

Study: Boreal forest bends to development but there is a breaking point

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Northern Alberta's boreal forest shows a surprising resiliency to human intrusion, but University of Alberta researchers warn the landscape has a definite breaking point.

The U of A research team led by graduate student Stephen Mayor found that up to a certain point plant life in the [boreal forest](#) responded to intrusions such as roadways and farm fields by actually increasing its biodiversity.

The researchers, counted [plant species](#) in sites across the whole of northern Alberta, an area larger than Germany. Then satellite and aerial photos were used to compare the numbers of plant species to the percentage of human disturbed land vs. the percentage of natural, undisturbed boreal landscape.

It might be expected that the more disturbance, the fewer kinds of plants the researchers would find. Instead, the team found more species were growing as the percentage of disturbed land rose.

But Mayor says there was a tipping point. When the amount of disturbed land in a study area began to exceed 50 per cent disturbed a threshold was reached and the researchers found fewer and fewer plant species. "We found that when more than half of an area was visibly changed by human use, the number of native boreal plant species began to decrease," Mayor said.

The researchers found some unexpected results when comparing disturbed study plots with [wilderness areas](#), where there was zero human presence.

The researchers discovered the biodiversity of plant life in areas of 50 per cent human disturbance actually exceeded what they found in pristine areas like northern Alberta's Wood Buffalo National Park.

"Our research findings mean that the variety of plant life in the boreal forest can tolerate farms, forestry, even oil and [gas extraction](#) but only in moderation," said Mayor. "There are real and predictable limits to how much intrusion nature will allow."

Surprisingly, the researchers found an important caveat. Human encroachment favoured some species over others. [Native species](#) that had lived in the forest for thousands of years were replaced by invasive weeds from Europe and other alien ecosystems.

The researchers believe their study area, all of northern Alberta including the oil sands, was the largest ever used in a study of this kind.

The research was published Oct. 16 in the journal *Nature Communications*.

Provided by University of Alberta

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