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Bacteriological Survey of Nova Scotia Shellfish Area 15 Yarmouth County

Surveillance Report EPS 5-AR-75-5
Atlantic Region

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BACTERIOLOGICAL SURVEY OF NOVA SCOTIA SHELLFISH AREA 15 YARMOUTH COUNTY

by

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ABSTRACT

Bacteriological surveys of Nova Scotia Shellfish Area 15, Yarmouth County, were conducted from June to October 1974. The area surveyed included Chebogue River, Tusket River, Indian Bay and Pubnico Harbour.

Results of the survey indicate that the bacteriological water quality of the upper portion of the Chebogue River was unsatisfactory for the direct harvesting of shellfish. The existing shellfish closure (15-5) is to be maintained in the River.

The upper portion of the Tusket River was moderately contaminated by sewage from the village of Tusket. It is essential that this portion of the River be closed for the harvesting of shellfish.

Bacteriological water quality in Indian Bay was shown to be satisfactory in terms of the approved shellfish growing area standard. Fecal contamination from the fish plant and boat operations at the wharf of Lower East Pubnico warrant the installation of a new shellfish closure at Pubnico Harbour.

RÉSUMÉ

Des relevés bactériologiques ont été conduits entre les mois de juin et octobre 1974, dans la zone de pêche coquillière 15, c'est à dire, le comté de Yarmouth. Les secteurs ont compris la rivière Chebogue, la rivière Tusket, la baie Indienne et le havre de Pubnico.

Les données ont indiqué que la qualité bactériologique des eaux de la partie supérieure de la rivière Chebogue est insuffisante pour la récolte des mollusques. La fermeture présentement en vigueur devra-être maintenu.

La partie supérieure de la rivière Tusket a été modérément contaminée près du village de Tusket. Il est donc nécéssaire d'instituer une fermeture dans ce secteur.

La qualité bactériologique des eaux de la baie Indienne est acceptable pour la pêche coquillière. La contamination en provenance de l'usine de poissons et des bateaux de pêche situés au quai de Lower East Pubnico, cependant, est telle qu'une fermeture doit être instituer dans la havre de Pubnico.

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1 INTRODUCTION

Bacteriological surveys were conducted in Nova Scotia Shellfish Area 15, Yarmouth County, from June to October, 1974. The area surveyed included Chebogue River, Tusket River, Indian Bay and Pubnico Harbour (Figure 1). The purpose of the survey was to assess the present classification of these areas for the direct harvesting of shellfish as recommended in the sanitary survey conducted in 1971 (3).

At present, Chebogue River is under shellfish closure as described in the Nova Scotia Fisheries Regulations PC-1970-2189, Schedule "G",-

> "15-5 The Chebogue River, Yarmouth County, north of a straight line drawn true east from Hemeon's Point on the west side of the River to the southern point of Hall's Island on the east side of the River."

2 MATERIALS AND METHODS

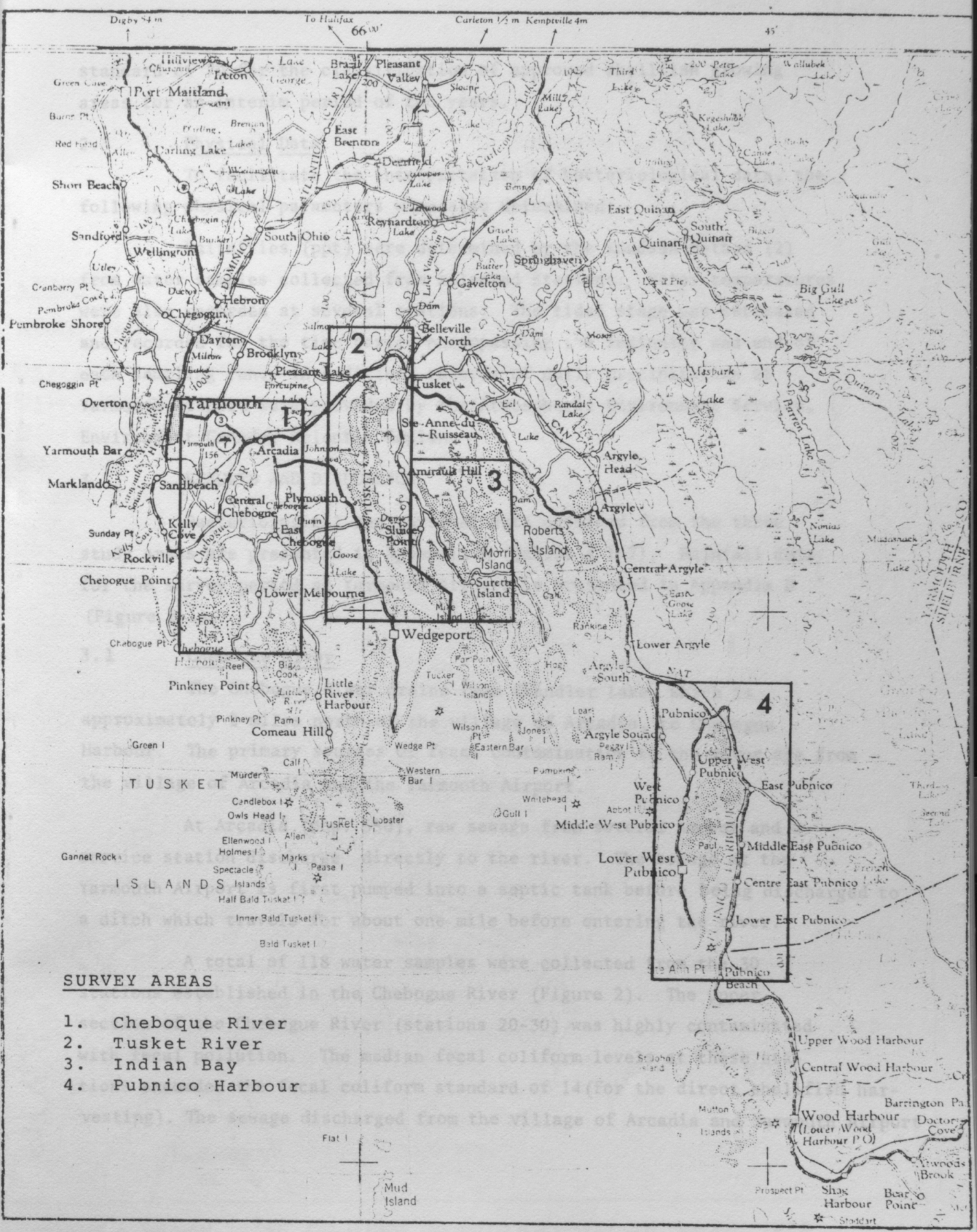
2.1 Sampling

Water samples were collected in sterile glass bottles at a depth of approximately one foot by means of a rod sampling device. All samples collected were kept in an insulated cooler and transported to the mobile laboratory for analysis within two hours of collection.

2.2 Bacteriological Analyses

All water samples were tested for fecal coliform levels by multiple tube dilution (MPN) method according to the A.P.H.A. "Recommended Procedures for the Bacteriological Examination of Sea Water and Shellfish" (1). Bacto-lauryl Tryptose Broth was used as the presumptive test medium with incubation at 35±0.5°C for 24 and 48 hours, and positive cultures were transferred to Bacto-EC Medium and incubated in a water bath at 44.5±0.2°C for 24 hours. The most probable number (MPN) of fecal coliform was derived using a 5-tube decimal dilution MPN table.

The total coliform test is deleted in this survey because a fecal coliform standard with a median MPN value of 14 and a 90 percentile value of 43 was proposed and adopted by the National Shellfish Sanitation Program at New Orleans in January, 1974, to replace the total coliform



SURVEY AREAS

1. Cheboque River
2. Tusket River
3. Indian Bay
4. Pubnico Harbour

FIGURE 1 LOCATION OF SURVEY AREAS, YARMOUTH COUNTY, NS-15, 1974

standard of 70 for the classification of approved shellfish growing areas for an interim period of two years.

2.3 Physical Data

To facilitate the interpretation of bacteriological data, the following physical parameters were also determined:

Salinities (ppt) were determined by the Knudsen Method (2) from water samples collected from selected stations. Water temperatures were also recorded at several stations. The tidal stage was estimated and recorded for the time period encompassing the beginning and end of each sampling run. In addition, records of daily precipitation at Yarmouth Airport were provided by the Atmospheric Environment Service, Environment Canada, Atlantic Region.

3 RESULTS AND DISCUSSION

Bacteriological and physical data obtained from the three study areas are presented in Appendix A (Tables A 1-7). Rainfall data for the survey period at Yarmouth Airport is presented in Appendix B (Figure B-1).

3.1 Chebogue River

The Chebogue River drains from Chandler Lake, which is approximately 2 miles north of the village of Arcadia, to Chebogue Harbour. The primary sources of fecal contamination to the river are from the village of Arcadia and the Yarmouth Airport.

At Arcadia (pop. 550), raw sewage from several houses and a service station discharge directly to the river. The sewage at the Yarmouth Airport is first pumped into a septic tank before being discharged to a ditch which travels for about one mile before entering the river.

A total of 118 water samples were collected from the 30 stations established in the Chebogue River (Figure 2). The upper section of the Chebogue River (stations 20-30) was highly contaminated with fecal pollution. The median fecal coliform levels at these stations exceeded the fecal coliform standard of 14 (for the direct shellfish harvesting). The sewage discharged from the village of Arcadia and Yarmouth Airport

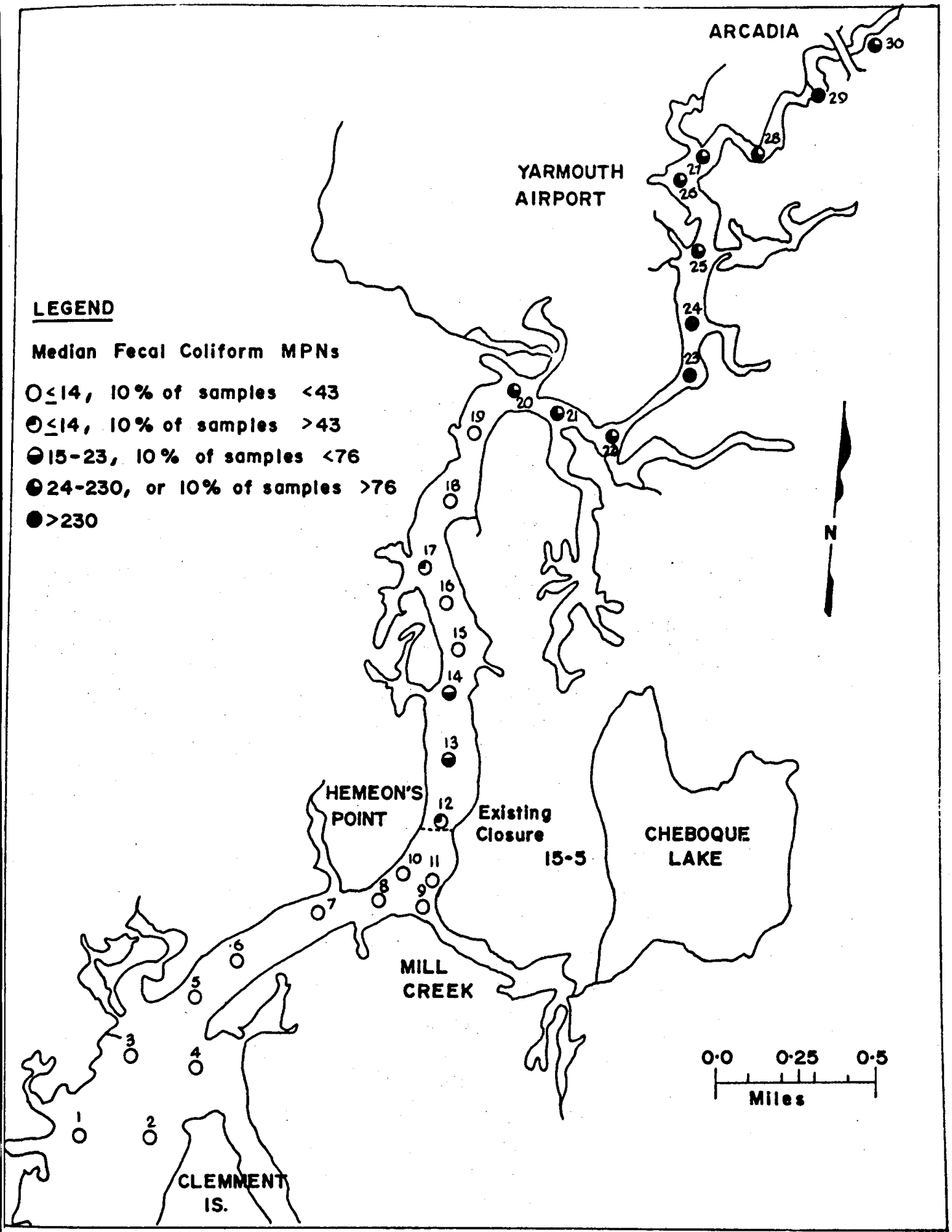


FIGURE 2: MEDIAN FECAL COLIFORM DENSITIES - CHEBOQUE RIVER 1974

contaminated the whole course of the river down to the existing closure line (station 12). Beyond station 12, the bacteriological quality of the river was satisfactory.

3.2 Tusket River

There is no known source of fecal contamination in the Tusket River other than the village of Tusket (pop. 423). Bacteriological data obtained from 60 stations in the Tusket River (Figure 3) indicate that the upper portion of the Tusket River (stations 1-17) was moderately polluted from sewage discharged from the village of Tusket. The median fecal coliform levels at most of these stations were slightly above the acceptable fecal coliform standard of 14 (for the direct harvesting of shellfish). The remainder of the stations (stations 18-60) in the river were of satisfactory bacteriological quality. The majority of the stations had median fecal coliform densities of less than 2.

3.3 Indian Bay

For purposes of this report, the Indian Bay area has been geographically described as comprising those shellfish-growing waters bounded by Amirault Hill in the North and Surette Island in the south. The majority of the population in this area is concentrated in the three villages of Amirault Hill (pop. 359), Sluice Point (293) and Surette Island (pop. 214). Septic tanks are used for the disposal of sewage in these villages.

Bacteriological data obtained from this study indicate that the water quality in Indian Bay was satisfactory with the exception of the three stations (stations 43,44 and 45) near Amirault Hill, which had median fecal coliform densities greater than 23 (Figure 4).

3.4 Pubnico Harbour

Pubnico Harbour is located at the southern section of Yarmouth County, Nova Scotia. The harbour is approximately seven miles long and half a mile wide. The area is well populated, with the settlement being concentrated along the roads on both the east and west shores of the harbour. The total population of municipalities around Pubnico Harbour is approximately 2200, which includes the communities of Lower East Pubnico, Centre East Pubnico, Middle East Pubnico, East Pubnico, Pubnico,

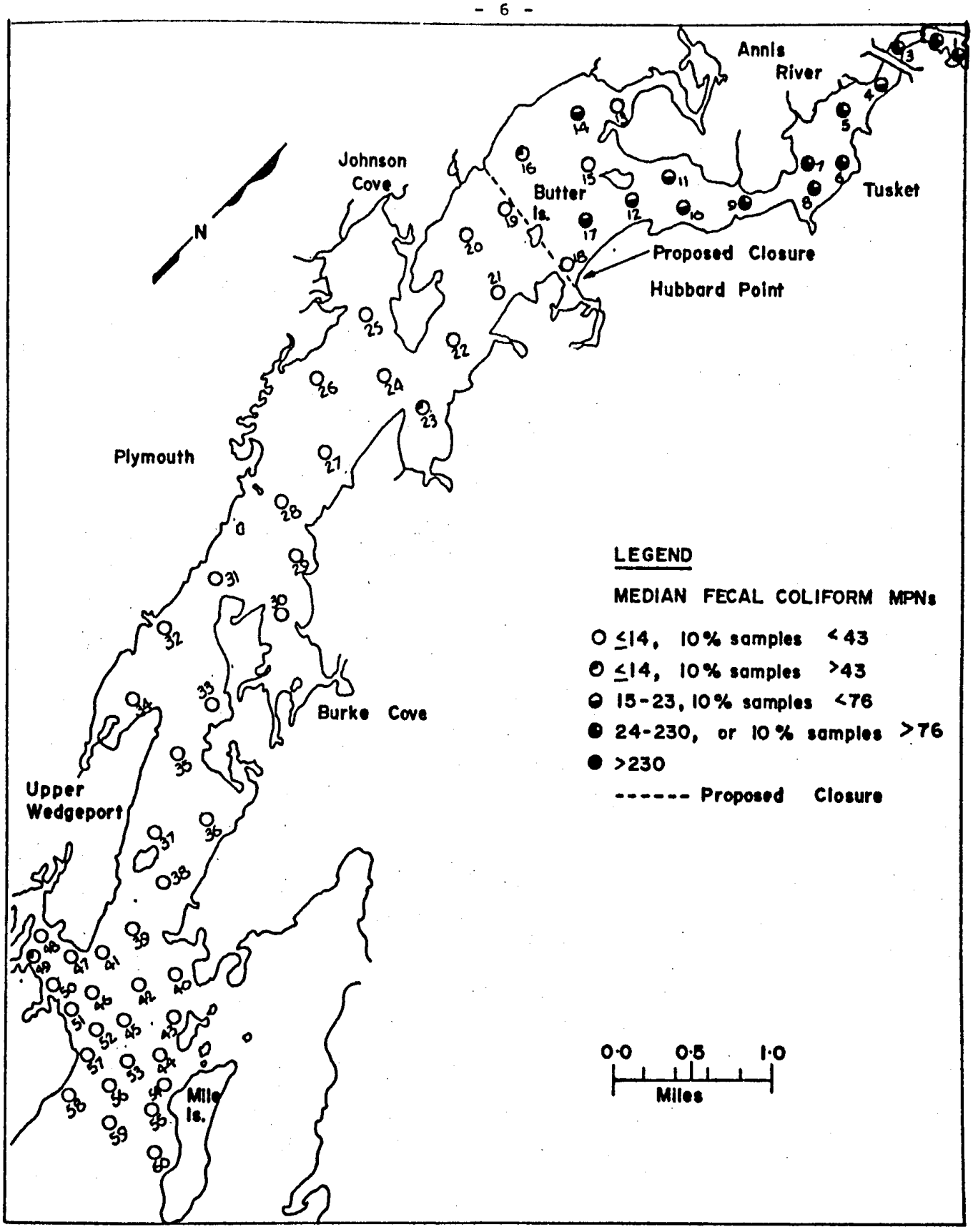


FIGURE 3: MEDIAN FECAL COLIFORM DENSITIES - TUSKET RIVER, 1974

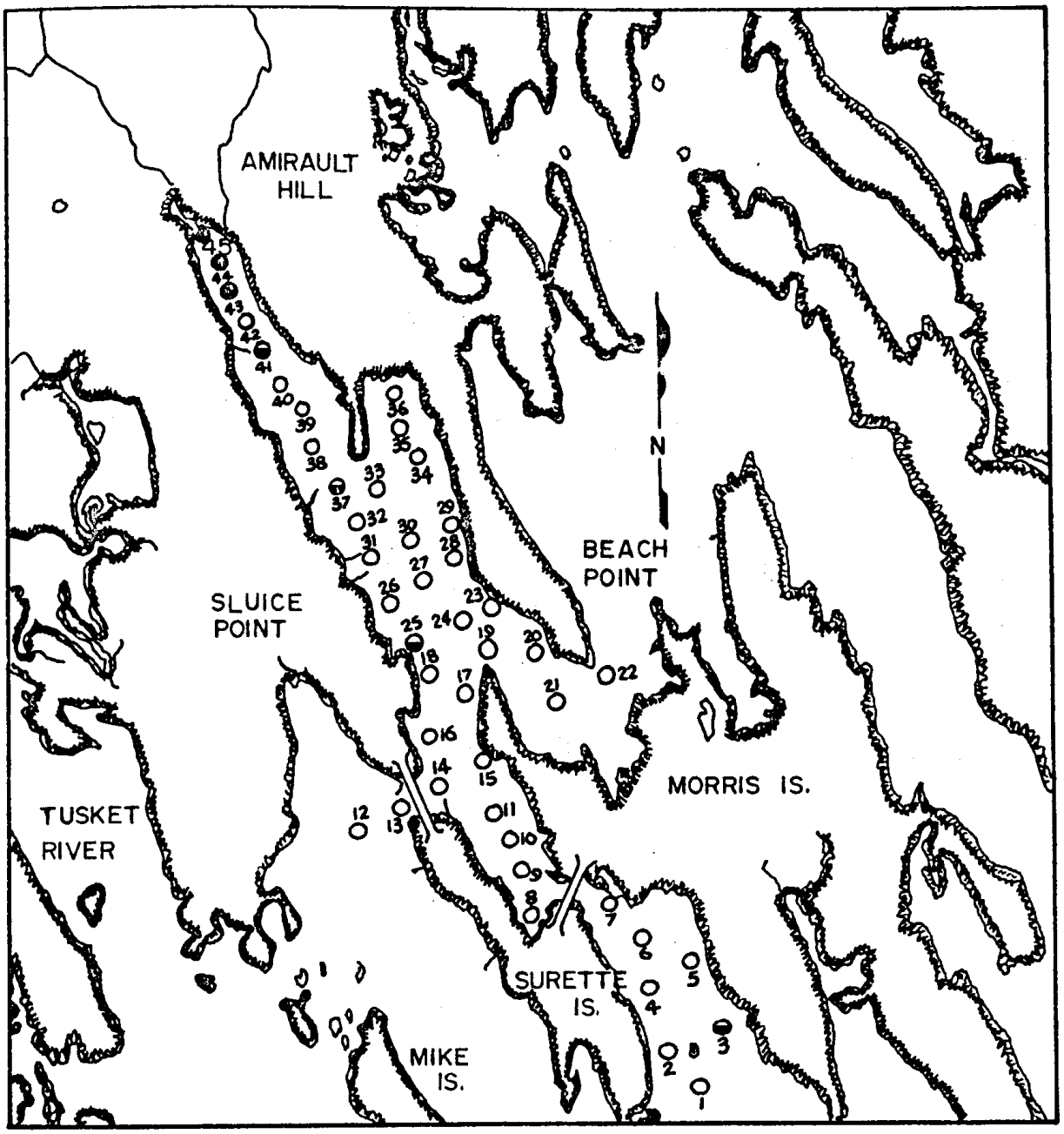


FIGURE 4: **MEDIAN FECAL COLIFORM DENSITIES, INDIAN BAY 1974**

LEGEND:

MEDIAN FECAL COLIFORM MPNs

○ ≤14, 10% of samples <43

◐ ≤14, 10% of samples >43

◒ 15-23, 10% of samples <76

● 24-230, or 10% of samples >76

◉ >230

0·0 0·5 1·0

Miles

Upper West Pubnico, West Pubnico, Middle West Pubnico and Lower West Pubnico.

The main industry around Pubnico Harbour is fishing. There are six fish plants in the area. At Lower East Pubnico, there is a large wharf where 20-25 fishing boats are often moored. Fish wastes from the B.C. Packers Plant discharge directly to the harbour. There are two fish plants at the wharf of Middle East Pubnico. Sealife Fisheries Limited employs about 150 people. A septic tank is used for disposal of sewage wastes while other plant wastes discharge directly into the harbour through several outfalls. The Pubnico Cooperative Association Limited employs about 22 people. This plant handles only salt fish and the wastes discharge directly to the harbour. Sewage wastes are disposed separately in a septic tank. There are two salt fish plants at Lower West Pubnico. Both d'Entremont Fisheries Limited and Walter D. Surette have a septic tank for disposal of sanitary wastes. The plant wastes are discharged directly to the harbour. The Inshore Fisheries Limited at Middle West Pubnico employs about 15 people. A septic tank is used for sanitary waste disposal, while plant wastes are discharged directly to the harbour.

There are several other sources of pollution that may affect the harbour. A very large wharf located at Deris Point just south of Lower West Pubnico provides moorage for approximately 50 boats. A service station and a gasoline storage depot at Upper West Pubnico may also contribute some pollution to the harbour.

There is very little shellfish harvesting in Pubnico Harbour and none of commercial value. Clams are found mostly along the eastern shore of the East Pubnico flats. There are few clams, if any, on the western side of the harbour.

The median fecal coliform values obtained for the 98 sampling stations in Pubnico Harbour are presented in Figure 5. Bacteriological water quality in the harbour was generally very good with the exception of several stations influenced by the fish plant waste and wharf operations. The standing wharf closures at Middle and Lower West Pubnico

were adequate in protecting the areas from fecal contamination at stations 31,32,39,40 and 55. Waste discharged from B.C. Packers Fish plant and boats at the wharf in Lower East Pubnico contaminated a fairly large sector of the shoreline waters from stations 66 to 71. The two fish plants at Middle East Pubnico also contributed a considerable amount of fecal contamination to the receiving waters at the wharf (stations 79 and 80).

4 CONCLUSIONS

4.1 Chebogue River

The upper portion of the Chebogue River is subject to fecal contamination from sewage discharged from the village of Arcadia and Yarmouth Airport. It is, therefore, recommended that the existing closure (15-5) at the Chebogue River be retained.

4.2 Tusket River

The upper portion of the Tusket River is moderately polluted by the sewage discharged from the village of Tusket. It is recommended that this sector of the river be closed for the harvesting of shellfish. The exact position of the closure line (as indicated in Figure 3) should be defined by the installation of survey monuments.

4.3 Indian Bay

Bacteriological water quality in most of Indian Bay is satisfactory in terms of shellfish harvesting. The only contaminated area in Indian Bay is in a small swampy section of the bay near Amirault Hill (Stations 43-45). The coliform densities in this section were only slightly above the acceptable limit for direct harvesting of shellfish. Since there is no shellfish resource in this section it is not necessary to implement any shellfish closure in Indian Bay.

4.4 Pubnico Harbour

A small section of Lower East Pubnico shoreline is grossly contaminated by untreated wastes from fish plant and boats at the wharf. It is essential that a shellfish closure be installed at this section of the shoreline. The approximate location of the proposed closure line is shown in Figure 5.

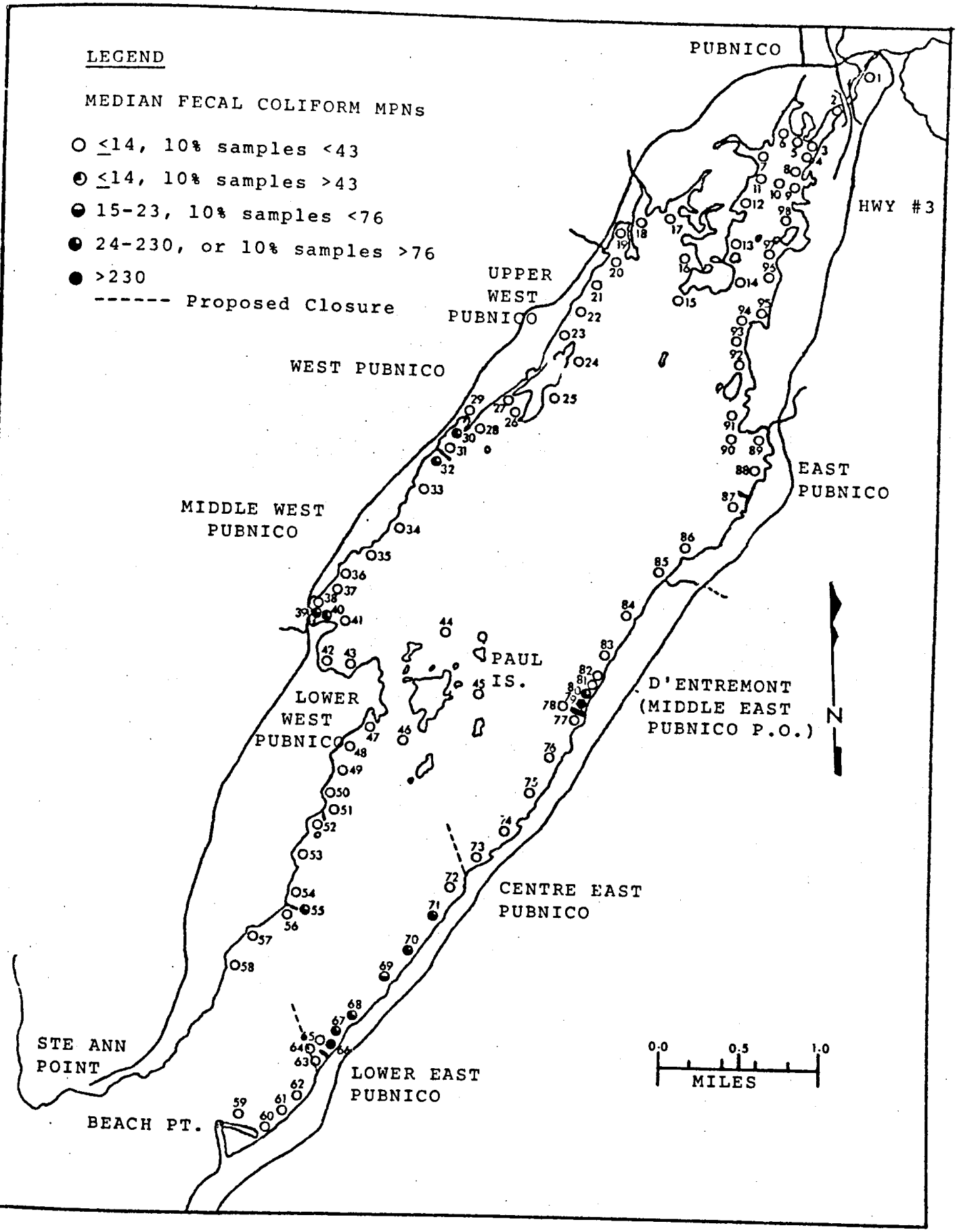


FIGURE 5 MEDIAN FECAL COLIFORM DENSITIES, PUBNICO HARBOUR, 1974

5 RECOMMENDATIONS MARITIME STANDING COMMITTEE ON SHELLFISH

5.1 Chebogue River

The upper portion of the Chebogue River is subject to fecal contamination from sewage discharged from the village of Arcadia and Yarmouth Airport. It is, therefore, recommended that the existing closure (15-5) at the Chebogue River be retained.

5.2 Tusket River

The upper portion of the Tusket River is moderately polluted by the sewage discharged from the village of Tusket. It is recommended that the sector of the river just above Butter Island be closed for the harvesting of shellfish.

5.3 Indian Bay

Bacteriological water quality in most of Indian Bay is satisfactory in terms of shellfish harvesting. The only contaminated area in Indian Bay is in a small swampy section of the bay near Amirault Hill (Stations 43-45). The coliform densities in this section were only slightly above the acceptable limit for direct harvesting of shellfish. Since there is no shellfish resource in this section it is not necessary to implement any shellfish closure in Indian Bay.

5.4 Pubnico Harbour

A small section of Lower East Pubnico shoreline is grossly contaminated by untreated wastes from fish plants and boats at the wharf. It is essential that a shellfish closure be installed at this section of the shoreline.

The existing 400 ft. wharf closure at Middle East Pubnico should be extended to include the area 1000 feet north and 1000 feet south of the wharf (as shown in Figure 6).

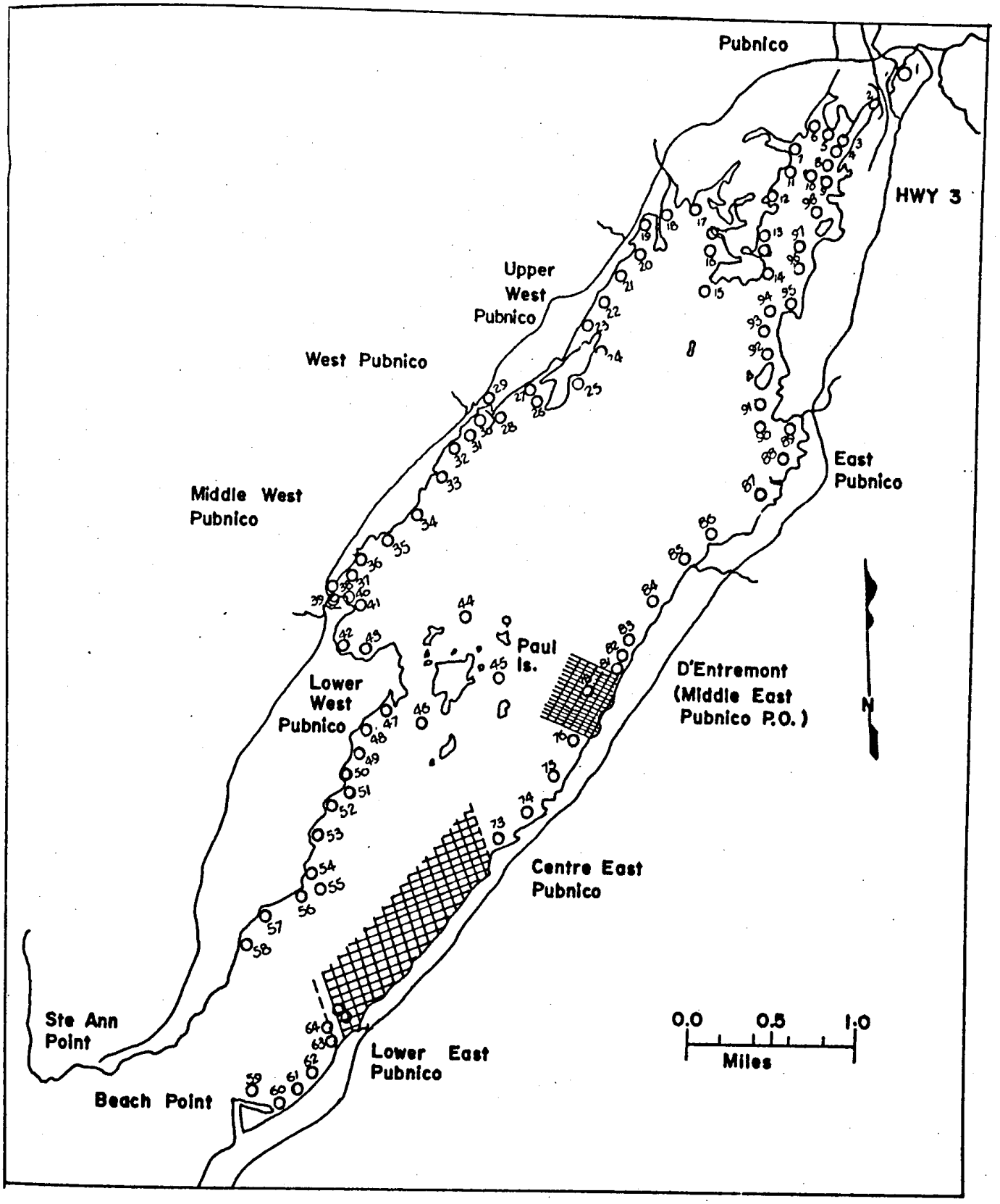


FIGURE 6: RECOMMENDED CLOSURES - PUBNICO HARBOUR, 1974

REFERENCES

1. American Public Health Association, Recommended Procedures for the Examination of Sea Water and Shellfish, Fourth Edition, American Public Health Association, New York, 105 pp (1970).

2. Anon. Determination of Chlorinity by the Knudsen Method, G. M. Manufacturing Company, New York (1962).

3. L. P. Fedoruk. Sanitary Survey of Nova Scotia Shellfish Area #15. Environmental Protection Service, Department of the Environment, Manuscript Report No. AR-71-1-1, 6 pp (1971).

ACKNOWLEDGEMENTS

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APPENDIX A

TABLES

TABLE A-1 FECAL COLIFORM DATA, CHEBOQUE RIVER, NS-15, 1974

STATION NO.	MPN's PER 100 ml OF WATER				Median
	June 24	June 28	July 17	Sept. 19	
1	4	8	23	5	7
2	8	17	5	2	7
3	7	5	8	2	6
4	2	8	14	7	8
5	2	7	26	4	6
6	7	5	27	<2	6
7	5	8	7	2	6
8	2	23	13	?	8
9	5	4	23	4	5
10	7	<2	8	7	7
11	13	2	13	2	8
12	64	4	22	2	13
13	-	17	22	2	17
14	22	17	13	2	15
15	13	7	33	5	10
16	11	11	31	11	11
17	33	11	21	2	16
18	13	8	22	<2	11
19	13	11	17	11	12
20	14	17	33	79	25
21	920	7	33	22	28
22	>2400	220	33	5	130
23	1600	540	17	13	280
24	920	1600	14	49	290
25	-	180	11	70	70
26	220	350	8	11	120
27	540	240	33	34	140
28	280	540	8	14	150
29	920	350	110	350	350
30	220	180	1600	210	120

TABLE A-2 FECAL COLIFORM DATA, TUSKET RIVER, NS-15, 1974

STATION NO.	MPN's PER 100 ml OF WATER				
	July 9	July 12	July 16	Oct. 3	Median
1	-	26	17	46	26
2	-	13	70	33	33
3	-	8	33	49	33
4	-	21	33	21	21
5	-	46	13	33	33
6	-	21	70	49	49
7	-	33	49	17	33
8	49	110	46	49	49
9	70	49	49	[illegible]	49
10	13	11	17	46	15
11	23	8	21	49	22
12	31	5	8	33	20
13	5	5	4	17	5
14	46	13	13	23	18
15	8	8	7	23	8
16	8	7	4	49	8
17	5	22	21	21	21
18	5	5	23	13	9
19	2	4	17	23	11
20	4	14	2	7	6
21	7	5	8	8	8
22	8	13	2	11	10
23	7	2	2	49	5
24	2	5	2	5	4
25	11	<2	9	11	10
26	11	<2	2	2	2
27	<2	<2	4	4	<3
28	<2	4	<2	11	<3
29	5	2	<2	5	4
30	2	<2	<2	5	<2
31	<2	<2	<2	5	<2
32	<2	2	2	5	2
33	<2	<2	<2	2	<2
34	5	<2	2	<2	<2
35	5	2	<2	<2	<2
36	<2	<2	<2	<2	<2
37	<2	<2	<2	2	<2
38	<2	<2	2	2	<2
39	<2	2	2	2	2
40	<2	5	2	5	4

Cont'd

TABLE A-2 (CON'D)

STATION NO.	MPN's PER 100 ml OF WATER				Median
	July 9	July 12	July 16	Oct. 3	
41	5	5	<2	<2	<4
42	<2	<2	<2	<2	<2
43	<2	<2	<2	2	<2
44	<2	<2	<2	2	<2
45	<2	<2	5	2	<2
46	2	<2	2	2	2
47	<2	17	<2	8	<5
48	2	5	5	17	5
49	11	46	8	7	10
50	2	14	5	8	7
51	<2	<2	2	<2	<2
52	<2	<2	7	4	<3
53	<2	<2	<2	5	<2
54	<2	<2	<2	<2	<2
55	<2	<2	<2	4	<2
56	2	<2	<2	2	<2
57	<2	<2	<2	<2	<2
58	<2	<2	<2	2	<2
59	5	<2	<2	<2	<2
60	<2	<2	<2	<2	<2

TABLE A-3 FECAL COLIFORM DATA, INDIAN BAY, NS-15, 1974

STATION NO.	MPN'S PER 100 ml OF WATER JUNE 25	JULY 19	MEDIAN
1	2	2	2
2	<2	5	<4
3	8	33	21
4	2	2	2
5	5	2	4
6	2	<2	<2
7	2	<2	<2
8	<2	<2	<2
9	2	5	4
10	2	<2	<2
11	4	<2	<3
12	2	<2	<2
13	<2	<2	<2
14	<2	<2	<2
15	2	<2	<2
16	<2	<2	<2
17	2	<2	<2
18	<2	<2	<2
19	2	<2	<2
20	<2	8	<5
21	2	2	2
22	<2	<2	<2
23	<2	<2	<2
24	5	<2	<4
25	<2	33	17
26	2	<2	<2
27	2	<2	<2
28	<2	<2	<2
29	2	<2	<2
30	2	<2	<2
31	5	<2	<4
32	<2	<2	<2
33	<2	<2	<2
34	2	8	5
35	2	23	13
36	17	11	14
37	9	33	21
38	5	23	14
39	11	5	8
40	4	8	6
41	23	11	17
42	17	5	11
43	46	79	63
44	46	95	71
45	31	26	29

TABLE A-4 FECAL COLIFORM DATA, PUBNICO HARBOUR, NS-15, 1974

STATION NO.	MPN's PER 100 ml OF WATER				
	July 22	July 24	Aug. 6	Oct. 2	Median
1	2	-	5	5	5
2	4	-	5	13	5
3	2	-	<2	26	2
4	<2	-	2	17	2
5	<2	-	<2	49	<2
6	5	-	<2	27	5
7	<2	-	<2	33	<2
8	<2	-	<2	2	<2
9	<2	-	<2	5	<2
10	2	-	<2	17	2
11	<2	-	<2	3	<2
12	<2	-	<2	23	<2
13	<2	-	<2	2	<2
14	<2	-	<2	5	<2
15	<2	<2	<2	<2	<2
16	<2	<2	<2	<2	<2
17	<2	<2	<2	8	<2
18	<2	<2	<2	31	<2
19	<2	<2	<2	2	<2
20	<2	<2	<2	<2	<2
21	2	<2	<2	7	<2
22	<2	2	<2	<2	<2
23	<2	2	<2	11	<2
24	<2	<2	<2	2	<2
25	<2	2	<5	5	<2
26	<2	<2	<2	4	<2
27	<2	<2	<2	2	<2
28	2	<2	2	9	2
29	<2	<2	<2	2	<2
30	<2	<2	<2	5	<2
31	8	4	2	79	6
32	2	2	140	11	7
33	<2	-	<2	2	<2
34	<2	-	<2	11	<2
35	2	-	<2	8	2
36	<2	-	<2	2	<2
37	<2	-	<2	17	<2
38	<2	-	<2	5	<2
39	<2	-	< 2	220	<2
40	2	-	<2	350	2
41	<2	<2	<2	8	<2
42	2	2	<2	<2	<2
43	<2	<2	<2	<2	<2
44	<2	<2	<2	<2	<2
45	2	4	<2	2	2
46	<2	<2	2	<2	<2
47	8	<2	<2	5	<4
48	<2	<2	<2	<2	<2
49	<2	<2	<2	11	<2
50	<2	11	<2	2	<2

Cont'd

TABLE A-4 (CON'D)

STATION NO.	MPN's PER 100 ml OF WATER				
	July 22	July 24	Aug. 6	Oct. 2	Median
51	2	<2	<2	<2	<2
52	<2	21	<2	14	<8
53	<2	<2	<2	<2	<2
54	<2	2	<2	6	<2
55	<2	2	<2	>2400	<2
56	5	2	<2	54	4
57	2	<2	<2	-	<2
58	<2	<2	<2	<2	<2
59	<2	<2	<2	<2	<2
60	4	<2	<2	<2	<2
61	<2	2	<2	<2	<2
62	8	13	<2	<2	<5
63	2	23	<2	<2	<2
64	33	7	<2	5	6
65	21	17	<2	2	10
66	>2400	>2400	>2400	79	>2400
67	70	79	>2400	2	75
68	22	26	130	<2	24
69	<2	33	27	<2	<18
70	<2	2	350	<2	<2
71	<2	2	170	<2	<2
72	2	<2	<2	2	<2
73	2	<2	<2	<2	<2
74	5	<2	<2	5	<4
75	13	<2	<2	<2	<2
76	49	<2	<2	2	<2
77	46	5	2	<2	4
78	<2	5	<2	2	<2
79	5	>2400	1600	5	800
80	920	130	2	6	68
81	<2	8	40	5	7
82	13	5	8	<2	7
83	<2	5	2	<2	<2
84	<2	5	8	2	4
85	<2	<2	<2	2	<2
86	<2	<2	<2	<2	<2
87	<2	<2	<2	2	<2
88	<2	<2	<2	13	<2
89	11	<2	2	13	7
90	<2	2	2	2	2
91	<2	<2	<2	2	<2
92	<2	<2	<2	-	<2
93	<2	5	<2	-	<2
94	<2	2	<2	-	<2
95	<2	-	<2	-	<2
96	<2	-	<2	-	<2
97	<2	-	<2	-	<2
98	2	-	<2	-	<2

TABLE A-5 SALINITY, TEMPERATURE AND TIDAL STAGE AT TIME OF SAMPLING, CHEBOQUE RIVER, NS-15, 1974

STATION NO	JUNE 24	JUNE 28	JULY 17	SEPT. 19
		Salinity (PPT)		
3	20.5	19.6	25.4	26.5
15	20.5	22.9	25.9	26.5
28	14.8	14.6	25.9	-
		Temperature (°C)		
3	8	18	14	14
15	10	18	19	14.5
28	12	18	20	15
		Tidal Stage		
Time	1400-1500	1039-1130	0845-0930	1100-1230
Tide	High-Rising	Low-Falling	High-Rising	Low-Rising

TABLE A-6 SALINITY, TEMPERATURE AND TIDAL STAGE AT TIME OF SAMPLING, TUSKET RIVER, NS-15, 1974

STATION NO.	JULY 9	JULY 12	JULY 16	OCT. 3
		Salinity (PPT)		
3	-	0.0	0.9	-
9	2.2	0.0	3.5	1.3
22	14.8	11.8	9.4	-
35	18.0	17.1	19.5	-
59	19.4	19.9	19.5	22.7
		Temperature (°C)		
3	-	15	16	-
9	16	14	16	14.5
22	13	13	15	-
35	12	11	13.5	-
59	11	11	12	14.5
		Tidal Stage		
Time	0930-1130	0800-0930	0915-1045	1320-1440
Tide	Low-Rising	Low-Falling	High-Falling	High-Falling

TABLE A-7 SALINITY, TEMPERATURE AND TIDAL STAGE AT TIME OF SAMPLING, PUBNICO HARBOUR, NS-15, 1974

STATION NO.	JULY 22	JULY 24	AUG. 6	OCT. 2
		Salinity (PPT)		
3	10.6	-	23.3	17.6
27	26.5	27.3	23.3	-
44	26.5	28.5	24.6	-
58	26.5	28.5	25.9	28.2
89	26.5	27.8	23.3	-
		Temperature (°C)		
3	18	-	20	14
27	18	17	19.5	-
44	16.5	14	18.5	-
58	14	12.5	15.5	-
89	21	17.5	21	-
		Tidal Stage		
Time	1300-1515	1430-1700	1030-1300	1120-1250
Tide	High-Falling	High-Falling	High-Rising	High-Falling

APPENDIX B

FIGURE

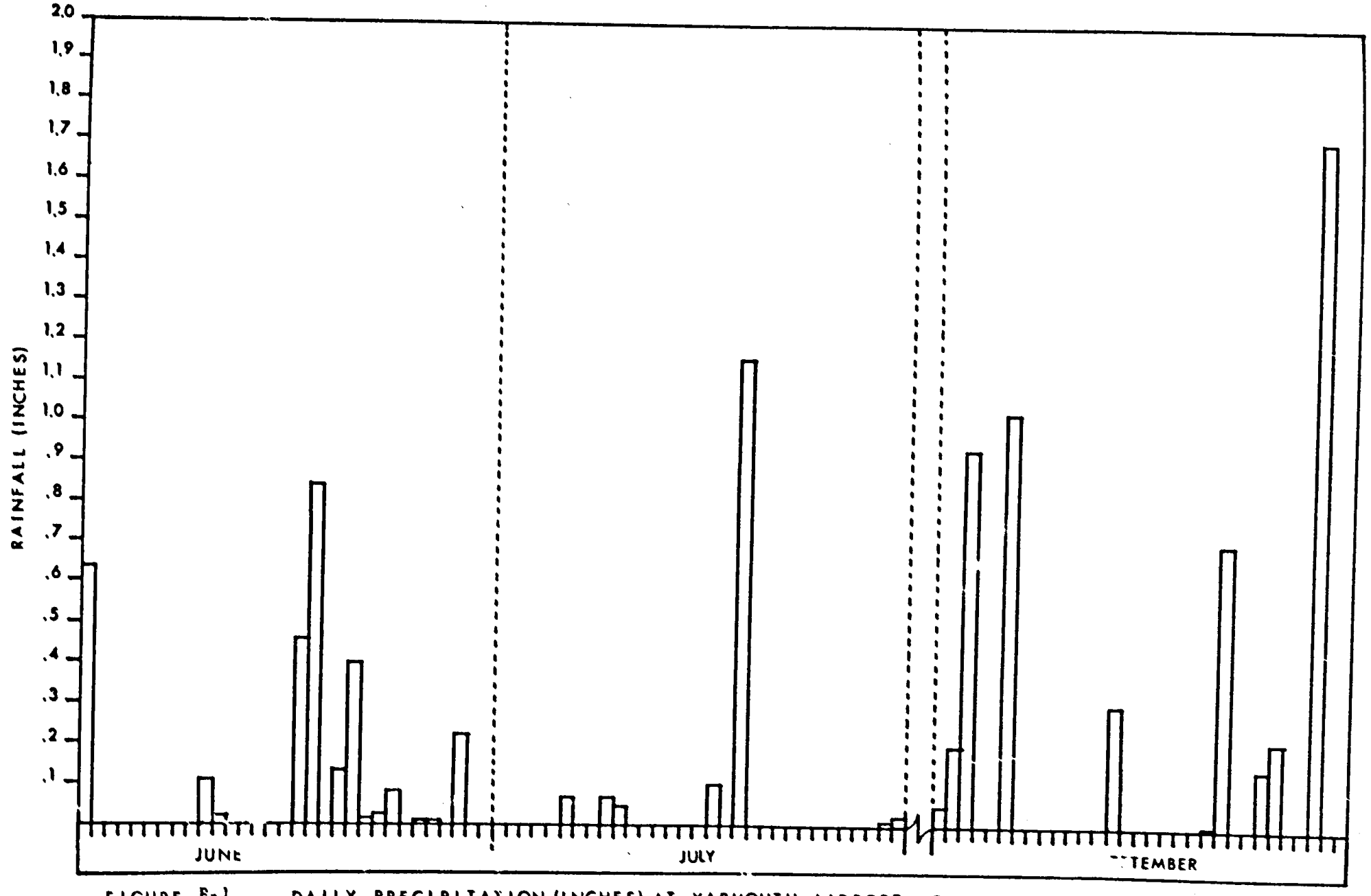

FIGURE E-1 DAILY PRECIPITATION (INCHES) AT YARMOUTH AIRPORT, NOVA SCOTIA, 1974.

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