

# BIOLOGICAL DIVERSITY IN KANANASKIS COUNTRY

## BIODIVERSITY STUDENT DATA FORM

**Date:** \_\_\_\_\_

**Time:** \_\_\_\_\_

**Weather Observations:** \_\_\_\_\_

**Group Members:** \_\_\_\_\_

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### **Student Data Sheet**

In this field study, you will be exploring two different areas; a native plant undisturbed site and an invasive alien disturbed site. In your assigned groups, complete the data sheet with as much detail and accuracy as possible as directed in this data form.



## NATIVE PLANT UNDISTURBED SITE – QUADRAT STUDY

### Temperature

Ensure thermometers are left for 2 minutes to accurately reflect the temperature of the area.

Air Temp. (°C) 1 m above the ground	
Air Temp. (°C) at ground level	
Soil Temp. (°C)	

### Light

Using the Light / Moisture Meter, place the photometer bulbs towards the sky. Set the switch to the “light” position and record the reading, A (dark) to H (bright).

Light	
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### Soil Moisture

Using the Light / Moisture Meter, place the probe gently into the soil. Switch the probe to “moisture” and record the reading, 1 (dry) to 10 (wet).

Soil Moisture	
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### Soil pH

Take a pinch of the soil from the soil sampling tube and add it to the soil sampling vile. Add half the container of distilled water and shake until a soil slurry forms. Insert a stripe of pH paper into the vile and compare the colour reading.

Soil pH	
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### Soil Profile

Using the soil sampling tube, remove a cross section of soil from your quadrat. Use the soil sample to draw a detailed diagram of the cross section that includes:

- Measurements of the thickness of each layer (cm).
- Descriptions of the components of each layer.

## NATIVE PLANT UNDISTURBED SITE – GROUND COVER ASSESSMENT

Randomly throw your 50 cm x 50 cm square into your quadrat. In the grid below, do a detailed drawing using symbols to represent the plants found in your grid square.


### Identify Plant Species

Symbol	Common Plant Name

### Calculate the Diversity Index

- 1) Record the # of different species in your grid
- 2) Count the total # of specimens in the grid.
- 3) Divide the number of species by the number of specimens to get the diversity index.

Diversity Index	
Number of species	
Total number of specimens (individuals)	
Diversity Index: # of species	
# of specimens	

**NATIVE PLANT UNDISTURBED SITE – DIVERSITY WITHIN A SPECIES**

Chose one of the most common plants (tree, shrub, or herb) anywhere in this site (it does not have to be in the quadrat). Select a species with at least 5 individuals observed within the area. Complete this section of the form on the species you choose.

**SPECIES:** \_\_\_\_\_

<b>HEIGHT</b>	
Using your estimation skills approximate the following:	
Height of the smallest individual	
Height of the tallest individual	
Average height	

<b>LEAVES / NEEDLES</b>
Observe a length of branch / stem and draw a diagram on how the leaves/needles are arranged along the branch / stem

<b>DENSITY</b>
How many plants are there per square metre?

<b>GROWTH PATTERNS</b>
Note the variations in trunk or stem shape, canopy shape, distance between branches, numbers of leaves/needles, and any other unique growth patterns you observe between species.

<b>CANOPY CIRCUMFERENCE SIZE</b>	
Using the tape measurer in your equipment box to measure the shrub circumference or estimate the tree circumference of::	
Smallest canopy	
Largest canopy	
Average canopy circumference	

<b>BIOLOGICAL IMPACTS</b>
Look carefully at the individuals and record any sign of fungus, rust, galls, blights, etc. on any of the species. Detail your observations

## NATIVE PLANT UNDISTURBED SITE – INSECT ASSESSMENT

Using the square below, complete a detailed drawing of your **3m x 3m quadrat** using symbols to indicate where insects (or insect evidence such as webs, galls, casings, burrows, etc.) were found. Conduct a **shrub shake** on ONE shrub in your quadrat and add the data to your assessment.



### Identify Insect Species

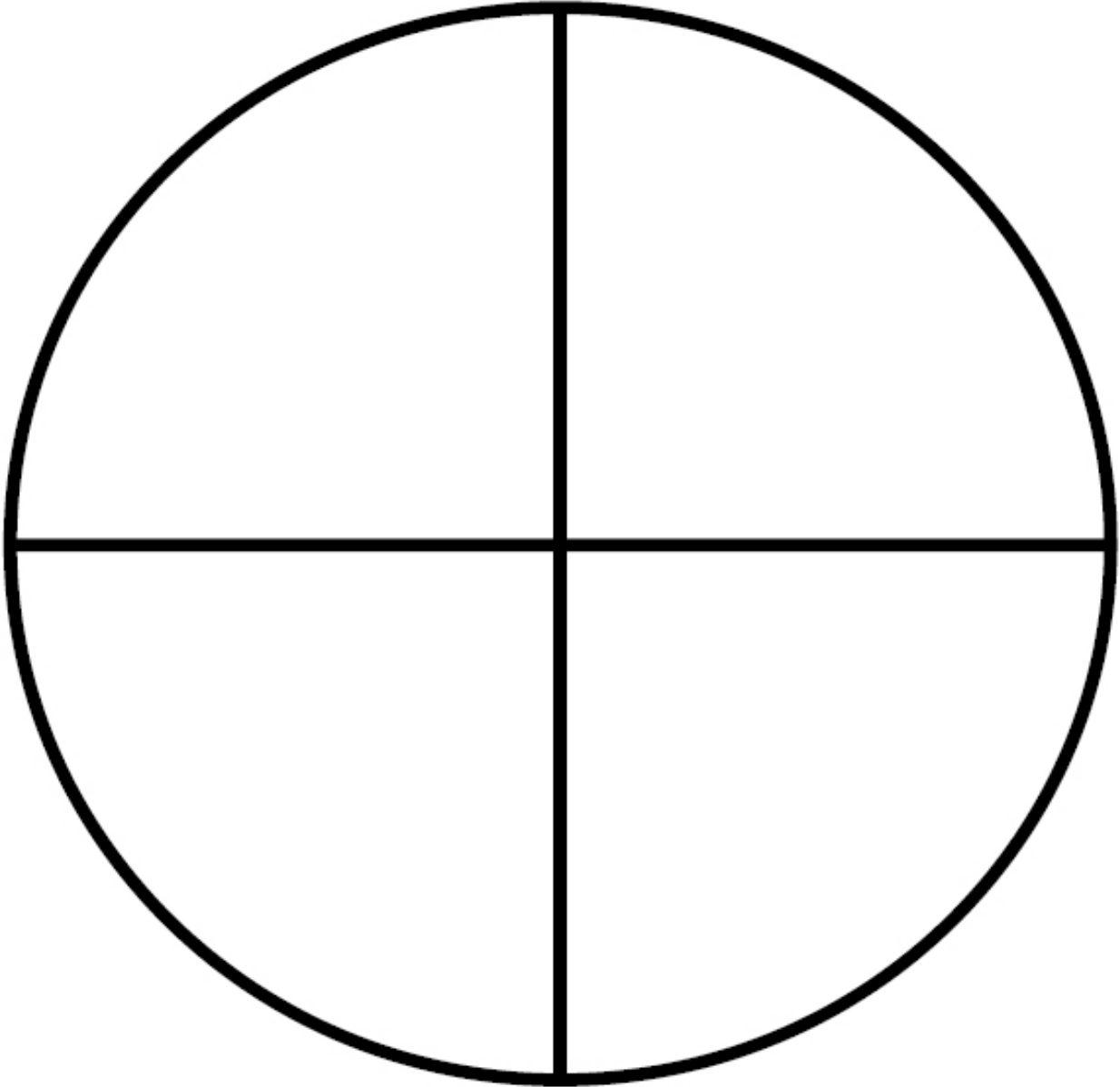
Symbol	Insect Name

### Calculate the Diversity Index

- 1) Record the # of different species in the quadrat.
- 2) Count the total # of specimens in the quadrat.
- 3) Divide the number of species by the number of specimens to get the **Diversity Index**.

<b>Diversity Index</b>	
Number of species	
Total number of specimens (individuals)	
Diversity Index: # of species # of specimens	

**NATIVE PLANT UNDISTURBED SITE – BIRD COUNT**

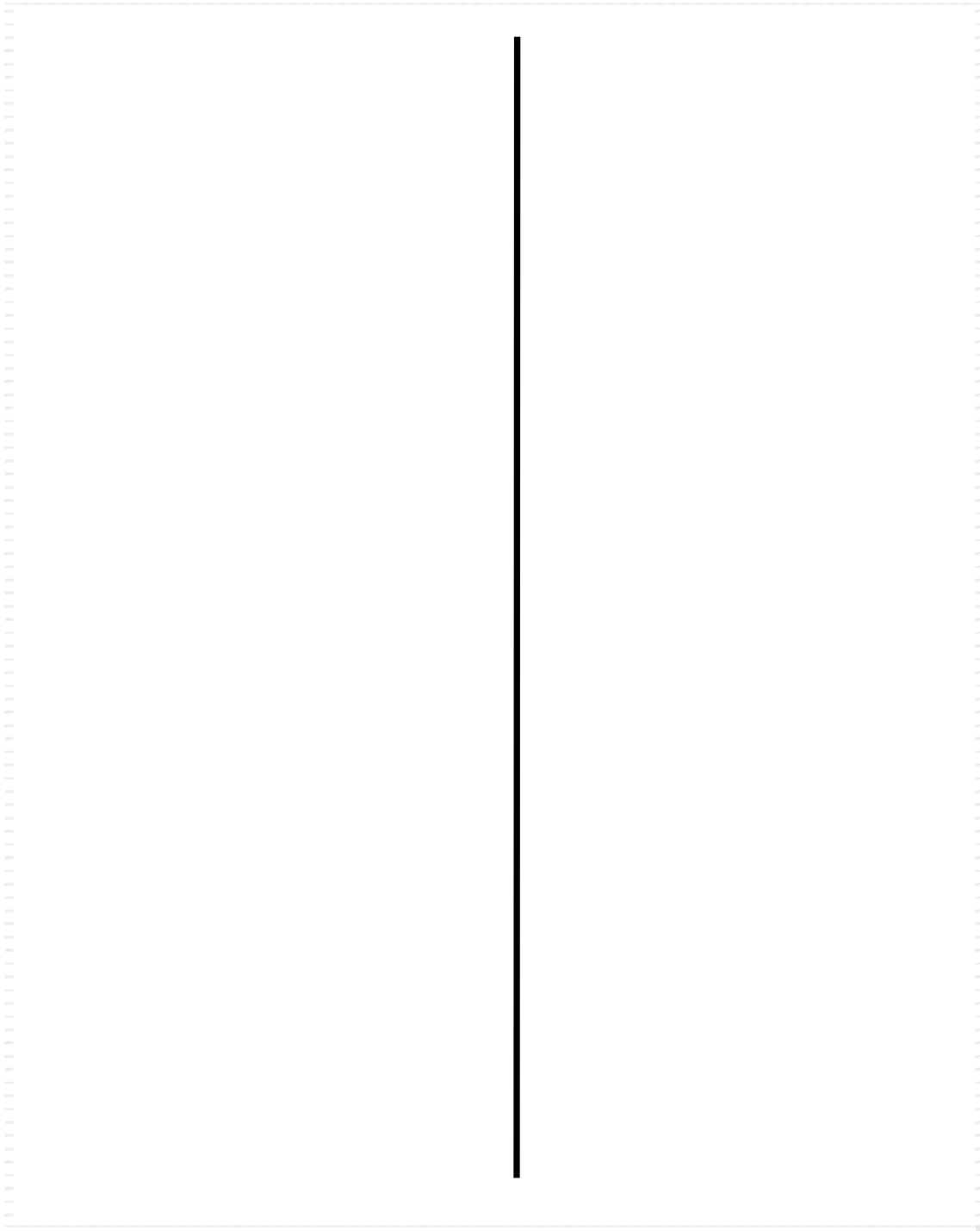


# of Birds Seen \_\_\_\_\_ # of Birds Heard \_\_\_\_\_ Total # of Birds \_\_\_\_\_

Can you identify any species? \_\_\_\_\_  
\_\_\_\_\_

**Instructions:** Find a place to sit comfortably and quietly. Record all birds seen or heard in the designated time period (5 or 10 minutes) on the above data sheet. Assume you are in the middle. It doesn't matter if you know the names of birds observed or heard; use symbols to identify the different species and plot them in the circle relative to your position.

## NATIVE PLANT UNDISTURBED SITE – LINE TRANSECT



**Instructions:** Line transects involve an observer moving along a pre-determined route through a study area recording the distances at which each individual/track/sign is seen. To investigate the presence or absence of wildlife, walk the entire length of the 25 m transect line, observing all signs 1 metre on either side of the transect. Document any wildlife sign, such as: tracks, scat, trails, burrows, scratch marks, browsing, food caches etc.

## INVASIVE ALIEN DISTURBED SITE – QUADRAT STUDY

### Temperature

Ensure thermometers are left for 2 minutes to accurately reflect the temperature of the area.

Air Temp. (°C) 1 m above the ground	
Air Temp. (°C) at ground level	
Soil Temp. (°C)	

### Light

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<b>GROWTH PATTERNS</b>
Note the variations in trunk or stem shape, canopy shape, distance between branches, numbers of leaves/needles, and any other unique growth patterns you observe between species.

<b>CANOPY CIRCUMFERENCE SIZE</b>	
Using the tape measurer in your equipment box measure (shrub) or estimate(tree) the following:	
Smallest canopy	
Largest canopy	
Average canopy circumference	

<b>BIOLOGICAL IMPACTS</b>
Look carefully at the individuals and record any sign of fungus, rust, galls, blights, etc. on any of the species. Detail your observations

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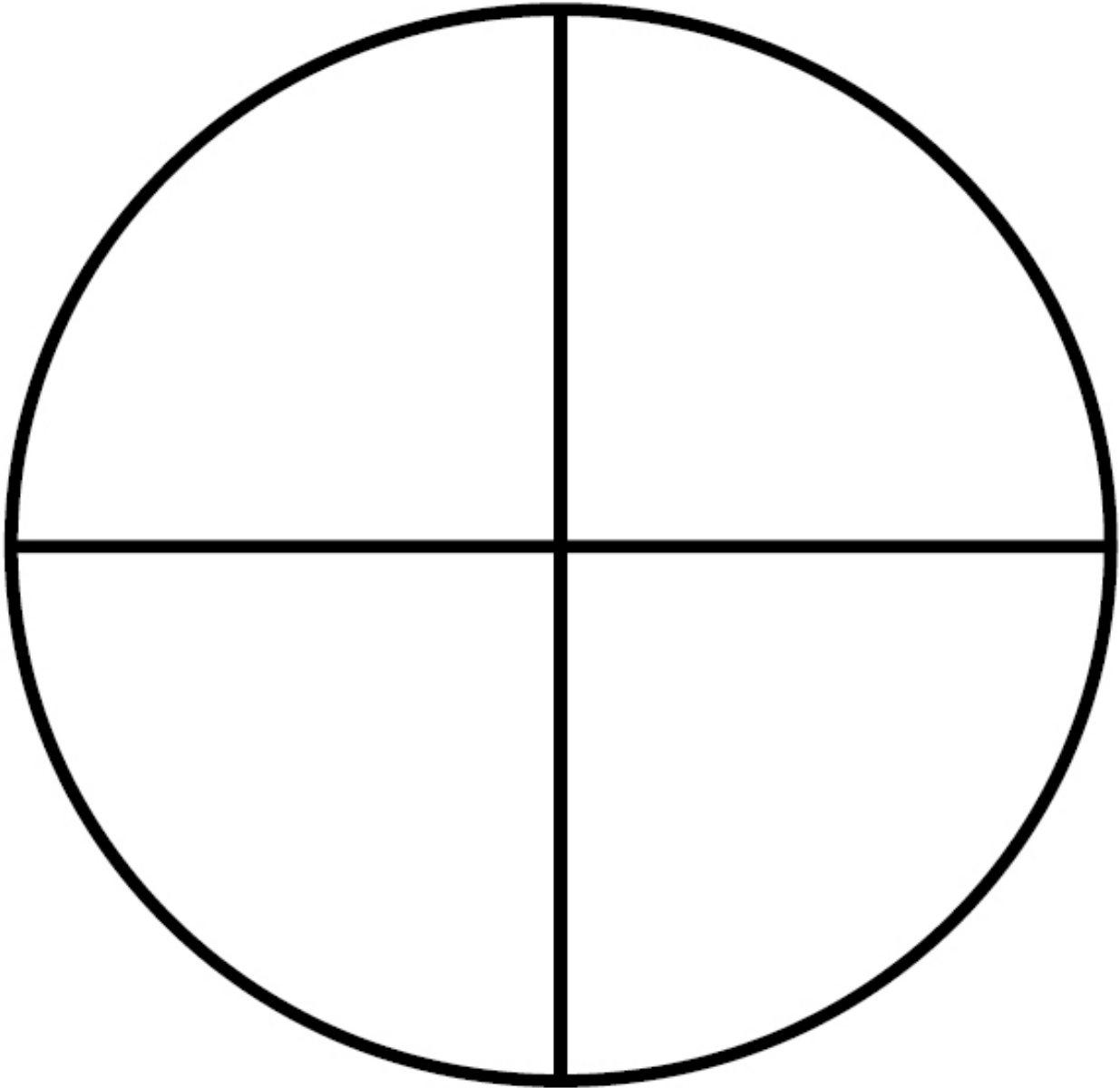
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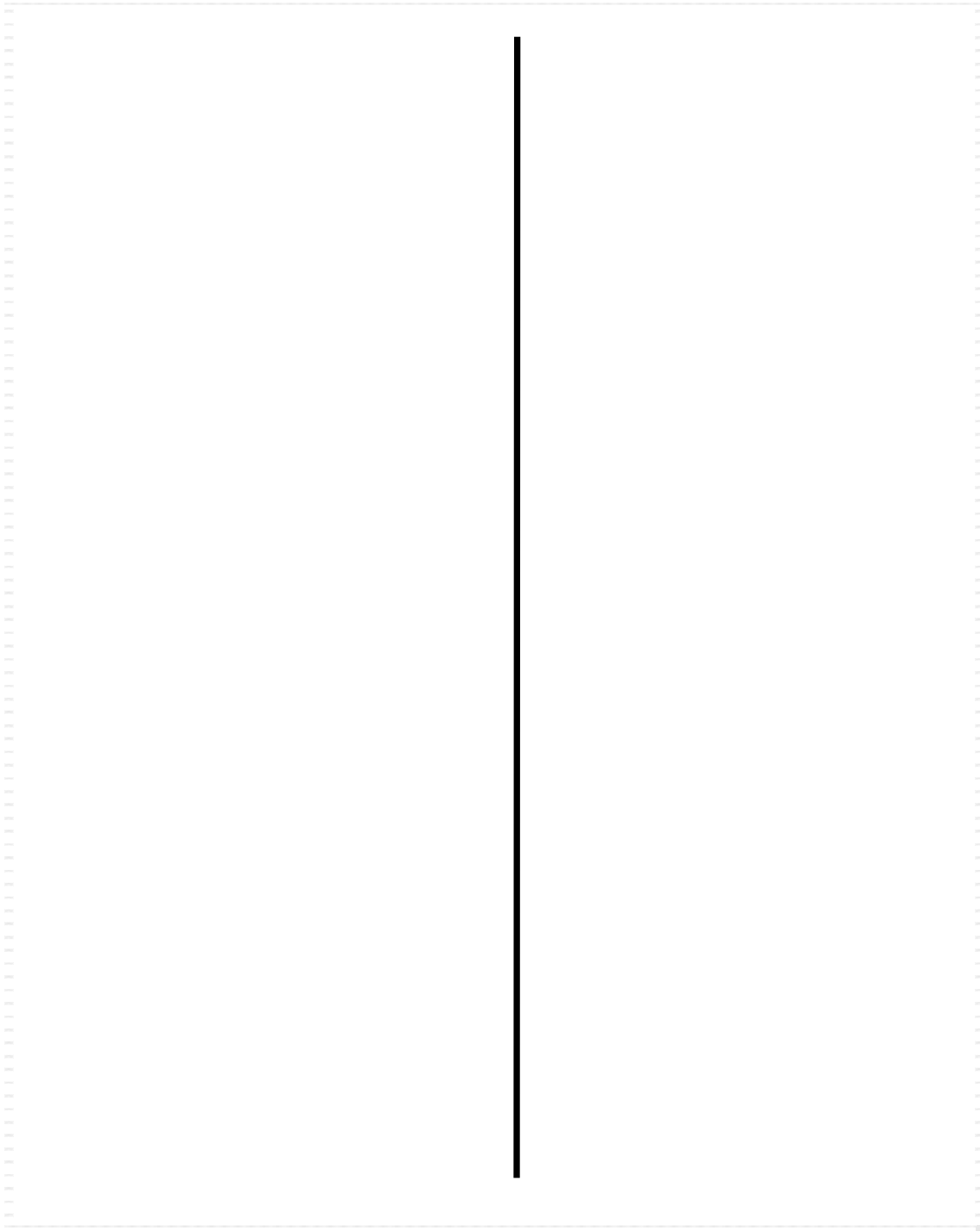


# of Birds Seen \_\_\_\_\_ # of Birds Heard \_\_\_\_\_ Total # of Birds \_\_\_\_\_

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## Focusing Questions

Which ecosystem studied had the **greatest biological diversity**? Explain your reasoning.

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Why is it advantageous to have variation or diversity **WITHIN** a species?

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Why is it advantageous to have variation or diversity **BETWEEN** species?

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If you were a land manager, are there any **other factors** you would consider in addition to *Diversity Index* if you were responsible for protecting ecosystems? What other factors would you consider?

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What do you think should be done about *invasive alien species* in Alberta? What should be done about *invasive alien species* in protected areas?

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What do you think YOU, as an individual, or as a group could do to protect **Alberta's Biodiversity**?

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