

2,500-square-meter study areas — formerly patchworks of scraggly shrubs and parched earth — has sprouted a dense blanket of knee-high grass. In contrast, none of the study areas that maintained their normal population of the hopping rodents underwent a similar transformation, notes Brown, an ecologist at the University of New Mexico in Albuquerque.

All three species of native kangaroo rats (genus *Dipodomys*) had to be excluded before the study sites — bordering a transitional region that includes both desert shrubland and grassland — began their startling botanical conversion, Brown says. This finding documents for the first time that the collective actions of several related types of animals — not just the behavior of a single species — can dramatically alter the fate of an ecosystem, he says.

Identifying a small group of animals, a “keystone guild,” that can significantly change the ecology of a habitat may have profound implications for conservation efforts, Brown asserts. He and Edward J. Heske, also from the University of New Mexico, report their work in the Dec. 21 SCIENCE.

“People are only worried about the much more comprehensible and simple question of conservation — whether a species is there or not,” comments marine ecologist James A. Estes of the University of California, Santa Cruz. “But if [an ecosystem] is tied together by a guild rather than a single species, our emphasis ought to be on conservation of the guild rather than the species.”

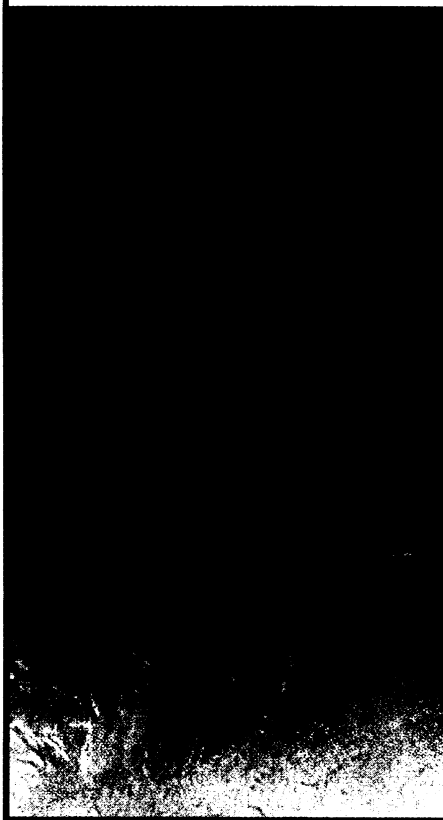
Brown suggests that if ecologists cannot prevent the extinction of species that appear to play a key role influencing their local environment, they should replace the lost animals with organisms able to serve a similar habitat-preserving function.

He adds that the ecological impact of eliminating a keystone guild, though initially subtle, can prove dramatic. For example, during the first five years of the desert experiment, only small changes occurred — the lack of kangaroo rats, which eat large seeds, spurred rainy-season growth of annual plants that bear these seeds. After nine years, however, grasses began to replace those plants, restoring lasting greenery to the once-sparse landscape. A perennial known as Lehmann’s lovegrass increased 20-fold and the annual grass *Aristida adscensionis* tripled in abundance.

Brown says he hasn’t determined why banishing kangaroo rats should promote grassland, but he suggests two possibilities: Frequent burrowing by the rats may prevent grass seeds from taking root, and the accumulation of dead organic material that the rats normally help decompose may hold vital moisture needed for the grasses to thrive.

— R. Cowen

Distant image of Earth’s icy Antarctica



Rare ice-free areas appear amidst the vast whiteness of western Antarctica in this image captured by the Jupiter-bound Galileo spacecraft during its first swing past Earth. The dark Ross Sea (left) laps against the Ross Ice Shelf. Bare peaks of the Convoy Range and the barren Dry Valleys near the main U.S. research base at McMurdo add a dash of brown (lower center), as do the Darwin Mountains (far right).

Engineers at NASA’s Jet Propulsion Laboratory in Pasadena, Calif., produced this photo by combining monochrome images made through red, green and violet filters to recreate the frozen terrain’s subtle colors.

After rounding Venus last Feb. 10, Galileo zipped to within 962 kilometers of Earth. The craft captured this image on Dec. 8, from about 181,000 km.

NASA designed Galileo’s course to use the gravity of Venus and Earth to accelerate the craft on its loop-the-loop journey. Galileo should begin close observations of an asteroid (Gaspra) next October, swing past Earth again in 1992, and finally orbit Jupiter in 1995. During its recent encounter, Galileo took about 3,500 images of Earth and its moon.

Some autism tied to rare fetal disorders

Any of a dozen rare diseases affecting the brain may, when experienced in the womb or during infancy, increase one’s risk of autism, a new study concludes. Data gleaned from a study of nearly all Utah’s residents show that one in 10 cases of autism occurred in individuals with a history of these disorders.

The findings support the theory that various types of brain damage early in fetal life set the stage for the devastating symptoms of autism, says psychiatrist Edward R. Ritvo of the University of California, Los Angeles. These symptoms include unresponsiveness to others, lack of language skills, and repetitive body movements. The disease afflicts one in 2,500 children worldwide.

From 1984 to 1988, Ritvo and his colleagues conducted a survey of autism among Utah’s 1.6 million inhabitants. They located 233 autistic individuals possessing early medical records.

In the December AMERICAN JOURNAL OF PSYCHIATRY, the scientists report finding that 26 of the autistics had been diagnosed early in life with one of 12 rare diseases. These included such viral and bacterial infections as congenital forms of herpes, rubella and cytomegalovirus; chromosome and genetic abnormalities such as fragile X syndrome, Down’s syndrome and tuberous sclerosis; and metabolic disorders such as congenital hypo-

thyroidism and an enzyme deficiency known as Sanfilippo’s syndrome.

Ritvo cites “astronomical” odds against these rare diseases randomly occurring among 11 percent of Utah’s autistics. Indeed, Ritvo maintains, because some participants in the study were not screened for fragile X syndrome, nearly 17 percent of the autistics might have had one of these diseases.

The only clinical difference among the Utah autistics involved IQ — an average of 42 among the 26 with the rare diseases versus 60 among the rest. In the future, Ritvo says, his team will attempt to pin down critical parts of the brain altered by the rare diseases in autistics. He suspects these diseases may affect other areas of the brain in individuals who do not develop autism.

“The UCLA group has confirmed what’s been suspected about autism for some time, but in a thorough epidemiological study,” remarks psychiatrist Fred R. Volkmar of Yale University. For example, in the last 20 years, researchers have linked congenital rubella and Down’s syndrome to autism, he says.

Ritvo says the Utah study provides “the best evidence to date” that in a significant minority of cases, autistic symptoms represent the final common pathway of several diseases that undermine brain function.

— B. Bower