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Arctic Char Stream Enhancement

TASIUJAALUK INSPECTION
1987

Kuujjuaq Research Centre
Makivik Corporation

1988

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Arctic Char Stream Enhancement

TASIUJAALUK INSPECTION 1987

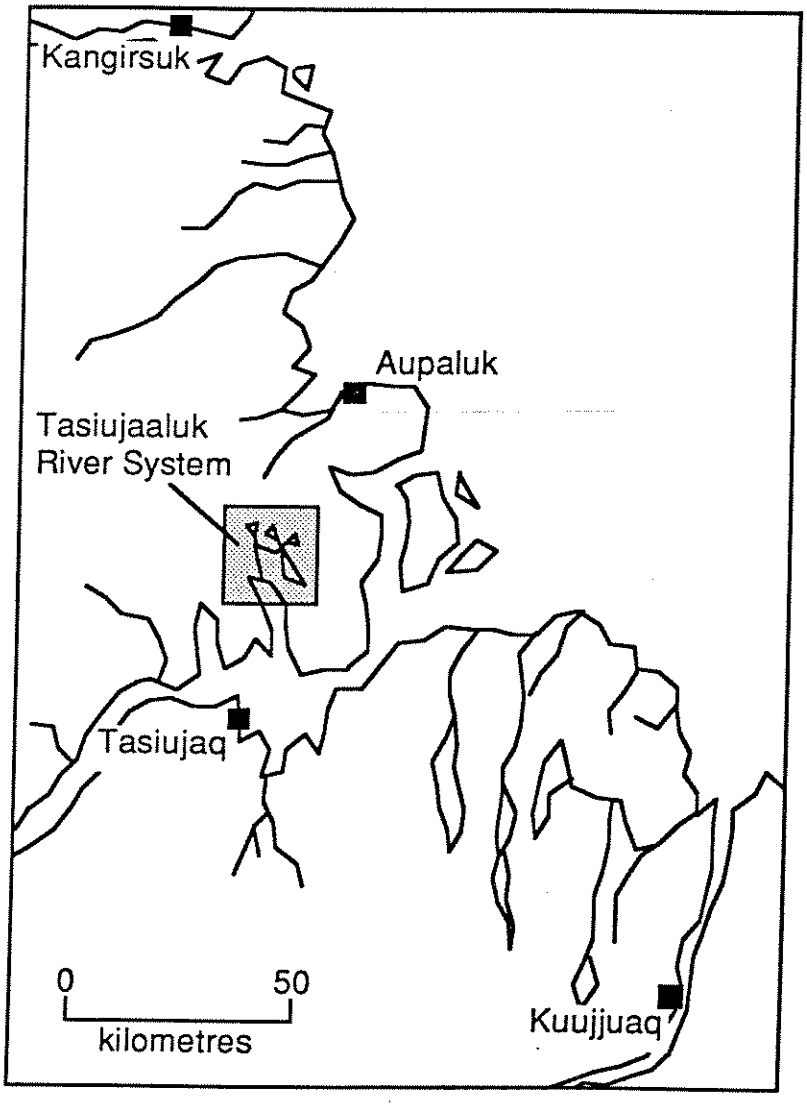
Introduction

In 1984, the Makivik Research Department surveyed a number of Arctic char rivers in Southern Ungava in order to identify places where fish have a problem migrating up to their spawning areas. From hunter interviews, ground surveys and aereal photo interpretation, the main problem rivers were identified. In 1986, the Anguvigaq General Assembly selected Tasiujaaluk and Qingaujaq (Aupaluk) as the first systems to be worked on. Where as time and money restrictions allowed only an inspection to be done at Qingaujaq, remedial work was conducted at Tasiujaaluk.

Tasiujaaluk: River System Discription

Tasiujaaluk is a char system shared between residents of Tasiujaq and Aupaluk. It is situated at the bottom of a long tidal bay. Rock bars create a serie of salt water lakes at its mouth. The tide goes over the last bar only at the peak of its cycle so that char can enter the river only during the highest tides. Three lakes are used by char for spawning and overwintering. The junction of these lakes is approximately 1 1/2 mile from the sea.

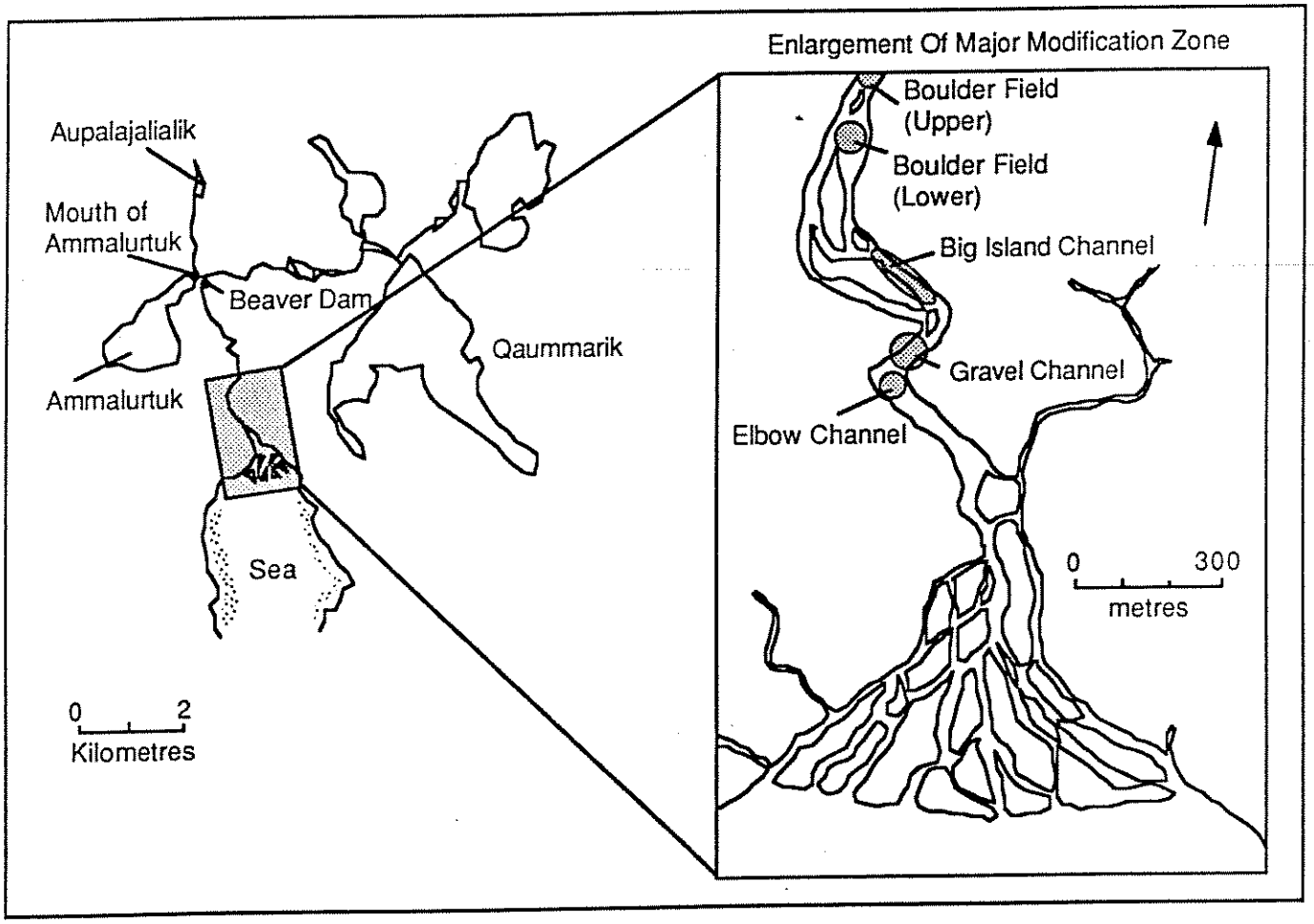
Tasiujaaluk is a narrow (20 to 70 feet) stream consisting mainly in small rocks and gravel channel, occasionally going through boulder fields.



Review of work done in 1986

During the first week of August a team of workers from Aupaluk, Tasiujaq and the Makivik Research Department gathered at Tasiujaaluk. They inspected the system between the river mouth and the outflows of Ammalurtuk and Qaummanik. The river section between Ammalurtuk and Aupalajaliavik was not inspected. They found that the major obstructions to char migration were situated in the lower 1.5 kilometer of the river (close to the sea) except for a beaver dam situated just down river from the upper fork.

The following map shows the areas where modifications were done in 1986:



The beaver dam was dismantled and two beavers were shot. The outflow of Ammalurtuk was cleared to facilitate the access of fish to the lake on a dry year. In the lower portion of the system, the problems encountered by char migration were diverse; mainly water getting "lost" through two large boulder fields and wide gravel bars with very low water levels. For the two boulder fields, diversion walls were build with large rocks to reduce water losses through side streams and a main channel was created down through the field. For the gravel and other low water level areas, channels were deepened by removing rocks out the stream or moving gravel to the sides.

Inspection of Tasiujaaluk in 1987

During the last week of August, (at the peak of the new moon tide cycle), a field crew surveyed the Tasiujaaluk river system. The purpose of this visit was to look at the condition of the modifications done in 1986 and to fix the stream in places where the char was beleived to have problems passing through. The entire length of the system between the river mouth, Ammalurtuk and Aupalajalialik was inspected.

It was found that certain modifications done in 1986 has been dismantled by the ice break-up and the early summer currents where as others were still in function. Because of the heavy rains in August the stream level was very high and quite suitable for fish to access both lakes. Only the entrance of the lower boulder field needed some corrections. However the mouth of Aupalajalialik might need some clearing on a very dry year.

The table below gives a review of the major modifications done in 1986 and their state during the 1987 inspection.

SITE	1986 MODIFICATIONS	1987 INSPECTION and CORRECTIONS
Mouth of Aupalajalialik	- None	- Deepest spot approx. 12" inches - Might need minor work in a very dry year
Higher Boulder Field	- Diversion wall constructed with rocks and retention steel wire (35 feet long)	- Wall completely gone - Wire still tight, willows tangled in it - Good channel for fish migration
Lower boulder field	- Diversion wall constructed with rocks and retention wire (50 feet long) - Channel and pools created down through the boulder field	- Wall completely gone - Wire loose by 2 feet - Channel still existing only in some sectins but most of it was partially or completely filled in. - Boulder field entrance is a small rock and gravel bar with water running through in 18 - 20 small channels. - Minor rock removal in the largest 3 of these channels
Big island channel	- Rock removal to deepen the channel near shore	- Channel still deepest (deepest point=24" inches). Most current going through that channel
Gravel channel	- Diversion wall constructed (25 feet long) - Channel created through gravel field	- Wall still in good condition - Good flow in the channel (deepest point=11" inches) - Upper part of modifications still visible and helping to channel flow - Lower part of channel not visible anymore
Elbow channel	- Rock removal and channel deepened	- Good channel along outside shore

CONCLUSION

There was a very good flow in the river all the way between two of the three lakes (Ammalurtuk and Aupalajaliavik) and the stream mouth. Therefore we beleive there was no problem for fish to migrate to the lakes. We inspected the system at the peak of the new moon tidal cycle when the high tide floods the salt water lakes and fish can access the system. However only three char were seen in the river. Most likely, the majority of the char had already completed their migration by then. This situation is very different from last year when the system had completely dried up in some sections by August 9. At the end of August1986, approximately 100 fish were trapped in various pools as heavy rain in mid-August had swollen the river and allowed fish to move up. The stream was restored to a good flow by late September of that year.

From this years observations, attempts to divert water with loose medium size (12" - 18") rock walls, in locations where current is strong in the spring, is not successful as a durable modification. On the other hand, small water diversion in areas of poor current and deepening existing channels have lasted through the spring and are more promising.

Acknowledgements

Field crew:	Aupaluk;	Charlie Sequaluk Mark Iggyook
	Tasiujak:	Johnny Mosesiapik Bobby Cain Jr. Susie Angnatuk (cook) Arthur Kallak (canoe operator)
	Makivik:	Réjean Dumas

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Recommendations for future work in Tasiujaaluk

Tasiujaaluk displays different types of obstacles to up stream char migration. This makes it an interesting system to study although it is difficult to segragate the different elements of the problem, specifically:

a. Shallow gravel beds evenly spread over the width of the stream

b. Boulder fields through which the water flow gets diffused.

At present, we still need to evaluate the long term durability of the 1986 modifications still standing and see if the fishing success will improve in the wintering lakes. We also need to find diversion wall design which will last longer.

For these reasons we feel that annual activities should be maintained in Tasiujaaluk over the next three summers (1988 - 1990) according to the following recommendations.

1. That Tasiujaaluk be inspected annually between the sea and Aupajalialik by a field crew of 3 men. Their task will be to :

- document the stream condition with special reference to the modifications done earlier.

- do the necessary modifications to improve the stream channel and render suitable for char migration during that given summer.

- if diversion walls are necessary we recommend that gabion baskets be used (blocks made of rocks held in wire mesh cages), since loose boulders do not provide a durable diversion.

- observe char migration in critical areas (especially at the bottom of the lower boulder field) to document the problem experienced by char.

This work should be carried at the beginning of the char migration to best evaluate the potential problem encountered by the char. Since only small modifications should be required, we feel that disturbance to char migration due to the workers present in the stream should not be significent.

2. That the annual monitoring of the fish catch and fishing effort be continued on this system.

3. That the situation in Tasiujaaluk be reevaluated in three years from now (fall 1990) in light of the fishing success documented on the wintering lakes and the migration problems encountered during these years.

4. That we secure the following funding to undertake the above over a three year period (1988-1990)

Stream inspection		5 000
Community meeting		750
Report		500
Harvest monitoring		500
Administration		250
Annual budgets	Year 1:	$7 000
	Year 2: (5% indexation)	$7 280
	Year 3: (5% indexation)	$7 570
Total required (1988 - 1990):		**$21,850**