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# A Bacteriological Assessment of the Foxley River, Prince Co. (Shellfish Area, P.E.I. No. 1)



Surveillance Report EPS 5-WP-72-15
Atlantic Region

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# A BACTERIOLOGICAL ASSESSMENT

of

# THE FOXLEY RIVER, PRINCE CO.

# (SHELLFISH AREA P.E.I. #1-8)

by

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for

Shellfish Bacteriological Surveillance
Environmental Protection Service

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ABSTRACT

During the month of July 1972, the waters of Foxley River, P.E.I. were assessed bacteriologically to determine the adequacy of the existing shellfish closure Schedule "F" #1-8.

As determined by the analytical data, and the observations made during a physical sanitary investigation of the surrounding watershed to Foxley River, the existing shellfish closure is adequate and in compliance with criteria for national shellfish standards.

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## 1. INTRODUCTION

In compliance with a proposal adopted by the Interdepartmental Shellfish Committee Meeting at Ottawa in March 1972, a physical sanitary and bacteriological survey of Foxley River, P.E.I., was carried out during the month of July 1972, by the Mobile Laboratory Services of Environmental Protection Services, Atlantic Region.

A sanitary survey conducted by the Truro, N.S. office of Public Health Engineering Division, National Health and Welfare in 1964, recommended the existing shellfish closures on a sector of Foxley River. This was due to the possibility of sewage pollution from a nearby church and Glebe House.

The existing shellfish closure on the Foxley River is defined in the Prince Edward Island, Fishery Regulations as "Schedule F: 1-8 That portion of Foxley River, Prince County, that is above the easterly boundary line of Sections P and Y of Division No. 314 as shown on the plan showing Oyster Leases in Foxley River Area".

The purpose of the study was to evaluate the adequacy of the existing closure (Schedule F #1-8) and re-define the closure description with appropriate monument marker numbers. This was a result of the increased farming and recreational development within the surrounding watershed, that may have affected the water overlaying the shellfish producing bed.

A total of 205 water samples were collected from 41 sampling stations. The sampling times were so arranged as to obtain samples

representative of conditions at different tidal phases (See Table 1).

The physical sanitary survey of the surrounding watershed was conducted during the sampling period for evidence of actual or potential pollution sources.

Salinity determinations were made each day from a composite of the samples collected to determine the effect of dilution on salinity due to rainfall and induced landwash (See Table 2).

Weather data was obtained from the Department of the Environment, Atmospheric Environment Service, for the area. Parameters such as wind velocity and direction, atmospheric temperature, precipitation and cloud cover are included for consideration in this report (See Table 3).

## 2. METHODS

All samples were tested for coliform bacteria by the methods outlined in A.P.H.A. "Recommended Procedures for the Bacteriological Examination of Sea Water and Shellfish" Fourth Edition 1970. Coliform and fecal coliform densities were determined from all water samples by multiple dilution tubes (MPN) methods using Bacto-Lauryl Tryptose Broth with three or five tubes in each of at least three consecutive decimal dilutions with incubation at 35.5°C for 24 and 48 hours. The confirmation of all positive cultures was done in (a) Bacto-Brilliant Green Bile Broth with incubation at 35.5°C for 24 and 48 hours, and (b) Bacto-E.C. medium with incubation for 24 hours

at 44.5°C in a recirculating water bath.

Salinity determinations were made by the Knudsen Method from composite samples. Salinities were expressed as parts per thousand.

Water samples were collected from the 41 sampling stations by a rod sampling device in sterile 8-ounce glass bottles. Samples collected in the morning were transported to the Fisheries Culture Station at Ellerslie for bacteriological analysis within one hour from sampling. The samples collected in the afternoon were transported under refrigeration to the Mobile Laboratory located at Charlottetown and analyzed within three hours after sampling.

## 3. RESULTS & DISCUSSION

The location of the 41 sampling stations included in the monitoring study is shown in Figure 1. Coliform and fecal coliform MPN counts for the 205 water samples collected are recorded in Table 4.

Sampling stations #1, 2, 3, 4, represent the water quality of Foxley River Estuary. The median MPN coliform values at these stations for 5 samplings were consistently higher than the National Standards for shellfish producing waters.

Salinity determinations were made each day from a composite of water samples collected, and slight variations were noted in the daily PPT values as shown in Table 2.

The Department of the Environment, Atmospheric Environmental Service reported no precipitation for the survey area during the sampling period of July 21 to July 26.

The sanitary investigation of the shoreline and surrounding watershed revealed sources of pollution affecting the water quality of Foxley River only in the proximity of sampling stations #1 and #2.

At sampling stations #1 to #4 representing the water quality in the estuary of Foxley River, all samples recorded MPN coliform counts greater than the standards for "Satisfactory compliance".

The sources of pollution affecting the waters at these stations were: the effluent from a Church, the Glebe House sanitary waste system gaining access to the river by seepage, and farm yard drainage to the shoreline by way of a natural water course.

## 4. CONCLUSIONS

It may be concluded that:

(a) the water quality for the area under study, as represented by sampling stations #4 to #41 inclusive, and the bacteriological data of this report, is determined to be satisfactory, and meets with standards for "Satisfactory compliance",

(b) the water quality as represented by sampling stations #1 to #3 inclusive, and the bacteriological

data of this report evaluated together with the noted physical conditions in the surrounding area, qualify the adequacy of the existing closure on the Foxley River.

## 5. RECOMMENDATIONS

(a) That the existing shellfish closure on the Foxley River, Prince County, as defined by the Prince Edward Island Fishery Regulations P.C. 1972-520, March 21, 1972 "Schedule F" Item 1-8, to be rescinded.

(b) That a shellfish closure on the Foxley River, Prince County, to be implemented as indicated on Figure 1 of this report, and to be so marked by the positioning of the appropriate monument markers.

TABLE 1. TIDAL PHASE & SAMPLING TIME

FOXLEY RIVER, PRINCE CO., P.E.I, JULY 1972

| DATE 1972 | TIDAL PHASE HIGH TIDE (hrs) | LOW TIDE (hrs) | SAMPLING TIME (hrs) |
|---|---|---|---|
| July 21 | 0218 | 1515 | 1030 - 1200 |
| July 24 | 0440 | 1355 | 1000 - 1100 |
| July 24 | 0445 | 1355 | 1400 - 1500 |
| July 25 | 0540 | 1410 | 0930 - 1030 |
| July 25 | 0540 | 1410 | 1300 - 1400 |

TABLE 2. COMPOSITE SALINITY VALUES

FOXLEY RIVER, PRINCE CO., P.E.I., JULY 1972

| DATE 1972 | SALINITY PARTS PER THOUSAND |
|---|---|
| July 21 | 23.8 |
| July 24 | 24.6 |
| July 24 | 25.0 |
| July 25 | 24.1 |
| July 25 | 25.3 |

TABLE 3. CLIMATOLOGICAL DATA

FOXLEY RIVER, PRINCE CO., P.E.I. JULY 1972

| DATE | SAMPLING TIME (hrs) | WATER TEMP. °C | AIR TEMP °C | WIND VELOCITY DIRCTION (mph) |
|---|---|---|---|---|
| July 21 | 1030 - 1200 | 18° | 22° | W° 5/10 |
| July 24 | 1000 - 1100 | 18° | 18° | SW° 5/10 |
| July 24 | 1400 - 1500 | 17.5° | 20° | SW° 5/10 |
| July 25 | 0930 - 1030 | 19° | 18° | W° 5/10 |
| July 25 | 1300 - 1400 | 18° | 24° | W° 5/10 |

TABLE 4. COLIFORM & FECAL COLIFORM MPN DATA AND SAMPLE COLLECTION DATES

FOXLEY RIVER, PRINCE CO., P.E.I. JULY 1972

| Station No. | Coli-form AM July 21 | F.C. AM July 21 | Coli-form AM July 24 | F.C. AM July 24 | Coli-form PM July 24 | F.C. PM July 24 | Coli-form AM July 25 | F.C. AM July 25 | Coli-form PM July 25 | F.C. PM July 25 | Median Coli-form | Median F.C. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2400+ | 1100 | 93 | 43 | 23 | 23 | 240 | 43 | 75 | 15 | 93 | 43 |
| 2 | 43 | 43 | 43 | 23 | 23 | 23 | 93 | 23 | 93 | 4 | 43 | 23 |
| 3 | 240 | 240 | 93 | 93 | 23 | 9 | 240 | 75 | 240 | 43 | 240 | 75 |
| 4 | 11 | 4 | 9 | 9 | 23 | 23 | 93 | 23 | 43 | 11 | 23 | 11 |
| 5 | 9 | 4 | 9 | 9 | 43 | 23 | 15 | 4 | 9 | <3 | 9 | 4 |
| 6 | <3 | <3 | 15 | 15 | 23 | 23 | 9 | 9 | <3 | <3 | 9 | 9 |
| 7 | 7 | 7 | 9 | 9 | <3 | <3 | <3 | <3 | 4 | <3 | 4 | <3 |
| 8 | 4 | 4 | <3 | <3 | 4 | <3 | <3 | <3 | <3 | <3 | <3 | <3 |
| 9 | <3 | <3 | <3 | <3 | <3 | <3 | 4 | <3 | <3 | <3 | <3 | <3 |
| 10 | <3 | <3 | <3 | <3 | 4 | 4 | 9 | <3 | <3 | <3 | <3 | <3 |
| 11 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 |
| 12 | <3 | <3 | 15 | 15 | 4 | <3 | 4 | <3 | <3 | <3 | 4 | <3 |
| 13 | 43 | 43 | 23 | 23 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 |

TABLE 4 CONTINUED

| Station No. | Coli-form AM July 21 | F.C. AM July 21 | Coli-form AM July 24 | F.C. AM July 24 | Coli-form PM July 24 | F.C. PM July 24 | Coli-form AM July 25 | F.C. AM July 25 | Coli-form PM July 25 | F.C. PM July 25 | Median Coli-form | Median F.C. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | 4 | <3 | <3 | <3 |
| 15 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | 9 | 9 | <3 | <3 |
| 16 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | 4 | <3 | <3 | <3 |
| 17 | 9 | 9 | 4 | <3 | 4 | <3 | <3 | <3 | <3 | <3 | 4 | <3 |
| 18 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 |
| 19 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 |
| 20 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 |
| 21 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 |
| 22 | <3 | <3 | 9 | 9 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 |
| 23 | <3 | <3 | <3 | <3 | <3 | <3 | 4 | <3 | 23 | 9 | <3 | <3 |
| 24 | <3 | <3 | <3 | <3 | <3 | <3 | 9 | <3 | <3 | <3 | <3 | <3 |
| 25 | <3 | <3 | <3 | <3 | 4 | <3 | <3 | <3 | <3 | <3 | <3 | <3 |
| 26 | <3 | <3 | 21 | 4 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 |

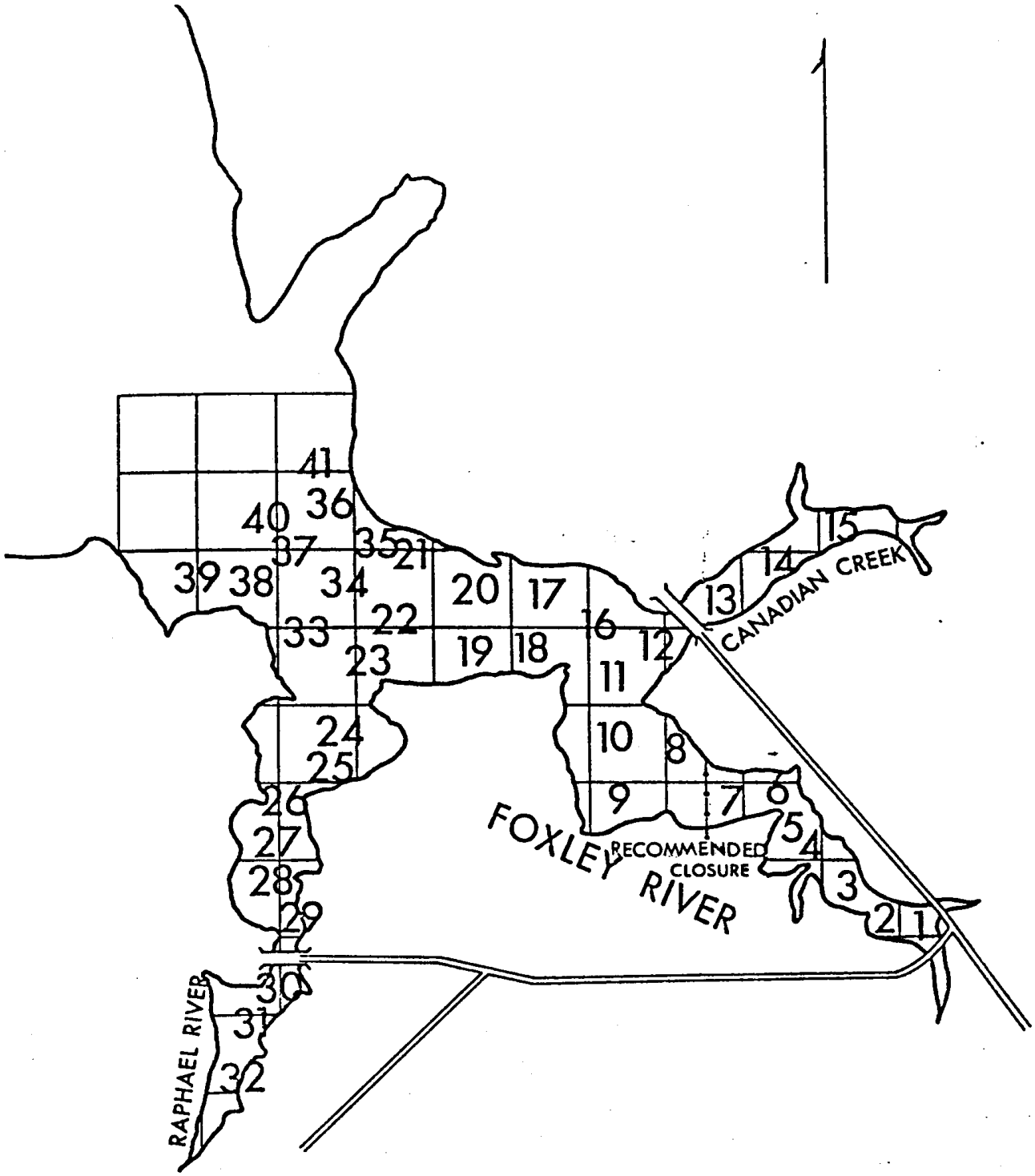
TABLE 4 CONTINUED

| Station No. | Coli-form AM July 21 | F.C. AM July 21 | Coli-form AM July 24 | F.C. AM July 24 | Coli-form PM July 24 | F.C. PM July 24 | Coli-form AM July 25 | F.C. AM July 25 | Coli-form PM July 25 | F.C. PM July 25 | Median Coli-form | Median F.C. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 27 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | 15 | 4 | <3 | <3 |
| 28 | 15 | 15 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 |
| 29 | <3 | <3 | <3 | <3 | <3 | <3 | 28 | <3 | <3 | <3 | <3 | <3 |
| 30 | 4 | 4 | 9 | 9 | <3 | <3 | <3 | <3 | 4 | <3 | 4 | <3 |
| 31 | 2400 | 460 | 4 | 4 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 |
| 32 | 75 | 43 | 7 | 7 | 9 | 9 | <3 | <3 | <3 | <3 | 7 | 7 |
| 33 | 4 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | 9 | <3 | <3 | <3 |
| 34 | 4 | <3 | <3 | <3 | <3 | <3 | 9 | 4 | 4 | 4 | 4 | <3 |
| 35 | <3 | <3 | <3 | <3 | <3 | <3 | 9 | 9 | <3 | <3 | <3 | <3 |
| 36 | 9 | 4 | <3 | <3 | <3 | <3 | <3 | <3 | 4 | <3 | <3 | <3 |
| 37 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 |
| 38 | <3 | <3 | 4 | <3 | <3 | <3 | <3 | <3 | 9 | 4 | <3 | <3 |
| 39 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | 9 | 4 | <3 | <3 |

TABLE 4 CONTINUED

| Station No. | Coli-form AM July 21 | F.C. July 21 | Coli-form AM July 24 | F.C. July 24 | Coli-form PM July 24 | F.C. July 24 | Coli-form AM July 25 | F.C. July 25 | Coli-form PM July 25 | F.C. July 25 | Median Coli-form | Median F.C. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 |
| 41 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 | <3 |

FIGURE 1.

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ENVIRONMENTAL PROTECTION SERVICE

ATLANTIC REGION

Foxley River
Shellfish Area, P.E.I. #1
Survey Sampling Stations 1972

| SCALE: | DATE: | DWG. NO. |
|---|---|---|
| DRAWN: | CHECKED: | APPROVED: |