MONITORING PROTOCOL

coast watchers
COMMUNITY VOLUNTEER PROGRAM

16th Annual Monitoring Season

LAKE HURON CENTRE FOR COASTAL CONSERVATION

The Lake Huron Centre for Coastal Conservation

Our Vision: *A healthy Lake Huron coastal ecosystem*

Our mission: *To provide leadership and expertise, in collaboration with partners, to achieve a healthy Lake Huron coastal ecosystem.*

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WELCOME TO COAST WATCHERS

Coast Watcher Citizen Science Volunteers are the eyes and ears of Lake Huron. For 16 years, dedicated volunteers in coastal communities just like you have participated in the collection of shoreline data. Through the data you have collected, we are able to contribute to decision-making surrounding water quality, shoreline restoration, climate change indicators, species at risk and invasive species. Every year volunteers collect over 89,000 data points to add to the long-term data set, donating over 1,500 hours of volunteer time to the program. We have you to thank for creating such an amazing data set giving us a detailed profile of the place we love most- Lake Huron.

Coast Watchers was designed to educate and engage members of the coastal community and allow you to take an active role in the conservation and protection of our lake. Along with the data you collect, we hope to enrich your experience in the program through opportunities to learn more about Lake Huron's coastal ecosystems, threats to habitat health, and opportunities for action. We will host webinars throughout the monitoring season and encourage volunteers to participate in the shoreline clean-ups we host throughout the year as well.

This guide provides you with the key skills to monitor your shoreline. Your observations will be compared with similar observations made along other parts of the lakeshore.

The program includes the elements the Coastal Centre believes are the larger threats to overall coastal health; however, coastal environments are ever-changing and so too are the threats and issues that challenge them. As a Coast Watcher, you are asked to follow specific protocols and look for specific threats, conditions and species; the longer you participate the more information and training we can share with you. Eventually, you will find yourself building an intuitive connection with your shoreline—one that allows you to "see" the issues and problems before we even know about them.

Feel free to contact us for additional information on topics that are of interest to you. You may also be interested in becoming involved in, or telling your neighbours about our other programs provided by the Coastal Centre, such as Green Ribbon Champion.

Thank you for your dedication and hard work!

Daniela Klicper
Coastal Stewardship Coordinator
Lake Huron Centre for Coastal Conservation

GENERAL MONITORING PROTOCOLS

Getting Started

To become a Coast Watcher (CW), you must officially sign up by completing some required paperwork. These forms are kept confidential. You will be assigned a unique Coast Watcher number that will be used throughout the program to tie all your submitted data to your specific site.

CW training occurs between March and April every year, offered as free workshops at several locations along the shoreline or digitally for those who cannot attend the in-person sessions. If you are a new CW, you must attend one of these sessions to learn how to follow the protocol, fill in the data sheet, and use the monitoring equipment. Alumni CWs are invited to attend these sessions each year for updates and training. Your presence will assist us in mentoring new volunteers each year. Equipment will be provided at these workshops.

Monitoring During a Pandemic

It is **important** to adhere to Ontario Public Heath guidelines of physical distancing, mask wearing and beach closures when in public areas. Scope out your beach and choose a time of day when your monitoring site will be less crowded. Keep yourself safe by bringing hand sanitizer and choosing a monitoring buddy within your household. We can still make a difference and enjoy beautiful Lake Huron as Citizen Scientists in this time.

General Monitoring Protocols

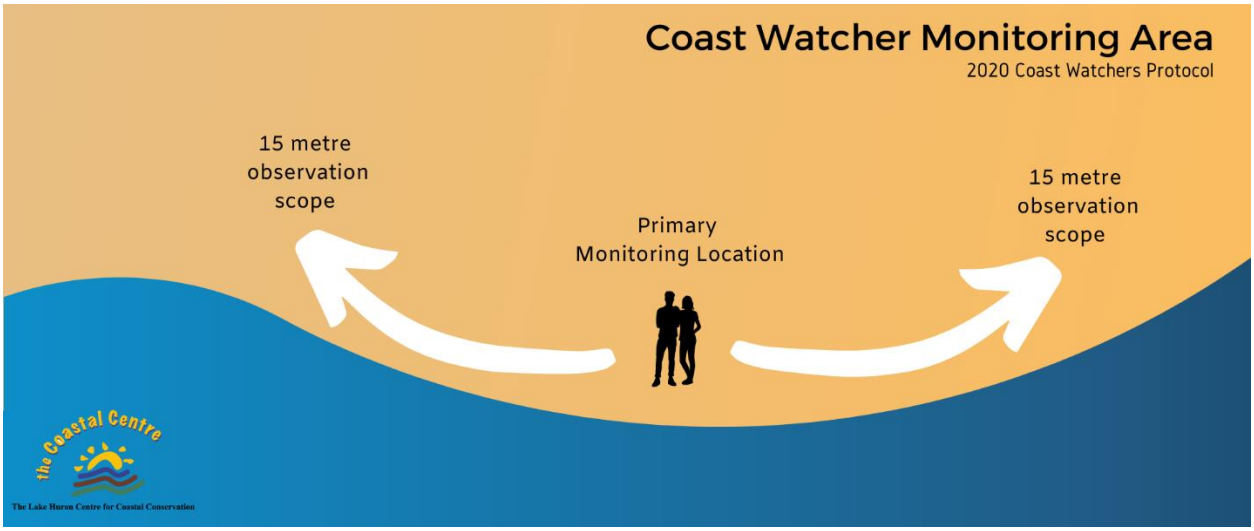
The monitoring season is 26 weeks long from May 1 until October 31 every year. Coast Watchers commit to monitoring the same place once per week, ideally at the same time on the same week day. For example, "*Samantha will monitor Goderich Main Beach on Monday Mornings at 9:00am*". Consistency is important to keep the data consistent and

un-bias, capturing all weather events and climactic conditions across the monitoring season.

We recognize that life gets busy and even with the best of intentions, some days will be missed. Please do not fret over missing a day or two, but if you intend to be away, we ask that you consider asking a neighbour, friend or family member to take over your monitoring activities while you are absent. If you are a seasonal resident and can only commit to a few weeks per year, that is ok too! Please communicate this to us so we can understand what your availability is.

Where to Monitor:

Coast Watcher Volunteers will pick a section of coast that is relevant for them. For example, if you are a cottage owner you can monitor the shoreline in front of your cottage; if you go to a public beach at least once-per-week you can select a point at that beach to monitor. Volunteers must choose a specific spot to monitor from for wind and wave data. Other observational data can be recorded from 15 m on either side of the primary monitoring location (30 m total). Please get permission before going on any privately owned property (e.g. neighbours), or avoid monitoring that area if you cannot get permission.



Events and Occurrences:

Living and visiting the lake often shows us some strange and unique occurrences such as pollution spills, fish and bird die-offs, massive erosion events or species at risk nesting and migration. It is important to collect this information so we can inform our partner organizations and find solutions if there is an environmental risk or a rare species to monitor.

Pollution Hotline

The Ontario Ministry of the Environment and Climate Change has a toll-free, 24-hour public hotline for reporting spills and/or acts of pollution. This service is available at **1-800-268-6060**. In addition to locating polluters from callers' tips, the hotline is also used

to gather information on new and emerging environmental issues. Hotline callers may choose to remain anonymous.

Illegal harm to plants and animals

The Ministry of Natural Resources and Forestry has a toll-free, public hotline for reporting illegal harm to plants and animals protected by legislation in Ontario. This service is available at **1-877-TIPS-MNR (847-7667)**. Use this line if you witness an illegal act that harms an endangered or threatened species in Ontario. (See the Species at Risk section for more information).

If you do contact either hotline, please be sure to inform us of the situation you are reporting immediately after you have notified the MOECC/MNRF. Please phone 226-421-3029 or 519-523-4478, or email coastalcentre@lakehuron.ca.

Piping Plover Observations

All Piping Plover sightings should be immediately reported to Bird Studies Canada, as well as recorded on your data sheet. You can contact Bird Studies Canada at: **ontarioplovers@birdscanada.ca or 519-586-3531 ext. 128**

RECORDING / SUBMITTING DATA

As a Coast Watcher, you will fill out a 'Field Data Card' every time you monitor the shoreline. To send this data to be added to the program's database you can submit it in the following ways:

If you have access to a computer:

- You can record your observations in-field on the data card and when you return to your computer you would input this information into the provided Microsoft Excel spreadsheet. You would then email this completed spreadsheet at the end of every month to coastwatchers@lakehuron.ca.
- You can scan or take a photo of your data sheets and e-mail them at the end of every month to coastwatchers@lakehuron.ca.

If you do not have a computer:

- If you are local to Goderich, you can drop off your data cards in person to the Lake Huron Centre for Coastal Conservation's office.
- You can mail your completed data cards at the end of each month to: LHCCC, P.O Box 477, Goderich, ON. N7A 4C7

Photo Submissions

In some cases, you may want to submit photos with your field data sheet. Reasons to submit photos include Algae blooms, plastic pollution washups, storm damage, a species you would like help identifying, or just a beautiful day you want to share. There is space on the field sheet to make note of the images you take. Please organize your photos in folders based on the images you captured. At the end of each month create a ZIP folder and send to us using the online portal **www.wetransfer.com or a Google Drive link.** Send to **coastwatchers@lakehuron.ca.**

TEMPERATURE

Coast Watchers monitor air temperature and water temperature. All temperatures will be reported in degrees Celsius (°C). Temperature is a measurement taken by most environmental monitoring programs. Recording temperatures creates a complete picture of conditions at the sampling site at the time of monitoring and over an extended period.

While temperature may be one of the easiest measurements to perform, it is also one of the most important parameters we test because temperature affects the rates of chemical and biological reactions within the water.

Equipment

- Kestrel anemometer (2000 or 2500) (if available)
- Pool thermometer

Procedures

Air Temperature:

To use the Kestrel anemometer, hold it out in front of you. The bottom of the instrument should be pointing to the ground. Ensure the screen is displaying degrees Celsius. Count to 60 and record your measurement in degrees Celsius (°C).

To take a temperature reading, use the toggle buttons to reach the temperature screen. There will be a tiny thermometer with the °C at the bottom.

The Kestrel Anemometer also records Wind Chill. The instrument is displaying wind chill when the thermometer and wind graphic (see wind watch) are visible. You do not have to record this measurement.

If the instrument is showing °F, press and hold the middle button, while pressing the left or right toggle, to switch to °C.

Water temperature is taken by walking into the lake (Please be careful), holding the thermometer by the string, and letting it hang into the water column. One metre water depth is usually about waist deep. If you are unsure, please take a moment to measure where 1 m is on your body before entering the lake.

The string attached to the water thermometer has a knot tied at 30 cm from the top of the instrument. Standing in the water at 1 m depth, hold the knot at the surface of the water and allow the instrument to dangle below the surface. Hold the thermometer under the water for at least 1 ½ minutes. Bring the thermometer up to the surface (but not out of the water) and read the temperature.

Record the temperature to the nearest 0.5°C.

Taking water temperature is not an absolute requirement of the program. The data is extremely valuable; however, safety comes first. Please do not enter the water if you are not comfortable doing so.

WIND

Wind is measured in kilometers per hour (km/h), and circumference degrees. Wind and weather conditions (whether raining or sunny, windy or calm) can have an impact on physical, chemical and biological activity in the water. Wind speed and direction can be an indication of the source of some airborne pollutants. It can also affect turbidity, dissolved oxygen and surface water temperature.

Wind direction is important to measure throughout the monitoring season so prevailing winds can be determined. Prevailing winds are considered the dominant wind direction during a season and can greatly influence specific processes occurring at that time of year.

Equipment

- Kestrel anemometer (2000 or 2500)
- Compass Rose

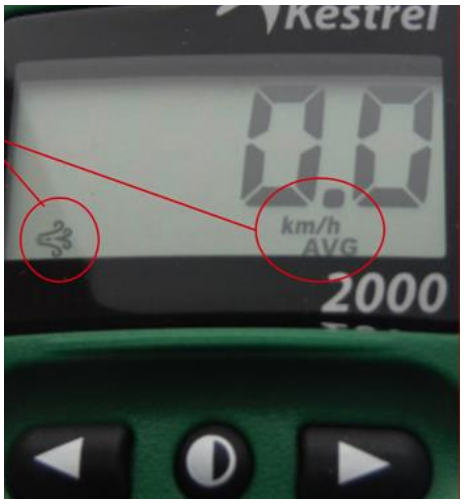
Procedures

Wind Speed

Facing into the wind, hold the Kestrel Anemometer in front of your body, with the impeller (spinning fan) parallel to the ground. Wait one minute to allow the instrument to capture accurate measurements.

Record current wind speed (km/h), wind speed average (km/h), and wind speed max (km/h). The instrument displays different icons for each measurement. Use the toggle buttons to change the display. If the instrument is not showing km/hr., press and hold the middle button, while pressing the left or right toggle until you see the proper unit.

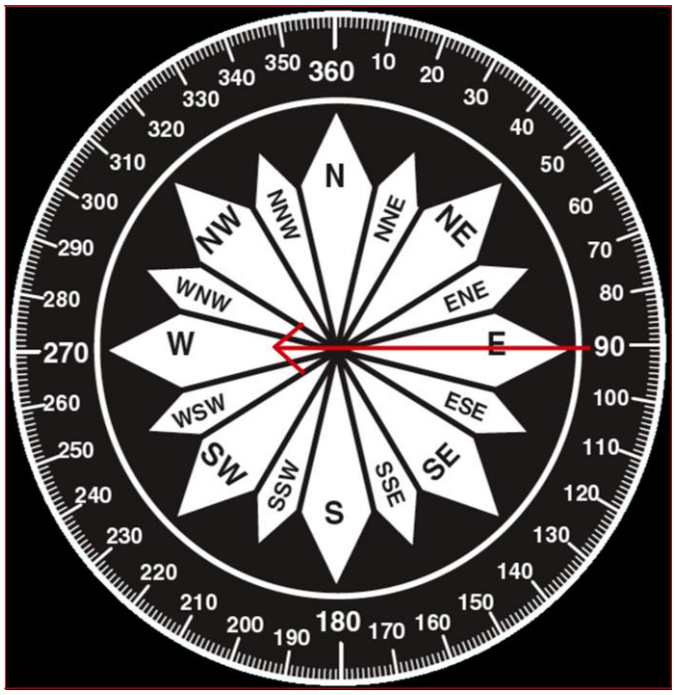
Current Wind Speed
Wind graphic + Km/Hr.



Average wind speed
Wind graphic + Km/Hr. + AVG

Maximum wind speed
Wind graphic + Km/Hr. + MAX

Wind Direction



Record the direction of the wind using the Compass Rose. *Wind direction is measured from the direction it originated from.* For example, in the diagram below, if you estimate an East wind (the wind is blowing from the East towards the West), the circumference degree would be 90. In the compass rose diagram here, the red arrow represents the direction of the wind. Record 90 °.

Some days wind direction can be difficult to determine. Using a stick with a string attached is a helpful trick; any stick and length of string will do, or look to a flag flapping in the wind. On days with no wind, simply put ‘n/a’.

WAVES

Wave height and average wave direction are measured using the Beaufort scale. This scale describes wave height using descriptive words and compares these to wind speed.

Wave direction is provided using the same compass rose as described in the Wind protocols. Wave direction can be influenced by wind direction. Wave direction affects transport of sediments, nutrients, and debris. Wave direction is measured from the direction it originated from.

Wave activity moves sand along the shore and re-suspends it in the water. E. coli lives in the sand and will be re-suspended in the water with the sand. As the strength of waves increase, so does the amount of re-suspended sand, and the amount of re-suspended bacteria.

Equipment

- Beaufort scale (displayed on next page)
- Compass rose

Procedures

Wave Height

Using the Beaufort scale, select the appropriate number (1—12). Sometimes wind speeds can assist, but make sure to confirm the number by ensuring the descriptions do match the appearance of the waves.

You will rarely, if ever, see a Beaufort Scale reading over 9 on Lake Huron.

Wave Direction

Wave direction uses the same procedures as wind direction. Determine the average wave direction by observing the general direction of the waves as they wash up on the shore. Wave direction is measured from the direction it originated from. Use a compass rose to estimate the corresponding degree measurement.

BEAUFORT SCALE

Beaufort Number	Anemometer Reading Wind Velocity		Description	Lake Observation	Nearshore Wave Height
	Knots	Km/hr.			
0	0-1	1	Calm	Glassy smooth; mirror-like	Smooth
1	1-3	1-5	Light air	Ripples	Ripples
2	4-6	6-11	Light breeze	Small short wavelets	10 cm
3	7-10	12-19	Gentle breeze	Large wavelets; crests begin to break	11 - 60 cm
4	11-16	20-28	Moderate breeze	Small waves; some white-caps	60 cm - 1 m
5	17-21	29-38	Fresh breeze	Better formed waves; many white-caps	1 to 1.2 m
6	22-27	39-49	Strong breeze	Large waves, many white-caps; umbrellas hard to use	1.2 to 1.5 m
7	28-33	50-61	Near gale	Large to very large waves; walking in wind is difficult	1.5 - 1.8 m
8	34-40	62-74	Gale	Very large waves; twigs breakoff trees	1.8 - 2.2 m
9	41-47	75-88	Strong gale	High seas; wind damages buildings, blow off roof shingles	2.2 - 3.5 m
10	48-55	89-102	Storm	High seas; wind uproots trees	3.5 - 4 m
11	56-63	103-117	Violent storm	High seas; wind causes widespread damage	4 - 4.5 m
12	>63	>117	Hurricane	High seas; Category 1 hurricane.	>4.5 m

Wave Height Examples:

BEAUFORT SCALE 1

Ripples, but no wavelets.

BEAUFORT SCALE 4

Small waves, some white-caps

BEAUFORT SCALE 6

Large waves, many white-caps

VISIBILITY

Visibility is defined as a measure of the distance at which an object can be clearly discerned. Visibility affects boating, road traffic, aviation, and other daily activities. Visibility recorded over time can be used to assess trends in atmospheric conditions.

Equipment

- None, binoculars are optional

Procedures

The horizon is the apparent intersection between the earth and sky. When you look at the lake on a clear day you can see the horizon. If the atmosphere is holding moisture, the horizon will be hidden behind fog or haze. If there is a storm approaching, or smog is occurring over the area, the horizon will not be visible.

If you can see the horizon, check-mark 'YES' on your field sheet, if you cannot, check-mark 'NO'.

Visibility Watch Examples:

VISIBILITY- Y

Horizon is clearly visible

VISIBILITY - N

Horizon is not clearly visible

PRECIPITATION

Tracking precipitation allows us to compare, create trend-lines, observe fluctuations, and predict weather patterns on Lake Huron. Precipitation can include rain, hail, snow, or mist. Rainfall can affect the rate of run-off pollution from land and the temperature, pH and turbidity of lake water. CWs record the type and amount of precipitation in millimeters (mm) at each site for the past 24 hours.

Option 1 - Standard Coast Watchers Precipitation Monitoring

Equipment

- Coast Watchers rain gauge

Procedures

Place your CW rain gauge in an open place where rainfall will not be affected by tree branches or roof overhangs. The gauge can be inserted into the ground, or bolted to a deck or post. Record your precipitation (from the last 24 hours) amount in millimeters. When you have taken down the measurement, please ensure that you empty the rain gauge so that it can be ready for the next 24 hours; this will provide stronger representative data.

Option 2 - Precipitation Monitoring through CoCoRaHS

Equipment

- CoCoRaHS rain gauge

Procedures

The Community Collaborative Rain, Hail and Snow Network (CoCoRaHS) is a network of volunteers working together to measure and map precipitation. The Coastal Centre has partnered with CoCoRaHS, and Coast Watchers have the option to use a CoCoRaHS rain gauge and submit the data online through their program.

Install the CoCoRaHS rain gauge according to the instructions provided, and visit www.cocorahs.org to register. Click “Join CoCoRaHS” and fill out the required information. Under “How did you find out about CoCoRaHS?” please enter “Coast Watchers”. Precipitation amounts in millimeters (mm) are entered daily through the online form. Please also record the amount of precipitation on your field data card. After recording the measurement, ensure that you empty the rain gauge so that it can be ready for the next 24 hours; this will provide strong representative data.

PHOTO-MONITORING

Pictures can be powerful tools to monitor dynamic shorelines where the appearance of the coast can change rapidly from month to month and year to year. There are a number of instances throughout the protocols where we ask you to take pictures; this exercise is separate and is done once per month to capture the shoreline itself.

Equipment

- Digital camera (use highest resolution you can, always shoot horizontal)

Procedures

Pick a spot on your beach that you will always take the photo from. This spot should have a view of your beach, including the water, open beach and the vegetation. The example below provides some indication of what we are looking for, and illustrates the change to the beach and dunes in response to changing water levels.

1950 **1990** **2018**

Save the images to your computer using the following format: CW#_YEAR_MM_DD We recommend creating one unique folder for these images titled, “photo-monitoring”.

Always save images using the following template:

CW#_YEAR_MM_DD_PHOTO#

001_2015_05_01_1

001_2015_05_01_2

WILDLIFE WATCH

Many different types of wildlife inhabit the coastal ecosystems on Lake Huron. CW's may come across birds, mammals, reptiles, insects or other types of wildlife during their monitoring. It's important to maintain a safe distance away from wildlife, especially if it seems to be sick or injured. Record all wild animals you see in this section. Observations of 'pets' like dogs will fall in another section of the field data card.

Fish and bird carcasses are common sites along the Lake Huron shore. CWs regularly visit the shoreline and could very well be the first to observe an abnormal mortality event. As they decompose, their nutrients percolate into the sand and feed plant growth in the coastal zone.

Occasional deaths are to be expected in the coastal zone; these are normal. ***If the beach is covered with dead or lethargic fish or birds, this is an environmental emergency.*** Dead loons, mergansers, cormorants, gulls, and other birds washing up onto area beaches may be caused by an outbreak of avian botulism. Avian botulism is more likely to occur during the late summer and fall. Avian botulism is a neuro-toxin that accumulates in prey items ingested by the bird. The toxin causes paralysis and the infected bird will eventually drown and wash to shore. Large numbers of dead birds are cause for alarm.

Dead fish floating on the water surface, or washing up in abnormally large numbers, may signal a sudden drop in dissolved oxygen levels, the influx of some toxic substance, or a disease or infestation of the fish.

Procedure

- Fill out the field data card with observations of alive and dead wildlife.

- Large mortality events can be a wash-up of many of the same species, or a multi-species event. Animals still alive may require immediate assistance. DO NOT touch the animal until you get in contact with a professional.
- If you see significant numbers of dead birds or bats in one location contact the
    - **Canadian Cooperative Wildlife Health Centre: 1-866-673-4781**
- If you discover a fish die-off, contact the
    - **Ministry of Natural Resources and Forestry: 1-800-667-1940**
- If you suspect the fish died as a result of a spill, call the
    - **Ministry of the Environment, Conservation and Parks Spills Action Centre: 1-800-268-6060**

Wildlife Watch Example:

Circle YES or NO each day you visit the beach. Reporting no mortality event or no wildlife presence is just as important as reporting one.

BIRDS		**YES** **NO**
Species (*list*)	#	Condition (*alive, dying, dead, decomposed*)
Loon	*5*	*Dead*
Mallard Duck	*6*	*Alive, swimming*

Note the species. If you cannot identify the species, use a descriptive pronoun such as "white" or "black" bird, or take a photo.

FISH		**YES** **NO**
Species (*list*)	#	Condition (*alive, dying, dead, decomposed*)
White fish	*300+*	*Dead*
Crayfish	*1*	*Alive*

Provide an actual, or estimated count.

OTHER		**YES** **NO**
Species (*list*)	#	Condition (*alive, dying, dead, decomposed*)
Snake	*1*	*Alive, Unknown species*

Photo Examples of Mortality Cases:

2019: CW087, Bird Mortality

2019: CW069, Fish Die-off

SPECIES AT RISK

Background

The Ontario Ministry of Natural Resources and Forestry's Committee on the Status of Species at Risk in Ontario (COSSARO) evaluates the conservation status of species occurring in Ontario and makes recommendations on their status. Ontario's Endangered Species Act (1971) protects species listed in regulation under the Act and their habitats. The OMNRF is responsible for enforcing the Act. Some species are also protected under the Fish and Wildlife Conservation Act.

Information on Species at Risk locations is sensitive because of the threat of poaching and trapping. Information on the occurrence of these species is the result of observations by many naturalists and volunteers, such as CW's, as well as agencies and other organizations. COSSARO would not have up-to-date information without the help of citizen scientists reporting their sightings of Species at Risk in Ontario.

The recovery of Species at Risk, especially the protection of their habitat along the shoreline, requires information on their location. Through CW's, we are able to have many trained eyes and ears on the coast which makes it more likely that we will detect rare and at-risk species throughout the spring-summer-fall months. All Species at Risk data collected through the CW program are shared with the Natural Resources Information Centre (NHIC). Depending on the sensitivity of the species, the NHIC will make the information available to organizations and agencies across the province.

Procedure

While you are doing your regular CW activities, keep an eye out for Species at Risk. Take a moment to go through the additional details in the Species at Risk guide and narrow the list down to Species at Risk in your area.

If you see a Species at Risk, fill in the table on the field sheet and take as many photos as you can.

Species	**#**
Monarch Butterfly	*1*

CW019_2014_08_15

Species at risk on Lake Huron include:

Endangered	Threatened	Special Concern	Extirpated
Piping Plover Massasauga Rattlesnake Common Five Lined-Skink Queensnake Spotted Turtle	Eastern Hog-nosed Snake Pitcher's Thistle Chimney Swift Bank Swallow Eastern Whip-poor-will	Snapping Turtle Eastern Ribbonsnake Dwarf Lake Iris Tuberous-Indian Plantain Monarch Butterfly	Karner Blue Butterfly

Submit your data at the end of each month so we can compile the Species at Risk observations from all CW's, and submit them to NHIC.

There may be exceptions to this protocol; some species may require an immediate phone call to the MNRF. We will notify you if you are monitoring in an area where specific instructions may apply.

All Piping Plover sightings should be immediately reported to Bird Studies Canada, so that appropriate conservation measures can be taken. Report plover sightings to agress@birdscanada.org. Piping Plovers are becoming increasingly more common along Lake Huron, and may be observed at all beaches.

More information on Species at Risk in Ontario can be found on the Ontario Ministry of Natural Resources and Forestry website: http://www.ontario.ca/environment-and-energy/species-risk-ontario-list.

ALGAE BLOOMS

Abnormal algae blooms have become a chronic issue in recent years, with nearshore or beach areas becoming fouled with large piles of rotting plants. There are three main types of algae that grow in Lake Huron: Chara, Cladophora, and Periphyton.

All three types grow on the rocks on the lake bottom. Wave energies from storms and high winds can pull some of these algae off the rocks and deposit the plants on the beach. Some algae washing up onto the beach is perfectly normal, and to be expected. When large amounts of algae pile up on our beach, it tells us that in the previous weeks algae growth has bloomed in the nearshore.

By collecting information on where and when abnormal algae blooms occur along our shorelines, we build a database of occurrence that can be compared to the weather data CW's collect.

We can also share the data with local municipalities that may, or may not, know about the algae problem on their shorelines. Some Lake Huron municipalities have elected to clean the beach of algae, and having an idea about where and when algae blooms occur can help municipal staff develop appropriate policies for its removal.

Procedures

As a CW, you may see piles of algae along the shore all the time, this is normal and you do not need to make record of this.

Every day you should look for abnormal algae blooms and check-mark "NO" on the field sheet to confirm you have checked and observed nothing abnormal that day.

Abnormal algae blooms may appear in the water as dark green to black muck, or as piles of green to black matter on the beach. It is difficult to quantify what is normal and not normal for any one beach along the shoreline, but generally speaking, an algae bloom worth recording covers the length of your beach (> 10 m long), is greater than 0.5 m wide, and forms a deep linear pile.

If you suspect an algae bloom, we ask that you:

- Take a photograph (remember to turn on the date stamp if your camera has this option)
- Fill in the algae blooms area of the field sheet (see examples on the next page)

It is very important that you check for algae every day you visit your beach and remember to circle "NO" twice in the algae bloom section of the field sheet if you do not see algae in either the water, or on the beach.

Algae Watch Examples:

ALGAE ON LAND

Measure length and width

ALGAE IN WATER

Measure length and width

To fill out the algae section of the data card, specify where the algae is located (land or water), take an estimated size of the occurance, and make notes if you see other things of interest, including animals in the algae, litter, or a potential cause of the bloom.

ALGAE BLOOMS (take pictures)			
Location	Visible	Length (m)	Width (m)
In Water	yes no		
On Beach	yes no		
Other (notes)			

PLASTIC POLLUTION

Plastic pollution on the shores of Lake Huron is increasing every year. While many items are visible with our eyes, plastic pollution also exists at the micro-scale as fragments that result from the breakdown of larger plastic items. Microbeads also exist in the lake. Microbeads are tiny multi-coloured spheres that are used in personal care products. Recently it was determined that many of these microbeads travel through water treatment facilities and into the open lake. Plastic pellets called "nurdles" can also be found floating in the lake and washing onto shorelines. Nurdles are raw plastic materials used to make virtually all other plastic products.

All of this plastic is a threat to the health of Lake Huron. While impacts of plastic pollution have been well studied in marine environments, little is known about impacts to freshwater lakes. Current research in Ontario is focusing on the sources of plastic pollution with the intent of advising preventative policies. Some research in the US is beginning to look at rates of ingestion in aquatic fish and birds. Research on impacts to humans is forthcoming.

Plastic Watch is included in the Coast Watchers program because Coast Watchers are likely to be the first witnesses to a large wash-up of plastic pollution and can notify the Coastal Centre if a beach clean-up event is required for their area.

Procedures

Coast Watchers are asked to keep an eye on their beach for two things:

1. Plastic Pellet event (see examples for pictures)
2. Watch for litter accumulation and notify the Centre if a beach clean-up is required.

Beach clean-ups can be one of the best ways to remove plastic litter from the Lake Huron ecosystem. Any Coast Watcher could also choose to participate in the Coastal Centre's Beach Clean-up program, but regular Coast Watchers protocols do not require the removal of plastic items on a daily basis. Please contact the Centre if you would like more details about our Beach Clean-up program.

Plastic Pollution Examples:

MICRO PLASTICS

Plastic pieces that are smaller than your finger tip (technically 5mm)

SHORELINE LITTER

Medium sized litter that can be easily picked up

LARGE DEBRIS

Debris that is larger than a bread box.

Plastic pellets, or nurdles, are regularly washing ashore on Lake Huron. They can be next to impossible to remove and are very time consuming to pick up.

If you see a mass wash-up of pellets that are covering your beach, please let the Centre know so we can assess the situation. Researchers at the University of Western Ontario may be interested in visiting the shore to collect samples.

Circle YES on the field sheet, and notify the Centre. A beach clean-up event is not usually practical for these pellets; However, we can help you organize one if you wish to tackle the removal of these pellets from your beach.

If you take on doing a 5- or 10-minute beach clean-up while you are out on the shore, let us know how many pounds of litter you pick up! We can add these records to our data base and track them from year-to-year.

To fill out the plastic watch section of the data card, determine if there was a plastic or human-made waste wash up event, determine if a beach clean-up is needed, specify if you picked up litter and how much you collected, and identify the most common pieces of litter. *It's not our trash, but it's our planet!*

PLASTIC WATCH (take pictures)		
Plastic wash up?	Yes	No
Beach clean-up needed?	Yes	No
Beach clean-up done?	Yes	No
Pounds of litter removed:		
Most common types of litter:		

HUMAN ACTIVITIES

The Lake Huron shoreline has always been a place of recreation and relaxation in the hot Ontario summer months. Many beach communities are known for specific recreational pursuits, while others are used for a wide range of activities.

As summers become hotter and more and more people move to the shoreline, we expect a greater number of people to visit the Lake Huron coast and visit more frequently. This may have detrimental impacts to coastal ecosystems. By monitoring human activities, we can better understand how the shoreline is being used and by how many people over time.

Procedures

During your daily monitoring activities, fill in the Human Activities section of your field sheet.

Remember to write a zero (0) you see no activity. If you fill in the OTHER line, please write down the activity you are describing.

HUMAN ACTIVITIES	
Activity	#
People on Beach	
Water activities (no motor)	
Water activities (motor)	
Motorized vehicles (on beach)	
Dogs on Beach	
Other	

COASTAL IMPACTS

Coastal impacts monitoring is completed twice per year —in the spring and fall.

Cumulative impacts to coastal ecosystems can be difficult to monitor. The creation of several access paths through a dune, or extra staircases down a bluff, may appear to have little immediate consequence. The installation of one seawall or deck, or the renovation of a small cottage into a full-service home may seem harmless one at time. One pass of an ATV, the removal of one old tree, or any of these activities, can't possibly harm the coast? Can they?

It is easy to think in a linear "one cause – one effect" mode. However, the reality is that, over time, all these small seemingly insignificant impacts, when combined with all of the other shoreline uses, can become a large cumulative impact that degrades habitat quality over time.

Climate change will only add to the impacts as more and more people flock to Lake Huron's coast to cool off in the summer. It becomes important to try to better understand the cumulative impacts to habitat quality along the coast of Lake Huron in order to find an appropriate balance between conservation and recreation.

The longer you are a CW, the more you will notice the short- and long-term changes in the coast you are monitoring. Through our habitat monitoring activity, we hope to paint a picture of the quality of your beach now, and over time, so we can improve our understanding of the changes caused by various activities over time.

Procedures

Habitat monitoring is completed once per year between May and June. The Coastal Centre will provide a Coastal Impacts Monitoring sheet for you to complete and send back. This can be done electronically, or by mail. Take the data sheet to your beach and spend some time walking the shoreline looking for the impacts in the list. Do your best to pick the most appropriate option for each impact. This is not meant to be time consuming, or difficult. We are simply trying to gather some data on the rate of change, and extent of impacts on coastal ecosystems along the Lake Huron shore.

Coastal Impacts Monitoring Examples:

OFF ROAD VEHICLE TRAILS

This photo shows beach grooming and vehicle trails

VEGETATION CLEARING

Trees or groundcover vegetation removed

SHORELINE STRUCTURES CONSTRUCTION

New stairs built down bluff

Watch	Daily	Monthly	Once per season	By Choice
Temperature	Record daily			
Wind	Record daily			
Wave	Record daily			
Visibility	Record daily			
Precipitation	Record daily			
Photo-monitoring		One image of your shoreline		Photos of interesting observations, (e.g. Species at risk, mortality events, etc.)
Mortality	Look daily			
Algae	Look daily			
Species at Risk	Look daily			
Plastic	Look daily			Participate in our shoreline clean-ups, or organize one in your community.
Human Activities	Record daily			
Coastal Impacts & Microplastics sample (if applicable)			Complete once between May 1 and June 30	
Field sheets / Excel spreadsheet		Submit monthly		Some observations may require immediate submission (e.g. Species at risk, mortality events, etc.)
Photographs		Submit monthly		

OVERVIEW OF COAST WATCHER PROTOCOLS

Start of season duties – Season starts: May 1

- Contact the Lake Huron Centre for Coastal Conservation to confirm your participation;
- Ensure all Coast Watcher forms have been submitted and/ or are up to date;
- Look for an alternate Coast Watcher to help with monitoring if you are planning to be away;
- Ensure all of your equipment is working and you have enough field sheets for the season.

End of season duties – Season ends: October 31

- Submit final excel spreadsheet / field data sheets;
- Submit the final photographs;
- Complete Coast Watcher annual evaluation

THANK YOU TO THE GENEROUS SPONSORS OF THE COAST WATCHERS PROGRAM