



TROUT TREK: A CUTTHROAT TROUT SURVIVAL GAME

GRADE: 1-12

TIME: 30-45 minutes

THEME: Environmental Learning

CURRICULUM CONNECTIONS:

Science, Physical Education, Geography, Math

MATERIALS:

- Coloured popsicle sticks (3 colours)
- 3 buckets or containers, preferably matching the stick colours
- rope, additional pylons or other markers for habitat barriers, starting habitat and spawning habitat
- clipboard and recording sheet or outdoor whiteboard
- pencil or marker
- timer

LEARNING GOALS:

- identify basic habitat needs of Westslope Cutthroat Trout
- explore how changes in habitat conditions can affect a population
- recognize that several environmental pressures can act at the same time
- collect and compare simple population data
- use evidence to identify a possible limiting factor
- understand that restoration actions should respond to an identified challenge
- evaluate whether a restoration action appears to improve habitat conditions
- recognize that restoration does not guarantee the survival of every individual
- understand that ecological restoration involves observation, action, monitoring and adaptation

ACTIVITY OVERVIEW

Students become Westslope Cutthroat Trout moving through a large-scale outdoor habitat model to find Food, Suitable Water and Shelter before reaching Spawning Habitat.

As habitat conditions change over four rounds, students observe how resource loss, barriers and multiple pressures affect the trout population. They then use their results to choose a restoration action and test whether it improves the outcome.

The game connects to Parks Canada's Westslope Cutthroat Trout restoration work and explores how evidence, action and monitoring can help support species and their habitats.

To modify this activity for grades 1-3, see suggestions on page 9.



TROUT TREK



BEFORE GOING OUTSIDE

Following the Parks Canada presentation, return to the Westslope Cutthroat Trout.

Ask: **What does a trout need from its habitat to survive?**

Students may identify food, suitable water, shelter, space, appropriate temperatures, spawning habitat and connections between different parts of its habitat.

Explain that the class is going to build a simplified model of a trout habitat.

In the model:

- Green = Food
- Blue = Suitable Water
- Red = Shelter

Explain:

Our game can't include everything that happens in a real stream. Instead, we're going to use these three resources to investigate what can happen to a trout population when habitat conditions change.

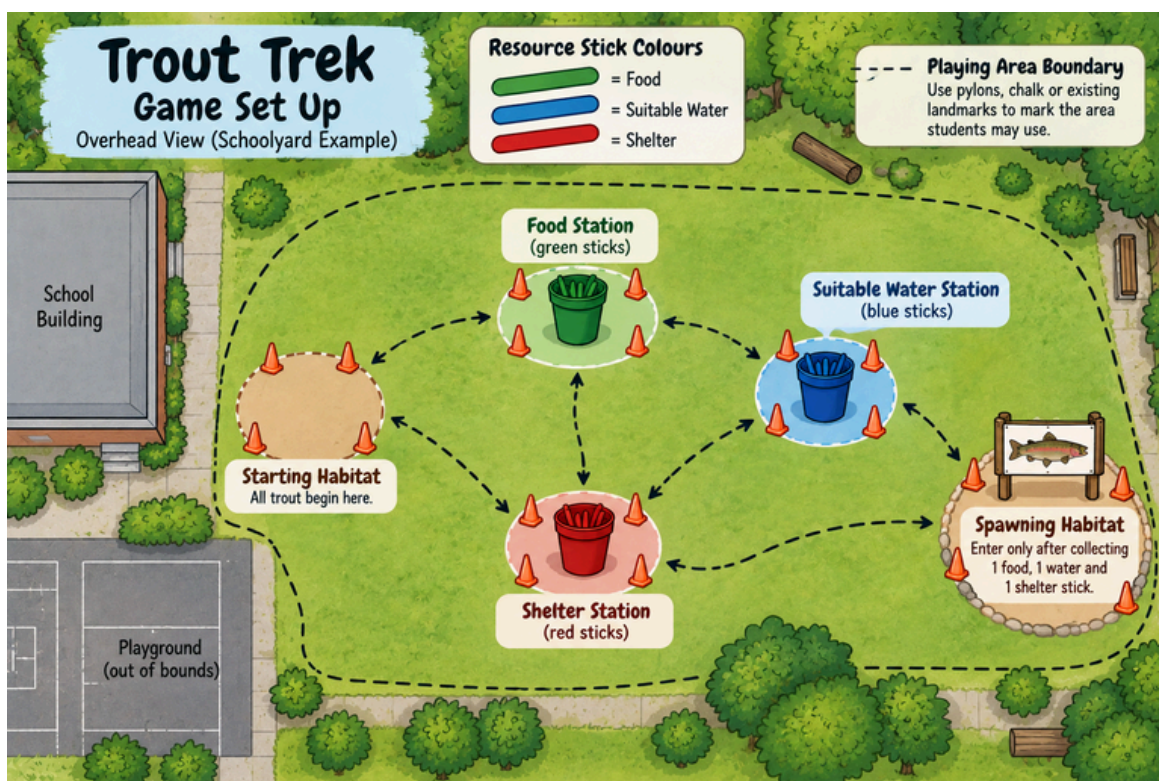
Introduce the central question:

What happens to the trout population when their habitat changes, and what can people do in response?

TAKE IT OUTSIDE: SETTING UP THE GAME

Choose an outdoor space such as a schoolyard, field or outdoor classroom. The space will become a large-scale model of Westslope Cutthroat Trout habitat.

You don't need to create a realistic stream. The goal is to create a playing area where students must move through the "habitat," find the resources they need and reach spawning habitat.





TROUT TREK



SETTING UP THE GAME:

1. Mark the Habitat Boundary

Clearly identify the permitted playing area.

Use:

- pylons
- field lines
- pathways
- fences
- trees
- rope
- chalk

Review the boundaries with students before beginning.

2. Create Starting Habitat

Mark an area at one end of the playing space. All trout begin each round here. Make the area large enough for the entire class to gather safely.

3. Set Up the Resource Stations

Place each resource in its own bucket or container. For Round 1 start with enough popsicle sticks for every student in each bucket (i.e. 30 students = 30 popsicle sticks x 3 buckets = 90 popsicle sticks)

- Green = Food
- Blue = Suitable Water
- Red = Shelter

Spread the three stations throughout the playing area rather than placing them beside one another. Students should need to move through the habitat to find all three resources.

If possible, arrange the stations so students have several possible routes through the habitat.

4. Create Spawning Habitat

Mark another area away from Starting Habitat using pylons, hoops, rope, chalk or a sign.

5. Prepare for Habitat Changes

Before beginning, identify places where you can easily change the game in later rounds. Have any additional pylons or rope ready.

You might:

- remove resource sticks
- create a barrier with pylons or rope
- close one route
- make part of the habitat unavailable
- move a resource station
- reduce access between habitat areas

HOW TO PLAY:

Students become Westslope Cutthroat Trout. Their goal is to move through the habitat, collect what they need and reach Spawning Habitat.

To successfully complete a round, a trout must:

1. Leave the starting habitat.
2. Collect one of each coloured popsicle stick (1 **Food** + 1 **Water** + 1 **Shelter**)
3. Reach the spawning habitat with all three resources.

Students may visit the stations in any order.

How Long Is Each Round?

Allow approximately 2-3 minutes per round.

A round ends when:

- the allotted time has passed, or
- all trout have reached Spawning Habitat or can no longer collect the resources they need.

If the outcome is already clear, you do not need to let the timer run out.



TROUT TREK



HOW TO PLAY CONTINUED:

Game Rules

- Take only one stick of each colour.
- Do not take resources from another trout.
- If a bucket is empty, that resource is no longer available.
- Stay within the habitat boundaries.
- Move safely around other trout.
- A trout reaches Spawning Habitat only if it has all three resources.
- This is not a race. There is no reward for being the first trout to finish.

The question is: **What happens to the population?**

ROUND 1: A Habitat With What Trout Need

In this round there needs to be enough popsicle sticks in each bucket for each student to get 1 of each

All students begin in the Starting Habitat.

Call: **TROUT TREK!**

Students have 2 minutes to travel through the habitat, collecting: 1 Food + 1 Suitable Water + 1 Shelter

Once they have all three sticks, they head to the Spawning Habitat.

At the end of the round, count how many trout successfully completed the journey.

Record the result.

Ask:

- **What helped our trout survive?**
- **Were the resources you needed available?**

Tell students: **Our stream is about to change.**

ROUND 2: Something Changes

Return the popsicle sticks to their buckets and send all trout back to the Starting Habitat.

This time, quietly introduce one environmental challenge. Choose a change appropriate for your space.

Variation A: Less Food

Remove some of the green Food sticks.

Represents: Reduced food availability or changes to the food web.

Variation B: Less Suitable Water

Remove some of the blue Suitable Water sticks.

Represents: A reduction in suitable habitat conditions.

Variation C: Loss of Shelter

Remove some of the red Shelter sticks.

Represents: Loss or alteration of cover and shelter.

Variation D: Habitat Barrier

Keep the same number of resource sticks, but use pylons or rope to block an important route.

Represents: reduced habitat connectivity or difficulty accessing part of the habitat.

Variation E: Habitat Loss

Close part of the playing area, restrict access to a station or move a resource station.

Represents: Loss or alteration of available habitat.



TROUT TREK



HOW TO PLAY:

Start round 2.

Reset all trout back to starting habitat.

Call: **TROUT TREK!**

Students once again try to collect all three resources and reach spawning habitat in allotted time.

Record the number of successful trout.

Ask:

- **What changed?**
- **Did everyone have access to what they needed?**
- **Which resource or habitat condition became limiting?**
- **What happened to our trout population?**

ROUND 3: Multiple Pressures

Now make the habitat more challenging.

Explain: **Environmental challenges don't always happen one at a time. What happens when several things change at once?**

Choose two or three changes pressures the round 2 variations and combine them.

For example:

- **Scenario 1 - Resource Pressure:** Remove some Food and Shelter sticks.
- **Scenario 2 -Habitat + Resource Pressure:** Remove some Suitable Water sticks and add a habitat barrier.
- **Scenario 3 - Habitat Loss:** Close part of the habitat, remove some Shelter sticks and move the Food bucket farther away.
- **Scenario 4 - Teacher's Choice:** Create your own combination based on your space. The goal is to create a noticeable change, not to make survival impossible.

Reset all trout back to starting habitat.

Call: **TROUT TREK!**

Students once again try to collect all three resources and reach spawning habitat in allotted time.

Record the number of successful trout.

Then stop.

Do not reset the habitat.

STOP: What Happened to Our Trout?

Leave the resource buckets, barriers and habitat changes exactly as they were during Round 3.

Gather students where they can see the playing area.

Count and record:

- how many trout started
- how many reached Spawning Habitat
- how many did not

Ask the trout that didn't make it: **What stopped you?**

Students might report:

- the Food bucket was empty
- there were no Shelter sticks left
- Suitable Water was unavailable
- a barrier made part of the habitat difficult to reach
- they ran out of time



TROUT TREK



HOW TO PLAY:

Look for Evidence

Ask:

- **What seems to be limiting our trout population?**
- **What evidence do we have?**

For example:

- “Twelve trout couldn't find Shelter.”
- “There was still Food left, so Food probably wasn't our biggest problem.”
- “Some trout had all three resources but couldn't reach Spawning Habitat because of the barrier.”

Emphasize: Identify the challenge before choosing the solution.

Become the Restoration Team

Tell students: **For the next round, you're no longer just the trout. You're also the restoration team.**

Ask: **Based on our evidence, what could we change in the habitat to give the trout population a better chance?**

Possible restoration actions could include:

- returning some Food
- returning some Suitable Water
- returning some Shelter
- removing or opening part of a barrier
- reopening habitat that had been unavailable
- improving connections between habitat areas

Students do not need to fix everything.

Choose one or two actions that directly respond to the evidence from Round 3.

Make a Prediction

Before changing the habitat, complete these statements together:

- Our evidence showed _____.
- We are going to restore/change _____.
- We think this will help because _____.
- We predict that _____ trout will reach Spawning Habitat in the next round.

ROUND 4: HOPE IN ACTION

Make the restoration changes selected by the class.

Do not automatically return the habitat to its Round 1 condition.

If students restore Shelter, for example, another resource shortage or habitat barrier might remain.

Reset all trout back to starting habitat.

Call: **TROUT TREK!**

Play for allotted time.

At the end of the round, record the final population result.

After Round 4: Did Restoration Make a Difference?

Compare the actual result with the class prediction.

Ask:

- **Did more trout reach Spawning Habitat than in Round 3?**
- **Was our prediction close?**
- **What changed between Round 3 and Round 4?**

Complete the population chart.



TROUT TREK



ROUND	Habitat Condition	Starting # of Trout	# Trout in spawning area at end	What did we notice?
1. Habitat With What Trout Need	Resources readily available			
2. Something Changes	One environmental challenge			
3. Multiple Pressures	Two or more challenges			
4. Hope in Action	Restoration introduced			



TROUT TREK continued



HOW TO PLAY:

Compare the Rounds

Once all four rounds are complete, gather around the chart.

Ask:

- Which round had the greatest number of trout reach Spawning Habitat?
- Which had the least?
- What happened when one habitat condition changed?
- What happened when several pressures occurred together?
- What changed after restoration?

DISCUSSION & QUESTIONS TO PROMPT THINKING:

Habitat

- What did our trout need to complete their journey?
- Which resources became limiting?
- Could having lots of one resource make up for completely losing another?
- How did access to different parts of the habitat matter?
- Why might connected habitat be important?

Environmental Change

- What happened when only one condition changed?
- What happened when several pressures occurred at the same time?
- Were all trout affected in the same way?
- Which change had the greatest effect on our population?
- What evidence supports your answer?

Restoration

- How did we decide what to restore?
- Why did we look at evidence before taking action?
- Did our restoration work?
- What evidence suggests that it did or didn't?
- Did restoration need to return the population to its Round 1 result to be useful?
- What might we try next?
- How could we find out whether our restoration continued to work over time?

Connecting Back to Parks Canada Presentation

- What challenges were affecting the Westslope Cutthroat Trout?
- What actions did people take?
- How would scientists know whether those actions were working?
- Why would monitoring need to continue after restoration?
- What did our game have in common with the Parks Canada restoration story?
- What was different?

Hope in Action

Ask: **Did simply hoping for more trout change the outcome?**

Then: **What actually changed the outcome?**

Students should begin to see that hope in this activity was connected to evidence, action and possibility.

A useful closing idea is:

Hope becomes action when we understand what is happening, make a meaningful change and keep learning from what happens next.



TROUT TREK



FOR GRADES 1-3:

- use three rounds instead of four
- change only one habitat condition at a time
- focus on Food, Suitable Water and Shelter
- use simple language such as “something changed” rather than “environmental pressure” or “limiting factor”
- let students physically help restore the game habitat
- keep discussion short and concrete
- The key idea for younger learners is: Living things need suitable places to live. When habitats change, it can become harder for animals to find what they need. People can take action to help care for and restore habitats.

OPTIONAL EXTENSIONS:

Add a Predator

For an additional food-web challenge, introduce a natural trout predator such as an Osprey. This works best as a bonus round after students understand the core game.

Set Up a Predator Zone

Mark one section of the habitat with pylons.

Choose one or two students to be Ospreys.

Ospreys may move only within the Predator Zone. They cannot:

- guard a resource bucket
- stand directly at Spawning Habitat
- chase trout outside their zone

Use gentle tags only.

Shelter Protects Trout

This extension gives the red Shelter sticks an additional function.

If an Osprey tags a trout that has a red Shelter stick, the trout uses its Shelter to escape. The trout gives the red stick to the Osprey and continues playing. It must now return to the Shelter Station and find another red stick before reaching Spawning Habitat.

If a trout is tagged without Shelter, it has been caught by the predator and leaves the active playing area for the remainder of the round.

Compare Shelter Conditions

Try playing once with plenty of Shelter and once with fewer red Shelter sticks while keeping the number of predators the same.

Ask:

- Did the predator change?
- What changed in the habitat?
- How did access to shelter affect the trout population?

Predators Aren't the Villains

Natural predation is part of an ecosystem.

Ask: **If we want more trout to survive, should our restoration team simply remove the Osprey?**

Use the discussion to distinguish between a natural predator-prey relationship and environmental pressures that restoration may be designed to address.

The goal is not to create an ecosystem where every trout survives.

The larger question is:

How can a habitat support a sustainable trout population while also supporting the other living things connected to it?



TROUT TREK



OPTIONAL EXTENSIONS:

Graph the Trout Population

Use the results from each round to create a bar or line graph.

Older students can calculate the percentage of starting trout that successfully reached Spawning Habitat.

Compare population success across the four habitat conditions.

Play Another Restoration Round

After evaluating Round 4, ask: What would our restoration team try next?

Choose another evidence-based action and play again. Compare the new result with Round 4.

This reinforces the idea that restoration can involve monitoring and adaptation over time.

Design a Restoration Plan

In small groups, students develop their own restoration response to the Round 3 habitat.

Include:

- the challenge
- evidence that the challenge exists
- the proposed action
- why they think it could help
- what they would monitor
- how they would know whether it was working

Groups can compare approaches before deciding which one they would test.

What Did Our Model Miss?

Have students research one factor not represented in Trout Trek, such as water temperature, genetics, introduced species, disease, competition or climate change.

Ask them to explain:

- **How could this factor affect Westslope Cutthroat Trout?**
- **How could we modify Trout Trek to represent it?**

ADAPTATIONS & ACCESSIBILITY:

The goal of Trout Trek is participation in the ecological model, not speed or distance travelled. Adapt the playing area and student roles so everyone can participate outdoors.

Possible adaptations include:

- reduce the size of the playing area
- place resource stations along accessible surfaces
- allow walking, wheeling or other appropriate forms of movement
- eliminate running entirely
- allow students to work with a partner
- provide visual cards showing Food, Suitable Water and Shelter
- use symbols as well as colours for students who may have difficulty distinguishing colours
- allow students to observe one station or habitat area and report what happens
- allow students to respond verbally, visually or in writing

For students who should not move throughout the entire playing area, create a meaningful outdoor role rather than automatically moving the activity indoors.

Students can participate as:

- habitat scientists
- population counters
- restoration planners
- resource managers
- observers
- data recorders

Everyone can contribute to understanding what happens to the trout population.



TROUT TREK



TEACHER NOTE

This is a Model

Trout Trek intentionally simplifies a complex ecosystem.

Food, Suitable Water and Shelter are represented by individual popsicle sticks, but real habitat conditions are much more complicated.

For example, trout do not literally “collect” suitable water. The blue stick represents having access to appropriate aquatic habitat conditions.

The model also leaves out many ecological factors, including:

- water temperature
- water chemistry and quality
- disease
- competition
- genetics
- reproduction
- predators
- seasonal changes
- introduced species
- climate
- differences between individual trout
- complex food-web relationships

Use these limitations as a learning opportunity.

Ask:

- **What does our model help us understand?**
- **What can't our model tell us?**

Don't Predetermine the Result

The numbers suggested in this activity are examples.

Adjust the amount of each resource according to your class size and playing area.

The goal is not to make exactly a certain number of trout survive.

Allow students to see what actually happens and work with the evidence they generate.

Restoration Should Respond to Evidence

Avoid automatically returning resources in Round 4.

Students should first identify what happened in Round 3 and then propose a response.

The learning sequence is:

Observe → Gather Evidence → Identify a Challenge → Act → Monitor → Learn → Adapt

Restoration Doesn't Mean “Fixing Nature”

Not every environmental change requires human intervention, and restoration does not mean creating a perfect ecosystem where every organism survives.

The purpose of Round 4 is to demonstrate how an identified environmental pressure might be addressed and how scientists can monitor the results.