

Cultural Diversity and Conservation Biology

The recognition of social or cultural diversity has been proposed as an important part of biodiversity because it emphasizes that humans are as much a part of nature as any other form of life. Do you agree? While it may be appropriate to recognize the diversity inherent in various cultures, this definition allows large urban areas, and other feats of human technology to be considered on equal footing with significant natural features such as the Great Barrier Reef, the Everglades, or the Cumberland Plateau. Further, because many cultures and religions still promote high reproductive rates, it is clear that many aspects of most human cultures do not promote biodiversity conservation. Conservation Biology must emphasize those cultural aspects that ARE compatible with conserving biodiversity. How did we reach the level of social disconnect that separates humans from nature?

The History of Conservation Biology

Conservation Biology began in the U.S. - what led to this phenomenon?

Perhaps 10 million people lived in North America about 300 years ago - at the time of European settlement.

Why were early Americans apparently so “compatible” with the environment?

While there are many who doubt that primitive Americans had particularly noble conservation ethics, it is certainly true that they:

- 1) existed in low numbers
- 2) possessed limited technology
- 3) had primitive weaponry
- 4) lived at low density
- 5) had not yet effectively harnessed agriculture (although some cultures did cultivate some crops).

Even our not-so-human ancestors practiced some form of ‘conservation’.

Whether it was the conservation of warmth:

Huddled family masses at the back of a cave, or
Keeping the fire going to keep from freezing and scare the hyenas - (self preservation)

Nomadism minimized local impacts of foraging and hunting - but was not developed as a conservation measure, per se.

Learning how to prepare and preserve food for the future

Humanity’s success was linked to our ability to conserve, i.e. plan for the future – think ahead. The ability to adapt to changing seasons, changing food supplies, and changing energetic needs was not instinctive – it was learned. (However, this does not appear to be unique in the animal kingdom - black bears demonstrate this ability by responding to ripening fruits in distant corners of their range, and many relatively “dumb” species cache food for later consumption: acorn woodpecker, pinyon jay, gray squirrel, wood rat, etc.). Survival depended on this ability to learn

and *pass on to subsequent generations*. While such cross generational 'lore' has occurred elsewhere in the animal kingdom, it is relatively rare.

Another difference that sets humans apart from other animals is the development of **religion** and **spirituality**. Lacking sufficient technology to significantly alter the landscape, native Americans (descendants of Pleistocene wanderers from 10,000 - 20,000 years ago) and other aboriginal societies developed philosophies that, today, in hindsight, appear to have encouraged a more balanced existence than humankind's current relation with nature. The recognition of animal gods, cave paintings, petroglyphs, and other forms of worship and sacrifice, are evidence of this relation with nature. **However**, even early humans exhibited the potential to alter, if not abuse, natural resources – bison slaughters, fires, and, potentially, the loss of Pleistocene megafauna.

The development of agriculture (domestication and planting of crops) encouraged sedentary societies, increased human caloric intake, increased birth rates, enhanced survival, and extended life spans. The result: a growing human population especially in urban centers. As people became increasingly disconnected from nature, and decreasingly involved in the production of food and extraction of natural resources - the ultimate source of civilized humanity's material wealth.

Changes in human demographics and a concern over the disappearance of one abundant wildlife, led to the 1st game laws (primarily seasons and species restrictions), or, wildlife and plants simply became the property of aristocracy and were off limits to the huddled masses.

Religious doctrine has had a profound influence on how humans interact with their landscape and the biota it harbors. Some followers of Judeo-Christian thought have interpreted their writings in ways that promote and justify humans as the dominant organism on Earth. At one extreme, extinction of species and their habitats are viewed as necessary means by which humans assert their dominance and propagate religious doctrine. Environmental problems and crises outlined by scientists are viewed by followers as unfolding events of divine Providence and that such issues are relatively irrelevant given the belief in a second coming of a prophet and the promise of better things to come in the afterlife. Other Judeo-Christian followers believe that God gave humans stewardship of Earth and the responsibility of maintaining its creatures and processes, that in turn sustains humanity, and which if followed is a favorable strategy that will better assure them a place in heaven upon judgement. Still others view modern civilization, technology, and sometimes scientific thought as corrupt manifestations of the material world that disconnect humans from Nature which is God. To reconnect with Nature-God, these followers isolate themselves from other societies and urban settings.

Since Judeo-Christian beliefs dominated or permeated modern European thought, politics, economics, and encounters with non-believers, its followers that settled the New World largely interpreted and dealt with native peoples and hostile landscapes via various interpretation of scripture. Largely, wilderness and Native Americans were viewed by European settlers as obstacles to conquer or convert; scripture was used to justify and sanctify the displacement, pilfering, and killing of other humans and their lands (e.g., also Crusades). Of course once settlers distanced themselves from more formalized religious settings during the course of continental colonization, the justification for these actions became a means of survival. A more populous and then independent nation of the U.S. would latter view settlement as a heroic

endeavor that would lead not only to individual prosperity but to the ascendancy of the country as a powerful nation-state. The means (killing and displacement of Native Americans, slavery, species loss, landscape denaturation) justified the ends as religion and economics became intertwined with political machinery that fueled a policy of manifest destiny.

The discovery and settlement of North America by Europeans provided an opportunity for early pioneers to avoid the mistakes made in their homelands over many centuries of agriculture and human population growth: i.e. the elimination of forests, soil erosion, and extinction of regional fauna and flora preceded their departure for the New World. Unfortunately, there was more interest in converting the “new” continent into something more familiar – less forests, fewer sharp teeth, fewer savages, trees in rows... To complicate the taming of North America, as species were lost, new ones were introduced – not as replacements, but as reminders of home. In most cases, these exotic species incurred their own impacts on the landscape – European starling (a beloved bird in Europe), house sparrow, rock dove, black rat (plague), house mouse, chickory, dandelion, Dutch elm disease, Chestnut blight... A tremendous force in the taming of the “west” was **Daniel Boone** and the long-riflemen. But as much as he facilitated the settlement of North America, Boone also was one of the first Americans who recognized the value of untamed wilderness (note his many failures at owning and managing land). The passage through the Cumberlands opened the west to fur trapping, exploration, continued settlement, and the virtual extermination of aboriginal culture.

Modern American land policy can be traced to the post Revolutionary War colonies. In large part through the writings and influence of **Thomas Jefferson**, the large Tory estates were subdivided into smaller parcels. This set the stage for the development of a national philosophy of individual land ownership. At this time, the lands beyond the Appalachian Mountains were virtually unclaimed - this vast landscape became a national estate, which led to the development of states, and much later the creation of a national system of parks, forests, and refuges. “The new nation, with all its appalling wastefulness, its openhandedness, its generosity and greed, its pride and its independence, was about to begin spreading rapidly from ocean to ocean.” (In Kentucky the subdivision of the landscape is nowhere more apparent than in the number [120] of counties in this relatively small state)

But while landscapes and biota were being altered and extirpated by waves of settlers, others (particularly those in urban denatured settings) began to recognize and lament the loss of wild places and fauna. Stimulated by the writings and illustrations of naturalists such as **William Bartram**, and **John James Audubon**, urbanites increasingly expressed dissatisfaction with the ills they believed were caused by modern civilization. The naturalists and anthropological-historians such as **George Catlin**, famous for his paintings of Native Americans, helped quantify America’s rich natural history and stimulate appreciation of native peoples, thus fertilizing new ways of thinking about the American land. “Bartram’s Travels” are still turned to for vivid images of the primeval landscape - and Audubon memorialized the animal world with

Ralph Waldo Emerson and Henry David Thoreau carried these ideas further by defining the **Transcendental-Preservation Ethic**. They believed that the material world reflected the real truth and works of a divine creator. The divide between the higher spiritual truth could be achieved only when humans transcended the gap between the two worlds through study and

reconnection with nature. To these philosophers, Nature is the manifestation of God. Thoreau, you would appreciate, proposed a reversal in the traditional work week - his model was one day of work for 6 days of nature study and relaxation. He was also perhaps the nation's 1st "bunnyhugger."

New technologies and inventions accelerated the human impact on the environment during the 1800s. With the advent of the circular saw and steam mill the forests of the U.S. were quickly felled. The development of the wood pulp mill also led to a frantic rush for wood - these changes helped "puncture the Myth of Superabundance." At this time, lumbering was our largest manufacturing industry. Fire was also abused, and as much as 25,000,000 acres of forest were burned each year. In the 1850s gold was mined with huge nozzles "that could tear up whole hillsides." For every ounce of gold recovered, tons of topsoil washed into streams below.

In addition, both the federal government and states were either giving away (Homestead Act of 1862) land or selling it for incredibly cheap prices - 12.5 cents per acre, for example. The post-Civil War proliferation of firearms and railroads were the instruments of mass species slaughter and fragmentation, respectively. The mid 1880s witnessed the near extermination of the fur seal, and the complete extermination of the passenger pigeon. At the beginning of the 19th century their number was estimated at 5 billion. Around 1810, ornithologist Alexander Wilson, reported seeing a flock that was a mile wide, 240 miles long, and contained more than 2,000,000,000 birds. Pigeons were killed by the thousands and shipped to urban markets, some were fed to livestock. Other species that were pushed to the brink during these days: sea otter, bison (about 1,000,000 killed each year from 1872-1875).

Big oil began in the 1860s - gushers spewed like volcanoes over the landscape at the rate of 5,000 - 110,000 barrels a day wasted. Through all of this, natural gas was just allowed to dissipate.

The country's 1st conservation classic was **George Perkins Marsh's** "Man and Nature" (1864) He promoted ecological research and reforestation, but was a proponent of tree plantations. Nonetheless, it was a book ahead of its time and has been termed the "fountainhead of the conservation movement." Erosion of topsoil would later become a prominent environmental concern during the 1930's dustbowl -where irresponsible soil husbandry had been practiced on prairie soils for decades on soils that should never have been farmed in the first place (even today, irresponsible land and forest management not only threaten biodiversity but human life as well - recall the January 2001 landslides in El Salvador - nearly 1,000 people dead because of greedy removal of forests on unstable soils).

Major John Wesley Powell, around 1870, explored the arid west, including the Colorado River and Grand Canyon, describing the region in scientific and popular terms. Powell pointed out the inability of this part of the country, because of its aridity, to support agriculture. He would eventually call for drastic reforms in land and water use. Unfortunately his insights were insufficient to prevent the abuse of these fragile landscapes. This is why the Colorado River runs near dry before it enters the ocean...to provide water to cities such as Las Vegas and Los Angeles; cities that would otherwise be constrained in size and population from a lack of this resource.

Gifford Pinchot began responsible forestry around the turn of the century - aided by **T. Roosevelt**. This period can be viewed as the moment when brakes started to be applied to the rampant development in the U.S. By the turn of the century more than 132,000,000 acres of forest had been set aside in the west, and the practice of modern forestry had begun. The ideal forestry under Pinchot, however, was not preservation - his philosophy could be summed with this quote: "...*the use of the earth for the good of man.*" Hence, the **Resource Conservation Ethic**, a philosophy that emphasized use and management of natural resources, and that became the cornerstone of U.S. Forest Service Policy i.e. **multiple use**..

John Muir founded the **Sierra Club** and established the **National Park movement**. Muir viewed nature in a spiritual sense and emphasized preservation as the proper approach toward its value. Yosemite National Park was established in 1890 as the result of Muir's efforts – during Roosevelt's terms in the White House, 1900-1908, he established the wildlife refuge system, and continued the creation of National Parks. Although Primack (pg. 15) suggests that Muir was one of the first to ascribe *intrinsic* value to nature, my take is that his view was still *instrumental* - it was useful to people because it helped renew the human spirit. For something to be intrinsically valuable its worth must be self-contained. The view of nature as intrinsically valuable would have to wait until Leopold.

Pinchot & John Muir began as allies in the fight to stop the waste of forests and other natural resources, but they disagreed on the appropriateness of livestock in the National Forests and the **Hetch Hetchy** controversy as follows: San Franciscans had designated this valley in Yosemite National Park as the location for a dam that would provide water and electricity for their city. The developers and U.S. Army Corps of Engineers promoted the site as the least expensive and most practical. Muir, the Sierra Club and others argued that this kind of development would open up all of the national parks to unmitigated abuse. The debate lasted for a decade, but the resistance of the park preservationists sent a clear message to developers and pro-development arms of the government - such battles would continue to be hard fought. Muir's efforts would eventually culminate in the creation of 6 national parks and a dozen national monuments, not to mention the **National Park Service** itself. To this day the parks are run on this notion: "*to conserve the scenery...and the wildlife...in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations.*" On this point, I disagree with Udall's notion that "the highest traditions of public service" are to be found in the NPS. Why? Geocentrism. Nonetheless, the U.S. park paradigm has become the global standard - it has been responsible for the protection of vast landscapes and unique resources, but the concept has its problems and critics...Throughout this period, great strides were made in setting aside scenic resources (Grand Canyon, Sequoia, Mount Rainier, Crater Lake, Glacier, Mesa Verde National Parks, etc.), but little attention had been directed to wildlife protection.

Instrumental vs. Intrinsic Value

Although both philosophies are very different in suggesting the value of biodiversity (one emphasizes utility, the other spirituality), they are both similar in being **anthropocentric** – human-centered - and, therefore, instrumental.

It was not until several decades later that an alternative philosophy was proposed.

Aldo Leopold grew up in a Midwest with both of the above philosophies in evidence. Leopold is famous for 2 books **Game Management** (1933), and **A Sand County Almanac** (1949), and numerous papers and articles. He is credited not only with the founding of the field of modern wildlife management, but is also recognized as the most powerful influence on the creation of the **Evolutionary-Ecological Land Ethic** – the cornerstone of Conservation Biology. Leopold viewed people as part of the Biotic Community – a part of the whole collection of life on earth, and suggested that resource use and preservation were compatible concepts. Perhaps his most influential prose was found on pages 129-130 of “Thinking Like a Mountain” in *A Sand County Almanac*.

And yet, Leopold was dead wrong about many things: the “edge” concept, for example. **Franklin Delano Roosevelt** responded to the depression with conservation-related public projects such as the Civilian Conservation Corps (**CCC**), the Tennessee Valley Authority (**TVA**), and the Soil Conservation Service (**SCS**) - these were important parts of the New Deal. This period was a combination of conservation and massive infrastructure development: especially dams for hydroelectric power, and visitor facilities at national parks. In 1934 the Taylor Grazing Act closed the public domain to homesteading (except Alaska). The **Pittman-Robertson Act** was passed in 1937 - this established a tax on the sale of arms and ammunition and has become (and still is) one of the most important funding sources for state wildlife projects - including wildlife restoration.

The result of regionally failing agriculture, increasing technology, world wars, and a rapidly growing human population, was the transformation of the U.S. into an urban society. Quickly, the majority of the population lost contact with nature - either in wilderness, or even the rural countryside where nature was still the predominating influence. How did this affect conservation efforts in this country? It certainly made voices such as Aldo Leopold increasingly important. It also made such voices increasingly out of tune with the 60 years of economic, technological, and population growth in the U.S. that has been promoted by every federal administration - democrat or republican - since FDR.

For most of the 20th century **The Wildlife Society** and wildlife management programs in state universities supplied most of the personnel and know-how for wildlife and wildland management. Generally, there was a bias toward managing game species even 3 decades after Leopold’s untimely death in 1948. Before his work achieved public acceptance, Leopold died helping a neighbor fight a brush fire. He died as he lived: concerned more for the well-being of others and the world around him than for himself. Fittingly, his legacy remains. Then, in the late 1970s, after the discovery of the dangers of DDT, PCBs, and other contaminants (see **Rachel Carson’s A Silent Spring**), and after the dangers of human population growth were made clear by **Paul and Anne Ehrlich (The Population Bomb)**, Conservation Biology, a crisis discipline, was born – in part because the wildlife profession was not providing an adequate philosophical base for increasingly complex science and politics – specialists in game management were no longer sufficient.

The book, **Conservation Biology**, appeared in 1980; edited by Soule’ and Wilcox, it was the product of a 1978 San Diego conference of the same name. The authors of the chapters were and are giants in the broad array of ecological disciplines. The journal, *Conservation Biology*, began

in 1987.

Whereas authors in the *J. Wildl. Manage.* typically are from state & federal wildlife agencies or wildlife programs at universities (75%), contributors to Conservation Biology herald from a much different background (81% from other affiliations) – in keeping with the multidisciplinary make-up of the new field.

Author affiliation of papers in <i>JWM</i> and <i>CB</i> – April 1997								
	Univ. Wildl	Univ. other	State Wildl.	State other	Federal Wildl.	Federal other	Zoolog. parks	Private
JWM	15	5	7	0	5	2	1	1
CB	5	22	0	1	1	0	1	2

This analysis also suggests that the *JWM* continues to be the main publication outlet for traditional wildlife ecologists/managers.

Susan Jacobsen analyzed the structure of Conservation Biology and found that it is made up of a complexity of sciences:

- Basic biology
- Applied natural resource management
- Geology
- Climatology
- Economics
- Political science
- Law
- Education
- Communication

To name a few.