Map Analysis

Next Generation Science Standards:

- MS-LS2-1 Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

Hawai'i Content and Performance Standards III:

- SC.8.2.1 Describe significant relationships among society, science and technology and how one impacts the other.

Description:
Haleakalā National Park protects the biodiversity of endemic species. This activity will introduce students to the boundaries and topography of Haleakalā National Park.

Duration: 45 minutes

Objectives: At the end of this lesson, the students will be able to:

- Determine how Haleakalā National Park protects biological diversity and describe three ways students can help too.

Background:
The isolated location of Hawai'i, about 2,000 miles from our nearest neighbor, has created the unique plant and animal biodiversity that is found here in the islands. Although isolated, the islands popularity as a visitor destination has brought with it both a number of desirable and undesirable effects. Haleakalā National Park contains designated Wilderness Areas which means that is "untrammeled" by people. The Wilderness Act of 1964 protects Wilderness Areas from roads, buildings and even too much signage. In Wilderness Areas people are only temporary visitors and are not allowed to permanently live there. The Wilderness Areas within Haleakalā National Park protect much of the remaining biodiversity of Maui's endemic species.

Vocabulary:
Biodiversity: The variety of organisms in a specific environment.
Species: A group of similar individuals that can usually breed among themselves and produce fertile offspring.

Materials Needed:

Map Analysis Worksheet (included)
Map Analysis Worksheet Teacher Answer Key (included)
Computer with online access (For each group or for individual students)
National Gap Analysis Program Protected Areas Data Viewer
http://gis1.usgs.gov/csas/gap/viewer/padus/Map.aspx

Procedure:

Step 1: Discuss the geography and biodiversity of the Hawaiian Islands.

Discuss the isolation of the Hawaiian Islands. Hawai'i is about 2,000 miles from the nearest land. This isolation has created the unique plant and animal biodiversity that is found here in the islands. Review that biodiversity is the variety of organisms in an ecosystem.

Step 2: National Gap Analysis Program (GAP) Protected Areas Data Viewer

Ask students to access the National Gap Analysis Program (GAP) Protected Areas Data Viewer. Go to: http://gis1.usgs.gov/csas/gap/viewer/padus/Map.aspx
If students do not have individual online access, they can work in small groups or use ELMO.

Step 3: Hand out the Map Analysis Worksheet

Ask students to follow the instructions on the worksheet and complete the questions.

Step 4: Review National Park Service and introduce idea of Wilderness.

Discuss what a Wilderness area and its importance/significance.

Step 5: Discussion and journal activity

Discuss their predictions on the effects that elevation has on biodiversity in the park.

- Remind them what the highest and lowest elevations are.
- Think of how many different ecosystems might exist in this range of elevations = coastal, rainforest, dry forests, sub-alpine desert, etc.

Ask students to answer the following questions in their journal:

- Predict ways that Haleakalā National Park protects biodiversity.
- How you could help the park protect the biodiversity of Maui?

Name: _____ Date: _____ Period: _____

Map Analysis Worksheet

- Access the National Gap Analysis Program (GAP) Protected Areas Data Viewer. http://gis1.usgs.gov/csas/gap/viewer/padus/Map.aspx
- Click and drag to move to the Hawaiian Islands on the map. Notice its isolated location from all other landmasses. Center the Hawaiian Islands on the map.
- Use the zoom gauge in the upper left area to zoom in and center Maui on the map. Zoom in about half way so that you can view the entire island of Maui.
- Be sure that under the "Build a Map" area on the left:
  "Select a Protected Land View" is on "By Owner" (you can also adjust the transparency)
  "Select a Base Map" is on "Basic Reference"

1. What is the name of your nearest National Park Service (NPS) site? (Hint: Click on it for more Information.) _____

2. What is the "Ownership Type"? _____

3. What is its "Gap Status"? _____

4. What is the "Designation type" of this area? (Hint: there are 2, click on a few different areas)

_____

5. What is the size in acres of each of these protected areas?

_____

- Scroll down to the bottom of the "build a map" area.
- Under "Select a Base Map" choose "USGS Topographic"
- Zoom in further on Haleakalā National Park. (Hint: Use the toggle on Ownership transparency to see elevation)

6. What is the highest elevation you can find within the park? _____

7. What is the Hawaiian Name of this location? _____

8. What is the lowest elevation found within the park? _____

9. Predict what effect the elevation would have on the biodiversity found in the park. Why?

_____

_____

Map Analysis Worksheet Teacher Answer Key

- Access the National Gap Analysis Program (GAP) Protected Areas Data Viewer.
  http://gis1.usgs.gov/csas/gap/viewer/padus/Map.aspx
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  "Select a Protected Land View" is on "By Owner" (you can also adjust the transparency)
  "Select a Base Map" is on "Basic Reference"

1. What is the name of your nearest National Park Service (NPS) site? (Hint: click on it for more Information.) Haleakalā National Park

2. What is the "Ownership Type"? Federal

3. What is its "Gap Status"? 2 – Managed for biodiversity - Disturbance events suppressed

4. What is the "Designation type" of this area? (Hint: there are 2, click on a few different areas)

Wilderness Area and National Park

5. What is the size in acres of each of these protected areas?

Wilderness = 17,141 National Park = 12,122

- Scroll down to the bottom of the "build a map" area.
- Under "Select a Base Map" choose "USGS Topographic"
- Zoom in further on Haleakalā National Park. (Hint: Use the toggle on Ownership transparency to see elevation)

6. What is the highest elevation you can find within the park? 10,023 feet

7. What is the Hawaiian Name of this location? Puʻuʻulaʻula

8. What is the lowest elevation found within the park? 0 feet or sea level

9. Predict what effect the elevation would have on the biodiversity found in the park. Why?

There would be great biodiversity because of the great range of elevation!