also going to use its EDPrime extra-low dispersion glass on its 60mm Spacemaster, a popular scope that's been around for more than 20 years.

The new model, No. 78-2000 will be priced at $639.95 for body only and should be available in March.

Objective Lens Aperture: 60mm
Weight: 38.4 oz.
Length: 11.6 inches

TICK CHAPS

NOT ALL NEW INVENTIONS DESIGNED to help birders are high tech. The prototype of a product that prevents Lyme Disease was stitched together on a home sewing machine by a Department of Natural Resources' wildlife manager.

Tick Chaps, a variation on cowboy gear, were designed by Carl McIlquham of Antigo, WI, so that people who love to be in the outdoors can be there without fear. The chaps keep ticks from making contact with your lower legs and from moving up your body to other vulnerable areas.

For years McIlquham had told his wife Barbara that someone just had to make something to protect people from ticks. "One evening about two and a half years ago, I came home, and Carl was working at the sewing machine. I knew then that he was in earnest," Barbara, a third grade teacher, recalled.

Together, they developed and tested Tick Chaps. The thigh-high chaps are made from strong, lightweight nylon. Side zippers make them easy to get on and off. Elastics at the ankles help prevent ticks from crawling underneath the chaps, and the nylon itself is slippery, so ticks have a hard time taking hold. Tick Chaps come in a variety of colors, all light so that ticks are easy to spot.

The truly innovative part of the chap is the "tick flap," an inverted cuff located at mid-thigh, that impedes the upward movement of any tenacious tick. And for even more protection, each flap overlaps the "killer strip," a band of absorbent material over a non-absorbent backing, where one can apply tick repellent. McIlquham insists that the chaps are effective without using repellents, but if the wearer wants extra protection, repellents containing DEET or permethrin work fine on the chaps. The "flap" and the "strip" minimize evaporation of the repellent, prevent it from rubbing off, and protect the wearer from getting repellent on skin and clothes.

In informal field tests around Wisconsin, the McIlquhams claim that people wearing Tick Chaps end up with 98 percent fewer ticks than those who don't. But perhaps the best testament to their effectiveness is that many state agencies and the Army Corps of Engineers are purchasing the Tick Chaps for personnel in the field.

Right now, Tick Chaps are a cottage industry available through the mail from Forest Mate, P.O. Box 600, Antigo, WI 54409. Prices range from $29.95 to $34.95.

A feature of tick Chaps is the "tick flap," an inverted cuff located at mid-thigh designed to impede the upward movement of ticks.

PHOTOGRAPH COURTESY OF FOREST MATE

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CAPTURE THE MOVEMENT: VIDEO CAMERAS IN THE FIELD

by Michael Godfrey

A FEW MILES EAST OF PATAGONIA, Arizona, I got my first look at a Zone-tailed Hawk. The experience lasted less than a full second—specifically it lasted only so long as I needed to pick the bird from among the Turkey Vultures in whose company it had enrolled itself, likely for the well published subterfuge of seeming harmless.

The next second found me fumbling desperately with the heavy tripod, recorder, camera, microphone, and the ubiquitous spaghetti of cables attending broadcast-grade video. It takes a few minutes, if all goes well, which in this instance all did, for the birds kettled out over a wash before me, spiraling, mingling, in general making nice for the camera, which happened to be white-balanced and full of fresh batteries and tape. One of the Zone-taileds made a lively dip out of its troupe of shills, enough to make the point, visually.

It's all there on tape now. It turns out there were two Zone-taileds, an adult and a recent fledgling which made a pass at the adult, later interpreted for me as begging behavior. The adult made its turns clockwise with the vultures—the youngster

was all over the place, inept and vocal. It was footage I badly needed and for which I had driven 2500 miles one-way in a VW van. I had kept the tape rolling until the birds were effectively out of sight. It was a rich rewarding feeling which my wife, Heather, and I savored in silence for long minutes.

Then I got to thinking...the globe-girdling width of Texas, the heat, the lack of sleep, ghastly interstate food and lodging, whatever I wanted to count as privation I had endured for the privilege of actually seeing the bird only long enough to let the shape register. The rest I saw by proxy on the one-inch black-and-white TV screen that serves as view finder. Zeiss 10x40s it's not. I needed the footage to make a living, but I had acquired it at a cost which becomes dearer over time. An itinerant Easterner can expect his one and only lifetime to afford but a single audience with a juvenile Zone-tailed Hawk learning to hunt—at best. This had been a life bird.

Later during that same trip, we went to Arivaipa Canyon. It is a place of unutterable beauty. Getting there is a half-day trip from Tucson, so one sleeps in one's van, having sidled up to the justifiably skeptical Nature Conservancy warden. In summer, Arivaipa Canyon hosts the nation's most accessible (hah!) Common (hah!) Black-Hawks, and they draw the attention of many a dedicated bird molester.

Upcanyon, we drive past a dark snag of alligator juniper. One of its irregularities turns slightly and reveals a band of white. Same story. As soon as I realize I'm looking at the illusive raptor of my quixotic dreams I dive for the toys. When I come up, the bird is gone. We stay in Arivaipa until the food runs out, but the bird has vanished.

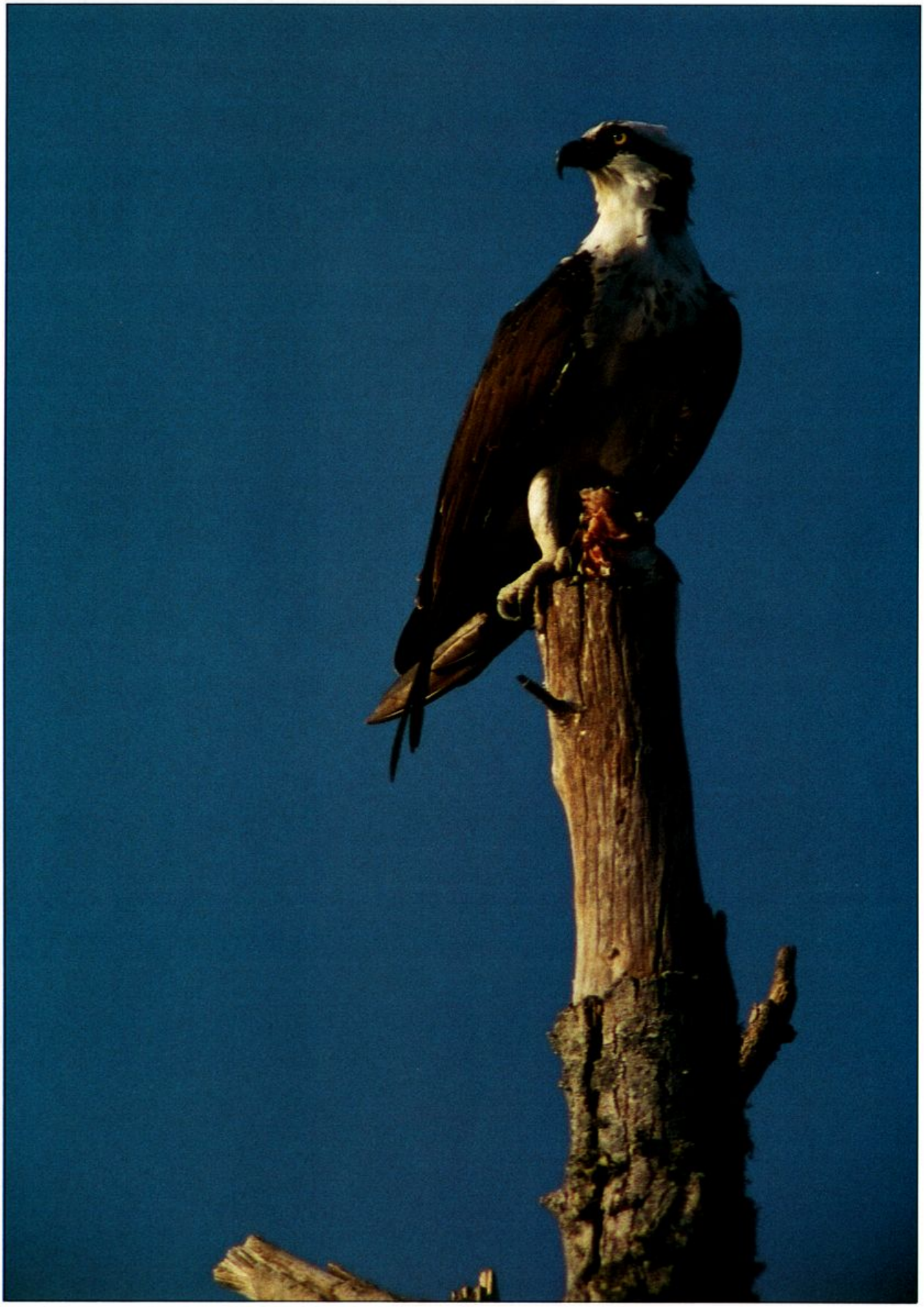
Three roasty-toasty days in a desert canyon—for which I admit I am grateful—but no footage. Heather, on the other hand, had the Zeisses on the black-hawk for most of my paroxysm of fumbling, saw the dark eye, the yellow mask, watched the head bob and tilt to follow the unusual proceeding in the back of the van, and ultimately, saw the broad, black wings and white-banded tail in egress. I hadn't seen diddely squat. What's worse, we went back another year and filmed the bird for the better part of two days and I still haven't seen it.

As a matter of fact, of the 200, more or less, life-bird encounters that have graced the decade in which I've been filming North American birds on broadcast-quality video, about one quarter have been single-instance birds so far, and it would be fair to say I really haven't seen them. The male Costa's Hummingbird at Cottonwood Springs, the Flammulated Owl in Cave Creek Canyon, the Northern Hawk Owl in Ontario, the Stilt Sandpiper pair at Chincoteague—somehow they haven't shown up again. If I want to luxuriate in the recollection, I can look at it on tape frame by frame, but I can't call up those images on the back of my lids. They're not available.

So, although she had no way of knowing it, it struck me as ironic that Susan Drennan would ask for my thoughts on how video might be useful in birding. Upon reflection, lugging the junk around and being preoccupied with its use and peccadillos has in part degraded my observations as a naturalist. It has also enhanced them.

For every black-hawk I can hope for a compensating Black-chinned Hummingbird, who—I didn't notice through the view finder and probably wouldn't have through binoculars—reversed on his perch. I happened to spool slowly through the event on the tape later and saw the bird catch a gnat in the process. At Cape May, a Merlin pumping toward the camera zigged slightly. The tape showed it snag a dragonfly, an event which passed the notice of dozens of birders. Of all the times you've watched Osprey dive on fish, have you ever seen the feet come forward? Can you say with confidence when in the dive sequence that occurs? Have you a mental picture of how far forward the feet come relative to the head and body and, more importantly, what is the hydrodynamic presentation at impact? Stepping through a frame at at time, I've found the feet are in trail until the bird's head is perhaps a meter from impact. The legs swing 180 degrees forward until the talons are directly ahead of the face so that the head is tucked between the thighs and shielded by the feet. Tape the strike of an owl or a buteo and you'll see the legs at just about right angles to the body at impact, the head and body reared back as if to land, and, during the last meter, the wings will pump a time or two slowing things down. The Osprey does not change the body axis, flare, nor shift the angle of the wings. It does not brake in any way. It just puts its feet in front of its face and bores in. You've got to be a keen observer to see that through the Zeisses.

So, upon reflection, yes, Susan, there is information in video which can help amass the fund of information each of us relies on in observing birds as parts of their—and our—sustaining life system. It isn't always easy to get and it may not be worth the forgone opportunity for direct observation. But depending on one's purposes, I think video could be very helpful and may compare favorably with, say, firing off a couple of 35 mm stills, then settling back to inspect a bird's feathers through the spotting scope.



PHOTOGRAPH BRIAN CLEARY

But first, some distinctions. We're not talking about broadcast equipment—that weighs 50 pounds or more, and it costs the kind of figures that impoverish governments. We are talking about *home* video recorded on *consumer* equipment.

Of late there has come upon us a consumer video format known as high-band 8. Unlike its predecessor VHS, Hi-8 can be transferred to a broadcast edit format and used for the most noble of video purposes, if such there be. It yields a better resolution than VHS, and it's smaller and lighter. To date, it looks like the birder's best format for recording bird behavior. With a separate (from the camcorder) recorder, you can edit at home. Crudely.

There are two reasons why making your own video recordings of birds in the field might give you more information than still photography. Actually, these are dimensions, more than reasons.

Time. Events happen through time, and in photography time works visual magic. Events unfold and tell their own story. To record that story, the seized instant must be poignant indeed. That's why a good still photographer is more than an illustrator—he or she must capture the poised intent, the power, mystery and drama in a single instant. It rarely comes together. With time on your side, the depiction is more readily achieved; there's more information available.

Here's an example. Last year I found a Red-shouldered Hawk's nest and set about to film the raising of the young. I climbed a tree some yards away and mounted camera and recorder at eye level. As the two chicks developed, one behavior that invariably threw me into (suppressed) laughter in the remote blind was their penchant for mirror-image motions. They'd both fix on a fly buzzing around and move in unison such that you could impute the insect's trajectory. They'd do it in response to a low-flying airplane, a squirrel, even one-another. It became a theme, which was, eventually, set to music in a video cassette titled *Flight Song*. There would be no way to depict that behavior with still photography.

Also, composition is sometimes easier in motion than in still photography. You really don't have to fill the frame to get the drama (or the information)—in fact, if you fill the frame with flying bird, it's usually not long before you lose the bird entirely. The eye requires a context in which the action can unfold, and the bird must be shown within its context or some of the meaning is lost. For that reason, the stovepipe lenses that bankrupt still photographers aren't necessary in the kind of videography we're talking about. And with one exception that I know of (Canon's L-1 model Hi-8 camcorder), interchangeable lenses aren't feasible in consumer video anyway.

You can, by using the time dimension in motion photography, show and imply worlds of context and relationship.

Finally, time provides opportunity for the most exquisite of differentiators between still and motion photography, the reveal. You can zoom out, over time, to *reveal* the context, the relative sizes—from a close-up of the head of a hatchling eagle, widening to show the adjacent mass of its mother, the endless architecture of the nest, the supporting pine snag, the marsh. Or the adjacent condos or the onrushing bulldozer. You can tilt up to the nest in the tree. You can pan across the marsh to it. You can (s-l-o-w-l-y) zoom in from the rainforest context to the head of the bat dangling at its roost, from the winter bottomland deciduous forest to the woodcock in the leaves. You can, in sum, by using the time dimension in motion photography, show and imply worlds of context and relationship.

There's also the audio dimension—sound. Sound contributes not only to realism, it adds information otherwise absent. I'm in production now on an ecological profile on Northern Cardinals. Filming some sequences of feeding visits, I used a lavaliere mike suspended from the bottom of the nest. When the male arrived to feed, the blind and naked hatchlings lay low in the nest until the big guy uttered a low, short CHUCK—then gaping mouths popped up in unison. I may not get the Nobel prize for this discovery, but I've not seen reference to the behavior in the literature and I'm pleased to learn about it. The point is, from ten feet away, I never heard the cue. It took the intimacy of the super-close microphone to pick it up.

Generally speaking, the audio component of your recording is equally important with the visual—certainly, some scenes are audio dependent. Any event involving obviously synchronized sound must capture the audio to be effective. The cardinal didn't move his bill, but a crow turning itself inside out with a vocal offering demands the supporting audio.

Here trouble arises. Birders tend to travel in rowdy bands, much given to mindless chatter. The visual experience seems somehow manque unless narrated to no one in particular, and one can easily hear a dozen conflicting descriptions simultaneously. This is unfortunate for we (can) hear much more than we see, and that channel is never so effectively blocked as by noise from

within. If you want to capture the grunting and splashing of mixed wading birds at a Ding Darling feeding frenzy, you've no choice but to get away from the herd.

Getting pure audio is yet another challenge. It is the absolute bane of professionals—in a conservative nine-tenths of the significant footage one gets, the audio is ruined by motor sounds or barking dogs or distant Dempsey Dumpsters. Almost nowhere in North America is one out of earshot of motor sounds for more than a few seconds at a time. Fortunately, the sound track you're likely to need for home reference and analysis can stand a few hits of intrusive sound and still be useful.

It is in the audio dimension that a significant difference separates the broadcast realm from the consumer. I don't know of a consumer camera that can accept a signal from a remoted microphone, and then the microphone, to produce a quality sound recording, must be off the camera. It must also be directionally focused or must be close to the sound source. The problem with small microphones mounted on the camera is that they pick up the lens' servomotor whines and the fumbling, breathing, and lip smacking noises of the operator, as well as ambient jabber from all directions. You can't operate the camera without touching it and you can't touch it without registering an intrusive noise.

If you find that you really need good sound recordings to get the kind of information you're interested in from your consumer video camcorder, you'll have to navigate around the audio dilemma. A suggested priority would be to find a way to remove the microphone and if possible to fit it into a parabolic reflector to minimize irrelevant sound. If you can't remove the mike, perhaps you can isolate the causes of the most egregious operator-induced noises—the earring scratching the camcorder, your glasses, absent drumming with the fingers.

Although this is not a tract on the salvation of faltering marriages, we must now cover stability and companionship.

Stability is essential. The notion that you can hand-hold a camcorder and get a meaningful image of bird behavior is a fatuity—especially at higher magnifications. A unipod is perhaps better than nothing but is generally not adequate. Use a tripod. Use the top of your car. Wedge the thing into the fork of a tree, but don't bother to push the go button if the camcorder is not secured. The image will perform a maddening dance preventing any useful analysis or enjoyment. If you use a tripod, and that's certainly the preferred support, endure the extra weight of a stout one, lock it down in all axes, push go and take your hands off it. Footage of even a distant nest or feeding flock will likely yield some delights and insights, but only if the image is stable. Today's camcorders are light, and, lacking mass, they don't readily resist trembling.

Finally, you need a confederate. A quiet one, sensitive to communication by nod or nudge. Someone to see, hear, and alert you to the many things you're missing because you've suctioned your eyeball into a video viewfinder. A pal to make supplicative shushing gestures to the approaching child, the nice man with the screech-owl tape. Someone to tell you what the black-hawk really looked like.

MICHAEL GODFREY *is producer of Audubon's* Up Close *series of ecological profiles of North American bird groups on video and* Audubon's Videoguide to Birds.

TRAVEL: NEW DESTINATIONS IN A REDEFINED WORLD

by Jessica Cohen

FIFTEEN YEARS AGO, WHEN ASA Wright's cocoa and coffee plantation in Trinidad became unprofitable, she found she had a captive market as provider of birdwatchers' lodgings. She converted her house to a hostel for naturalists willing to forgo hotel finery for doorstep proximity to undisturbed wildlife. Such places were rare at that time, according to Victor Emanuel, who has run a birding tour company for 20 years. But now, he says, several areas of Central and South America are responding to the continued attention of wildlife devotees by providing more comfortable, clean quarters and—more crucially—by preserving the surround verdure. "Costa Rica, Venezuela, Ecuador, and Belize are seeing a boom in infrastructure development of new lodges."

This interplay between commerce and ecology resounds with ecotourism—commercial touring of natural preserves that benefits the host country, providing them with incentive to protect their resources. Fortunately, an unlimited energy source, human curiosity, fuels the cycle. Emanuel, who launched his touring business driving people in his own car from Texas to birding spots in Mexico, watched his business grow at 10–20% per year from 1975 on, expanding through South and Central America to Asia and Africa. He and other birding tour operators constantly monitor politi-