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SUSKWA RIVER STEELHEAD:
1982 COLONIZATION OF THE
CPYJ c. 1 mm SMITHERS

SUSKWA RIVER STEELHEAD:
1982 COLONIZATION OF THE
UPPER HAROLD PRICE WITH
STEELHEAD FRY.

BY
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BRITISH COLUMBIA FISH AND WILDLIFE
BRANCH
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INTRODUCTION

Since 1978, the Fish and Wildlife Branch has been conducting a steelhead enhancement project to colonize Harold Price Creek above the Harold Price Falls with steelhead fry (Fig. 1). This project was designed to increase the number of adult steelhead returning to the Suskwa system, thereby improving steelhead angling in the lower Bulkley and Suskwa Rivers (Chudyk, 1979).

The fry requirements for the 1982 stocking of the upper Harold Price were estimated to be 350,000 fry (Yawarski, 1982). However, this target was reduced to 100,000 because there was a poor return or escapement of steelhead for the summer of 1981, and also this was a pilot year for holding adult brood stock in the isolation box system.

METHODS

Adult Captures

Three methods were used to collect brood stock. Angling, set netting and drift netting.

The set net involved anchoring one end of a 4 inch mesh (stretched) gill net directly off the mouth of the Suskwa and holding on to the other end of the float and lead lines on shore. When a fish swam into the net, the person holding on to the lines could feel it. Then two people in a boat would work their way along the net to the fish, remove it from the net and put it in a garbage bucket and take it to a holding or transport tank.

Drift netting entailed drifting the four inch mesh (stretched) gill net with the current between two boats or one boat and someone on shore. Any fish caught would either be seen or felt and then be removed from the net immediately and taken to a holding or transport tank.

Scale samples were taken from all fish captured. Life histories were recorded and compared with previous samples (Appendices).

Transporting and Holding Adults

Once the fish were captured, they were taken from the capture site (usually in plastic garbage buckets) to a truck fitted with a 150 gallon fiberglass tank (Fig. 2). The tank was filled with water from the holding facilities at Evelyn Station (Fig. 3). Once the fish were placed in the tank, oxygen was bubbled through the water to insure adequate oxygenation of the water during transport. The fish were then hauled to the holding facility and placed in isolation boxes. (Fig. 4).

The holding facilities consisted of two banks of eight compartments constructed of 10 and 16 gauge aluminum 121.9 cm x 61 cm x 243.8 cm. Individual compartments were 30.5 cm x 121.9 cm x 61 cm with separate water inlets, outlets and lids. Water temperatures of the collection sites and the holding facility were monitored during the collection and holding of the brood stock. Any fungal growth on the adults during holding was treated with malachite.

Spawning

The fish were checked for ripeness once or twice a week (Fig. 5). Upon finding a ripe female, hatchery personnel would spawn the fish.

The eggs were fertilized, treated with Galamycien, sealed in an insulated water jug and sent to the Fraser Valley Trout Hatchery via Pacific Western Airline.

Most of the females were air spawned, that is once they were ripe, they were anesthetised using 2-Phenoxy and then a hypodermic needle was inserted into the body cavity through which compressed oxygen was blown, pressurizing the body cavity and venting the eggs (Fig. 6 & 7).

Three females were killed for disease analysis so they were incision spawned. The rest were released.

Rearing and Release

The fry were hatched, reared and marked (right maxillary clip) at the Fraser Valley Trout Hatchery. In September the fry were transported via tank trucks to the upper Harold Price watershed where regional and hatchery staff seeded the fry using buckets and a helicopter (Fig. 8).

RESULTS

Twenty-eight steelhead were captured using the angling, set and drift netting techniques (Tables 1 and 2). Twenty were kept for brood stock of which seven were males and thirteen were females. Of the eight not kept, one female was a hooking mortality and the other seven were males tagged and released at the point of capture. From the twenty that were kept, one male was a holding mortality and one female had not

TABLE 1

SUSKWA BROOD STOCK COLLECTION 1982

Date 1982	Method	Location	Sex	Comments
April 13	Angling	Mouth of Suskwa	M	
" 15	Angling	Mouth of Suskwa	M	
" 15	Angling	Mouth of Suskwa	M	Holding Mortality
" 16	Angling	Mouth of Suskwa	F	
" 16	Angling	Mouth of Suskwa	F	
" 16	Angling	Mouth of Suskwa	F	Hooking Mortality
" 17	Angling	Mouth of Suskwa	F	
" 28	Drift net	Above Suskwa Bridge	M	
" 30	Drift net	Above Suskwa Bridge	M	
" 30	Drift net	Above Suskwa Bridge	F	
May 3	Set net	Mouth of Suskwa	M	
" 4	Set net	Mouth of Suskwa	F	
" 4	Set net	Mouth of Suskwa	F	
" 4	Set net	Mouth of Suskwa	M	
" 4	Set net	Mouth of Suskwa	M	Tagged & released
" 5	Set net	Mouth of Suskwa	M	Tagged & released
" 5	Set net	Mouth of Suskwa	F	
" 6	Set net	Mouth of Suskwa	M	Tagged & released
" 6	Set net	Mouth of Suskwa	M	Tagged & released
" 6	Drift net	Mouth of Suskwa	M	Tagged & released
" 6	Drift net	Mouth of Suskwa	M	Tagged & released
" 6	Drift net	Mouth of Suskwa	F	
" 6	Drift net	Mouth of Suskwa	F	
" 6	Drift net	Mouth of Suskwa	F	
" 7	Drift net	Mouth of Suskwa	F	Fresh scar on one side
" 7	Drift net	Mouth of Suskwa	F	
" 10	Drift net	Mouth of Suskwa	F	
" 10	Drift net	Mouth of Suskwa	M	Tagged & released

TABLE 2

BROOD STOCK CAPTURE METHOD AND SUCCESS

METHOD OF COLLECTION	MAN DAYS USED	# of FISH CAUGHT	% OF TOTAL CATCH	CATCH/ MAN DAY
Angling	20	7	25	.35
Set Net	11	9	32	.82
Drift Net	16	12	43	.75
Total	47	28	100	—

ripened by the time we terminated the egg take. The total number of fish used for the egg take was eighteen (six males and twelve females) (Table 3).

The number of eggs produced was approximately 60,000. After hatching and rearing the total number of fry produced for liberation was 48,312. Because the egg take was spread out over thirty-nine days, the fry were graded into two size classes of 1.5 and 2.3 grams.

The 1.5 gram fry (15,504 fish) were seeded at five sites above the upper bridge on Harold Price Creek. The 2.3 gram fry (32,808 fish) were planted at nine sites on Blunt Creek and one site below the confluence of Blunt and Harold Price Creek on September the 8th (Fig. 9).

TABLE 3

1982 SUSKWA BROOD STOCK SPAWNING INFORMATION

Date Spawned	Sex	Length (mm)	Tag # (Yellow)	Comments
----	M	914	----	Holding mortality April 23/82
May 22	F	826	00090	Released June 4
"	F	889	00091	Released June 4
"	F	864	00092	Spawning mortality
"	F	787	00094	Released June 4
May 25	F	787	00093	Released June 4
June 3	F	889	00095	Released June 4
"	F	775	00096-97	Released June 4
June 10	F	851	00098	Released June 18
"	F	927	00099	Killed
"	F	838	00100	Killed - scar on side
"	M	650	00070	Killed
"	M	800	00071	Killed
June 17	F	787	00072	Released June 18
June 29	M	978	00073	Released June 29
"	M	991	00074	Released June 29
"	M	940	00075	Released June 29
"	M	978	00076	Released June 29
"	F	762	00077	Released June 29
----	F	800	00078	Released un-spawned

DISCUSSION

The average fecundity of steelhead in the Skeena system is approximately 7,000 eggs/female (Wilkman, 1979). We expect to produce four to five thousand fry per female. This reduced figure is due to the loss of eggs using the express method of spawning and there is usually an 18% egg to fry loss whenever the eggs are shipped due to shock from handling and transport (M. MacDonald pers. comm.). Our initial target of 100,000 fry therefore required twenty four females and six males. The number of brood stock collected was less than this target because there did not seem to be many fish around, and it was feared that taking too many Suskwa fish to colonize the Harold Price would leave the lower Suskwa inadequately stocked.

The collection of brood stock was difficult because of the snow and ice conditions which prevailed. Collection sites at the mouth of the Suskwa and the Suskwa Canyon are downstream of two major slumping banks which muddied the rivers before the ice was off. These conditions made netting the most productive method of brood stock collection.

All the brood stock was captured in the Bulkley River off the mouth of the Suskwa because our efforts to collect brood stock in the Suskwa were fruitless. We were certain we were collecting Suskwa stock because a radio tagging study done by the Fish and Wildlife Branch in 1979 (Lough, 1980) indicated that Suskwa fish winter in the areas we did our collection.

The holding and spawning of the fish went well. One holding mortality resulted when a leaf plugged the intake to one of the compartments. This hazard was remedied by screening the water. Except for the ones that were kept for disease analysis all fish were released in fairly good shape.

The areas that could be seeded were outlined in a report of a recent habitat assessment of the Harold Price (Yawarski, 1982). Since we had fewer than the recommended number of fry, the fry were planted in the optimum sites outlined in Yawarski's report. The fry were spread out as much as possible upon release because natural dispersal of introduced fry is poor (Parkinson M.S., 1978).

The fry were marked (with the rare exception of undersized fish) with a right maxillary clip to aid in monitoring the growth and survival of the fry in the natural habitat.

SUMMARY

1. Twenty eight Suskwa steelhead were collected from the mouth of the Suskwa between April 13 and May 10 using angling and netting techniques.
2. Twelve females and six males were used for the egg take between May 22 and June 29.
3. The Isolation box method of holding steelhead worked well.
4. After being hatched and raised in the Fraser Valley Trout Hatchery, 48,312 marked fry were planted in the upper Harold Price Creek on September 8.

REFERENCES AND LITERATURE CITED

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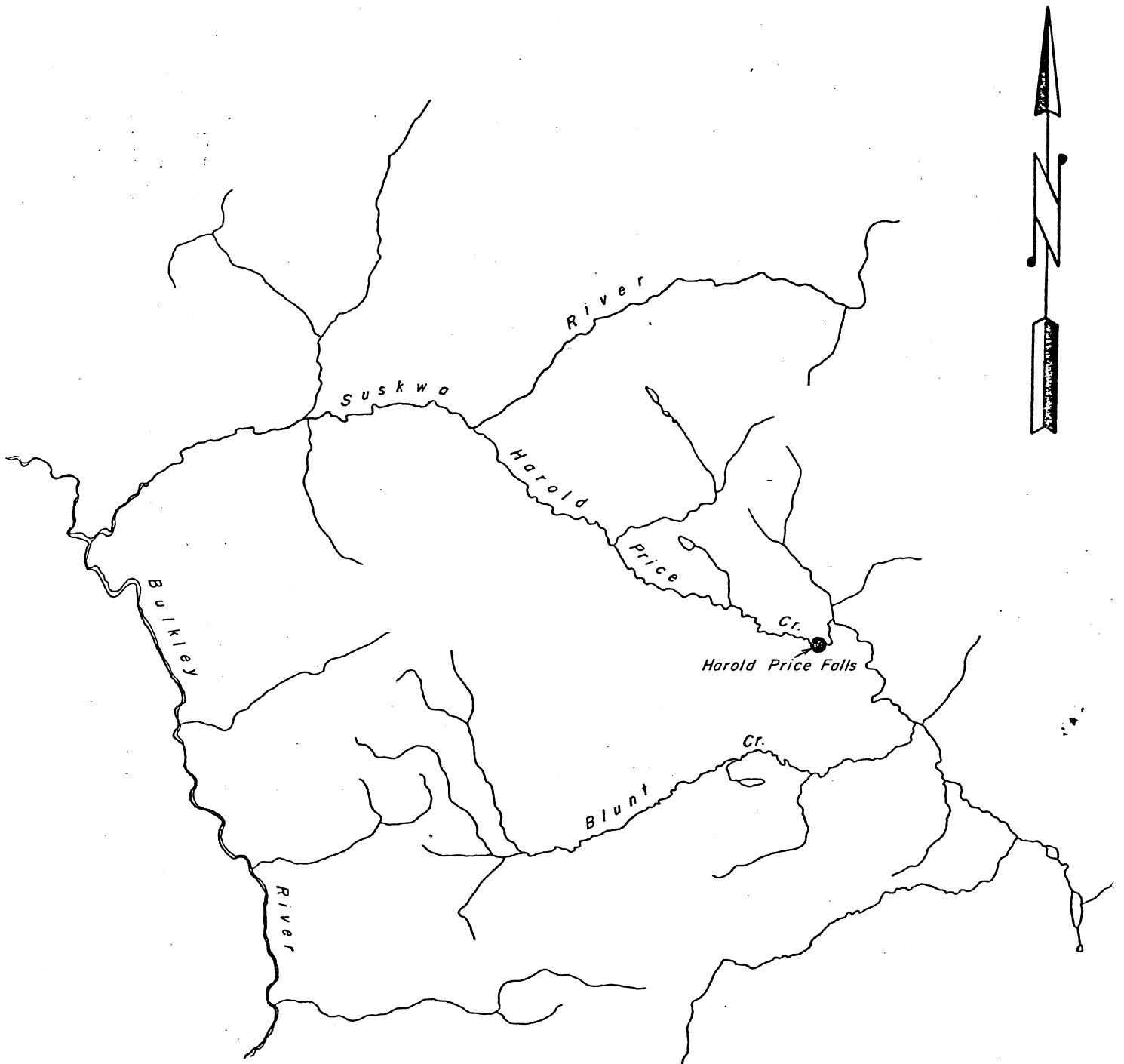


Fig. 1 Location of Harold Price Falls

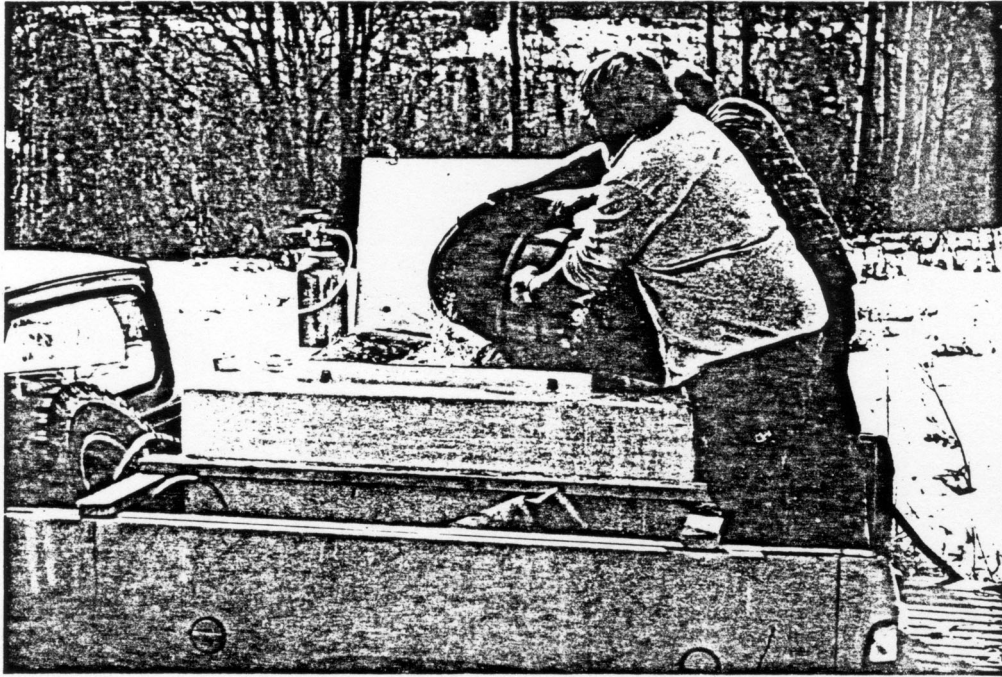


Fig. 2 Putting fish in transport tank

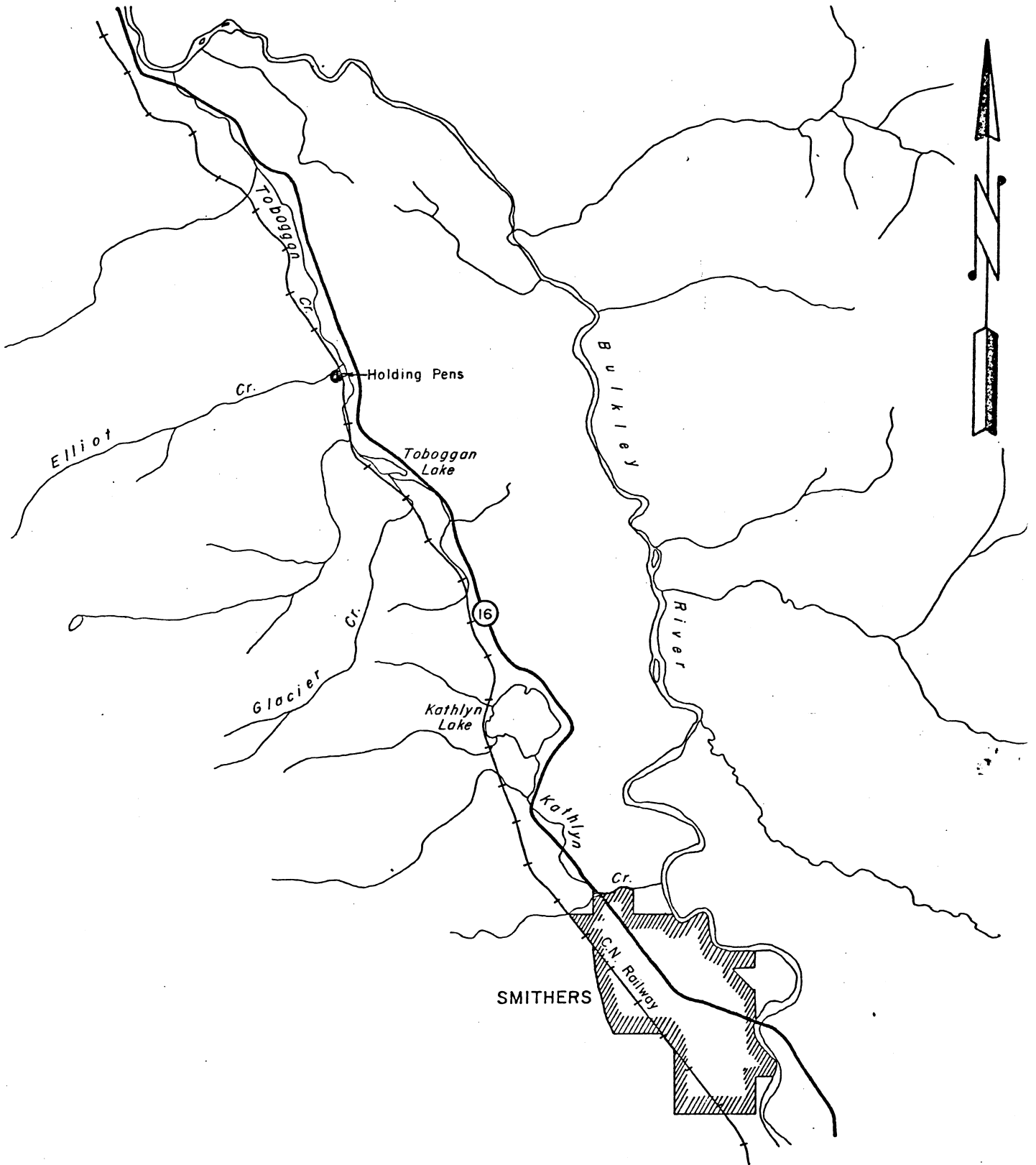


Fig. 3 Location of adult steelhead holding facilities

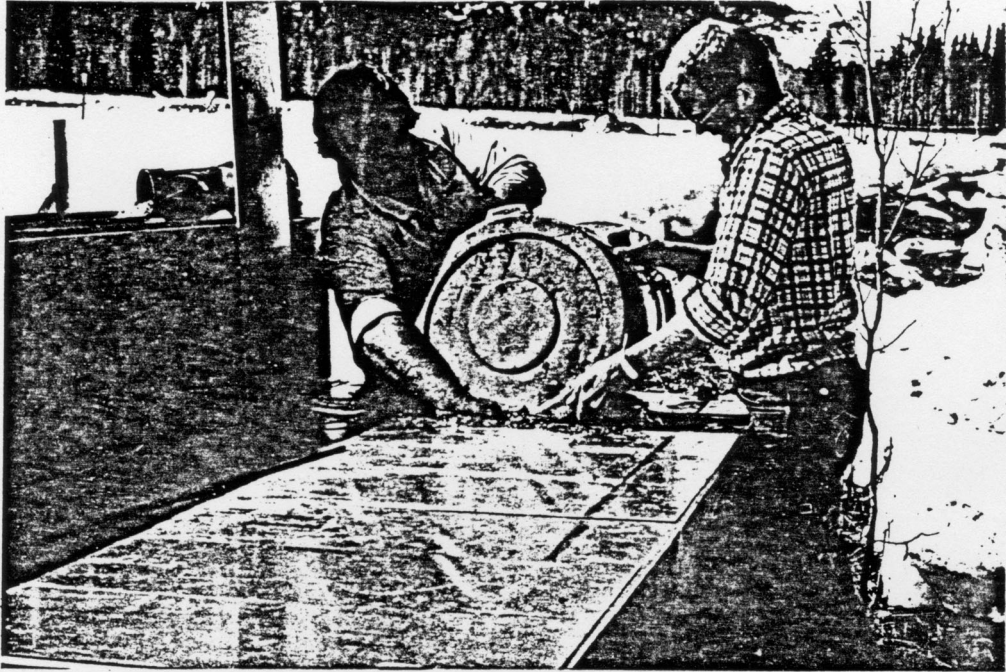


Fig. 4 Adult holding facility

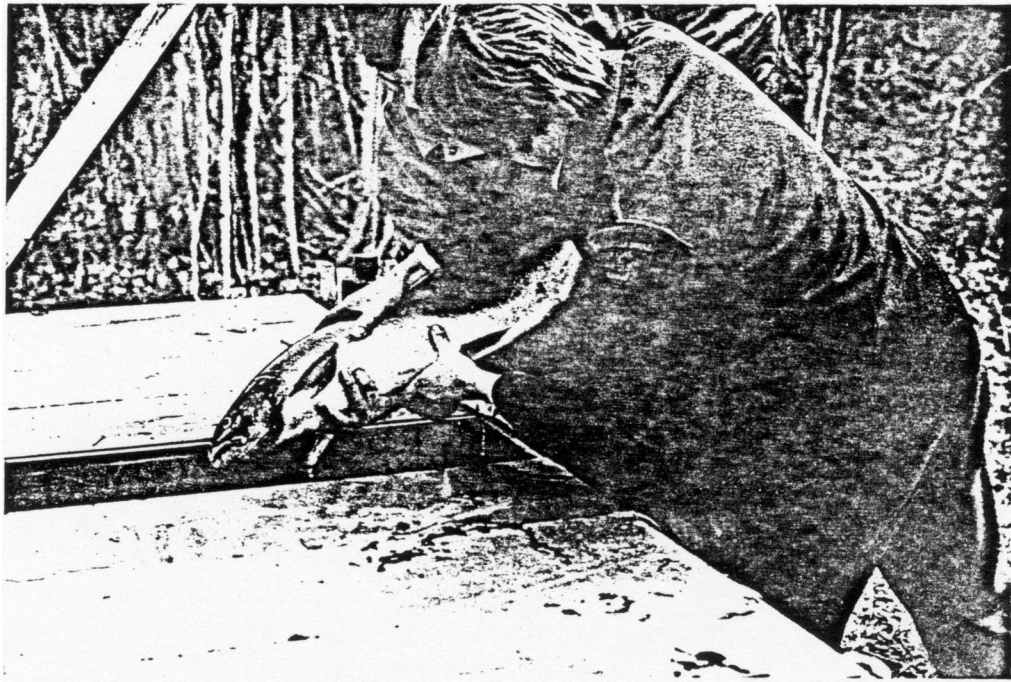


Fig. 5 Checking fish for ripeness



Fig. 6 Spawning equipment



Fig. 7 Spawning a fish

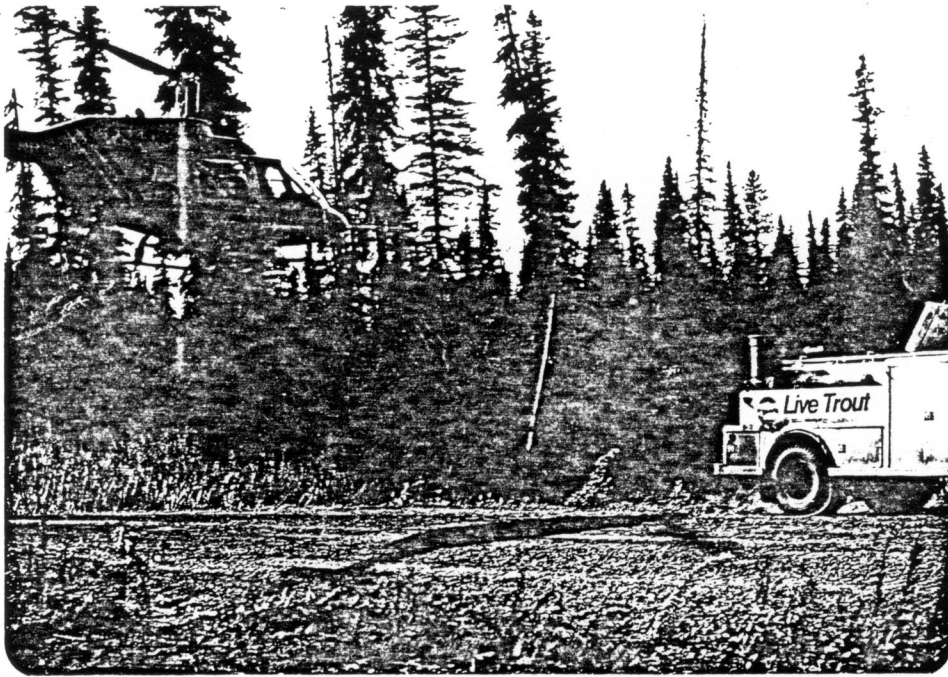


Fig. 8 Fry release on Upper Harold Price

APPENDICES

APPENDIX 1

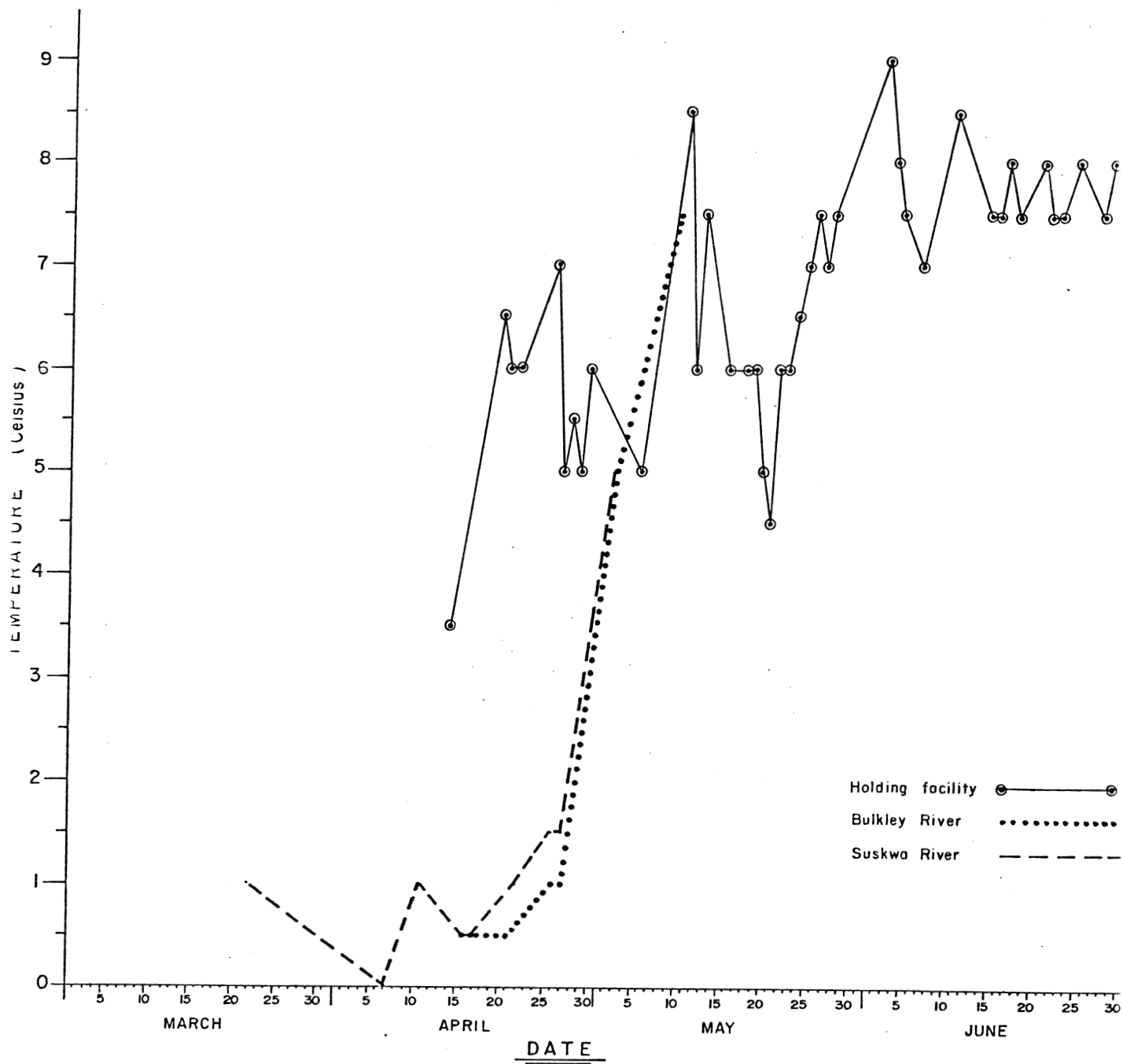
AGE OF SUSKWA STEELHEAD BROOD STOCK - 1982

Age Group	Number of Steelhead	Male	Female	Percent
3.1+	3	3		11
4.1+	1	1		4
R.2+	1		1	4
3.2+	5	2	3	18
4.2+	9	4	5	33
3.3+	2	1	1	7
4.3+	1	1		4
3.1S1+	3		3	11
3.1S1S1+	1		1	4
4.2S1+	1		1	4
10	27	12	15	100

APPENDIX 2

COMPARISON OF AGES OF SUSKWA BROOD STOCK FOR 1977, 1979 AND 1982.

Ocean Age	1977		1979		1982	
	(N)	%	(N)	%	(N)	%
Repeat Spawners (%)	(1)	4	(1)	6	(5)	18
One ocean fish (%)	(0)	0	(2)	13	(4)	15
Two ocean fish (%)	(17)	65	(12)	75	(15)	56
Three ocean fish (%)	(8)	31	(1)	6	(3)	11
	(26)	100	(16)	100	(27)	100



APPENDIX 3

Water temperature of the Bulkley River, Suskwa River
and the Steelhead holding pens
(1982)