Podcast Interview: Blair Hedges

PNAS: Welcome to Science Sessions. I'm Paul Gabrielsen. Deforestation is a common theme in the tropics, as people clear forested land for logging or farming operations, or to create charcoal. The nation of Haiti in the Caribbean is particularly affected by deforestation. In a recent PNAS paper, Blair Hedges and colleagues used aerial and satellite imagery to assess the percentage of original forest remaining in Haiti. Hedges, of Temple University in Philadelphia, found that the percentage of forested land had declined from 4.4% in 1988 to only 0.32% by 2016. Forests are cradles of biodiversity, and the study also found that the loss of forests is accompanied by a loss of species. Hedges hopes his inventory of the remaining forest will point the way toward maintaining what's left. Hedges talks about previous work that inspired his study.

Hedges: There wasn't much forest left, even when I started working there in the early 1980s. But a few years ago, a study was done across the whole country with satellite imagery concluding that one third of Haiti was forested, and this got into the popular news and was discussed quite a bit. And the message was that the deforestation problem in Haiti, which has been in the news for many many years, was a myth. And some of us who have worked in Haiti, in the forests and on biodiversity, pretty much knew that it wasn't a myth. But we didn't have any accurate data, so we went ahead and did this study to get those accurate data.

PNAS: He and his colleagues looked at satellite images to identify forested areas, then looked back through previous years' images to see what forests had persisted, year after year. These, they concluded, were the original primary forests. Hedges describes how deforestation threatens biodiversity.

Hedges: In Haiti, you have a lot of patches of forest that are left that used to be continuous forest, now they're little pockets the size of an acre or two and they separate populations essentially completely - species of small animals that can't move back and forth between unforested areas. And so, you're reducing population sizes, and that reduction itself will lead to extinction in the future.

PNAS: Many of the remaining forested areas in Haiti are on mountaintops, since that's the terrain that's most difficult to access for tree cutters. The researchers found that 42 of Haiti's 50 highest peaks had lost their primary forest. Hedges traveled to ten of those mountaintops to identify and quantify the animal species present.

Hedges: The mountaintops are also important for evolution in the sense that they tend to be areas of endemism, where species are found in that one place but nowhere else in the world. It turned out to be a good thing for protecting endemic species because that meant the endemics on each of the mountaintops were still maintained, at least until all the forest on the mountain was completely removed. In our study we found most of them completely gone. So when I traveled to these mountaintops to do this study with a team of biologist assistants, we sometimes hiked up to the top and looked around to identify species of frogs, lizards and snakes and listen for their calls at night and of course identified birds as well. There are a few mammals that are endemic to the island

of Hispaniola, and we saw evidence of those up in the forest; they're very rare. We used a helicopter for most of these trips because some of the mountains are so remote that no biologist had actually been there before.

PNAS: The study found that areas with protected status, such as national parks, were not immune to deforestation. Although current protections are not preventing tree cutting, Hedges has hope that there's still time to change course.

Hedges: Now that we have the scientific data of where the primary forest is located, how much exists, then we know exactly where to protect and also we know the methods to use to find out how good our protection is. We kind of put together a model in this study of not only Haiti but other areas in the world that might also lose all of its forest - not to say Haiti will definitely lose all of its forest. We still have hope that with this information something can be done. But if it comes to that point where all the forest is gone, all the primary forest, then what you have left would be secondary forest and unfortunately in the tropics, unless you regrow the primary forest very quickly, up in these mountains, the rains will wash away the soil. The biodiversity levels will go down, maybe 80%, maybe 90%, and those species will tend to be - think of cockroaches and rats, species that are very generalist and can survive in tough situations. It's a different world ahead, but it's not too late to try to prevent that from happening.

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