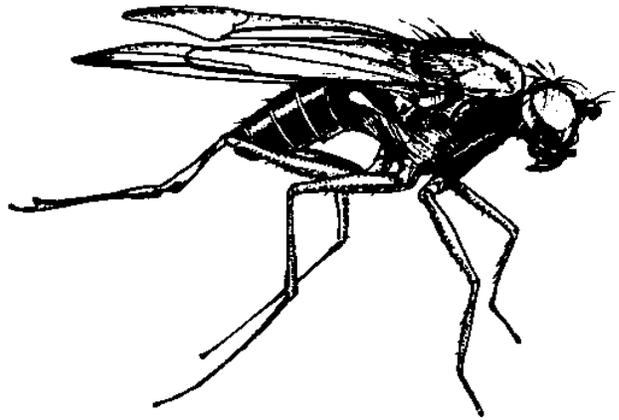
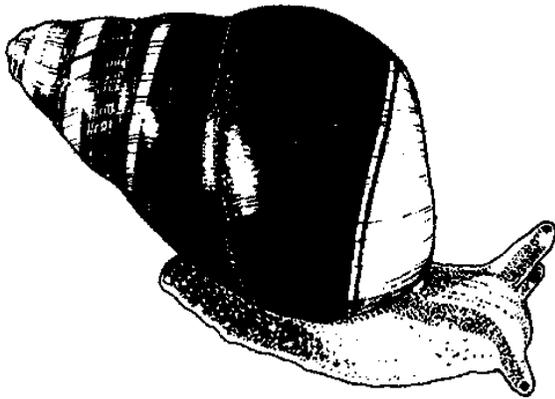
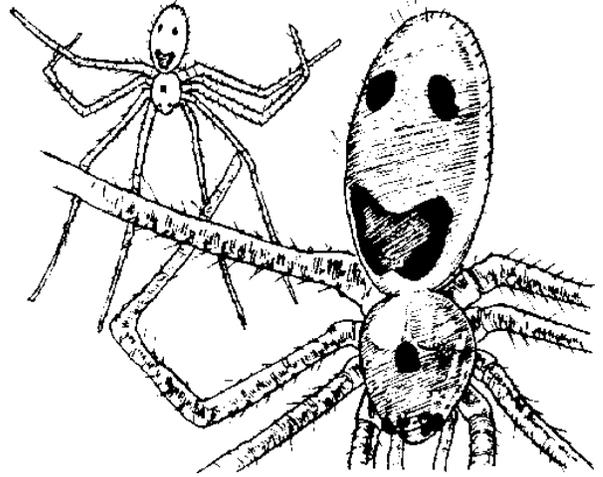
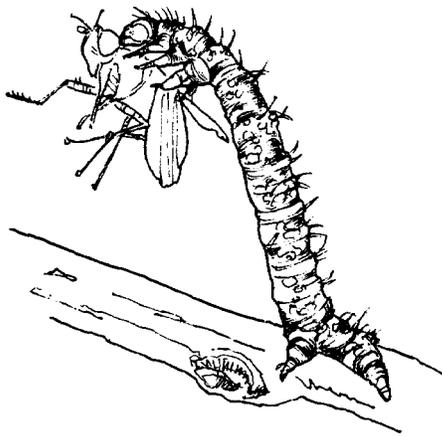


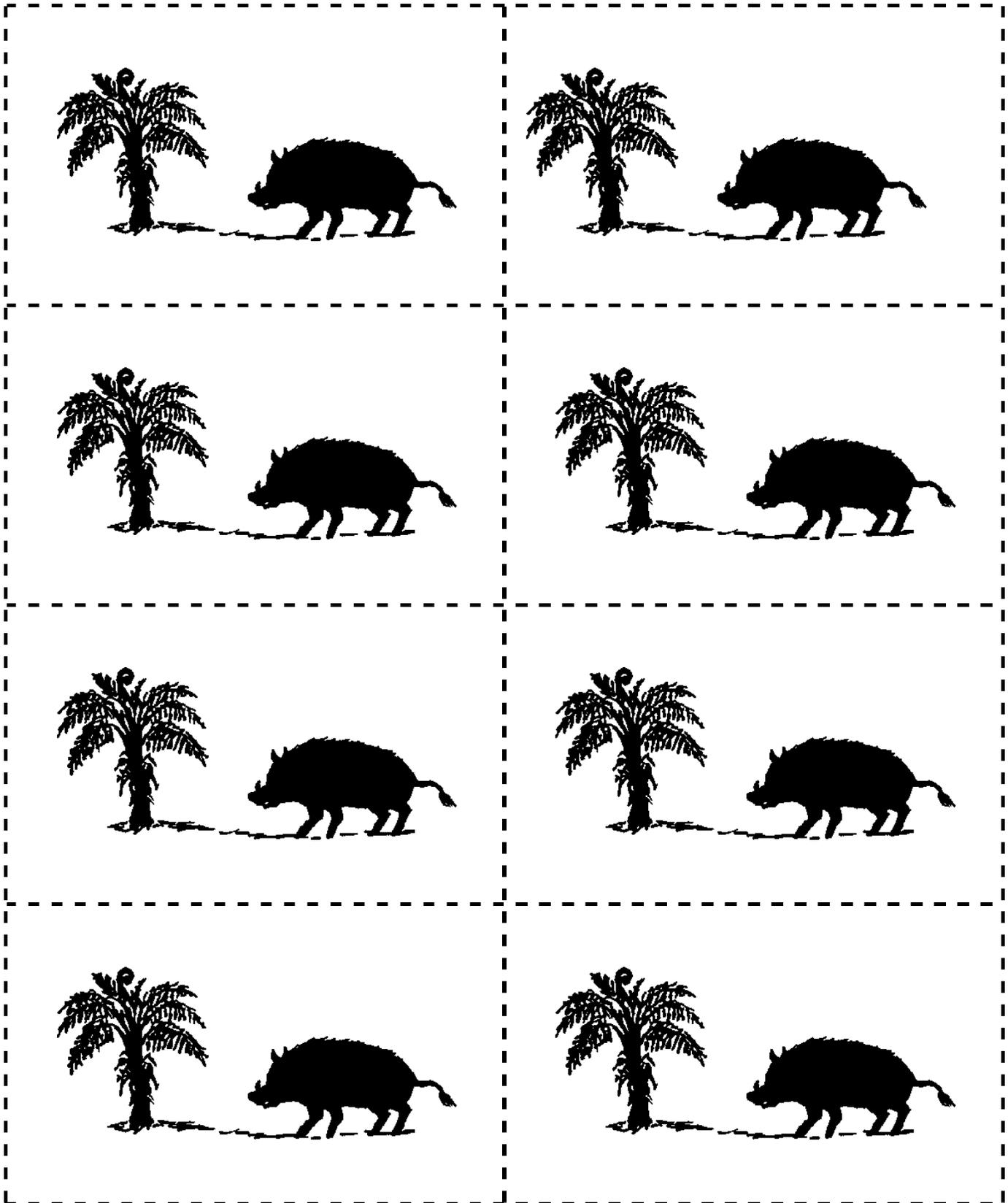
Copy five sets of Native Plant and Animal Cards.

<p>‘Ōhi‘a lehua (<i>Metrosideros polymorpha</i>) Endemic</p> <p>The first tree to grow on new lava flows, ‘ōhi‘a lehua is the most common native tree in the islands. Its blossoms are said to be sacred to the volcano goddess Pele.</p> <p>description: dark green leaves vary from round to narrow, smooth to hairy. Flowers are pink, yellow, white, peach and most commonly red. Ranges in size from a small 30-cm (1-ft) shrub to a 30-m (100-ft) tree.</p> <p>habitat: from sea level to 2,700 m (9,000 ft). The largest trees are in areas of high rainfall.</p>	<p>Koa (<i>Acacia koa</i>) Endemic</p> <p>Koa is the Hawaiian word for warrior. Hawaiians carved the straight trunks of this giant tree into sturdy outrigger canoes.</p> <p>description: 15–40 m (50–140 ft) tall and up to 4 m (12 ft) in diameter. “Leaves” on mature trees are crescent-shaped, flattened leaf stems. True leaves are finely divided.</p> <p>habitat: dry and medium wet forests from 460–1,800 m (1,500–6,000 ft) elevation. Koa are found on all the main Hawaiian Islands.</p>
<p>‘I‘iwi (<i>Vestiaria coccinea</i>) Endemic</p> <p>The brilliant red feathers of the ‘i‘iwi match the red ‘ōhi‘a blossom on which it feeds. In addition to sipping nectar, ‘i‘iwi also hunts for insects. Its Hawaiian name sounds like its loud, squeaky call.</p> <p>description: 14 cm (5.5 in); red with black wings; long, curved salmon-colored bill and orange legs.</p> <p>habitat: lives in rainforests on all main islands except Lāna‘i; it is listed by the state as endangered on O‘ahu and Moloka‘i.</p>	<p>Common ‘amakihi (<i>Hemignathus virens</i>) Endemic</p> <p>This small forest bird builds its nest in the uppermost branches of trees. Listen for its high “tseet” or mewing call as it searches for insects, nectar and fruit.</p> <p>description: 11.5 cm (4.5 in); dark curved bill; males yellowish-green breast; females and young duller green.</p> <p>habitat: frequently seen on branches of koa, ‘ōhi‘a or māmane trees and common introduced plants; found on all main islands except Kaho‘olawe and Ni‘ihau.</p>
<p>Hāpu‘u, Hawaiian tree fern (<i>Cibotium splendens</i>) Endemic</p> <p>The downy covering of the new fronds (<i>pulu</i>) was used as a wound dressing and was once collected and exported for pillow stuffing.</p> <p>description: up to 5 m (16 ft) tall. Bright green fronds are 1–3 m (3–9 ft) long. <i>Pulu</i> is golden.</p> <p>habitat: understory of rainforests.</p>	<p>‘Ākala (<i>Rubus hawaiiensis</i>) Endemic</p> <p>This native shrub is also known as Hawaiian raspberry. Unlike other raspberry plants, ‘ākala generally has no thorns or only soft thorns that are easily removed.</p> <p>description: 1.5–4 m (5–15 ft). Pink flowers bear large tasty red or yellow fruits.</p> <p>habitat: rainforests above 1,200 m (4,000 ft). Rare except on Kaua‘i, Maui, and Hawai‘i.</p>

Copy five sets of Native Plant and Animal Cards.



Copy five sets of Native Plant and Animal Cards.



Copy one set of Preserve It! Cards.

1

Pigs have been found in the preserve. Describe one way that pigs damage a native forest.

Draw an Encounter! card.

5

You find a tree fern knocked over. The inside of the trunk has been eaten away. Which non-native animal is responsible?

Draw an Encounter! card.

2

You suspect that an 'amakihī bird has malaria. Name a plant or animal that could be affected if the 'amakihī dies.

Draw an Encounter! card.

6

You find a *kāhuli* (snail) with tiny teeth marks on its shell. Which introduced animal was trying to eat it?

3

Mosquitoes are spreading in the preserve. You are looking for places where the mosquitoes breed. Which native animals would be most negatively affected by mosquitoes?

7

Give an example of a native plant and animal in the preserve that rely upon each other.

Draw an Encounter! card.

4

Name an introduced animal that could get into a preserve even if a fence were built around the boundary.

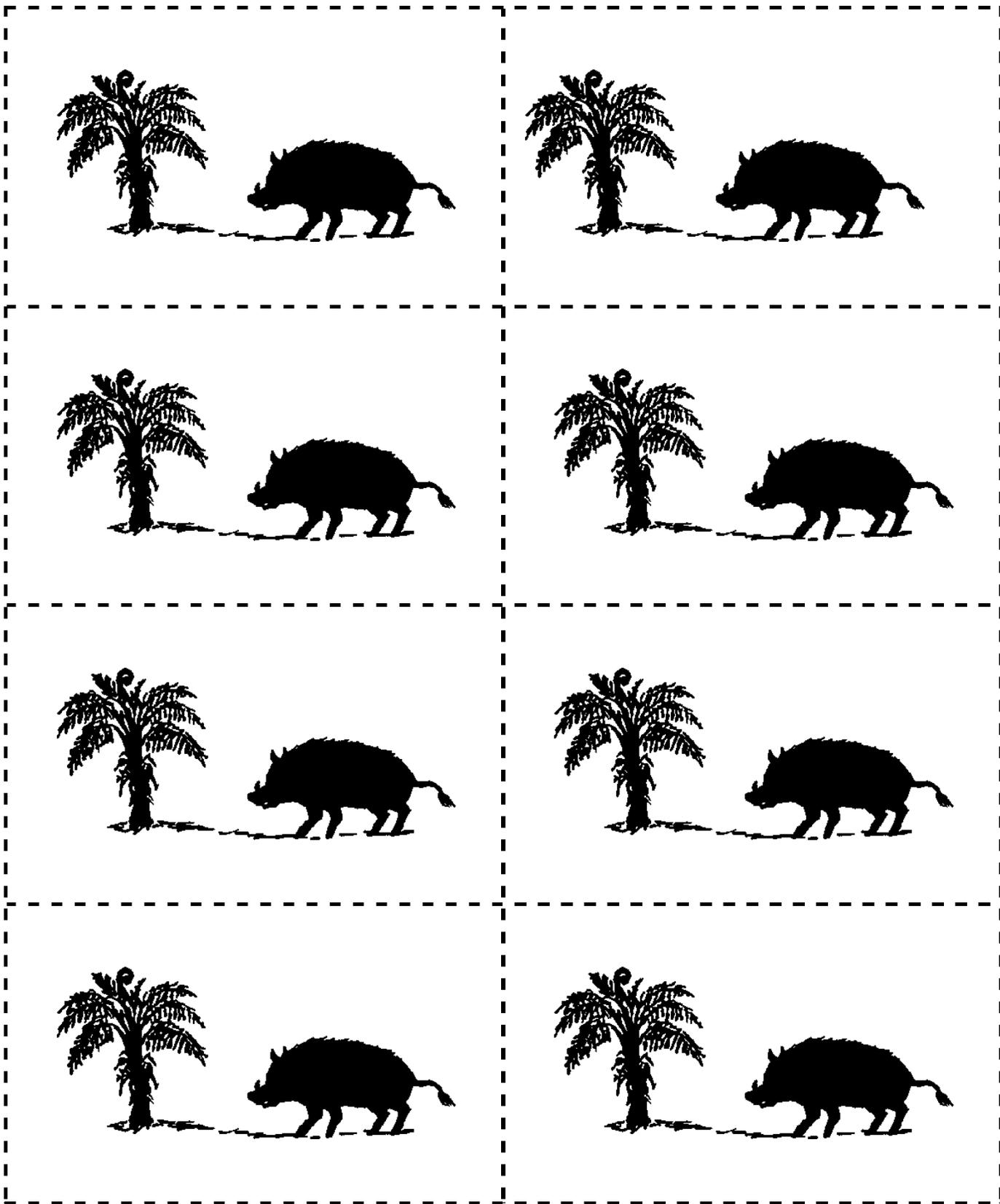
Draw an Encounter! card.

8

High in a tree you find a bird's nest with a broken egg. Which non-native animal could have gotten into the nest?

Draw an Encounter! card.

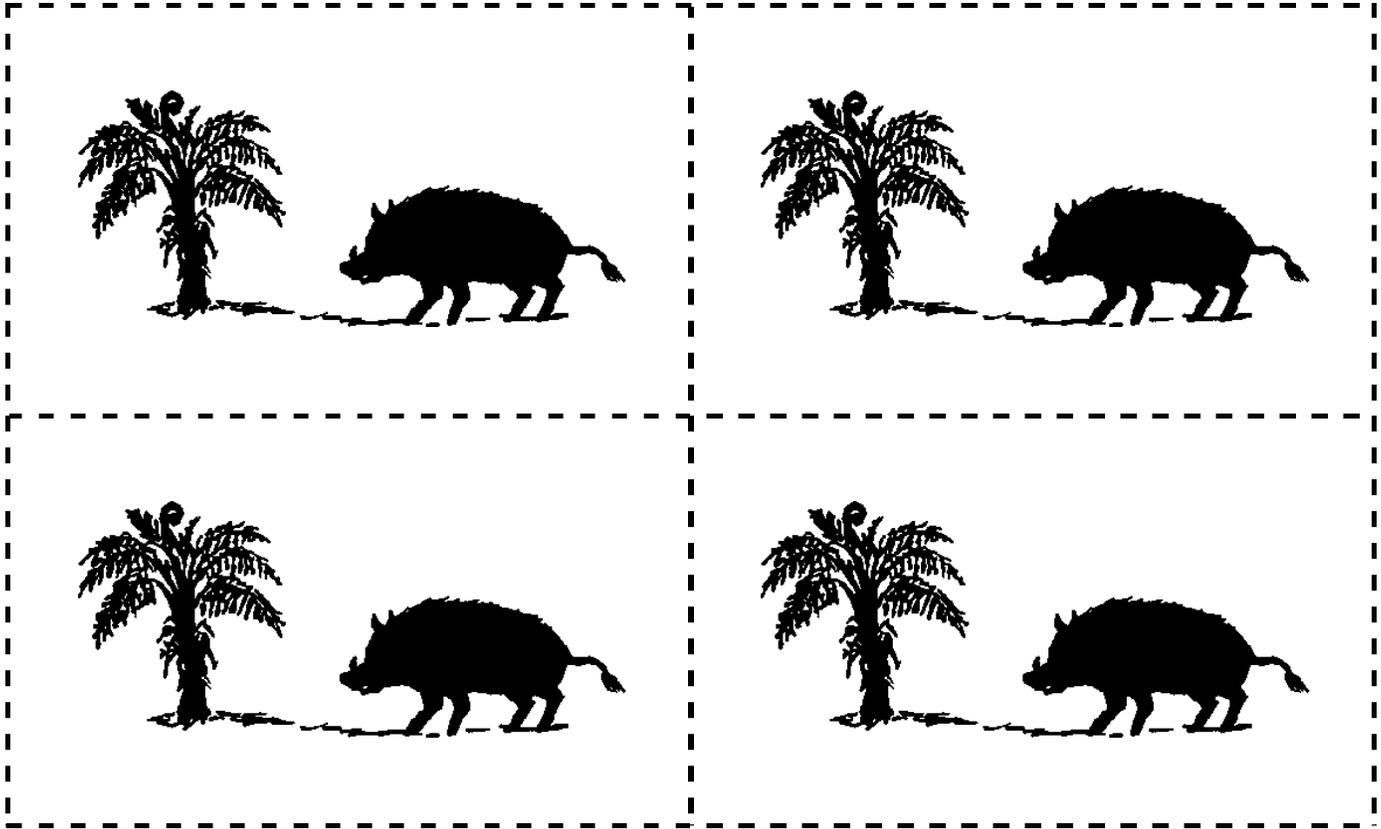
Copy one set of Preserve It! Cards.



Copy one set of Preserve It! Cards.

<p>9</p> <p>Pigs knock over <i>hāpu‘u</i> tree ferns in the forest and root up plants on the forest floor. How could this affect nearby streams?</p>	<p>13</p> <p>Give an example of a pollinator in the forest ecosystem.</p> <p>Draw an Encounter! card.</p>
<p>10</p> <p>How does a forest help to prevent soil erosion?</p> <p>Draw an Encounter! card.</p>	<p>14</p> <p><i>Kāhuli</i> are an endangered species. If the snails can live on only one tree throughout their lives, why do entire ecosystems need to be preserved to save them?</p> <p>Draw an Encounter! card.</p>
<p>11</p> <p>You find a <i>hāpu‘u</i> tree fern knocked over and filled with rain water. You decide to:</p> <ul style="list-style-type: none">a. leave the water for animals to drinkb. dump out the water (and turn over the log) so mosquitoes don’t breedc. soak your feet.	<p>15</p> <p><i>‘Ākala</i> plants lost their hard thorns through the process of evolution. Why were these thornless plants able to survive in Hawai‘i?</p> <p>Draw an Encounter! card.</p>
<p>12</p> <p>Give an example of a native predator in the forest ecosystem.</p>	<p>16</p> <p>You find broken bird eggs on the forest floor and begin a rat control program. You:</p> <ul style="list-style-type: none">a. introduce mongoose to eat the ratsb. introduce cats to control the ratsc. set rat traps in areas where birds are nesting. <p>Draw an Encounter! card.</p>

Copy one set of Preserve It! Cards.



Copy one set of Preserve It! Cards.

17

A visitor to the preserve wants to know why 'ōhi'a trees are no longer common in lowland areas. You respond that:

- a. 'Ōhi'a was used to build ships at one time and many trees were cut.
- b. A disease spread by mosquitoes wiped out many native trees.
- c. Native ecosystems in lowland areas were removed to make way for agriculture and ranching and replaced by introduced trees in many areas.

18

A class visiting the preserve asks you why taxpayers should spend money to preserve native ecosystems. You respond that:

- a. Many native Hawaiian plants and animals occur nowhere else in the world.
- b. Native forests are good watershed cover.
- c. A native plant or animal may have properties that help to cure diseases or improve varieties of food crops.

19

An owner of a vacation cottage near the preserve has introduced blackberries to her garden because they make good pies and jams. The blackberry plants have thorns. Why would blackberries have an advantage over native thornless plants in the preserve?

Draw an Encounter! card.

20

A family living near the preserve visits you and explains that they want to let their cat's kittens loose on the preserve. You respond:

- a. Good, the cats will help control the rats.
- b. Fine, people love kittens and will enjoy seeing them.
- c. No, take them to the Humane Society.

Copy one set of Preserve It! Cards.

ENCOUNTER!



ENCOUNTER!



ENCOUNTER!



ENCOUNTER!



ENCOUNTER!



ENCOUNTER!



ENCOUNTER!



ENCOUNTER!



Copy one set of Encounter! cards.

1

A hiker with seeds sticking to the mud of her boots enters the preserve and spreads an introduced weed that sprouts. Add three introduced plants and lose one point.

2

A careless camper starts a fire that rages out of control. It is heading your way. Remove two native animals and lose two points.

3

A large pig is seen approaching your fence from outside the preserve. If your fence is not completed, lose two native plants and one point. If your fence is completed, receive one point.

4

A sow and her piglets are making their way toward the preserve. Lose two native animals and two points if you can't stop them with a fence. If you can stop them, add a native plant and receive one point.

5

Pigs are spreading guava in the preserve. If your fence can't stop them, add three introduced species and lose one point. If your fence is built, receive one point.

6

Funding has been cut and you lost your preserve manager. A guava seed sprouts in a pig's droppings. Since no one is monitoring the preserve, the guava spreads. Add four introduced plants to the preserve and lose two points.

7

Funding for fencing has been cut and staff has to be reduced. Add one introduced animal to the preserve and lose one point and one section of fence.

8

Koa seedlings have sprouted in an area where you have removed introduced pest plants. Remove two introduced species from the preserve and receive one point.

Copy one set of Encounter! cards.

ENCOUNTER!



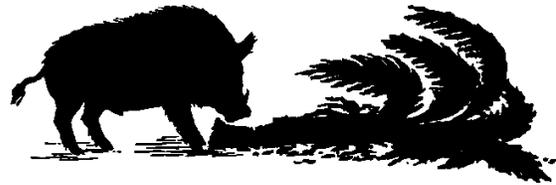
ENCOUNTER!



ENCOUNTER!



ENCOUNTER!



Copy one set of Encounter! cards.

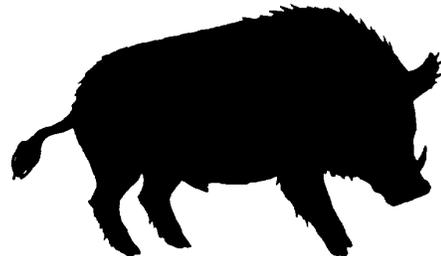
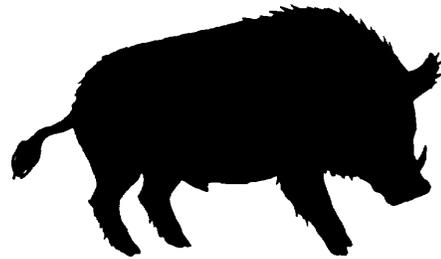
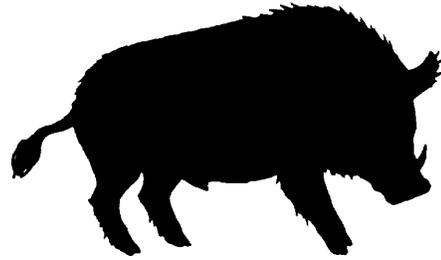
<p>9</p> <p>A sixth grade class visits the preserve and helps to pull introduced weeds. Remove four introduced species and receive two points.</p>	<p>11</p> <p>Researchers trapped mongooses and removed them from the preserve. As a result, more native bird chicks survived during nesting season. Remove two introduced animals from the preserve and receive two points.</p>
<p>10</p> <p>The rat population is increasing in the preserve and native snails are decreasing. Add four introduced animals and lose two points.</p>	<p>12</p> <p>Funding has been increased for preserve management. You receive one section of fence and restore two native plants to the preserve. If your fence is already rebuilt, receive one point.</p>

Copy one set of Encounter! cards.

banana poka



feral pig



Make eight copies of this page.

1. Root up plants, spread seeds of non-native plants through their droppings, expose soil that muddies streams.
2. 'ākala and 'ōhi'a (pollinated by 'amakihi and other birds)
3. birds, since mosquitoes spread bird diseases
4. mosquito, mongoose, rat, ant, bird, cat
5. pig
6. rat
7. The 'ōhi'a tree and 'ākala are pollinated by birds and the birds sip their nectar. The kāhuli cleans plants' leaves and the plants provide food and shelter for the snails.
8. rat, cat
9. The soil could erode into streams and the increased silt could harm stream life.
10. The plants hold soil place.
11. b
12. 'apapane, 'amakihi, carnivorous caterpillar, happy-face spider
13. 'apapane, 'amakihi
14. The trees they live on need other animals to pollinate them. These animals need large enough spaces to live and raise their young.
15. Before the arrival of people there were no large animals to eat the plants.
16. c
17. c
18. All answers are correct.
19. Thorns protect the plants from being eaten by large grazing animals so the plants can spread.
20. c

