

# EXTREME VARIATION IN THE TAILS OF ADULT HARLAN'S HAWKS



**William S. (Bill) Clark**

**Many adult Harlan's Hawks have tails somewhat similar to this one**



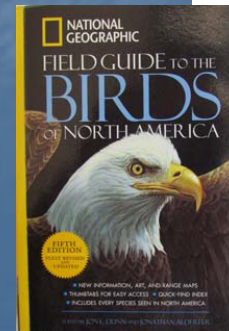
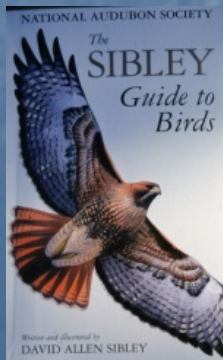
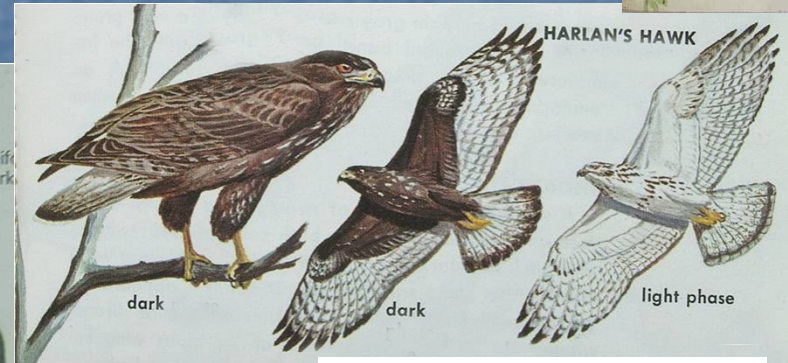
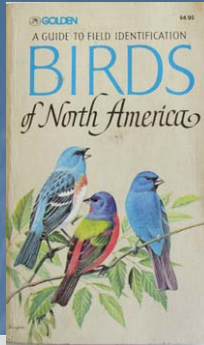
**Bob  
Dittrick**

**But many others have very different tails, both in color and in markings**

# ADULT HARLAN'S HAWK TAILS

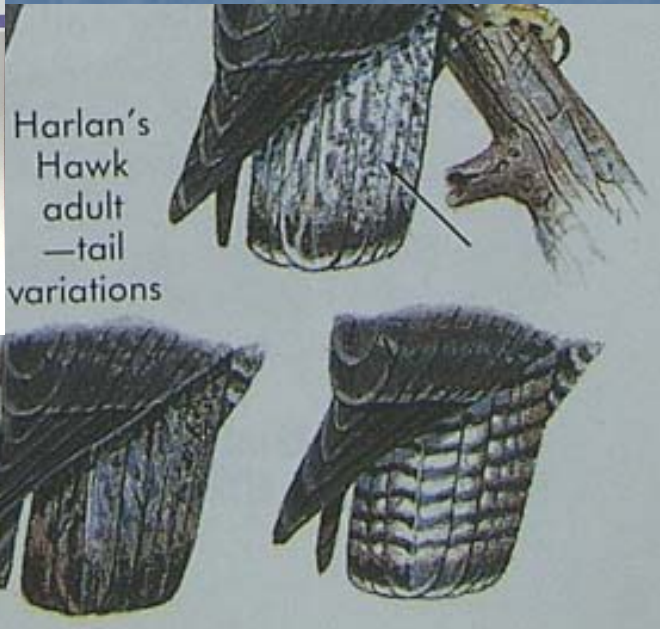
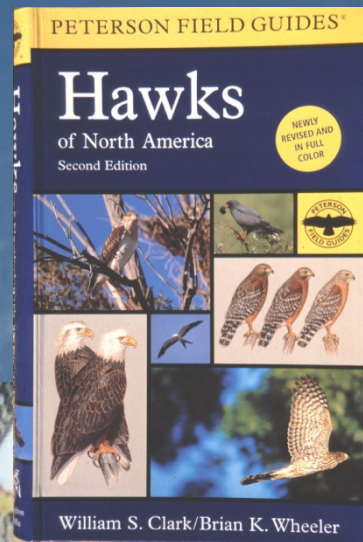
**BIRD FIELD GUIDES show only a few of the many variations in the tail patterns of adult Harlan's Hawk**

They usually depict only gray tails



# Even specialty raptor guides show only a few of the many variations in the tail pattern of adult Harlan's Hawks

## HAWKS II

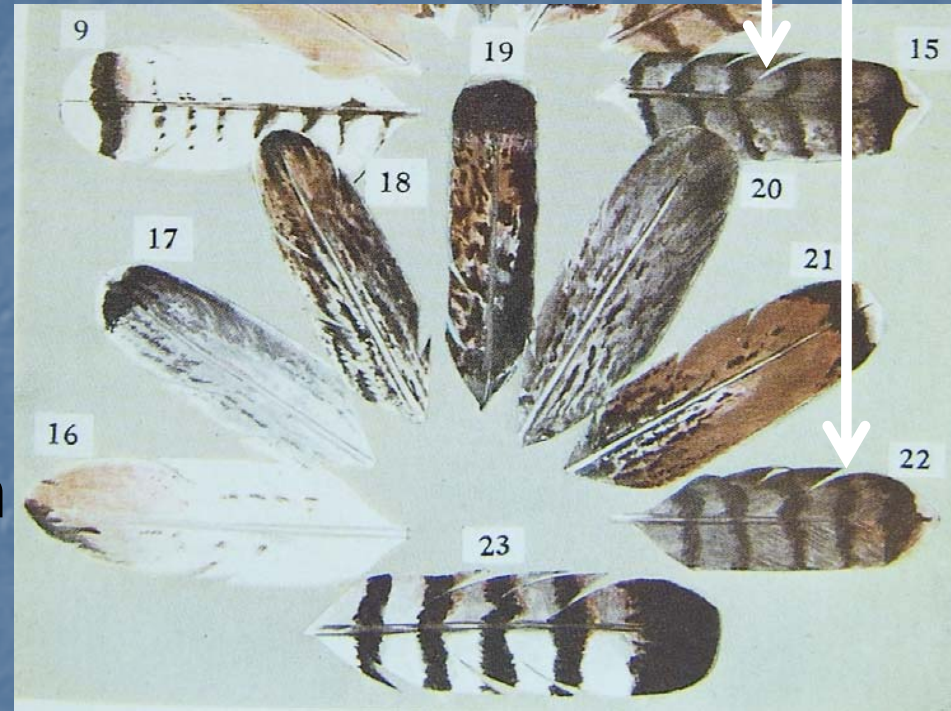


Peterson series: Hawks

# ADULT HARLAN'S HAWK TAILS

Taverner (1927) showed a larger sample of tail feathers. Most are gray, from whitish-gray (9 & 16) to light (17) to darker gray (20), to mostly rufous (21), with a variable amount of mottling & grizzling.

15 & 22 are juvenile tails



Subterminal band can be narrow (9) to wide (23), dusky (20) to black (19), ill-defined (18), missing (16), or sharply defined (17).

Taverner, P. A. 1927. A study of Buteo borealis, the Red-tailed Hawk, and its varieties in Canada. Victoria Mem. Mus. Bull. No. 48 Biol. Series 13:1-25.

# ADULT HARLAN'S HAWK TAILS

Few museum collections have enough adult specimens to show the large range of variation in their tails. (U of Mich has more than 100)

**NOTE THAT NO TWO TAILS ARE EXACTLY ALIKE!**

Royal Alberta  
Museum



And that  
many  
show  
some  
rufous

U of Iowa



**Photos of adult Harlan's Hawk tails of specimens used herein were taken in some of the museums listed in the next slide.**

**I thank the curators & collection managers for their help and for permission to use these valuable resources.**

**Photographers of tails of live hawks are noted throughout, except for mine.**

Academy of Natural Sciences, Philadelphia; Arkansas State U; Bell Museum (U. of Minn); Boise State U bird collection; Burke Museum (U of WA); California Academy of Science; California State U Long Beach bird collection; Canadian Museum of Nature; Carnegie Museum of Natural History; Cowan Vertebrate Collection (U of BC); Delaware Museum of Natural History; Denver Museum of Nature & Science; Field Museum; LSU Museum of Natural Science: Ornithology; Monte L. Bean Museum (BYU); Museum of Natural History, U of Iowa; Museum of Southwestern Biology (U of NM); Museum of Vertebrate Zoology (U of CA); Museum of Wildlife & Fish Biology (UC Davis); Museum of Zoology, U of Mich; Natural History Museum of LA County; Nebraska State Museum; Philip L. Wright Zoological Museum (U of MT); Oklahoma State U; Sam Noble OK Museum of Natural History; Peregrine Fund; Royal Alberta Museum; Royal British Columbia Museum; Royal Ontario Museum; San Diego Natural History Museum; Slater Museum (U. of Puget Sound); WFSD collection, Texas A & M; UCLA – Dickey Bird and Mammal Collections; U of AK Museum; U of AB bird collection; U of AZ bird collection; U of CO Bird Collection; U of Kansas Natural History Museum; U of MO bird collection; U. S. National Museum; Utah Museum of Natural History; Western Foundation of Vertebrate Zoology.

# My article in *Birding*



**Extreme**

**Adult Harlan's Hawk**  
Yukon Territory, June  
photo by © William S. Clark

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**NOTE:** Figures mentioned in the text and preceded by a 'W' (i.e., Figs. W18-W22) appear in an expanded online version of the article: [aba.org/birding/v41n1p136w1.pdf](http://aba.org/birding/v41n1p136w1.pdf)

**Variation in the tails of Adult Harlan's Hawks**

The distinctive "Harlan's" Hawk, currently classified as a subspecies (*Buteo harlani*) of the widespread Red-tailed Hawk, shows extreme variation in the color and pattern of the tail. This article summarizes and presents extensive photographic documentation of variation in the tails of Harlan's Hawks.

**Adult Harlan's Hawk**  
Texas, December  
photo by © William S. Clark

**Hawk's**

John J. Audubon in 1831 described Harlan's Hawk and sent the type specimen to the British Museum. It has been alternately considered a separate species, *Buteo harlani* (from the 1830s to 1891, as well as from 1944 to 1973), and a subspecies of the Red-tailed Hawk, *B. jamaicensis harlani* (from 1891 to 1944 and from 1973 to the present). Harlan's Hawk breeds in Alaska (except for the coastal southeast), the Yukon Territory, extreme northwestern British Columbia, and much of the Northwest Territories. Its winter range is large, including southwestern British Columbia and most of the western and central U.S., east to Illinois and Louisiana. Throughout the winter range, Harlan's Hawk occurs locally with and less commonly than various other subspecies of Red-tailed Hawk.

**Overview of Variation in Harlan's Hawk**  
Tails of adult Harlan's Hawks are illustrated in various field guides as pale to medium gray with some dark mottling and a more-or-less well-defined darker subterminal band (e.g., Peterson 1980; Robbins et al. 1983; Sibley 2000; Dunn and Alderfer 2006). Several of these guides include just one illustration. Specialty raptor guides (Wheeler and Clark 1999; Clark and Wheel-

# ADULT HARLAN'S HAWK TAILS

All adult Harlan's whose tails are shown are pure *harlani* lacking any Red-tail traits (not hybrids)



Light-morph



Dark-morph



Mus. of Southwest Biology



Canadian Mus. Of Nature

All Harlan's whose tails are shown are pure *harlani* lacking any Red-tail traits (not hybrids). Dark adults (85%) are like this:



Blackish plumage with white bases, often usually forming white breast marks, one or more secondaries unbarred, whitish undertails, & other traits.

All Harlan's whose tails are shown are pure *harlani* lacking any *Red-tail* traits (not hybrids). Light adults (~ 10%) are like this:

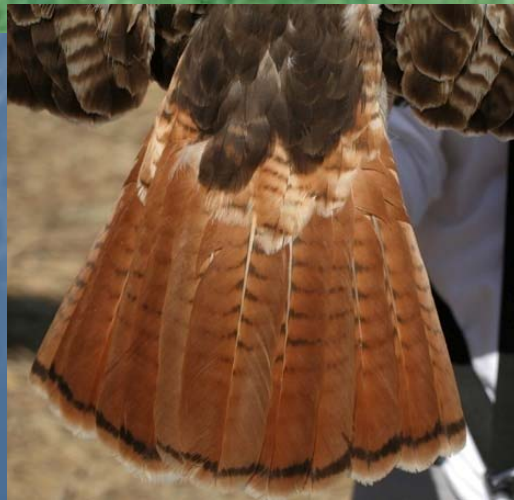
Al Hinde



White throat & streaks on forehead. Often one or more secondaries unbarred or widely barred. Blackish markings on white underparts and under wing coverts

# RED-TAILED HAWKS

Tails of adult Red-tails vary little;  
>99% are like one of the six below



# Adult Red-tailed Hawks look different



**Dark brown plumage, dark throat & no streaks on forehead. Wide malar. Secondaries narrowly barred. Brownish markings on buffy underparts and under wing**

# RED-TAILED HAWKS

Many adults from British Columbia & Alberta have noticeably banded tails



# RED-TAILED HAWKS

Adults from se  
Alaska and coastal  
BC: *B. j. alasensis*



Univ.  
British  
Columbia

Field  
Museum



# HARLAN'S HAWK differs from RED-TAILED HAWK

*harlani*

*Buteo*



This presentation is on The Peregrine Fund's Global Raptor Information Network web site. See next slide for URL:

# Harlan's Hawk differs from Red-Tailed Hawk, *Buteo jamaicensis calurus*, by:

1. Adult plumage by color morph especially in tail pattern and color;
2. Harlan's adult & juvenile plumages are almost alike; those of Red-tails differ;
3. Frequency of color morphs; &
4. Extent of bare area on the tarsus.

For my presentation explaining these differences, go to:

<http://www.globalraptors.org/grin/ResearcherResults.asp?resID=155>

And scroll down to 'Publications' and click on 'pdf' after 'Harlan's Hawk differs...'

Here is the first sample showing variation in adult *harlani* tails. These show little rufous.



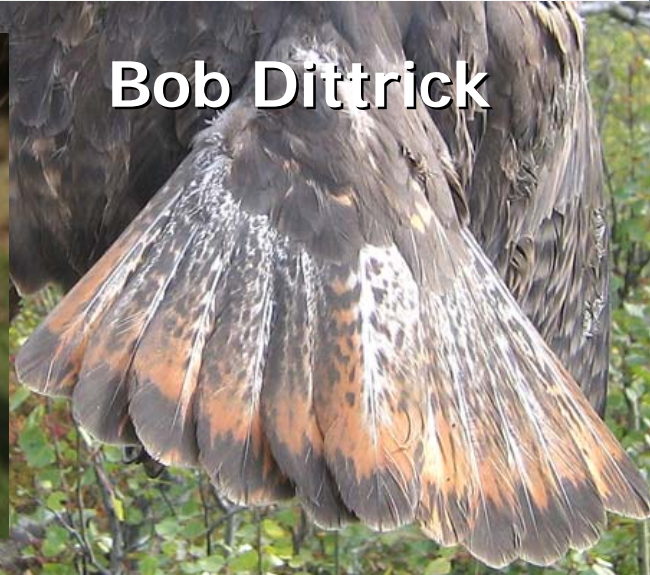
# Here are more examples of extreme variation in adult *harlani* tails



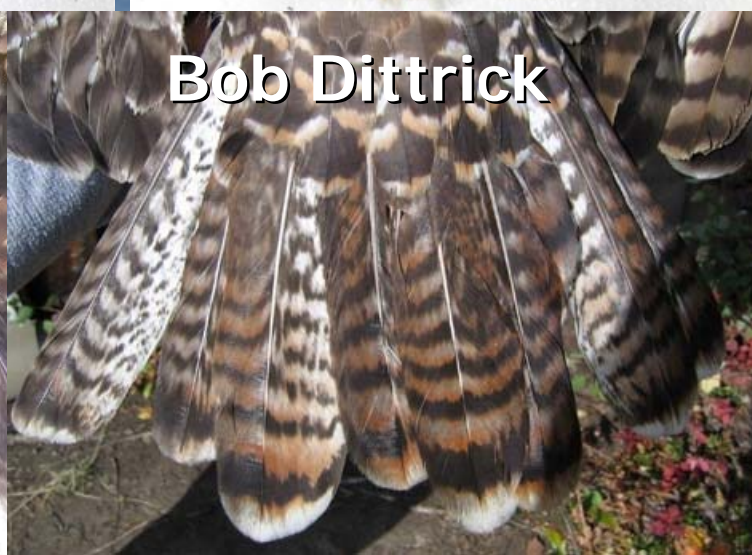
Yet more



**& more**



**& more**



**Bob Dittrick**

**& even more**



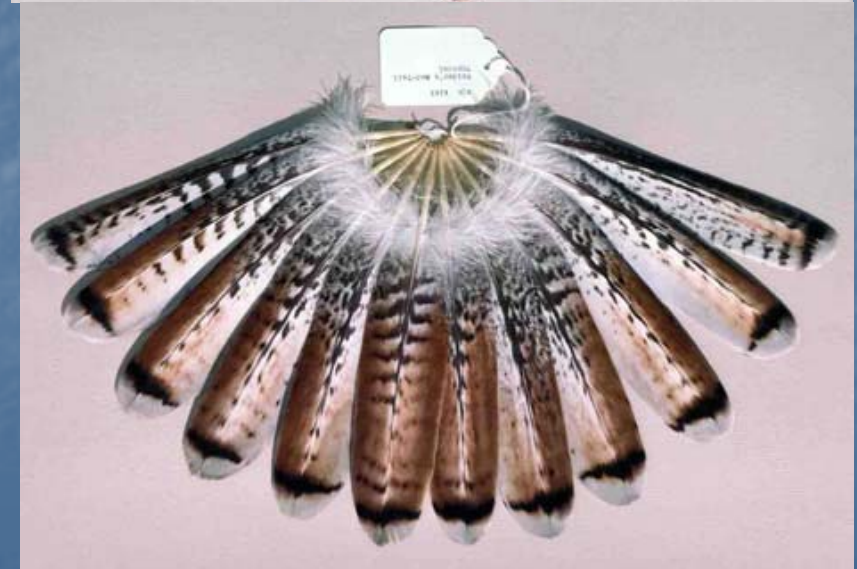
# Even more



Finally...



# Spread tails courtesy of Bill Voelker



# % rufous in the tails of 554 adult Harlan's

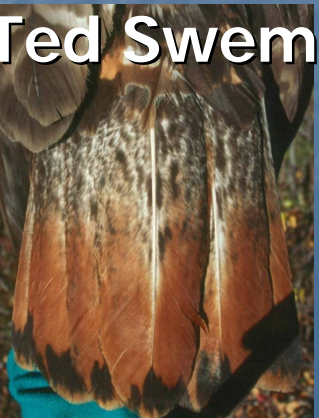


None or <10% 254 46%



10-50% 158 28%

Ted Swem



>50% 143 26%

# **Oberholser 1974**

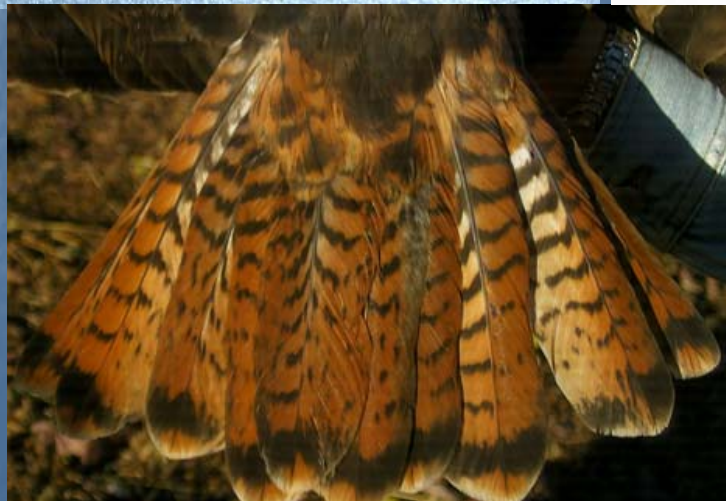
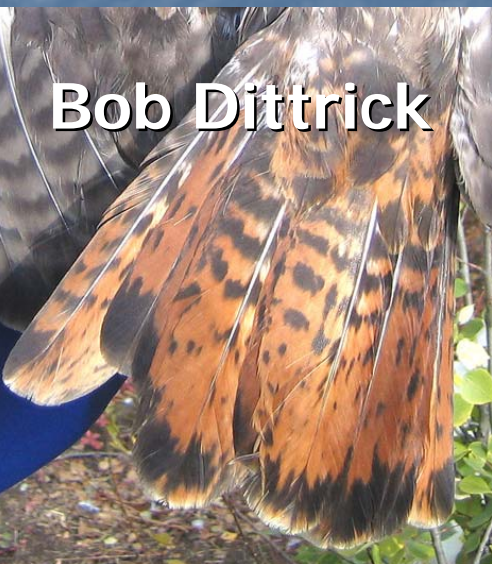
## **The Birdlife of Texas**

**'Over the years much ink and paper have been used in attempts to show exactly how many reddish freckles a Harlan's can have on its tail without being a Redtail.'**

Examples of variation in rufous adult *harlani* tails; none are like adult tails of *Buteo jamaicensis*. (1 of 2)



Examples of variation in rufous adult *harlani* tails; none are like adult tails of *Buteo jamaicensis*. (2 of 2)



Rufous adult *harlani* tails often show wide dark banding on the base, narrowing toward the tip; some show dark mottling and speckling as well. Bands often do not extend to subterminal band, with an unbanded area above it.



**Remember that almost all adult tails of Red-tailed Hawk look like these:**



**Always uniform rufous base and a variable amount of narrow dark bands**

# Jim Lish prepared this composite using two of Bill Voelker's pics

Red-tail adult

Harlan's adult



Harlan's on the right shows wider and wavier banding, thicker at base.

Rufous adult *harlani* tails often show areas of other colors, usually white or gray.

Subterminal band is usually wide & irregular in width and pattern, absent on some feathers or parts of feathers.



Rufous Harlan's tails are variable & many have dark bands wider at the base, often with a gap in banding above the wide & irregular subterminal



A few adult Red-tails (out of > 1000)  
have *harlani*-like tail markings

All four were  
otherwise pure  
adult Red-tails.

Is this due to gene  
flow with *harlani*?  
Or chance odd  
expressions of  
ancestral *Buteo*  
traits?

PA



CA



MICH



FL



# Juvenile dark Harlan's tails are distinctive



**Dark bands are wide & often wavy. 'Spike' on last band often forms hourglass. Pale bands are often white. Sometimes shows with spots on tips.**

# Tails of dark juveniles sometimes show pale spots on the tips

Jim Lish



**New adult  
rufous feathers  
in dark-morph  
juvenile tail**

**This tail is clearly  
that of a juvenile  
Harlan's Hawk.  
No juvie Red-  
tailed Hawk has a  
tail like this.**



**USNM**

**New adult rufous feathers in Cody Fields intermediate-morph juvenile tail**



**This tail is clearly that of a juvenile Harlan's Hawk. No juvie Red-tailed Hawk has a tail like this.**

**New adult  
rufous feather  
in dark-morph  
juvenile tail**

**This juvenile  
Harlan's Hawk  
has started molt  
into adult  
plumage**

**No juvie Red-  
tailed Hawk  
looks like this**



**NWT Oct.**

**Doug Tate**

**Rufous in the tails of adult Harlan's Hawks occurs too often for this to be the result of interbreeding with Red-tailed Hawks**

**Adjacent breeding Red-tails show normal tails, lacking grey, wide irregular banding, mottling, grizzling, or other *harlani* traits.**

**Harlan's adult tails are highly variable, in color as well as pattern.**

# Pattern and color can also vary among feathers in some tails



# Pattern and color can also vary in individual tail feathers





**Dark and light-morph adults can have similar tails**

**Royal Saskatchewan Museum**

Tail of Audubon's *harlani* type specimen. Tail is medium gray with a hint of rufous and some wavy banding on some feathers.

I have not found a similar tail on more than six hundred other adult Harlan's Hawks.



# Some juvenile Harlan's Hawks have adult-like tails



**Adult *harlani* have distinctive tails that almost always differ from those of *Buteo jamaicensis*.**

**These vary greatly in color from white to pale gray to dark gray to rufous or some mix of the above, with characteristic dark mottling, irregular barring, and a vague dusky to crisp dark subterminal band.**

**No two tails seem to appear exactly the same; even feathers differ.**

In summary, tails of adult Harlan's Hawks show a large range of variation; those of Red-tailed Hawks are much more alike, with little variation.

Tail variation is a trait of *harlani*

Why and how do they show such variety in their tails?

**Thanks to Bill Voelker for permission to use his spread tails.**

**Thanks also to Ryan Brady, Bob Dittrick, Cody Fields, Al Hinde, Buzz Hull, Jim Lish, Rick Morse, Betsy Rosencrans, Ted Swem, Doug Tate, Step Wilson, and many other photographers for the use of their photos.**

**Thanks again to the curators and collection managers at many museums for permission to look at and study their valuable skin collections.**

# THANKS FOR YOUR ATTENTION



Thanks also to The Peregrine Fund (especially Lloyd Kiff) for making this presentation available on their Global Raptor Information Network (GRIN) web site