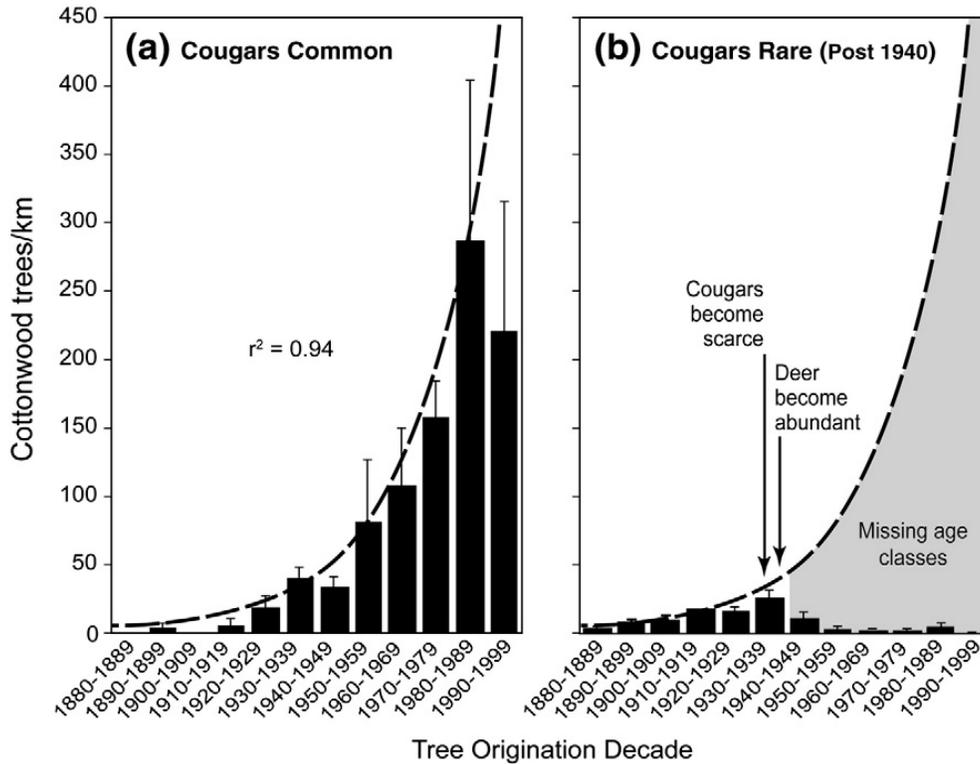




Cougars and Trees in a Trophic Cascade



Caption: A comparison of the age structure of cottonwood trees growing in two different riparian areas within Zion National Park in 2005. (a) North Creek, an area where cougars are common, and (b) the North Fork of the Virgin River in Zion Canyon, an area where cougars are rare. The dashed line in the left figure represents the best fit for the data. This same line is shown in the right figure for easier comparison of the two data sets.

OBSERVATIONS, NOTES & QUESTIONS

BACKGROUND INFORMATION	BIG IDEAS, NOTES & QUESTIONS
<p>Utah’s Zion National Park is famous for its desert landscape and canyons, but forests cover the riverbanks (also called riparian areas). Under normal conditions, riparian areas are home to cottonwood trees, shrubs (such as willows), wildflowers, aquatic plants, fish, tree frogs, toads, lizards, butterflies, mule deer, coyotes, black bears, and cougars. However, human activity over the last 150 years has impacted the plants and wildlife in some areas.</p> <p>Historically, healthy riparian forests would have been common along the Virgin River in Zion Canyon. However, beginning around 1862, European-American farmers settled in the canyon, and by 1915 they had destroyed much of the canyon’s native vegetation. In 1918, the government created Zion National Park to protect Zion Canyon and surrounding areas from human impacts, and soon the natural ecosystems began to recover. During the late 1920s and early 1930s, park managers built new roads and trails in the park. With new access, the number of visitors increased in the area along the Virgin River in Zion Canyon, and cougars were displaced from high-use areas. As cougars were displaced, the population of mule deer grew rapidly, which in turn affected the vegetation that deer consume.</p> <p>To determine how the loss of a top predator like the cougar affects riparian vegetation, researchers examined canyon regions in Zion National Park with and without cougars. In 2005, they counted and measured the sizes of cottonwood trees along riparian areas within these canyons. Tree size is an indicator of tree age. Figure (a) shows cottonwood data collected in North Creek, an area where visitors are rare and cougars are plentiful. Figure (b) shows cottonwood data collected along the Virgin River in Zion Canyon, which has few cougars.</p>	