Ecosystem Classification Mapping of the Forested Areas of Portobello Creek, NWA

July, 1984

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January, 1985

Environment Canada
Canadian Wildlife Service

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Service canadien de la faune

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Table of Contents

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Introduction

Ecosystem classification mapping of National Wildlife Areas began in 1977 when Malone completed mapping the Amherst Point Sanctuary and the Tintamarre National Wildlife Area. Malone continued mapping in 1978 and completed ecosystem maps of Wallace Bay, Shepody (Germantown section), Portage Island and Cape Jourimain National Wildlife Areas as well as the John Lusby section of the Chignecto NWA. Ecosystem mapping of Portobello Creek NWA began in 1984. Because of its large size, it was decided to ecosystem map Portobello in two phases, the forested section in 1984 and the marsh and other sections in 1985. This report summarizes the 1984 mapping effort.

Methods

Methods employed and terminology used are essentially the same as those described by Malone (1977) and are as follows:

A 1:12,500 colour photo mosaic of Portobello Creek NWA was assembled using 1982 Department of Natural Resources aerial photographs. A base map was then constructed by placing an acetate overlay over the mosaic. Ecosystems were interpreted

from the uncorrected 9 X 9 inch aerial photographs and delineated on individual acetate overlays. The photographs with acetate overlays were used in the field to check and revise ecosystem indentification. The data were later transferred from acetate overlays to the base map.

Forest associations were mapped in the field by estimating to within 10% the coverage of a species. Thus in the example

$$\frac{rS_8hE_1wB_1}{4 - 1}$$

red spruce comprises 80% of the stand, hemlock 10% and white birch 10%. Other trees might be present but would not account for 10% or more of the stand. Below the horizontal line in the foregoing example the first numeral denotes the average height of the stand according to the following scale:

Height (ft)	Code
0-10	1
11-20	2
21-30	3
31-40	4
etc.	5

Thus in the example the average stand height is 30-40 feet. The second numeral below the line denotes stand density subjectively according to the following scale:

Stand density (%)	Code
67-100	1
34- 66	2
0- 33	3

Therefore the stand in the example was stocked at a density of 67% to 100%. Common forest ground flora are listed on the base maps under or near the forest reference.

Understory or ground cover species were recorded in order of frequency of occurence in the given ecosystem. Scientific and common names are according to Roland and Smith (1969). The species abbreviations are those adopted by the Canadian Institute of Forestry. For herbaceous plants either the scientific or common name is abbreviated.

Description of Area

For convenience of description of the forested ecosystems of Portobello Creek NWA, I have divided the area into four sections. They are as follows: the South Side, the West End, the North Side and the Wooded Islands. See Fig. 1.

The South Side is that portion of the Portobello Creek NWA extending from the easternmost corner near Lakeville Corner to the Southernmost corner along the Church Road, a distance of approximately 13 kilometers. Soils of the South Side are the Silty Loam type of the Interval Series (Stobbe, 1941). They are immature soils of considerable agronomic value, except their elevation is approximately that of the St. John River and it is generally not feasible to drain them for agricultural purposes. Most of the South Side experiences flood conditions for up to three months a year (Wright and McIntyre, 1970) and as a result flood tolerant vegetation predominates throughout

most of that section. Silver maple (Acer saccharinum) is the dominant tree species along the South Side as it accounts for approximately 75% of the forest cover in pure stands. Wire birch (Betula populifolia), trembling aspen (Populus tremuloides) and paper birch (Betula lutea) occur but at densities of less than 10%. Other species occur in significant densities along the westernmost 25% of the South Side. Even there the species that occur such as yellow birch (Betula lutea), largetooth aspen (Populus grandidentata), red maple (Acer rubrum) and red oak (Quercus rubra) together made up only 20% or less of the forest canopy. Also, none of the foregoing species alone comprise 10% or more of the forest canopy and thus the species are denoted collectively as mixed hardwoods (MH) on the cover map. Ground cover along the South Side is primarily sensitive fern (Onoclea sensibilis). Ostrich fern (Pteretis pensylvanica) commonly occurs but only on the better drained soils.

The West End of Portobello Creek NWA extends from the Southernmost boundary post along the Church Road in a northerly direction to the railroad bridge across the Noonan Stream: a distance of about 3.8 kilometers. It is bounded to the west by the Church Road and to the east by the Noonan Stream and Portobello Creek. Soils of the West End are also primarily poorly drained Interval Silty Loam with a few better drained ridges.

Much of the West End suffers from flooding for several weeks of the year. At the beginning of the West End section northwards to the old dump site silver maple and sensitive fern

dominate the forest canopy and ground cover respectively. North of the old dump site, however, where the more elevated ridges occur we find mixed stands of red maple, largetooth aspen, red oak, yellow birch, white birch, wire birch and occasionally sugar maple (Acer succharinum). Eastern white cedar (Thuja occidentalis) and eastern hemlock (Tsuga canadensis) are scattered throughout the mixed hardwood stands and on the higher ridges pure stands of balsam fir (Abies balsamea) are found. White spruce (Picea glauca) and red spruce (Picea rubens) are also fairly common along these higher ridges.

Ground cover is mostly sensitive fern throughout the silver maple. Lily-of-the-valley (Maianthemum canadense) is common throughout most of the West End, as are Clubmosses (Lycopodium spp.) and bunchberry (Cornus canadensis). Balsam fir regeneration makes up much of the ground cover of the softwood areas. New York Fern (Dryopteris noveboracensis) and Lady Fern (Athyrium filix-femina) were also noted in several locations.

The forested North side of Portobello Creek NWA is made up of a narrow band of the lowland silver maple along the Portobello Creek flowage plus a much wider band of upland forest. The interval silty loam soil of the lowland very quickly rises into the "undifferentiated soil complex" described by Stobbe. Again the lowland areas are flooded for

much of the growing season and support mostly flood tolerant species described in an earlier section of this report. The more elevated of undifferentiated soils however support a forest characteristic of the Eastern lowlands section of the Acadian Forest Region described by Rowe (1972). The more level land with somewhat inpeded drainage supports red spruce, white spruce and balsam fir sometimes in pure stands but more often mixed with white pine (Pinus strobus) red maple, sugar maple, yellow birch and white birch. Eastern hemlock is fairly common as is eastern white cedar. Red oak is more common here than elsewhere on the area. A few mature white pine are also found throughout the North Side. The forested section of the north side extends along approximately 9.5 kilometers of boundary.

Ground cover on the north side is made up of bunchberry, Salix spp., ostrich fern, lady fern, bracken fern (Pteridium aquilinum), Kalmia spp., sphagnum moss and wood sorrel (Oxalis montana).

The Wooded Islands of Portobello Creek NWA include French Island plus numerous other smaller islands. French Island, by far the largest of the islands, is the only one with any significant amount of upland forest. Soils of the smaller wooded islands and much of French Island are poorly drained Interval Silty Loam. The upland soils of French Island is "Stony Phase" Kings loam (Stobbe 1941). The forest of French island is quite similar to that of the North side of Portobello Creek NWA except that it has been more heavily harvested than

the North Side. There are a number of small areas that were clear-cut less than ten years ago. Selective cutting has also been practised on the island for a number of years. As a result of that practise, red oak is much less common on the island than one would expect.

The forests of the other wooded island are primarily silver maple with meadow-sweet (Spiraea latifolia) as the dominant understory species. Two of the islands which are slightly more elevated that the rest contain some red oak, red maple, wire birch, yellow birch and trembling aspen. Again meadow-sweet and sensitive fern dominate the understory.

Significant sites

There are two forest sites on Portobello Creek NWA that are of special significance. One area is a small pocket of eastern white cedar on French island the other is a group of mature red oak located along Portobello Creek about one mile N.E. of where Noonan Stream joins Portobello Creek (Figure 1).

The cedar stand is unique in that it consists of several mature cedar trees growing on what appears to be a well-drained side-hill. Normally cedar appears to grow best in the Portobello area in very moist soils. Also, it is the only stand of large, easily accessible cedar that I know of on any of our National Wildlife Areas. However, only a small part of this stand appears to be on land owned by Canadian Wildlife Service.

Most of the land occupied by the mature red oak is owned by Canadian Wildlife Service. This stand consists of several (perhaps as many as twenty) mature trees located on a high ridge of land immediately adjacent to Portobello Creek. It is the only stand of its kind that I am aware of in the Maritime Provinces. Immediate steps should be taken to insure preservation of those marvellous trees and in 1985, in conjunction with the wetland ecosystem mapping of Portobello, I intend to do a complete inventory of this oak stand. On completion of the inventory I believe we should designate the stand as an ecologically significant site and post it accordingly.

Note: The original 9x9" acetate overlays used in the field as well as a base map are on file with this report. When the wetland ecosystem mapping of Portobello is finished in 1985 a complete ecosystem classification map will be drafted and a copy will be attached to this report.

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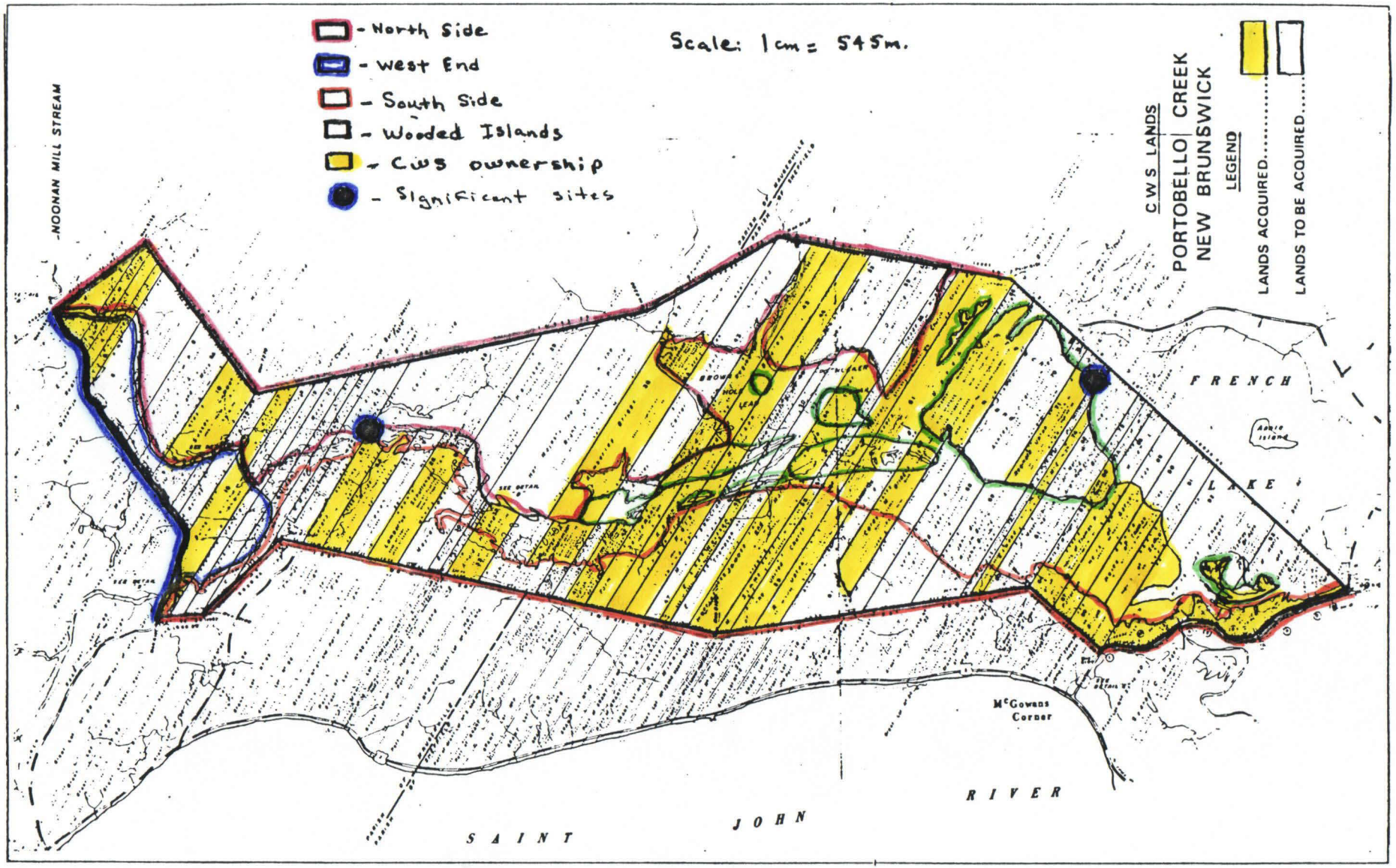

Figure 1. Showing areas described in text as North side, West and, South side and Wooded Islands and significant forest sites.