

Ecosystem Explorers – Student Worksheet

Observations

Monitoring Station: Soil Sampling

Test the pH of the different collected soil samples and record the results below.

Soil Source	pH	Acidic, Neutral, or Basic
<i>Garden</i>		
<i>Forested area</i>		
<i>Sports field</i>		

Monitoring Station: Water Quality Testing

Test the different samples of collected water for the following parameters and record the results below.

Water Source	pH	Nitrite	Nitrate	Phosphate	Chlorine	Hardness	Other
<i>Tap water</i>							
<i>Bottled water</i>							
<i>Lake water</i>							
<i>Pond water</i>							

Monitoring Station: Biodiversity Survey

Observe the abundance of different species found within a quadrat and record the results in the next tables.

Eco Inventories

Eco Inventories

Quadrat 1: Near to non-natural/paved surface (adjacent to metre stick and paved surface)

Plants	Invertebrates (animals without backbones)	Vertebrates (animals with backbones)	Other
<p>We found _____ (#) different kinds of plants inside the quadrat.</p> <p>We estimate that _____ % of the quadrat was covered in plant vegetation.</p> <p>2 plants we found in the quadrat include:</p> <ol style="list-style-type: none"> 1. 2. <p>There were tree branches above the quadrat:</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>	<p>We found _____ (#) of invertebrates inside the quadrat.</p> <p>We found...</p> <ul style="list-style-type: none"> ▫ _____ (#) insects (6 legs or less) ▫ _____ (#) spiders (8 legs) ▫ _____ (#) sowbugs (14 legs) ▫ _____ (#) centipedes (more than 20 legs, 1 pair per body segment) ▫ _____ (#) millipedes (more than 30 legs, 2 pairs per body segment) ▫ _____ (#) worms (no legs) 	<p>We found the following signs of vertebrates in the quadrat:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Animal tracks <input type="checkbox"/> Scat (poop) <input type="checkbox"/> Bitten off twigs or leaves <input type="checkbox"/> Fur <input type="checkbox"/> Feathers <input type="checkbox"/> Bird nests <input type="checkbox"/> Woodpecker holes <input type="checkbox"/> Squirrel dreys (clumps of grass or leaves) 	<p>We found the following abiotic elements in the quadrat:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Rocks <input type="checkbox"/> Soil <input type="checkbox"/> Water <p>We found the following signs of human activity in the quadrat:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Garbage <input type="checkbox"/> Other:

Eco Inventories

Quadrat 2: 40 centimetres down the metre stick.

Plants	Invertebrates (animals without backbones)	Vertebrates (animals with backbones)	Other
<p>We found _____ (#) different kinds of plants inside the quadrat.</p> <p>We estimate that _____ % of the quadrat was covered in plant vegetation.</p> <p>2 plants we found in the quadrat include:</p> <ol style="list-style-type: none"> 1. 2. <p>There were tree branches above the quadrat:</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>	<p>We found _____ (#) of invertebrates inside the quadrat.</p> <p>We found...</p> <ul style="list-style-type: none"> ▫ _____ (#) insects (6 legs or less) ▫ _____ (#) spiders (8 legs) ▫ _____ (#) sowbugs (14 legs) ▫ _____ (#) centipedes (more than 20 legs, 1 pair per body segment) ▫ _____ (#) millipedes (more than 30 legs, 2 pairs per body segment) ▫ _____ (#) worms (no legs) 	<p>We found the following signs of vertebrates in the quadrat:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Animal tracks <input type="checkbox"/> Scat (poop) <input type="checkbox"/> Bitten off twigs or leaves <input type="checkbox"/> Fur <input type="checkbox"/> Feathers <input type="checkbox"/> Bird nests <input type="checkbox"/> Woodpecker holes <input type="checkbox"/> Squirrel dreys (clumps of grass or leaves) 	<p>We found the following abiotic elements in the quadrat:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Rocks <input type="checkbox"/> Soil <input type="checkbox"/> Water <p>We found the following signs of human activity in the quadrat:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Garbage <input type="checkbox"/> Other:

Eco Inventories

Quadrat 3: 80 centimetres down the metre stick.

Plants	Invertebrates (animals without backbones)	Vertebrates (animals with backbones)	Other
<p>We found _____ (#) different kinds of plants inside the quadrat.</p> <p>We estimate that % of the quadrat was covered in plant vegetation.</p> <p>2 plants we found in the quadrat include:</p> <ol style="list-style-type: none"> 1. 2. <p>There were tree branches above the quadrat:</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>	<p>We found _____ (#) of invertebrates inside the quadrat.</p> <p>We found...</p> <ul style="list-style-type: none"> ▫ _____ (#) insects (6 legs or less) ▫ _____ (#) spiders (8 legs) ▫ _____ (#) sowbugs (14 legs) ▫ _____ (#) centipedes (more than 20 legs, 1 pair per body segment) ▫ _____ (#) millipedes (more than 30 legs, 2 pairs per body segment) ▫ _____ (#) worms (no legs) 	<p>We found the following signs of vertebrates in the quadrat:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Animal tracks <input type="checkbox"/> Scat (poop) <input type="checkbox"/> Bitten off twigs or leaves <input type="checkbox"/> Fur <input type="checkbox"/> Feathers <input type="checkbox"/> Bird nests <input type="checkbox"/> Woodpecker holes <input type="checkbox"/> Squirrel dreys (clumps of grass or leaves) 	<p>We found the following abiotic elements in the quadrat:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Rocks <input type="checkbox"/> Soil <input type="checkbox"/> Water <p>We found the following signs of human activity in the quadrat:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Garbage <input type="checkbox"/> Other:

Eco Inventories

Quadrat 4: Natural area that is distant from any non-natural or paved area.

Plants	Invertebrates (animals without backbones)	Vertebrates (animals with backbones)	Other
<p>We found _____ (#) different kinds of plants inside the quadrat.</p> <p>We estimate that _____ % of the quadrat was covered in plant vegetation.</p> <p>2 plants we found in the quadrat include:</p> <ol style="list-style-type: none"> 1. 2. <p>There were tree branches above the quadrat:</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>	<p>We found _____ (#) of invertebrates inside the quadrat.</p> <p>We found...</p> <ul style="list-style-type: none"> ▫ _____ (#) insects (6 legs or less) ▫ _____ (#) spiders (8 legs) ▫ _____ (#) sowbugs (14 legs) ▫ _____ (#) centipedes (more than 20 legs, 1 pair per body segment) ▫ _____ (#) millipedes (more than 30 legs, 2 pairs per body segment) ▫ _____ (#) worms (no legs) 	<p>We found the following signs of vertebrates in the quadrat:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Animal tracks <input type="checkbox"/> Scat (poop) <input type="checkbox"/> Bitten off twigs or leaves <input type="checkbox"/> Fur <input type="checkbox"/> Feathers <input type="checkbox"/> Bird nests <input type="checkbox"/> Woodpecker holes <input type="checkbox"/> Squirrel dreys (clumps of grass or leaves) 	<p>We found the following abiotic elements in the quadrat:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Rocks <input type="checkbox"/> Soil <input type="checkbox"/> Water <p>We found the following signs of human activity in the quadrat:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Garbage <input type="checkbox"/> Other:

Discussion Questions

Soil Sampling

Which collected soil sample showed the healthiest pH level? Which sample showed the poorest pH level? Do the results surprise you? Why or why not?

What natural changes can affect the soil pH of an ecosystem?

How can soil pH affect the pH of nearby bodies of water?

How can climate change affect the soil pH of ecosystems?

Soil Restoration

How can human activities impact soil health in an ecosystem?

What actions can be taken to restore damaged or degraded soil in an ecosystem?

Water Quality Testing

Which collected water sample showed the healthiest pH and nutrient levels? Which water sample showed the poorest levels? Do the results surprise you? Why or why not?

What are some factors that can influence water quality?

Which human activities can cause a change in water pH or nutrient levels?

How can different water quality parameters (pH, nitrate levels, hardness, etc.) affect the suitability of water for various uses (drinking, agriculture, aquatic life, etc.)?

Biodiversity Survey

Which quadrat had the least biodiversity (the lowest number of different species found)?

Which quadrat had a greater variety of biodiversity (the greatest number of different species found)?

Do the results surprise you? Why or why not?

What can be said about the biodiversity in a more natural location versus biodiversity in more non-natural areas? Where do we expect to find more biodiversity?

How do human-made landscapes and activities affect biodiversity?