

Module 2, Lesson 3

Animals around the world

The zoo in your community is so popular and successful that it has decided to expand. After careful research, zookeepers have decided to add an exotic animal to the zoo population. They are holding a contest for visitors to guess what the new animal will be. You will use skills you have learned in classification and analysis to find what part of the world the new animal is from and then identify it.

To help you get started, the zoo has provided a list of possible animals. A list of clues will help you choose the correct answers. You will combine information you have in multiple layers of maps to find your answer.

Task 1: Open the map

1. If you do **not** intend to save your work:
 - a) Launch an Internet browser.
 - b) Click on this link:
 - c) <http://arcg.is/1HgQVdU>
 - d) Skip Step 2 and proceed with the lesson.
2. If you wish to save in a Public or Organization account, go to <http://esriurl.com/SaveAGO> and follow the directions.

A map of the world appears on your screen and includes background information. A legend to the left contains a list of the layers you will be working with. A series of buttons and tools will help you perform GIS functions.



3. Look at the ArcGIS Online map window and observe the following:
 - On the right side you see a map.
 - On the left side you see a column that displays the legend for the map.
 - In the top right corner you will see a “Modify Map” link.
4. Click on the Modify Map link.
5. Look at the top of the ArcGIS Online map viewer window and notice the different buttons. You will use some of these buttons as you progress through this lesson



Task 2: Enlarge the ArcGIS Online window

If the ArcGIS Online Map Viewer window is small when the map document first opens, you may wish to enlarge it.

6. In the upper right corner (PC) or upper left corner (Mac) of your ArcGIS Online window there are three buttons. Click the middle button (PC) or the right green button (Mac).

PC



Mac



Now the ArcGIS Online Map Viewer window fills your whole screen.

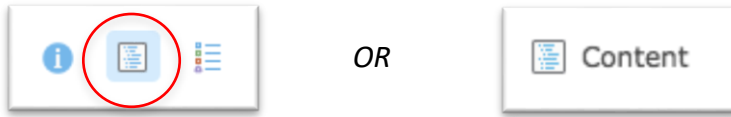
You can also change the size of your ArcGIS Online window by stretching it. Stretching the window instead of maximizing it allows you to organize other windows and dialog boxes as they appear.

7. Place the cursor on any corner of the ArcGIS Online window that is not at the edge of your screen. The cursor changes to a diagonal double-headed arrow. Click and drag the window outward until the ArcGIS Online window fills about two-thirds of the screen. Let go of the mouse button.

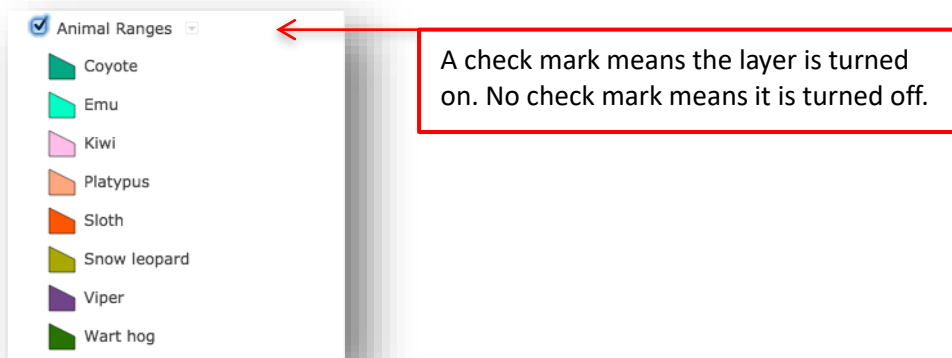
Task 3: Clue #1 — The mystery animal lives in the Eastern Hemisphere

The Eastern Hemisphere is the area of the world found east of the prime meridian and west of the International Date Line.

8. Click on **Show Contents of Map** button.



9. Turn on the **Animal Ranges** layer by placing a check mark next to the layer name.



The legend lists the names of new animals the zoo is considering. To expand any legend that in this case, describes colors that represents an animal's home range, **single click the layer name and then the Show Legend icon**. The map shows where those animals live in the world. A different color represents each animal. The same list of animals appears in your “Animal list” worksheet.

10. Turn off the **Animal Ranges** layer by clicking the check mark next to the layer name.

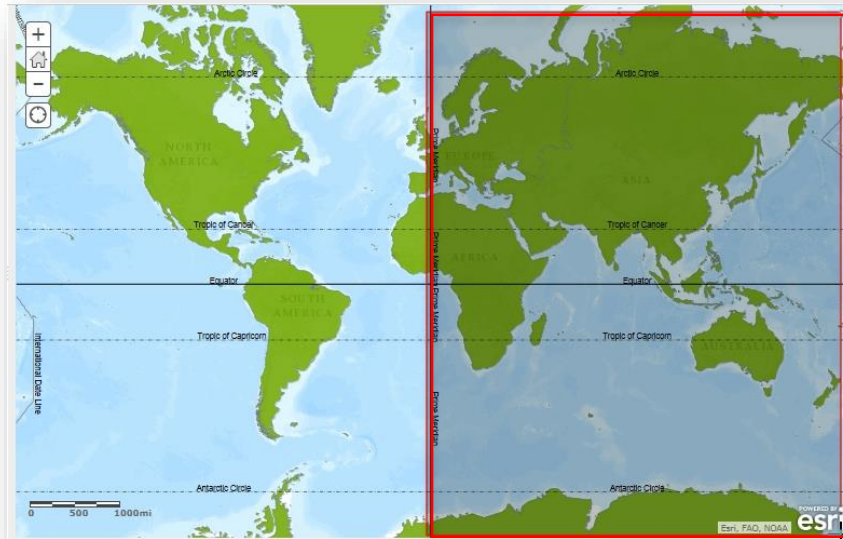
The animal that you are looking for lives east of the Prime Meridian (0° longitude)

11. Turn on the **Major Lines** layer by clicking the box next to the layer name.



This is a layer showing the major lines of latitude in the world.

12. Locate where the Prime Meridian and the North Pole meet on the top center of the map.
13. Hold the shift key down and click and hold your mouse where the Prime Meridian and the North Pole meet.
14. Drag a box around the entire Eastern Hemisphere and stop at the far southeast tip.
15. Release your mouse button.

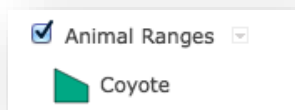


The continents in the Eastern Hemisphere will now be centered.

Note: If you make a mistake, click the Home button and start over.



16. Turn on the Animal Ranges layer.



17. Click each animal range located in the Eastern Hemisphere. The name of the animal will appear in the popup window.


Note: The red box will disappear but you will have zoomed into that area. If the popup window doesn't give you the information on the animal range you clicked on, click on the arrow at the top right of the Identify window until you see the Animal Ranges information.

Q1: On your "Animal list" worksheet, place an X under the animals located in the Eastern Hemisphere (either part or all of their range is in the hemisphere).


18. Turn off the **Animal Ranges** layer.

Task 4: Clue #2 — The mystery animal lives near the Tropic of Capricorn

The Tropic of Capricorn is a major line of latitude located at approximately 23.5°S. This is the most southerly latitude where the sun can appear directly overhead at noon. This happens during the December solstice — about December 21 — the official change from the spring season to the summer season (remember, the seasons are reversed in the southern hemisphere).

 **Q2: Look at your map. Is the Tropic of Capricorn located in the northern hemisphere (north of the Equator) or in the southern hemisphere (south of the Equator)?**

- a. Northern Hemisphere
- b. Southern Hemisphere

 **Q3: Look at your map. What continents does the Tropic of Capricorn cross? Circle all that apply.**

- a. Africa
- b. Europe
- c. North America
- d. Australia

19. Click the Home button. 

20. Hold the Shift key down and click your mouse at the intersection of the equator and the Prime Meridian.

21. Drag a box to the far southeast corner of your map.

22. Release your mouse button.




You are now zoomed in to the Southern Hemisphere, east of the Prime Meridian.



23. Turn on the Animal Ranges layer.

24. Click each animal range that is visible in the eastern part of the southern hemisphere.

 **Q4: On your “Animal list” worksheet, place an X next to the animals that are located in the southern hemisphere (either part or all of their range must be in the hemisphere).**

25. Close the popup window.

26. Turn off the Animal Ranges layer.

Task 5: Clue #3 — The mystery animal lives in temperate, mixed-broadleaf forest areas

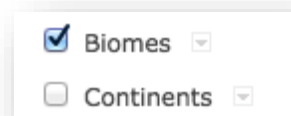
A biome is an area that has similar animals, plants, and climate. A biome is a way of classifying the world into natural regions so that it's easier for people to study and research them.

Let's use the information you have to make a map showing the world's biomes

27. Click the Home button. This will zoom the map out to the whole world so that you can see all the biomes.

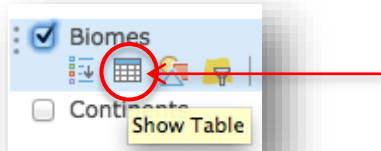
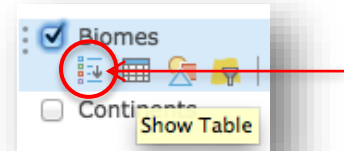
28. Turn off the **Continent** layer.

29. Turn on the **Biomes** layer. (Be patient, it may take a few seconds to display this layer.)



30. Click on the Biomes layer name and the Show Legend icon to show its legend.

31. Hover over the Biomes layer and choose the **Show Table** button.



32. Scroll down the list until you see Temperate Mixed Forests.

33. Click the record (row) containing Temperate Mixed Forests.

It will become highlighted in blue in your table.

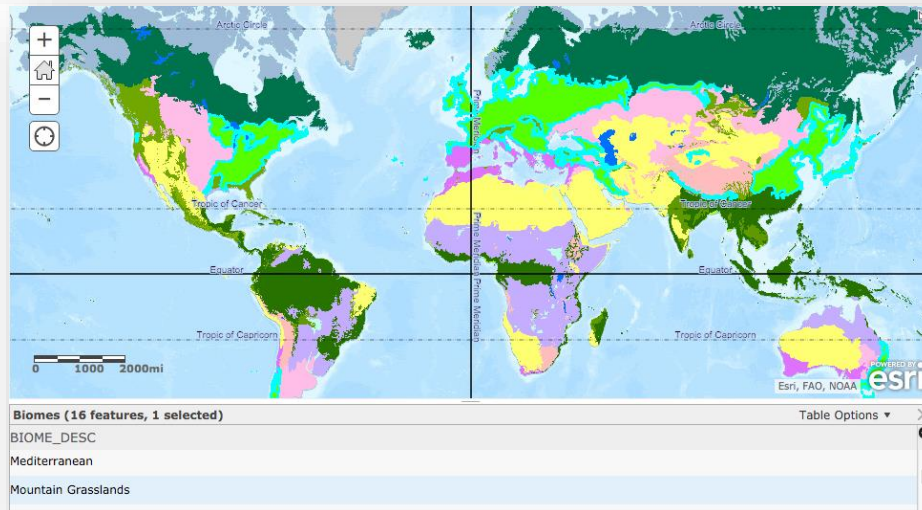
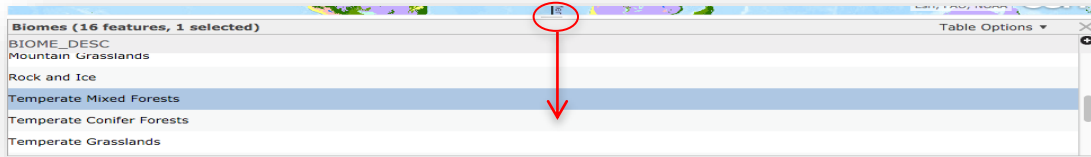
Biomes (16 features, 1 selected)		Table Options ▾
BIOME_DESC		
Mountain Grasslands		
Rock and Ice		
Temperate Mixed Forests		
Temperate Conifer Forests		
Temperate Grasslands		

You will see all the temperate broadleaf and mixed forest regions outlined in bright blue on your map. This shows the relationship between the attribute data and the map.

Temperate broadleaf and mixed forests are typically located midway between the tropics and the poles. The temperature changes in these areas vary widely with distinct warm and cool seasons. This area is home to a variety of animal species, including brown bears, owls, deer, and ladybugs.

Now that you understand a bit about biomes, return to the southeastern part of the world and continue your search for the mystery zoo animal.

34. Click on the top center of the table and drag the table down so you can see your entire map but you can still see a row of data in the table.



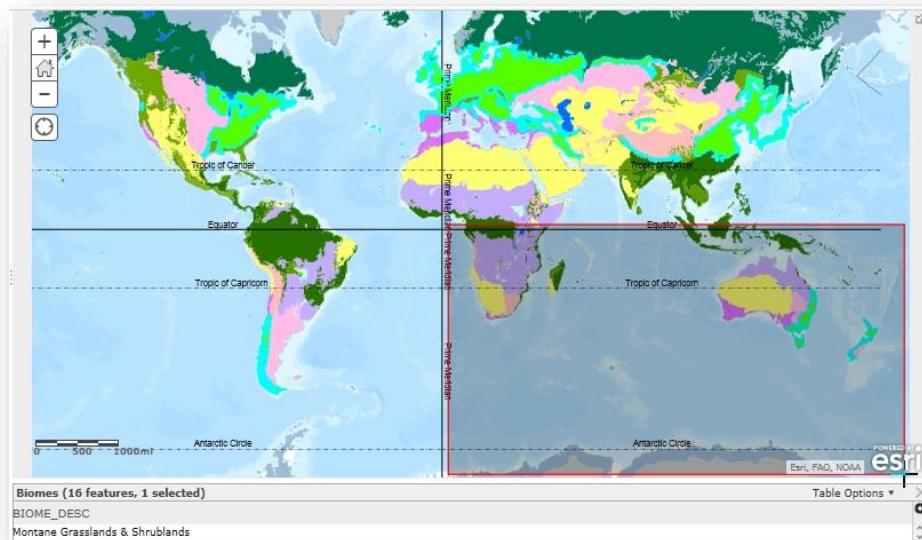
35. Click the Home button.

36. Find the intersection of the lines of the Equator and the Prime Meridian.

37. While holding the Shift key down, click and hold your mouse at the intersection of the Equator and the Prime Meridian.

38. Drag a box to the southeastern corner of the world.

You are
zoomed
to the
Southern
Hemisphere east of the Prime Meridian.



now
back

39. Turn on the **Countries** layer. The countries will appear with a black outline over the biomes.

40. Click on any country, and the name of that country will appear.

🌐 **Q5: What two countries in this area have temperate broadleaf and mixed forest? (Hint: You are looking for the areas outlined in bright blue south of the equator and east of the Prime Meridian. You may have to click and drag the map slightly to the left to see both countries.)**

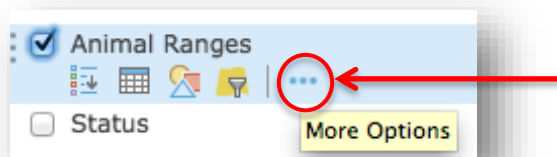
- a. _____
- b. _____

You have narrowed down the countries to Australia and New Zealand.

41. Turn off the Biomes layer.

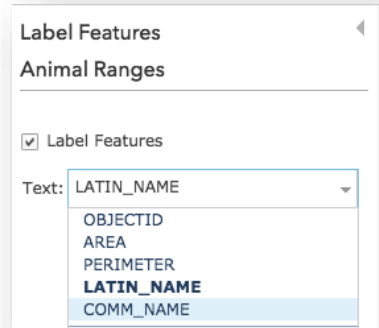
42. Turn on the Animal Ranges layer.

43. Click on the **Animal Ranges** layer name, click the ellipses and click on **Create Labels**.




44. Click the plus sign to the right of **Text**.

45. Scroll down and click on **COMM_NAME**.



46. Click **OK**.

 **Q6:** On your “Animal list” worksheet, place an X under the names of the animals found in these two countries. _____

Task 6: Clue #4 — The mystery animal is widespread across its country but lives mostly in endangered or critical areas

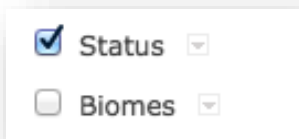
Now you will look at the conservation status of the ecoregions in each country.

Ecoregions are smaller than biomes. They each have their own plant, animal, and climate characteristics. The World Wildlife Fund has defined 825 ecoregions on earth. One type of information that the WWF records about ecoregions is their conservation status. There are three levels of classification:

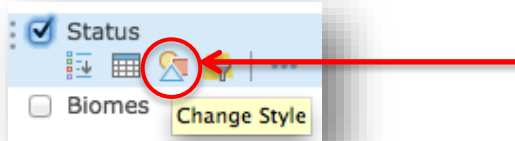
- Stable or intact — Species and ecosystems are abundant and not at any significant risk.
- Vulnerable — Where the area is at high risk for the extinction of species and reduction of the ecosystems.
- Critical or endangered — Where species in this area are at a very high or extremely high risk of becoming extinct.

47. Turn off the Animal Ranges layer.

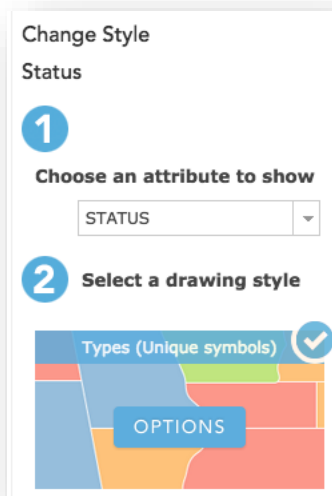
48. Turn on the Status layer by placing a check mark next to the layer name.



49. Click on the **Status** layer name and click on the **Change Style** icon.



50. Click the down arrow to the right of **Choose an attribute to show** and click on **STATUS**.



ArcGIS Online will choose a Unique symbols style that is appropriate and you do not need to do anything else.

51. Click **DONE**.

52. Click on the Status layer name and the Show Legend icon to display the legend.

 **Q7: Look at your legend. Which areas of Australia and New Zealand are critical or endangered? (Hint: Click on the layer name Status to view the legend.)**

- a. The coastal areas.*
- b. The central areas.*

 **Q8: Which country is mostly covered by critical or endangered areas?**

- a. Australia*
- b. New Zealand*

53. Turn on the Animal Ranges layer.


 **Q9: What is the name of the mystery animal?** _____

Task 7: Placing the mystery animal

Now that you have identified the mystery animal, you need to decide where it should live in the zoo.

Use the map of the zoo provided by your teacher (worksheet 2). Think about the following when you are choosing a new home for this animal:

1. Should you put the animal near other animals with similar characteristics or in a separate area?
2. What kind of habitat do you think it would like? Remember the biome that it was living in (go back to Step 5).
3. Will it be seen on the tour that you created?

 **Q10: Draw the new enclosure on your map — be sure to label the enclosure with the name of the zoo's newest resident.**

 **Q11: Write a brief paragraph explaining the location you chose for the animal.**

Step 8: Save your work and exit ArcGIS Online

54. If you have an ArcGIS Organization account, save your map in your My Contents.

Conclusion:

The kiwi is a small flightless bird that lives only in New Zealand. New Zealand has more flightless birds than any other country. Some people believe the birds there didn't need to fly because they didn't have many enemies to fly away from.

The kiwi bird is about the size of a chicken. Kiwis usually mate for life and typically lay only one egg at a time. The reason for this is that a kiwi egg can be up to 10 times larger than a chicken egg! Kiwis have an excellent sense of smell and are the only bird with nostrils at the end of its beak.

Unfortunately, the kiwi population in New Zealand faces threats from an increase in predators, human influence, and loss of habitat. Numerous organizations aim to help the kiwi begin to thrive again in New Zealand.

Module 2, Lesson 3

Animals around the world

Worksheet 1: Animal list

Class	Viper	Wart hog	Sloth	Emu
Lives in the Eastern Hemisphere?				
Lives in the Southern Hemisphere?				
Lives in the two countries found in step 5?				

Class	Coyote	Kiwi	Platypus	Snow Leopard
Lives in the Eastern Hemisphere?				
Lives in the Southern Hemisphere?				
Lives in one of the two countries found in Task 5?				