

SHORELINE WATER SAFETY REPORT

EXECUTIVE SUMMARY

This report will build on the recommendations presented to the Priorities Committee on June 25 and August 13, 2008 by the Junction Creek Safety Committee (“the Safety Committee”), relating to shoreline water safety and rescue. As directed by the Priorities Committee, the mandate was to “*coordinate, prioritize and report back*” on a city-wide action plan that will promote safety awareness and reduce water-related accidents. Based on our research, staff recommends that the priorities for immediate action be:

1. An education and awareness campaign focused on shoreline water safety.
2. A swift water rescue training program for firefighters.

In light of the huge areas of water within the city’s limits, which include still water and swift water (defined by the National Fire Protection Association (“NFPA”) as having a current greater than one knot, or 3 metres/sec.), creeks, rivers and lakes, various types of water bodies and conditions must be considered in order to ensure the utmost safety for all residents of Greater Sudbury.

To that end, and taking into account a reasonable allocation of limited resources, it was determined from all sources examined in this report that child and youth education, rather than physical barriers (such as fences) or warning systems (such as signs), represents the most effective foundation for the development of any shoreline safety strategy.

A list of contributors to this report and background references are attached as an Appendix to this report.

BACKGROUND

Junction Creek Safety Committee

The tragic drowning death of Adam Dickie in Junction Creek in August, 2007, prompted city Council to establish the Junction Creek Safety Committee, spearheaded by Councillors Landry-Altmann and Cimino. The Safety Committee brought together individuals and agencies with various relevant backgrounds to share information, concerns and suggestions in order to:

- establish educational and public safety programs
- review infrastructure criteria and capacities under extreme events
- review safety / rescue procedures.

To this end, the Safety Committee established three sub-committees:

- Communications / Education
- Infrastructure
- Safety / Rescue

Their dedicated efforts generated a series of recommendations outlined in their June 18, 2008 Progress Report, which the Priorities Committee subsequently directed be reviewed, considered and prioritized. In the interim, as a direct result of the Safety Committee's hard work, several actions have already been taken in furtherance of shoreline safety and awareness, as described below.

Mapping: Currently, Emergency Services is working with the City's geographic information systems staff to develop a standardized mapping system for Junction Creek and Nolin Creek. These maps will establish specific "rendezvous points", focussing on where roadways intersect with the creeks. The rendezvous points, partly based on the fire department's already established drafting points (where fire hoses and pumps can access a water source), are broken down by geographic areas along the length of the creeks and will be used as congregation points for coordination of rescue operations.

Once complete, the maps can be located in emergency units for reference as well as with EMS, Police and Fire Services dispatch centres. This will ensure that all responding units and dispatchers are operating from the same maps.

Discussions are also underway between Emergency Services and the Nickel District Conservation Authority ("NDCA") to host an information session for all emergency services. The objective of the session would be for NDCA to provide background information on the characteristics of the Junction/Nolin Creek system and the review the new Larch Street access point to the underground culvert. This information could be taken back to the respective emergency services to be shared with front-line staff.

Pamphlets and Education: The Sudbury and District Health Unit will be preparing bilingual educational pamphlets highlighting creek safety and reminding us of the Adam Dickie drowning ("Remember Me, Adam D"). These pamphlets will be distributed to neighbourhoods and schools bordering the creek areas and perhaps expanded to other water access areas in the future. The first set of pamphlets will focus on Junction Creek, and the Health Unit has agreed to assist in the development of a more generic version applying to swift water bodies in general. In addition, the Health Unit will partner with Greater Sudbury Housing Services, which will include the pamphlets in their existing mail-out program for tenants. The pamphlets will also be available at the Rainbow Routes trailhead information areas.

Since 2001, the Junction Creek Stewardship Committee has been offering an educational program to local schools called "Bug Search". Approximately 1,000 students have participated in the classroom and field trip portions of this program. In response to the Safety Committee's recommendations, this program now includes a message for swift water safety.

The Safety Committee's work also resulted in the NDCA reviving its spring thaw advisory program, which will now become part of the annual spring flood preparedness program for elementary schools.

In yet another positive outcome, the Health Unit set up an interactive display at the Children's Water Festival demonstrating the suction hazards of soft or silty creek/river bottoms. Over 800 grade three and four students took part in this event, which will now include further shoreline safety displays on an annual basis.

Memorial: Councillors Landry-Altmann and Cimino have initiated a dialogue with family and community members regarding the possibility of erecting a permanent memorial in memory of the 23 drowning victims of Junction Creek at the site of Adam's drowning.

These positive initiatives prompted by the Safety Committee's work are the foundation for the recommendations in this report as they relate to still and swift water safety in the broader community of Greater Sudbury. Accordingly, a brief overview of CGS's geography may be helpful.

Geography

The City of Greater Sudbury is 3,627 square kilometres in area, making it the largest municipality in Ontario based on total area - five times the size of Toronto and two-thirds the size of Prince Edward Island. CGS is quite unique in that fully one-third of the city's total surface area is covered by lakes (16.5%), rivers/creeks (12.2%) and wetlands (4.3%).

Greater Sudbury's geographic boundaries encompass over 330 named lakes greater than 10 hectares in size, with 112 of those being larger than 100 hectares, including Lake Wanapitei which is the largest city-contained lake in the world. The city's shorelines for lakes alone (i.e. excluding rivers, creeks and wetlands) measure over 2,700 kilometres. There are also hundreds of kilometres of rivers and creeks, including:

- Junction, Nolin, Copper Cliff, Frood, Maley and Garson Creeks
- Vermillion, Whitefish, Wanapitei, Whitson and Onaping Rivers

Historically, the downtown core of Greater Sudbury experienced flooding during high water events due to Junction Creek overflowing its banks. Over the decades, an active program of storm water management resulted in such flood events becoming virtually non-existent. Major capital projects completed by the NDCA include the construction of the Maley Flood Control Dam in 1971 and the Nickeldale Flood Control Dam in 1980 in the headwaters of Junction Creek. The 1,755 metres of box culvert built by the municipality and the Conservation Authority over the years provide significant flood protection for the downtown core by re-directing storm water runoff.

Most recently, as part of this ongoing process, the Larch Street bridge/culvert replacement is nearing completion, which incorporates a box culvert access structure that greatly enhances water access in the event rescue operations become necessary. Several other bridge/culvert replacements are envisioned, subject to availability of funding, including the Durham Street location where it crosses over Nolin Creek. Work is expected to commence on that project later this year.

In short, given the geographic nature of our “City of Lakes”, the issue of water safety goes beyond Junction Creek.

SOLUTIONS FOR SHORELINE SAFETY

As part of its broad overview of the various stakeholders’ input, the Safety Committee developed possible courses of action, which are examined below.

Restricting Access

Restricted access to waterways elicited varied perspectives, balancing safety with possible impediments to the use of trails and to rescue operations. The World Health Organization’s (“WHO”) “World Report on Child Injury Prevention” found that there is insufficient information to determine with any certainty whether restricting access to areas unsafe for swimming is an effective strategy. According to that report:

“While a barrier, for example, might be effective in preventing drowning in young children, this measure is not in general likely to keep older children and adolescents from accessing water.”

Similarly, there is no evidence that signage discourages children in such circumstances and it is not listed as an effective prevention measure by the WHO.

Currently the Rainbow Routes trail system encompasses over 120 kilometres of pathways, most of which border waterways. The stakeholder organizations responsible for trails and pathways feel that fencing areas along their borders would be contrary to their mission. For example, the 1991 Junction Creek Waterway Park Community Improvement Plan, as endorsed by Council, promotes increased access and use of the creek’s pathways:

“... interaction with the creek during non-runoff periods should be encouraged; safety concern should be a higher priority during high runoff or hazard periods.”

This is reflected in the CGS Official Plan, which states:

“...open space remains an integral component of the development. In particular, the linear open space system of the Junction Creek Waterway Park shall be maintained.”

In the preparation of this report, several municipalities that have urban waterways within their city limits were contacted to determine what, if any, policies or procedures were in place with regard to fencing. These municipalities include:

- Ontario - London, Brampton, Quinte West
- British Columbia - Kamloops, Chilliwack, Prince George
- Alberta - Wood Buffalo
- Saskatchewan - Regina
- Nova Scotia - Halifax

Even though most of these cities have experienced drowning deaths in the past, as a general rule fencing is not considered a viable part of a shoreline safety program due to various factors, such as interference with recreational pathways, the impracticality of fencing and/or erecting signs along lengthy shorelines, cost of installation and maintenance and the implication that areas that were not fenced or signed might be assumed to be safe.

A couple of municipalities do however erect fencing at specific locations, for example: at a retaining pond in a residential neighbourhood (Chilliwack); and where the threat exists of rapid changes in water flow conditions for drainage ditches (Halifax).

Currently CGS, like the municipalities mentioned above, has not implemented a fencing policy. Our practices are specific to individual circumstances. For example, Greater Sudbury Housing Services has fencing on their properties, however its purpose is to delineate the boundary lines. In addition, when deemed necessary CGS Parks Department maintains shorter “tot fences” along the edges of playgrounds where necessary to outline the safe play area. The Parks Department plans to erect such a fence at the Louis Street playground.

As an alternative to fencing, consideration might be given to planting bushes and shrubs along slopes to act as a buffer against someone accidentally rolling down the hill. This would be preferable to tree planting, which might interfere with the view of the bordering waterways. As a starting point, shrubs could be planted on the slope at the Louis Street playground, which borders Junction Creek.

Education and Awareness

Rather than physical barriers, the World Health Organization has commented that the most promising drowning prevention strategy for children involves targeted awareness-raising programs - in effect “psychological fencing”:

“Educating parents and caregivers about the risks for drowning is an important step for changing knowledge, beliefs and attitudes which in turn determine behaviour.”

This was confirmed through our interview process, during which each individual, without exception, strongly recommended putting our limited resources towards targeted education.

As a result, and in accordance with the Priorities Committee's direction to prioritize the Safety Committee's recommendations, it is felt that this recommendation be considered a priority action item by Council.

Raising awareness and providing information on water safety is only effective if it is coupled with a specific strategy aimed at changing behaviour by way of identifying high-risk target groups, developing a meaningful message, and ensuring that the message is received at a time and place where a change of behaviour is most probable (e.g. during high-water season, in schools, etc.).

Therefore, while shoreline safety is important to everyone, safety awareness is particularly essential for children aged 5 to 17, since the majority of drownings in that age group relate to natural waterway, non-motorized activities (as opposed to swimming pools or boats). A sound educational program targeting school-aged children could realistically achieve positive results, particularly when coupled with parental and public awareness initiatives.

One example of a targeted messaging opportunity involves the Junction Creek Stewardship Committee which, through the Junction Creek Educational Film Project, is currently producing a live action and animated film recounting the history of Junction Creek. There will be a particular emphasis on screenings in schools, which will be accompanied by supplementary educational materials provided free of charge to school boards. This Committee has agreed to include a swift water safety message in those materials.

In order to emphasize the need for swift water shoreline safety education, it is recommended that the City correspond with the various safety and lifesaving organizations such as The Lifesaving Society, The Canadian Red Cross, The Hospital for Sick Children's "Safe Kids Canada" and the NFPA's "Risk Watch", requesting that they review their national/provincial education packages in order to ensure that swift water safety is promoted. It may be of assistance to note that members of the CGS Health Unit's School Team sit on the "Risk Watch Coalition", which teaches safety to students (pre-kindergarten to grade 8) based on a national program, including water safety. In that capacity, the Health Unit should be strongly encouraged to support and emphasize the City's recommendation.

"Putting a face" to the education strategy would garner interest and humanize the process, taking it out of the realm of simple theory. In addition to the pamphlet campaign showing a photo of Adam, consideration might be given to partnering with the NDCA to initiate a billboard project in residential areas where shoreline safety is a concern, especially during the high water season. Such simple but high public profile projects must, however, be packaged with a targeted education and awareness program, as outlined above.

Rescue

Drownings in Ontario have declined approximately one-quarter since 1991, with the greatest decreases occurring in lake and river situations. However, it remains the second leading cause of death among children, second only to car crashes. Accordingly, it is important to ensure that our municipal rescue agencies receive proper training in this field, including swift water scenarios.

For the reasons to follow, we are also recommending that this be accepted as a priority item by Council.

Most drownings in Ontario occur while swimming. For children, the following statistics apply:

- *Under 5 years of age:* 95% of Ontario drownings occurred while the child was alone, with half of these fatalities involving backyard swimming pools, which is outside the scope of this report's mandate as it relates to open water situations.
- *Between the ages of 5 and 12:* 57% of Ontario drownings happened in lakes or rivers. For this age group, 63% of them were either playing in water or swimming, and one-quarter of them were either alone or with other minors.
- *Between the ages of 13 and 17:* 64% of Ontario drownings happened in lakes or rivers, with almost half of these involving swimming. Over half of them were either alone or with other minors.

With regard to rescuers, one recent study showed that while only 1% to 2% of firefighter-related incidents are swift water rescue calls, these accounted for an inordinately high frequency of firefighter deaths. In total, rescuer deaths represent one-third of North American drownings. This demonstrates that while swift water dangers form a relatively small percentage of emergency calls, they represent an exceedingly high risk not only to the victim, but to the rescuers as well. This is partly due to the natural instinct to enter the water in order to get to the helpless victim as quickly as possible.

Regarding the possible installation of anchor pins along the length of moving water bodies, fire rescue teams in Greater Sudbury are already trained to use natural or improvised features as anchor points for rescue lines where it is felt that this is necessary. Furthermore, rescue manuals emphasize the perhaps counter-intuitive warning not to tie a standard safety line to a rescuer near swift moving water. Should the rescuer be swept into the water, he/she could be inadvertently "pinned" underwater at the end of the tether, with the current preventing efforts to pull the rescuer back upstream to safety. According to an American expert in swift water safety, two firefighters died in this manner in 1995.

In the same vein, while it might be thought that a fixed horizontal cable across a moving body of water might be useful as a grab point for victims being swept downstream, this could act as a challenge to youngsters who may try to use it to cross a river/creek on a dare. Furthermore, there would be no way of predicting exactly where such lines should be installed given the great length of the waterways in question. Once again, firefighters are trained to use natural features to set up such a line should it become necessary on a case by case basis. This was in fact done during a recent Onaping River rescue.

On the topic of having a special alert for children in peril, Ontario EMS and fire rescue agencies have standardized communication procedures and terminology for dispatchers and crews, employed through a Computer Assisted Dispatch (CAD). Dispatchers are trained to obtain all relevant information from a caller in order to prioritize the urgency of the call and assign appropriate responding units. This information, which includes the nature of the emergency, condition of the patient and location assists in quickly determining the appropriate level of response.

It is recognized that a coordinated response to water emergencies is vital in order to ensure that a victim receives medical attention at the earliest possible opportunity. In possible drowning situations, minutes can be crucial in order to achieve a successful rescue operation.

In addition to the EMS mapping initiative described above, CGS's EMS, Fire and Police Services already meet on operational issues as required. Independent of the Safety Committee's recommendations, Emergency Services is currently in the process of drafting terms of reference for a formal joint emergency services operational group, who would look at interagency issues to improve coordination of response.

Addressing the Safety Committee's terms of reference relating to identifying rescue capabilities versus risk, statements from rescuers emphasized the significant hazards involved in water-based swift water rescues, including danger to the rescuers themselves (as mentioned above). It was therefore strongly suggested that shore-based water rescue training would represent an efficient use of limited resources, while at the same time increasing the safety factor for rescue personnel. Current rescue training for CGS firefighters relates to still water (shore and water based), boats and ice rescues.

The estimated initial and ongoing costs of swift water rescue training are as follows:

- Start-up costs of \$20,000 to have eight CGS firefighter personnel undergo instructor training, plus \$25,000 for the first year of CGS firefighter rescue training (which includes additional wages and expenses for 40 personnel). All remaining firefighters would be trained as shore-based emergency responders (e.g. riggers, safety personnel, lookouts, etc.), at no additional cost.
- Re-certification costs for the CGS instructors of approximately \$20,000 every two years.

Removal of Obstructions and Debris

For natural obstructions in creek beds, on a case by case basis a determination must be made as to whether this obstruction constitutes a safety hazard and/or unduly restricts water flow. A balancing of interests must be accounted for since, for example, Fisheries and Oceans Canada recommends that fallen trees may nurture important ecosystem and should be left in place, yet in some instances these may cause an obstruction resulting in a high-water situation.

Currently, there are processes in place dealing with fallen trees and other obstructions. For example, when the City is alerted to such obstructions, they will be removed by the Parks Department if within park areas, or otherwise by Roads and Transportation Services (Drainage).

In addition, the Junction Creek Stewardship Committee's "Adopt a Creek" program helps remove accumulated garbage where feasible, and many local grocery and department stores have their own programs in place for recovery of shopping carts, since these carts represent a significant investment for the business owner. It is suggested that the City facilitate a meeting of affected retail store owners and representatives of the NDCA and the Junction Creek Stewardship Committee with a view to discussion cooperative plans for recovery of abandoned carts along our waterways.

Nevertheless, without evidence linking waterway obstructions to drownings in CGS, it is not feasible to make any definitive recommendations regarding safety at this time, other than to invite further input from stakeholders and the community with a view to revisiting these particular issues under a future mandate.

Similarly, with regard to the *Drainage Act*, insufficient information as to the benefits, cost, and legal impact of such a designation is currently available, therefore this too may be brought forward at a later date.

Alternatively, given that these issues share a common theme, that being possible diversion of water flow, as reflected in the Safety Committee's recommendations these issues could be incorporated into the City's Storm Water Management Study in order to gather more detailed information. This study, which is examining water flow rates, is currently in progress however resource limitations have resulted in an extended time span for completion.

BUDGETING

During its budget deliberations on January 12, 2009, the Finance Committee allocated a one-time distribution of \$110,000 for a creek and moving water implementation strategy. Keeping in mind the two priority recommendations of an education/awareness campaign and firefighter rescue training made in this report, the following budget allocations are proposed:

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|-------------------------------------|--------------------------|
| • Swift-water rescue training | \$45,000 (start-up cost) |
| • Education and awareness campaign | \$50,000 |
| • Junction Creek Memorial | \$10,000 |
| • Shrub and bush planting on slopes | \$ 5,000 |

CONCLUSION

As directed by the Priorities Committee, the focus of this report has been to coordinate a review of the Safety Committee's recommendations through further consultation and research, prioritize those recommendations based on the outcome of those tasks, and report back to the Priorities Committee on specific recommendations.

Throughout all interviews, research and contacts, one common theme emerged: the importance of targeted education with a view to changing behaviours of children and youths, coupled with an awareness campaign for their caregivers and the community at large.

In addition, should a swift water emergency situation arise, the need for proper firefighter training that would increase safety to victim and rescuer alike has been demonstrated.

Accordingly, in addition to the commendable initiatives prompted by the work of the Safety Committee as described in the body of this report, it is recommended that the Priorities Committee support a shoreline water safety program and swift water rescue training for our firefighters, pursuant to the global themes outlined in this report.

APPENDIX

REFERENCE SOURCES

The following stakeholders contributed to this report:

- Junction Creek Safety Committee – Councillors Joscelyne Landry-Altmann & Joe Cimino
- Emergency Services - Joe Nicholls
- Fire Services - Bill Battison and Gord Stauffer
- Police Services – Todd Zimmerman
- Infrastructure Services (Operations-Drainage) - Ron Norton
- Nickel District Conservation Authority - Paul Sajatovic
- Risk Management - Bruce Drake
- Junction Creek Stewardship Committee - Carrie Regenstreif and Johanne Jamieson
- Parks Services - Kevan Moxam
- Rainbow Routes - Deb McIntosh
- Sudbury & District Health Unit - Shelley Westhaver and Ghislaine Goudreau
- Greater Sudbury Housing Services - Denis Desmoules and Robert Sutherland

Various research sources were examined, including the following:

- World Report on Child Injury Prevention (World Health Organization/Unicef)
- Water Smart Action Guide (Lifesaving Society)
- The National Drowning Report, 2000 Edition (Lifesaving Society)
- National Drowning Trends Report, 1992 – 2001 (Lifesaving Society)
- The Drowning Report, 2008 Edition (Lifesaving Society, Ontario)
- Facts about Child Drowning (The Hospital for Sick Children)
- Child & Youth Unintentional Injury, 1994 – 2003 (Safe Kids Canada)
- NFPA 1006 Standard for Technical Rescuer Professional Qualifications, and NFPA 1670 Standard on Operations and Training for Technical Search and Rescue Incidents (National Fire Protection Association)
- City of Lakes website
- Water Incident Research Alliance website
- Risk Watch website (NFPA)

In addition, outside agencies were contacted to obtain further details, including the Royal Lifesaving Society of Canada (for drowning statistics) and various other Canadian municipalities (to determine their shoreline water safety policies).