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THE SUBSPECIES OF THE GREAT HORNED OWLS OF THE CENTRAL GREAT PLAINS, WITH NOTES ON ADJACENT AREAS

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Great Horned Owls (*Bubo virginianus*) nest in local areas of suitable habitat throughout the Great Plains region of Nebraska, Kansas, Oklahoma and adjacent states (A.O.U. 1983). However no comprehensive treatment of subspecific variation in the mid-continental populations has been done since that of Oberholser (1904). He has been followed by the American Ornithologists Union (1957), and others (e.g., Johnston 1965 and Sutton 1967). Taverner (1942) did an exemplary study of the Canadian populations, which today needs little modification.

Oberholser (1904) attributed birds from southeastern South Dakota to eastern Texas to the darker eastern subspecies *B. v. virginianus* (Gmelin), while paler birds from farther west were ascribed to *B. v. occidentalis* Stone (1896), (Kansas northward to the Prairie Provinces, and *B. v. pallescens* Stone (1897) (New Mexico and Texas southward. More recently, Sutton (1967) identified birds from western Oklahoma as *pallescens*. The sub-boreal nesting population, *subarcticus*, occasionally winters at least as far south as Nebraska (A.O.U. 1957).

Unfortunately the literature relating the nomenclature and ranges of the names/populations involved is confused and confusing. A brief review:

Snyder (1961) proposed the subspecific name *scalariventris* for the birds from the eastern part of the range of *subarcticus*, but it has seldom been recognized. Karalus and Eckert (1974) in a popular book, published a superficial review of variation in the species and recognized *scalariventris*. They mapped its range as overlapping populations they called *subarcticus*, and "*wapacuthu*," to which in turn they assigned almost completely overlapping ranges *inter se*! It should be noted that no one else has ever recognized such a subdivision! McGillivray (1989) made a morphometric study of geographic variation in skeletal size but: a) included no useful measurements; b) overlooked collections with large series of skeletons; and c) combined skeletons that in some regions may have two resident and possibly at least one migrant subspecies, i.e. birds from diverse gene pools.

More recently Browning and Banks (1990) clearly demonstrated that the name *B. wapacuthu* (Gmelin) does not apply to the Great Horned Owl, and that *subarcticus* should be used for the subboreal nesting populations. Actually most of the authors cited above have followed that usage. I would note that probably the specimens of Snowy Owl, "*n*," and "*o*" listed by Sharpe (1875), that were received by the British Museum (Natural History) from the Hudson's-Bay Company, might well have been the basis for the description of the Wapacuthu Owl, and probably should be considered to be co-types of the name.

And lastly after struggling to identify birds as *B. v. occidentalis* for several years, (as have others of Sutton 1967, Rea 1983), Dickerman (1991) has concurred with Stone (1897) that the name was based on a migrant of the subarctic population and the concept has neither discrete characters nor range. Unfortunately Karalus and Eckert (1974) and McGillivray (1989) presented maps of the alleged range of this phantom population!

The elimination of the *occidentalis* problem now permits a reevaluation of geographic variation in the mid-continental populations, i.e. those ranging from the eastern prairies to the Rockies and from Texas north to the boreal zone. This paper provides a prelimi-

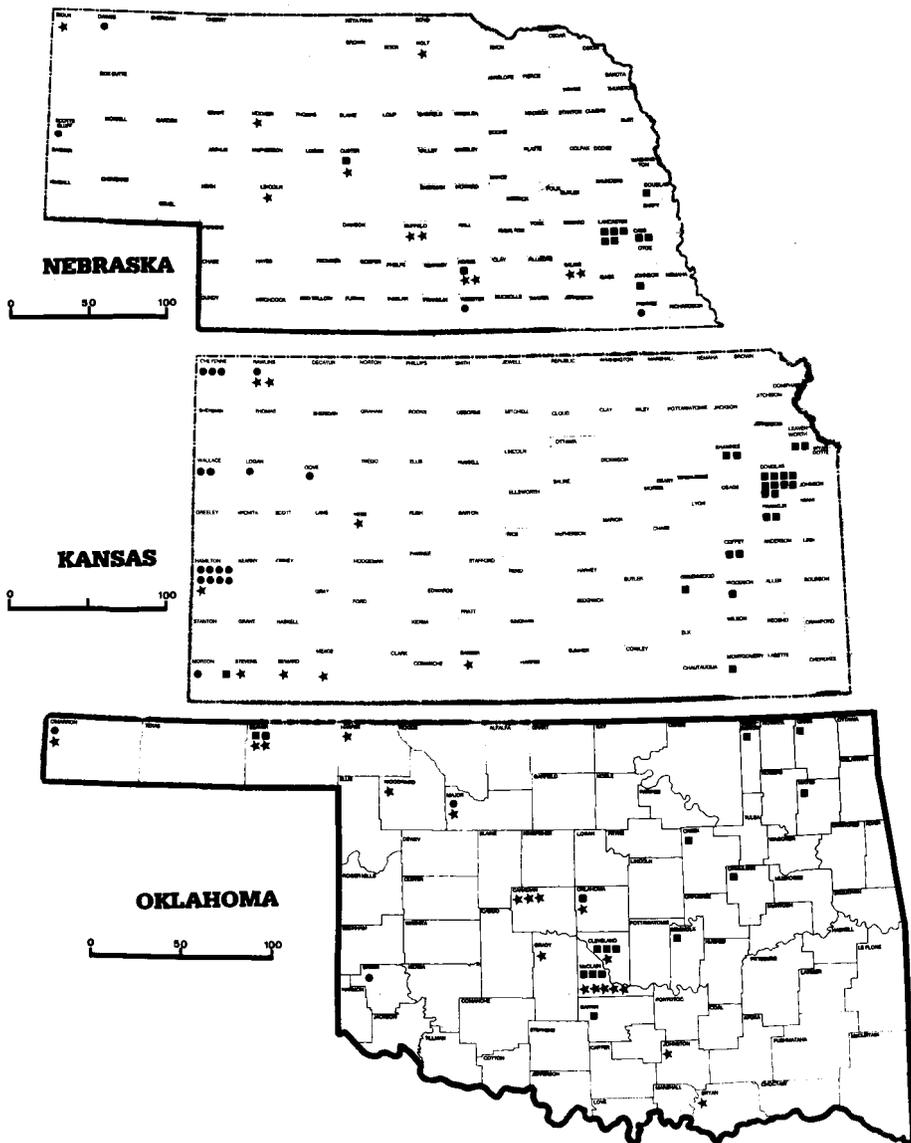


FIGURE 1. Distribution by county, in Nebraska, Kansas and Oklahoma of specimens of Great Horned Owls examined. Squares = *B. v. virginianus*; circles = *B. v. pallescens*; and stars = specimens variably intermediate between the two subspecies. Note, the map scale of Oklahoma differs slightly from those of Nebraska and Kansas.

nary survey of the east-west transition in the mid-prairie region.

Materials and Methods

One hundred and fifteen specimens from Oklahoma, Kansas and Nebraska in the collections of the: Stovall Museum, University of Oklahoma, University of Kansas Museum of Natural History, and the University of Nebraska State Museum (UNSM) were examined. In each collection there were one to several birds from well within the ranges of the dark, heavily barred, richly ochraceous nominate *virginianus*, and/or the pale, lightly barred, white-footed *pallescens* to use as standards for comparisons. Speci-

mens were compared with these standards and then considered to be one or the other (or variously intermediate), and were plotted on the respective state maps by county (Fig. 1). It should be noted that most specimens in the intermediate group were more like *virginianus* than *pallescens*. There was a sufficient number of nesting season (February to August) specimens from Kansas (18) and Oklahoma (10) to determine the nesting distribution of subspecies in those states. The color variation among specimens from winter months paralleled that found among the nesting-season birds. Within this region of little topographic variation, there is apparently little winter movement. Thus with the exception of two specimens from Nebraska (see beyond), all specimens for each state, including nestlings with sufficient first basic plumage to use for comparisons were combined in Figure 1.

In addition, 31 specimens of *pallescens* from New Mexico and eastern Colorado were examined in the Museum of Southwestern Biology, Albuquerque; the Denver Museum of Natural History; and in the American Museum of Natural History.

Results

The general paucity of material available from Nebraska, Kansas and Oklahoma must be stressed. Only 115 specimens were available from an area of about 250,000 square miles! Of 258 counties, 204 were not represented by specimens and only 11 were represented by more than two specimens! Yet, within these limitations, some conclusions may be reached.

1. Nominate *virginianus* is found in "pure" form in the easternmost counties of each of the states, extending farthest west in Oklahoma. This conforms with the findings of Sutton (1967). This is also the form of Arkansas and central Texas (A.O.U. 1957). In Kansas, *virginianus*-like birds apparently extend westward along the Arkansas River, including an intermediate found among the 9 otherwise pure *pallescens* from Hamilton County. It should be noted that there are two specimens intermediate towards *virginianus* from Colorado (Wray, April; and Golden, October), both in the Denver Museum of Natural History.

Three specimens from eastern New Mexico (Tucumcari and 5 mi. S, 11 mi. W Portales, all Museum Southwestern Biology) are nearest *virginianus*. Indeed if they were from the eastern U.S., they would be considered variants of that form that were somewhat pale dorsally and/or somewhat lightly barred ventrally. These were all resident birds, not migrants; however other specimens from eastern New Mexico are near typical *pallescens*.

2. *pallescens* is found in "pure" form in the westernmost counties of each state, probably extending farther east in Kansas and Nebraska — but data is weak based on this study.

A nesting season specimen typical of *pallescens* from Pawnee County in southeastern Nebraska demonstrates that local populations may occur in island-like habitats within the intergrade zone. Thomas E. Labeledz informs me that there is an extensive prairie area in Pawnee and the adjacent counties.

3. Two specimens from Nebraska represent winter vagrants of *subarcticus*: UNSM 16270 from Cuming Co., near West Point, 12 March 1990 is an "ultratypical" specimen, while 12761 from Custer Co., 1 mi. S of Victoria, 10 October 1945 is too pale for the central Nebraska nesting population, and I would identify it as *subarcticus* x *virginianus*. Houston (1978) in the only major banding study of Great Horned Owls, reported three birds banded as nestlings in Saskatchewan (= *subarcticus*) that were recovered in Nebraska, distances of 1225, 1280 and 1415 kilometers from their banding sites!

Discussion

Few large birds are as variable geographically in plumage, as the Great Horned Owl. However, this variation has been obfuscated by several factors: 1) Most authors have been non-critical in comparing specimens in different stages of wear. Thus, worn and faded adults have been considered dissimilar to their fresh-plumaged fledglings (Taverner 1942). 2) A very large percent of specimens in collections are winter-taken (often road-kills), yet the extent of both long and short distance dispersals have been vastly underrecognized. For example, because Minnesota has been a good source of

specimens of the pale northern subspecies *subarcticus* (see Houston 1978), the state is well represented in collections, but probably the majority of all specimens are migrants! To compound the problem, the variation resulting from this winter mixing has been "explained" by the invocation of color phases and morphs for which little or no evidence exists in this species (Oberholser 1904, and subsequent authors).

3) Being big birds, authors (especially in earlier times) have often worked with material at hand rather than aggregating material from many museums as is regularly done with smaller birds today. For example, Oberholser saw only two or three of Captain Bendires' series of at least 11 specimens from Walla Walla, Washington, taken during the winters of 1880-1882. At least 5 of the series, including one that Oberholser did examine, are much paler than the dark bird selected as the type of *lagophonus*. The dark birds taken at Walla Walla are short-distant migrants from the near-by Rockies north of the Snake River (Dickerman in prep.). 4) And finally, until now, no one has critically reexamined Oberholser's revision! Thus curators (including myself until recently) have non-critically accepted, and struggled to accommodate, "taxa" as *occidentalis*! No wonder subspecies are sometimes questioned.

I believe subspecies of Great Horned Owl are so well-marked that I would reverse McGillivray's suggestions (1989:785) that differences among these be addressed by biochemical techniques. To the contrary, I'd suggest that the subspecies of Great Horned Owls be used as a yardstick to evaluate the taxonomic utility of new biochemical (molecular) techniques as they appear and before they are accepted as gospel.

Problem areas.

1. The zone of intergradation between southern, small pale *pallescens* and larger and pale *subarcticus* (and their recharacterization) must be determined by examination of *nesting season* specimens from Montana, Wyoming, North and South Dakota and western Minnesota. Taverner (1942), Rand (1948) and Godfrey (1966,1988) all recognized that the southernmost nesting birds of the Canadian prairie provinces was *subarcticus*, and its range obviously does not stop at the international boundary. Apparently the existence of Oberholser's name *occidentalis* has prevented acceptance of that fact!

2. The disparate variation that now must be lumped into *subarcticus* can only be resolved with series of hard to obtain nesting-season specimens from the subboreal regions of mid-continental Canada.

3. Lesser regional issues center largely on the extent of migrations and the better defining of subspecific ranges (for example the winter movement of *lagophonus* into the nesting range of *saturatus* and vice versa); defining the southern range of *saturatus* based on nesting season specimens (intergrades with paler populations resemble *lagophonus*; and perhaps a reevaluation of McGillivray's suggestion that the Florida population is smaller than eastern *virginianus*).

Finally the "take-home-message" is that collectors, preparators and curators should save a flat skin (or minimally a wing and the tail) of birds prepared as skeletons to permit subspecific identification. It is even more critical for biologists taking tissues for biochemical or molecular studies to preserve the voucher specimen so they will know which gene pool they have sampled.

Acknowledgements

I would like to acknowledge and thank the curators, collections managers, and others associated with ornithological collections in Oklahoma, Kansas, Nebraska, and elsewhere, for giving me open access to collections in their care! Thomas E. Labeledz allowed me to cite the two specimens of *subarcticus* from Nebraska and provided ecological information on the state. The comments of presubmission reviewers, who would probably prefer to be nameless, greatly improved this paper.

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1992 REPORT OF THE KANSAS BIRDS RECORDS COMMITTEE

This report summarizes records received and evaluated by the committee for the calendar year 1992, as well as any decisions pending from the previous year. Birds are listed under one of two categories: Records Accepted and Records Rejected. A total of 66 submissions were received and 29 were circulated for evaluation. The KBRC record number follows the scientific name, with the locality, observer(s) documenting the record, any supporting physical evidence, and any significant change in status. Rejected records have the observer(s) names omitted and a brief explanation as to the reason for rejection.

Records Accepted

Red-necked Grebe (*Podiceps grisegena*); 92-21; 1; 12 November 1991; Wilson Reservoir, Russell Co.; Mike Rader.

Red-necked Grebe (*Podiceps grisegena*); 92-63; 1; 1 December 1992; Perry Lake, Jefferson Co.; Richard Rucker.

Clark's Grebe (*Aechmophorus clarkii*); 92-20; 1; 8 November 1991; Wilson Reservoir, Russell Co.; Mike Rader.

Brown Pelican (*Pelecanus occidentalis*); 92-49; 1; 26 July 1992; Tuttle Creek Reservoir, Pottawatomie Co.; Ted Cable and Dave Rintoul; Photographs.

Brown Pelican (*Pelecanus occidentalis*); 92-46; 1; 11 August 1992; Wilson Reservoir, Russell Co.; Mike Rader.

Glossy Ibis (*Plegadis falcinellus*); 92-32; 1; 3 May 1992; Perry Lake, Jefferson Co.; Dan LaShelle, Joanne Brier, and Lloyd Moore; Photograph. **First state record, also verified with physical evidence.**

Gyr Falcon (*Falco rusticolus*); 92-01; 1; 11 March 1990; Cheyenne Bottoms Wildlife Area, Barton Co.; Steve Crawford et al.

Gyr Falcon (*Falco rusticolus*); 92-19; 1; 5 November 1991; Wilson Lake, Russell Co.; Mike Rader.

Pomarine Jaeger (*Stercorarius pomarinus*); 92-11; 2; 26 December 1991; Milford Lake, Geary Co.; Chuck and Jaye Otte et al.

Common Black-headed Gull (*Larus ridibundus*); 92-64; 1; 8-9 December 1992; Perry Lake, Jefferson Co.; Chris Hobbs; Video tape. **Third record, first verified with physical evidence.**

Great Black-backed Gull (*Larus marinus*); 92-15; 1; 10 February 1992; Lake Afton, Sedgwick Co.; Pete Janzen and Don Vannoy.

Black-legged Kittiwake (*Rissa tridactyla*); 92-22; 1; 3 April 1992; Perry Lake, Jefferson Co.; Chris Hobbs.

White-throated Swift (*Aeronautes saxatalis*); 92-28; 5; 17 April 1992; KU Campus, Lawrence, Douglas Co.; Christopher Burris and Susan Frantz; Photographs. **Fourth record, first verified with physical evidence.**

Broad-tailed Hummingbird (*Selasphorus platycercus*); 92-58; 1; 4-5 September 1992; Elkhart, Morton Co.; Mick McHugh and Mark Corder; Photograph.

Allen's Hummingbird (*Selasphorus sasin*); 92-56; 1; 25 August 1992; Bonner Springs, Wyandotte Co.; Chris Hobbs, Jan Hall, and Lloyd Moore; Photographs. **First state record, also verified with physical evidence.**

Red-naped Sapsucker (*Sphyrapicus nuchalis*); 92-18; 1; 23 March 1992; near Colby, Thomas Co.; Chuck and Jaye Otte.

Gray Flycatcher (*Empidonax wrightii*); 92-51; 1; 5 September 1992; near Point of Rocks, Morton Co.; Mick McHugh.

Canyon Wren (*Catherpes mexicanus*); 92-50; 1; 6 September 1992; Cimarron River, Morton Co.; Richard Parker, Steve Crawford, and Tom Shane; Photographs. **First state record, also verified with physical evidence.**

Swainson's Warbler (*Limnothlypis swainsonii*); 92-38; 1; 14-25 June 1992; near Elk City Lake, Montgomery Co.; Edwin Miller and Bob Gress; Photograph.

Connecticut Warbler (*Oporonis agilis*); 92-33; 1; 23-24 May 1992; Perry Lake, Jefferson Co.; Dan LaShelle.

Black-throated Sparrow (*Amphispiza bilineata*); 92-53; 1; 11 September 1992; Overland Park, Johnson Co.; Chris Hobbs and Lloyd Moore; Photograph.

Lesser Goldfinch (*Carduelis psaltria*); 92-35; 1; 7 January 1978; Topeka, Shawnee Co.; Eugene Lewis and Malia Weide; Photograph. **First record verified with physical evidence.**

Records Rejected

Parasitic Jaeger (*Stercorarius parasiticus*); 92-17; 2; 31 August 1985; Cheyenne Bottoms Wildlife Area, Barton Co.; Identification questionable; insufficient details to eliminate similar species.

Long-tailed Jaeger (*Stercorarius longicaudus*); 92-16; 1; 31 August 1985; Cheyenne Bottoms Wildlife Area, Barton Co.; Identification questionable; insufficient details to eliminate similar species.

Common Black-headed Gull (*Larus ridibundus*); 91-39; 1; 29 November 1991; Milford Lake, Geary Co.; Identification questionable; insufficient details to eliminate similar species.

Mew Gull (*Larus canus*); 92-05; 1; 4 December 1991; Tuttle Creek Reservoir, Riley and Pottawatomie Co.; Identification questionable; insufficient details to eliminate similar species.

Black-legged Kittiwake (*Rissa tridactyla*); 92-02; 1; 28 December 1991; Lake Olathe, Johnson Co.; Identification questionable; insufficient details to eliminate similar species.

Fish Crow (*Corvus ossifragus*); 92-45; 2; 14 July 1992; near Lowell, Cherokee Co.; Identification questionable; insufficient details to eliminate similar species.

Grace's Warbler (*Dendroica graciae*); 92-54; 1; 12 September 1992; Point of Rocks, Morton Co.; Identification questionable; insufficient details to eliminate similar species.

The following is a list of the members and alternates of the committee for the period covered by this report, including their terms of office:

Position #1:	Mick McHugh	October 1990-1993
Position #2:	Scott Seltman	October 1990-1993
Position #3:	Marvin D. Schwillig	October 1990-1993
Position #4:	Max C. Thompson, Chairperson	October 1991-1994
Position #5:	Lloyd D. Moore	October 1991-1994
Alternate #1:	Ted T. Cable	October 1991-1994
Position #6:	Galen L. Pittman, Secretary	October 1991-1994
Position #7:	Roger L. Boyd	October 1992-1995
Alternate #2:	David E. Seibel	October 1992-1995

Letter to the Editor — The paper on golden eagles by Thomas L. Flowers in the December "Bulletin" is valuable except for some misleading assertions at the bottom of Page 35. This is to respond to misrepresentations directly specifically towards the Kansas Department of Wildlife and Parks along with some other necessary followups.

There are references to "care" taken by KDWP to protect black-footed ferrets. It's highly unlikely that any of these endangered mammals still exist in Kansas although state and federal listings are still maintained. It can only be assumed that the author may be referencing recent work by Dr. Robert Robel at KSU and funded through the Chickadee Checkoff to assess the status of prairie dog towns in the event we may someday be able to re-introduce black-footed ferrets in Kansas. Some elaboration on this would help to clarify the point the author is attempting to make.

The next statement — "Little consideration is given to eagles." — is puzzling. Within the confines of a relatively small Chickadee Checkoff budget, KDWP sponsors several eagle projects. In fact, we probably are biased in our eagle work compared to other species and our available funds. Here is a listing of most of the eagle projects we sponsored last year:

1. Surveyed nest sites and success of golden eagles through the Prairie Raptor Project.
2. Once again sponsored golden eagle re-introduction efforts in Russell County through the Prairie Raptor Project.
3. Sponsored a three year mid-winter river bald eagle survey to complement our reservoir eagle survey for population trends and to add information to justify critical habitat designations.
4. Cooperated with the U.S. Fish and Wildlife Service in monitoring bald eagle nesting sites.
5. Sponsored several "Eagle Days" and other eagle appreciation and educational events.

Additionally, endangered species permits for bald eagles are administered through our Environmental Services Section and other actions and responsibilities occur through our Law Enforcement Division.

The author describes strychnine as still available in various forms. However, strychnine was banned officially by the EPA on October 4, 1988 for above-ground use. Mr. Flowers describes an adult Golden Eagle found dead near a prairie dog town in April of 1990 with "strong evidence" that it was poisoned by strychnine. The author relates of first-hand knowledge of the landowner "broadcasting" strychnine-laced grain. A check with authorities indicated this illegal activity had never been reported. Therefore, copies of this response along with the article have been provided to the Environmental Protection Agency, the Kansas State Board of Agriculture, the U.S. Fish and Wildlife Service and the KDWP Law Enforcement Division for any potential enforcement actions.

The author is right in inferring some state and federal roles for obtaining easements to protect feeding areas for eagles. From a more direct perspective, if it is not considered important to report such flagrant violations as illegal poisonings, is it realistic to demand greater expectations through habitat protection efforts?

Mr. Flowers points out that easements could be used to protect prairie dog towns used as feeding areas for gold eagles similar to agreements used to protect wetlands. The

author then lists mallards among other food items found at eagle nest sites. It would seem that existing programs to protect wetlands (used by mallards) will also help golden eagles as well. This provides further justification for wetland priorities. Additionally, prairie dog towns are next to or part of some playa wetlands in Meade County and other areas of western Kansas. Perhaps with more cooperation and insight, some of the excellent programs available to help conserve wetlands could also include adjacent prairie dog towns as well and enhance conservation efforts for golden eagles even more.

Ken Brunson, Nongame Program Coordinator, Kansas Department of Wildlife and Parks, Pratt, Kansas 67124.

Letter to the Editor — Thank you for the courtesy of allowing me to respond to Mr. Brunson's comments and allegations.

The intent of my paper "Golden Eagles Nesting In Meade County, Kansas" was to stimulate interest and study in a species that we know very little about. Before publication, my manuscript was reviewed by professionals at three universities and also by two Kansas Department of Wildlife and Parks employees. Maure Weigel of the Prairie Raptor Project was also given a copy for review and we discussed my findings in detail. Once submitted to "The Bulletin", it was again sent out for editorial reviews. No one, until Mr. Brunson, took exception to anything in the paper.

The main item of concern from Mr. Brunson seems to be my knowledge of the poisoning of a Prairie Dog town and failure to report what he calls "illegal activity" in regard to the use of strychnine-laced grain. The poisoning occurred in the spring of 1989. The deteriorated remains of a Golden Eagle were found in April 1990 and I found out about the use of strychnine even later. Was it a violation of the Federal Insecticide, Fungicide and Rodenticide Act if materials purchased before the October 4, 1988 ban were used under the old product label? I never saw which label was used, nor the date on the label. Further, we do not positively know if this was a case of secondary poisoning or perhaps a natural death from some other cause.

Mr. Brunson makes sharp accusations that I am negligent because I did not report this incident. I was appalled by the poisoning, but am I negligent? I still am not sure that the use of this chemical was illegal, and must assume that it was a legal use of this poison. Perhaps Mr. Brunson is more knowledgeable about chemical labels than I am.

Mr. Brunson has also taken offense at my statement that "Little consideration is given to eagles." Taken out of context, this may seem offensive to the agency charged with the protection and management of all wildlife in Kansas. Within the context of my paper, no offense is intended. Considering that a pair of Golden Eagles may occupy up to 35 square miles of home range, as was noted in my article, it would take a massive effort to determine if damage would be done by poisoning. Anything less does not do the job. Mr. Brunson may take offense if he desires, or he can see the positive side and build upon a deficiency in the permitting and site investigation procedure. Information of this type could be used as a way to eventually prevent poisoning in critical Golden Eagle habitat. Easements on critical areas could be more politically acceptable than total prohibition of poisoning. Information of this type could also be used to increase funding and staffing for Mr. Brunson's agency. I would hope Mr. Brunson could use information in my paper and other papers published in "The Bulletin" to build an even better Kansas Department of Wildlife and Parks.

I regret that a person that I have never met, but who obviously shares many of my same goals and interests was offended by my paper. Should others be offended, they may contact me at the address below.

Thomas L. Flowers, P. O. Box 87, Meade, Kansas 67864.

Errata — Vol. 44:1. Joanne Brier was incorrectly listed as the photographer of the Pyrrhuloxia. It should have read Joann Garrett.