

# **Travaillant Lake Fish Movement Study 2003**

**GRRB 00546**



**REWARD RRC OR GRRB**

Prepared for  
Gwichya Gwich'in Renewable Resource Council

by

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## Introduction

To effectively manage and protect fish populations, the life history and biology of the fish must be understood. If the biology or life history of an important fish species is unfamiliar, research can be conducted that will help in the understanding of a species. For instance, it is unclear whether broad whitefish from Travaillant Lake are lacustrine (lake-locked), spending the entire lives within the lake; or migratory, in which they may travel long distances to the Mackenzie River. The uncertainty surrounding the migrations or seasonal movements of broad whitefish in Travaillant Lake needs to be addressed. If the life history of broad whitefish from Travaillant Lake involves regular or long migrations, this can result in complications

in the management of this species. If migratory, they may be more susceptible to local fishing pressures, and industrial development, and complications with trans-boundary management issues between settlement regions may arise.

There is local concern that construction of the Mackenzie Valley pipeline will cause irreversible, negative impacts on fish and water quality in the Travaillant Lake system, by potentially adding contaminants, increasing sedimentation and erosion, and increasing access to this otherwise inaccessible lake. This has increased awareness that there is a need to gather preliminary information on the fish resources that inhabit this system before the pipeline goes through. To protect fish populations from potential impacts, we first need to understand the movements and the biology of Travaillant Lake fish; then we need to apply that knowledge to management decisions.

In response to this, the Gwich'in Renewable Resource Board has been conducting a fish movement study on the lake since 2002. Accelerated exploration and development has intensified the need to gather baseline information on the fish resources that inhabit this system before development occurs. This study attempts to determine if fish species (mainly broad whitefish) are migratory or lacustrine (lake-locked) by tagging live fish, and using harvest location of returned tags to determine fish movements. If fish are recaptured in the Mackenzie River, it is conclusive evidence that the fish in Travaillant are not restricted to the Travaillant system, but do travel a long distance to the Mackenzie River. If fish are re-caught within Travaillant Lake, it will increase the understanding of the utilization of this lake by local fish species. Biological information was collected on all fish caught to help us better understand the biology and vital rates of Travaillant Lake fish. This data can then be compared to information collected after proposed development has occurred, to detect and monitor changes in population structure. This report outlines results of the 2003 Travaillant Lake Fish Movement Study.



## Materials and Methods

Fieldwork was conducted from 14-27 July, 18-31 August and 19-23 October, 2003. Fish tagging and biological sampling were performed by GRRB biologist Les Harris with assistance from Tsiigehtchic community members Dan Andre, Thomas Kendo and Barney Natsie, and Tsiigehtchic youth Brian Francis. Fish were captured using 4.5 and 5-inch gill nets set at different locations along the southwest shore of Travaillant Lake ( $67^{\circ}39'50''\text{N}$ ,  $131^{\circ}54'13''\text{W}$ ), and in the Travaillant River ( $67^{\circ}36'29''\text{N}$ ,  $131^{\circ}51'58''\text{W}$ ) during fall spawning.

In July and August, broad whitefish (*Coregonus nasus*) and lake whitefish (*C. clupeaformis*) caught in the nets were tagged using T-bar anchor tags (Floy tags), sampled for biological characteristics (length and weight) and released. Lake trout (*Salvelinus namaycush*), northern pike (*Esox lucius*) and inconnu (*Stenodus leucichthys*) that were caught in the nets were only sampled for biological characteristics, then released. These fish were not tagged as this study focuses on the movements of the whitefish species within the lake. Any fish found dead in the nets were retained and sampled in greater detail for biological characteristics that could only be collected through a lethal analysis. Aging structures (fins or otoliths) were retained from all fish for future analysis. Dry fish was made out of all dead fish if possible.

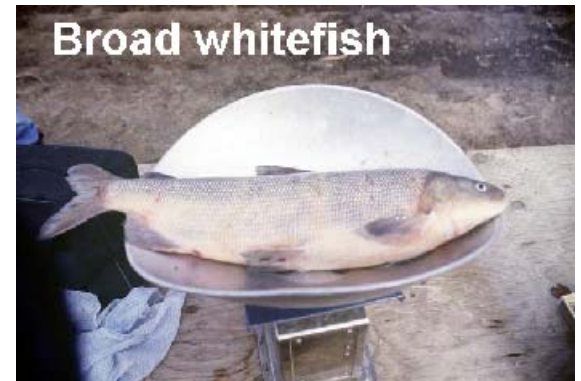
In October, broad whitefish and lake whitefish were collected in the Travaillant River using a 4.5-inch gill net. During October, these species start congregating in preparation to spawn, or they start undergoing their spawning migrations and many samples can be collected over a short duration of time. All samples collected in October were retained and analyzed for length, weight, sex, maturity and gonad weight. Ovaries and testes from mature adults, and stomach and muscle samples from all fish were collected and preserved for future analysis.



## Results

### Whitefish

- total caught = **226**
- number tagged = **134**
- smallest length = **370 mm (14.5 inches)**
- largest length = **645 mm (25.4 inches)**
- average length = **445 mm (17.5 inches)**



### Crooked back

- total caught = **301**
- number tagged = **175**
- smallest length = **350 mm (13.8 inches)**
- largest length = **646 mm (25.4 inches)**
- average length = **436 mm (17.2 inches)**



### Trout

- total caught = **55**
- number tagged = **0**
- smallest length = **550 mm (21.7 inches)**
- largest length = **830 mm (32.7 inches)**
- average length = **673 mm (26.5 inches)**

\* no trout were tagged as this study focuses on the whitefish species of Travaillant Lake.



### Jackfish

- total caught = **60**
- number tagged = **0**
- smallest length = **623 mm (24.5 inches)**
- largest length = **1150 mm (45.3 inches)**
- average length = **929 mm (36.6 inches)**

\* no jackfish were tagged as this study focuses on the whitefish species of Travaillant Lake.



Fishing was most successful in the fall, followed by July and then August. Figure 1 shows the composition of captured fish species from each field season spent at Travaillant Lake, and the total catch composition of 2003.

In 2003, 643 fish were captured and 309 of these fish were tagged. Over the two years of the study, 844 fish have been caught, of which 404 have been tagged. To date, no tag have been reported or returned to the Gwich'in Renewable Resource Board.

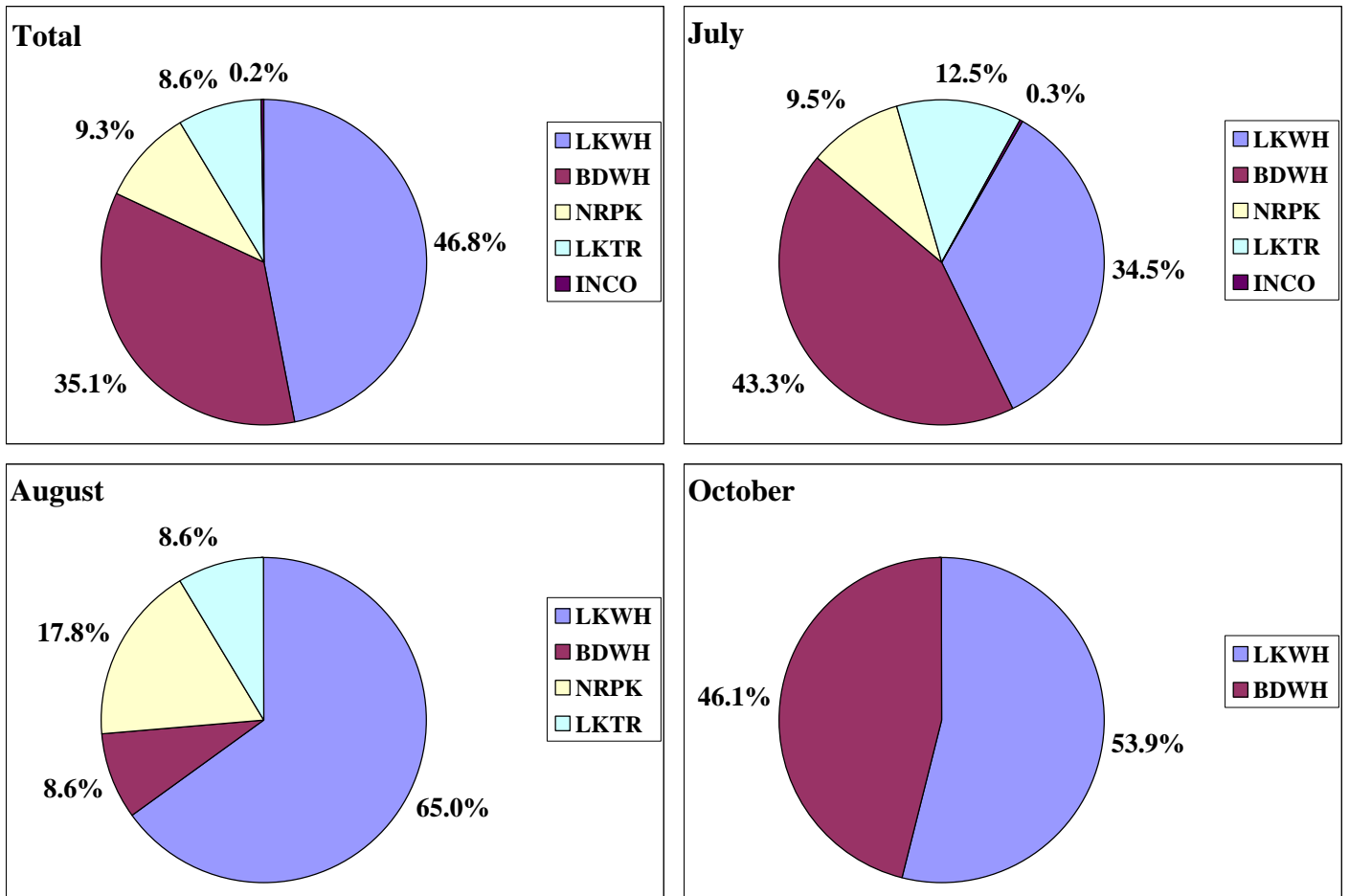


Fig. 1. Composition of captured fish species from Travaillant Lake. (LKWH = lake whitefish, BDWH = broad whitefish, NRPK = northern pike, LKTR = lake trout and INCO = inconnu.)

## What's Next?

Remember, there are still fish out there with tags in them! If anyone catches a fish with a tag in it, please report it to your local RRC or the GRRB. There is a reward of **\$10** for the tag and harvest information, and **\$20** for the whole fish with the tag and harvest information. The return of tags and the harvest information will help us determine if these Travaillant Lake fish are migrating to other areas. Information that should be recorded if a tagged fish is caught includes:

- **where** the fish was caught,
- the **date** the fish was caught,
- the **type** of fish you caught,
- the **tag number**,
- and any **other information** that you would like to share.

The Travaillant Lake Fish Movement Study will continue in 2004, but we propose to modify the study by using radio-telemetry to track the movements of broad whitefish within Travaillant Lake. The best method to determine fish movements within a lake or river is to radio-tag individual fish and monitor/record their movements.

## Acknowledgements

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