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A Bacteriological Assessment of the Buctouche River Estuary, Kent County (Shellfish Area, N.B. No. 6)

Surveillance Report EPS 5-WP-72-24
Atlantic Region

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A BACTERIOLOGICAL ASSESSMENT

of

BUCTOUCHE RIVER ESTUARY, KENT COUNTY

(Shellfish Area, N.B. #6)

by

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for

Shellfish Bacteriological Surveillance
Environmental Protection Service

Report Number EPS 5-WP-72-24

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ABSTRACT

A bacteriological assessment study of the Buctouche River Estuary (New Brunswick Shellfish Area #6) was conducted during June 1972, by personnel of the Mobile Bacteriological Laboratory Unit of Environmental Protection Service, Atlantic Region.

The purpose of the study was to assess the adequacy of the present closure (SOR/71 - 28 New Brunswick Fishery Regulations para 6 - 4) as a result of a request from local fishermen in the area. The closure reads: "That portion of Buctouche River, Kent County, including Back River, above or westerly of a straight line drawn from Survey Monument No. 3A, as shown on the plan of the Buctouche Area, to Survey Monument No. 3F, as shown on that plan, except that in that portion of Buctouche River from the railroad bridge at Buctouche to a straight line drawn across the river from Survey Monument No. 3K to Survey Monument No. 3L as shown on that plan, except that oysters may be taken from February 15 to March 31, both days inclusive, in any year".

The existing closure was found to be adequate and in compliance with national standards for shellfish producing waters.

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1. INTRODUCTION

A bacteriological assessment of the Buctouche River Estuary (New Brunswick Shellfish Area #6) was conducted during June, 1972 by personnel of the Mobile Bacteriological Laboratory Unit of Environmental Protection Service, Atlantic Region.

The purpose of the study was to assess the need or the adequacy of the present closure (SOR/71-28 New Brunswick Fishery Regulations para 6-4). This resulted from a request from local fishermen in the area. The closure area has an abundance of shellfish and has potential economic importance.

The Buctouche River receives only two known direct sources of sewage pollution within the bacteriological survey section. These sources are effluents from lagoons serving Ste. Marie de Kent (pop. 1966) located at Mount Carmel Bridge and the village of Buctouche (pop. 1800).

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 samples by multiple dilution tubes (MPN) methods using Bacto-Lauryl Tryptose Broth, with three tubes in each of at least three consecutive decimal dilutions with incubation at 35.5°C for

24 and 48 hours. Confirmation of all positive cultures was completed in: (a) Bacto-Brilliant Green Bile Broth with incubation at 35.5°C for 24 and 48 hours, and in (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 (See Table 1).

Samples were obtained from 32 sampling stations with the aid of a rod sampling device. These samples were placed into sterile 8-ounce glass bottles and transported to the Mobile Laboratory within 1 hour of collection. The samples were immediately inoculated into prepared fermentation tubes, in the appropriate graduated quantities, for incubation.

3. RESULTS

The locations of the 32 water sampling stations along with the median value of the total coliforms and fecal coliforms at each station, are shown in Figure 1. Bacteriological results for 127 water samples collected from these stations are presented in Table 2. Water temperature, air temperature, tidal stage and wind data, as well as daily rainfall (Atmospheric Environment Service, Department of the Environment) for Buctouche, are presented in Tables 3, 4 and 5, respectively.

There were nineteen (59 percent) stations with median coliform MPN counts greater than 70. Four (12 percent) of the stations

had median coliform counts exceeding 230. Eight (25 percent) of the stations sampled had median fecal coliform MPN counts higher than 23.

The coliform levels were highest in the railway bridge area of Buctouche. This may be due to the presence of sewage lines not yet connected to the lagoon system.

4. DISCUSSION

Land-wash from agricultural land and run-off from buildings and manure piles on both sides of the Buctouche River would contribute significantly to pollution loadings reported herein. The present findings support those presented in the 1970 Public Health Engineering Division sanitary and bacteriological survey. Although the results of this survey tend to indicate an improvement in the bacteriological condition of the Buctouche River Estuary, the heavy rainfalls experienced during the 1970 survey were not present during this survey. Therefore, the apparent improvement in conditions between 1970 and 1972 may be misleading.

5. CONCLUSIONS

It may be concluded that:

(a) the effluent discharging to the Buctouche River from the sewage lagoon at Ste. Marie de Kent, near the western closure line, and the sewage lagoon at Buctouche, near the eastern closure

line, are direct sources of bacterial pollution.

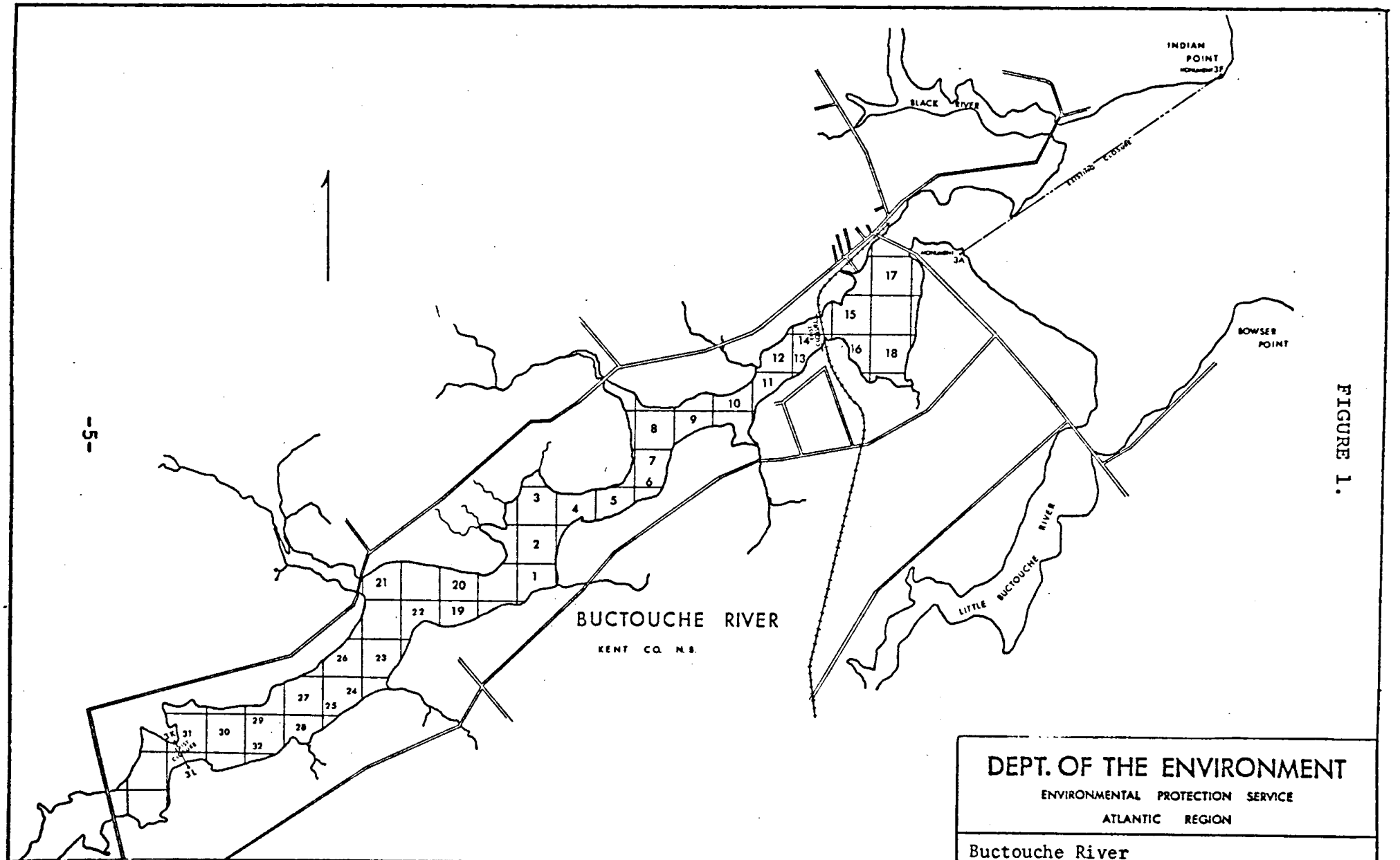
(b) the bacteriological data of this report demonstrates the need for continued maintenance of the existing shellfish closure.

6. RECOMMENDATIONS

It is recommended that:

(a) The existing shellfish closures on the Buctouche River, Kent County, N.B. as defined by the New Brunswick Fishery Regulations, P.C. 1971-16 January 12, 1971 Schedule "E: Item 6-4 is adequate and to remain in effect.

(b) The Environmental Protection Service should inform the appropriate pollution abatement authorities of the pollution conditions in the Buctouche River.



DEPT. OF THE ENVIRONMENT
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ATLANTIC REGION

Buctouche River
Shellfish Area N.B. #6
Survey Sampling Stations 1972

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

FIGURE 1.

TABLE 1. SALINITY DATA OF COMPOSITED SAMPLING FOR THE BUCTOUCHE RIVER SURVEY DURING JUNE, 1972.

DATE 1972	SALINITY PARTS PER THOUSAND
June 5	20.2
June 6	16.0
June 7	17.3
June 7	19.0

TABLE 2. COLIFORM & FECAL COLIFORM MPN DATA FOR THE BUCTOUCHE RIVER SURVEY (SHELLFISH AREA N.B. #6), 1972.

Station No.	Coli-form	F.C.	Coli-form	F.C.	Coli-form	F.C.	Coli-form	F.C.	Coli-form	F.C.
	June 5		June 6		June 7 A.M.		June 7 P.M.		Median	
1	14	14	23	4	43	9	21	<3	22	7
2	75	23	93	15	23	9	23	4	49	12
3	28	15	460	21	93	21	23	9	60	18
4	93	23	23	4	240	93	75	23	84	23
5	75	23	39	14	240	15	150	20	113	18
6	15	3	23	4	210	20	240	43	117	12
7	120	15	75	9	240	21	23	4	98	12
8	21	15	75	23	460	150	93	23	84	23
9	210	15	23	4	75	23	150	15	113	15
10	210	23	43	4	460	43	93	15	152	19
11	>1100	240	43	4	240	21	93	15	167	18
12	>1100	460	210	7	>1100	1100	240	23	>1100	242
13	>1100	240	210	15	1100	150	240	23	670	87
14	240	23	250	23	210	75	240	43	240	33
15	>1100	1100	240	43	460	93	43	9	350	68
16	43	<3	150	21	460	23	210	75	180	22

TABLE 2 CONTINUED

Station No.	Coliform June 5	F.C.	Coliform June 6	F.C.	Coliform June 7 A.M.	F.C.	Coliform June 7 P.M.	F.C.	Coliform Median	F.C.
17	93	23	150	23	460	93	43	9	122	23
18	150	43	210	75	240	15	75	23	180	33
19	75	9	75	23	240	15	460	43	158	19
20	15	9	43	7	23	4	23	23	23	8
21	3	3	23	4	43	4	23	7	23	4
22	15	9	23	<3	21	15	75	15	22	12
23	75	11	43	7	43	<3	21	<3	43	4
24	11	<3	21	<3	15	4	43	7	18	2
25	93	23	9	<3	23	9	93	15	58	12
26	75	43	23	4	43	7	23	4	33	6
27	75	20	28	7	21	4	15	<3	25	6
28	93	43	43	9	28	<3	7	<3	36	5
29	43	23	75	11	23	7	15	4	33	9
30	93	15	93	43	75	23	460	75	93	33
31	240	7	150	43	210	43	460	93	225	43
32	---	--	93	23	210	75	240	43	210	43

TABLE 3. CLIMATOLOGICAL DATA FOR THE BUCTOUCHE RIVER DURING SURVEY PERIOD OF JUNE, 1972.

DATE 1972	SAMPLING TIME	WATER TEMP. °C	AIR TEMP. °C	WIND VELOCITY AND DIRECTION (MPH)
June 5	0900 - 1030	16°C	17°C	W° 5-10
June 6	1400 - 1600	18°C	15°C	W° 10-15
June 7	0900 - 1100	16°C	15°C	W° 5-10
June 7	1400 - 1600	17°C	16°C	W° 5-10

TABLE 4. TIDAL PHASE AND SAMPLING TIMES FOR THE BUCTOUCHE RIVER SURVEY DURING JUNE, 1972.

DATE 1972	TIDAL PHASE (hrs) HIGH TIDE	LOW TIDE	SAMPLING TIME (hrs)
June 5	1100 -	2043	0900 - 1030
June 6	1215 -	2135	1400 - 1600
June 7	0610 -	0740	0800 - 1000
June 7	1330 -	2225	1400 - 1600

TABLE 5. RAINFALL DATA FOR THE BUCTOUCHE RIVER SURVEY DURING JUNE, 1972 SAMPLING PERIOD

Date 1972	Precipitation in Inches
June 1	.61
June 2	.55
June 3	.02
June 4	.35
June 5	0
June 6	0
June 7	.02
June 8	.02
TOTAL	1.57

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ER ESTUARY, KENT COUNTY (SHELLFISH AREA, N. B
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