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RECENT LITERATURE

Edited by Robert C. Beason

RESEARCH TECHNIQUES

(see also 26)

1. Does blood sampling Ring-billed Gulls increase parental desertion and chick mortality? K. M. Brown. 1995. Colon. Waterbirds 18:102–104.—The author reports on a 1992 study of Ring-billed Gulls (*Larus delawarensis*) at a colony on Lake Erie in Ontario, Canada. Adult gulls (n = 105) were trapped during late incubation, uniquely color banded, and blood samples were taken from the brachial vein. Chicks (n = 78, 26 broods) from nests of blood-sampled adults were color marked and blood samples taken from the jugular vein. The nests were monitored from a blind through fledging. Adult birds generally returned quickly to their nests, and there was no abandonment. Two chicks died as a result of the blood sampling, but there was no significant difference in chick survival and fledging success between broods where blood samples were taken and control broods. The author concludes that taking blood samples from a tolerant species produces minimal effects. This is an interesting study because investigator disturbance has caused serious problems in some species, and the welfare of study animals should always be of concern. [Dept. of Biology, York Univ., North York, Ontario, M3J 1P3 Canada.]—William E. Davis, Jr.

2. Evaluation of an extendable pole-net to collect heron eggs in the canopy of tall trees. R. K. Hines and T. W. Custer. 1995. Colon. Waterbirds 18:120–122.—The authors report on the use of an extendable pole-net used to retrieve otherwise inaccessible eggs from Great Blue Heron (*Ardea herodias*) nests as part of a contamination level study at the Upper Mississippi River National Wildlife and Fish Refuge. The net-pole consisted of four collapsible 2 m sections to which was attached an 11 cm diameter wire loop and nylon mesh stocking basket 9 cm deep. A photograph of the apparatus is included. Of 200 eggs collected with the net-pole 2 were broken and an additional 22 were dented or cracked. Eggs were incubated until piping, and the percentage of eggs in which piping occurred did not differ significantly between intact and damaged eggs. Anyone whose research protocol involves retrieving eggs from "inaccessible" nests will want to read this paper. [National Biological Service, Upper Mississippi Science Center, P.O. Box 818, La Crosse, WI 54602 USA.]—William E. Davis, Jr.

3. Spatial and temporal variation in the detectability and density of columbids in Puerto Rico and on Vieques Island. F. E. Rivera-Milán. 1995. Ornithol. Neotrop. 6:1–17.—Using both auditory and visual census techniques, the author examined the effects of detectability on a species' estimated density. Samples were made at 1.6 km intervals along 5 routes, each 8 km long. Call and sight counts were made for 3 min at each station. Visual counts were limited to a 60 m radius marked with paint. Arboreal species such as the Scaly-naped Pigeon (*Columba squamosa*) were more detectable visually than species that spent more time on the ground such as the Zenaida Dove (*Zenaida aurita*), but both species are highly vocal in the breeding season and were easily detectable. The detectability for each of the 10 species was significantly correlated for each of the 3 lifezones in which they were found except for the detectability of the Scaly-naped Pigeon in the moist zone. The author concludes that the adjustments in density estimates must be made to account for the differences of detectability between species, but not for the same species between habitats. [U.S. Fish Wildlife Service, Office of International Affairs, Suite 860, ARLSQ, Arlington, VA 11103, USA.]—Robert C. Beason.

BEHAVIOR

(see also 7, 9)

4. Social dominance in migrant and resident Turkey Vultures at carcasses: evidence for a despotic distribution. D. A. Kirk and D. C. Houston. 1995. Behav. Ecol. Sociobiol. 36:323–332.—In order to examine the effects of flock size and competition, and habitat type on social dominance in migrant and resident Turkey Vultures (*Cathartes aura meridionalis* and

C. aura ruficollis, respectively) in central Venezuela, carcasses were placed and observed in three habitat types (open and semi-open grasslands, and gallery forests). Resident vultures fed at carcasses in gallery forests significantly more often than in open and semi-open habitats, while migrant birds showed no preference for foraging in any particular habitat. Although carcasses were found significantly more quickly by both subspecies in open and semi-open habitats versus forests, resident vultures located forested carcasses significantly faster than did migrant individuals. Feeding rates of resident Turkey Vultures declined significantly, and indeed mean numbers of resident vultures at carcasses declined with increased migrant group size. Conversely, increased numbers of other residents at a carcass did not result in reduced feeding rates of residents already present. The number of resident vultures did not influence the feeding rates of migrant birds as much as other migrants did. Interestingly, the feeding rate of migrant Turkey Vultures was significantly influenced by the presence of King Vultures (*Sarcoramphus papa*), which in turn had only a minimal effect on the feeding rates of resident vultures. The relationship between encounter rates and group size was only weakly correlated for both subspecies; however, mean resident encounter rate with migrants increased in relation to migrant group size. Migrant encounter rates with other migrants, resident encounter rates with other residents, and migrant encounter rates with other residents were not influenced by the group size of the latter in each case. Migrant vultures won 86% of all interactions at carcasses with resident individuals. These data indicate that resident Turkey Vultures foraged at carcasses in gallery forests to reduce competition from the larger and more dominant migrant vultures. [Applied Ornithology Unit, Dept. of Zoology, Univ. of Glasglow, Glasglow, G12 8QQ, Scotland, U.K.]—Danny J. Ingold.

5. Influence of weather on time allocation of unpaired Pied Flycatcher *Ficedula hypoleuca* females. M. Hovi. 1995. Ornis Fennica 72:79–84.—The daily activity budget of unpaired female Pied Flycatcher was determined by radio-tracking birds for 1–4 days in four study areas that were occupied by several singing males. Female behavior was divided into three categories for an analysis of their time budgets: (1) mate sampling (visiting male territories), (2) foraging, and (3) other activities, primarily moving around. It was discovered that over 60% of the time was devoted to foraging, while only 14% of the time was utilized for mate sampling. Warmer temperatures the day of tracking or the previous day resulted in female primarily visiting male territories. This suggests that females took advantage of good weather to check out potential mates. During adverse weather conditions, females concentrated more of their efforts on foraging. Heavier females were found to spend a greater proportion of their time in mate sampling activities, regardless of weather conditions. The authors suggest that this may have been due to the increased interest in pairing that would accompany reproductive readiness. [Dept. of Biology, Konnevesi Research Station, Univ. of Jyväskylä, P. O. Box 35, FIN-40351 Jyväskylä, Finland.]—Sue Bennett.

6. Extra-pair paternity, sperm competition and the evolution of testis size in birds. A. P. Møller and J. V. Briskie. 1995. Behav. Ecol. Sociobiol. 36:357–365.—Sperm competition should be positively correlated with testis size and thus overall sperm production, if fertilization success is directly proportional to the amount of sperm that is inseminated. Indeed, several studies have shown that those species in a variety of vertebrate groups presumably faced with intense sperm competition, usually have testes that are larger than expected relative to their body size. Here the authors test this hypothesis by comparing data on the extent of extra-pair parternity in birds as determined by DNA profiling techniques from the literature with testes masses during the breeding season. A positive but not significant relationship between extra-pair paternity across 53 bird species and residual testis mass was detected; the correlation was, however, quite evident in bird species with extra-pair paternity greater than 30%. When phylogeny and body size were controlled for using a multiple regression, testis mass was significantly, positively correlated with extra-pair paternity using two different classification schemes. A pairwise comparison between sister taxa also revealed a significant positive association between relative testis mass and the degree of extra-pair paternity. The authors argue that although enlarged testes are necessary to avoid sperm depletion in some species in which males mate with many females, the more potent selection pressure for increased testes mass seems to be in situations of intense sperm competition that has lead to an arms race of copulations and counter-copulations. Furthermore, the fact

that retaliating males who achieve the last copulation are not always successful, suggests that females may in fact largely control the paternity of their offspring. If this is the case, the authors suggest that larger testes in males to counter sperm competition may be their only available evolutionary option. [Zoological Inst., Copenhagen Univ., Universitetsparken 15, DK-2100 Copenhagen O, Denmark.]—Danny J. Ingold.

FOOD AND FEEDING

(see also 4, 5, 18, 22)

7. Strategy of the Pygmy Owl while hunting avian and mammalian prey. C. Kullberg. 1995. Ornis Fennica 72:72–78.—Pygmy owl (*Glaucidium passerinum*) hunting behavior was studied using radio-tagged individuals. A seasonal change in their diet and resulting hunting strategy was observed. During the summer, the owls hunt day and night and the main prey was mammals, usually small rodents. In winter months, however, the owls are active primarily during daylight hours and the nocturnal rodents they consume during the summer were not preyed on during the winter. Instead, they mainly prey on tits (*Parus* spp.). The owls shifted their hunting strategies depending on the prey available. When hunting rodents, the owls acted as a sit-and-wait predator, perching for long periods of time, usually quite close to the ground. When hunting birds, the owls would perch for shorter periods of time, and higher in the tree in order to ambush from above. Predation risk for avian prey was found to be greater in the exterior and lower parts of a tree. Dominant tit species displace subordinate species from the inner, safer areas parts of the tree. Although the food abundance is lower near the center, dominant birds appear to trade food abundance for lowered predation risk. This subjects smaller, subordinate species to foraging in areas that have greater food abundance, but greater predation risks. [Dept. of Zoology, Stockholm Univ., S-10691 Stockholm, Sweden.]—Sue Bennett.

8. Characteristics of nocturnal feeding sites of Avocets *Recurvirostra avosetta* on the Guerande peninsula. [Caracteristiques des sites d'alimentation nocturne des avocettes elegantes *Recurvirostra avosetta* dans la presqu'ile Gueramdaise.] Y. Chepeau and S. Le Drean-Quenec'hdu. 1995. Alauda 63:169–178. (in French, English abstract, figure and table captions).—The authors studied nocturnal habitat use of Avocets on the Guerande peninsula, western France, during the winter of 1994–95. Behavior was independent of tidal rhythms, the birds resting during the day and feeding at salt pans at night. Among the 20 study sites, the Avocets preferred mud flats with 0–15 cm of water as foraging sites and avoided dry sites. Data on invertebrate populations at the mud flats indicate a low species diversity, but high density, particularly of Chironomid (Diptera) larvae. Potential management to benefit the birds is discussed and the study is continuing. [S.E.P.N.B., 10 bis, Blvd. Stalingrad, F-44000 Nantes, France.]—Jerome A. Jackson.

SONGS AND VOCALIZATIONS

9. Song degradation and estimation of acoustic distance in Black-capped Chickadees (*Parus atricapillus*). J. R. Fotheringham and L. Ratoliffe. 1995. Can. J. Zool. 73:858–868.—Experimental evidence suggests that territorial males of some bird species can estimate the distance to singing conspecifics by assessing the amount of degradation in their song, i.e., the amount of distortion and attenuation. Black-capped Chickadees respond to the song of distant conspecifics by countersinging, but respond physically to nearby conspecifics, attempting to drive them away. The authors had two purposes in this study: to compare the amount and type of song degradation in different habitats, and to test the response of male Black-capped Chickadees to recordings of degraded and undegraded songs.

Undegraded songs were broadcast in open and forested habitats, and recorded at six distances. In open habitat, song degradation was minimal up to 60 m, while degradation in forest habitat was evident at just 5 m and peaked at 50–70 m. Thus, chickadee song degrades with distance in forested habitats, providing a means for territorial males to estimate proximity of singing conspecifics. For the second part of the study, undegraded and degraded songs were broadcast from within a male's territory (n = 20 birds) while an observer recorded behavioral responses. Analysis revealed no significant difference in responses to the

two song types, suggesting that chickadees do not use song degradation as a distance cue. The authors speculate that, because sound degrades differently in open vs. wooded habitats, and because chickadees live in both habitats, song degradation would be an unreliable measure of distance. [Dept. of Biology, Queen's Univ., Kingston, ON K7L 3N6, Canada.]—Scott W. Gillihan.

NESTING AND REPRODUCTION

(see also 1, 2, 5, 6, 21, 23, 25, 28)

10. The influence of laying sequence and ambient temperature on egg size variation in the Swallow *Hirundo rustica*. J. Banbura and P. Zielinski. 1995. J. Ornithol. 136:453–460.—Studies of Barn Swallows in central Poland over two breeding seasons revealed no consistent pattern of variation in egg length, breadth, or volume with sequence of laying within a clutch or with ambient temperature during the six days before onset of laying. [Dept. of Ecology and Vertebrate Zoology, Univ. of Lodz, Banacha 12/16, 90-237 Lodz, Poland.]—Jerome A. Jackson.

11. Reproductive success of the Gray Heron *Ardea cinerea* in the Arcachon valley. [Le success de reproduction du heron cendre *Ardea cinerea* dans le bassin d'Arcachon.] J.-M. Lekuona amd F. Campos. 1995. Alauda 63:179–183. [French, English abstract, figure and table captions.]—This is a status report and analysis of a long-term (1978–1993) study of Gray Herons at a bird sanctuary in southwest France. The heronry grew from two nesting pairs in 1978, to more than 300 pairs in 1990, then declined slightly in 1991 and 1992. Data on reproductive success compare only 1992 and 1993. Most (91.6%) of the pairs were of birds 3 years old or older, and older parents (3+ years) reared more young (mean = 2.0) than pairs with at least one younger parent (mean = 1.8 young). The authors found a positive correlation between average wind speed and chick mortality. Population change, age of breeding adults, and brood size are compared for this and two other heronries studied in different years. Annual population growth (39.2%) and percent of breeding pairs 3 years of age or older were greatest at the Arcachon valley heronry. Number of breeding attempts per pair and brood sizes were intermediate to those of the other two heronries. [Dept. de Zoologia y Ecologia, Univ. de Navarra, 31080 Pamplona, Navarra, Spain.]—Jerome A. Jackson.

12. Bluebird nest boxes: unusual designs. R. A. Bittner. 1995. Sialia 17:137–139.—In order to test the nest box preferences of Mountain Bluebirds (*Sialia currucoides*) and Tree Swallows (*Tachycinta bicolor*) in an attempt to alleviate nest-box competition between these species, 10 different styles of nest boxes were built and placed along trails near Abernethy, Saskatchewan. Little information is presented regarding the placement of the boxes so it is unclear whether they were erected in pairs or by themselves. Of the 10 box styles, four possessed only one opening and varied only slightly in their dimensions (standard boxes), while the other six were somewhat unusual in that they possessed more than one entrance (test boxes). The standard boxes were disproportionately occupied by Tree Swallows (about 50–60% of the time), while most of the experimental boxes were disproportionately occupied by Mountain Bluebirds (about 40–50% of the time). Bluebirds showed a preference for experimental boxes with slightly larger floors, while swallows seemed to favor standard boxes with smaller floors. Depth from the bottom of the entrance to the floor didn't seem to influence either species. Although rough diagrams are presented of the 10 box types, no dimensions are provided; thus, it is difficult to determine to what extent varying dimensions may or may not have influenced swallow and bluebird nest-box choice. Bluebirds seem to prefer, or at least were not deterred by boxes with downward slanting, cottage-style roofs that partially concealed the entrance cavities (of which there were two to four per experimental box). Loses to predation [mostly raccoons (*Procyon lotor*)] were equally severe in standard and experimental boxes, until the number of entrances in the latter group was reduced from four or three to two (in addition, pieces were added around the entrances to increase their depth). Although the author suggests that Mountain Bluebirds are tolerant to and seem to prefer a variety of styles of multi-entrance nest boxes, it is difficult to assess the extent to which such boxes really alleviate Tree Swallow competition, since the author provides no information regarding how they are placed. [Box 97, Abernethy, Saskatchewan, SOA OAO Canada.]—Danny J. Ingold.

13. Removing American Crows and duck nesting success. R. G. Clark, D. E. Meger, and J. B. Ignatiuk. 1995. Can. J. Zool. 73:518–522.—Can duck nesting success be boosted by removing a nest predator? The authors established four 10.2 km^2 study plots in Saskatchewan, randomly designating two for crow removal and two to serve as controls. Nesting crows were removed by shooting. Duck nests (n = 66) were monitored throughout the nesting season. The proportion of successful nests (those that hatched at least one egg) was higher on the removal plots than on the controls, although the difference was not statistically significant. The authors believe that the apparent lack of enhanced nest success was due to the actions of other predators present on the plots, especially mammals. They cite other studies that similarly found no improvement in nest success with the removal of only one species from a community of predators, and contrast this with studies utilizing exclosures, which enhance nest success by excluding a suite of predators. [Canadian Wildlife Service, Prairie and Northern Wildlife Research Centre, 115 Perimeter Rd., Saskatoon, SK S7N 0X4, Canada.]—Scott W. Gillihan.

14. Testing the features of the Peterson box. W. H. Davis. 1995. Sialia 17:135–136.—Data have been accumulating during the past few years that suggest that Eastern Bluebirds (*Sialia sialis*) prefer to nest in a box style designed by Richard Peterson in which the front panel slopes inward resulting in progressively less space near the inside bottom of the box. In addition, unlike the traditional circular entrance hole or recently designed slot entrance to bluebird nest boxes, the Peterson box has an oval entrance (5.5 cm vertical; 3.5 cm horizontal). In a two-year study, the author set out to determine what features of the Peterson box are more attractive to bluebirds and perhaps less attractive to House Sparrows (*Passer domesticus*), compared to the more traditional rectangular box with a slot entrance. When paired boxes that varied only in the angle of the slope of the front panel (all had slot entrances) were presented to bluebirds and House Sparrows, no significant difference was detected in the degree of box use by either species. However, when these species were presented with paired boxes that varied only in the width of the front panel and type of entrance cavity (Peterson 9 cm-wide front panel and oval entrance versus traditional 10 cm-wide front panel and slot entrance), bluebirds nested significantly more often in the Peterson-style boxes even though the front panel did not angle inward. House Sparrows, on the other hand, nested significantly more often in the control boxes with slot entrances. From these data the author suggests that Eastern Bluebirds prefer nest boxes with either a slightly smaller floor or an oval entrance, or both. Sparrows seemed to prefer boxes with either a larger floor or a slot entrance, or both. The angle of the front panel of the box apparently had no effect on nest-box choice in either species. [130 Jesselin Dr., Lexington, KY 40503, USA.]—Danny J. Ingold.

15. Comparison of use of several styles of nest boxes by cavity nesting birds: an update. K. L. Berner. 1995. Sialia 17:127–135.—The author presents results from six years of field tests on cavity-nesting bird preferences for six types of Eastern Bluebird (*Sialia sialis*) nest boxes in upstate New York. Both bluebirds and Tree Swallows (*Tachycineta bicolor*) demonstrated a distinct preference for the front-opening, wedge-shaped Peterson-style boxes (bluebirds nested in 39% of available Peterson boxes while Tree Swallows used 72% of available Peterson boxes). Bluebirds also nested in traditional North American Bluebird Society boxes (NABS), pvc boxes, and slot boxes to a lesser extent (16%, 19%, and 16% of available boxes respectively), but completely avoided Seneca and tree-branch boxes [both of which are shallow, horizontally oriented boxes designed to deter raccoon (*Procyon lotor*) predation]. In addition to Peterson boxes, Tree Swallows nested in all five of the other box styles, using 55% of available NABS and Seneca boxes, and 36% of available slot boxes (slot opening versus a round or oval entrance). House Wrens (*Troglodytes aedon*) nested in boxes of all styles, using 10–20% of available boxes of each type, with the exception of tree-branch boxes, which they occupied 45% of the time. House Sparrows (*Passer domesticus*) nested in four of the six box styles and apparently preferred Seneca boxes, while completely avoiding pvc and tree-branch boxes. These data suggest that Tree Swallows and House Wrens were the least selective when choosing a nest box, while bluebirds were considerably more fastidious; however, the findings should be considered somewhat tentative since the author presents little information regarding the experimental design of this project (i.e., how and in what com-

binations boxes were paired, which leads to the question of whether certain box styles would have been used more or less in the presence or absence of other boxes). [SUNY, Cobleskill, NY 12043 USA.]—Danny J. Ingold.

16. The influence of forced site change on the dispersal and breeding of the Black-legged Kittiwake *Rissa tridactyla*. J. A. Fairweather and J. C. Coulson. 1995. Colon. Waterbirds 18:30–40.—Black-legged Kittiwakes (*Rissa tridactyla*) show strong fidelity to the nest-site of the previous breeding season. The authors report on a breeding colony of uniquely color-banded birds in North Shields, Tyne and Wear, England, which was forced to move when nest sites, situated on the window ledges of a warehouse, were covered with wire mesh after permission was granted to convert the warehouse into residential units. In 1991, when the birds returned to find their previous nest sites unavailable, 36% of the returning birds (n = 150) nested on the warehouse roof and adjacent building where nesting had not previously occurred, 18% began nest-building but abandoned the site, and 7% bred at other colonies. Hence, only 43% of the displaced birds bred in 1991. This percentage increased to 88% of surviving birds in 1992, and 92% in 1993. Most of this increase represented birds that had moved to other colonies (53% of surviving birds in 1992, and 57% in 1993) up to 11 km from the warehouse. Patterns of movements to and within other colonies were examined in relation to nest position in the colony in 1990 before the warehouse site was closed, breeding experience, and gender. Artificial nest-site ledges constructed on a building 1 km from the warehouse did not attract any nesting birds from the warehouse colony but did attract other kittiwakes. The authors conclude that the poor reproductive success of the displaced colony in 1991, and for some birds in more than one year, potentially reduced lifetime reproductive success for most of the birds. This paper illustrates the value of establishing populations of color-marked birds. [Dept. of Biological Sciences, Univ. of Durham, South Road, Durham DH1 3LE, United Kingdom.]—William E. Davis, Jr.

17. Does the Great Spotted Cuckoo choose Magpie hosts according to their parenting ability? J. J. Soler, M. Soler, A. P. Møller, and J. G. Martinez. 1995. Behav. Ecol. Sociobiol. 36: 201–206.—Magpie (*Pica pica*) nests parasitized by Great Spotted Cuckoos (*Clamator glandarius*) were compared to nearby unparasitized Magpie nests during two breeding seasons in southern Spain, in order to determine whether: (1) Magpie nest size is a reliable indicator of territorial quality, (2) Great Spotted Cuckoos preferentially parasitize host nests of a specific size, and (3) Great Spotted Cuckoos selectively parasitize high-quality Magpie pairs. A significant negative correlation was detected between Magpie nest volume and breeding date. Since large nests were associated with early breeding and early breeders often obtain the best territories which positively affect their breeding success, the authors were able to establish a direct relationship between large nests and the quality of magpie pairs. Magpie pairs with larger nests were parasitized by cuckoos significantly more often than pairs with smaller nests. In order to determine if cuckoos were actually selecting magpie parents of high parenting ability, the authors manipulated clutch sizes by introducing into both parasitized and unparasitized Magpie nests, the same number of parasitic and non-parasitic eggs. The number of Magpie and cuckoo fledglings in naturally parasitized nests was significantly higher than the number of fledglings in experimentally parasitized nests. Moreover, there were no instances in which Magpies from experimentally parasitized nests reared more chicks than parents from naturally parasitized nests. Thus, these findings strongly support the hypothesis that Great Spotted Cuckoos indeed preferentially parasitize Magpies of higher parental quality. [Dept. of Population Biology, Zoology Inst., Univ. of Copenhagen, Universitetparken 15, DK-2100 Copenhagen O, Denmark.]—Danny J. Ingold.

18. Urban breeding sites of Peregrine Falcons *Falco peregrinus*—new chances for an endangered species? [Der wanderfalke *Falco peregrinus* als Brutvogel in der Grossstadt—Neue Chancen für eine vom Aussterben bedronhte Tierart?] R. Schneider. 1995. Ornithol. Beob. 92:315–319. (in German, English summary)—Peregrine Falcons have established nest sites in downtown Berlin as they have in other major cities. The prey choices of one pair was monitored from 1992–1993. Using a CCD camera to continuously monitor the nest, the author identified 477 avian prey items of 31 species brought to the nest. Four species composed most of the diet: Rock Dove (*Columba livia*) 27%, Starling (*Sturnus vulgaris*) 16%, Black-headed Gull (*Larus ridibundus*) 12%, and Swift (*Apus apus*) 11%. The preponderance

of these species appears to result from a combination of a preference for larger items and availability of prey species. These prey species vary in size from 40–300 g, but several other species taken less frequently were in the range of 100–400 g. However, those species were uncommon in the city or spent most of their time in the bushes and trees where they were unavailable to the falcons. Based on a comparison between several nests, the author concluded that food availability limits reproduction in the city. [Projektgruppe Naturschutz, Inst. für Biologie, Humboldt-Univ. zu Berlin, Invalidenstr. 43, D-10115 Berlin, Germany.]—Robert C. Beason.

MIGRATION, ORIENTATION, AND HOMING

19. Migratory orientation of European Robins is affected by the wavelength of light as well as by a magnetic pulse. W. Wiltschko and R. Wiltschko. 1995. J. Comp. Physiol. A 177: 363–369.—Two mechanisms of how birds might detect the magnetic field have received attention during the past years: magnetite and photopigments. In this paper, the authors report the results of their investigations on the magnetic sensory abilities of the European Robin (*Erithacus rubecula*). When tested in the absence of visual cues with dim white light, the birds oriented in their seasonally appropriate direction (NNE) in spring. When illuminated with red light (633 nm) they were disoriented, but with green light (571 nm) they were oriented as well as under white light. In a second experiment, the same birds were treated with a brief, but strong magnetic pulse. The influence of the pulse varied between birds causing a change in direction by some but not all birds in a nonuniform manner, i.e., some birds shifted their orientation clockwise, others counterclockwise. Although there was no homogeneity in response, individual birds were consistently oriented in the same direction each night. The reasons for the differences in the responses of the robins compared to other species treated in the same manner are unknown. One potential factor is that the robins were first year birds captured on their return trip to the breeding grounds and previous experiments dealt only with adult birds. The effects of the magnetic pulse are more consistent with the idea that the effect was on a magnetic map rather than a magnetic compass because the goal of the different birds, although unknown, are most likely different. A comparison of these results with those from other experiments on the mechanisms of magnetic field detection emphasizes the need for caution in generalizing between species when so few data are available for any species. [Fachbereich Biologie der Univ. Frankfurt a.M., Zoologie, Siesmayerstr. 70, D-60054 Frankfurt a.M., Germany.]—Robert C. Beason.

HABITAT USE AND TERRITORIALITY

(see 20)

ECOLOGY

(see also 23, 24, 25)

20. Composition of bird communities following stand-replacement fires in northern Rocky Mountain (USA) conifer forests. R. L. Hutto. 1995. Conserv. Biol. 9:1041–1058.—In 1989 and 1990, bird community composition was quantified at 34 burned forest sites in Montana and Wyoming after widespread fires in 1988. Sites supported an average of 45 species, with a total of 87 species (31 breeding) found in the study. A review of additional studies revealed that 15 species are more abundant in early post-fire communities than in 14 other vegetation types typical of the northern Rockies. Three feeding guilds are most abundant in post-fire communities (woodpeckers, flycatchers, and seedeeaters). Black-backed woodpeckers (*Picoides arcticus*) appeared to be nearly restricted to standing dead forests created by fire. Two-thirds of breeding species nested in fire-killed snags, with broken top snags and standing dead aspens especially important. Forest conditions (presence of snags) prior to a fire may be important to habitat suitability for cavity nesters. Management implications include allowing stand-replacement fire regimes and reduction (or exclusion) of salvage cutting, which may remove the most important element for feeding or nesting birds in these conifer forests. [Div. of Biological Sciences, Univ. of Montana, Missoula, MT 59812 USA.]—Kristin E. Brugger.

21. A reevaluation of the effects of forest fragmentation on rates of bird-nest predation. D. J. Haskell. 1995. Conserv. Biol. 9:1316–1319.—Experimental use of quail eggs to estimate the frequency and causes of nest predation could provide insufficient evidence to evaluate the null hypothesis of no relationship of forest fragment size and nest predation. Japanese quail eggs may be too large for small-mouthed predators, such as chipmunks and mice, to remove from nests and may not mimic the size of passerine eggs (30–100% wider). Thus a subset of nest predators might have been excluded from previous testing. The author evaluated the possibility of incomplete consideration of small-mouthed predators in previous studies (and therefore underestimation of predation in large forest fragments with potentially greater predator abundance) with an egg placement experiment. Six forest fragments near Ithaca, NY, ranging from 97 to 2407 ha, were selected. On 28 June 1994 clay eggs (size not given) were placed at 25 m intervals from the edge of each forest at the position of an Ovenbird (*Seiurus aurocapillus*) nest. After 5 days, eggs were collected. The number of eggs preyed upon by small-mouthed predators increased with forest fragment size. When these were excluded from analysis, predation declined with increasing forest fragment size. Investigations of the effect of forest fragmentation on nest predators may help to elucidate the relationships of fragment size and nest predation. These data suggest that more complex relationships exist than have previously been identified. [Div. of Biological Sciences, Corson Hall, Cornell Univ., Ithaca, NY 14853 USA.]—Kristin E. Brugger.

22. Habitat utilization, diet and reproductive success in the Kestrel in a temporally and spatially heterogeneous environment. J. Valkama, E. Korpimäki, P. Tolonen. 1995. Ornis Fennica. 72:49–61.—An investigation into the foraging habitats selected for by breeding kestrels (*Falco tinnunculus*) in relation to prey availability and breeding success was conducted in western Finland. Use of agricultural fields, considered the main hunting habitat, varied within breeding seasons, as well as among study years (1989–1991). This change was found to occur in study areas supporting both large and small farms, and in both males and females. The main prey species, *Microtus* voles, underwent a three year population cycle, crashing in 1989, remaining low in 1990, and increased in 1991. The most notable occurrence of habitat shift was in 1990, a low vole year, when habitat preference switched from agricultural fields to forests and marshlands, supporting the authors prediction that farm fields would be more heavily utilized in good vole years as opposed to bad vole years. The authors also predicted that field use would decrease over the course of the breeding season, independent of vole production, because of increasing vegetative cover. However, this was not the case, and kestrels hunts over fields whenever the voles were there, regardless of vegetation density. Kestrels were also seen to hunt over hay fields that had been recently harvested, possibly because low plant cover as well as the potential of injured prey. This suggests that while these birds will hunt over areas with less vegetative cover, they do not apparently change their main habitat. The authors further theororized that in low vole years, the kestrels should spend greater amounts of time perch-hunting, a technique that utilizes less energy. However, the opposite was found to be true in their study area. The male kestrels spent more time perch-hunting in the vole-abundant years, and flight-hunting in the crash and low-vole years. Kestrels nesting near smaller agricultural fields were found to have higher reproductive success, probably because their habitat was more stable, and because of the substantial habitats suitable for alternative prey in low *Microtus* years. [Lab. of Ecological Zoology, Dept. of Biology, Univ. of Turku, FIN-20500 Turku, Finland.]—Sue Bennett.

POPULATION DYNAMICS

(see also 3, 11, 22)

23. Heron nesting at Pea Patch Island, upper Delaware Bay, USA: abundance and reproductive success. K. C. Parsons. 1995. Colon. Waterbirds 18:69–78.—The author reports on a 1993 study of breeding wading birds (herons, egrets, and ibises) at 125 ha Pea Patch Island, which since the early 1970s has been the nesting site of 5000 to 12,000 pairs. The purposes of the study were to determine the abundance of each of the 9 breeding species, productivity of the most abundant species and attendant factors (e.g., causes of nesting failure), and comparisons between upland and *Phragmites* marsh nesting sites. The dominant nesting species were Cattle Egrets (*Bubulcus ibis*) 4642 pairs (38% of total nesting wader

pairs), Snowy Egrets (*Egretta thula*) 2456 (20%), Glossy Ibises (*Plegadis falcinellus*) 2100 (17%), and Little Blue Herons (*Egretta caerulea*) 1327 (11%). Sections of the paper deal with the abundance and distribution of each species, nesting chronology, offspring production and mortality, and investigator disturbance. The *Phragmites* marsh hosted 10,100 of the 12,251 breeding pairs (82%), and different species were concentrated in different subsections of the marsh. There was greater hatching synchronization within subareas of the marsh than within species. Reproductive success for most species was less at Pea Patch Island in 1993 than in the 1970s and less than has been found in other east coast heronry studies. Predation, egg inviability, and nestling starvation were major factors in egg and chick loss. Avian predators included Fish Crows (*Corvus ossifragus*), and dogs, foxes, and raccoons were present. The author concludes that Pea Patch Island is a wildlife resource of national significance, particularly in the context of continued habitat loss and the reduction or disappearance of many other major east coast heronries. [Manomet Observatory, P.O. Box 1770, Manomet, MA 02345-1770 USA.]—William E. Davis, Jr.

24. Dramatic increase of LeConte's Sparrow in conservation reserve program fields in the northern Great Plains. L. D. Igl and D. H. Johnson. 1995. Prairie Nat. 27:89–94.—During one year of a multi-year study on grassland birds in Conservation Reserve Program (CRP) fields, the authors noted a significant increase in populations of LeConte's Sparrows. Surveys had detected a total of only 12 breeding pairs in the period 1990–93, followed by 290 pairs in 1994. The years 1989–93 were drought years, while precipitation in 1994 was well above normal—some counties in the study region received almost twice as much precipitation as the long-term average. LeConte's Sparrows prefer relatively wet habitats for nesting, and apparently responded to the increased precipitation of 1994. The authors suggest that CRP fields offer suitable nesting habitat for this species only during wet years. Current legislation allows emergency grazing and haying in CRP fields during extremely wet or dry years, activities which negatively impact LeConte's Sparrows. [National Biological Service, Northern Prairie Science Center, 8711 37th St. SE, Jamestown, ND 58401 USA.]—Scott W. Gillihan.

25. Breeding success, predation and local dynamics of colonial Common Gulls, *Larus canus*. M. Kilpi. 1995. Ann. Zool. Fennici. 32:175–182.—Common Gull colonies were studied to determine the extent to which predation and breeding success affect the local dynamics of the colony. Predators were known to take both young and adults and the dynamic response of the colony differed depending upon which age class the predator operated. Identified predators of the 15 colonies studied included mink (*Mustela vison*), Herring Gulls (*L. argentatus*) and very infrequently, Great Black-backed Gulls (*L. marinus*), raccoon dog (*Nyctereutes procyonoides*) and humans. Mink took both young and adult Common Gulls, whereas the other gull species (primarily Herring Gull) predated pre-fledgling young of all sizes. The proportions of Common Gull populations affected by Herring and Great Black-backed Gulls remained roughly at the same level all of the study years, while the proportion of the colony population affected by mink predation decreased. Several possible explanations for this decrease were put forth: a decline in the mink population, redistribution of birds between colonies or a possible combination of both. Mink were determined to have affected a much greater proportion of Common Gull breeding pairs than did herring gulls, having killed the offspring of up to 50% of all pairs in some years and in up to 6 colonies annually. Colonies were found to differ in their risks for failure and predation, with the size of the colony inversely related to the severity of breeding predation. Overall, it was found that of the 15 colonies observed, only 5 showed a population increase. Thirteen colonies were studied in detail; of these, 4 experienced population increases and suffered only 4 severe failures in 32 colony years. The remaining 9 colonies that suffered population decreases experienced 34 failures in 72 colony years. The author concluded that disturbed colonies should remain stable or grow. Those colonies most affected chick predation should decline gradually, while large adult predation will cause the population to decline rapidly. The effects of reduced reproductive success may be slow because generally, loss of offspring to predation is a rare event, and in long-lived species breeding in a stable environment, will not have severe repercussions. Such predation would be easily outweighed by the long-term benefit of breeding in a familiar colony instead of dispersing to a different site where recruitment may be more

difficult. [Univ. of Helsinki, Dept. of Ecology & Systematics, Zoological Lab., P.O. Box 17, FIN-00014 Helksinki, Finland.]—Sue Bennett.

26. Relative abundance of *Chauna torquata* (Oken, 1816) (Aves, Anhimidae) in wetlands of Rio Grande do Sul, Brazil. [Abundancia relativa de *Chauna torquata* (Oken, 1816) (Aves, Anhimidae) em terras umidas do Rio Grande do Sul, Brasil.] C. S. Fontana, C. V. Cademartori, R. A. Ramos, C. J. Drehmer, and A. E. Tavares. 1994. Biociencias (Instituto de Biosciencias Pontificia Universidade Catolica do Rio Grande do Sul) 2:125–133. [Portuguese, English abstract.)—This year-long study of the distribution and relative numbers of Southern Screamers in wetlands of Rio Grande do Sul, Brazil, was accomplished using aerial surveys from an ultra-light airplane as well as from the ground. Ground censuses were conducted in April, July, September, and November 1989, and January 1990; aerial censuses in January and May 1989. It is unfortunate that air and ground censuses weren't conducted simultaneously for comparison and maximum coverage. Highest numbers (1,052) were tallied on the January 1990 ground census and May 1989 aerial census (961). Lowest numbers were observed on the January 1989 aerial census (460) and July 1989 ground census (528). Although no seasonal pattern is evident in the overall data, censuses revealed apparent differences in numbers with season at individual sites. Coastal areas had fewer birds during July, September, and November, whereas inland sites seemed to have more birds during these months. A review of the literature suggests the majority of nesting takes place from July through December, with some nesting reported in every month but February. Additional censusing would be useful. [Bolsista do Museu de Ciencias e Tecnologia da PUCRS, Caixa Postal 1429, CEP 90619-900 Porto Alegre, RS Brasil.]—Jerome A. Jackson.

ZOOGEOGRAPHY AND DISTRIBUTION

(see also 32)

27. Establishment of the first inland colony of Great Cormorants *Phalacrocorax carbo* in the Pas-de-Calais department, France. [Implantation d'une premiere colonie continentale de grands cormorans *Phalacrocorax carbo* dans le Pas-de-Calais, France.] A. Ward, L. Barbier, and M. Delsaut. 1995. Alauda 63:185–189. [French, English summary and figure captions.]—Here they come! The blessing of reduced environmental contaminants seems to be reflected in cormorant population successes everywhere. Unfortunately many aquaculture facilities were established in prime cormorant habitat during the low years and cormorants are now finding themselves transferred from troubled to troublesome status. Four pairs of Great Cormorants nested successfully in the Reserve Naturelle Volontaire des etangs du Romelaere in northern France in 1993—58 pairs in 1994! Figures show growth of wintering populations since 1980/81. [6, rue de l'Ouest Mont, F-62910 Eperlecques, France.]—Jerome A. Jackson.

EVOLUTION AND GENETICS

(see 6, 17)

PHYSIOLOGY AND DEVELOPMENT

(see 19)

PARASITES AND DISEASES

(see 17)

WILDLIFE MANAGEMENT AND ENVIRONMENTAL QUALITY

(see also 8, 12, 14, 15, 16, 18, 27, 33)

28. First captive breeding of the Oriental Crested Ibis (*Nipponia nippon*). L. Fulai, L. Bin, S. Seming, W. Jengrong, and L. Lingyun. 1995. Colon. Waterbirds 18:23–29.—The Oriental Crested Ibis is a highly endangered species with a world population of about 40 birds in 1993. The species was previously widespread in eastern Asia but the population precipitously declined during the latter half of the 20th century. In an effort to save the species from extinction, an observation and protection station was established in 1983 in Shaanxi Province, where a small relic population of seven birds had been discovered in 1981. In 1986

a captive breeding center was established in the Beijing Zoo as part of the recovery effort. Observations at three nests of wild birds were made in 1986. Five chicks were taken from nests and a sixth was loaned by the Ibis Protection Center in Japan. Artificial nests were provided for the 3 captive pairs and dummy eggs placed in the nests to induce females to lay. One pair has produced viable eggs which were removed and incubated and chicks fed according to protocols developed from observations of the nesting behavior of wild birds. Two eggs were laid in 1988 but were infertile. Two eggs hatched in each year from 1989–1991 but all chicks died. In 1992 and 1993 a total of 6 chicks were reared to fledging and were still alive in late 1994. The paper includes a growth curve for the 1992 chicks, analyses of natural and artificial foods fed to the captive Crested Ibises, and the results of genetic studies. [Beijing Zoo, Beijing 100044, People's Republic of China.]—William E. Davis, Jr.

MISCELLANEOUS

29. Penguins bled by vampires. G. Luna-Jorquera and B. M. Culik. 1995. J. Ornithol. 136:471–472.—The authors found a vampire bat (*Desmodus rotundus*) apparently attempting to feed on the blood of a Humboldt Penguin (*Spheniscus humboldti*) chick on Isla Pan de Azucar, Chile. While there were two chicks present, only one was "attacked"—so the title here is a bit misleading. The bat was seen leaving the chick which was found to have "two small cuts" on the tarsometatarsus. This is merely a first record of a vampire bat attempting (?) to feed on bird blood. The authors present no evidence that vampire bats regularly attack penguin chicks, ever attack adult penguins, or that they cause serious harm to the penguins. They do mention the potential of disease transmission. An interesting anecdote, but much more evidence is needed. Rabid penguins? [Institut für Meereskunde, Dusternbrooker Weg 20, D-24105 Kiel, Germany.]—Jerome A. Jackson.

PHOTOGRAPHY, RECORDINGS AND SOFTWARE

30. Johann Christian von Mannlich (1741–1822)—a significant 18th century bird artist. [Johann Christian von Mannlich (1741–1822)—ein bedeutender Vogelmaler des 18. Jahrhunderts.] R. Schlenker and W. Baumeister. 1995. J. Ornithol. 136:435–440. [German, English summary.]—The authors describe an unpublished manuscript, begun in 1787/1788 and completed about 1799, titled "Sammlung europaischer Vogel" [Collection of European Birds] with more than 300 paintings that were previously unknown to ornithologists. Several of the watercolor paintings are described and one, a Black-bellied Plover (*Pluvialis squatarola*) is illustrated in color. General body proportions are excellent (although the bird appears a bit "front-heavy"). Feather texture and plumage pattern and conformation are incredibly good. The bird is shown in profile, perched on a rock ledge with a nondescript countryside in the background. This seems to be a real treasure! [Vogelwarte Radolfzell am Max-Planck-Institut für Verhaltensphysiologie, Schlloß, D-78315 Radolfzell-Möggingen, Germany.]—Jerome A. Jackson.

31. Thayer Birding Software. P. Thayer. 1994–1995. Thayer Birding Software, Cincinnati, OH—This software consists of three segments: a CD-ROM (**Birds of North America:** 1994, ISBN 1-887148-00-0, $65), a set of two 3.5 inch disks (**Birds of the World** by Charles Sibley: 1995, ISBN 1-887148-04-3, $75), and a set of eight 3.5 inch disks (**Birder's Diary:** 1995, ISBN 1-887148-06-X, $69). (Birder's Diary version 1.5 is reviewed here; version 1.6 with some improvements is available after November, 1995 for $85.) The segments are sold separately or as an interacting package. System requirements: IBM-compatible computer with a 486SX or better processor, MCI-compatible sound card, Windows 3.1, 2X CD-ROM drive, 256-color VGA monitor, and 8 megabytes of RAM. Hard drive requirements: 2 megabytes for Birds of North America, 3 megabytes for Birds of the World, and 25 megabytes for Birder's Diary.

Unlike a typical ornithological resource book, this computer software package contains a very wide variety of applications, some especially good for rank amateurs and some for dedicated listers or professional taxonomists. Because it is used in a computer, the applications can be cross-referenced (hyperlinked) with a click of a button. The bulk of the CD-ROM Birds of North America is a computerized "field guide" to 895 birds of North America, which, unlike books, combines full-color photos (primarily of breeding plumage males from VIREO), with recorded songs for 550 species (from the Laboratory of Ornithology), and

range maps and habitat descriptions. A user simply types in the common or Latin name of a bird to bring up its photo, then has the option of playing its song, and of seeing its range map and habitat description. Unlike typical field guide plates, it does not show several similar species in one view, but they can be compared by paging forward or back. Besides the field guide features, the CD-ROM contains much additional advice to birders such as suggestions for new birders, birding hot spots, birding ethics, how to attract birds, birding organization addresses, binocular brand and model recommendations, and a reference list.

The 2-disk Birds of the World, by Charles Sibley, is advertised as "a college level textbook of ornithology." We wouldn't call it that, but it is a detailed reference book that gives the classification of each of the 9730 birds of the world, according to Sibley, Ahlquist, and Monroe (S-A-M: Sibley and Monroe, 1990, Distribution and Taxonomy of Birds of the World; its Supplement, 1993; Monroe and Sibley, 1993, A World Checklist of Birds), though this computerized book has been updated to 1995. There are several introductory chapters discussing avian phylogeny and classification systems, along with explanations for why the S-A-M system is preferred. For each of the orders and families, Sibley gives detailed descriptions of the characteristic anatomy. The terminology is technical, but the reader can refer to a glossary of terms in the introduction for definitions. Sibley also shows how each group is related to similar groups, and briefly lists the diet, behavior, and breeding habits of the order or family. Under each family, every included species is listed with Latin name, English common name, habitat, and geographic distribution. An index provides quick access to any of the species by simply typing the common or Latin name (or choosing from a list) and clicking a button. A provision is made so that the user can add annotations to the species or group for future reference. The index search feature in Sibley insists on the correct name and spelling: it finds no matches if the user asks for Wigeon, or American Widgeon, but can find American Wigeon and *Anas americana*. Oriole or Baltimore Oriole yield no North American birds, but Northern Oriole works. An unfortunate glitch in the programming caused Gray (or Grey) Catbird to be omitted from the search capability, and for any bird name starting with the color Gray, the search must start be started with Grey.

The 8-disk Birder's Diary portion of the package is able to link the two portions already discussed, as well as provide numerous listing services of its own. As its name implies, it allows a birder to record in checklist fashion each bird seen on any trip, and using the dates and places entered by the user, creates a life list, an annual list, a state list, a backyard list (etc.) of all birds seen. As each bird is entered on a list, the user may write notes that can be recalled later. The diary will handle lists for a number of different individual birders or groups. Since the program includes the official American Birding Association (ABA) checklist for each state and for the USA and Canada, it can print out those lists, and also can show the species of birds that the observer has *not yet* seen for that state, province, or North America, thus creating a hit-list for avid birders. A user can easily get various kinds of summaries of the lists previously entered, such as "In which [years, states, trips] did I record seeing a Dickcissel?" Click a button, and the program provides a report that specifically answers the question. The Birder's Diary also provides a helpful service to the taxonomist. By using a "Rosetta Stone" button, the program will compare the classification of any bird according to four common lists: American Birding Association, American Ornithologists' Union, Sibley, and "traditional" (Wetmore). From this 4-line comparison list, a user can go immediately to Sibley's discussion of that species (if the Sibley book is loaded), or can go immediately to a colored picture and song (if the bird is on the ABA list, and if the CD-ROM is loaded). For people who enjoy computer games or self-tests, Thayer has included a wide variety of birding quizzes. They are all multiple choice on species identification, but can be varied by level of difficulty, and type of clues: photo, and/or song, and/or range. Birders who prepare annual reports for Christmas Bird Counts or the ABA will appreciate the standardized reports ready to print and send.

The software comes with easy-to-follow installation instructions, an extensive help menu that can be consulted on-screen as needed, and a technical assistance telephone number. [P. O. Box 43243, Cincinnati, OH 45243, USA.]—Edwin and Evelyn Franks.

BOOKS AND MONOGRAPHS

32. Seasonal atlas of Quebec birds. [Atlas saisonnier des oiseaux du Quebec.] A. Cyr and J. Larivee. 1995. Les Presses de l'Universite de Sherbrooke et La Societe de Loisir Or-

nithologique de l'Estrie, Inc., Sherbrooke, Quebec, Canada. 711 pp., numerous maps, black-and-white line drawings for all species studied, and some black-and-white photos. $56.95, softcover, (In French.).—This is a different kind of atlas, presenting information on the occurrence of bird species in Quebec during four seasonal periods: spring, summer, fall, and winter. However, the inclusive dates of the seasonal periods vary among species depending on the timing of events in the species' life history. As such, it provides a broader time base than the "traditional" breeding bird atlas or atlas based on Christmas Bird Count Data. Data used in preparing the species accounts were taken from field checklists submitted during the period 1969–1989 and include 1,767,466 records of 303 species. Coverage during the period was not even. Figure 12 (p. 14) in the book shows a dramatic, more or less continuing, increase from fewer than 2000 cards submitted in 1969 to nearly 12,000 cards submitted in 1988. Approximately 72% of the area south of 50°N latitude was included by the checklists submitted. Based on these data, Breeding Bird Surveys, and Christmas Bird Counts, the authors consider 112 species' populations to have increased in Quebec, and 191 species to have declined between 1970 and 1989. The 55 introductory pages provide maps and data on climate, vegetation, hydrography, and land use, discuss biodiversity and species richness, and detail habitat changes and limitations of the data. Among the major limitations are the question of accuracy of data submitted, the uneven coverage through time, and possible limits on comparability with other atlas-type data. No other spring and fall atlases have been attempted to date, thus the maps presented here may be the standard for comparison. Details in species accounts help correct some problems. Appendices provide several tables of data arranged by species, year, month, etc., scientific and French common names of plants and animals mentioned, and descriptions of computer programs used for analyses. Tear-out overlays provided at the back of the book include extent of seasonal coverage, a grid of latitude and longitude, major cities, natural regions, and river systems. A 3-page glossary, extensive bibliography, and species index add to the utility of the book. This book represents a novel approach to atlasing and puts to use data that otherwise would remain in dusty files or be otherwise lost. Perhaps more importantly, it provides feedback to birders that says "It's good and important to keep records." As with Christmas Bird Count data, because of the general lack of substantiation of records, scientific use of the volume should be confined to generalizations and common species and for comparison with other data sources to identify trends. I hope there will be an English version published—the "French only" will limit readership, although the meat of this book is to be found in the maps which transcend language problems. This is a monumental effort that has been put together in a thorough and systematic fashion. Other organizations that collect field cards from their members should take a close look at this volume as an example of what might be done with their data.—Jerome A. Jackson.

33. Wildlife and oil spills: response, research, and contingency planning. L. Frink, K. Ball-Wier, and C. Smith (Editors). 1995. Tri-State Bird Rescue & Research. Wilmington, DE 19803. 182 pages. US$20.00. ISBN 1-56268-050-1—The document contains the proceedings of the Third International Conference on the Effects of Oil on Wildlife, held January 1993 in New Orleans, LA. Twenty-six papers and 3 extended abstracts cover a range of topics including toxicology of oil exposure in sea birds and marine mammals, administrative concerns and facility requirements for oil spill emergency planning, and case histories of recent oil spills and rescue efforts. This document provides a good introduction to oil spill issues and a pragmatic overview of the resources that are required to successfully conduct wildlife cleaning operations after a spill. The experiences of global experts in oil spill contingency planning are well articulated. Toxic effects of oil depend on the specific mixture of hydrocarbons present in oils such as fuel oils (No. 1, No. 2, No. 6), jet fuel, kerosine, diesel fuel or bunker C crude. External effects include matting of feathers or fur, resulting in insulative failure and potentially hypothermia. Internal effects include blockage of the GI tract by tar balls, liver damage, and weight loss. The legal framework for wildlife clean up efforts in the US is established by the Oil Pollution Act (OPA) of 1990, which has no funding, but which enables the use of Natural Resources Damage Assessments (NRDA) to obtain funding. The experiences of state (AK, NY) and federal agencies (USFWS) in planning for oil spills reveals a need for regional and local preparedness. Minimal contingency plans would identify the facility for wildlife cleaning (a building that can house 100 live oiled birds, with electricity, heat, toilets, and telephones), water systems that can provide 37,855 l/d of 0.8 to 1.0 grains/

l hardness at 41° C at 145–200 g/cm^2 pressure, hazardous waste storage, sewage systems that can handle 18,927 l/d soapy water, and sufficient people (up to 25) to staff the cleaning lines. Methods of animal capture and cleaning (including pinnipeds and otters) and choice of soaps are reviewed. Human health concerns are addressed: these can be serious, depending on the location of the spill, weather conditions and proximity of the spill site to human development. Retrospective analyses are provided of incidents in Alaska (1989), Gulf of Mexico (1992), Arabian Gulf (1991), Patagonia (1991), Netherlands (1988–1989), and Panama (1986). In summary, the document is an excellent overview of biological, social, and economic issues associated with getting the work done after an oil spill contaminates fish and wildlife resources. [% E. Muller, Tri-State Bird Rescue & Research, Inc., 110 Possum Hollow Rd, Newark, DE 19711 USA.]—Kristin E. Brugger.