Islands cause extinctions, and Utah’s wild places are rapidly becoming islands of natural landscape surrounded by a sea of human impact, say experts. Our national parks and other protected native landscapes were once shielded by buffer zones around them and by corridors of natural area between them. Now they are increasingly cut off and surrounded by human encroachments such as ranchettes, cabins, subdivisions, strip malls, over-grazed pastures, clear-cut forests, fenced farmlands, and highways.

Whether oceanic island or mainland island of wilderness, the smaller the size, the more extinctions, say ecologists. For example, Bryce Canyon National Park, which is only about five miles wide by twenty miles long, has lost 40 percent of its small mammal population since the park was created, including the spotted skunk, the red fox, and the white-tailed jackrabbit, notes David Quammen, who spent eight years studying island biogeography for his book *Song of the Dodo*. The larger Yellowstone-Teton national park system, on the other hand, lost one species, the gray wolf, in the same time period.

By making islands of wild places, we condemn many native species within them to extinction. It is a fact of biogeography that’s true of islands on the ocean as well as islands of natural landscapes surrounded by a sea of human impacts. Island plant and animal populations are small and cut off, so they’re vulnerable to extinction, Quammen remarks. “All populations
fluctuate in size from year to year responding to good conditions—like gentle weather and abundant food—or bad conditions—like drought, harsh winters, and famine—that they encounter. Small populations are more likely to fluctuate to zero when conditions are bad because zero is never far away.” A large, dispersed mainland population would survive the same population swing. Islands in the ocean are not completely isolated, Quammen notes; they have the traffic of seagoing birds. Similarly, artificial islands of wilderness in Utah are not absolutely cut off—what’s an island to a chipmunk isn’t one to an eagle—but the island paradigm holds true.

The rate of island syndrome extinctions can be predicted by the size of the park and the year it was established. The smaller the park and the longer it is isolated, the more species it loses, a recently updated study of western national parks found. “The premise behind establishing parks is that by protecting in perpetuity a patch of landscape, we can protect in perpetuity the ecological community within it,” Quammen wrote for The New York Times. But most national parks are not large enough—as islands—to host their full complement of species over time. “Nature isn’t convenient. Nature can’t be compartmentalized. Nature is inherently big,” he points out.

On the other hand, connections between protected natural areas and buffer zones of open land around them ensure the long-term health of the native landscapes that are designated as protected, says Eric Rickart, a local expert on island biogeography and curator of mammals for the Utah Museum of Natural History. “We need large areas protected; it’s a law of biology. Large spaces support a large number of species. But they don’t have to be huge untouched areas. We need core wild areas, without roads or human disturbance, surrounded by areas of increasing human use.”

Several groups of Utah animals are at high risk for extinction today: big predators like wolverines, lynx, and pine martin; amphibians, such as salamanders and frogs; and Bonneville and Colorado cutthroat trout. Also, Utah’s share of plants awaiting listing as threatened or endangered, and its proportion of rare plants, is one of the highest in the United States, say local biologists.

Keeping open corridors of natural landscape, such as streams or drainages, to connect protected wild areas helps animals avoid island syndrome extinction, biologists note. However, different types of animals have different requirements. For example, grizzly bears are not known to travel within narrow corridors, while cougars will pad through a passageway as
slim as an irrigation ditch. Native plants also rely on natural corridors. Often wild plants require shade or protection from drying winds in order to get started. If their seeds fall into a hayfield or a roadside, they may not germinate. But if blown or carried along a wild corridor, native plants will spread into other wild areas.

When protected natural areas become islands, the native plant and animal relationships within them begin to unravel, and the result is a cascading loss of species diversity. This makes a difference in our preservation priorities, Quammen observes. Wilderness supporters shouldn’t define what’s wild solely in terms of the human experience of solitude and natural beauty. We should protect landscapes that support the greatest richness of plants, animals, birds, amphibians, insects, and trees. We’re overvaluing scenic landscapes and undervaluing biologically important ones, he said in an interview. “Our wilderness discussion has been confused by debates over what’s ‘natural,’ what’s ‘pristine,’ and what’s ‘wilderness’ with a small ‘w.’ I don’t believe we should debate definitions of wilderness. I think we should be concerned about preserving biological diversity. Biodiversity—the variety of life in a given area—is a form of richness, just like the Social Security Trust Fund or the books in our libraries,” he says. “It belongs to future generations. You can’t measure ‘natural,’ you can’t measure ‘pristine.’ But you can measure and count biological diversity. Biological diversity is what’s important in the long run, and what our standard should be in terms of protecting landscape.” The Utah Wilderness Coalition wilderness proposals were not drawn up with preserving biodiversity as the primary objective, notes Dick Carter, longtime Utah wilderness advocate, but they do accomplish that. A large percentage of the acreage they recommend for wilderness designation adjoins or connects other already protected areas, such as national parks and monuments. Buffering and connecting these preserved tracts, as the wilderness proposals suggest, would help reduce the high risk of extinctions in protected natural areas.

In fact, Utah can become a trendsetter in applying biodiversity as a criterion for protecting native landscapes with wilderness designation, according to Quammen. He points to the landmark scientific paper by seven local scientists, including mammologist Rickart, “Selecting Wilderness Areas to Conserve Utah’s Biological Diversity,” published in the April 1996 *Great Basin Naturalist*. The paper outlines objective scientific standards for wilderness evaluation of Utah’s Bureau of Land
Management land. “The use of biological and ecological criteria to designate Bureau of Land Management wilderness areas in Utah . . . would help to avoid future conflicts over resource management,” these local scientists write.

Roadless natural areas are vital, the scientists argue, and it has nothing to do with backpackers. Cutting roads into native landscapes creates a pathway for the invasion of nonnative, or exotic, plant species. “The disturbance caused by road building gives aggressive and broadly adapted non-native species [such as cheatgrass] a toehold. Later, wildfires allow exotic grasses to spread and crowd out native species. Nonnative grasses have greatly increased grassland wildfire frequency in Utah from former cycles of about 60–110 years to less than five-year cycles now,” the paper’s authors say. “Given the costliness of aggressive fire suppression and habitat restoration measures, the most economical strategy for preventing the spread of introduced [nonnative] grasses to areas that are still relatively pristine may be to maintain their roadless character,” the paper said.

It just makes sense to use wilderness designation to protect native species, the local scientists argue. “Over the long term, it is both cheaper and easier to protect species . . . in their intact, functioning ecosystems than to conserve them individually in fragmented and decimated populations under the Endangered Species Act.”

It’s not only isolation on small islands of habitat that threatens native species with extinction, Quammen wrote in *Song of the Dodo*. Introducing exotic animal species into a native landscape causes a net loss of biodiversity as well, “With all exotics you can lose five or ten native species for every one exotic you introduce,” he states. For example, in east Africa, the Nile perch was introduced to lakes because it’s a larger fish and a better source of protein than native species. Trouble is, Nile perch outcompete and feed on the native fish, so nearly all of those natives are now extinct. The Nile perch itself may be doomed, having decimated its own food source.

In Utah, rainbow trout and mountain goats are two of many exotics introduced by the Division of Wildlife Resources for sport. But rainbow trout dominate native trout food sources and mate with native trout, endangering the gene pool of both the Bonneville and Colorado cutthroat. Aggressive feeders, rainbow trout may also threaten native Utah salamanders and frogs, critics say. Similarly, mountain goats overgraze their adopted home, damaging the plants that native elk and deer feed on.
But can’t wildlife managers preserve habitat for popular game animals and at the same time help save other less charismatic species? “Yes,” Quammen replies. “But that’s not to say that everything good for deer is good for biodiversity. For example, encouraging a large population of elk and deer is not necessarily helpful, especially if you kill off their predators.”

Biologists point out that the destruction of willows and aspen seedlings on streambanks in Yellowstone is caused by the intensive grazing of its abnormally large elk herds; it’s the elimination of predators in the past that allowed Yellowstone elk herds to grow huge. “Game animals have friends that endangered species would love to have. The white-tailed deer is never going to be an endangered species. It’s got friends in high places,” Quammen says. There are probably more deer in North America now than when Columbus landed. But nongame wildlife need advocates as well. And game managers can be voices of moderation to the hunting community, Quammen says.

Only 4 percent of the world is preserved in parks and protected areas, Quammen points out, and we can’t give up on the other 96 percent. “We shouldn’t separate ourselves from nature. We can’t say, ‘Nature will be in parks and preserves and we’ll be everywhere else.’ We can learn how to live and conduct our businesses in ways that encourage biodiversity. We should plant native species when landscaping our homes, stop using pesticides, and welcome back native birds and bugs. A lot of the landscape in the West is destroyed, not by mining and timber companies, but by liberal conservationists who want to have a cabin on twenty acres in the foothills. We all have friends and loved ones who are doing that and we need to speak up about it. People who want to live in the country and commute to town erode wild landscape. If you love the landscape, live in the city.”

Quammen is encouraged by one political development in Utah: “Southern Utah’s new Grand Staircase-Escalante National Monument—which reconnects two islands of natural landscape, Bryce Canyon National Park and Capitol Reef National Park—is the best news for biodiversity in the past ten years.”
Pepperweed.

Downy brohme.

Leafy spurge.

Purple loosestrife.

Spotted knapweed.

Yellow starthistle.