

environmental ebook™

interesting information
and helpful suggestions

By Fred Laughter and Robert Brehm

A Work-in-Progress: January 2007 Draft

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environmental ebook™ is a work in progress.

In response to suggestions from readers, this resource will be updated periodically for accuracy and effectiveness as an informational tool.

Draft 1.0 – *January 2007*



eChapter 1

How You Can Help

Starting now, people all over the world need to change some of the things we do each day.

Use Less Water

Water is precious. We must use it wisely. Turn off the faucet. Take shorter showers and shallower baths. You don't need to hear the sound of water flowing while you wash your hands or brush your teeth.

Minimize Your Use of Pesticides & Chemicals

Pesticides and harsh chemicals for homes, lawns and gardens are usually poisonous. Don't poison your family and friends, or yourself, or the environment. Learn more about eco-friendly alternatives.

Recycle Responsibly

Buy products that incorporate post-consumer recycled materials, and participate fully in opportunities to reduce, reuse, and recycle at home and work.

Encourage Better Energy Strategies

Let's learn more about how to use less energy, reduce our carbon footprint, and support the development of alternative energy sources and green technologies.

Buy Products Made with Sustainability in Mind

Make informed choices about the "real" environmental costs of making, transporting, using, and disposing of consumer products and single-use packaging.

4 lbs.
(1.81 kg)

FACT: "Four pounds of trash every day. That's how much solid waste is generated by each man, woman and child in the United States. This waste includes substantial amounts of paper and cardboard (40%), as well as yard waste (18%), metals (9%), plastic (8%) and other products. Where does it all go? More than 70% of this material is buried directly in the ground in disposal facilities known as landfills." [\[source\]](#)



eChapter 2

Global Warming

The overwhelming majority of environmental and meteorological scientists agree that man-made factors are contributing to global warming during this century.

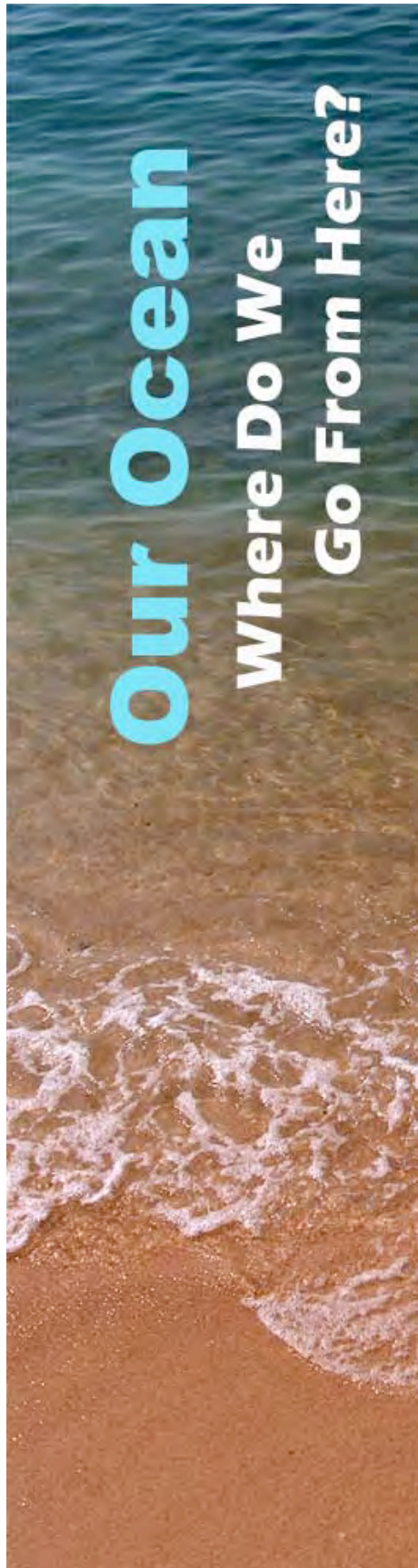
How Much Hotter?

Forecasts anticipate a rise in global temperature of from 1.44 to 6.3°F (0.8 to 3.5°C) by 2100 if no action is taken to cut down on the production of greenhouse gases, or a rise of from 1 to 3.6°F (0.5 to 2°C) even if action is taken (because of already released gases that will persist in the atmosphere). [\[source\]](#)

FACT: During the past 100 years, the average temperature has climbed about 1 degree Fahrenheit (0.6 of a degree Celsius) around the world. [\[source\]](#)

The effects of global warming may include:

- Millions of human refugees, from Florida to Bangladesh, as coastal land is flooded because of rising sea level.
- Millions of acres of lost habitat for plants and animals already stressed environmentally.
- Reduced food production worldwide, as the temperate weather zones shift away from traditional farmlands, toward polar regions.
- Disruption to local, regional, and global economies, as people and materials are diverted due to global-warming disasters.
- Increased damage caused by stronger storms, hurricanes, tornadoes, typhoons, etc.
- Devastating wildfires and forest fires.
- Die-offs as endangered species more rapidly move toward extinction.
- Political disruption as millions of people suffer.



eChapter 3 Our Ocean

There's only one ocean, and we're all connected to it, directly or indirectly, for our seafood, climate, weather, recreational opportunities, transoceanic distribution of materials and products, and much more.

The Flood of Plastics

The world's largest dump is a slowly rotating mass of trash-laden water about twice the size of Texas, located on the surface of the Pacific Ocean between San Francisco and Hawaii. Known as the Eastern Garbage Patch, this long-lasting floating disaster is part of a system of currents called the North Pacific subtropical gyre, slowly circulating clockwise. The massive mess of the Eastern Garbage Patch is only one of a dozen giant gyres of floating trash in the ocean.

Nearly 90% of floating marine litter is durable plastic materials such as polyethylene and polypropylene, Styrofoam, nylon, and saran. Most of it starts on land, floats into storm drains during storm run-off, then accumulates in rivers, and floats to the ocean.

FACT: The average American used 223 pounds of plastic in 2001. The plastics industry expects per-capita usage to increase to 326 pounds by the end of this decade. [\[source\]](#)

- The United Nations Environment Program estimates that 46,000 pieces of plastic litter are floating on **every square mile** of the ocean's surface worldwide. [\[source\]](#)
- An estimated 1 million seabirds choke or get tangled in plastic nets or other debris every year. About 100,000 seals, sea lions, whales, dolphins, other marine mammals and sea turtles suffer the same fate.



eChapter 4 Extinction

The Yangtze River Baiji, a rare white dolphin that survived for twenty million years, is effectively extinct, according to a recent announcement by the Baiji.org Foundation. The [most recent sighting](#) was in 2004.

Chinese writings in the 3rd Century B.C. estimated this freshwater dolphin's population at approximately 5,000 Baiji on the Yangtze River. According to news reports, an estimated 400 dolphin remained in the early 1980s.

The combination of river pollution, increased shipping, overfishing, and loss of habitat cut the number to 13 confirmed sightings in 1997. By year-end 2006, there were none left, based on baiji.org's intense six-week search. None survive in captivity. The species is gone.

The extinction of the Yangtze River Baiji is the first loss of large aquatic mammal since the Caribbean monk seal's extinction in the 1950s.

FACT: If the current rate of species extinction continues, or accelerates as now seems to be the case, the number of species becoming extinct in the next decade could number in the millions. [\[source\]](#)

Connections

The Yangtze River carries billions of tons of cargo to and from international markets. The ship sounds confounded the sonar that the nearly sightless Baiji used to find food. Too often the ships accidentally hit these intelligent mammals. The Baiji struggled under the stress of habitat loss (Three Gorges project) and severe river pollution.

The low price of made-in-China products currently is based only on the cost of Chinese labor and materials. If environmental costs are included, many consumers might find made-in-China products are just too expensive. What price for losing the Baiji forever?



eChapter 5

Money & the Environment

Money is a form of stored energy. Depending on how money is used, it can contribute to environmental problems or to their solution, or both.

Spending Money

Conscientious consumers are thoughtful about everything they purchase – including product origin (materials, labor, transportation), product-life-cycle, and the post-consumer fate of the products when no longer useful for their original purpose.

Let's start by considering product origin. For example, if you want to help save the rainforests, and you understand that indigenous peoples need sustainable sources of income, then you might want to buy eco-friendly products that provide jobs and income to the native people who live in the rainforest.

FACT: One-and-a-half acres of rainforest disappear every second. At current rates of deforestation, the last rainforests will disappear in 40 years. [\[source\]](#)

Among high-profile examples of rainforest friendly products are:

- [Ben & Jerry's](#) Rainforest Crunch ice cream, made with Brazil nuts reportedly harvested by natives in the Amazon. Introduced a decade ago, Rainforest Crunch raised awareness among millions of consumers. Even if the economic benefits to rainforest native peoples were minimal – at least Ben & Jerry tried!
- [The Body Shop](#) international chain of retail stores offers [rainforest-friendly personal care](#) products made from Brazil nuts harvested by natives (so they can earn a living without clear-cutting the rainforest). Every bit helps.



eChapter 6 Better Energy

We're all learning more about solar power, wind energy, water-based energy, thermal, and biomass. They hold great potential as safe sources of renewable, sustainable energy with minimal environmental impact.

In addition to encouraging better energy sources, we all need to reduce our energy consumption through conservation, better planning, and new technologies.

FACT: Electricity generated by fossil fuels for a single home puts more carbon dioxide into the air than two average cars. [\[source\]](#)

Protect the Environment by Using Less Energy

Here are some tips to help you use less energy:

- Only use lights and appliances when you need them. When you leave a room, turn them off.
- Use natural light and heat whenever possible.
- In your home, turn the heat down a few degrees.
- In cold weather, wear warm clothes indoors.
- In summer, turn the air conditioning off or down.
- Use rechargeable batteries instead of single-use "disposable" batteries.
- Exchange suggestions with coworkers and family members to encourage smarter use of energy.
- Measure how much electric power you are using, so you can keep track of your savings.
- Avoid wasteful driving habits, and plan trips to save gas and prevent single-occupant trips.

[Send us your suggestions](#), and we'll add them to the list.



Air

eChapter 7 Air

The World Health Organization (WHO) says [4.6 million people](#) are killed worldwide by air pollution annually, including 3 million who die from air pollution associated with vehicles and industrial emissions, and 1.6 million from indoor air pollution associated with using solid fuel.

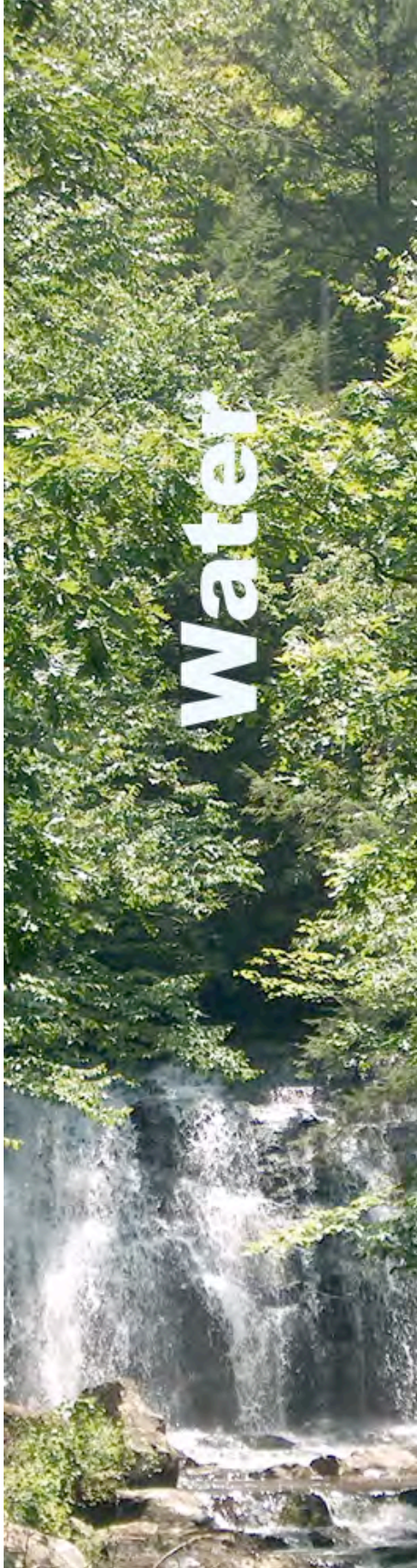
Many people only think of air pollution as being a problem in the air we breathe in the lower atmosphere. Some of the man-made pollution, including carbon dioxide, rises to the upper atmosphere and contributes to the “greenhouse gases” that cause global warming.

Change is Possible! **FACT:** In the 1950s, smog levels in Southern California were worse than they are today in Mexico City. [[source](#)]

More People + More Cars = More Air Pollution

- Beijing, China reportedly has the [worst air pollution of any city in the world](#). The number of automobiles has doubled in the past 5 years to nearly 3 million in this mega-city of more than 8 million people.
- China has [16 of the world's 20](#) most air-polluted cities.
- With 4 million cars and more than 8.5 million people, [Mexico City](#) is the most polluted city in the Americas: ozone levels exceed WHO limits 300 days per year.
- U.S.A.'s most air-polluted city is [Los Angeles](#), which is also the most car-dense metropolis in the world with 1.8 registered automobiles per licensed driver.
- The [Blacksmith Institute](#) reports that, in terms of overall pollution (air + water + soil), Russia and countries in the former U.S.S.R. represent 5 of the 10 most polluted places in the world.

Around the world, air pollution remains a major problem.



eChapter 8 Water

If all the water in the world were represented by a single drop, the amount of fresh water would be 3% of that drop, or about the amount of moisture in a water-particle in a cloud. Of that tiny quantity, the amount that is safe, unpolluted, and available to support terrestrial life is only a few thousand molecules of water vapor

Scientists believe that the amount of water on Earth has been about the same for the past two billion years. The proportion of liquid water (ocean, lakes, rivers, aquifers) to solid water (ice, snow) has changed over time. The Ice Ages came and went, and sea level went down and then rose. A new cycle of [flooding in low coastal areas](#) may be beginning. Millions of people will become refugees in their own countries, and habitat will be lost.

Some countries have an abundance of water. Canada has [20%](#) of the world's fresh water and Canada has only [one-half of 1%](#) of the world's human population. Other countries are water starved. The World Health Organization (WHO) estimates that [80% of all human sickness](#) in the world is attributable to unsafe water and sanitation.

WATER WARS: In the 21st Century, wars increasing will be fought over access to water, just as wars were fought over oil in the past century.

Make Saving Water Your #1 Priority!

- Each day, the average **individual** in the U.S.A. uses 100 to 176 gallons of water at home.
- The average European **individual** uses one-fifth as much water: 20 to 35 gallons.
- [Average families in Africa use 5 gallons per day.](#)

Change your behaviors and activities to use less water and leave more water for other people, species, and ecosystems.



eChapter 9

Soil

Human life depends on soil to meet some of our most basic needs, including agriculture, key natural resources, and the physical foundation for our homes, schools, meeting places, businesses, roads, etc.

Soil protects the food chain and our drinking water by serving as the filter and buffer between the Earth's air, water, rocks, and living forms. An average soil sample contains 45% minerals, 25% water, 25% air, and 5% organic matter. There are hundreds of thousands of types of soils worldwide, and each is its own unique micro-ecosystem.

Soil is a complex non-renewable natural resource that is alive with billions of microscopic life. There are more individual living organisms in a spoonful of soil than there are people on Earth. [\[source\]](#)

The natural process of creating thin layers of new soil takes centuries, but the unnatural process of soil loss is rapid. Precious soil is being lost worldwide because of water and wind erosion, new construction, and pollution.

The UN Food and Agriculture Organization (FAO) estimates that the global loss of productive land through erosion is the equivalent of 50 to 70 billion square meters per year. [\[source\]](#) In addition, billions more are lost each year because of human construction and pollution.

There are at least 36,000 known hazardous waste sites on U.S.A. soil, which will cost an estimated \$100 billion to \$500 billion to clean up [\[source\]](#). The U.S.A. represents less than 5% of the world's population, and 20% of the world's wealth [\[source\]](#), so the total number of hazardous waste sites in the world might be calculated as somewhere between 130,000 and 720,000 if haz-mat sites are proportionate to a country's wealth or population, based on data for the U.S.A. These numbers, though staggering, may be conservative estimates.



eChapter 10 Food

The global population is increasing at the rate of 80 million people per year and will reach 8 billion people living on Earth by 2025. [\[source\]](#) Nonetheless, according to the Food and Agriculture Organization (FAO) of the United Nations, the forecast for global food production in 2030 gives cause for *optimism* [\[source\]](#):

- **The world population will be increasingly well-fed by 2030**, with 3050 kilocalories (kcal) available per person in 2030, compared to 2800 kcal today.
- **Patterns of food consumption are becoming more similar throughout the world**, with greater consumption of meat and dairy products.
- **Cereals are still by far the world's most important sources of food**, both for direct human consumption and meat production. An extra billion tons of cereals will be needed annually by 2030.
- **Much of future food production growth will come from higher productivity**. In developing countries, almost 70% of the increase in crop production will come from higher yields, around 20% from an expansion of arable land, and 10% from multiple cropping and shorter fallow periods.
- **Adequate water for irrigation is crucial to the world's food supplies**.

The number of chronically hungry people in the world – now more than 800 million – is *increasing* at the rate of four million more people each year. [\[source\]](#)

World Health Organization (WHO) estimates that over one billion people currently are overweight* and their numbers are increasing by 50 million per year, heading toward 1.5 billion overweight people worldwide by 2015. [\[source\]](#)

*Note: "Overweight" is defined as BMI \geq 25; where Body Mass Index (BMI) = weight in kilograms \div height in meters \div height in meters.



eChapter 11

Human Impact

For countless thousands of years, humans were largely nomadic, moving with the seasons, surviving in the eat-or-be-eaten world shared with other top-of-the-food-chain predators. Between 100,000 years ago and 50,000 years ago, large mammals (megafauna like the woolly mammoth) became extinct because of the combination of human hunting and climate change. [\[source\]](#)

Around 11,500 years ago, humans started agriculture, raising wheat, barley, peas, lentils, and flax in the “Fertile Crescent” of Mesopotamia (modern Iraq). With the advent of agriculture, settlements emerged, which became towns, connected by roads and commerce. City-states emerged, then empires, followed in history by modern nations.

In the decades before and after 1800, the Industrial Revolution transformed the world, as manual labor was replaced by mechanized industry, with metal machines powered by steam (fuelled primarily by coal), including mass-production factories and steamships. The internal combustion engine and assembly-line factories started producing the first of hundreds of millions of automobiles, trucks, and tractors. Electricity was harnessed, which led to power plants, transmission lines, and electric power for homes and industry, which fast-tracked consumer-based economies with low-cost goods sold through mass media.

The unplanned legacy of the Industrial Revolution includes:

- Poisons pumped and dumped into air, water, and soil.
- Toxic smog over major cities around the world.
- Relentless disappearance of vast areas of forest.
- Once-fertile areas that have become desert.
- Ozone depletion over Antarctica and climate change.

Whether viewed through a [microscope](#) or [satellite telescope](#), the curse of human impact becomes a prayer for change.



Learning from the Past

eChapter 12

Learning from the Past

In his best-selling book, [Collapse: How Societies Choose to Fail or Succeed](#), Professor Jared compares several societies to determine the role of environmental factors.

The author defines a framework for considering the collapse of a society, consisting of **five sets of factors** that include environmental damage, climate change, hostile neighbors, loss of trading partners, and society's responses to its environmental problems and to other problems.

Among the failed societies cited in the book are: [Easter Island](#) (which collapsed because of deforestation), the Polynesians on [Pitcairn Island](#) (environmental damage and loss of trading partners), the [Anasazi](#) of the Southwestern U.S.A. (environmental damage, climate change, hostile neighbors), the [Maya](#) of pre-Columbian Central America (environmental damage, climate change, hostile neighbors), and the [Norse](#) colonies in [Greenland](#) (environmental damage, loss of trading partners, climate change, hostile neighbors and unwillingness to learn from Inuit natives).

In *Collapse*, Professor Diamond also discusses successes:

- Japan's [Tokugawa](#) period (1603 to 1867), when deforestation was reversed and trees were planted.
- The Polynesians of the tiny Pacific island of [Tikopia](#), who solved problems that doomed similar islands.
- The people of the central highlands of [New Guinea](#), who have lived off the land for 40,000 years.

Our fate on Earth is based, in part, on what we learn from the past. Environmental damage must be abated, climate change minimized, hostility among neighbors abandoned as wasteful and too expensive, trading partners must address the environmental components of trade, and people everywhere must develop wiser responses to our worsening environmental problems.



eChapter 13

Work

As we face environmental crises that threaten our very existence, now is the time to reconsider how our “work” effects our planet, and consider what work must be done.

The [global labor force](#) consists of 3.001 billion people, including 42% engaged in agriculture, 37% in services, and 21% in industry.

- Agriculture: working with the land requires respecting every facet of sustainability, including smarter farming practices, fewer poisons, less erosion, and better water use.
- Services: every service business should include an environmental component, and environmental services should be harnessed as a powerful engine for creating jobs and strengthening local economies.
- Industry: worldwide, we need to rethink the environmental impact associated with every step of sourcing materials, transportation, industrial processes and waste streams, use, and disposal.

Economist Nicolas Stern compiled the “[Stern Review on the Economics of Climate Change](#)” for the U.K. government. Released in October of 2006, the 700-page Stern Report estimates that the overall costs of global climate change could lead to a loss of 5% to 20% of the global economy.

The Stern Report recommends spending 1% of the global Gross Domestic Product (GDP) to reduce greenhouse gas emissions through carbon emissions trading, energy R&D, reduction of deforestation, and various techniques for adapting to climate change. The world’s GDP is \$60 trillion, so Stern’s 1% solution represents an investment of \$600 billion per year, most of which translates into vital new jobs for many tens of millions of people worldwide.

Let’s work together to solve the environmental problems.



eChapter 14

Business and Industry

Many businesses and industries are changing, to become genuinely green in their practices and products. [Wal-Mart Stores, Inc.](#) (NYSE: [WMT](#)) serves as an interesting case study in evolving priorities and increasing environmental responsibility on the company's "[Road to Sustainability.](#)"

For decades, Wal-Mart has been a major part of the problem. Wal-Mart encouraged mass-market consumption with abandon on a staggering scale. In addition, with its tunnel-vision focus on lowest-cost goods, Wal-Mart purchased products from factories in countries with little or no environmental protection. By aggressively seeking market domination, Wal-Mart became the largest retailer in the world, now generating about a third of a trillion dollars in revenues annually. But Wal-Mart's priorities are changing.

With 175 million customers each week, and a supply chain of 60,000 suppliers worldwide, Wal-Mart can single-handedly bring economic decisions into alignment with environmental responsibility on a grand scale. Consider this:

- Wal-Mart is investing \$500 million in sustainability projects, including working with suppliers to reduce excess packaging and save energy.
- Wal-Mart is already the world's biggest seller of organic milk and the biggest buyer of organic cotton.
- Wal-Mart has opened two green stores (in Texas and Colorado), where it is experimenting with alternative building materials, low-power lighting systems, alternative energy, intensive recycling, and other green business practices that can be applied to some or all of Wal-Mart's 6,600 big-box stores.

If Wal-Mart can transform its corporate value-system to meaningfully embrace sustainability, why can't every business and industry?



eChapter 15 Carbon Footprint

Carbon footprint is a term that represents a way of measuring the environmental impact of human activities based on the amount of greenhouse gases produced, defined as units of carbon dioxide.

[Click here](#) to calculate your carbon footprint, based on your annual use of electricity, gas, oil, coal, and various modes of transportation.

You Can Reduce Your Carbon Footprint

1. Use less electricity
 - Turn off lights and appliances when not in use
 - Replace your light bulbs with energy-savers
 - Reduce your home heating and air conditioning
 - Add home insulation and weatherproofing
 - Replace old home appliances with energy-savers
2. Travel less, especially by automobile
 - Plan your weekly shopping as a single trip
 - Carpool and ride-share with others
 - Use public transportation whenever possible
 - Walk or ride a bicycle on short trips (don't drive)
3. Buy local products to reduce the impact of shipping
 - Buy produce from local farms, and try to buy fruits and vegetables that are in season (out-of-season foods are shipped, trucked or flown from far away)
 - Better yet, plant a garden and grow some food
 - Avoid buying clothing and other goods that were made far away and shipped thousands of miles.

Off-Set Your Carbon Footprint

- Plant a tree (and donate to tree-planting groups)
- Donate energy-efficient technologies to others
- Invest in sustainable technology development.

Green Technologies



eChapter 16 Green Technologies

Innovative green technologies use less energy and provide reduced carbon footprints. Some green technologies are easy to identify and acquire (such as low-energy light bulbs), while others require self-education and significant investment (hybrid cars, residential solar panels, etc.).

Numerous green technologies are poised somewhere between research and development (R&D) and being commercially available. These green technologies are at their critical tipping point; unfortunately, global warming and species extinction are also at the tipping point.

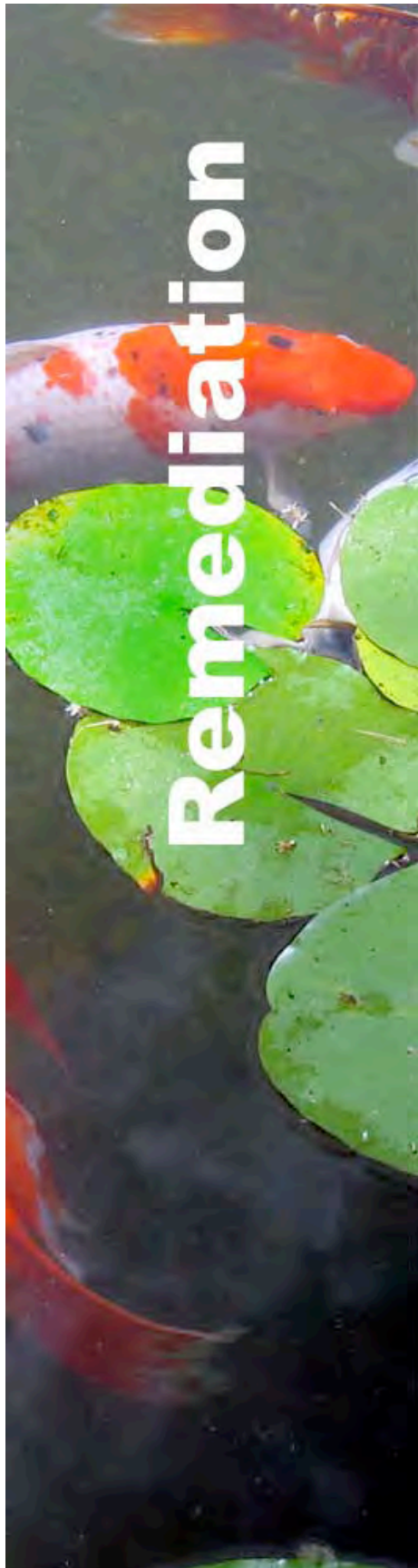
The [Green Pages](#) (by ECO Services International of Switzerland) is one of many online directories of green products and services. As more green products are sold, the lower their cost will become through economies of scale.

In the U.S.A., Federal Government spending in 2006 on energy research and development was less than one-half the annual spending level 25 years earlier. [\[source\]](#)

Lighting the Way

Compact fluorescent light bulbs (CFLs) are an example of a green technology that is widely available. Spiral-type CFLs typically use only one-fourth to one-third as much energy as standard incandescent bulbs to provide the same amount of light, and CFLs last up to 10 times longer.

Every CFL can prevent more than 450 pounds of emissions from a power plant over the light bulb's lifetime. [\[source\]](#) An organization called onebillionbulbs.org has a goal of getting Americans to use one billion CFLs, which will reduce the demand of power plants the equivalent amount of the annual greenhouse gas emissions of one million automobiles.



eChapter 17

Environmental Remediation

Remediation is the process of providing a remedy to correct a problem. Environmental remediation is the process of containing or removing toxic contaminants and other pollution from environmental media such as air, water, and soil. Environmental remediation strives to restore the condition of contaminated sites in order to reduce the health threat to humans and other lifeforms.

Significant resources are committed to clean-up and restore some contaminated sites. Other sites are considered so polluted that they are isolated with fences and other containment measures to prevent the contamination from spreading to the rest of the environment.

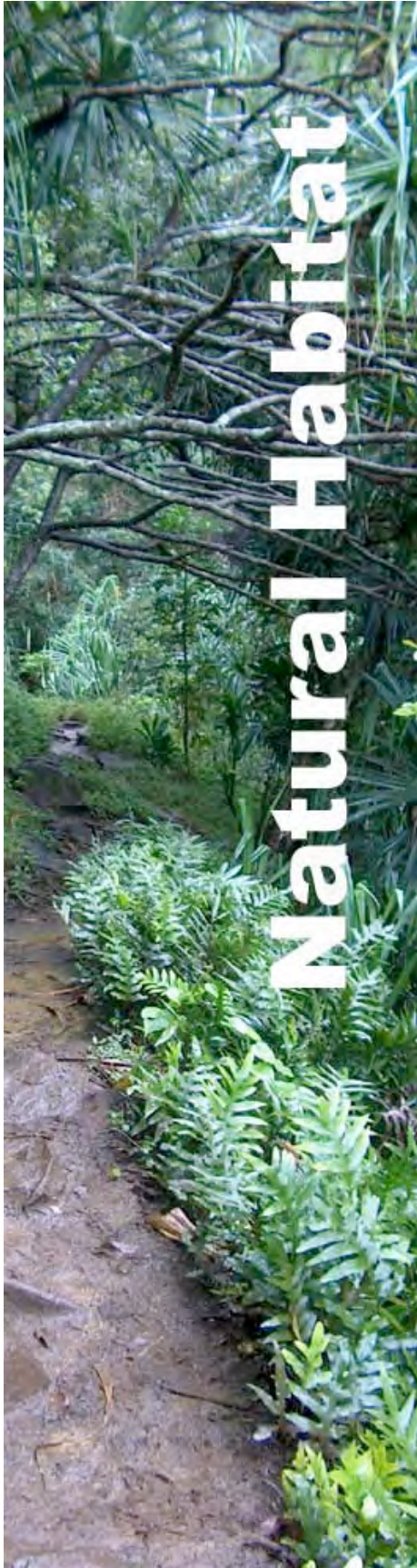
FEEDBACK: The U.S. Environmental Protection Agency (EPA) created REACH IT, an online searchable database of information on treatment and characterization technologies for a range of contaminant types and media. In 2006, the EPA discontinued the online REACH IT system. [Click here](#) to provide your feedback to the EPA on this decision.

Understanding the Process

In North America, before remediation begins, a series of Environmental Site Assessment (ESA) reports are prepared:

- Phase 1 ESA determines the likelihood that a site is contaminated, without taking samples.
- Phase 2 ESA involves collecting and analyzing samples to identify and quantify contaminants.
- Phase 3 ESA is a report recommending specific methods and budgets necessary to cleanup a site and to provide future monitoring of the site.

After all three phases are completed, and the proposed remediation plan is approved by appropriate government agencies, physical remediation of a polluted site can start.



eChapter 18

Natural Habitat

Habitat can be defined as the place where an organism or group of organisms (population) lives, including the surrounding physical environment and the complex interaction in the area of all other organisms. On a larger scale, landscapes are interdependent habitats, usually with overlapping, loosely defined boundaries.

Human activities in recent years have resulted in habitat loss and fragmentation on a scale and at a rate without precedence in the two-billion-year history of life on Earth.

As the human population increases, land is used for:

- Agricultural fields and livestock production
- Housing developments
- Commercial and industrial developments
- Roads, railroads, airports
- Power generation and transmission networks
- Water management systems to serve humans.

In addition, habitat is being lost due to global warming, rising sea levels, deforestation, desertification, surface mining, and human-caused pollution of air, water, and soil.



DONATE: You can help environmental organizations increase wildlife habitat:

- [The Nature Conservancy](#) (programs worldwide)
- [Wildlife Habitat Council](#) (eastern U.S.A.)
- [Ducks Unlimited](#) (wetlands in U.S.A.)

Compounding the problem of habitat loss is habitat fragmentation, where native habitat is reduced to patches or corridors that are isolated from each other. This patchwork quilt of fragmented habitats is susceptible to reduced gene pools for surviving species and invasion by non-native species.

Habitat restoration and preservation is the key to protecting biodiversity.



Biodiversity

eChapter 19 Biodiversity

[Biodiversity](#) (biological diversity) is the optimal number and relative abundance of native species and individual organisms living in a defined area, including variation at the genetic, species, habitat, and landscape levels.

How Many Species Are Known?

There are approximately 1.4 million to 1.75 million species that have been identified by scientists. [\[source\]](#) The known species tend to be physically larger than species not yet identified.

How Many Species Are Not Yet Known?

Estimates of the total number of species globally range from 2 million to 140 million, with various scientists embracing the 10 million to 14 million mid-range. Using this range as the probable total, 82 percent to 90 percent of all species on Earth are not yet identified.

Given the current rate of extinction, millions of species may be extinct before humans know they ever existed.

“Predictions and estimates of future species losses abound. One such estimate calculates that a quarter of all species on Earth are likely to be extinct, or on the way to extinction within 30 years. Another predicts that within 100 years, three quarters of all species will either be extinct, or in populations so small that they can be described as ‘the living dead.’” Dr. Barbara Corker [\[source\]](#)

What Species are Most at Risk?

The species most important to humans, namely humans themselves (*Homo sapiens sapiens*) have only been on Earth for 130,000 years. [\[source\]](#) Having arrived late at the biodiversity party, and having behaved badly in recent time, humans may depart the scene prematurely as a result of the cascading collapse of vital ecosystems.



Finding the Future

eChapter 20 Finding the Future

Human inventiveness and labor created the environmental crisis now upon us. Human inventiveness and labor can slow the environmental decline and, hopefully, reverse at least part of the damage. To succeed, we must change our daily living habits and activities to become better friends with our world.

“...if everyone in the world lived at the United Kingdom standard of living (and why should people elsewhere be denied this right) then we would either need another three worlds to supply the necessary resources or alternatively, would need to reduce the world population to 2 billion.”
[\[source\]](#)

Learning to Live Within Our Environmental Means

We are constantly bombarded with advertisements that promote “new” products that are “bigger” and “faster” and offer “more convenience.” As consumers of products and services (and of the future of our planet), we might ask:

- Must the treadmill of *new products* conscript old products to landfills, even if the old products are still adequate for their intended purpose?
- What are the real environmental, energy and use-of-resource costs of *bigger* and *faster*?
- Does the *convenience* of new products translate into [inconvenient truths](#)?

Our consumer dollars are our votes in the marketplace. Every purchase is a vote for or against the planet’s future.

Educate, Communicate and Advocate

We all need to learn as much as we can about making environmentally responsible decisions. We all need to communicate effectively with others, through our words and actions. Through communication with government leaders, we must be determined advocates for change.



Learn More

eAppendix Online Resources

These resources are provided to assist in your learning more about the environment and important actions you can take to make a difference.

We welcome your suggestions for additional resources to be included. [Send us an email with your recommendations.](#)

Environmental Organizations (Global)

[World Business Council for Sustainable Development](#): “brings together some 180 international companies in a shared commitment to sustainable development through economic growth, ecological balance and social progress.”

[World Conservation Union](#): “the world’s largest and most important conservation network. The Union brings together... 111 government agencies, more than 800 non-governmental organizations (NGOs), and some 10,000 scientists and experts from 181 countries in a unique worldwide partnership.”

[World Wildlife Fund](#): “global environmental conservation organization”

[World Resources Institute](#): “working at the intersection of environment and human needs”

[United Nations Environment Network](#): “global portal to authoritative environmental information based on themes and regions”

[International Institute for Sustainable Development](#): “champions sustainable development around the world through innovation, partnerships, research and communications”

[Green Cross International](#): “provides unbiased environmental analysis and expertise, information dissemination, education, objective evaluations for public debate, scientific studies, and social and medical support.”

[Greenpeace International](#): “focuses on the most crucial worldwide threats to our planet’s biodiversity and environment”

[Global Environment Facility](#): “helps developing countries fund projects and programs that protect the global environment.

[Environmental News Network](#): “Our mission is simple: to provide a global perspective on environmental issues, and to promote thought, discussion, and awareness among our readers.”