

Hubbles Lake ESA

Environmental Sensitivity: Very High

- Long residence time of water and low oxygen levels make the lake and associated groundwater highly sensitive

Land Status:

- The majority of the land surrounding the lake is privately owned
- The County owns a small piece of land at the southwest corner of the lake

Key features:

- This ESA represents a unique landscape feature containing a deep, spring-fed kettle lake

Management Considerations:

- Much of the drainage basin has been cleared for agriculture and contains residential acreages. The areas adjacent to the shoreline have been developed for permanent residences and recreational resorts. Agricultural runoff and contaminant input from adjacent resorts/residences could eventually deteriorate the water in the lake, since the residence time for water is estimated to be about 100 years. For these reasons, further land clearing and residential development should be restricted in the area.
- Cabin owners need to follow good shoreline protection practices by maintaining a dense vegetated buffer around the lake
- Restrict development around the lake, especially campgrounds, in order to conserve ecological connectivity and habitat characteristics of lakeshore environments

Hubbles Lake ESA

Site Location:

Hubbles Lake is located just south of Highway 16 between Range Roads 13 and 14, a few kilometres west of Stony Plain.

Area: This ESA encompasses an area of approximately 88 ha. Hubbles Lake itself has a surface area of 37 ha, an average depth 7 m, with a maximum depth of over 30 m.

Description:

The Hubbles Lake ESA is comprised of the lake and a 100 m riparian buffer around the lake¹. Hubbles Lake is a deep, clear, small lake situated in the Carvel pitted delta, with a volume of approximately 4.0 million m³. The terrain is rolling to hilly in nature, and the lake is thus very sheltered by topography. There is no defined inlet or outlet, therefore ground water inflow likely contributes the most volume to the lake. The lake bottom is irregularly shaped with four deep holes, two holes being over 30 m deep. Emergent wetland vegetation surrounds much of the shoreline, while upland forest around the lake is primarily aspen and balsam poplar. The effective drainage basin is approximately 136 ha and a peatland is present at the southeast end of the lake. Permanent residences are located along 40% of the shoreline and commercially operated resorts are located in surrounding areas.

Due to the size and shape of the lake, it rarely mixes (turns over), resulting in unusual water quality characteristics and few algae. Hubbles Lake has been identified as mesotrophic, and the water tends to be very clear with Secchi depths of 5 m in mid-summer.

Although the lake supports a local sport fishery, it frequently winterkills, however; Northern pike and yellow perch are present. The clear water and depth make Hubbles Lake a popular destination for scuba divers. In an attempt to improve or create fish habitat, 2,000 old tires were chained together and sunk in the lake in 1967. The success of this venture has not yet been evaluated.

¹ All lake ESAs in the County include a 100 m buffer from the shoreline. This buffered area is not to be interpreted as a development restriction zone, but rather, a precautionary planning zone in which development must be met with extreme care for the conservation of riparian environments.

HUBBLES LAKE ESA

SIGNIFICANCE: Regional

Areas which likely perform a significant function in maintaining regional hydrological functions (e.g., aquifer recharge, water quality, etc)

- Species + Habitats
- Landscape Ecology
- Wetlands
- Landforms
- Groundwater Resources
- Surface Water Resources
- Protected Areas



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Brad Peter, co-ordinator of the Lakewatch program for the Alberta Lake Management Society, helps local volunteers take water quality samples at Hubbles Lake, west of Stony Plain, earlier this month.

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Want to keep your favourite Alberta lake pristine? You've got to do something yourself

Volunteers take control of lake health

BY ALEXANDRA ZABJEK, EDMONTON JOURNAL JULY 26, 2014



Brad Peter, left, and Jackson Woren from the Alberta Lake Management Society do water quality sampling on Hubbles Lake on July 11, 2014.

Photograph by: John Lucas, Edmonton Journal

The pontoon skims slowly across the clear waters of Hubbles Lake.

It is a brilliant July morning just west of Stony Plain. Three Hubbles Lake homeowners, who could be lounging on a dock or beach, are trying to find the lake's deepest point — 27 metres. There they will collect water samples, check temperatures, and record data that could help keep Hubbles Lake pristine for future generations.

But this little lake has its quirks. The deep spot is small and the depths erratic. Boat owner Jody Kyfiuk lets the pontoon drift slightly and the depth finder jumps from eight to 20 metres. Guided by a map detailing the contours of the lake floor, it still takes 20 minutes of inching forward, circling around, and let's-take-a-shot-in-the-dark guesswork before they hit their sweet spot.

The Hubbles group is led by Brad Peter, co-ordinator of the Lakewatch program for the Alberta Lake Management Society (ALMS). He brings the equipment and knowledge needed to find information

about the temperature, pH, conductivity, and nutrients of Hubbles Lake.

In Alberta, this is often lake stewardship: a group of volunteers working under the guidance of a charity organization; a cherished lake with limited or dated baseline ecological data to inform residents and policy-makers about its health; a burgeoning stewardship society, whose volunteers want a well-managed lake and know they must champion the cause.

"I don't have an environmental background. I'm a volunteer," says Kyfiuk, a stay-at-home mom who moved to the area about 10 years ago. She is one of five members of the Hubbles Lake Stewardship Society.

When a developer proposed a major recreational facility for the lake in 2012, Kyfiuk said it crystallized the need to form a stewardship society. Lake users are more aware of how their actions can affect their favourite watering hole. Clear waters can turn green and murky in a matter of years.

"There are changing societal values. There's a heightened awareness in our generation, whereas it was once fine to cut down the shoreline, fertilize the grass," says Richard Fedorak, who owns a seasonal property at Hubbles Lake.

Alberta lakes are often prone to blue-green algae, which thrive off nutrients such as phosphorous and nitrogen. The rich soil that makes Alberta so agriculturally fertile can make a lake "green," as natural erosion transports those soil nutrients to the water. But nutrients also come from external sources, such as fertilizers, sewage, and industrial run-off that enter a lake's watershed.

Three years ago, Alberta Health Services implemented a provincewide blue-green algae warning system that makes its way into the media. And one might assume the problem is getting worse, but Peter points out that without historical data, it's hard to say how a lake has changed over the years.

At Hubbles Lake, last monitored in 1983, they're trying to establish some baseline data.

Lakewatch technician Jackson Woren leans over the side of the boat and lowers a circular piece of black-and-white metal into the water. The device is called a secchi disc and is attached to a marked rope. Woren lets it plunge through the water until it is no longer visible. The rope marks a descent to seven metres — a good sign for this lake, which is considered oligotrophic, or nutrient poor.

The rudimentary test will be bolstered by samples gathered at the deep spot and 10 other locations on the lake. Lakewatch staff will come to Hubbles five times this summer. Volunteers label bottles, move equipment, and record data.

"It kind of makes you realize how precise you have to be. There's process, process, process," says Kyfiuk.

There are about 800 lakes in Alberta and 30 well-used recreational lakes in central Alberta. Only a handful have lake watershed management programs and ALMS' Lakewatch team is monitoring 33 this year.

The majority of the group's funding comes from the provincial government and its data are uploaded to a provincial database.

Some bigger lakes such as Pigeon and Wabamun have received thousands of provincial dollars to perform paleolimnology tests, where a core of lake muds that represent decades of sediment accumulation is analyzed to show changes over generations. Some lakes also have nutrient budgets — expensive, in-depth, multi-year studies showing where the nutrients in a lake come from, whether from nearby septic systems or dust fall.

But Arin MacFarlane Dyer, executive director of ALMS, argues all lakes need more scientific analysis and that data must be collected systematically — not as a reaction when problems arise.

"Every single lake needs a nutrient budget to come up with plans," she says. "If you don't have a plan, you don't know where you're going and lakes can't just be left alone to do their own thing. They will turn green and smelly and toxic. They need to be actively managed."

ALMS has released a workbook for groups to develop their own lake watershed management plans. It's a daunting, 60-page document. But with so few lake watershed management plans in the province, it's one of the best resources volunteer groups have.

A spokesman for Alberta Environment and Sustainable Resource Development says the province is doing a "refresh" to re-consider how the province can best support lake use in Alberta.

"There's lots of on the ground action and one-off things as a provincial government that we've been supporting," says Andy Ridge, executive director of water policy. "There wasn't really a broad, coherent strategy or vision that articulated what does the government of Alberta really want for our lake resources."

"We've identified a need to come up with something very specific around providing a more common and consistent approach for lake management."

At Hubbles Lake, the scene is idyllic. The pontoon moves past a paddle boarder performing yoga poses on her board, limbs stretching toward the sun and then the surf. A loon pops its head briefly above the water, challenging onlookers to grab their cameras before it disappears.

"It's clean, it's clear, it's deep," says Fedorak. "It's a jewel just outside Edmonton."

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Lake health warnings now a rite of summer

Extraordinary measures being considered as blue-green algae blooms become more common

BY ALEXANDRA ZABJEK, EDMONTON JOURNAL JULY 27, 2014



A sign warning of the health risks associated with blue-green algae is displayed at a public beach on Pigeon Lake.

Photograph by: Greg Southam, Edmonton Journal

Warnings about the health of Alberta lakes have become a rite of summer. But extraordinary measures are being considered by some volunteer groups and the province to improve water quality as residents fight to keep their lakes premier recreational destinations.

At Pigeon Lake, one of the premier warm weather spots around Edmonton, groups are considering using in-lake treatments, such as biological, physical, or chemical controls after a string of summers marked by blue-green blooms, said Brian Waterhouse, who chairs the Alliance of Pigeon Lake Municipalities.

Alberta lakes are prone to blue-green algae blooms, which thrive off phosphorous that naturally exists in fertile soils here. But development activities that leach phosphorous-filled materials such as fertilizers, sewage, and agricultural run-off into lake watersheds add to the problem.

A provincewide blue-green algae warning system initiated three years ago by Alberta Health Services has brought renewed focus to water quality. Alberta's first algae warning this year came in June, marking the beginning of what has become a regular stream of troublesome summer advisories for lake goers.

There are 800 lakes in Alberta and about 30 well-used recreational lakes in central Alberta.

One of the biggest issues is that lakes present a tricky tangle of jurisdictions. The federal government is in charge of the fish, the province is in charge of water quality and the shore line. Municipalities — even summer villages — are in charge of land development around a lake. It's not always clear how those jurisdictions can best interact to ensure lake health.

"Lakes have been languishing; there's no regulatory audits across the multiple jurisdictions," says Arin MacFarlane Dyer, executive director of the [Alberta Lake Management Society](#), a provincially funded charity that monitors lakes. "We know how to (manage lakes) but we need to have someone who says it's important and that we do need to do it. It's a real leadership issue."

At Pigeon Lake — the popular recreation destination 60 kilometres south of Edmonton — a well-organized community pushed for a two-year study of the lake's nutrient contents. The results were released earlier this month.

The nutrient budget shows more than 50 per cent of the lake's phosphorous comes from its sediments. The finding is similar to what was found at a handful of other Alberta lakes through studies in the 1980s and 1990s.

"The internal loading is always an interesting dilemma," says limnologist Chris Teichreb who authored the report. "The question becomes, what can you do about it?"

In-lake controls can include physical, chemical, or biological changes. Such techniques have been used for decades in the United States where higher populations and more intensive lake use have increased strain on lakes.

At Pine Lake, near Red Deer, one solution is that higher-nutrient bottom water is pumped out of the lake. But this technique only works in thermally stratified lakes that have significant water being added through natural or artificial means.

Only a handful of other recreational lakes in Alberta have used such measures.

There are dozens of other possible physical, chemical or biological controls that can improve water quality — but all options are expensive and must be rigorously evaluated for broad environmental impacts. The desired results could be limited, experts warn. For example, research is being done into the addition of aluminum, iron, or calcium salts to a lake to reduce phosphorous release from sediment. It is also possible to change the fish community in a lake to promote more grazing of algae.

Physical controls could include tactics such as dilution and flushing, which involves adding more water to a lake. The possibility of dredging the bottom of Pigeon Lake has been discounted, since tests show phosphorous concentrations in the lake sediments are the same up to 30 centimetres deep.

“That’s absolutely not practical,” said Waterhouse. “That’s potentially thousands of tons of materials we’ve had to find a place for, we’d have to replenish some water, and the process disrupts the fish and the biota of the whole lake.”

A provincial spokesperson said in-lake treatments may be considered in certain lakes.

“There may be situations where that type of intervention, some form of in-lake treatment, may be worthwhile because of the nature of the lake, its location and opportunities,” said Andy Ridge, executive director of water policy for [Environment and Sustainable Resource Development \(ESRD\)](#). “There could be circumstances where we do want to pursue that, but you’d want to go through a thorough and consistent assessment of what are the merits of that.”

The Pigeon Lake nutrient budget shows about half the phosphorus that enters the lake every year comes from external sources, with an especially large contribution from atmospheric deposition — meaning dust and rainfall. The remainder comes from overland run-off, streams, sewage, and ground run-off.

Groups such as the [Pigeon Lake Watershed Association](#) have been working to control external sources that add nutrients to the lake by educating residents about fertilizers and keeping natural barriers to the lake. A model land use bylaw for municipalities surrounding the lake was published earlier this summer. Such efforts remain essential, said Teichreb.

“Even if you do implement an in-lake option, if you still have nutrients coming in from outside, you’re fighting a losing battle,” he said.

“I don’t think these blooms will go away completely and I don’t think that’s a realistic goal for most of our lakes in Alberta. The goal is one that will take a long time ... You have to

encourage people to stick with it.”

Not all lakes have the same up-to-date, detailed data as Pigeon Lake. Some argue the battle against phosphorous entering lakes is the first, and most crucial step, for almost every lake in Alberta to keep from turning green.

“We know the basic things are sewage and agriculture and fertilizers,” said Dave Trew, executive director of the North Saskatchewan Watershed Alliance. “There’s a variety of well-known sources. You don’t have to do 10 years of research to figure that out. The key thing is to prevent any phosphorous enrichment.”

An engineering firm is expected to present the Alliance of Pigeon Lake Municipalities with viable treatment options for Pigeon Lake by the end of the year, said Waterhouse. He hopes trials could be run by next summer.

“(In-lake controls) have got to be considered because the lake’s to the point where it’s so stressed ... we need something that will work a bit quicker than the watershed approach.”

Any control options would need appropriate provincial and federal approvals. But it’s not known what level of government would pay for such treatments.

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County organizes to protect its lakes

BY ALEXANDRA ZABJEK, EDMONTON JOURNAL JULY 26, 2014



Mayatan Lake resident Walter Nielsen wanted to form a lake management group after a campground was proposed for the area. He contacted the North Saskatchewan Watershed Alliance, which is now helping to guide Mayatan residents through development of a land-use plan.

Photograph by: Bruce Edwards Bruce Edwards

Parkland County has taken the unusual step of requesting lake land use plans for five county lakes, an initiative earning praise from those working to promote healthy lakes in the province.

Just four Alberta lakes have lake watershed management plans, according to the Alberta Lake Management Society. Part of the problem is jurisdictional — counties and municipalities are in charge of development around Alberta lakes, while the province is in charge of water quality.

With a \$225,000 provincial grant, Parkland County is creating a comprehensive land use plan for Wabamun Lake. County officials hope the plan will be a template for plans at smaller county lakes, including Hubbles, Jackfish, Mayatan, and Lake Isle.

“We started to look at the growth happening in Parkland County because it will continue and it will put more pressure on our lakes,” said Duncan Martin, project manager for lake land use plans in the county.

At Mayatan Lake, resident Walter Neilson wanted to form a lake management group after

a campground was proposed for the area. He soon contacted the North Saskatchewan Watershed Alliance (NSWA), a group now helping to guide Mayatan residents through the development of a land use plan.

“As I got into this, I was confident that I’d find the person who I could say, ‘You’re the person who looks after lakes, tell me what to do.’ And I haven’t found that person yet,” Nielson said.

The NSWA helps the group gather technical information and bring together provincial, county, community, and federal groups to discuss Mayatan.

“We’re trying to bring the land and water managers together,” said Dave Trew, the organization’s executive director, referring to the county and province.

As for Neilson, his group has one goal: “We want to do what we can to make sure the lake, 50 years from now, is in as good or better shape as it is today.”

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