

extent of patchiness on overstory tree species and age, while range shape appeared to be determined by topography, and juxtaposition of ranges of neighboring conspecifics. Foraging, done mostly by males, was most intense in the early evening but continued periodically throughout the night. Eighty percent of observed foraging attempts by males occurred in one to four intensive foraging areas (IFAs) within each home range. Mean size of 15 IFAs in seven ranges was 0.5 ha (range 0.1–1.4 ha, SD = 0.4), and mean total area in IFAs per range was 1.0 ha (range 0.6–1.5 ha, SD = 0.3). Distances from centers of IFAs to respective nests ranged from 10–410 m but most (73%) were <140 m from nests, and six of seven nests were contained within an IFA. Foraging areas, day roosts, and territorial song posts of males were mostly associated with mature, open stands of ponderosa pine (*Pinus ponderosa*) mixed with Douglas-fir (*Pseudotsuga menziesii*). One brood of three young and one brood of two young dispersed from the nest in different directions, with part of the brood being attended by the male and part by the female. Fledged young were dependent on adults for food for 13–17 d, but by 24–31 d young were no longer provisioned with food. Adults rarely associated with young after this time. Fledglings left the study area by 1 September and adults by 13 October. **Linkhart, Brian D. 1984. M.Sc. Thesis, Department of Fishery and Wildlife Biology, Colorado State University, Fort Collins, CO 80523, USA.**

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RESOURCE PARTITIONING IN AN ASSEMBLAGE OF BREEDING RAPTORS FROM  
SOUTHEASTERN WYOMING

Food habits and nest site features of Golden Eagles (*Aquila chrysaetos*), Prairie Falcons (*Falco mexicanus*), Red-tailed Hawks (*Buteo jamaicensis*), and Ferruginous Hawks (*B. regalis*) were studied near Medicine Bow, Wyoming, during 1981 and 1982. Foods consisted primarily of leporids and sciurids. Wyoming Ground Squirrels dominated the diet of Prairie Falcons, while Golden Eagles preyed on leporids more than the other raptors. Diet overlap ranged 59–99% between the species. Nest aspects varied widely but the mean used by this raptor assemblage was 300°. Mean height of nests and nest substrates used by Golden Eagles were greater than those of other species. Seventy-eight percent of the raptors nested out of sight of the nearest active neighbor, and 77% nested within view of a road. Overlap in use of different nest substrates ranged 62–94%. Prairie Falcons were the most specialized and Ferruginous Hawks the most versatile raptor species in terms of food habits and use of nest sites. In spite of high levels of overlap, detailed analyses suggested possible partitioning of leporid and sciurid prey and differential use of trees and cliffs as nest sites. **MacLaren, Patricia A. 1986. M.Sc. Thesis, Department of Zoology and Physiology, University of Wyoming, Laramie, WY 82071, USA.**

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NEWS AND REVIEWS

**Proceedings of the Second Symposium on African Predatory Birds** by J. M. Mendelsohn and C. W. Sapsford (Eds.). 1984. 245 pp. Published by the Natal Bird Club, % Durban Natural History Museum, P.O. Box 4085, Durban 4000, SOUTH AFRICA.

These proceedings represent the culmination of a symposium held at majestic Golden Gate Highlands National Park in South Africa, 22–26 August 1983. The proceedings contain a total of 43 contributions and four resolutions adopted at the symposium. Eighteen contributions are abstracts or extended abstracts, and three of the remaining 25 papers are in the form of notes. Eleven full length articles discuss natural history of species in specific regions of southern Africa. Two articles were on captive propagation, two on pesticides (others mention pesticide usage in southern Africa), four on general physiology and one article introduced falconry as an arm of conservation. Among the papers was an update on the distribution, status and conservation of raptors in Madagascar. The author list contains 64 names representing seven countries outside South Africa.

The status of raptors in Madagascar, as reported by Langrand and Meyburg, was alarming. Their report stated that most of the endemic raptors on the island are today rare, extremely localized, or both, as a result of extensive deforestation. The Madagascar Serpent Eagle (*Eutriorchis astur*) and the Madagascar Sea Eagle (*Haliaeetus vociferoides*) are now among the most threatened raptors in the world, and the Madagascar Serpent Eagle may already be extinct. The last reported sighting was in the early 1970s. Many of the remaining species are confined to small forested regions or are found locally. The Madagascar Kestrel (*Falco newtoni newtoni*) is the most abundant raptor on the island, and only two migrant species, the Eleonora's Falcon (*F. eleonorae*) and Sooty Falcon (*F. concolor*), occur on the island from mid-October to early May.

Ian Newton's paper on mortality and population turnover rate suggested several alternative methods for estimating these parameters from ring recoveries, as such tend to excessively overestimate life history parameters. His opinion was that more sound estimates can be obtained from local populations and their fidelity to breeding territory, and on this basis some species appear highly transient. Most of the data presented were from his work on the Sparrowhawk (*Accipiter nisus*), but the overall indication is that temperate-zone raptors have higher breeding and death rates than their tropical and sub-tropical equivalents.

The proceedings also contained a comprehensive overview of effects of organochlorine pesticides on birds by Dr. Newton. His conclusions indicated that aldrin and dieldrin were more toxic than DDT and DDE, causing mortality both of embryos and adults. The increased mortality resulting from these compounds led to very rapid population declines of Sparrowhawks and the Peregrine Falcon (*F. peregrinus*) in Britain. However, when organochlorine use has been stopped, remaining populations had a substantial increase in numbers.

A related paper by W. R. Thomson on DDT and other organochlorines in Zimbabwe causes even more concern. Estimates of tonnage application in Zimbabwe for 1982 amounted to 96% of the average annual application rate in the United States from 1956 to 1970. Content of DDT in human milk in Harare has ranged as high as 0.807 mg/l, which exceeds the previous world record high by 0.238 mg/l. Thomson reported that the political climate was more attracted to the low cost and effectiveness of DDT than to alternative methods. The escalated use of organochlorines in Zimbabwe is a matter of grave concern, and recent increases in birth defects have caused government administration and agricultural scientists to begin considering alternative methods of pest control. Indications are that a change in political attitude towards application of harmful pesticides is now changing for the better (P. Mundy, pers. comm.).

Tom Cade presented a paper which approaches the subject of captive propagation from a cost-benefit perspective. Alternatives to captive propagation are too often overlooked in today's notion that captive propagation is proper justification "to save species from extinction." Dr. Cade reports that this was not always so, however, and from time to time activities to preserve biological diversity in the world should be reconsidered. Sound advice, to be sure. Mostly within the last 20 yr has a strong interest developed in propagation for the purpose of saving species from extinction and restoring them in nature. The earliest successful efforts to do so was seen with the American Bison (*Bison bison*). Since 1970, considerable success has been achieved with captive propagation of raptors, and true domestication appears to be within reach for some members of *Falco*.

Nevertheless, Cade reported that captive propagation and reintroduction is labor-intensive and costly. For example, the California Condor (*Gymnogyps californianus*) program will have cost at least \$10 million by the time the captive-produced condors are ready to breed in the wild. Cade reported that to maintain 100 species of raptors in captivity at a minimum population level of 100 birds/species would cost approximately \$10 million/yr. On the other hand, these figures are lower than the purses awarded at some sporting events. Such poignant examples should cause anyone to reevaluate just how they spend their wealth. Obviously, funding is available for projects, but as Cade suggests, it is up to those of us who care most about these birds to convince others that they are worth the cost.

One of the final papers, by W. R. Thomson, reported on a system adopted by the Zimbabwe government, whereby falconry has been legalized and closely allied to raptor conservation. The paper outlined the strict system by which falconry is practiced in Zimbabwe, to include the requirement that all registered falconers complete record cards detailing the locations of breeding sites of all species of raptors used in the sport of falconry. As a result, official records of several species, including non-raptors, increased tremendously within a single year's time. Also, five of Zimbabwe's most experienced falconers were initially appointed as honorary officers of the Department of National Parks and Wildlife Management. Today, honorary falconry officers and all registered permit holders perform as arms of government. The result has been that the falconry community in Zimbabwe is able to police its ranks not simply as private citizens but as government officials. The system has further resulted in a beneficial and comfortable relationship between falconers and government and provides an example for serious consideration by other countries.

Resolution 1 passed at the symposium called for the intervention of international conservation and health agencies in affecting the discontinuance of DDT use in Zimbabwe, Zambia and other Third World countries and for manufacturing countries to discontinue the production and supply of DDT to Third World countries.

Resolution 2 encouraged zoological gardens and wildlife display organization in southern Africa to construct display/breeding cages for the Bateleur (*Terathopius ecaudatus*) and to display educational materials on the role of raptors in the ecosystem as well as causes and consequences of their extirpation.

Resolution 3 commended the South Africa Agricultural Union's stand to prevent poisoning of birds of prey and vultures on South African farms.

Resolution 4 recommends the marking of FM and other communications towers in parts of South Africa in order to reduce mortality to vultures.

Only three of the 43 papers discussed some of Africa's owls. In light of apparent declines with many diurnal species as reported, it would seem that a natural follow to the symposium would be to bring together a similar data bank on Africa's nocturnal raptors. Yet, all in all, the proceedings are highly recommended reading for any ornithologist or raptor biologist, particularly those who are currently conducting studies in that region of the globe.—**Jimmie R. Parrish.**