

## **1.0 INTRODUCTION**

At first glance, Prince Edward Island does not seem a likely place to have viable Atlantic salmon (*Salmo salar*) populations. With such a small surface area of 575,600 ha (1,422,300 acres) and approximately 260 drainage basins, it might appear that the short, low gradient streams would not provide adequate salmon habitat. Indeed, the highest hills on the Island barely reach 150 metres in height and many of the streams that boast salmon runs are short and drain relatively flat terrain.

Prior to European settlement, most of the larger rivers on Prince Edward Island would have contained runs of Atlantic salmon. By 1960, there were approximately fifty-five rivers with remaining runs of salmon. What is most disturbing to many people is the sharp drop in the number of salmon rivers in recent years. A 2000-2002 survey of all large streams on Prince Edward Island documented salmon runs in thirty-three rivers. Since that survey was completed, we have lost salmon runs from eleven additional rivers. Today, salmon can be found in only twenty-two streams, many of which are on the verge of losing their salmon run.

There are a number of factors which could be having an impact on Atlantic salmon populations in Prince Edward Island. Return rates from sea have dropped from historical levels for all Atlantic salmon in North America. While this is a serious concern, it does not explain why salmon populations in some rivers on Prince Edward Island are remaining stable and others are decreasing. Something is happening in the fresh water environment to depress salmon populations. Sedimentation in watercourses is a major environmental issue in Prince Edward Island and can certainly affect habitat for juvenile and adult salmonids. Other contaminants, for example pesticides, have resulted in fish kills in a number of Prince Edward Island streams. Diminished water quality, for example depressed oxygen levels and elevated summer water temperatures, has been documented in several Prince Edward Island watercourses, particularly those with large or numerous impoundments. Throughout North America, dams prevent salmon from accessing spawning areas and can pose a barrier to salmon smolts going to sea. Prince Edward Island has no shortage of man-made and beaver constructed dams and the impact of these structures on resident and anadromous fish populations is well documented.

A number of watershed and angling organizations have been working diligently to restore Atlantic salmon habitat and salmon populations in Prince Edward Island. Without their efforts, the number of rivers which have lost salmon runs would be considerably greater than it is today.

### **1.1 Objectives**

The Atlantic Salmon Conservation Foundation is a long awaited source of funding for groups carrying out stream restoration projects. To ensure that maximum benefit is obtained from future projects, it is vitally important to first lay out a management strategy. With funding from the Foundation, the P.E.I. Council of the Atlantic Salmon Federation initiated a study to assess salmon rivers and develop a conservation strategy for Atlantic salmon in Prince Edward Island. The primary objectives of the study were:

- to consolidate information and data for river systems with Atlantic salmon on Prince Edward Island;
- to develop a classification system for Atlantic salmon on Prince Edward Island;
- to outline habitat management strategies for individual rivers with salmon stocks;
- to offer suggestions for changes needed to rehabilitate salmon populations in rivers where stocks have been recently extirpated;
- to suggest possibilities for increasing angler opportunities.

## **1.2 Methodology**

The many books and research papers available on habitat and populations of Atlantic salmon in North America and Europe provided background information for this report. Both the federal Department of Fisheries and Oceans (DFO) and various pertinent provincial departments were important sources of information, with some contributions dating back to the 1800s. I was especially pleased to consult and work with members of various watershed groups across the province, several of whom not only volunteered historic information, but also helped with electrofishing and redd surveys.

In the mid-1980s, Ron Gray (DFO biologist) convinced me and others that the path to angling opportunities for Atlantic salmon on Prince Edward Island was through semi-natural rearing. Many non-government groups welcomed the opportunity to work closely with both federal and provincial governments, and an era of cooperation and impressive dedication was launched. This semi-natural rearing initiative required major efforts in data collection, habitat enhancement, and applied management. The successes and failures of the initiative contributed greatly to the suggestions in the current document.

Many student projects (special topics, honors programs and graduate research) in the University of Prince Edward Island Biology Department and Holland College have contributed greatly to our knowledge of Atlantic salmon on Prince Edward Island. Information was also available from researchers at U.P.E.I. that have been conducting field and laboratory studies on Atlantic salmon and other salmonids for almost four decades.

### **Field work conducted for this project included:**

1. A habitat assessment was carried out in rivers where salmon populations were recorded between the years 2000 and 2002. These rivers were identified in an electrofishing survey of all major rivers in Prince Edward Island (Guignion et al. 2002).
2. A follow-up electrofishing survey on rivers which contained salmon in 2002 was conducted in 2007 and expanded in 2008 to include provincial index sites (as described in MacFarlane 2009) to document changes in distribution of Atlantic salmon since the 2000-2002 data collection.
3. In 2008, sections of river where Atlantic salmon populations do or should occur (with the exception of small tributaries) were walked, habitat problems and critical zones noted and many G.P.S. readings taken to document observations. On watercourses such as the Morell River, various river reaches were covered by canoe. Sections of some rivers, for

example the Midgell, were visited as many as three times to ascertain if new beaver dams were established during the summer which would prevent instream movement of salmon and other fish such as gaspereau.

4. In autumn 2008, a salmon redd survey was conducted on rivers known to have Atlantic salmon populations to locate spawning and nursery areas as well as blockages that would prevent instream fish movements.



**Figure 1. Electrofishing in the West River.**