

# **Spring Trout Fishery in the East River of Pictou, Nova Scotia, 2014-15. Project Report Update.**



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## Introduction

Tagging studies and angler creel surveys are used to evaluate fisheries and collect biological data on fish populations. The East River of Pictou, located in central Pictou County, Nova Scotia supports a popular spring fishery for sea run speckled trout, *Salvelinus fontinalis* and sea run brown trout, *Salmo trutta*. Speckled trout (brook trout) are a native species to Nova Scotia and the Provincial Fish. Brown trout were first introduced to Nova Scotia prior to 1925 and have established many self-sustaining populations and in some river systems the angler catch is dominated by brown trout. Sea run trout migrate to productive estuarine water to take advantage of the abundance of forage and can reach weights of greater than 1kg (Spares et al, 2014). As in other sea trout fisheries, much of the angling activity takes place in the spring of the year when the trout are in tidal waters and in the lower reaches of river systems. Spring fisheries for sea run trout are typically characterized by small catch per hour and large rates of retention (MacMillan and Madden 2007). The start date of the trout fishery in the main river stem and estuary of the East River was delayed to 15 May from 15 April to protect downstream migrating Atlantic salmon, *Salmo salar*. Anglers have expressed concern about a decline in the status of the sport fishery on the East River. Water quality assessments indicate that the pH level is close to 7 (neutral) and summer thermal conditions are marginal in the main branch of the East River for speckled trout (MacMillan et al 2005 and 2008).

## Methods

Members of the Pictou County Rivers Association, volunteers, and staff of the Nova Scotia Department and Fisheries and Aquaculture angled for trout between 1 April and 15 May 2014, on several sites in the East River of Pictou and estuary (Figure 1). Angling methods included the use of fly, lure, and live bait. Water and air temperature, and the number of anglers and hours spent angling were recorded. All captured trout were anesthetized using clove oil and measured to the nearest mm in forklength, weighed to nearest g, marked with individually numbered carlin tags, scale sampled, adipose fin clipped, and released. Effort and catch per hour during the tagging (marking) period was calculated. Water temperature loggers were deployed at three sites, Kerrowgare, Elgin (upper West Branch East River), and in Blue Acres (head of tide).

An angler creel survey on East River was undertaken during 15 May to 5 June 2014-15. Seven of the most popular angling locations were sampled from the Gut Bridge in the estuary to about 25km upstream to the highway bridge in Springville. Anglers were counted and interviewed to measure activity and their catch at each site. Survey sites were visited once or twice during a survey day by one creel survey clerk. One circuit required about 2 to 3h to complete; therefore, a sampling day usually required approximately 4 to 6 h. The second circuit was started soon after completion of the first circuit. Creel clerks attempted to interview as many anglers as possible and budget time to complete circuits in about 2-3 h. Anglers were interviewed to obtain information on their hometown, gear type used, duration of angling, and the number and species caught. Tag numbers or tag marks on trout were recorded. Mean catch per hour of angling was determined for each day when more than two anglers were interviewed and the total hours angled was greater than five. Anglers who fished for 0.5hrs or more were included in the survey. The catch was measured for forklength in mm and weight in grams. Scale samples was collected to age trout. Water and air temperatures and weather conditions were recorded (Appendix). The proportion of released trout was calculated. To facilitate reporting of tagged trout caught outside creel survey interviews, signs were placed at strategic locations and business cards were distributed to anglers.

Effort, total angler hours spent on each system, was estimated from activity strata from the following equation;  $E = TA$ , where  $E$  = effort (number of hours angled),  $T$  = duration of the fishing day (hours), and  $A$  = mean

activity. The total number of speckled trout caught was estimated using the following equation:  $C = E * CPUE$ , where  $C$  = total number of fish caught,  $E$  = effort, and  $CPUE$  = mean catch per unit effort. Standard deviation, standard error, and coefficient of variance was calculated for catch per unit effort and activity. Coefficient of variance was calculated for effort and catch using the following equation:  $CV = SE(x) / x$ ,  $CV(E) = CV2(A)$ ,  $CV(C) = CV2(A) + CV2(CPUE)$ , where  $CV$  = coefficient of variance,  $SE$  = standard error,  $x$  = mean,  $E$  = effort,  $A$  = activity,  $CPUE$  = catch per unit effort, and  $C$  = catch.

The number in the speckled trout population was estimated using the Adjusted-Petersen method:  $N = (M+1) * (C+1) / (R + 1)$ , where  $M$  = number of tags available for recapture,  $C$  = number captured, and  $R$  = number recaptured. Two speckled trout population estimates were calculated. The first from a recapture ( $R$ ) that was recorded by creel clerks (tagged and tag marked trout) and from the capture ( $C$ ) of the total number of retained trout recorded during the creel survey. The second from a recapture ( $R$ ) from tag returns collected by creel clerks and those submitted by anglers who were not directly interviewed during the creel survey period. The capture ( $C$ ) in the second population estimate was the estimated number of trout harvested during the creel survey period. Tag loss was (0.2) and was used to estimate the number of tags available for recapture.

On 11 June 2014, a snorkel survey was conducted in pools located in Bridgeville, Springville, and Black Rock as a method of counting trout to estimate population number from tag returns. Size classes of speckled trout and brown trout that were counted during snorkel survey were recorded as between 15 cm to 30 cm and >30cm.

Weight-length relationships were calculated using the power function,  $w = a l^b$  where  $w$  = weight in g,  $l$  is length,  $a$  is the scaling factor, and  $b$  is the exponent. The exploitation rate ( $u$ ) was calculated from  $u = R/M$ , where  $R$  is the number of recaptures and  $M$  is the number of speckled trout marked. Tag loss was evaluated by recording the number of trout creel that had tag marks and a clipped adipose fin. Tag loss was incorporated in the estimates of exploitation to adjust the number ( $M$ ) of tags available for capture. Weight-length relationships were calculated for each species and to estimate weight of harvest and population of speckled trout. Catch statistics were compared to previous surveys conducted (1998-2000 & 2013). Correlations between water temperature and speckled trout catch-per-hour were evaluated.

## Results and Discussion

Researchers and twelve volunteers spent 575 hours to capture 61 speckled trout and 16 brown trout from 5 April to 14 May, 2014. Mean forklength was 33.2 cm (6.5, SD) for speckled trout and 38.3 cm (7.7,SD) for brown trout. A total of 57 speckled trout and 15 brown trout were tagged (Figure 2). Catch per hour was 0.12 (0.26, CV) for speckled trout and was 0.03 (0.05,SD) for brown trout during the tagging phase. Mean water temperature during that tagging period was 8.5°C (3.2, SD). Speckled trout catch per hour was correlated with increasing temperature,  $r^2=0.273$ ,  $p<0.004$ .

Mean daily water temperatures at Blue Acres warmed to stressful (>20°C) levels for speckled trout in late June through early September. Mean daily water temperatures at the Kerrowgare site and Elgin site exceeded stressful conditions for speckled trout for a 42 day period and a 9 day period, respectively. Thermal conditions in the Kerrowgare site are potentially influenced by Hunter Lake (Figure 3).

A total of 222 anglers were counted and 181 anglers were interviewed from 15 May to 5 June, 2014. The majority (96%) of anglers was from Pictou County and 4 % of anglers traveled from Colchester County, Kings County, and Halifax Regional Municipality. The angler population was comprised of 97% males, 3% females, and 6% children younger than sixteen years of age. The percentage of anglers that used the following gear

was 49% for bait, 38% for lure and bait, 11% for lure, 4% for fly, and 4% for combination of bait, lure, and/or fly. The percentage of anglers using bait and participation of male anglers were greater than the provincial average (A Survey of the Sportfishing Industry in Nova Scotia 2014).

During the creel survey period from 15 May to 5 June, 2015, 180 anglers spent 444 hours to catch 92 speckled trout and 12 brown trout. Forty percent of the catch of speckled trout was released and 42% of brown trout were released. The mean size of the retained trout was 30.1cm for speckled and 42.2 for brown trout. Twenty nine percent of the angler catch of speckled trout was longer than 35cm in East River (Figure 4). In comparison the percentage of large trout (>35cm) caught in a regulated fishery in Antigonish Harbour was 64% in 2006 and 53% in 2007. The percentage of large (>35cm) sea trout caught in River Denys Basin was 6 in 2008 and 14 percent in 2010 prior to regulatory changes to reduce harvest. The most popular angling locations on East River were Blue Acres, Highway 104, Railway Bridge, and Fulton's Pool (Figure 5). Less angling pressure was observed in the upper reaches and that was consistent with other sea run fisheries in spring. Over the eighteen days surveyed, the mean daily activity (angler counts) was 5.8 (0.25, CV) anglers and daily activity was observed to decline after opening day. Water temperatures ranged 9 to 19.1°C (Figure 6). Mean catch per hour of retained speckled trout was 0.06 (0.36, CV). Feeding and movement of trout is influenced by water temperature and optimal temperatures for trout are in the range of 12-16°C (Power 1980). As water temperatures fall below optimal temperatures for feeding during the spring fishery the catch per hour decreased. Catch per hour for retained speckled trout was zero on the four days in late May when water temperatures were less than 10 °C (Figure 7). Eighty-five percent of the speckled trout catch was captured in May when mean temperature was 14 °C, (1.5, SD) or warmer. Estimated total angler effort spent on the East River from 14 May to 5 June was 2013 hours and resulted the total harvest of 122 (0.61, CV) speckled trout (Table 1). The weight of the speckled trout harvest was approximately 60kg. Although some angling effort was missed, the most popular angling sites were evaluated during the survey.

A total of fifteen trout (fourteen with tags and one with tag marks) were recaptured by anglers after the opening of the angling season on 15 May (Table 2). Recaptured speckled trout were reported from all but one tagging site (Figure 8). The mean distance between tagging and recapturing was 13.7 km and ranged from zero to 48 km and the mean number of days between tagging and recapturing was 20 days and ranged from one to 56 days. Of the trout that were captured at the same location of tagging, one was caught 26 days after tagging at the Railway site. Six of the recaptured trout were caught at a different location from the tagging site. The longest distance (48km) was from two trout tagged at the Gut Bridge and recaptured at Hunter Lake. The two recaptured trout were tagged 31 days and 54 days prior to being recaptured at Hunter Lake on 12 June. In general, sea run trout would be expected to migrate upstream into freshwater regions from May through July.

The number of marked trout recorded during the angler interviews of the creel survey was four tagged and one with tag marks. The trout with tag marks was included as a recapture to estimate the number in the speckled trout population. The speckled trout population estimate using the creel survey capture from angler interviews was 464 (219-1071, 95%, c.i.). The estimated weight of the population was 228 kg.

A total of six tagged speckled trout were submitted by anglers during the creel survey period. The six recaptures submitted by anglers were combined with the four recaptured tags recorded during creel survey angler interviews and used to estimate population number of speckled trout using the estimated harvest as the capture C. The proportion of tags lost (0.2) was applied to the number (57) of tags available for recapture to estimate M. The population estimate of speckled trout was 519 (294-1001, 95%, c.i.). The estimated weight of the population was 255 kg.

Two exploitation rates were estimated from the number of trout recaptured. During the creel survey period (15 May -5 June) the exploitation rate was 24% and from tag returns over the entire season the exploitation rate was 30% (Table 3). The exploitation rate could be underestimated if some anglers fail to report catching a tagged trout. The majority of tag returns to estimate the exploitation rate were reported by anglers and the proportion of anglers who failed to report a capture of a tagged fish is unknown. Future surveys should include a question to anglers to evaluate the proportion of anglers who failed to report catching a tagged trout.

The length frequency indicated that most of the trout captured were 3+ years and 4+ years of age. The largest forklength recorded was a 65 cm brown trout (6+ years) and a 48cm speckled trout (5+years). Size differences between trout species suggest that brown trout longevity is greater than speckled trout. Length-weight relationship was  $wt = 0.0054FL^{3.22}$ ,  $r^2 = 0.932$ ,  $n=59$ , during the tagging period and was  $wt = 0.0045FL^{3.28}$ ,  $r^2 = 0.943$ ,  $N=37$ , during the capture period. Brown trout captured during both periods were grouped and the length-weight relationship was  $wt = 0.0437FL^{2.6}$ ,  $r^2 = 0.89$ ,  $n=18$ .

Brown trout were captured in numbers that were insufficient to estimate harvest or population size. The data suggest a difference in the catchability between speckled trout and brown trout. A total of 30% of the 57 speckled trout tagged were recaptured by anglers and none of the 15 brown trout tagged were reported to be recaptured. The rate of capture is often used as an index of population density and can vary among species. Comparisons of catch data between trout species may greatly underestimate the number of brown trout in the population. Snorkel surveys were conducted in pools on the main branch of the East River on 11 June 2014. Forty-eight percent of the 29 trout counted were brown trout and of the 21 large (>30cm) trout counted, 12 or 57% were brown trout (Table 4). Characteristics that provide brown trout with a competitive advantage over speckled trout include an increased difficulty of capture and increased size and longevity compared to speckled trout (Waters 1983). Additionally, brown trout are tolerant of warmer and more disturbed habitat conditions compared to speckled trout (Fausch and White 1981). Direct counts from snorkeling may be more representative of the actual numerical differences between the populations of trout species.

The first six days of the 2014-15 creel surveys was compared to previous creel data (1998, 1999, 2000, 2013) from the East River of Pictou. A summary of six years of data from creel surveys between 1998-2000 and 2013-2015 indicated that the East River of Pictou remains a popular fishery among anglers (Table 5). Results of interest include a change in the percentage of brown trout in the catch that has increased from 4% in 1998 to 26% in 2015. The catch per hour and weight of the catch of speckled trout was the smallest on record in 2014 and 2015. Bait remains the most popular angling method used. The small number of anglers (4) or 4% of the total that refused to participate was not believed to significantly influence the results of the creel surveys.

Factors that may have impacted the survey results include poor weather conditions that reduced angling success during the marking period and during the first weeks of the angling season. Additionally, many trout were marked shortly before the opening of the angling season and adequate mixing of marked with unmarked trout may not have occurred. As well, tag loss was large (0.2) and the population estimate was based on few recaptured trout and the rate of reporting of recaptured tagged trout by anglers is unknown. Despite these limitations, the large volunteer effort from the Pictou County Rivers Association has provided a greater understanding of the sea trout fishery on East River.

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**Table 1.** Summary of catch statistics from the East River Creel survey and estimated number of trout harvested and released by anglers on East River of Pictou, 15 May - 5 June, 2014.

Retained catch per hour			Activity			Effort	Harvest		
Days	N	mean	CV	Days	mean	CV	angler hours	N	CV
13		0.06	0.36	18	5.8	0.25	2013	122	0.61

**Table 2.** Summary of tagging and recapture data, East River of Pictou, 2014.

Tagged		Temp °C	Site	Method	Species	Length	Weight	Scale	Tag	DNA	Notes	Recaptured	
Date												Date	Site
	Air	Water											
5-Apr	-2.0	2.0	TCH	fly	Brown	38.7	600	yes	35027	1	DNA taken		
5-Apr	-2.0	2.0	TCH	fly	Brown	46.6	930	yes	36207	2	DNA taken		
5-Apr	-2.0	2.0	TCH	fly	Brown	45.5	950	yes	35076	3	DNA taken		
5-Apr	-2.0	2.0	TCH	fly	Brown	34.5	420	yes	35000	4	DNA taken		
5-Apr	-2.0	2.0	TCH	spin-lure	Speckle	46.8	975	yes	36257	5	DNA taken		
7-Apr	6.0	4.0	TCH	lure + bait	Brown	48.9	1250	yes	36263	6	DNA taken		
8-Apr	8.0	3.0	Blue Acres	lure + bait	Brown	34.9	440	yes	36205	7	DNA taken		
12-Apr	-	4.0	TCH	lure + bait	Brown	35.4	580	yes	36284	8	DNA taken		
12-Apr	-	4.0	TCH	lure + bait	Brown	30	400	yes	36252	9	DNA taken		
15-Apr	13.0	7.0	Gut and TCH	lure + bait									
18-Apr	14.0	7.0	Blue Acres	lure + bait									
19-Apr	9.0	7.0	Railway	lure + bait	Speckle	33.1	420	yes	36241	10	DNA taken	15-May	Railway
22-Apr	9.0	7.0	Gut	lure + minnow	Speckle	33	400	yes	36274	11	DNA taken	26 Apr/12 Jun	Gut/Hunter L
22-Apr	9.0	7.0	Gut	lure + minnow	Speckle	34.3	510	yes	36272	12	DNA taken		
22-Apr	14.0	11.0	Railway	fly lure + minnow	Speckle	27	210	yes	35014	13	DNA taken		
23-Apr	15.0	10.0	Gut	lure + bait	Speckle	40.1	770	yes	35028	14	DNA taken		
23-Apr	15.0	10.0	Gut	lure + bait	Speckle	34.4	495	yes	36246	15	DNA taken		
23-Apr	15.0	10.0	Gut	lure + bait	Speckle	38.3	520	yes	35042	16	DNA taken		
25-Apr	6.0	6.0	Gut										
26-Apr	8.0	9.5	Gut	lure + bait	Speckle	30	300	yes	35070	17	DNA taken		
26-Apr	8.0	9.5	Gut	lure + bait	Speckle	31.7	290	yes	35001	18	DNA taken		
26-Apr	8.0	9.5	Gut	lure + bait	Speckle	36.6	580	yes	36232	19	DNA taken		
26-Apr	8.0	9.5	Gut	lure + bait	Speckle	31.5	370	yes	36216	20	DNA taken		
27-Apr	7.0	8.0	Gut	lure + bait	Speckle	43	960	yes	35072	21	DNA taken		
27-Apr	7.0	8.0	Gut	lure + bait	Speckle	28	220	yes	35029	22	DNA taken		
29-Apr	4.0	6.0	Gut	lure + bait	Speckle	28.5	380	yes	36206	23	DNA taken		
29-Apr	4.0	6.0	Gut	lure + bait	Speckle	30.2	330	yes	36254	24	DNA taken		
29-Apr	4.0	6.0	Gut	lure + bait	Speckle	36.8	520	yes	36255	25	DNA taken		
29-Apr	4.0	6.0	Fulons	lure + bait	Speckle	31.2	350	yes	39192	26	DNA taken	27-Jun	Lorne mill
30-Apr	6.0	6.0	Gut	lure + minnow	Speckle						Not processed		
1-May	6.0	6.0	Gut	lure + minnow	Speckle	32.4	444	yes	39184	27	DNA taken		
1-May	10.5	8.0	Gut	lure + bait	Speckle	23	130	no	39113	-			
1-May	10.5	8.0	Gut	lure + bait	Speckle	27.7	235	no	39116	-			
2-May	9.0	9.0	Gut	lure + minnow	Speckle	41.7	845	yes	39105	28	DNA taken	24-May	Plymouth
2-May	9.0	9.0	Gut	lure + minnow	Speckle	31.4	360	yes	39198	29	DNA taken		
2-May	9.0	9.0	Gut	lure + minnow	Speckle	34.2	420	yes	39134	30	DNA taken		
3-May			TCH	lure + minnow	Brown	55.2	1785	yes	39109	33	DNA taken		
3-May			TCH	lure + minnow	Brown	35.9	524	yes		34	DNA taken		
3-May			TCH	lure + minnow	Speckle	32.2	342	yes	39182	31	DNA taken		
3-May			TCH	lure + minnow	Speckle	36.5	601	yes	39120	32	DNA taken		
3-May			TCH	lure + minnow	Speckle	37.7	655	yes	39161	35	DNA taken		
4-May		10.0	TCH	lure + minnow	Brown	45.4	1150	yes	39114	37	DNA taken		
4-May		10.0	TCH	lure + minnow	Speckle	30.4	344	yes	39156	36	DNA taken		
4-May		9.5	Fulons	lure + minnow					No Fish				
5-May		9.0	TCH						No Fish				
5-May		9.0	Blue Acres						No Fish				
7-May		11.5	Gut	lure + minnow	Speckle	25.6	207	yes	39174	38	DNA taken	24-May	Gut
7-May		11.5	Gut	lure + minnow	Speckle	29.8	304	yes	39169	39	DNA taken		
8-May	14.0	12.0	Gut	lure + minnow	Speckle	41.2	802	yes	39126	40	DNA taken		
8-May	14.0	12.0	Gut	lure + minnow	Speckle	39.2	668	yes	MORT	41	MORT		
8-May	14.0	12.0	Gut	lure + minnow	Speckle	22.8	119	yes	39135	42	DNA taken		
9-May	10.0	13.0	TCH	lure + minnow	Speckle	37.3	700	yes	35058	42	DNA taken	11-May	TCH
10-May	13.0	12.0	Black R	lure + minnow	Brown	35.9	525	yes	39177	44	DNA taken		
10-May	13.0	12.0	Black R	lure + minnow	Brown	29.6	340	yes	35018	45	DNA taken		
10-May	13.0	12.0	Black R	lure + minnow	Brown	33.5	405	yes	35046	46	DNA taken		
10-May	13.0	12.0	Black R	lure + minnow	Brown	31.5	315	yes	35008	47	DNA taken		
10-May	13.0	12.0	Black R	lure + minnow	Speckle	39.8	810	yes	39175	43	DNA taken		
11-May	-	-	Blue Acres	lure + bait	Brown	30.7	300	yes	36245	54	DNA taken		
11-May	-	-	Blue Acres	lure + bait	Speckle	43.4	1100	yes	35052	53	DNA taken	16-May	Blue Acres
11-May	16.0	12.0	TCH	lure + bait	Speckle	30.8	395	yes	35091	48	DNA taken		
11-May	16.0	12.0	TCH	lure + bait	Speckle	34.8	550	yes	36270	49	DNA taken	05-Jun	Churchville
11-May	16.0	12.0	TCH	lure + bait	Speckle	41.8	880	yes	35021	50	DNA taken		
11-May	16.0	12.0	TCH	lure + bait	Speckle	39	850	yes	36210	51	DNA taken		
11-May	16.0	12.0	TCH	lure + bait	Speckle	48.2	1750	yes	35060	52	DNA taken		
11-May	16.0	12.0	TCH	lure + bait	Speckle	41.5	950	yes	36275	55	DNA taken	15-May	TCH
12-May	12.0	16.0	Gut	lure + minnow	Speckle	32.1	465	yes	35040	57	DNA taken	12-Jun	Hunter L
12-May	12.0	16.0	Gut	lure + minnow	Speckle	37.3	260	yes	35007	58	DNA taken	24-May	Gut bridge
12-May	6.0	11.0	TCH	lure + minnow	Speckle	27.2	210	yes	35004	56	DNA taken		
13-May	-	13.0	Fulons	lure + minnow	Speckle	27.7	250	yes	35051	60	DNA taken		
13-May	-	13.0	Fulons	lure + minnow	Speckle	32.5	440	yes	36238	59	DNA taken		
13-May	12.0	9.5	TCH	lure + minnow					No Fish		No Fish		
14-May	16.0	14.0	Blue Acres	lure + minnow	Speckle	32	380	yes	36203	61	DNA taken		
14-May	16.0	14.0	Blue Acres	lure + minnow	Speckle	26.5	210	yes	36277	62	DNA taken		
14-May	16.0	14.0	Blue Acres	lure + minnow	Speckle	22.7	130	yes	35047	63	DNA taken		
14-May	16.0	14.0	Blue Acres	lure + minnow	Speckle	40.1	825	yes	36239	64	DNA taken		
14-May	16.0	14.0	Blue Acres	lure + minnow	Speckle	27.5	220	yes	MORT	65	DNA taken		
14-May	16.0	14.0	Blue Acres	lure + minnow	Speckle	46.3	1380	yes	35050	66	DNA taken		
14-May	16.0	14.0	Blue Acres	lure + minnow	Speckle	22.8	130	yes	35096	67	DNA taken	19-May	Blue Acres
14-May	16.0	14.0	Blue Acres	lure + minnow	Speckle	25.8	170	yes	35003	68	DNA taken	15-May	Blue Acres
14-May	16.0	14.0	Blue Acres	lure + minnow	Speckle	27.3	215	yes	35020	69	DNA taken		
14-May	16.0	14.0	Blue Acres	lure + minnow	Speckle	25.4	115	yes	36297	70	DNA taken		
14-May	16.0	14.0	Blue Acres	lure + minnow	Speckle	26.4	210	yes	35083	71	DNA taken	09-Jun	Bridgeville
14-May	16.0	14.0	Blue Acres	lure + minnow	Speckle	28.2	272	yes	35071	72	DNA taken	18-May	Blue Acres
			Unknown		Speckle						tag marks	15-May	TCH

**Table 3.** Population estimates for sea run brook trout and angler exploitation rates from the East River of Pictou, 2014.

Marked	Captured	Recaptured	Population N	95% c.i. lwr	95% c.i. up
57	48	5	464	219	1071
46	123	10	519	294	1001

Exploitation Rate during creel 15 May to 5 June

Marked	Recaptured	Exploitation Rate
46	11	0.24

Exploitation Rate season 15 May to 30 August

Marked	Recaptured	Exploitation Rate
46	14	0.30

**Table 4.** Snorkel counts of brook trout and brown trout from the East River of Pictou, 11 June, 2014.

Species	Length category		Total
	15cm-30cm	> 30cm	
Brown	2	12	14
Speckled	6	9	15
Total	8	21	29



**Table 5.** Angler activity, gear type used, and catch parameters from the East River of Pictou, 15 May-20 May, 1998-2000, 2013-2015.

	1998	1999	2000	2013	2014	2015	mean
Number of anglers							
Railway bridge	12	12	48	12	21	12	20
Trans Canada Hwy	12	16	17	28	56	29	26
Tidal pool Blue Acres	33	19	27	23	38	42	30
Fultons Pool	20	19	21	3	10	17	15
Black Rock Pool	8	4	1	0	0	12	4
Springville	2	2	0	0	0	-	1
Total	87	72	114	66	125	112	96
Effort							
hours fished	110	136	144	164	344	283	197
Hours fished per Angler	1.4	2	1.6	2.5	2.8	2.5	2.1
Brown trout							
Total catch	1	2	3	8	8	7	5
Percentage of total catch	4%	7%	10%	23%	18%	26%	15%
Speckled trout							
Total catch	26	25	27	32	37	20	28
Catch per angler	0.33	0.37	0.24	0.48	0.30	0.18	0.32
Catch per hour	0.24	0.18	0.18	0.20	0.11	0.07	0.16
Average length cm	27	30	31	35	30	29	30
Average weight	352	463	562	635	363	334	451
Gear used as a percentage							
Bait	90	72	84	65	67	70	75
Lure	10	25	13	35	30	25	23
Fly	0	3	3	0	3	5	2

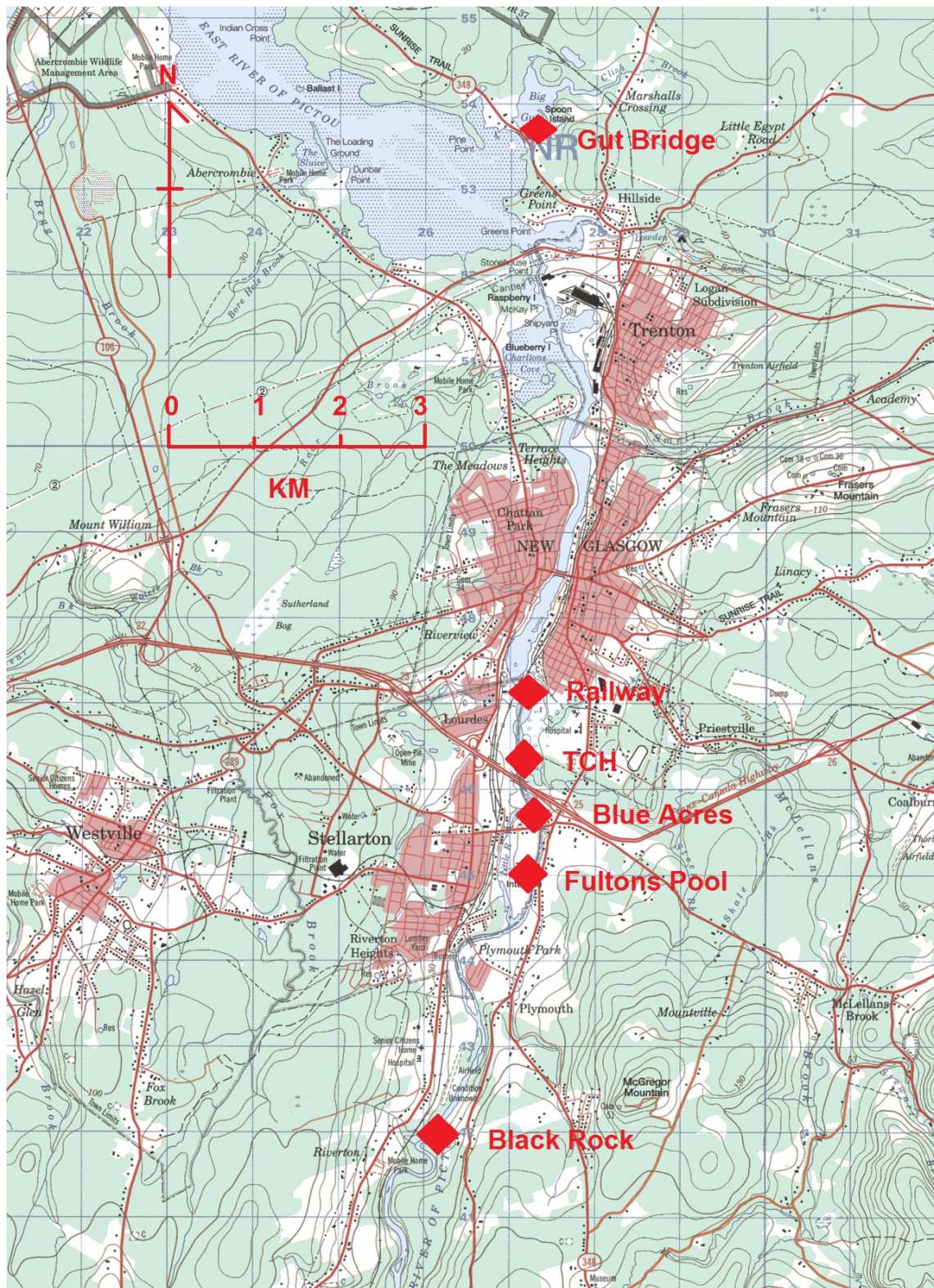
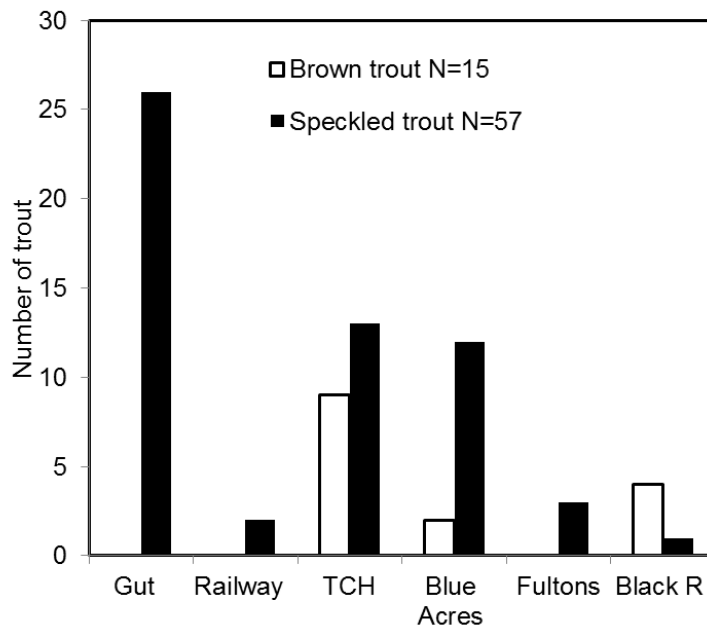
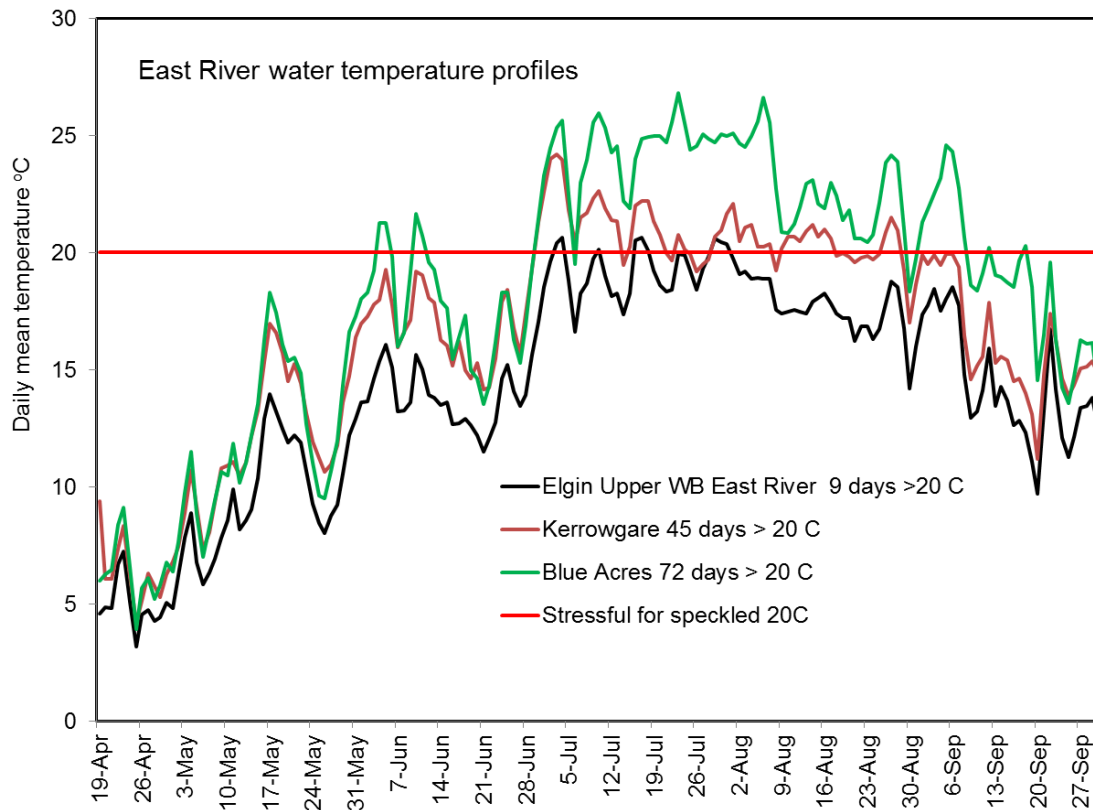


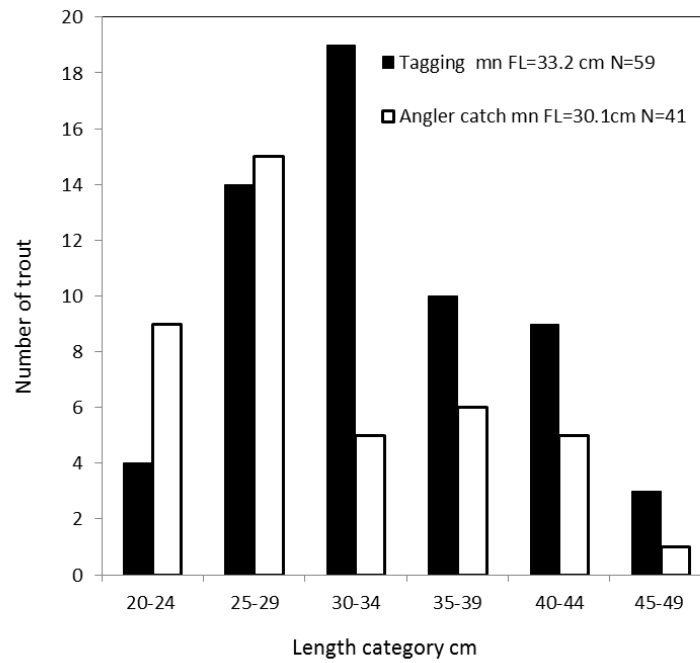
Figure 1. Location of tagging and angler creel survey sites in East River of Pictou, 2014.



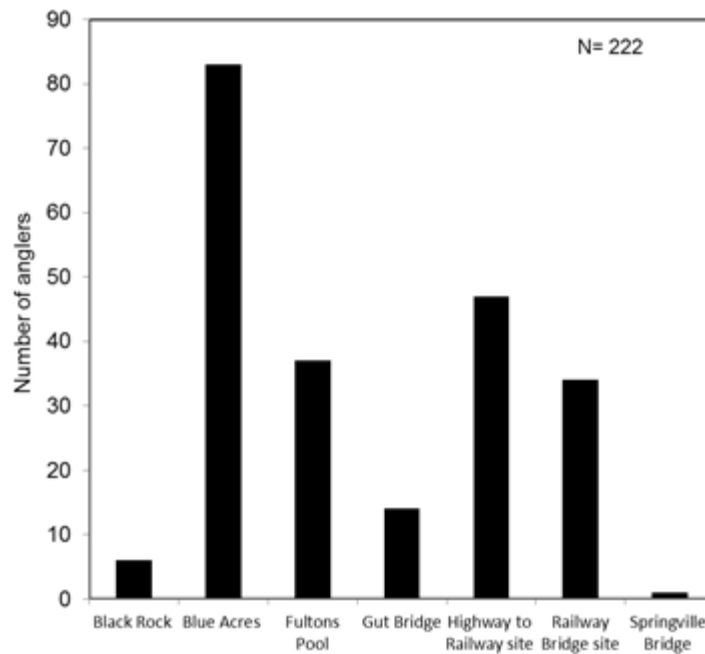
**Figure 2.** Number of trout tagged at each site on East River of Pictou, 5 April -14 May, 2014.



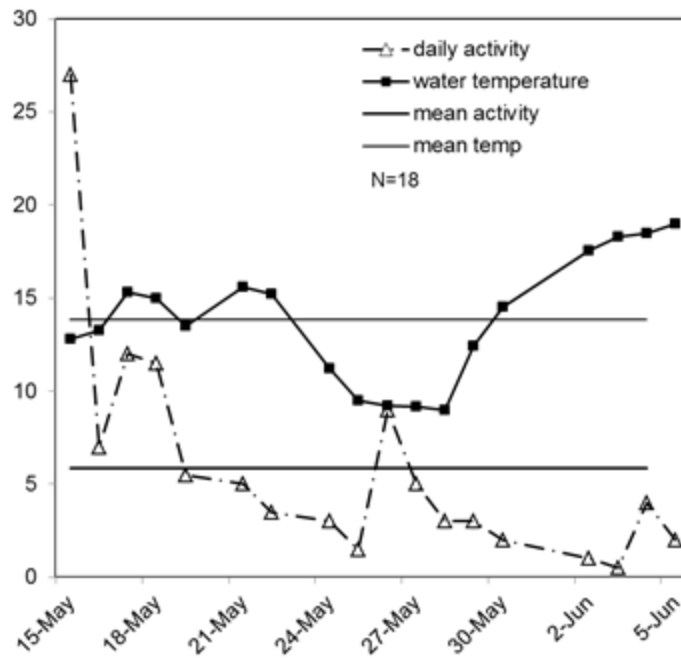
**Figure 3.** Daily mean water temperature profiles on three sites, East River of Pictou, 2014.



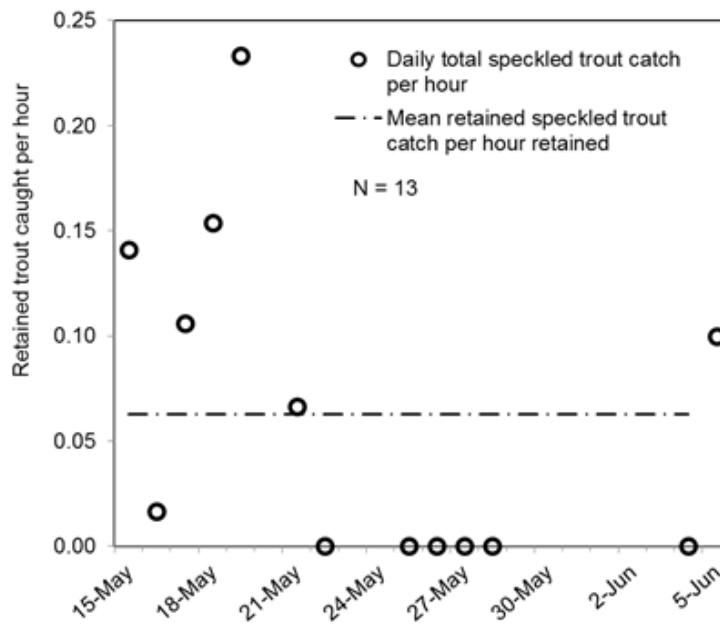
**Figure 4.** Length frequency distribution of speckled trout captured during the tagging phase and creel survey phase of the East River of Pictou, 2014.



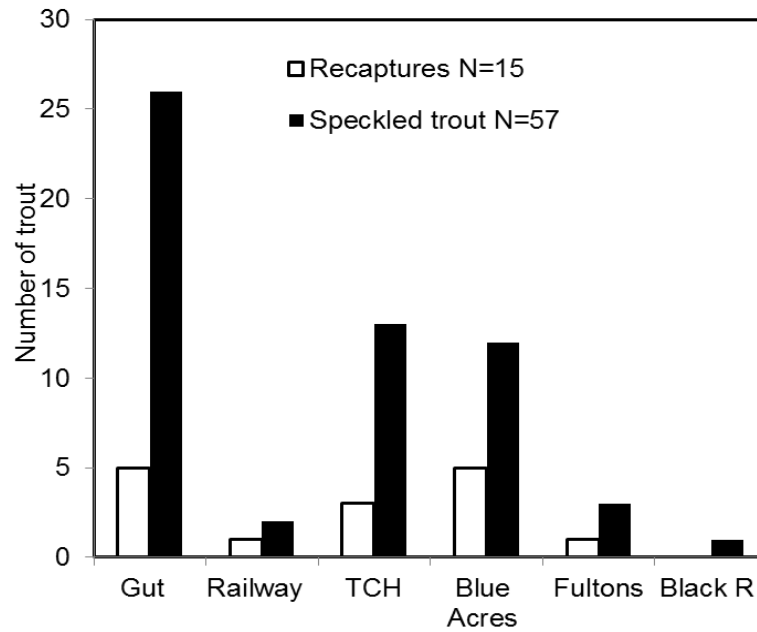
**Figure 5.** Total angler counts during the East River creel survey, 15 May -5 June, 2014.



**Figure 6.** Mean daily angler counts and water temperature during the East River creel survey, 15 May -5 June, 2014.



**Figure 7.** Mean daily catch per hour of retained speckled trout captured by anglers, East River Pictou, 15 May - 5 June, 2014.



**Figure 8.** The number speckled trout recaptured and tagged at each creel survey site, East River of Pictou, 2014.

**Appendix Angler creel survey sheet****SITES & ANGLER COUNTS – East River of Pictou 2014**

NAME OF SAMPLER \_\_\_\_\_ DATE \_\_\_\_\_

WEATHER CONDITIONS (Fill out once at beginning of sample period)

Air Temp. \_\_\_\_\_ % Cloud \_\_\_\_\_ Snow/Rain \_\_\_\_\_ Windy/Calm

Tide time (low/high) \_\_\_\_\_ Other observations \_\_\_\_\_

<u>Site Name</u>	<u># cars</u>	<u># anglers</u>	<u>Time (am/pm)</u>	<u>H<sub>2</sub>O Temp</u>
------------------	---------------	------------------	---------------------	----------------------------

Springville Bridge	_____	_____	_____	_____
--------------------	-------	-------	-------	-------

Black Rock Pool	_____	_____	_____	_____
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Fultons and Plymouth Pool	_____	_____	_____	_____
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Blue Acres	_____	_____	_____	_____
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Highway Bridge and downstream	_____	_____	_____	_____
-------------------------------	-------	-------	-------	-------

Railway Bridge	_____	_____	_____	_____
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Gut Bridge	_____	_____	_____	_____
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**CATCH & SAMPLE FORM – East River 2014**

Name of Sampler \_\_\_\_\_ Date \_\_\_\_\_

Site (brook, lake, etc.) \_\_\_\_\_ Time \_\_\_\_\_

Name of Angler \_\_\_\_\_

Address (town) of angler \_\_\_\_\_

Gear: Bait \_\_\_\_\_ Lure \_\_\_\_\_ Fly \_\_\_\_\_

**CATCH INFORMATION**

Hours angler(s) has fished so far (today) \_\_\_\_\_ per angler.

Number (per angler) \_\_\_\_\_

<u>Species caught</u>	<u>Kept</u>	<u>Released</u>	<u>***Adipose Clipped</u>
-----------------------	-------------	-----------------	---------------------------

A. Salmon	_____	_____	_____
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Brook trout	_____	_____	_____
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Brown trout	_____	_____	_____
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\_\_\_\_\_

**SAMPLING INFORMATION** (See kept fish above):

	<u>SPECIES</u>	<u>LENGTH (cm)</u>	<u>****ADIPOSE FIN CLIP</u>
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<u>1</u>	_____	_____	_____
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<u>2</u>	_____	_____	_____
----------	-------	-------	-------

<u>3</u>	_____	_____	_____
----------	-------	-------	-------

<u>4</u>	_____	_____	_____
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