1995

TOBOGGAN CREEK STEELHEAD ASSESSMENT

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INTRODUCTION

Assessment of the steelhead trout population in the Toboggan Creek watershed has been extremely limited. Previous work in relation to this stock included incidental documentation of steelhead during fall fence counts of coho salmon, by members of the Smithers chapter of the Steelhead Society of B.C. in the fall of 1978, and by technicians from the Toboggan Creek Salmon and Steelhead Enhancement Society yearly, beginning in 1988. Although local residents and agencies were cognizant of the potential of Toboggan Creek, as an important steelhead producer, other assessment priorities took precedence.

Enhancement of steelhead at Toboggan Creek Hatchery, located approximately 13 kilometers northwest of Smithers, B.C. on Highway 16 West (Fig. 1), began in the spring of 1985. Stocks of steelhead trout, including the Toboggan Creek stock, were enhanced by the planting of hatchery-produced fry. A total of 151,036 steelhead fry from the Toboggan stock, averaging 2.1 grams in weight, were released during the years 1985 through 1987. This stock was not enhanced in 1988, but in 1989 and 1990 the Toboggan stock was used to produce 14,818 and 13,280 steelhead respectively. These later plants were yearling fish which averaged 7.8 grams in 1989 and 23.2 grams in 1990. All stocking of enhanced Toboggan Creek steelhead was done by transplant into steelhead-barren habitat in Trout Creek, an adjacent tributary, and into the mainstem Bulkley River near the confluences of Toboggan Creek and Trout Creek. Enhanced steelhead were never stocked into Toboggan Creek itself.

Assessment of returning hatchery-produced steelhead adults has been very limited as well, although some preliminary work done in 1992 indicated good numbers of adipose-clipped fish holding near the confluence of Toboggan Creek and the Bulkley River in March of that year.

The Toboggan Creek counting fence was operated in the spring of 1993 to assess this steelhead stock for the first time. An estimate of the spawning escapement of steelhead was achieved by sampling 174 steelhead as they migrated up the creek to spawn, all of these fish were spaghetti tagged. Observations of tagged and untagged fish later on, on the spawning redds, indicated an escapement that was approximately two and a half times larger than the number sampled. Another study in spring of 1994, this time using the fence for kelt recaptures, found a spawning escapement of 237 steelhead upstream of the fence. A total of 133 upstream migrants and 98 kelts were sampled in the 1994 study.

Funding from the provincial Habitat Conservation Fund made it possible for this study to be repeated in the spring of 1995. This report summarizes the findings of the 1995 assessment.

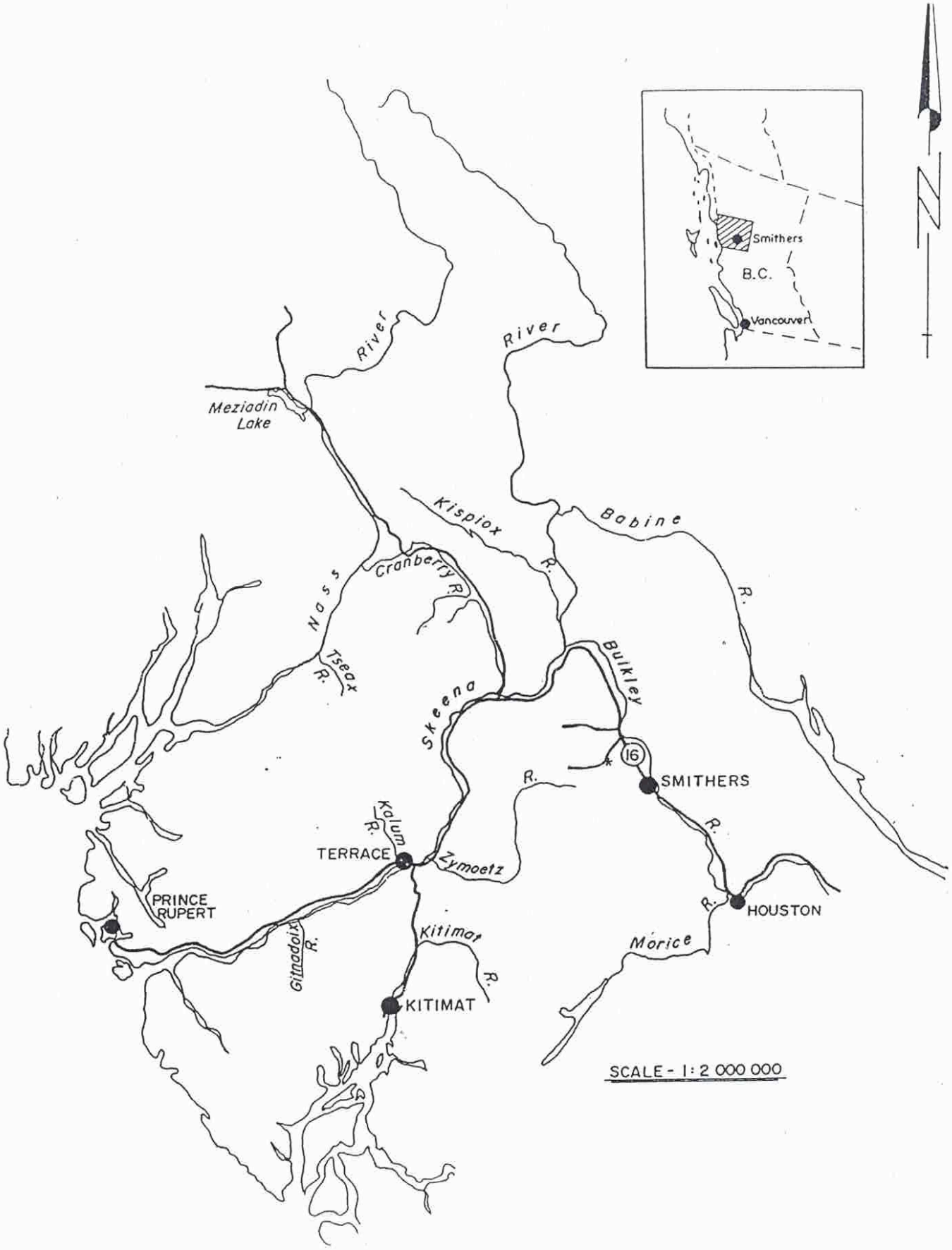


Fig.1 Location of Toboggan Creek Hatchery near Smithers, B.C. *

METHODS

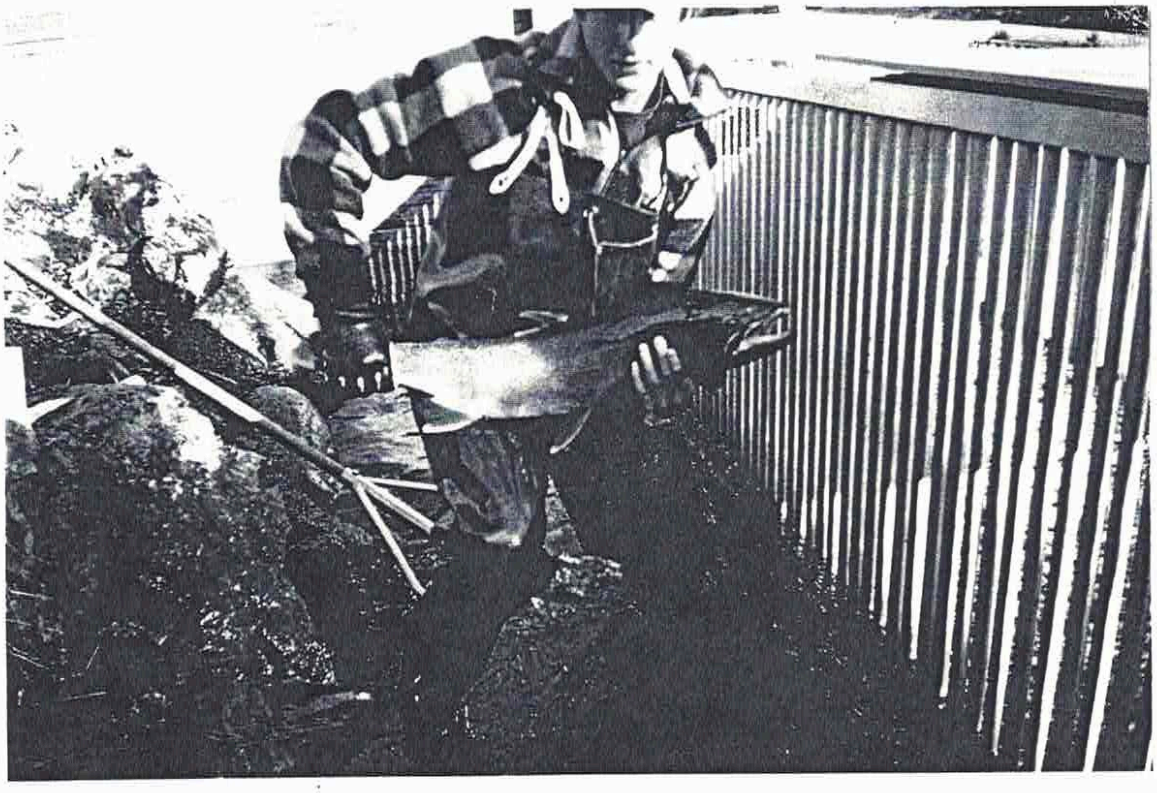
The Toboggan Creek steelhead trout population was assessed by means of a mark and recapture study. This study utilized the Toboggan Creek counting fence as capture point for installing of tags on upstream migrants and for the purposes of stopping downstream migrating steelhead to enable seining of the kelts for recapture documentation (Fig. 2).

A large majority of steelhead spawning in Toboggan Creek are thought to winter in the mainstem Bulkley River and migrate into the creek to spawn, starting as the creek begins to rise with the snow melt in early to mid April. Data collected from previously tagged fish, recaptured at the fence site, support this assumption. As long as the counting fence panels are put in place as soon as the fence sill is ice free, the number of fish that migrate in prior to this should be minimal.

Due to the fact that spring runoff is unpredictable, and that there is the possibility of the fence being inoperable for at least a portion of the spawner migration during peak runoff, it became necessary to utilize a mark and recapture method of determining the total spawning escapement. This assured that the number of steelhead which may migrate into the creek when the fence is inoperable can be accurately quantified.

As well as having an anchor tag inserted in the back of each steelhead, adjacent to the right-hand base of the dorsal fin, a small round hole was punched through their right operculum. This was done during the upstream migration to ensure that we could still identify marked steelhead in the event that the anchor tag was dislodged prior to recapture, and could also indicate to what degree tags such as these are removed during the spawning process. Scale samples and fork lengths were taken from each steelhead handled to provide some additional stock-specific information. Also, each fish was identified as to sex, condition and whether they were wild steelhead or of hatchery origin. Previous tags were documented and reported. Population size upstream of the counting fence was arrived at using the Adjusted Petersen Estimate technique (Ricker,1975).

Fig. 2 The Toboggan Creek counting fence structure, and an adipose-clipped hatchery steelhead trout captured at the fence in 1995.



RESULTS AND DISCUSSION

The fence panels were installed on March 30, 1995 and the Toboggan Creek counting fence operated continuously, with the exception of a 36 hour period on May 14, until June 05, 1995 when the panels were laid down. High runoff flows caused by rain and the subsequent acceleration of snow melt caused the May 14 interruption of sampling. Other than this the counting fence worked very efficiently and with only minimal problems with fence maintenance and debris accumulation. Any steelhead that were not sampled while migrating upstream of this point would have had to do so prior to March 30, 1995 or during the 36 hour period beginning at 8:00 p.m. on May 14. The latter scenerio appears to be the most likely given the migration pattern of steelhead spawners in 1995.

A total of 200 steelhead trout were sampled on their upstream migration past the Toboggan Creek counting fence (Table I). The first fish was captured on April 26, which is consistent with other years' results, and the last upstream migrant was handled on May 22, 1995. Female steelhead made up 45.0 % of the fish handled, with the majority of these seen during the later stages of the migration. Six of the steelhead sampled had clipped adipose fins, which identified them as hatchery-produced fish. 6/200 = 3% Hatchery Production

Timing of steelhead migrating upstream past the fence showed one peak in 1995, coinciding with the increasing water flows recorded at a gauge located near the Toboggan Creek Hatchery (Fig. 3), during the week ending May 11, 1995. Had the fence panels remained in place for the 36 hour period during the week ending May 18 this peak would likely have been extended.

Steelhead kelts holding upstream of the counting fence were first observed beginning on May 22nd and on May 24th a total of 37 kelts were sampled and placed downstream of the fence. A total of 125 steelhead were sampled during their downstream migration as kelts (Table II), male fish accounted for 58.4 % of this total. All steelhead kelts were scrutinized for tags and operculum punches, of these 81 had been marked during the upstream migration past the fence. Of the 81 steelhead which were determined to have been anchor tagged only three had lost their tags during spawning, less than a 4.0 % loss rate.

In total, 244 different steelhead trout were sampled between April 26 and June 5, 1995 (Table III), with 54.0 % of these being males. Adipose clips made up 3.3 % of the fish sampled, with three of these being female and five being male.

Table I. Summary of upstream migrating steelhead spawners put through the Toboggan Creek counting fence, in spring of 1995.

DATE (1995)	MALE	FEMALE	TOTAL COUNT	ADIPOSE CLIPS
Apr 26	1	0	1	
Apr 30	6	2	8	
May 01	11	6	17	1 male
May 02	2	4	6	1 female
May 05	12	8	20	
May 06	12	6	18	
May 07	14	8	22	
May 08	9	2	11	
May 09	22	16	38	1 male/ 2 female
May 10	7	15	22	
May 11	4	3	7	1 male
May 12	1	4	5	
May 13	5	3	8	
May 14	3	13	16	
May 22	1	0	1	
Total Count	110 male	90 female	200 steelhead	3 male / 3 female

Fig. 3 Timing of Steelhead through Toboggan Creek Counting Fence in 1995.

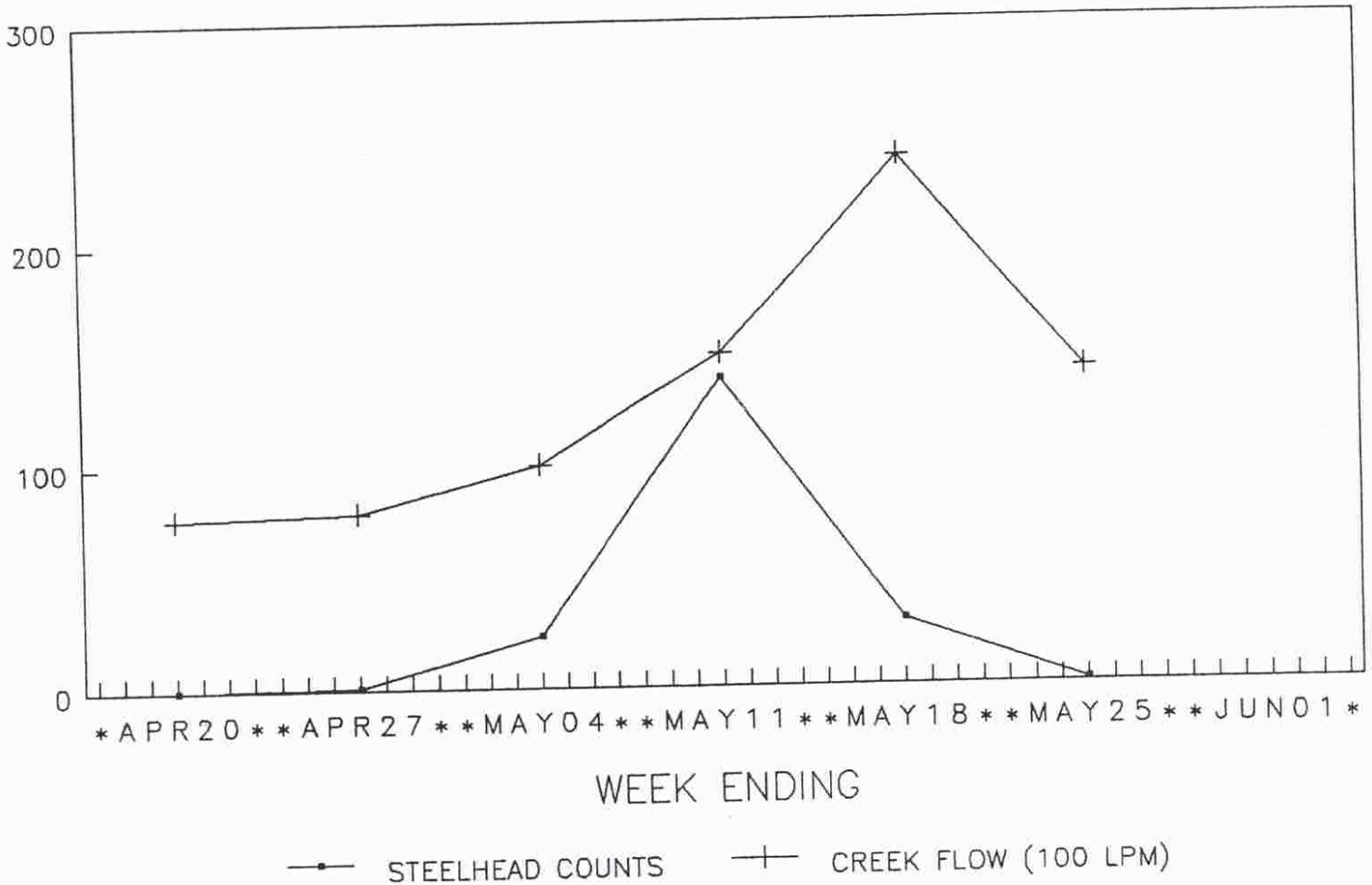


Table II. Summary of downstream migrating steelhead kelts put through the Toboggan Creek counting fence, in spring of 1995.

DATE (1995)	MALE	FEMALE	TOTAL COUNT	FISH PREVIOUSLY MARKED AT FENCE
May 24	18	19	37	28
May 26	7	6	13	9
May 29	23	12	35	22
May 31	17	11	28	16
Jun 05	9	3	12	6
Total Count	74 male	51 female	125 steelhead	81 recaptures

Table III. Summary of all individual steelhead handled during sampling at Toboggan Creek counting fence, in spring of 1995.

DATE (1995)	MALE	FEMALE	TOTAL COUNT	ADIPOSE CLIPS
Apr 26	1	0	1	
Apr 30	6	2	8	
May 01	11	6	17	1 male
May 02	2	4	6	1 female
May 05	12	8	20	
May 06	12	6	18	
May 07	14	8	22	
May 08	9	2	11	
May 09	22	16	38	1 male/ 2 female
May 10	7	15	22	
May 11	4	3	7	1 male
May 12	1	4	5	
May 13	5	3	8	
May 14	3	13	16	
May 22	1	0	1	
May 24	4	5	9	1 male
May 26	3	1	4	
May 29	8	5	13	1 male
May 31	4	8	12	
Jun 05	3	3	6	
Total Count	132 male	112 female	244 steelhead	5 male / 3 female

With the total number of steelhead being marked for the study being 200 fish, the sample for marks being 125 fish, and the number of recaptures observed at 81 fish; the total steelhead spawning escapement was estimated at 305 fish upstream of the counting fence. No estimate of steelhead spawners downstream of the counting fence was made in 1995, due to high turbidity in the lower portions of Toboggan creek during peak spawning. As has been the case in previous studies, many steelhead are presumed to have spawned downstream of the counting fence.

Observations of steelhead spawning upstream of the Toboggan Creek counting fence indicate a marked to unmarked ratio that is higher than the kelt recapture data. Of the 89 steelhead observed spawning 69 (77.5 %) carried anchor tags (Table IV), as compared to 81 (64.8 %) out of 125 fish sampled as kelts. This may be attributed to the fact that some of this visual observation was done prior to the time when the unmarked fish would have been on the redds, those enterring on May 14 to 16 when the fence was laid down due to high water flows.

In addition to the 214 steelhead which we fitted with anchor tags we handled 30 previously tagged steelhead (Table V). The majority of these steelhead, 22 in total, were tagged in the spring of 1995 at the Toboggan Creek-Bulkley River confluence during another study. The fact that only 23 of 63 steelhead handled, during the study at the confluence, were observed at the counting fence this spring indicates the large number of steelhead that may be spawning in Toboggan Creek downstream of the counting fence, and in the mainstem Bulkley River in the vicinity of its confluence with Toboggan Creek.

A total of 215 scale samples were taken from steelhead which were captured during the assessment work carried out in 1995. These scales will be forwarded to the D.F.O. scale lab in Vancouver for analysis.

SUMMARY AND RECOMMENDATIONS

As a result of sampling done in 1995, an escapement estimate of 305 spawners was achieved for the Toboggan Creek steelhead stock spawning upstream of the counting fence. Total numbers of steelhead utilizing Toboggan Creek could be much higher.

The counting fence worked well for both the marking and the recapturing of steelhead in Toboggan Creek in 1995. Work done in 1995 to improve the efficiency of seining steelhead kelts proved to be very beneficial.

Substantial numbers of steelhead appear to be spawning in the lower reaches of Toboggan Creek, and possibly in the Bulkley River mainstem in the vicinity of Toboggan Creek. An accurate estimation of steelhead spawners in these areas should be a priority in future years.

Table IV. Observations made of spawning steelhead upstream of the Toboggan Creek counting fence, during the spring of 1995.

Date	Spaghetti Tagged	Untagged
May 13	8 fish	0 fish
May 16	6 fish	0 fish
May 18	24 fish	7 fish
May 19	19 fish	7 fish
May 21	12 fish	6 fish
Totals	69 fish	20 fish

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Table V. Tagging information from previously tagged steelhead handled at the Toboggan Creek counting fence, spring of 1995.

Tag #	Date Observed	Date and Location of Tagging
S00234	May 06/''95	Sep 13/''93 on Lower Skeena
S00382	*May 09/''95	Apr 30/''93 at Toboggan Fence
S00544	May 29/''95	May 13/''93 at Toboggan Fence
000212	May 24/''95	Sep 16/''94 at Toboggan Fence
S00701	**May 01/''95	Apr 27/''94 at Toboggan Fence
C00063	May 09/''95	Jul 12/''94 in Stat Area 4-13
4076/4100	May 09/''95	Aug 17/''94 in Stat Area 4-09
S01496	May 14/''95	Apr 18/''95 near Trout Creek
S00884	May 10/''95	Apr 17/''95 near Trout Creek
S00886	May 06/''95	Apr 17/''95 near Trout Creek
S00888	May 01/''95	Apr 18/''95 near Trout Creek
S00889	May 11/''95	Apr 18/''95 near Trout Creek
S00891	May 09/''95	Apr 18/''95 near Trout Creek
S00892	May 09/''95	Apr 18/''95 near Trout Creek
N03502	May 02/''95	Apr 18/''95 near Trout Creek
N03506	May 02/''95	Apr 18/''95 near Trout Creek
N03507	May 09/''95	Apr 19/''95 near Trout Creek
N03508	May 09/''95	Apr 19/''95 near Trout Creek
N03510	May 07/''95	Apr 19/''95 near Trout Creek
N03514	May 29/''95	Apr 19/''95 near Trout Creek
N03520	May 01/''95	Apr 20/''95 near Trout Creek
N03523	May 10/''95	Apr 20/''95 near Trout Creek
N03527	May 09/''95	Apr 21/''95 near Trout Creek
N03529	May 07/''95	Apr 21/''95 near Trout Creek
N03533	May 14/''95	Apr 24/''95 near Trout Creek
N03602	May 09/''95	May 01/''95 near Trout Creek
N03604	May 14/''95	May 01/''95 near Trout Creek
N03605	May 07/''95	May 01/''95 near Trout Creek
N03608	May 10/''95	May 02/''95 near Trout Creek
2401PRFVOA	May 24/''95	Date/Location Unknown

* recaptured prior to this on April 19/''95 near Trout Creek
** this steelhead returned for the second year in a row

ACKNOWLEDGEMENTS

Randy Bryce, Mike Jacobs and Bernard Lundy were responsible for the daily operation and maintenance of the counting fence on at least a twice daily basis, Clint Landrock assisted in the evenings and on weekends. Thanks to their willingness to work an everchanging schedule, as dictated by water flows and steelhead movements, the data collected were representative.

Thanks also to Ev Person, a Society Director who volunteered many hours during the kelt sampling; Gord Wadley, who also helped out with kelt sampling; and to the provincial Habitat Conservation Fund for providing the funding for this year's, and last year's steelhead assessment programs.

Also, thanks to Ken and Kelly Landrock, owners of the land on which the counting fence structure is located, for the steady monitorring of the counting fence when it is unattended. As well, Ron Tetreau, a provincial Fisheries Technician, helped in tracking down the tagging locations of previously tagged steelhead recaptured during fence operations.

REFERENCES

Ricker, W.E. 1975. Computation and Interpretation of Biological Statistics of Fish Populations. Bulletin 191. Department of the Environment, Fisheries and Marine Service. 382 p.

APPENDICES

Appendix 1. Upstream migrating steelhead spawners put through the Toboggan Creek counting fence, during the spring of 1995.

DATE (1995)	SEX	LENGTH (INS.)	WEIGHT (LBS.)	TAG # (OR.)	SCALE #
APR 26	M	32.0		N03601	NO SCALES
APR 30	M	32.0		N03626	57298-R1
	M	26.0		N03627	R2
	M	31.0		N03628	R3
	M	33.0		N03629	R4
	F	26.0		N03630	R5
	M	33.0		N03631	57299-R1
	F	29.0		N03632	R2
	M	31.0		N03633	R3
MAY 01	M	34.0		N03634	R4
	M	32.0		*N03520	R5
	F	25.0		N03635	57300-R1
	F	32.0		*S00888	R2
	M	32.0		N03636	R3
	M	33.0		N03637	R4
	F	31.0		N03638	R5
	M(AD)	23.0	5.0	N03639	52472-R1
	M	31.0		N03640	R2
	F	28.0		**S00701	R3
	M	33.0		N03641	R4
	M	29.5		N03642	R5
	M	29.5		N03643	52473-R1
	M	17.5		N03644	R2
	F	26.5		N03645	R3
	M	30.0		N03646	R4
	F	29.5		N03647	R5
MAY 02	F(AD)	28.0	8.5	N03648	57201-R1
	M	31.0		*N03506	R2
	M	34.0		N03649	R3
	F	28.0		*N03502	R4
	F	29.0		N03650	R5
	F	28.0		N03651	57202-R1
MAY 05	M	32.0		N03652	R2
	M	32.0		N03653	R3
	F	27.0		N03654	R4
	M	30.0		N03655	R5
	M	34.0		N03656	57203-R1
	M	30.0		N03657	R2
	M	32.0		N03658	R3
	F	28.0		N03659	R4
	M	30.0		N03660	R5
	M	30.0		N03661	57205-R1
	F	30.0		N03662	R2
	M	35.0		N03663	R3
	F	29.0		N03664	R4
	F	32.0		N03665	R5

Appendix 1. Upstream migrating steelhead spawners put through the Toboggan Creek counting fence, during the spring of 1995.

DATE (1995)	SEX	LENGTH (INS.)	WEIGHT (LBS.)	TAG # (OR.)	SCALE #
MAY 05	F	28.0		N03666	NO SCALES
	F	32.0		N03667	57204-R1
	M	31.0		N03668	R2
	M	25.0		N03669	R3
	F	30.0		N03670	R4
	M	35.0		N03671	R5
MAY 06	M	35.0		N03672	57206-R1
	F	29.5		N03673	R2
	F	29.0		*S00886	R3
	F	27.5		N03674	R4
	M	31.0		N03675	R5
	M	31.5		N03676	52458-R1
	F	32.5		***S00234	NO SCALES
	M	22.5		N03677	52458-R2
	F	32.0		N03678	R3
	F	33.5		N03679	R4
	M	30.0		N03680	R5
	M	28.0		N03681	52459-R1
	M	31.5		N03682	R2
	M	23.0		N03683	R3
	M	31.0		N03684	R4
	M	30.5		N03685	R5
	M	28.5		N03686	52475-R1
	M	23.5		N03687	R2
MAY 07	F	28.0		N03688	R3
	M	29.0		*N03605	R4
	M	33.0		N03689 and N03690	R5
	M	32.5		N03691	52476-R1
	M	33.0		N03692	R2
	M	36.5		N03693	R3
	F	28.0		N03694	R4
	F	31.0		N03695	R5
	F	28.0		N03696	57207-R1
	M	34.0		N03697	R2
	M	29.0		N03698	R3
	F	33.0		N03699	R4
	M	33.0		N03700	R5
	M	29.0		*N03510	57208-R1
	F	34.0		N03701	R2
	M	25.5		N03702	R3
	F	28.0		N03703	R4
	F	28.5		N03704	R5
	M	32.5		N03705	57209-R1
	M	24.5		N03706	R2
	M	29.0		*N03529	R3

Appendix 1. Upstream migrating steelhead spawners put through the Toboggan Creek counting fence, during the spring of 1995.

DATE (1995)	SEX	LENGTH (INS.)	WEIGHT (LBS.)	TAG # (OR.)	SCALE #
MAY 07	M	34.0		N03707	57209-R4
MAY 08	M	32.0		N03708 and N03709	R5
	M	30.5		N03710	57210-R1
	M	32.0		N03711	R2
	M	25.0		N03712	R3
	M	30.0		N03713	R4
	M	34.0		N03714	R5
	M	29.5		N03715	57211-R1
	M	32.0		N03716	R2
	F	33.5		N03717	R3
	F	32.0		N03718	R4
	M	24.0		N03719	R5
MAY 09	M	31.0		N03720	57212-R1
	M	33.0		N03721	R2
	M	32.5		*S00891	R3
	M	30.5		N03722	R4
	M(AD)	31.0	12.0	N03723	R5
	M	28.0		*N03507	57213-R1
	F	32.5		N03724	R2
	F	30.5		N03725	R3
	F	34.0		N03726	R4
	M	29.0		**S00382	R5
	M	26.5		N03727	57214-R1
	F	28.0		N03728	R2
	M	24.0		N03729	R3
	M	29.0		N03730	R4
	M	27.0		*S00892	R5
	M	28.0		*N03508	57215-R1
	M	33.5		N03731	R2
	F	26.0		N03732	R3
	F	30.0		N03733	R4
	F	31.0		*N03527	R5
	F	31.0		N03734	57216-R1
	M	30.0		N03735	NO SCALES
	F(AD)	31.0	11.5	N03736	NO SCALES
	M	34.0		N03737	NO SCALES
	M	27.5		N03738	NO SCALES
	F	22.0		****C00063	NO SCALES
	M	33.0	12.0	N03739	NO SCALES
****RADIO TAGGED FISH - #4100 and 4076 OPERC. TAGS					
	F	25.0		N03740	NO SCALES
	F	30.0		N03741	NO SCALES
	M	30.0		N03742	NO SCALES
	F	30.0		N03744	NO SCALES

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DATE (1995)	SEX	LENGTH (INS.)	WEIGHT (LBS.)	TAG # (OR.)	SCALE #
MAY 09	M	35.0		N03745	NO SCALES
	F	27.0		*N03602	NO SCALES
	F(AD)	30.0	10.5	N03746	NO SCALES
	F	29.0		N03747	NO SCALES
	M	33.0		N03748	NO SCALES
	M	28.0		N03749	NO SCALES
	M	28.5		N03750	NO SCALES
MAY 10	M	31.0		*N03523	57216-R2
	F	29.0		N03751	R3
	F	27.0		N03752	R4
	M	33.0		N03753	R5
	F	23.5		N03754	57217-R1
	M	28.5		N03755	R2
	F	33.0		N03756	R3
	F	31.0		*N03608	R4
	F	34.5		N03758	R5
	M	30.5		N03759	57218-R1
	M	23.0		N03760	R2
	F	29.0		N03761	R3
	F	27.0		N03762	R4
	M	32.0		N03763	R5
	F	32.5		N03764	57219-R1
	M	31.0		N03765	R2
	F	28.5		N03766	R3
	F	30.5		N03767	R4
	F	31.5		N03768	R5
	F	28.5		N03769	57220-R1
	F	31.0		N03770	R2
	F	28.5		*S00884	R3
MAY 11	F	31.5		N03771	R4
	M	31.0		*S00889	R5
	M	32.0		N03772	57221-R1
	M(AD)	28.0	9.0	N03773	R2
	M	34.5		N03774	R3
	F	29.5		N03775	R4
	F	28.0		N03776	R5
MAY 12	F	25.5		N03777	57222-R1
	M	32.0		N03778	R2
	F	26.0		N03779	R3
	F	30.0		N03780	R4
	F	28.0		N03781	R5
MAY 13	M	32.0		N03782	57223-R1
	M	33.0		N03783	R2
	F	30.5		N03784	R3
	F	28.5		N03785	R4
	M	32.0		N03786	R5

Appendix 1. Upstream migrating steelhead spawners put through the Toboggan Creek counting fence, during the spring of 1995.

DATE (1995)	SEX	LENGTH (INS.)	WEIGHT (LBS.)	TAG # (OR.)	SCALE #
MAY 13	M	31.0		N03787	57224-R1
	F	27.0		N03788	R2
	M	32.0		N03789	R3
MAY 14	F	31.0		*N03604	R4
	M	33.0		N03790	R5
			and	N03791	
	M	29.5		N03792	57225-R1
	F	29.0		N03793	R2
	F	32.5		N03794	R3
	F	33.5		N03795	R4
	F	26.5		N03796	R5
	F	27.5		*N03533	57376-R1
	F	31.0		N03797	R2
	F	30.0		*S01496	NO SCALES
	F	28.0		N03798	NO SCALES
	F	30.0		N03799	NO SCALES
	F	27.0		N03800	NO SCALES
	M	32.0		N03801	NO SCALES
	F	28.0		N03802	NO SCALES
	F	32.5		N03803	NO SCALES
MAY 22	M	34.0		N03806	57376-R3

(AD) ADIPOSE-CLIPPED HATCHERY STEELHEAD
* PREVIOUSLY TAGGED DURING ANGLING ASSESSMENT, APR-MAY/'95
** PREVIOUSLY TAGGED AT TOBOGGAN CREEK FENCE IN OTHER YEARS
*** PREVIOUSLY TAGGED IN LOWER SKEENA RIVER, SEPT. 13, 1993
**** PREVIOUSLY TAGGED IN STATISTICAL AREA 4, NEAR PR. RUPERT

Appendix 2. Downstream migrating steelhead kelts put through the Toboggan Creek counting fence, during the spring of 1995.

DATE (1995)	SEX	LENGTH (INS.)	TAGGED/ PUNCHED	TAG # (OR.)	SCALE #
MAY 24	M	32.0	Y/Y	N03636	*
	M	34.0	Y/Y	N03806	*
	M	35.0	Y/Y	N03672	*
	M	31.0	Y/Y	N03640	*
	F	28.0	Y/Y	N03798	*
	F	28.0	Y/Y	N03703	*
	F	26.0	Y/Y	N03779	*
	F	26.0	Y/Y	N03696	*
	M	34.5	Y/Y	N03774	*
	F	32.5	Y/Y	N03694	*
	M	34.0	Y/Y	N03649	*
	F	28.0	Y/Y	N03781	*
	M	30.0	Y/Y	N03713	*
	M	28.0	Y/Y	N03749	*
	F	30.5	Y/Y	N03767	*
	F	24.0	Y/Y	**000212Y	*
	M	24.0	Y/Y	N03719	*
	F	25.5	Y/Y	N03777	*
	F	28.0	Y/Y	N03728	*
	F	32.0	Y/Y	N03678	*
	F	29.0	Y/Y	N03751	*
	F	29.0	Y/Y	S00886	*
	F	28.0	Y/Y	N03802	*
	F	27.5	Y/Y	N03674	*
	M	32.5	Y/Y	N03691	*
	M	28.5	Y/Y	N03755	*
	M	33.0	Y/Y	N03748	*
	M	31.0	Y/Y	N03633	*
	M	36.0	N/Y	N03812	*
	M	31.0	N/N	N03807	57376-R4
	M(AD)	28.5	N/N	N03808	R5
	M	25.0	N/N	N03809	57377-R1
	F	30.0	N/N	N03810	R2
	-PREVIOUSLY TAGGED BY PRFVOA 2401				
	M	30.0	N/N	N03811	R3
	F	31.5	N/N	N03813	R4
	F	28.0	N/N	N03814	NO SCALES
	F	30.0	N/N	N03815	57377-R5
MAY 26	M	29.5	Y/Y	N03643	*
	F	27.0	Y/Y	N03788	*
	F	31.0	Y/Y	N03797	*
	M	33.0	Y/Y	N03637	*
	M	34.0	Y/Y	N03634	*
	F	28.0	Y/Y	N03776	*
	M	32.5	Y/Y	S00891	*
	F	29.0	Y/Y	N03664	*

Appendix 2. Downstream migrating steelhead kelts put through the Toboggan Creek counting fence, during the spring of 1995.

DATE (1995)	SEX	LENGTH (INS.)	TAGGED/ PUNCHED	TAG # (OR.)	SCALE #
MAY 26	F	28.5	Y/Y	S00884	*
	F	27.0	N/N	N03816	57378-R1
	M	30.0	N/N	N03817	R2
	M	21.5	N/N	N03818	R3
	M	32.0	N/N	N03819	R4
MAY 29	M	30.0	Y/Y	N03660	*
	M	37.0	Y/Y	***N03514	NO SCALES
	M	31.0	Y/Y	N03675	*
	M	34.0	Y/Y	N03737	*
	M	30.0	Y/Y	N03657	*
	M	30.5	Y/Y	N03722	*
	M	34.0	Y/Y	N03697	*
	F	30.0	Y/Y	N03799	*
	F	32.5	Y/Y	N03764	*
	M	23.0	Y/Y	N03683	*
	F	34.0	Y/Y	N03701	*
	M	31.0	Y/Y	N03506	*
	F	31.5	Y/Y	N03768	*
	M	32.0	Y/Y	N03778	*
	F	31.0	Y/Y	N03527	*
	M	32.0	Y/Y	N03652	*
	F(AD)	31.0	Y/Y	N03736	*
	M	29.5	Y/Y	N03642	*
	M	30.5	Y/Y	N03710	*
	F	30.5	Y/Y	N03725	*
	M	30.0	Y/Y	N03661	*
	M	29.0	N/Y	N03821	*
	M	32.0	N/Y	N03826	*
	M	37.0	N/N	NO TAG	NO SCALES
	M(AD)	38.0	N/N	NO TAG	57378-R5
	M	33.0	N/N	NO TAG	57379-R1
	F	28.0	N/N	N03827	57380-R2
	F	32.0	N/N	N03820	57379-R2
	F	30.0	N/N	N03822	R3
	M	22.5	N/N	N03823	R4
	M	33.5	N/N	N03824	R5
	M	29.0	N/N	N03825	57380-R1
	M	25.0	N/N	N03828	R3
	F	27.0	N/N	N03829	R4
	F	31.0	Y/N	****S00544	R5
MAY 31	M	35.0	Y/Y	N03663	*
	M	33.0	Y/Y	N03721	*
	M	33.0	Y/Y	N03790 and N03791	*
	M	30.5	Y/Y	N03685	*
	M(RT)	33.0	Y/Y	N03739	57383-R5

Appendix 2. Downstream migrating steelhead kelts put through the Toboggan Creek counting fence, during the spring of 1995.

DATE (1995)	SEX	LENGTH (INS.)	TAGGED/ PUNCHED	TAG # (OR.)	SCALE #
MAY 31	M	28.0	Y/Y	N03681	*
	M	31.5	Y/Y	N03676	*
	M	30.0	Y/Y	N03646	*
	M	29.5	Y/Y	N03715	*
	F(AD)	30.0	Y/Y	N03746	57382-R2
	M	31.0	Y/Y	N03765	*
	M	30.5	Y/Y	N03759	*
	F	28.0	Y/Y	N03688	*
	F	33.5	Y/Y	N03795	*
	M	24.0	Y/Y	N03729	*
	M	32.0	Y/Y	N03601	57382-R5
	F	29.0	N/N	N03830	57381-R1
	F	30.0	N/N	N03831	R2
	F	34.0	N/N	N03832	R3
	M	30.5	N/N	N03833	R4
	M	36.0	N/N	N03834	R5
	M	32.5	N/N	N03835	57382-R1
	F	32.0	N/N	N03836	R3
	F	33.0	N/N	N03837	R4
	F	33.0	N/N	N03838	57383-R1
	M	27.0	N/N	N03839	R2
	F	22.5	N/N	N03840	R3
	F	23.0	N/N	N03841	R4
JUN 05	M	32.0	Y/Y	N03786	*
	M	33.0	Y/Y	N03692	*
	M	28.5	Y/Y	N03750	*
	M	30.0	Y/Y	N03735	*
	M	34.5	Y/Y	N03774	*
	M	34.0	Y/Y	N03707	*
	M	29.0	N/N	N03842	57384-R1
	M	25.0	N/N	N03843	R2
	F	27.5	N/N	N03844	R3
	F	31.0	N/N	N03845	R4
	M	25.5	N/N	N03846	R5
	F	28.0	N/N	N03847	NO SCALES

(AD) ADIPOSE-CLIPPED HATCHERY STEELHEAD
(RT) RADIO-TAGGED STEELHEAD
* SCALE SAMPLES ALREADY TAKEN DURING THE UPSTREAM SAMPLING
** PREVIOUSLY TAGGED DURING COHO FENCE COUNT, SEPT. 16/'94
*** PREVIOUSLY TAGGED DURING ANGLING ASSESSMENT, APR. 19/'95
**** REPEAT SPAWNER, TAGGED ON MAY 13, 1993 AT TOBOGGAN FENCE