Return from an Apocalypse:
A Chute Park Adventure

Distance: 1 km return **Approx.** Time: 1.5 hrs

Trail Info: This trail is situated around a bike skills park and often meanders off a groomed gravel trail, requiring you to have good sturdy foot ware. Be aware that there may be mountain bikers zooming around the bike skills park as well. The adventure also requires some climbing up sandy slopes so wear clothing that you don't mind getting dirt on.

Directions: Take Exit 15 on the 101 highway and turn left off the ramp towards Berwick. Go through the set of lights on Commercial Street and take the 4th road on the right called Orchard Street. Drive 300 m, passing the West Kings Memorial Health Centre and turn into Chute Park on the left.

Trail Tools: Bring a daypack with water, snacks, first aid kit and anything else you need. Prepare and gather these tools for each person before heading out on the trail.

- Magnifying lens (if you have one)
- a 3 foot string or rope for each person
- Spy Scope - decorated cardboard toilet-paper role
- Small plastic or paper cup
- Snack and water and sunscreen
- Adventure Journal

Emerge and Learn about Nature's Survival

⇨ Start inside the ring of small trees at the beginning of the bike park trail at the edge of the parking lot.

You are part of the Restoration Squad after an apocalypse. 20 years ago, a great asteroid destroyed this landscape and the people hid underground until life started growing back. The underground food and resources are running low and the humans need to get out and live above ground again. Your fellow humans are counting on you to discover the secrets to survival in this barren land. Some plants and animals have already returned here and can teach us how to survive! Sometimes you will see fast, 2-wheeled creatures zipping by and making a lot of noise; try to stay out of their way.

As you explore the crater, see if you can figure out the secrets to survival and fill in the blanks below with the secret words. At the end you will learn the ultimate secret to survival by inserting the highlighted that correspond to each secret you've found along the way. Then you can report back and teach others in the caves underground. Make additional notes and drawings in you Adventure Journal as well. Be sure you have lathered on sunscreen; the sun is bright on the surface. Let's climb out of the ground to begin our search.

Chute Park Sand Quarry

Humans are environment changers. We use natural resources from the Earth, like sand and gravel from this quarry, to build roads, make cement and glass. This pit was mined ~20 years ago and is now in the process of succession and slowly re-wilding itself with hardy plants and animals. Discuss the positives and negatives of quarries.

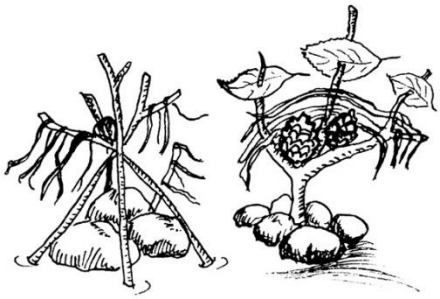
1. Everyone crouch low to the ground, close your eyes, and climb an invisible ladder until you are standing tall again. You have now climbed out of the cave! Squint and shield your eyes to adjust them to the bright light of the sun.
2. Take out your spy scope and look out into the crater below. What do you see? Do you see any dangers? Is it safe to go out into the open? Do you feel prepared? Make sure you have water…. It is hot out there!
3. Stand in a circle and everyone develop a call to tell the others the coast is clear.
4. When you all are ready, everyone give their call. Now let's go!

1. Be Tough

⇨ Walk 30 m to where you see a large white granite rock to the right and walk down off the trail to the right of it.

Look at the ground around you. What do you see? What is living here?

The plants and animals here need to be tough to live in such a dry and harsh environment. They need to have resilience so they can change and adapt to survive in the harsh environment. Could you live here on a hot day?
Using the tough stuff you find in this area, make sculptures and experience what it is like to work here in the open. You can use rocks, sticks or whatever you find. Leave the sculptures for the next explorers to find and admire.



Draw a picture of the tough stuff art in your Adventure Journal.

Enter the missing letters in the word below to finish the first secret to survival (HINT: Look for the word mentioned in the text above).

Secret 1: R E S _ L I E _ C _

Give your all clear signal to move on to the next secret.

2. Stay Low

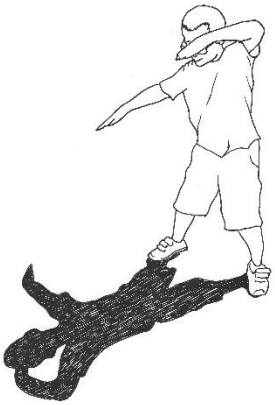
- ⇨ Walk 30 m over to the big tree to the left of the main trail and beside a little mound of dirt.

This tree is unusually large for this area, it is a balsam poplar, and is one of the toughest plants in Canada. Notice what its lower branches are doing. Look at the other plants and trees in this area, why do you think their lower branches all hug the ground as well?

Balsam Poplar is known as pa'migli in the Mi'kmaw language (www.mikmaqonline.org). It has sticky buds with a distinctive sweet smell. Go ahead and scratch and sniff the leaves! The resin in the buds can be used as an antiseptic against infections.

Shade the ground like a Balsam Poplar.

1. Everyone stand in a circle with arms (branches) out in front of you.
2. Now everyone crouch down and cross arms to make as much shade on the ground as you can.
3. Can you block out all of the sun's rays?
4. One at a time, enter the centre of the circle and experience the shade compared to the exposed area.
5. Now go under the Balsam poplar's shade… is there a temperature difference?
6. Where do you feel coolest?



Give your all clear signal to move on to the next secret.

3. Go Slow You Lazy Animal

⇨ Start at the balsam poplar tree and move south to the Pine tree beside the main trail for this activity.

It is usually too hot for animals to run around too much here during warm days. Many mammals prefer to nap in the heat of day. Practice going slow with a slow race!

1. Mark a starting line with sticks or a scrape in the sand at the Balsam Poplar tree and do the same for an end line at the Pine tree, 20 m (40 paces) away.
2. Lazy animals line up along the starting line. Chose a lazy local animal to be and practice that animal. Some examples are cat, dog, raccoon, and skunk.
3. 1-2-3- Go! Race as slowly as you can.
4. The last person to reach the finish line wins.
5. No racer can stay still during the race and will need to jump ahead 3 times if they do.

Give your all clear signal to move on to the next secret.

4. Tools You Can Use

⇨ Walk 20 m south to the base of the sandy slope.

Rain and wind on this steep slope is continually eroding rocks and sand down into the bottom of the crater. Plant life is always trying to get its roots into this bare ground, but it is a very difficult place to live. The hardiest creatures can lay down roots and then that changes things so other creatures can move in and survive here. This is called succession, when one organism makes room and habitat for another organism. For example, the moss and grass need help to get their roots to hold on in the sandy soil and rock. Who is the first one to start the process of securing the slope? Let's find out!

1. Half of you be moss and half be grass. Your roots are your feet and your hands are leaves (your leaves cannot touch the ground). Stand still and wave your leaves around in the air.
2. First the moss walks up the sandy slope and tries to stay put without falling or bending over to use your hands. Hold your leaves up high as you walk.
3. Then the grass walks up and holds onto the moss without anyone falling over or sliding down.

How easy is it to stay put on the loose sandy slopes? Why can't you get very far on your feet-roots?

We may be missing a creature in the succession of organisms on this sandy slope. Introducing *Lichen Technology*! Moss and grass need this natural tech to stay put on this slope, especially during storms with heavy rains that can wash them away.

Clever LICHENS
Lichens use cool tools like hooks and chemicals to colonize rough surfaces and create a habitat for other plants to take hold and grow! Different organisms working together and changing the environment to make it livable is a key lesson.
Lichens also get their Nitrogen (a key nutrient for life) from the air so they can grow fairly quickly.

Look for Lichens with your magnifying lens… they are the lowest life forms on the ground and look like tiny spiky plants or a crusty covering. They can be green, brown, grey, black, red, pink or a combination of colours.
How many different colours and shapes of Lichens can you find? Draw one in your Adventure Journal.

Be like lichens

Without lichens and their tools, other plants can't gain a root-hold and get nutrients from this bare, loose sand. Lichens colonize bare soil first and have tiny hooks to hold onto the rocks in the sand and they break the rocks down with acid to release minerals and nutrients.

1. Find hooks. Look for two small sticks you can hold in your hands.
2. Hold a stick in each hand and climb the slope, digging your sticks like hooks into the sand as you go.
3. How far up can you get?
4. Come back down and split the group into lichen, moss and grass.
5. The lichen climbs back up the slope while the grass and moss hold onto them.
6. How far can you all go?
7. Now freeze and see if you can stay perfectly still without sliding down for 10 seconds while someone times from below.

Once you have climbed back down, enter the missing letters in the word below to finish the second secret to survival. This secret is nature's process of change to support a diversity of life.

Secret 2: S U C _ _S S _ O _

Give your all clear signal to move on to the next secret.

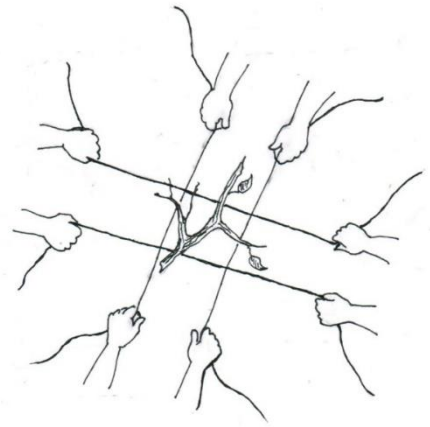
EARTHWORKS

Nothing ever stays the same. That is a fundamental truth about the universe. Sometimes abiotic forces (from non-living things) like hurricanes and earthquakes change the environment, but biotic forces (from living things) also change conditions in environments. Succession is the process of living things changing environments to encourage the growth of other living things. For example, when pine and spruce seeds blow into an area and start growing, eventually squirrels will move into the forest as well because there are spruce and pinecones available for their food.

5. Work as a Team

⇨ Walk left along the trail 30 m to the edge of the first clump of bushes right of the trail.

Ants like making their homes in sand because it is easy to move around and make tunnels. You may see them crawling around their ant hills in various places along the trail. One thing that really helps with survival is working together as a team and ants have this skill perfected! Sometimes food is too heavy to carry for just one ant so more help is needed.



Work Together like Ants

1. Stick your fingers above your head like ant antennae. Greet and communicate with the other ants in your group by putting your antennae together. You agree to carry food together!
2. Pick some good size leaves and sticks to be the piece of food.
3. Everyone stand in a circle and hold a piece of string or rope crisscrossed across the circle to make a kind of web-net to hold your food.
4. Find a way to hold the food in the centre of the ropes and walk to the next stop with it.
5. How far can your ant team travel with the food before it falls?

Give your all clear signal to move on to the next secret.

6. Attract Helpers

⇨ Walk along the path 15 meters to the edge of some trees to the right.

The plants in this area need to attract insect helpers. Ants, bees, flies and beetles benefit from the plants by taking nectar and pollen for food and the plants get pollinated so they can make seeds. Make the best smell ever to attract these helper insects by making perfume in a cup.

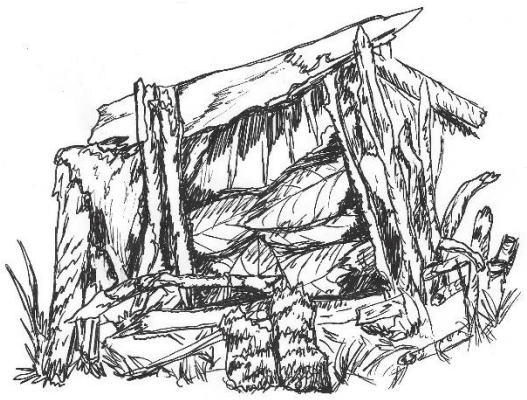
1. Everyone take a cup and search for neat smelling stuff.
2. Put each ingredient into your perfume cup.
3. Pick plant leaves, but be sure not to rip up whole plants.
4. You can even put in some earth and lichens to see what they smell like.
5. Add bits of attractive colours as well since insects are attracted to colours as well.
6. Name your perfume mixture something fun (e.g. Eau de Moss).
7. Everyone share their smell with the others and say which ones you like and why.

When you are done, pick a favourite smell and rub it on a journal page and label it. Find a small plant nearby and dump your mixture under it. How does this help the plant?

Give your all clear signal to move on to the next secret.

7. Make a Protected Place

- ⇨ Walk along the path 15 feet to where the crater opens up to the right before the path turns a corner.



What do you notice about this area that is different from the middle of the crater? There are many more plants here and lots more shade. Life needs protection and the shelter provided by the edge of the crater has helped plants set up here and in turn create even more shady sheltered areas.

Build mini shelters for the small creatures here so they can survive and stay cool. Use any natural materials you can find. What materials make the best shelters?

Use your magnifying lens to find small creatures living in the lichens and moss. Draw and write about them in your Adventure Journal.

Can you guess the next secret to survival?

Secret 3: _ H _ L _ E R

Give your all clear signal to move on to the next secret.

8. Get to Know Your Neighbours

- ⇨ Walk straight into the open area towards the slope where the trees are.

This bank is a perfect quiet place to go up and perch to enjoy the view in the shade of trees. When we are silent and still for a period of time, we start to notice things happening in nature that we would otherwise miss if we are loudly moving about. Sitting silently is a perfect way to observe nature and what it does to survive and thrive. Everyone find a comfortable place to sit around 20 m apart so you can enjoy nature on your own for a few minutes. Be still and silent for 5 to 10 min, or however long you want, but have a time goal in mind. You might see birds or animals going about their business if you can blend into your surroundings without being seen or heard. You can camouflage yourself by covering yourself with leaves and dirt so you can't be seen or smelled. Here are some things to do at your perch:

1. Check out the tiny things near you
2. Sketch a creature, a neat rock or a tree at your special spot in your Adventure Journal.
3. Make up a story about an animal or plant
4. Write a poem about survival in a dry land
5. Listen to the sounds
6. Check in with everyone once you are finished to see what everyone experienced.

The fourth secret to survival is sometimes hard to find!

Secret 4: C A M _ _ F L _ G _

Give your all clear signal to move on to the next secret.

Earth Steps

Humans need resources to sustain their communities. However, the wealth system of the capitalist society we live in often causes the accumulation of wealth at the expense of the environment. Through longitudinal study observations and scientific knowledge about the finite resources of the earth, we now realizing that our natural resources (eg. forests, sand/gravel and fossil fuels), are being degraded and depleted at an alarming rate, and disproportionately towards wealthy, privileged societies, by the almost 9 billion people on Earth. There needs to be a balance between resource extraction for infrastructure and profit and the need for a resilient environment for future generations. If natural resources are extracted quickly for maximum profits, that leaves little chance for our grandchildren and other living things to adapt in a depleted world.

How can you help balance resource use?

- **Conserve energy**. You can do this though conserving electricity in your home by turning lights out and using efficient appliances and watching your fuel consumption by only driving when necessary or taking public or active transport.
- **Mind what you buy**. Reducing what you buy, repurposing and reusing items, or recycle items if they can be.
- **Get political**. Encourage the Nova Scotia government's strategy to balance the resource use in our province. Talk to your MLA's about this important topic to keep it current in NS politics. See the NS government's strategy plan here to learn more - https://novascotia.ca/natr/strategy/

9. Be Resilient like a Monarch

⇨ Back on the path, walk 30 m until you are halfway along the east side trail between where you just came from and to where the trail turns to the left.

Some tough creatures travel from far away to find food and places to raise a family. Monarch butterflies' migration is part relay race, part obstacle course — and full of danger. Monarch Butterflies travel from Mexico to Nova Scotia each year, which is ~5 thousand kilometers away! The milkweed plants here along this slope to your right, are the perfect food for monarchs and you may be able to see their big fat striped caterpillars munching on leaves in August. Can you find any? Do not handle the caterpillars, only observe them, since they may not survive if disturbed from their plant.
Try not to get the milkweed's milky plant juices in your eyes or mouth either. Milkweed plants have a poison that can make you vomit. Only monarch caterpillars are adapted to eat milkweed leaves and hold the poison in their body as butterflies so other animals find them gross and don't eat them. This is an adaptation to keep them safe from predators, but some young inexperienced predators have to learn the hard way… yuck!

Have a Scare Off! Be a milkweed plant and try to scare away predators with your scariest or grossest face:

1. Stand face to face with a partner and take turns making the scariest or grossest face you can.
2. A judge can decide who has the scariest or grossest face.

Monarch Butterfly Migration is a complicated and dangerous business. In the Fall, monarchs fly south to Mexico for the winter. In March, they lay eggs in Mexico and a month later, the newly hatched monarchs (1st Generation) fly North and lay eggs on Milkweeds. The 1st Generation dies in a couple weeks and the eggs hatch (2nd Generation). The 2nd Generation monarchs continue the journey North, lay eggs (3rd Generation) and die. The 3rd Generation lay eggs in the North (4th Generation) and die. The 4th Generation (great-great grandchildren) fly all the way back to Mexico for the winter. https://journeynorth.org/monarchs/resources
Plant a Butterfly Garden to help monarchs with food along their migration route! Flowers that monarchs like are Zinnias, Milkweed, Verbena, Joe Pye, Butterfly Bush and Orange Cosmos.

Milkweed plants are the only food that monarch caterpillars eat. That means that they are important to the survival of the species and need to grow everywhere along the monarch's migration route. There are 73 species of milkweed across North America but only 2 in Nova Scotia (common and swamp milkweed). Look for the showy purple globe flower heads in July and the fat green seed pods in August.

Be an Amazing Monarch!

Make an migration obstacle course to fly through and challenge yourself to be a tough and resilient Monarch Butterfly on its way North for the summer!

1. Start by setting up a 20 m course along the side of the path with a start (Mexico) and end line (Nova Scotia) scraped in the sand.
2. Also mark lines in the sand 1/3 and 2/3 along the course to mark where the monarchs change into 2nd Generation and 3rd Generation butterflies.
3. Between the start and finish lines, place objects to jump and weave around as obstacles. Designate side boundaries as well so the fliers don't get off track.
    a. A ring of rocks can be a lake or ocean to jump over since Monarchs often have to fly over bodies of water.
    b. Sticks stuck in the sand can be tall buildings that Monarchs need to fly around.
    c. Backpacks can be mountains to fly over.
4. Someone can be a young bird predator that chases the monarchs around. But if a bird tags a monarch, the bird needs to stop and stay still for 30 seconds to recover from the monarch poison!
5. When monarchs are tagged by a bird, stay still for 30 seconds to recover from your narrow escape.
6. All Monarchs start as Generation 1 at the southern Mexico starting line while someone times the race.

7. Monarchs squat down to lay their eggs at the 1/3 line and then die by falling over onto the ground. Then crouch down in a ball shape for 5 seconds before opening up your chrysalis spreading your wings (arms) wide to continue the race as Generation 2.
8. Squat down at the 2/3 line and lay eggs, die and then crouch down for 5 seconds before opening up your chrysalis and keep flying as Generation 3.
9. Repeat this again at the Nova Scotia line. Then turn around and fly all the way back to the Mexico line as Generation 4 to finish the race!

Without secret number five, we would not have the energy we need to be on this adventure. Hope you've had a good breakfast!

Secret 5: F _ _ D

Give your all clear signal to move on to the next secret.

10. Where's the Water?

⇨ Walk back to the path and go 60 m to where the path turns to the left.

You have been out in the dry crater for a long time. Do you have any water left to drink? The plants and animals here need to conserve water to survive. Can you tell by looking at the plants where the water is?

Attack of the Water Stealing Alien!
Look at the ground to the right of the path for the next 30 m. This crawling plant is called the Virginia Creeper vine and is an escapee from someone's garden. Where is it getting its energy and water from here? Can you see where it started from?
Under the leaves, find one section of the woody vine near the path and look for the new growth from this year (it will be greener and end where the bark becomes dark). How far has the creeper grown this year?
Check the box below:

- ☐ 1 hand length (approximately 12cm if using kid hands)
- ☐ 2 hand lengths
- ☐ 3 hand lengths
- ☐ 5 or more hand lengths

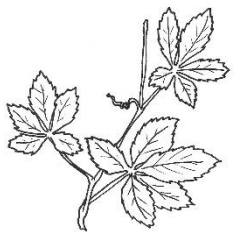
If the creeper grows this much in one year, how long do you think it will take to cover the whole crater? Should we let it?

Virginia Creeper is an introduced alien species that often sprawls away from where it was planted, covering the ground, and climbing trees and buildings.

This next secret is one we can't live without, especially on hot days.

Secret 6: W _ T E _

Give your all clear signal to move on to the next secret.



11. Lessons from the Surface

⇨ Walk back 40 m to the circle of trees you started at.

From this look off area, scan the bowl of this Crater again with your spy scope. Now that you know the secrets to survival in tough environments, where on the map would you like to live?

Now that you have knowledge of the world above ground, climb back down the ladder and into the cave to tell everyone what you have learned.

1. Everyone stand in a circle in the ring of trees.
2. Climb an invisible ladder down into the ground and crouch down.
3. Now that you are underground again, you can turn on your headlamp (pretend by turning a knob on your forehead) so you can see the paper in front of you and solve the final secret to survival!

Secret 1: R E S _ L I E _ C _
Secret 2: S U C _ _S S _ O _
Secret 3: _ H _ L _ E R
Secret 4: C A M _ _ F L _ G _
Secret 5: F _ _ D
Secret 6: W _ T E _

You now have the answers to solve the final secret by filling in the numbered space with the specific highlighted letter from each secret number!

Final Secret:

6 **D** 6 **P** 3 3 5 2 **H** 6 1 **G I** 1 **G** 4 1 **V I R** 5 1 **M** 4 1 3 **S**

This final secret is important for all life on earth, especially for places that change a lot. When you get home, draw in your Adventure Journal a picture of an environment that allows you to have all the things you need to survive and thrive. Use the lessons from this adventure to guide your imagination!

BEYOND THE ADVENTURE

Berwick is known as the Apple Capital of Nova Scotia and was built as a hub for the surrounding farming community. Apples no longer roll through Berwick on the trains to Halifax, but that doesn't mean Berwick isn't thriving. For those interested in the local apple industry, there is a museum in Berwick and many of the apple farmers around may give tours if the timing is right.

Chute Park was donated in 2017 to the town by the late Lewis Chute (1932-2018). It was a working sand pit mine ~20 years ago and is the perfect place to build a bike skills park for the community. Many mountain bikers' rate it as an excellent skill-building park, so you may want to bring your bike along for an added adventure!

CREDITS:

This document was created by Marina Myra of Wild Roots Nature Education Centre. This work was inspired by material from Earth Adventures in the Halifax Region 3rd Edition, by Alan Warner, Janet Barlow, and George Taylor.

Editing was by Dr. Alan Warner, Professor Emeritus, Department of Community Development, Acadia University.

Illustrations by Marina Myra and Lois Bearden.

FINANCIAL SUPPORT:

This Trail Adventure Project was made possible with the generous funding from the Municipality of the County of Kings - Department of Communities, Culture and Heritage.

SECRET ANSWERS

Secret 1: RESILIENCE
Secret 2: SUCCESSION
Secret 3: SHELTER
Secret 4: CAMOUFLAGE
Secret 5: FOOD
Secret 6: WATER

Final Secret:

ADAPT TO CHANGING ENVIRONMENTS