

As you work with the text, consider all the ways you can connect to and demonstrate a deeper understanding of the text. Use the following strategies while you read:

- Summarize main ideas and label them MI, then underline their supporting details.
- Circle words you do not know or key words (the most important words for this article's topic) and use context clues to define them
- Connect it to the unit we are studying using evidence from the text
- Complete the task at the end of the article (if applicable)



## AOW5: "Scientists Say the Tiny Heroes of Earth's Ecosystem Are All Around Us"

by Washington Post, adapted by Newsela staff 7/20/2017

It is springtime in the woods in Maine. Melting snow soaks the forest floor. Rain spills off new leaves into growing puddles. Tiny egg cases that endured the winter hidden among leaves begin to thaw out in the water and sun. They hatch, releasing tiny crustaceans known as fairy shrimp. Larger creatures – wood frogs, blue-spotted salamanders – lay their eggs in the pools, where no fish might make a meal of them. Mammals come to the pools for a drink of water. Birds swoop down to snack on larvae.

Vernal pools are temporary pools. They exist only in the spring, evaporating in summer. For a few brief months, they are sources of life. Though they represent a tiny proportion of the landscape – usually a fraction of a percent – in some ecosystems they can support up to 35 percent of rare species.

To the world, they may be just puddles, but to their inhabitants, they are the whole world.

### "You Have To Be Impressed"

Once you take a look at them, "you have to be impressed," said Aram Calhoun, a conservation biologist at the University of Maine. Yet few people are looking. Vernal pools are so small they fall through the cracks in environmental regulations, and so modest that few conservation campaigns would choose them as a poster child.

"They're definitely the underdogs," Calhoun said.

In the latest issue of the journal *Biological Conservation*, Calhoun and her fellow scientists go to bat for vernal pools and other neglected parts of nature. The entire issue is devoted to small natural features including rocky outcrops, cramped caves, single trees, even the patches of vegetation that flourish along the sides of roads and the edges of fields. These places have important effects on their landscapes.

"I'm a small natural feature myself," said Calhoun, who is 5 feet tall, "so it resonates with me. ... I like to speak out for the things that don't have a lot of people speaking out for them."

The special issue was organized by Malcolm Hunter, Calhoun's husband and fellow University of Maine scientist. He calls the significance of small natural features the "Frodo effect," for the unassuming hobbit who becomes the hero of the "Lord of the Rings."

### "Snag" Trees Are Home To Many Creatures

Like Frodo, these small features are the unlikely heroes of the system. Just as the members of the "Fellowship of the Ring" had to trust Frodo to save the day, Hunter said scientists must protect small natural features to support the

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world's biodiversity or the variety of plants and animals.

Take, for example, a "snag," a dead or dying tree. It might appear to be just a decaying log, a symbol of death, not life. But snags are host to communities of decomposers – fungi, bacteria and bugs. Birds, bats and mammals feed on these and, in turn, become prey to larger predators. A single snag can support a hundred species.

Hunter says there are two families of beetles the are only found in a snag tree. They are the longhorn and metallic wood borers beetles. "And there are more species in those two families of beetles than all the birds and all the reptiles and all the amphibians put together," he said.

The main sources of diversity are all these little things, he said. "Things like a big old snag are incredibly important to these little creatures."

### **Mature Trees Are At Risk**

David Lindenmayer of Australia National University is another writer for the scientific journal. He makes the case for protecting single, large old trees, whose tall canopies and gnarled trunks provide homes and resources not found in younger trees. In southeastern Australia, where Lindenmayer works, 39 species depend on the hollows in the trunks of older mountain ash trees. Among them is Leadbeater's possum, a critically endangered species that is found nowhere else.

These small spaces are important in nature, Lindenmayer said. It takes only a few to make "a massive difference in the ecosystem," providing resources to make a place livable, he said.

However, large old trees, like other small natural features, are at risk. Logging and forest fires have reduced the number of mountain ash older than 150. It takes more than a century for them to reach the size at which the "Frodo effect" starts to take hold.

Poor decisions made today will have effects for centuries to come, Lindenmayer said.

### **Protecting The Land Is Vital**

Traditionally, environmental regulations are not designed to protect a single tree or a vernal pool. But they can be. Calhoun and others recently worked with the Environmental Protection Agency to develop a program for managing temporary wetlands. Developers can pay a fee to build over temporary pools in inhabited areas. That money then goes to local homeowners to fund conservation of pools on their land.

"It's a way humans and conservation can coexist," Calhoun said.

Lindenmayer said large swaths of protected land are vital for many species, but most of the world is not going to be set aside as a wildlife preserve.

Small-scale handling of natural features might be the best way for scientists to protect them, he said, especially as the human population continues to grow.

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## Quiz

1. Which section highlights the idea that the loss of small natural spaces has already put some larger species in danger?
  - a. The introduction (paragraphs 1-3)
  - b. "Snag Trees Are Home to Many Creatures"
  - c. "Mature Trees Are At Risk"
  - d. "Protecting the Land is Vital"
2. The following sentence from the section "Snag Trees Are Home to Many Creatures" helps to prove the claim that small natural features are critical to ecological conservation.

*Just as members of the "Fellowship of the Ring" had to trust Frodo to save the day, Hunter said scientists must protect small natural features to support the world's biodiversity or the variety of plants and animals.*

Which sentence from the section provides further support for the claim?

- a. Like Frodo, these small features are the unlikely heroes of the system.
- b. It might appear to be just a decaying log, a symbol of death, not life.
- c. A single snag can support a hundred species.
- d. "Things like a big old snag are incredibly important to these little creatures."

3. Which two of the following sentences from the article include CENTRAL ideas of it?
  - 1) *Tiny egg cases that endured the winter hidden among leaves begin to thaw out in the water and sun.*
  - 2) *To the world, they may be just puddles, but to their inhabitants, they are the whole world.*
  - 3) *However, large old trees, like other small natural features, are at risk.*
  - 4) *Developers can pay a fee to build over temporary pools in inhabited areas.*
  - a. 1 and 2
  - b. 2 and 3
  - c. 3 and 4
  - d. 4 and 1
4. Which of the following summaries of this article is both accurate and objective?
  - a. Small natural features like puddles and dead trees contain many species that support larger ecosystems. Scientists hope to make rules to protect these places for the future.
  - b. Many small and wonderful creatures can live in unexpected places like dead trees and puddles. Scientists have wisely found ways to make developers pay to protect these places.
  - c. Some pools of water that exist only in spring contain many rare and important species. Scientists were impressed to make this discovery and shared it in an exciting new magazine.
  - d. A scientist has called the significance of small natural features the "Frodo effect." He is explaining this idea to people who have never heard of Frodo in a new magazine.