By ELIZABETH ROYTE
Photographs by CHRIS JOHNST

On the Brink
Hawaii's Vanishing Species

Belayed 2,000 feet above Kauai's Koke'e Valley, botanists Ken Wood, foreground, and Steve Perlman risk their lives to rescue Hawaii's imperiled plants from extinction. Out of reach of goats and other alien invaders, such cliffs are among the last strongholds of the state's native flora. With the unhappy distinction of being the country's endangered species capital, the Hawaiian Islands have already lost hundreds of original life-forms while hundreds more teeter on the verge of oblivion.
Descended from a California wildflower, the flaxflower Haleakala silversword offers a shining example of adaptation. A few hundred candelabra species, marooned on these once-lifeless volcanic outposts by winds and snows, blossomed into at least 8,000 endemic plants and animals. The process begins anew along Hawaii’s southeast coast as molten lava lays a new foundation for life.
To mainland eyes, this musical glen on Maui appears as Hawaiian as the Hula. In fact, none of the plants nourished by Wailea Falls are native. Introduced competitors have usurped much of the islands' natural heritage, so that today even the lei, or flowered necklace, is typically strung with foreign flora.
THE PIGS ARE OUT THERE. We see their hoofprints, their mud wallows, the plants they've grazed and crushed. This tract of forest, one of the most protected tropical rain forests in Hawaii, does not look healthy. Casey Cho and Howard Hoshide, large men in camouflage clothing, walk lightly. The hunting dogs dart ahead of us through the thick brush.

We are not out here today for sport. Howard and Casey work full-time for Hawaii Volcanoes National Park on the Big Island of Hawaii, hunting the feral pigs that are destroying this rare ecosystem. Casey slashes through tree ferns and tangled vines with his trail knife. Then, from a distance, we hear the muffled bark of a dog pursuing a pig.

"Got one!" Howard cries.

We take off through the forest, leaping over logs and sliding between muddy branches. The barking fills the afternoon air. The voice of another animal, hoarse and desperate, soon rises above the din. "Sounds like a big one," Howard yells back over his shoulder. We arrive at a clearing to see a sow pinned by the dogs and squealing in terror.

Casey approaches the pig with his knife poised. He avoids hunting with guns as much as possible—the sound of gunfire sends the forest's pigs into hiding. Placing his right foot on her neck, Casey quickly severs two major arteries and the windpipe. She collapses in the mud.

Scenes like this occur in Hawaii every day, where wildlife managers are scrambling to set the islands' natural balance right, to undo some of the environmental damage humans have wrought. Agriculture and development long ago obliterated the islands' wilder side in most of the lowlands. But away from the beaches and golf courses, in the high mountains and the isolated valleys, the last refuges for unique native heritage are under siege of another sort. These areas are threatened by introduced species—the pigs we were chasing, for instance—that have destroyed much of the native landscape and the creatures that rely on it.

For weeks field specialists have escorted me through the islands' misty forests, pointing out native marvels like flowers that match the shape of birds' beaks. They told me about ferns that resemble four-leaf clovers, predatory caterpillars that ambush insects, and aphids that live on icy mountain tops, surviving on tiny insects delivered by the wind.

There was a celebratory aspect to this litany of wonders, but

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Filling its abdomen with blood, a Culex mosquito delivers a lethal dose of Asian malaria to anYesso. Probably brought to Hawaii in a whaling ship's water casks, the disease-carrying stowaways have taken a heavy toll on native birds. During recent outbreaks “birds literally dropped out of the trees,” says biologist Carter Atkinson.
Requiem or recovery?

It was overshadowed, always, by a sense of loss. The plight of endemic species has become so dire that conservationists call Hawaii the endangered species capital of the nation. Although its islands represent just two-tenths of one percent of total U.S. land area, three-quarters of the nation’s extinct plants and birds once lived only in Hawaii. More than a third of the 526 plants and the 88 birds on the U.S. endangered and threatened species list come from there.

Remote oceanic islands like Hawaii are more vulnerable to ecological invasion than any other landscapes. Only a few types of birds, insects, and plants colonize such places, often evolving into species or even hundreds of unique species. These islands shelter no large land mammals or reptiles, only creatures that gradually lose their natural defenses against such predators.

The causes of Hawaiian species’ decline are numerous and complicated, but if conservation biologists had to name the most significant threat to native rain forest species today, they would, without hesitation, indict the feral pig.

Soaking through the forest with Casey and Howard, I can easily see why. In search of grubs and worms, pigs uproot shrubs and rototill the soil with their snouts. They sow seeds of alien plants in their droppings. Those seeds grow into tangles of vines like the South American banana poka and small trees like the Brazilian strawberry guava, which form dense thickets that crowd out native trees.

Non-natives such as rats and mongooses also spread alien seeds, and goats also devour fragile tree shoots. But pigs are more destructive and more widespread. Despite the best efforts of hunters, as many as 4,000 pigs remain in the park; more than 100,000 roam the islands.

Fewer pigs in Hawaii seem like an idea Hawaii’s people would easily accept. But the pig has become a flash point in a conflict between hunters who want to maintain a stable population for food and sport and conservationists who wish to eradicate pigs in certain areas to protect native flora and fauna.

Conservationists, who work in state reserves and federal parks and for private organizations like the Sierra Club and the Nature Conservancy, stress that the loss of even one species may contribute to the decline of entire ecosystems and that native plants and animals contain genetic information that could lead to new foods and medications.

They know that the survival of hundreds of endangered species now depends on human intervention. Their work crews kill feral animals, erect fences to keep ungulates away from fragile plants, breed birds in captivity, pollinate flowers by hand, and destroy non-native plants. By restoring and maintaining healthy ecosystems, conservationists hope to give Hawaii’s native species the respite and protection they need to survive.

Earth’s most remote archipelago harbors more than a third of the birds and plants on the U.S. endangered and threatened species list. Most find refuge among uplands too steep for development, such as the Koolau Range, which overlooks Honolulu (below). More than a quarter of Hawaii’s land remains unspoiled, giving conservationists cause for hope. Compared with most states, we’ve got a lot to work with,” says the Nature Conservancy’s Alan Holt.
Guillied by erosion, a goat-secured slope along Kauai’s Na Pali Coast offers a lone billy no place to hide. European explorers imported the destructive grazers to provide fresh meat for ships’ crews. State game laws backed by sport hunters maintain their numbers and, according to critics, perpetuate their damage.
I t's RAINING LIGHTLY as Ed Misaki and I walk through the rain forest of the Kauaikeolu Preserve. Ed manages the 2,794-acre forest for the Nature Conservancy, one of the best developed of Hawaii's seven inhabited islands. He leads me through the dense understory. Great tuffs of mud stick to our rubber boots. Fallen trees clutter the narrow trail. Thick, velvety moss and ferns grow atop the logs, blanketing the forest floor. When we walk off trail, the forest thickens, with a dense growth of underbrush. It's as if Ed's picking out the densest part, the unseen unseen. These delicate forms have no defenses against the animals.

Ed explains, "Hawaii is the most isolated island group in the world. And it begins just as these volcanic peaks rise, but no life on them. Once life arrives—ants, insects, birds, the wind, or ocean currents—it develops with little influence from the outside world."

No land reptiles or amphibians could swim that far. The only mammals that arrived under their own steam were the honey bear and the monk seal. We walk on through the forest. Ed stops short. "Oh, wow," he says. "Take a look at this." He points to the delicate pink blossoms of a mint vine and plucks a leaf for me to smell. It has a slight fragrance, but I'd hardly call it minty. The mint oil scent so pleasant to humans actually deters browsers, but this plant has no such protection.

"Hawaiian species didn't need such defense mechanisms," Ed says. "Some plants lost their thorns, some birds lost their ability to fly. It makes sense. A plant that mutated and didn't spend energy making an oil could spend more energy making bigger fruits or flowers."

From a biologist's point of view, mutations like this made Hawaii one of the most remarkable places on earth, surpassing even the Galapagos Islands for the number of species that evolved from a common ancestor. One lobelia, for example, diversified into more than a hundred kinds of species. Some evolved crossed barks that are good for plying open flower buds or probing bark for insects.

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Others evolved long, curving hooks to break nectar from the lobelia blossoms.

Today only 21 species of honeycreeper remain. Fourteen of those are endangered. "I wish I could say I'd make Moalau a better place for them." Ed says wistfully. "But no one has seen one since 1963." Ed has searched for signs of the creeper for ten years. He saw the small scarlet bird only once—a stuffed male specimen in the Bishop Museum in Honolulu.

Ed brings me to the edge of a ridge to look 3,000 feet down into Pelekunu Valley. A soft wind blows shards of mist up the fern-covered slopes. A dense shade of green shimmers in the light rain. Ed stands beside me, chewing absentmindedly on a blade of grass. For him the valley is not only beautiful but also inspiring. More than 90 percent of the plants around us are native. "When I was in school, they didn't teach us about the uniqueness of Hawaiian species," he says. "Green was green." Today Hawaiian children learn the difference in the classroom. Ed escort them to this ridge to let them see and feel the difference.

Fifty miles southeast of Molokai, on the island of Maui, the upper reaches of Haleakala National Park's Kipahulu Valley hold such a wealth of native plants and birds that access is strictly controlled. The National Park Service has declared the valley off-limits to the 2.2 million people who visit the island annually. Pigs are banned as well—park crews strung miles of fences across the valley in the late 1980s to keep them out.

To see this success story, I join Steve Anderson, a park resource manager, as he sets out with his assistant, Patti Weld, for a week in the field. Steve manages vegetation protection. In a typical week he'll uproot or spray herbicides on alien plants, record the locations of endangered species, and check fence lines for gaps the pigs could squeeze through.

This morning, at a base camp near the coast, he helps his crews prepare for the week ahead. Giant nets spread over the grass they pile up buckets of food and cans of water, machetes, fense posts, rain tarp, and other supplies. A helicopter arrives to carry the food and the crews up Kipahulu. From the air he can see streams roaring down the steep walls of the seven-mile-long valley, cascading in waterfalls over rugged cliffs. In the upper reaches, 'Ohi'a lehua trees, with small leaves and brilliant red flowers, dominate the canopy.

Under the canopy the forest floor undulates with a lush carpet

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Hawaii’s lost world

At least a thousand creatures that once roamed Hawaii’s landscape have vanished since Polynesian voyages—and later European explorers. Most set foot here about 1,800 years ago. Having evolved in isolation, native species were not equipped to survive the onslaught of predators and competitors introduced with human arrival. Among the first to go were 20 species of flightless birds—easily prey for humans—including the large terrestrial mouse-like, long-spurred, “maui today, only from skeletal remains.

This painting offers us one-shoulder glimpse of some Hawaii’s bygone creatures and others now living on borrowed time. More than 50 native plants and animals are portrayed. Of the 17 birds included, 13 are extinct, four are probably extinct (neither the Kauai ‘I’iwi nor the Molokai creeper, for instance, has been sighted in more than 35 years), and ten are endangered.

Many of the state’s 150 recognized ecosystems have been blighted in this composite scene, from sea-level marshes at the bottom of the painting to alpine desert at the top. Birds and other animals are grouped on or near vegetation common to their habitats. Natural communities are associated with wet, windward, northeastern-facing slopes are depicted on the right, while those that occupy drier, leeward slopes appear on the left.

- Extinct
- Endangered
- Rare but not officially endangered
- Common plants
Trailing hunting dogs through the thickest reaches of Hawaii Volcanoes National Park, rangers conduct a search-and-destroy mission for feral pigs. "It’s like warfare," says Larry Kukina, a park resource manager, of the grueling, hazardous hunts. "Many of the dogs get hurt." As for the estimated 4,000 pigs thatなんです the park, rangers purged about 300 a year from areas subsequently kept pig-free by fences.

Proud to be a pig hunter: Holucon Bustamente’s wild boar tattoo (above) reflects the importance of swine in traditional Polynesian culture. Conservationists counter that today’s tusked boar, which is more akin to the European boar than to the small, domesticated pig ancient Hawaiians imported aboard their canoes.
Guarded by sturdy fencing, healthy forest inside Hawaii Volcanoes
National Park, at left, abuts scrubby rangeland now roamed by cattle
and feral goats and pigs but slated for protection. Seventy miles of
fence encloses about a third of the park's rain forests.

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of ferns, vines, shrubs, and fallen 'ohia, which, with their
abundance of moose, ferns, and lichens, could be considered miniature forests in their
own right.

"Fifteen hundred years ago almost all of
Hawaii, at least on the islands' windward,
wet sides, looked like this," Steve tells me
over the roar of the engine.

I try to imagine the first Polynesian set-
tlers, who beached their canoes on the Big
Island about A.D. 400, exploring this forest,
burning birds for food and for their colorful
feathers, gathering leaves for medicine.

These original Hawaiians were not as
dangerous a presence as once was thought. The
settlers cleared lowland forests to cultivate
the plants they brought with them—breadfruit, bananas, sugarcane, taro. They
brought small pigs. Their presence led to the
extinction of at least 53 species of birds.

Captain James Cook, who arrived in 1778,
took matters further. Word of his discovery
spread throughout the West, and other ships
soon followed. Over the next several decades
outsiders introduced introduced cattle, goats, sheep, and
large European pigs. Eventually, many of these
animals escaped and flourished in a
paradise without cold winters or natural
predators. The Europeans and those who
came after changed the islands more in 200
years than the Polynesians had in 1,400.

As time went on, a vast agricultural empire arose. By 1900 the demand for wood and pas-
tureland had denuded much of the upland
forest. Government agencies reforested hill-
sides with alien trees like eucalyptus and pine
in the early 1900s. In the following decades
developers poured concrete over beaches and
drained wetlands.

Runoff from sugarcane fields and slopes prone to landslides stains
Kauai's Anahola Bay after a downpour. Hawaii suffers soil loss at one
of the highest rates in the nation. Consequences include fouled
streams and coral reefs smothered by silt.

BUT HIGH OVER KIPAULU I see only
what Hawaii once was. The helicopt-
ner drops off Steve, Patti, and me at
Charlie Camp, a work station at 4,750
feet. Crews spend as long as a week
here, returning each damp night after a day
of poisoning alien plants or repairing the
fence. The camp is an eight-by-eight-by-
eight-foot metal-roofed cube with three
rope hammocks slung one above the other.
A deck runs around the cube. Rats run
around the deck.

Rats came ashore in Polynesian canoes and
European ships. The rats ate bird eggs and
spread alien seeds carried in their fur and
droppings. Trapping rats in thick rain forest
doesn't make sense, so Steve's colleagues
have been granted federal approval to poison
rats near bird-nesting areas.

Today Steve and Patti will inventory
plants between Charlie Camp and Ginger
Camp, our destination at 5,180 feet. I'm
wondering what fauna we'll see at Ginger
and why we've allotted six hours for a two-
hour hike. I soon find out. The valley is
steep, with trails not so much marked as
suggested by snippets of blue plastic tied to
shrubs. The idea is to take a step into the
thick-twig green mystery and hope your foot
hits solid ground. Invariably, I stumble over
hidden logs, trip on roots, slide in mud. It
rains 250 inches here each year, and it's rain-
ing now. Hard.

As we walk, Patti and Steve joke at
plants. The Carex spicata, a grassy tussock
plant, is spreading at the fence line—a native
fleeting. Patti is ecstatic about a blue-
fringed Lobelia gynacoea also growing natu-
really along the ground. "This is great!" she
yells. "Yeah, terrific," says Steve, turning to
me. "They've got pretty weak stems,
somewhat..." He doesn't have to finish. I know by
now what that means. No pigs. Success.

We hear the guttural calls of an endan-
gerered crested honeycreeper and spot an 'opu-
pane—a red honeycreeper with a short,
curved bill used for gleanning nectar and inset-
ts from blossoms. Somewhere out there in
the rain and the fog are the endangered moku-
pa'a and 'akepa. Like all Hawaii's native
birds, these honeycreepers are threatened by
diseases like avian pox and malaria and by
non-native birds that compete with them for
food and territory.

Avian diseases along with competition

National Geographic, September 1995

Hawaii’s Vanishing Species
Weeding out non-indigenous plants, a Park Service employee takes a swipe at _elephant_ ginger, one of the most problematic of the 900 or so species threatening to crowd out native flora. To stem the flow of exotic animals, beagles are trained to sniff out unwelcome arrivals at the Honolulu airport.

Unraveling the intricacies of species' decline takes time. Goats in Haleakula Crater were long blamed for the demise of the silversword, a silvery green plant that grows for as long as 50 years before it sends up a tall spike that bursts into hundreds of magenta flower heads. After that one spectacular bloom the plant dies.

Argentine ants appeared near the rim of the crater in the mid-1960s, but it was years before scientists realized that the ants were preying on the native yellow-faced bee, a key pollinator of the silversword. If the silversword disappears, not only will people miss seeing a strange and radiant plant, but also the bee will lose one of its food sources and the world will lose a library of chemical compounds and a link in the evolutionary chain.

Despite the odds, the park has had definitive successes. The lushness of Kipahulu Valley inside the pig fence proves that. Everywhere, I see evidence of humans working to restore the forest. We pass small snake plots, delineated with blue tape, for the study of changes in vegetation. We pass several garbage bags that a crew has filled with _elephant_ ginger, an import from the Himalayas.

"Ginger forms a dense carpet that keeps anything else from taking root," Steve says. "And it's fire tolerant, so it could grow high up mountain sides. The pigs spread it."

Steve's crews have succeeded in keeping the ginger from the upper valley, but at lower elevations, where habitat degradation is often severe, battling invaders would be a losing game. So few native plants are left there that if one weed was killed, another would spring up in its place.
Devouring a nēnē—Hawaii's endangered state bird—a mongoose presents a classic case of biocontrol run amok. Imported during the 19th century to rid cane fields of marauding rats, the weasel-like, diurnal predators seldom encounter the nocturnal vermin but prey instead on nēnē and other ground-nesting birds.
Thus sometimes it seems that no sooner is one problem solved than another emerges: Intensive hunting rescued the Haleakala silverswords from the goats, but now the Argentine ants threaten the plants' long-term survival by preying on the yellow-faced bee. None of this dampens Paul and Steve's enthusiasm. It's late afternoon and finding harder as we make our way downhill, but they still seem jolly, dashing off trail to show me rare orchids and delicate mints. When we reach 3,180 feet, we clamber over a hog-wire fence and arrive at Glider Camp, a three-sided tent on a platform. It has more room than Charlie, plenty of hooks for wet clothes, and rats. Exhausted by nine o'clock, I retire to my sleeping bag, on a cot under the tarp. It is pleasantly cool, and I tell myself that the sound of scamppering feet is just branches in the wind, as I think about the work we are laboring in the rain, hauling fence posts, digging up weeds. And I start to wonder: Aren't all plants, at some point in their history, immigrants? Are we humans—and the fruits, vegetables, and animals they have brought here—part of the island's evolution?

The people of Hawaii have wondered about these questions and more. Over the past decades many natives have argued for sovereignty. Those who claim Hawaiian ancestry make up nearly 20 percent of the state's 1.2 million people. Though they differ on exactly what form self-governance should take, dozens of political factions do agree on one point: They want control of Hawaiian land. For some natives this includes the right to hunt feral pigs whenever and wherever they want. Pigs have long been an important part of Hawaiian spiritual life: They are essential to traditional ceremonies such as those marking the birth of a child, the building of a canoe, or graduation from hula school.

Pua Case Lapaula, a 34-year-old hula teacher and a founder of the Hawaiian State Wildlife Conservation Association, speaks for about 400 hunters who want to keep pigs to roam free. "Who are these people to tell me how to use the land of my ancestors?" asked Pua, over breakfast at a roadside house on the Big Island's northeastern coast, an area marked by dramatic sea cliffs and sprawling sugarcane plantations. Pua is a graceful woman with long brown hair. She grew up on Hawaii, spending summers with her grandparents at Anahoomalu Bay, dependent on the land and the sea for food. "My grandmother expected me to learn Hawaiian values and traditions," she said. "She was teaching me to live in harmony, unity." She opened her hands in a symbol of balance.

But today Anahoomalu Bay is dotted with luxury hotels. It is difficult for Pua to bring her daughter there to fish and gather plants. "There are many angry people," she said. "There is a lifestyle we follow, and developers, the state, and scientists are taking that away from us."

Pua told me that although pigs cause some harm to the forest, they are an essential part of kula, that in Hawaiian legend the pig is a tiler of soil. As she spoke to me, Pua potted a plastic bag at her side. It contained leaves she had collected that morning for making lei, the flowered necklaces she would give to her hula students. "This plant has a hundred uses," she said, smiling. It isn't native, I reminded her. "If it has a use," she said, "it has value."

That night I met a Hawaiian conservationist who's trying to bring the two sides together. "The locals have a lot of knowledge; it shouldn't be discounted," said Julie Leilahoa, land manager for the Natural Areas Reserve System, a state conservation agency. "But as a biologist, I know that if we lose something here, it's gone to the entire world. Each side needs to be educated: The conservationists need to learn more about cultural sensitivity; the local community needs to learn more about conservation."

Compromise of any sort is alien to Keith Robinson. A horticulturist on the island of Maui, Robinson is blunt and forceful, and he conducts his life with a survivalist's fervor. He refuses to drink water during a hike. He wears a hard hat even in hotel lobbies and carries a machete almost all the time. A 53-year-old bachelor with a grim mouth and cold eyes, Robinson doesn't swear, drink, or smoke—but he does steal seeds.

Hiking miles over public land, he searches for the rare and the threatened. He spreads fertilizer on plants in the field and collects seeds to propagate in his own hundred-acre private reserve. When they mature, he'll disperse their offspring through an underground network of 20 like-minded green thumbs on five other islands. His purpose: to save a fraction of Hawaii's native flora from extinction. I meet Robinson one morning for a hike at $3.50, but the hour still isn't early enough for him. He would have preferred 6:30. He doesn't speak to me, nor I to him, as we circle up the switchbacks of Waimea Canyon State Park in his truck.

I'm subjected myself to Robinson's early morning tre because I've heard he has some strong opinions on how government and private agencies manage endangered species. "If you can keep up with me, you'll see

Dromely in distress is no match for a Jackson's chameleon, a lightning-tongued African lizard sold by exotic pet shops. Set free by owners who tire of tending them, they compete with native birds for insect prey.

Outnumbered five to one, an endemic inchworm is overwhelmed by African big-headed ants. The aggressive aliens have exterminated many insect species that once pollinated native plants and provided food for birds.

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Working by lantern light, biologists Jon Griffin, kneeling, and Robert Covington repair a fence around one of the last *Delissea undulata*. "It was hanging from a few roots inside a sinkhole," says Griffin. "Any disturbance would have killed it." Seeds germinated in test tubes offer hope for the species' survival.

"something," he promises as we hike down a serpentine trail to the canyon floor. We trot a few miles along a riverbed and then scramble, hand over hand, up the eroded canyon wall. The air is filled with the thick, pungent smell of goat urine.

Goats are wreaking havoc here. Decades ago tons of thousands roamed the canyon, pounding the ground to bare red dirt. Hunting reduced their numbers, but today's 1,500 animals still knock boulders and avalanches of soil onto what little vegetation remains. In the interest of keeping the island well stocked with game, state land managers allow Kauai hunters a bag limit of only two goats a year.

Robinson shows me a wire fence built by state biologists to protect an endangered tree from the ravages of goats. Boulders have crashed into the fence, and the goats are eating the tree. "Idiots," he mutters, menning the biologists.

Marching back along the trail, he rails against the feds, the state, environmentalists, hunters, and anyone else in the world, he says, "who isn't willing to do the W-O-J-R-K the way I do.

"They're not willing to hike into these places and collect the seeds!" he yells, swinging his machete. "They won't save an endangered tree if it's outside the reserve boundary!" he yells, kicking a rock from the path. "They can't do a thing about these alien species, and they don't even know how to grow the endangered plants in the field!"

Robinson directs many of his broadsides at the National Tropical Botanical Garden, in Kauai, and Steve Pertman, a botanist there, resents it—with good reason. Robinson has brought seeds to the botanical garden, and the two have worked successfully on numerous projects.

Pertman is no wimp himself when it comes to fieldwork. He spends 12-hour days pursuing endangered plants, hiking canyons and dangling from ropes on 2,000-foot cliff faces to pollinate rare flowers.

It doesn't take a day with Keith Robinson to know that neither the state nor the federal government is doing a stellar job of protecting native species from alien introductions. Even the bland language of a 1993 congressional report, "Harmful Non-Indigenous Species in the United States," indict the federal handling of such problems.

The system, according to the report, "is piecemeal, lacking adequate rigor and comprehensiveness." The country's regulations and programs "are not keeping pace with..."
Sleuthing for insects at 2.6 miles above sea level, conservation biologist Steven Montgomery scrutinizes the snowcapped summit of Mauna Kea, Hawaii's highest peak. Among his finds: a colitch bag with "antifreeze" in its blood. Hawaii harbors at least 5,000 species as yet unknown to science. Barring unprecedented action, many may vanish undiscovered.

The idea that every living creature has a right to exist greatly appeals to me. But all the species in Hawaii can't share the same space. And science cannot save every endangered species. There is never enough time, never enough money. The U. S. Fish and Wildlife Service has an annual budget of four million dollars to save threatened and endangered species in Hawaii; federal agencies estimate the state needs 25 million dollars more.

For the 1994 breeding season alone the state and federal governments spent more than a million dollars to keep the 'Ala 'au, or Hawaiian crow, from extinction. Fewer than 20 birds remain in the wild, 15 in captivity on Maui at the Ohlinda Endangered Species Propagation Facility. Ornithologists have begun releasing captive-bred birds. Despite the crows' small population and the difficulties of finding suitable habitat, researchers believe the species can be saved.

Sea birds and nesting, a cousin of the Canada goose that is Hawaii's state bird. By the early 1950s, when scientists realized that overhunting and predation by rats and mongooses had decimated the population, Hawaii's lowlands, where the birds thrived in pre-European times, had already been converted into sugar and pineapple plantations. By 1951 no more than 50 birds survived in the wild.

I spent some time with Cathleen Hodges, an endangered species specialist at Halaukai National Park who studies the ecology of the nēnē. Through rolling grasslands we searched, unsuccessfully, for nēnē nests. It was still early in the nesting season. We ran the trapline. Seven held the odor carcasses of rats. From trap 44 we removed an intact dead mongoose and carried him to a picnic table for an impromptu necropsy.

"We get a couple dozen rats a month and about one mongoose," Cathleen said, making deft incisions with my Swiss army knife. "I don't see any subspecies body fat, so he probably lived lower down, where it's warmer. My guess is he froze to death last night." She checked his stomach for bird feathers or bones but found only fur.

Even if Cathleen captured all the rats and mongooses in Hawaii and the nēnē's habitat was restored, the goose would still face another threat. Captive breeding has boosted the nēnē population to 800, but all those birds are closely related. With so much genetic similarity between individuals, the birds may be especially vulnerable. Clearly, the nēnē will require hands-on management for some time. But how much further should we go? How much money should we spend?

For scientists like Steve Perlman, the answer is simple. We save species because they took millennia of years to evolve and they have a right to exist. These species tell us about the evolution of life.

The dedication of people like Perlman is why Hawaiian conservationists refuse to give up hope.

"I would sell cars or do something else if I didn't think we were making a difference," says Alan Holt, science director of the Nature Conservancy's Hawaii office. "We can't go backward or stay the same. We will lose some species, but we can save thousands of others." Holt projects a positive image, and he supports his outlook with an anecdote. One summer, 15 years ago, Holt and a team of scientists spent six days surveying Molokai's Oloku, the only mountain in Hawaii that has never sheltered an upland forest. Exploring each valley and ridge, the team plucked every non-native species it found. The results filled only one-gallon bag. That excursion reminded Holt why resource managers and researchers work such grueling days to turn the invasive tide.

What's left of Hawaii is simply too precious to waste.