

SOLUTIONS

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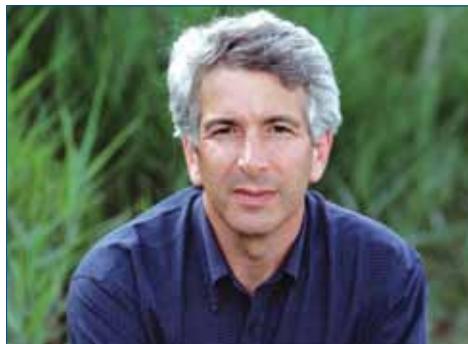
> **WISE INVESTMENTS**

Snowfall in California's High Sierra supplies much of the state's fresh water. What is the true value of such a resource?

PAGE 6

WHERE WE STAND

By EDF President Fred Krupp



While Washington sleeps, cities, states and businesses join the climate battle

REGIONAL LEADERS RISE TO THE CHALLENGE OF CLIMATE CHANGE

As the world gathered in Durban, South Africa, in December to wrestle with the problem of climate change, the United States was in no position to lead. But even as the stalemate in Washington, D.C. continues, cities, states and businesses across America are working to meet the climate challenge.

Take the tiny town of Borrego Springs, CA, population 3,500. That's where San Diego Gas & Electric is experimenting with turning the power grid into a smart grid (*see page 10*). Houses there will not only consume power but also produce, store and even sell it. This means greater use of renewable energy and fewer polluting power plants.

The impetus for the smart grid in California is the Global Warming Solutions Act (AB32), which EDF cosponsored. In October, the state adopted a cap-and-trade program to help achieve AB32's goal of reducing carbon dioxide emissions to 1990 levels by 2020. This will show other states, and leaders on Capitol Hill, how a carbon market can reduce emissions efficiently, create jobs and modernize the energy infrastructure (*see page 4*).

Meanwhile, the science behind climate change continues to accumulate, convincing even former skeptics like Richard A. Muller. He's a professor of physics who runs the Berkeley Earth Surface Temperature Project, which is partly funded by the conservative Charles G. Koch Foundation.

Muller and his team of physicists, statisticians and climatologists spent two years analyzing some 1.6 billion temperature readings from more than 39,000 stations. What did they find? As Muller wrote in *The Wall Street Journal*: "Global warming is real."

It is real, of course, and as the evidence continues to mount, it's inevitable that the conversation will finally turn toward solutions to global warming.

That's already happening in the corporate world. In 2011, EDF's Climate Corps, in its fourth year, trained 96 MBA and MPA students and parachuted them into dozens of companies to search out energy savings and change corporate cultures (*see page 13*).

At EDF, we believe sound science and market-based innovation are the most powerful tools to solve environmental problems. They can light the way forward, as these examples show, even in a year when Washington was in the dark.



Environmental Defense Fund's mission is to preserve the natural systems on which all life depends. Guided by science and economics, we find practical and lasting solutions to the most serious environmental problems.

Our work is made possible by the support of our members.



ON THE COVER:

Ruler of the high mountain meadows, the great gray owl (*Stirx Nebulosa*) is the planet's largest

owl. Now endangered in California, it offers dramatic testimony of the need for new thinking to preserve vanishing habitat.

EDF editor Peter Klebnikov traveled from the summits of the Sierra Nevada to the sea to document a fast-growing new conservation tool. *See page 6*.

Cover photo: Tim Fitzharris/Minden Pictures

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LETTERS AND COMMENTS FROM READERS

In October, EDF economist Dr. Gernot Wagner published *But Will the Planet Notice?* about the economics of global warming. Author Bill McKibben describes the book this way: “If you want to understand how an economist thinks about the biggest challenge our planet has ever stumbled up against, this book is an awfully good place to start.”

Recently Dr. Wagner answered questions from EDF’s Facebook community (facebook.com/EnvDefenseFund). We’ve excerpted some comments here. Learn more about Dr. Wagner’s book and read his blog, at maketheplanetnotice.com.

Growth and sustainability

“How can we have a sustainable planet when we operate under the economic theory that we must produce and sell more than we did last year? We need jobs, but buying more stuff depletes our resources.”

—**Barbara Tellman**

Wagner: Infinite material growth on a finite planet isn’t possible. Simple as that. Still, we need to find practical steps we can take. We can’t all worry about humanity’s footprint on the planet whenever we go to the store. We

should worry about whether we are paying the full price for what we buy—including environmental costs. For more, see my recent blog post at edf.org/gwagnerblog.

Socialist vs. capitalist

“In Sweden we have had taxes on carbon dioxide emissions for a long time. Can you explain why a market-loving country such as the United States has not embraced carbon taxation?” —**Gunnar Köhlin**

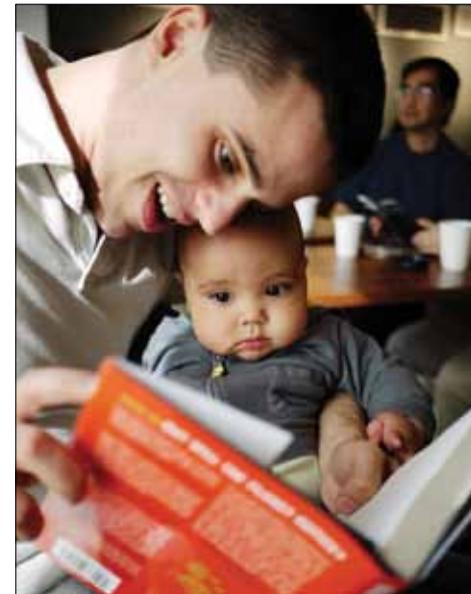
Wagner: That’s the big irony here. Leave it to socialist economic systems to start to privatize the cost of carbon pollution.

What can a student do?

“If the conservatives deny climate science and the liberals have no plan to counteract climate change (or are supporting projects like the Keystone XL pipeline), how do we get climate policies in place? What can students do to foster better policy?”

—**Lea Zeise, Madison, WI**

Wagner: The most important thing any student can do is to study up on the economics, and to encourage others to do the same. We need smart policy. As



Siripanth Nippita

Dr. Gernot Wagner, EDF economist and author, with his son and editor, Annan.

the Keystone XL pipeline shows [see page 14], there are plenty of misguided projects out there. (If you do a benefit-cost analysis of such a pipeline, ignoring the effects of global warming is about the worst thing you could do.)

EDF wants to hear from you. Submit comments by email (see page 2) or visit solutions.edf.org. All printed letters are edited for clarity and length.

SEND A POSTCARD FROM THE EDGE: EXTREME WEATHER, WITH A TOUCH OF IRONY

You can help end the denial of climate change. Send EDF’s striking e-cards to family and friends. Following a year of epic flooding, drought and back-to-back blizzards, we are learning exactly what extreme weather feels like. Such violent weather is just what scientists predicted we would see in a warming world. **Share the experience.**



➤ Go to edf.org/climate/extreme-weather

EDF MEMBERS GOT RESULTS IN 2011

100,000 Number of you who emailed your senators to vote against Rand Paul’s dirty air bill

2 million Number of emails you sent to decision makers

Thanks to all of you! With your help, we defeated Rand Paul’s clean air assault, derailed multiple attacks on EPA and bedrock environmental laws, and delayed the Keystone XL pipeline.

Now we need your help in 2012. Join the action network: edf.org/action

HEADING DOWN THE ROAD TO A GREEN ECONOMY



Superstock

California, with the world's eighth-largest economy, continues to charge ahead of Washington in confronting climate change.

In late October, the state's Air Resources Board voted to create a cap-and-trade market for greenhouse gases under California's landmark bipartisan 2006 climate bill, the Global Warming Solutions Act (AB32), which EDF cosponsored and defended in court and at the polls.

"California's law is proof that common-sense climate action is still possible on a large scale in the United States even though Washington, D.C. remains gridlocked," said Fred Krupp, EDF's President.

AB32 aims to cut California's greenhouse gas emissions (GHGs) to 1990 levels by 2020, while generating one-third of its electricity from renewable sources like solar and wind. The cap-and-trade market alone, which begins operating in 2013, will slash the state's warming emissions by an amount equivalent to taking some 3.6 million cars off the road.

Simple idea, big results

The basic idea behind the new market is simple. California "caps" the amount of GHGs that more than 300 facilities, accounting for about 60% of the state's warming pollution, may emit, and lowers that cap every year.

Companies receive permits (called allowances) to emit a decreasing amount of GHGs. Those that emit less than their limit may sell or trade the excess to companies that emit too much.

This gives both parties a powerful financial incentive to cut pollution. And it creates a market for innovators to develop better ways for companies to meet their goals.

"The cap-and-trade market is already driving investments," says Derek Walker, EDF's director of strategic climate initiatives. For example, California's three biggest utilities, with more than 15 million customers, have released plans for "smart grid" development to help them make greater use of renewable energy, energy efficiency and electric vehicles.

The benefits of the new carbon market extend far beyond the requirement that the state derive one-third of its energy from renewable sources by 2020. Other benefits include:

- Regulation of emissions from the state's largest industrial sources, including the cement industry.
- Preservation and better

management of state forests.

- More efficient appliances that cut energy use and emissions.
- Decreased pollution and more efficient water use in farming.
- Reduction of methane emissions from landfills.
- Drastic reductions in greenhouse gas emissions from motor vehicles.

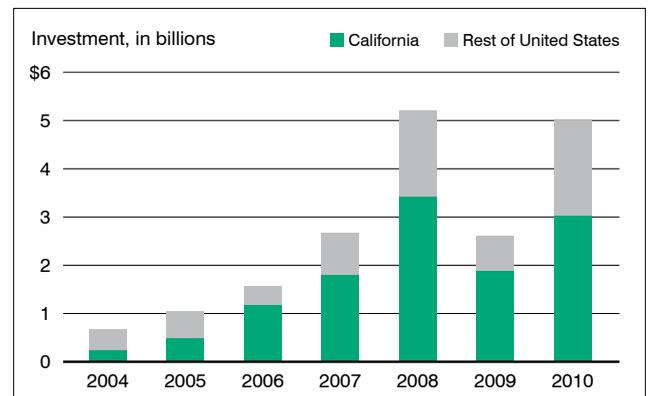
AB32 also allows companies to offset up to 8% of emissions by buying credits from projects that reduce greenhouse gas emissions in sectors like forestry. Tim O'Connor, EDF's director of California climate initiatives, expects the offset program will soon expand to agriculture. "We estimate our work with rice growers in California could, by 2020, generate a direct investment of \$35 million for offsets from more sustainable rice farming," he says.

Of course, the European Union already has a cap-and-trade market, and Brazil, China, South Korea and Australia are considering carbon taxes or carbon markets. All are racing to get ahead of the United States in the global clean-energy market.

That market's potential can be seen in California. Since AB32 passed, the state has received more than \$9 billion in clean-energy venture capital. It boasts 500,000 jobs in the clean-tech sector, which is growing much faster than the state's economy as a whole.

"This is only the tip of the iceberg," says O'Connor. "As California's role in the \$142 billion global carbon market grows, our competitiveness will only increase."

A MECCA FOR CLEAN-TECH CAPITAL



Source: The Cleantech Group

Since 2006, when AB32 became law, clean-tech investment in California has exceeded that in the other 49 states combined.

MAKING THE GULF OF MEXICO WHOLE AGAIN



Richard Schultz/Corbis

More than a year after BP's ruptured deepwater well in the Gulf of Mexico was capped, New Orleans remains vulnerable to hurricanes, and Louisiana's wetlands—which nurture the region's \$23 billion fishing industry—are in bigger trouble than ever. The state loses up to 30 square miles of coastland each year, due to canals and levees that starve the wetlands of sediment and freshwater.

The oil spill worsened the ecological disaster, but it also opened up opportunities to rethink how the Mississippi River and its delta are managed.

For 35 years, EDF has been at the forefront of efforts to restore Gulf Coast wetlands. In 2011, we joined forces with allies ranging from the Louisiana governor's office to the 17,000-member United Houma Nation to press for full restoration of the Gulf.

In an agreement EDF helped advance, BP committed \$1 billion in 2011 as a down payment for damages to Gulf natural resources. We also wanted to ensure that most of the Clean Water Act penalties from the BP disaster—which could reach \$21 billion—go to rebuilding badly damaged Gulf ecosystems.

We then helped shape a bill in Washington that would dedicate 80% of the fines to ecosystem restoration and economic recovery, instead of to the general federal budget. Cosponsored by two Democrats and seven Republicans, the proposed legislation represents a bipartisan milestone for a polarized Congress.

“EDF played a critical role in bridging the differences between the parties.”

—William K. Reilly, Co-chair, National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling

As Senators Mary Landrieu (D-LA) and Richard Shelby (R-AL) hammered out the bill, known as the RESTORE Act, we gathered support on both sides of the aisle by introducing provisions that were important to both Republicans and Democrats.

“Such bipartisan consensus is rare in the Senate these days,” said Shelby in a commentary he wrote for *Mobile's Press-Register* in October. “Without it, the RESTORE Act would have no chance of passing the Senate and reaching the president's desk.”

Our strategy included radio ads pointing out how investing in coastal restoration creates more jobs than oil and gas investments.

To advance wetlands restoration, EDF scientist Dr. Angelina Freeman helped develop a model project in Myrtle Grove, LA. It demonstrated how the Mississippi River's land-building power can be harnessed to restore wetlands

and protect coastal communities.

The Army Corps is now using EDF's wetlands rebuilding model on its first restoration projects.

Polls show that a large majority of voters clearly favor directing the oil spill penalties toward recovery of the Mississippi Delta and the Gulf Coast, but hurdles remain. This critical bill still needs to pass both chambers of Congress, which must act quickly before its focus shifts to the 2012 elections.



Lockwood/Animals Animals

Restoring wetlands protects coastal communities as well as threatened species like this Louisiana black bear cub.



WHAT'S NATURE WORTH?

By Peter Klebnikov

Beyond providing natural beauty and wildlife habitat, ecosystems perform valuable services—from controlling floods to purifying and storing drinking water. That's why EDF is encouraging the utilities, government agencies and companies that benefit from these services to invest in ecosystem protection.

Many of California's rivers are born in remote mountain forests and meadows, high in the Sierra Nevada. These ecosystems hold snowmelt like a sponge, slowly releasing pure water to downstream farms and cities during the dry late summer. Wildlife, too—from the great gray owl and sandhill crane, to the willow flycatcher and rare frogs—depends on this lush habitat in the summer heat.

Without the environmental services provided by such pristine ecosystems, we'd have to build more dams and treatment plants. It's far less expensive, in fact, to save the natural systems if we can.

This realization is at the core of EDF's nationwide effort to protect ecosystems by bringing in new investors.

We are encouraging government agencies, landowners and businesses to finance the conservation of the freshwater ecosystems on which they depend—because in doing so they'll help the environment and save money.

The High Sierra

Beginning with the 1848 Gold Rush, people began flooding into the remote territory along the California-Nevada border. The ensuing century of logging, overgrazing and development destroyed many of the region's marshy streambeds and lowered the water table. This has impaired the land's ability to provide clean water to farms and cities across the state.

Today, many of the remaining 400 square miles of meadows in the Sierra are damaged, and nearly one in five vertebrate species in the Sierra Nevada is at risk.

In 2010, the National Fish and Wildlife Foundation asked EDF to work with state agencies and other environmental organizations to create a program to restore the Sierra meadows. We knew that ranchers, who own 40% of the remaining meadows, would be key to any solution, so we held a series of meetings to win their trust. Then we

California has lost 90% of its wetlands.

developed an approach that will let them restore the meadows while ensuring their ranches' prosperity.

"EDF listened to ranchers without automatically blaming the cattle for the environmental damage and made them comfortable," says Elisa Noble of the California Farm Bureau. "There was no preconceived agenda."

In Plumas County, ranchers have already replanted native vegetation, slowed excessive stream flows and improved grazing practices.

"If we can get these fragile systems functioning properly, the benefits of a watershed-wide approach will be felt far and wide by cities and farms throughout the state," says our project coordinator Ashley Rood.

"Climate change predictions of larger floods and extreme drought make it even more urgent to restore ecosystems that can protect communities and wildlife," adds EDF conservation scientist Dr. Stacy Small-Lorenz.

Building relationships

Our program helps ranchers, many of whom are struggling to make ends meet, restore their meadows. "There is intense pressure to develop the West," says Rood. "One of the most heartbreaking things is the loss of ranches, one at a time. If we restore an entire watershed, we can help landowners hold on to their property through conservation payments and range improvements."

Rick Roberti, a plainspoken fourth-generation Plumas County rancher with a sense of humor as broad as the horizon, is one of our partners. Touring his ranch, nestled among mountains still streaked with last year's snow, Roberti points to a pile of broken farm machinery. "Our main crop here is iron," he jokes.

Like many of his fellow ranchers, he initially opposed the meadow restoration project. Even after he signed on, he says, "My friends saw me putting up fences to keep the cattle out of the stream, and said: 'What the heck are you doing?'"

Now Roberti is proud of the 20-acre meadow he helped recreate on his land. "Before it looked like a dust bowl," he says. "Now look at it. It's a beautiful, healthy meadow. I see sandhill cranes and other rare wildlife. And there's better forage for my cattle."

And Dave Goss, a rancher who lives nearby, speaks excitedly of how his grandson caught a 23-inch trout in



Rolf Nussbaumer/Minden Pictures

Black-chinned hummingbirds are drawn to newly replanted riverside forests.

what, until recently, was a ditch. "This restoration has done me a lot of good in so many ways," he says.

To date, thousands of acres have been restored. The National Fish and Wildlife Foundation has now set a goal of conserving 60,000 acres. As Roberti says: "If every rancher makes an effort, we can change things around here."

A big vintage

Further down the watershed lie the great farms of the Central Valley. Around Lodi, CA, the area is ideal for wine grapes. The cool nights increase acid in the grapes while warm days ensure just enough sugar content. Many growers have been here for generations.

The slow-moving Mokelumne River winds through these lush fields. It supplies 90% of the water for 



Mathew Grimm

EDF's Ashley Rood speaks with rancher Ned Coe about restoring Sierra Nevada mountain meadows, which store and filter water for California cities and farms.



Photos.com

Winegrowers, who have a reputation for being environmentally progressive, are working with EDF to rebuild habitat, even as they increase profits.

the East Bay Municipal Utility District, which serves 1.3 million people around Oakland and Berkeley. It also provides hydroelectric power to 125,000 homes through a PG&E dam.

Extensive forests once flourished along the Mokelumne's banks. But over the past century, logging, agriculture and development have transformed the landscape. Dam construction cut off Chinook salmon migration routes and blocked the gravel and wood that the salmon need for spawning. The loss of the forest decreased shade, making the water too warm for salmon in places, and reduced habitat for birds like the yellow warbler. Erosion sent sediment into the river, harming downstream habitat.

Today, EDF is working with winegrowers and other landowners to restore the river's ecosystem. "Our goal is to restore rivers and riverside habitat in ways that are compatible with thriving agriculture," says Ann Hayden, EDF senior program manager. "And we'd like to replicate the program in watersheds throughout the country."

Chris Storm is sustainability manager at Vino Farms, which raises 4,300 acres of zinfandel, syrah and other varieties of grapes. Storm is one of a new generation of growers who are preserving wildlife habitat by introducing sustainable methods—while at the same time increasing their profits.

"Growing wine is about telling a story," he says. "This is ours." He explains that Vino's commitment began in 2006 with an agreement EDF helped broker to restore wildlife habitat. Vino then brought in 500 goats to browse invasive blackberry bushes and planted native vegetation along the lower Mokelumne. Today, young cottonwoods, ash and box elders flourish along the riverbank, while sweet-smelling mugwort and elderberry shrubs attract butterflies and bees. The river's edge has become more hospitable to Swainson's hawks and 60 other bird species.

In the vineyards, separating the varieties of grapes, newly planted hedgerows teem with beneficial insects like parasitic wasps, which reduce the need for pesticides. "This is important because we now fight a new pest species every year," says Storm. "It's better for the ecosystem, and it's better for the bottom line. I'm also convinced it makes the grapes more intense in flavor."

Winemakers agree. Michael-David Winery and Bogle Vineyards, for example, are paying Vino and other growers a premium price for sustainable production on 25,000 acres under the Lodi Rules Sustainable Winegrowing program.

Much of the impetus for sustainable labels comes from big-box retailers like Costco and Walmart, who are responding to consumer demand.

VALUING ECOSYSTEMS

What if you could create a market for financing the restoration of threatened ecosystems around the country? EDF is attempting to do just that in California. First, we're developing tools to measure the economic value of an ecosystem. Next, we'll attract public and private investors to finance its conservation.

The Department of Agriculture (USDA) awarded a grant to EDF and our partners to find ways to measure the benefits of preserving the Mokelumne River watershed. We will also create an accounting system that lets utilities, government agencies and others pay landowners to conserve habitat.

"EDF is a leader in determining which of nature's services are most valuable and translating that information into investment decisions on a large scale," says Mark Nechodom, senior advisor for environmental markets with the USDA.



Gary Whitton/Shutterstock

Well-managed forests and meadows store water, reducing the need for new dams.

The goal is to replace concrete with green infrastructure. For example, global warming and changes in runoff patterns are increasing the risk of costly flooding downstream. For the state's utilities, investing in floodplain buffers could be far more cost effective than building new dams, while also benefiting ranchers and wildlife.

"Farmers and ranchers who manage their land responsibly help nature and people," says Holly George of University of California's Cooperative Extension. "EDF is doing valuable work in creating ways to pay them for these services."

“EDF is helping us see the benefit of replanting the riverbanks,” says Storm. “The alternative—a flat monoculture—benefits no one except the chemical companies.”

There's carbon in them thar lowlands

Journey's end for the Mokelumne is the Sacramento–San Joaquin Delta, the hub of California's water supply system. The 1,150-square-mile Delta, once a vast expanse of rich peat soil wetlands, has been drained over the past century for agriculture. Thousands of miles of levees now channel the water's flow, and the drainage has caused the land to subside so severely that some places in the Delta are now 25 feet below sea level. Entire towns and the state's capital, Sacramento, are now in danger of flooding.

But the Delta could be rescued by its own remarkable ability to store carbon, an ecosystem service that will become highly valued when California launches an economy-wide cap-and-trade market for carbon dioxide and other greenhouse gas emissions in 2013. By rewarding carbon storage, this market could enable the state's industries to offset part of their global warming pollution by paying Delta farmers to literally “grow” wetlands.

EDF is working with The Nature Conservancy and the California Department of Water Resources to develop pilot projects that could make this idea a reality, while also providing flood control and restored habitat for more than 300 species of mammals, amphibians and birds. The state has committed over \$2 million to launch the first such project on Twitchell Island.

In the end, of course, many of nature's most precious benefits can never be wholly quantified. Which is as it should be.

Standing in the shade of a restored native forest, Chris Storm says he will never cut it down, even though it shades his wine grapes.

“For me, it's about doing the right thing,” he says quietly. “Plus, I welcome the shade on a hot day.”

▶ SLIDESHOW: See how ranchers are improving mountain meadows at edf.org/sierrameadows

FINDING VALUE IN WILD LANDS, FROM THE SUMMIT TO THE SEA

The bounty of nature is priceless, but unfortunately that means nature's many benefits are often treated as free. EDF is quantifying the value to society of threatened California ecosystems and finding potential partners who'd benefit from restoring them. Our goal is to replicate this model nationwide.

Managing forests better

- Prevents catastrophic fires
- Protects drinking water for as many as 1.3 million people
- Offers cheaper alternative to water treatment or new dam construction
- Decreases sedimentation downstream

INVESTORS: utilities; municipalities; state and federal government

Reviving mountain meadows

- Creates habitat for vanishing species
- Improves livestock forage
- Filters water for cities and farms
- Serves as a natural reservoir
- Sequesters carbon

INVESTORS: utilities; state and federal agencies

Restoring streams and riparian vegetation

- Improves habitat for salmon and steelhead
- Decreases operating and maintenance costs for dams
- Decreases erosion and improves water quality
- Provides flood control

INVESTORS: federal and state agencies; wineries

Rebuilding wetlands

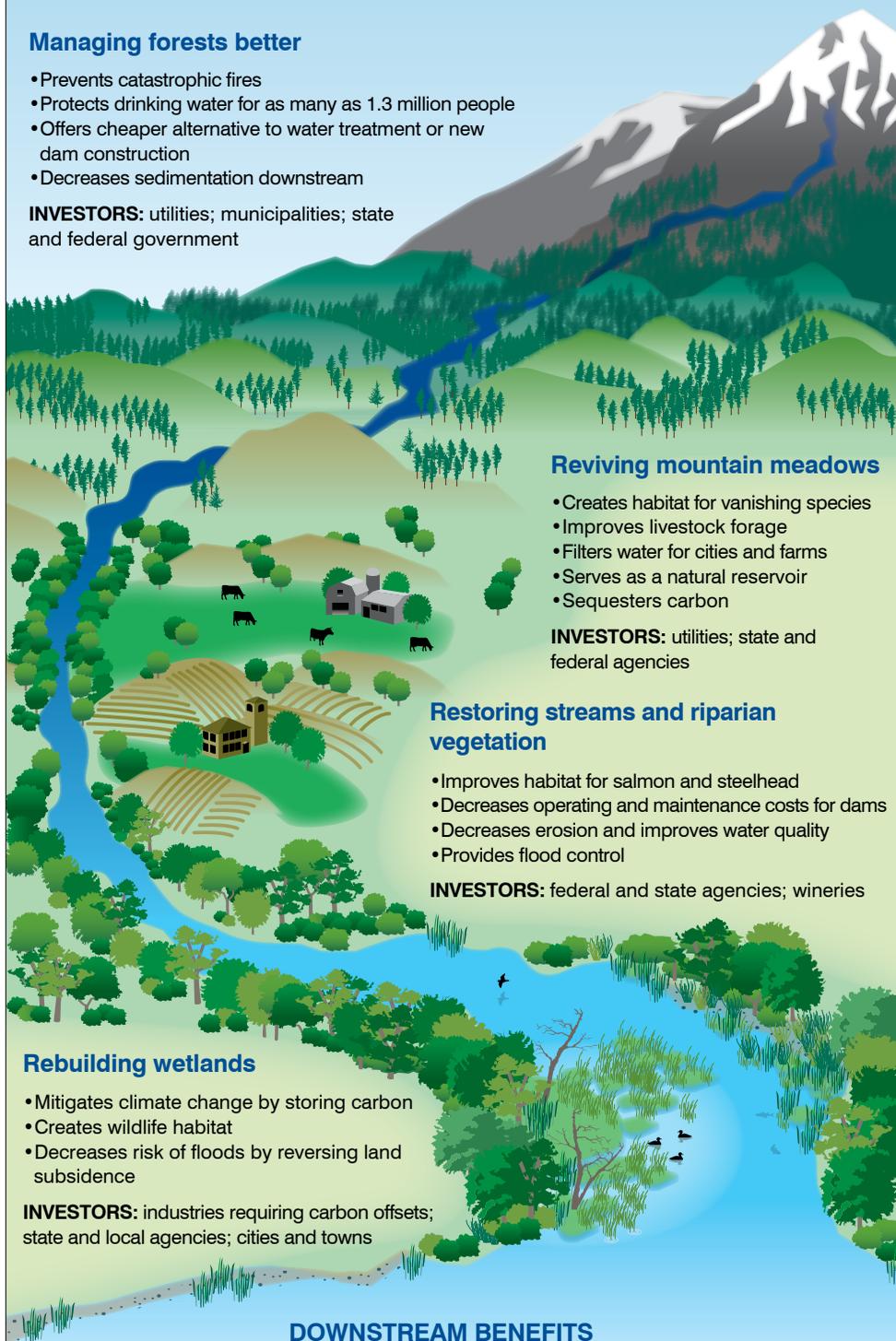
- Mitigates climate change by storing carbon
- Creates wildlife habitat
- Decreases risk of floods by reversing land subsidence

INVESTORS: industries requiring carbon offsets; state and local agencies; cities and towns

DOWNSTREAM BENEFITS

FISHERIES: Benefits the salmon industry by improving habitat conditions in spawning streams.

URBAN: Improves water quantity and quality for cities and farms to the south.



A NEW WORLD OF ENERGY

From California to New York, a greener electric grid is taking root



John Rae

Borrego Springs, CA, population 3,500, is a throwback to America's past. This high desert community of pueblo-style houses, 80 miles northeast of San Diego, has no traffic lights and no big-box stores. Its main attraction is the dark night sky, making it a haven for astronomers.

But behind its sleepy facade, Borrego Springs is a laboratory of technologies that could transform the nation's energy future. It's where San Diego Gas & Electric (SDG&E), working with EDF and others, is field testing elements of a \$3.6 billion plan to modernize the power grid.

Since Thomas Edison's day, the electric grid has run one way—from generating stations to customers. The smart grid adds computer intelligence to make it a two-way street.

"The promise of the smart grid is that a house with solar panels and a plug-in car in the garage can not only consume power but also produce, store and sell it," says EDF's smart grid director Miriam Horn. "It means we can bring supply and demand into harmony."

For example, smart appliances can pause briefly when solar or wind power is interrupted, and the smart grid can signal cars to recharge when there is a surplus of clean power. All this will allow SDG&E to make far greater use of renewable energy.

The advances being explored at Borrego Springs will help California meet its goal of generating one-third of its electricity from renewable sources by 2020—and bring electric cars to scale without causing brownouts.

"Our goal is to improve our efficiency and empower our customers to have more control over their energy use," says Armando Infanzon, SDG&E's smart grid policy manager. "EDF helped us tremendously with our deployment plan."

The smart grid will allow people to control their home energy use from anywhere they are. "It's crucial for utilities to take advantage of technology like smart phones and the Internet that are already in the hands of customers," says Infanzon.

The main impetus for change is California's landmark Global Warming Solutions Act (AB32), which EDF helped write and cosponsored in 2006. The law establishes America's first economy-

wide cap-and-trade program for carbon emissions (*see story, page 4*).

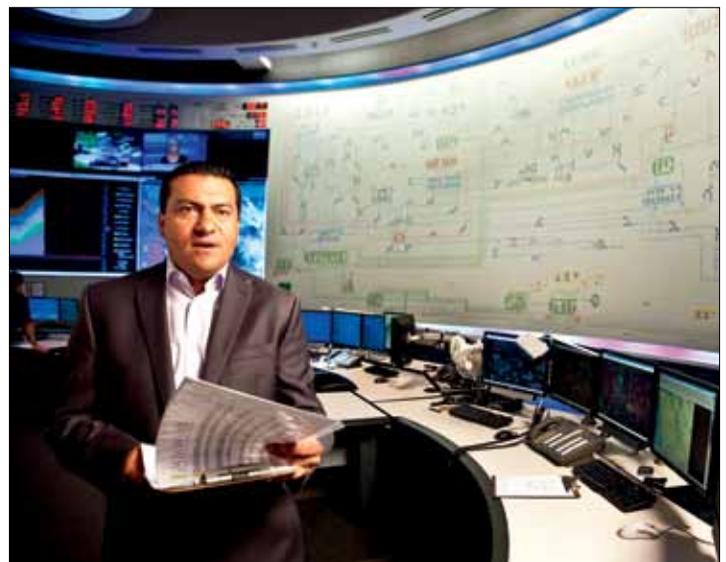
Electricity generation is the largest source of U.S. greenhouse gas emissions, but the smart grid could help utilities cut their emissions as much as one-third by reducing peak demand and improving efficiency, all while meeting the growing need for power.

EDF helped the California Public Utilities Commission (PUC) develop guidelines for smart grid investments by the state's investor-owned utilities—SDG&E, Pacific Gas & Electric and Southern California Edison—which serve 20 million customers.

"EDF has played an indispensable role in ensuring that our smart grid investments deliver environmental returns," says California PUC president Michael Peevey.

Customers are also pushing for change. "Seeing how much the electricity costs when I fire up the big screen or air conditioning is changing my habits," says Julian Granirer of San Diego. SDG&E estimates that its investment will cut 6.8 million tons of global warming pollution and save up to \$615 million in fuel costs annually.

EDF is also working on smart grid projects in Texas, North Carolina, Illinois and New York. "Investing in the smart grid costs less than building new fossil-fuel plants and transmission lines," says EDF attorney Lauren Navarro, "and can save money for customers."



John Rae

"Changes in the way electricity is delivered will be greater in the next ten years than in the past 100," says Armando Infanzon of SDG&E.

THE U.S., CUBA AND OIL DIPLOMACY



Radius Images/Corbis

As the Obama Administration tightens safety standards for deepwater drilling in U.S. waters, Cuba begins its own drilling program. Will it be safe enough?

By January 2012, Cuba plans to begin drilling for oil just 60 miles from Key West, in partnership with the Spanish oil company Repsol. Within 18 months, there could be six exploratory deepwater wells in operation in the pristine waters where Ernest Hemingway once fished.

A major oil spill in Cuban waters would have devastating impacts in both Cuba and the United States. Florida's \$60 billion tourism and fishing industries—as well as the Dry Tortugas marine sanctuary and deepwater corals in the Southeast Atlantic—are at stake.

That's why EDF has started a conversation between Cuban and U.S. officials to ensure that any drilling is done safely. The 2010 BP oil disaster in the Gulf of Mexico was a reminder of how damaging a blowout is, and how hard it can be to cap a leak in deep water.

But the demand for energy surges on—and not just in the United States. Vast untapped reserves of oil and gas lie off Cuba's north shore—enough, experts say, to make Cuba a net exporter of oil.

In September, EDF, operating under a special license from the U.S. government, led an unprecedented delegation to Cuba, including former EPA administrator

William K. Reilly, co-chairman of the BP oil spill commission. The goal was to assess Cuba's offshore oil and gas plans and to share lessons learned about the risks of offshore drilling with Cuban officials.

"The trip put the spotlight on the lack of dialogue between the United States and Cuba on how to prepare and respond to an oil spill in Cuban waters," says Lee Hunt, head of the International Association of Drilling Contractors, who helped organize the trip. "EDF has proved itself as an influential voice and broker for environmental diplomacy."

After broad media coverage, Dan Whittle, the director of EDF's Cuba program, was asked to testify before the U.S. House Natural Resources Committee. "The Administration should take immediate steps to initiate negotiations with the Cuban government to ensure that sufficient environmental and safety standards are in place before drilling begins," he said.

It's a sensitive political issue because if there were a spill, U.S. technology might be prevented from being quickly deployed due to the long-running U.S.

embargo of Cuba.

From an economic standpoint, it's hard to criticize Cuba for its desire to exploit its natural resources. The United States has more than 5,000 wells in its territorial waters in the Gulf. But none are nearly as close to the Florida coast as the proposed sites off Havana.

At our urging, the Obama Administration has agreed to pre-authorize some U.S.-based companies to assist in preventing and containing major oil spills in Cuban waters. "That's a start," says Whittle, "but we need a more comprehensive policy, with direct government-to-government engagement."

"The United States has strong spill-response agreements with Canada, Mexico and Russia," Whittle adds. "We need to make sure Cuba has the same safeguards and rigorous oversight. We can't let politics get in the way of common-sense actions."



Carol Zuber Mallison

Due to prevailing currents, an oil spill in Cuban waters could foul beaches and marine life from Florida to North Carolina.

LET'S GET DRASTIC WITH PLASTIC

How to recycle what they won't pick up at the curb

Here's a shocking statistic: Of the 30 million tons of plastic Americans tossed out in 2009, a mere 7% was recycled. The rest wound up clogging landfills, littering streets or sluicing down waterways into the ocean. In response, many of us are avoiding

single-use plastics and finding other ways to recycle them. You can start by taking full advantage of curbside programs and municipal recycling centers. Then consider going the extra mile to recycle the plastics that they don't accept.

Here's how:



LDPE (low-density polyethylene)
PLASTIC BAGS, WRAPPINGS



PP (polypropylene)
CONTAINERS AND LIDS



PS (polystyrene)
PLASTIC TAKE-OUT, STYROFOAM



HARD-TO-RECYCLE WASTE

EXAMPLES

Supermarket and produce bags, bags inside boxes, case wrap for snacks, wrap for packs of water bottles, wrap for paper products.

Yogurt and similar containers, food storage containers (including Tupperware), medicine bottles, threaded twist-top caps, flip-top caps on squeeze jars and bottles.

Plastic take-out containers, Styrofoam egg cartons and meat trays, molded Styrofoam for shipping, packing peanuts, disposable cups, plates and utensils.

Candy wrappers, potato chip bags, juice drink pouches, pens, cookie packages, tape dispensers and glue bottles.

WHERE TO RECYCLE

Bring collected bags to designated drop-off bins at more than 12,000 locations nationwide: pharmacies (like Rite Aid, CVS), grocers (like Albertsons, Kroger, Publix, Stop & Shop, Trader Joe's, Waldbaum's), and national retailers (like Walmart, Barnes & Noble, Staples, Target, JC Penney).

Plastics stamped with the #5 symbol can be dropped off at "Gimme 5" locations nationwide, including more than 230 Whole Foods markets, or mailed to the Gimme 5 redemption center (see preserveproducts.com/recycling). PP caps and lids, even if not stamped #5, may be recycled at official Aveda retail stores.

Go to Earth911.com, type in #6 and your zip code, or return to Dart Container.¹ For molded Styrofoam (except foodware) refer to pdf in epspackaging.org.² Packing peanuts are reused by many shipping stores, including Mail Boxes Etc. and The UPS Store.

A company called Terracycle (terracycle.net) organizes programs to collect hard-to-recycle waste. Terracycle donates 2 cents or more per item to the charity or school of your choice.

SECOND LIFE

New bags and packaging, composite lumber, backyard decks and fences, lawn and garden products, playground equipment.

Cutting boards, colanders, plates, cups, toothbrushes, razors, cutlery, bottle caps, plastic lumber, car battery cases.

Molding, insulation, plastic lumber, flowerpots and other products.

Fences and park benches, picture frames, waste bins, tote bags, backpacks, pencil cases, baby toys and more.



RESOURCE BOX

To recycle packing peanuts
Recycling information by zip code
Mobilize your community
Recycling agencies, by state
Plastic bag recycling laws by state
Environmental Protection Agency overview

loosefillpackaging.com
Earth911.com
americarecyclesday.org/toolkit
1800recycling.com/state-guidelines
plasticbaglaws.org/legislation/state-laws
epa.gov/osw/conservation/rrr/recycle.htm

¹ dart.biz/web/envirom.nsf/pages/drop-off.html ² epspackaging.org/imagesstories/Drop_Off_Recycling_Locations911

MISSION POSSIBLE: EDF CLIMATE CORPS IS ON ENERGY'S FRONT LINES



From Baghdad to B-school: Former Capt. Greg Zielinski, pictured here with an Iraqi colleague, says sustainability is his new mission.

Duty. Honor. Country. Those ideals have been ingrained in former U.S. Army Capt. Greg Zielinski's mind ever since he was a cadet at West Point. He carried them with him to Iraq, where he served as a platoon leader and logistics officer in West Baghdad from 2007 to 2009.

Now an MBA student at MIT's Sloan School of Management, Zielinski was hired as a 2011 EDF Climate Corps fellow at Union Pacific Railroad in Omaha, NE—part of our innovative program to boost energy efficiency and train a new generation of green business leaders.

"I still feel I'm serving my country,

but in a different way," says Zielinski, one of four military vets in EDF Climate Corps this past summer.

In his 11-week stint at Union Pacific, Zielinski examined energy use at the railroad's maintenance shops and rail yards around the nation. By fixing leaks in air compressor systems and switching to LED lighting, he discovered,

the railroad could cut 10,000 tons of carbon pollution annually and save \$1.1 million.

"Before Iraq, I took energy for granted," Zielinski says. Now, sustainability has become his new career mission.

Zielinski was one of 96 MBA and MPA students EDF put through intensive training and deployed to 78 companies, cities and universities to find energy savings. Destinations ranged from AT&T to Target to the New York City Housing Authority.

All told, the 2011 fellows recommended changes to lighting, computing and ventilation practices that could cut as much pollution as taking

87,000 SUVs off the road.

Since EDF started Climate Corps in 2008, the students have uncovered efficiencies that could save more than \$1 billion in net operational costs over project lifetimes. Companies are implementing projects accounting for 86% of the savings identified in the first three years, investing more than \$50 million to do so.

"In this economy, everyone is looking for ways to save, and energy efficiency is a huge, largely untapped opportunity," says Victoria Mills, our Corporate Partnerships managing director.

EDF Climate Corps began with companies and expanded to the public sector. North Carolina A&T University, for example, is acting on recommendations that could save \$2.5 million over five years—and pay for themselves in just three months.

Now the program is poised to grow even further. And several EDF Climate Corps fellows, such as Elizabeth Turnbull, a 2010 fellow at Adidas, have been hired full time after graduation to work on environmental initiatives.

"We're building a diverse movement to make energy efficiency a top priority for every organization that pays a utility bill," says Michael Regan, EDF director of energy efficiency.

YOUR LEGACY TO THEM: A FUTURE

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CLEAN AIR UPDATE

A win for port cities

EDF, working with the Environmental Protection Agency (EPA), has created a new program to slash diesel emissions from trucks at U.S. ports. The program gives truckers incentives to upgrade to cleaner models, including access to low-interest loans and help on down payments.

EDF also helped convince some of the biggest retailers, including Walmart, Lowe's and Best Buy, to transport 75% of their off-loaded cargo on cleaner trucks by 2014.

"Trucks, ships and cargo handling equipment at ports create vast amounts of diesel exhaust pollution," says EDF health scientist Dr. Elena Craft. "This is a big win for port cities."

The Ports of Long Beach and Los Angeles, for example, are Southern California's biggest sources of air pollution. Together, they emit more diesel exhaust than 15,000 tractor-trailers idling their engines year-round.

Courts to developers: Cut pollution

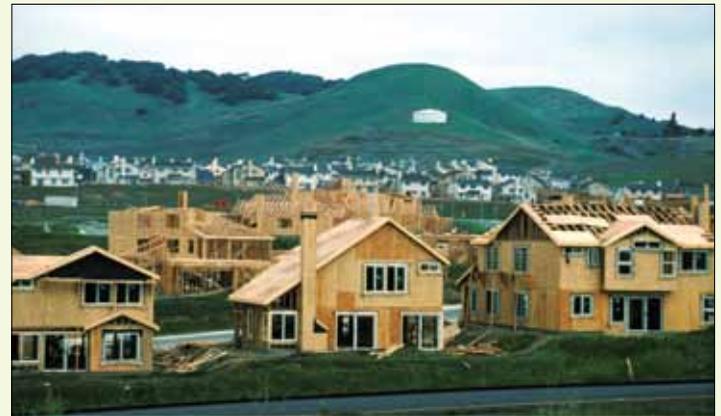
The U.S. Supreme Court handed EDF an important victory in October when it refused to review a challenge by developers to a critical clean air law.

In 2006, local officials in California's San Joaquin Valley, with EDF's help, passed a law that encourages developers to reduce emissions by building new developments near existing shopping

centers and bus stops, adding bike lanes, and using cleaner construction equipment. The National Association of Home Builders challenged the law, and EDF intervened in the case, prevailing in the lower courts.

The Supreme Court's decision will resonate well beyond the Valley, because other jurisdictions have already adopted, or are considering, similar laws.

Next to Los Angeles, the San Joaquin Valley has the worst air pollution in the country.



Jeff Greenberg/PhotoEdit Inc.

Following our court wins, more cities in California are considering laws that limit the air pollution impact of new development.

KEYSTONE PIPELINE ON HOLD

Following widespread opposition—including 28,000 emails to the White House from EDF members—President Obama ordered a new review of the Keystone XL oil pipeline.

The proposed pipeline would carry crude that generates more greenhouse gas emissions than conventional oil. There are concerns that pipeline leaks could poison the Ogallala Aquifer and endanger Nebraska's unique Sandhills ecosystem.



Carol Zuber/Mellison

EDF sues over ozone delay

In October, EDF filed suit in federal court to force the Obama Administration to tighten standards for ozone pollution, the principal ingredient in smog. The action came a month after the Administration announced it would delay a new, stricter rule until 2013.

Scientists say that a stronger ozone standard will save 12,000 lives every year and prevent 58,000 asthma attacks, while avoiding 21,000 hospital and emergency room visits. EDF was joined in the suit by the American Lung Association and two other environmental groups.

"The Administration's decision was a big disappointment," said EDF's general counsel Vickie Patton. "It ignores the unanimous recommendation of EPA's own scientific advisory board. We're confident we will prevail in court."

Calling the shale gas industry to task



As states consider more drilling for shale gas, EDF is working to protect water supplies.

America's natural gas industry was born in New York State in 1825, when an entrepreneur drilled a shallow well and piped gas to local businesses through hollowed-out logs.

Today, New York is central to the national debate over hydraulic fracturing, or fracking, the controversial process of injecting water, sand and chemicals deep underground to release natural gas locked in shale.

In 2010, New York put a moratorium on drilling pending an environmental

review. Last September, state officials unveiled a draft plan to permit drilling but protect key watersheds. Mark Brownstein, chief counsel to EDF's energy program, sits on a state advisory panel and is fighting for tougher regulations and enforcement.

In West Virginia, EDF is helping update inadequate rules on shale gas

development, as well as advising local groups and key leaders.

In Wyoming, Texas and Montana we successfully pushed for laws requiring disclosure of chemicals used in fracking, and have helped shape proposed rules to accomplish the same goal in Colorado.

"Public opposition to new natural gas development will grow without strong regulations, backed by vigilant enforcement," says Fred Krupp, EDF's president. "The gas industry has yet to earn the public's trust."

Stars to Congress: Listen to your mothers



Actress Julianne Moore tapes an appeal for stronger mercury and air toxics standards.

Moms Clean Air Force (moms-clean-air-force.org) has strengthened its voice with new celebrity power: Actresses (and mothers) Blythe Danner and Julianne Moore have each starred in videos urging the critical importance of maintaining the Clean Air Act's protections against mercury, arsenic and other poisons. Started with EDF's help last summer, the grassroots organization now includes a core of 12 bloggers and 37,000 members. Says Danner, "Nobody wants their children to breathe air that is full of toxins."

When China's factories go green, the whole world profits



Exports, including jeans, account for 33% of China's carbon pollution.

Roughly 20 pairs of jeans are sold in the United States *every second*. Imagine if all jeans were green—that is, sustainably produced?

Levi Strauss & Co. took a step in that direction by partnering with EDF to improve the energy efficiency of its supply chain in China, where 40% of jeans sold by the apparel industry in America are made. The project evolved from our partnership with Walmart, in which EDF experts visited more than 400 Chinese factories to identify energy-saving opportunities.

"Energy efficiency is the fastest, most cost-effective way to cut greenhouse gas and air pollution in China," says our project

manager Dr. Andrew Hutson. "Simple changes to lighting, heating and ventilation have yielded impressive results."

Our partner in the Levi Strauss & Co. initiative is Sustainable Development Capital LLP, a London-based investment bank. "One of the main barriers to energy efficiency improvements is the lack of access to capital," says Hutson.

EDF is initially working with five denim mills, with a first-year goal of enrolling 100 factories and attracting \$50 million in private capital to cut their energy use 25%. Long term, we aim to unlock billions of dollars to invest in energy efficiency for Asia's entire textile industry.

PROTECTING THE MAYA FOREST

EDF unites with forest communities in Mexico to combat climate change



CULTIVATING SUSTAINABLE FARMING PRACTICES



Shade-grown coffee

CREATING A MARKET FOR THE CARBON STORED IN FORESTS



The forest sequesters carbon

Rich in biodiversity and ancient culture, the Maya Forest is also a vast storehouse of carbon, which, when released into the air, contributes to climate change. With one-third of Mexico blanketed by forest—most of it communally managed—it's vital that local people get more value from keeping trees alive than cutting them down.

In a new project, EDF is working to protect the Maya Forest—the second-largest tropical forest in the Americas—by connecting forest communities in Chiapas State with opportunities to improve their livelihoods. Through such efforts, these long-term stewards of the forest can help preserve its treasures.

Learn more about EDF's work with forest communities worldwide, at edf.org/foreststewards



Selling forest products

ENCOURAGING SMART FORESTRY PRACTICES TO PRESERVE TREES AND WILDLIFE



Prime habitat for jaguars



Home to the scarlet macaw