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Rainbow Trout (*Oncorhyncus mykiss*) Investigations in Trout River, Newfoundland, 2001.

Études menées en 2001 sur la truite arc-en-ciel (*Oncorhyncus mykiss*) de la rivière Trout, à Terre-Neuve.

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Abstract

In 2001 investigations were undertaken in Trout River, Newfoundland to verify the presence of rainbow trout (*Oncorhyncus mykiss*) and to determine the extent to which they have become established. Rainbow trout abundance, in-stream distribution, spawning success and habitat utilization was investigated. The study was a collaboration of the Department of Fisheries and Oceans, Gros Morne National Park, the Atlantic Salmon Federation, and the Community of Trout River. The results indicate that rainbow trout have established a small population in Trout River. This is the first confirmed rainbow trout population in western Newfoundland. Atlantic salmon and brook trout are also present throughout the Trout River system as well as other species. The length frequency distribution of rainbow trout collected indicates that they have successfully reproduced for several years. The distribution of rainbow trout within the Trout River system appears to be restricted to Trout River Pond, the mainstem of Trout River downstream from Trout River Pond, and Feeder Brook, the first tributary (approximately 1.0 km) upstream from the estuary. More intensive surveys to determine rainbow trout spawning locations and rearing areas may suggest reasons for this or reveal a wider distribution within the river system. Studies of habitat preference may also reveal the extent to which rainbow trout would colonize other river systems.

Résumé

Une étude de la rivière Trout, à Terre-Neuve, a été menée en 2001 en vue de déterminer si la truite arc-en-ciel (*Oncorhyncus mykiss*) s'y retrouvait et si c'était le cas, comment bien établie elle y était. À cette fin, on a tenté d'établir l'abondance de l'espèce, sa distribution dans le cours d'eau, le succès de la ponte et son utilisation de l'habitat. L'étude était un effort concerté de Pêches et Océans Canada, du parc national du Gros Morne, de la Fédération du saumon atlantique et de la communauté de Trout River. Les résultats obtenus révèlent qu'une petite population de truite arc-en-ciel s'est établie dans la rivière Trout. Ceci constitue la première population confirmée de cette espèce dans le secteur ouest de Terre-Neuve. Le saumon atlantique et l'omble de fontaine, ainsi que d'autres espèces, sont aussi retrouvés dans l'ensemble du réseau hydrographique de cette rivière. La distribution des fréquences de longueurs des truites arc-en-ciel recueillies indique qu'elles s'y reproduisent avec succès depuis plusieurs années. La distribution de l'espèce dans le réseau de la rivière Trout semble être restreinte à l'étang Trout River, à l'axe fluvial en aval de cet étang et au ruisseau Feeder, le premier tributaire (environ 1,0 km) en amont de l'estuaire. Des relevés plus exhaustifs visant à trouver les frayères et les aires de croissance de cette truite permettraient peut-être d'établir pourquoi cela est le cas ou révéler qu'elle est beaucoup commune dans ce réseau hydrographique. Enfin, des études de la préférence de cette espèce en matière d'habitat permettraient peut-être d'établir dans quelle mesure la truite arc-en-ciel pourrait coloniser d'autres réseaux hydrographiques.

Introduction

Rainbow trout (*Oncorhyncus mykiss*) are not native to Newfoundland but were established in some areas of the Avalon Peninsula through stocking programs in the late 1800s and early 1900s (Scott and Crossman 1964). There were no known reports of rainbow trout outside of this area before 1979 (Porter, 2000). In recent years there is concern that straying of reproductively viable rainbow trout escaping from aquaculture operations in Baie d' Espoir and the Maritime Provinces could colonize other areas of Newfoundland, particularly the west coast. Colonization by rainbow trout could negatively impact the productivity of indigenous Atlantic salmon and brook trout populations. Observations in an artificial stream tank suggest that rainbow trout are antagonistic towards brook trout *(Salvelinus fontinalis)* and Atlantic salmon (*Salmo salar*) parr (Gibson 1981).

Incidental catches of rainbow trout were reported from Trout River, on the west coast of Newfoundland (Fig. 1) in the past but the first confirmed case was in 1981 (Chadwick and Bruce 1981). This fish was identified as hatchery origin (Porter, 2000). Angling catches of rainbow trout have also been reported from other west Newfoundland rivers (Anon. 1950) and were again reported from Trout River and other western Newfoundland rivers in 1999 (Porter, 2000) and in 2000 (pers. comm. R. Porter, DFO unpublished). None of these previous reports were confirmed to be fish from a self-sustaining feral population.

Trout River is a scheduled river that supports populations of anadromous (sea-run) Atlantic salmon and brook trout. This system is also known to support resident populations of brook trout.

Recreational fishing occurs for anadromous Atlantic salmon and anadromous and resident brook trout primarily by residents in the area. The angling occurs primarily in Trout River Pond and in the mainstem downstream from Trout River Pond. Although no formal assessment was carried out prior to 2001, the status of the Atlantic salmon stock on Trout River was considered to be low based on low catches and catch rates in the recreational salmon fishery. Historical angling catches for Atlantic salmon are provided in Appendix 1.

The purpose of the investigations in 2001 was to determine the presence and extent to which rainbow trout are established in the Trout River system: its habitat utilization, in-stream distribution, abundance and spawning success. The project was a collaboration between, the Department of Fisheries and Oceans (DFO), Gros Morne National Park, the Atlantic Salmon Federation, and the Community of Trout River.

Methods

Study Area

Trout River flows in a north-westerly direction discharging into the Gulf of St. Lawrence just south of Bonne Bay on the west coast of Newfoundland (Fig. 1). The estuary is partially enclosed, forming a small barachois used by juvenile sea-run Atlantic salmon and brook trout for feeding in the summer months. The river has a total axial length of 33 km and a mainstem length of 7 km (Porter et al. 1974). Including the five main tributaries (Feeder Brook, Alder Brook, Narrows Brook, Western Brook, Noname Brook) (Fig. 2), Trout River has a basin perimeter of 107 km, a mean basin width of 7 km and a drainage area of approximately 254 km^2. The watershed drains a high plateau area and empties into Trout River Pond. The pond is approximately 3 km from the mouth of the river. A complete habitat survey has not been conducted. However, tributaries flowing off the Plateau are believed to have barriers to upstream fish passage. Two falls impassable to upstream swimming fish are located on Feeder Brook tributary (Falls#1 – UTM 421545; 547931; Falls#2 – 421545; 5479088) (Fig. 2).

Fish Counting Fence

A portable fish counting fence (Anderson and MacDonald 1974) was installed in the mainstem of Trout River from early June to end of September 2001 to capture any migrating fish. The counting fence was located approximately 1km upstream from the mouth of the river in the community of Trout River (lat. 49^0 28' N, long 58^0 08' W). The counting fence was comprised of approximately 30 sections each measuring three metres in length. The downstream trap was constructed of wood (Anderson and MacDonald 1974) but the upstream trap was constructed of the same materials as the counting fence. Both traps measured approximately 2.5m long by 2.5m wide. The counting fence and traps were held in place by their own weight and sandbags. All fish captured were enumerated and released or collected for biological sampling as per experimental license issued by DFO.

Spawning and Juvenile Surveys

Spawning surveys for possible rainbow trout redds were carried out by walking Feeder Brook and Narrows Brook tributaries (Fig. 2) in early July and by snorkeling the mainstem from Trout River Pond to the estuary on 8 July. In Newfoundland, rainbow trout (Avalon Peninsula) spawn primarily in the spring (late March to mid-May) (Frost 1938, 1940). Therefore, it was expected that redds would be visible in July. However, given a hatching time of 32-65 days (Frost 1940) and that rainbow trout fry emerge from mid-June to mid-August (Scott and Scott 1988) it was unlikely that redds could be confirmed as belonging to rainbow trout. But spawning locations would be documented for future investigation.

Juvenile fish surveys were carried out to search for and determine the distribution of rainbow trout and other species within the river system. Electrofishing spot-

checks and angling was used to survey fluvial areas and fyke nets were used in the littoral zone of Trout River Pond. The number of fish per 100 m^2 that occupied one site where rainbow trout occurred in the greatest numbers was determined by electrofishing using the removal method (Zippin 1956). Computations were performed using MicroFish 3.0 software (Van Deventer and Platts 1989).

Biological Sampling

Biological sampling was conducted on all fish captured in Trout River in 2001. Details of biological sampling protocols are given in Appendix 2. The data record form used when sampling angled rainbow trout is reproduced in Appendix 3. Fulton's condition factor (CF = whole weight / fork length^3) was calculated for all fish that were weighed and measured (Ricker 1975).

Results

1. FISH COUNTS AND ENVIRONMENTAL CONDITIONS

The fish counting fence was operated from June to September 2001. The downstream trap was operated from 6 June to 1 September 2001 and the upstream trap was operated from 15 June to 1 September (Table 1). Water levels were high in early summer (Fig. 3) due to a late spring thaw and runoff from the high plateau areas surrounding the Trout River watershed. High water levels were recorded on 25 July and 30 August (Fig. 3). The mean daily water temperature was relatively cool in early summer but warmed considerably in August when water levels were lowest (Fig. 3). The mean daily water temperature did not rise above 20 C for the season but there were some days in early August when the daily maximum was over 22 C. The counting fence washed out on 2 September due to a buildup of debris following a heavy rainfall and was not replaced. Counts of fish in both the downstream and upstream traps are considered to be partial because sections of the fence were removed on several occasions during high water levels. Daily downstream and upstream counts for all species encountered are given in Appendices 4 and 5.

In the downstream trap, the first rainbow trout was counted on 26 June 2001 (Fig. 4; Appendix 4). Rainbow trout were also counted in late June, early July and mid-August (Fig. 4). Rainbow trout fry were captured only in mid-August. A total of eight rainbow trout parr and 62 rainbow trout fry were counted in the downstream trap along with 267 sea-run brook trout, 233 resident brook trout, 130 Atlantic salmon parr and 195 Atlantic salmon smolt (Table 2). Atlantic salmon smolts were counted leaving the river in a series of pulses from June to mid-July and throughout the summer (Fig 5). Atlantic salmon parr and brook trout were counted mainly from June to mid-July and in smaller numbers throughout the summer (Figs. 6-7). Large numbers of American *smelt (Osmerus*

mordax), American eels (*Anguilla rostrata*) and sticklebacks (*Gasterostidae*) were counted in early summer (Figs. 8-9).

In the upstream trap, the first rainbow trout was counted on 17 June 2001 (Fig. 10; Appendix 5). A total of eight rainbow trout were counted in the upstream trap along with 36 small salmon, 15 large salmon, 849 sea-run brook trout and 127 resident brook trout (Table 2). Brook trout were counted moving upstream mainly in July (Fig. 11) and Atlantic salmon adults throughout the summer (Fig. 12).

2. SPAWNING SURVEYS

There was no visual evidence of past spawning activity in July but a large number of Atlantic salmon parr, brook trout parr and several rainbow trout were observed in the three tributaries that were surveyed (Table 3).

3. JUVENILE SURVEYS

3.1 Fluvial Areas

Electrofishing spot-check surveys were carried out at four locations: Alderbed Brook (6 July); Feeder Brook (6, 7, and 19 July); Western Brook (31 July); and the mainstem (Feeder Brook to bridge, 25 August) (Table 3). Approximately 5.0 km of river was surveyed.

Rainbow trout were found only in Feeder Brook. This tributary is the one closest to the mouth of Trout River (Fig. 2). Brook trout and salmon parr were also found in Feeder Brook and in the other tributaries surveyed (Table 3).

The number of rainbow trout per 100 m^2 in Feeder Brook was estimated at 1.19 (95% CI = 1.14-1.24) (Table 4) on the basis of a population estimate at one enclosed site. The number of Atlantic salmon parr at the same site was 13.94 (95% CI = 11.21-16.66) per 100 m^2 and the number of brook trout was 4.93 (95% CI = 3.97-5.88) per 100 m^2 (Table 4).

Several electrofishing spot-checks were also carried out in the littoral zone of Trout River Pond in 2001 and 2000 but no juvenile fish were captured.

Angling surveys were carried between the Town of Trout River municipal pump house and Feeder Brook falls on 22 August. A total of 34 resident brook trout, two salmon parr, and one sea-run brook trout were angled in Feeder Brook (Table 3).

Anglers reported catching rainbow trout in the Trout River estuary from mid to late July. Three of these fish were examined and sampled. These fish were quite large (approximately 1-2 kg).

3.2 Lacustrine Areas

Fyke nets (2) were set at five different locations (Fig. 2) in the littoral zone of Trout River Pond from mid-June to the end of August. The nets were fished for about 1000 hours total (Table 5). Two rainbow trout were captured at two of the five net locations (Table 5). Both of these fish were female and had fork lengths of 9.9 cm and 14.1 cm (Table 6). Brook trout, Atlantic salmon (smolt and parr), tomcod (*Microgadus tomcod*), smelts and eels were also captured at four of the sites (Table 5).

4. BIOLOGICAL CHARACTERISTICS

With the exception that only whole weight was obtained from three fish caught by angling in the estuary, biological sampling followed the protocol outlined in Appendix 2.

Biological information was obtained from 31 out of 33 rainbow trout parr and rainbow trout adults that were captured from all sources in Trout River from June to August 2001 (Table 6).

Three rainbow trout angled in the Trout River estuary were the largest observed based on weight (Table 6, 7a). The maximum weight was 1814 gm. This was from a sexually mature male (Table 6). Excluding the estuary, the largest rainbow trout observed in 2001 was caught in the downstream trap of the counting fence on 26 June (Table 6).

The fork length of rainbow trout caught other than in the estuary ranged from 7.0 - 43.9 cm (Table 7b). The average overall fork length was 15.4 cm (Table 7b). Although sample sizes were small, fork length varied somewhat by location. The smallest fish were caught in Feeder Brook tributary and the largest were at the counting fence in the mainstem. This could be due to the presence of migrating fish in the mainstem. (Table 7b).

The fork length distribution of all the rainbow trout observed in Trout River in 2001 was consistent with at least three year-classes being present (Fig. 13).

The length-weight relationship of rainbow trout captured in Trout River is shown in Fig. 14.

Thirty rainbow trout were internally sexed (Table 7c). Both male and female fish were found. The percentage female was 61%.

Including one spent female, nine (7 females and 2 males) out of 30 internally sexed rainbow trout were considered to be sexually mature based on visual examination of gonads (Table 7d). The one female rainbow trout that was classed as spent had a condition factor of 0.90 compared to an average of 1.11 for other sexually mature fish (Table 7e).

The minimum fork length of rainbow trout considered to be sexually mature was 18.0 cm and the minimum weight was 63 gm (Table 7f). Histological examination of gonad tissue is needed to confirm sexual maturity classifications based on visual examination.

Discussion

It is concluded based on the results from the counting fence operation and juvenile surveys in 2001 that rainbow trout are present in the Trout River watershed. The evidence suggests that rainbow trout have successfully reproduced in Trout River for several years and have established a small population. This is the first confirmed rainbow trout population in western Newfoundland.

The fork length distribution, presence of both sexes and of sexually maturity fish indicates that rainbow trout in Trout River are not recent escapees from an aquaculture operation. The length-weight relationship is characteristic of isometric growth and is also consistent with that of a feral population (Ricker 1975). The minimum size of sexually mature rainbow trout is consistent with values for other populations in Newfoundland of 20.3-25.4 cm (Scott and Crossman 1964) and 15-25 cm (Scott and Scott 1988).

The origin of the rainbow trout observed in Trout River is unknown. They are either the progeny of aquaculture escapees that spawned in the wild and are now similar to wild fish or are the products of plantings of rainbow trout fry. Such plantings occurred on the Avalon Peninsula, Newfoundland where feral populations became established (Scott and Crossman 1964). The Trout River population may have originated from a similar plantings in western Newfoundland or through a range extension of populations in other areas.

There are no rainbow trout aquaculture operations in the Trout River area. The closest aquaculture operations are in Baie d'Espoir, Newfoundland and in the Maritime Provinces. Rainbow trout operations in Baie d'Espoir currently use all female diploid fish but operations in the Maritime Provinces use both sex diploids. Therefore, the most likely aquaculture source would be operations in the Maritimes.

The distribution of rainbow trout within the Trout River system appears to be restricted to Trout River Pond; the mainstem of the river downstream from Trout River Pond; Feeder Brook, the first tributary (approximately 1.0 km) upstream from the estuary; and the estuary. More intensive surveys to determine spawning and rearing areas may suggest reasons for this distribution or reveal a wider distribution within the river system.

Atlantic salmon and brook trout are also present throughout the Trout River system as well as other fish species indicating a certain level of coexistence. There is evidence that rainbow trout are antagonistic towards other salmonids (Gibson 1981) but are known to coexist in other areas of Newfoundland. This may be dependent on stream morphology and the ability of rainbow trout to occupy a wide range of microhabitat (Cunjak and Green 1982, 1984). The number of rainbow trout per 100 m^2 in the Feeder Brook tributary of Trout River was lower than for either Atlantic salmon parr or brook trout. Whether or not this represents a displacement of indigenous salmonids by invading rainbow trout or the filling of vacant or under-utilized habitat is unknown. Volpe et al. (2001) suggest that in British Columbia, invading Atlantic salmon may be capable of colonizing and persisting in coastal rivers that are under-utilized by native steelhead. If the reverse is also true, rainbow trout might be more likely to colonize rivers in Newfoundland where native Atlantic salmon and brook trout populations are low. On the basis of counting fence results in 2001, it appears that the Atlantic salmon population on Trout River is low (McCormack et al. 2002).

Factors controlling distribution and colonization success of rainbow trout are unknown at this point. Hence, it is impossible to predict the extent to which rainbow trout may have invaded and colonized other river systems in western Newfoundland. Rainbow trout were reported by anglers near the mouths of other rivers in recent years (Porter 2000) but it is not known whether these were recent escapees from aquaculture operations or strays from established populations. In order to determine the extent to which rainbow trout are likely to persist in Trout River or other rivers of western Newfoundland, investigations of habitat preference, inventory of habitat resources and identification of spawning and rearing areas need to be carried out. A better understanding of the factors influencing distribution and abundance of rainbow trout is essential for the conservation of native Atlantic salmon and brook trout stocks as well as effective management of these fisheries resources.

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Table 1. Counting fence operations on Trout River, 2001.

Start Date	End Date	Comments
Downstream Trap		
6-Jun-01	1-Sep-01	Partial Count for smolts
		6 June - Due to forecast of heavy rain - removed few sections of fence
		7 June - Removed more conduit (due to debris)
		8 June - Replaced 2 sections of conduit near smolt trap, but removed again in evening.
		9 June - Removed 2 sections of conduit in front of smolt trap
		10 June - Replaced some conduit.
		12 June - Fence fishing every 2nd conduit
		13 June - Due to heavy rain/debris - pulled conduit.
		1 July - Smolt trap door closed from 2030hrs to 0800 hrs (July 2) - reason unknown.
		17 June - Low water level in smolt trap.
		18 June - Put plastic around fence to increase water level
		18 Aug. - Smolt trap opened at 2000hrs due to high rain.
		19 Aug. - At 1100hrs replaced conduit in smolt trap. Operational again.
		24 Aug. - Removed screens from smolt trap due to high water.
		25 Aug. - Smolt trap operational.
		1 Sept. - Opened smolt trap due to high water.
		2 Sept - Washed out.
Upstream Trap		
15-Jun-01	1-Sep-01	18 June - Pulled every 2nd conduit.
		19 June - Replaced conduit.
		10 Aug. - From 1030-1530 hrs removed conduit between the two traps for repairs. Damaged caused by high water overnight. Replaced every 2nd conduit.
		11 Aug. - Replaced every conduit.
		13 Aug. - Put plastic along bottom of fence to increase water level.
		18 Aug. - Removed plastic. At 2000hrs removed every 2nd conduit because of heavy rain.
		19 Aug. -.Replaced 2.5 section of conduit. At 1100hrs replaced remaining conduit.
		1 Sept. - Due to high water removed every 2nd conduit.
		2 Sept - Washed out.

Table 2. Counting fence results on Trout River, 2001.

Species	**Downstream Trap** (6 June to 1 Sept.)	**Upstream Trap** (15 June to 1 Sept.)
Rainbow Trout parr	8	8
Rainbow Trout fry	62	0
Brook Trout (Sea-run)	267	849
Brook Trout (Resident)	233	127
Atlantic salmon parr	130	36
Atlantic salmon smolt	195	6
Atlantic salmon adults (< 63 cm)	0	36
Atlantic salmon adults (>= 63 cm)	0	15
Smelt	364	0
Eels	363	9
Stickleback	3260	0

Table 3. Results of rainbow trout spawning surveys and electrofishing surveys on Trout River, 2001.

Note: As=Atlantic salmon; Bt=Brook trout; Rt=Rainbow trout.

		Spawning Surveys			Electrofishing				Angling					
		Number Redds				Number of Juveniles			Number of Fish					
									Brook trout					
Date	Tributary	Rainbow trout	Salmon parr	Salmonid Fish Observed**	Survey Type	Brook trout	Rainbow trout	Salmon parr	Resident	Sea-run	Rainbow trout	Salmon parr	Distance Surveyed (km)	Comments
5-Jul	Feeder Brook	0	0	As, Bt, Rt									0.5	Walking Survey-mouth to upstream
6-Jul	Narrows Brook	0	0	As, Bt, Rt									0.3	Walking Survey-mouth to upstream
8-Jul	Mainstem (Feeder Bk. to Bridge)	0	0	As, Bt, Rt									2.0	Snorkel survey - R. Porter and L. Fudge
6-Jul	Alderbed Brook				Spotcheck-1	30	0	20					~0.5	
6-Jul	Feeder Brook				Spotcheck-2		3						1.0	
7-Jul	Feeder Brook				Spotcheck-3		1	50 to 80					~0.5	Rainbow Immature. Parr count approximate
19-Jul	Feeder Brook*				Closed Site:									
					Sweep-1	14	6	35						
					Sweep-2	11	1	26						
					Sweep-3	2	0	9						
					Total	27	7	70						
31-Jul	Western Brook				Spotcheck-4	69		28					2.0	Main Stem of Inner Trout River Pond
25-Aug	Mainstem (Feeder Bk. to Bridge)				Spotcheck-5	22	3						1.0	The 22 fry included both trout and parr
22-Aug	Feeder Brook Falls								34	1		2		
mid to late July	Estuary										3			

* 19-Jul was the only closed site electrofished on Trout River. All other sites were open.

Table 4. Density of rainbow trout, Atlantic salmon parr and Brook trout electrofished on Feeder Brook tributary July 19, 2001. Statistical information generated by Microfish 3.0 software.

	Rainbow Trout				Salmon Parr				Brook Trout			
Removal Pattern	6	1	0		35	26	9		14	11	2	
Total Catch				7				70				27
Population Estimate				7				82				29
Site Area (m^2)				588.42				588.42				588.42
Density(/100m^2)				**1.19**				**13.94**				**4.93**
Chi Square				0.170				2.140				2.829
Pop. Est. Std Err				0.124				8.069				2.749
Lower CI*				7.000				70.000				27.000
Upper CI				7.303				98.056				34.630
Calculated Lower CI				6.697				65.944				
Capture Probability				0.875				0.467				0.563
Capture Prob. Std Err				0.124				0.086				0.122
Lower CI*				0.572				0.295				0.313
Upper CI				1.178				0.638				0.812
Calculated Lower CI				6.697				65.944				23.370

* Population estimate lower confidence interval was set equal to the total catch.

Table 5. Total number of fish captured and hours fished by fyke nets at stations 1-5, with UTM references, Trout River Pond, 2001.

Date	Station Number	UTM	Effort (hours)	Rainbow Trout	Brook Trout		A. salmon		Tomcod*	Stickle-back	Smelts	Eels
					Resident	Sea-run	Smolt	Parr				
June 22 - August 22	1	418536; 5478455	515.45	1	335	55	38	189	11	2936	158	112
June 22 - June 25	2	419140; 547708	92.35	0	12	0	0	5	1	600	20	2
June 27 - July 13	3	419565; 5477993	262.70	1	139	11	8	118	3	2265	25	5
August 20 - August 23	4	420669; 5476743	70.13	0	0	0	0	0	0	0	0	10
August 23 - August 26	5	442351; 5475161	65.2	0	22	0	0	3	4	950	151	8
Total			1005.8	2	508	66	46	315	19	6751	354	137

* *Microgadus tomcod*

Table 6. Summary of rainbow trout sampled from Trout River, 2001.

Note: Maturity - 1= immature; 2=mature; 3=spent.

Fish No.	Capture Method	Capture Loc.	Sample No.	Date	Fork Lt. (cm)	Whole Wt. (gm)**	CF	Sex	Maturity	BLOOD VIAL	BLOOD FROZ	RT GONAD	LT GONAD	STOMACH	TISSUE	OTOLITH	FISH	PHOTOS
1	Fence (D)	Mainstem	4	26-Jun	43.9	759	0.90	F	Mature/Spent	X	X	X	X	X	X	X	X	
2	Fence (D)	Mainstem	5	29-Jun	13.6	29	1.15	F	Immature	X		X	X	X	X	X	X	5.1 - 5.5
3	Fence (D)	Mainstem	6	3-Jul	8.4	6	1.01	M	Immature	X		X	X	X	X		X	6.1 - 6.2
4	Fence (D)	Mainstem	13	12-Jul	9.8	9	0.96	F	Immature			X	X	X	X		X	13.1 - 13.3
5	Fence (D)	Mainstem	25	1-Aug	13.0	24	1.09	F	Immature	X	X	X	X	X	X	X	X	
6	Fence (D)	Mainstem	29	20-Aug	18.0	63	1.08	F	Mature	X	X	X		X	X			29.1 - 29.2
7	Fence (D)	Mainstem	30	23-Aug	8.7	7	1.06	M	Immature	X			X	X	X	X		30.1 - 30.4
10	Fence (U)	Mainstem	2	22-Jun	29.4	281	1.11	M	Mature	X	X	X	X	X	X	X	X	2.1 - 2.4
11	Fence (U)	Mainstem	3	22-Jun	27.5	226	1.09	F	Mature	X	X	X	X	X	X	X	X	3.1 - 3.2
12	Fence (U)	Mainstem	23	22-Jul	26.5	194	1.04	F	Mature	X			X	X	X		X	
13	Fence (U)	Mainstem	24	26-Jul	26.5	230	1.24	F	Mature	X	X	X	X	X	X	X	X	24.1 - 24.2
14	Fence (U)	Mainstem	28	15-Aug	16.3	53	1.22		Immature	X	X	X	X	X	X		X	28.1 - 28.4
15	Fence (U)	Mainstem	31	26-Aug	35.5	480	1.07	F	Mature	X	X	X	X	X	X		X	31.1 - 31.5
16	Fence (U)	Mainstem	1	18-Jun	32.7	401	1.15	F	Mature			X	X	X	X	X	X	1.1 - 1.3
17	Fyke Net	Trout R. Pd.	7	28-Jun	14.1	34	1.21	F	Immature			X		X			X	7.1 - 7.5
18	Fyke Net	Trout R. Pd.	14	13-Jul	9.9	9	0.93	F	Immature			X	X	X	X			
19	Electro (O)	Feeder Brook	8	6-Jul	7.0	4	1.17	M	Immature					X	X	X	X	8.1 -8.2
20	Electro (O)	Feeder Brook	9	6-Jul	7.7	6	1.31	F	Immature			X	X	X	X	X	X	9.1 - 9.4
21	Electro (O)	Feeder Brook	10	6-Jul	10.4	14	1.24	M	Immature	X	X	X	X	X	X	X	X	10.1 - 10.4
22	Electro (O)	Feeder Brook	11	7-Jul	7.2	3	0.80	F	Immature			X	X	X	X		X	11.1 - 11.3
23	Electro (O)	Feeder Brook	12	7-Jul	7.4	5	1.23	F	Immature			X	X	X	X		X	12.1 - 12.4
24	Electro (C)	Feeder Brook	16	19-Jul	12.4	20	1.05	M	Immature	X			X	X	X	X	X	16.1 - 16.4
25	Electro (C)	Feeder Brook	17	19-Jul	7.4	5	1.23	M	Immature					X	X	X	X	17.1 - 17.2
26	Electro (C)	Feeder Brook	18	19-Jul	7.35	3	0.76	F	Immature	X			X	X	X		X	18.1 - 18.2
27	Electro (C)	Feeder Brook	19	19-Jul	7.81	5	1.05	M	Immature	X		X		X	X	X	X	19.1 - 19.2
28	Electro (C)	Feeder Brook	20	19-Jul	7.82	6	1.25	F	Immature	X		X	X	X		X	X	20.1 - 20.4
29	Electro (C)	Feeder Brook	21	19-Jul	7.6	5	1.14	M	Immature	X			X	X	X		X	21.1 - 21.2
30	Electro (C)	Feeder Brook	22	19-Jul	8.4	6	1.01	M	Immature	X			X	X	X		X	22.1 - 22.2
31	Angling	Estuary	15	18-Jul		**1814**		M	Mature			X	X	X	X	X		15.1-15.2
32	Angling	Estuary	26	31-Jul		**907**		F				X	X	X		X		
33	Angling	Estuary	27	31-Jul		**907**		F					X					
8	Fence (D)	Mainstem	Not Sampled	18-Aug														
9	Fence (U)	Mainstem	Not Sampled	17-Jun														

Note1: Trout River Sample # 15, 26, 27 - Whole weights are estimated.
Note2: Trout River Sample #26 and #27 - unsure if left or right gonad.
Note3: Trout River Sample #1 - stomach also frozen.
Note4: Trout River sample #30 - one otolith in scale envelope and one in chemical preservative.
** Whole weights in bold type were originally estimated in pounds then converted to grams.

Table 7. Summary of biological characteristics of rainbow trout on Trout River, 2001.

A.

	Capture Location				
Data	**Estuary**	**Feeder Brook**	**Mainstem**	**Trout R. Pd.**	Grand Total
Min of Whole Wt. (gm)	907.2	3.0	6.0	9.0	3.0
Max of Whole Wt. (gm)	1814.4	20.0	759.0	34.0	1814.4
Average of Whole Wt. (gm)	1209.60	6.83	197.29	21.50	210.19
N	3	12	14	2	31

B.

	Capture Location				
Data	**Estuary**	**Feeder Brook**	**Mainstem**	**Trout R. Pd.**	Grand Total
Min of Fork Lt. (cm)		7.0	8.4	9.9	7.0
Max of Fork Lt. (cm)		12.4	43.9	14.1	43.9
Average of Fork Lt. (cm)		8.21	22.13	12.00	15.44
N		12	14	2	28

C.

No. of Fish	Capture Location				
Sex	**Estuary**	**Feeder Brook**	**Mainstem**	**Trout R. Pd.**	Grand Total
F	2	5	10	2	19
M	1	7	3		11
(Unsexed)			1		1
Grand Total	3	12	14	2	31

D.

No. of Fish	Sex			
Maturity	**F**	**M**	**(Unsexed)**	Grand Total
Immature	10	9	1	20
Mature	6	2		8
Mature/Spent	1			1
(Unknown)	2			2
Grand Total	19	11	1	31

E.

Average of CF	Sex			
Maturity	**F**	**M**	**(Unsexed)**	Grand Total
Immature	1.07	1.11	1.22	1.09
Mature	1.11	1.11		1.11
Mature/Spent	0.90			0.90
(Unknown)				
Grand Total	1.07	1.11	1.22	1.09

F.

	Maturity				
Data	**(Unknown)**	**Immature**	**Mature**	**Mature/Spent**	Grand Total
Min of Fork Lt. (cm)		7.0	18.0	43.9	7
Max of Fork Lt. (cm)		16.3	35.5	43.9	43.9
Average of Fork Lt. (cm)		9.61	28.01	43.90	15.44
N		20	7	1	28
Min of Whole Wt. (gm)**	907.2	3.0	63.0	759.0	3
Max of Whole Wt. (gm)**	907.2	53.0	1814.4	759.0	1814.4
Average of Whole Wt. (gm)**	907.2	12.7	461.2	759.0	210.19
N	2	20	8	1	31

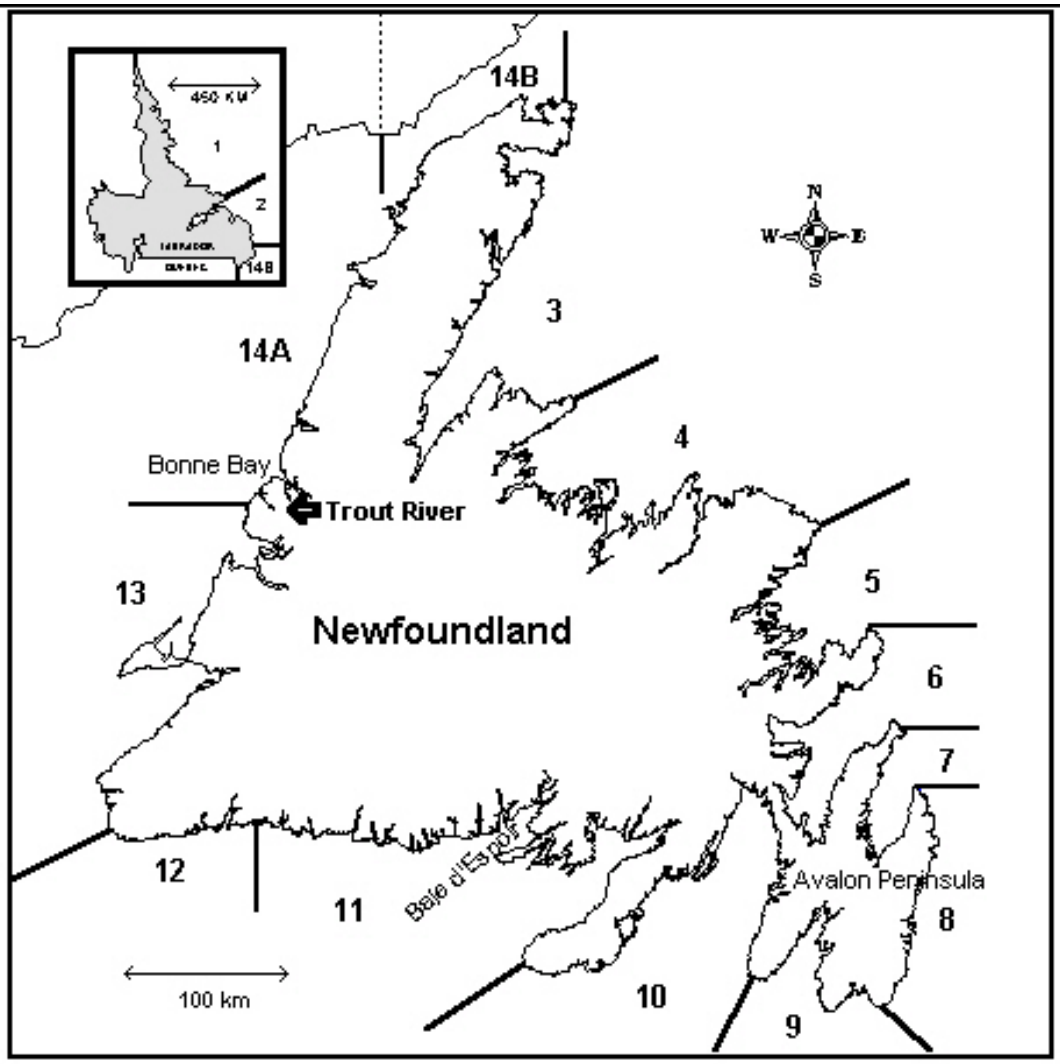


Figure 1. Map showing 14 Salmon Fishing areas of Newfoundland and location of Trout River.

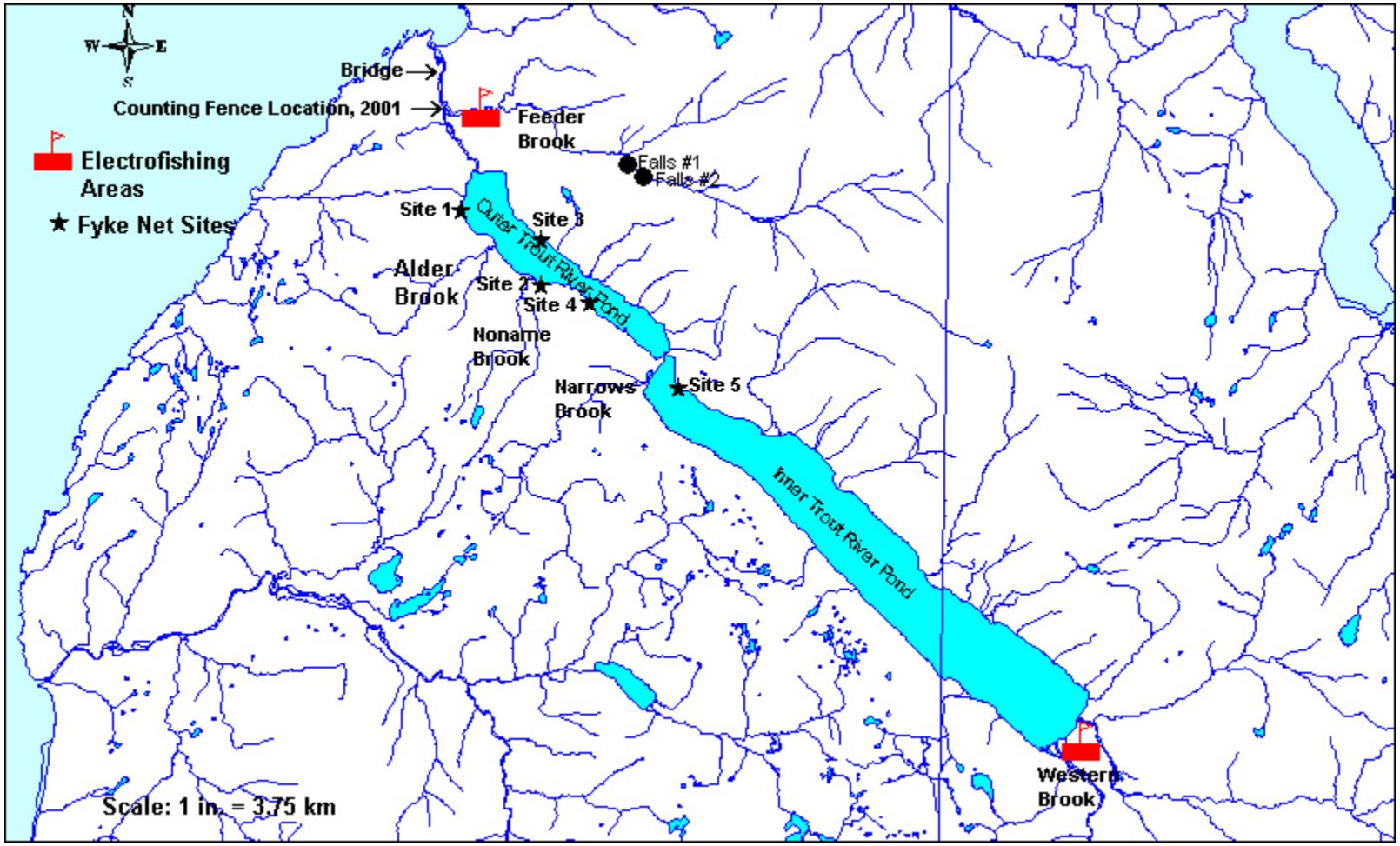


Figure 2. Map of Trout River system and sampling locations in 2001.

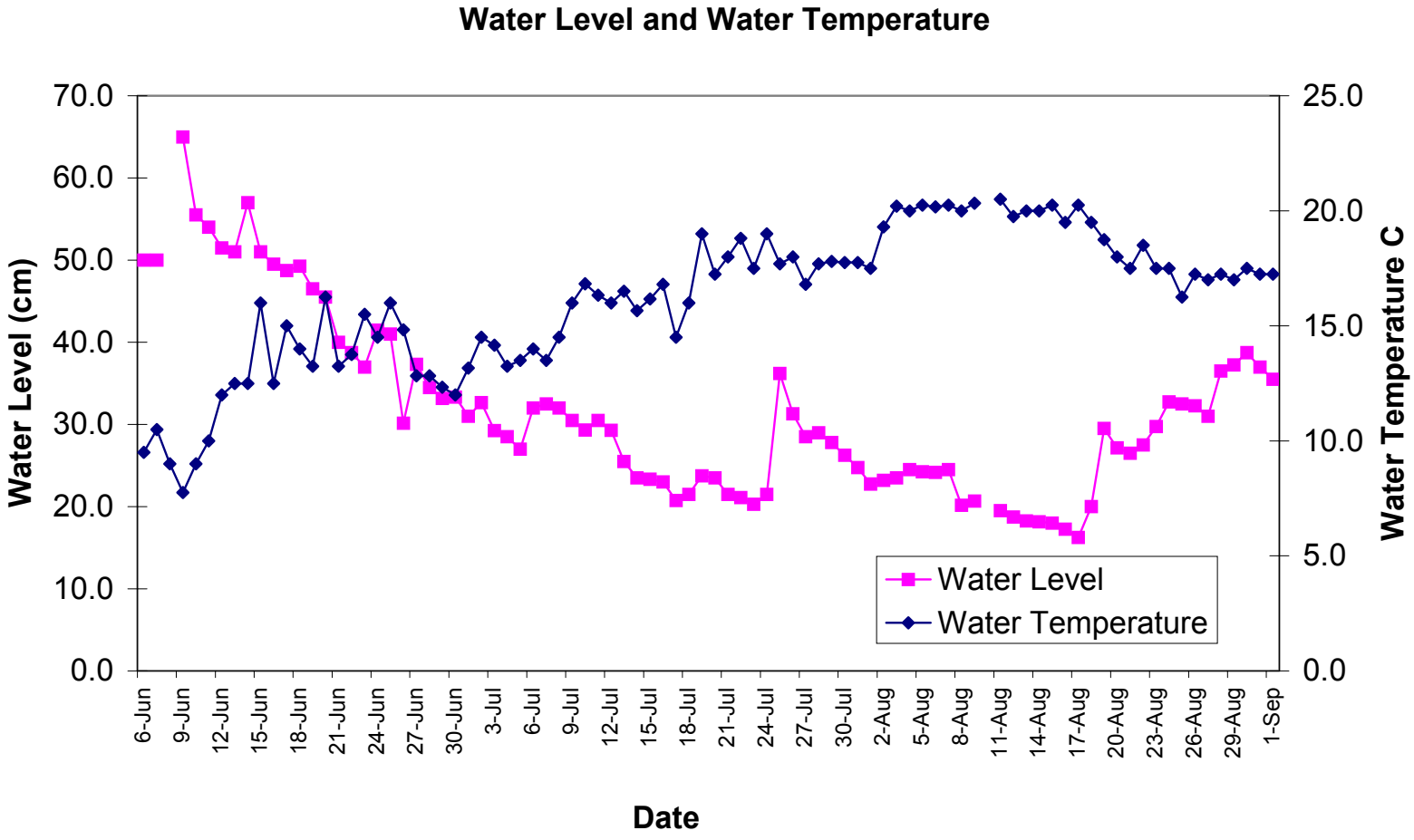


Figure 3. Mean daily water level and water temperature recorded during trap checks at the counting fence on Trout River, 2001.

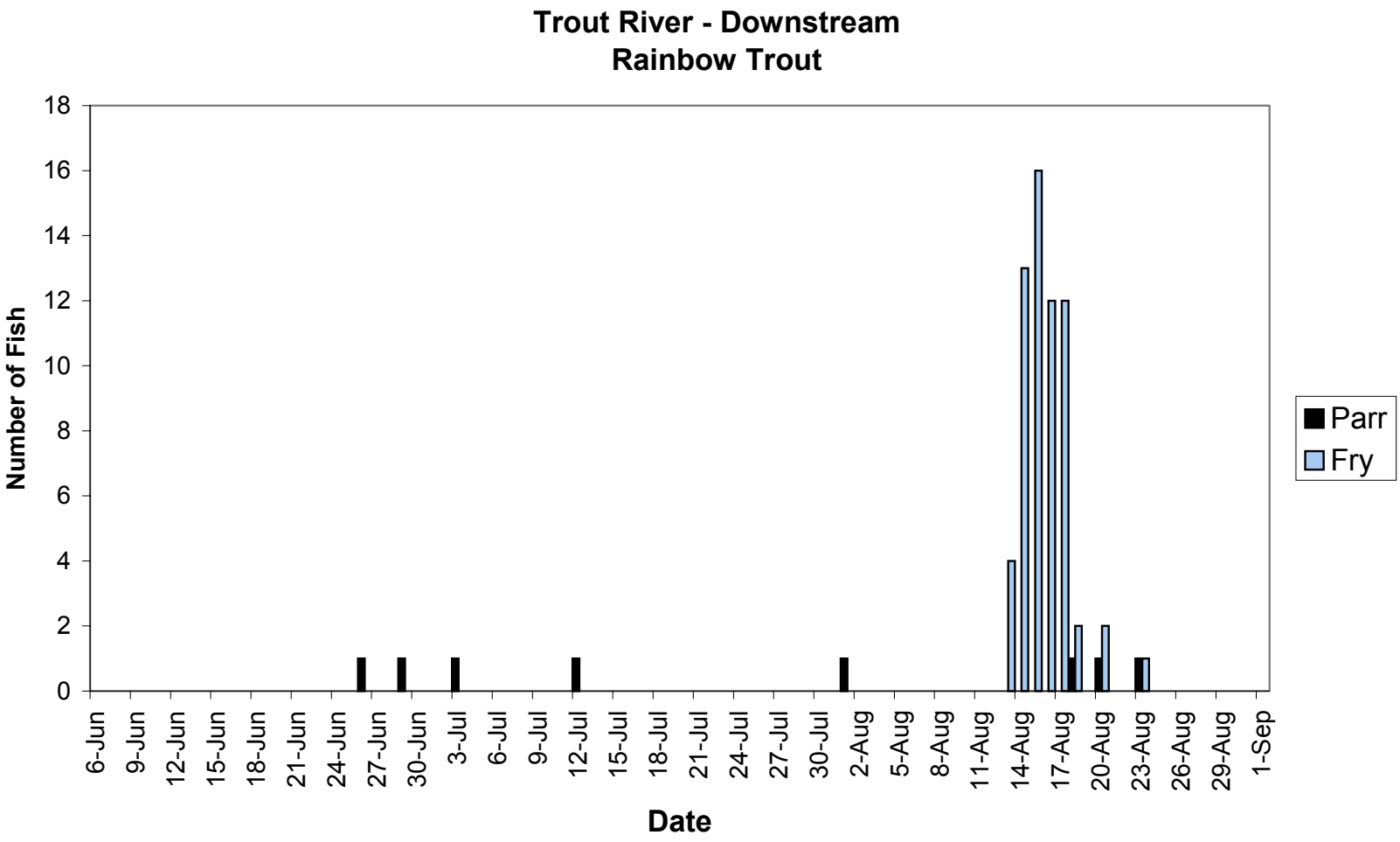


Figure 4. Rainbow trout downstream counts at the counting fence on Trout River, 2001.

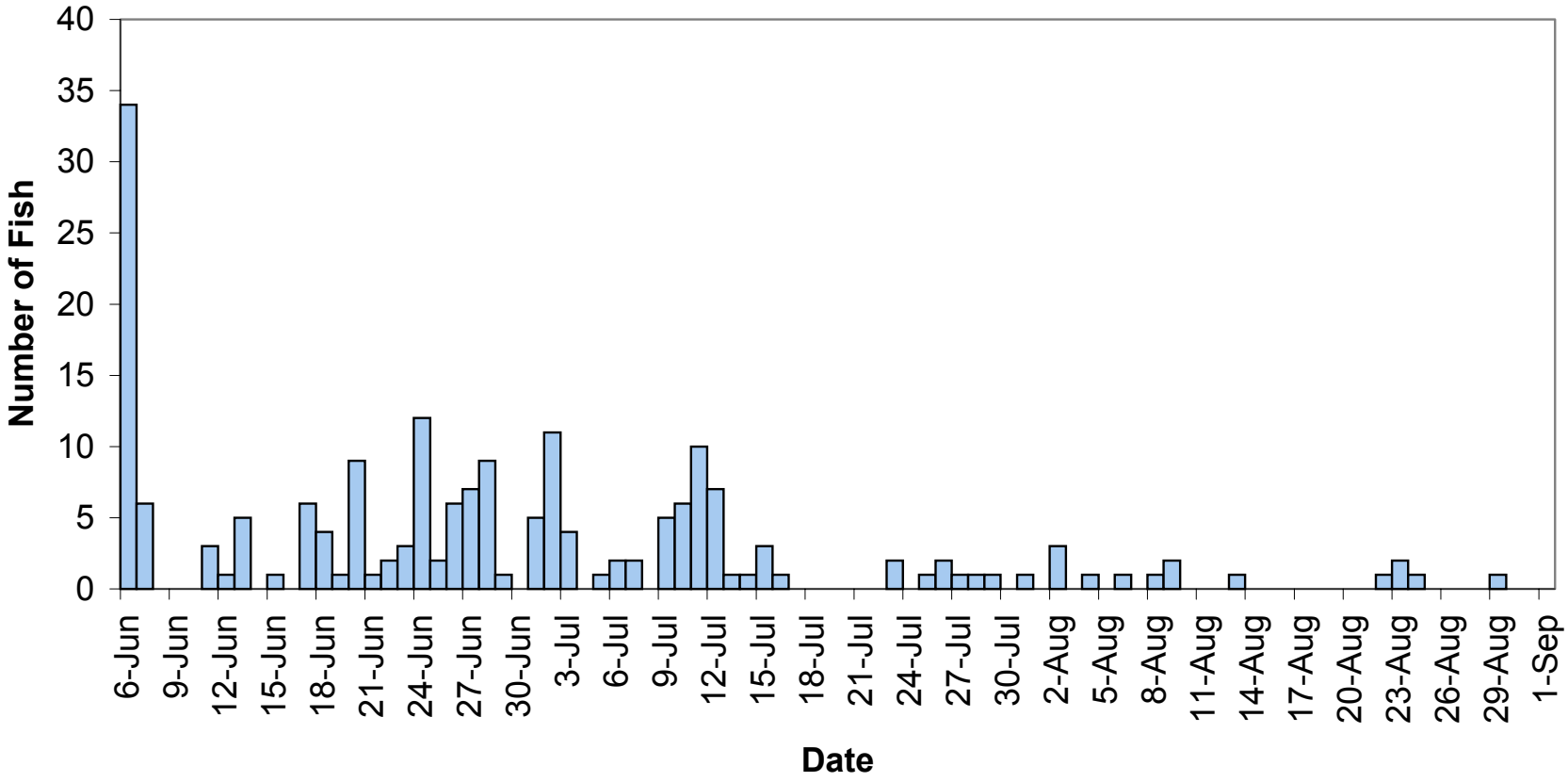


Figure 5. Atlantic salmon smolt downstream counts at the counting fence on Trout River, 2001.

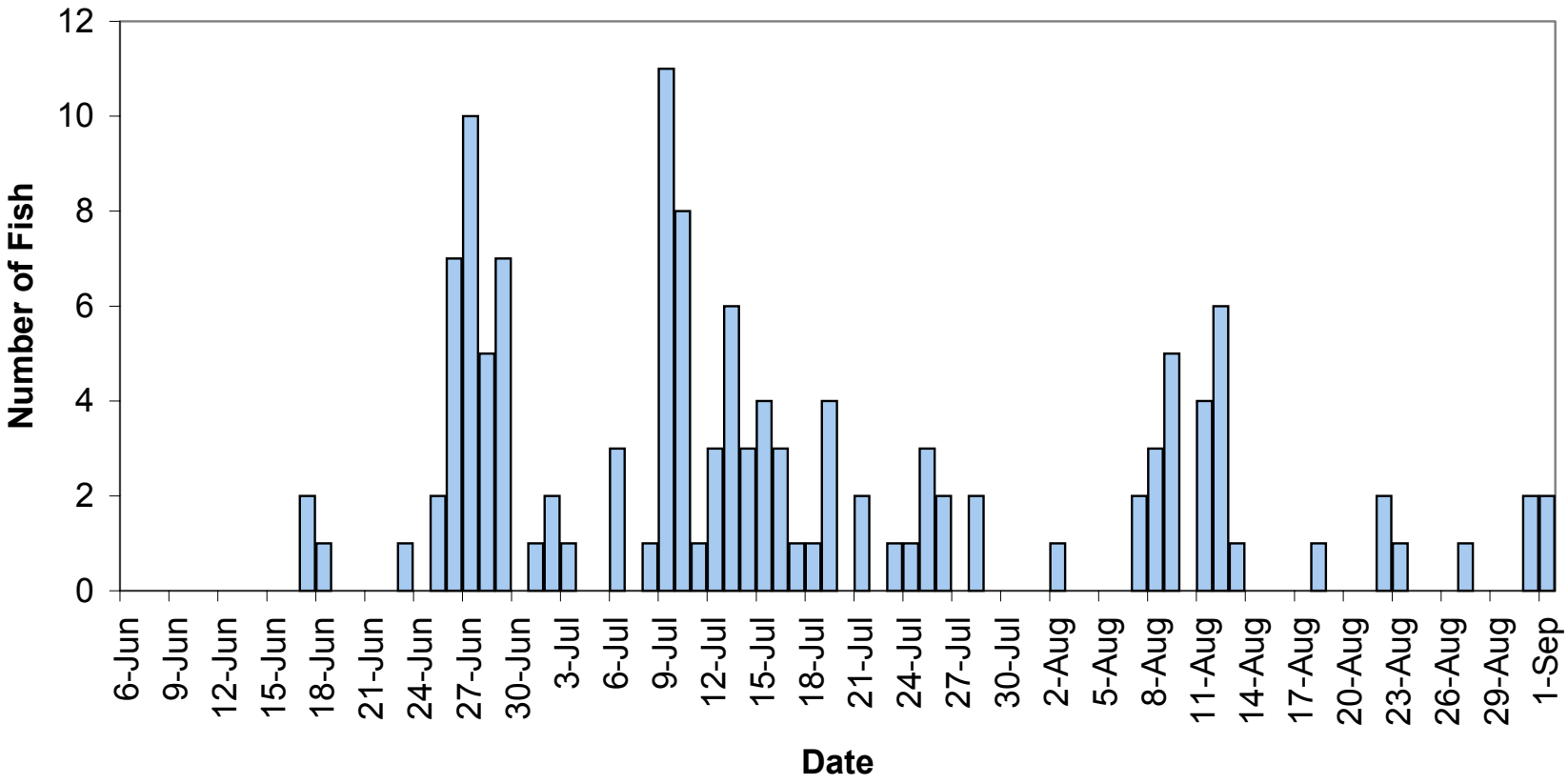


Figure 6. Atlantic salmon parr downstream counts at the counting fence on Trout River, 2001.

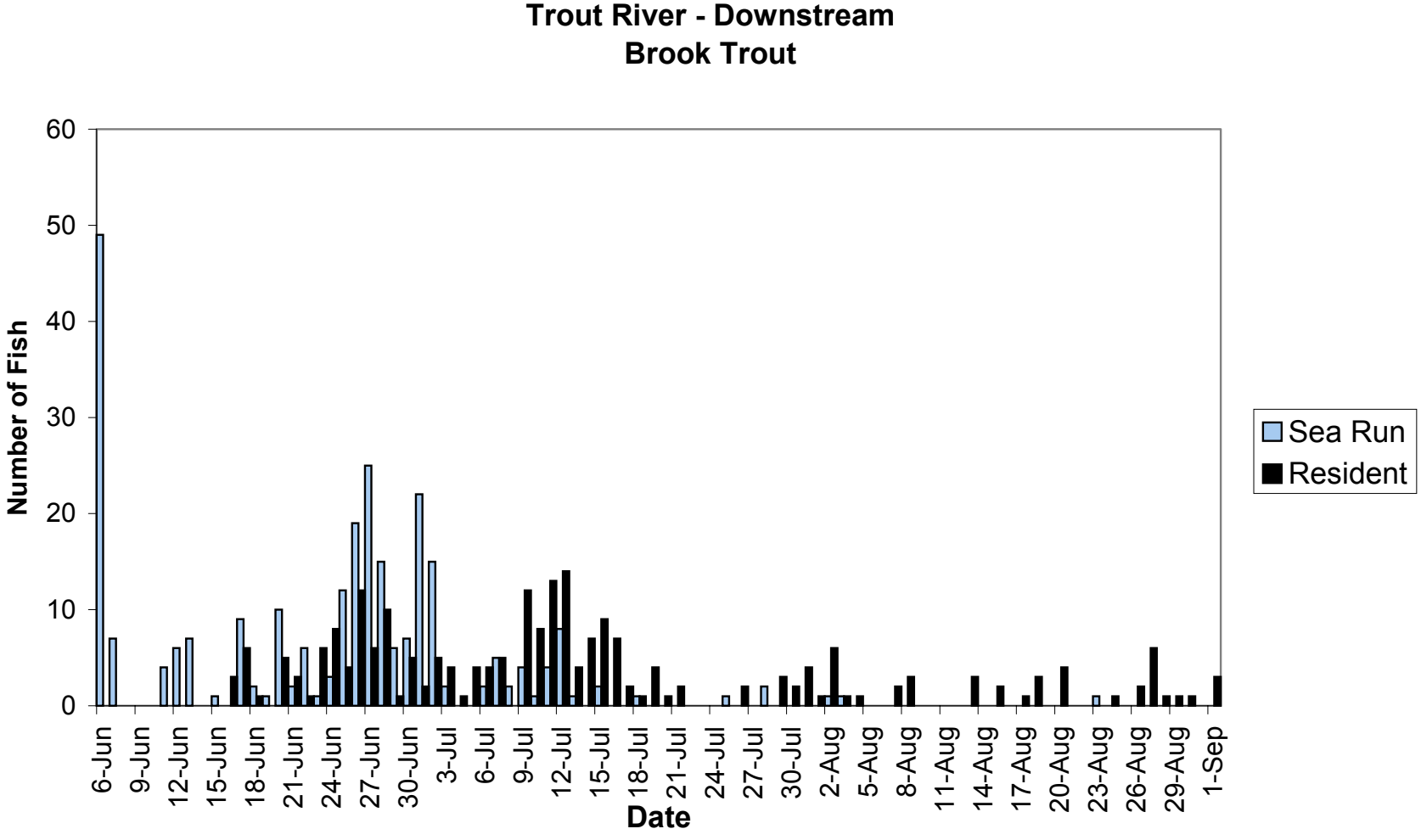


Figure 7. Brook trout downstream counts at the counting fence on Trout River, 2001.

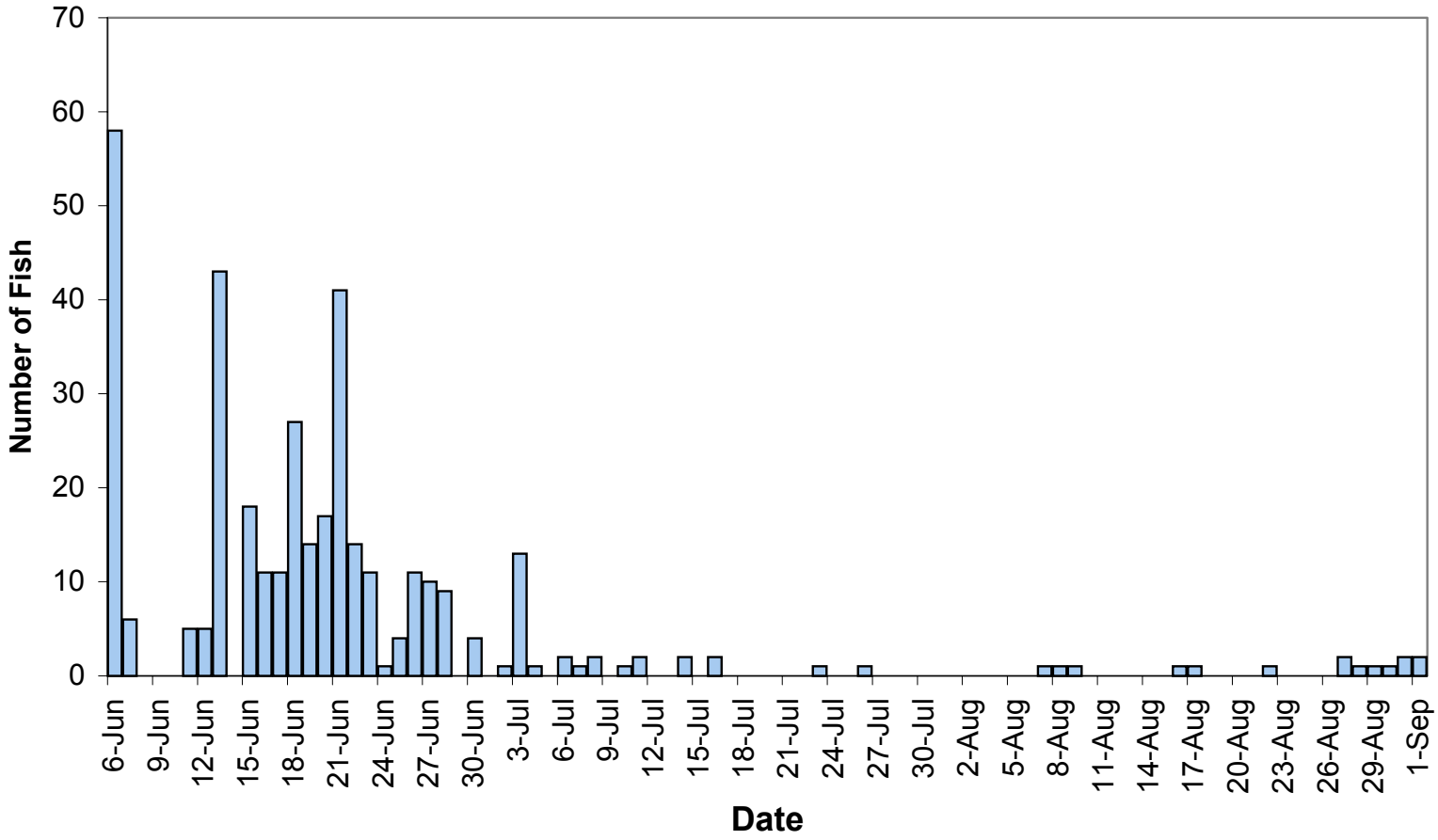


Figure 8. American smelt downstream counts at the counting fence on Trout River, 2001.

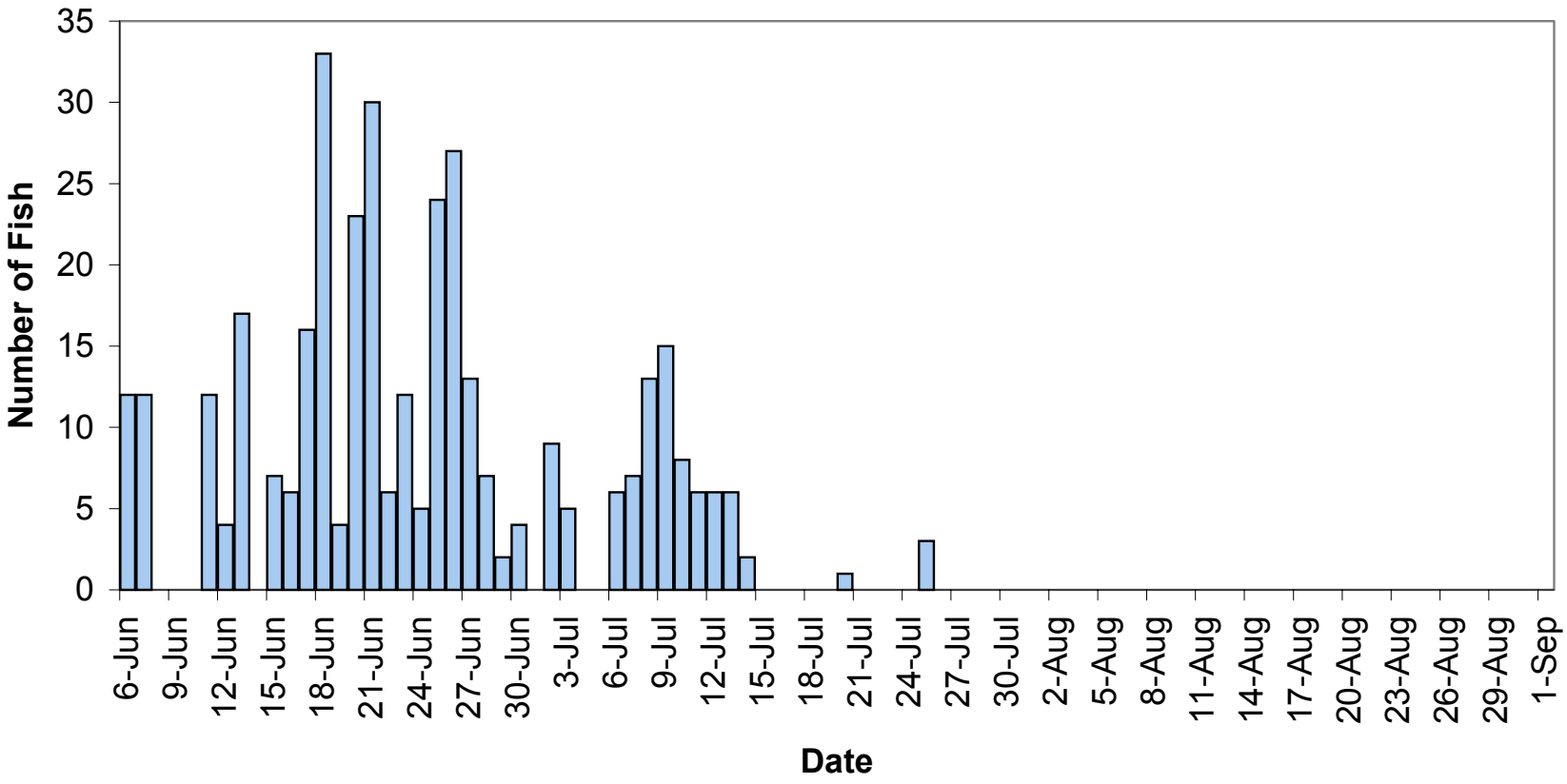


Figure 9. American eel downstream counts at the counting fence on Trout River, 2001.

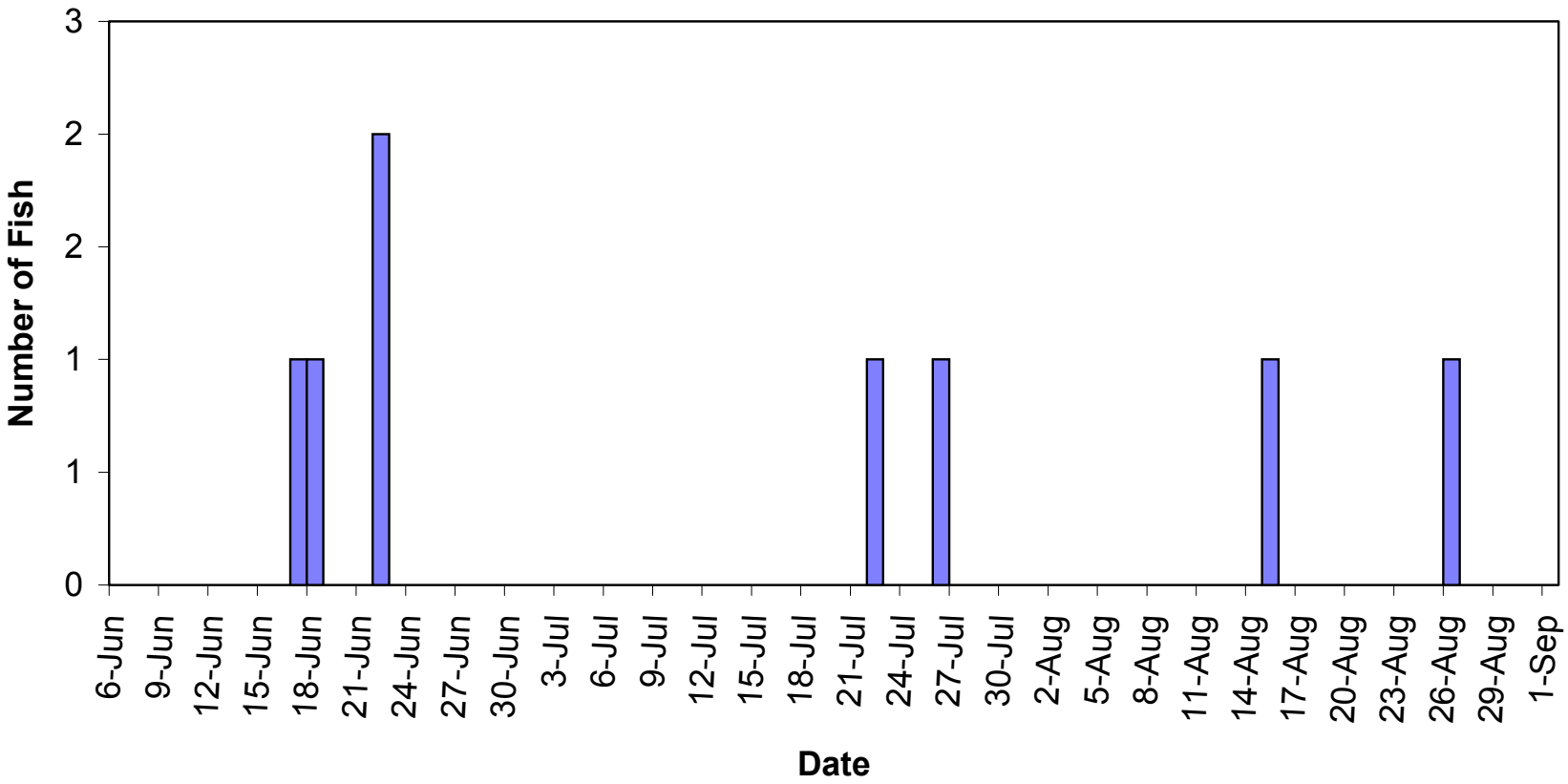


Figure 10. Rainbow trout upstream counts at the counting fence on Trout River, 2001.

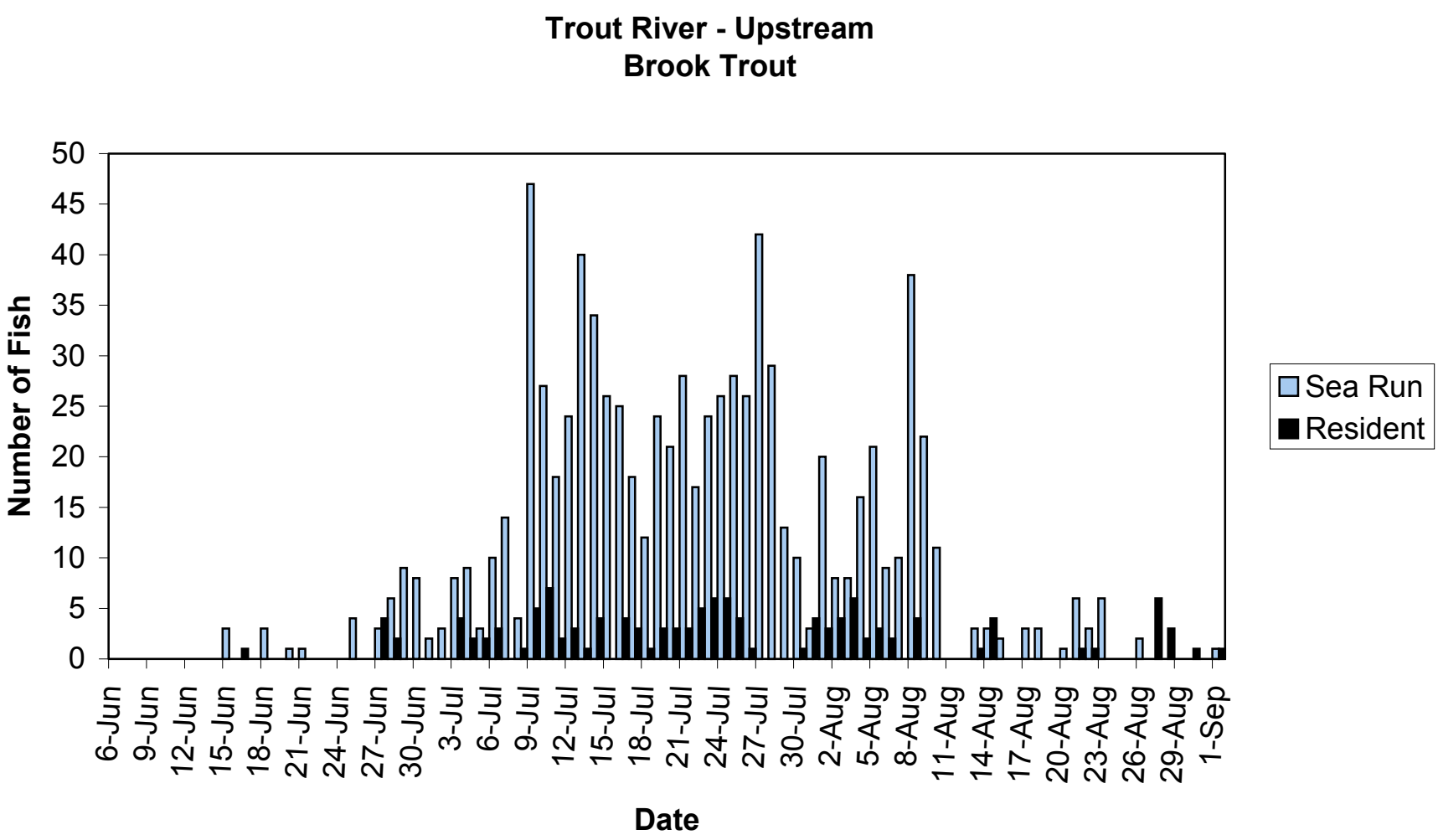


Figure 11. Brook trout upstream counts at the counting fence on Trout River, 2001.

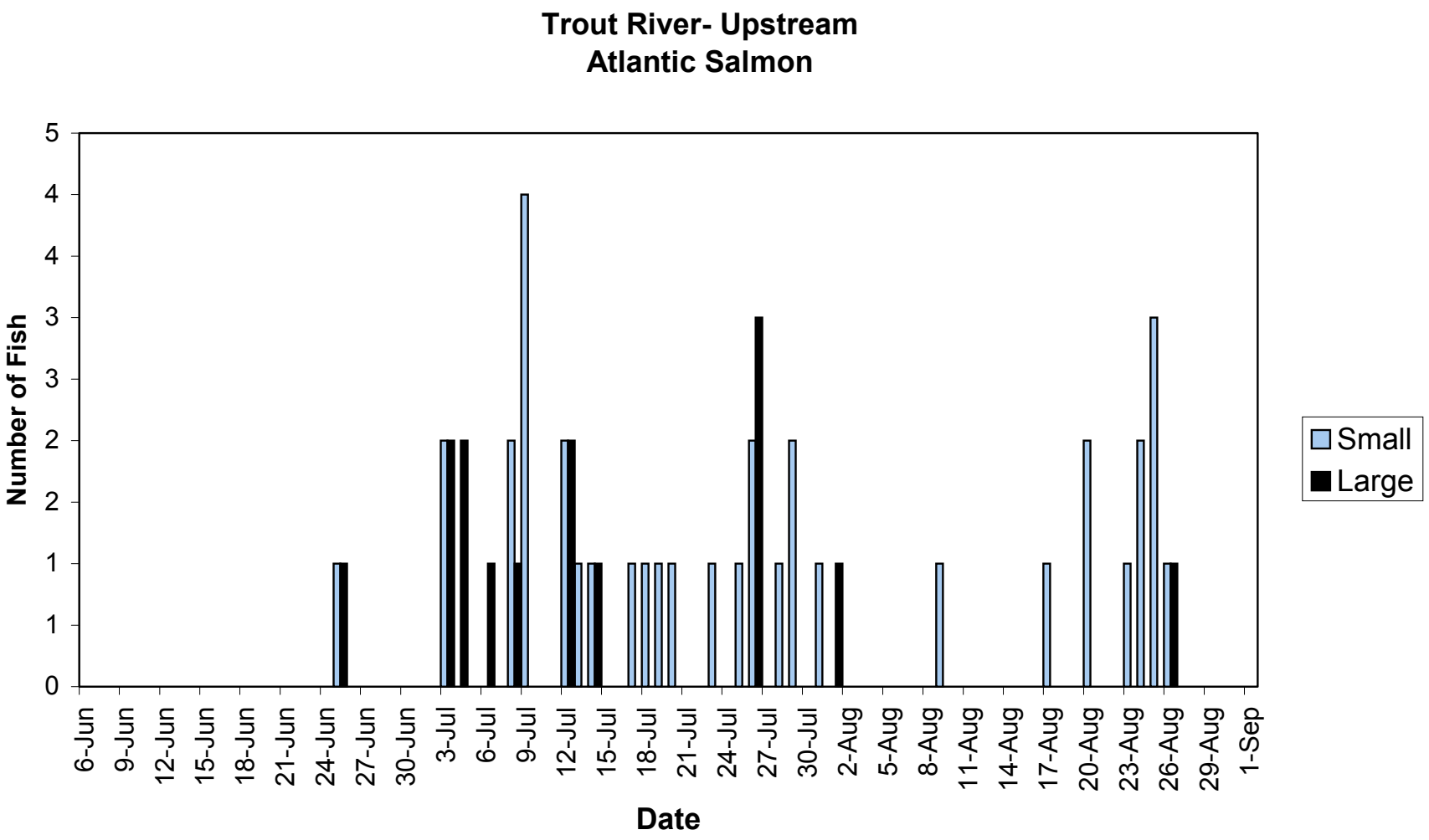


Figure 12. Atlantic salmon adults upstream counts at the counting fence on Trout River, 2001.

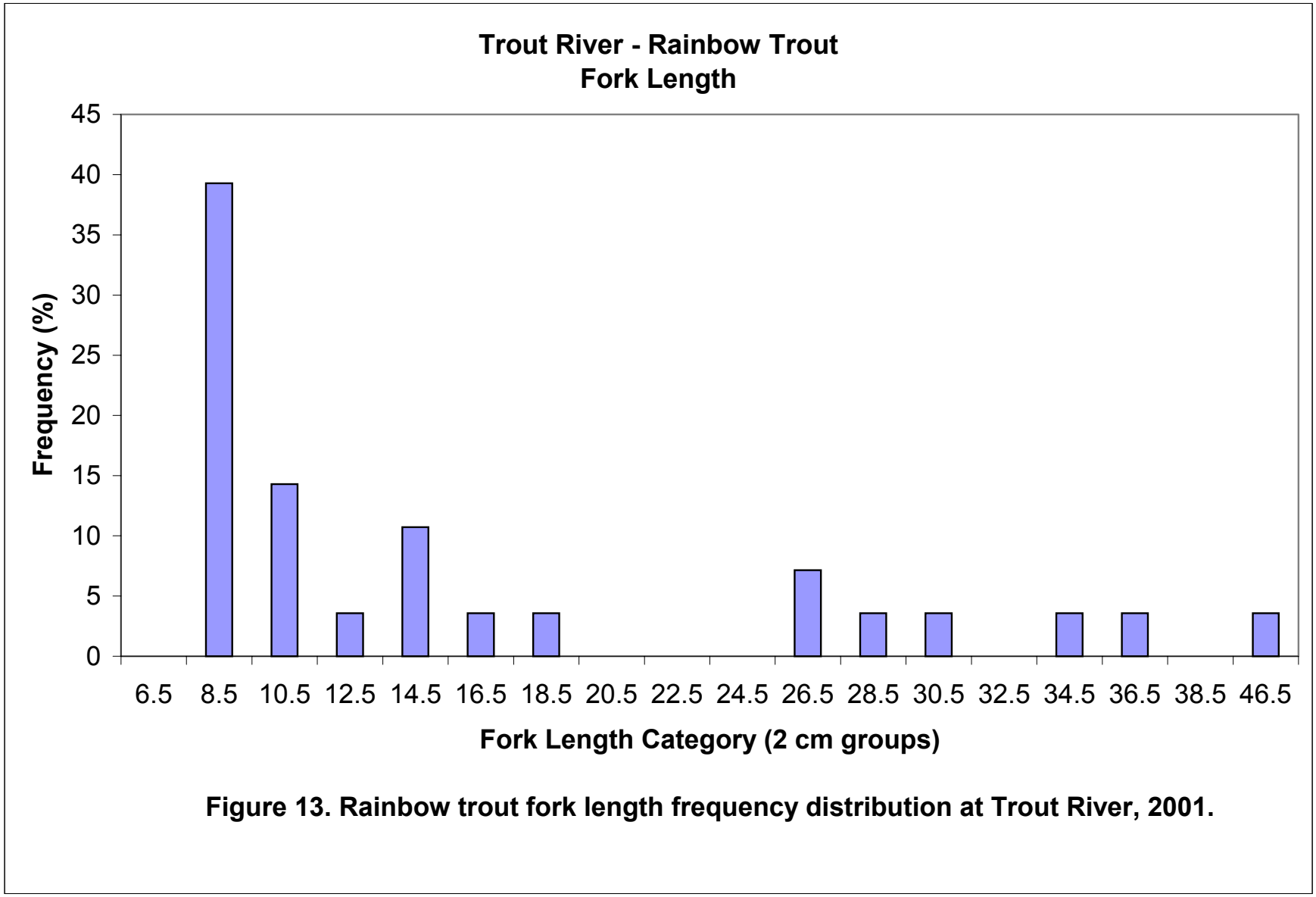


Figure 13. Rainbow trout fork length frequency distribution at Trout River, 2001.

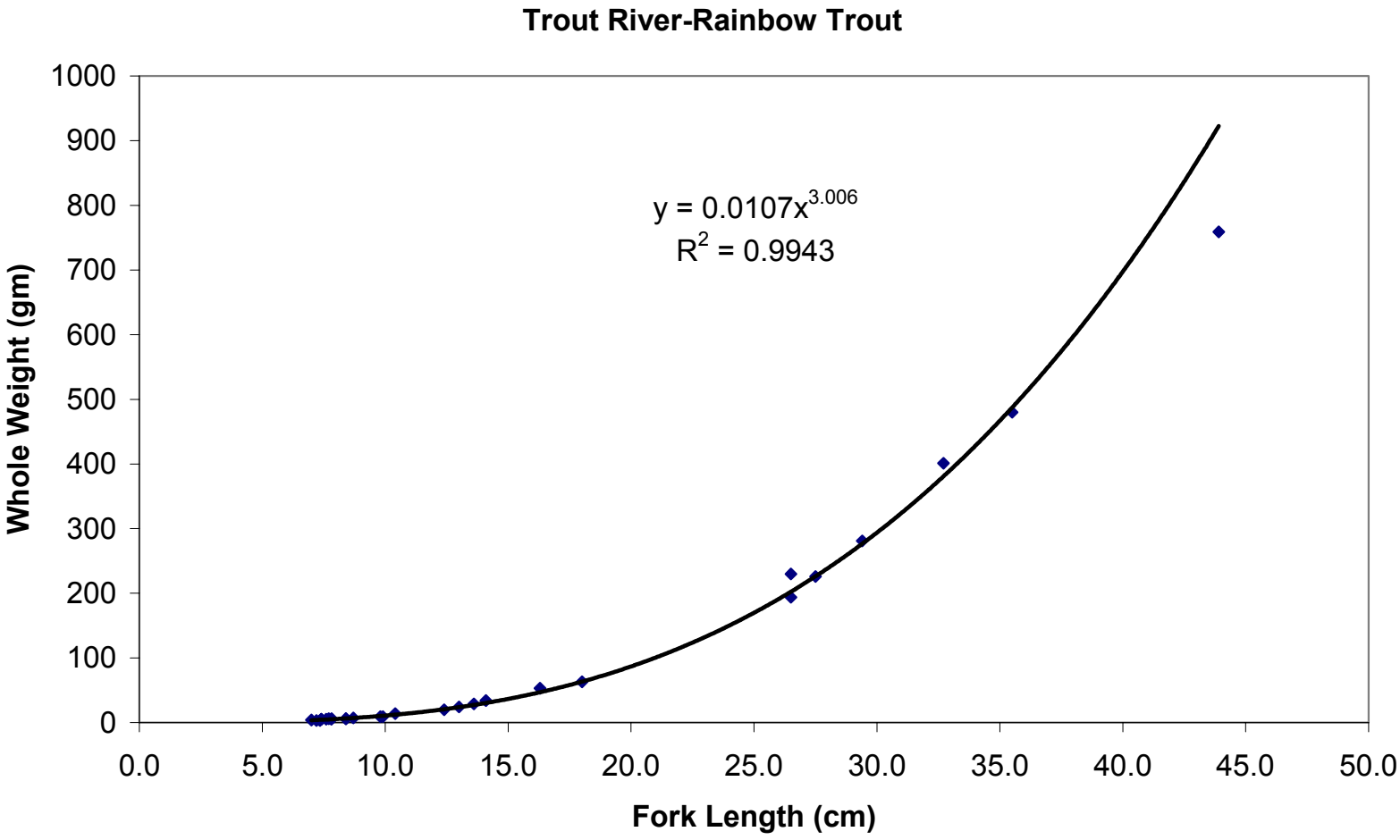


Figure 14. Weight-length relationship for rainbow trout at Trout River, 2001.

Appendix 1. Recreational Atlantic salmon fishery catches and effort on Trout River, 1974-2000.

Year	Effort Rod Days	Small (<63 cm) Ret.	Rel.	Tot.	Large (>=63 cm) Ret.	Rel.	Tot.	Total (Small + Large) Ret.	Rel.	Tot.	CPUE
1974	346	10	.	10	0	.	0	10	.	10	0.03
1975	224	2	.	2	0	.	0	2	.	2	0.01
1976	181	3	.	3	1	.	1	4	.	4	0.02
1977	374	8	.	8	0	.	0	8	.	8	0.02
1978	56	11	.	11	0	.	0	11	.	11	0.20
1979	87	6	.	6	0	.	0	6	.	6	0.07
1980	185	8	.	8	0	.	0	8	.	8	0.04
1981	531	54	.	54	0	.	0	54	.	54	0.10
1982	324	47	.	47	0	.	0	47	.	47	0.15
1983	308	6	.	6	1	.	1	7	.	7	0.02
1984	277	13	.	13	0	.	0	13	.	13	0.05
1985	312	0	.	0	*	0	0	0	0	0	0.00
1986	229	1	.	1	*	0	0	1	0	1	0.00
1987	85	1	.	1	*	0	0	1	0	1	0.01
1988	257	0	.	0	*	0	0	0	0	0	0.00
1989	224	3	.	3	*	0	0	3	0	3	0.01
1990	513	19	.	19	*	0	0	19	0	19	0.04
1991	360	23	.	23	*	0	0	23	0	23	0.06
1992	336	9	8	17	*	0	0	9	8	17	0.05
1993	504	6	2	8	*	0	0	6	2	8	0.02
1994	479	28	1	29	*	0	0	28	1	29	0.06
1995	444	18	1	19	*	2	2	18	3	21	0.05
1996	539	40	0	40	*	1	1	40	1	41	0.08
1997**		98	46	144	*	10	10	98	56	154	
1998**		49	19	68	*	0	0	49	19	68	
1999**		51	6	57	*	4	4	51	10	61	
2000**		34	7	41	*	2	2	34	9	43	
84-89 $\bar{X}$	230.7	3.0	.	3.0	.	0.0	0.0	3.0	0.0	3.0	0.0
95% CL	82.3	5.3	.	5.3	.	0.0	0.0	5.3	0.0	5.3	0.0
N	6	6	0	6	0	5	6	6	5	6	6
86-91 $\bar{X}$	278.0	7.8	.	7.8	.	0.0	0.0	7.8	0.0	7.8	0.0
95% CL	152.1	10.8	.	10.8	.	0.0	0.0	10.8	0.0	10.8	0.0
N	6	6	0	6	0	6	6	6	6	6	6
92-96 $\bar{X}$	460.4	20.2	2.4	22.6	.	0.6	0.6	20.2	3.0	23.2	0.1
95% CL	96.5	17.4	4.0	15.2	.	1.1	1.1	17.4	3.6	15.5	0.0
N	5	5	5	5	0	5	5	5	5	5	5
97-99 $\bar{X}$		66.0	23.7	89.7		4.7	4.7	66.0	28.3	94.3	
95% CL		68.9	50.7	117.7		12.5	12.5	68.9	60.6	128.7	
N		3	3	3		3	3	3	3	3	

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.

CPUE IS BASED ON RETAINED + RELEASED FISH FOR 1985 - 1996 AND ON RETAINED FISH ONLY PRIOR TO 1985.

* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

**DATA OBTAINED FROM THE LICENSE STUB RETURN; 2000 DATA ARE PRELIMINARY

Appendix 2. Trout River Field Outline, 2001

1. **Trap Checks**- Operate Counting Fence June 4 to mid-September (downstream and upstream traps). Check trap at 0800, 1200 and 1600 hrs daily. More often if required. If Atlantic salmon or brook trout avoid entering either the downstream or upstream traps, a short section of conduit is to be removed and fish visually counted.
2. **Environmental Data**-Record water temperature, air temperature, water level, cloud cover, weather and wind direction at each trap check. Use a pocket thermometer to record water and air temperature. A 'Hobo Temp-mentor' will also be placed inside the adult trap to record water temperature. A metre stick will be place on downstream side of adult trap to record water level. The metre stick should be placed so the water level reads 50 cm. We will also try to find a permanent benchmark to measure water levels so that comparisons can be measured across years.
3. **Parr**-Count and release.
4. **Smolt**-Count and release. Sample and freeze all salmon smolt mortalities. Collect fork length, whole weight, internal sex and scales. Identify precocious males and record on back of scale envelope.
5. **Kelts**-Sample all salmon kelt. Collect fork length, whole weight, external sex and scales. Examine for the presence of tags. Remove any button tags, record the tag numbers of any Carlin or other tags but do not remove the tag from the fish.
6. **Adult salmon**-Count and release, without handling, all small (< 63 cm) and large (≥ 63 cm) salmon captured at the fence. Examine all salmon for the presence of tags and external marks. Remove and button tags, record the tag number of any Carlin tags or other tags but do not remove the tag from the fish. **External Marks-**Check all adult salmon for the presence of external marks and record the location of the mark. Indicate if it looks like a net mark.
   a) Sampled fish - record (**Net External Marks**) or (**No external Marks**) on scale envelopes.
   b) Fish that are not sampled - record fish with (**External Marks**) or (**No external Marks**) in field book.
7. **Mortalities**- Grilse or Large salmon found dead above the counting fence, on the fence or in the smolt trap should be recorded as 'morts' in the adult trap counts for that day. If there wasn't any fish that day they should be recorded as 'morts' on the counting fence sheets the last day there was fish. All mortalities (including those found downstream of the fence) should be sampled, tagged and frozen. Collect fork length, whole weight, internal sex and scales. Note: mortalities upstream may be from angling or other causes, we should try to determine cause.
8. **Brook Trout**-Count and measure (fork length) (if water temperatures are below 18 C) and release.
9. **Other Species**-Count and measure all smelts and eels. Sticklebacks should be counted only. Count and measure all other species. If unidentifiable fish are captured please hold one specimen for positive identification others may be

counted and released. If Arctic char are captured hold one specimen for positive ID.

10. Rainbow Trout- Count and sacrifice all rainbow trout captured at the counting fence. Tag each specimen, photograph and freeze (i.e. after all sampling has been done). Note: when photographing, try to spread out the dorsal fin so that they can be seen in the photo, also get as close to the fish as possible, ensuring that the photo is in focus and the entire fish is in the viewing frame. Be sure to label photographs with proper specimen number, date and location.

a) **Sampling**- Collect fork length, total length, whole weight, upper maxillary length, internal sex, and scale samples from all rainbow trout. Record if fin rays are deformed. Record all information on scale sample envelope. Be sure to label the envelope with the proper specimen tag number, date and location.

b) **Stomachs**-Remove the stomach from all rainbows, tie off using cotton string and a wing tag. Record the stomach tag number on the scale sample envelope. Preserve stomachs in 10% formalin.

c) **Otoliths**-Collect otoliths from all rainbow trout. Place both otoliths in an envelope labelled with the proper specimen number, date and location. Otoliths will be used for strontium 90 analysis to distinguish freshwater and marine history.

d) **Blood Samples**-Collect blood samples from all rainbow trout at the counting fence as per instructions provided.

e) **Gonads**- Photograph gonads first. Place the left gonad in Bouin's Fluid and freeze the other. Be sure to label vials with the proper specimen number, date and location.

f) **Tissue Samples**-Collect a piece of the dorsal fin (a one-hole punch is ideal for this). Place in 1.5-ml Ependorf tube with 95% ethanol. Tissue samples are used for DNA analysis. Preserve separately as per instructions.

g) **Spawning survey**-In mid-June, walk tributaries flowing into Trout River Pond and the main stem to look for redds. Rainbow trout have been known to spawn in gravel riffles above a pool. Collect eggs or emerging fry from any redd encountered and preserve in 95% ethanol. Mark the location of redds on a map and describe the habitat.

h) **Juvenile surveys and sampling-** Beginning in mid-June as soon as water conditions permit, check headwaters and lower part of main stem (snorkelling and electro-fishing for presence or absence): i) set two fyke nets in lower part of Trout River Pond. Check fyke nets on a daily basis; ii) electro-fish at least one closed site; iii) conduct spot checks at several locations. Record habitat characteristics (Keith Clark to assist).

i) **Snorkel survey-** In mid- to late July, snorkel major pools in the main stem when water levels permit and count all fish encountered.

j) **Bay D' Espoir** - Sample 12 fish from each of 2 stocks (length, weight, sex, tissue, scales, photo, gonads, no stomach, no blood).

k) **Shoal Hr. Brook** – Tentatively, July 30-Aug. 4. Sample 100 rainbow trout by electrofishing (closed and open sites), angling or fyke nets.

l) **River of Ponds**-Collect adult or juvenile rainbow trout using fyke nets and by electrofishing.

11. **Recreational salmon Fishery**-Request permission of anglers to collect fork length, whole weights, internal sex, and scales from their catch.
12. **Recreational Trout Fishery**-For brook trout, request permission of anglers to collect fork length, whole weight, internal sex, scales and otoliths from their catch. For rainbow trout, request permission of anglers to collect fork length, whole weight, internal sex, blood samples, tissue samples, scales, otoliths and gonads from their catch. Record if there are any fin deformities.
13. **Sampling of live fish should only be conducted when water temperatures are below or at 18 C.**

Appendix 3. RAINBOW TROUT - SAMPLING SHEET 2001

SAMPLE #: _____

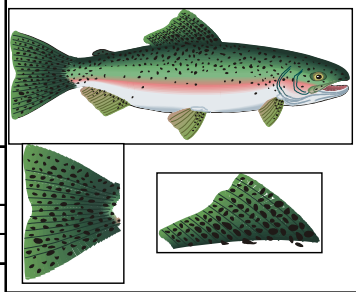
DATE SAMPLED: _____

DATE OF CAPTURE: _____

NAME OF ANGLER: _____

LOCATION OF CAPTURE: _____

Identification



Note: You can identify a rainbow trout by the lines of dark spots radiating out along the dorsal fin and tail.

FORK LENGTH (cm): _____

WHOLE WEIGHT (g): _____

SEX: _____

MATURITY: _____

DESCRIBE GONADS: _____

Additional information:

1. Contact the person who has the fish prior to scheduling the sampling trip to assure that the individual is fully aware of the estimated time of arrival.

2. If fish is alive take a blood sample (assure syringe and hypodermic are rinsed with heparin solution immediately prior to taking the sample) and place in the 1.5 ml Ependorf tubes. Keep tubes cool (do not freeze) until a 1 microlitre subsample of whole blood can be extracted using a capillary tube. Place the capillary tube containing the blood into the propidium iodide solution provided in the snap-cap tube. Gently shake the tube from side to side, making sure the blood has flowed from the capillary tube into the propidium iodide solution. Do not remove the capillary tube from the propidium iodide solution. These tubes should be labelled (date and location) and kept cool during transfer to HQ. Theses samples should be returned to HQ ASAP.

3. Take a scale sample.

4. Take photographs of fish, with particular emphasis on showing shape of fish and fins (possible fin deformities), also a photo of gonads if possible.

5. Check for fin deformities (dorsal, pectoral, pelvic, caudal) and describe.

6. Dissect the specimen and remove gonads. Place the left gonad in Bouin's Fluid and freeze the other. Preserve the stomachs in 10% formalin. Label all vials and freezer bags for later identification.

7. If fish has not been frozen, take tissue sample or piece of fin (or gill operculum; a one hole paper punch is ideal for this) and place in Ependorf tubes with 95% ethanol.

8. Remove otoliths, blot dry on clean paper towel and place in separate sample envelope. This envelope should be properly labeled with the same specimen number as on the scale sample envelope. Also record the date and location of the sample.

Appendix 4. Downstream trap daily and total counts, 2001.

Date	Rainbow Parr	Rainbow Fry	Brook Trout (Sea-run)	Brook Trout (Resident)	Salmon parr	Salmon smolt	Smelt	Stickle-backs	Eels
6-Jun			49	0	0	34	58	3	12
7-Jun			7	0	0	6	6		12
8-Jun			0	0	0	0	0		
9-Jun			0	0	0	0	0		
10-Jun			0	0	0	0	0		
11-Jun			4	0	0	3	5	3	12
12-Jun			6	0	0	1	5	2	4
13-Jun			7	0	0	5	43		17
14-Jun			0	0	0	0	0		
15-Jun			1	0	0	1	18	1	7
16-Jun			0	3	0	0	11		6
17-Jun			9	6	2	6	11		16
18-Jun			2	1	1	4	27	2	33
19-Jun			1	0	0	1	14	1	4
20-Jun			10	5	0	9	17	1	23
21-Jun			2	3	0	1	41	1	30
22-Jun			6	1	0	2	14	15	6
23-Jun			1	6	1	3	11	5	12
24-Jun			3	8	0	12	1	1	5
25-Jun			12	4	2	2	4	6	24
26-Jun	1		19	12	7	6	11	52	27
27-Jun			25	6	10	7	10	36	13
28-Jun			15	10	5	9	9	52	7
29-Jun	1		6	1	7	1	0	23	2
30-Jun			7	5	0	0	4	23	4
1-Jul			22	2	1	5	0	23	
2-Jul			15	5	2	11	1	40	9
3-Jul	1		2	4	1	4	13	30	5
4-Jul			0	1	0	0	1	10	
5-Jul			0	4	0	1	0	30	
6-Jul			2	4	3	2	2	46	6
7-Jul			5	5	0	2	1	64	7
8-Jul			2	0	1	0	2	74	13
9-Jul			4	12	11	5	0	103	15
10-Jul			1	8	8	6	1	104	8
11-Jul			4	13	1	10	2	69	6
12-Jul	1		8	14	3	7	0	39	6
13-Jul			1	4	6	1	0	43	6
14-Jul			0	7	3	1	2	37	2
15-Jul			2	9	4	3	0	36	
16-Jul			0	7	3	1	2	47	
17-Jul			0	2	1	0	0	13	

18-Jul			1	1	1	0	0	24	
19-Jul			0	4	4	0	0	30	
20-Jul			0	1	0	0	0	19	1
21-Jul			0	2	2	0	0	42	
22-Jul			0	0	0	0	0	36	
23-Jul			0	0	1	2	1	46	
24-Jul			0	0	1	0	0	40	
25-Jul			1	0	3	1	0	29	3
26-Jul			0	2	2	2	1	77	
27-Jul			0	0	0	1	0	79	
28-Jul			2	0	2	1	0	366	
29-Jul			0	3	0	1	0	199	
30-Jul			0	2	0	0	0	51	
31-Jul			0	4	0	1	0	35	
1-Aug	1		0	1	0	0	0	20	
2-Aug			1	6	1	3	0	100	
3-Aug			1	1	0	0	0	33	
4-Aug			0	1	0	1	0	29	
5-Aug			0	0	0	0	0	55	
6-Aug			0	0	0	1	0	33	
7-Aug			0	2	2	0	1	16	
8-Aug			0	3	3	1	1	42	
9-Aug			0	0	5	2	1	44	
10-Aug			0	0	0	0	0		
11-Aug			0	0	4	0	0	6	
12-Aug			0	0	6	0	0	11	
13-Aug		4	0	3	1	1	0	10	
14-Aug		13	0	0	0	0	0	17	
15-Aug		16	0	2	0	0	0	15	
16-Aug		12	0	0	0	0	1	12	
17-Aug		12	0	1	0	0	1	3	
18-Aug	1	2	0	3	1	0	0	4	
19-Aug			0	0	0	0	0	3	
20-Aug	1	2	0	4	0	0	0	11	
21-Aug			0	0	0	0	0	7	
22-Aug			0	0	2	1	1	8	
23-Aug	1	1	1	0	1	2	0	6	
24-Aug			0	1	0	1	0	2	
25-Aug			0	0	0	0	0	140	
26-Aug			0	2	0	0	0	37	
27-Aug			0	6	1	0	2	59	
28-Aug			0	1	0	0	1	23	
29-Aug			0	1	0	1	1	69	
30-Aug			0	1	0	0	1	213	
31-Aug			0	0	2	0	2	98	
1-Sep			0	3	2	0	2	26	
TOTAL	**8**	**62**	**267**	**233**	**130**	**195**	**364**	**3260**	**363**

Appendix 5. Upstream trap daily and total counts, 2001.

Date	Rainbow Trout	Brook Trout (Sea-run)	Brook Trout (Resident)	Salmon parr	Salmon smolt	Salmon (Small)	Salmon (Large)	Total Adult Salmon	Eels
6-Jun									
7-Jun									
8-Jun									
9-Jun									
10-Jun									
11-Jun									
12-Jun									
13-Jun									
14-Jun									
15-Jun		3		1	1			0	
16-Jun			1					0	
17-Jun	1							0	
18-Jun	1	3			1			0	2
19-Jun					1			0	
20-Jun		1						0	
21-Jun		1						0	3
22-Jun	2							0	
23-Jun								0	2
24-Jun					1			0	
25-Jun		4				1	1	2	
26-Jun								0	
27-Jun		3	4	1				0	
28-Jun		6	2	1				0	
29-Jun		9						0	1
30-Jun		8						0	
1-Jul		2						0	
2-Jul		3						0	
3-Jul		8	4	1		2	2	4	
4-Jul		9	2	2			2	2	
5-Jul		3	2					0	
6-Jul		10	3				1	1	
7-Jul		14						0	
8-Jul		4	1			2	1	3	
9-Jul		47	5	1		4		4	
10-Jul		27	7	2				0	
11-Jul		18	2					0	
12-Jul		24	3			2	2	4	
13-Jul		40	1	1		1		1	1
14-Jul		34	4	2		1	1	2	
15-Jul		26						0	
16-Jul		25	4	1				0	
17-Jul		18	3			1		1	

18-Jul		12	1			1		1	
19-Jul		24	3	1		1		1	
20-Jul		21	3			1		1	
21-Jul		28	3					0	
22-Jul	1	17	5	2				0	
23-Jul		24	6	1		1		1	
24-Jul		26	6	1				0	
25-Jul		28	4	1		1		1	
26-Jul	1	26	1	1		2	3	5	
27-Jul		42						0	
28-Jul		29				1		1	
29-Jul		13				2		2	
30-Jul		10	1					0	
31-Jul		3	4	3		1		1	
1-Aug		20	3	1			1	1	
2-Aug		8	4					0	
3-Aug		8	6	1				0	
4-Aug		16	2	1				0	
5-Aug		21	3	1				0	
6-Aug		9	2	1				0	
7-Aug		10		1				0	
8-Aug		38	4	1				0	
9-Aug		22				1		1	
10-Aug		11		1				0	
11-Aug								0	
12-Aug								0	
13-Aug		3	1	1				0	
14-Aug		3	4	1				0	
15-Aug	1	2		1				0	
16-Aug								0	
17-Aug		3				1		1	
18-Aug		3						0	
19-Aug								0	
20-Aug		1				2		2	
21-Aug		6	1					0	
22-Aug		3	1		1			0	
23-Aug		6		1		1		1	
24-Aug						2		2	
25-Aug						3		3	
26-Aug	1	2				1	1	2	
27-Aug			6		1			0	
28-Aug			3					0	
29-Aug								0	
30-Aug			1					0	
31-Aug								0	
1-Sep		1	1	1				0	
TOTAL	**8**	**849**	**127**	**36**	**6**	**36**	**15**	**51**	**9**