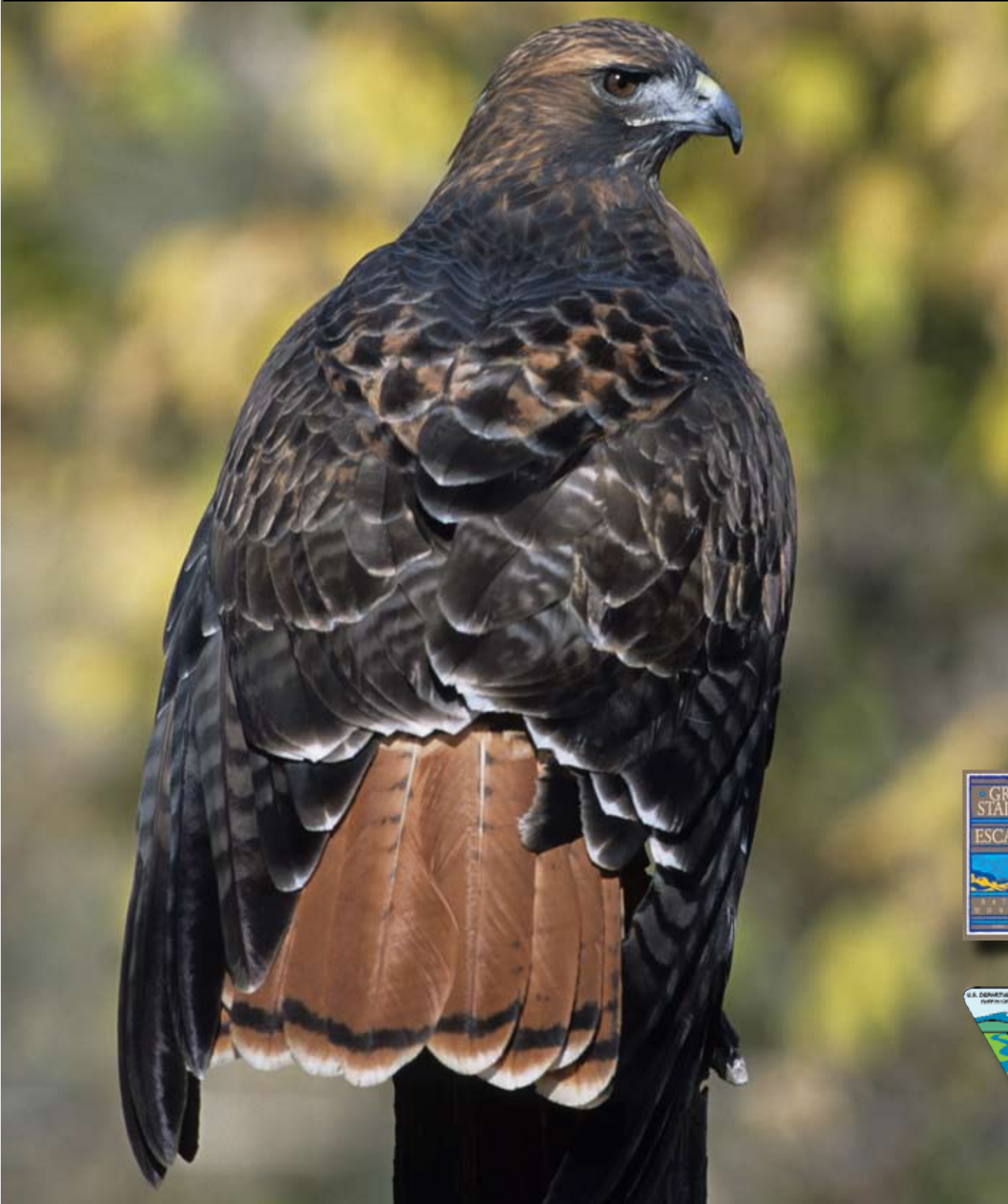


# Identifying Flora and Fauna in Grand Staircase - Escalante National Monument

## Student Activity



Grand Staircase-Escalante National Monument



# Identifying Flora and Fauna in Grand Staircase-Escalante National Monument

Grand Staircase-Escalante National Monument is a place of great *diversity*. There are five vegetation zones, ranging from semi-arid scrub and grassland to pinion-juniper woodland, ponderosa pine forest, and mixed conifer forest. Northern and southern habitat boundaries for many species overlap in GSENM. Animals that rarely live together share the Monument's resources, both year round and during migrations.



In order for scientists to study this diversity they need to be able to differentiate one species from another. They do that by using *classification*, or identification keys.

In this activity you will identify some of the organisms that live in GSENM using classification keys. You'll even get a chance to create your own key!

It may be hard to imagine but taxonomy, the science of classifying organisms, is going through big changes. Most of us think that once an organism has been classified it's over, done, finished! Not necessarily.

For centuries taxonomists, the scientists who classify organisms, have used observable *characteristics* including:

- *Morphology* – the structure of an organism
- *Reproduction* – the process by which an organism reproduces itself
- *Function* – the use or action of specific body parts
- *Habitat* – the environment in which an organism lives
- *Behavior* – response to specific stimuli
- *Heredity* – acquired genetic traits

Recent advances in *DNA* and *RNA* sequencing have resulted in major reevaluating of past classifications. Micro-organisms previously grouped by structure, habitat, and reproduction are now being split into new groups or lumped together in groups that seem to have little in common, other than their DNA or RNA.

In the past century, the process of classification hasn't changed much. Organisms are still "keyed" into the *taxonomic hierarchy* based on how closely related they appear to be. This taxonomic hierarchy begins with Domain or Kingdom and proceeds through Phyla, Class, Order, Family, Genus, and species.

One final product of classification is a scientific name for each organism. Latin-based scientific names, like *Turdus migratorius* or *Ursus horribilis* (American robin and grizzly bear),

are the same worldwide. That's not the case with common names. *Canis lupus* is "wolf" in English, "lobo" in Spanish, and "loup" in French. *Puma concolor* is called "mountain lion," "puma," or "cougar." Communication is a problem when common names are used.

Genus and species names also make it easy to identify closely related organisms. *Canis latrans*, the coyote, *Canis lupus*, the wolf, and *Canis familiaris*, the domestic dog, are all in the family Canidae and share similar characteristics.

Some organisms have three-word scientific names, like *Canis lupus rufus*. Rufus (meaning red-brown) denotes a *subspecies* classification. There's quite a controversy between taxonomists about creating new species or using subspecies. They've even resorted to calling each other names! Those in favor of creating new species are called "splitters" and they've named the red wolf *Canis rufus*. Those who would rather go with subspecies (*Canis lupus rufus*) are called "lumpers".

## Using Classification Keys: Flora and Fauna

Using a classification key is a bit like going on a treasure hunt. You begin at one point, read the clue, figure it out, and move on to the next point.

### Flora

Look at the four sketches below. These are all native plants that grow in Grand Staircase-Escalante National Monument. Without names there's no way of telling them apart, unless you use their location (top left, bottom right, etc...), or number them. That's the point of a classification key, it identifies one thing from another and names it.

#### Question 1



a) \_\_\_\_\_



b) \_\_\_\_\_



c) \_\_\_\_\_



d) \_\_\_\_\_

To name each plant and review the basics of classification keys, complete the following steps:

**Step 1**

Look for similar characteristics and choose one to start with. Classification keys have to start somewhere, so the first step in making a key is careful observation. It’s important to find one specific common characteristic that will differentiate organisms into separate groups.

Many plant classification keys begin with the characteristic of reproduction, separating flowering from non-flowering plants. Other plant keys begin with the type of stem or leaf.

Look at the native plant sketches. The leaves in two sketches are thin and pointed, or needle-like, while the leaves in the other two sketches are not. By using leaves as the first characteristic, the four sketches can be divided into two different groups, those with needle-like leaves and those that are not needle-like.

**Step 2**

Continue differentiating organisms by similar and/or different characteristics. After choosing leaves as the beginning characteristic, new characteristics need to be found that will differentiate the two groups of sketches apart.

Look at the plants with needle-like leaves. Notice that the leaves begin in different places. This structural characteristic can be used to tell the needle-like leaved plants apart.

Look at the sketches that don’t have needle-like leaves. Notice that one plant has flowers that produce plumed seeds while the other has flowers that become red berries. This characteristic will differentiate these plants.

**Step 3**

Identify individual organisms by common and/or scientific names. Below is a simple classification key based on the characteristics broken down in steps one and two.

Use this key to identify the plants in the sketches by common name. Write the name of each plant on the native plant sketches.

- 1a. Leaves thin and needle-like. . . . .Go to 2
- 1b. Leaves not thin and needle-like. . . . .Go to 3

- 2a. Leaves sprout from root . . . . .Yucca
- 2b. Leaves grow on woody branches. . . . . Pinion pine

- 3a. Flowers form plumed seeds . . . . .Cliffrose
- 3b. Flowers form red berries . . . . .Squawbush sumac

**Fauna**

Following this key are photos of animals from Grand Staircase-Escalante National Monument. Each animal has a letter but not a name. Using the abbreviated taxonomic key, identify each animal and write its common and scientific/Latin name below the photo.

- 1a. Scaled skin, legs short or absent, most eggs are laid and have leathery covering  
Class Reptilia, Order Squamata . . . . .Go to 2
- 1b. Feathered body and wings, horny beak, hard shelled eggs. Class Aves . . . . .Go to 3
- 1c. Body covered with hair, milk produced by mammary glands, live births, Class  
Mammalia . . . . .Go to 6
- 2a. Has legs, moderate sized, eats other vertebrates and insects – Family Crotaphytidae  
-Lizard with a large head and two black collar markings around the neck.  
[Crotaphytus collaris](#), Collared Lizard
- 2b. legs absent, head broad and triangular, hollow fangs- Family Viperidae  
- Small venomous rattlesnake with gray or brown markings on a body that  
matches the soil color. Dark stripe behind the eye. [Crotalus cerastes](#).  
Rattlesnake.
- 3a. Small-tiny bird with short tail . . . . .Go to 4
- 3b. Large soaring bird with sharply hooked beak . . . . .Go to 5
- 4a. Long billed, with rapid wing beats and hovering flight. Order Apodiformes, Family  
Trochilidae. – Small hummingbird with bright rufous color. [Selasphorus rufus](#) –  
Rufous hummingbird
- 4b. Small, perching bird with narrow head and long, slender bill. Order Passeriformes,  
Family Troglodytidae – Brown body, white throat and barred tail. [Catherpes  
mexicanus](#) – Canyon wren.
- 5a. Huge black bird with 9-foot wingspan. Order Ciconiiformes, Family Cathartidae. –  
Bald red head. [Gymnogyps californianus](#) – California condor.
- 5b. Large bird with broad wings and tail. Order Falconiformes, Family Accipitridae –  
Distinctive red tail in adults. [Buteo jamaicensis](#) – Red-tailed hawk.
- 6a. Four legged, swift running animal with even-toes. Order Artiodactyla . . . . .Go to 7
- 6b. Medium sized animal with large conical canine teeth for eating meat. Most swift  
runners with excellent sense of smell. Order Carnivora . . . . .Go to 8
- 6c. Small, winged mammals. Order Chiroptera, Family Vespertilionidae . . . . . Go to 9
- 7a. Horned and hooped with two toes on each foot. Family Bovidae. Males have large  
curved horns. [Ovis Canadensis](#) - Desert bighorn.
- 7b. Medium sized with long, thin legs. Brown on back with distinct black and white  
markings on their heads and necks. Family Antilocapridae, [Antilocapra  
americana](#) – Pronghorn antelope
- 8a. Medium sized and long muzzled with non-retractable claws. Family Canidae, [Canis  
latrans](#) Coyote
- 8b. Small to medium sized, short muzzle, retractable claws. Family Felidae, [Puma  
concolor](#)- Mountain lion
- 9a. Large eyes, square snout; and large, pale ears. [Antrozus pallidus](#) Pallid bat
- 9b. Medium sized bat with very large ears, range in color from gray to buff of brown.  
[Corynorhinus townsendii](#) Townsend's big-eared bat.

Question 2



a) \_\_\_\_\_  
\_\_\_\_\_



b) \_\_\_\_\_  
\_\_\_\_\_



c) \_\_\_\_\_  
\_\_\_\_\_



d) \_\_\_\_\_  
\_\_\_\_\_



e) \_\_\_\_\_  
\_\_\_\_\_



f) \_\_\_\_\_  
\_\_\_\_\_



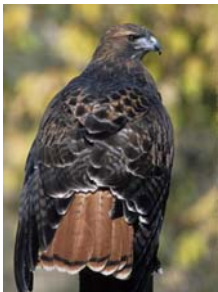
g) \_\_\_\_\_  
\_\_\_\_\_



h) \_\_\_\_\_  
\_\_\_\_\_



i) \_\_\_\_\_  
\_\_\_\_\_



j) \_\_\_\_\_  
\_\_\_\_\_



k) \_\_\_\_\_  
\_\_\_\_\_



l) \_\_\_\_\_  
\_\_\_\_\_

### Create a Classification Key

Using your expertise about classification keys, create your own “identification key” for the animals from GSENM that you could use in the field to identify animals by their common names. You may want to use the internet links for each animal to learn more about them and help with your classification key. Links are located on the genus and species names in the taxonomic key. Your teacher also has a list of links.

This is your chance to be creative *and* scientific.

*Question 3*

1a. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

1b. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

1c. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2a. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2b. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2c. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3a. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3b. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3c. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4a. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4b. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4c. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5a. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5b. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5c. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6a. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6b. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6c. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Vocabulary:**

<i>Classification</i>	Categorizing organisms into groups on the basis of specific characteristics.
<i>Characteristic</i>	Trait, type, or attitude.
<i>Diversity</i>	Variety or multiformity.
<i>DNA</i>	Deoxyribonucleic acid; a nucleic acid that consists of two long chains of nucleotides twisted together into a double helix and joined by hydrogen bonds between complementary bases adenine and thymine or cytosine and guanine; it carries the cell's genetic information and hereditary characteristics via its nucleotides and their sequence and is capable of self-replication and RNA synthesis.
<i>RNA</i>	Ribonucleic acid; a long linear polymer of nucleotides found in the nucleus but mainly in the cytoplasm of a cell where it is associated with microsomes; it transmits genetic information from DNA to the cytoplasm and controls certain chemical processes in the cell.
<i>Subspecies</i>	Division or sub-grouping of the species level of classification.
<i>Taxonomic hierarchy</i>	System of organizing living things.

**Animal Links:**

Canyon wren - *Catherpes mexicanus*

[http://www.birds.cornell.edu/programs/AllAboutBirds/BirdGuide/Canyon\\_Wren.html](http://www.birds.cornell.edu/programs/AllAboutBirds/BirdGuide/Canyon_Wren.html)

California condor – *Gymnogyps californianus*

[http://www.birds.cornell.edu/programs/AllAboutBirds/BirdGuide/California\\_Condor.html](http://www.birds.cornell.edu/programs/AllAboutBirds/BirdGuide/California_Condor.html)

Collared lizard - *Crotaphytus collaris*

<http://www.reptilesfaz.com/Lizards-Subpages/h-c-collaris.html>

Coyote - *Canis latrans*

[http://www.mnh2.si.edu/education/mna/image\\_info.cfm?species\\_id=29](http://www.mnh2.si.edu/education/mna/image_info.cfm?species_id=29)

Desert bighorn - *Ovis canadensis*

[http://www.mnh2.si.edu/education/mna/image\\_info.cfm?species\\_id=241](http://www.mnh2.si.edu/education/mna/image_info.cfm?species_id=241)

Mountain lion - *Puma concolor*

[http://www.mnh2.si.edu/education/mna/image\\_info.cfm?species\\_id=287](http://www.mnh2.si.edu/education/mna/image_info.cfm?species_id=287)

Pallid bat - *Antrozous pallidus*

[http://www.mnh2.si.edu/education/mna/image\\_info.cfm?species\\_id=8](http://www.mnh2.si.edu/education/mna/image_info.cfm?species_id=8)

Pronghorn antelope - *Antilocapra americana*

[http://www.mnh2.si.edu/education/mna/image\\_info.cfm?species\\_id=7](http://www.mnh2.si.edu/education/mna/image_info.cfm?species_id=7)

Rattlesnake - *Crotalus cerastes*

<http://www.reptilesfaz.com/Snakes-Subpages/h-c-cerastes.html>

Red-tailed hawk - *Buteo jamaicensis*

[http://www.birds.cornell.edu/programs/AllAboutBirds/BirdGuide/Red-tailed\\_Hawk.html](http://www.birds.cornell.edu/programs/AllAboutBirds/BirdGuide/Red-tailed_Hawk.html)

Townsend's big-eared bat - *Corynorhinus townsendii*

[http://www.mnh2.si.edu/education/mna/image\\_info.cfm?species\\_id=51](http://www.mnh2.si.edu/education/mna/image_info.cfm?species_id=51)

Rufous hummingbird – *Selasphorus rufus*

[http://www.birds.cornell.edu/programs/AllAboutBirds/BirdGuide/Rufous\\_Hummingbird.html](http://www.birds.cornell.edu/programs/AllAboutBirds/BirdGuide/Rufous_Hummingbird.html)