the trunk of a small white fir (*Abies concolor*) within a stand dominated by bigtooth maple (*Acer grandidentatum*) and Gambel oak (*Quercus gambelii*). No old nests were found in the stand. On 7 June the nest contained 3 eggs. All eggs hatched, but 1 chick disappeared the first wk after hatching. The 2 remaining young fledged by 15 August and were last seen in the nest stand on 23 August.

During incubation the female could be approached to within 3 m and could have been hand-netted on numerous occasions. With the exception of this extreme tolerance of the female to close approach, the behavior of the pair was similar to neighboring pairs. The immature female noted by White in 1963 could be touched while on the nest incubating.

Newton et al. (1981) reported that in a relatively stable population of the European Sparrowhawk (*A. nisus*), yearlings formed 17% of the breeding males and 16% of the breeding females. In *A. striatus* and *A. cooperii*, yearlings (especially males) appear to comprise a much smaller proportion of the breeding population than in *A. nisus*, though the reasons for this are not clear. Meng (1951), Hennessy (1978) and Reynolds and Wight (1978) reported that yearlings formed 6% (N=36), 20% (N = 15) and 6% (N = 34), respectively, of breeding females of Cooper's Hawk populations in New York, Utah and Oregon. Though males were not observed at every nest, all seen by these authors were adult. On the basis of examination of testes of 10 immature male Goshawks, Hoglund (1964) concluded that immature males are normally incapable of breeding. This may also be true of yearling males in *A. cooperii* and *A. striatus*, but to my knowledge, has not been studied. Reynolds (1972) discussed the general lack of nesting by yearling male Goshawks, Coopers Hawks and Sharp-shinned Hawks and hypothesized that since males are the principal food providers during the nesting season, foraging experience may be a prerequisite for successful nesting. Reynolds and Wight (1978) suggested that an immature male, lacking experience, may be subject to greater risk of predation or accident while foraging, and therefore, deferring the age of first breeding may increase its future fitness. A concommitant of deferred breeding is delayed sexual maturity. However, a similar argument should apply to the ecologically similar *A. nisus*, yet considerable numbers of European Sparrowhawks, and at least as many males as females, breed successfully their first year (Newton et al. 1981). Furthermore, the relatively larger proportion of yearling breeders is found in both stable and recovering populations, though it may be accentuated in the latter (Newton, pers. comm.). The breeding biology of the closely related Sharp-shinned Hawk has not been intensely studied, and breeding by yearlings, including males, may not be as rare as might be concluded from existing observations.

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Aegyptius Monachus Carrying Food In Its Claws

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On 24 September 1983, while taking a census of the Black Vulture (*Aegyptius monachus*) on the island of Mallorca (Balearic Islands) for ICONA (Ministerio de Agricultura), we observed an adult of this species flying with a relatively large, whitish object in its claws. The bird approached our observatory (Alfabia, 1,067 m above sea level) following the area's mountain crests at a height of approximately 30 - 50 m above the terrain. We could not determine where it came from — possibly from far away. After observing its flight — straight — for about 5 min, we saw it land on a rocky promontory 500 m from our position. It began to peck at the object in its claws. With the aid of binoculars (8 & 9x) we confirmed the fact that the bird was eating. With almost complete certainty the vulture had transported a part of a sheep (*Ovis aries*) which constitutes its basic diet on the island (70% according to Mayol (*Soc. Hist. Nat. Bal.*, 22:150-178, 1976.))

Our observation is of ethological interest, since no author cites this bird's ability to carry food in its claws (Bernis *Ardeola*, 12:45-99, 1966), Valverde (*Ardeola*, 12:101-115, 1966), Cramp and Simpson (Handbook of the Birds of Europe, the Middle East and North Africa, Vol II, Hawks to Bustards, R.S.P.B., Oxford University Press, 1980)). We must nevertheless mention the observation of Hiraldo (*Donana acta vertebrata* 3(1):19-31, 1976) referring to a Black Vulture presumably capturing a lizard (*Lacerta* sp.). These observations confirm the fact that the Black Vulture, the only species of Palearctic vulture known to us to have this behavior, maintains the grasping capacity of its claws to a greater extent than other species of the group.

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THESIS ABSTRACTS

Ecology of Breeding Burrowing Owls in the Columbia Basin, Oregon

The ecology of breeding Burrowing Owl (*Athene cunicularia*) was studied in northcentral Oregon during the spring and summer of 1980 and 1981. Pairs began arriving on the study areas as early as the first week of March; however, most arrivals were during April. Egg-laying began the first week of April and continued into the first week of May. Whole family groups left the nesting areas as early as the first week in July while members of other families remained until at least the end of September.

Nest success was 57% for 63 nests in 1980 and 50% for 76 nests in 1981. Desertion was the major reason for nest failure and may have been related to the proximity of other nesting pairs. Badgers (*Taxidea taxus*) were the major nest predtors. Nests which were lined with cow or horse dung were significantly less prone to predation than nests not lined, suggesting dung masks odors of nest occupants.

Diets were determined by pellet analysis. Arthropods comprised 91.6% of the total prey by number; however, they contributed only 22.0% of the total biomass. Vertebrates, mostly small mammals, comprised the balance. *Perognathus parvus* (Great Basin Pocket Mouse) was the most important vertebrate prey and *Stenopelmatus fuscus* (Jerusalem Cricket; Gryllacridadae) was the most important arthropod. Coleoptera were preyed upon very heavily, but they were dominated by very small (< 10 mg) beetles and, therefore, contributed little to the total biomass. Burrowing Owls preyed on mammals during the spring then shifted to insects during the summer. Burrowing Owl diets were influenced by soil type, and owls selected mammals in proportion to their occurrence in the environment.

Burrowing Owls selected 3 of 5 habitats for nesting. Hole availability and possibly food availability as important prerequisites function analysis indicated variables responding to horizontal visibility and possibly food availability as important prerequisites for nest selection. Soil texture greatly influenced re-use and longevity of nest burrows. — **Green, Gregory A. 1983. M.S. thesis, Oregon State Univ., Corvallis.**

Reproductive Ecology and Habitat Utilization of Richardson's Merlins in Southeastern Montana

Reproductive ecology, food habits, habitat utilization, and eggshell quality of Richardson's Merlin (*Falco columbarius richardsonii*) in southeastern Montana were examined. Breeding activity spanned five months. Clutch size, brood size, and fledging success at active nests were similar ($P > 0.05\%$) among four years. Birds comprised >90% of individual prey items, and 61% of avian prey species were typically associated with predominantly open habitats. Horned Lark (*Eremophila alpestris*), Lark Bunting (*Calamospiza melanocorys*), and Vesper Sparrow (*Pooecetes gramineus*) collectively comprised 57% of all prey. Home ranges of three breeding male Merlins encompassed approximately 13, 23, and 28 km^2, and each male traveled a maximum of 8 to 9 km from his nest. These home ranges encompassed five physiognomic habitat types. Percentages of total observations by habitat type indicated greatest us of sagebrush and grassland habitats. Sagebrush, riparian, and pondrosa pine habitats were used more ($P < 0.05$) than expected, but grassland and agriculture habitats received less ($P < 0.05$) use than expected. Comparisons of Montana eggshells with pre-pesticide (pre-1946) eggshells indicated 12% and 20% reductions in eggshell weight and eggshell thickness indices, respectively. These reductions were significant ($P <$). Seven organochlorine compounds were detected in eggs collected on the study area. The overall management goal should be maintenance of a viable Merlin population and the habitat features essential for its continued existence. Management recommendations include limitation of alteration of ponderosa pine sideslope habitat, restriction of activities from 10 March through 20 July, rescheduling of activities, establishment of 400 m zones of no disturbance surrounding nests, limiting loss of prairie habitat and sagebrush removal, limiting use of organochlorine compounds, reviewing potential impacts of activities prior to their occurrence, and maintaining confidentiality of nest locations. — **Becker, Dale M. 1984. M.S. Thesis, University of Montana, Missoula.**