

Catfish Creek Conservation Authority Ice Management Plan

Revised October 2023

Catfish Creek Conservation Authority
8079 Springwater Road
R.R. #5 Aylmer, ON
N5H 2R4



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Purpose & Distribution List

This Ice Management Plan has been prepared and distributed by the Catfish Creek Conservation Authority (CCCA) and is intended as a guide to users in the event of potential ice mitigation.

As this is a live document, the CCCA is responsible for its compilation and distribution. Users should notify the CCCA in writing of any required change in their contact information.

Ice Management Plan Distribution List January 2023

Organization	Elected Official or Department	Number of Copies
Township of Malahide	Clerk	1
Municipality of Central Elgin	Clerk	1
Township of South- West Oxford	Clerk	1
Town of Aylmer	Clerk	1
Ontario Provincial Police		1
Aylmer Police Department		1
Ministry of the Environment (London)		1
St. Thomas - Elgin Health Unit		1
County of Elgin	Emergency Management Coordinator	1
County of Elgin	Engineer	1
Ministry of Transportation & Communications		1
Catfish Creek Conservation Authority:		
Staff Members		3
Chairperson		1
Vice-Chairperson		1
Ministry of Natural Resources	Aylmer, District Manager	1
Streamflow Forecast Centre	MNR Peterborough	1

Introduction

Historically the Catfish Creek Conservation Authorities (CCCA) administrative area has predominantly been subject to ice jam induced flooding. Therefore, the CCCA administers the *Catfish Creek Conservation Authority Ice Management Plan*. This plan is considered a live document and is revised/updated as required; it is not a guarantee to prevent any future flooding within CCCA's administrative area.

The purpose of this document is to provide the Conservation Authority, its member municipalities Emergency Coordinators and any applicable government agencies the basic and recommended tools during flooding within the CCCA administrative area. All agencies public or private who are likely to be involved with flood emergencies must be aware of their agency responsibilities at times of emergency response due to flooding. Additionally, watershed residents who have been warned/notified of Flood Watch or Flood Warning watershed conditions must assume the responsibility to safeguard their personal safety and belongings. It is highly recommended that residents pay close attention during their fall/winter preparations that properties and belongings are flood proofed.

The Ontario Ministry of Natural Resources & Forestry is the provincial agency responsible for flood emergencies. Within the CCCA administrative boundary, this role is assigned to the CCCA, and are responsible for alerting member municipalities and applicable agencies of possible flooding within its administrative area.

An internal Flood Operations Plan has been compiled to provide a systematic procedure for the Authority Flood Co-coordinator and staff to consult during flood emergencies.

A minimum requirement of the Flood Management Program necessitates that the Flood Operation Plan be reviewed annually or additionally if required.

The Conservation Authority is not responsible for notifying individual citizens of the watershed. This responsibility lies with the applicable municipal Emergency Coordinator. It is this position who has responsibility to ensure the notification of its citizens.

Catfish Creek Conservation Authority Personnel Response List

Flood Warning Coordinator

Dusty Underhill

General Manager/Secretary-Treasurer:	Office:	519-773-9037
	Fax:	519-765-1489

The First Alternate

Peter Dragunas

Water Management Technician:	Office:	519-773-9037
	Fax:	519-765-1489
	Cell:	519-808-6370

The Second Alternate

Gerrit Kremers

Resource Planning Coordinator	Office:	519-773-9037
	Fax:	519-765-1489

Legislation

Conservation Authorities in Ontario have been assigned the responsibility of maintaining an Ice Management Plan, within their administrative watershed boundaries.

Conservation Authorities Act, ONTARIO REGULATION 686/21, MANDATORY PROGRAMS AND SERVICES, Consolidation Period: From January 1, 2023 to the e-Laws currency date.

Ice management

4. (1) An authority shall provide programs and services for ice management within its area of jurisdiction, if the authority determines that ice management is necessary to reduce the risks associated with natural hazards referred to in subsection 1 (1).

(2) Programs or services provided under subsection (1) shall include the development and implementation of an ice management plan on or before December 31, 2024 that identifies,

- (a) How ice within the authority's area of jurisdiction may increase the risk of natural hazards; and
- (b) The steps that are necessary to mitigate these risks, including identifying equipment and resources needed to carry out these steps.

(3) An authority may update the ice management plan referred to in subsection (2) from time to time as the authority considers it advisable.

Objectives of this Ice Management Plan:

- Manage and mitigate riverine ice within the Conservation Authorities Act, Ontario Regulation 686/21, *Mandatory Programs and Services*.
- To organize a communication system, linking Catfish Creek Conservation Authority with Emergency Coordinators, municipalities and agencies,
- To assist in assisting to reduce the potential for flood associated damage.

Ministry of Natural Resources Mandate

1. The Ministry of Natural Resources and Forestry (MNRF) is the lead administrative ministry having overall government responsibility for natural hazard management policies/programs, which includes flood management.
2. To maintain a Provincial Flood Warning System and notify Conservation Authorities of flooding potential in their jurisdiction.
3. To organize the Provincial response, in support of jurisdictional municipalities having to contend with a flood emergency.
4. To respond to jurisdictional municipality requests for Provincial assistance to flood emergencies, providing:
 - a) the total resources of, and available to the municipality under its Flood Contingency Plan have been committed, or are inadequate to manage the current conditions,
 - b) the municipality has declared that an emergency exists within its jurisdiction, and the declaration has been made by the head-of-council or designated alternate in conformity with a pre-established Flood Contingency Plan,
 - c) the need for Provincial Assistance is originated by the head-of-council or designated alternate,
 - d) the MNRF puts together a declaration that a provincial emergency exists.
4. In a declared Provincial emergency by the MNRF, to employ a Provincial Flood Contingency Plan and coordinate delivery of the Provincial response.

Malahide Township Responsibility

Appendix "G", Malahide Township Emergency Flood Contacts

At all times Malahide Township staff are charged with the operation and instruction to the ice breaking contractor.

As per the Township of Malahide, Tender EM-23-01, Port Bruce Ice Breaking Services.

The Township of Malahide will advise the Contractor where each piece of equipment is to be delivered and the required time of arrival.

The Township of Malahide staff will be responsible to provide direction to the operators as required to perform the works required (e.g. when to clear out the harbor/mouth of the river of ice, when to push the ice under the Lake Erie ice shelf)

The Township of Malahide will notify the Contractor of rescheduling of rentals to address unforeseen conditions including breakdowns, weather - heavy rain, material delivery delays, labour deficiencies.

The Township of Malahide requires that all the Health & Safety Procedures & Traffic Control are followed, that, proper rental equipment is being used as requested i.e. – safety equipment / shields,

that, proper working techniques are used, that, proper and thorough cleanup is done daily, that, proper delineation is placed to ensure the public safety of the jobsite overnight prior to departure from the worksite.

Unless otherwise directed, during a potential ice jam generated Flood Warning Watershed Condition Statement the Authority will advise applicable Malahide Township Staff they consider activating the ice management equipment (dragline).

To assist staff with determining the appropriate timing window for ice breaking operations please refer to section ***CCCA Flood Watch and Warning Guidelines***.

Conservation Authority Mandate

Ice management

4. (1) An authority shall provide programs and services for ice management within its area of jurisdiction, if the authority determines that ice management is necessary to reduce the risks associated with natural hazards referred to in subsection 1 (1).

(2) Programs or services provided under subsection (1) shall include the development and implementation of an ice management plan on or before December 31, 2024 that identifies,

- (a) How ice within the authority's area of jurisdiction may increase the risk of natural hazards; and
- (b) The steps that are necessary to mitigate these risks, including identifying equipment and resources needed to carry out these steps.

(3) An authority may update the ice management plan referred to in subsection (2) from time to time as the authority considers it advisable.

- maintain a flood forecasting and warning system to notify municipal delegates, media, local and Ontario Provincial Police, Ministry of Natural Resources and Forestry and other applicable agencies by issuing Watershed Condition Statements,
- provide technical recommendations to jurisdictional municipalities for limiting or reducing the effect of ice jamming,
- following consultation with jurisdictional municipalities, advise the local Response Coordinator when an emergency no longer exists by way of All Clear Watershed Condition Statement.

Ice Monitoring

In the fall of 1983, CCCA established an ice-monitoring program within the CCCA administrative boundary. The program is designed to sample and clarify in channel ice sources, thickness and quality, which may have the potential to cause ice jams and associated flooding in Port Bruce.

As the ice develops, the ice monitoring stations will be assessed each Monday morning beginning at 8:00 am. During ice melt and subsequent break-up, the ice monitoring stations will be inspected whenever deemed safe and necessary, to ensure a constant flow of ice break-up information and conditions to assess possible ice jamming circumstances. Ice monitoring stations are identified in Appendix 'B' map. For safety reasons, two staff members are to complete the ice monitoring circuit.

Ice monitors will record information appropriate to describing the ice conditions at the monitoring stations, such as; ice thickness, ice quality, extent of ice cover, cross section profiles, decay of ice, weather conditions, etc. The information is documented on the Ice Survey sheets (Appendix 'C'). The ice monitoring information is reviewed and included in the "Port Bruce Ice Conditions Bulletin" (Appendix 'D'), which is posted on the authority's web site and social media. A copy of the "Ice Conditions Bulletin" is also emailed to the Township of Malahide office.

Local weather forecasts for the region can be attained from the Environment Canada Weather, website https://weather.gc.ca/forecast/hourly/on-137_metric_e.html or the Weather Network web site <https://www.theweathernetwork.com/ca/weather/ontario/london>

Checklist of Deteriorating Weather Conditions Affecting Catfish Creek Stage Discharge

The Authority Flood Warning Coordinator can use the following checklists as a guide to determine when the alternate is required to assist with preliminary weather and channel flow monitoring, to determine the probability of issuing Watershed Condition Statements leading up to and including a Flood Warning Watershed Condition Statement.

9.1 Free Flow Conditions

- Rain is persisting and more is forecasted.
- Advisory issued by the Surface Water Monitoring Centre of the Ministry of Natural Resources and Forestry.
- Determine flows using the Government of Canada, Environment Canada Real-Time Hydrometric Data website for station "Catfish Creek at Sparta" gauge number 02GC018.
- Check the bridges at Dingle Street and Glencolin Bridge.
- A visual check off the Myrtle Street Bridge for water levels relative to the creek bank.
- A complete watershed tour should be completed after a Water Safety Watershed Condition Statement is issued.

9.2 Ice Conditions

- 10mm of precipitation in a 24 hours period.
- Deterioration of river ice conditions, specifically at Jamestown Line Bridge.
- When the Sparta Gauge stage registers 1.474 meters or 38.98m³/s discharge.
- If the Sparta Gauge flow rises 1.5 meters from the original level prior to the start of precipitation (rain).
- Advisory issued by the Surface Water Monitoring Centre of the Ministry of Natural Resources.
- Long-range forecast expecting warming weather and precipitation.
- Strong SW winds are recorded at Port Bruce on the Windfinder web site <https://www.windfinder.com/#8/39.5000/-98.3500> and are accompanied by rain and mild temperatures forcing ice to jam the Port Bruce harbour mouth area.

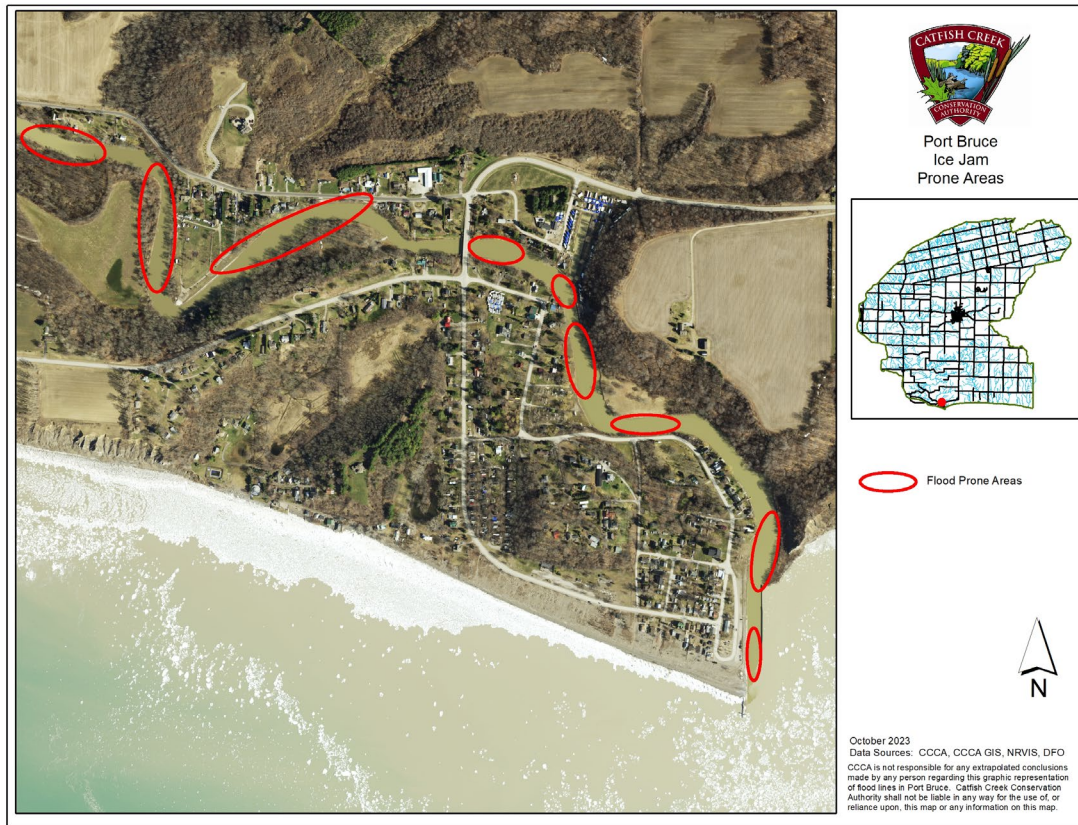
On a Test Basis

- Degree-days is the difference in the maximum temperature minus the minimum temperature (e.g. High of +6°C. and low of -1°C).
- Caution should be exercised when 10-degree days have been reached.
- Appendix B, CCCA Flood Watch and Warning Guideline Check List

Ice Jamming Extent

“Ice-related flooding tends to be local and highly site specific. While ice jams may be relatively common at a given site, they cannot be predicted with certainty in any given year.” U.S Army Corps of Engineers, Engineering and Design Ice Engineering Manual.

There are multiple zones within the area of Port Bruce that are prone to ice jamming and subsequent flooding (see map below).



The zones where ice jams may occur are generally areas where channel cross-sectional morphology fluctuates; narrows, widens, bends or after breaching onto a flood plain area which allows the flow and ice to be conveyed onto the flood plain thereby lowering the hydraulic conveyance capacity.

Most breakups take place during warming periods (thermal breakup), when the ice cover strength deteriorates to some degree due to temperature increases and creek flows increase (mechanical breakup) because of snowmelt and or precipitation. Consequently, most ice breakups occur between thermal breakup and mechanical breakup.

Thermal and or mechanical breakups do not happen at all points on the creek at the same time. They occur at different places, times and intensities depending on location, topography, stream morphology and thermal exposure of the ice.

When or if the ice flows get to large for the hydraulic conveyance capacity of the creek they may stop, accumulate and jam in areas of the creek that may morphologically obstruct ice migration, until such time as the creek flows intensify, increasing the hydraulic transport capacity of the creek to move the jammed ice.

“As a rule of thumb, the stage must rise 1-1/2 to 3 times the ice thickness before the ice moves.” In conclusion, ice jams form when the accumulated mass of the moving ice exceeds the rivers hydraulic capacity to move the ice through the morphological transport limitations of a river.

As outlined above (U.S Army Corps of Engineers, *Engineering and Design Ice Engineering Manual*) the Catfish Creek Conservation Authority may be unable to project flood inducing ice jams in Port Bruce within an acceptable degree of certainty, we are able to monitor, compile and interpret data from numerous sources. Flood status notifications and Watershed Condition Statements are issued based on data regarding adverse weather conditions, precipitation intensity/duration, temperature increase duration, physical watershed characteristics, pre-storm and duration of the storm creek water levels, seasonal watershed characteristics such as Catfish Creek and Port Bruce harbour ice thickness type and condition, snow water equivalency, lake levels and ice cover.

The Conservation Authority appeals to the watershed residents living within flood prone areas to be mindful of Watershed Conditions Statements and take appropriate action.

If you have any questions, please feel free to contact the Water Management Technician at CCCA at 519-773-9037 or by email at water@catfishcreek.ca

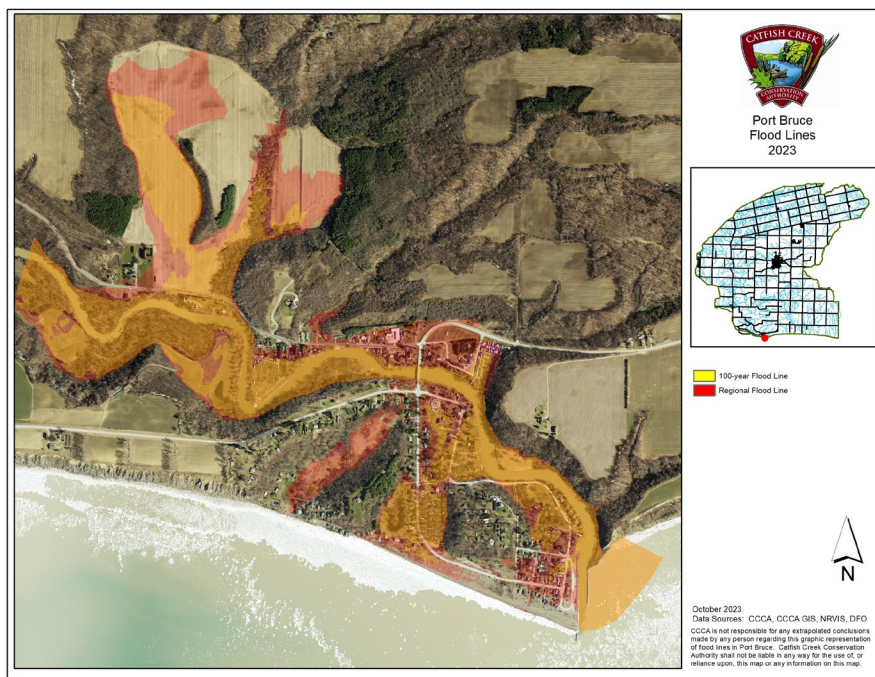
Jamestown



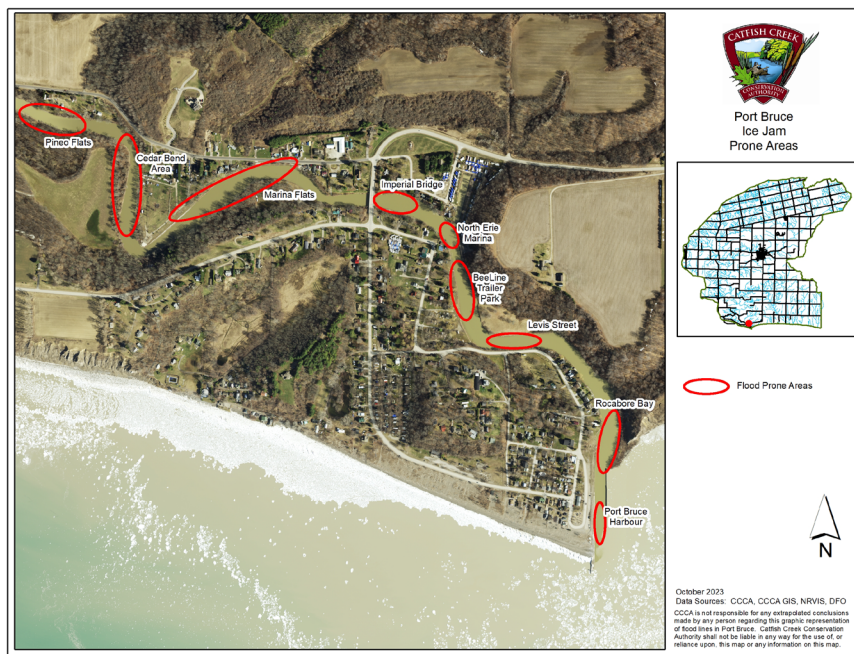
Jamestown is not located in the Hamlet of Port Bruce but the ice consistency during the spring freshet is critical to the CCCA Flood Forecasting and Warning (FFW) procedure. This area requires continual monitoring since a flood warning for Port Bruce will be issued when the ice in this area breaks. This reach of the Catfish Creek at Jamestown has been selected for the decisive warning deliver point due to channel uniformity and the most probable cause of ice fracture here is due to stage increase of the Catfish Creek and travel lead-time to Port Bruce.

Port Bruce

The Village of Port Bruce has residential development within the flood plain (see map below) of the Catfish Creek and ice mitigation is an essential component of spring breakup and freshet induced elevated channel flows.



Ice jams occur regularly at nine different locations within a 3.3 km reach of Catfish Creek, between Pineo Flats to the west of Port Bruce and Rocabore Bay at the harbour.



Port Bruce has been at risk to ice induced flooding from the Catfish Creek on numerous occasions.

During ice break-up, the hazard to flooding within Port Bruce can be directly attributed to considerable ice accretions (jams) along the lower reaches of Catfish Creek. This coupled with elevated seasonal snowmelt runoff and or rain on snow weather events result in intensified channel discharge. This has the capacity to produce flooding of low-lying areas along the flood plain reaches of the Catfish Creek and within the Village of Port Bruce.

Generally, ice jams within the channel confines of Catfish Creek may be attributed to channel morphology and bathymetry. "The flooding at Port Bruce is a function of an intricate relationship between sedimentation (littoral and fluvial) and ice jams." *Riggs*. Sedimentation coupled with Lake Erie ice cover extent, wind direction and possible wave action during ice break-up on Lake Erie are associated with ice jams within the Port Bruce Harbour area.

The channel width of Catfish Creek, within the Hamlet of Port Bruce fluctuates from twenty-five to sixty meters.

Ice jam contributing channel morphological complexities are as follows:

Pineo Flats



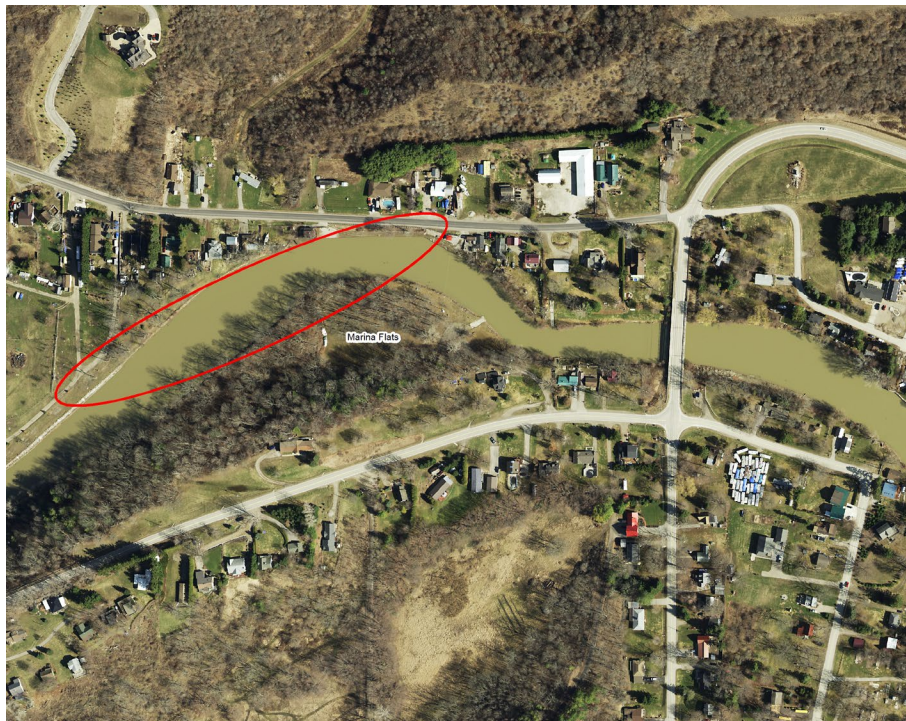
The Pineo Flats area is the second location for ice jam monitoring as elevated water conditions approach the Hamlet of Port Bruce. Morphologically this area has well defined and confined flood plain for the initial channel breach floodwater holding capacity. As the waters are elevated the channel spills over the banks and onto the confined flood plain thereby lowering the hydraulic ability to move ice along the channel and inducing an ice jam as the waters rise until the floodway is hydraulically full and is able to transport ice further down the creek to the Cedar Bend area.

Cedar Bend



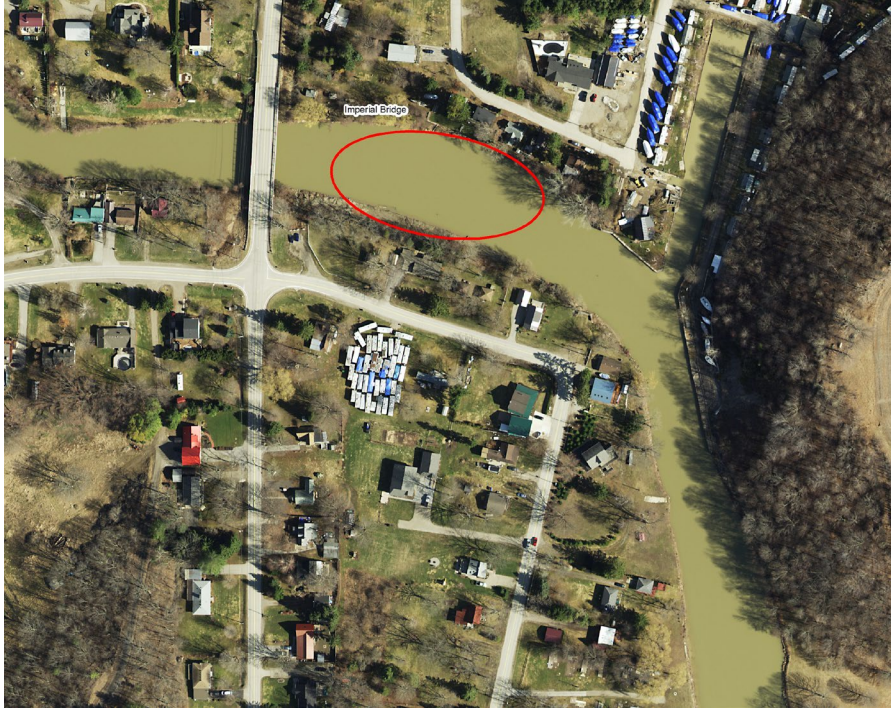
As most areas in the lower reaches of the Catfish are, Cedar Bend is characteristic of the morphological structure of the creek at Port Bruce. As the flows come from Pineo Flats, the channel narrows at the bend and then immediately widens which again induces lower hydraulic energy ability and the flows slow and the ice begins to holdup until such time as the force of the water is able to force the ice move again.

Marina Flats



The ice stalling and jamming in this area is very typical of Port Bruce. The creek comes off a narrower reach to a wider one. This is combined with a flood plain area (trailer park on south bank) and a bend. Once again, the creek flows from a higher transport force area (narrower) to a diminished transport force zone (wider) with a bend at the distal end. The ice jams in this area and spills over the southern bank further diminishing the hydraulic force until the water level rises again to begin moving the ice downstream.

Imperial Bridge



The area immediately downstream of the Imperial Bridge is prone to ice jamming due to the creek coming from a marginal transport zone (narrow) immediately upstream of the Imperial Street Bridge to a wider reach with diminished transport force.

North Erie Marina



Ice jams often form along this constricted reach of the channel (46m upstream to 27m downstream) and a bend in the creek significantly reduce in channel flow capacity compared to that of both the upstream channel.

BeeLine Trailer Park



The Catfish Creek channel opens to 60 meters in width at the BeeLine Campground this initiates a decrease in the hydraulic transport capacity and ice begins to accumulate as the creek flow slows. As the ice begins to accumulate, the creek reaches bankfull and spills over into the adjacent campground, slowing the hydraulic transport capabilities even more.

Levis Street



The aforementioned upstream width (BeeLine Campground) decrease at Levis Street. The over bank flooding at BeeLine Trailer Park (3.2) reduces the hydraulic transport capacity which induces an ice jam at Levis Street where the channel narrows down to 34 meters. The BeeLine flood plain area channel spill over reduces the upstream hydraulic transport capacity and the channel does not have enough force to continue the ice migration, until the flow once again increases enough to continue pushing the ice to the harbor area.

Rocabore Bay



There is increased probability of ice jamming at this location primarily due to channel morphology (very wide reach of the Catfish Creek) and lake effect wave action. Both decrease in channel velocities, and channel discharge capacities, which may induce ice buildup and consequent jamming. CCCA recommends ice-breaking equipment (100ft. boom dragline with minimum 2yd. bucket) on standby during the winter months to break ice when required in the Bay and Harbour areas.

Port Bruce Harbour



A study completed by Cumming-Cockburn and Associates in 1984 identified that that some flood damage might be associated with open water flooding an average of about once every fifty years. To date Catfish Creek has not experienced open channel flooding at Port Bruce.

The study concluded that ice jamming in the area could raise water levels in the order of 2 meters above the comparable free flow conditions. It was determined that a 1:2-year flow with ice jams could yield a flooding condition greater than that of the 1:100-year open water flood event.

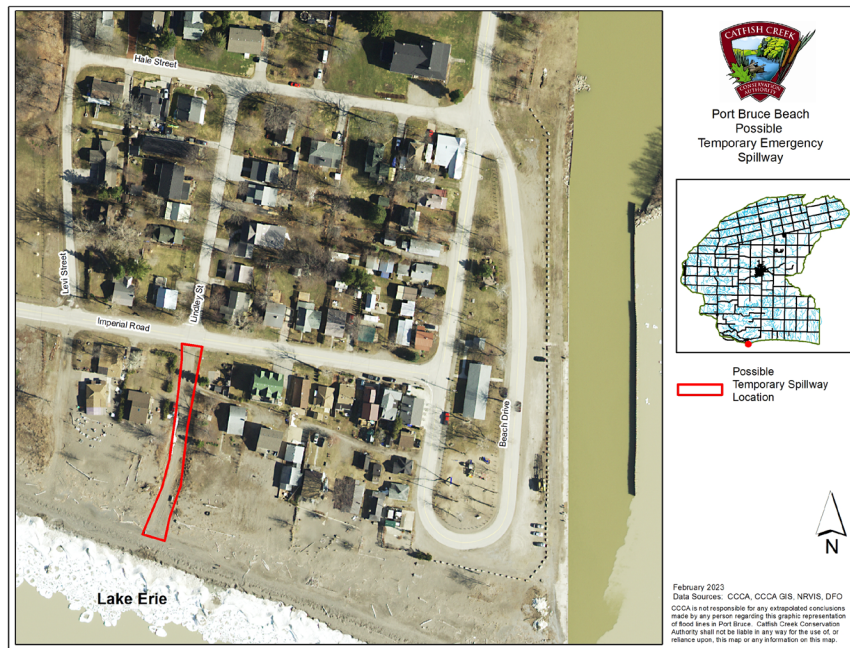
Ice Management Strategy

The understanding of the Catfish Creek channel hydraulics coupled with Port Bruce local knowledge have identified that keeping the channel flowing within Port Bruce during break-up is the current operational method of mitigating and reducing flood damage due to ice jams. A component of the Ice Management Strategy is to contract equipment (dragline) to help keep the channel clear of ice jams, in the area south of Rocabore Bay and the harbor to Lake Erie. This measure is intended to provide the in-channel ice flows unobstructed passage to Lake Erie, provided Lake Erie ice does not plug Port Bruce harbour.

When and safety permitting recommended ice management measures and tasks to compliment the ice breaking operations include:

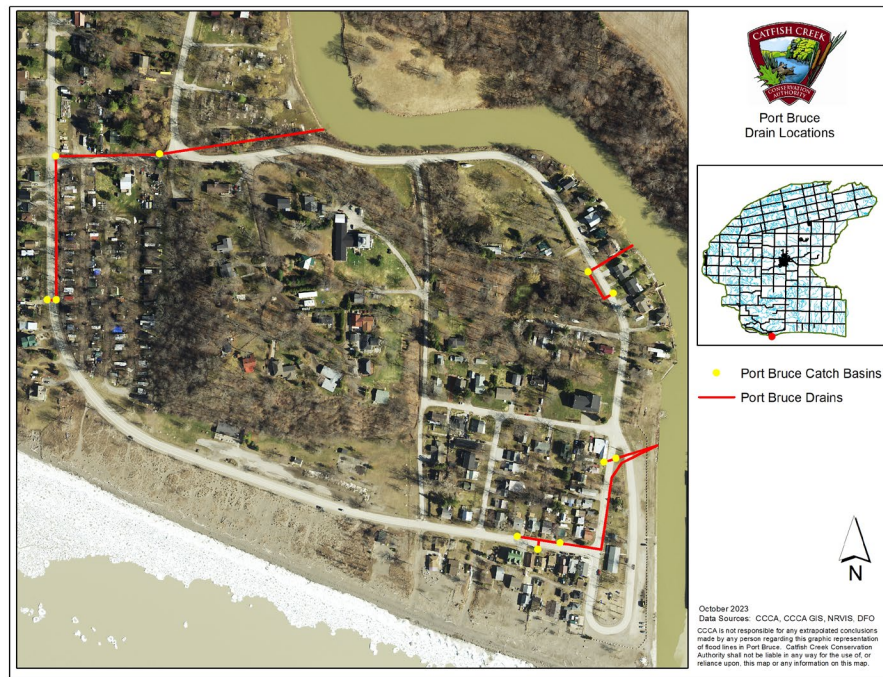
- At any time of year when passing over the Catfish Creek on a bridge, complete a windshield inventory approximately two channel widths above and below the crossing of in-channel debris (trees) at all crossings in the watershed, and notify appropriate municipality to arrange for removal if they present a future flood hazard.
- Bathymetric channel sounding in the spring and fall to ascertain channel morphology, and identify sediment deposition zones for possible ice grounding and verify water depth capacity.

- In November, post a notice in the local newspaper instructing homeowners in Port Bruce to remove all seasonal docks, support posts, sun decks and floatable objects that are not permanently attached to a residential dwelling, to reduce any potential impacts because of flooding and/or in-channel ice build-up. (Appendix 'E').
- Implementation of the Ice Monitoring Program to document information such as ice thickness, ice quality, extent of ice cover, decay of ice, weather conditions (Appendix 'C').
- Weekly Ice Condition Bulletins; will be posted on the Authorities website and social media platforms to inform property owners in Port Bruce of the ice conditions. (Appendix 'D').
- During lake ice conditions, monitoring (weekly photographs) of the ice ridge formation along the length of the shoreline in Port Bruce.
- Possibly creating a temporary emergency spillway opening at the south side of Imperial Road along the Lindley Street beach extension if warranted to provide an alternative escape route for severe floodwaters.

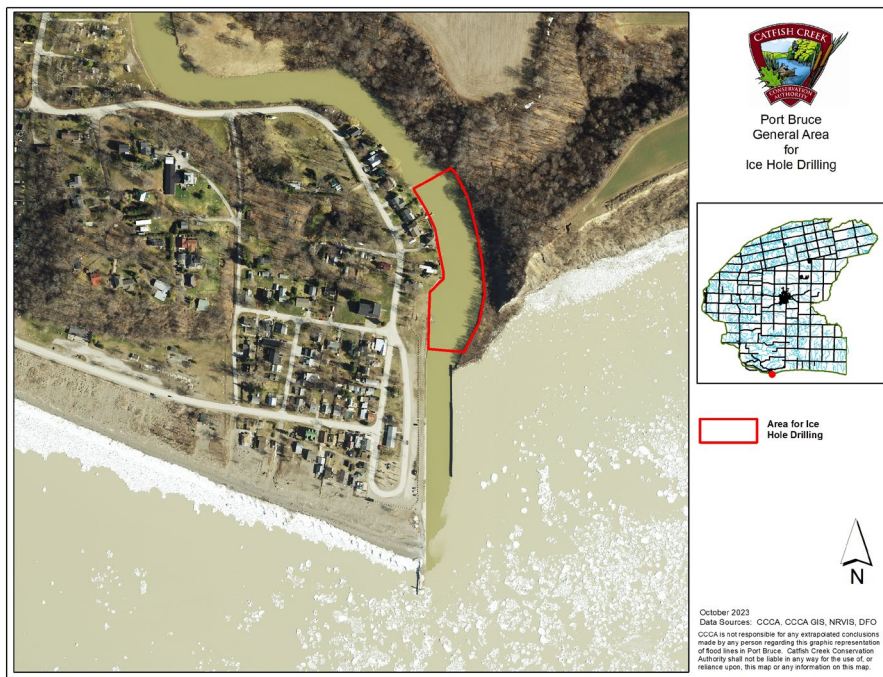


The CCCA is required to approve such spillway on as needed basis. This is only a temporary flood reduction item and needs to be addressed on a yearly basis.

- Municipal drainage in Port Bruce needs to be assessed and maintained to prevent excess water from backing up from the Catfish Creek during lake or riverine elevated flows.



- When and if safely possible systematically drill holes in the ice along the main channel of the creek for approximately 100 meters north of Rocabore Bay (see map below) to the northern extent of the break wall. This project should weaken ice at specific locations, thus aiding the ice breakup process.



- Meet with officials from the Township of Malahide on an annual basis to discuss possible improvements to the Ice Management Program.

Ice Management Procedure

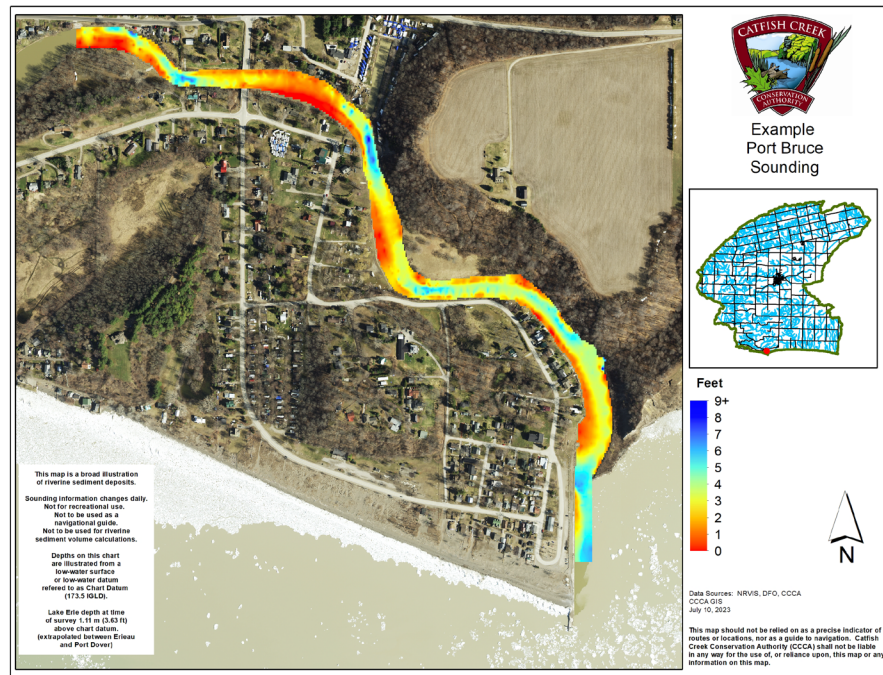
The recommendation is to stage land based ice breaking equipment at Rocabore Bay. Pre freshet and initial ice breaking must be structured in a systematic order, commencing at the harbour and working sequentially upstream, ensuring all the broken ice is removed from the harbour area prior to the freshet flows.

Authority flood staff will monitor weather and ice conditions to determine a date for ice removal from the harbour in preparation of ice breakup and freshet runoff. As required will meet with the Municipal Flood Coordinator to discuss the implementation of initial ice-breaking operations at the harbour. The Municipal Flood Coordinator is responsible for coordinating all ice-breaking operations at Port Bruce. It is the responsibility of the Municipal Flood Coordinator to notify the ice-breaking contractor to proceed with ice breaking and/or ice removal. Whenever possible, the Authority recommends that ice-breaking operations be proposed for daylight hours.

If the Catfish Creek channel and ice flows are impeded by lake ice at the harbour mouth most of the ice will naturally be forced underneath the lake ice. The recommendation is that the dragline try to assist riverine ice flows underneath the lake ice by pushing the ice down with the bucket if it appears the ice may jam. As flows slow, the dragline is required to drag along the lower depths of the Catfish to stir the ice and prevent any ice damming at the lower depths. This assists in maintaining an open channel for water to flow through. As the dragline brings ice up from the bottom, the requirement is for the operator to toss the bucket of ice onto the lake ice at the southern distal end of the breakwall thereby assisting to break the lake ice using the weight of the ice. This will allow the riverine flows to dissipate around the breakwall and out to the lake. This procedure needs to be repeated as long as the riverine ice is impeding the riverine flows.

Responsibilities of the Authority

1. Complete a windshield inventory of in channel hazards debris, trees etc. from Jamestown to Rocabore Bay at the harbour, and arrange for their removal when and if required.
2. Complete spring (May) and fall (October) channel soundings of Catfish Creek at Port Bruce to generate a bathymetric map to identify possible ice jam locations (see map below).



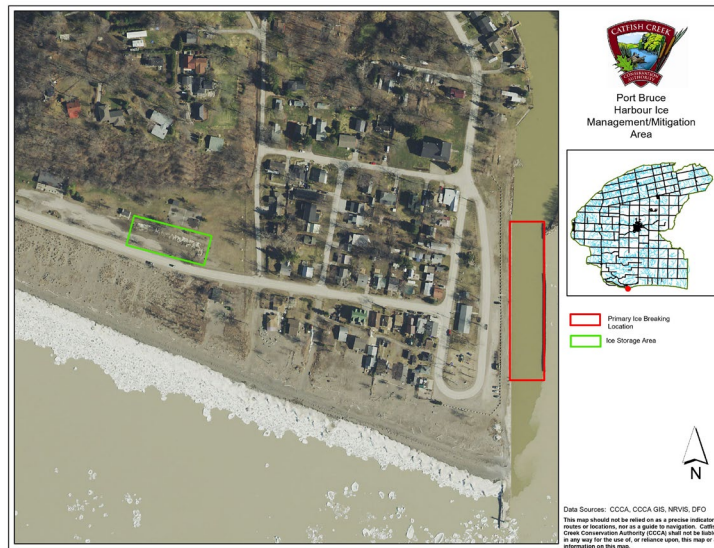
3. Convey information through the CCCA website and social media regarding public Flood Management Program notices (Dock Removal, Ice Conditions Bulletins, etc.).
4. Assess, compile, report and post the information collected from the Authority's ice monitoring course. (Appendix 'C')
5. When and if required provide weather forecast information, water level data and riverine/Lake Erie ice conditions to the Municipal Flood Coordinators within the CCCA administrative boundary.
6. Monitor the Lake Erie ice ridge formation along the Port Bruce shoreline and coordinate the construction of emergency spillways if necessary as per section 4.0 *Ice Management Strategy*.
7. Communicate with the Municipal Flood Coordinator and provide continued support during an emergency.

Responsibilities of the Township of Malahide

- a) Contracting of all equipment for ice breaking/removal purposes.
- b) Coordinate all ice breaking operations.
- c) Arrange for and maintain adequate communications with the operator of the ice breaking equipment.
- d) Ensure that all municipal-owned road allowances adjacent to the creek are accessible for ice breaking operations.

Extent of Ice Breaking and Ice Storage

The maximum extent of ice breaking and ice removal on Catfish Creek in Port Bruce is in the harbour area, north from Rocabore Bay to the southern extent of the break wall at the harbour outlet to assist with ice jam mitigation in Port Bruce. The green rectangle outlines the ice storage location. This property is administered by the Ministry of the Environment, Conservation and Parks, Port Burwell Provincial Park Cluster, 9 Wilson Lane, PO Box 9, Port Burwell ON, N0J 1T0, 519-874-4691.



Area of ice breaking and removal

Communications

The Authorities on duty Flood Warning Coordinator who will organize an emergency information control center at the Authority's administration office will administer communication between the Municipal Flood Coordinator and the Authority.

All information will be communicated through the Authority's mobile radio system to the Coordinator for further assessment. Alternative modes of communication include cellphones, landlines and or periodically returning to the office when required for debriefings.

On every occasion, staff checks an ice monitoring route location, they will:

- 1) Observe and record all applicable information in their log books (who, what, where, when, why).
- 2) Relay the data to the emergency information control center at the Authority's administration office via the truck radio,
- 3) Record in their respective logbooks and relay their departure time from that location to the emergency control center.

The ice monitoring routes are outlined on a map in Appendix 'F'. The Flood Warning Coordinator will keep in constant contact with the field staff.

This series of checks is intended to provide the Flood Warning Coordinator with a location of the observer in case of an accident. For safety reasons any deviation from the outlined route in Appendix 'F' will require notification to the emergency control centre.

Truck Mobile Radio Channels

Channel 1 = Watershed Wide Radio Transmission

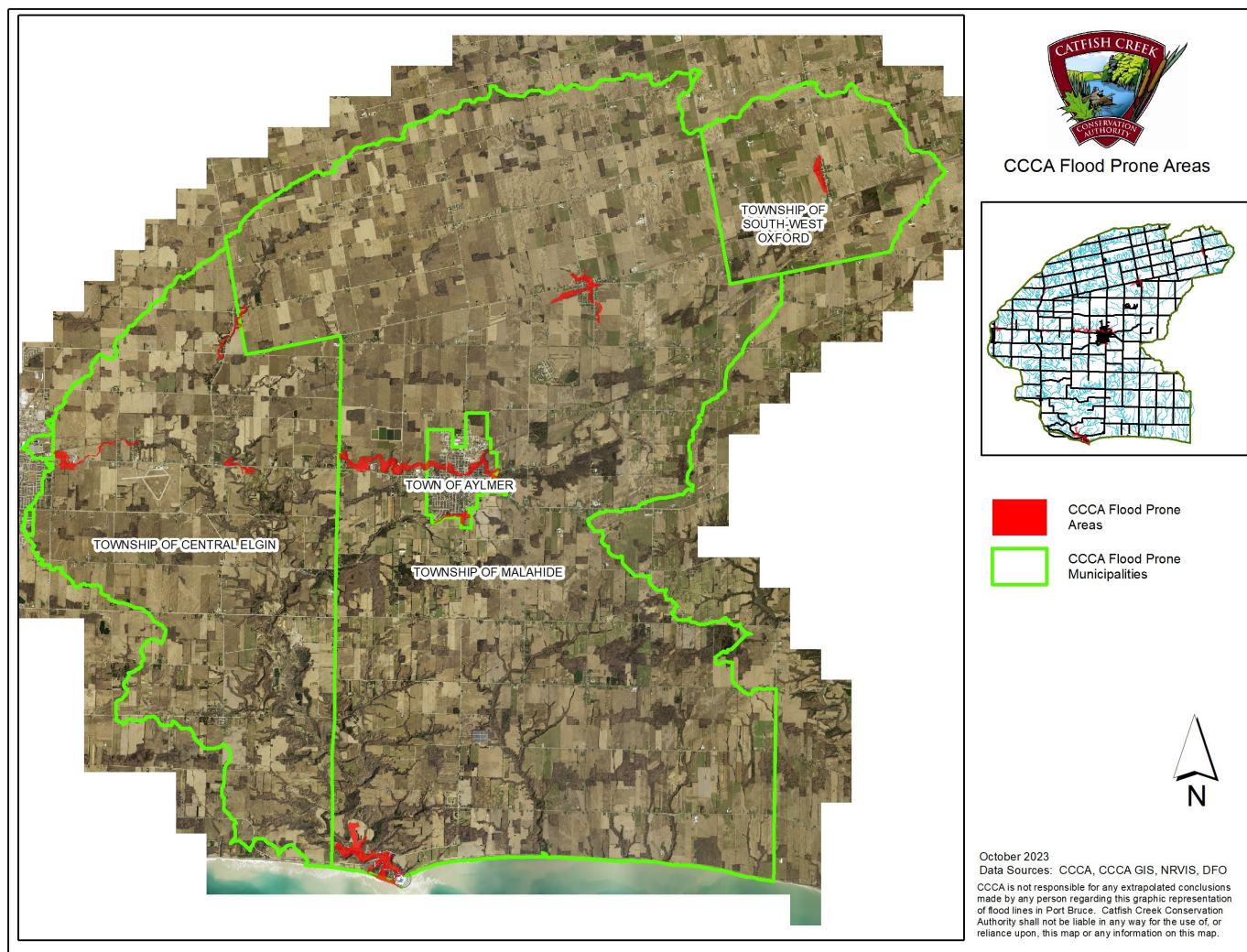
Channel 2 = Springwater park

Channel 3 = Malahide Roads Department

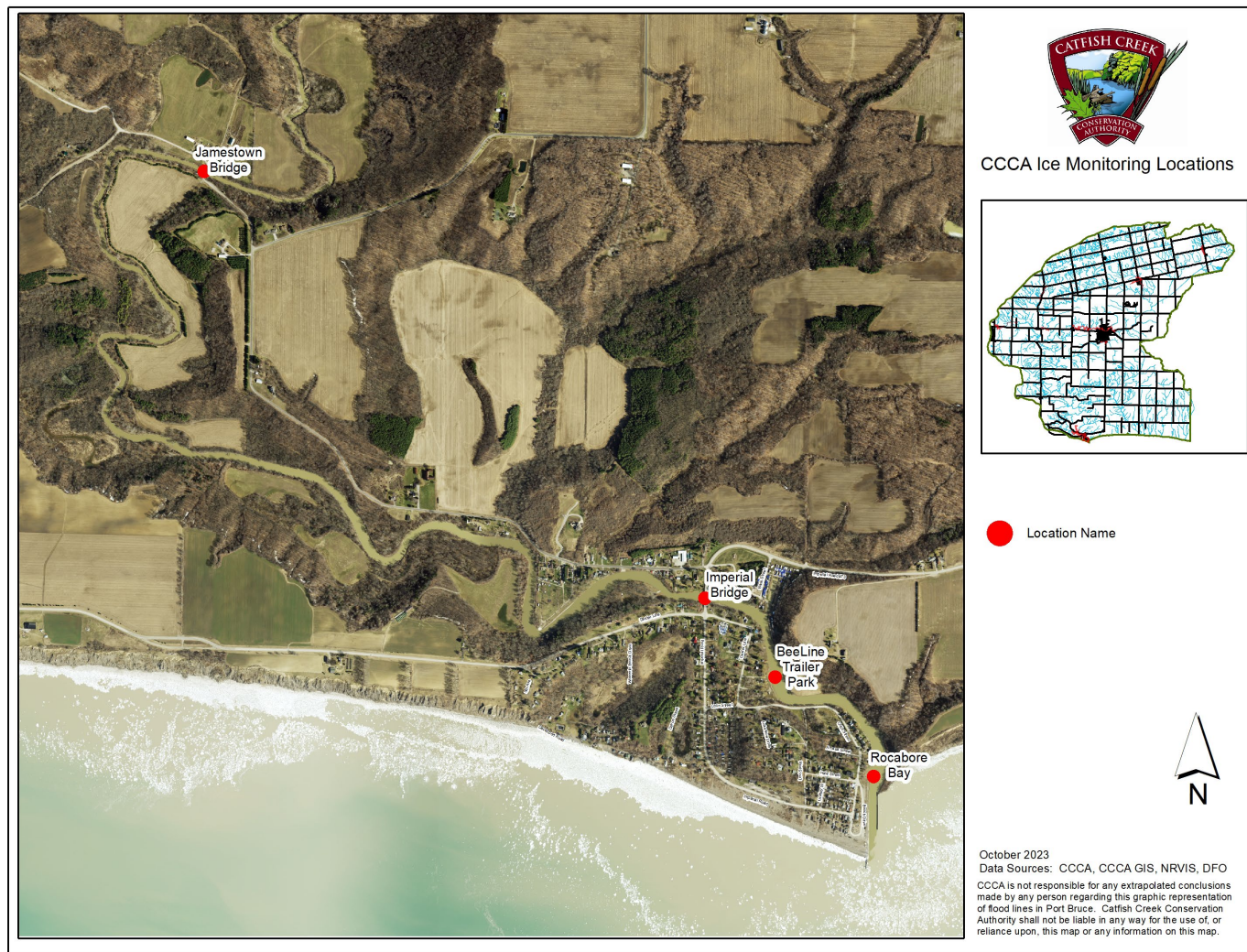
Truck Mobile Radio Stations

CA50 = Administration Office

Appendix A, CCCA Flood Prone Areas



Appendix B, CCCA Ice Monitoring Locations



Appendix C, River Ice Monitoring Form

RIVER ICE MONITORING FORM CATFISH CREEK CONSERVATION AUTHORITY

Site: _____ Observer: _____ Date: _____ YY MM DD
Time: _____

Air Temperature _____ °C Water Temperature _____ °C

Open Water: Yes/No

Width open? 0, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100%

Where in cross-section? _____

Upstream _____ m Percent of width open? _____ %
Downstream _____ m Percent of width open? _____ %

Current: fast, average, slow

Moving Ice: Yes/No

Where in cross-section? _____

What kind? Slush, Pancakes, Large Sheets, Floes, Small Blocks, Other _____

Stationary Ice: Yes/No

Where in cross-section? _____

What kind? Pancake ice, Sheet ice, Blocks (jam), Other _____

Ice Thickness: White _____ cm, Black _____ cm, Frazil _____ cm

Ice Quality: competent, deteriorated, candled

Water on top of ice: Yes/No

Presence of Ice Jam: Yes/No

Location of Upstream end _____

Location of Downstream end _____

Overbank flow? Yes/No

Presence of shear walls: Yes/No Height _____ m

Snow Cover on ice: Yes/No Average Depth _____ m

Photographs: Upstream, Downstream, Left Bank, Right Bank, Other

Sketch:

Observations: ___ Frequent visits during rapid changes; Freeze up, Break-up, Ice Jams
 ___ Infrequent visits during mid winter

SITE:**Freeze Up**

Event	Time of Event									
	Observed					Estimated				Water Stage (m)
	Yr	Mo	Dy	Time		Yr	Mo	Dy	Time	
Initial Ice Formation										
Complete Freeze Over										
Peak Stage										

Break-Up

Event	Time of Event									
	Observed					Estimated				Water Stage (m)
	Yr	Mo	Dy	Time		Yr	Mo	Dy	Time	
Score Lead Formation										
Transverse Cracks or Leads										
Peak Stage										
Main Ice Cover First Moves										
Water clear of Ice										

Ice Jams

Event	Time of Event									
	Observed					Estimated				Water Stage (m)
	Yr	Mo	Dy	Time		Yr	Mo	Dy	Time	
Jam Initiated										
Jam Present										
Peak Stage										
Jam Releases										

Appendix D, Ice Condition Bulletin

For Release

Enter Date Here

Port Bruce Ice Condition Bulletin

Information Changes Daily, Not Intended For Recreational Use

The Catfish Creek Conservation Authority has visually assessed and measured the ice thickness on Catfish Creek. Ice condition, strength and thickness vary throughout the system depending on local circumstances.

General ice conditions are as follows:

Jamestown Bridge **XX.X** cm (**X.X** in)

Imperial Rd. Bridge **XX.X** cm (**X.X** in)

BeeLine Trailer Park **XX.X** cm (**X.X** in)

Rocabore Bay **XX.X** cm (**X.X** in)

The 5 day forecast Issued: **11.00 AM EST, Tuesday 20th February 2007** by Environment Canada for **London and area projects moderate daily temperatures with overnight freezing conditions.**

Catfish Creek Conservation Authority will continue to monitor ice conditions on the Lower Catfish Creek reaches through to ice break-up to better identify potential ice formation concerns.

Warming temperatures coupled with rain and rapid snowmelt may cause increased creek flows. This, in concert with the ice cover may cause flooding situations. Residents along the creek are advised to monitor their local conditions, and to stay away from the streambanks during high flows.

Contact: Peter Dragunas, Water Management Technician
 Catfish Creek Conservation Authority
 water@catfishcreek.ca

Review and replace items in red as necessary and delete this portion of the bulletin.

PUBLIC NOTICE

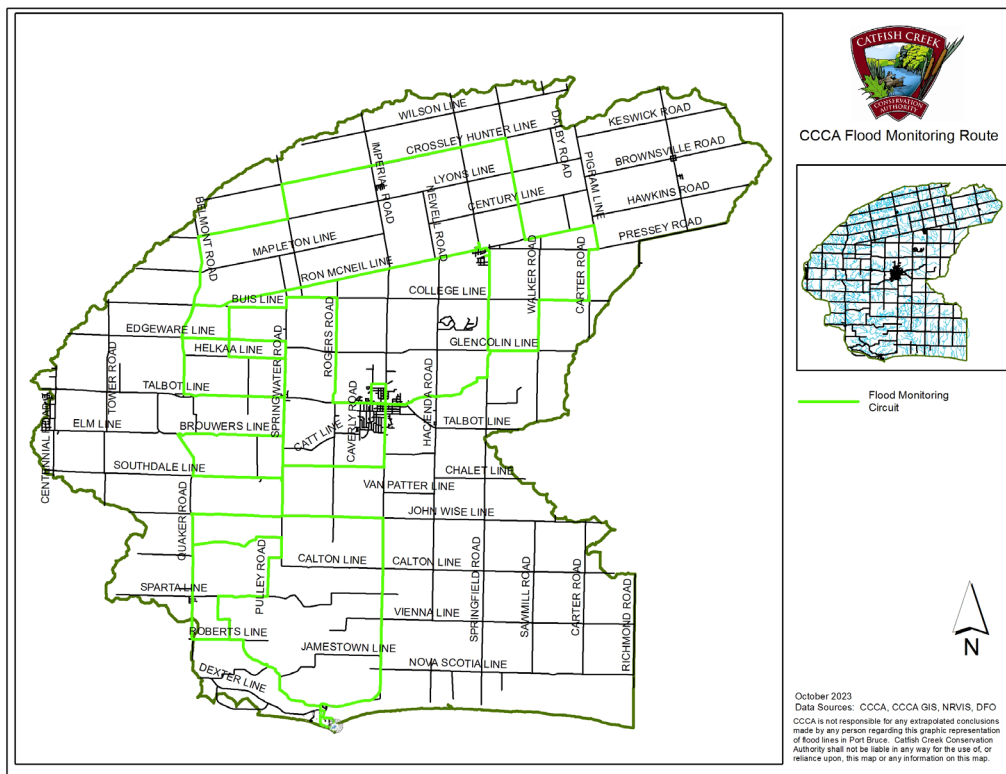
ATTENTION ALL RESIDENTS IN PORT BRUCE

Catfish Creek Conservation Authority and the Municipality of Malahide request the co-operation of Port Bruce residents to remove all seasonal docks and support structures from the waters of Catfish Creek by **November 15, 2023**. This request is to assist in reducing potential impacts because of flooding and/or in channel ice build-up.

Leaving obstructions in the channel could accelerate ice build-up and adversely influence the movement of in channel ice through Port Bruce. Channel flow patterns around obstructions may also accelerate creek-bank erosion during high run-off periods. Boat docks dislodged due to flooding or ice jam events can pose a serious safety threat to the public. In addition, we request that all other floatable objects such as; picnic tables, propane tanks, barrels, etc. are removed or secured within flood prone areas.

Further inquiries relative to this matter may be directed to the attention of Mr. Peter Dragunas, Water Management Technician, Catfish Creek Conservation Authority, (519-773-9037)
Thank you for your prompt attention to this matter.

Appendix F, Flood Monitoring Circuit



Appendix G, CCCA Staff Flood Emergency Contacts

CCCA Staff	E-mail	Cell Phone	Office Phone
Flood Watch Co-ordinator Dusty Underhill General Manager/Secretary-Treasurer	generalmanager@catfishcreek.ca		519-773-9037
First Alternate Peter Dragunas Water Management Technician	water@catfishcreek.ca	519-808-6370	519-773-9037
Second Alternate Gerrit Kremers Resource Planning Coordinator	planning@catfishcreek.ca		519-773-9037
Al Bradford Conservation Area Supervisor	properties@catfishcreek.ca		519-773-9037
Thom Polland Field Technician	caassistant@catfishcreek.ca		519-773-9037
Administration Office	admin@catfishcreek.ca		519-773-9037

Appendix H, Malahide Township Emergency Flood Contacts

Malahide Township Emergency Flood Contacts					
Call Order	Contact	Email	Cell Number	Office Number	Extension
1	Jeff Spoor	JSpoor@malahide.ca	519-615-3384	519-773-5344	230
2	Ryan Desutter	rdesutter@malahide.ca	226-545-0432	519-773-5344	320
3	Monica Badder	mbadder@malahide.ca	226-973-4132	519-773-5344	241
4	Nathan Dias	ndias@malahide.ca	519-808-1703	519-773-5344	223