



Canaima National Park, Venezuela

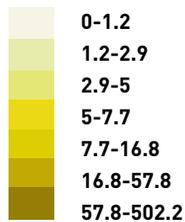
THE IMPACTS of population and population growth can vary widely, depending on the activities of the people involved and the nature of the environmental setting in which they live. A good example of this is Canaima National Park in Venezuela.

Covering about 30 000 square kilometers in the state of Bolívar in southeastern Venezuela, Canaima National Park is a place of spectacular natural beauty. Although known best as the home of Angel Falls, the world's tallest, and dozens of tall rock *mesas* called *tepuys* that rise dramatically out of the surrounding flat lands, Canaima contains a wide array of biological resources in the forests that still cover much of the park. It is also the home of thousands of Pemón, an indigenous people who have resided in this portion of northern South America for 200 to 300 years.

For generations, the Pemón have relied primarily on shifting cultivation, or swidden agriculture, for their livelihood. Swidden agriculture involves growing crops in small plots that are cleared of forest through a combination of cutting and burning foliage. Each plot is used for a short period of time, after which the Pemón abandon it to allow the forest to regenerate and soil nutrients to

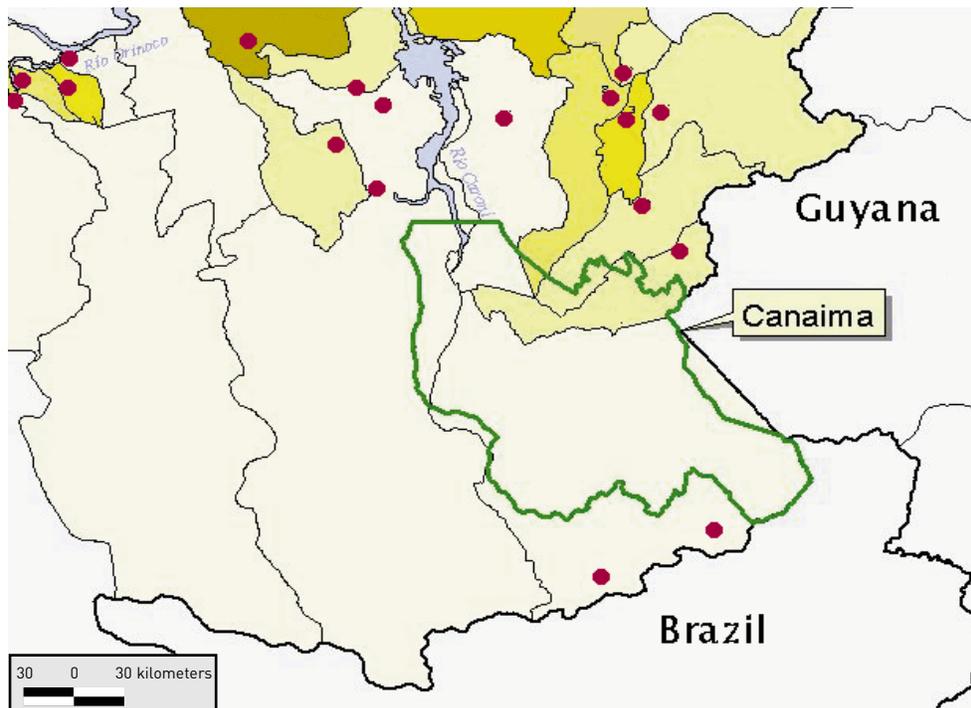
POPULATION DENSITY NEAR CANAIMA NATIONAL PARK, 2000

Population density per square kilometer



Park boundary

Community



30 0 30 kilometers

Source: OCEI.

recover. Unfortunately, in recent years forest regeneration has declined dramatically, and much of the area cleared by the Pemón has become grasslands instead – areas that are not suitable for agriculture because of their lack of soil nutrients. Researchers blame much of this transition on population growth.

Nearly all of the human residents of Canaima are Pemón. Population tends to be widely dispersed in small villages, usually located on the edge of dense stands of forest. Due to this dispersed settlement pattern, population density in Canaima and its surrounding area is quite low – so low that population-related problems at first glance seem unlikely. But population has been growing rapidly in recent years, for two main reasons. One is natural increase, where the number of births exceeds the number of deaths – in the case of Canaima, due largely to improved health care saving more lives. The other is in-migration, mainly by other Pemón relocating from the nation of Guyana east of the park, due largely to uncertainty about their future under the government of that country. The result has been extremely high rates of population growth throughout much of Canaima, a trend expected to continue in coming decades.

What are the impacts of this population growth? Although population densities remain low, they are increasing. The swidden agriculture that the Pemón practice is sustainable only for extremely sparse populations, where continual relocation of plots is possible to allow the recovery of forest and soil nutrients.

When population density increases, plots are used for longer periods and recovery times are reduced. Moreover, denser populations mean more fires to clear land, increasing the risk that forest not being cleared will be affected when fires get out of control. In the absence of adequate base nutrients to begin forest regrowth, and with less and less forest to serve as a source of seed due to lack of regeneration or inadvertent burning, grasslands become established. Thus, in delicate ecosystems such as those found in Canaima, even slight increases in population density can lead to an imbalance in the cycle of life under certain conditions. Such situations point up the real importance of understanding not only how many people occupy an area, but what they are doing and how those activities affect their natural surroundings.

