

## **World Fisheries Trust**

### **Investigation into fish mortality on the Sao Francisco, September 17 to October 10**

A major mortality occurred in large Surubim (20kg+) in January, 2005. This mortality also occurred in smaller (10kg to 20kg) Surubim in the following months through June, 2005 and also in other species to some degree (data not presented).

### **Report Summary**

#### **Fish Sampling**

A sampling program was organized to sample various fish species in the Sao Francisco river that have been affected by the fish mortality. The sampling took place from September 19 to October 11.

#### **Species sampled:**

Curimba, Pacu, Dourado, Surubim, Pira, Matricha, Pacama

A total of 45 fish were sampled over the 3 week period

A minimum of 5 'healthy fish' from each species were sampled. Fish showing signs of sickness from each species were sampled where possible. (Unfortunately not a large number of 'sick fish' were caught).

All fish were sampled where possible for,

- a. Heavy metal analysis
- b. Pesticide analysis
- c. Bacteriology
- d. Virology
- e. Histology
- f. Parasitology

Samples were taken in triplicate for heavy metal analysis, pesticide analysis (Promoter (Justice Dept.), DFO (Vince and Lisa), and Reserva.

### **Results to date:**

#### **Heavy Metal and Pesticide Analysis:**

No results have been obtained to date for heavy metal and pesticide analysis. Samples were submitted to the Promoter (Justice Dept) on October 13. These samples are being analysed by the Department of Agriculture. Results are expected soon (approximately two weeks).

We are waiting for an export permit to ship samples from Brazil to Alberta for analysis at DFO.

#### **Bacteriology:**

Bacterial cultures considered significant were isolated from three species (Curimba, Pacu, Surubim). The veterinary college has a fish health laboratory that will identify the cultures isolated. Results are expected in approximately two weeks.

#### **Virology:**

We are still searching for a laboratory to do virus analysis

#### **Histology:**

This work is being done in Belo Horizonte at Puc Minas by Dr. Hugo Godinho.

#### **Parasitology:**

This work is being done by Renata Correa at the Correvasse laboratory in Tres Marias.

### **Sampling by DFO (Vince and Lisa)**

Sampling was done on Piau (identified as a possible indicator species). Several sites were sampled including sites in the "kill zone" and sites where pollution enters the Sao Francisco (zinc smelter waste water and sewage treatment).

Waiting for export permit for samples to be shipped to Canada for analysis.

### **Significance of results of testing.**

#### **Heavy Metal Analysis:**

- Presence or absence of heavy metals in several fish species.
- Possible cause of fish mortality.
- Safety of fish to eat (heavy metal levels in muscle)
- Baseline data for database

#### **Pesticide Analysis:**

- Presence or absence of pesticides in several fish species.
- Possible cause of fish mortality.
- Baseline data for database

#### **Bacteriology:**

- Determine if bacterial pathogen involved in mortality.
- Baseline data for database

#### **Virology:**

- Determine if viral pathogen involved in mortality.
- Baseline data for database

#### **Parasitology**

- Determine if parasite(s) contributing to mortality.
- Baseline data for database

### **Transfer of technology to Brazilian groups.**

Part of the project is to be able to transfer technology to Brazilian groups.

While in Brazil I spent time with Renata C (parasitologist at Correvasse) and provided her with some training in bacteriology. I will be corresponding with her by e-mail to provide additional assistance with protocols.

We also identified a laboratory in Belo Horizonte that is interested in taking on the fish health bacteriology work. This new fish health lab is situated at the Veterinary College and is being managed by Dr. Luciene Lima. I will be corresponding with her on an ongoing basis with respect to the identification of the bacterial cultures isolated and possible further involvement

It is planned that someone will go to Alberta from Brazil to train with Vince and Lisa in their lab when the samples are being analysed for heavy metals and pesticides.

### **Conference and University Presentations:**

A presentation was made at a two day conference organized by CIDA in Tres Marias which approximately 200 people attended. The title of the presentation was 'Investigation into the fish mortality on the Sao Francisco'

A presentation was also made to a University class at PUC Minas University.