



End to End



The State of the Sturgeon River and the Alberta Water Crisis

A Master's Research Project in partial fulfilment of the requirements for the Masters of
Journalism degree

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Preface

I have vivid memories of canoeing in the Sturgeon when I was young, launching boats from a dock across from St. Albert Place. I was shocked, therefore, when I realized last summer that the dock was gone. I didn't know when it had disappeared; maybe it happened recently, maybe it had been gone for years. All I knew was that a part of my past had vanished before my eyes. What's more, had not an associate pointed out the change to me, I would never have realized it was gone.

That's the trouble with rivers: they're part of the landscape, seemingly eternal, so we don't spot changes in them until after it's already too late. But a wise and informed citizenry, to which I hope this work will contribute, can spot those changes, and can save their rivers.

This work would not have been possible without the support of a small army of researchers, scientists, and ordinary citizens. I thank my family and my professors for their copious advice, and all the people I interviewed for taking time out of their day to answer my many questions, many of who went far beyond the call of duty to dig up answers to them. Especial thanks go to the staff of the *St. Albert Gazette*, who gave this young intern a chance to research and publish this project, and to Mr. Bruce Davidson of Walkerton, Ont., for sharing his experiences.

This work is dedicated to all the people of the Sturgeon — may they use it well.



Kevin Ma
Carleton University, 2006

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Glossary

- aquifer: a pocket of water-bearing rock that easily transmits water to wells and springs, typically composed of sand or gravel. Aquifers are recharged when surface water percolates down through soil into them.
- Atim Creek: stream that feeds into the Sturgeon River and flows past the communities of Stony Plain and Spruce Grove.
- basin: a region of land that drains into a single water body. Sometimes called a “watershed.”
- bio-accumulative: term applied to substances that animals cannot easily break down. These substances build up in body tissue (usually fat) and can remain in animals for a long time. As a result, they accumulate, eventually to toxic levels.
- bio-magnification: a process where a bio-accumulative toxin widely distributed in the environment becomes concentrated in fewer and fewer creatures as it moves up the food chain. Say 10 rats eat 10 units of a poison that becomes lethal if a creature eats 10 units of it. The rats eat one unit each, so they survive, but if a cat then eats those 10 rats, it dies. Similar processes involving the pesticide DDT once drove peregrine falcons to near extinction.
- bitumen: a black, tar-like substance that can be refined into artificial oil. Extracting and refining bitumen requires lots of water.
- BLESS: the Big Lake Environment Support Society, one of the most active environmental groups in the Sturgeon and based in St. Albert.
- Boundary Waters Treaty: agreement signed in 1909 that governs how Canada and the U.S. use several lakes and rivers that cross their shared border. It says that Canada may take no more than three-quarters of the flow in the Milk and St. Mary rivers, both of which flow through Alberta.
- Campylobacter*: a type of bacteria that can contaminate water. Can cause vomiting, fever, and diarrhoea in people.
- consumption/consumed: water diverted for a purpose that prevents that water from returning to that water body any time soon. If you drink a glass of water from a river, you consume the water since you absorb it into your body. If you

pour that glass back into the river, you divert the water without consuming it.

Cows and Fish: an environmental group in Alberta that studies riparian zones and advocates their preservation. It is the only group recognized by the Alberta government as being able to provide technical assessments of the health of a riparian zone, and works closely with Alberta Environment.

dewater: to drain land of water.

diversion/diverted: water re-directed by humans from a water body for a specific purpose. If you dip a glass of water into a river for a drink, you have diverted the water in the glass. Requires a license.

E. coli: abbreviation for *Escheria coli*, a type of bacteria found in manure, uncooked hamburger, and water. Some strains of it can sicken or kill people if ingested. The O157:H7 strain of *E. coli* contaminated a well in the town of Walkerton, Ont., in 2000, killing seven people.

enhanced oil recovery: technique used by the oil industry to extract oil from a well. A well loses pressure as you pump oil out of it, making it more difficult to pump. Enhanced recovery operations pump a substance (either water, nitrogen, or carbon dioxide) into the well to replace the oil, fill the cracks and restore the pressure.

EPCOR: company responsible for freshwater services for most of the Sturgeon.

first-in-time, first-in-right: system of water rights used to distribute scarce water resources in Alberta and other jurisdictions. It specifies that the party who has the oldest water license shall take water from a water body before everyone else. Alternatives to the first-in-right system include riparian rights (“take as much as you like as long as you don’t affect people downstream”) and a water budget (“X party gets Y water for Z activity”).

floodplain: region of land along a river submerged during floods.

flow: measure of the amount of water in a river, typically expressed in cubic meters per second.

Giardia: a parasite that can contaminate water. Can cause diarrhoea and cramps in people.

- in situ* oil recovery: technique used by the oil industry to extract bitumen from oil sands. Some oil sands are too deep underground to dig up. To mine them, oil workers inject steam into the oil sands to melt the bitumen and then pump it out.
- irrigation: the act of diverting water from a natural water body to grow crops in water-scarce areas. Techniques vary from simple open-ditch irrigation (very inefficient) to drip irrigation (very efficient).
- Kilini Creek: stream that flows into the Sturgeon River and past the Onoway Wash Plant.
- leachate: water that percolates through and out of a landfill, picking up a variety of contaminants in the process.
- license: legal authorization to divert water.
- loss: water diverted that leaks, seeps, or evaporates from the diversion system before it can be used. If you dip a glass into a river, and there's a hole in the glass, the water that drains from the hole is lost water.
- Master Agreement of Apportionment: legal agreement signed in 1969, it governs how the western provinces use several rivers that cross their borders. It requires Alberta to take no more than half the natural flow of ten rivers (including the North and South Saskatchewan rivers) that cross its border with Saskatchewan.
- NGO: acronym for non-governmental organization.
- nitrogen: a nutrient for plant growth found in fertilizers, manure, and the environment. Runoff can carry it into lakes and streams, where it can cause explosive plant and algae growth. When those plants die, they suck all the oxygen out of the water, killing other plants and animals.
- North Saskatchewan River: Canadian waterway that starts in the Rocky Mountains and flows east to Saskatchewan, where it joins the South Saskatchewan River. The Sturgeon River is a tributary of this river.
- North Saskatchewan Watershed Alliance (NSWA): an umbrella group established as part of the Water for Life Strategy, consisting of some 182 NGOs, industry groups, governments, and other community organizations. They are the official watershed planning and advisory council for the North Saskatchewan watershed, and are working on a comprehensive management plan for the basin.

- non-point-source pollution: multiple structures, creatures or activities that add small amounts of contaminants to a watershed at many locations, contaminants that, collectively, harms the environment. Example: cows.
- oil sands: sand deposits that contain bitumen.
- Onoway River Valley Conservation Authority (ORVCA): environmental group based in the western Sturgeon that aims to raise awareness of ecological threats to the region's groundwater.
- Ontario Conservation Authorities: watershed-based organizations in Ontario similar to the proposed Watershed Planning and Advisory Councils, except with the power to enforce bylaws and levy fines.
- Provincial Water Advisory Council: appointed body that provides advice to the government on water issues.
- point-source pollution: a single structure, creature or activity that adds vast amounts of contaminants to a watershed at a single location that harms the environment. Example: a waste treatment plant.
- phosphate: a class of chemicals containing phosphorous. Phosphate is the natural form of phosphorous.
- phosphorous: a nutrient for plant growth found in substances like artificial fertilizers and manure. Runoff can carry it into lakes and streams, where it can cause explosive plant and algae growth. When those plants die and decompose, they suck all the oxygen out of the water, killing other plants and animals.
- riparian vegetation/zone: water-hungry plants (typically green) found on the shores of lakes, rivers, and wetlands. A riparian zone contains many such plants and is usually very wet and water-logged. Riparian zones are important sources of food and shelter for many creatures, and maintain the health of waterways by filtering runoff, reducing shore erosion, and storing water.
- runoff: water that flows over a surface. Includes all precipitation and river flow.
- saline water: groundwater containing more than 4,000 milligrams per litre of total dissolved solids. It is unfit for drinking or irrigation.
- sewage: water contaminated by human use or waste, typically flushed or poured down a drain.
- St. Albert Place: building in downtown St. Albert located on banks of Sturgeon River, home to the city government.

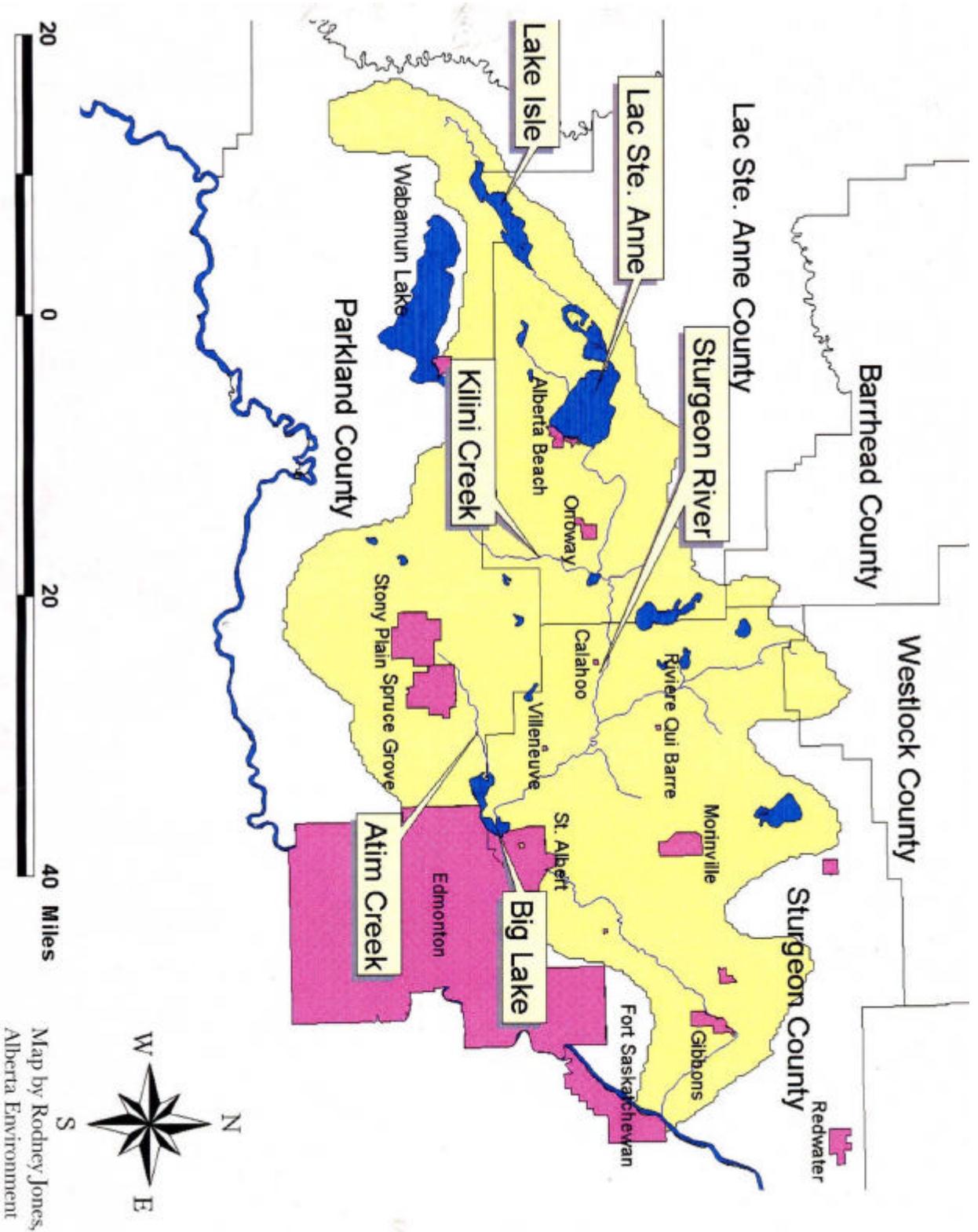
- storm-water: AKA urban runoff. Water that falls from the sky, runs over a populated area, and enters a water body. Note that this includes runoff from a country cottage, but excludes runoff from a farm.
- Sturgeon, the: refers to the Sturgeon watershed, the region of land that drains into the Sturgeon River and its tributaries. Stretches east to west from Fort Saskatchewan to Entwistle and north to south from Rivere Qui Barre to Stony Plain.
- Sturgeon River: refers to the 259-kilometre long stream that flows from Hoople Lake to the North Saskatchewan River.
- Water for Life Strategy: a 10-year plan established by the Alberta government in 2003 to address persistent water shortages and conflicts in the province.
- watershed: a region of land that drains into a single water body. Sometimes called a “basin.”
- watershed management: principle that says people who live within a watershed should live with the water in that watershed instead of getting more from elsewhere, and should co-operate to manage that water for the benefit of all.
- Watershed Planning and Advisory Council (WPAC): organization charged by the Alberta government with the task of creating and promoting a water management plan in a specific basin, which the provincial government will then implement through legislation. They are also responsible for monitoring the state of the watershed and recommending issues to the Provincial Water Advisory Council for further study.
- wetland: area of land where water covers the soil or is present at or near the surface of the soil for most of the year, and feature plants and soils specially adapted to wet conditions. They often store and filter significant amounts of water and provide habitat for many species.

Cast of Characters

- Advisory Committee on Water Use Practice and Policy: official panel struck by the Alberta government in 2003 to make recommendations on the use of water in oil recovery operations.
- Belley, Roger: parks co-ordinator for the City of St. Albert.
- Blodgett, Elke: potter and well-known Sturgeon-area environmentalist.
- Brown, Christine: member of St. Albert city council and economist.
- Boutillier, Guy: Alberta MP and environment minister as of this writing. Succeeded Lorne Taylor.
- Butler, Derril: Reeve of Lac Ste. Anne County.
- Burkhart, Dave: President of the Big Lake Environmental Support Society.
- Davidson, Bruce: vice-chair of the Concerned Walkerton Citizens group, an environmental group based in Walkerton, Ont., dedicated to drinking water safety.
- Ewaschuk, Ernie: spokesperson for the Land Stewardship Centre, which promotes eco-friendly land use.
- Fitch, Lorne: member of Cows and Fish, an environmental group that studies riparian zones in Alberta.
- Hall, Kevin: professor of environmental engineering and head of the Centre for Water and the Environment at Queen's University (Ontario).
- Harrison, Rob: Alberta Environment employee and spokesperson for Water for Life.
- Hingston, Alan: Alberta Environment hydro-geologist responsible for groundwater licensing in the Sturgeon.
- Hittinger, Mike: conservation technician for the Northwest Alliance Conservation Initiative, an Alberta-based NGO that promotes environmentally friendly agricultural practices.
- Hrudey, Steve: professor of public health drinking water quality expert at the University of Alberta.
- Jackson, Leah: environmental consultant for the City of St. Albert (succeeded Derek Richmond in September 2005).
- Lema, Robert: grandfather who has lived on the banks of the

- Sturgeon River outside of St. Albert his whole life.
- Loomis, Stuart: St. Albert environmentalist and retired geomorphologist/landscape historian.
- Northcott, Mike: member of the Onoway River Valley Conservation Authority.
- Postel, Sandra: water scholar and author of several books on the world water crisis.
- Rich, Kate: Alberta Environment employee and spokesperson for Water for Life.
- Richmond, Derek: former environmental consultant for the City of St. Albert. Headed project to add grit interceptors to St. Albert's storm sewers.
- Schindler, David: internationally renowned limnologist and freshwater scientist at the University of Alberta.
- Scott, Tracy: vice-president of the North Saskatchewan Watershed Alliance.
- Skinner, Ian: member of the Onoway River Valley Conservation Authority.
- Smith, Daniel: professor of environmental engineering water quality expert at the University of Alberta.
- Taylor, Lorne: Alberta MP and former environment minister. Created the Water for Life Strategy while in office.
- Thompson, John: former senior economist for Alberta Environment who's advised the government on water licenses and irrigation for 14 years.
- Vickery, B.J.: director of environment and regulatory affairs for Lafarge North America's western Canada operations.
- de Villiers, Marq: Canadian author and writer of the book *Water*.

Map of the Sturgeon Watershed



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