

A productive and easy method to discover what animal species are present in a particular parcel of managed land is the conduct of regular road kill surveys. This method is described in *Resource Management Notes*, Vol. 6 No. 2 p. 4, the Newsletter published by the FL DNR in Tallahassee. As a result of this practice, six "new" species have been added to the Guana River State Park's vertebrate list.

Systematic collection of these data can be made during routine patrols of park staff in performance of their regular duties. An impressive vertebrate list can be accumulated in this way in a cost effective manner. Bert Charest, the state park's biologist, points out that rare and highly secretive species can often be added to park lists via road kill surveys.

* * *

On April 21, 1994, Director Kennedy's Bulletin Board contained a memorandum to all NPS employees regarding strategic planning for the Service. Sections on "Creating Our Future," "Our Changing Circumstances," and "Our Symbiotic Roles," were followed by "The Ten Most Important Things We Can Do." Separate sections on these 10 were headed: (1) Lead through exemplary park resource management; (2) Achieve sustainability in park operations and development; (3) Ensure that the NP System reflects our shared national heritage and use the System to help people forge emotional, intellectual, and recreational ties with that heritage; (4) Develop and support heritage education; (5) Move toward ecosystem management; (6) Reorient assistance programs to focus on conservation of entire landscapes and critical open space; (7) Develop NPS leadership; (8) Invest in employees; (9) Create management structure and systems that place organizational resources as close as possible to the sources of value and enhance accountability for results; and (10) Pursue maximum public benefit through partnerships and other forms of entrepreneurial management.

* * *

Craig Shafer, author of *Nature Reserves: Island Theory and Conservation Practice*, has written an invited chapter entitled "Beyond Park Boundaries" for a forthcoming book, *Landscape Planning and Ecological Networks*, to be published in 1994 by Elsevier. Focus of the book is on reversing the negative effects of habitat fragmentation.

* * *

R. Gerald Wright, NPS Research Biologist, is one of three authors of an article, "An Ecological Evaluation of Proposed New Conservation Areas in Idaho: Evaluating Pro-

posed Idaho National Parks," appearing in *Conservation Biology*, Vol. 8, No. 1, pp 207-216. The article deals with four areas that have been proposed by various interest groups as national parks. The four average 220,000 ha and contain important biological, scenic, recreational, and geological resources, but the biological resources that would be protected have received little consideration. Using the USFWS Gap analysis project databases, the authors evaluated the vegetation types contained in each proposal and found the proposals wanting in this regard.

"However," their abstract states, "the protection provided by each proposal could be enhanced...with the addition of relatively few hectares...Although national parks throughout the world play an important role in the conservation of biodiversity, this attribute is often accidental, and as our analysis showed, more attention needs to be devoted to biological data in the selection and design of new parks."

* * *

An ecological thriller in the making is the once-abandoned and now about-to-be-revived effort to combat *Solenopsis invicta*, the Argentine fire ant accidentally introduced into the U.S. in the early '40s, and seriously threatening insect biodiversity in its seemingly inexorable spread.

The unfinished story is outlined by Charles C. Mann in the March 18, 1994 issue of *Science* (pp 1560-61). The ants, which began as territorial "monogynes," have developed a "polygyne" form that creates interconnected "super-colonies" with scores of egg-laying queens. Today they dominate in Texas and may be ready to spread throughout the South...their polygyne form represents "a kind of sheet of fire ants through the earth," according to David F. Williams of the Medical and Veterinary Entomology Research Lab at the USDA Agricultural Research Service in Gainesville, FL. In one research area studied, the number of other ant species fell by 70 percent after the fire ant invasion; the number of arthropod species—insects, spiders, ticks, etc., dropped by 40 percent.

A late 1950s attempt to eliminate the pests, using World War II bombers and the poison mirex, only helped spread the fire ants rather than controlling them, and the effort was abandoned after 1960. However, recent reports that they are actually damaging the environment has given rise to plans for a "rejuvenated" program...one that will not resemble the mirex orgies of the past, but instead will be "a three-legged stool." occa-

sional use of mirex, educational efforts, and biological control.

Three organisms are being studied—for efficacy and for their effects on non-targeted species. The three most likely candidates for "hero" in this epic are a protozoan parasite, *Thelohania solenopsae*, known in Argentina to kill as many as 2/3 of the *S. invicta* in a colony; a phorid fly in the genus *Pseudateon*, that preys exclusively on fire ants; and *Solenopsis daugeri*, a parasitic ant. Because of its ability to mimic the queen's pheromones, the parasitic ant hornswaggles worker ants into feeding it, rather than the queen they are supposed to be guarding—thus allowing the parasites to "yoke" the queen, who starves to death in full view of the workers who serve her.

Williams says controlling fire ants may be necessary to avert a small-scale catastrophe for insect biodiversity in the South.

* * *

The Desert's Past: A Natural Prehistory of the Great Basin, by Donald K. Grayson (Smithsonian Institution Press, Washington, DC, 1993, 356 pp, \$44.95) is reviewed in the March 18, 1994 issue of *Science* by David P. Adam of the USGS, Menlo Park, CA. He notes that the book provides a useful overview of the insights gained through analysis of packrat middens and accelerator-mass-spectrometer radiocarbon dating over the past two decades. The remarkably late appearance of single-leaf pinon pine during the Holocene, for example, now is understood far better than it was only a few decades ago. This book brings together the results of a wide variety of investigations in archeology, geology, paleohydrology, climatology, meteorology, biogeography, dendrochronology, and history "to create an engrossing description of the region's changing environment during the past 25,000 years."

* * *

Desperate measures to control the rabbits and foxes introduced to the island of Australia in the mid-1800s are being considered by the Cooperative Research Centre for Biological Control of Vertebrate Pest Populations (a government and university consortium), and a chorus of rising concern is greeting the proposal.

Described by Virginia Morell in the August 1993 issue of *Science* (pp 683-4), the plan is to release genetically redesigned viruses that will sterilize most foxes and rabbits by tricking the females' immune systems into attacking male sperm.

Mark Bradley, a reproductive immunologist and project leader of the fox program, admits that "No country has ever tried to

manage a pest species on this scale or in this way before. It raises questions across disciplines, from virology to immunology to the animals' social behavior and ecology." Yet it could, if successful and safe, provide a model for wiping out pests in other fragile, threatened habitats such as Hawaii and New Zealand.

During the 110 years of failed control attempts, foxes and rabbits have been implicated in the extinction 20 species of local marsupials.

* * *

Run, do not walk, to find the April 1994 issue of *BioScience* (Vol. 44, No. 4). No pages are cited, because the entire issue is jam-packed with articles of interest to NPS scientists and resource managers. Five Special Section articles deal with Hurricane Andrew and its impact on the Everglades: "Hurricane Andrew" by Stuart L. Pimm, Gary E. Davis, et al, assesses damage and considers long-term consequences to well-studied ecosystems; "Hurricane Andrew's Effects on Marine Resources" by James T. Tilmant, Richard W. Curry, Ronald Jones, et al, describes the small underwater impact that contrasts sharply with the destruction in mangrove and upland-forest communities; "Hurricane Impact on Uplands and Freshwater Swamp Forest" by Lloyd Loope, Michael Duever, Alan Herndon, et al, treats large trees and epiphytes, which sustained the greatest hurricane damage; "Hurricane Andrew's Impact on Freshwater Resources" by Charles T. Roman, Nicholas G. Aumen, Joel C. Trexler, et al, finds that water quality--so important to defining the Everglades' unique ecological composition--appears to have been little affected; "Mangroves, Hurricanes, and Lightning Strikes" by Thomas J. Smith III, Michael B. Robblee, Harold R. Wanless, and Thomas W. Doyle, is an assessment of Hurricane Andrew that suggests an interaction across two differing scales of disturbance.

In the same issue, Jeffrey P. Cohn's "Salamanders slip-sliding away or too surreptitious to count?" is an overview of the scientific debate regarding salamander numbers. He notes that Interior Secretary Babbitt announced last November that the USFWS and International Paper had agreed to conserve 4,500 acres of company-owned timberland in Alabama for the Red Hills salamander...listed as threatened in 1976.

Also in this excellent issue is a piece by Raymond E. Grizzle titled "Thinking of Biology: Environmentalism should include human ecological needs." Grizzle's "references" amounts to a literature review of the

subject, citing 37 sources including former NPS scientist S.P. Bratton. Grizzle posits that lack of explicit inclusion of human needs in the formulation of environmental protection programs has created problems that are insurmountable at the level of what he terms "the basic world view." Striking a now familiar note of "transcendence" above the current level of struggle, he concludes: "Environmentalism must be expanded to explicitly address human needs."

* * *

A dismal record of success in attempts to reintroduce endangered plants (in "mitigation" efforts) as an easy option in the political and legal frameworks of conservation is exposed in an article by William H. Allen in the February 1994 issue of *BioScience* (pp 65-68). Translocation, often in order to allow a development years in the planning "to reconcile the long-term realities of ecology with the short-term imperatives of the

economic bottom line") is the most dramatic of the reintroduction techniques "and the one where success is the most uncertain—especially for species that are rare or restricted to rare habitats."

Instead of being treated as something we know how to do with a high degree of confidence, "mitigation" by this means is "surrounded by uncertainty and partial success at best and failure more frequently," according to a quote from Don Falk, executive director of the Society for Ecological Restoration based in Madison, WI. "At its worst," Falk says, "mitigation can be a charade, a fairy tale." He adds: "At its best, it is a healing art of ecology...the art of the possible."

* * *

"A Conceptual Model of Arid Rangeland Degradation" by Suzanne J. Milton, W. Richard J. Dean, et al in the February 1994

Continued on back cover

issue of *BioScience* details the escalating cost of declining productivity. A four-step model of degradation is presented and analyzed against data from all levels of the arid ecosystems. Shifts in vegetation composition have been conceptualized to occur either in predictable sequences or unpredictably in response to stochastic events. As degradation progresses, each step may lead to a number of states, and within each state various cyclic successions may occur. At every descending step of rangeland degradation, restoration becomes more costly in terms of loss of secondary productivity and expenditure of energy.

The authors conclude that "Unless rangelands are maintained at the step-one condition by livestock reduction in dry years, productivity will be irreparably lost because further degradation involving changes in secondary productivity, fauna, and soil become too costly to reverse in an overpopulated, resource-starved world."

* * *

Two more articles in the February 1994 *BioScience* that are of interest to certain resource managers are "Forest Gaps and Isolated Savanna Trees" by A. Joy Belsky and Charles D. Canham, and "Coevolution of Agroecosystems and Weed Management" by C.M. Ghersa, M.L. Roush, S.R.

Radosevich, and S.M. Cordray. The former, an application of patch dynamics in two ecosystems, concludes that discontinuities alter both the microclimate and the availability of resources crucial to component species. The latter maintains that weed-management practices have become closely linked to social and economic, rather than biological, factors. The key proposed by the authors to finding a way out of the resulting dilemma, lies in minimizing the use of energy and maximizing the use of information.

In both cases, the references cited amount to a virtual survey of the literature.

* * *

To meet the need for a pocket-sized field reference for the wetland plant list, Resource Management Group, Inc., has published the most recent version of the *National List of Scientific Plant Names* for Regions 1, 2, 3, 9, and 10. Region 1 is ME, NH, VT, MA, CT, RI, WV, KY, NY, PA, NJ, MD, DE, VA, and OH; Region 2 is NC, SC, GA, FL, TN, AL, MS, LA, and AR; Region 3 (which currently is sold out) is MI, IN, IL, MO, IO, WI, and MN; Region 9 is WA, OR, ID, western MT and western WY; Region 10 is CA.

The books, which are \$15 each plus shipping and handling, can be ordered from Resource Management Group, Inc., PO Box 487, Grand Haven, MI 49417-0487.