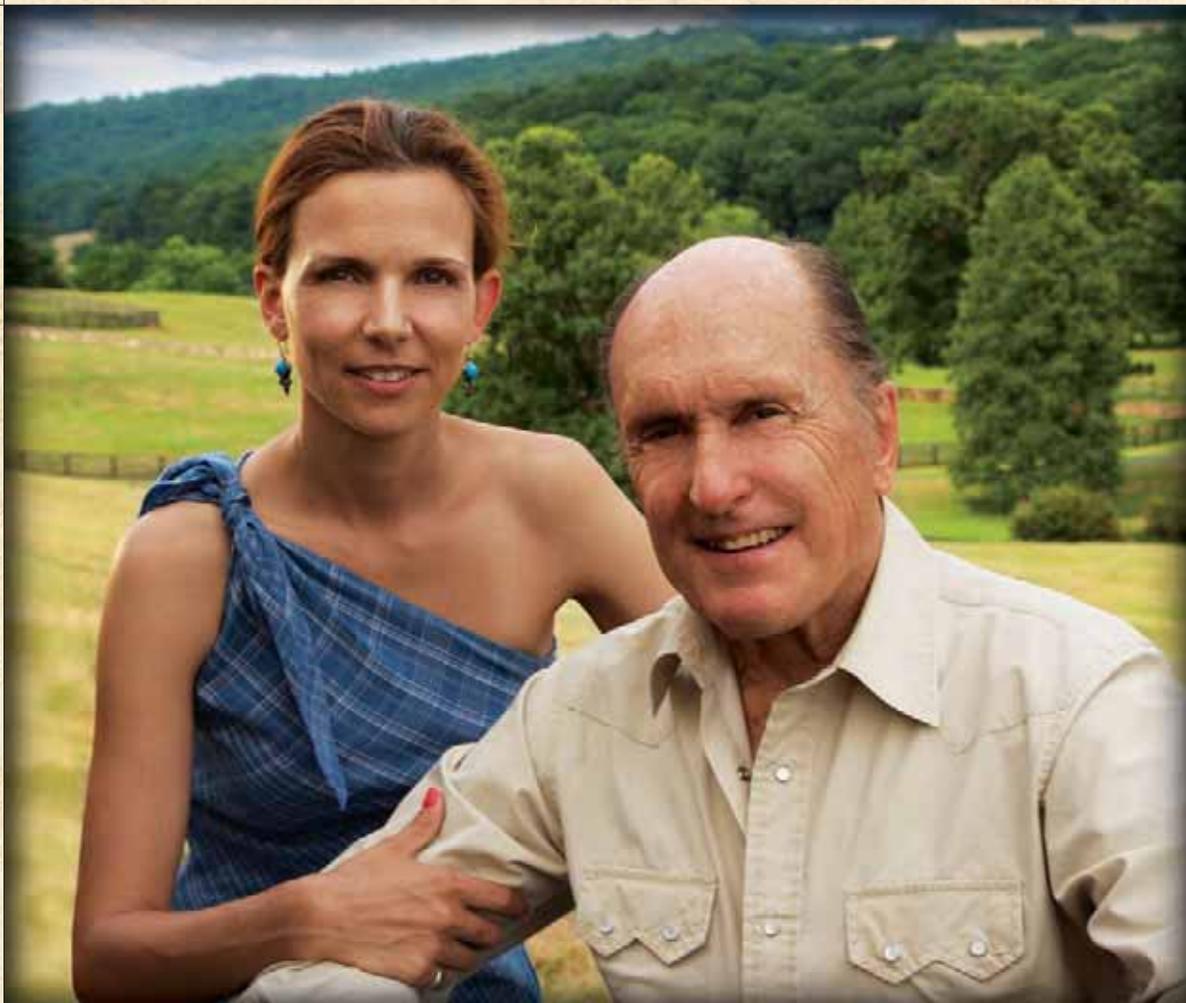


Global Warming and the Lost Lands: Understanding the Effects of Sea Level Rise ■ **An Assault on Bristol Bay** ■ **Living Green** What Makes Carpet Green? ■ **The U.S. Air Force: Pushing the Envelope** Creating Solutions for America's Energy Concerns ■ **Earth View** Why Land Trusts are So Critical ■ **Doing Business with the Poor for Prosperity** ■ **Sustainable Solutions** SC Johnson ■ **Building Smart** Better Building with Logs ■ **Knowledge Sharing** Lessons from America's First Land Managers ■ **Going Global** Focusing on Local Needs and Opportunities ■ **Corporate Commitment** Building a Better World ■ **Change Agents** Forests To Fight Poverty ■ **Personal Perspective**

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Robert and Luciana Duvall

Saving Rural America

The Fight Against the NIET Corridors



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Bristol Bay, Alaska
Photograph by Robert Glenn Ketchum

The Price of Detachment

When I was a child, life was so much easier. People were interconnected – not just families, but neighborhoods, schools and churches. People actually liked each other and wished one another well. Over the years all that has changed: couples divorce and families separate, neighborhoods die and destructive elements gain hold, schools baby-sit rather than inspire and churches struggle to survive. I'm not sure when life changed; it just seemed to happen one day, and the world has suffered a terrible blow.

My husband, who was raised on a farm, thinks it's because people don't have to depend on each other anymore. Farm families depended on each other for their survival, so they made their relationships work. No one had to ask for help; everyone just pitched in. It was in their DNA.

What happened to us? Maybe we did stop needing each other, which is why we began to separate from our families, our neighborhoods, our schools and our churches. And the more independent we became the more we moved away from the center of life. Was this detachment prompted by our wondrous technological advances? Or did it creep in when money became king and everything else became secondary? Did it happen when TV replaced nature as the premier nurturer? Or maybe it happened when violence became entertainment.

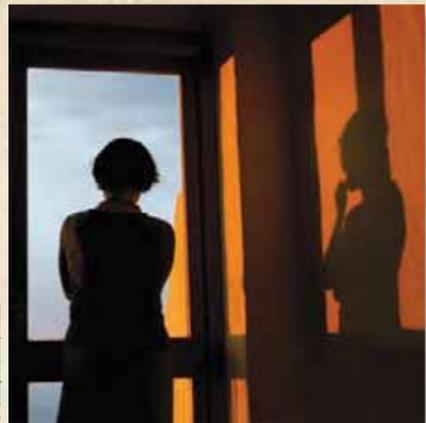
Regardless of why, it's time to reengage in life in the most basic way. We must start caring more for each other and for the world. By whatever means possible, we must find our way back home, not only individually but collectively, as a nation, in order to regain our self-worth and our faith.

“... when by physical and mental barriers we violently detach ourselves from the inexhaustible life of nature; when we become merely man, not man-in-the-universe, we create bewildering problems, and having shut off the source of their solution, we try all kinds of artificial methods each of which brings its own crop of interminable difficulties . . .

“... Man must realize the wholeness of his existence, his place in the infinite; he must know that hard as he may strive he can never create his honey within the cells of his hive, for the perennial supply of his life food is outside their walls. He must know that when man shuts himself out from the vitalizing and purifying touch of the infinite, and falls back upon himself for his sustenance and his healing, then he goads himself into madness, tears himself into shreds, and eats his own substance . . . His wealth is no longer magnanimous; it grows merely extravagant. His appetites do not minister to his life, keeping to the limits of their purpose; they become and end in themselves and set fire to his life and play the fiddle in the lurid light of the conflagration . . . Man appears, instead as a psychological problem, or as the embodiment of a passion that is intense because abnormal, being exhibited in the glare of a fiercely emphatic artificial light. When man's consciousness is restricted only to the immediate vicinity of human self, the deeper roots of his nature do not find their permanent soil, his spirit is ever on the brink of starvation, and in the place of healthful strength he substitutes rounds of stimulation. Then it is that man misses his inner perspective and measures his greatness by its bulk and not by its vital links with the infinite, judges his activity by its movement and not by the repose of perfection – the repose which is in the starry heavens, in the ever-flowing rhythmic dance of creation.” – written by Rabindranath Tagore from his book *SĀDHANĀ: The Realisation of Life*; MacMillan and Co., Limited; Calcutta, Bombay, Madras, London. 1920.

Rosemarie Calvert
Independence, WV

P.S. – Our Center for a Better Life consortium, www.centerforabetterlife.com, belongs to everyone who cares about change. When you have a moment, please log on and become a member; it's free. Thank you!



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life...we must care for each
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Cover Photo - Bill Simone
Cover Design - Rick Wattai

In Memorial

livebetter is dedicated to John G. Colson, who passed away from lymphoma in 2007. He was not only a consummate publisher but also a good friend. Without his enthusiasm, guidance and support this magazine might not have been possible.

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SUBSCRIPTIONS: U.S.: \$12/year, Students: \$8/year, Seniors: \$8/year, Government: \$8/year, Military: \$8/year. For foreign subscriptions please call 1-304-892-3811 or email rcalvert@forestpartners.net for more information. Send U.S. funds to *livebetter*, P.O. Box 247, Newburg, WV 26410 or log onto our website at www.centerforabetterlife.com to subscribe via the internet.

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Below is a partial list of some really great human beings who have been kind enough to share their time, energy and enthusiasm with us in an effort to promote the importance of sustainability.

1. Actor Robert Duvall and his wife, Luciana Duvall
2. Robert Glenn Ketchum, Nature Photographer and Author
3. Major General Fulberg, U.S. Air Force Civil Engineer; President, Society of American Military Engineers (SAME)
4. Lt. Colonel Brian Weidmann, Air Force Program Manager, Office of the Civil Engineer
5. Professor Vincent Gaffney, Chair in Landscape Archaeology and Geomatics, University of Birmingham, The Institute of Archaeology and Antiquity, Edgbaston Birmingham, United Kingdom
6. Edwin Pinero, Federal Environmental Executive, Council on Environmental Quality, Executive Office of the President of the United States
7. Alex Beehler, Asst. Deputy Under Secretary of Defense, Environment, Safety & Occupational Health
8. Lloyd Timberlake, Director North American Office, World Business Council for Sustainable Development
9. Julio Moura, CEO, GrupoNueva
10. Bob Uhler, President and CEO, MWH Global, Inc.
11. Vice Admiral Loose, Deputy Chief of Naval Operations for Fleet Readiness & Logistics, U.S. Navy
12. Ken Undercoffer, President, Pennsylvania Council of Trout Unlimited
13. Mark Rey, Under Secretary, Natural Resources & Environment, U.S. Dept. of Agriculture
14. Sally Collins, Associate Chief, Forest Service, U.S. Dept. of Agriculture
15. Lieutenant General Strock, Retired, Commander-in-Chief, U.S. Army Corps of Engineers
16. Major General Riley, Director of Civil Works, U.S. Army Corps of Engineers
17. Tom and Sherry Kuhns, owners of Kuhns Bros. Log Homes
18. John Gordon, Pinchot Professor Emeritus of Forestry and Environmental Studies Yale School of Forestry and Environmental Studies
19. Roger Ballentine, President, Green Strategies (Green Consultant to Wal-Mart and former Energy Advisor to President Clinton)
20. Bill Downes, Chief Forester, Dept. of the Interior, Bureau of Indian Affairs
21. John Vitello, Forester - Senior Specialist, Dept. of the Interior, Bureau of Indian Affairs
22. Joe Porrovecchio, Vice Chair, U.S. Green Building Council N.J. Chapter; SAME Fellow
23. Werner Braun, President, the Carpet and Rug Institute
24. Frank Hurd, Vice President and Chief Operating Officer, the Carpet and Rug Institute
25. Gary Morishima, Board Member, Intertribal Timber Council (a consortium of over 60 American Indian Tribes and Alaska Native Corporations)
26. Denise Schlener, National Director, Land Trust Alliance

Thank you for caring deeply about the world, humanity, the environment and its many inhabitants.



Building a Better World

By Bob Uhler
President and CEO
MWH Global, Inc.

Corporate America is awash in the green movement. Homebuilders are increasingly incorporating energy-efficient lighting and recycled materials into their structures. Automobile manufacturers are building hybrid vehicles that are very efficient and can burn cleaner sources of fuel. And, firms around the world in virtually every industry seem to be focused on reducing their carbon emissions. To be sure, these are all good and admirable efforts.

People in our company have chosen this profession – as environmental engineers and consultants – because they aspire to create a sustainable future for this planet, our children and the generations that will follow. Our purpose – Building a Better World – is embedded in our corporate culture and everything we do. We reaffirm our purpose every day in 35 countries across six continents, where more than 6,000 MWH team members help businesses, municipalities and governments solve some of the world's most complex challenges in an environmentally responsible manner.

Our company's passionate pursuit of sustainability – both for us and for our clients around the globe – has been a commitment and journey well worth the effort. Our customers are happier. Our workers are more engaged, and our recruitment efforts have been made easier. Our business has been bolstered.

But these sorts of transformations don't happen overnight – at least they didn't for MWH. And considering that we are an environmental

engineering firm, sustainability has, at least to some degree, been ingrained in our DNA for more than 160 years. Yet despite our heritage, the seeds of our current push toward sustainability were planted within just the past 18 months.

For the most part, we allow MWH country companies around the globe to operate as independently as possible. At the same time, our home office provides a uniform framework for accounting, marketing and the sharing of knowledge. The reason for this approach is simple: What works in Australia doesn't necessarily work in England, and what works in England doesn't necessarily work in the United States. And, until recently, that's how our company approached sustainability. While our teams in Australia and Europe were the first to embrace sustainability, their American counterparts took a more tempered approach.

In early 2007 I, along with our executive team, decided to formalize our sustainability efforts across our entire organization. The spark came in part during the Clinton Global Initiative, a conference of leaders from the political, corporate and philanthropic arenas, which took place in late 2006. During dinner one evening, as I visited with other attendees, I started talking with the CEO of a prominent technology company. The executive, whose company was many times larger than ours, said to me, "I wish I had your company." Surprised by his remark, I asked why. He said, "Because your company can make a real difference. It has the global reach; it has the technology; it has the credibility; and it has the passion. You can be an advocate for change while my company produces products."

With that as inspiration, our company set out to develop a multi-year, multi-faceted program aimed at driving adoption of sustainable practices throughout every division of our firm. We decided that combating climate change plus raising awareness of its causes and effects would be our primary focus. To spearhead the effort, we created a new executive position, director of sustainable development, and we developed a climate change committee composed of MWH engineers, sustainability experts and business executives.

Our next step was to look in the mirror. We analyzed, measured and devised strategies to cut our carbon emissions by 15 percent –



Building a Better World – is embedded in our corporate culture and everything we do.



San Francisco, Denver, Seattle, Chicago and other cities, to discuss climate change as united environmental stewards and to share best practices. We were an early sponsor of The Climate Group, a non-profit organization dedicated to advancing business and government leadership on climate change.

In the communities where we work, we are also developing a program to offset some of the carbon emissions produced by our projects. We've committed to planting 100 trees in each city where we operate, and we invite our clients to join in and plant 100 more.

In addition, we also developed a worldwide program for middle-school students which provided them with education about the water cycle, energy use and climate change. The idea is to empower youngsters with information, to encourage them to pursue careers in science and engineering and, hopefully, to help spark the bright leaders of tomorrow who can solve the problems of today. The program has been translated into three languages, and we expect to roll it out to 150 classrooms by the end of 2008.

an ambitious yet achievable goal. We adopted ways to make our air travel more sustainable. We made a \$1.5 million capital investment to improve our video conferencing capabilities. We moved one of our key global meetings from Singapore to Orlando, Fla., a decision that reduced our travel-related carbon emissions for the annual event by as much as 40 percent because many of the attendees were based in the United States.

Next, we turned to our corporate cars and ordered that all replacements to our fleet of 500 conventional vehicles must be fuel-efficient hybrids. We also examined where we worked and the materials we used for our projects. We set stringent, uniform guidelines for our supply-chain managers to follow. As a result, we began using more environmentally friendly materials on the job site. And as our company grows and we need more space, we have adopted a policy to sign leases only in buildings that are certified under the federal LEED program. We have more to do to get our own house in order, but we think this is a good start.

In the communities where we work, we are also developing a program to offset some of the carbon emissions produced by our projects. We've committed to planting 100 trees in each city where we operate, and we invite our clients to join in and to plant 100 more. The program not only mitigates our environmental impact and improves the cities where our clients work and play; it has proved to build camaraderie among our workers. Without question, this is a win-win proposition for our company, our clients and our communities.

While all of these efforts are laudable, we also recognize that we can accomplish more by working together with elected leaders, municipal officials, academic researchers and private industry. That's why we host and participate in workshops, including ones in New York,

I recognize that the work we've done at MWH is a small step in the worldwide effort to combat climate change and to promote sustainability. The consumption of energy and the emission of carbon dioxide in fast-growing countries such as China and India will continue during the foreseeable future. No one company or government can change this. But I'm also an optimist. For 30 years, I've worked in the environmental engineering industry watching the profession grow in importance and sophistication. I've also seen the United States make significant strides as a result. We've provided clean drinking water and safe places for our children to swim by cleaning up our rivers and bays. We've enacted regulations that restrict the release of air pollutants to ensure we have fresh air to breathe. And we have helped develop technologies, such as hydroelectric, wind and solar power, which can reduce our reliance on relatively dirtier sources of energy.

Climate change is no longer a political issue; it is a global issue. Politicians on both sides of the aisle have come forward to push for change. If the will and resources are there, I am certain that the nation's engineers can solve any technical problems we encounter. I am both fortunate and proud to be part of a company and an industry that has an opportunity to make a positive difference in responding to climate change today, tomorrow and in the decades to come.

For more information log onto www.centerforabetterlife.com.

What Makes Carpet Green?

With so much attention on global warming and the outdoor environment, few have considered the effect of the indoor environment – specifically, the air they breathe in their very own home and workplace.

▶ According to former U.S. Surgeon General Richard H. Carmona, in the past 25 years the percentage of indoor air quality health evaluations conducted by the Centers for Disease Control (CDC) has increased from 0.5 percent to 52 percent.

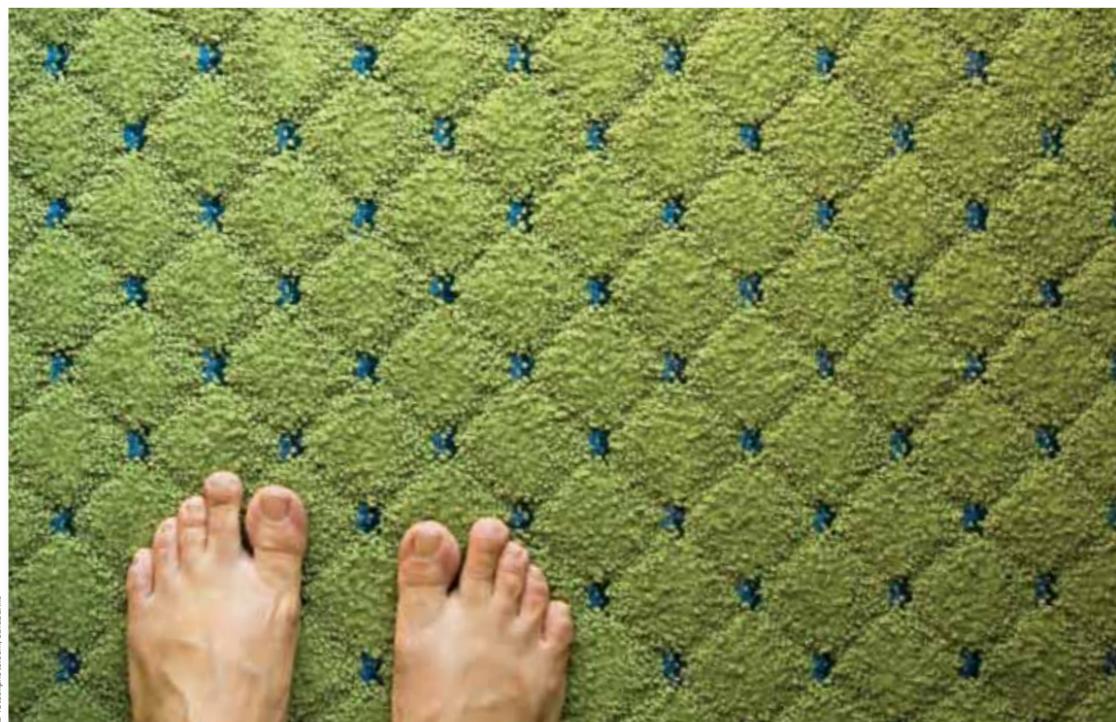
▶ Restated, indoor air quality evaluations have increased from one in every 200 to one in every two.



While these are startling, they correlate directly to Admiral Carmona's study on indoor air quality in non-industrial structures – meaning, in workplaces, schools, offices, houses, apartment buildings and vehicles. According to his January 2005 groundbreaking report, Americans spend an astonishing 85 to 95 percent of their time indoors.

This is a significant lifestyle change from earlier generations' making indoor air quality not only a hot topic but also one of this country's greatest health concerns. According to Carmona, the rate of asthma in young children has correspondingly risen by 160 percent in the past 15 years, and today one out of every 13 school-aged children has asthma. Carmona stressed that, "while we need to be cognizant and concerned about our outdoor environment, including pollution and smog, we must put at least equal emphasis on the long-overlooked issue of indoor environments."

Because carpet covers almost 70 percent of U.S. floors, it is important to dissect its impact on America, especially given the perceived health threats.



Despite what your mother may have told you, carpet actually traps allergens and acts as a filter.

The "Killer Carpet" Scare

During the "killer carpet" scare in the early '90s, people were hesitant to invest in carpet because they were uncertain about its potential effect in their homes. A common myth was that carpet contained the volatile organic compound (VOC) formaldehyde; but, according to Frank K. Hurd, vice president and chief operating officer of the Carpet and Rug Institute (CRI), formaldehyde has not been put in carpet for more than 20 years.

VOCs are chemicals used to manufacture and to prepare many building materials, interior furnishings, textiles, office equipment, cleaners, personal care supplies and pesticides. According to the U.S. Environmental Protection Agency (EPA), VOCs are common in the indoor environment, and their levels may be ten to thousands of times higher indoors than outdoors. A single indoor air sample may contain anywhere from 50 to up to hundreds of individual VOCs – irritants resulting in headaches; eye, nose and throat irritation; and dizziness, to name a few known complications.

VOCs are coined "volatile" because their chemicals can evaporate at room temperature and escape into the air. "Off-gassing" is what instigated carpet paranoia in the early '90s. However, according to Hurd, "as a general rule, off-gassing is a non-issue. Within 30 days no off-gassing occurs in carpet. Tables and chairs in your office put off more off-gassing than the carpet." In fact, carpet is actually the lowest VOC emitter among indoor products such as paint, floor adhesive, floor wax, wall covering and sheet vinyl.

Another very common misconception is that carpet contributes to asthma and to allergies among adults and children alike. However, no scientific study links the rise of allergy and asthma cases to carpet use. In fact, research reports have illustrated just

the opposite. A 15-year Swedish study discovered no link between carpet usage and incidences of allergy or asthma. Surprisingly enough, when carpet usage in Sweden decreased by 70 percent, allergy reactions among the general population actually increased 30 percent. Another major analysis was conducted on behalf of the European Community Health Survey and involved 19,218 subjects from 38 health centers across 18 different countries, including the United States. The data was consistent in that it showed fitted carpets in bedrooms were related to fewer asthma symptoms and less bronchial responsiveness. The results were even more pronounced among dust-mite sensitized individuals.

Despite what your mother may have told you, carpet actually traps allergens and acts as a filter. Studies have measured the distribution of airborne dust associated with normal activities on smooth surfaces and on carpeted floors. Findings point out that walking on hard surfaces disturbs more particles, which become airborne and enter the breathing zone. In contrast, carpeted surfaces trap more particles so that walking disturbs fewer of them and results in fewer particles in the breathing zone.

In response to concern over VOCs and other health impacts, the Carpet and Rug Institute has implemented programs to prove carpet free of potentially harmful chemical levels. According to Werner Braun, president of the Carpet and Rug Institute, "CRI came up with a Green Label Program in 1992 as a voluntary response to indoor air quality issues. Since its inception the Green Label Program has voluntarily lowered its standard four times, and carpet has become not only the lowest emitter of VOCs among floor coverings but one of the lowest-emitting VOC products in the home and in the office. Just recently a new Green Label Plus was

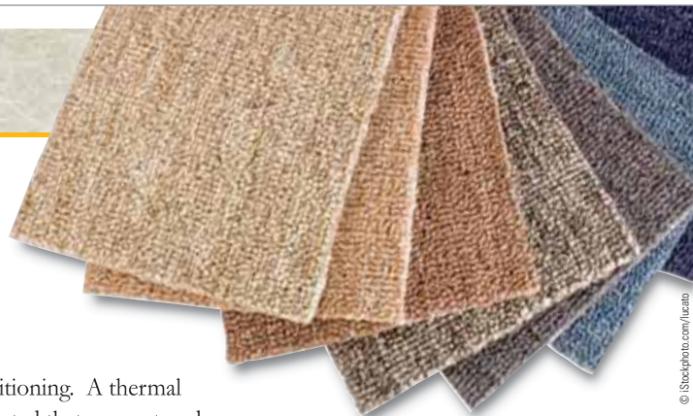
unveiled; it not only tests for more chemicals but has instituted a lower threshold for the commercial environment. This independent monitoring program for carpet meets, and even exceeds, California's indoor environmental quality standards for low-emitting products. A similar effort was also launched to upgrade the Green Label program for adhesives."

Sustainability Considerations

Sustainability considerations, such as product life extension, recycling and contribution to energy efficiency, come into play when evaluating the "greenness" of carpet. Thanks to technology, today's carpet is more stain- and soil resistant than ever before; but industry surveys show that carpets have been removed and replaced prematurely simply because they "ugled out." Upon testing, CRI discovered that many cleaning products not only did a poor job of removing soils and stains; they actually made the problem worse by leaving behind detergents that attracted dirt to the product. CRI's Seal of Approval (SOA) testing program concluded that only four of 25 products initially tested cleaned better than water.

Braun elaborates, "The SOA testing program was eventually expanded to include tests of deep-cleaning extractors to insure they performed up to standard and to give the consumer valuable information he or she needed to make sure his or her investment is being protected. The SOA program has since added vacuum cleaners to it and has been a resounding success in identifying products that work. Again, all this goes a long way in reducing the environmental footprint of carpet by keeping it on the floor through its useful life."

While the cleaning and upkeep of carpet is imperative, it is obvious that no carpet will last forever. Currently, 4.7 billion pounds of



carpet are annually disposed of in landfills and that number will only rise. In laymen's terms, that figure equates to 13 trillion BTUs – enough energy to power 106,000 homes annually or to produce 108 million gallons of gas per year – enough to drive 2.7 billion miles annually. To tackle this challenge, the carpet industry signed an historic agreement with state and federal governments to achieve 40 percent landfill diversion by the year 2012. From this agreement, the Carpet America Recovery Effort (CARE) was established as a 501c3 non-profit organization to act as a facilitator, advisor, information provider and forum for a myriad of stakeholders to facilitate progress toward CARE's mission. That goal, Braun simply states, "is to develop market-based solutions for the recycling and reuse of post-consumer carpet."

Efforts are underway nationally to increase the options for recycling waste carpet as well as to use components containing post-consumer carpet content to make new carpet. A number of options exist for managing carpet waste: direct reuse, refurbishment, recycling carpet backing into new carpet backing and "carpet to carpet" recycling. However, in no way can all carpet material be used for new carpet so considerable effort is being focused upon non-carpet products containing post-consumer and post-industrial materials derived from recycled carpet such as nylon boards, roof shingles, composite railroad ties and marine timbers, among other items.

Another important sustainability factor that makes carpet "green" is its ability to reduce home energy consumption when used. Today's consumer is increasingly aware of a product's energy efficiency value. America's residential sector currently consumes approximately 12 percent of the nation's total annual energy consumption for space

heating and air conditioning. A thermal study on carpet indicated that a carpet-pad combination reduced heat loss by as much as 54 percent when installed on a non-insulated wood floor over a ventilated crawl space and by as much as 72 percent when installed on a non-insulated, exposed-edge concrete slab on grade. Those numbers equate to as much as a 15 percent savings on an annual heating bill.

Another of the carpet industry's latest innovations has been introduction of the Sustainable Carpet Assessment Standard or NSF 140. "Architects, designers and end users will now have one standard to identify carpets that have a reduced environmental impact. The first multi-attribute American National Standards Institute (ANSI) approved Standard – NSF 140-2007, Sustainable Carpet Assessment Standard for environmentally preferable building materials – introduced at the U.S. Green Building Council's November Greenbuild 2007 conference and exhibition in Chicago. The unified Standard for sustainable carpet is voluntary, inclusive and based on life cycle assessment (LCA) principles. The first carpet products certified to the approved Standard are expected to be available in the marketplace by the second quarter of 2008. The NSF mark will appear on the packaging of certified products to demonstrate compliance," explained Braun. For more information on the NSF 140-2007, Sustainable Carpet Assessment Standard, please visit www.nsf.org/info/carpet.

Not only is carpet green and sustainable, but it offers a unique way to decorate commercial and residential buildings. Carpet comes in a variety of interesting colors, styles and textures, all of which can add great accent to any room. Carpet also enhances room acoustics and makes it easier to converse with friends or to listen to the

TV. With the aging of the baby boomers it is important to note that carpet provides soft surfaces as well as great slip and fall prevention. Carpet offers overwhelming advantages in health, finance and style. Having the right products and a proactive stance on carpet maintenance, anyone can help keep carpet green by giving it a long, full life.

Braun concurs, "Carpet has many wonderful and useful benefits, from its warmth and comfort underfoot to its ability to trap allergens and to keep them out of the breathing zone in an effort to improve indoor air quality. Its ease of maintenance and the cost savings involved in comparison to other flooring options, as well as the safety from slips and falls are all documented benefits."

In addition, Braun restates the carpet industry's commitment to being green and sustainable by saying, "the carpet industry understands that no industry can sustain itself at the expense of our environment, our societies or our people. We are all in this world together and our products should reflect our commitment to the balance between environmental, social and economic contributions of the industry."

Consumers and professionals alike can find extensive information about carpet selection, installation, maintenance, products and indoor air quality by visiting CRI's websites (carpet-rug.org, carpet-health.org, and carpetrecovery.org) or by calling CRI's toll-free telephone number (1-800-882-8846).

For more information log onto www.centerforabetterlife.com.

WHAT CAN YOU DO WITH 261 MILLION POUNDS OF OLD CARPET?

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When you CARE to find solutions, the sky's the limit.

The Carpet America Recovery Effort (CARE) makes a vital contribution to the environment. A voluntary program of the nation's carpet manufacturers, CARE finds innovative ways to keep old carpet out of landfills and get it into new products. So you'll find post-consumer and post-industrial carpet and padding in everything from railroad ties to car parts – it's even being used to create energy.

In fact, in 2006, CARE kept 261 million pounds of post-consumer carpet from simply being thrown away – a 16% increase since 2005. And that's too important a fact to sweep under the rug. To learn more, visit www.carpetrecovery.org.



www.carpetrecovery.org

Why Land Trusts are So Critical

By Denise Schlener
National Director, Land Trust Alliance

When I was a young child, my grandfather and I would walk my dog in the woods near his home outside New York City. One day everything was all gone. The big trees, the frogs in the pond and the songs of the birds had given way to a bare landscape where houses would soon grow.

At age 5, I didn't have the words to describe what I felt that day. But, I've experienced those same emotions at least a thousand times over since then as the open spaces next door, the neighborhood farm and the woods I hiked through have continued to disappear.

My story is one that is all too familiar to most. On a national scale, figures on these losses are staggering: Each year America loses two million acres of farms, forests and natural lands to development. That's almost one-half the size of New Jersey transformed by development each year. Landscapes are converted to shopping malls, subdivisions and highways. In the process, more than 100,000 acres of wetlands are destroyed which degrades water quality and contributes to flooding.

There is another story, however, that rarely garners national attention. It's about the quiet, community-based movement that has grown from the tens of thousands of personal stories, inspiring people to work together to permanently conserve the lands important to them. This effort occurs through a special type of private, nonprofit organization called a land trust, whose mission is typically

to preserve a certain type of land that is important to the character and soul of each community. The combined impact of 1,667 private land trusts operating in every state of the nation is growing significantly and bringing the benefits of clean water, wildlife protection, parks, urban gardens, family farms, forests and access to waterways to millions of Americans.

Land trusts, the majority of which are run by volunteers, work with landowners who wish to either voluntarily donate or to sell their land for conservation purposes. Little known just two decades ago, land trusts are now one of the fastest-growing and most successful conservation movements in American history. Together the local, state and national land trusts have conserved 37 million acres of land in the United States – an area more than sixteen times the size of Yellowstone National Park. This phenomenon is not restricted to the large national conservation organizations. In the most recent survey conducted, the number of land trusts nationally grew by 32 percent during 2000-2005. More significantly is that the pace of conservation grew substantially. Private land conservation by local and state land trusts grew from 337,937 acres per year during 1995-2000 to 1,166,697 acres during 2000-2005. The largest growth resulted from the use of conservation easements – legal agreements between landowners and land trusts which preclude development but allow the owners to continue to own and to use their land for purposes such as forestry and farming.

Take Bill and Walter Nunnally, for example, who decided they didn't

want their 1,000-acre family farm to become another statistic. Teaming up with the Land Trust for Tennessee, they worked to protect their 150-year-old farm from development by using a conservation easement. Under the agreement, farming will be allowed to continue, but the land must remain undeveloped, regardless of who may own it in the future.

In Oregon, after planting thousands of trees to reforest his property, Don Byrd donated an easement to the Southern Oregon Land Conservancy in order to protect his 2,271-acre property from potential development. And in Virginia, where a state tax credit provides a generous incentive for landowners to donate conservation easements, the Piedmont Environmental Council has helped property owners in a nine-county region conserve more than 240,000 acres of rich farmland, scenic vistas and riparian lands.

Successes are growing daily. Indeed, for 2000-2005, an average of 2.6 million acres of private land was conserved (by local, state and national groups such as The Nature Conservancy) – an amount exceeding the total land area that the U.S. Department of Agriculture estimated would be converted to developed land.

Land saved tells only one part of the story about this movement. When neighbors come together to talk about conserving land, some remarkable things can happen to a community or, for that matter, a state. The Vermont Land Trust was a path-breaker 20 years ago in recognizing that local communities also had critical needs for affordable housing. That Trust built a coalition of affordable housing and land conservation advocates who conceived of, and then lobbied for, the creation of the Vermont Housing and Conservation Board (VHCB). Since then, VHCB grants have helped communities conserve more than 365,000 acres of land while making available nearly 8,500 units of permanently affordable housing.

Today land trusts are breaking new ground in the ways they engage and serve their communities. In Hailey, Idaho, the Wood River Land Trust's conservation acquisitions along the Big Wood River have evolved into a vision for the community: a permanent greenway that

will include public walking trails, swimming and fishing areas, bird and wildlife watching. This greenway will also protect the floodplain while simultaneously securing a wildlife habitat for the moose, elk, otter and birds that frequent the river and its lands.

Elsewhere in the west, political lines are blurring as ranchers are working hand-in-hand with land conservationists to preserve ranchlands that sustain their livelihoods, protect their water quality and

provide for their scenic vistas of rural landscapes. The cattlemen's land trusts started in several western states have now joined forces with conservationists nationally to secure legislation that would increase tax incentives for landowners to donate their land for conservation. Other land trusts, such as the Scenic Hudson in New York, have responded to community concerns about the effects of ill-planned growth by establishing themselves as strong voices for building better communities through smart land use and transportation planning.

The growth of the land trust movement speaks to the power that conserving land has had in bringing people together in a way that seemed unimaginable a few decades ago. The trust that develops when people work together to conserve the lands they love is allowing land trusts

to build new bridges in their communities and beyond, by addressing the range of needs people have for the land. These goals include creating affordable housing, protecting ecological systems that provide clean water and habitat for wildlife, and helping to ensure that land-dependent economies survive.

As social commentators decry the demise of local civic organizations contributing to the strong fabric of a healthy community, land trusts are helping to buck the trend. Almost 50 years later, I still feel the same sense of loss when I see open lands and natural areas disappear into development. But the work of trusts to conserve lands and to build our communities is a story that gives me much hope for the future. 🌱

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Each year America loses two million acres of farms, forests and natural lands...



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Lessons from America's First Land Managers

To the Indian people of the Quinault Nation in Washington State, the cedar tree is the “tree of life” because it is fundamental to every aspect of their existence. ▶ From its wood the Quinault people build houses and dwellings as well as carve canoes for fishing. ▶ The cedar bark is used to make clothing while its roots make baskets. ▶ Still other parts of the “tree of life” become art and objects used in religious ceremonies. ▶ “The cedar is treated with respect,” explained Gary Morishima, a natural resource technical advisor with the Quinault Indian Nation. ▶ The tribe balances its needs with those of the forest. ▶ Before gathering cedar bark, they ask the permission of the cedar. ▶ They take only a part of the bark and leave the rest for the tree to sustain its life.



© Photograph: Larry Workman

Constantly and for generations, the Quinault people and other tribal nations throughout the Americas managed the forests to maintain a state of balance and adaptation with the world.

Cal Mukumoto, a forest business management consultant who has worked with Indian tribes for decades, believes that this tribal “balance” is paramount and, quite possibly, the answer to a future of environmental sustainability. “Tribes embody the whole concept of sustainability and what it really means,” Mukumoto said. “Tribes really have a sustainable viewpoint.”

Fire and the Tribal Way

Some conservationists and environmental activists believe that true sustainability and preservation of America's forests depends upon the absence of man. This ideology is based upon the precept that nature completely maintains itself and that man serves only as interference to nature's plan. However, the Americas were not the desolate, unkept forests that some misguided environmental activists believe it to have been hundreds of years

ago. The Indians know this first hand; after all, it is their heritage.

According to Trudy Pinkham, a Yakama tribe forester in Washington, it is unrealistic and illogical to expect the forest to maintain itself. “You cannot preserve the forest unless you put it under a glass,” Pinkham said. “To be in the woods is a disturbance to the forest. My people depend on the forest so we wisely manage the forest.”

In fact, if the Indians had not practiced sustainable forestry years before European settlement, the forests that exist today might not be as healthy or as sprawling. “Some people operate under the premise that the primordial eco-system here prior to European settlement was one big wilderness – unmanaged and with very few people. However, in reality it was a heavily populated, heavily used forest,” according to John Vitello, a forester with the Department of the Interior's (DOI) Bureau of Indian Affairs (BIA). Vitello said, “Fires frequently ran through the ecosystem; and man, as well as other natural events, caused these fires. So what we have in North America are fire-dependent ecosystems.”

As Vitello explained, a fire-dependent ecosystem is composed of vegetation that has evolved with fire. For example, in the western half of the continental United States, ponderosa pines grow in great number. The health of ponderosa pine forests is dependent upon fire. Because the ponderosa bark is exceptionally thick, frequent fire would cleanse the forest of competitive brush and fire-prone tree species (such as firs) without harming the pine. This process would also thin out the young pine trees and provide more moisture and growing room and a distinct competitive advantage for the residual surviving pine. Exclusion of fire



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The preservation and management of Indian forests is not just about the forests. It is about life.

from these ecosystems is contrary to nature. Without frequent fire, forests become thick with brush and fire-prone species leading to increased water stress, the proliferation of insect and disease outbreaks and eventually to catastrophic wildfire that kills even the mature pine.

Native Americans didn't try to exclude fire. When conditions warranted, they used fire to maintain the health of the forest. Fuel loads were reduced, foods and medicines that were important for the wildlife and for the community were produced and the forests were sustained.

Victoria Wesley agrees with Vitello's view of fire. As a forester and a member of the San Carlos Apache tribe in Arizona, she is quite familiar with fire-dependent ecosystems and the ponderosa pines. Over time the Apache's ponderosa forests were not managed with fire as they had originally grown accustomed to doing. As a result, the pines grew too close together, and lower forms of vegetation ran rampant. Now, in some cases, her tribe has gone back to using fire.

Pinkham is accustomed to fire as well. Without it the Yakama people may not have had the luscious huckleberry fields and bitter root plants that have sustained her people's diets for hundreds of years. John Waconda, a BIA regional forester and New Mexico Isleta Pueblo tribal member, concurs; he explains that even today Indians “try to promote and to encourage traditional forestry practices such as the use of fire.”

The Importance of Planning

However, as the landscape of the Americas has changed, (even for Indians residing throughout various U.S. reservations), the reliance on “natural events” for forest management has shifted. As Waconda

noted, the advent of housing and private land ownership has led to more modern practices of land management so as to not damage the existing infrastructure; “natural events” are not always containable nor controllable.

As in their use of fire, tribes choose practices different from traditional ones. “One of the most important things that guides us is the principle of forestry management planning,” Waconda said. But for Waconda's tribe and tribes throughout America, forestry planning isn't about timbering and profits; instead, it's about a holistic approach to both preserving and profiting from the forest. “Our management plans certainly are a lot different from other public and private planning processes and procedures,” Waconda said.

The uniqueness lies in the blending of forecasting the economic uses of timber, the selling of timber and other forest products, and the balancing of religious and cultural elements that revolve around the forest. “In Indian country they're looking at managing their forests not just for commercial products . . . but also for sustenance of their culture. So there are cultural plant materials, places in the forest that they use for ceremonies or gathering of materials that they use for crafts or items that they use in their daily lives; there are traditional foods in the forest,” explains Bill Downes, BIA chief forester.

As Pinkham explained, the forests mean more than wood products to be sold for outside industry; they represent teepee poles for ceremonies and homes for her people. “There's no connection to many non-Indians. For them, it's dollar figures. For me, it's my culture,” Pinkham said.

Albert Bordeaux, director of forestry and a member of the Rosebud Sangu



© Photograph: Larry Workman

Oyate Lakota tribe, is working to use the forest for his people as well. And as August came to an end, Bordeaux, a man who lives “with” the forest, was dealing with Rosebud’s “annual cut.” Before any of that timber is sold, Bordeaux and his team will take care of the tribe’s needs first. “We’re trying to provide homes for the homeless,” Bordeaux continues. “Timber is here for the people. We try to manage the best we can with what we have without getting depleted.”

And in helping the forests and the people, the community is strengthened. According to Morishima, “The forests are a part of the tribal community.” From economics to firewood, from medicines to food, from spiritual practices to art, the preservation and management of Indian forests is not just about the forests. It is about life.

The Difference Between “With” and “In”

In suburbs across America, residents often say that they live “in” the suburb or neighborhood. But Indians have always felt closer to their land – so close that they are one in the same. The difference is that instead of living “in” the forest, Indians live “with” the forest – a bond that is as close as kin.

Waconda views the forest as “an integral part of our existence. There is no

disconnect between humans and the land.” Pinkham shares this philosophy and explains, “Our people believe this is a circle of life – everything has a meaning.” Thus, they have been living with the land for generations – never taking more than they needed so that future generations would not have to go without.

Long before Pinkham was a forester for her tribe, she learned a valuable lesson from an elder – her grandmother. While she and her grandmother were picking bitter roots, carrots and berries, Pinkham had the urge to take more than she needed. Her grandmother explained to her “We take only as much as we need,” Pinkham said. After all, there were other mouths in the community to feed – more people than just the Pinkhams.

Despite their emphasis on sustainability, the Indians have survived not only because of conservation but also because of adaptation. “The tribes have been agents of change,” Morishima said. “You cannot stop the clock; it’s really an adaptive attitude.” For example, when the pine beetle infestation spread through forests of the Yakama tribe, the Indians recognized the causes of the infestation: unhealthy, overstocked stands. “When the outbreak happened,” Morishima said, “they took remedial actions to care for the forest and for the land.” From this the Yakama Reservation exemplified the

truest principles of Indian sustainability.

Concepts surrounding the viability and sustainability of tribal forestry practices are gaining popularity as a model of forestry. Downes at the BIA believes that Indian forests may be used “as a model for public landowners and maybe even private landowners” because of the traditional, generational knowledge that Indians have regarding forestry.

Don Motanic of the Intertribal Timber Council, www.itcnet.org, agrees: “Tribal forest practices would fit a private landowner’s goals if he or she wanted to manage the forest for more than a generation.”

A State of Being

Wesley, a tribal woman and a forester, has her own unique perspective. She said, “I’ve never lived off of the reservation (in Arizona) so I can’t relate to the outside.” For Wesley, forestry management and respect is about more than a process. It is about her very being. Upon being born, Wesley was rolled in the dirt with her umbilical cord buried in the wilderness – a process that “will, in essence, make a connection between your spirit and the natural world,” she said.

And it is with this perspective that Wesley views tribal forestry – not separate from man but a piece of man. “Whatever you do, good or bad will come back to you. What you do to Mother Earth will come back to your tribe,” Wesley said. “Some think we’re not a part of the natural world. We’re all connected to this planet. Living ‘with’ is a state of being; I was raised in that way.”

Think how the Earth and the lives of its inhabitants would be different if we were all raised that way. 🌿



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Focusing on Local Needs and Opportunities

By Julio Moura
CEO, GrupoNueva

I have found, with the benefit of hindsight, that the best way to go global in business is to focus hard on local needs and opportunities.

In the late 1990s I became chair and CEO of GrupoNueva (GN), a Latin American holding company that was involved in three different areas of business: forestry products, pipes and water management systems, and light construction materials. It was a difficult economic time in Latin America, and my two-fold mission was to make the various subsidiaries more profitable while, at the same time, making them more environmentally sound and socially responsible.

I began to look into this notion of doing business with the poor, but it struck me initially as more theory than practice. How can you improve a business by selling to people who have little money?

Then in late 2001, the economy of Argentina virtually collapsed when the currency plummeted over a three-month period and unemployment rose to more than 18 percent of economically active people. GN's pipe, plumbing equipment and water systems' subsidiary, AMANCO Argentina, was selling few pipes or fittings to its usual big retail customers. The company was threatened with bankruptcy.

We thought back to the depression of the 1930s and to what our grandparents had done back then: Getting only the small amounts

they could pay for, they bought their daily needs from street merchants for cash. So we developed a "mobile sales" project that involved loading AMANCO goods on the backs of two trucks and sending them into the poorer neighborhoods of Buenos Aires to visit the smallest plumbing and home repair storefront shops.

This service offered customers more than 50 different items and the possibility of buying, invoicing, shipping and delivering in one single transaction. Mobile Sales reached out to the small customer and provided limited quantities of our products. The small customer avoided the need to keep large inventories, replenished only what he needed and paid cash (at a fair price to him that still returned a profit to us, as there were no middlemen).

This strategy saved the subsidiary from bankruptcy and led to a new way of doing business. AMANCO started with the two trucks in the capital and later, after the crisis and the reasons for starting the project had subsided, had seven trucks at work in three cities. We added more than 1,000 small customers that the company had never reached before. The approach doubled the number of plumbing fixtures customers, and these new clients were generally very prompt in their payments. Mobile Sales became 15 percent of AMANCO Argentina's total sales but 40 percent of its revenue.

I cannot claim that these mobile sales helped poor people meet their housing needs. But they convinced me that doing business at the base of the economic pyramid can be very good business, indeed. And I do believe we helped poorer people, who tend to be their own home builders and home improvers.

Looking for more base-of-the-pyramid business spurred AMANCO to work with Habitat for Humanity, the non-profit non-governmental organization (NGO). Habitat builds houses with the help of soon-to-be homeowners and sells the dwellings to partner families at no profit (financed with no-interest loans). Habitat

has a very active program in Central America, and GN – now headquartered in Santiago, Chile – was then based in Costa Rica.

Habitat had been buying construction materials from local retailers. Working with AMANCO, the NGO could purchase wholesale and deal with only one supplier who was familiar with them so

their transaction and opportunity costs would be lower. AMANCO improved its sales volume, began serving a new line of customers and opened new sales channels. AMANCO and Habitat began working together in five countries.

We next did a study and found that most of the more stable companies in Latin America were doing business low down on the economic pyramid. So we held a contest among employees to come up with ideas for doing business with the poor in ways that benefit the company and benefit the poor. To my astonishment, some 250 ideas were submitted; of those, nine were turned into business plans.



Farmers are achieving improved standards of living with incomes doubling to around \$1,950 a year. This is helping them to integrate into the formal economy and to pay for their children's schooling.

The best proposal involved developing simple, gravity-fed irrigation systems for small Guatemalan farmers planting only a few acres of land. Just because the systems would allow farmers to double or triple harvests – creating an opportunity for a quick payback – does not mean that the farmers could afford them or get the credit to buy them.

We have found that when you do business with the poor, you often need non-traditional business partners. Guatemala's Ministry of Food, Agriculture and Livestock agreed to help finance installation of the systems and to provide technical assistance as well as training. Two local NGOs, Opcion and Aj Ticonel, worked directly with farmers and have been developing overseas markets for the new range of crops grown. We were thus helping farmers move away from low-cost, subsistence crops, such as corn and beans, toward export-oriented produce, such as string beans, that would bring in more money. The project gradually attracted buy-in by Guatemala's Export Association for non-traditional products, trading companies, vegetable exporters, and seed and fertilizer companies.

AMANCO's irrigation system improves water use by saving up to 50 percent. Soil quality also benefits as the drip irrigation techniques help prevent erosion. Farmers quickly saw a 22 percent rise in production, coupled with a major improvement in produce quality. They were also achieving 33 percent savings in labor costs and improved standards of living with incomes doubling to around \$1,950 a year. This increased income was helping farmers to integrate into the formal economy and to pay for their children's schooling. AMANCO became a very successful company in a relatively short time and was recently sold to a Mexican company.

We are now focusing our base-of-the-pyramid business on the forestry company Masisa, which has several hundred retail outlets around Latin America for boards and other building materials. We have taken the novel step of hiring people from poorer neighborhoods, mostly women, and making them "corporate consultants," advising us on the types of furniture that poor people like, need and can afford. Once we develop designs, we train local carpenters in how to make the furniture by using Masisa boards.

The results have been so positive that I have pledged that 10 percent of all our corporate sales will be to the poorer segments of society by 2008. In fact, I am sure that this is the case today, but we are working on ways to measure it and prove it.

GN has greatly improved over the years, both in terms of its bottom line and in terms of its impacts upon the environment and society – impacts that we report on regularly and publicly. I am now seeking new investments around the world in countries such as India and China. GrupoNueva and I are going global, but that journey took an important early route through the poor neighborhoods of Buenos Aires.

Since the beginning of time, business has been about providing customers with ever better goods and services, ever more efficiently, at ever more attractive prices. That remains true today. But I am convinced that, in the near future, the truly successful companies will be those that find ways, through their core businesses, to help society meet its key challenges, such as poverty, globalization and environmental degradation.

In fact, that may already be true today. 🌱

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How can you improve a business by selling to people who have little money?

Better Building With Logs

Before the first Aryan invaders appeared in India, people were harvesting trees to build structures for every conceivable purpose. ▶ Many thousands of years later when the first pioneers came to America, settlers were still using logs to build everything from homes to general stores to public buildings.

▶ The advent of new building methodologies, coupled with ongoing technological improvements, led the way to new and improved building techniques. ▶ But times have changed again, and logs are fast becoming the cleaner, greener and more sustainable building material of choice.



Photograph: Bill Simone

Building green and sustainable means building more intelligently for the environmental, economic and health benefits of the current population as well as for future generations. It means leaving a smaller footprint while increasing the quality of life for everybody to include enhancing and protecting ecosystems and diversity.

Most people visualize a cabin nestled in the woods when they think of building with logs, but more and more structures, from daycare centers to corporate headquarters, are taking advantage of the world's most renewable resource. These state-of-the-art buildings are presenting a sustainable solution that is unmatched by more traditional building practices. Building with logs allows architects, engineers and contractors to work with the environment in a simpler, more holistic fashion by using renewable resources in a cost-effective manner to fit everyday needs.



Photograph: Bill Simone

According to the Log Homes Council, log structures are environmentally aware and sustainable structures. Most are “greener” by comparison to conventional structures because they save energy and reduce environmental impacts. Timber is the only renewable construction material on earth; it requires less energy and labor between harvest and placement on the structure's site. In addition, log walls provide “surface as finish,” saving material and labor costs because other building material layers are not required.

For 20 years the log industry has worked to educate consumers on the importance of thermal performance in log structures, which contain greater “heat capacity” or thermal mass in their walls, compared to lightweight wood framing construction practices. The results of comprehensive reviews and studies regarding log structures indicate that, in most U.S. climates, there are proven benefits of thermal mass – using a wall's heat capacity to control and to reduce annual heating and cooling energy demand. In fact, according to Tom Kuhns, president of Kuhns Bros. Log Homes, one of the premier manufacturers of both residential and commercial log structures, “The thermal mass of a typical log wall has proven to perform as well as R-15 insulation – with less energy and resources used to create the wall system.”

These benefits can increase, depending upon climate, wall thickness, levels and placement of insulation, and the types of windows installed. For instance, industry experts recommend avoiding log walls of less than six-inches thick in most climates and eight-inches thick in colder climates to provide for sufficient thermal protection. This thermal protection significantly benefits owners and the environment by helping to reduce not only energy waste but also envi-

Log structures may be expected to perform from 2.5 percent to over 15 percent more energy efficiently compared to an identical wood-frame structure.

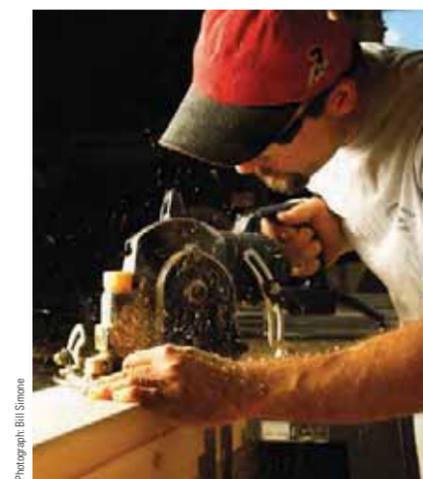
ronmental waste. In the distant future when the log structure is demolished or de-constructed for component parts, the logs will be recycled to produce other lumber and wood products unlike stick-frame structures, which are often demolished and shipped directly to landfills.

The Unmatched Performance of Log Structures

Compared to well-insulated traditional stick-frame structures, log structures save more energy. Concrete, block and brick walls have higher heat capacity but also have higher heat flow conductivity compared to solid wood wall sections. Hence, masonry walls may require adding conventional insulation to meet code in most U.S. climates versus comparable log walls, where the insulating material is the structural material. Studies indicate that log construction thermal mass that is “integral” to its assembly is nearly as effective as exterior insulation on concrete and masonry walls per unit of insulation and heat capacity. In a log wall its “insulation” is mixed with the heat capacity and provides dual functionality of both structure and thermal protection. The homogenous assembly of the log wall also has fewer thermal short-circuits than lightweight wood or the increasingly popular steel framed walls. Thinner walls found in traditional wood-frame structures do not take advantage of solid wood, which naturally moderates swings in temperature and humidity in the structure's living or work space.

In practical terms log structures may be expected to perform from 2.5 percent to more than 15 percent more energy efficiently compared to an identical wood-frame structure. This equates to a significant reduction on heating and cooling-related utility bills while maintain-

ing equal or superior comfort under real-world weather conditions. Over the long term these savings add up to make log structures not only a more sustainable choice but also a more economical one.



Photograph: Bill Simone

Log structures also offer intrinsic benefits such as the reduction of external noise and/or noise pollution which is not as easily achievable in a traditional wood-frame structure. Anyone who has lived or worked in a log structure knows that outside noise is not an issue. According to Kuhns, “There haven't been any actual tests done on log walls to claim a specific Sound Transmission Class (STC); however, the density of a solid wood wall with its mass certainly limits sound transmission.”

Sound travels around obstacles and through openings in those obstacles. Minimizing sound transmission, therefore, becomes the same effort used to minimize heat loss. In other words, the same qualities that provide better thermal value also help in better overall acoustic performance. The density of solid wood log walls significantly limits sound transmission while the profile of the log actually deflects sound and

provides a more comfortable, quiet environment.

Over the years reports have flourished about fires that have burned the inside and outside of log buildings without destroying the building's structural integrity; such instances illustrate the fire-resistive nature of solid wood walls. It is a combination of the insulating response of the charred wood at the surface with the slow rate at which flame will spread along the wood surface that makes log structures more resistant to fire. The Log Homes Council has confirmed the fire-resistive nature of log walls through a series of exhaustive tests, satisfying the one-hour fire-resistant ratings while providing even longer ratings with greater wall thickness. Kuhns elaborates, "A six-inch log wall has a one-hour fire rating while an eight-inch log wall has a full two-hour fire rating."

Unlike conventionally framed houses, log structures have no concealed cavities for fire to travel through. Combined with the selection of beam and deck second-floor and roof options often incorporated into log buildings, log structures are a top choice for endurance and integrity in a fire.

One common misconception about log structures is their vulnerability to wood-eating insects and fungi. When wood used in log structures is "kiln-dried," the structure is actually less likely than traditional wood-framed structures to have problems with pests. The simplicity of a log structure also makes detection of insects more visible as opposed to traditional wood-framed structures, where the presence of wood-eating insects could potentially go undetected.

Kiln-drying to an average of less than 15 percent moisture is recommended by independent forestry experts in order to produce the most stable and trouble-free building material. This process pre-shrinks the logs and makes them stable and uniform compared to unseasoned wood. Using high heat, the logs are sanitized; mold, fungi (which causes wood decay),

insects, their larvae and eggs are killed. It also produces logs that are pre-shrunk with a drier surface, which allows for instant application of finishes that absorb more deeply and last longer. In addition, proper kiln-drying reduces the weight of the logs and makes them easier to handle while simultaneously increasing their insulation values.

The Importance of Preservation and Maintenance

Even in ancient log construction known to have been built before 700 B.C. in Eastern Europe, certain techniques were used to make log structures last as long as possible. Special corner notches that shed water, organic coatings that blocked water penetration and retarded fungal growth, and other innovations such as large roof overhangs and stone foundations were used to protect the logs from insects and fungal decay. These inventions were primarily based on the desired durability of the structure and the available materials found locally.

Today builders have even more options to choose from when designing, engineering and constructing sound, durable and beautiful log structures. Understanding a few basic facts about wood will help keep any log structure properly maintained. For instance, preservation and maintenance decisions should be based primarily on the site and the geographic location of the log structure as well as an understanding of the biological agents that are harmful to wood. Different climate regions have different effects on log structures, depending on relative humidity and precipitation.

Good engineering, materials, construction and maintenance are essential to a quality log building that will outlast a traditionally built structure. Tom Kuhns explains, "As with any building or home, log structures require maintenance. Modern building techniques and advances in preservation are now making it easier to maintain the beauty of log structures indefinitely."

The log building is a fundamental

American construction concept. Some of the oldest occupied structures in the world are log buildings that prove their durability when properly designed and constructed. According to Kuhns, "log structures are inherently over-engineered due to their very nature of incorporating solid log walls and massive beams. To achieve the look that most buyers want with exposed beam and purlin roof systems, heavy timber joist and log walls, log structures are some of the most structurally sound buildings being built today." In fact, many accounts exist where log buildings were the only structures to survive natural disasters, such as hurricanes and tornadoes, intact or with very minor damage. In addition, log buildings are known to have a longer life span than the 55-year average of traditionally built structures.

The Many Benefits of Improved Living

Modern manufacturing methods continue to advance new technologies by working to make log structures even more durable, energy-efficient and cost-effective. In addition to these benefits, the added value of working with a natural and renewable resource that is inherently more environmentally friendly and environmentally efficient is a big boost when considering building for a sustainable future.

Whether it is a home, military barracks, day-care center or corporate headquarters, any building can be constructed with logs. As the world enters an era where sustainability is essential, all building stakeholders and occupants will benefit from the recognition of log structures as green and efficient dwellings. Building green and sustainable will not only create an environmentally sound, personally satisfying, resource-efficient place to live and to work but will also return economic gains in increased asset valuations, cost savings and improved personal and worker productivity. 🌿

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Forests to Fight Poverty

By John Gordon
Pinchot Professor Emeritus of Forestry and Environmental Studies
Yale School of Forestry and Environmental Studies

About 10 years ago Joyce Berry, Ralph Schmidt and I assembled a book titled *Forests to Fight Poverty: Creating National Strategies*¹. We wrote the book at the request of the United Nations Development Programme (UNDP). At that time the UNDP was deeply interested in the linked questions of poverty alleviation, deforestation, and the quality and quantity of aid flowing from developed to developing nations.

In the book's foreword, Gus Speth, then Administrator of UNDP (now Dean of the Yale School of Forestry and Environmental Studies), wrote:

"(Forestry) is not a minor sector involving a small proportion of the society. Marginal agricultural lands where families practice subsistence farming in a shifting mosaic of farmland and forest are home to one-half the people of Africa, one-third the people of Asia and one-quarter of the people of Latin America. The proportion of poor in these areas is even greater."

His statement is still substantially true. But the book focused on "national" solutions – how countries could devise effective ways to decrease rural poverty while maintaining and enhancing forests and their priceless cargo of biological diversity.

National strategies that are not top-down or externally driven but that are created with participation of all stakeholders are still badly needed. With the added perspective of a decade of largely ineffective top-down, public sector, foreign-aid-driven attempts at "solving" rural poverty, hope has shifted substantially



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... countries could devise effective ways to decrease rural poverty while maintaining forests...

toward the view that private sector investment will be critical to national plans and solutions. Thus, the possibilities for positive effects of enlightened private forest investment on local economies in poor, rural places are almost unlimited.

First, the poor people and places that Speth described are often in locations where trees can be purposefully grown for a wide variety of products, ranging from fruit, herbs and wood for local use, to high-value timber for industrial and export use. The reclamation of waste land with trees is said to be a potential on 100 million hectares in India alone. Second, worldwide investor interest in forestland has never been higher; and the price of forestland in developed countries has increased which is heightening the desire to invest in the developing world's "emerging markets." Third, the science of growing trees on plantations has made great progress in the past decade, and it is now feasible to grow a wide variety of high-yield, high-value species of trees on plantations. Fourth, emissions from deforestation equal 18 percent of all global CO2 emissions.

We cannot afford to ignore them. New forests would help offset this carbon loss, and reducing the destruction of existing forests would help reduce carbon and biodiversity loss. Finally, the cost of establishing and tending tree plantations is attractively low in developing countries.

Thus, there is an opportunity to couple the world demand for planted forests with the developing world's alleviation of poverty; such an effort has never existed, at least in this form, before. But there are numerous problems to be overcome, and purposeful action is needed to make this opportunity real. The environmental effects of planting new forests must be carefully observed and managed. In the past new forests have sometimes replaced intact native forests; and planted forests have, in

some places, had some adverse effects on local water supplies and agricultural patterns. Also, local people must participate fully in ownership and management of these new forests. This participation must extend beyond payment of wages and processing and use of forest products. Careful matching of tree species and cultural



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The possibilities for positive effects of enlightened private forest investment on local economies in poor, rural places are almost unlimited.

methods to local climates and cultures will also be key to sustained and sustainable production by the newly planted forests. Without broad acceptance and participation of local people, investments would be too risky for most rational investors to pursue.

Cooperation among investors, local people, non-governmental organizations (NGOs) and sources of science and technology can overcome these barriers and open an unprecedented era of positive forestry. Interested parties² are establishing a new non-profit organization, Forests To Fight Poverty (FTFP), to help these elements of the solution work together to find the most promising places to accelerate the planting of new forests and to alleviate poverty. One hope is that FTFP will complement and enhance the efforts of the huge array of NGOs, governments and private companies now involved in the developing world's forest plantation establishment and management. Another hope is that FTFP will make it easier for those now engaged in cooperating to meet their mutual goals. But even without FTFP or any new organization, new forests now provide a great opportunity to help reduce rural poverty. It is urgent that all those interested in forests and poverty alleviation pursue this opportunity.

¹ R., Schmidt, J. K. Berry, and J. Gordon. 1999. *Forests to Fight Poverty: Creating National Strategies*. Yale University Press, New Haven, CT.

² See www.centerforabetterlife.com/ftfp.

About the Creators of Forests To Fight Poverty

John C. Gordon, Ph.D., is Pinchot Professor Emeritus of Forestry and Environmental Studies at the Yale School of Forestry and Environmental Studies, where he was Dean from 1983-1992. He has been a Fulbright Scholar in Finland (University of Helsinki) and India (Bangalore). Gordon's primary expertise is in the biological basis of forest productivity, the management of research

and forest policy. He has led several national-level assessments, including those on research and resource management in national parks, forestry research (for the National Research Council/National Academy of Sciences) and American Indian forests. He served as a member of the Congressionally-mandated Scientific Panel on Late Successional Ecosystems and was co-chairman of the Seventh American Forest Congress. Gordon has extensive consulting experience with public and private organizations, including the World Bank and the United Nations Development Programme, as well as international experience in a variety of countries to include India, Pakistan, China, Costa Rica, Brazil, Argentina, Finland and Scotland.

Joyce K. Berry is Vice President for Advancement and Strategic Initiatives at Colorado State University (CSU). Before that she was CSU's Dean of the College of Natural Resources. Berry has a Ph.D. in Forestry and Environmental Studies from Yale University. Her primary expertise is in the human dimensions of and public involvement in the management of natural resources. She co-chaired the Social Science Workshop of the Seminar of Experts on Sustainable Development of Boreal and Temperate Forests, a 50+ country meeting that ultimately led to the Montreal Process of criteria and indicators for sustainable forestry. Berry was also a member of the Board of Directors and the Executive Committee of the Seventh American Forest Congress.

Ralph Schmidt has over 25 years of experience in international development and global environmental issues, specializing in forests. His work with forests has been broad in scope, involving such issues as combating poverty, biodiversity conservation, carbon sequestration and climate change, and international trade. Schmidt has worked in more than 60 countries on projects involving governments, non-profit groups, academic institutions and the private sector. From 1990-2001 he was Director of Forest Programs at the United Nations Development Programme in New York. Prior to that he was Forest Management Officer at the Food and Agriculture Organization in Rome and also Chief of the Forest Service in Puerto Rico. Schmidt received his B.A. and M.S. in Forest Science from Yale University. 🌿

For more information on Forests To Fight Poverty or to contact John Gordon, please log onto www.centerforabetterlife.com/ftfp.

For more information on sustainability log onto www.centerforabetterlife.com.



Saving Rural America

The Fight Against the
NIET Corridors Part Two

As she looked out lovingly over their 60-acre farm of rolling hills and green pastureland, Luciana Duvall explained how she felt when she arrived in Virginia from Argentina: “When I walked up to this hill the first day I arrived on this farm, I sat down here, and the wind was absolutely brilliant, and it felt like the station before heaven. It was my first day in Virginia,” she said. As she remembered that moment 12 years later, she continued passionately, “When you see this, you can understand why.”



Sitting underneath a tent canopy in the middle of a hot July day in 2007, Mrs. Duvall reflected, "It's kind of ironic that today I'm hosting a party for the people of Virginia to protect this land. In a way sometimes you think you choose things, and sometimes things choose you. I believe that this place, in a way, has chosen me." The party that she and her husband, actor Robert Duvall, hosted on their northern Virginia farm for more than 1,000 members of their community was a "No-Power Picnic" aimed at, according to Duvall, "thwarting Dominion Power."

Argentinian-born wife. The "fight" that Mrs. Duvall is referring to is the one that hundreds of thousands of rural Americans, from all stations of life, are continuing to wage against the National Interest Electric Transmission (NIET) Corridors. The fight is not only against the Department of Energy's designation of these "corridors" but also, more specifically for the Duvalls and their community, against Dominion Virginia Power and Allegheny Power. These two power companies are working feverishly and aggressively to obtain approval from the state public

streams, springs, state and federal conservation easements, a National Forest, state parks, protected watersheds, wildlife preserves, historical lands and thousands of rural landowners' homes, as well as farms that have been family-owned and-operated since America was in its infancy.

And, in the process, the land and everyone's life will be irreparably damaged by the use of eminent domain to seize private property for the corporate profit of Dominion Virginia Power and Allegheny Power. Ironically, rural Americans will be victimized twice by these power companies:

take advantage of rural America. This unwitting combination will allow them to feed what many people believe is corporate greed as well as a gross disregard for the Earth and its inhabitants.

"We're trying to thwart this whole thing, to try and defeat Dominion Power – to keep them from putting these towers up, to keep them from going through this sacred land and to keep them from going through the personally sacred land owned by other people. People are against this, but I don't know how effective we are. These power companies are pretty powerful; I think they have money in both political parties' pockets. I call this 'right-wing socialism,' if there is such a thing – this eminent domain thing – capitalism taking over other people's property. We met with one of the top energy guys in the administration early in 2007, and it was like our words were falling on deaf ears. These people weren't about to do anything to correct the situation," said Duvall emotionally. "Someone brought up the other day that they were going to do power lines in New York state, and Senator Hillary Clinton got it jinxed. So, there must be ways that things can be done down here in Virginia."

Like many rural property owners, Robert and Luciana Duvall are "wed" to their land and very concerned about the possible effects to their farm. But, equally apparent is their concern for others who are less fortunate than they are and their determination to leave the land intact for future generations.

"From my point of view," continues Duvall, "I have a wonderful farm, and I put it in easement several years ago – the whole thing is in easement in order to preserve the land. I feel very much wed to this land, but I'm in a different situation than many people. I'm the kind of person that if they came in and put towers up, I could move tomorrow because of my background, my past, my line of work.

I can up and leave, but most people can't do that. I'm wed to the land only so far that I put it in easement. I love my place; but if I had to sell it, I would, but I would sell it under the condition that it be preserved absolutely. The land as I own it and as I live on it now should be preserved, and this is the premise to go from – to protect this land that we love, that we're wedded to."

For many the lines seem to be drawn between those who care

harmful practices would be "ahead of the time."

"Even if tomorrow they said global warming doesn't exist, still, you have to protect this land. It doesn't matter if you have the next Ice Age; it's our duty today to protect the land. We're going to the moon, but we can't put these power lines underground?" Mrs. Duvall questioned. She continued by saying that maybe the Dominion Virginia Power and Allegheny Power decision-makers aren't from Virginia or the other involved states, so they might not have an appreciation for the



Photographs: Bill Simone

The Duvalls are a very community- and socially-minded couple; and, as a result, they have opened their home to other causes. According to the actor, "We've done this before for charities at the hospital, but this is even bigger. My wife went out and bought beef for the fajitas; we have tents set up and everything. I think it will be nice for the community, the young people and the children. I think it will be welcoming; this is a community thing."

"It's great that Bobby and I can add a little bit to the fight against these people who are so outrageous," said Duvall's

service commissions to construct a 500-kV power line from southwestern Pennsylvania through West Virginia into northern Virginia.

This Trans-Allegheny Interstate Line (TrAIL) will clear-cut everything in its 200-foot-wide, 240-mile-long path and leave behind 180-foot high interconnected towers with high transmission lines generating electricity via antiquated, "dirty" coal-fired power plants – the primary cause of global warming's greenhouse gases (GHG). This path runs roughshod over some of America's most sacred and coveted lands – through forests, lakes,

once when they have their lands and homes seized and then again when they pay 100 percent of this proposed approximately \$1 billion construction project via rate hikes on their electricity bills.

Thanks to Congress's Energy Policy Act of 2005 (EPACT 2005) and the Federal Energy Regulatory Commission (FERC), these power companies are not required to invest even one cent in this company-owned construction project even though 100 percent of the profits flow back to them. All Dominion Virginia Power and Allegheny Power have to do is take advantage of EPACT 2005's Section 1221 and



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Photograph: Bill Simone

deeply for the land and the rich history of America and those who do not. Mrs. Duvall commented, "I learned that (fashion designer) Ralph Lauren donated \$13 million to the National Trust for Historic Preservation. So while you have citizens in America who spend millions to restore the history of this country, you have others who just don't care." She thoughtfully theorized that maybe in the past putting up power lines for electricity was a bold move that was "ahead of its time" because "it was a way to bring prosperity to your people." But today she believes that to find ways around these antiquated and

beauty or legacy of the affected states or the people born to these states. However, she is quick to point out that they still have a responsibility to do the right thing. "When you have power or you have money or you're famous, your responsibilities are even greater than others'. I don't know with what faith these people face their children when they go home. And, I'm sure there is a lot of hypocrisy when it comes to them," she added.

Mrs. Duvall is very much in favor of prosperity and business; in fact, she calls herself a "Reagan Republican," but she is quick to point out that prosperity must be

balanced by the needs of all people, not just a few, and for the benefit of the environment. She commented, "We can't always have everything we want."

"This is a very unique part of the world, and we want to protect it. We wouldn't have power lines in the Grand Canyon or in the Nile or through the Great Wall of China, so why have them here? That's what I stand for, and that's why I believe in this fight," explained Mrs. Duvall.

Duvall echoes his wife's thoughts and feelings. His love for Virginia may have started as a child, but the beauty of Virginia brought him back as an adult. "I lived over in Loudon County for awhile because my father had been from here and my brother had been from Virginia. Before I bought this place, I was living in New York, but I got rid of my apartment when I moved here. I like Virginia a lot . . . a bunch . . . it's great," he said.

"My love for Virginia comes from family, but it also comes from the beauty of Virginia. And, here they want to put these power lines through this beautiful Piedmont area. They wouldn't put them through the Grand Canyon or Yellowstone Park, I don't think. My wife is from Argentina; she loves this area. And people would say it's a selfish thing; but if we moved, we would still want the land to be preserved and to be without these towers, for God's sake. This is a personal and moral issue."

Duvall continued, "Of all the places in America – and there are some wonderful places – we opt for this area. This is our first choice for living in. I can live anywhere I want to between what I do, but I love Virginia a lot. It's a beautiful, wonderful area. Another thing about this area: We've only won five equestrian gold medals in the history of the Olympics for the United States, and four of those five live in this immediate area. It's definitely horse country, and the power lines are not particularly advantageous for that lifestyle."



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The Duvalls are working closely with the Piedmont Environmental Council and Virginians for Sensible Energy Policies to secure that lifestyle and the lifestyle of others in the northern Virginia area. Mrs. Duvall explained that the Virginians for Sensible Energy Policies placed a wonderful ad in the Richmond newspaper and in other newspapers to say "if Dominion Virginia Power was a country, it would be more polluted than the Czech Republic." She feels that the message was very effective in educating many people to the long-standing polluting practices of Dominion.

"I think you have to fight them that way. At some point it becomes abstract because the politics, the lobbyists and the money run the show sometimes; but I think the people here are very strong, and everybody has to do whatever they can – send a letter, send a note, type an email – keep selling it. It's now or never; there is no 'second round.' The Piedmont Environmental Council and other organizations feel very optimistic about this fight. Who wouldn't be when it's about defending this country? But, you never know; you cannot underestimate your enemy," said Mrs. Duvall.

"This has been going on for awhile," explained Duvall. ". . . and I think people

don't know about it because all the different groups need to consolidate to go against these power companies. I think the power companies are just quietly lying in the background knowing that they might win."

Whether hosting picnics for a thousand people on their property, traveling to Washington, D.C., to meet with energy administrators or writing letters to governors, Mr. and Mrs. Robert Duvall are not only actively engaged in this battle but also morally compelled to "see it through" to its end. They are committed neighbors and committed members of their community. Their strength of character and willingness to actively engage in issues of importance also make them great Americans. They set the bar for others to follow and act as leaders for the less fortunate to gain strength from.

One could feel the depth of emotion and commitment Mrs. Duvall has for the land and for the environment when she diverted the NIET corridor discussion to what seemed to be one of her oldest and dearest friends – a hickory tree in the center of the yard in front of her and her husband's house. She spends her days with her old friend as she sits in front of her computer and looks out at its majestic beauty. "I care very much about my trees because, you know, you can't replace them. It sounds very silly, but we have very old trees – the oldest hickory tree in the county. And we have over 200-year-old boxwoods so I care deeply for these things. They have a history and a legacy. There's no way that I will see a tree grow to that size in three lifetimes, even if I live to be 100."

"If you let them cut your trees, then nothing has any meaning," said Mrs. Duvall as she continued to look out lovingly from her station before heaven. 

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The U.S. Air Force: Pushing the Envelope

Creating Solutions for
America's Energy Concerns

The economic impact of energy is having a tremendous effect upon America at home and on the job. To combat this effect, consumers and businesses alike are undergoing major transformations to better manage their resources, to rethink their priorities, to more effectively pursue their goals and to enable better decision-making. The U.S. Air Force is no exception to this changing mindset. In some areas it plays by different rules from the private sector, but the Air Force is just as concerned with transformation as any business looking to ensure it is relevant tomorrow. Energy efficiency is a key enabler in this metamorphosis, and the Air Force's top leadership has a holistic strategy for dealing with it.

Rising energy prices, with their impact on the bottom line, drive how the Air Force operates, particularly with a \$7 billion annual energy budget - \$6 billion for aviation fuel and \$1 billion for facility energy. With this level of resources at stake, sustainability becomes critical, especially when it's driven by today's economics. The Air Force is addressing key issues with a new comprehensive energy strategy overseen by the Secretary of the Air Force's Senior Focus Group for Energy. Its plan incorporates all energy-consuming activities from aircraft acquisition to flying operations and running the installations that support them. The strategy is designed to reduce the Air Force's energy consumption, carbon footprint and cost of operations while simultaneously eliminating waste. One example of an aviation initiative is the use of simulators to

reduce actual flight hours in order to deliver huge energy savings. Another step is considering how much fuel to load onto an aircraft and how much to land with because the additional weight of fuel has an energy cost or energy burden. And, yet another energy-saver is the use of synthetic fuels called "synfuels."

The Air Force's infrastructure energy strategy (facilities and ground fuels) is part of an overarching approach and accounts for 20 percent of the Air Force's total energy use (aviation fuel accounts for the remaining 80 percent). This synergistic, holistic protocol is made up of four "pillars" consisting of: improving the current

infrastructure, improving the future infrastructure, expanding renewables and managing costs. These pillars include programs of change to extend and to improve the life cycle and energy efficiency of buildings while incorporating sustainability practices to build better for the future.

A Case for a Culture Change

Major General Del Eulberg, The Air Force Civil Engineer, explains why the Air Force's new strategy and culture change are so critical: "The continued pressure on the defense budget, along with the continued demand relative to Middle East operations, has really put a focus, almost a sense of

urgency, on our need to better manage our built environment, as well as our operations. We need to free up resources so that the warfighters in harm's way have everything they need to conduct operations. For example, saving energy at Malmstrom Air Force Base frees up resources to make sure we can get the up-armored vehicles to the Airmen on the ground in Iraq and Afghanistan. There is a direct linkage between turning that light switch on and off and helping those guys in harm's way."

The Air Force's focus on energy is not new; it's been imbedded in their DNA since America's first oil embargo.



© U.S. Air Force photo

As a matter of fact, the Air Force Senior Focus Group on Energy received the Presidential Award for Leadership in Federal Energy Management during a special ceremony at the White House on Nov. 2, 2007. The Air Force has a proud history of not only meeting but, in many cases, exceeding Presidential conservation mandates, such as Executive Order (EO) 13123, which required a 30 percent increase in efficiency from 1986 to 2005. This committed effort by the Air Force saved taxpayers \$2.9 billion in energy costs. The current Presidential mandate, EO 13423, challenges all federal agencies to change their culture and to become more energy aware in order to meet an even more aggressive efficiency goal of an additional 30 percent by 2015.

So, what's changed? "I think the link," according to The Civil Engineer, "is understanding that our installations worldwide, not just our airplanes, are three-dimensional weapons systems made up of the built environment and the natural environment; and all the various components have value that enable us to train our Airmen in peacetime and to conduct operations in wartime. So part of the Air Force transformation is developing a culture shift that requires an understanding of asset management and its linkage to our ability to conduct operations. How we manage 166 installations around the world, valued at \$243 billion, impacts how we operate every day. It impacts how we train people, the decisions they make, as well as the associated resource implications. Our transformation is all about understanding

asset management, and energy is a key subset of that."

An Historic Transformation

This is an historic Air Force transformation that holistically and synergistically revolves around the energy-driven components of aviation, the built and natural environment, and ground fuels. Major General Eulberg chairs the group that is responsible for the transformation of the Air Force built environment, natural environment and ground fuels; he reports directly to the Secretary of the Air Force's top energy management steering group, the Air Force Energy Senior Focus Group. According to The Civil Engineer, "America's Air Force is very concerned



PV solar array system at Nellis Air Force Base in Nevada

about its obligations to conduct its missions in support of the national defense, and we owe it to the American people to do it as efficiently and as effectively as possible. When you look at the demand and supply side of energy, it is important to address this at every level of the organization. This is

not going to be improved by one policy letter from a General in Washington, D.C. This has to permeate every level of the U.S. Air Force, affecting everybody's lifestyle – how they think every day and how they go about their business in accomplishing their mission."

The Air Force already has an impressive start on its way to this culture change. According to the Environmental Protection Agency's "Green Power Partnership," this military branch is already the Federal Government's No. 1 purchaser of green power and No. 5 purchaser nationwide. In fact, 10 percent of the Air Force's electricity is from renewable sources. This includes a growing capability to actually produce green power on air bases. The Air Force operates 166 bases consisting of \$243 billion in real property with 700 million square feet of facilities

We're pursuing the transition to renewable energy wherever feasible – whether it be biomass, waste-to-energy, wind generation or PV systems.

worldwide. According to Major General Eulberg, "Our basing strategy allows the Air Force to project air power for our nation. We have gone through two major base realignment and closure (BRAC) actions, and we still have excess basing capacity. We need to close more bases. Short of that, our challenge is how do we shrink our bases, our infrastructure, from the inside out?" Part of this strategy is to find more efficient ways to operate our bases, and the energy strategy is a vital component of the overall strategic approach.

Renewable Energy Diversifies Supply

Renewable energy is a means to shrink a base from the inside. Under its renewable energy strategic pillar, the Air Force is expanding on-base renewable energy

production. One example is the use of wind turbines at both F.E. Warren and the Ascension Islands – a total capacity of 4 megawatts (MW) – and the Air Force has plans to expand this approach to several other installations. At Nellis Air Force Base, crews broke ground this past April on North America's largest photovoltaic (PV) solar array system – 14.2 MW – enough energy to supply upward of 25 percent of the installation's power needs or the rough equivalent of 2,200 American households' use. This project was accomplished via a partnership between the Air Force, the State of Nevada and the private sector with no taxpayer dollars. The agreement allows a private company to use land on the base to produce solar power in exchange for 20 years of reduced power rates for the Air Force. The environmental benefits are clear;

the project occupies 140 acres on base with 33 acres being part of an old "capped" landfill that couldn't be used for other purposes without an expensive environmental cleanup. To make things even better, the project will help the State of Nevada reduce its greenhouse gas footprint by 24,000 tons of carbon dioxide. The project is a win-win for all as it allowed a public utility to meet its state mandate for supplying renewable power to its customers. The array will be complete by mid-December 2007.

In addition, according to Major General Eulberg, "we have examples of using biomass to generate power, as we're doing at Hill Air Force Base, where we basically use the methane gas off a landfill to generate power. We have an aggressive program to go after renewables because, again, it not only makes economic sense; it gives us energy security. If we can generate this energy on our installations, it's more secure. We're pursuing the transition to renewable energy wherever feasible – whether it be biomass, waste-to-energy, wind generation or PV systems. We have examples of all four of those going on right now and lots of options and opportunities for the future."



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PV solar array system at Nellis Air Force Base

The Air Force's dedication to renewables is apparent by its own renewable energy generation and by its financial support to private industry through direct purchases

© U.S. Air Force photo

of green power. Purchasing green power from utility providers costs more per kilowatt hour (kWh) than traditional forms of energy; however, the Federal Government is allowed to do so, with the support of Congress, where it makes sense. This is the Air Force's means of socio-economic outreach — supporting an industry and a vision to help spur economic development in alternative energy use. Another forward-thinking move by the Air Force is their use of alternative fuels for vehicles, as well as its expanding use of low-speed vehicles on all bases to reduce energy use and greenhouse gas (GHG) emissions.

Pushing the Envelope on Alternative Fuels

The General was particularly excited and proud when speaking about the Air Force's use of alternative fuels for aviation. "I'm very encouraged by the increased emphasis on the aviation side of the Air Force on saving energy relative to aviation fuels. And, I'm very proud to say that the United States Air Force is really pushing the envelope relative to alternative fuels in the aviation industry. We had the B-52 test where we flew a bomber with a synthetic fuel blend. The private sector was watching that very closely because if we can use alternative fuels in the aviation industry, using the United States Air Force as the example, the impact to our nation is huge. Not only does it save the Air Force money with less reliance on foreign energy sources, but just think



Misawa Air Base aircraft hangers in Japan — comparing the difference with replaced lighting

what the economic impact would be for the aviation industry and our nation. This is an exciting area that deserves a lot of attention."

The Fundamental Importance of Conservation

Renewable energy is new and exciting, but conservation is critical. According to the General, it is the basic "blocking and tackling" of the energy management business. Renewable energy gets a lot of attention as it is technologically very intriguing, but the economic conditions and renewable resources don't exist in the right combination in all locations. However, in day-to-day operations any facility manager will find opportunities to save money by paying close attention to how energy is consumed by things like the building's heating, ventilating, air conditioning and lighting systems. Additionally, Air Force budgets for new construction will allow for replacement of only 3 to 5 percent of existing buildings and infrastructure in the next eight to ten years. As a result, this military branch's primary focus is on improving current infrastructure through increased awareness, fact-based decision management and focused technologies with proven payback. There are numerous examples of energy and water conservation on air bases such as at Peterson Air Force Base in Colorado, which uses native grasses and other low water-consuming landscaping as well as storm runoff for golf course irrigation. Engineers at Misawa Air Base in Japan completely replaced the

lighting in an aircraft hangar. The benefits include reduced energy use and higher-quality lighting for aircraft maintenance technicians. Modernizing and extending the life of existing facilities is an integral part of the Air Force's strategy and — done right — it can result in better energy efficiency, lower cost and higher-quality facilities for the mission.

As the Air Force shrinks its force by 40,000 people, or about 10 percent, it is critical that the organization come up with new ways to do business and new ways to transform itself. According to Major General Eulberg, "... that's our challenge, as we reduce the number of personnel, we have to be more efficient and effective and transform the way we do business. We have to more effectively manage these 166 bases because as we draw down people, if we don't change how we do business, then all we're going to ask our people to do is 'more with less' and, for me, that's a failure in leadership. It's a retention issue; it's a recruitment issue; it's a warfighting issue. Bottom line: We have to do things better than we're doing them today.

"I think the key is, whether corporate America or the U.S. Air Force, leadership has to set the expectation, create the environment and allow people to succeed. Said another way, you give them the vision; give them the structure; and they utilize their talents to make a difference for the future. And that's really what we're trying to do. And, as we change the culture of the United States Air Force, as we think about energy in everything we do, I think we can all benefit as a result of that — the environment, our national defense and our ability to free up resources to do other things." 🌱



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Peterson Air Force Base in Colorado

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Alaska has been home to its fair share of environmental assaults and controversies as a direct result of wars between materialists and conservationists. So in 2008 it's probably not a big surprise that Alaska is, once again, the center of a contentious environmental issue: the development of a copper and gold mine in the tributaries of Bristol Bay, which is adjacent to the Bering Sea. The proposed project raises many questions of sustainability - from the cultural concerns of tribal peoples who have historically lived off the land to the preservation of what many believe is the world's most viable, unique watershed. To understand

the primary issues, one must first get a glimpse of the uniqueness and grandeur of Bristol Bay.

An Assault on Bristol Bay

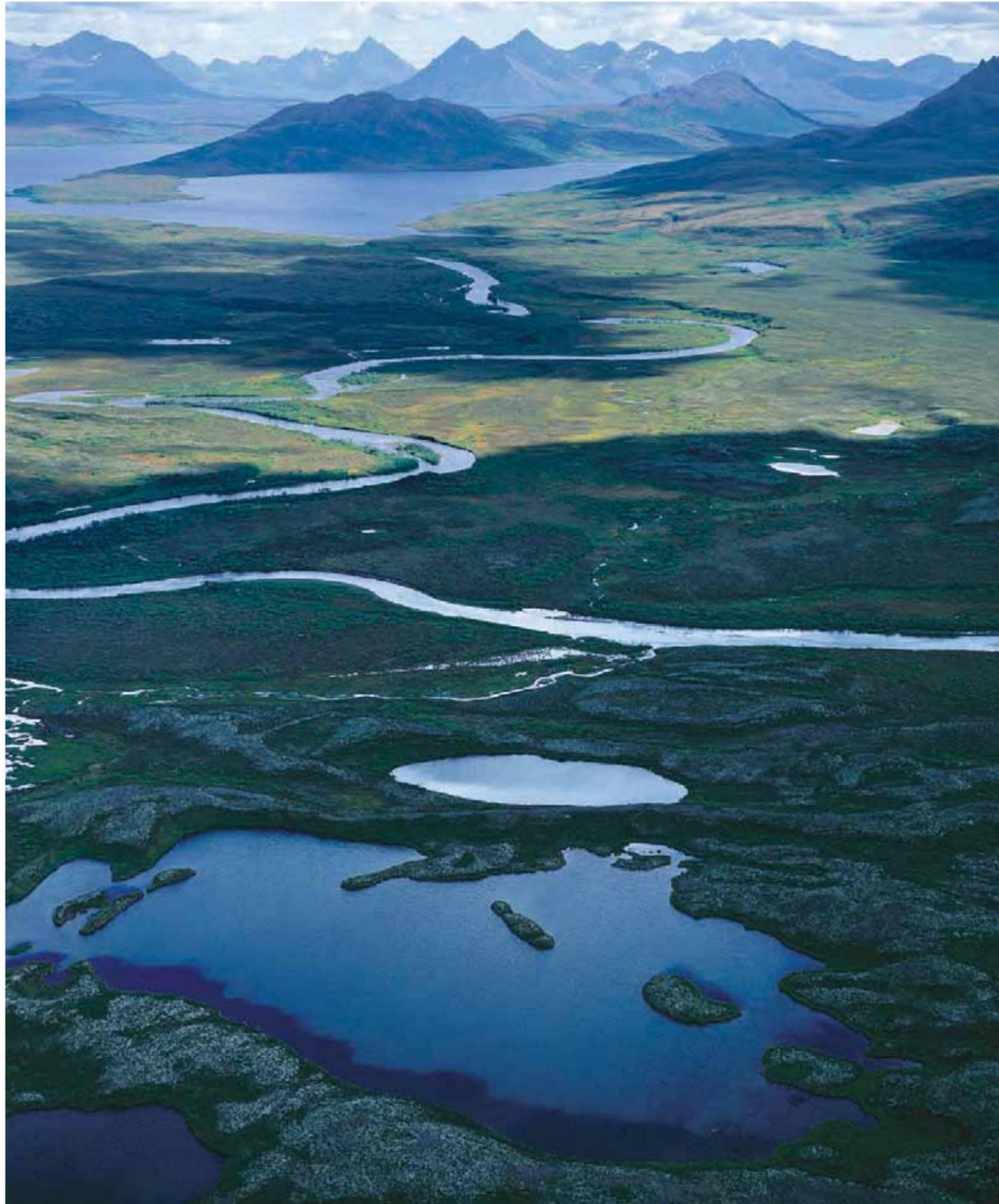


“There are few places left in the world as wild, biologically productive, remote, beautiful, economically important and fragile as the Bristol Bay watershed in western Alaska. The earth’s greatest epic of birth and death takes place here as millions of fish engaged in the planet’s largest salmon run begin and end their lives in the region’s pristine streams and rivers. Humans, brown bears, rainbow trout and numerous other species rely on the bounty of these lands and waters. Without hyperbole this is one of the last great natural places in existence,” explains Deborah Williams, executive director, Alaska Conservation Foundation (ACF), in the foreword to *Rivers of Life: Southwest Alaska, The Last Great Salmon Fishery*. Photographs by Robert Glenn Ketchum. Essay by Bruce Hampton. Copyright © 2001 by Aperture Foundation, Inc.¹

The Uniqueness of Bristol Bay

“Here in the southwest corner of Alaska known as Bristol Bay, in a region about the size of the state of Washington brimming with freshwater lakes and streams, exists one of the earth’s grandest and most spectacular wildlife pageants – one whose numbers exceed the past great migrations of bison . . . and which, in the short history of humankind, has proven far more important. As their ancestors have done for countless millennia before them . . . young salmon will grow and mature over the next few years, descend freshwater streams to the sea, travel over one thousand miles throughout the North Pacific Ocean, then return with remarkable timing and precision to ascend, spawn and die in the waters of their birth.

“Although the journey of the salmon is a well-known phenomenon, what isn’t widely acknowledged is that Pacific salmon have disappeared from 40 percent of their original range and their survival is at risk in another 27 percent. In Alaska’s Bristol Bay – home to the world’s greatest wild sockeye salmon population – they still



occur in numbers almost beyond belief, both humbling and stirring human imagination,” explains Bruce Hampton in *Rivers of Life: Southwest Alaska, The Last Great Salmon Fishery*.¹

Bristol Bay’s six major rivers, numerous lakes and small streams, most at low elevations and within short distance from tidewater, are what make the region such a vital sockeye nursery. It seems that nature’s perfect blend of location, environment and wild salmon have created an ecosystem laying claim not only to the world’s greatest fishery but also to the largest protected brown bear population in the world. Between 5,000 and 8,000 bears inhabit southwest Alaska and share this unique, vital ecosystem with eagles, otters and the greatest population of large native rainbow trout in the world. All life in this area, including that of humans, is dependent upon the salmon for their survival; thus, the “circle of life” is easily discernible in Bristol Bay.

Given the rugged and remote nature of this area, few humans inhabit Bristol Bay, which is surely another reason why its ecosystem is so vibrant and abundant. For those unaware, the terrain is an exhaustive wilderness with only mostly centuries-old, Alaskan native villages scattered across the region. The closest highway is 250 air miles away, so airplanes and boats are the primary means of transportation. Most of the surrounding area is public land; in fact, 90 percent of the region is comprised of national parks, wildlife refuges, Wood-Tikchik, the nation’s largest state park, and other city, state and federal land. The remaining 10 percent is owned by Alaskan native corporations.

Subsistence fishing is still vitally important to the Alaskan natives – not only for food but also for cultural and social reasons. They are inexplicably tied to the salmon, as they have been since the beginning of their existence. According to Terry Hoeflerle, chief executive of the Bristol Bay Native Association, “the salmon are a part of the

heart and soul of the region. They make up the bones and blood of everyone in Bristol Bay. We fish them; we eat them; we wait for them to arrive. Without that aspect of the economy, there’s not much else. The thought that the fish won’t return is a terrifying one.”¹

Salmon provide economic security to the area, which produces a sustainable industry worth \$100 million annually to fishermen. Although this total is enormous, it pales by comparison to the seven-times greater economic gain as salmon pass through and enter the retail market while providing more than 25,000 jobs. This figure doesn’t account for the additional \$50 million annually spent locally by Alaskan anglers. Again, none of this economic gain would be possible without the salmon.

Alaska is not only biologically diverse; it is physically diverse with more than 10 percent of the world’s most active volcanoes. The majority of this geological instability lies close to Bristol Bay. In fact, Pavlof Volcano, which is situated at the lower end of the peninsula, has erupted more than 30 times since its discovery in 1778.

The Concern over Pebble Mine

So why would a copper and gold mine in Bristol Bay – the Pebble Mine project – be a topic of conversation, much less a possibility? Would not the thought of losing the salmon, along with the entire ecosystem, be sufficient to render the issue moot? From the perspective of a person with no material gain, this is definitely an insanely ridiculous thing to consider. But unfortunately, from the perspective of those who stand to gain materially, the interjection of a gold and copper mine into a pristine and priceless ecosystem is not only viable but agreeable.

Can a project such as Pebble Mine (projected to be rich in copper, gold and other ores) be designed and managed in a manner that will bring economic gains to the surrounding area without compromising the area’s salmon population? What about

Subsistence salmon fishing not only allows many natives to survive; it connects them to their heritage.

the impact on the Alaskan natives and on their traditional way of life – a lifestyle that has existed long before copper, gold and profits were in the American lexicon?

The consensus is that most Bristol Bay residents are afraid of the environmental uncertainty and degradation that mining could likely bring. To them, the economic gains of having a mine are not worth the risk of harming an ecosystem and the people's ancient way of life, particularly because this lifestyle is tied to their survival and to their culture. Subsistence salmon fishing not only allows many natives to survive; it connects them to their heritage – the same way that it did for their parents and for their

ancestors. For the natives, subsistence is about more than food; it's about self-sufficiency, family, cooperation and outdoor skills. It's about needing the land more than money. For these people fishing is part of their personal identity; it's part of their very being. As long as they have the land, they will always survive and never go hungry.

Jack Hobson, president of the Nondalton Tribal Council, echoes this thought. His people, too, rely upon the salmon, caribou and the land for their life and cultural sustenance. Hobson and his tribe have been protesting the potential Pebble Mine for more than four years now. He thinks that he not only needs to protect the land and

the fisheries from the mine but also the sustainability of his tribe's future. "I'm connected to Bristol Bay by trying to protect our subsistence way of life," Hobson said.

In 2007 the American Rivers Organization released its list of the most endangered waterways throughout the United States. Bristol Bay came in at No. 8 because of the potential creation of the Pebble Mine. Amy Kober of the Northwest Region of American Rivers said, "The rivers that feed Bristol Bay support the largest, most productive salmon fishery in the world. An open-pit mine in the headwaters of the Kvichak and Nushagak rivers is a wildly risky gamble that threatens a lucrative

fishing industry, our natural heritage, clean drinking water and the well-being of local communities. There are so few places in the world where wild salmon runs are still strong and healthy. Bristol Bay is no place for a mine. Its rivers and salmon are truly more precious than gold."

American Rivers is not the only organization that has voiced concern. David Harsila, president of the Alaska Independent Fisherman's Marketing Association, said that he and his organization have "found that mining is an inherent problem with the environment and the salmon." Harsila described the salmon in Bristol Bay as "very sensitive," and he believes that if the Pebble Mine is created, "the salmon will be affected in a very big way . . . It really looks bad from our point of view."

According to Ann Rappaport, a field supervisor with the Anchorage Fish and Wildlife Office, and Phil Brna, a fish and wildlife biologist with Fish and Wildlife Services (FWS), the increased presence of exposed metals in waterways as well as of other chemicals associated with mining (such as acid mine drainage, mercury, arsenic and cyanide) can kill off salmon populations. "Some of these metals are so toxic they can kill fish," Brna said. Ultimately, with the presence of metals and chemicals the entire watershed faces destruction.

Jeff Courier, borough manager with the Lake and Peninsula Borough (the government of the Bristol Bay area), said Bristol Bay would see a direct economic gain from the mine as the state has a severance tax attached to the extraction of natural resources such as the ore in the Pebble Mine project. As to how much revenue would be generated, Courier said that the proposal has the potential to be quite profitable though it's like "trying to nail a chunk of J-E-L-L-O to the wall" – describing the uncertainty that accompanies mining and profits.

The fear for many is that if the salmon goes, so goes the industry of the area. "Salmon has been the only economic driver in Bristol Bay for decades . . . You have to realize that," Courier said. The borough



"Tourists aren't coming here to look at an open-pit mine, they are coming to fish."

notes that "the majority of borough residents rely upon commercial fishing as a primary source of cash income." And just as the economy and tribal lifestyle is tied to the salmon, so is the sustainability of the area's tourism – a cash crop that is incredibly lucrative.

For Danny Constantine of Renewable Resources, a former employee of the Department of the Interior (DOI), the mining project isn't just about fish. It's about what is tied to the salmon industry: tourism. "Tourists aren't coming here to look at an open-pit mine," Constantine said. "They're coming to fish."

Tourism is second only to salmon, though they are inexplicably interrelated: "Tourism and recreational activities are the second-most important industries in the borough, and are rapidly increasing in economic importance," according to borough representatives.

Joe Donovan, a mining expert who has

worked in British Columbia with mines and who currently serves as a West Virginia University (WVU) professor of geology as well as a director of the National Mine Lands Reclamation Center (NMRLC), said: "The concerns are real. With any form of mining comes some impact to the land that surrounds it. Once the mine goes into operation, the land will never be the same. The holes dug from mining and the rocks removed leave the earth altered forever."

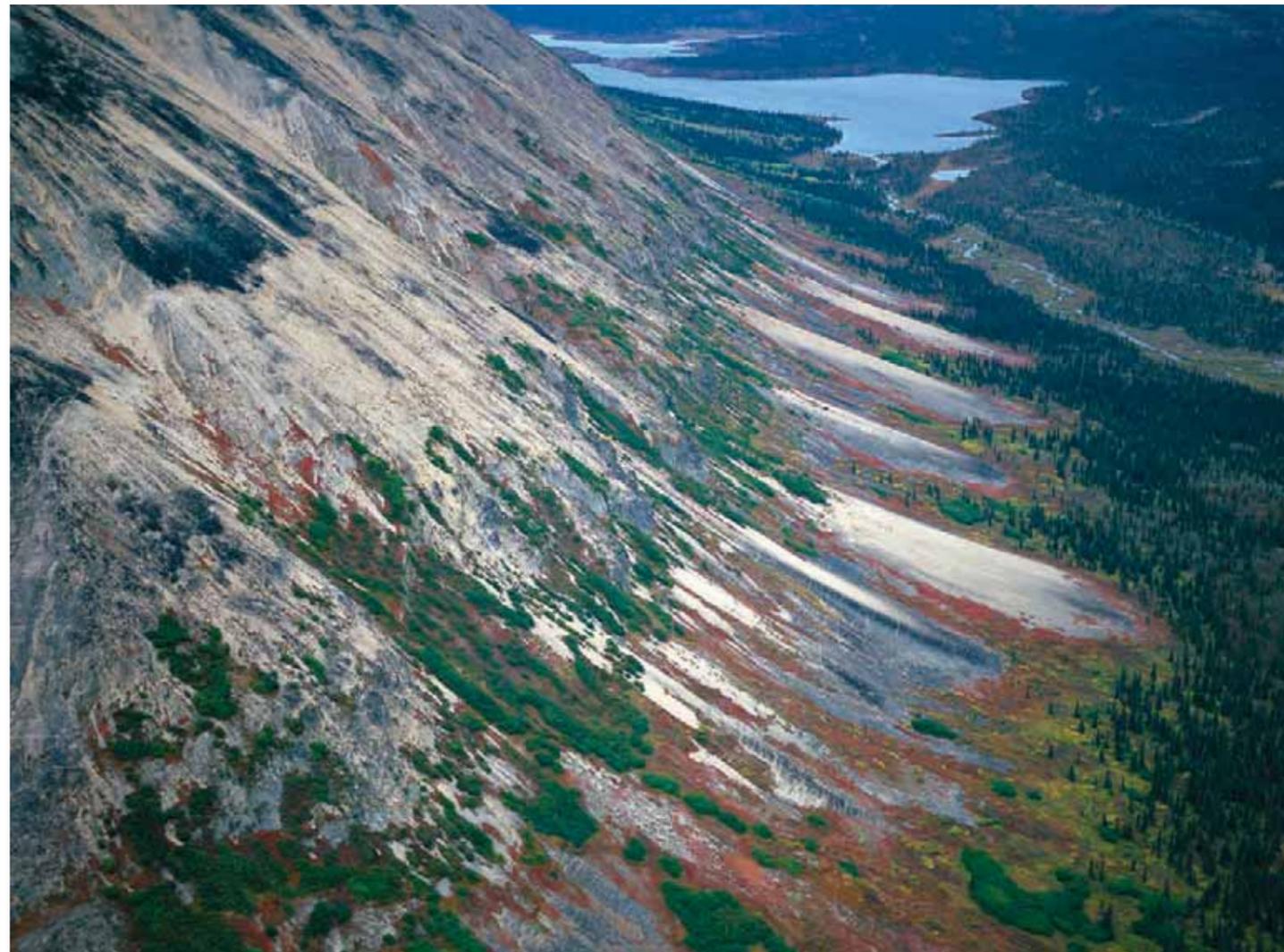
The Uncertain Pebble Project

Mike Smith, the National Environmental Policy Act (NEPA) and permitting manager for Northern Dynasty (the company behind the Pebble Mine project), defined the mine's progress as being in the "very early stage." In 2001 Northern Dynasty Mines Inc., a Canadian company, purchased the mineral rights to state, public lands for what is believed to be the largest gold and copper ore deposit in the world. To obtain mineral rights in Alaska, a company participates in an overly simplistic process that begins with the staking of a claim by placing four posts in the ground at the four corners of the mineral site, said Dick Mylius, director of the Division of Mining Land and Water in the Alaska Department of Natural Resources (DNR).

After the land has been claimed, the company pays a fee on a per-acre basis; mineral rights are rented in allotments of 40 acres for \$25 a year or 160 acres for \$100 a year. Mylius said that Pebble purchased the mineral rights to tens of thousands of acres of land in the area. And, without explanation, representatives from the Alaska DNR stated that in Alaska, Canadians have the right to purchase American mineral rights.

It is that easy. An ecosystem can be potentially destroyed for as little as \$100 a year for every 160 acres. This small cost for a large mining agency turns into a huge cost for the tribes and wildlife in the area.

Although no plan is concrete, Sean Magee, spokesperson for Northern Dynasty, said



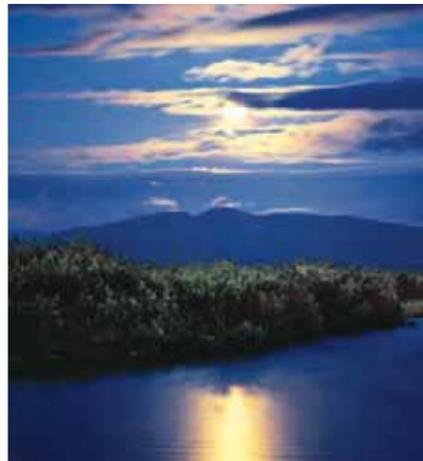


that two potential drilling/mining sites exist in the Bristol Bay tributaries. These sites would directly impact between 13 and 15 square miles. Pebble West would be an “open-pit” mine, while Pebble East would require more rigorous mining techniques. “Projects of this scale will certainly have effects on the environment,” said Magee.

Brna explained that the mere presence of a mine – from its inception – will automatically directly impact the area by adding a mine where nature now exists. Moreover, small changes that could occur because of mine placement, such as an increase in water temperature, can destroy ecosystems – a concern that has led many in opposition to ask “Is it worth it?” Brna said, “If you change these temperatures by one or two degrees, you change the fish’s ability to survive.”

Current estimates from Northern Dynasty show that if the mine makes it past the permit stage, more than 2,000 construction jobs, lasting between two and a half to three years, and 1,000 operating jobs, lasting the mine’s lifetime (speculated to be between 50 and 100 years) will be created. The local tribes and Alaskans will be granted the jobs, while a small tax will be placed upon the

extraction of the minerals taken out by the Canadian company. While the area could use some economic gains, Hobson of the Nondalton tribe believes that the creation of the mine is a short-term fix for the area’s economy and a long-term assault on the ecosystem.



“It would help the area economically,” Hobson said. “But it’s a high risk for a short-term gain. We’ll spend the rest of the years trying to clean that place up.” Specifically, Hobson is concerned about cyanide being used to extract minerals from rock.

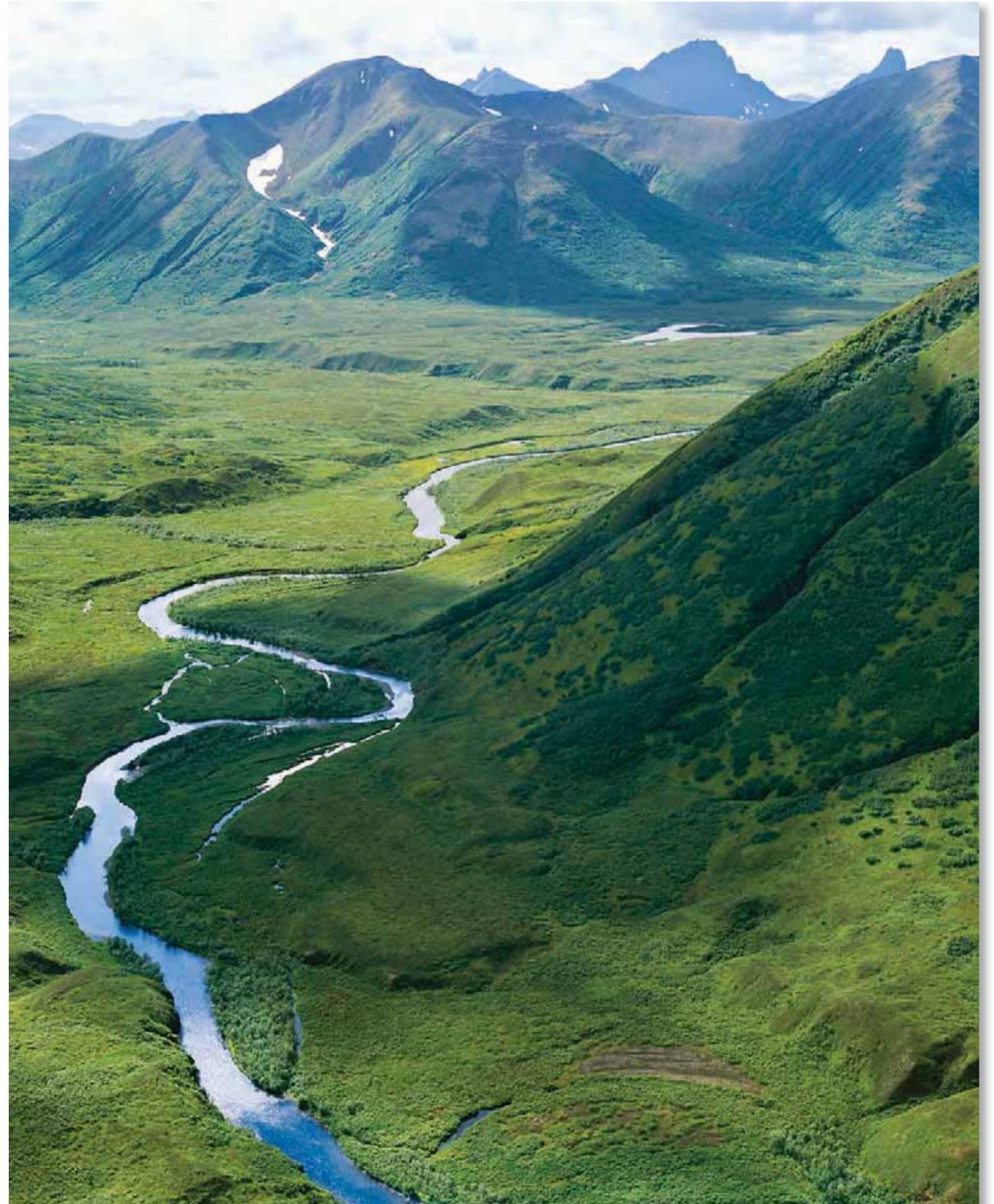
According to Professor Donovan, cyanide in large concentrations is toxic to wildlife. Although Magee explained that Northern Dynasty is unsure if such practices will be used in the Pebble Project, the U.S. Geological Survey (USGS) has stated that cyanide is commonplace in gold mining – specifically in Alaska.

In addition, a new road system that is planned to be more than 100 miles long leading up to the mine will kill some surrounding vegetation. And vegetation that is not killed will have higher levels of metals in plants that humans eat, Brna and Rappaport explained. And far beneath the deepest of mine shafts and drilling sites, beneath the gold and the copper, lie fault lines, area biologists said. “What if an earthquake strikes and cyanide contaminates the watershed?” they wonder.

“There’s going to be a loss of fish and wildlife,” Brna said. “That’s the trade-off for economic development . . . are we willing to accept that loss for gold and copper?”

“This is one of our last great chances to do it right – to manage wisely a habitat and a sustainable fishery, factoring in the needs of all species reliant on the renewable bounty of one of earth’s most magnificent geographic regions. There is something else at stake here – the rights of future generations to know, experience and benefit from these great lands and waters. With the tools of knowledge, financial resources and inspired engagement, we at the ACF believe that this heritage can and should be passed along substantially undiminished. This is one of our nation’s greatest stewardship challenges and opportunities,” said Deborah Williams, executive director, Alaska Conservation Foundation.¹

¹ The photos and certain sections of this feature were taken directly from *Rivers of Life: Southwest Alaska, The Last Great Salmon Fishery*. Photographs by Robert Glenn Ketchum. Essay by Bruce Hampton. Copyright © 2001 by Aperture Foundation, Inc. To see and to read more about Bristol Bay and southwest Alaska, please go online to www.centerforabetterlife.com to order a copy of this enlightening book with breathtakingly beautiful photography. There you also will discover more Robert Glenn Ketchum photos.



Doing business with the poor for prosperity

By Lloyd Timberlake, Director, North America Office
World Business Council for Sustainable Development

When Bangladeshi banker Muhammad Yunus won the Nobel Peace Prize in 2006, it was in recognition of his successful work over decades to create a bank for the poor people of his country. But it was another type of acknowledgment as well. By giving the award to the CEO of a reportedly profitable bank, the Norwegian Parliament was also recognizing that profitable business can be a powerful force for good in the world.

With a repayment rate exceeding 99 percent, the Grameen Bank that Yunus established has loaned more than \$6 billion, helped build 640,000 homes, sponsored more than 50,000 scholarships and student loans, and changed the lives of 80 percent of his country's poor families. Building on this record of success, Grameen has recently expanded into communications, nutrition and health care.

In his Nobel acceptance speech, Yunus explained:

“The frustrations, hostility, and anger generated by abject poverty cannot sustain peace in any society. For building stable peace, we must find ways to provide opportunities for people to live decent lives . . . By defining ‘entrepreneur’ in a broader way, we can change the character of capitalism radically and solve many of our unresolved social and economic problems within the scope of the free market . . . The challenge is to innovate business models and apply them to produce desired social results cost-effectively and efficiently.”

The economies of the globe's "emerging and developing" (which once meant "poor") countries in 2005 accounted, for the first time, for more than half of the world's combined gross domestic production (GDP)...

Big companies are finding a great many reasons to think like Yunus. Many of them involve self-interest, with the organizations trying to build more prosperous, more sustainable businesses.

The economic world is changing rapidly, and companies are trying to figure out how to change with it. The economies of the globe's "emerging and developing" (which once meant "poor") countries in 2005 accounted, for the first time, for more than half of the world's combined gross domestic production (GDP), *The Economist* reported in a 2006 September survey titled "The New Titans."

This shift in economic balance "is likely to be the biggest stimulus in history," *The Economist* said. "As these newcomers become more integrated into the global economy and their incomes catch up with the rich countries, they will provide the biggest boost to the world economy since the Industrial Revolution, which fully involved only one-third of the world's population. By contrast, this new revolution covers most of the globe so the economic gains – as well as the adjustment pains – will be far bigger."

Much growth in what used to be called the "Third World" has been accounted for by the real new titans such as Brazil, Russia, India, China and South Africa, the so-called BRICS countries. But many countries in Africa are growing more quickly than, say, the United States; and the commodities

boom caused by the BRICS' needs for minerals and fibers should spur that boom for some time to come.

So the big multinational companies of the world must plan to do less business in the North, where population growth is stagnating in many areas, and to do more business in the developing world, where much of the economic action is today and where, by 2050, 85 percent of the larger planetary population will reside. But how should companies operate in parts of the world where, despite economic growth, the majority of the populations remain poor? In fact, some 4 billion people, out of a world population of more than 6 billion, are "poor" by most definitions.



In 2006 a number of CEOs who are members of the World Business Council for Sustainable Development (WBCSD) put their signatures on a Statement of Intent on Doing Business with the World, which said in part that, "in striving to align profitable and self-sustaining business ventures with the needs of society, we have set the following objectives:

- To develop a deeper understanding of how global issues such as poverty, the environment, demographic change and globalization affect our individual companies and sectors;
- To use our understanding of these issues to search for more inclusive business solutions that help to address them on both a local and global scale;

- To align our core business strategies with the solutions that we have identified;
- To incorporate long-term measures into our definition of 'success,' by targeting profitability that is sustainable and supported by a responsible record in managing social, environmental and employment matters."

Signers included top executives of such companies as General Electric, Anglo American, BP, Unilever and Toyota. The Council is a collection of 200 of the world's biggest companies (about \$7 trillion in combined annual turnover), which believe that helping society tackle major challenges such as globalization and environmental degradation is good business (www.wbcso.org).

Yet before 1999, the WBCSD members rarely talked about poverty, because they did not want to be associated either with its existence or its cure. Then in that year, thousands of young people demonstrated on the streets of Seattle at a meeting of the World Trade Organization. It appeared to the CEOs that the young people of the wealthy countries – essentially their own sons and daughters – were demonstrating not only against trade and globalization but against business itself.

This event led the Council to organize around the issue of base-of-the-economic-pyramid, or pro-poor, or inclusive, business – doing business with the poor in ways that are real business, and thus potentially growable without limit, but also that help people create their own "sustainable livelihoods." It seemed to many members a good time to get involved in such business projects because:

1. Many developing nations are improving governance, legal structures and investment infrastructure to make it easier for companies large and small to do business there. The World Bank documents these improvements in its regular Doing Business reports.
2. Lower communications and transportation costs allow more geographically dispersed production and sales.
3. Public expectations of corporations are changing as communities and civil society

increasingly expect companies to get involved with social problems.

4. New, and better, partners are available to companies. In the recent past, many not-for-profits, non-governmental organizations (NGOs), foundations, citizens' groups and multilateral organizations made poor partners for business, as they were suspicious of business and its motives. Today many of these groups have the business savvy to help companies operate in poor countries and poor neighborhoods. They also understand how companies can assist in realizing their own goals, such as improved sanitation, water supply, healthcare, housing and business opportunities in the developing world.

This base of the pyramid business work led the Council to create a Development Focus Area. The members of this group are not only developing affordable products and services that improve overall quality of life but also developing suppliers from low-income communities in the countries in which they operate, thereby building capacity, generating employment and bringing small businesses into the formal economy. The companies are also providing basic services such as water, sanitation, energy, housing, healthcare and communications services.

The South African utility Eskom supplies approximately 95 percent of the country's electricity; however, before 1994 only 12 percent of the rural population had access to electricity.

The Council now has dozens of examples of such inclusive business, and in none of those examples are the poor getting products or services of lower quality than those sold to more affluent customers. But often the way that the product is sold changes.

The seed company Pioneer Hybrid, now a part of DuPont, sells seeds, fertilizer and pesticides in Kenya.



The seed company Pioneer Hybrid, now a part of DuPont, sells seeds, fertilizer and pesticides in Kenya. But these were traditionally sold in 50-kilo bags and bigger – an investment of several weeks' income for most farmers and impossible to carry home on one's back. A local NGO worked with Pioneer and farmers in the Siaya district to repackage the goods in affordable mini-packs. Farmers can now buy a chewing-gum sized sachet of 250 seeds of a local vegetable for five shillings (6 cents), and for another 10 shillings (12 cents) they can get a pack of fertilizer for 150 planting holes. A good farmer can earn anything from between 2,000 to 4,000 shillings (\$25-50) by using these packs. Pioneer's sales have increased as a result of this new selling mechanism.

The South African utility Eskom supplies approximately 95 percent of the country's electricity; however, before 1994 only 12 percent of the rural population had access to electricity. Eskom pledged to connect 1.75 million homes between 1994 and 2000. Problems with meeting this goal included high cost per connection, a lack of community understanding of the program and non-payment by recipients under the initial scheme.

The company developed better community interaction programs, pre-payment

meters and the tokens to feed them. Local shops sold the tokens, and local people were trained to install the systems and to do maintenance. Thus Eskom created jobs in the communities while lowering their own connection and maintenance costs.

In most countries, cement companies sell to wholesalers and retailers to sell on to builders. But in developing countries, the builders are mostly people constructing their own homes. Apasco, a Mexican subsidiary of the global cement company Holcim, realized that selling cement in bulk through a chain of middlemen dramatically raised prices. By opening new distribution centers in remote areas where cement could be purchased bag by bag and by providing technical and safety advice to builders, Apasco was able to sell responsibly to the poor. Lessons learned in Mexico are being studied at headquarters to see if this model can be replicated elsewhere.

Much has been written about the sort of micro-finance pioneered by Yunus: making small, short-term loans to poorer people so that they can invest in their businesses or their homes or their children's education. One problem with this is transaction costs; if you are loaning someone tens of dollars and paying the person making the loans hundreds of dollars in salary, then you soon go out of business.

The phone company Vodafone is lowering transaction costs by helping customers use their cell phones to manage money. Following a successful pilot program in Kenya, the company has been rolling out a service that allows customers to access cash via their mobile phones. Called M-PESA, the service allows customers to borrow, transfer and make payments by using a mobile phone; this is transforming financial services by making transactions cheaper, faster and more secure.

Vodafone CEO Arun Sarin said his company sees significant growth potential in emerging markets like Kenya partly because research shows that mobile technology can revolutionize social and economic growth in these countries. "This is not for altruistic

purposes,” he said. “We have no desire to undertake the role of governments or NGOs or embrace an exclusively philanthropic approach to ‘do good.’ Rather, we recognize that around 20 percent of the world’s mobile phone users are from low-to middle-income countries and can see that the next billion mobile phone users are likely to live in markets that have very different needs from those we are used to.”

Doing business with the poor is not just about selling to; it is also about buying from. Over the past 50 years, U.S.-based consumer products manufacturer SC Johnson has become one of the biggest users of natural pyrethrins in its household insect control products.

Through the pilot, existing microfinance clients received a cell phone with which they could make electronic payments on their loans. Each phone is equipped with a special subscriber identity module (SIM) card that allows the transactions to take place. Besides loan payments, users are also able to deposit or to withdraw cash from authorized M-PESA agents, typically a small storeowner that has enough ready cash on hand to complete the transactions. Clients are also able to make person-to-person money transfers, to purchase airtime for re-sale or personal use and to receive account statements.

According to Vodafone, the pilot project confirmed several important benefits to users. Clients found M-PESA safe and convenient to use as it meant that they did not have to carry large amounts of cash

with them and they could also enjoy longer “banking hours,” which had the benefit of leading to a reduction in default rates.

Doing business with the poor is not just about selling to; it is also about buying from. Over the past 50 years, U.S.-based consumer products manufacturer SC Johnson has become one of the biggest users of natural pyrethrins in its household insect control products. A daisy known as pyrethrum is the source for a naturally occurring insecticide that degrades quickly in the environment. The pyrethrum flower is grown and supplied to SC Johnson by small-hold farmers in the highlands of Kenya.

When SC Johnson launched Raid® in 1950 as the world’s first commercial aerosol insecticide, the family-owned and managed company chose to use environmentally benign natural pyrethrum as the active ingredient. The company became important to the highland community by providing livelihoods for more than 200,000 Kenyan farmers and their families. When lower-cost synthetic alternatives emerged, SC Johnson chose to maintain natural pyrethrins in their product mix because they valued the long relationship it had built with the Pyrethrum Board of Kenya (PBK) and with the highland farmers. Instead, SC Johnson focused efforts on assisting PBK to become a more efficient producer of natural pyrethrins.

Oil companies and mining companies often find themselves operating out in remote rural areas and surrounded by poor farmers. Having no products to sell the local people, their inclusive business strategies focus on making local companies part of their supply chains.

BP is managing an investment of around \$20 billion to develop oilfields and pipelines in the South Caspian region, which contains 10 billion oil-equivalent barrels of proven oil reserves, but where more than 60 percent of households cannot afford the standard “food basket.” With its partners, BP has designed a mechanism that brings local small and medium enterprises (SMEs) more effectively into the oil industry supply chain. Thus the SMEs’ development of skills and reliability becomes a crucial part of BP’s business interests.

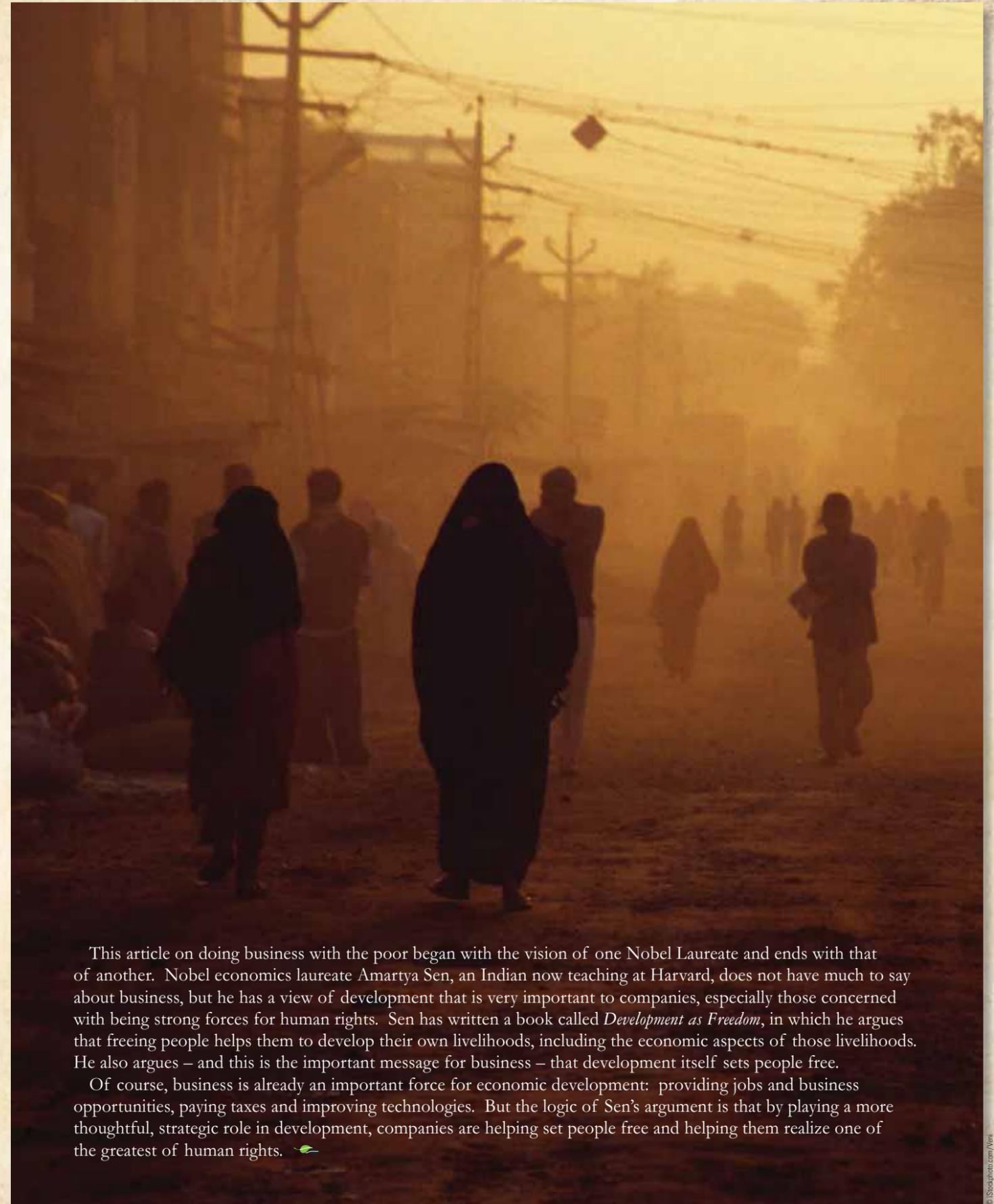
The pyrethrum flower is grown and supplied to SC Johnson by small-hold farmers in the highlands of Kenya.



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BP and the Norwegian oil company Statoil, with their business partners and development partners, have been supporting in Azerbaijan a fund to stimulate capability among contractors in the oil industry; the plan would both improve BP’s business and create jobs in the community. BP, Statoil and Unocal run a \$600,000 program with German Technical Co-operation (GTZ) and the International Finance Corporation (IFC), the private sector arm of the World Bank Group, to establish the Supply Chain Technical Assistance organization. This partnership will help equip Azerbaijan’s local businesses to participate more actively in business opportunities related to major oil and gas field development projects.

The program will engage at least 30 local companies in sectors identified as providing long-term opportunities in the oil and gas industry. Assistance is tailored to their needs by addressing issues such as business planning, access to capital, management training and the attainment of standards required by the international business community based in Baku.



This article on doing business with the poor began with the vision of one Nobel Laureate and ends with that of another. Nobel economics laureate Amartya Sen, an Indian now teaching at Harvard, does not have much to say about business, but he has a view of development that is very important to companies, especially those concerned with being strong forces for human rights. Sen has written a book called *Development as Freedom*, in which he argues that freeing people helps them to develop their own livelihoods, including the economic aspects of those livelihoods. He also argues – and this is the important message for business – that development itself sets people free.

Of course, business is already an important force for economic development: providing jobs and business opportunities, paying taxes and improving technologies. But the logic of Sen’s argument is that by playing a more thoughtful, strategic role in development, companies are helping set people free and helping them realize one of the greatest of human rights. 🌱

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“The Greenland Ice Sheet is likely to be eliminated (within 50 years) unless much more substantial reductions in emissions are made than those envisaged (and will) probably be irreversible, this side of a new ice age,”

Kofi Annan, Secretary-General of the United Nations, November 2004.

Global Warming and Lost Lands:

Understanding the Effects of Sea Level Rise

Professor Vincent Gaffney, Chair in Landscape Archaeology and Geomatics
University of Birmingham, The Institute of Archaeology and Antiquity
HP Visual and Spatial Technology Centre, Edgbaston, Birmingham United Kingdom

According to the United States Geological Survey (USGS), elimination of the Greenland Ice Sheet would create a potential sea level rise of 6.55 meters or approximately 21.5 feet. This increased water level would have an effect on more than 669,739,138 people around the world with an accompanying land loss of more than 5,431,902 (km²). The West Antarctic Ice Sheet is particularly vulnerable because most of it is grounded below sea level. A break-up of the two buttressing ice shelves would result in a rapid rise in global sea level of about 8 meters or 26.25 feet. This scenario is not even worst-case, which would include additional melting of the East Antarctic Ice Sheet, the Antarctic Peninsula, plus other ice caps, fields and glaciers for a total potential sea level rise of 80.32 meters or 263.5 feet. To put this into perspective, “a sea level rise of 10 meters would flood about 25 percent of the U.S. population with the major impact being mostly on people and on infrastructures in the Gulf and East Coast states,” according to a USGS Sea Level and Climate report.





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Even conservative estimates of an increased sea level rise of just 95 centimetres, or approximately 3 feet, by 2100 will create havoc in the United States because, according to the USGS, “prediction of shoreline retreat and land loss rates is critical to planning future coastal management strategies. To date, long-term planning for the Nation’s shore-



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line has been done piecemeal, if at all. Consequently, entire communities are being developed without adequate consideration of potential erosion, flooding and storm damage related to sea level rise.” In fact, the USGS suggests that approximately 27 percent of the U.S. East Coast shoreline is in the “very high” risk category with more than 20 percent in the “high” risk category, about 23 percent in the “moderate” risk category and just less than 30 percent in the “low” risk category. In other words, the entire East Coast shoreline is at risk.

Regardless of the expedited impact of human-induced global greenhouse gases, the Earth’s natural cycle of long-term climate change and sea level rise is known to have had a devastating effect upon humans in prior periods. For example, experts agree that global sea level was about 125 meters, or 410 feet, below the current sea level at the last glacial maximum about 20,000 years ago. As the climate warmed, the sea level rose because of melting ice sheets. One disaster occurred when the sea level rose in the area now known as “the North Sea,” dooming the people and the land.

Global Warming and the Lost European Country

To many the North Sea is a stretch of grey uninteresting water crossed when going from England to France by plane or ship. Few people ever imagine as they make that journey that the murky waters cover a prehistoric landscape larger than the United Kingdom itself. However, people might well pause for thought if they realised that, between 10,000 and 7,000 BC, global warming raised sea levels and swallowed a vast, inhabited plain that had stretched without break from England to Denmark – an area so large that, effectively, Europe lost an entire country. Over the past 5 years, scientists and archaeologists in Britain have begun to use the latest technology to explore this lost world and to provide a dire warning about the impact of future sea rises.

In many ways the story of the people, culture and country that were lost began nearly 80 years ago in September 1931, when the trawler *Colinda* was fishing some 25 miles off the Norfolk coast near the Leman and Ower Banks in the southern North Sea. When trawlers fish, their heavy nets scrape the seabed to haul in not only the catch of the day but also flotsam such as wood, shells, odd bones and even lumps of

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peat. Whether this day’s catch was less than usual or whether the crew was just bored, one lump of peat trapped in the net was broken open, and a prehistoric barbed point fell out. The find, a rather elegant artefact made of antler and measuring 8.5 inches in length, was probably used as a harpoon, a leister, a fish or an eel spear. The skipper of the *Colinda*, the wonderfully named Pilgrim E. Lockwood, was intrigued enough to take the find home. From there, it eventually found its way to the Castle Museum in Norwich.

The Mystery of the Leman and Ower Harpoon

Archaeologically, the harpoon itself was not unique and was rapidly dated to the archaeological period known as the Mesolithic (c. 9,000 BC to 4,000 BC). However, what was different about the Leman and Ower point was where it was found – 25 miles from the coast of modern Britain. How had the “harpoon” arrived so far from land?

The mystery of the harpoon was eventually uncovered by a group of brilliant, young academics from Cambridge, most notably Grahame Clark (who later became Britain’s foremost expert on the Mesolithic) as well as Harry and Margaret Godwin, two dynamic botanists. They believed that new scientific techniques in geology and plant sciences could be used to explore and to explain how societies adapted to or changed with their environment. The study of plant pollen, preserved in geological or archaeological deposits, would allow the researchers to reconstruct the nature of past environments and even begin to trace change over time.

The Harpoon Tells a Startling Story

The journey to discover the importance of the harpoon began when the Godwins asked Pilgrim Lockwood for assistance. In 1932 the *Colinda* returned to the Leman and Ower banks to recover more of the peat that had encased the “harpoon.” The results were startling. Pollen indicated that the harpoon had come from fresh – not saltwater – and the surrounding environ-

ment was comparable to samples taken from dry land in the countries that now surround the North Sea. Clark quickly appreciated the significance of the results and concluded that evidence pointed to the existence of a great plain, inhabited by hunters, which stretched across the area of the North Sea 10,000 years ago and whose rising sea levels after the last ice age had inundated this land.

Unfortunately, the murky waters of the North Sea also placed this landscape far beyond the reach of modern archaeological prospecting or exploration. In the absence of any practical method to explore this territory, the lands of the North Sea were gradually forgotten except, perhaps, as a land bridge across which Britain was colonised. However, archaeological material, bones and stone tools continued to be recovered from the North Sea. Interest was reinvigorated in 1998 by the work of Professor Bryony Coles, who drew upon all available knowledge to produce a series of speculative maps of the area that she called “Doggerland” after the great banks in the southern North Sea. Despite this, Coles concluded that “we have little more in the way of firm archaeological evidence than Clark had . . . in 1936.” The North Sea, therefore, remained terra incognita.



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Searching for a Lost World

However, a chance discussion in a University of Birmingham (UK) master’s class made Vincent Gaffney think about the lost land again. Although the area had largely been ignored by archaeologists, the discovery of oil and gas in the North Sea and the

increasing extraction of gravel aggregate from the seabed meant that an immense amount of information had been slowly gathered about the sea and its geological history. Researchers at Birmingham began to speculate whether seismic data, collected for oil exploration, could also be used to locate buried features underneath the sea to explore this lost world. A hastily arranged meeting between archaeologists Vince Gaffney and Simon Fitch, along with Dr. Ken Thomson, a specialist in seismic processing, suggested that this might be a possibility.



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Seismic survey is a technology often used by geologists to explore the subsurface of the earth and frequently chosen by the oil and gas industry for exploration. Usually surveys collect single lines of data – effectively showing a slice through the earth’s crust. However, more usefully for this project, 3D seismic data can also be collected. This data forms a digital cube that can be sliced horizontally and vertically to provide vertical profiles and horizontal maps of the land beneath the seabed.



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Uncovering a Lost World

The new research team approached a petroleum geology survey company, PGS, for sample data; and the first experiments were wildly successful. Within a short time the team produced the first plan of a river that flowed across the North Sea 10,000 years ago. The excitement at seeing these dramatic images emerge can hardly be described. The team felt like explorers of a completely unknown country. The first river was named the “Shotton” for Fred Shotton, a geologist from Birmingham. He is famous, among many things, for being dropped into occupied territory to map the invasion beaches and to ensure that they were suitable for the Allies’ heavy vehicles on D-Day (<http://www.arch-ant.bham.ac.uk/shottonproject/profshotton.htm>).

After this promising start a further 23,000 km² of seismic data were donated by PGS Ltd. for study. The project area was now actually equivalent to Wales, a modern country! This time a group of researchers, funded through a grant from the aggregate industry, began working full-time on this huge amount of data. They began to map out the new country. At its centre was a huge lake occupying a great marine depression more than 100 km in length and now known to marine geologists as the “Outer Silver Pit.” This imposing area of water was surrounded by extensive plains, across which ran large river systems. Great estuaries formed where the rivers flowed into the lake

and marshlands. One in particular, flanked by the lakeside, appears to have covered more than 300 km². However, this was not a featureless landscape; low hills bounded valleys, and even individual hillocks could be discerned within the seismic images.

Global Warming and an Historical Warning

The country would have been a wonderful environment for hunters. Water abounded; fish, birds and other game would have been plentiful. The lakes and marshes would also have provided reeds for basketry. However, it is clear from the study that the landscape was changing and that it was, ultimately, doomed. As the waters rose, the estuaries of the rivers became wider; marshes extended. Eventually the sea broke into the great lake, and it became tidal estuary with fearsome rip tides. Gradually the land was inundated and lost.

What significance has such a story today? First we should note that these discoveries are not simply scientific novelties; a very real, human tragedy lies behind the loss of this immense landscape. The coastlines, rivers, marshlands and hills mapped during this project were, for thousands of years, parts of a familiar landscape to the peoples of Europe. Rivers would have been

named; estuaries and low hills associated with ancestral memories would have become dear to these peoples. Insidious and slow overall, but terrifyingly fast at times, inundation must have been devastating for the people who lived here. Whole territories may have disappeared within the memory of generations. The distress caused by the loss of lands that supported communities and tribes is almost impossible for us to understand.

All was lost, along with the landscape itself, as sea levels rose and the land retreated. Disturbingly, these changes occurred as a consequence of sea level change equivalent to the rate currently predicted over the next century. It is a distressing fact that in Britain, in north western Europe and in the United States, most of the population and critical infrastructures are on the coast and, unlike the hunters of Mesolithic Europe, we will not be so mobile or as flexible in the face of rapid and possibly catastrophic sea rise.

At a time when global warming and sea level rise are now accepted as amongst the greatest threat to our lifestyles, the fate of the landscapes and peoples of the North Sea may yet be interpreted not as an academic curiosity but as a significant warning,

Mitigating Disaster: The Potential Beyond the Study

The long-term goal of this study is to provide an indication of how this material from the North Sea could contribute to the world's understanding of how rapid climate and sea level change influence landscape development and human activity. If detailed environmental modelling and reconstruction can be combined with the seismic data, there are applications in seabed engineering and international heritage management strategies for the continental shelf.

With respect to the U.S. East Coast's extreme exposure to the effects of sea level rise, this new technology, partnered with the region's seismic data collected for oil and gas exploration, could offer new information and options to mitigate what may be an otherwise impending disaster.

For more information on this project and the applications of this new technology, please contact Professor Vincent Gaffney at the University of Birmingham via email at: v.l.gaffney@bham.ac.uk.

For Dr. Gaffney's complete article, with additional images, please log onto www.centerforabetterlife.com.



Way to go Al!



We join the planet in congratulating our Advisory Board member, former Vice President, and Nobel Laureate, Al Gore.



Nobel Prize Award Ceremony - Stockholm - December 10, 2007

1. EnOcean

EnOcean manufactures and markets world-leading energy harvesting technology, sensors and RF (radio frequency) communication in a single solution for building and home automation, lighting, industrial, automated meter reading and environmental applications. Dramatic advances in this technology are significantly broadening the application of battery-free wireless lighting control in sustainable, green construction in the United States. Installation, system configuration, commissioning, operation and maintenance are simple and quick. The products are scalable and can be moved easily so they adapt readily to changing floor plans. The EnOcean technology is based on miniaturized, ultra low power electronics. They are fully compatible with existing sensors and industry-standard networks. For more information please visit www.enocean.com or call 801-733-6118.



2. Mecho/5 with EcoVeil Shadecloth

Mecho/5 with EcoVeil shadecloth is the first complete solar shading system to receive Cradle to Cradle certification from MBDC, the sustainable product development and consulting firm founded by William McDonough and Michael Braungart. Cradle to Cradle products can be reused or recycled, are manufactured with energy- and water-efficient processes and are socially responsible. MechoShade Systems' products enable buildings to be environmentally friendly and energy efficient. They enhance personal and workplace productivity by minimizing solar heat gain, excessive brightness and annoying glare from direct sunlight. The EcoVeil shadecloth is made from a thermoplastic olefin (TPO) based yarn. For more information please visit www.mechoshade.com or call 718-729-2020.



4. American Heritage Crafters

American Heritage Crafters (AHC) is a unique company consisting of two different but synergistic divisions created to manufacture and to market high-quality, handcrafted home furnishings and accessories. The web-based retail sales division carries a full line of more than 3,450 high-end furniture, lighting and accessory products, all of which are 100 percent American-made.



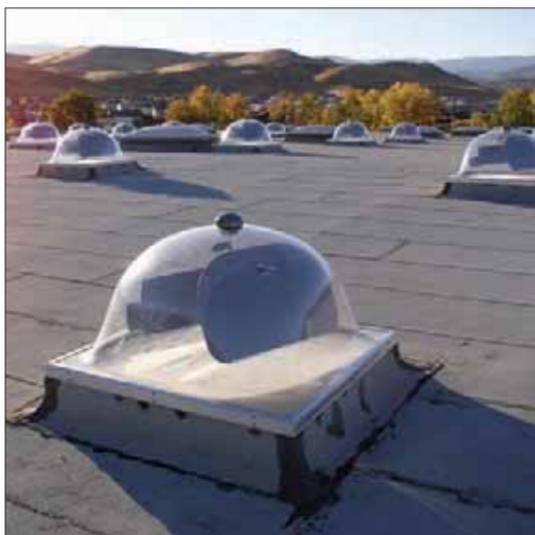
The second division concentrates on the manufacturing of millwork items and log furniture. The Kuhns Bros. Millwork Store includes two exclusive lines of furniture, more than 300 custom door designs, moldings, hardwood flooring and custom millworks. American Heritage Crafters is a sister company of Kuhns Bros. Enterprises. To find out more, please visit www.americanheritagecrafters.com.

5. Siemens Wireless Room Temperature Sensors

Wireless room sensors are not new. What is new is the way Siemens Building Technologies, Inc., has incorporated reliable, redundant mesh networking technology to ensure its new wireless room temperature sensors are immune to signal interruption. In Nov. 2005, Siemens introduced APOGEE® Wireless, the first wireless building automation system based on mesh topology. With a display that features temperature, setpoint values and occupancy condition, the device will enable the most ambitious, cost and energy-efficient HVAC control schemes. HVAC system designers and contractors can place the wireless sensor in the most optimal location to deliver occupant comfort and control rather than where it is easiest to wire. For more information, please visit the APOGEE Wireless website at www.usa.siemens.com/wireless.



Seven Products you should Check out



3. Ciralight SunTrackerOne

Many people spend more than 80 percent of their time indoors under inadequate electric lighting which is both uncomfortable and inefficient. Most people, including 75 percent of employees surveyed, prefer daylighting over electric lighting. Electric lighting does not satisfy human biological needs as compared to full-spectrum daylighting. This fact is critical since these biological needs affect well-being, health and healing. High-performance daylighting systems, such as Ciralight SunTrackerOne, solve this problem by optimizing these biological benefits. In fact, electric lighting can be turned off completely for up to 10 hours during the day using Ciralights. Energy consumption decreases making it very efficient. To find out more, please visit Ciralight at www.ciralight.com or call 877-645-2728.

6. Tecta America's TectaGreen™

TectaGreen's long successful continuous green roof application incorporates a specially-engineered system of layers which protects roof membranes from extreme temperature fluctuations and ultraviolet radiation. It also includes a new modular system which can be placed over the top of a conventional roof.



Both incorporate drought-tolerant plants and provide environmental and aesthetic solutions and benefits for rooftops. TectaGreen™ can double the life span of conventional roofs, provide energy savings by reducing heating and cooling costs and improve stormwater management by minimizing run-off. It also conforms to rigorous U.S. Green Building Council (USGBC) green standards and qualifies for LEED certification for tax benefits. For more information please go to www.greenroof.com.

7. Tecta Environmental Solutions

When looking for solutions to providing energy for your building, utilizing the roof makes perfect sense. Designed to increase energy productivity and savings, Tecta Environmental Solutions include: Tecta's new solar tracking skylights and light pipes, cool roof coatings, TectaGreen™ green roofs and TectaSolar's photovoltaic cells. Tecta Environmental Solutions provide environmental alternatives to help keep buildings cooler, to save energy by utilizing natural light and to extend the useful life of the roof. And, Tecta's nationwide team of project managers and site supervisors has the expertise to utilize Tecta Environmental Solutions to fulfill Leadership in Energy and Environmental Design (LEED) specifications from construction to certification. For more information, please go to www.tectaamerica.com.



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SC Johnson: Doing Their Part to Grow Greener Products

In 2001 SC Johnson devised Greenlist™, a ground-breaking process that classifies raw materials considered for use in the company's products according to their impact on the environment and on human health. Today the Greenlist™ process provides ratings for more than 95 percent of the raw materials that SC Johnson uses, including surfactants, solvents, propellants, insecticides and more. A computerized, global system is integrated with all aspects of the company's product development processes. The firm's goal was to go beyond meeting legal and regulatory requirements by increasing year-after-year the percentage of raw materials having the least impact on the environment and on human health. SC Johnson started at 12 percent in 2001, and today the company is at more than 34 percent.

Through the Greenlist™ process each raw material receives a "3" to "0" rating. An ingredient with a "3" rating is considered "Best"; with a "2," "Better"; with a "1," "Acceptable"; and with a "0," used

only on a limited basis when no viable alternative exists. While government regulatory requirements do not restrict some raw materials with a "0" score, over the years SC Johnson has decided to limit their use. Instead, the company has chosen to work toward replacing these "0"-rated materials with those that are more biodegradable and that have a better environmental or health profile.

As an environmental leader, SC Johnson continues to uphold the sustainability principle of transparency. In February 2007, SC Johnson decided to share its patented Greenlist™ process with other public and private organizations, including competitors, royalty-free. Because the process is highly flexible and adaptable, companies licensing Greenlist™ will be able to modify the patented process to reflect their own unique chemicals and materials. They will also gain a proven management system of establishing, evaluating and reporting performance against measurable objectives. Organizations looking to license Greenlist™ must be willing to establish measurable goals and to report on them annually.

"We're committed to environmental leadership and to the principle of sharing our sustainability practices so other companies can adapt or adopt our learning into their operations. The true winner is the environment, which is our goal," said Scott Johnson, vice president of global environmental and safety actions for SC Johnson.

Greenlist™ is a reflection of SC Johnson's steadfast commitment to the environment and to the spirit of innovation. From being a pioneer in the introduction of water-based aerosols in 1955 to guiding its leadership to become the first company to remove chlorofluorocarbons (CFCs) from all aerosol products three years ahead of the 1978 mandate, SC Johnson has set the bar. Greenlist™ is the company's next step toward ensuring product development decisions are made for the viability of today's generation and for the continuation of the Earth and its future generations. 🌱

For more information on Greenlist™ log onto www.scjohnson.com.
For more information on sustainability log onto www.centerforabetterlife.com.

Windex® glass cleaner is actually "green." Manufacturer SC Johnson reformulated the product with its patented Greenlist™ process, cutting 1.8 million pounds of VOC and giving it 30 percent more cleaning power.



The Importance of Being Native

By Ken Undercoffer, President
Pennsylvania Council of Trout Unlimited

I was about 13 when I caught my first trout, a native brookie that dashed out from underneath the washed-out roots of an old hemlock stump and took my worm-baited hook. Only the roots of that old stump remain on the edge of the pool where I was baptized into the world of trout fishing nearly 60 years ago.

There are still many old hemlock stumps standing like tombstones throughout Pennsylvania . . . all that is left of the massive white pine and hemlock forest that once covered most of the Commonwealth. These giant trees stood so thick and tall that sunlight barely reached the forest floor.

It only took a couple of generations for the lumber industry to reduce this magnificent forest to a gaunt wasteland. Fire swept through the cuttings soon after the loggers moved on, often burning even the thousands of years of humus that had accumulated on the forest floor.

The scarred mountains and valleys have recovered in the intervening hundred years or more. Maple, beech and oak have replaced much of the evergreen forest, but majestic white pines once again top the hardwoods on many mountain-sides. Hemlocks again stand tall in the forest bottoms along mountain streams and shade their waters from the sun. This is where brook trout still live and have for millennia.

The brook trout I caught that day was barely 6 inches long, legal size in those days. It was the most beautiful fish I had ever seen. Its back

was deep green, like the moss that covered the rocks in Moose Creek, and vermiculated with a slightly lighter shade of olive. The sides were covered with brilliant red dots, each surrounded by a distinct blue halo. Its lower fins were crimson and pin-striped with black and white on their forward edges.

This particular brookie had squirmed up through the gravel of a redd late in the winter some three years before. It had managed to survive assaults by herons, mink, its larger brethren and, up to now, 13-year-old boys who would make a meal of it.

Brook trout are native to the Appalachians. They have been living here since long before the last ice age. They survived the demise of the saber tooth cat and the mastodon. They were here long before the first native American walked over this land. They have been victims of many assaults and have somehow endured. Maybe I sensed that as I admired this beautiful little fish in my hand although it took many more years for it to reach a conscious level.

Rainbow, brown, and brook trout have been transplanted into streams from one end of this country to the other. Now brook trout are invading the cold, headwater streams of Oregon and the West, displacing the native cutthroats that have been living there for millennia. Most major trout streams throughout the West are now dominated by non-native salmonids. European brown trout have invaded the best streams in Pennsylvania, driving the native brookie into headwaters, where it is making its last stand. Rainbows transplanted from the West Coast into the southern Appalachians have driven southern strain brook trout from many of the streams they once inhabited.

Native trout are an integral part of the natural order of things. Native species and undisturbed places are disappearing at an alarming rate. Hopefully, we will be able to preserve what is left before it is too late. 🌿

For more information log onto www.centerforabetterlife.com.



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Native trout are an integral part of the natural order of things.



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