

# WILD EARTH

## *Citizen Science*

looking to  
protect nature

The Journal of the  
Wildlands Project

FALL/WINTER 2001-2002

\$6.95 US / \$8.50 Canada



074470816836

## WILDLANDS PROJECT



*reconnect restore rewild*

WE ARE AMBITIOUS. We live for the day when grizzlies in Chihuahua have an unbroken connection to grizzlies in Alaska; when wolf populations are restored from Mexico to the Yukon to Maine; when vast forests and flowing prairies again thrive and support their full range of native plants and animals; when humans dwell on the land with respect, humility, and affection.

Toward this end, the Wildlands Project is working to restore and protect the natural heritage of North America. Through advocacy, education, scientific consultation, and cooperation with many partners, we are designing and helping create systems of interconnected wilderness areas that can sustain the diversity of life.

*Wild Earth*—the quarterly publication of the Wildlands Project—inspires effective action for wild Nature by communicating the latest thinking in conservation science, philosophy, policy, and activism, and serves as a forum for diverse views within the conservation movement.

### WILD EARTH

**Publisher** Dave Foreman

**Editor** Tom Butler

**Managing Editor** Jennifer Esser

**Assistant Editor** Joshua Brown

**Art Director** Kevin Cross

**Science Editor** Reed Noss

**Poetry Editors** Gary Lawless, Sheila McGrory-Klyza

*Wild Earth* (ISSN 1055-1166) is published quarterly by the Wildlands Project, a nonprofit educational, scientific, and charitable corporation. • Periodicals postage paid at Richmond, VT and additional offices. Postmaster: Send address changes to *Wild Earth*, P.O. Box 455, Richmond, VT 05477. • ©2002 by the Wildlands Project. All rights reserved. No part of this periodical may be reproduced without permission.

Wildlands Project  
P.O. Box 455  
Richmond, VT 05477  
802-434-4077  
802-434-5980 (fax)  
info@wildlandsproject.org  
www.wild-earth.org

# Contents

2

Around the Campfire

*with Dave Foreman*

Early Awareness of Extinction

5

Letters

8

A Wilderness View

*Tom Butler*

Optimism and Hope

13, 51, 65

Poetry

94

Reviews

*Precious Heritage*

*Borderland Jaguars*

*Prairie Birds*

*The Wild East*

100

Artists This Issue

108

Announcements

INSIDE BACK COVER

Species Spotlight

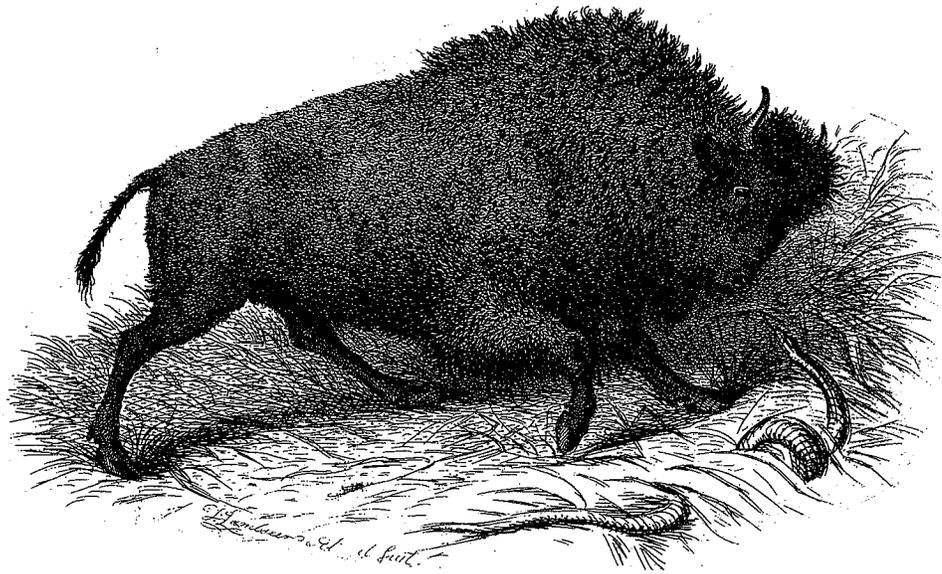
*Epinephelus itajara*

ON THE COVER

white pine (detail), serigraph by

David Hunsberger, ©1997

- VIEWPOINTS** 10 Natural History and the Spiral of Offering *Thomas Lowe Fleischner*
- CITIZEN SCIENCE**  
looking to protect nature 14 Citizen Scientist or Amateur Naturalist? *Reed Noss*  
18 Observations Count *Rick Bonney*  
24 Macroinvertebrate Data: Volunteers vs. Professionals *Eleanor Ely*  
28 Neighborhood Nestwatch *Peter P. Marra and Robert Reitsma*  
31 Keeping Track *Joshua Brown*  
34 An Inventory of Nature *Debra Shore*  
36 Diving for Data *Christy Pattengill-Semmens*  
39 A Meeting of Monarchs and Citizens *Michelle Prysby*  
44 Voices in the Night *Linda Weir*  
46 Birds in Forested Landscapes *Rick Bonney*  
48 A Citizen Science Web Sampler
- BIODIVERSITY** 52 The Soil's Living Surface: Biological Crusts *George Wuerthner*  
56 Toward Grassland Recovery in the Sky Islands Region *Tony Povilitis*  
60 Sonoran Jaguars: Conserving Borderland Cats  
*Carlos A. López González and Gustavo Lorenzana Piña*  
66 Restoring Scotland's Caledonian Forest *Alan Watson Featherstone*
- CONSERVATION HISTORY** 72 "Untrammled," "Wilderness Character," and the  
Challenges of Wilderness Preservation *Douglas W. Scott*
- LANDSCAPE STORIES** 80 Worlds Apart: Florida in the Present Tense *Joel B. McEachern*
- CONSERVATION STRATEGY** 83 The National Public Lands Grazing Campaign *Mark Salvo and Andy Kerr*  
86 Pedaling Conservation Biology Across America  
*Christopher Pyke and Britta Bierwagen*
- WILDLANDS PHILANTHROPY** 89 Saving School Trust Lands: A Utah Community  
Chooses Conservation and Education *Brooke Williams*



## Early Awareness of Extinction

ALTHOUGH EXTINCTION has been going on for as long as there has been life on the planet, humans have only recently become aware of it. We first began to understand what fossils were only 200 years ago. Even after educated people accepted that fossils were the remains of long-dead creatures, they were reluctant to believe that such creatures were extinct. At the end of the eighteenth century, biological theory was wrapped in the idea of the Great Chain of Being, which argued that by removing one link (species) the whole chain could break. Thomas Jefferson, after studying the fossil of a giant ground sloth dug up in western Virginia (which he misidentified as a lion), wrote in 1799,

"If this animal has once existed, it is probable on this general view of the movements of nature that he still exists."<sup>1</sup> He asked Meriwether Lewis and William Clark to be on the lookout for living counterparts to the fossil animals being found.

At the time of Jefferson's writing, French scientist Georges Cuvier was convincing most natural historians that the fossils being unearthed in Europe were of extinct animals. Religious scientists thereupon revised earlier theories to allow for extinction in God's perfect plan. The evidence for extinct mammals grew as more fossils were dug up and described. By 1825, for example, ten extinct North American vertebrates had been described.

After scientists settled on the reality of extinction, the "how" remained to be answered. Suggested mechanisms for extinction depended on whether one was a catastrophist or a uniformitarian. Cuvier proposed localized catastrophes to explain extinctions, while others, led by William Buckland of England, looked to Noah's flood as the universal catastrophe that accounted for extinct species. Swiss geologist and biologist Louis Agassiz, who emigrated to the United States and became one of the foremost American scientists of his era, argued for mass glaciation as the cause of past extinctions. Buckland went over to Agassiz's glacier theory in 1842.<sup>2</sup>

English geologist Charles Lyell was the “early champion of slow, natural changes across the surface of the earth as a cause of Pleistocene extinctions.” According to Donald Grayson, Lyell believed that “the extinction of species is a predictable, natural, and ongoing phenomenon, one that can be expected to occur slowly during the course of ages.”<sup>3</sup> Although the reality of extinction of species was well accepted before mid-century by both catastrophists and uniformitarians, Lyell and other advocates of gradual, natural extinctions had a hard time explaining what the actual mechanisms of extinction were.

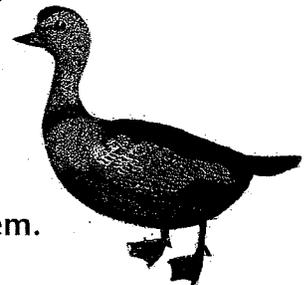
In both North America and Europe, other scientists, including France’s Jean-Baptiste de Monet de Lamarck, suggested that humans had caused past extinctions. Lyell rejected human causation because he believed the extinctions occurred before humans were present. However, by the 1860s, the great French bone digger Jacques Boucher de Perthes changed the minds of Lyell and others. Boucher de Perthes’s careful, stratigraphic excavations in the Somme River valley proved that early man and the extinct great beasts were contemporaries. After visiting Boucher de Perthes’s diggings in 1859, Lyell wrote, “That the human race goes back to the time of the mammoth and rhinoceros (Siberian) and not a few other extinct mammals is perfectly clear....” In 1860, British anatomist Richard Owen acknowledged extinction of the fossil beasts by the “spectral appearance of mankind on a limited tract of land not before inhabited.”

Alfred Russell Wallace, intrepid explorer and codiscoverer with Darwin of natural selection, believed in cata-

strophic glaciation and thus rejected human causation even after Lyell, Owen, and Darwin accepted it. Finally, after the turn of the century, Wallace accepted that glaciation had not been so widespread as he had believed, and, in concert with climatic changes, “the extinction of so many large Mammalia is actually due to man’s agency....”<sup>4</sup>

Based on the evidence in the ground, by the last half of the nineteenth century educated people recognized that prehistoric extinctions had occurred and that it was likely that Stone Age humans had a hand in them. During that same period, some began to turn their eyes to evidence that new extinctions were then taking place and that humans were again responsible. In 1832, nearly three decades before he accepted Boucher de Perthes’s views that humans had hunted extinct beasts, Lyell wrote that “the annihilation of a multitude of species has already been effected, and will continue to go on hereafter, in a still

**Based on the evidence in the ground, by the last half of the nineteenth century educated people recognized that prehistoric extinctions had occurred and that it was likely that Stone Age humans had a hand in them.**



more rapid ratio, as the colonies of highly civilized nations spread themselves over unoccupied lands.”<sup>5</sup>

It was not long after Lyell’s warning that many hunters and naturalists in North America called for an end to the mass slaughter of bison, passenger

pigeon, and waterfowl then taking place. Civilizations, in fact, have recorded extinctions since 80 A.D., when the European lion became extinct.<sup>6</sup> In 1914, famous naturalist William T. Hornaday of the New York Zoo delivered a stirring series of lectures on wildlife conservation at the Yale School of Forestry, which were published as a widely read book, *Wild Life Conservation*. He listed 10 species that had become “totally extinct in a wild state between 1840 and 1910”:

- Great auk,
- Labrador duck,
- Pallas cormorant,
- Passenger pigeon,
- Eskimo curlew,
- Carolina parakeet,
- Cuban tricolor macaw,
- Gosse’s macaw,
- Yellow-winged green parrot,
- Purple Guadalupe macaw.<sup>7</sup>

The magnitude of the extinction crisis, however, remained invisible, even to most conservationists and biologists, through much of the twentieth

century. Extinction was a problem that conservationists sought to stay, but its enormity—that the modern extinction event was of the magnitude of the dinosaur extinction event—was unimagined. However, in 1936, leading American conservationist Aldo

