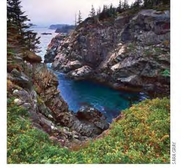
Geography of Hope
12 Conservation Success Stories



1 For centuries, **Wao Kele O Puna** has been central to the culture of Native Hawaiian people as a place for traditional hunting and gathering. This largest remaining expanse of lowland tropical rain forest on the Island of Hawai'i is a key aquifer recharge area for the Island's main drinking water source. In 2006 The Trust for Public Land acquired the 25,000-acre rain forest with funding from the U.S. Forest Service's Forest Legacy Program, an important federal source for protecting privately owned forest lands. The land has been conveyed to a state agency, preserving its natural, cultural, and spiritual values for all Hawaiians.

2 Saving and restoring forests is key to fighting global warming. The 24,000-acre **Garcia River Forest** in northern California is among the first independently inspected and verified sources of carbon credits. This previously logged property was acquired by The Conservation Fund in 2004, with The Nature Conservancy holding a conservation easement. As the forest regrows, the redwoods and Douglas fir will absorb carbon dioxide, helping mitigate climate change. For about $5 per month on their utility bill, Californians can voluntarily offset their energy use with Garcia River Forest carbon credits. The income will support re-storation and sustainable forest management.

3 Building community support and a vibrant coalition of partners has been the key to saving the **South Puget Sound Prairies**, an ecosystem that almost vanished. Over the past decade private landowners, government agencies, and conservation groups have restored thousands of acres of these oak savannas and golden grasslands. Land managers control invasive nonnative species through prescribed burning and weed removal, while volunteers have planted a million native seedlings. It's a thrifty, successful model of hope and vision leading to community engagement and conservation action.

4 With 31 million acres already under lease across five Rocky Mountain states, energy development will dramatically impact the western landscape in coming decades. Along Montana's 100-mile **Rocky Mountain Front**, one can still see the West as Lewis and Clark encountered it. Spurred by sportsmen's groups united to conserve "America's Serengeti" for hunting, fishing, and outdoor recreation, Congress recently prohibited any new oil and gas leases on federal land here. While extraction from state and private lands still poses a risk, conservation easements and lease buybacks may keep this extraordinary landscape healthy and whole.

5 Ranching has been a way of life for a century in the **Malpai Borderlands**, where New Mexico, Arizona, and Mexico meet. Here a partnership among the region's ranching families maintains that legacy while conserving a wildlife-rich landscape of high desert grasslands and isolated mountain ranges, or "sky islands." The Malpai Borderlands Group has protected 75,000 acres through conservation easements and has improved the health of grazing lands by returning fire to the ecosystem. The group also conceived the practice of "grassbanking," where neighboring ranches share grazing lands so that fragile areas can be rested during drought.

6 The scenic beauty and magnificent wildlife of the **Laramie Foothills** testify to a legacy of stewardship by generations of Colorado ranching families. Paleo-Indians camped on these rugged grasslands 13,000 years ago. Now the Laramie Foothills Mountains to Plains project, a partnership among Larimer County, the city of Fort Collins, land trusts, and local landowners, is shielding an 85-square-mile open-space corridor from rampant residential development spreading along the Front Range. Funding comes from Great Outdoors Colorado, a state trust fund and millions approved in local ballot initiatives. By voting for conservation, Coloradans have put their wallet where the wildlife is.

7 Behind the story of the near extinction of bison lies another reality: the disappearance of tallgrass prairie, the continental sea of grass that gave way to the plow, making America breadbasket to the world. In the past two decades, the realization of this loss has propelled heroic efforts at recovery. The Nature Conservancy's **Tallgrass Prairie Preserve** in Oklahoma is the largest protected remnant, with other large reserves across the Midwest. Greater scientific attention and increasing public acceptance of prescribed fires have been keys to restoring this great American landscape.

8 The **Chicago Wilderness** is more than a place—it is a people-powered call to action. Over the past decade a coalition of 200 groups has helped conserve and restore a 225,000-acre network of parks and wild places in Illinois, Indiana, and Wisconsin. Citizen scientists have made biodiversity their passion, monitoring populations of frogs, birds, and butterflies. Thousands of volunteers restore prairies, woodlands, and wetlands; many of which are in or near urban areas. And young students are learning that nature is nearby, ensuring that "no child is left inside."

9 The **Apalachicola River Basin** forms the bull's-eye within one of America's biodiversity hotspots—the Florida Panhandle. More species of reptiles and amphibians are found here than anywhere else in the United States. A rich estuary for fish, crab, and oysters, the river and bay support a valuable seafood economy. Lands for conservation, recreation, and wildlife watching, including national forest, state forest, state parks, and nature preserves, span several hundred thousand acres. With an impending tide of residential development, and imprudent water consumption upstream, will that be enough to preserve the nature of this place?

10 Metro Atlanta's sprawling growth is gobbling up open space and threatening the region with water shortages. Hope lies in conserving green space throughout the watershed, essential to securing sufficient clean water for five million people. Over the past decade the **Chattahoochee River Greenway Project** has protected 70 miles of riverfront, doubling previously existing parkland. The goal is to complete a 180-mile green necklace from the mountains through Atlanta and beyond. The project connects people to nature through recreational access to parks and riverfront, reduces pollution, and strengthens the economy and quality of life for Georgians.

11 Amidst ancient Appalachian ridges in southwest Virginia lies the **Clinch Valley**, the nation's leading hotspot of aquatic diversity. Dozens of rare species of freshwater fish, mussels, and cave-dwelling animals depend on clean water in the Clinch and Powell rivers and their interconnected cave systems. People need clean water too. While natural resources—coal, timber, and arable land—are the basis for the region's economy, unsound practices can threaten water quality. Through innovative strategies such as conservation-based forest management, local farmers are protecting the rivers and surrounding forests, demonstrating the connection between a healthy rural economy and a healthy environment.

12 The wild bluffs and cobble beaches of the **Bold Coast** form an iconic stretch of Maine's coastline, a place for hiking, hunting, and wildlife watching. Here along the nation's easternmost shore, the efforts of conservation-minded landowners, land trusts, and state agencies have conserved more than 15,000 acres, with funding from individuals, foundations, and the Land for Maine's Future bond program. State-wide, nearly a half million acres and 1,019 miles of shoreline have been conserved through this state bond program, ensuring public access for traditional uses of the land. It's a wise investment by the people of Maine in the long-term health of the state's economy.

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LandScope America is a new online resource for the land-protection community and the public. Bringing together maps, data, photography, and stories, it helps people explore natural lands and waters and conserve the places they love.

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LandScope America

Open Space at Risk

From panoramic western landscapes to urban pocket parks, America's open spaces are a cherished part of our national and local identities. While their ecological importance and ability to sustain our spirits have long been appreciated, only recently has the economic value of these lands and waters been more fully understood. Forest, wetlands, and other natural lands provide people with essential services, including pure water, abundant wildlife, and a moderating influence on our changing climate.

Yet America's open spaces—rural, urban, and suburban—are dwindling rapidly. Each year about two million acres of open space are converted to other uses, amounting to almost 6,000 acres a day. **Development pressure**—the spread of housing and other structures into agricultural lands and natural habitats—is a major force in supplanting and fragmenting open space. Given that U.S. population is projected to increase by 135 million people over the next 40 years, how we choose to develop will be key to the sustainability of our farmlands, working forests, and natural habitats.

Among other concerns: Widespread **oil and gas exploration** is transforming many formerly serene rural western landscapes. Nearly 80,000 major dams have **altered water flows** in rivers and streams across the nation, leading to declines in native fish and other aquatic life. The spread of nonnative **invasive species** is rendering rangelands unusable, clogging water intake pipes, and reducing native biodiversity. And looming above the existing panoply of threats is the specter of **climate change**. An unpredictable mix of rising temperatures and shifting rainfall patterns will not only disrupt natural ecosystems, but also exacerbate the impact of more familiar threats (see maps at far right).

Fortunately, awareness and action to protect open space has never been greater. Using a variety of innovative conservation approaches, citizens, land trusts, and public agencies have rallied to protect many of America's finest lands and waters (see their stories above). The need now is for increased investment, continued commitment, and renewed hope for our future.

LandScope America is supported by a generous grant from the Wist Hill Foundation for Nature. The following organizations have partnered with NatureServe and the National Geographic Society to develop LandScope America: Colorado Natural Heritage Program, Florida Natural Areas Inventory, Maine Natural Areas Program, Maine Department of Inland Fisheries and Wildlife, Virginia Department of Conservation and Recreation — Natural Heritage Program, and Washington Natural Heritage Program.

We thank the many groups who provided data and assistance for this map, especially Colorado State University, Conservation Biology Institute, IHS Inc., the Land Trust Alliance, The Trust for Public Land, The Nature Conservancy, U.S. Forest Service, and U.S. Geological Survey. Thanks to ESRI for its support in printing this map.

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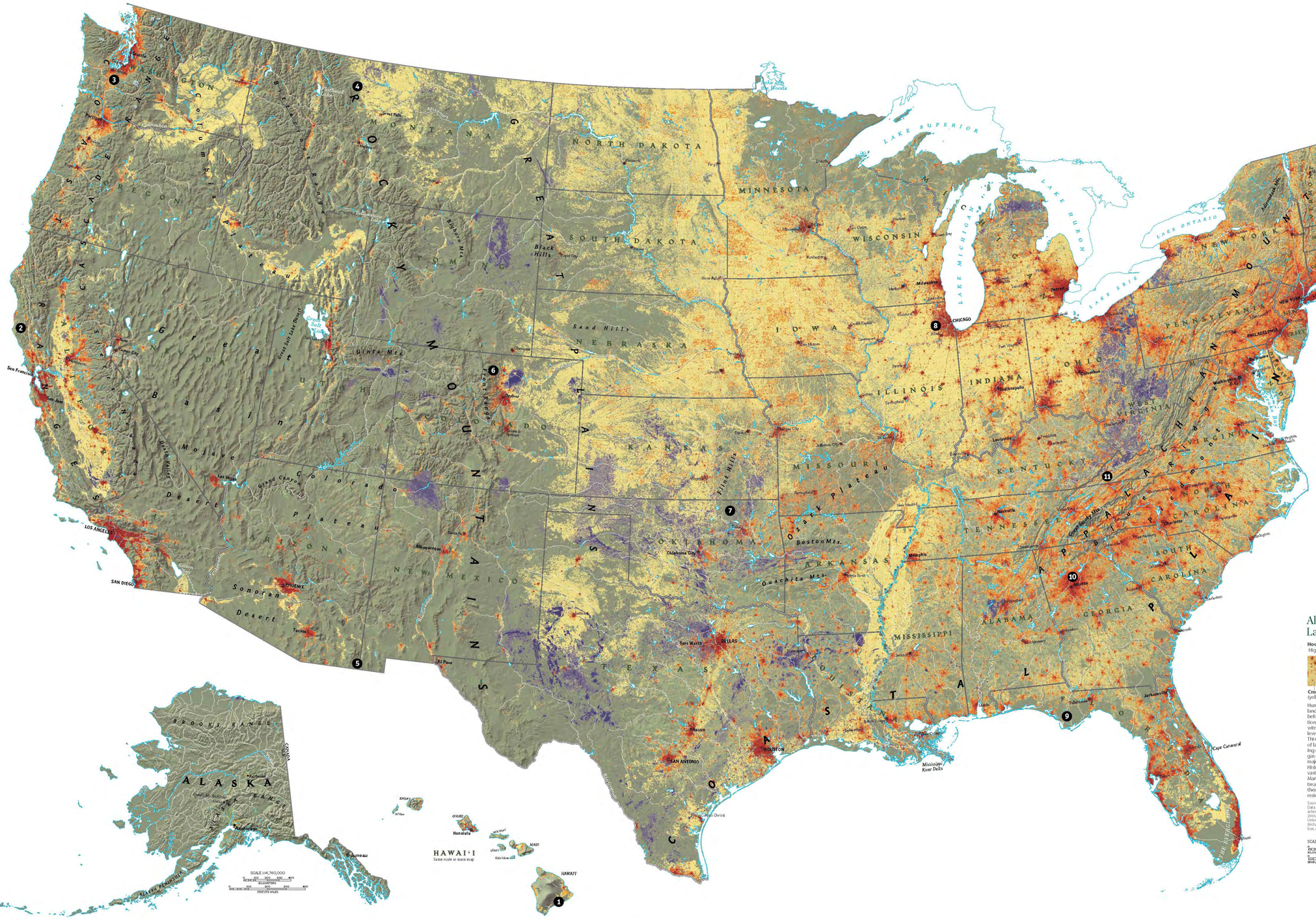
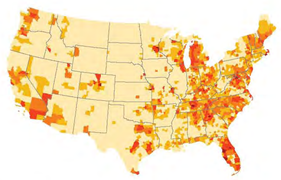
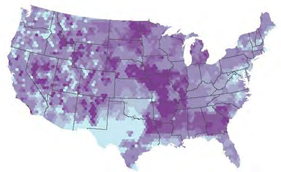




Development Pressures
New housing development will place added pressures on remaining open space and natural habitats. The problem is not merely population growth, but rather the way we choose to develop: new housing consumes almost twice as much land per person now compared to 20 years ago. Many areas are seeing major changes in housing density (measured as units per acre)—shifting, for instance, from rural to exurban, suburban or urban densities. Projecting such increases in housing density through 2030 provides an indication of where conflicts from development may be most pronounced.

Source: David M. Theobald, Colorado State University.



Climate Change
Changes in climate are projected to have major impacts on many U.S. ecosystems, causing some species to shift their ranges and others to vanish altogether. Looking at predicted changes in temperature, precipitation, and productivity, among other factors, provides a glimpse into where climate stress may have the greatest effect on wildlife habitat.

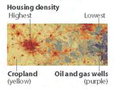
Source: US Forest Service Rocky Mountain Research Station, supported by WWF.

Altered River Flows
Hidden from sight beneath the water's surface, America's fish and other aquatic life have suffered serious declines due in part to altered flows from dams and water diversions. Looking at the storage capacity of dams in relation to the volume of upstream runoff provides an indication of where natural river and stream flows are likely to have been most altered.

Source: The Nature Conservancy; data from U.S. Geological Survey and Army Corps of Engineers.

Altered Landscapes

Housing density
Highest — Lowest



Cropland (yellow) **Oil and gas wells** (purple)

Human modification of America's lands has been occurring since before European colonization, yet the past century has witnessed unprecedented levels of landscape alteration. This map depicts three classes of land use—cropland, housing development, and oil and gas drilling—that have exerted major changes on the landscape. Historically, agriculture converted vast areas of prairie and forest. Many of these farmlands are now treasured as open space and are themselves being threatened by residential sprawl.

Sources: Cropland: National Land Cover Dataset, 2001; Housing: National Land Characteristics Consortium Housing density 2000; David M. Theobald, Colorado State University; Active oil and gas wells: IHS Inc. (includes all states with significant production, except Pennsylvania).

SCALE 1:5,575,000
KILOMETERS
STATUTE MILES

Invasive Species
Aggressive invaders from other parts of the world are having an enormous impact on U.S. ecosystems, causing billions of dollars of damage each year. Zebra mussels arrived in U.S. waters in 1988; they now clog water ways across much of the country's midsection. Similarly, tamarisk, a thirsty shrub of arid land, has spread across much of the West, displacing many native riparian species.

Sources: zebra mussels: USGS Nonindigenous Aquatic Species Program; tamarisk: USGS National Institute for Invasive Species Science.

A Gallery of Threats

Across America a variety of land use activities and other threats are taking a toll on our remaining open spaces and natural habitats. Alteration of the landscape from development and traditional resource-extraction industries—such as mining, logging, and oil and gas drilling—is now being further aggravated by growing markets in biomass-based fuels and wind energy. Other, often less visible, threats include disruptions to natural fire regimes and forest pest outbreaks promoted by warming climates.

High resolution IKONOS satellite imagery courtesy of GeoEye, www.geoeye.com. Copyright 2008. All rights reserved.

Logging can eliminate old-growth forests, fragment intact habitats, and harm sensitive wildlife. Construction of logging roads may open access to previously remote areas and roll up nearby streams.

Mining of coal and other minerals not only transforms the mine site itself, but severe products can have significant downstream impacts. Mountaintop removal, a technique increasing in some regions, is particularly destructive ecologically.

Oil and gas drilling to tame our fossil fuel addiction can fragment and degrade sensitive wildlife habitats and turn remote and scenic landscapes into industrial zones.

Irrigation is applied to more than 55 million acres of farmland, often at the expense of native species. Ecological impacts include: major rerouting of natural waterways and depletion of groundwater.

Suburban sprawl is consuming increasingly large swaths of prime farmland, a trend that shows no sign of slowing.

Forest pests are changing the very nature of our forests. Some, such as the Midwest's emerald ash borer, are introduced from abroad; others, like the mountain pine beetle in the Rockies, are native but have become more destructive due to **global warming**.

Coastal areas, home to about half of the entire U.S. population, have been hard hit by transport development. **Low-elevation wetlands** and other coastal buffers, expose many communities to increased storm and flood hazards.