birds.

Big Stone Pond. Easily reached from the Entrance Road (see map) by turning south on the road that leads to the Old C.C.C. Camp. The Pond, which is in view from the Camp, is attractive after the middle of the summer to Pied-billed Grebes, a few broods of dabbling ducks, and such transient shore birds as the Solitary Sandpiper, Lesser Yellow-legs, and Pectoral Sandpiper.

Swamp Trail. A continuation south of the road to the Old C.C.C. Camp. The first two miles of this road, which eventually reaches Sturgeon Bay, goes through or passes in the immediate vicinity of aspen woods, a large marsh, tamarack-spruce bogs, and cedar woods. Among the birds that one may expect to hear or see during June or early July are the Common Sapsucker, Traill's Flycatcher, Short-billed Marsh Wren, Solitary Vireo, Nashville Warbler, Chestnut-sided Warbler, Canada Warbler, and Swamp Sparrow. Six miles from the Old C.C.C. Camp the Swamp Trail makes the second crossing of Big Sucker Creek and then traverses a cut-over area that is especially good for the Olive-sided Flycatcher, Mourning Warbler, and White-throated Sparrow.

Waugoshance Point Road. A continuation of the Entrance Road westward from the Laway Settlement to its end at the Parking Lot. During June and early July the coniferous-deciduous woods along the last three miles of the Road is the best in the Park for Olive-backed Thrushes and Black-throated

Blue Warblers. The Parula Warbler may be found by turning north from the Entrance Road on the trail to the Station Point Cabin on the shore, then walking west through the pine woods back of the dunes. Nests of the species should be looked for in *Usnea* lichen suspended from balsam-firs.

Outer Waugoshance Point. Roughly that part of the Point west of the Parking Lot; to be reached only by walking. This area may be explored by going west along the shore and returning by way of the interior. In the nesting season this trip should give every opportunity of observing Piping Plovers on the beach and/or bars, an occasional dabbling duck and perhaps a merganser (any of the three species) in the lagoon, and the association of birds peculiar to the cedar clumps back from the dunes. Most any time after the first of August a similar trip will very likely yield transient Semipalmated Plovers, Black-bellied Plovers, Least Sandpipers, Semipalmated Sandpipers, and Sanderlings on the beach; many mergansers, gulls, and terns on the bars; Solitary Sandpipers, Greater Yellow-legs, Lesser Yellow-legs, and Pectoral Sandpipers around the beach pools; great numbers of migrating or wandering passerine birds in the cedar clumps; and one or two Bald Eagles in flight or perched on some high tree in the distance. There is also the possibility of seeing an occasional Ruddy Turnstone, Baird's Sandpiper, and Bonaparte's Gull.

ANNOTATED LIST OF BIRDS

The ensuing list includes all the species that occur, or have been known to occur, within the boundaries of Wilderness Park and the encompassed Laway Settlement from the first of June to the first of September. Both specimens and sight records are the basis for the inclusion of species.

Information under each species intends to show, first of all, its summer status with respect to abundance. When practicable an attempt is then made to indicate the species' chosen habitat or habitats. In the cases of species known to breed in the Park, at least one nesting record or some evidence of nesting is cited. When the available nesting records of a species are too numerous to list, the earliest and sometimes the latest dates are given. The locations of nests within habitats are pointed out in many instances.

When specimens have been taken, the collections in which they now reside and their respective catalogue numbers are indicated in parentheses. The majority of specimens mentioned are in the collection of the University of Michigan Biological Station (U.M.B.S.).

All technical names of species are in accordance with the A.O.U. *Check-List of North American Birds* (Fourth Edition and Supplements). The common names follow the *Check-List* except in a few cases where the senior author has adopted what he believes to be more suitable species designations.

Common Loon, *Gavia immer*. Not known to nest in the Park, but lone individuals are often seen through the summer just off shore in Lake Michigan. The Grabers noted two individuals together off Station Point on June 12, 1949.

Holboell's Grebe, *Colymbus grisegena*. Rare transient. One record: a dead specimen in advanced decay was found by the Grabers on the north shore of the Park, July 29, 1949.

Pied-billed Grebe, *Podilymbus podiceps*. Recorded from late July through August on Big Stone Pond. Only one or two individuals have usually been seen at a time. Presumably the species has nested here, as well-grown young have been noted twice by Pettingill and his students: on July 28, 1941, and August 2, 1947.

Great Blue Heron, *Ardea herodias*. Seen regularly through the summer in the marshes and around the beach pools and lagoon at Waugoshance Point; also noted occasionally at Big Stone Pond and other suitable places. In 1949, the Grabers first saw birds-of-the-year on July 22. The population of Great Blue Herons observed every summer seems sufficiently high to indicate the continuing presence of a rookery in, or very near, the Park.

Black-crowned Night Heron, *Nycticorax nycticorax*. One record: On July 23, 1949, Pettingill and his students found two fully grown birds-of-the-year in the marsh immediately south of Big Stone Pond. One of the two birds was collected by Tordoff and is now in the U.M.B.S. collection (No. 1530). No rookeries of the Black-crowned Night Heron have been discovered in or near Wilderness Park.

American Bittern, *Botaurus lentiginosus*. Summer resident in the larger marshes. The Grabers found a nest with two eggs on June 15, and a nest with three eggs on June 16, 1949, in dense bulrushes at Waugoshance Point.

Mallard, *Anas platyrhynchos*. Presumably a summer resident. On June 11, 1949, the Grabers observed a pair on Little Sucker Pond and on June 13 three individuals (two males and one female) on Sturgeon Bay. In the late summer, Pettingill and his students have occasionally seen a few individuals, either females or fully grown young, on Big Stone Pond and in the marshes at Waugoshance Point.

Black Duck, *Anas rubripes*. Common summer resident; seen more often than any other dabbling duck. On June 24, 1949, the Grabers saw two adults with three young, still partially down-covered, on Big Stone Pond; and on August 12, 1937, Theodora Nelson and several students captured and then released a brood of about 12 young, still unable to fly, at Temperance Island, west of Waugoshance Point.

Pintail, *Anas acuta*. Though a summer resident in northern Lower Michigan, the Pintail has been observed only twice in Wilderness Park, both times by Pettingill and his students, as follows: two females on Big Stone Pond, August 8, 1942; two individuals, either females or fully grown birds-of-the-year, flushed from the shore at Waugoshance Point, August 2, 1955.

Green-winged Teal, *Anas carolinensis*. A rare summer resident in northern Lower Michigan, this species has been recorded only two times in the Park. In both instances, one bird was seen, as follows: by Blanchard on Big Stone Pond, August 3, 1936, and by Pettingill and his students at Waugoshance Point, August 12, 1952.

Blue-winged Teal, *Anas discors*. Presumably a summer resident, as it is often seen through the summer; the only dabbling duck, besides the Black Duck, that can be considered common. On June 24, 1949, the Grabers saw a male on Big Stone Pond. At this locality and Waugoshance Point, U.M.B.S. personnel have frequently observed several individuals during late July and August. The highest number ever counted on any one trip was nine, at Waugoshance Point, August 14, 1944.

Wood Duck, *Aix sponsa*. Though considered a summer resident in northern Lower Michigan, the Wood Duck is rarely seen. The only record for Wilderness Park was obtained by Pettingill and his students, August 2, 1949, when they watched two individuals, either females or birds-of-the-year, swimming on Big Stone Pond and later taking flight.

Scaup Duck, *Aythya* sp. Rare transient. One record: an individual, either a female or a bird-of-the-year, seen by Pettingill and his students off Waugoshance Point on August 2, 1949.

American Golden-eye, *Bucephala clangula*. Rare transient (possibly summer resident). One record: On August 3, 1954, Pettingill and his students observed three individuals, females or birds-of-the-year, flying close together off Waugoshance Point, parallel to the shore.

Buffle-head, *Bucephala albeola*. Rare transient. One record: an individual, either a female or a bird-of-the-year, seen swimming off Waugoshance Point by Pettingill and his students on August 16, 1947.

Hooded Merganser, *Lophodytes cucullatus*. Summer resident. On August 17 and 23, 1948, the Grabers saw a female with seven young still in downy plumage off shore at Waugoshance Point. Pettingill and his students have observed the following flocks (each possibly comprising a female with fully grown brood) in the beach pools, in the lagoon, or off shore at the Point: four, August 12, 1940; six, August 17, 1942; seven,

August 14, 1944; three, August 13, 1945; thirteen, August 4, 1953. Kendeigh and his students noted two at the Point on August 6 and 10, 1946 (Nelson, 1956: 9).

American Merganser, *Mergus merganser*. Common summer resident. In 1949, the Grabers noted a brood of seven downy young and another of nine on the gravel-sand bars at Waugoshance Point, June 15 and 16. That same year they also saw females flying into the woods from Lake Michigan almost daily during June. The gravel-sand bars are favorite loitering areas for both adults and fully grown young. Here, several times in June of 1949, the Grabers saw about 20 males, all staying more or less together. During August of five different years, Pettingill and his students have observed gatherings ranging in size from seven (August 13, 1949) to as many as 50 (August 17, 1942).

Red-breasted Merganser, *Mergus serrator*. Summer resident. Eight different broods have been observed along the shore of Waugoshance Point. The earliest of the season, comprising about 12 downy young with one female, was noted by Blanchard and his students on June 28, 1937. One brood comprising seven small downy young with one female was watched by Pettingill and his students on August 2, 1955. Still other broods, all of larger young but still unable to fly, have been recorded by Pettingill and his students on the following dates: August 18, 1941; August 3 and 14, 1948; August 14, 1953; and August 2 and 12, 1955.

Turkey Vulture, *Cathartes aura*. Three records, all of individuals observed soaring over the Park area: two individuals, by Pettingill and his students, August 3, 1942; seven, by Ruth Gilreath, June 16, 1946; one, by Theodora Nelson, June 6, 1947. There is no evidence of the Turkey Vulture breeding in Michigan as far north as the Park.

Goshawk, *Accipiter gentilis*. One record: a fully grown immature female (U.M.B.S. No. 1771), found dead on the shore at Waugoshance Point, August 13, 1954, by Pettingill and his students.

Sharp-shinned Hawk, *Accipiter striatus*. Presumably a summer resident. In the summer of 1949, the Grabers found the species rare until August when individuals were seen regularly in wooded areas. Pettingill and his students have observed one or two individuals on the following dates: August 19, 1943, at Big Stone Pond; August 16, 1947, August 13, 1949, and August 8, 1950, at Waugoshance Point.

Red-tailed Hawk, *Buteo jamaicensis*. Four records, all of individuals seen in the air above Waugoshance Point: several individuals, August 6, 1946, by Kendeigh and his students; one individual, August 2, 1947, by Pettingill and his students; one, July 23, and two, August 6, 1950, by Whiting. There is no evidence of the Red-tailed Hawk nesting in the Park.

Red-shouldered Hawk, *Buteo lineatus*. One record: an individual seen by Pettingill and his students at Waugoshance Point on August 18, 1941. There is no evidence that the species is a summer resident.

Broad-winged Hawk, *Buteo platypterus*. Undoubtedly a summer resident. In the summer of 1949, the Grabers found the species uncommon until after July when individuals were seen on many occasions flying over woods and marshes. On June 14 they watched an immature bird being mobbed by Yellow-shafted Flickers, Blue Jays, and Robins. Pettingill and his students observed one individual over Waugoshance Point on August 13, 1945.

Bald Eagle, *Haliaeetus leucocephalus*. Not known to nest in the Park at the present time, but an aerie in use for several years once occupied a tree south of Big Stone Pond. The Grabers regularly saw two adults and two immature birds through the summer of 1949. On the majority of the trips that have been taken by Pettingill and his students to Waugoshance Point in August, from one to three individuals have been observed.

Marsh Hawk, *Circus cyaneus*. Presumably a summer resident. In 1949, the Grabers did not note the species until July 12. Thereafter, they regularly saw from one to three individuals in the marshes and over other open areas. Pettingill and his students have almost invariably observed a few individuals on their August trips to Waugoshance Point.

Osprey, *Pandion haliaetus*. Rarely seen; no nesting record. The Grabers noted one individual flying over the marsh south of Big Stone Pond on June 10, 1949.

Pigeon Hawk, *Falco columbarius*. Uncommon transient. Three records, obtained by Pettingill and his students: at Waugoshance Island, one individual in immature plumage seen in flight on August 12, 1940; at Waugoshance Point, one individual noted on

August 18, 1941, and another on August 13, 1945.

Ruffed Grouse, *Bonasa umbellus*. Permanent resident. In the summer of 1949, the Grabers found the species regularly in coniferous-deciduous woods and came upon many broods after the middle of June.

Virginia Rail, *Rallus limicola*. Common summer resident. The Grabers observed this species regularly in 1949 whenever they explored the marshes on Waugoshance Point. Seven eggs in a nest which they found there hatched on July 23.

Sora, *Porzana carolina*. Presumably a summer resident. In 1949, the Grabers flushed one individual from the marshes at Waugoshance Point on June 15 and 17.

Piping Plover, *Charadrius melodus*. Nests regularly on the gravel-sand beach and bars between Station Point and the end of Waugoshance Point. As many as 12 pairs were estimated by the Grabers to have nested in 1949. The earliest and latest breeding records are June 9, 1949, three newly hatched chicks (Grabers), and August 2, 1955, four chicks about two days old (Pettingill and students).

Semipalmated Plover, *Charadrius semipalmatus*. Common transient; a few almost invariably observed in August at Waugoshance Point. As many as 10 were observed on August 18, 1941 (Pettingill and students), and eight on August 6, 1946 (Kendeigh and students). Among the transient shore birds, only the Least Sandpiper occurs in greater numbers during this summer period.

Killdeer, *Charadrius vociferus*. Nests commonly on the sand flats of Waugoshance Point and Island. In 1949 the Grabers found young birds frequently after July 13. From late July through August many adults and well-developed young-of-the-year regularly feed and loiter along the shore and around the beach pools of Waugoshance Point.

Golden Plover, *Pluvialis dominica*. Rare transient. One record: an adult in post-nuptial molt seen on August 13, 1954, at Waugoshance Point (Pettingill and students).

Black-bellied Plover, *Squatarola squatarola*. Transient; seen irregularly during August at Waugoshance Point. Usually only one or two individuals have been observed on any one day, but as many as 29 were counted by Frank J. Hinds, Theodore Nelson, and students on August 14, 1935 (Nelson, 1956: 20), and 15 on August 10, 1946 (Kendeigh and students). Individuals have been noted in both full nuptial and winter plumages, as well as in various stages of the postnuptial molt. An adult female specimen (U.M.B.S. No. 1671), collected by R. R. Graber on August 15, 1950, was about midway in the molt, with mottled underparts.

Ruddy Turnstone, *Arenaria interpres*. Uncommon transient. Five records, all at Waugoshance Point: two, August 12, 1940, seen by Pettingill and students, and eight, August 10, 1946, by Kendeigh and students (Nelson, 1956: 20); one, July 31 and August 14, 1948, and five, August 2, 1955, by Pettingill and students.

American Woodcock, *Philobela minor*. An uncommon summer inhabitant of alder thickets; no nests have been found. Pettingill and his students flushed one on August 6, 1946, and another on August 5, 1947; the Grabers flushed one or two on several different days in the summer of 1949.

Wilson's Snipe, *Capella gallinago*. Undoubtedly nests. In 1949, between June 15 and July 13, the Grabers noted courtship flights often above the marshy areas at Waugoshance Point. Pettingill and his students have occasionally observed a few individuals feeding during late July and early August in the muddy periphery of Big Stone Pond.

Upland Sandpiper, *Bartramia longicauda*. One record: an individual seen in a grassy area at Waugoshance Point, July 20, 1946, by Kendeigh and his students. The Upland Sandpiper is a summer resident east and southeast of the Park where there are suitably fallow fields.

Spotted Sandpiper, *Actitis macularia*. A common summer resident along the shore of Lake Michigan. At Waugoshance Point in 1949, the Grabers found a nest with four eggs as early as June 12 and three newly hatched young as late as July 16. Probably from one to three pairs usually nest adjacent to Big Stone Pond, judging by the regularity with which individuals have been seen there in the early summer by U.M.B.S. personnel.

Solitary Sandpiper, *Tringa solitaria*. Transient; seen more or less regularly in late July and through August at Big Stone Pond and the beach pools on Waugoshance Point. As many as three individuals have been recorded on trips in August. A female specimen

(U.M.B.S. No. 1808), collected on August 12, 1955, at the Point by Luther H. Rogers, was probably a bird-of-the-year.

Greater Yellow-legs, *Totanus melanoleucus*. Transient; observed irregularly during August at Big Stone Pond and Waugoshance Point. As many as 15 individuals were seen by Blanchard at the Point on August 8, 1923 (Nelson, 1956: 22), and five by Pettingill and his students at Big Stone Pond on August 7, 1943.

Lesser Yellow-legs, *Totanus flavipes*. Transient; noted occasionally in July and with fair regularity in August at Big Stone Pond and Waugoshance Point. In 1946, Kendeigh and his students found six at Big Stone Pond as early as July 20. The largest number counted on any one trip was eight, at the Point on August 13, 1949, by Pettingill and his students.

Knot, *Calidris canutus*. Rare transient. One record: two individuals in winter plumage seen on August 18, 1941, at Waugoshance Point by Pettingill and his students (Nelson, 1956: 23).

Pectoral Sandpiper, *Erolia melanotos*. Transient; noted irregularly in late July and through August at Big Stone Pond and Waugoshance Point. Pettingill and his students found as many as four at Big Stone Pond on July 28, 1941, and three at the Point on August 2, 1955.

White-rumped Sandpiper, *Erolia fuscicollis*. Rare transient. One record: an individual identified by Tordoff and R. R. Graber at Waugoshance Point on July 14, 1949.

Baird's Sandpiper, *Erolia bairdii*. Uncommon transient. Five records, all at Waugoshance Point, obtained by Pettingill and his students: two, July 13, 1949 (one of these was taken by Tordoff — U.M.B.S. No. 1555), two, July 27, 1949; one, August 12, 1952; one, August 2, and one, August 12, 1955.

Least Sandpiper, *Erolia minutilla*. Common transient; no other transient shore bird is regularly seen in as great numbers during August at Waugoshance Point. In 1949, the Grabers recorded the species (three individuals) as early as July 14 and found groups of from two to seven individuals in the last two weeks of the month; later that year, on August 13, Pettingill and his students noted at least 25.

Red-backed Sandpiper, *Erolia alpina*. Rare transient. One record: an individual in winter plumage seen at Waugoshance Point on July 27, 1949, by R. R. Graber.

Dowitcher, *Limnodromus griseus*. Rare transient. One record: two individuals in winter plumage seen at Waugoshance Point on August 8, 1950, by Pettingill and his students.

Semipalmated Sandpiper, *Ereunetes pusillus*. Transient; seen more or less regularly in late July through August at Waugoshance Point. In 1949, the Grabers noted the species (one individual) as early as July 14; Pettingill and his students later found as many as four on July 23. The largest number of individuals observed at any one time was six, on August 10, 1946, by Kendeigh and his students.

Buff-breasted Sandpiper, *Tryngites subruficollis*. Rare transient. One record: a female specimen (U.M.B.S. No. 1751) collected by Pettingill at Waugoshance Point on September 1, 1953.

Sanderling, *Crocethia alba*. Transient; seen quite regularly in late July and August at Waugoshance Point, usually in small groups of from two to five individuals. A flock of 14 was observed on July 29, 1949, by Pettingill and his students.

Herring Gull, *Larus argentatus*. Although this species does not nest in the Park area, it is commonly observed throughout the summer along the entire shore of Lake Michigan. The gravel-sand bars are favorite loitering grounds.

Ring-billed Gull, *Larus delawarensis*. Like the Herring Gull, this species does not nest in the Park area (the nearest colonies of both species are on Green Island, off Point La Barbe, Upper Michigan, about 10 miles directly northeast), but it is observed throughout the entire summer along the Lake Michigan shore, often loitering on the gravel-sand bars. It is the commoner of the two gulls.

Bonaparte's Gull, *Larus philadelphia*. Uncommon transient; observed on three occasions at Waugoshance Point. Kendeigh and his students saw one individual in immature plumage on August 10, 1946. Pettingill and his students noted two in immature plumage on August 16, 1947. In 1953, they identified three in immature plumage and one in adult plumage, August 14, on a gravel-sand bar among loafing Herring Gulls, Ring-

Y billed Gulls, Common Terns, and Caspian Terns. One of the immature birds was collected (U.M.B.S. No. 1745).

X Common Tern, *Sterna hirundo*. In the summers indicated below, U.M.B.S. personnel have reported nesting colonies, usually small, at Temperence Island or on the gravel-sand bars at Waugoshance Point: 1923-25 (nests not counted); 1945 (178 nests); 1946 (600 nests); 1949 (10 nests); 1950 (3 nests); 1954 (35 nests). In 1948, the Grabers found a nest with three eggs, still being attended by adults, as late as August 17. The Common Tern, even during summers when not nesting in the Park, has been commonly observed along the Lake Michigan shore, frequently resting on the gravel-sand bars.

X Caspian Tern, *Hydroprogne caspia*. Commonly observed from the Lake Michigan shore and sometimes loafing on the gravel-sand bars, increasing in numbers as the summer advances; never as numerous as the Common Tern. There is no nesting colony near Wilderness Park.

X Black Tern, *Chlidonias niger*. Not known to nest in the Park area, but occasionally seen in the summer over the larger marshes, searching for food. On July 18, 1949, the Grabers saw an adult at Sturgeon Bay catching food and carrying it southeastward, beyond the Park boundary, presumably to its young.

X Mourning Dove, *Zenaidura macroura*. Uncommon summer resident. The Grabers saw a few regularly in cut-over and other open areas in 1949, and found a nest with one egg and one young on July 5, seven feet from the ground on the top of a birch stub. The next year, on August 8, Pettingill and his students discovered a nest with two eggs, still being incubated, about three feet from the ground on the stump of a big tree.

X Yellow-billed Cuckoo, *Coccyzus americanus*. Uncommon; presumably a summer resident. In 1949, the Grabers observed three individuals, each time singly, in shrubby areas.

X Black-billed Cuckoo, *Coccyzus erythrophthalmus*. Uncommon; presumably a summer resident. The Grabers encountered the species three times in 1949 (June 9, July 10, and July 13), in each instance at the edge of coniferous-deciduous woods.

X Screech Owl, *Otus asio*. Rare; presumably a permanent resident. The Grabers heard this species on July 1, 1949. Later, on July 7, they heard and saw an individual in a rather open pine woods.

X Great Horned Owl, *Bubo virginianus*. Fairly common; undoubtedly a permanent resident. On June 27, 1949, during a trip through woods near the south boundary of the Park, the Grabers heard three individuals. Nelson observed one individual on July 6, 1947, along the Swamp Trail, and Pettingill and his students observed another on July 31, 1948, in the same locality.

X Long-eared Owl, *Asio otus*. On June 12, 1949, the Grabers found the wings and pectoral girdle of an individual on the beach near the end of Waugoshance Point.

Saw-whet Owl, *Aegolius acadica*. Permanent resident. A specimen in juvenal plumage and able to fly (U.M.B.S. No. 1520) was collected by R. R. Graber at Waugoshance Point in dense cedar woods on July 22, 1949. The next year, on August 19, in the same area and habitat, Pettingill collected another specimen (U.M.B.S. No. 1670), which was undergoing the postjuvinal molt.

X Whip-poor-will, *Caprimulgus vociferus*. Undoubtedly a summer resident; common. In 1949, between June 14 and July 3, the Grabers heard the species regularly in open pine woods and coniferous-deciduous woods. On July 20, in an area with open stands of red pine, birch, and maple they came upon an individual which feigned injury, presumably because they were near a nest or young.

X Common Nighthawk, *Chordeiles minor*. Common summer resident. In 1949, the Grabers noted courtship flights regularly over all open areas at Waugoshance Point from June 9, the day the Grabers arrived in the Park, until July 20. Nickell found a nest with two eggs in a treeless rocky area at the Point on June 23, and the Grabers later found a nest with one newly laid egg in open coniferous-deciduous woods on July 20.

X Chimney Swift, *Chaetura pelagica*. Regularly seen over different parts of the Park and the Laway Settlement, but no nests have been found.

X Ruby-throated Hummingbird, *Archilochus colubris*. Presumably a summer resident; fairly common. The species is more frequently seen in the late summer, at which time both adults and birds-of-the-year tend to concentrate wherever there are fresh sap-

sucker borings and beds of cardinal-flowers (*Lobelia Cardinalis*).

X Belted Kingfisher, *Megaceryle alcyon*. Seen frequently at the ponds and along the creeks. No nests have been found.

X Yellow-shafted Flicker, *Colaptes auratus*. Common summer resident. The species is frequently encountered along the beaches and edges of marshes where it searches for food. The Grabers located several nests in 1949. The first one found (on June 10) contained eggs. Young birds were first noted out of the nest about July 1.

Pileated Woodpecker, *Dryocopus pileatus*. Undoubtedly a permanent resident. Since 1935 when the species was first reported from the Park (see Nelson, 1956: 34), U.M.B.S. personnel have observed it from time to time, either in coniferous-deciduous woods, flying across open areas, or working on tall stubs in the marsh south of Big Stone Pond. The Grabers noted individuals at least a dozen times in the summer of 1949 and were impressed with the many tree excavations which this big woodpecker had made in all the coniferous-deciduous woods they visited. No nests have been found.

(+) Common Sapsucker, *Sphyrapicus varius*. Common summer resident; most frequently seen where cedars, aspens, and birches are prevalent. In 1949, the Grabers found three nests as follows: June 14, nest with eggs, 20 feet from ground in a live aspen; June 27, nest (contents not seen), 30 feet from ground in a live aspen; July 1, nest with young, 10 feet from ground in a dead aspen.

(+) Hairy Woodpecker, *Dendrocopos villosus*. Fairly common permanent resident. Seen most often in coniferous-deciduous woods with a large proportion of deciduous trees. The Grabers found a nest in a large birch on June 10, 1949, and came upon several family groups during the first two weeks of July.

(+) Downy Woodpecker, *Dendrocopos pubescens*. Fairly common permanent resident. Somewhat more widely distributed than the Hairy Woodpecker, appearing in all kinds of woods and in shrubby areas. The Grabers found young birds and family groups in 1949 soon after the first of July.

X Eastern Kingbird, *Tyrannus tyrannus*. Common summer resident. In 1949, the Grabers found six nests at Waugoshance Point and one on the Island, all in cedars, from three to 12 feet from the ground, with an average height of about five feet. One nest contained two eggs when found on June 15 and three eggs the following day; another nest contained three eggs when found on June 29.

(+) Crested Flycatcher, *Myiarchus crinitus*. Summer resident; fairly common in pine woods, coniferous-deciduous woods, and cut-over areas. The Grabers noted a nest in 1949 in an old stub near Little Sucker Pond.

X Eastern Phoebe, *Sayornis phoebe*. Summer resident, nesting more or less regularly on buildings in the Park and the Laway Settlement. The Grabers found two nests with eggs at the Old Camp Grounds on June 21, 1949.

X Traill's Flycatcher, *Empidonax traillii*. Commonly observed south of Big Stone Pond and along the Swamp Trail in alder thickets where it is presumably a summer resident; doubtlessly occupies similar habitats elsewhere in the Park. No nests have been found.

(+) Least Flycatcher, *Empidonax minimus*. Fairly common summer resident in deciduous woods, especially in aspen woods near open areas. In 1949, the Grabers found two nests, one of which was being built on June 21.

X Eastern Wood Pewee, *Contopus virens*. Common summer resident in open deciduous woods. A nest found by the Grabers in 1949 at the Old Camp Grounds contained three eggs which hatched about July 10.

X Olive-sided Flycatcher, *Nuttallornis borealis*. Summer resident. In 1949, the Grabers observed the species in six different places, usually in cut-over areas where there were scattered, small stands of conifers. Two such places were south of Big Stone Pond, along the Swamp Trail. A nest with four eggs, which the Grabers found on June 24, was 16 feet from the ground in a spruce. The eggs hatched on June 30 and the young left the nest on July 17. In 1954, Whiting watched a pair of Olive-sided Flycatchers on June 23, feeding young in a spruce near Little Sucker Creek.

X Horned Lark, *Eremophila alpestris*. Not known to nest in the Park. There are two records from Waugoshance Point, probably of wandering or transient individuals, as follows: four, by Kendeigh and his students, on August 6, 1946; one, by Pettingill and his students, on August 16, 1947.

X Tree Swallow, *Iridoprocne bicolor*. Summer resident. In 1949, the Grabers found several nests in dead-tree cavities near Big Stone and Little Sucker Ponds and at Waugoshance Point. In one of these nests there were five eggs which hatched about June 24. At the Point, as the summer advances, increasingly large numbers of individuals appear until, by August, the species is often abundant.

X Bank Swallow, *Riparia riparia*. Not known to nest in the Park. A few individuals, presumably transient, have been observed by U.M.B.S. personnel during August in 1946, 1950, 1952, and 1955.

① Rough-winged Swallow, *Stelgidopteryx ruficollis*. Not known to nest in the Park. One record: an individual observed by Pettingill and his students at Waugoshance Point on August 1, 1954.

X Barn Swallow, *Hirundo rustica*. Summer resident. The Grabers reported the species nesting at the Laway Settlement in 1949. At Cecil Bay, in a building about three miles east of the Park entrance, Pettingill and his students found two nests in 1944, one with eggs and one with young, on July 29. Transient Barn Swallows are invariably common at Waugoshance Point during August.

① Cliff Swallow, *Petrochelidon pyrrhonota*. Not known to nest in or near the Park. One record: an individual seen by Pettingill and his students at Waugoshance Point on August 3, 1954.

X Purple Martin, *Progne subis*. Nests at the Laway Settlement. Commonly observed after mid-summer at Waugoshance Point.

X Blue Jay, *Cyanocitta cristata*. Common resident in the summer; most frequently observed in deciduous woods. On June 22, 1949, the Grabers found a pair feeding young out of the nest.

X Common Crow, *Corvus brachyrhynchos*. Common summer resident. One family, with young fully grown but still being fed by the parents, was observed by the Grabers on July 14, 1949.

X Black-capped Chickadee, *Parus atricapillus*. Common permanent resident in various wooded habitats. In 1949, the Grabers found a nest with young on July 10. At about this time family groups were first noted moving through the woods.

⊗ White-breasted Nuthatch, *Sitta carolinensis*. Uncommon permanent resident. On July 11, 1949, the Grabers found a nest with young in a red oak, seven feet from the ground, at the Old Camp Grounds.

X Red-breasted Nuthatch, *Sitta canadensis*. Common summer resident, mainly in coniferous-deciduous woods (where conifers predominate) and spruce-tamarack bogs. On June 22, 1949, near the point where the Swamp Trail crosses Little Sucker Creek, the Grabers found a nest with young, 12 feet from the ground, in a balsam-fir stub which stood in a clearing not far from a growth of tall conifers. The young left the nest on June 24.

⊗ Brown Creeper, *Certhia familiaris*. Summer resident. In the summer of 1949, the Grabers saw the species seven times, either in uniformly coniferous woods or in coniferous woods mixed with aspens and birches. On June 29 they found a nest with young, about 45 feet from the ground in a large aspen, and the next day watched the young leave this nest.

⊗ House Wren, *Troglodytes aedon*. Summer resident; common in cut-over or other open places where there is ample slash or fallen timber for nesting sites. In such areas, during the summer of 1949, the Grabers found several nests, one of which was being built on June 14.

⊗ Winter Wren, *Troglodytes troglodytes*. Undoubtedly a summer resident; frequent in cedar woods and spruce-tamarack bogs where the trees are so densely concentrated as to all but exclude the sunlight.

X Short-billed Marsh Wren, *Cistothorus platensis*. Common summer resident in the larger marshes. At Waugoshance Point on June 24, 1949, the Grabers found a nest with three well-developed young, situated about five inches above water in a small shrub (sweet gale, *Myrica Gale*), surrounded by a dense growth of sedges.

? Catbird, *Dumetella carolinensis*. Uncommon summer resident. In the summer of 1949, the Grabers recorded this species only twice: on June 21, when they saw an adult at the edge of the Swamp Trail near its crossing of Little Sucker Creek; on July 6, when

they found a family (adults with two young on the wing) in an alder thicket. Station personnel have reported Catbirds occasionally at Waugoshance Point in August, long after the nesting season.

X Brown Thrasher, *Toxostoma rufum*. Summer resident; common in shrubby areas and in the smaller clumps of cedars at Waugoshance Point. In the latter habitat the Grabers found a nest with three eggs on July 4, 1949, six feet from the ground on a cedar branch. When they inspected the nest again on July 13, it contained two small young at least a day apart in age and a piped egg. The Grabers observed many wandering family groups after the first of July, the young in most cases being able to fly well. In August, according to reports of Station personnel, the Brown Thrasher is very common at the Point, probably as a result of many individuals gathering from other places.

X Robin, *Turdus migratorius*. Summer resident; very common in nearly all upland habitats with suitable nesting sites. The Grabers found young several days out of the nest when they arrived in the Park on June 10, 1949.

⊗ Wood Thrush, *Hylocichla mustelina*. Uncommon summer resident. One record: on July 6, 1949, the Grabers found an adult with one young, which had just left its nest, 15 feet from the ground in a white pine growing in a coniferous-deciduous woods.

⊗ Hermit Thrush, *Hylocichla guttata*. Common summer resident; frequently observed in open pine woods. Whiting, on June 16, 1955, found a nest with four eggs about 20 inches from the ground in the depressed, rotted center of a stump.

⊗ Olive-backed Thrush, *Hylocichla ustulata*. Common summer resident in coniferous-deciduous woods where conifers predominate. In the summer of 1949, the Grabers heard this species more often than either the Hermit Thrush or the Veery. On June 20, a nest under construction was found by Tordoff, six feet from the ground on a spruce limb; it contained three eggs on June 24. Another nest under construction was found by Nickell on June 26, 40 inches from the ground next to the trunk of a spruce; this contained one egg at 8:30 a.m. and two at 6:00 p.m., June 27, and three at 10:25 a.m., June 28. In 1953, Berger found a nest with four eggs on June 16, four feet from the ground in a spruce.

X Veery, *Hylocichla fuscescens*. Common summer resident in all woods where there is considerable shade; especially numerous in dense cedar woods. On July 7, 1949, the Grabers saw two stubby-tailed young in the woods west of the Station Point Cabin.

⊗ Eastern Bluebird, *Sialia sialis*. Common summer resident at the edges of such open habitats as ponds and marshes where there are suitable nesting sites. In 1949, the Grabers found four nests, one of which was three feet from the ground in a stump; it contained three eggs when found on June 10 and four eggs on June 19.

⊗ Golden-crowned Kinglet, *Regulus satrapa*. Fairly common summer resident in dense cedar woods and spruce-tamarack bogs. On June 19, 1949, the Grabers watched adults feeding young recently out of the nest.

⊗ Ruby-crowned Kinglet, *Regulus calendula*. Rare summer resident. One record: on July 28, 1948, Pettingill together with George Miksch Sutton, Ernest P. Edwards, and Robert B. Lea, came upon a family of six or seven individuals in a sparse growth of cedars, balsam-firs, spruces, and aspens, not far from the Swamp Trail (see Sutton, 1948: 159). Sutton collected one specimen (G.M.S. No. 10414), which proved to be a female in juvenal plumage with fully grown flight feathers and no evidence of the postjuvenal molt being under way.

X Cedar Waxwing, *Bombycilla cedrorum*. Very common summer resident. The Grabers found nine nests in various wooded habitats during the summer of 1949. The earliest nest they found was one just completed on June 10.

X Starling, *Sturnus vulgaris*. During the summer of 1949, the Grabers recorded the species only once — an individual seen by them at Sturgeon Bay on June 21. Now and then U.M.B.S. personnel have seen small numbers at Waugoshance Point after mid-July. Kendeigh and his students reported as many as 45 on July 20, 1946; Pettingill and his students saw one flock of 15 on August 7, 1956. No nests have been found in the Park.

X Solitary Vireo, *Vireo solitarius*. Uncommon summer resident. First reported in 1946 when Kendeigh observed one individual on June 26. The next year Pettingill and his students found a nest with three eggs on August 2, 10 feet from the ground in one of

several cedars growing close together near the Swamp Trail. There was one newly hatched young in the nest when next seen on August 5. During their summer of 1949 in Wilderness Park, the Grabers located only three pairs, all in coniferous-deciduous woods.

Red-eyed Vireo, *Vireo olivaceus*. Very common summer resident in all deciduous woods, particularly where aspens predominate. In 1949, the Grabers saw a nest being built as early as June 10; later, in a coniferous-deciduous woods, they found a nest with three small young on July 7, eight feet from the ground in a cedar.

Warbling Vireo, *Vireo gilvus*. Not known to nest. Two records: one individual heard singing by the Grabers, early in the summer of 1949, near the Swamp Trail about a quarter of a mile from Big Stone Pond; one identified by Pettingill and his students on August 4, 1951, at Waugoshance Point.

Black and White Warbler, *Mniotilta varia*. Common summer resident in coniferous-deciduous woods and in pure stands of cedar. Although no nests have been found, the Grabers in 1949 saw an adult carrying food as early as June 13 and noted many family groups after the middle of July.

Tennessee Warbler, *Vermivora peregrina*. Transient. One record: two individuals identified by Pettingill and his students at Waugoshance Point on August 14, 1948. The Tennessee Warbler undoubtedly occurs more often in the late summer than this record indicates.

Nashville Warbler, *Vermivora ruficapilla*. Common summer resident; especially numerous in tamarack-spruce bogs. On July 5, 1949, the Grabers watched a male feeding two young already able to fly but still with stubby tails. Soon after this date the Grabers found several family groups.

Parula Warbler, *Parula americana*. Summer resident; apparently confined to the forest-edge habitat of pine woods at Waugoshance Point. In 1949, the Grabers located 15 singing males, 12 along the north shore of the Point and three along the south shore, and found four occupied nests, all along the north shore. The nests in all cases were in balsam-fir and their average height from the ground was about 10 feet. The young in the first nest, which they found on June 28, left as early as July 3. The one young bird in the fourth nest, found on July 12, left (somewhat prematurely) as late as August 4. (For an extensive report on the study of these nests, see Graber, 1951: 75-83).

Yellow Warbler, *Dendroica petechia*. Common summer resident, mainly in the low, dense cedar growth at Waugoshance Point and Island. In 1949, the Grabers found four nests (two being built and two with incomplete clutches) on June 15, one nest (with an incomplete clutch) on July 4, and one nest (being built) on July 14. All the nests were four feet or less from the ground in cedars.

Magnolia Warbler, *Dendroica magnolia*. Uncommon summer resident in low stands of spruce and balsam-fir at woodland edges. On June 23, 1949, the Grabers found a nest with four half-grown young, about three feet from the ground in a balsam-fir.

Cape May Warbler, *Dendroica tigrina*. Transient. Two records, both from Waugoshance Point: one adult male (U.M.B.S. No. 1556) collected by Tordoff, August 13, 1949; another adult male (U.M.B.S. No. 1665) collected by the Grabers, August 19, 1950.

Black-throated Blue Warbler, *Dendroica caerulescens*. Uncommon summer resident in coniferous-deciduous woods where there is a moderately dense understory of bracken and striped maple. Nelson recorded three pairs on July 6, 1947, during her walk along the entire Swamp Trail from Big Stone Pond to Sturgeon Bay. In the summer of 1949 the Grabers noted the species about a dozen times only. They found a pair on June 26, feeding three young just out of the nest, and observed stubby-tailed young, able to fly, as late as July 14.

Myrtle Warbler, *Dendroica coronata*. Summer resident in nearly all wooded habitats; common in open pine woods, in coniferous-deciduous woods, in cut-over areas, and in dense cedar growth at Waugoshance Point. On June 28, 1949, the Grabers found a nest (with three young nearly ready to leave) about seven feet from the ground on the branch of a spruce.

Black-throated Green Warbler, *Dendroica virens*. Common summer resident, mainly in large coniferous-deciduous woods, often among conifers near the edges. Probably the most common species of *Dendroica* in the Park. Four nests have been found, all in

cedars, as follows: with four eggs, about seven feet from the ground, by Berger, June 16, 1953; with four eggs, about eight feet from the ground, by Whiting, June 17, 1953; with one egg, 14 feet from the ground, June 24, and with four young, seven feet from the ground, by the Grabers, July 7, 1949. The Grabers found three young birds just out of a nest in 1949 as early as June 19 and collected one as a specimen (U.M.B.S. No. 1525).

Blackburnian Warbler, *Dendroica fusca*. Common summer resident in coniferous-deciduous woods where conifers predominate. A young female specimen (U.M.B.S. No. 1527) just out of the nest was collected by Tordoff on July 7, 1949.

Chestnut-sided Warbler, *Dendroica pensylvanica*. Observed irregularly along the Swamp Trail in alder thickets and in a few other shrubby places near marshes; probably a summer resident but no nests have been found. The Grabers observed only a few individuals during the summer of 1949.

Bay-breasted Warbler, *Dendroica castanea*. Transient. One record: the Grabers saw one individual in fall plumage at Waugoshance Point on August 19, 1950. Like the Tennessee Warbler, this species probably occurs more often in the late summer than this record indicates.

Pine Warbler, *Dendroica pinus*. Common summer resident in all open pine woods. On July 18, 1949, the Grabers saw a male feeding stubby-tailed young which had recently left a nest.

Palm Warbler, *Dendroica palmarum*. Transient. One record: an individual identified by R. R. Graber along the Swamp Trail on August 24, 1948.

Oven-bird, *Seiurus aurocapillus*. Common summer resident, primarily in aspen woods and coniferous-deciduous woods. Next to the American Redstart, the Oven-bird is probably the commonest warbler in the Park. In 1949, the Grabers found a nest with four eggs on July 8, but came upon a family of six, all four young out of the nest, as early as June 24.

Northern Water-thrush, *Seiurus noveboracensis*. Uncommon; not known to nest. At Waugoshance Point, Sutton collected a fully grown male bird-of-the-year (U.M.B.S. No. 1423) on July 26, 1948; at the same locality later that year Pettingill and his students saw one individual on August 14.

Mourning Warbler, *Oporornis philadelphia*. Summer resident in dense shrubby areas with considerable coniferous growth. During the summer of 1949 the Grabers located no more than 10 singing males. That same summer, on July 3, Whiting found a nest with two young which left the nest the following day. One of the young was taken as a specimen (U.M.B.S. No. 1524).

Yellow-throat, *Geothlypis trichas*. Common summer resident in alder thickets and in other wet, shrubby places. On June 16, 1949, the Grabers found a nest with four eggs, about five inches above ground, in a three-foot cedar at the junction of a marsh and a clump of cedars near the end of Waugoshance Point.

Wilson's Warbler, *Wilsonia pusilla*. Transient. One record: an individual in fall plumage seen by Pettingill at Waugoshance Point on August 19, 1950.

Canada Warbler, *Wilsonia canadensis*. Common summer resident in spruce-tamarack bogs, usually in dense tree growth near the edges. On June 26, 1955, Whiting flushed four young, which had recently left the nest, from the edge of a bog. After July 1, 1949, the Grabers often saw adults carrying food.

American Redstart, *Setophaga ruticilla*. Common summer resident; undoubtedly the most abundant warbler in the Park, occurring in all wooded environments. Of the eight nests found by the Grabers in 1949, all were in trees within six feet of the ground, but Whiting in 1953 discovered a nest 15 feet from the ground in a cedar. The Grabers in 1949 noted young birds out of the nest on June 29.

Bobolink, *Dolichonyx oryzivorus*. Not known to nest. Soon after mid-July Station personnel have occasionally observed small flocks of this species loitering in the marshes at Waugoshance Point or flying over the area.

Red-wing, *Agelaius phoeniceus*. Common summer resident in the marshes, particularly those at Waugoshance Point. A nest with four young about ready to leave was found by the Grabers on June 17, 1949.

Baltimore Oriole, *Icterus galbula*. Uncommon summer resident. In 1949, the Grabers located only three pairs, all in open deciduous woods, and on July 8, Whiting

saw one young bird which had recently left a nest. An old nest was noted by the Grabers in a tall aspen along the Swamp Trail.

Common Grackle, *Quiscalus quiscula*. Uncommon summer resident. In 1949, the Grabers saw only a few individuals, all in the vicinity of the Old Camp Grounds, and on July 1 noted adults feeding young out of the nest.

Brown-headed Cowbird, *Molothrus ater*. Uncommon; nests with Cowbird eggs have never been found. In the summer of 1949, the Grabers saw Cowbirds only three times, at the Old Camp Grounds; they failed to discover any eggs, despite the fact that they found nests of 20 species known to be Cowbird hosts elsewhere, and they came upon no young. Sometimes U.M.B.S. personnel have noted a few Cowbirds, usually in flocks, in the late summer at Waugoshance Point.

Scarlet Tanager, *Piranga olivacea*. Observed uncommonly in deciduous-coniferous woods where it is presumably a summer resident. In the summer of 1949, the Grabers found two pairs, one of which, at the Old Camp Grounds, was observed carrying food on July 3.

Rose-breasted Grosbeak, *Pheucticus ludovicianus*. Uncommon; not known to nest. The Grabers observed one singing male, on June 14, 1949, in a tall aspen not far from the point where the Swamp Trail crosses Little Sucker Creek. Other Biological Station personnel have occasionally noted from one to several individuals in the late summer at Waugoshance Point.

Indigo Bunting, *Passerina cyanea*. Observed only at the Laway Settlement, where in the summer of 1949 the Grabers noted a singing male at the shrubby edge of a woods.

Evening Grosbeak, *Hesperiphona vespertina*. One record: on August 8, 1950, Pettingill and his students saw three individuals, all apparently adult, near the top of a high pine at Waugoshance Point. They were not observed again, though the area was later visited several times by Pettingill, the Grabers, and other Station personnel.

Purple Finch, *Carpodacus purpureus*. Common in all habitats where there are coniferous trees; undoubtedly a summer resident. Though no nests have been found, the Grabers saw an adult feeding a young bird out of the nest on June 23, 1949.

Pine Siskin, *Spinus pinus*. Uncommon; not known to nest. All records of this species have been obtained at Waugoshance Point after the first of July by Station personnel. The earliest summer record is July 3 (1949) when Whiting saw one individual near the Sturgeon Bay Cabin. No more than three individuals have ever been noted on any one trip. An adult female specimen (U.M.B.S. No. 1457) was collected by Pettingill on August 14, 1948.

Common Goldfinch, *Spinus tristis*. Common summer resident, observed most often in shrubby areas. On July 20, 1949, the Grabers found a nest with two eggs in an alder at the edge of a marsh.

Red Crossbill, *Loxia curvirostra*. In the late summers of 1947 and 1951 small flocks of this species were reported by Station personnel in the Park area. From one flock of six near the Old Camp Grounds at Big Stone Bay on August 2, 1947, Robert B. Lea collected three specimens (two males, U.M.B.S. Nos. 1373 and 1374, and one female, No. 1375); all were apparently adults. Pettingill and his students saw a flock of about 20 individuals at Waugoshance Point on August 4, 1951.

White-winged Crossbill, *Loxia leucoptera*. This species has been recorded in the Park only in the late summer of 1950 when small flocks were seen by Station personnel on several different trips. From small flocks observed at Waugoshance Point on August 5, Pettingill collected three adult male specimen (U.M.B.S. Nos. 1647, 1663, and 1664) and R. R. Graber one adult female specimen (U.M.B.S. No. 1648). Pettingill and his students watched a flock of seven at the Point on August 8, and R. R. Graber noted three individuals together at the same locality on August 15.

Rufous-sided Towhee, *Pipilo erythrophthalmus*. Common summer resident in cut-over areas where there is a sparse growth of shrubs and small trees. Three pairs were noted by Nelson along the Swamp Trail on July 6, 1947. During the summer of 1949 the Grabers found the species especially common in shrubby habitats at the southern boundary of the Park and on July 1 watched adults feeding young just out of a nest.

Vesper Sparrow, *Pooecetes gramineus*. Uncommon summer resident. In the summer of 1949 the only area in the Park where the Grabers found this species was at Waugo-

shance Point. Here, on the sparsely vegetated sand flats, they noted a few individuals regularly, and on July 4 watched two young birds just beginning to fly.

Chipping Sparrow, *Spizella passerina*. Common summer resident at the edges of clearings and in open woods. On June 10, 1949, the Grabers found a nest, eight feet above the ground in a spruce, with young about ready to leave.

Field Sparrow, *Spizella pusilla*. Uncommon; a few possibly nest in the southern part of the Park on open sandy ridges sparsely covered with shrubs. In this locality on July 20, 1949, R. R. Graber collected a fully grown female bird-of-the-year (U.M.B.S. No. 1516), which was undergoing the postjuvenile molt. The Grabers saw another fully grown juvenile at Waugoshance Point on July 15, 1949.

White-throated Sparrow, *Zonotrichia albicollis*. Common summer resident in cut-over areas. In 1949, the Grabers saw adults carrying food as early as June 13. On June 24, at the base of a small balsam-fir near the Swamp Trail, the Grabers found a nest with two eggs. There were four eggs in the nest on June 27, three small young and one egg on July 7.

Swamp Sparrow, *Melospiza georgiana*. Common summer resident in the large marsh south of Big Stone Pond; infrequent in the marshes at Waugoshance Point. On June 10, 1949, the Grabers found four well-developed young in a nest near the Swamp Trail, situated about one and a half feet above water in cattails. A specimen in juvenal plumage with all flight feathers fully grown (U.M.B.S. No. 1439) was collected by Pettingill near the edge of a marsh at the Point on July 31, 1948.

Song Sparrow, *Melospiza melodia*. Common summer resident in nearly all shrubby places. The Grabers found five nests in the summer of 1949. One nest, discovered on June 15, contained five young about ready to leave.

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Ponds. Among the four ponds, only Big Stone Pond has been given any careful attention by the authors and other Station personnel. The Spotted Sandpiper nests regularly near its margin and possibly the Pied-billed Grebe has bred occasionally on the pond itself. The Great Blue Heron, Black Duck, Blue-winged Teal, Wilson's Snipe, and several species of transient shore birds frequently visit its marshy edges for feeding purposes.

Sand Flats. Wide-level stretches of sand and loose stones, usually dry and generally barren except for a scanty growth of such herbaceous plants as grasses, shrubby cinquefoil (*Potentilla fruticosa*), and painted-cup (*Castilleja* sp.). All such areas are confined to the outer parts of Waugoshance Point and to Waugoshance Island. Three bird species are known to breed here, namely, the Killdeer, Common Nighthawk, and Vesper Sparrow.

Beach Pools. Shallow, with a thin fringe of bulrushes and a few other marsh plants. The three beach pools are of ornithological interest mainly as feeding and loitering areas for a few ducks and shore birds.

Gravel-Sand Beaches and Bars. Generally devoid of vegetation. The Piping Plover nests on the open beaches and bars, the Spotted Sandpiper back from the beaches where there is plant cover. Besides being feeding grounds for the Killdeer and many species of transient shore birds, these places also serve as loitering areas for mergansers and large numbers of Herring Gulls, Ring-billed Gulls, Common Terns, and Caspian Terns.

The Lagoon. For the most part shallow, with marshy edges. Great Blue Herons and maturing broods of mergansers are the birds that most frequently feed in this partially land-locked body of water.

OUTSTANDING PLACES FOR BIRD FINDING

In the judgment of the senior author who has led class groups in the Park for 18 summers the places indicated below are the most productive for birds.

Big Stone Pond. Easily reached from the Entrance Road (see map) by turning south on the road that leads to the Old C.C.C. Camp. The Pond, which is in view from the Camp, is attractive after the middle of the summer to Pied-billed Grebes, a few broods of dabbling ducks, and such transient shore birds as the Solitary Sandpiper, Lesser Yellow-legs, and Pectoral Sandpiper.

Swamp Trail. A continuation south of the road to the Old C.C.C. Camp. The first two miles of this road, which eventually reaches Sturgeon Bay, goes through or passes in the immediate vicinity of aspen woods, a large marsh, tamarack-spruce bogs, and cedar woods. Among the birds that one may expect to hear or see during June or early July are the Common Sapsucker, Traill's Flycatcher, Short-billed Marsh Wren, Solitary Vireo, Nashville Warbler, Chestnut-sided Warbler, Canada Warbler, and Swamp Sparrow. Six miles from the Old C.C.C. Camp the Swamp Trail makes the second crossing of Big Sucker Creek and then traverses a cut-over area that is especially good for the Olive-sided Flycatcher, Mourning Warbler, and White-throated Sparrow.

Waugoshance Point Road. A continuation of the Entrance Road westward from the Laway Settlement to its end at the Parking Lot. During June and early July the coniferous-deciduous woods along the last three miles of the Road is the best in the Park for Olive-backed Thrushes and Black-throated

Blue Warblers. The Parula Warbler may be found by turning north from the Entrance Road on the trail to the Station Point Cabin on the shore, then walking west through the pine woods back of the dunes. Nests of the species should be looked for in *Usnea* lichen suspended from balsam-firs.

Outer Waugoshance Point. Roughly that part of the Point west of the Parking Lot; to be reached only by walking. This area may be explored by going west along the shore and returning by way of the interior. In the nesting season this trip should give every opportunity of observing Piping Plovers on the beach and/or bars, an occasional dabbling duck and perhaps a merganser (any of the three species) in the lagoon, and the association of birds peculiar to the cedar clumps back from the dunes. Most any time after the first of August a similar trip will very likely yield transient Semipalmated Plovers, Black-bellied Plovers, Least Sandpipers, Semipalmated Sandpipers, and Sanderlings on the beach; many mergansers, gulls, and terns on the bars; Solitary Sandpipers, Greater Yellow-legs, Lesser Yellow-legs, and Pectoral Sandpipers around the beach pools; great numbers of migrating or wandering passerine birds in the cedar clumps; and one or two Bald Eagles in flight or perched on some high tree in the distance. There is also the possibility of seeing an occasional Ruddy Turnstone, Baird's Sandpiper, and Bonaparte's Gull.

ANNOTATED LIST OF BIRDS

The ensuing list includes all the species that occur, or have been known to occur, within the boundaries of Wilderness Park and the encompassed Laway Settlement from the first of June to the first of September. Both specimens and sight records are the basis for the inclusion of species.

Information under each species intends to show, first of all, its summer status with respect to abundance. When practicable an attempt is then made to indicate the species' chosen habitat or habitats. In the cases of species known to breed in the Park, at least one nesting record or some evidence of nesting is cited. When the available nesting records of a species are too numerous to list, the earliest and sometimes the latest dates are given. The locations of nests within habitats are pointed out in many instances.

When specimens have been taken, the collections in which they now reside and their respective catalogue numbers are indicated in parentheses. The majority of specimens mentioned are in the collection of the University of Michigan Biological Station (U.M.B.S.).

All technical names of species are in accordance with the A.O.U. *Check-List of North American Birds* (Fourth Edition and Supplements). The common names follow the *Check-List* except in a few cases where the senior author has adopted what he believes to be more suitable species designations.

Common Loon, *Gavia immer*. Not known to nest in the Park, but lone individuals are often seen through the summer just off shore in Lake Michigan. The Grabers noted two individuals together off Station Point on June 12, 1949.

Holboell's Grebe, *Colymbus grisegena*. Rare transient. One record: a dead specimen in advanced decay was found by the Grabers on the north shore of the Park, July 29, 1949.

Pied-billed Grebe, *Podilymbus podiceps*. Recorded from late July through August on Big Stone Pond. Only one or two individuals have usually been seen at a time. Presumably the species has nested here, as well-grown young have been noted twice by Pettingill and his students: on July 28, 1941, and August 2, 1947.

Great Blue Heron, *Ardea herodias*. Seen regularly through the summer in the marshes and around the beach pools and lagoon at Waugoshance Point; also noted occasionally at Big Stone Pond and other suitable places. In 1949, the Grabers first saw birds-of-the-year on July 22. The population of Great Blue Herons observed every summer seems sufficiently high to indicate the continuing presence of a rookery in, or very near, the Park.

Black-crowned Night Heron, *Nycticorax nycticorax*. One record: On July 23, 1949, Pettingill and his students found two fully grown birds-of-the-year in the marsh immediately south of Big Stone Pond. One of the two birds was collected by Tordoff and is now in the U.M.B.S. collection (No. 1530). No rookeries of the Black-crowned Night Heron have been discovered in or near Wilderness Park.

American Bittern, *Botaurus lentiginosus*. Summer resident in the larger marshes. The Grabers found a nest with two eggs on June 15, and a nest with three eggs on June 16, 1949, in dense bulrushes at Waugoshance Point.

Mallard, *Anas platyrhynchos*. Presumably a summer resident. On June 11, 1949, the Grabers observed a pair on Little Sucker Pond and on June 13 three individuals (two males and one female) on Sturgeon Bay. In the late summer, Pettingill and his students have occasionally seen a few individuals, either females or fully grown young, on Big Stone Pond and in the marshes at Waugoshance Point.

Black Duck, *Anas rubripes*. Common summer resident; seen more often than any other dabbling duck. On June 24, 1949, the Grabers saw two adults with three young, still partially down-covered, on Big Stone Pond; and on August 12, 1937, Theodora Nelson and several students captured and then released a brood of about 12 young, still unable to fly, at Temperance Island, west of Waugoshance Point.

Pintail, *Anas acuta*. Though a summer resident in northern Lower Michigan, the Pintail has been observed only twice in Wilderness Park, both times by Pettingill and his students, as follows: two females on Big Stone Pond, August 8, 1942; two individuals, either females or fully grown birds-of-the-year, flushed from the shore at Waugoshance Point, August 2, 1955.

Green-winged Teal, *Anas carolinensis*. A rare summer resident in northern Lower Michigan, this species has been recorded only two times in the Park. In both instances, one bird was seen, as follows: by Blanchard on Big Stone Pond, August 3, 1936, and by Pettingill and his students at Waugoshance Point, August 12, 1952.

Blue-winged Teal, *Anas discors*. Presumably a summer resident, as it is often seen through the summer; the only dabbling duck, besides the Black Duck, that can be considered common. On June 24, 1949, the Grabers saw a male on Big Stone Pond. At this locality and Waugoshance Point, U.M.B.S. personnel have frequently observed several individuals during late July and August. The highest number ever counted on any one trip was nine, at Waugoshance Point, August 14, 1944.

Wood Duck, *Aix sponsa*. Though considered a summer resident in northern Lower Michigan, the Wood Duck is rarely seen. The only record for Wilderness Park was obtained by Pettingill and his students, August 2, 1949, when they watched two individuals, either females or birds-of-the-year, swimming on Big Stone Pond and later taking flight.

Scaup Duck, *Aythya* sp. Rare transient. One record: an individual, either a female or a bird-of-the-year, seen by Pettingill and his students off Waugoshance Point on August 2, 1949.

American Golden-eye, *Bucephala clangula*. Rare transient (possibly summer resident). One record: On August 3, 1954, Pettingill and his students observed three individuals, females or birds-of-the-year, flying close together off Waugoshance Point, parallel to the shore.

Buffle-head, *Bucephala albeola*. Rare transient. One record: an individual, either a female or a bird-of-the-year, seen swimming off Waugoshance Point by Pettingill and his students on August 16, 1947.

Hooded Merganser, *Lophodytes cucullatus*. Summer resident. On August 17 and 23, 1948, the Grabers saw a female with seven young still in downy plumage off shore at Waugoshance Point. Pettingill and his students have observed the following flocks (each possibly comprising a female with fully grown brood) in the beach pools, in the lagoon, or off shore at the Point: four, August 12, 1940; six, August 17, 1942; seven,

August 14, 1944; three, August 13, 1945; thirteen, August 4, 1953. Kendeigh and his students noted two at the Point on August 6 and 10, 1946 (Nelson, 1956: 9).

American Merganser, *Mergus merganser*. Common summer resident. In 1949, the Grabers noted a brood of seven downy young and another of nine on the gravel-sand bars at Waugoshance Point, June 15 and 16. That same year they also saw females flying into the woods from Lake Michigan almost daily during June. The gravel-sand bars are favorite loitering areas for both adults and fully grown young. Here, several times in June of 1949, the Grabers saw about 20 males, all staying more or less together. During August of five different years, Pettingill and his students have observed gatherings ranging in size from seven (August 13, 1949) to as many as 50 (August 17, 1942).

Red-breasted Merganser, *Mergus serrator*. Summer resident. Eight different broods have been observed along the shore of Waugoshance Point. The earliest of the season, comprising about 12 downy young with one female, was noted by Blanchard and his students on June 28, 1937. One brood comprising seven small downy young with one female was watched by Pettingill and his students on August 2, 1955. Still other broods, all of larger young but still unable to fly, have been recorded by Pettingill and his students on the following dates: August 18, 1941; August 3 and 14, 1948; August 14, 1953; and August 2 and 12, 1955.

Turkey Vulture, *Cathartes aura*. Three records, all of individuals observed soaring over the Park area: two individuals, by Pettingill and his students, August 3, 1942; seven, by Ruth Gilreath, June 16, 1946; one, by Theodora Nelson, June 6, 1947. There is no evidence of the Turkey Vulture breeding in Michigan as far north as the Park.

Goshawk, *Accipiter gentilis*. One record: a fully grown immature female (U.M.B.S. No. 1771), found dead on the shore at Waugoshance Point, August 13, 1954, by Pettingill and his students.

Sharp-shinned Hawk, *Accipiter striatus*. Presumably a summer resident. In the summer of 1949, the Grabers found the species rare until August when individuals were seen regularly in wooded areas. Pettingill and his students have observed one or two individuals on the following dates: August 19, 1943, at Big Stone Pond; August 16, 1947, August 13, 1949, and August 8, 1950, at Waugoshance Point.

Red-tailed Hawk, *Buteo jamaicensis*. Four records, all of individuals seen in the air above Waugoshance Point: several individuals, August 6, 1946, by Kendeigh and his students; one individual, August 2, 1947, by Pettingill and his students; one, July 23, and two, August 6, 1950, by Whiting. There is no evidence of the Red-tailed Hawk nesting in the Park.

Red-shouldered Hawk, *Buteo lineatus*. One record: an individual seen by Pettingill and his students at Waugoshance Point on August 18, 1941. There is no evidence that the species is a summer resident.

Broad-winged Hawk, *Buteo platypterus*. Undoubtedly a summer resident. In the summer of 1949, the Grabers found the species uncommon until after July when individuals were seen on many occasions flying over woods and marshes. On June 14 they watched an immature bird being mobbed by Yellow-shafted Flickers, Blue Jays, and Robins. Pettingill and his students observed one individual over Waugoshance Point on August 13, 1945.

Bald Eagle, *Haliaeetus leucocephalus*. Not known to nest in the Park at the present time, but an aerie in use for several years once occupied a tree south of Big Stone Pond. The Grabers regularly saw two adults and two immature birds through the summer of 1949. On the majority of the trips that have been taken by Pettingill and his students to Waugoshance Point in August, from one to three individuals have been observed.

Marsh Hawk, *Circus cyaneus*. Presumably a summer resident. In 1949, the Grabers did not note the species until July 12. Thereafter, they regularly saw from one to three individuals in the marshes and over other open areas. Pettingill and his students have almost invariably observed a few individuals on their August trips to Waugoshance Point.

Osprey, *Pandion haliaetus*. Rarely seen; no nesting record. The Grabers noted one individual flying over the marsh south of Big Stone Pond on June 10, 1949.

Pigeon Hawk, *Falco columbarius*. Uncommon transient. Three records, obtained by Pettingill and his students: at Waugoshance Island, one individual in immature plumage seen in flight on August 12, 1940; at Waugoshance Point, one individual noted on

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August 18, 1941, and another on August 13, 1945.

Ruffed Grouse, *Bonasa umbellus*. Permanent resident. In the summer of 1949, the Grabers found the species regularly in coniferous-deciduous woods and came upon many broods after the middle of June.

Virginia Rail, *Rallus limicola*. Common summer resident. The Grabers observed this species regularly in 1949 whenever they explored the marshes on Waugoshance Point. Seven eggs in a nest which they found there hatched on July 23.

Sora, *Porzana carolina*. Presumably a summer resident. In 1949, the Grabers flushed one individual from the marshes at Waugoshance Point on June 15 and 17.

Piping Plover, *Charadrius melodus*. Nests regularly on the gravel-sand beach and bars between Station Point and the end of Waugoshance Point. As many as 12 pairs were estimated by the Grabers to have nested in 1949. The earliest and latest breeding records are June 9, 1949, three newly hatched chicks (Grabers), and August 2, 1955, four chicks about two days old (Pettingill and students).

Semipalmated Plover, *Charadrius semipalmatus*. Common transient; a few almost invariably observed in August at Waugoshance Point. As many as 10 were observed on August 18, 1941 (Pettingill and students), and eight on August 6, 1946 (Kendeigh and students). Among the transient shore birds, only the Least Sandpiper occurs in greater numbers during this summer period.

Killdeer, *Charadrius vociferus*. Nests commonly on the sand flats of Waugoshance Point and Island. In 1949 the Grabers found young birds frequently after July 13. From late July through August many adults and well-developed young-of-the-year regularly feed and loiter along the shore and around the beach pools of Waugoshance Point.

Golden Plover, *Pluvialis dominica*. Rare transient. One record: an adult in post-nuptial molt seen on August 13, 1954, at Waugoshance Point (Pettingill and students).

Black-bellied Plover, *Squatarola squatarola*. Transient; seen irregularly during August at Waugoshance Point. Usually only one or two individuals have been observed on any one day, but as many as 29 were counted by Frank J. Hinds, Theodore Nelson, and students on August 14, 1935 (Nelson, 1956: 20), and 15 on August 10, 1946 (Kendeigh and students). Individuals have been noted in both full nuptial and winter plumages, as well as in various stages of the postnuptial molt. An adult female specimen (U.M.B.S. No. 1671), collected by R. R. Graber on August 15, 1950, was about midway in the molt, with mottled underparts.

Ruddy Turnstone, *Arenaria interpres*. Uncommon transient. Five records, all at Waugoshance Point: two, August 12, 1940, seen by Pettingill and students, and eight, August 10, 1946, by Kendeigh and students (Nelson, 1956: 20); one, July 31 and August 14, 1948, and five, August 2, 1955, by Pettingill and students.

American Woodcock, *Philobela minor*. An uncommon summer inhabitant of alder thickets; no nests have been found. Pettingill and his students flushed one on August 6, 1946, and another on August 5, 1947; the Grabers flushed one or two on several different days in the summer of 1949.

Wilson's Snipe, *Capella gallinago*. Undoubtedly nests. In 1949, between June 15 and July 13, the Grabers noted courtship flights often above the marshy areas at Waugoshance Point. Pettingill and his students have occasionally observed a few individuals feeding during late July and early August in the muddy periphery of Big Stone Pond.

Upland Sandpiper, *Bartramia longicauda*. One record: an individual seen in a grassy area at Waugoshance Point, July 20, 1946, by Kendeigh and his students. The Upland Sandpiper is a summer resident east and southeast of the Park where there are suitably fallow fields.

Spotted Sandpiper, *Actitis macularia*. A common summer resident along the shore of Lake Michigan. At Waugoshance Point in 1949, the Grabers found a nest with four eggs as early as June 12 and three newly hatched young as late as July 16. Probably from one to three pairs usually nest adjacent to Big Stone Pond, judging by the regularity with which individuals have been seen there in the early summer by U.M.B.S. personnel.

Solitary Sandpiper, *Tringa solitaria*. Transient; seen more or less regularly in late July and through August at Big Stone Pond and the beach pools on Waugoshance Point. As many as three individuals have been recorded on trips in August. A female specimen

(U.M.B.S. No. 1808), collected on August 12, 1955, at the Point by Luther H. Rogers, was probably a bird-of-the-year.

Greater Yellow-legs, *Totanus melanoleucus*. Transient; observed irregularly during August at Big Stone Pond and Waugoshance Point. As many as 15 individuals were seen by Blanchard at the Point on August 8, 1923 (Nelson, 1956: 22), and five by Pettingill and his students at Big Stone Pond on August 7, 1943.

Lesser Yellow-legs, *Totanus flavipes*. Transient; noted occasionally in July and with fair regularity in August at Big Stone Pond and Waugoshance Point. In 1946, Kendeigh and his students found six at Big Stone Pond as early as July 20. The largest number counted on any one trip was eight, at the Point on August 13, 1949, by Pettingill and his students.

Knot, *Calidris canutus*. Rare transient. One record: two individuals in winter plumage seen on August 18, 1941, at Waugoshance Point by Pettingill and his students (Nelson, 1956: 23).

Pectoral Sandpiper, *Erolia melanotos*. Transient; noted irregularly in late July and through August at Big Stone Pond and Waugoshance Point. Pettingill and his students found as many as four at Big Stone Pond on July 28, 1941, and three at the Point on August 2, 1955.

White-rumped Sandpiper, *Erolia fuscicollis*. Rare transient. One record: an individual identified by Tordoff and R. R. Graber at Waugoshance Point on July 14, 1949.

Baird's Sandpiper, *Erolia bairdii*. Uncommon transient. Five records, all at Waugoshance Point, obtained by Pettingill and his students: two, July 13, 1949 (one of these was taken by Tordoff — U.M.B.S. No. 1555), two, July 27, 1949; one, August 12, 1952; one, August 2, and one, August 12, 1955.

Least Sandpiper, *Erolia minutilla*. Common transient; no other transient shore bird is regularly seen in as great numbers during August at Waugoshance Point. In 1949, the Grabers recorded the species (three individuals) as early as July 14 and found groups of from two to seven individuals in the last two weeks of the month; later that year, on August 13, Pettingill and his students noted at least 25.

Red-backed Sandpiper, *Erolia alpina*. Rare transient. One record: an individual in winter plumage seen at Waugoshance Point on July 27, 1949, by R. R. Graber.

Dowitcher, *Limnodromus griseus*. Rare transient. One record: two individuals in winter plumage seen at Waugoshance Point on August 8, 1950, by Pettingill and his students.

Semipalmated Sandpiper, *Ereunetes pusillus*. Transient; seen more or less regularly in late July through August at Waugoshance Point. In 1949, the Grabers noted the species (one individual) as early as July 14; Pettingill and his students later found as many as four on July 23. The largest number of individuals observed at any one time was six, on August 10, 1946, by Kendeigh and his students.

Buff-breasted Sandpiper, *Tryngites subruficollis*. Rare transient. One record: a female specimen (U.M.B.S. No. 1751) collected by Pettingill at Waugoshance Point on September 1, 1953.

Sanderling, *Crocethia alba*. Transient; seen quite regularly in late July and August at Waugoshance Point, usually in small groups of from two to five individuals. A flock of 14 was observed on July 29, 1949, by Pettingill and his students.

Herring Gull, *Larus argentatus*. Although this species does not nest in the Park area, it is commonly observed throughout the summer along the entire shore of Lake Michigan. The gravel-sand bars are favorite loitering grounds.

Ring-billed Gull, *Larus delawarensis*. Like the Herring Gull, this species does not nest in the Park area (the nearest colonies of both species are on Green Island, off Point La Barbe, Upper Michigan, about 10 miles directly northeast), but it is observed throughout the entire summer along the Lake Michigan shore, often loitering on the gravel-sand bars. It is the commoner of the two gulls.

Bonaparte's Gull, *Larus philadelphia*. Uncommon transient; observed on three occasions at Waugoshance Point. Kendeigh and his students saw one individual in immature plumage on August 10, 1946. Pettingill and his students noted two in immature plumage on August 16, 1947. In 1953, they identified three in immature plumage and one in adult plumage, August 14, on a gravel-sand bar among loafing Herring Gulls, Ring-

billed Gulls, Common Terns, and Caspian Terns. One of the immature birds was collected (U.M.B.S. No. 1745).

Common Tern, *Sterna hirundo*. In the summers indicated below, U.M.B.S. personnel have reported nesting colonies, usually small, at Temperence Island or on the gravel-sand bars at Waugoshance Point: 1923-25 (nests not counted); 1945 (178 nests); 1946 (600 nests); 1949 (10 nests); 1950 (3 nests); 1954 (35 nests). In 1948, the Grabers found a nest with three eggs, still being attended by adults, as late as August 17. The Common Tern, even during summers when not nesting in the Park, has been commonly observed along the Lake Michigan shore, frequently resting on the gravel-sand bars.

Caspian Tern, *Hydroprogne caspia*. Commonly observed from the Lake Michigan shore and sometimes loafing on the gravel-sand bars, increasing in numbers as the summer advances; never as numerous as the Common Tern. There is no nesting colony near Wilderness Park.

Black Tern, *Cblidonias niger*. Not known to nest in the Park area, but occasionally seen in the summer over the larger marshes, searching for food. On July 18, 1949, the Grabers saw an adult at Sturgeon Bay catching food and carrying it southeastward, beyond the Park boundary, presumably to its young.

Mourning Dove, *Zenaidura macroura*. Uncommon summer resident. The Grabers saw a few regularly in cut-over and other open areas in 1949, and found a nest with one egg and one young on July 5, seven feet from the ground on the top of a birch stub. The next year, on August 8, Pettingill and his students discovered a nest with two eggs, still being incubated, about three feet from the ground on the stump of a big tree.

Yellow-billed Cuckoo, *Coccyzus americanus*. Uncommon; presumably a summer resident. In 1949, the Grabers observed three individuals, each time singly, in shrubby areas.

Black-billed Cuckoo, *Coccyzus erythrophthalmus*. Uncommon; presumably a summer resident. The Grabers encountered the species three times in 1949 (June 9, July 10, and July 13), in each instance at the edge of coniferous-deciduous woods.

Screech Owl, *Otus asio*. Rare; presumably a permanent resident. The Grabers heard this species on July 1, 1949. Later, on July 7, they heard and saw an individual in a rather open pine woods.

Great Horned Owl, *Bubo virginianus*. Fairly common; undoubtedly a permanent resident. On June 27, 1949, during a trip through woods near the south boundary of the Park, the Grabers heard three individuals. Nelson observed one individual on July 6, 1947, along the Swamp Trail, and Pettingill and his students observed another on July 31, 1948, in the same locality.

Long-eared Owl, *Asio otus*. On June 12, 1949, the Grabers found the wings and pectoral girdle of an individual on the beach near the end of Waugoshance Point.

Saw-whet Owl, *Aegolius acadica*. Permanent resident. A specimen in juvenal plumage and able to fly (U.M.B.S. No. 1520) was collected by R. R. Graber at Waugoshance Point in dense cedar woods on July 22, 1949. The next year, on August 19, in the same area and habitat, Pettingill collected another specimen (U.M.B.S. No. 1670), which was undergoing the postjuvinal molt.

Whip-poor-will, *Caprimulgus vociferus*. Undoubtedly a summer resident; common. In 1949, between June 14 and July 3, the Grabers heard the species regularly in open pine woods and coniferous-deciduous woods. On July 20, in an area with open stands of red pine, birch, and maple they came upon an individual which feigned injury, presumably because they were near a nest or young.

Common Nighthawk, *Chordeiles minor*. Common summer resident. In 1949, the Grabers noted courtship flights regularly over all open areas at Waugoshance Point from June 9, the day the Grabers arrived in the Park, until July 20. Nickell found a nest with two eggs in a treeless rocky area at the Point on June 23, and the Grabers later found a nest with one newly laid egg in open coniferous-deciduous woods on July 20.

Chimney Swift, *Chaetura pelagica*. Regularly seen over different parts of the Park and the Laway Settlement, but no nests have been found.

Ruby-throated Hummingbird, *Archilochus colubris*. Presumably a summer resident; fairly common. The species is more frequently seen in the late summer, at which time both adults and birds-of-the-year tend to concentrate wherever there are fresh sap-

sucker borings and beds of cardinal-flowers (*Lobelia Cardinalis*).

Belted Kingfisher, *Megaceryle alcyon*. Seen frequently at the ponds and along the creeks. No nests have been found.

Yellow-shafted Flicker, *Colaptes auratus*. Common summer resident. The species is frequently encountered along the beaches and edges of marshes where it searches for food. The Grabers located several nests in 1949. The first one found (on June 10) contained eggs. Young birds were first noted out of the nest about July 1.

Pileated Woodpecker, *Dryocopus pileatus*. Undoubtedly a permanent resident. Since 1935 when the species was first reported from the Park (see Nelson, 1956: 34), U.M.B.S. personnel have observed it from time to time, either in coniferous-deciduous woods, flying across open areas, or working on tall stubs in the marsh south of Big Stone Pond. The Grabers noted individuals at least a dozen times in the summer of 1949 and were impressed with the many tree excavations which this big woodpecker had made in all the coniferous-deciduous woods they visited. No nests have been found.

Common Sapsucker, *Sphyrapicus varius*. Common summer resident; most frequently seen where cedars, aspens, and birches are prevalent. In 1949, the Grabers found three nests as follows: June 14, nest with eggs, 20 feet from ground in a live aspen; June 27, nest (contents not seen), 30 feet from ground in a live aspen; July 1, nest with young, 10 feet from ground in a dead aspen.

Hairy Woodpecker, *Dendrocopos villosus*. Fairly common permanent resident. Seen most often in coniferous-deciduous woods with a large proportion of deciduous trees. The Grabers found a nest in a large birch on June 10, 1949, and came upon several family groups during the first two weeks of July.

Downy Woodpecker, *Dendrocopos pubescens*. Fairly common permanent resident. Somewhat more widely distributed than the Hairy Woodpecker, appearing in all kinds of woods and in shrubby areas. The Grabers found young birds and family groups in 1949 soon after the first of July.

Eastern Kingbird, *Tyrannus tyrannus*. Common summer resident. In 1949, the Grabers found six nests at Waugoshance Point and one on the Island, all in cedars, from three to 12 feet from the ground, with an average height of about five feet. One nest contained two eggs when found on June 15 and three eggs the following day; another nest contained three eggs when found on June 29.

Crested Flycatcher, *Myiarchus crinitus*. Summer resident; fairly common in pine woods, coniferous-deciduous woods, and cut-over areas. The Grabers noted a nest in 1949 in an old stub near Little Sucker Pond.

Eastern Phoebe, *Sayornis phoebe*. Summer resident, nesting more or less regularly on buildings in the Park and the Laway Settlement. The Grabers found two nests with eggs at the Old Camp Grounds on June 21, 1949.

Traill's Flycatcher, *Empidonax traillii*. Commonly observed south of Big Stone Pond and along the Swamp Trail in alder thickets where it is presumably a summer resident; doubtlessly occupies similar habitats elsewhere in the Park. No nests have been found.

Least Flycatcher, *Empidonax minimus*. Fairly common summer resident in deciduous woods, especially in aspen woods near open areas. In 1949, the Grabers found two nests, one of which was being built on June 21.

Eastern Wood Pewee, *Contopus virens*. Common summer resident in open deciduous woods. A nest found by the Grabers in 1949 at the Old Camp Grounds contained three eggs which hatched about July 10.

Olive-sided Flycatcher, *Nuttallornis borealis*. Summer resident. In 1949, the Grabers observed the species in six different places, usually in cut-over areas where there were scattered, small stands of conifers. Two such places were south of Big Stone Pond, along the Swamp Trail. A nest with four eggs, which the Grabers found on June 24, was 16 feet from the ground in a spruce. The eggs hatched on June 30 and the young left the nest on July 17. In 1954, Whiting watched a pair of Olive-sided Flycatchers on June 23, feeding young in a spruce near Little Sucker Creek.

Horned Lark, *Eremophila alpestris*. Not known to nest in the Park. There are two records from Waugoshance Point, probably of wandering or transient individuals, as follows: four, by Kendeigh and his students, on August 6, 1946; one, by Pettingill and his students, on August 16, 1947.

Handwritten mark: an arrow pointing up and to the right, with the number '22' written below it.

X Tree Swallow, *Iridoprocne bicolor*. Summer resident. In 1949, the Grabers found several nests in dead-tree cavities near Big Stone and Little Sucker Ponds and at Waugoshance Point. In one of these nests there were five eggs which hatched about June 24. At the Point, as the summer advances, increasingly large numbers of individuals appear until, by August, the species is often abundant.

X Bank Swallow, *Riparia riparia*. Not known to nest in the Park. A few individuals, presumably transient, have been observed by U.M.B.S. personnel during August in 1946, 1950, 1952, and 1955.

① Rough-winged Swallow, *Stelgidopteryx ruficollis*. Not known to nest in the Park. One record: an individual observed by Pettingill and his students at Waugoshance Point on August 1, 1954.

X Barn Swallow, *Hirundo rustica*. Summer resident. The Grabers reported the species nesting at the Laway Settlement in 1949. At Cecil Bay, in a building about three miles east of the Park entrance, Pettingill and his students found two nests in 1944, one with eggs and one with young, on July 29. Transient Barn Swallows are invariably common at Waugoshance Point during August.

① Cliff Swallow, *Petrochelidon pyrrhonota*. Not known to nest in or near the Park. One record: an individual seen by Pettingill and his students at Waugoshance Point on August 3, 1954.

X Purple Martin, *Progne subis*. Nests at the Laway Settlement. Commonly observed after mid-summer at Waugoshance Point.

X Blue Jay, *Cyanocitta cristata*. Common resident in the summer; most frequently observed in deciduous woods. On June 22, 1949, the Grabers found a pair feeding young out of the nest.

X Common Crow, *Corvus brachyrhynchos*. Common summer resident. One family, with young fully grown but still being fed by the parents, was observed by the Grabers on July 14, 1949.

X Black-capped Chickadee, *Parus atricapillus*. Common permanent resident in various wooded habitats. In 1949, the Grabers found a nest with young on July 10. At about this time family groups were first noted moving through the woods.

⊗ White-breasted Nuthatch, *Sitta carolinensis*. Uncommon permanent resident. On July 11, 1949, the Grabers found a nest with young in a red oak, seven feet from the ground, at the Old Camp Grounds.

X Red-breasted Nuthatch, *Sitta canadensis*. Common summer resident, mainly in coniferous-deciduous woods (where conifers predominate) and spruce-tamarack bogs. On June 22, 1949, near the point where the Swamp Trail crosses Little Sucker Creek, the Grabers found a nest with young, 12 feet from the ground, in a balsam-fir stub which stood in a clearing not far from a growth of tall conifers. The young left the nest on June 24.

⊗ Brown Creeper, *Certhia familiaris*. Summer resident. In the summer of 1949, the Grabers saw the species seven times, either in uniformly coniferous woods or in coniferous woods mixed with aspens and birches. On June 29 they found a nest with young, about 45 feet from the ground in a large aspen, and the next day watched the young leave this nest.

⊗ House Wren, *Troglodytes aedon*. Summer resident; common in cut-over or other open places where there is ample slash or fallen timber for nesting sites. In such areas, during the summer of 1949, the Grabers found several nests, one of which was being built on June 14.

⊗ Winter Wren, *Troglodytes troglodytes*. Undoubtedly a summer resident; frequent in cedar woods and spruce-tamarack bogs where the trees are so densely concentrated as to all but exclude the sunlight.

X Short-billed Marsh Wren, *Cistothorus platensis*. Common summer resident in the larger marshes. At Waugoshance Point on June 24, 1949, the Grabers found a nest with three well-developed young, situated about five inches above water in a small shrub (sweet gale, *Myrica Gale*), surrounded by a dense growth of sedges.

? Catbird, *Dumetella carolinensis*. Uncommon summer resident. In the summer of 1949, the Grabers recorded this species only twice: on June 21, when they saw an adult at the edge of the Swamp Trail near its crossing of Little Sucker Creek; on July 6, when

they found a family (adults with two young on the wing) in an alder thicket. Station personnel have reported Catbirds occasionally at Waugoshance Point in August, long after the nesting season.

X Brown Thrasher, *Toxostoma rufum*. Summer resident; common in shrubby areas and in the smaller clumps of cedars at Waugoshance Point. In the latter habitat the Grabers found a nest with three eggs on July 4, 1949, six feet from the ground on a cedar branch. When they inspected the nest again on July 13, it contained two small young at least a day apart in age and a piped egg. The Grabers observed many wandering family groups after the first of July, the young in most cases being able to fly well. In August, according to reports of Station personnel, the Brown Thrasher is very common at the Point, probably as a result of many individuals gathering from other places.

X Robin, *Turdus migratorius*. Summer resident; very common in nearly all upland habitats with suitable nesting sites. The Grabers found young several days out of the nest when they arrived in the Park on June 10, 1949.

⊗ Wood Thrush, *Hylocichla mustelina*. Uncommon summer resident. One record: on July 6, 1949, the Grabers found an adult with one young, which had just left its nest, 15 feet from the ground in a white pine growing in a coniferous-deciduous woods.

⊗ Hermit Thrush, *Hylocichla guttata*. Common summer resident; frequently observed in open pine woods. Whiting, on June 16, 1955, found a nest with four eggs about 20 inches from the ground in the depressed, rotted center of a stump.

⊗ Olive-backed Thrush, *Hylocichla ustulata*. Common summer resident in coniferous-deciduous woods where conifers predominate. In the summer of 1949, the Grabers heard this species more often than either the Hermit Thrush or the Veery. On June 20, a nest under construction was found by Tordoff, six feet from the ground on a spruce limb; it contained three eggs on June 24. Another nest under construction was found by Nickell on June 26, 40 inches from the ground next to the trunk of a spruce; this contained one egg at 8:30 a.m. and two at 6:00 p.m., June 27, and three at 10:25 a.m., June 28. In 1953, Berger found a nest with four eggs on June 16, four feet from the ground in a spruce.

X Veery, *Hylocichla fuscescens*. Common summer resident in all woods where there is considerable shade; especially numerous in dense cedar woods. On July 7, 1949, the Grabers saw two stubby-tailed young in the woods west of the Station Point Cabin.

⊗ Eastern Bluebird, *Sialia sialis*. Common summer resident at the edges of such open habitats as ponds and marshes where there are suitable nesting sites. In 1949, the Grabers found four nests, one of which was three feet from the ground in a stump; it contained three eggs when found on June 10 and four eggs on June 19.

⊗ Golden-crowned Kinglet, *Regulus satrapa*. Fairly common summer resident in dense cedar woods and spruce-tamarack bogs. On June 19, 1949, the Grabers watched adults feeding young recently out of the nest.

⊗ Ruby-crowned Kinglet, *Regulus calendula*. Rare summer resident. One record: on July 28, 1948, Pettingill together with George Miksch Sutton, Ernest P. Edwards, and Robert B. Lea, came upon a family of six or seven individuals in a sparse growth of cedars, balsam-firs, spruces, and aspens, not far from the Swamp Trail (see Sutton, 1948: 159). Sutton collected one specimen (G.M.S. No. 10414), which proved to be a female in juvenal plumage with fully grown flight feathers and no evidence of the postjuvenal molt being under way.

X Cedar Waxwing, *Bombycilla cedrorum*. Very common summer resident. The Grabers found nine nests in various wooded habitats during the summer of 1949. The earliest nest they found was one just completed on June 10.

X Starling, *Sturnus vulgaris*. During the summer of 1949, the Grabers recorded the species only once — an individual seen by them at Sturgeon Bay on June 21. Now and then U.M.B.S. personnel have seen small numbers at Waugoshance Point after mid-July. Kendeigh and his students reported as many as 45 on July 20, 1946; Pettingill and his students saw one flock of 15 on August 7, 1956. No nests have been found in the Park.

X Solitary Vireo, *Vireo solitarius*. Uncommon summer resident. First reported in 1946 when Kendeigh observed one individual on June 26. The next year Pettingill and his students found a nest with three eggs on August 2, 10 feet from the ground in one of

several cedars growing close together near the Swamp Trail. There was one newly hatched young in the nest when next seen on August 5. During their summer of 1949 in Wilderness Park, the Grabers located only three pairs, all in coniferous-deciduous woods.

Red-eyed Vireo, *Vireo olivaceus*. Very common summer resident in all deciduous woods, particularly where aspens predominate. In 1949, the Grabers saw a nest being built as early as June 10; later, in a coniferous-deciduous woods, they found a nest with three small young on July 7, eight feet from the ground in a cedar.

Warbling Vireo, *Vireo gilvus*. Not known to nest. Two records: one individual heard singing by the Grabers, early in the summer of 1949, near the Swamp Trail about a quarter of a mile from Big Stone Pond; one identified by Pettingill and his students on August 4, 1951, at Waugoshance Point.

Black and White Warbler, *Mniotilta varia*. Common summer resident in coniferous-deciduous woods and in pure stands of cedar. Although no nests have been found, the Grabers in 1949 saw an adult carrying food as early as June 13 and noted many family groups after the middle of July.

Tennessee Warbler, *Vermivora peregrina*. Transient. One record: two individuals identified by Pettingill and his students at Waugoshance Point on August 14, 1948. The Tennessee Warbler undoubtedly occurs more often in the late summer than this record indicates.

Nashville Warbler, *Vermivora ruficapilla*. Common summer resident; especially numerous in tamarack-spruce bogs. On July 5, 1949, the Grabers watched a male feeding two young already able to fly but still with stubby tails. Soon after this date the Grabers found several family groups.

Parula Warbler, *Parula americana*. Summer resident; apparently confined to the forest-edge habitat of pine woods at Waugoshance Point. In 1949, the Grabers located 15 singing males, 12 along the north shore of the Point and three along the south shore, and found four occupied nests, all along the north shore. The nests in all cases were in balsam-fir and their average height from the ground was about 10 feet. The young in the first nest, which they found on June 28, left as early as July 3. The one young bird in the fourth nest, found on July 12, left (somewhat prematurely) as late as August 4. (For an extensive report on the study of these nests, see Graber, 1951: 75-83).

Yellow Warbler, *Dendroica petechia*. Common summer resident, mainly in the low, dense cedar growth at Waugoshance Point and Island. In 1949, the Grabers found four nests (two being built and two with incomplete clutches) on June 15, one nest (with an incomplete clutch) on July 4, and one nest (being built) on July 14. All the nests were four feet or less from the ground in cedars.

Magnolia Warbler, *Dendroica magnolia*. Uncommon summer resident in low stands of spruce and balsam-fir at woodland edges. On June 23, 1949, the Grabers found a nest with four half-grown young, about three feet from the ground in a balsam-fir.

Cape May Warbler, *Dendroica tigrina*. Transient. Two records, both from Waugoshance Point: one adult male (U.M.B.S. No. 1556) collected by Tordoff, August 13, 1949; another adult male (U.M.B.S. No. 1665) collected by the Grabers, August 19, 1950.

Black-throated Blue Warbler, *Dendroica caerulescens*. Uncommon summer resident in coniferous-deciduous woods where there is a moderately dense understory of bracken and striped maple. Nelson recorded three pairs on July 6, 1947, during her walk along the entire Swamp Trail from Big Stone Pond to Sturgeon Bay. In the summer of 1949 the Grabers noted the species about a dozen times only. They found a pair on June 26, feeding three young just out of the nest, and observed stubby-tailed young, able to fly, as late as July 14.

Myrtle Warbler, *Dendroica coronata*. Summer resident in nearly all wooded habitats; common in open pine woods, in coniferous-deciduous woods, in cut-over areas, and in dense cedar growth at Waugoshance Point. On June 28, 1949, the Grabers found a nest (with three young nearly ready to leave) about seven feet from the ground on the branch of a spruce.

Black-throated Green Warbler, *Dendroica virens*. Common summer resident, mainly in large coniferous-deciduous woods, often among conifers near the edges. Probably the most common species of *Dendroica* in the Park. Four nests have been found, all in

cedars, as follows: with four eggs, about seven feet from the ground, by Berger, June 16, 1953; with four eggs, about eight feet from the ground, by Whiting, June 17, 1953; with one egg, 14 feet from the ground, June 24, and with four young, seven feet from the ground, by the Grabers, July 7, 1949. The Grabers found three young birds just out of a nest in 1949 as early as June 19 and collected one as a specimen (U.M.B.S. No. 1525).

Blackburnian Warbler, *Dendroica fusca*. Common summer resident in coniferous-deciduous woods where conifers predominate. A young female specimen (U.M.B.S. No. 1527) just out of the nest was collected by Tordoff on July 7, 1949.

Chestnut-sided Warbler, *Dendroica pensylvanica*. Observed irregularly along the Swamp Trail in alder thickets and in a few other shrubby places near marshes; probably a summer resident but no nests have been found. The Grabers observed only a few individuals during the summer of 1949.

Bay-breasted Warbler, *Dendroica castanea*. Transient. One record: the Grabers saw one individual in fall plumage at Waugoshance Point on August 19, 1950. Like the Tennessee Warbler, this species probably occurs more often in the late summer than this record indicates.

Pine Warbler, *Dendroica pinus*. Common summer resident in all open pine woods. On July 18, 1949, the Grabers saw a male feeding stubby-tailed young which had recently left a nest.

Palm Warbler, *Dendroica palmarum*. Transient. One record: an individual identified by R. R. Graber along the Swamp Trail on August 24, 1948.

Oven-bird, *Seiurus aurocapillus*. Common summer resident, primarily in aspen woods and coniferous-deciduous woods. Next to the American Redstart, the Oven-bird is probably the commonest warbler in the Park. In 1949, the Grabers found a nest with four eggs on July 8, but came upon a family of six, all four young out of the nest, as early as June 24.

Northern Water-thrush, *Seiurus noveboracensis*. Uncommon; not known to nest. At Waugoshance Point, Sutton collected a fully grown male bird-of-the-year (U.M.B.S. No. 1423) on July 26, 1948; at the same locality later that year Pettingill and his students saw one individual on August 14.

Mourning Warbler, *Oporornis philadelphia*. Summer resident in dense shrubby areas with considerable coniferous growth. During the summer of 1949 the Grabers located no more than 10 singing males. That same summer, on July 3, Whiting found a nest with two young which left the nest the following day. One of the young was taken as a specimen (U.M.B.S. No. 1524).

Yellow-throat, *Geothlypis trichas*. Common summer resident in alder thickets and in other wet, shrubby places. On June 16, 1949, the Grabers found a nest with four eggs, about five inches above ground, in a three-foot cedar at the junction of a marsh and a clump of cedars near the end of Waugoshance Point.

Wilson's Warbler, *Wilsonia pusilla*. Transient. One record: an individual in fall plumage seen by Pettingill at Waugoshance Point on August 19, 1950.

Canada Warbler, *Wilsonia canadensis*. Common summer resident in spruce-tamarack bogs, usually in dense tree growth near the edges. On June 26, 1955, Whiting flushed four young, which had recently left the nest, from the edge of a bog. After July 1, 1949, the Grabers often saw adults carrying food.

American Redstart, *Setophaga ruticilla*. Common summer resident; undoubtedly the most abundant warbler in the Park, occurring in all wooded environments. Of the eight nests found by the Grabers in 1949, all were in trees within six feet of the ground, but Whiting in 1953 discovered a nest 15 feet from the ground in a cedar. The Grabers in 1949 noted young birds out of the nest on June 29.

Bobolink, *Dolichonyx oryzivorus*. Not known to nest. Soon after mid-July Station personnel have occasionally observed small flocks of this species loitering in the marshes at Waugoshance Point or flying over the area.

Red-wing, *Agelaius phoeniceus*. Common summer resident in the marshes, particularly those at Waugoshance Point. A nest with four young about ready to leave was found by the Grabers on June 17, 1949.

Baltimore Oriole, *Icterus galbula*. Uncommon summer resident. In 1949, the Grabers located only three pairs, all in open deciduous woods, and on July 8, Whiting

saw one young bird which had recently left a nest. An old nest was noted by the Grabers in a tall aspen along the Swamp Trail.

Common Grackle, *Quiscalus quiscula*. Uncommon summer resident. In 1949, the Grabers saw only a few individuals, all in the vicinity of the Old Camp Grounds, and on July 1 noted adults feeding young out of the nest.

Brown-headed Cowbird, *Molothrus ater*. Uncommon; nests with Cowbird eggs have never been found. In the summer of 1949, the Grabers saw Cowbirds only three times, at the Old Camp Grounds; they failed to discover any eggs, despite the fact that they found nests of 20 species known to be Cowbird hosts elsewhere, and they came upon no young. Sometimes U.M.B.S. personnel have noted a few Cowbirds, usually in flocks, in the late summer at Waugoshance Point.

Scarlet Tanager, *Piranga olivacea*. Observed uncommonly in deciduous-coniferous woods where it is presumably a summer resident. In the summer of 1949, the Grabers found two pairs, one of which, at the Old Camp Grounds, was observed carrying food on July 3.

Rose-breasted Grosbeak, *Pheucticus ludovicianus*. Uncommon; not known to nest. The Grabers observed one singing male, on June 14, 1949, in a tall aspen not far from the point where the Swamp Trail crosses Little Sucker Creek. Other Biological Station personnel have occasionally noted from one to several individuals in the late summer at Waugoshance Point.

Indigo Bunting, *Passerina cyanea*. Observed only at the Laway Settlement, where in the summer of 1949 the Grabers noted a singing male at the shrubby edge of a woods.

Evening Grosbeak, *Hesperiphona vespertina*. One record: on August 8, 1950, Pettingill and his students saw three individuals, all apparently adult, near the top of a high pine at Waugoshance Point. They were not observed again, though the area was later visited several times by Pettingill, the Grabers, and other Station personnel.

Purple Finch, *Carpodacus purpureus*. Common in all habitats where there are coniferous trees; undoubtedly a summer resident. Though no nests have been found, the Grabers saw an adult feeding a young bird out of the nest on June 23, 1949.

Pine Siskin, *Spinus pinus*. Uncommon; not known to nest. All records of this species have been obtained at Waugoshance Point after the first of July by Station personnel. The earliest summer record is July 3 (1949) when Whiting saw one individual near the Sturgeon Bay Cabin. No more than three individuals have ever been noted on any one trip. An adult female specimen (U.M.B.S. No. 1457) was collected by Pettingill on August 14, 1948.

Common Goldfinch, *Spinus tristis*. Common summer resident, observed most often in shrubby areas. On July 20, 1949, the Grabers found a nest with two eggs in an alder at the edge of a marsh.

Red Crossbill, *Loxia curvirostra*. In the late summers of 1947 and 1951 small flocks of this species were reported by Station personnel in the Park area. From one flock of six near the Old Camp Grounds at Big Stone Bay on August 2, 1947, Robert B. Lea collected three specimens (two males, U.M.B.S. Nos. 1373 and 1374, and one female, No. 1375); all were apparently adults. Pettingill and his students saw a flock of about 20 individuals at Waugoshance Point on August 4, 1951.

White-winged Crossbill, *Loxia leucoptera*. This species has been recorded in the Park only in the late summer of 1950 when small flocks were seen by Station personnel on several different trips. From small flocks observed at Waugoshance Point on August 5, Pettingill collected three adult male specimen (U.M.B.S. Nos. 1647, 1663, and 1664) and R. R. Graber one adult female specimen (U.M.B.S. No. 1648). Pettingill and his students watched a flock of seven at the Point on August 8, and R. R. Graber noted three individuals together at the same locality on August 15.

Rufous-sided Towhee, *Pipilo erythrophthalmus*. Common summer resident in cut-over areas where there is a sparse growth of shrubs and small trees. Three pairs were noted by Nelson along the Swamp Trail on July 6, 1947. During the summer of 1949 the Grabers found the species especially common in shrubby habitats at the southern boundary of the Park and on July 1 watched adults feeding young just out of a nest.

Vesper Sparrow, *Pooecetes gramineus*. Uncommon summer resident. In the summer of 1949 the only area in the Park where the Grabers found this species was at Waugo-

shance Point. Here, on the sparsely vegetated sand flats, they noted a few individuals regularly, and on July 4 watched two young birds just beginning to fly.

Chipping Sparrow, *Spizella passerina*. Common summer resident at the edges of clearings and in open woods. On June 10, 1949, the Grabers found a nest, eight feet above the ground in a spruce, with young about ready to leave.

Field Sparrow, *Spizella pusilla*. Uncommon; a few possibly nest in the southern part of the Park on open sandy ridges sparsely covered with shrubs. In this locality on July 20, 1949, R. R. Graber collected a fully grown female bird-of-the-year (U.M.B.S. No. 1516), which was undergoing the postjuvinal molt. The Grabers saw another fully grown juvenile at Waugoshance Point on July 15, 1949.

White-throated Sparrow, *Zonotrichia albicollis*. Common summer resident in cut-over areas. In 1949, the Grabers saw adults carrying food as early as June 13. On June 24, at the base of a small balsam-fir near the Swamp Trail, the Grabers found a nest with two eggs. There were four eggs in the nest on June 27, three small young and one egg on July 7.

Swamp Sparrow, *Melospiza georgiana*. Common summer resident in the large marsh south of Big Stone Pond; infrequent in the marshes at Waugoshance Point. On June 10, 1949, the Grabers found four well-developed young in a nest near the Swamp Trail, situated about one and a half feet above water in cattails. A specimen in juvenal plumage with all flight feathers fully grown (U.M.B.S. No. 1439) was collected by Pettingill near the edge of a marsh at the Point on July 31, 1948.

Song Sparrow, *Melospiza melodia*. Common summer resident in nearly all shrubby places. The Grabers found five nests in the summer of 1949. One nest, discovered on June 15, contained five young about ready to leave.

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