

# Fish Kill Report

Outlet Channel – Lake Francis to Lake Manitoba – (via Rd 93 N)

June 15, 2012

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## Issue

- Fisheries Branch and Water Science responded to reports of a fish kill near Twin Lakes Beach (Fig 1).
- Several reports from concerned public went to government officials and the media (CBC & CTY)

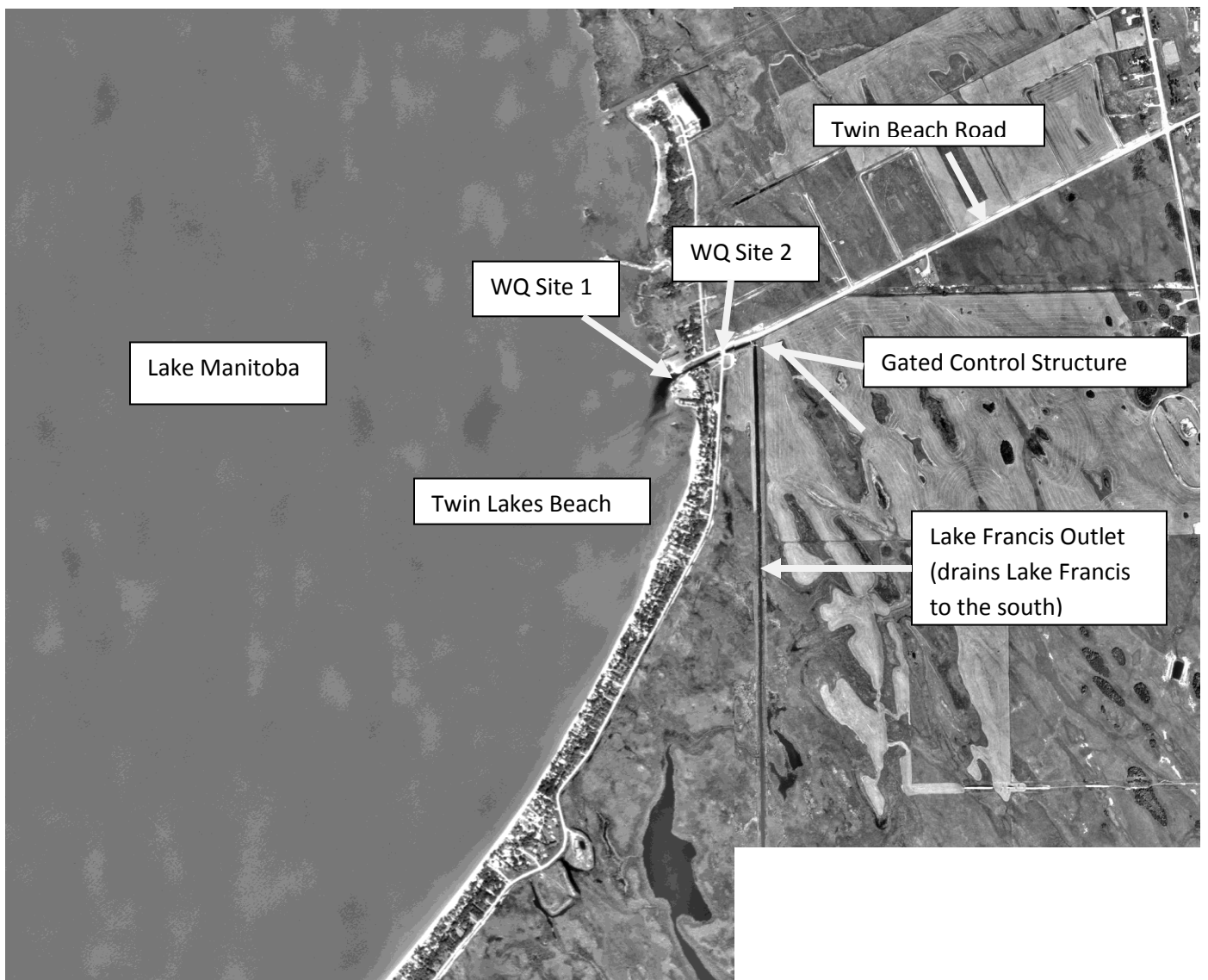


Figure 1

## Observations

- ≈100-300 dead Common Carp (*Cyprinus carpio*) were found downstream (Figs 2-3) of the gated control structure (Fig 4) to mouth of Lake Manitoba.
  - NB these fish presumably are the result of the gates having been opened at 10:30 (see Fig caption 4).
- Similar amounts of dead fish were observed upstream of the control structure. This assemblage was dominated by Common Carp, but also included White Sucker (*Catostomus commersonii*) and Freshwater Drum (*Aplodinotus grunniens*).
- We observed many more live fish in the channel upstream of the gated control structure than dead ones, again dominated by Common Carp. We also live captured a single Fathead Minnow (*Pimephales promelas*). Fisheries Branch staff estimated the channel to be about 1/3 full of live Common Carp.
- The density of live fish appeared to increase and mortalities decreased (Figs 5-6) as we moved upstream. About 200m upstream of the control structure, on-lookers noted what appeared to be a riffle. This phenomenon was in fact the backs of the carp aggregating in dense clusters engaged in spawning behaviour (see Scott and Crossman, 1997 for a description of this behaviour).
- Some of the dead fish showed various signs of stress prior to mortality (Fig. 7-8).
- The fish showed signs of suffocation (grey gills).
- Water Science Management staff were on site and water quality samples (Table 1) taken from 3 locations along the drain (Fig 1) were submitted to ALS (Table 1).
- Fisheries Branch staff collected fish samples for disease testing. Samples collected are provided in Table 2.

**Table 1 – Water quality Parameters measured at Twin Lake Beaches fish kill site – June 15, 2012.**

<u>Parameter</u>	<u>Units</u>	<u>Site 1</u>	<u>Site 2</u>	<u>Site 3</u>
Ammonia, Total (as N)	mg/L	0.083	0.141	0.112
Oxygen, Dissolved	mg/L	2.6	3.4	3.3
E. Coli	CFU/100 ml	120	50	40
Total Suspended Solids	mg/L	12	21	165
BOD	mg/L	2.8	3.4	3.2
Temperature	°C	20.5	19.9	--

**Table 2 – Fish species and number collected for testing by DFO Science by disease.**

<u>Species</u>	<u>No collected</u>	<u>Disease</u>
Common carp	20	KHV; IPN & SVCV *
Freshwater Drum	3	VHS, IPN and SVCV
White Sucker	2	VHS, IPN and SVCV
Fathead Minnow	1	VHS, IPN and SVCV

\*(spring viremia of carp virus)



Fig 2. Dead fish at end of channel as it enters Lake Manitoba and site of water quality station 1.



Fig 3. Dead fish looking up the road side drain towards Twin Lakes Beach road crossing. Water quality station 2 is upstream of the culverts.



Fig 4. Screened gates at the bottom end of a channel that originates from Lake Francis (Lake Francis Outlet). Water Branch staff indicated that the dead fish were backed up against the upstream side of the gates for approximately 5 metres. Gates were opened around 10:30 am to release dead fish to Lake MB and then again around 2:00 pm. This was the site of water quality station 3. Most of the Common Carp, Freshwater Drum, White Sucker and one live Fathead Minnow were collected just upstream of the gated screen or at the crossing to the screens when the screens were opened to release the fish.



Fig 5. Looking upstream from the gated screens, note some dead carp on the surface in the middle and along the sides of the channel.



Fig 6. Note Pelicans fishing in channel.

Figs 7-8. Dead fish just below the crossing to the screened gate. On some fish there was haemorrhaging on the ventral side between pectoral fins and a bulbous inflammation at the vent.



## Conclusion & Discussion

- These fish died as a result of low dissolved oxygen (DO). Although the values reported (Table 1) would not normally be considered lethal concentrations of DO for Common Carp, additional observations were considered in reaching this conclusion:
  - Fish behaviour and water temperature are both indicative that the fish were in the early stages of reproductive processes.
    - Spawning occurs for Common Carp when water temperatures range between 17-26°C.
    - The live fish behaviour matches that described in Scott and Crossman (1997) and Stewart and Watkinson (2007).
  - Heavy concentrations of actively spawning fish will increase fishes' metabolic rate and oxygen demand.
  - High biological oxygen demand (BOD) on the local water column during this activity and at the time of death may have resulted in a localised condition where DO was depressed below the level captured by WQ samples.
  - No other WQ data showed levels that would cause mortality in fish.
  - Although disease testing results are still pending, and a positive test result for KHV would exacerbate individual specimen's susceptibility to stressors, there is little evidence thus far to support this die-off being caused by disease, since:
    - KHV rarely becomes symptomatic below 24°C.
    - Other species of fish were also found dead at the same time and place.