

# WHERE HAVE ALL THE KOA GONE?



Grade 5

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## Lesson at a Glance

A class debate focuses on the question, “Should we continue to log koa in Hawaiian forests?” Students assume the roles of store owner, naturalist, ecologist, landowner, woodcarver/furniture maker and consumer and debate the merits of using, managing and conserving a dwindling resource.

## Key Concepts

Forests provide habitat for plants and animals, watershed protection, recreation and many raw materials, some of which can be recycled. With careful management, timber and other forest products can be a renewable resource.

## Objectives

Students will be able to:

- 1) Debate various viewpoints about logging *koa*.
- 2) Write a persuasive letter expressing their views about the management of native Hawaiian forests.

## Time

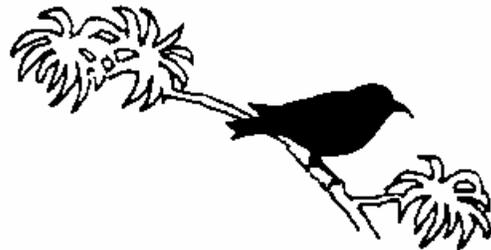
one to two class periods

## Subject Areas

social studies, language arts, Hawaiian studies

## Materials

student role cards (provided)  
forest illustrations (provided)



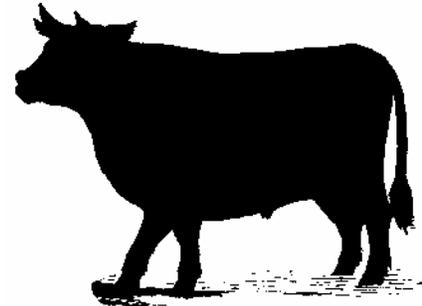
## Teacher Background

Forests provide **habitat** for plants and animals, recreational areas for bird watching, hiking, camping, fishing and hunting, and wood products for construction, furniture, paper, and other uses. Forests also provide watershed areas that help insure a steady supply of clean, fresh water. Not all forests are alike, and most are better for some uses than others. Intact, **undisturbed forests** provide habitat for native plants and animals. In Hawai‘i, most of these forests are dominated by ‘*ōhi‘a* and *koa* trees. They are not often visited by people, and host few if any introduced plants or animals. Most Hawaiian forests are **disturbed**, or no longer in pristine condition. These areas are used for hunting, logging, and other purposes. Non-native plants, such as guava and eucalyptus, and the introduced birds and insects associated with them are common in very disturbed forests.

The distinction between disturbed and undisturbed forests is important. Since many undisturbed forests in Hawai‘i provide the only habitat for rare or **endangered species**, loss of these areas will likely lead to a great number of species’ **extinctions**.

Some scientists refer to forests dominated by *koa* trees as an endangered habitat because these forests have been reduced to 15 percent of their former range; fewer than 20,000 ha (50,000 ac) remain in the state. ‘*Ōhi‘a-koa* forests (forests with at least 25 percent each of ‘*ōhi‘a* and *koa*), are more common, with about 60,000 ha (150,000 ac) occurring statewide.

Conversion of forests for pasture and cropland and the damage caused by feral cattle have played a major role in the forests’ decline. Grazing cattle compact soil, damage roots and eat *koa* seedlings, hindering or preventing forest regeneration. Introduced plants, such as banana poka, have an impact on forests as well. Introduced for their attractive flowers, banana poka vines completely smother trees and eventually kill them. Manually removing the vines from trees is a time-consuming and prohibitively expensive task. Large tracts of forested lands have also been lost to fires.



Approximately 100 native insects are associated with *koa* trees. Insect-eating birds, such as the Maui parrotbill, the woodpecker-like ‘*akiapōlā‘au*, or the small Kaua‘i thrush have declined with the loss of *koa*. These birds and a number of additional forest birds are now endangered. *Koa* is prized as a beautiful wood. It is presently valued at six dollars per board foot and the supply does not meet the demand. This demand makes it profitable for a private landowner to log *koa* trees. Some private landowners replant *koa* in logged areas or lands that were once used for pasture. They find that some other native species come back when *koa* returns. These replanted forests, however, lack the **diversity** of species found in an undisturbed forest. Scientists studying native forest birds have found that most birds prefer undisturbed forests where the **understory** (low growth on the forest floor) is still intact. When forests are opened for logging, even for selective cutting of individual trees, weed species tend to become established in the disturbed areas.

Since such a large percentage of native forests has been degraded or replaced, many believe that the remaining undisturbed forests should not be exploited for lumber or other purposes. Many of these areas are currently being managed as wildlife habitat by government agencies and private conservation organizations. Private landowners own some undisturbed forests. Those forests that are currently zoned as **conservation** land are protected from exploitation. However, pressure to use the land for agricultural or other purposes could eventually lead to the degradation of additional forested areas. For more information refer to the vegetation status map.

## Teaching Suggestions

1. Explain that most of the original native Hawaiian forests have been disturbed. Most of the forests we see are degraded, or dominated by introduced trees, such as guava.
2. Ask students to express ideas about why they think so little native forest remains in the Islands. Discuss the impact of humans on forests. Explain that conversion of forest to other uses, such as cattle ranching, has been far more destructive than the removal of trees for lumber.
3. Ask students how the removal of native forests might affect other native plants and animals. Distribute the illustrations of native and introduced forests and ask students to describe how the pictures are different.
4. Introduce the debate question, “Should we continue to log *koa* in Hawaiian forests?” and distribute one *koa* debate role card to each student. Ask students to compose brief statements supporting the position described. Make certain they understand that they are to defend the positions stated on the role cards and not their personal points of view.
5. When position statements are completed, ask all students playing the same roles to meet and discuss their statements.
6. Ask each group to select a representative to participate in a class debate. The representatives should describe who they are and give their position statements and their rationale.
7. Afterwards, allow debaters to question one another and clarify their positions. Encourage other class members to make comments and ask questions.
8. Have students vote for the most convincing argument. Then take a second vote to see which positions students personally hold. Students could also act as a legislative committee and take a vote on whether logging of *koa* should continue, and if so, under what circumstances.
9. Discuss the value of understanding others’ perspectives and the various ways that individuals can participate in the decision-making process regarding resource use. Citizens can make their views known by testifying at legislative sessions or by supporting private organizations that share their points of view. Have students write letters to the editor or their congressional representatives expressing their views about management of native forests.

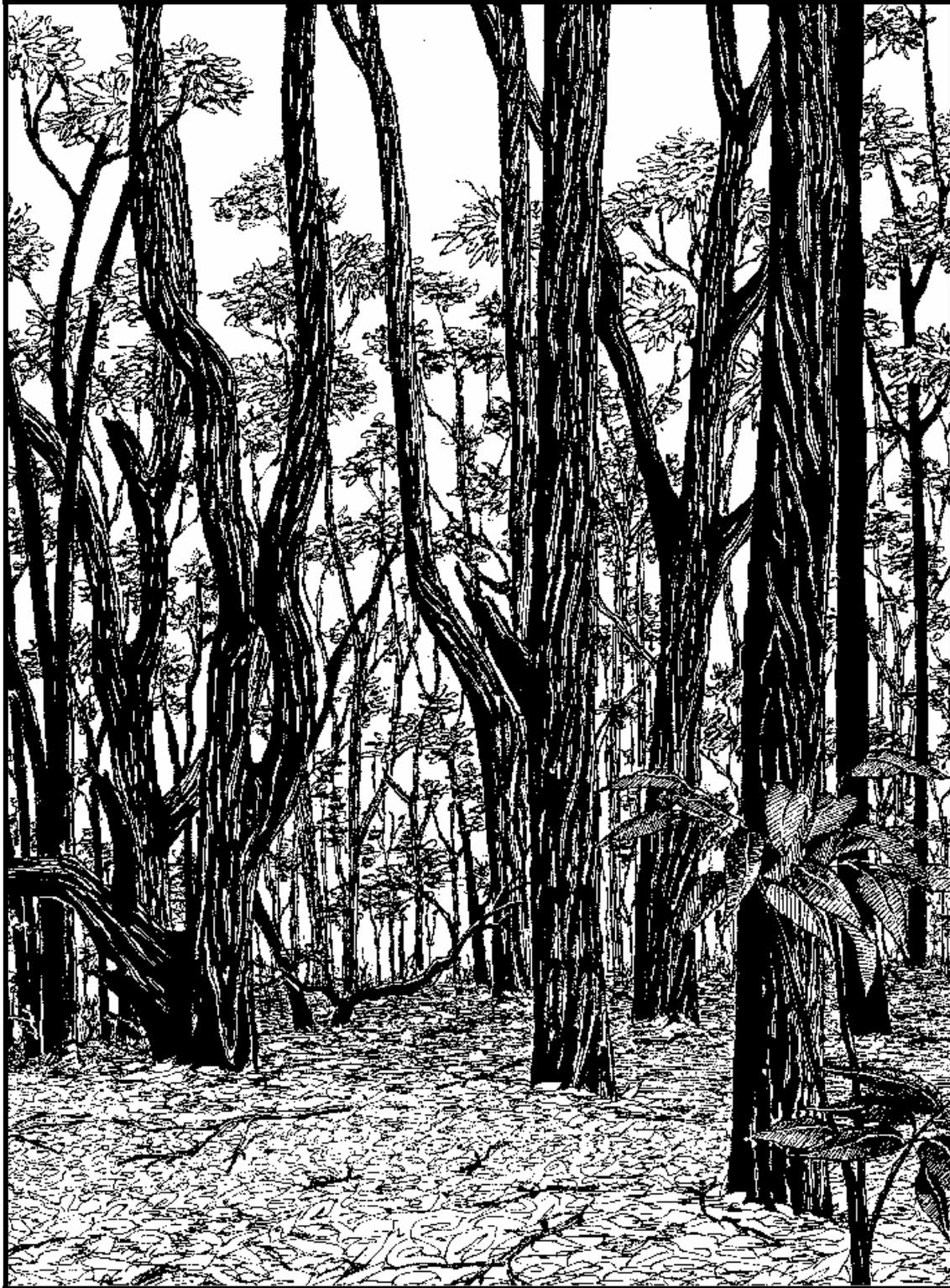
## Extended Activities

- Ask students to make up a song about forests to be sung to the tune of “Where Have All the Flowers Gone?”
- Plant a *koa* or other native tree on the school grounds and take care of it during the school year.
- Take a field trip to a native forest or an area where *koa* trees can be found.
- Bring small items made from *koa* to class and create a *koa* display that presents various points of view about managing native forests. (See the Plant Propagation Chart.)
- Have students make mobiles by tying symbols of forest uses such as timber, recreation, and habitat to the ends of chopsticks. The goal is to find a balance among competing forest uses.

- In his classic work, *A Sand County Almanac* (1949), Aldo Leopold wrote: “Wilderness is a resource which can shrink but not grow. Invasions can be arrested or modified in a manner to keep an area usable for either recreation, or for science, or for wildlife, but the creation of new wilderness in the full sense of the word is impossible.” Have students discuss this statement with reference to native Hawaiian forests.



*'ōhi'a-koa forest*



Forest replanted in eucalyptus

Role: Nick/Nora, Naturalist

Position: Logging of *koa* in forests should be allowed only in disturbed areas.



Background: You spend much of your time in the forest, watching birds and enjoying nature. You like to take your children to the old forests where trees are over 30 m (100 ft) tall. In your view, undisturbed native forests are special places that may disappear if they aren't legally protected. You are concerned that some native birds and insects that depend on *koa* will become extinct if logging is allowed. You know that most native birds are found in undisturbed native forests. You believe that even if cut trees are replaced, the areas opened up by the logging will allow introduced plants to come in and perhaps take over. You own some *koa* furniture yourself and don't want to stop all logging, but want to make sure that the few remaining undisturbed forests remain that way.

Role: Larry/Lei, Landowner

Position: Logging of *koa* in forests should be allowed.



Background: You own 200 ha (500 ac) of forest with tall *koa* trees. You have been able to make money from clearing much of the land for cattle pasture, and the *koa* trees you have cleared have sold for a high price. Since the *koa* is so valuable, you have begun to replant *koa* trees on parts of your land. You are happy to report that some native plants and animals are coming back to the forests you have replanted. You believe that you are taking good care of the land, and that private landowners have every right to do as they want with their property.

Role: Carl/Carol, Consumer

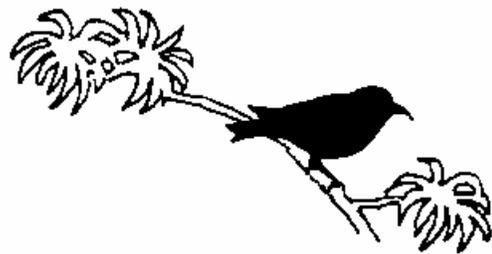
Position: Logging of *koa* in forests should be allowed.



Background: You are very fond of *koa* products. The *koa* paneling on your walls and *koa* furniture in your house is admired by all your friends. You have never been in a native Hawaiian forest and neither have most of the people you know. These forests might be rare, but since most people don't use them for recreation, you believe that the valuable *koa* wood should be made available to people. If more *koa* were available, it would probably not be so expensive. Besides, there must be someone who is making sure that not all the *koa* is taken.

Role: Ethan Ekela, Ecologist

Position: Logging of *koa* in forests should no longer be allowed and no one should be allowed to enter remaining forests without a permit.



Background: You view native Hawaiian forests as an endangered habitat. If present rates of logging continue, you believe that most forests where *koa* grows will be gone in ten years. You would like the government to step in and preserve all remaining native forests, even forests that have been disturbed. Even though private landowners are replanting *koa* trees, you believe that this will not really save native forests. You've seen that only a few different kinds of native plants and animals return when *koa* trees are replanted after logging. These replanted forests are really not like original native forests, which have many kinds of plants and animals. Because forests dominated by *koa* are now so rare, you would like to see strict laws created to preserve the forests that remain. You never buy *koa* products and wish others wouldn't, either.

Role: Steve/Sally, Store owner

Position: Logging of *koa* in forests should be allowed.

Background: You own a store that specializes in *koa* products. You sell *koa* furniture, bowls and picture frames. You also sell *koa* by the board foot to customers. *Koa* sells for six dollars per board foot and the finished *koa* products are your best selling high-priced products. Your customers want *koa* products and you want to be sure that *koa* is continually supplied. You know that it takes an average of 60–80 years for *koa* trees to grow to commercial size. You figure you won't be around in 60 or 80 years anyway, so why not log the trees now and make a profit? When the *koa* are gone you can import a new kind of wood.



Role: Keone/Karla, *koa* lover, (woodcarver, furniture maker)

Position: Logging of *koa* in forests should be allowed if new seedlings are planted for every tree that is cut.

Background: You enjoy working with *koa*. You love the golden cinnamon color of the wood and its beautiful texture. The *koa* bowls, picture frames, and furniture you make earn a good profit. Stores are continually asking for more *koa* products. You want to be able to satisfy your customers' demands and want *koa* logging to continue. But, you also want *koa* logging to be done carefully so that this beautiful wood will always be available. You believe that as *koa* trees are cut, seedlings should be planted so that there will always be a supply of *koa*.

