Creek Under Pressure

Trace how human changes affect animals in and beside a stream

ZOO.10.6 "Explain how human impacts have changed the environment of aquatic and terrestrial organisms (e.g., habitat destruction, urbanization, and climate change)."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Read the passage. Underline three human actions, circle the environmental change each one causes, and number an animal affected by each change with the matching action.

Changes at Pine Creek

1. At Pine Creek, a narrow strip of forest once shaded the water and held damp leaf litter along its banks. When landowners cleared trees for lawns and buildings, direct sunlight reached more of the creek. On hot days, the exposed water could warm faster, leaving less dissolved oxygen for brook trout, which need cool, oxygen-rich water. Without roots to hold soil, rain could wash more sediment into the channel. Sediment that settles among streambed stones can cover the spaces where trout lay eggs. On land, red-backed salamanders also lost shady, moist leaf litter that helps keep their skin from drying out.

2. As the nearby town grew, rooftops, streets, and parking lots replaced soil that had absorbed rain. Stormwater flowed quickly across pavement into Pine Creek, sometimes carrying oil, road salt, and loose dirt. A rapid surge could wash away some streambed insects that trout eat. Salt in freshwater can also harm some aquatic invertebrates, though the effect depends on how much enters the creek. Roads cut across patches of forest, leaving salamanders less continuous damp ground to cross. A salamander crossing an exposed road risks drying out or being struck by a vehicle.

3. Climate change adds pressure even where no trees are cut. Rising average air temperatures can raise stream temperatures, making warm days more difficult for cold-water trout. Warmer water holds less dissolved oxygen than cooler water. Longer dry spells can lower creek levels and leave fewer damp hiding places beneath logs for salamanders. A heavy downpour after a dry spell can send a sudden pulse of runoff from paved areas into the creek. These pressures interact: shade from remaining trees may cool a stretch of water, but shade alone cannot stop a warming climate or prevent every flood.

2 ANSWER WITH EVIDENCE

Use the passage

1. How could clearing creekside trees change both trout egg habitat and salamander habitat? Explain a different environmental change for each.

2. Explain how pavement could affect trout by changing their food supply.

3. How might road salt affect creek animals differently from the way a road affects salamanders?

4. Why might keeping tree shade fail to protect brook trout during climate change? Include a change to water conditions.

3 YOUR TURN

Your own words

A new housing project is planned beside Pine Creek. Propose one change to its design that could help both brook trout and red-backed salamanders. Explain how it changes each animal's environment, and name one threat it cannot fully remove.

Creek Under Pressure

PART 1 · READ AND MARK

Read the passage. Underline three human actions, circle the environmental change each one causes, and number an animal affected by each change with the matching action. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How could clearing creekside trees change both trout egg habitat and salamander habitat? Explain a different environmental change for each.	**Without tree roots, more sediment can wash into the creek and cover spaces where trout lay eggs. Salamanders lose shady, moist leaf litter that helps keep them from drying out.**
2	Explain how pavement could affect trout by changing their food supply.	**Rain runs quickly across pavement into the creek. The resulting surge could wash away some streambed insects that trout eat.**
3	How might road salt affect creek animals differently from the way a road affects salamanders?	**Salt entering freshwater can harm some aquatic invertebrates. An exposed road puts crossing salamanders at risk of drying out or being struck by a vehicle.**
4	Why might keeping tree shade fail to protect brook trout during climate change? Include a change to water conditions.	**Shade may cool part of the creek, but rising air temperatures can still warm the water. Warmer water holds less dissolved oxygen, which brook trout need.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Keep a wide strip of creekside forest instead of clearing it for lawns. Its shade can help keep the water cooler and more oxygen-rich for brook trout, while its leaf litter provides damp cover for red-backed salamanders. The trees cannot fully stop rising air temperatures from warming the creek.

Accept other feasible design changes if the response explains a supported environmental benefit for both animals and identifies a threat the change would not fully remove.