

*REPORT:*

**PROCEEDINGS OF THE CONFERENCE ON RAPTOR CONSERVATION  
TECHNIQUES, FORT COLLINS, COLORADO, 22-24 MARCH, 1973**

**Part 4. RAPTOR RESEARCH TECHNIQUES**

edited by  
Byron E. Harrell

The concluding session of the Conference on Saturday evening, 24 March, 1973, consisted of nine papers and was chaired by Joseph R. Murphy and Richard R. Olendorff. Four of the papers were completed for publication in this issue of *Raptor Research*. One paper was transferred to the management part of the proceedings. A list of papers and abstracts of those not published here are given below. [For other parts see *Raptor Research* 7(2) and 8(1) and *Raptor Research Report* No. 2 and 3.]

65. Nelson, R. Wayne, Department of Biology, University of Calgary, Calgary, Alberta, Canada T2N 1N4.  
*Field Techniques in a Study of the Behavior of Peregrine Falcons* [published in *Raptor Research* 7(3/4):78-96, 1973].

66. Clayton M. White and Steve K. Sherrod, Dept. of Zoology, Brigham Young University, Provo, Utah 84601.  
*Advantages and Disadvantages in the Use of Rotary-winged Aircraft for Raptor Research* [published in *Raptor Research* 7(3/4):97-104, 1973].

67. Enderson, James H., Biology Dept., Colorado College, Colorado Springs, Colorado 80903.  
*Time-lapse Photography: Its Usefulness in Studying Nesting Raptors.*

ABSTRACT. Inexpensive time-lapse cameras may be used to gather large quantities of otherwise nearly unobtainable data on parental behavior, nestling behavior, food, molt, and mortality at raptor nests. Such information has been successfully gathered by different workers at the nests of at least six species of raptors. Representative of the results are the findings that, in Alaskan Peregrines (1) the female incubates about twice as much as the male, (2) eggs were rarely uncovered for more than three minutes, (3) males only rarely brood the nestlings, (4) brooding rate drops rapidly two weeks after hatching, (5) young are normally fed within a few hours of hatching, (6) feedings occur every 4-5 hours, (7) nestlings do not feed themselves in the first 25 days, (8) the male did not incubate at a nest that failed, although he had repeated opportunity, and (9) unlike males, females interrupt their molt in this period. J. Craig has made success-

ful records of Great Horned Owl activity at night. Difficulties in time-lapse photography include inadequate recording of short-term events, equipment malfunction, and camera theft.

68. *Dunstan, Thomas C.*, Dept. of Biological Sciences, Western Illinois University, Macomb, Illinois 61455.

*Application of Radio-telemetric Techniques to Studies of Strigiform and Falconiform Birds.*

**ABSTRACT.** Radio-telemetric techniques were used to study various aspects of the life histories of 17 species of birds of prey. Methods of attaching transmitters to subjects were: (1) double body loop harnesses for both breast and back packages, (2) sutured rump package, (3) tail feather package, and (4) leg jess package.

Territories and home ranges of both breeding and wintering raptors, interspecific spatial and temporal relationships, and post-fledgling activities of juvenile birds were determined. Nest sites were located by: (1) tracking captured radio-tagged prey, and (2) locating nests in winter from an airplane and marking the locations with transmitters.

69. *Fuller, Mark R., and John R. Tester*, Dept. of Ecology and Behavioral Biology, University of Minnesota, St. Paul, Minnesota 55455.

*An Automatic Radio Tracking System for Biotelemetry* [published in *Raptor Research* 7(3/4):105-106, 1973].

70. *David H. Ellis*, Montana Cooperative Wildlife Research Unit, University of Montana, Missoula, Montana 59801.

*A Telemetering Egg for Use in Studies of Incubation and Nesting Behavior* [published in *Raptor Research* 7(3/4):73-77, 1973, with Joel R. Varney as junior author and a changed title].

71. *Kochert, Michael N.*, Idaho Cooperative Wildlife Research Unit, University of Idaho, Moscow, Idaho 83843.

*Evaluation of a Vinyl Wing-marker for Raptors.*

**ABSTRACT.** A color-coded, vinyl wing-marker was devised for birds of prey by wrapping a crescent-shaped piece of material around the leading edge of the wing and securing it between the secondaries and scapulars. Over 100 Golden Eagle (*Aquila chrysaetos*) nestlings were fitted with wing-markers. Birds have been wearing markers for over 2½ years with no adverse effects. Over 50 sightings of marked eagles have been reported since 1970, and all except two were

in south Idaho and southeastern Oregon. Methods of handling birds and attaching the marker are discussed. Effectiveness of the marker style, materials used, and application of the marker to other raptor species is reported.

72. *Ellis, Cathy H.*, Montana Cooperative Wildlife Research Unit, University of Montana, Missoula, Montana 59801.

*A Color-marking Technique for Permanently Dyeing Raptor Feathers.*

**ABSTRACT.** Tags, dyes, paints, and bands have been widely used on raptors, but a permanent, easily applied color-marking technique practical for field use with raptors has not come to my attention. Experiments in 1970 and field testing in 1970, 1971, and 1972 have produced such a technique. The technique allows telescope identification of marked birds (eagles) for at least one mile and for a period of one to three years (depending on the completeness of annual molts).

73. *Sergei Postupalsky*, Dept. of Wildlife Ecology, University of Wisconsin, Madison, Wisconsin 53706.

*Studies of Reproductive Success in Raptors: Some Problems with Criteria and Terminology* [published in "Management of Raptors", *Raptor Research Report* No. 2, pp. 21-31, 1974].

The following transcription of the Raptor Research Techniques Session discussion period was edited for clarity and redundancy and irrelevancy and was reorganized in sequence. The discussion on the Postupalsky paper was included in the "Management of Raptors." Some discussion in the management area that was on techniques is also included.

### *Bio-telemetry*

LESLIE BROWN. Could I ask Mr. Fuller how far away these things can be tracked, and secondly, how much does it cost?

MARK FULLER. With our system we have a range with hawks and owls of about three miles. This is a big system; and then we have portable receivers, and with them I can go out beyond that range and locate animals. With other systems described by Dr. Dunstan we get much longer range; and by going up in the air and tracking from the air you can get up to 15 or 20 miles on a bird. On the cost of the Cedar Creek System—this was the first permanent radio tracking system that was developed. It was developed over a number of years through the cooperation of engineering departments and so forth. So the real cost is hard to estimate, but we are funded by NIH grants and AEC grants and

without those we'd be in no position to do anything. Other telemetry units, portable units that are used by many more people, are quite reasonable, I think, for the amount of data that you get.

JAMES ENDERSON. I'd like to ask Mr. Fuller if there is a reliable method for releasing the transmitters. In the case of some species in which I am interested this would be desirable.

FULLER. Well, there are two methods. One developed by Dr. Dunstan involves the suturing method of attaching the harness where after a certain amount of time the suture will dissolve away, and the harness will fall off. And that would be used on the back pack type of transmitter, and the tail transmitter of course will be molted out each year. And if a certain amount of weight is applied to the feather this will stimulate the follicle within about three weeks and that feather will be dropped. So depending upon the period of study and your particular wants and needs you can have a permanent package or one that will come off within an indeterminate amount of time by the suture loss or during the same molt period.

ROBERT COLEMAN. Mr. Fuller, what weight range were you talking about in terms of stimulating feather dropping? Is this in hawks and owls you're talking about?

FULLER. Yes, I found with a number of species that if the transmitter weighs under about 1.75% of the bird's body weight that it will be tolerated—that there's no follicle stimulation and it will remain on until the molt. With transmitters ranging from 2% to 4% of the bird's weight, I had dropping as early as three weeks and then as long as eight weeks.

ENDERSON. Is this, when attached, to a single feather?

FULLER. Yes.

#### *Time-lapse Photography*

VOICE. How long does it take to go through the 24 hour period in one reel?

ENDERSON. At one minute intervals a 50-foot reel lasts about 3½ days, something like that. The real success with this technique with super eight really awaits the development of large capacity magazines for super eight film.

THOMAS RAY. We did put the photoelectric cell on to turn the camera off during the night hours with diurnal bird of prey; then I altered it to put the strobe on at night to get a picture of the owls; the strobe would come on at night and go off during the day.

*Marking Techniques*

BROWN. Could I ask, Mr. Ellis, how far away from the original nest could the birds be seen some months, nine months later?

DAVID ELLIS. We observed one about 25 miles from the eyrie that she came from.

BROWN. So she wasn't still in the parental territory.

ELLIS. No. That's what we were trying to find with the technique.

LAURENCE FRANK. A couple of comments on standardization. Now that more and more people are color marking large raptors, particularly things like eagles that migrate large distances, ultimately there are going to have to be standard clearing houses so that different people aren't putting the same marks on eagles from very different populations. We are getting Golden Eagles from Idaho all the way to northern California. It is clear that people in California, further west, people far north, had better not be using the same marks as people in Idaho are using.

RICHARD OLENDORFF. This of course is done by the Bird Banding Office.

FRANK. Do they control this?

OLENDORFF. Yes, very strictly.

*Metric System*

FRANK. I am always sort of surprised at wildlife studies in America which persist in the use of such barbarous measurement as inches, feet, square miles, acres, townships, etc. There are a lot of other wildlife biologists in the world and they're all talking in terms of kilometers, meters, hectares, etc. Well, it is obviously difficult for us to change over immediately and use these terms particularly in such matters as areas and distances, since we are so used to speaking in terms of acres and miles and so forth. I think it would be very useful, particularly for comparison with foreign studies, if we at least in our studies here give our data both in our measurements and in metric standards. We should join the rest of the scientists who have made conversion to the metric system.

OLENDORFF. I think that is very valid criticism.

POSTUPALSKY. I think a number of journals require that. Very often you see so many acres and in parenthesis you see so many hectares and so forth. I think this is being done, at least the bigger journals do.