

REPORT:

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

Part 2. RAPTOR ECOLOGY SESSION

edited by
Byron E. Harrell

The opening session of the Conference on Thursday morning, 22 March, 1973 consisted of seven papers and was chaired by Dr. Gustav Swanson. An eighth paper in this area was inadvertently omitted from the program and was given the following day. Five of the eight papers were completed for publication in this issue of *Raptor Research*. Abstracts of the other papers are included below. The following papers on Raptor Ecology were presented.

1. *Gessaman, James A.*, Dept. of Zoology, Utah State University, Logan, Utah 84322.

Is Heart Rate a Good Measure of the Energy Metabolism of Semi-free-living Kestrel?

ABSTRACT. The ECG of Kestrels (*Falco sparverius*) was transmitted by telemetry to a receiver at distances of up to 250 feet. Two electrodes were surgically implanted in each bird and connected to an ECG transmitter harnessed on the bird's back. Carbon dioxide production and heart rate (measured by counting the R spikes on the ECG) of Kestrels resting in a small chamber at 10 different temperatures and of Kestrels during flight in a wind tunnel were measured. Subsequently the birds were released inside a large quonset building, and their heart rates were monitored for five seconds of every minute during each 24-hour period. Total daily CO₂ production of each of six birds was estimated for four days from the heart rate of each in conjunction with a CO₂-heart rate regression for each individual. Total daily CO₂ production was simultaneously estimated by a totally independent technique, the doubly-labeled water (D₂O + H₂¹⁸⁰) method. A comparison of the results of these two methods suggests that the total daily CO₂ production of a Kestrel can be estimated from its heart rate with an error of less than 25%.

2. *Mosher, J. A.*, 1160 E. 230 S., Provo, Utah 84601.
The Energetics of Size-dimorphism.

ABSTRACT. The relationship between size-dimorphism and energetics of the Broad-winged Hawk was examined. The resting metabolic rate (RMR) of three

male and four female Broad-wings was measured over 20-30 days using food balance calorimetry. There was no significant difference between male and female per gram metabolic rates. It was concluded that a dimorphic pair of Broad-wings has an energetics advantage over a hypothetical monomorphic pair, proportional to the degree of the dimorphism. A model describing the relationship between size-dimorphism and the energy savings due to dimorphism is presented.

3. *Koplin, James R.*, School of Natural Resources, California State University, Humboldt, Arcata, California 95521.

Differential Habitat Use by Sexes of American Kestrels Wintering in Northern California [published in *Raptor Research* 7(2):39-42, 1973].

4. *Platt, Joseph B.*, Dept. of Zoology, Brigham Young University, Provo, Utah 84601.

Habitat and Time Utilization of Nesting Sharp-shinned Hawks—A Telemetry Study.

ABSTRACT. Data will be presented concerning a telemetry study of Sharp-shinned Hawks (*Accipiter striatus*). A pair of nesting adults was outfitted with radio transmitters and monitored from the time their eggs hatched until their young dispersed from the area 47 days later. The young were also tracked from fledging to dispersal.

The boundaries of the territory were determined. Within these boundaries were eight distinct communities; the utilization of these types by the birds will be discussed. Changes in the activity patterns and habitat utilization as the season progressed will be presented. Differences in time budgets of the male and female will be examined. Prey selection and the various foraging strategies employed by the raptors will also be presented.

5. *Sara Jane Johnson*, Dept. of Zoology and Entomology, Montana State University, Bozeman, Montana 59715.

The Post-fledging Period of the Red-tailed Hawk [published in *Raptor Research* 7(2):39-44, 1973].

6. *Michael W. Collopy*, School of Natural Resources, California State University, Humboldt, Arcata, California 95521.

Predatory Efficiency of American Kestrels Wintering in Northwestern California [published in *Raptor Research* 7(2):25-31, 1973].

7. Meyer L. *Ueoka*, School of Natural Resources, California State University, Humboldt, Arcata, California 95521.

Foraging Behavior of Ospreys in Northwestern California [published in *Raptor Research* 7(2):32-38, 1973 with James R. Koplín as junior author].

44a. Thomas C. *Dunstan*, Dept. of Biological Sciences, Western Illinois University, Macomb, Illinois 61455.

Spatial and Temporal Relationships between Breeding Red-tailed Hawks and Great Horned Owls in South Dakota [published in *Raptor Research* 7(2):49-54, 1973, with Byron E. Harrell as junior author and a slightly changed title].

The following transcription of the Raptor Ecology Session discussion period was edited for clarity and removal of redundancy and irrelevancy and was re-organized in sequence.

Sharp-shinned Hawk

JERRY MCGOWAN: I'd like to ask Mr. Platt a question. After you have just observed young Sharp-shins to have made their first flight from the nest, did you find them returning to the nest tree to roost or for other activities, and if so, for how long, or for how many days, did they continue to do this?

JOSEPH PLATT: I was able to move right underneath the nest area in the grove and just quietly sit there. I had a young perch near me; the female preened just a few feet away. So I think I was observing normal behavior, and they did not pay any attention to the nest *per se*. They had a very regular place of perching. It was on the north end of the grove where they could see the adults coming back easier. But there was no affinity for the nest at all.

DAVID ELLIS: I'd like to ask what method you used for triangulating the bird; did you actually locate the bird in a certain point on the map?

PLATT: For observation, I'd go into the study area when I knew where they were going and wait and track them coming in. It was a fairly visible area. The growth was low and open. The road provided me fast access up and down. I could get a mile away and triangulate myself with some accuracy; otherwise visual observations over the 45 days put it all together.

GLEN WOOFINDEN: Have you heard any special procedures in trying to find the nests of your Sharp-shinned or Cooper's Hawks by mating behavior or any special observation?

PLATT: There are a whole lot of things in the wind and I think that if you would join with us in the accipiter discussion, other people have a lot better methods than I can give you.

Red-tailed Hawk

BRUCE WOLHUTER: I want to address a question to Miss Johnson. You seem to have an unusually high density of Red-tails. Then you mentioned a number of nests that didn't make it. Do you have any idea why you had such a high number that didn't make it, or that you said had problems?

SARA JANE JOHNSON: I think it must be that 60% of the birds that begin nesting are successful, so it's about 40% failure. That's during incubation up to maybe the first week after hatching. I think that the amount of failure after the birds start nesting is a little lower than the average in other areas.

MORLAN NELSON: Did you observe adults running the young ones out of the area? Did you ever see any aggression of the adults forcing the young to move out?

JOHNSON: No, not driving the young out of their territory. The adults always recognize their own young, even one that had been there 70 days after fledging. He had been gone a week and he came back and there was no antagonism at all. There was some aggression at times when the young would hassle the adults for food—you know, keep chasing them from perch to perch. But that is the only form of aggression—just doing food hassles—not driving them out of the territory.

STEVEN CHINDGREN: What do you attribute to the cause of Red-tails which you said didn't make it?

JOHNSON: As for the cause, I don't know. It's pretty normal. I think the average is. I'm giving another paper on the reproduction in which I'll give the figures. It's from about 20% to 40% failure before hatching in all populations. Mine is a little bit higher than most, but this seems to be normal.

CHINDGREN: Do you attribute this to desertion of the egg or to infertile eggs?

JOHNSON: I did not climb any of the nests for my nesting study until after the young had hatched, so this wouldn't be a factor in the failure. I don't know if it was desertion or if they just failed to lay eggs or if they deserted after they laid.

GILES GREENFIELD. In connection with the nesting failures, I noticed on one chart two nests in consecutive years produced the same number of young. I wonder whether the parents were the same. Did you identify that?

JOHNSON. No, I had no accurate idea if they were the same adults both years or not.

GREENFIELD. I also notice the similarity of the same two nesting areas each year and I wondered, in view of failure elsewhere, whether they had the same parents?

JOHNSON: It could be that the adults are permanently paired; if they are and if these are older adults, they are probably more successful, and if they maintain the same territory they probably do have a higher success rate than other territories. But I'm sure that while the nests that were lost (some of them after the young had hatched), were due to predation, so this would also be a factor which really wouldn't be related to territories so much or the birds' nesting.

KENNETH MESCH: In non-productive nests did you find adults defending that nest site? Or could these be alternate nest sites in other years?

JOHNSON: I think in close to 70 nests that produced young over the two years, I had two where the adults were defending the nests and after I climbed them there was nothing there, no eggs, or anything. I assume that maybe they were juveniles and that this was their first nesting attempt. But they did defend the nest partly through the summer without even laying eggs.

MESCH: What I'm talking about is that map that you had of productive and non-productive Red-tails. Was this non-productive nest site defended by adults?

JOHNSON: No.

MESCH: Oh, they weren't. How did you know that these were active at all?

JOHNSON: Well, they failed after they started the nesting attempt.

MESCH: Then there were adults there.

JOHNSON: Well, I checked the nests starting when they returned. They came back by the first of March and immediately set up territories and started building nests. This is when I first checked and then I came back about a month later, actually after I figured that the eggs had hatched, and then I started checking. These are then the ones that aren't defended; they are the ones that have failed.

American Kestrel

JOHN BAGLIEN: A question for Mike Collopy here. Considering the prey selection and relative importance of various species of prey on the diet; do you have any data that consider the relative differences in biomass available as food, comparing the rodents to the grasshoppers or other insects?

MICHAEL COLLOPY: No, that is something that is going to be considered. That's going to be done in conjunction with the metabolic studies that I plan on carrying on next fall. But just speculating a bit I'm sure there's more than one reason why there is the increase in rodents taken in the winter. I feel there are quite a lot fewer insects if any at all has an effect, but at the same time in the winter the metabolic rates are a great deal higher when it's cooler than in the summer, and they would have to catch twice or three times as many insects. I'm sure it would be much more expensive metabolically speaking than capturing three or four shrews or meadow voles during the day. But this is something that's going to be worked out. I'm sure it's very important.

PATRICK REDIG: Did you notice at any time the Kestrel making any attempt to stash food or stores?

COLLOPY: I've seen probably close to 25 different attempts. We've recorded all these and I plan to try to publish them this spring.

WOLHUTER: My experience with Kestrels has been in Kansas and Colorado and certainly we have quite a different climate during the winter season. Could you give us an idea of what your temperature extremes, high and low, would be for the winter months? You seemed to think it rather significant that you had that switch to the vertebrates that we would expect in our area. Did you expect this is unusual for your area or is this more the normal thing?

JAMES KOPLIN: May I answer that? The temperature fluctuates between normally let's say, 35 degrees to 50 degrees during the winter months; occasionally we get frost. But during the month of December we had a very cold low trough extending down into Humboldt—well, actually throughout California—which wiped out nearly all of our eucalyptus, for example, throughout the Bay area. In that part of the country it was severe; water lines froze up, it was an extremely cold time for California, the coldest on record for Arcata and the Bay area. Normally I would say we have a pretty substantial invertebrate prey population level, but not this particular year.

Osprey

JON SWENSON: I have a question for Mr. Ueoka. You say that the Ospreys nested along streams. Do you mean that these streams supported productive fisheries that could supply food for the Osprey? And if so, were those populations exploited?

MEYER UEOKA: They did take salmon in Elk River and other streams that they nested along. But through my observations I've never seen Ospreys fish these other streams. The fish that I could identify on delivery at nests were surf perch, and others that are found in the bay and not in the streams.

KOPLIN: At the risk of being boring could I answer that question? Osprey nest along the Eel River to quite a large extent and they do fish the Eel River. The birds that Meyer worked with nest inland from three to five miles. Just why we don't really know because there are suitable nest sites along the coast. Our assumption is that the combination of off-shore summer winds and fogs may limit their nesting activities to further inland. And they quite commonly have to fly three to five miles to the bay that day and fly back. The streams that his nests are on are so small that we doubt very seriously if they could catch any fish in them. They're generally empty or with no fish found in them during the summer months when the birds are there. In support of this idea, we've not seen any of the birds fish the streams. I've sat on Elk River road during the summer months for example and watched Ospreys fly toward the bay from the nesting area and fly back and give every appearance of not paying the least bit of attention to the streams. But they do feed on the streams on the Klamath River and on the Eel River.

SERGEJ POSTUPALSKY: Do you have any data on the depths in which the Osprey were fishing? In other words, were they in relatively shallow water or deep water?

UEOKA: The area on the slide that I showed looking toward the mud flat is usually covered with water during high tide, and that's where most of the fishing activities took place: during high tide and in the channel in low tide.

POSTUPALSKY: How much water is there? Just a few feet?

UEOKA: Yes, about three or four feet.

MELSTAD: Do you have recorded any period of activity by time of day; is there more activity in the morning or in the afternoon?

UEOKA: Yes, I did, and activity was heaviest from 12 noon until about 4:00 or 5:00 in the afternoon.

JOHN SMITH: Along this same line did you find that the birds collected or attempted to fish harder as the young became larger or did they possibly waste more food as the young were smaller and utilize less efficient fishing?

UEOKA: I saw more fishing activity during the brooding period; right off I can't give you the numbers on that. There was more activity observed at that time.

KOPLIN: I can answer that question. We measured these rates of food delivery at Osprey nests in Montana and Dave Graber did the same thing in California. As the young aged and grew in weight, the rate and quantity of food delivery increased in direct proportion to the size of the young.

SMITH: The size of prey, did that increase too?

KOPLIN: It seemed to be a situation where one particular nest pair would select prey of about the same size and another nest would select slightly larger prey. The upshot of the whole thing was they tended to deliver more prey of the same size at a given nest.