Amherst Point Sanctuary - 1981 Oldfield Investigation

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Introduction

The Amherst Point Sanctuary contains 90 acres of oldfield habitat in various successional stages (Figure 1). The "youngest" field was last cultivated in 1975 and is still covered predominantly by grasses and forbs, while succession in the "oldest" field has progressed to where the vegetative cover is dominated by young white spruce. There are several stages of vegetative succession between those two extremes.

The management philosophy concerning oldfield habitats on National Wildlife Areas in the Atlantic Region is that active habitat manipulation will be undertaken for the purpose of maintaining optimum habitat diversity and wildlife values including those complimentary to other components of the areas. In order to accomplish this it is necessary to have a good knowledge and understanding of the oldfield habitats and their wildlife values.

This investigation was undertaken to obtain information on the vegetative covers and wildlife values of oldfields at Amherst Point to provide a basis on which to plan and implement management strategies for the purpose stated above. The study was conducted on five oldfield units representing different successional stages and it consisted of the following three aspects: 1) vegetative covers; 2) bird populations and 3) small mammal populations. The procedures and results for each of these aspects are presented separately. Recommendations (based on the finding of this study) for the management of oldfields at Amherst Point Sanctuary are presented.

I. Vegetative Covers

Methods

The vegetative covers of the five study fields (No.'s 1-5) were investigated by sampling the vegetation at 10 meter intervals along a single transect run through each field. With the exception of field number 4, the transects were run from the NW corner to the SE corner of each field (Figure 2). The transect in field number 4 was run from the NE corner to the SW corner. At each sampling point a one meter square quadrat was placed on the ground and all plant species within the quadrat were recorded. Shrub and tree species within a 5 meter radius of the sampling point were recorded.

Results

A list of all the species recorded in the five study fields and the frequencies with which they occurred in each field are presented in Table 1. The species are arranged according to the following groups: grass and sedge; forbs; moss; small woody plants; shrubs; and trees. The data were summarized for each study field and presented in Table 2. Percent frequency occurrence values were converted to abundance ratings as follows: 1. Abundant = 76-100%; 2. Fairly Abundant = 51-75%; 3. Common = 26-50%; and 4. Scattered = 1-25%. To show the relative importance of each group of plants as a component of the vegetative cover each was rated as prominent, fairly prominent or minor.

The vegetative cover of each field is described briefly in the following account.

Field 1

This field, the youngest of the five study fields was last cultivated in 1971 when it was plowed and planted in grain. The prominent components of the field are grass and sedge, and forbs. Small woody plants are absent and shrubs and trees are not prevalent.

Field 2

This field is obviously a number of years older than field 1. The prominent components are forbs and small woody plants. The single most prevalent species is meadow sweet. Shrubs are a fairly prominent component of the vegetative cover, but trees are relatively scarce.

Field 3

This field is older than field 2 and the grass and sedge and forbs components are further reduced. The prominent components are small woody plants and shrubs. Shrubs in particular provide the dominant feature of the vegetative cover and young trees are well established.

Field 4

This field is comparable to field 1 in that the prominent components of the vegetative cover are grass and sedge and forbs. The successional process is more advanced, however, with small woody plants and shrubs also being prevalent and it represents a stage somewhere between those of fields 1 and 2.

Field 5

This field represents the most advanced stage of oldfield regeneration at Amherst Point Sanctuary and the dominating component of the vegetative cover is trees, particularly white spruce. Shrubs are also prevalent and comprise a second prominent component of the cover. Meadow sweet provides a prominent understory. While moss is prevalent, woodland herbs have not become established.

II. Bird Populations

Methods

The five study fields were each surveyed twice during the period 25 June to 16 July to determine the species and numbers of breeding birds within the fields and in adjacent edge habitats. All surveys were conducted during the morning between 0635 and 0910 hours. Each field was surveyed by slowly walking along a route that provided complete coverage. The locations of all birds seen and/or heard within the field or in adjacent edge habitats were recorded on field maps and the results of the two surveys were combined and interpreted to give an estimate of the number of nesting pairs.

Results

A total of 16 species of birds were suspected of nesting within the study area and an additional 7 species either nested in the fields or in adjacent edge habitats (Table 2). The most abundant species were Yellow Warbler (11 pairs), Song Sparrow (6 pairs), Common Yellowthroat (4-5 pairs), American Redstart (3-4 pairs), Chestnut-sided Warbler (2-3 pairs), Magnolia Warbler (2-3 pairs), Bobolink (2+ pairs) and White-throated Sparrow (2 pairs). Only one species, Song Sparrow, was suspected of nesting in all

five fields, while Common Yellowthroat was reported in four fields and Yellow Warbler in three.

The following is an account of the results for each field.

Field 1

This field was censused from 0635 to 0720 hrs. on 29 June and again from 0805 to 0830 hrs. on 7 July. Along with Field 4 it supported the lowest number of species of breeding birds, but a good variety was reported in adjacent edge habitats. Two pairs of Song Sparrows and at least two pairs of Bobolinks were suspected of nesting in the field. While six male Bobolinks were observed together on 7 July, females were observed at only two locations and aggressive behaviour suggested that nests were present at both sites.

Species suspected of nesting in adjacent edge habitats included Red-winged Blackbird and Swamp Sparrow (cattail fringe bordering Layton's Lake), and Eastern Kingbird, Alder Flycatcher, and several pairs of Song Sparrows, Yellow Warblers and Common Yellowthroat (various stages of older regeneration). Virtually all of these species were noted foraging in field 1 at some time. In addition several other species including Marsh Hawk, Tree and Barn Swallows and American Goldfinch were noted foraging in or over field 1 either during the surveys or while other fieldwork was being conducted.

Field 2

Field 2 was censused between 0730-0755 hrs. on 27 June and again from 0640-0705 hrs. on 16 July. Only three pairs of birds were believed to be nesting in the field; one each of Song Sparrow, Yellow Warbler and Common

Yellowthroat. Alder Flycatcher, Eastern Kingbird, Yellow Warbler and possibly a pair of Bobolinks were recorded in adjacent edge habitats. Tree and Barn Swallows were observed foraging over the field.

Field 3

Field 3 was censused from 0755 to 0820 hrs. on 29 June and again from 0710 to 0740 hrs. on 16 July. A good variety of species were suspected of nesting in the field with 7-8 species recorded including several pairs of yellow warblers and single pairs of Gray Catbird, Chestnut-sided Warbler, Common Yellowthroat, American Goldfinch, White-throated Sparrow, Song Sparrow, and possibly Cedar Waxwing.

Both Tree and Barn Swallows were noted foraging over the field. The many shrubs and small trees are probably used extensive for foraging by migrant warblers and other songbirds during both spring and fall migrations.

Field 4

Field 4 was censused from 0820 to 0835 hrs. on 29 June and 0745 to 0810 hrs. on 16 July. It supported a relatively low number and variety of breeding birds, with only one pair of Song Sparrow and one pair of Common Yellowthroat believed to be nesting there. The species recorded in edge habitats were Gray Catbird, Yellow Warbler, Chestnut-sided Warbler and Common Yellowthroat. Most of these species were observed foraging in the field and others including Marsh Hawk and swallows undoubtedly do so as well..

Field 5

Field 5 was censused from 0805 to 0910 hrs. on 25 June and from 0650 to 0750 hrs. on 7 July. It differed markedly from the other fields in that trees were the dominant feature of the vegetative cover. It also had the greatest variety and abundance of breeding birds. The most abundant species was Yellow Warbler with an estimated 7 pairs breeding in the field. There were also 3 or 4 pairs of American Redstart, 2 or 3 pairs of Magnolia Warblers and a number of other species with 1 or 2 pairs. Other species such as Black and White Warbler and Tennessee Warbler were recorded in the field, but observations suggest that these species were nesting in adjacent habitats and were only visitors to Field 5.

Summary

Fields 1, 2 and 4 had a relatively low variety and number of breeding birds. Bobolink which nested in Field 1 was the only species unique to these fields. However, these relatively open fields provide good foraging habitat for Marsh Hawks (and probably other predatory birds), swallows and birds nesting in adjacent edge habitat and other areas of the sanctuary.

Field 3 had a greater number of species with 7-8 species being suspected of nesting there including the only Gray Catbird and American Goldfinch. This field probably also provides good hunting for avian predators and like Field 5 is undoubtedly used extensively by migrant songbirds.

Field 5 contained the greatest variety and numbers of breeding birds with an estimated 22-30 pairs of 13-17 species. Many more or less "forest" birds were restricted to this field and like Field 3 it is used extensively by migrant passerines.

III. Small Mammal Populations

Methods

Small mammal populations of the five study fields were sampled to assess species composition and relative species abundance. Twenty-five sampling stations were located at 10 m intervals along a single transect in each field. The configuration of each transect was such that the transect was well within the limits of the study field. Two snap traps, one museum special and one victor, were set within a meter radius of each sampling station. A quick search was made for runs and other sign and if any were found the traps were set at those sites. Each trap was baited with a peanut butter-rolled oats mixture applied to a cotton ball.

The traps were operated for four nights between July 29 and August 5 giving a potential of 200 trap nights for each study field. The traps were checked between 0800 and 1200 hrs. following each night of operation.

Results

The species and numbers of small mammals taken from the five old-fields are given in Table 4. A total of 51 small mammals of seven species were collected. Interestingly, the Arctic Shrew was the most common species taken. According to Banfield (1974) they belong to the subspecies *Sorex arcticus maritimensis* that has been found only in southern New Brunswick and mainland Nova Scotia. Squires (1968) states that the species is rare in southern New Brunswick. Morton (1980) trapped several arctic shrews in the Tintamarre National Wildlife Area at the head of the Tantramar Marshes, New Brunswick and he suggests (pers. comm.) that the N.S.-N.B. Border Area may be one of the principal locations for this subspecies.

All seven species of small mammals were trapped in Field 5 which was also where the largest number was taken. It is not suprising that it was the only location where deer mice were trapped and one of only two fields where red-backed voles were collected.

The smallest number of animals and next to the fewest species were trapped in Field 1, the "youngest" of the study fields. It was surprising that no meadow voles were collected in this field. Field 2, which is in the next stage of oldfield succession after Field 1 had five species and the second largest number of animals. One half of the small mammals trapped there were arctic shrews and the largest number of short-tailed shrews were collected in this field.

Only two species were trapped in Field 3, which is in the second most advanced stage of regeneration of the five study fields. Red-backed voles were collected only in Field 3 and Field 5 and meadow jumping mice in fields 2 and 5 as well as Field 3. The only appreciable number of meadow voles were trapped in Field 4, but otherwise the species and numbers collected were similar to Field 1.

IV. Management Recommendations

The following recommendations are based largely on the findings of the investigation conducted in 1981 and presented in this report. It is believed that the implementation of these recommendations will result in the maintenance of oldfield habitats that provide optimum habitat diversity and wildlife values.

1. Maintain Fields 1 and 10 (Figure 1) in an early successional stage by cultivating and seeding with a grain-grass mixture every 10 years with a 5-year stagger between the two fields.

Schedule: Field 1 - 1982, 1992, etc.
Field 10 - 1987, 1997, etc.

By maintaining these fields in an early successional stage they will provide open habitat required by such species as Bobolink, Savannah Sparrow, American Kestrel, Marsh Hawk, etc. They should also provide waterfowl with nesting habitat. The unharvested grain will provide winter food for seed eating passerines and other species such as Ring-necked Pheasant.

2. Maintain Fields 2, 3, 4, 6, 7, 8 and 9 (Figure 1) in a mid successional stage similar to field 3 by mowing with a tractor and bush mower and hand operated bush mower. The treatment should be conducted on a 7 year rotation (one field per year). Mowing should be conducted to prevent the establishment of trees, but open stands of shrubs should be maintained.

Schedule: Field 3 - 1982, 1889, etc.
Field 8 - 1983, 1990, etc.
Field 9 - 1984, 1991, etc.
Field 6 - 1985, 1992, etc.
Field 7 - 1986, 1993, etc.
Field 3 - 1987, 1994, etc.
Field 4 - 1988, 1995, etc.

The maintenance of these fields in a successional stage similar to Field 3 will provide suitable nesting habitat for a variety of passerines

including such species as Gray Catbird, American Goldfinch and Eastern Kingbird which nest only in this type of habitat and other species that nest in a broader range of habitats (Table 3).

It is expected that mowing will also create habitat components similar to those of Field 2 which appears to be especially suitable for a variety of small mammals and in particular arctic shrew.

3. Maintain Field 5 as a young growth open stand of conifers and shrubs by selective thinning and removal of older trees. This should be conducted every 5 years or as considered necessary after inspection.

Schedule: 1983, 1988, etc.

It is evident from this investigation that this stage of oldfield succession provides the most suitable habitat for the greatest variety and number of breeding songbirds and small mammals (Tables 3 and 4). While providing habitat for woodland species such as Magnolia Warbler and deer mice it is open enough to afford edge habitat for a variety of other species.

Literature Cited

Banfield, A. W. F. 1974. The Mammals of Canada. University of Toronto Press, Toronto, Ontario.

Morton, Dale. 1980. Small mammal inventory of Tintamarre National Wildlife Area, 1978. CWS Internal Report, Sackville, N.B.

Squires, Austin. 1968. The Mammals of New Brunswick. Monographic Series No. 5. N.B. Museum, Saint John, N.B.

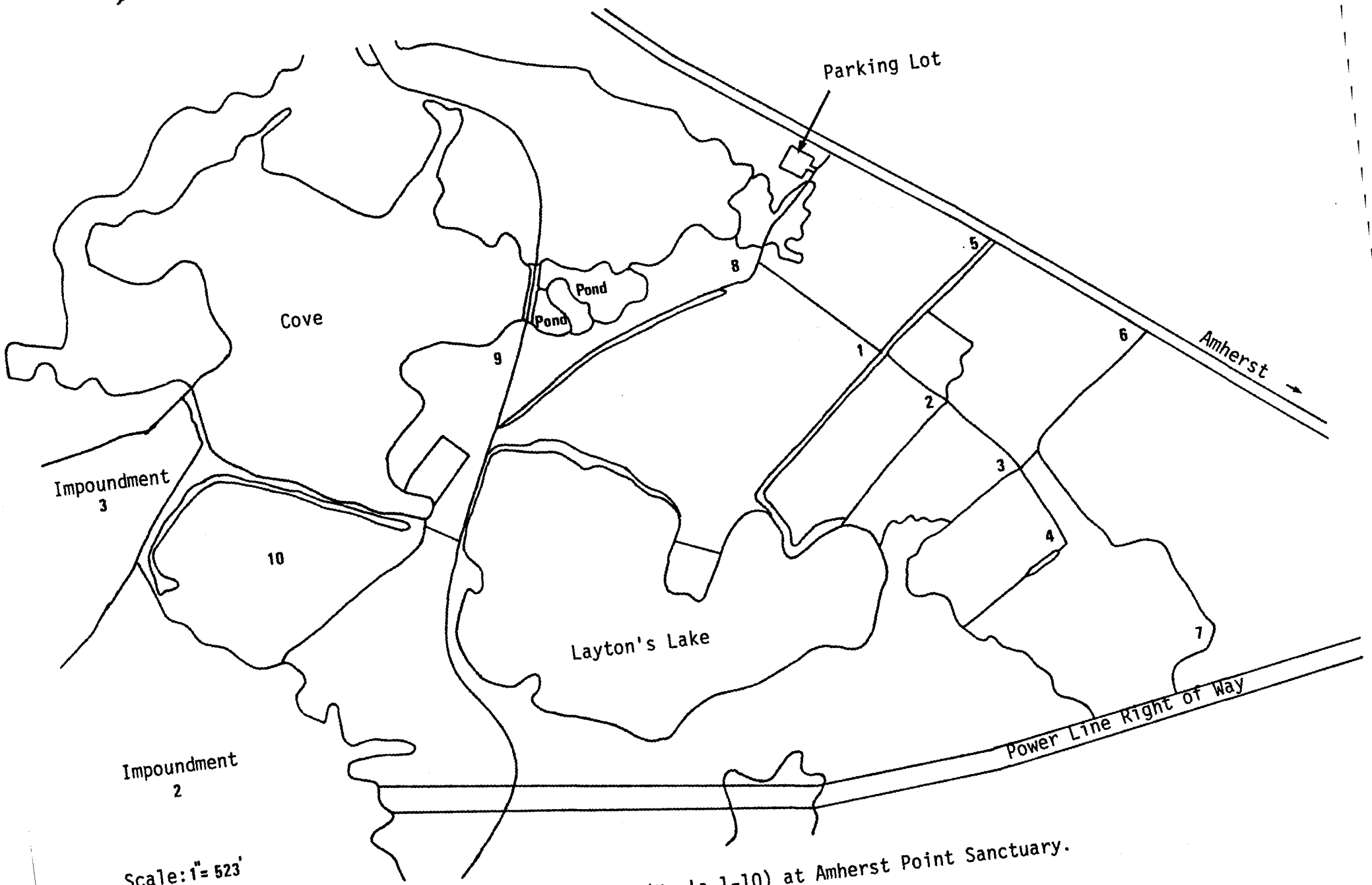

Figure 1. Location of Oldfield Habitats (No.'s 1-10) at Amherst Point Sanctuary.

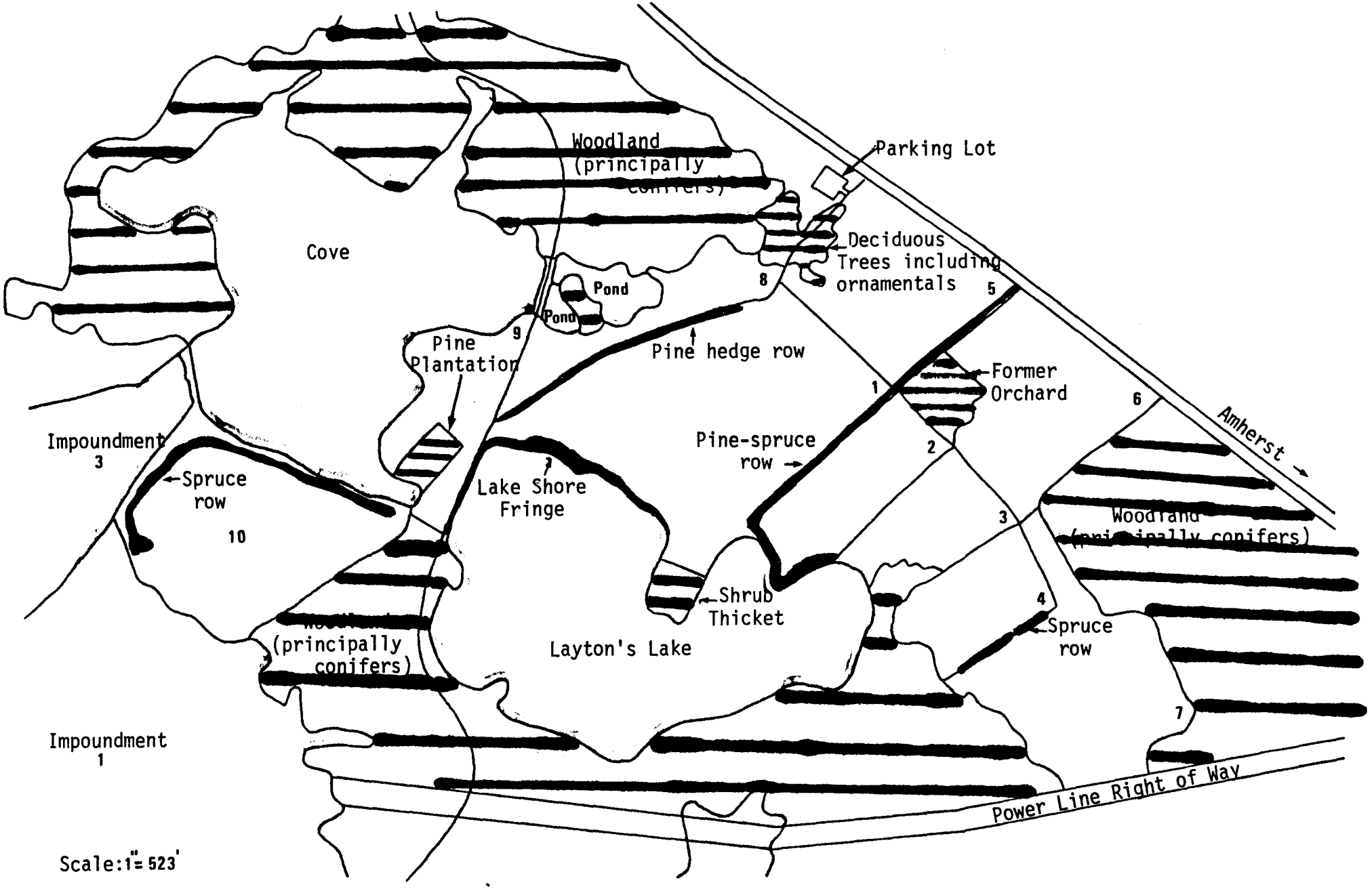

Figure 2. Location of Edge and adjacent habitat to Oldfield at Amherst Point Sanctuary.

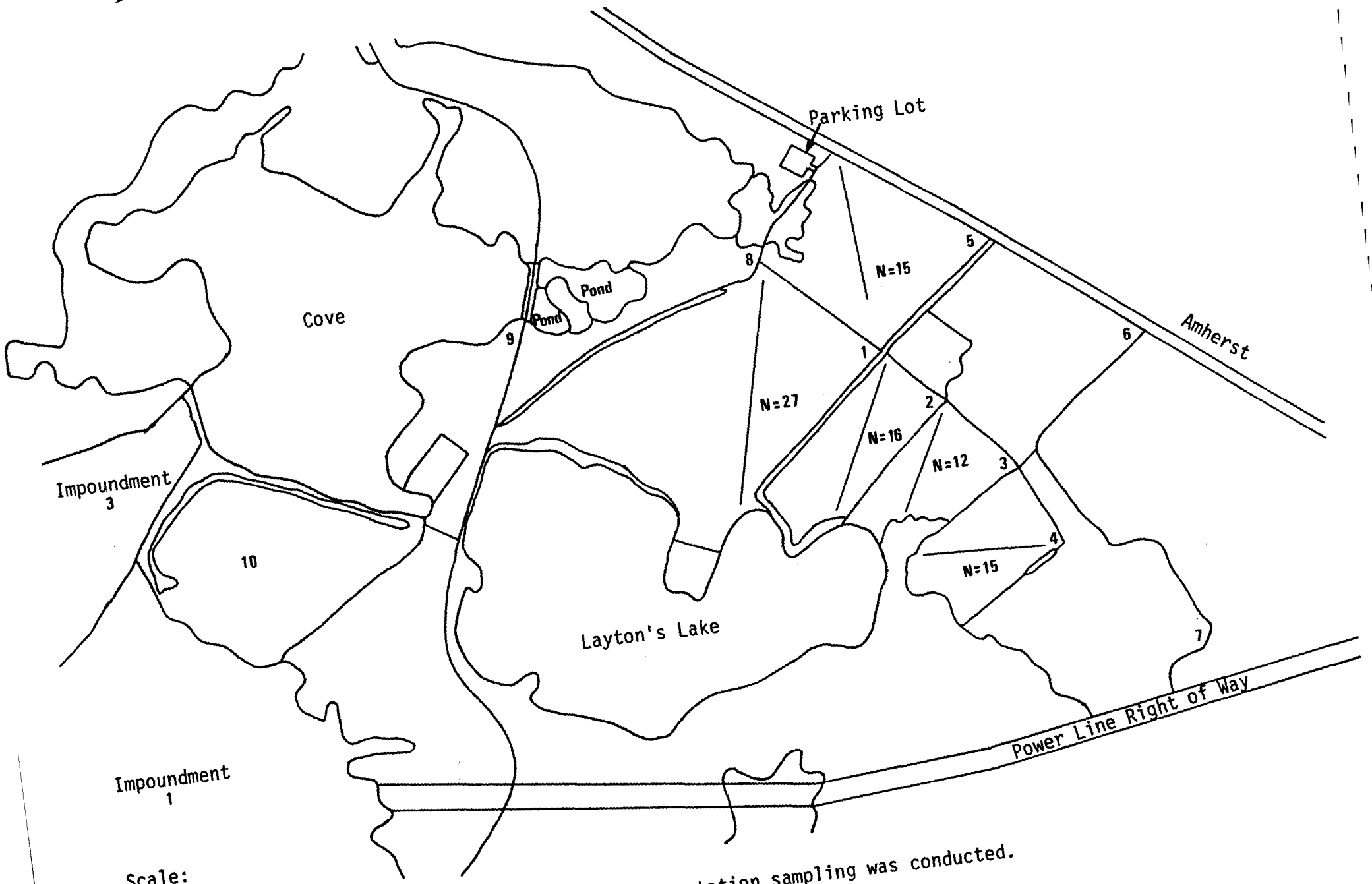

Figure 3. Location of Transects on which vegetation sampling was conducted.

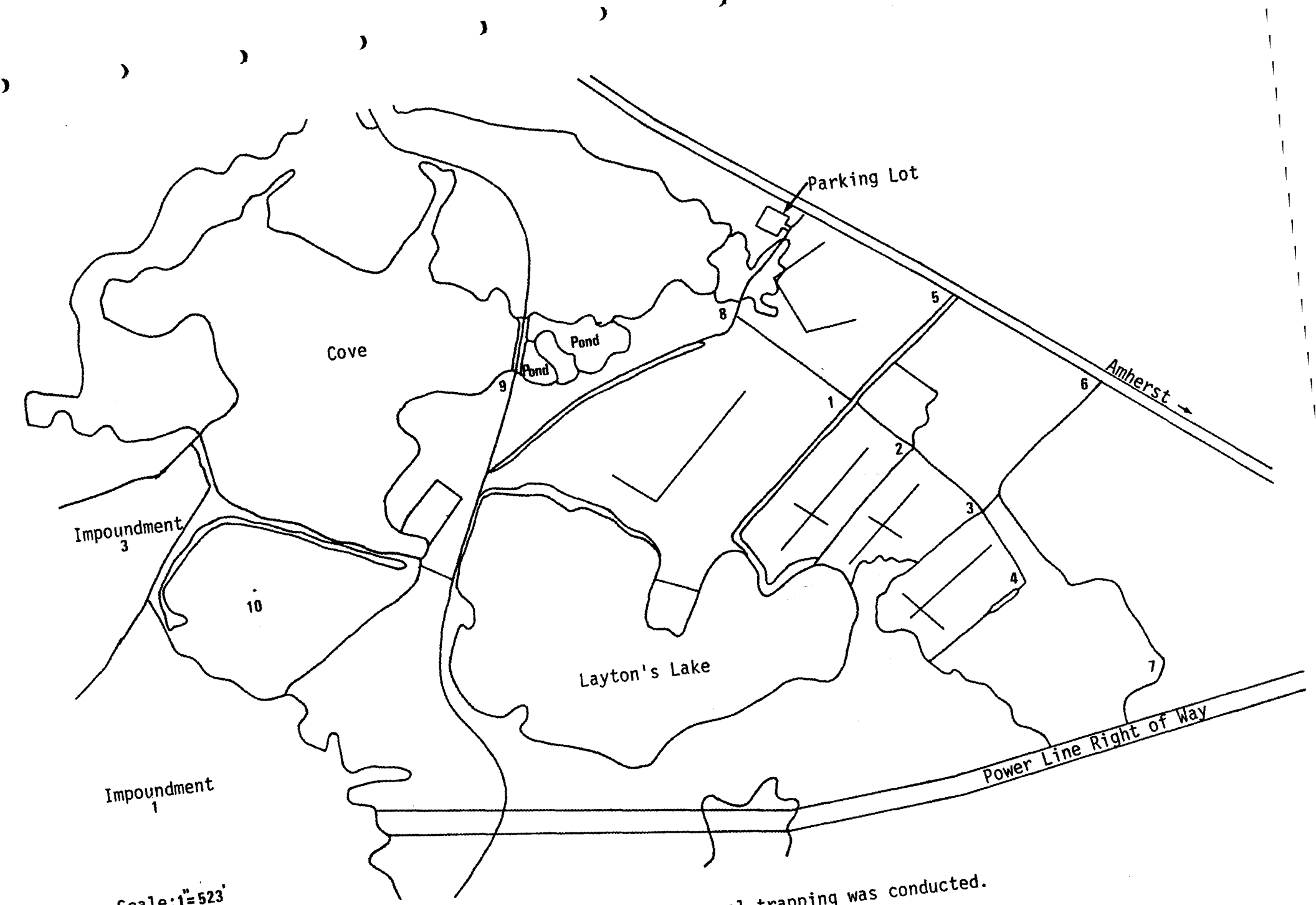

Figure 4. Location of Transects on which small mammal trapping was conducted.

Table 1. Plant species and their percent frequency occurrence values recorded in five oldfield study units at Amherst Point Sanctuary during 1981 oldfield investigation.

Species	% Frequency Occurrence				
Field Number -	1	2	3	4	5
Agrostis tenuis (Bent grass)	81	75	58	80	60
Agrostis sp. (Bent grass)	55	50	-	-	-
Carex spp. (Sedge)	81	25	-	60	20
Phleum pratense (Timothy)	85	50	25	67	-
Achillea Millefolium (Yarrow)	22	38	-	-	20
Aster Umbellatus (Tall White Aster)	70	-	25	-	-
Aster sp. (Aster)	41	81	42	87	87
Chrysanthemum Leucanthemum (Daisy)	-	-	-	20	-
Cirsium arvense (Canada Thistle)	70	-	25	27	-
Cornus canadensis (Bunchberry)	-	-	33	-	-
Equisetum arvense (Field Horsetail)	52	44	-	-	-
Fragaria virginiana (Wild Strawberry)	-	81	67	60	-
Galium sp. (Bedstraw)	37	-	-	87	-
Hieracium sp. (Hawkweed)	-	68	58	47	73
Oxalis stricta (Yellow Wood Sorrel)	59	31	-	20	-
Ranunculus acris (Tall Buttercup)	74	44	58	80	20
Rumex acetoselle (Sheep Sorrel)	-	25	-	20	-
Solidago canadensis (Canada Goldenrod)	30	44	33	73	-
Solidago graminifolia (N.l. Goldenrod)	22	44	-	47	-
Stellaria graminea (Stitchwort)	85	-	-	53	20
Taraxacum officinale (Dandelion)	44	31	-	60	-
Veronica officinalis (Common Speedwell)	-	-	42	-	-
Vicia cracca (Tufted Vetch)	81	-	-	53	27
Viola sp. (Violet)	-	31	-	-	-
Moss	30	56	67	40	80

Table 1. (continued)

Species	Field Number -	% Frequency Occurrence 1	2	3	4	5
Spirea latifolia (Meadow sweet)		-	94	83	47	80
Vaccinium angustifolium (Blue berry)		-	-	25	-	-
Rosa virginiana (Wild rose)		-	-	67	40	-
Alnus rugosa (Speckled Alder)		-	25	33	7	-
Amelanchier sp. (Wild Pear)		-	44	67	20	47
Aronia sp. (Chokeberry)		-	-	33	20	27
Cornus stolonifera (Red-osier Dogwood)		-	6	-	20	-
Crataegus sp. (Hawthorn)		7	13	58	20	13
Cornus alterniflora (Alternate-leaved Dogwood)		-	-	-	-	7
Pyrus malus (Apple)		15	-	76	-	33
Salix sp. (Willow)		37	-	8	7	-
Sambucus pubens (Red-Berried Elder)		-	-	8	-	-
Sorbus americana (Mountain Ash)		-	-	-	-	7
Abies balsamea (Balsam fir)		-	-	8	-	-
Acer rubrum (Red Maple)		-	-	8	-	7
Larix laricina (Larch)		-	13	17	-	13
Picea glauca (White Spruce)		11	-	33	13	100
Populus tremuloides (Trembling Aspen)		-	-	-	-	7

Table 2. Summary of vegetative cover compositions of five oldfield study units at Amherst Point Sanctuary from 1981 oldfield investigation.

Field 1

1. Grass and Sedge - Prominent Component; 3 Abundant and 1 Fairly Abundant Species.
2. Forbs - Prominent Component; 2 Abundant, 5 Fairly Abundant 4 Common and 2 Scattered species.
3. Moss - Common
4. Small woody plants - Absent
5. Shrubs - Minor Component; 1 Common and 2 Scattered species.
6. Trees - minor component; 1 scattered species

Field 2

1. Grass and Sedge - Fairly Prominent Component; 1 Abundant, 2 Fairly Abundant and 1 Common species.
2. Forbs - Prominent Component; 2 Abundant, 1 Fairly Abundant and 9 common species.
3. Moss - Fairly Abundant
4. Small woody plants - Prominent Component; 1 Abundant species
5. Shrubs - Fairly Prominent Component; 2 Common and 2 Scattered species.
6. Trees - Minor component; 1 Scattered species

Field 3

1. Grass and Sedge - Minor Component; 1 Fairly Abundant and 1 Common species.
2. Forbs - Fairly Prominent Component; 3 Fairly Abundant and 6 Common species.
3. Moss - Fairly Abundant
4. Small Wood Plants - Prominent Component; 1 Abundant, 1 Fairly Abundant and 1 Common species
5. Shrubs - Prominent Component; 1 Abundant, 2 Fairly Abundant, 2 Common and 2 Scattered species.
6. Trees - Fairly Prominent Component; 1 Common and 3 Scattered species.

Field 4

1. Grass and Sedge - Prominent Component; 1 Abundant and 2 Fairly Abundant species.
2. Forbs - Prominent Component; 3 Abundant, 5 Fairly Abundant, 3 Common and 3 Scattered species.
3. Moss - Common
4. Small woody plants - Fairly Prominent Component; 2 common species.
5. Shrubs - Fairly Prominent Component; 6 Scattered species
6. Trees - Minor Component; 1 Scattered species

Field 5

1. Grass and Sedge - minor component; 1 Fairly Abundant and 1 Scattered species
2. Forbs - Minor component; 1 Abundant, 1 Fairly Abundant, 1 Common and 3 Scattered species.
3. Moss - Abundant
4. Small Woody Plants - Fairly Prominent Component; 1 Abundant species
5. Shrubs - Prominent Component; 3 Common and 3 Scattered species
6. Trees - Prominent Component; 1 Abundant and 3 Scattered species

PAIRS ?

Table 3. Estimated number of pairs of breeding birds in five oldfields at Amherst Point Bird Sanctuary, 1981. Number in brackets indicates approximate number of pairs nesting in adjacent edge habitats.

Species	Field Number 1	2	3	4	5	Total
Bobolink	2+	-(?)	-	-	-	2+(?)
Song Sparrow	2(~3)	1	1	1	1	6(~3)
Common Yellowthroat	-(~2)	1	1	1(1)	1-2(~1)	4-5(~4)
Yellow Warbler	-(3)	1(2)	3(1)	-(1)	7	11(7)
Chestnut-s. Warbler	-	-	1(?)	-(2)	1-2(~1)	2-3(3)
White-thr. Sparrow	-	-	1	-	1	2
Gray Catbird	-	-	1	-(1)	-	1(1)
American Goldfinch	-	-	1	-	-	1
Cedar Waxwing	-	-	?(2+)	-	1	1(2+)
American Redstart	-	-	-	-	3-4	3-4
Magnolia Warbler	-	-	-	-	2-3	2-3
Swainson's Thrush	-	-	-	-	1	1
American Robin	-	-	-	-	1	1
Common Flicker	-	-	-	-	1	1
Wilson's Warbler	-	-	-	-	1	1
Alder Flycatcher	-(1)	-(2)	-	-	1	1(3)
Black-and-white Warbler	-	-	-	-	?(1)	?(1)
Tennessee Warbler	-	-	-	-	?(1)	?(1)
Red-eyed Vireo	-	-	-	-	?(1)	?(1)
Ruby-thr. Hummingbird	-	-	-	-	?	?
Eastern Kingbird	-(1)	-(1)	-	-	-	-(2)
Red-winged Blackbird	-(1)	-	-	-	-	-(1)
Swamp Sparrow	-(1)	-	-	-	-	-(1)

Table 4. Species and Numbers of Small Mammals Collected in Five Oldfield Study Units at Amherst Point Sanctuary during 1981 Oldfield Investigations.

Species	Number Collected					
Field Number -	1	2	3	4	5	Total
Sorex arcticus (Arctic Shrew)	3	7	-	5	2	17
Sorex cinereus (Masked Shrew)	1	1	-	1	4	7
Blarina brevicauda (Short-tailed Shrew)	1	3	-	2	1	7
Clethrionomys gapperi (Red-backed Vole)	-	-	3	-	4	7
Microtus pennsylvanicus (Meadow Vole)	-	1	-	3	1	5
Peromyscus maniculatus (Deer Mouse)	-	-	-	-	2	2
Zapus hudsonius (Meadow Jumping Mouse)	-	2	3	-	1	6
Total	5	14	6	11	15	51