



The Living City®  
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## Yellow Fish Road™ Program

### Participant Guide

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Toronto and Region  
**Conservation**  
for The Living City

# The Yellow Fish Road™ Program Participant Guide

Welcome to the Yellow Fish Road™ Storm Drain Marking Program!

This guide is designed with the busy teacher in mind. You will find it to be a handy reference to prepare for your program. The guide provides information on how to effectively plan and deliver a successful Yellow Fish Road™ program.

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*Director, Education, Training and Outreach*

*The Toronto and Region Conservation Authority,  
5 Shoreham Drive,  
Downsview ON, M3N 1S4 416-661-6600*

# Yellow Fish Road™ - An Introduction

## What is the Yellow Fish Road™?

Trout Unlimited Canada introduced the Yellow Fish Road™ program in 1991. The Toronto and Region Conservation Authority became a partner in 1992, and has helped thousands of participants deliver this program within our *watersheds*.

The Yellow Fish Road™ program educates the public about the impacts of pollution entering urban storm drains. As rainwater washes over urbanized surfaces like rooftops and roadways it can become contaminated with any *pollutants* that are on these surfaces. In most cities, this polluted water can then enter the storm drains and go directly into local rivers, streams and lakes untreated. Storm drain pollution can harm fish and wildlife and reduce water quality for human use.

To raise community awareness, Yellow Fish Road™ volunteers paint yellow fish symbols beside local storm drains and distribute educational fish hangers to nearby households. These actions remind people how to safely dispose of hazardous household chemicals, rather than allowing these to enter curbside storm drains.



## How does the Yellow Fish Road™ program help?

The Yellow Fish Road™ program helps to protect local water bodies from *non-point* source pollution. This type of pollution is spread over a large area and not from one specific location; it comes from many different sources. As such, non-point source pollution is hard to trace. For more information on non-point pollution, refer to the *background information* section.

### What is a Watershed?

A watershed includes the area of land in which all water drains to a common point. All streams, creeks, groundwater, and runoff go to the same drainage point (e.g. a river or a lake).

### What is a Storm Drain?

Storm drains (catch basins) are the grates found on the roads by the curb. Runoff water goes into the grates, through a network of underground tunnels, out an outfall, and into the local water body.

# Teachers Checklist

## PRE-EVENT PLANNING:

- Call 416-661-6600 to book a painting date with our staff.
- Organize your volunteer helpers. You will need 1 adult helper for every 6 students.
- Sign and return the *Volunteer Agreement Form* found in the *Forms and Templates* section of this guide.
- Divide all of your students into groups with no more than 6 students per group.
- Make copies of the map for each adult group leader and assign them a route.
- Remind students to wear older clothing and closed-toed shoes.  
Paint does not come out of clothing very easily!



## DURING THE EVENT:

- Record all data on the *Storm Drain & Fish Hanger Tally Sheets* found in the *Forms and Templates* section of this Guide.
- Help students follow all the rules for staying safe (see next page).
- Name tags are always helpful.

## AFTER THE EVENT:

- Clean all the paint rollers with water.
- Submit your *Storm Drain & Fish Hanger Tally Sheets* and *Teacher Evaluation Forms* to the Yellow Fish Road™ coordinator.
- Congratulate the students on a job well done!

## HELPFUL TIPS FOR A SAFE YELLOW FISH ROAD™ EVENT

- Remind students to stay hydrated and wear a hat and sunscreen if needed.
- Pick ONLY residential streets with low traffic volume, sidewalks, low speed limits and no bus routes for marking.
- Only mark streets for the Yellow Fish Road™ program during daylight hours.
- Ensure your entire group crosses the road at designated crosswalks when it is safe to cross. Mark one entire side of the street first then cross over to the other side.
- Cell phones are a useful tool to keep adult leaders in contact with each other. Two-way radios can also be used if available.
- Prepare a Safety Plan for emergencies. Include contact numbers for all adult leaders, directions to a "home base", first aid kits and locations of the closest hospital (refer to sample Safety Plan on next the page).
- Ensure that your participants are always standing on the curb or boulevard while painting, and not on the road.
- Everyone in your group, including your adult volunteers, should be wearing one of the high visibility safety vests provided.
- Always use all 4 road pylons to indicate the area where you are painting.

## SAMPLE SAFETY PLAN

**Group Leaders:** First Name, Last Name (insert phone #)

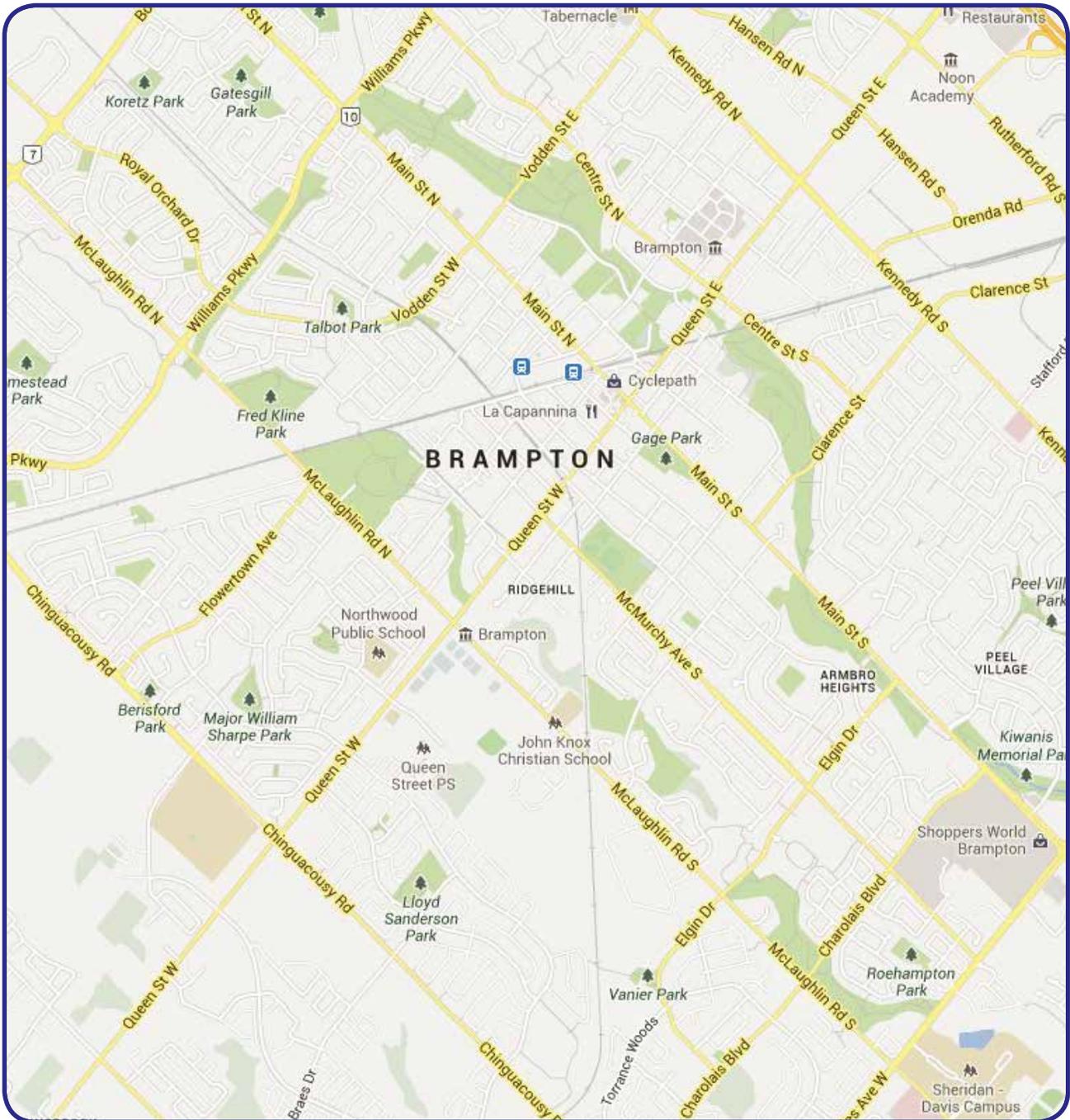
**Home Base:** Brampton P.S. (the corner of 3rd and 84th Street)

**School Address:** 123 Brampton Road

**School Phone Number:** 905-555-5550

**Completion Time:** 3:30pm (include travel time in your planning)

**Closest Hospital:** Insert Hospital Name & Address and Nearest Intersecton



## YELLOW FISH ROAD™ SUPPLIES

Don't worry about equipment and supplies, we provide you with a kit. All you need are your volunteers and your students and you're ready to go!

For safety reasons, it is extremely important to have all of the items listed below for each group of 6 children and 1 adult supervisor, so be sure to double check each kit before you head outside.



### YELLOW FISH ROAD™ PAINT KIT CONTENTS:

\*Please note that the items included in your kit(s) may change depending on your municipality. Please consult the Yellow Fish Road™ Coordinator if you have any additional questions concerning your kit(s).

- 1 carrying caddy
- 1 reusable fish stencil
- 50 – 100 fish-shaped hangers
- 1 pen/pencil
- 1 paint roller
- 1 clipboard with painting permit, *Storm Drain & Fish Hanger Tally Sheet*, *Painting Instructions* and map
- 4 pylons
- 7 safety vests (for all program participants to wear, including adult volunteers)
- 2 pairs of work gloves
- 1 broom
- 1 squeezable bottle of yellow outdoor latex paint



# Painting Procedures & Flyer Distribution

## PAINTING PROCEDURES

We recommend starting at the furthest storm drain and working your way back to the meeting spot. Remind everyone that it is better to do the painting well rather than fast!

Rotate the following duties – while 2 students are dropping off the fish-shaped hangers, the others will follow the painting procedures below.

### 1. SET UP THE SAFETY ZONE

- **Safety Superheroes:** 2 students need to be on sentry duty. Because moving vehicles may drive by, this job is very important! Superheroes protect a city's residents; these heroes must protect their group members!
- **Adult:** Before beginning to paint, create a safety zone by placing your 4 pylons. Place 2 pylons 1m away from either side of the storm drain. Place the remaining 2 pylons 1m apart in the area leading up to the storm drain. Once the pylons are in place, the Safety Superheroes can take up their positions on the curb or sidewalk behind the pylons
- **Children:** Standing on the curb behind the pylons, the Safety Superheroes should watch both directions for traffic at all times and ensure that everyone remains within the safety zone.

If a vehicle approaches, do not flag it down or attempt to stop it. Notify your group and observe it to ensure it keeps a safe distance from your workers. If it comes too close, immediately stop all work and instruct your team to retreat from the curb.



### 2. CLEAR THE STORM DRAIN AREA

- **Brushers:** 2 people need to put on work gloves; the brusher and the painter. The brusher cleans dust and debris from the curb above the storm drain with the broom provided.



### 3. HOLDING THE STENCIL

- Have the brusher put the stencil on the cleaned surface of the curb (face the fish toward the sidewalk) holding it firmly in place.
- The painter can then squeeze out a small blob of paint (about the size of a Loonie) inside the stencil. Add more paint in small portions if needed.



### 4. PAINT!

- **Painter:** Paint over the whole stencil. Press the roller down firmly – this will help to keep the outline of the symbol sharp and clear.
- Pick up all of the supplies and place them in the carrying caddy. After you have finished painting all of your storm drains, the wet roller should be washed in warm soapy water to prevent the paint from hardening on the roller. The stencil will also be wet, so fold it inward to avoid a mess.

**Tip:** Peel off the wet stencil very carefully to prevent smearing the freshly painted fish!



### 5. FILL OUT THE STORM DRAIN & FISH HANGER TALLY SHEET

- **Adults:** Keep a tally of the painted storm drains and record the types of garbage found on the *Storm Drain & Fish Hanger Tally Sheet*.
- \*\*\* **Note:** The information you record is critically important for us. It helps us keep track of where we have already painted!



# DISTRIBUTING “FISH HANGERS”

While the other group members are painting, one adult (if there is a second adult in the group) and two group members will take the fish hangers and distribute them to each house along the painting route.

## 1. WHERE DO I GO?

- Stay within sight of your adult supervisor.
- Stay on the same block as the painting crew.
- Go to the door in teams of two.
- If you think the house is unsafe for any reason, do not put a hanger there.



## 2. DELIVER THE FISH HANGERS

- Deliver Fish Hangers (in order of preference):
  - ➔ In the mailbox
  - ➔ Under a floor mat (have the fish’s head sticking out, so that the home-owner can find it)
  - ➔ On the doorknob
- Ensure that the hangers are secure and will not end up as litter on the street!



## 3. FILL OUT THE *STORM DRAIN & FISH HANGER TALLY SHEET*

- **Adults:** Keep track of the number of fish hangers delivered on each street and record it on the same *Storm Drain & Fish Hanger Tally Sheet* you used for the drain painting.

## PUBLIC INQUIRIES

On occasion you may meet residents when you are outside painting or delivering fish hangers. Most people are just curious. If you are approached by a resident who has a question:

- Notify the individual that you have received permission from the municipality to conduct the program, and show the permission letter.
- Explain what the Yellow Fish Road™ program is about.
- Give them Trout Unlimited Canada's toll-free number to contact them with their concerns (1-800-909-6040), or give them the contact information of the Toronto and Region Conservation Authority (416-661-6600). If the person is persistent, apologize for the inconvenience and move on. Make a note of it on your *Storm Drain & Fish Hanger Tally Sheet*.

*Note: Sometimes observers will ask questions, but on rare occurrences they may become agitated. Because safety is our primary concern, we advise all participants to avoid any confrontations and bypass houses or residents who make them feel uncomfortable.*

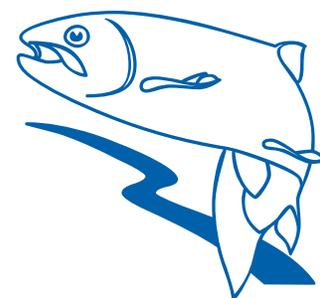


## TRACKING YOUR PROGRESS

The Toronto and Region Conservation Authority (TRCA) keeps track of the number of drains you paint and residents you reach with the hangers during your event. All of this data is then sent to Trout Unlimited Canada where they compile the numbers from all over Canada. This kind of information can then be used to determine the impact and size of the program and coordinate groups working within the region.

In addition, the *Storm Drain & Fish Hanger Tally Sheets* provide important feedback which helps us improve the program and gain continued support for this water quality initiative.

So don't forget to submit statistics and return your kits after your event!



Trout Unlimited  
Canada

# Forms and Templates

## VOLUNTEER AGREEMENT

The Toronto and Region Conservation Authority requires that the group leader or key contact sign the following Trout Unlimited Canada *Volunteer Agreement* (see next page), prior to implementing The Yellow Fish Road™ Program.

You are responsible for following the procedures outlined in this guide and supervising your group. As volunteers for Trout Unlimited Canada's Yellow Fish Road™ Program, your group will be covered both by Trout Unlimited Canada's general liability insurance and the Toronto and Region Conservation Authority's general liability insurance for the date(s) of the storm drain marking.

If your group is driving to the painting location, ensure that all drivers have adequate insurance and parents have given written consent for their children to be driven by volunteer drivers. This is your group's responsibility, not that of the Toronto and Region Conservation Authority or Trout Unlimited Canada.

Please complete the form on the following page and return it before your painting day to The Yellow Fish Road™ coordinator by e-mail to [yellowfishroad@trca.on.ca](mailto:yellowfishroad@trca.on.ca). For insurance and liability purposes, a *Volunteer Agreement* form must be signed and returned by the group leader prior to your painting date. Only those groups that have returned this form and have adhered to the procedures outlined in this Extension Activity & Participant Guide will be covered by Trout Unlimited Canada and/or the Toronto and Region Conservation Authority liability insurance.

The Yellow Fish Road™ Program

Toronto and Region Conservation Authority (TRCA)  
c/o Education, Training and Outreach Division  
5 Shoreham Drive  
Downsview, ON M3N 1S4  
Phone: (416) 661-6600  
Email: [yellowfishroad@trca.on.ca](mailto:yellowfishroad@trca.on.ca)

Website: [www.trca.on.ca/school-programs/outreach-education](http://www.trca.on.ca/school-programs/outreach-education)

For Yellow Fish Road™ Trout Unlimited Canada contact information, visit [www.yellowfishroad.org](http://www.yellowfishroad.org)



# TROUT UNLIMITED CANADA VOLUNTEER AGREEMENT FOR THE YELLOW FISH ROAD™ PROGRAM

We understand, as volunteers for Trout Unlimited Canada's Yellow Fish Road™ (YFR™) Program, it is the responsibility of our group to:

Designate a group leader to read the YFR™ Extension Activity & Participant Guide and be responsible for the group while implementing the YFR™ Program.

Obtain the necessary supplies and permissions, as outlined in the YFR™ Extension Activity & Participant Guide, whether through a YFR Partner, or through our own means.

Ensure group members understand and follow the safety and painting procedures outlined in the YFR™ Extension Activity & Participant Guide (or by a YFR™ Partner or the municipality).

Ensure the group is supervised at all times while marking the storm drains.

Ensure that any group members under the age of majority have written parental consent to participate; and ensure that parents understand that the group leader, not Trout Unlimited Canada, will be supervising the painting.

Ensure a minimum of 1:6 adult to child ratio for the marking.

As volunteers for Trout Unlimited Canada's Yellow Fish Road™ Program, your group will be covered by Trout Unlimited Canada's commercial general liability insurance subject to the policy coverage, exclusions, and conditions for the date(s) of the storm drain marking. Such coverage will only apply while the volunteers are performing authorized duties. Trout Unlimited Canada is not responsible for bodily injury incurred or damage to or loss of personal property incurred while implementing the Yellow Fish Road™ Program.

I have read, understood and agree with the above Trout Unlimited Canada Volunteer Agreement:

Signature: \_\_\_\_\_

Name (Please Print): \_\_\_\_\_ Date: \_\_\_\_\_

School/Group Name: \_\_\_\_\_

FULL Mailing Address: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Email Address: \_\_\_\_\_

Date(s) of Yellow Fish Road™ program painting: \_\_\_\_\_

Estimated # Child Participants: \_\_\_\_\_ Estimated # Storm Drains: \_\_\_\_\_

Estimated # Adult Participants: \_\_\_\_\_ Estimated # Houses: \_\_\_\_\_



# STORM DRAIN & FISH HANGER TALLY SHEET

## GENERAL INFORMATION:

School/Group: \_\_\_\_\_

Teacher/Group Leader Name: \_\_\_\_\_ Date: \_\_\_\_\_

City/Town: \_\_\_\_\_ # Students: \_\_\_\_\_

Neighbourhood: \_\_\_\_\_ # Adults: \_\_\_\_\_

Age/Grade of youth participants \_\_\_\_\_

## STORM DRAIN & FISH HANGER TALLY:

Keep track of the number of storm drains you paint and the number of fish hangers you distribute for each street.

Street Name	Storm Drains Painted	Fish Hangers Delivered

## LITTER CHECK:

Record below any unusual litter you find in or around the storm drains.

\_\_\_\_\_  
\_\_\_\_\_

## COMMENTS:

Let us know if you encountered anything else or if you have any ideas or suggestions to improve the program.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# Appendix: Teacher Resources

## GLOSSARY OF RELEVANT TERMS

**Algae:** a simple, non-flowering, and typically aquatic plant that includes the seaweeds and many single-celled forms. Algae contain chlorophyll but lack true stems, roots, leaves, and vascular tissue.

**Bioaccumulation:** the process by which pollutants build up in the bodies of consumers in the food web and become magnified in the organisms closer to the “top”.

**Biological Indicator:** a plant or animal that is generally sensitive to changes in the environment in which it lives. Thus, pollutants and other contaminants may affect these organisms quicker and more profoundly than others in the same ecosystem. For example, frogs and other amphibians are often considered indicator animals. Their skin is permeable and contaminants in the water can be easily absorbed through osmosis. They are usually the first casualties of acute or chronic water pollution.

**Community:** ecologically speaking, a community is an assemblage of interacting populations occupying a given area. Socially speaking, it is a social group of any size whose members reside in a specific locality, share government, and often have a common cultural and historical heritage.

**Contaminants:** a contaminant makes something impure by exposure to or addition of a poisonous or polluting substance.

**Eutrophication:** the addition of artificial or natural substances, such as nitrates and phosphates, through fertilizers or sewage, to an aquatic system. In other terms, it is the “bloom” or great increase of phytoplankton in a water body. Negative environmental effects include hypoxia, the depletion of oxygen in the water, which induces reductions in specific fish and other animal populations.

**Household Hazardous Waste:** materials deemed too dangerous for standard curbside residential waste pick-up. These typically include: paint, turpentine, bleaches, solvents, batteries, car fluids, electronic waste, flammables or explosives, corrosive materials, and poisonous/toxic chemicals.

**Household Hazardous Waste Depot:** municipally-run, drop-off centres for household hazardous waste. The locations of these depots can usually be identified by contacting the city’s information hotline.

**Infiltration:** the downward movement of water or other liquids into the ground towards the water table. Contaminants in these liquids are typically filtered out into the surrounding soil during this process.

**Macroinvertebrates:** invertebrates (animals that lack a backbone) visible to the naked eye.

**Non point-source pollution:** pollution that enters a system from multiple sources and through multiple vectors.

**Phosphates:** an inorganic chemical which is a salt or ester of phosphoric acid, containing  $\text{PO}_4^{3-}$  or a related anion.

**Photosynthesis:** the synthesis of complex organic materials from carbon dioxide, and water. Sunlight is captured by plants with the aid of chlorophyll to trigger this process.

**Point-source pollution:** pollution that enters a system through one vector (mode of transport) and sometimes from only one source. For example, a pulp and paper factory that releases harmful effluent directly into the river through one of its waste pipes.

**Pollutant:** a substance introduced into an environment that degrades the quality of any element of it. For example, warm water introduced into a cold lake is called a thermal pollutant as it can harm organisms adapted to living in cool water.

**Runoff:** the draining away of water, or substances carried in it, from the surface of an area of land, building or structure.

**Storm drain:** storm drains (catch basins) are the grates found on the roads by the curb. In most of Ontario, runoff water goes into these grates, through a network of underground tunnels or sewers, out an outfall and into the local water body untreated.

**Storm Water Retention Pond:** a retention pond is a type of best management practice (BMP) that is used to manage storm water runoff to prevent flooding and downstream erosion, and improve water quality in an adjacent river, stream, lake or bay. It is an artificial pond with vegetation around the perimeter, and includes a permanent pool of water in its design.

**Waste Water Treatment Facility:** a regionally-operated facility dedicated to removing contaminants from household sewage and wastewater, using a variety of techniques ranging from mechanical separation to chemical and biological treatment.

**Watershed:** a watershed includes the area of land in which all water drains to a common point. All streams, groundwater, and runoff go to the same drainage point (ex. a river or a lake).

**Watershed Habitat:** the areas within the watershed boundaries that support a variety of plant and animal life (ex. wetlands).

# GENERAL BACKGROUND INFORMATION

## **Non-point source pollution is the single largest contributor to water pollution!**

As rainfall or snowmelt move over and through the ground, it collects natural and human-made substances (chemicals, sediment and debris) and deposits them into lakes, rivers, wetlands, coastal waters and underground sources of drinking water.

### **What are the effects of non-point source pollution?**

Non-point source pollution in our watersheds impacts humans and other animals and plants that depend on that water. It is a major source of human exposure to toxic chemicals.

Municipal drinking water is treated before reaching households, but if the water going into the treatment plant is contaminated, it takes more time, energy and is more expensive to clean it.

### **Where do these pollutants come from?**

There are many sources of water *pollutants*. Canadian households annually generate more than 60,000 tonnes of hazardous wastes! Common examples of *household hazardous wastes* include: old car batteries, lighter fluid, turpentine, gasoline, used motor oil, antifreeze, pool chemicals and pesticides. Other pollutants that commonly end up in the water system are road salts, soaps and fertilizers. These may not be toxic, but in high concentrations they can have a negative impact on the aquatic ecosystem.

Since about 70% of our towns and cities are paved or built over, about half of the precipitation that falls on our cities never touches the soil. Water moving slowly through the soil naturally gets filtered through a process called infiltration. Water running over pavement collects debris and chemicals and goes directly into the storm drain system and into our rivers and lakes.

### **What Can You Do?**

- Educating communities about proper disposal of household hazardous wastes can reduce our impact on our aquatic ecosystems and ensure safe drinking water for all living things in our environment.
- By reducing our use of hazardous household products and by using “environmentally responsible” products, we can lessen the impact of harmful pollutants on our watersheds.

**FACT: It only takes one drop of oil to make 25 litres of water undrinkable!**



# BEST MANAGEMENT PRACTICES TO REDUCE NONPOINT SOURCE POLLUTION

Source	Best Management Practices:
Roads and Streets	<ul style="list-style-type: none"> <li>• Dispose of paints solvents and petroleum products at approved disposal sites, not in storm drains. Stop oil dumping on rural roads</li> <li>• Fix automobile oil and fuel leaks</li> <li>• Use nonchemical deicers (sand and ash) on roads, sidewalks, and driveways</li> <li>• Construct a sediment catch basin to collect storm water run-off</li> <li>• Reduce road construction run-off by building terraces and catch basins, and by planting cover crops</li> </ul>
Agriculture	<ul style="list-style-type: none"> <li>• Read and follow all labels and ask for application directions before using chemicals, fertilizers and pesticides</li> <li>• Use conservation tillage, contour farming and strip cropping wherever possible</li> <li>• Leave filter strips and borders along wetlands and streams. Plant shelter belts and windbreaks, grassed waterways</li> <li>• Use a cover crop to protect exposed soil. Terrace areas prone to erosion</li> <li>• Rotate crops and pasture management</li> <li>• Construct livestock waste collection and treatment ponds for confined livestock</li> <li>• Seal abandoned or waste disposal wells</li> <li>• Fence waterways to reduce riparian zone impacts by livestock</li> </ul>
Logging	<ul style="list-style-type: none"> <li>• Monitor water entering and leaving cut areas</li> <li>• Prevent sediment from reaching streams and lakes by building terraces, catch basins, and natural filters</li> <li>• Leave a vegetative buffer zone in riparian areas</li> <li>• Maintain and restore effective watersheds</li> <li>• Implement a plan to reduce erosion from roads</li> </ul>
Mining	<ul style="list-style-type: none"> <li>• Monitor water entering and leaving mine sites</li> <li>• Intercept and reroute uncontaminated water away from contaminated areas (keep clean water clean)</li> <li>• Construct catch basins and terraces, and plant cover crops, to catch sediment and prevent erosion</li> <li>• Catch and treat contaminated water (clean contaminated water)</li> <li>• Stabilize stream channels and mining waste areas to prevent release of materials to streams. Maintain buffer strips along streams</li> </ul>
Construction	<ul style="list-style-type: none"> <li>• Implement a sediment control plan</li> <li>• Plant ground cover to reduce erosion</li> <li>• Dispose of solvents, paint and other wastes at approved disposal sites</li> <li>• Build temporary, small dikes to slow and catch run-off</li> <li>• Build sediment catch basins to collect construction run-off</li> <li>• Build earth berms and filter run-off before water enters the stream</li> </ul>
Residential	<ul style="list-style-type: none"> <li>• Use nonchemical deicers (sand and ash) on roads, sidewalks, and driveways</li> <li>• Read and follow all labels and ask for application directions before using chemicals, fertilizers and pesticides</li> <li>• Consider xeriscaping</li> <li>• Use nonchemical fertilizers (compost) on gardens</li> <li>• Dispose of household hazardous wastes at approved disposal sites</li> <li>• Maintain septic tanks if sewers not available</li> </ul>

# YELLOW FISH ROAD™ CURRICULUM CONNECTIONS

## Yellow Fish Road™ Curriculum Links (Primary 2007 Revised)

Grade	Strand	Overall Expectation	Specific Expectation
2	<b>Understanding Life Systems:</b> Growth and Changes in Animals	Assess ways in which Humans have an impact on society and the environment, and ways in which humans have an impact upon animals and places where they live.	<b>1.2:</b> Identify Positive and Negative Impacts of Human activity on Animals and where they live
	<b>Understanding matter and Energy:</b> Properties of Liquids and Solids	Assess ways in which the uses of liquids and solids have an impact on Society and the Environment	<b>1.1:</b> Assess the ways in which liquids and solids in the home are used, stored, and disposed of in terms of the effect on personal safety and the health of the environment, and suggest responsible actions to replace inappropriate practices
	<b>Understanding Earth and Space Systems:</b> Air and Water in the Environment	Assess ways in which Humans have an impact on the Quality of air and water, and ways in which the quality of air and water has an impact on living things	<b>1.1:</b> Assess the impact of human activities on air and water in the environment, taking different points of view into consideration (e.g., the point of view of parents, children, other community members), and plan a course of action to help keep the air and water in the local community clean
			<b>1.2:</b> Assess personal and family uses of water as responsible/efficient or wasteful, and create a plan to reduce the amount of water used, where possible
			<b>2.5:</b> Investigate water in the natural environment (e.g., observe and measure precipitation; observe and record cloud formations; observe water flow and describe where it goes; observe a puddle over time and record observations)
	Demonstrate an understanding of the ways in which air and water are used by living things to help them meet their basic needs	<b>3.6:</b> State reasons why clean water is an increasingly scarce resource in many parts of the world	
3	<b>Understanding Life Systems:</b> Growth and Changes in Plants	Assess ways in which plants have an impact on society and the environment, and ways in which human activity has an impact on plants and plant habitats	<b>1.2:</b> Assess the impact of different human activities on plants, and list personal actions they can engage in to minimize harmful effects and enhance good effects
			<b>3.8:</b> Identify examples of environmental conditions that may threaten plant and animal survival (e.g., extreme heat and cold; floods and/or droughts; changes in habitat because of human activities such as construction, use of gas-powered personal watercraft on lakes)

# Yellow Fish Road™ Curriculum Links (Junior 2007 Revised)

Grade	Strand	Overall Expectation	Specific Expectation
4	<b>Understanding Life Systems:</b> Habitats and Communities	Analyse the effects of human activities on habitats and communities	<b>1.1:</b> Analyse the positive and negative impacts of human interactions with natural habitats and communities (e.g., human dependence on natural materials), taking different perspectives into account
		Demonstrate an understanding of habitats and communities and the relationships among the plants and animals that live in them	<b>1.2:</b> Identify reasons for the depletion or extinction of a plant or animal species (e.g., hunting, disease, invasive species, changes in or destruction of its habitat), evaluate the impacts on the rest of the natural community, and propose possible actions for preventing such depletions or extinctions from happening
			<b>3.4:</b> Demonstrate an understanding of a community as a group of interacting species sharing a common habitat
5	<b>Understanding Life Systems:</b> Human Organ Systems	Analyse the impact of human activities and technological innovations on human health	<b>1.1:</b> Assess the effects of social and environmental factors on human health, and propose ways in which individuals can reduce the harmful effects of these factors and take advantage of those that are beneficial
			<b>1.2:</b> Evaluate the effects, both beneficial and harmful, of various technologies on human body systems, taking different perspectives into account
	<b>Understanding Earth and Space Systems:</b> Conservation of Energy and Resources	Analyse the immediate and long-term effects of energy and resource use on society and the environment, and evaluate options for conserving energy and resources	<b>1.1:</b> Analyse the long-term impacts on society and the environment of human uses of energy and natural resources, and suggest ways to reduce these impacts
6	<b>Understanding Life Systems:</b> Biodiversity	Assess human impacts on biodiversity, and identify ways of preserving biodiversity	<b>1.1:</b> Analyse a local issue related to biodiversity

# Yellow Fish Road™ Curriculum Links (Intermediate 2007 Revised)

Grade	Strand	Overall Expectation	Specific Expectation
7	<b>Understanding Life Systems:</b> Interactions in the Environment	Assess the impacts of human activities and technologies on the environment, and evaluate ways of controlling these impacts	<b>1.1:</b> Assess the impact of selected technologies on the environment
		Investigate interactions within the environment, and identify factors that affect the balance between different components of an ecosystem	<b>1.2:</b> Analyse the costs and benefits of selected strategies for protecting the environment
		Demonstrate an understanding of interactions between and among biotic and abiotic elements in the environment	<b>3.8:</b> Describe ways in which human activities and technologies alter balances and interactions in the environment
	<b>Understanding Structures and Mechanisms:</b> Form and Function	Analyse personal, social, economic, and environmental factors that need to be considered in designing and building structures and devices	<b>1.1:</b> Evaluate the importance for individuals, society, the economy, and the environment of factors that should be considered in designing and building structures and devices to meet specific needs
	<b>Understanding Matter and Energy:</b> Pure Substances and mixtures	Evaluate the social and environmental impacts of the use and disposal of pure substances and mixtures	<b>1.1:</b> Assess positive and negative environmental impacts related to the disposal of pure substances (e.g., uranium) and mixtures (e.g., paint, sewage)
			<b>1.2:</b> Assess the impact on society and the environment of different industrial methods of separating mixtures and solutions
<b>3.5:</b> Describe the processes (e.g., evaporation, sifting, filtration, distillation, magnetism) used to separate mixtures or solutions into their components, and identify some industrial applications of these processes			

# Yellow Fish Road™ Curriculum Links (Intermediate 2007 Revised)

Grade	Strand	Overall Expectation	Specific Expectation
8	<b>Understanding Structures and mechanisms:</b> Systems in Action	Assess the personal, social, and/or environmental impacts of a system, and evaluate improvements to a system and/or alternative ways of meeting the same needs	<b>1.2:</b> Assess the impact on individuals, society, and the environment of alternative ways of meeting needs that are currently met by existing systems, taking different points of view into consideration
		Investigate a working system and the ways in which components of the system contribute to its desired function	<b>3.3:</b> Identify the various processes and components of a system
		Demonstrate an understanding of different types of systems and the factors that contribute to their safe and efficient operation	<b>3.9:</b> Identify social factors that influence the evolution of a system (e.g., growing concern over the amount of waste creates a need for recycling centres, and the recycling centres must grow as population and waste increase)
	<b>Understanding Matter and Energy:</b> Fluids	Analyze how the properties of fluids are used in various technologies, and assess the impact of these technologies on society and the environment	<b>1.2:</b> Assess the impact of fluid spills on society and the environment, including the cost of the cleanup and the effort involved
	<b>Understanding Earth and Space Systems:</b> Water Systems	Assess the impact of human activities and technologies on the sustainability of water resources	<b>1.3:</b> Assess the impact on local and global water systems of a scientific discovery or technological innovation
		Investigate factors that affect local water quality	<b>3.2:</b> Demonstrate an understanding of the watershed as a fundamental geographic unit, and explain how it relates to water management and planning
		Demonstrate an understanding of the characteristics of the earth's water systems and the influence of water systems on a specific region	<b>3.3:</b> Explain how human and natural factors cause changes in the water table

# Yellow Fish Road Curriculum Links (High School 2008 Revised)

Grade	Strand	Overall Expectation	Specific Expectation
<p style="font-size: 2em; font-weight: bold; margin: 0;">9</p> <p>Academic</p>	<p><b>Biology:</b> Sustainable Ecosystems</p>	<p>Assess the impact of human activities on the sustainability of terrestrial and/or aquatic ecosystems, and evaluate the effectiveness of courses of action intended to remedy or mitigate negative impacts</p>	<p><b>B1.1:</b> Impact of a factor related to human activity on Sustainability Aquatic or terrestrial Ecosystems, <b>B1.2:</b> Effectiveness of Government Initiatives on sustainability of Aquatic or terrestrial Ecosystems</p>
		<p>Investigate factors related to human activity that affect terrestrial and aquatic ecosystems, and explain how they affect the sustainability of these ecosystems</p>	<p><b>B2.4:</b> Investigate how human activity affects water quality, <b>b2.5:</b> Interpret data on the effects of human activity on terrestrial and aquatic ecosystems</p>
		<p>Demonstrate an understanding of the dynamic nature of ecosystems, particularly in terms of ecological balance and the impact of human activity on the sustainability of terrestrial and aquatic ecosystems</p>	<p><b>B3.1:</b> Analyze biotic and abiotic characteristics of sustainable and unsustainable terrestrial and aquatic ecosystems, <b>b3.5:</b> Identify factors related to human activity that have an impact on ecosystems</p>
<p style="font-size: 2em; font-weight: bold; margin: 0;">9</p> <p>Applied</p>	<p><b>Biology:</b> Sustainable Ecosystems and Human Activity</p>	<p>Analyse the impact of human activity on terrestrial or aquatic ecosystems, and assess the effectiveness of selected initiatives related to environmental sustainability</p>	<p><b>B1.1:</b> Impact of human activity on Sustainability Aquatic or terrestrial Ecosystems, <b>B1.2:</b> Effectiveness of a local Initiative of personal interest on sustainability of Aquatic or terrestrial Ecosystems</p>
		<p>Investigate some factors related to human activity that affect terrestrial or aquatic ecosystems, and describe the consequences that these factors have for the sustainability of these ecosystems</p>	<p><b>B2.2:</b> Investigate the characteristics and interactions of biotic and abiotic components of a terrestrial or aquatic ecosystem, and describe the importance of these components in a sustainable ecosystem, <b>B2.3:</b> Inquire into how a factor related to human activity affects a terrestrial or aquatic ecosystem, <b>B2.5:</b> Analyse the effects of human activity on terrestrial and aquatic ecosystems</p>
		<p>Demonstrate an understanding of characteristics of terrestrial and aquatic ecosystems, the interdependence within and between ecosystems, and the impact humans have on the sustainability of these ecosystems</p>	<p><b>B3.1:</b> Describe the interdependence of components within a terrestrial and aquatic ecosystem, <b>b3.5:</b> Identify factors related to human activity that have an impact on ecosystems</p>

# Yellow Fish Road™ Curriculum Links (High School 2008 Revised)

Grade	Strand	Overall Expectation	Specific Expectation
<b>10</b> Academic	<b>Chemistry:</b> Chemical Reactions	Analyse a variety of safety and environmental issues associated with chemical reactions, including the ways in which chemical reactions can be applied to address environmental challenges	<b>C1.1:</b> Analyse various safety and environmental issues associated with chemical reactions and their reactants and/or product(s)
			<b>C1.2:</b> Analyse how an understanding of the properties of chemical substances and their reactions can be applied to solve environmental challenges
<b>10</b> Applied	<b>Chemistry:</b> Reactions and Their Practical Applications	Analyse how chemical reactions are employed in common products and processes, and assess the safety and environmental hazards associated with them	<b>C1.2:</b> Identify practical applications of chemical reactions in a particular profession and assess the associated hazards, including hazards associated with the handling and disposal of chemicals

# Partner Recognition

Thank you to the following partners for supporting The Yellow Fish Road™ program and The Yellow Fish Road™ Participant Guide:



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