

RECENT LITERATURE

Edited by John A. Smallwood

RESEARCH TECHNIQUES

(see also 10)

1. Bird ringing: the greatest advance in the study of birds in the 20th century.

J. Coulson. 1993. *Alauda* 61:5-8.—This editorial is a thoughtful retrospective of the many advances of ornithology attributable to bird banding. For the first half of the 20th century, banding, he says, was essentially a toy of the curious ornithologist. In the past 40 years, however, uses of banding and banding data, and the nature and variety of bands and color bands have changed dramatically. Major advances have been made in the study of migration, population dynamics, philopatry, emigration, gene flow, conservation, and the activities and roles of individual birds. Coulson urges greater use of available data, and more international use of data. He also stresses the tremendous value of the data obtained largely at the personal expense of amateur ornithologists. This is a positive essay that should be read by any bird bander. It is a pity that the essay was not further developed with a full review of the literature. [Univ. of Durham, Dept. of Biological Sciences, Science Lab., South Road, Durham, DH 1 3LE, Grande-Bretagne, United Kingdom.]—Jerome A. Jackson.

2. Tests of a new sparrow-inhibiting box. W. H. Davis. 1993. *Sialia*. 15:127-

130.—The author monitored 102 shallow nest boxes with large slot entrances (5 cm × 8.7 cm) and 102 control boxes (deeper with narrower entrances) to determine the preferences for either box type by Eastern Bluebirds (*Sialia sialis*) and House Sparrows (*Passer domesticus*) near Versailles, Kentucky. No significant difference was detected in the number of experimental versus control boxes used by bluebirds (58 versus 69, respectively), although they did fledge significantly more young in the control boxes ($P < 0.01$). House Sparrows used significantly more control than experimental boxes (21 versus 1, $P < 0.01$), and generally avoided the larger-slotted shallower boxes. Although bluebirds tend to prefer a deeper nest box with a narrower opening, ostensibly they display more versatility in nest box choice than do sparrows. Thus, in locations where sparrows are numerous, large-slotted boxes may be useful for nesting bluebirds attempting to avoid sparrow competition. [School of Biological Sciences, Univ. of Kentucky, Lexington, KY 40506, USA.]—Danny J. Ingold.

3. The use of statistical power in conservation biology: the Vaquita and Northern

Spotted Owl. B. L. Taylor and T. Gerrodette. *Conserv. Biol.* 7: 489-500.—The consequences of accepting a false null hypothesis can be acute in conservation biology because endangered populations leave little margin for recovery from poor management decisions. The concept of statistical power provides a method of estimating the probability of accepting a false null hypothesis and is illustrated with two examples. Power to detect a decline in abundance of the Vaquita (*Phocoena sinus*), an endangered porpoise, decreased with population size and was unacceptably low in the range of estimated population sizes. Thus, detection of a decline should not be a necessary criterion for enacting conservation measures for some rare species. For the Northern Spotted Owl (*Strix occidentalis cuarina*), estimates of power allowed reinterpretation of previous modeling results. The probability of detecting a population decline was 0.13 to 0.64, thus a conclusion of stability in the previous model was not justified. Statistical power can be used to justify methods of monitoring small populations, such as those used with Northern Spotted Owls (demographic versus direct survey). Power shifted with size of study area, effort expended, and density of owl populations. In this example, power decreased for both monitoring methods at low population sizes. [Southwest Fisheries Science Center, PO Box 271, La Jolla, CA 92038, USA.]—Kristin E. Brugger.

4. Methods of locating Great Horned Owl Nests in the boreal forest. C. Rohner

and F. Doyle. 1992. *J. Raptor Res.* 26:33-35.—Little research has been conducted on Great Horned Owls (*Bubo virginianus*) in coniferous boreal forests because access to these largely uninhabited areas is difficult and owl nests are very hard to find in the dense cover. The authors describe a method to locate nests in order to encourage Great Horned Owl research in these northern forests.

Step one of the nest location method is acoustic triangulation of the nesting area. Males often roost within 100 m of the nest and hoot one hour after sunset and one hour before sunrise. Nesting females often join the males in hooting and triangulation on hooting birds during these times can provide a preliminary location of the nest site. Step two of the method involves visual search. Owls most often used Old Red-tailed Hawk (*Buteo jamaicensis*) and Common Raven (*Corvus corax*) nests as well as witches' brooms (fungus-induced clumps of dense foliage in white spruce, *Picea glauca*). The large number of witches' brooms required inspection of almost all trees in the study area. The presence of down feathers proved to be the best visual cue in determining if witches' brooms were being used as owl nests.

By using this method, 23 nests were located within 28 territories that were searched. Furthermore, out of more than 50 nests of 20 different pairs approached, only six females were flushed from the nest. Thus the authors feel that although this triangulation and search method is labor intensive, it also creates little disturbance. They suggest that daytime playback of Great Horned Owl calls may induce males to hoot more and thereby improve the technique; however, they caution on the disturbance that playbacks could cause. [Dept. of Biology, Univ. of British Columbia, Vancouver BC V6T 2A9, Canada.]—Robin J. Densmore.

5. Nesting efforts by wild Mallards with three types of radio transmitters. J. Rotella, D. Howerter, T. Sankowski, and J. Derries. 1993. *J. Wildl. Manage.* 57:690–695.—The purpose of this study was to determine if and how transmitter type and attachment method can affect Mallard (*Anas platyrhynchos*) nesting efforts. Data were collected near Strettleter, Alberta, in 1991. Pre-laying wild Mallard hens were captured and assigned to one of three treatment groups: backpack transmitters attached with harnesses, backpacks attached with glue and two subcutaneous sutures, or abdominal implants.

Thirty out of 104 radio-marked hens were monitored. The unmonitored radio-marked birds either died, left the study area, carried faulty transmitters, or lost their transmitters. A smaller proportion of birds fitted with sutured backpacks were monitored; retention time for these backpacks averaged 20 days.

Body mass and wing-chord length did not differ among treatment groups. Daily survival rates for nests did not vary by group. Estimates of nesting effort measurements varied by group. The proportion of birds with harnessed backpacks that nested was lower than that of the other two groups. Females with implants and sutured backpacks initiated more nests per bird and devoted more days to egg laying. All measures of nesting effort were similar for birds with implants and sutured backpacks.

Thus, the authors conclude that harnessed backpack transmitters adversely affect nesting behavior relative to other transmitter types. They suggest that studies using harnessed backpacks may underestimate nesting effort, hen success, and recruitment. Although they had no evidence that sutured backpacks negatively affected nesting efforts, they do not recommend their use. Furthermore, they suggest that implants be considered but caution on the poorer transmitting abilities associated with internal antennas. [Inst. for Wetland and Waterfowl Research, Ducks Unlimited, 1190 Waverly St., Winnipeg MB R3T 2E2, Canada.]—Robin J. Densmore.

BEHAVIOR

(see also 20)

6. Tit for tat among neighboring Hooded Warblers. R. Godard. 1993. *Behav. Ecol. Sociobiol.* 33:45–50.—Established territorial songbirds often respond less aggressively to neighbors than to strangers, a phenomenon known as the “dear-enemy” effect. Such reduced aggression is advantageous since it allows a territorial resident to reduce the amount of time and energy it spends in frequent escalated encounters with neighbors. However, if neighbors relinquish some advantage (perhaps territorial expansion) as a tradeoff for mutual restraint in interactions, a neighbor that ceased to respect shared boundaries should be challenged. By using playbacks of neighbors' or strangers' songs the author investigated the possibility of conditional retaliation by territorial Hooded Warblers (*Wilsonia citrina*) against cheating territorial neighbors in North Carolina. Territorial males responded significantly more aggressively ($P < 0.001$) to playbacks of neighbors' songs at the boundary after simulated intrusions of those neighbors than they did to neighbors' songs at the boundaries

after simulated intrusions of strangers. Responses to first playbacks of neighbors' songs waned from day 1 to day 8 as neighbors spent more time in close contact with one another. These data appear to fit a conditional tit-for-tat strategy in which territorial male Hooded Warblers cooperate with nonintrusive neighbors and retaliate against defecting neighbors. Whether or not this reciprocal behavior is an example of reciprocal altruism will require measures of costs and benefits of specific territorial behavior. [Dept. of Biology, Univ. of North Carolina, Chapel Hill, NC 27599, USA.]—Danny J. Ingold.

7. Does the cost of polygyny in House Wrens include reduced male assistance in defending offspring? L. S. Johnson and D. J. Albrecht. 1993. *Behav. Ecol. Sociobiol.* 33:131–136.—To date few studies have examined whether male polygynous songbirds allocate more energy in nest defense against potential predators at nests with a primary-mated female versus nests with secondary-mated females. Hence it is unclear whether secondary females in a polygynous relationship suffer reduced fecundity associated with reduced male assistance in defending offspring. In order to answer this question, the authors conducted an experiment during a single breeding season near Big Horn, Wyoming, to determine whether male House Wrens (*Troglodytes aedon*) discovered predators at nests of secondary females less often and less quickly than at nests of first-mated females. Frozen garter snakes (*Thamnophis elegans*) were placed at 23 nest boxes of monogamously mated males and 12 secondary boxes of polygynously mated males during the incubation stage. Males were no less likely to discover snakes at nests of secondary females than at nests of monogamous females; moreover, about equal amounts of time elapsed before males discovered snakes at secondary versus monogamous nests. In trials in which females did not discover snakes before males, males were again no less likely to discover snakes at nests with secondary females than at nests with monogamous females. When females did discover snakes before males (which was often accompanied by an alarm call), males did discover snakes more quickly at nests of monogamous females than at nests with secondary females, but the difference was not significant. No difference was detected in the proportion of males that physically attacked snakes at nests of monogamous versus secondary females. These data provide no evidence that female House Wrens who mate with already-mated males receive any less aid from males in defending their nests from small, diurnal predators than do females paired to unmated males. [Dept. of Biological Sciences, Univ. Pittsburgh, Pittsburgh, PA 15260, USA.]—Danny J. Ingold.

8. Flying ability of different pheasant strains. P. Robertson, D. Wise, and K. Blake. 1993. *J. Wildl. Manage.* 57:778–782.—Dispersal, flying ability, and return rates of identically raised farm, wild, and mixed farm/wild strains of Ring-necked Pheasants (*Phasianus colchicus*) were compared in order to determine if genetic change is responsible for perceived declines in flying ability of farm reared pheasants. The three strains of poults (599 wild, 425 mixed, and 989 farm, as well as 3000 untagged farm strain) were released near Cambridge, England, during July and August. During hunting season (1 October to 1 February) a team of observers followed the hunters and recorded the flying ability of all birds flushed, whether the bird was shot at, whether the bird was killed, distance moved by each bird (from release point to center of drive where killed), sex, strain, body mass, and tarsus length.

There were no differences in the return rates of the three groups, percent shot being 47, 48, and 51 for wild, mixed, and farm strains, respectively. The probability of being shot at or killed increased with higher flying scores. Wild birds had the lowest body masses while farm birds had the greatest. Males and females differed in mean distances moved (373 m and 496 m, respectively); however, there were no differences in distances moved between strains. A stepwise multiple regression of corrected flying scores for tagged birds against strain, sex, body mass, and tarsus length showed only strain to be significant with wild birds having the highest mean flying scores and farm birds the least. A similar test for all birds (including untagged) indicated only mass to be significant, with lighter birds having higher flying scores.

Thus, the data suggest that releasing birds from wild stock could improve flying performance. Other factors which may be influential in the deterioration of flying ability include selective hunting pressures on high fliers and the conditions of the game farm in which they

were raised. Furthermore, the mean difference in flying scores between strains was 3 degrees, while mean flying scores between drives varied up to 7 degrees. Therefore woodland management to improve flying quality may be a more effective management tool than the release of lighter wild strain birds. [The Game Conservancy, Fordingbridge, Hampshire SP6 1EF, United Kingdom.]—Robin J. Densmore.

9. The cost of polygyny in the House Wren *Troglodytes aedon*. L. S. Johnson, L. H. Kermott, and M. R. Lein. 1993. *J. Anim. Ecol.* 62:669–682.—The cost of polygyny in the House Wren is that secondary females produce 50–80% as many offspring as primary or monogamous females, and young of secondary females grow at a slower rate. This reduced reproductive success is linked to the males providing little or no aid to the secondary females. When the nest of the primary female failed, the male provided substantial assistance to the secondary female. It is unlikely that females randomly select mates or that females benefit from the presence of another female on the territory. The answer to why females ever mate with already mated males may be because those males reflect the best option when the females select a mate, but that has not been determined. [Dept. of Biological Sciences, Univ. of Pittsburgh, Pittsburgh, PA 15260, USA.]—Robert C. Beason.

FOOD AND FEEDING

(see also 12, 19)

10. Diet shifts of black-chested Eagles [Grey Eagle-buzzards] from native prey to European rabbits in Chile. E. Pavez, C. Gonzalez, and J. Jimenez. 1992. *J. Raptor Res.* 26:27–32.—The seasonal variation in the diet of Grey Eagle-buzzards (*Geranoaetus melanoleucus*) was analyzed using three different techniques, and compared with the estimated abundance of European rabbits (*Oryctolagus cuniculus*) in the field. Data were collected in San Carlos de Apoquindo, Chile, during 1987–1989. Eagle-buzzard diets were studied using pellets, prey remains, observations of kills, and prey carried.

The 624 prey items consisted of 78.2% mammals, 11.4% reptiles, 7.8% insects, and 2.6% birds. European rabbits were the most frequently consumed prey (43.9%). By biomass, the bulk of the eagles-buzzard's diet consisted of 95.8% mammals, and 81.7% of the total biomass were European rabbits. The diets of the 1987–1988 nonbreeding seasons were 100% and 95.2% mammals, respectively, while the 1987–1988 breeding season diets were 74.5% and 82.2%, respectively. Reptiles and insects made up the majority of the remaining breeding season diets.

Estimates of the eagle-buzzard's diet at the class level were influenced by study technique. Direct observations of capture and transport of prey overestimated consumption of insects and underestimated birds and reptiles. Analysis of prey remains underestimated the number of insects. Pellet analyses seemed to best represent eagle-buzzard diets at the class level. Comparing the abundances of different rabbit size classes in the field with those captured by eagle-buzzards showed that they preyed on rabbits primarily when kittens were available. When they were not available, eagle-buzzards preyed on medium-sized rabbits. A comparison of the percentage of diet composed of rabbits with that of previous studies showed that Grey Eagle-buzzards are eating more rabbits than they used to. [Union de Ornitologos de Chile, Casilla 268, Correo Central, Santiago, Chile.]—Robin J. Densmore.

NESTING AND REPRODUCTION

(see also 2, 4, 5, 7, 9, 18, 23, 27)

11. The Piping Plover *Charadrius melodus* nesting on St. Pierre and Miquelon, the north-west Atlantic. [Nidification du Pluvier Siffleur *Charadrius melodus* a Saint-Pierre-et-Miquelon.] A. DesBrosse and R. Etcheberry. 1993. *Alauda* 61:56–58. (French.)—This note summarizes the very few recent nest records of Piping Plovers in Newfoundland and adjacent maritimes, focusing especially on nests in the proposed area of the Grand Barachois national reserve. The very few records presented include egg dates in mid to late June and downy young in late June to early July. [57, rue Gloriette, 71100 Chalon-sur-Saone, Canada.]—Jerome A. Jackson.

12. American Robin nestlings compete by jockeying for position. S. B. McRae, P. J. Weatherhead, and R. Montgomerie. 1993. *Behav. Ecol. Sociobiol.* 33:101–1106.— There is little convincing evidence that adult nesting passerine birds are capable of recognizing individual nestlings within their broods. Thus, nestlings themselves must exert at least some control over the way in which parents distribute food. The authors tested the potential for American Robin (*Turdus migratorius*) nestlings to influence the distribution of food by parents by jockeying for position in the nest. To this end, the authors set out to determine the extent of variation in the arrival location of parents at the nest and to subsequently determine the predictability of food distribution by parents relative to their arrival locations. Parents at 14 of 20 nests arrived at predictable locations on the rim of the nest (significantly different from random, $P < 0.05$), and an average of 55% of the feeding visits resulted in a single nestling receiving the entire food load. There was significant variation in the proportion of feedings given to each position in the nest ($P < 0.01$) and the center received the highest proportion (40.4% of all first feedings). So although there was a clear advantage to occupying the center nest position, this position was beneficial only if the nestling was facing in the right direction (i.e., toward the parent). In nests in which the parental perch was more predictable, nestlings changed positions more often and a greater proportion of these movements was to the center position. One consequence of this jockeying was that food appeared to be equitably distributed among nestlings. Even so, the last-hatched nestlings starved to death in five of 11 nests that had an initial brood size of three or four. Broods that were reduced had significantly higher degrees of nestling movement both before and after the loss of the last-hatched nestling than broods that were not reduced. These data demonstrate that jockeying for position is a form of interference competition and that such competition was more intense in nests where one nestling eventually died. Furthermore, jockeying for position by nestlings can influence the pattern of food allocation by the parents and nestlings can improve their chances to receive food by moving to certain positions within the nest. [Dept. of Biology, Carleton Univ., Ottawa, ON K1S 5B6, Canada.]—Danny J. Ingold.

13. Nest and nest-site characteristics of a western population of Fox Sparrow (*Passerella iliaca*). K. J. Burns and S. J. Hackett, 1993. *Southwest. Nat.* 38:277–279.— Data from 23 Fox Sparrow nests and 25 nest sites were gathered in an area of sympatry between two Fox Sparrow subspecies (*P. i. stephensi* and *P. i. megarhyncha*) in Fresno County, California. All nests were bulky, made of sticks and bark, and 14 (61%) were placed on the ground. Forty percent of the nests were completely hidden, and most (60%) were located in or under the shrubby plant species mountain whitehorn (*Ceanothus cordulatus*). Although Fox Sparrows in eastern North America frequently nest in or under coniferous trees, only 48% of the 40-m radius nest-site plots contained coniferous trees larger than 1 m. The data suggest that Fox Sparrows choose nest sites based on general habitat characteristics such as the presence of dense shrubby vegetation, rather than seeking out particular plant species for nesting (as documented in previous studies). [Dept. of Zoology and Physiology, Louisiana State Univ., Baton Rouge, LA 70803, USA.]—Danny J. Ingold.

14. Aggression by honeyeaters and its consequences for nesting Striated Thornbills *Acanthiza lineata*. W. E. Davis, Jr., and H. F. Recher. 1993. *Corella* 17:25–27.— This paper documents extensive physical aggression by three honeyeater species directed at Striated Thornbills. Aggressive interactions included chases and actual attacks. The authors conclude that the thornbills are possibly excluded from the most productive habitats and forced to forage at greater distances from their nests, both of which could result in significant energy loss. This paper shows with abundant clarity that some bird species engage in direct interspecific competition. [Div. of Science and Mathematics, Boston Univ., Boston, MA 02215, USA.]—John C. Kricher.

15. Breeding biology of a subalpine population of Garden Warblers *Sylvia borin*. [Brutbiologie einer Gebirgspopulation der Gartengraszmücke *Sylvia borin*.] M. Widmer. 1993. *Ornithol. Beob.* 90:85–113. (German, with English summary.)—In the subalpine Urseren Valley of the Swiss Alps, the Garden Warbler begins breeding about three weeks later than in the lowlands. The delay is the result of the vegetation not yet being suitable. Nests are constructed in willow and alder bushes about 1 m above the ground. The timing of breeding

is more closely correlated with the phenology of geometrid caterpillars (the primary nestling food) and the vegetation than with the weather. Bad weather (freezing temperatures, rain, or snow) regularly occurred during the breeding season. In all years of the study (1989–1992) the laying of the first clutches coincided with the full bloom of bay willows. Mean clutch size (3.97 eggs) did not differ from those of the Swiss lowlands. Both parents participated in incubation (11.9 days) and care of the nestlings (10.4 days). After fledging, the adults attended the chicks for 2–3 weeks. Only rarely did bad weather result in nest failure. Replacement clutches were found for 40% of lost nests. Most pairs attempted two broods by overlapping broods or reducing the interval between breeding cycles. Because birds were color banded it was possible to determine that they retained the same mates for successive nests. [Zoologie Inst. der Univ. Bern, Baltzerstrasse 3, CH-3012 Bern, Switzerland.]—Robert C. Beason.

16. Notes on the breeding biology of the Regent Honeyeater. W. E. Davis, Jr., and H. F. Recher. 1993. *Corella* 17:1–4.—Two Regent Honeyeater (*Xanthomyza phrygia*) nests were monitored for six days and both nests disappeared. Observations of direct interspecific aggression with several other honeyeater species were frequent, and suggest strong intraspecific competition, possibly due to habitat fragmentation. [Div. of Science and Mathematics, Boston Univ., Boston, MA 02215, USA.]—John C. Kricher.

MIGRATION, ORIENTATION, AND HOMING

(see also 21, 25)

17. Migration of Wood Sandpipers *Tringa glareola* at Ägelsee, Switzerland. [Durchzug des Bruchwasserläufers *Tringa glareola* am Ägelsee bei Frauenfeld.] H. Leuzinger and L. Jenni. 1993. *Ornithol. Beob.* 90:169–188. (German, with English summary.)—Wood Sandpipers have a long migration and use inland stopover sites in northeastern Switzerland where many are banded. Based on banding recoveries, sandpipers make nonstop flights of up to 1000 km. From Switzerland, birds fly to southern France or to northern Italy. Many more birds stopover during autumn migration than during spring migration, probably because there is less water available in the spring. Adults migrate a month earlier than first year birds. [Schneit, 8523 Hagenbuch, Switzerland.]—Robert C. Beason.

HABITAT USE AND TERRITORIALITY

(see 6, 13, 23)

ECOLOGY

(see also 9, 14, 20, 27)

18. Regulation of parental effort in a long-lived seabird: an experimental manipulation of the cost of reproduction in the Antarctic Petrel, *Thalassoica antarctica*. B-E. Seather, R. Andersen, and H. C. Pedersen. 1993. *Behav. Ecol. Sociobiol.* 33:147–150.—The fitness of a long-lived bird species with altricial young is likely to involve a tradeoff between the energy invested in current offspring and the energy that remains for parental survival and further reproductive efforts. The authors conducted an experiment on nesting petrels in Dronning Maud Land, Antarctica, in which they artificially increased the effort required to feed the offspring by placing a 20-g lead ring around the leg of one parent. Adults wearing a lead ring (manipulated birds) significantly reduced both the rate and amount of food provisioning to their chick compared to the unmanipulated parent ($P < 0.05$). In addition, the amount of time between visits was significantly longer for loaded versus unmanipulated birds ($P < 0.001$). Unmanipulated parents did not compensate for the reduced feeding efficiency of their partners. Although there was no significant difference in the weight of control versus manipulated birds, a significantly higher proportion of chicks from the experimental group (with one manipulated parent) died compared with chicks in the control nests ($P < 0.05$). The results of this study suggest that the maintenance of body condition is an important determinant in the reproductive success of Antarctic Petrels. The lack of increase in parental effort in birds confronted with increased energetic demands is

likely the response to a potentially significant reduction in future lifetime reproductive success. [Norwegian Inst. For Nature Research, Tungasletta 2, N-7005 Trondheim, Norway.]—Danny J. Ingold.

19. Seed dispersal through removal of avian nestling fecal sacs. L. S. Simons and L. H. Simons. 1993. *Southwest. Nat.* 38:282–284.—The authors conducted a laboratory germination experiment with seeds obtained from the fecal sacs of one Curve-billed Thrasher (*Toxostoma curvirostre*) and five Cactus Wren (*Campylorhynchus brunneicapillus*) nests and control seeds from four intact saguaro (*Carnegiea gigantea*) fruits. Using published data they also compared the viability of seeds from nestling fecal sacs to that of adults of the same species. Seeds from intact fruit germinated at significantly higher rates ($P < 0.005$) than did seeds from nestling fecal sacs; moreover, the viability of seeds eaten by nestlings was significantly lower than the viability of seeds eaten by adult Cactus Wrens (47% versus 76%, $P < 0.005$). Collectively, seeds processed by nestlings had a 41% germination rate compared to a 65% rate for adults. Seeds from intact fruit had a 75% germination rate. The data suggest that although the germination rate of seeds from fecal sacs was only 40%, the parental removal of seed-laden sacs under certain conditions may serve as an important source of quality seed dispersal. [Dept. of Zoology, Arizona State Univ., Tempe, AZ 85287, USA.]—Danny J. Ingold.

POPULATION DYNAMICS

(see 24, 27)

ZOOGEOGRAPHY AND DISTRIBUTION

(see 11)

SYSTEMATICS AND PALEONTOLOGY

(see 26)

EVOLUTION AND GENETICS

(see 8)

PHYSIOLOGY AND DEVELOPMENT

20. Seasonal patterns of time and energy allocation by birds. W. W. Weathers and K. A. Sullivan. 1993. *Physiol. Zool.* 66:511–536.—Seasonal variation in field metabolic rate (FMR) between breeding and wintering seasons differs between species. One contributing factor appears to be diet. Carnivorous/insectivorous species show the greatest differences in FMR and exhibit increased energy demands during the breeding season. The energy reallocation hypothesis predicts that there should be little variation between seasons; a pattern found in granivorous and omnivorous species. Both Yellow-eyed Juncos (*Junco phaeonotus*) and Dark-eyed Juncos (*J. hyemalis*) conform to the reallocation hypothesis. Yellow-eyed Juncos forage longer during the winter compared with the breeding season to maintain their energy balance. The longer foraging time results from a 22% decrease in rate of energy gain when foraging on seeds in the winter compared to foraging on insects during the breeding season. Junco behavioral activity in cold weather appears to have no net energy costs. Most of the heat required for thermoregulation is produced as a by-product of physical activity. [Dept. of Avian Sciences, Univ. of California, Davis, CA 95616, USA.]—Robert C. Beason.

21. Biphasic mass gain in migrant hummingbirds: body composition changes, torpor, and ecological significance. F. L. Carpenter, M. A. Hixon, C. A. Beuchat, R. W. Russell, and D. C. Paton. 1993. *Ecology* 74:1173–1182.—Migrating Rufous Hummingbirds (*Selasphorus rufus*) that arrived with body masses below 3.5 g exhibited two stages or phases of weight gain. The first phase was a slow gain, associated with nonlipid body components, probably proteins to rebuild the flight muscles that were catabolized during the terminal stages of migratory flight. The second phase of weight gain was much more rapid and composed of lipid deposition. Overnight weight loss decreased before the bird departed on migration, probably a result of torpor to facilitate lipid deposition. These results indicate that hummingbirds that allow their weights to fall below 3.5 g incur a large cost of the time

required to rebuild their energy reserves so they can continue their migration. [Dept. of Ecology and Evolutionary Biology, Univ. of California, Irvine, CA 92717, USA.]—Robert C. Beason.

22. The neural integration of environmental information by seasonally breeding birds. G. F. Ball. 1993. *Am. Zool.* 33:185–199.—In this review paper the author examines how the central nervous system might integrate information from predictive sources such as photoperiod changes and from unpredictable sources such as visual and auditory information. Photoperiod sensitivity results in birds responding to daylengths in the spring by initiating reproductive structures and behaviors, but the same daylengths in the autumn do not produce the same responses. The induction of photorefractoriness varies between species and, in some species, between individuals. The mechanism underlying the photoperiodic response includes photoreceptors linked to a mechanism to measure time, the gonadotropin releasing hormone (GnRH) system, and the peripheral endocrine system. Very little is known about the connectivity of the avian GnRH system. Studies on photorefractory European Starlings (*Sturnus vulgaris*) indicate that part of the photosensitivity is associated with changes in the level of serotonin metabolites in parts of the GnRH system. These changes in photosensitivity do not involve changes in steroid feedback sensitivity. On the other hand, input from the visual and auditory systems do affect the endocrine system. The most obvious types of sensory information are those associated with social interactions such as courtship. Information from both photoperiod receptors and visual and auditory receptors seems to converge in the preoptic area and septum of the GnRH system. The author suggests that these neurons should be examined in future studies to determine their connections to other parts of the CNS, and on the effects on GnRH activity in the hypothalamic cells by photoperiod and social factors. [Dept. of Psychology, Johns Hopkins Univ., Baltimore, MD 21218, USA.]—Robert C. Beason.

PARASITES AND DISEASES

(see 27)

WILDLIFE MANAGEMENT AND ENVIRONMENTAL QUALITY

(see also 3, 27)

23. Reproductive performance of territorial Ovenbirds occupying forest fragments and a contiguous forest in Pennsylvania. P. Porneluzi, J. C. Bednarz, L. J. Goodrich, N. Zawada, and J. Hoover. 1993. *Conserv. Biol.* 7:618–622.—Marked, territorial male Ovenbirds (*Seiurus aurocapillus*) were observed for one nesting season (1990) to determine relative reproductive success in relation to area of forest in which they bred. A paired male was one that interacted with a female, defended a nest or fledglings, or carried food or nest material. A successful male was one seen with fledglings. Of 13 forests (one site <10 ha; seven sites 10–99 ha; three sites 100–999 ha; and two sites >10,000 ha), eight had territorial birds. Ovenbird density was related to percentage of forest within 2 km of study plots and distance to a large forest. Male reproductive success was higher in two large sites (59%, $n = 27$) than in six small sites (5.9%, $n = 17$), suggesting source-sink populations. A mechanism was not determined to explain poor reproductive success in small forests. Ovenbird sex ratios were not known, thus contribution of females could not be calculated. Brown-headed Cowbird (*Molothrus ater*) parasitism appeared to be low in all sites, and was thus discounted as a mechanism. Predation or other edge effects were invoked as possibly affecting reproductive success of Ovenbirds in small sites. [Hawk Mt. Sanctuary Assoc., Rt. 2, Kempton, PA 19529, USA]—Kristin E. Brugger.

24. Status of Piping Plovers in the Great Plains of North America: a demographic simulation model. M. R. Ryan, B. G. Root, and P. M. Mayer. 1993. *Conserv. Biol.* 7:581–585.—A stochastic population growth model using empirical demographic data confirmed that the Piping Plover (*Charadrius melodus*) population of the Great Plains of North America is declining by >7% annually. This decline could result in extirpation within 80 years. If recent adult (0.66) and immature (0.60) survival rates were held constant, a 31% increase in fledging success (from 0.86 to 1.13 chicks/pair) would be required to stabilize the

population. To attain annual population increases of 1% to 2% would require fledging success of 1.16 to 1.19 chicks/pair. Such growth could result in the Great Plains population reaching the number required (2550 pairs) for delisting from US Endangered Species Act in 30–50 years. Delays of one to five years in initiation of 1% population growth would yield a 13–67 year delay in reaching recovery. Recovery of the Great Plains Piping Plover population is feasible and could be hastened by small increases in survival. Protection of nests and chicks, improvement of nesting beach habitats, and management of river levels to protect nesting islands in the breeding range could increase reproduction. [School of Natural Resources, Univ. of Missouri, Columbia, MO 65211, USA.]—Kristin E. Brugger.

25. Toward conservation of midcontinental shorebird migrations. S. Skagen and F. L. Knopf. 1993. *Conserv. Biol.* 7:533–541.—Patterns of shorebird migration across midcontinental North American wetlands were detected from published reports and survey responses from National Wildlife Refuges. Smaller species and neotropical migrants moved primarily across the Great Plains, whereas larger species and North American migrants predominated in the intermountain west. Shorebirds were broadly dispersed in wetland habitats; shorebird presence at refuges was related to water management schemes. Populations of shorebirds in coastal systems appeared to concentrate at sites of seasonally predictable and abundant food resources. Transcontinental shorebirds appeared to disperse and use wetlands opportunistically. The latter migration system points to a need for large-scale coordinated regional wetland management efforts to ensure presence of mudflats and shallow water habitats during critical times in migration. [National Ecology Research Center, U.S. Fish and Wildlife Service, Fort Collins, CO 80525, USA.]—Kristin E. Brugger.

BOOKS AND MONOGRAPHS

26. Descriptions of thirty-two new species of birds from the Hawaiian Islands: part I, non-Passeriformes. S. L. Olson and H. F. James. 1991. *Ornithol. Monogr.* 45:1–88, and **Descriptions of thirty-two new species of birds from the Hawaiian Islands: part II, Passeriformes.** H. F. James and S. L. Olson. 1991. *Ornithol. Monogr.* 46:1–88. Softcover, \$25.00 (plus 5% for shipping and handling) for both; not sold separately. Order from M. C. Thompson, Dept. of Biology, Southwestern College, 100 College St., Winfield, KS 67156, USA.—In 1982, the team of Olson and James published an astounding *Prodromus of the fossil avifauna of the Hawaiian Islands* (Smithson. Contrib. Zool. 365), a general summary of extensive subfossil bird remains recently discovered in such places as sinkholes, lava tubes, sand dunes, and middens. The *Prodromus* presented some taxonomic innovations and described the fossils in general terms and named no new taxa, but it certainly piqued the interest of everyone interested in island birds. I doubt the authors anticipated that a decade would pass before the first of their formal descriptions would be published, but the continuing discovery of new fossil sites and new material kept them preoccupied. These two monographs include much material discovered since the *Prodromus*. Nearly all remains described in this work come from the smaller islands west of the big island of Hawaii, where new fossil sites have recently been found. Thus the present work is but the first chapter in what promises to be a long and exciting saga. Olson and James are to be commended for taking time to publish at least a partial report on their work. Their new taxa almost double the number of species in the modern Hawaiian avifauna. (Although the bones are referred to as fossils, they are actually remains of birds that “. . . are very much a part, perhaps the most important part ecologically and evolutionarily, of the modern avifauna of the Hawaiian Archipelago” and “. . . would still be alive today—skin, feathers, songs, enzymes and all—” if humans had not arrived in the islands around 400 A.D.) These discoveries call to question all previous generalizations and hypotheses based on species totals for islands, and are thus extremely important to students of island biogeography as well as evolution.

Most of the text is devoted to the straightforward and painstakingly detailed description of new taxa. Comparisons are made with historically known species, based in many cases on previously unavailable osteological specimens removed from study skins by the authors' own recently developed technique. Because they searched the world's bird collections thoroughly and probably located and examined nearly all specimens of Hawaiian birds, comparative material is surprisingly complete. Although the authors reserve the results of “more

stimulating lines of investigation" for future publications, they still include a few remarks about ecology, phylogeny, and even behavior in their formal descriptions.

Part I (No. 45) begins with the description of a small endemic *Pterodroma*, but the rest of the new nonpasserines are land birds of the families Plataleidae, Anatidae, Rallidae, Accipitridae, and Strigidae. Surprisingly, except for the raptors, all species were flightless, which undoubtedly contributed to their early demise after human contact. Flightless ibises that lived on the forest floor were apparently confined to the central island complex often called Maui Nui. *Apteribis glenos* from Molokai, among the first modern fossil discoveries in Hawaii, is now joined by a smaller high-elevation species from Maui, with a larger lowland one discussed but not yet named. Even more remarkable than the ibises are the moa-nalos, a group of ponderous grazing anatids thought to be geese at the time of the *Prodromus*. The new name (*moa* = fowl, *nalo* = lost, forgotten) was coined to reflect the present uncertainty as to their ancestry. Olson and James believe the moa-nalos' ossified syringeal bullae may indicate a relationship to ducks rather than true geese. One species, *Thambetochea chauliodous*, was previously described. This monograph names one new congeneric species, and two new genera, the monotypic *Chechelynechen* from Kauai and *Ptaiochen* from Maui. Moa-nalos were at least ecologically gooselike. They had unusually short bills adapted for grazing, and the feeding apparatus of the Kauai bird shows convergence with that of giant tortoises. True geese, including the modern Nene *Branta sandvicensis*, are also present among the fossils. A new flightless *Branta* is named from Maui, and evidence is given that the Nene was undergoing the transition to flightlessness in some populations at the time of human contact. Six new flightless species of *Porzana* are named, and several additional ones are discussed that are as yet too poorly known to properly diagnose. Rails are now known from all the larger Hawaiian Islands. Although congeneric, these species are considered the result of multiple invasions. They do not differ strikingly from flightless rails known from islands the world over, but include some of the world's smallest species.

New Hawaiian raptors include a harrier *Circus dosseus* that was mistakenly thought to be an *Accipiter* in the *Prodromus*. Its apparent adaptations for predation on small birds originally obscured its true relationship. Also discussed is an unnamed eagle of the genus *Haliaeetus*. The authors found that the continental *H. albicilla* and *H. leucocephalus* and the new Hawaiian eagle could not be distinguished osteologically. *Grallistrix*, a new endemic genus of owls with four new species, also had *Accipiter*-like proportions that in this case can be definitely linked to bird predation; their pellets were a major source of the passerine bird remains described in the second monograph. Interestingly, the authors consider the historically known Short-eared Owl, long regarded as an endemic subspecies *Asio flammeus sandwichensis*, to be a post-Polynesian colonizer.

The non-passerine fossils include descendants of 8–10 previously unknown colonizers (a petrel, an ibis, the moa-nalo ancestor, up to three geese, a large crane, an eagle, a harrier, and an owl) previously unknown in the Hawaiian Islands. In contrast, all of the passerine fossils discussed in Part 2 (No. 46) belong to historically known families, and no additional island colonizations need be hypothesized to account for their presence. (The authors back away from their assertion in the *Prodromus* that more than one colonizing species is represented among Hawaiian *Corvus*.) The crows include two new species that differ mainly in size and bill shape from the historically known *Corvus hawaiiensis*. Only members of the Corvidae and Drepanidini are described, although thrushes (*Myadestes*), honeyeaters (Meliphagidae), and monarchine flycatchers (*Chasiempis*) are also present among the fossils. They will presumably be discussed in future publications.

The remainder of the new taxa are all considered Hawaiian honeycreepers, here classified as a tribe of the Carduelinae rather than a subfamily of the Fringillidae. This allocation is based entirely on phenetic resemblances to known drepanidines and needs further corroboration. Several new and possibly new fossil species belong to historical genera (*Telespiza*, *Chloridops*, *Rhodacanthis*, *Hemignathus*, and *Ciridops*) which all are given very complete osteological diagnoses. The four new genera include two that are finchlike and two that are thinner-billed. *Orthiospiza* was a grosbeak that shared several features with *Chloridops*, *Rhodacanthis*, and *Loxioides*, but which differed enough to warrant a separate genus. *Xestospiza*, with two species, was more distinctive in having the bill elongated somewhat like that of *Melamprosops*, but also resembling the bills of cowbirds (*Molothrus*) of the Icteridae.

Other features of the skull, however, preclude any actual icterid relationship. Also icterid-like but clearly drepanidine is the new genus *Aidemedea*, whose three species had bills resembling those of meadowlarks (*Sturnella*). The new genus *Vangulifer* represents an entirely new branch in the adaptive radiation of Hawaiian honeycreepers, having a delicate and elongated but blunt-tipped bill. The authors propose several possible nearest relationships for it, including *Oreomyzta* and *Paroreomyza*. The anomalous historic distribution of the finchlike taxa of Hawaiian honeycreepers, which were known only from the island of Hawaii and remote Laysan and Nihoa, is revealed by the fossil discoveries to be an artifact. Likewise, several species thought to be single-island endemics are now shown to have had wider distributions. James and Olson hypothesize that the widespread extinctions of drepanidine finches were related to the destruction or alteration of lowland habitats for aboriginal agriculture.

The Latin names chosen by the authors are an entertaining mix of cleverly chosen classical terms, patronyms, and Hawaiian words. They show a sense of humor without loss of dignity. I particularly like the alliterative *Chelychelynechen* ("turtle-jawed goose"), the use of the Hawaiian *pau* ("finished") as the specific epithet for an extinct moa-nalo, and the whimsy shown in the epithet *regiskongi* for the huge "King Kong finch," although Olson modestly eschews credit for the name. Appropriately, many names honor those involved in the discovery, collection, and curation of the fossils. The authors, probably wisely, refrain from the temptation to offer "official" English or Hawaiian names for the new species. Nevertheless, as the popular literature becomes aware of the fossil species, such names may be inevitable, and many are suggested by such nicknames as "King Kong finch." "Moa-nalo," the one new English term based on Hawaiian words, is a useful general name for such a group with uncertain affinities. Both "goose" and "duck" might have been misleading.

Readers of these monographs should be aware that generic and species limits among Hawaiian birds are in a state of flux. No two general publications since 1980 have agreed totally. The taxonomy presented in these monographs differs in several important ways from that of the authors' 1982 *Prodromus*, but fortunately their new taxonomy for the most part represents progress toward a consensus. They have joined many others in splitting *Psittirostra* into five genera, lumping *Heterorhynchus* and *Hemignathus*, splitting *Paroreomyza montana* from *P. maculata*, and recognizing the Hawaiian Coot (*Fulica alai*), the Akekee (*Loxops caeruleirostris*), and the Kauai Amakihi ("*L. stejnegeri*" = *Hemignathus kauaiensis*) as full species. These changes are welcome and greatly reduce the points of disagreement between their work and my own.

As in the *Prodromus*, Olson and James present some novel classifications with virtually no supporting data. For example, they now recognize four rather than their previous single species of akialoa (*Hemignathus sensu stricto*) but acknowledge that "the pattern of differentiation in the individual island populations . . . is poorly known." Apparently, they have reversed their opinion as to whether "lumping" or "splitting" is the more "conservative" approach. Also, they recognize three rather than one species of Elapaio (*Chasiempis*) with only the explanation in a fine-print footnote that ". . . this is preferable for distinctive, allopatric insular forms." Presumably that is also their rationale for raising the Hawaiian Stilt (*Himantopus knudseni*) to full species. Yet they fail to recognize as species several other distinctive allopatric forms such as the two Millerbirds (*Acrocephalus familiaris*), and the Oahu amakihi ("*Loxops virens chloris*"), and it is unclear whether they still consider *Himatione freethi* a full species as they did, without explanation, in the *Prodromus*. The most complex taxonomic problem that remains unresolved among Hawaiian honeycreepers involves the complex of small green curve-billed insectivores. The AOU Check-list and my own publications put all the similarly plumaged short- and long-billed species in *Hemignathus*, only the cross-billed akepas in *Loxops*, and the Hawaii Creeper in *Oreomyzta*. Olson and James put the short-billed amakihi and the Hawaii Creeper in *Loxops*, but give no hint of the basis for this classification. Before their classification of these groups can be evaluated, Olson and James must address why the Hawaii Creeper *O. mana* should be placed in a genus with birds whose tongue synapomorphy it does not share, and why the remarkably similar plumage patterns and sequences of the amakihi, nukupuus, and aki-looas are not synapomorphic.

Even though the species descriptions are rather dry reading, these monographs have many things to recommend them to anyone interested in island biology in general and Hawaiian

birds in particular. Table 1 (No. 45), which lists all historically known Hawaiian land bird taxa in chronological order of their description, with authors, dates, and synonyms, will be immensely valuable to anyone who has to deal with the tangled web of Hawaiian bird taxonomy. Tables 5 (No. 45) and 14 (No. 46) concisely summarize Olson and James's taxonomy of the entire endemic Hawaiian avifauna with the fossil and historic distributions of all species. The text is remarkably free of errors, although I detected a few minor lapses: the citation fails to give the full title of my 1987 field guide; the Hawaiian name for the nominal monotypic genus *Magumma* should be Anianiau, not Akikiki; and Table 14 (Part II) overlooks *Himatione freethi*. Despite my taxonomic disagreements, I highly recommend these monographs as a model of careful research with meticulous attention to detail. Although largely simple catalogs of fossil species, these monographs should be a part of any library devoted to island biology until the authors publish something of more general interest.—H. Douglas Pratt.

27. Ecology and management of the Mourning Dove. T. S. Baskett, M. W. Sayre, R. E. Tomlinson, and R. E. Mirarchi, eds. 1993. Stackpole Books, Harrisburg, Pennsylvania. 567 pp. \$44.95, hardcover.—This marvelously comprehensive book, its publication anticipated for the past several years by ornithologists, wildlife biologists, and other Mourning Dove (*Zenaida macroura*) enthusiasts, was worth the wait. Everything one wants to know about Mourning Doves might not be given in this book, but everything that **is known** about the ecology and management of this abundant, widely distributed, and heavily hunted bird is presented in the 29 chapters. Although 73 figures are listed in the front of the book, that figure is deceiving. In addition to the 73 figures, most of which are line drawings, 322 half-tones, some of which are combined into plates, complement the narrative effectively; all are of high quality. More than 1400 references are cited, 19 of which are dated 1990 or later. Harold Irby's illustrations, which feature a pointillism technique, are excellent and add to the attractiveness of this volume.

The book is divided into four sections: "Introducing the Mourning Dove" (three chapters), "Life history and biology" (10 chapters), "Population characteristics and appraisal" (six chapters), and "Research and management" (10 chapters). In Section I (54 pages), discussions of Mourning Doves center on significance as a game species, religious importance, significance to nonhunters, historical perspective (with emphasis on exploration and settlement of North America), comparisons with Passenger Pigeons (*Ecopistes migratorius*; Mourning Doves were not an important commodity in the early game markets), sport hunting and regulations, habits and adaptations, and classification and distribution. Unlike most native birds, the Mourning Dove adapted, and often prospered, in the aftermath of human development of the landscape. Undoubtedly it is more abundant and widespread today than in historic times.

The 173 pages of Section II cover migration; nesting and production; reproductive strategy; the crop gland (a fascinating description of this uniquely columbid feature); growth, maturation, and molt; energetics, metabolism, and reproductive physiology; behavior; foods and feeding ecology; diseases, parasites, and contaminants; and other natural mortality. The Mourning Dove breeds throughout the 48 contiguous states, the southern portion of the Canadian Provinces, the Greater Antilles, and Mexico. Its breeding season, among the longest of all North American birds, peaks in late spring or early summer, then declines by September. Concern has been expressed about whether beginning the hunting season on 1 September results in killing adult doves with dependent young. In a 1979–1980 study, examination of 6950 active nests from February through October revealed that fewer than three percent of all nests found were present in September and October. Although 10 percent of observed fledging occurred in September and October, dove hunting under current regulations apparently has no substantial effect on recruitment of fledglings into the population. This section is bulging with information on the biology of the Mourning Dove, and it is effectively presented.

Section III (143 pages) includes chapters on historic development, current procedures, and biological evaluation of the Call-count Survey; analysis of banding data; and population characteristics and trends in the three Management Units: Eastern, Central, and Western. A remarkable amount of data is provided to the reader. In current practice, the Call-count Survey is run between 20 and 31 May on more than 1000 routes, each 20 miles in length,

that traverse mainly secondary roads. Beginning one-half hour before sunrise, at each of 20 stops spaced one mile apart, a biologist listens for three minutes and records all individual doves heard cooing; between stops (s)he records all doves seen sitting or flying. The collected data are analyzed for each management unit by the route regression method, which yields trends defined as an average rate of change over time, i.e., the ratio of the dove population in an area in year t to the population in year $t - 1$. Results from the Survey (it is an index, not a density estimate) are generally corroborated by results of the North American Breeding Bird Survey (>2000 routes). The discussion of analysis of banding data may be statistically "heavy" for some readers; Table 43 provides a useful list of terms, with definitions, used in analysis of banding and band recovery data. Mourning Dove populations in Eastern and Central management units can be described as "relatively stable," but doves in the Western Management Unit declined substantially between 1966 and 1987, particularly in the coastal states, where hunting may have been a significant contributory factor. The effects of environmental change associated with human development, including loss of nesting habitat and elevated amounts of pesticides (the granular form in particular), surely are contributory as well.

Section IV contains 10 chapters (134 pages) that deal with capture, banding, marking, aging, and sexing techniques; care and propagation; hunting regulations and harvest; methods of hunting in the Southwest, South, and Midwest; shooting field management; and research and management needs. Discussion of the dove management unit concept finally is presented here; placing it early in Section III would have been more helpful to the reader, I believe. If anyone doubts the popularity of Mourning Dove hunting in the U.S., the fact that about 45 million doves are killed each year by about 2.4 million hunters (data reported by state agencies for 1983-1987) should be convincing. Although the Mourning Dove is among the most studied and inventoried avian species in North America, good information on the national dove harvest and the number of participating hunters is still lacking. Why is mortality attributed to hunting twice as high in the Western Management Unit as in the Central Management Unit? Can Mourning Doves sustain hunting losses of 21 to 27 percent each year without such losses becoming additive? Why do male doves outnumber females by a substantial margin? What have been the extent and effects of loss of nesting and roosting habitats for Mourning Doves, and how can such losses be mitigated? Although the amount of information contained in this book is remarkable, much remains to be learned to effect more efficient management of this ubiquitous bird.

In a multi-authored book such as this one, repetition can be expected, and it is there. Discussions of the crop gland, food of nestlings, effects of September hunting seasons, and descriptions of the Breeding Bird Survey are examples. However, the repetition did not seem excessive to me, and, in fact, restatement within a different context can be helpful to the reader's comprehension. The text contains many dangling modifiers, but most readers will not catch them (nor care). I detected only two misspellings: morning dove (p. 173) and Lincoln-Peterson (p. 353). Curiously, in Table 21 North Dakota is included in the Midwest and in Table 22 Illinois and Iowa are included in the Great Plains. Among the many recipes for preparing Mourning Doves for the table, one (p. 483) was from Justin Wilson (1990). Alas, I looked in the "References cited" in hopes of obtaining the reference to his wild game cookbook, but it was not listed. These comments can be construed as nitpicking, and indeed they are. The fact is, the book is quite clean in an editorial sense, and Baskett and his coeditors are to be commended for their careful scrutiny.

A copy of *Ecology and management of the Mourning Dove* should be owned by any serious ornithologist or wildlife biologist. Descriptives such as "this book will be the standard for many years to come" probably are overused and particularly applied to books that do not deserve it. The book **does** deserve that descriptive, however. I cannot imagine anyone wanting detailed information about ecology and management of Mourning Doves **not** seeking this book as the primary reference. I recommend it enthusiastically.—Theodore A. Bookhout.