

The "less than" percentages suppose (which is highly improbable) that another bird trapped in each case would have been a return. They point out a correlation between percentage of returns and number of birds trapped, on the basis of which one may discount the significance of absence of returns in other species than the Song Sparrow, but they emphasize such significance as they may have in the Song Sparrow and the totals. The probable reason for a lower percentage in 1950 than in 1949 is that some of the Catbirds rated as adults were birds-of-the-year, or drifting birds. I know of no tangible age-criterion in the Catbird, like the eye-color of the Thrasher. The lack of returns in 1951 may not be referred to the small number of birds trapped, as the highest percentage was in 1949 with a smaller number.

I have of course no statistical evidence on the problem, or claim that what there is has proved anything. But significant evidence is obtainable by the sampling method, when properly applied. In view of 1951, my hypothesis that it is the rule for adult migrant birds to return consistently to the same locality to nest is not weakened, but modified (in lieu of further evidence) by the belief that abnormal spring migration weather may sometimes prevent at least some of them from doing so.

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BIRD PHOTOGRAPHY FOR BIRD-BANDERS

BY RICHARD B. FISCHER

At a regional meeting of the Eastern Bird-Banding Association some years ago Mr. Jesse Miller showed a series of miniature color slides of birds that his high school bird study group had banded. The birds had been held in the hand before an inexpensive 35-mm. camera while their pictures were taken. That simple technique for quickly recording in color what would require pages of description deeply impressed the audience, and in adapting it to my own needs certain refinements were made which may interest and assist other banders.

Aside from the undeniable and legitimate pleasure of having a portrait of some particular species, there are other reasons for wanting a photograph of a living bird. In studying the plumage development of young birds, progression of the moult, or assumption of breeding or winter plumage, color pictures are well-nigh indispensable. To record some abnormality of plumage or structure a photograph, again, is worth pages of written material.

THE FOCAL FRAME

Before discussing the ordinary equipment involved, which may vary with different photographers, we must consider a prime requisite—the focal frame. In place of a description of the device, your attention is called to Figure 1, showing it in use with a Kodak Bantam. Complete information on its use and construction plus valuable suggestions on close-up photography—which is what you will be doing—can be found in the splendid pamphlet "Portra Lenses and a Technique for Extreme Close-ups," available without charge from the

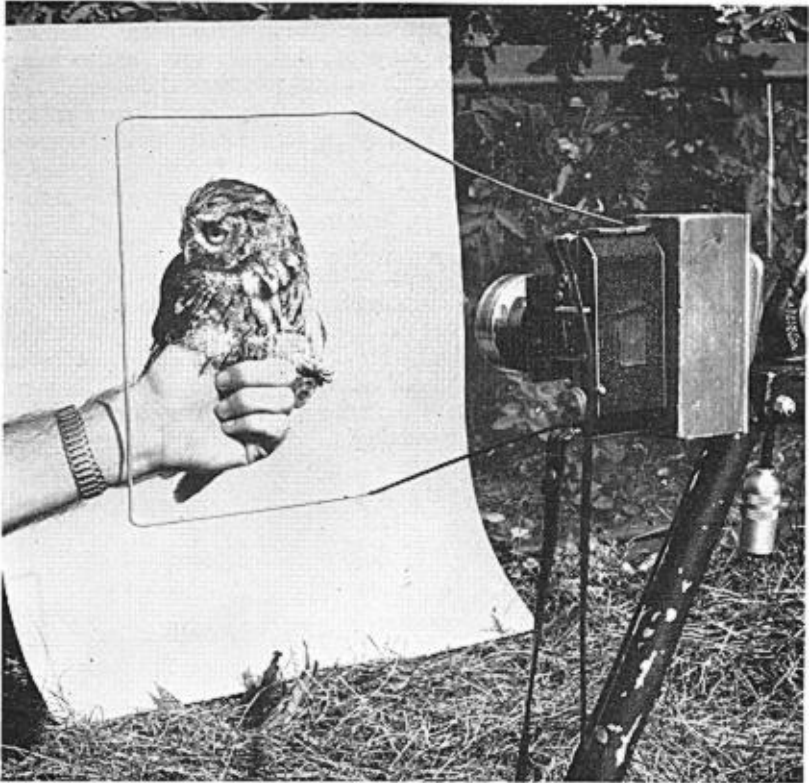


Figure 1. A gray phase Screech Owl being photographed with a Kodak Bantam on a focal frame.

Sales Service Division of the Eastman Kodak Company, Rochester 4, New York.

Everything placed within the focal frame will be recorded on the negative and will be in sharp focus. The size of the vertical, rectangular part of the frame will be determined by your equipment and the limitations imposed by your needs, as the pamphlet explains.

DEPTH OF FIELD

Depth of field is a matter of such critical concern in close-up photography that suggestions are in order here. What is depth of field? Well, you know from experience that when a camera is focused on something, say eight feet away, objects immediately before and behind the subject are also rendered sharply on the negative. The size of this band of sharp focus is known as depth of field.

I believe a 3+ portrait lens is best for securing large images of most land birds; if your work will deal with the larger species, a 2+ or a 1+ will be more suitable. Using a 3+ on a miniature camera with its normal 50-mm. lens, the depth of field is about $2\frac{1}{2}$ inches when the

camera is stopped down to $f/16$ (you will use $f/8$ most of the time) and the subject is 13 inches away. At a subject distance of $10\frac{1}{2}$ inches, depth has fallen to only $1\frac{3}{4}$ inches.

Until a bander has gained proficiency it is wise to get as much depth as possible by using a 3+ portrait lens at 13 inches; this will also yield satisfactorily large images. Later a shorter frame may be constructed and you may even wish to experiment with different strength lenses in combination. Bear in mind, however, that as the focal length of the combination is decreased the depth of field falls off at an accelerated rate.

USING A LARGE CAMERA TO TAKE SMALL PICTURES

I began this work with a Kodak Bantam and a 3+ portrait lens and took many pictures which fulfilled expectations. Nevertheless, images were still a bit too small and there was too much hand showing, so I tried using sheet color film in a $3\frac{1}{4} \times 4\frac{1}{4}$ Speed Graphic. Any camera having ground glass focusing will work just as well. Using a dark slide from one corner of which a quarter section had been cut, I was able to take four pictures on one sheet of film; these could be masked with Bantam size masks and bound in glass to give two-by-two-inch slides. Although this entailed higher cost and more careful focusing because of the decreased depth of field, the advantages gained were substantial. In effect, I was making Bantam size transparencies not with the normal focal length lens of 48-mm. but with a 135-mm. lens; this produced a marked telephoto effect and considerably improved perspective. In addition, the Graphic had a much wider range of shutter speeds, especially the important slow ones.

The reader might wish further details concerning the making of four pictures on one sheet of film. Taking a spare dark slide, I cut a section out of a corner measuring 41×57 mm., which was somewhat larger than the 28×40 mm. Bantam transparency. The ground glass on the camera was then marked off into four areas this size. In use, the camera is focused so that all the desired subject matter falls within one of the rectangular areas drawn on the glass. After inserting a loaded film holder, its dark slide is withdrawn and replaced by the sectioned one in such a way that, when the shutter is tripped, the one-quarter of the film that is exposed will record the chosen material. Before the holder is removed from the camera, the sectional slide must be withdrawn and the regular one inserted.

A record of each exposure is kept by checking off small squares on a piece of gummed paper fastened to the holder. To take the second picture I proceed as before, but the section adjacent to the first is the one to expose (for a reason which will be evident shortly) and this is done by turning the sectioned dark slide over.

It would be convenient if a quarter section could be cut from a second slide at its handle end so that exposures three and four could be made. When this is done, however, the slide will enter the film holder all right, but the light trap interferes with its withdrawal and there is real danger of impairing its light tight property. So, the half-exposed holder must be taken indoors and its film reversed to put

the unexposed area in the position formerly occupied by the exposed half of the negative. This is not as inconvenient as it sounds because pictures of this sort are taken close to home where a darkroom or closet is available.

A portrait lens is not needed with the sectioned slide set-up, but a different, much simpler focal frame must be used; mine measures 8 x 11 inches. It consists of a U-shaped piece of coat hanger wire, the "corners" of the U being right angles. The ends of the U are bent at right angles for a distance of two inches providing enough wire with which to fasten the frame with staples to a board—in a vertical position. The whole affair may then be placed on a box or other convenient support and moved as close to the camera as desired. A piece of newspaper bearing large letters is a good thing to focus on. Focus with the lens opened up to its maximum aperture setting.

Because of the greatly increased distance between the camera and focal frame, a long cable release (12 to 24 inches) is essential. It is well to add here that an absolutely rigid tripod is equally necessary, for whatever merits a picture may possess, it is worthless for our use if it is not in needle-sharp focus.

In my opinion the ideal equipment for photographing birds in the hand is a good 35-mm. camera with a lens having a focal length somewhere between 100 and 135-mm. This permits using the inexpensive 35-mm. color films (which the processors return mounted and ready for projection) and provides large images. As in the press camera and sectional dark slide combination, ground glass or reflex focusing is imperative.

CAMERA SUGGESTIONS

Banders who do not have a camera are advised to purchase a miniature and it is to them that the following remarks concerning 35-mm. versus Bantam film are primarily addressed. The salient advantage of 35-mm. film is its lower price—almost six cents less per shot—which amounts to a large saving if one takes many pictures. Expressed differently, a person can more easily afford to take several photos of the same bird.

Unfortunately, 35-mm. film comes in rolls of 20 and 36 exposures only. If we take all our bird pictures on weekends, and are particular about what is photographed, exposed film may remain in the camera for several weeks. But film manufacturers advise that exposed color film be processed as soon as possible—preferably within 48 hours. There is a way out of this seeming dilemma. For one thing, I have found it wise to get more than one picture of any bird, especially an unusual specimen, that I have taken the time and pains to set up the equipment for. As the photographic "bug" eats deeper and deeper into you it will become abundantly clear that your time is much more valuable than the price of an extra exposure. And frequently it is that second shot which makes the investment of time pay off. In making the second picture try a different pose and, if you have doubts about the exposure, change the aperture setting.

If more than a week passes and unused film remains in the camera,

the unexposed frames may be used profitably on shots of traps, feeding stations, and pictures of yourself banding various birds, all of which might form the basis of an illustrated lecture on bird-banding. Then, too, there are subjects of lasting beauty quite apart from a banding station to challenge your artistry and technique.

Bantam size film, whether black and white or color, is made only by the Eastman Kodak Company, in eight-exposure rolls. Obviously, using up unexposed frames is no problem here. A camera taking this size film is strongly recommended for the bander who intends to photograph only his birds and equipment and an occasional family or nature subject, since a roll can be used conveniently over two weekends.

EXPOSURE

Exposure in color photography is a matter of great importance because deviations from the optimum exposure are glaringly evident in the transparencies. Therefore I urge the use of a reliable photoelectric type exposure meter. Personally, I have found the General Electric DW-68 both inexpensive and especially useful due to its restricted angle of view and the resulting ease with which readings may be taken off small areas of a bird.

The method of metering a bird is similar to reading a scene having a considerable range of colors and contrasts: readings of all important areas are taken and a compromise exposure selected. Suppose one wishes to photograph a Chestnut-sided Warbler. Meter readings might be something like this: breast—20; wings and back—5. Clearly, an exposure based on the lightest area will underexpose the back and wings, thus failing to capture the feather detail, while one based on the lowest reading will so overexpose the breast as to destroy most of the delicate texture. However, a compromise exposure based on the average reading—12—will record dark and light portions satisfactorily. Since the yellow cap is a very small area and its reading (if it could be secured) would fall within the extremes, it is ignored in calculating the compromises.

The example posed above assumes that the bird is to be pictured in profile. What if we want a three-quarter rear view showing more of the bird's back but still having a little of the white side? Our compromise would then have been lower—perhaps 8 or 9. This will yield truer color in the back while not seriously over-exposing the lightest area. In the case of a three-quarter front view, the compromise exposure favors the breast reading.

Needless to say, meter readings must be accurate. Lest this grave admonition frighten the reader, let me say that the technique of using the instrument properly can be mastered quickly and easily by anyone. Hold the bird in full sunlight, taking care that no shadows fall on it. In reading any area, the meter is held a distance equal to the length of that area; even with the largest birds the distance should not exceed six inches.

If the meter is held too far from a subject, light from the background will strike the photoelectric cell and cause an error. Holding the in-

strument too close shuts out the light or casts a shadow, thus giving a reading that is too low. As the meter is brought close to a bird, observe that light readings fall to a certain value and remain at that point while the meter is brought still closer. When the readings begin to fall again, the meter is too close.

Many will find it easier to meter a gray, non-glossy card held in direct sunlight; this will give reliable readings because its tone is just about midway between those of most birds. When snow covers the ground, so much stray light is reflected into the cell as a photographer meters a bird that readings will be far too high resulting, of course, in serious under-exposure. A large gray card is the only alternative.

Even with the most perfect exposure meter in the hands of an expert, satisfactory transparencies are not a certainty unless one takes into account the light-passing properties of the camera and the projector the pictures will be shown with. (Again I ask you not to be dismayed.) Concerning the camera, it is known and honestly admitted by manufacturers that a shutter speed rated at 1/50 is not necessarily 1/50—it may be a bit more or less. What is usually true, however, is that the indicated speeds do actually bear the ratio to each other that their fractional quantities imply. That is to say, the indicated 1/50 is half as fast as the indicated 1/100 and twice as rapid as the indicated 1/25.

Regarding the projector, one should expose color film with the strength of the projection lamp in mind. Transparencies that are beautiful with a 150-watt bulb are usually seriously “washed out” at higher wattages; conversely, color slides which appear underexposed with a weak lamp are satisfactory when a projector having a stronger bulb is used.

These two variables—camera and projector—plus any consistent error in handling the meter may all be compensated for in a single preliminary test. A complete record of all meter readings, shutter speed, and diaphragm opening is kept for each frame on the first roll. For that first roll I urge the novice to employ the “protected exposure” technique of commercial photographers. This involves taking three shots of each subject: one at the calculated exposure, a second at the same shutter speed but one lens stop smaller, and the third with shutter speed still unchanged but the aperture opened up one stop. Most of my close-ups have been taken at $f/6.3$ and 1/50, and for those who lack a meter this is a good basic exposure. When the transparencies are projected, any necessary changes in metering or exposure technique will be apparent.

EXPOSURE RELATED TO DEPTH OF FIELD

A 3+ portrait lens operated at 13 inches will provide sufficient depth of field when the camera lens is stopped down to $f/6.3$ or smaller, and one should strive to use the smallest practical aperture setting. But as we know, exposure time (i.e., shutter speed) must be lengthened as the aperture is decreased; otherwise the transparency will be hopelessly underexposed. Where one ceases to slow down the shutter will depend upon the irritability of the subject. A speed of 1/50 is generally

adequate—faster exposures are almost never used—and 1/25 is often permissible.

Some birds like owls, hawks, and thrushes remain motionless for comparatively long periods thereby allowing a shutter speed as low as 1/10 or even 1/5; the correspondingly small apertures which these slow speeds permit will yield great depth of field.

Many birds ruin pictures by flitting their wings at the click of the shutter. You can determine in advance if a bird will do this:—Place a light tight cap on the lens and proceed as though actually taking a photograph. If the bird does move the tendency may often be corrected by tripping the shutter repeatedly, thus conditioning the bird to the sound.

Obviously this stragem is worthless if your camera is a model whose shutter cannot be released without advancing the film each time. However, you can achieve the same effect by tapping the metal part on the end of the cable release against the camera until the bird no longer responds to the sound.

POSING THE SUBJECT

The manner of posing a bird will depend upon what the photographer wishes to record. Here, too, I might offer some basic suggestions. For most record photos the three-quarter front view is best because it shows important head, breast, or wing markings and conveys an accurate impression of the bird's proportions. Except where it is necessary to show tail as well as bill length, straight profile shots are usually undesirable for they seldom present enough diagnostic breast or abdominal marks while not contributing materially to wing and tail details. Of course, variations from the three-quarter front view are in order depending upon what aspect the bander wishes to emphasize. Unless one is trying for special effects, direct head-on pictures are most disappointing in that perspective is very bad and little of the bird is shown.

The attractiveness of your pictures can be increased measurably by taking care in locating the bird within the focal frame. A first rule of composition requires that the center of interest be located in some area which is not in the geometrical center of the picture. Furthermore, the object photographed gains added interest if the greater part of its image falls to one side of the midline of the picture. Due to the shape of birds this problem tends to solve itself when images are large, but it deserves attention with small images.

In almost every straight record picture the bird will be looking directly forward or nearly so; keeping in mind another elementary rule of composition will enhance your results. Hold a bird in the focal frame in such a way that the space between the tail and the side of the frame nearest to it will be slightly less than the distance between the bird's head and the opposite side of the frame. This will give the bird some space to "look into" and will avoid the illusion of its fleeing from the picture.

From an artistic point of view one of the most difficult problems in bird photography is securing a catch light in the bird's eye—that tiny



Figure 2. Gray phase Screech Owl photographed at 13 inches with a 3+ portrait lens on a Kodak Bantam mounted on a focal frame. The scratch on the middle finger was made by the owl.

bright spot which above all else instills life in the subject. Try to orient the bird before the camera so that a catch light appears.

Since part of one's hand must necessarily appear close-up in each picture, clean hands and well-cared-for fingernails will help minimize their presence. Owing to the fact that exposures are based on light reflected from the birds, flesh tones may be too light ("washed out") in the case of a very dark specimen or abnormally dark when the bird

is light in tone. Though this cannot be avoided, the poor impression it creates can be reduced by holding the bird low in the focal frame so that a minimum of hand appears. As in Figure 2, grasp the subject by the tibiae (rather than the tarsi) to prevent any injury that might result from its struggles. With most small birds the feet can be tucked behind your fingers and the individual will appear to be crouching on your hand.

A carefully chosen background improves any photograph, particularly a color transparency. A cardinal rule is to keep it simple and evenly lighted so that its presence complements a subject while it itself remains unnoticed. My experience indicates that a thick hedge or well-kept lawn in full sunlight is excellent. Holding a bird about three feet in front of the background throws it out of focus yielding a soft backdrop against which the crisp image of the bird stands out clearly.

To obtain a very pleasing although unnatural background, use colored paper or cardboard having a soft surface. It may be mounted in a rigid frame or merely propped up against something as in Figure 1. Be careful that no shadows fall on that part which will form the actual background for the picture.

By all means avoid any foliage background through which spots or pieces of sky may be seen—they will be seriously out of focus on the transparency and produce a confusion of blobs of light which is most disturbing to the eye.

Sharp images, which we agree are essential, can be assured if certain considerations are borne in mind. It is plain that a tripod is indispensable in this work; it should be a very rigid one. Often a shaky tripod can be made more steady by weighting it with a heavy stone tied to its head but resting lightly on the ground. A cable shutter release should be used in place of the device built into the camera in order to eliminate the danger of jarring the instrument while making an exposure, especially a hasty one.

The focusing will be greatly simplified by the focal frame; however, even the short focus miniature lens has a shallow depth of field when operated so close to the subject and part of the bird may be out of focus unless it is placed carefully within the frame. Remembering that a lens distributes its depth of field so that one-third falls in front of the *point* focused on while the remaining two-thirds lie behind, hold a bird so very little is closer to the lens than the plane of the focal frame.

CONCLUSION

Throughout this paper there has been an emphasis on the use of color film. Having secured a sharp, properly exposed transparency the bander has on hand the material for an illustration in black and white as well as in color, for black and white negatives are easily made from color transparencies. Since color film is practically grainless, all or part of a transparency may be projected onto a black and white emulsion which can then be further enlarged to yield a print many times the size of the original colored image. Many of the larger photographic houses provide this service. A description of the method is

beyond my present aim, yet it is simple and the person who does his own black and white processing will want to try his hand at this, too.

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GENERAL NOTES

Extreme Old Age in Terns.—In *Bird-Banding*, 22: 179 (October, 1951) Dr. Oliver L. Austin, Sr., reported an Arctic Tern, *Sterna paradisaea* Brunnich, banded A-365164 as an adult at Pamet Point, Truro, Mass., on June 25, 1929, by O. L. Austin, Jr., and found recently dead at Tern Island, Chatham, Mass., on July 13, 1951. It was at least 23 years old, probably more, and was felt to be the oldest individual tern (of any species) known to date.

However, Dr. Rudolph Drost has called my attention to a note in *Die Vogelwarte*, 15: 39, of an Arctic Tern banded as a chick in 1920 with a band of the Ornithological Research Station "Vogelwarte Helgoland," on a small island at the mouth of the Elbe River in Germany, and found dead (killed by a cat) near its nest on another island about 20 km. away, in 1947. Dr. Drost believes that this is the oldest recorded individual of any species, in the wild.

Further correspondence brought details of two tern records of great interest, not published previously. It appears that the oldest known banded bird in North America is a Caspian Tern, *Hydroprogne caspia imperator* (Coues), number 378622, banded as a juvenile on July 19, 1925, by Frederick C. Lincoln on Little Hat Island in Lake Michigan, 16 miles east of St. James, Michigan. This bird was taken for a scientific specimen on August 9, 1951, by Frank J. Ligas at North Bass Island in Lake Erie, Ottawa County, Ohio, at the age of 26 years.

A Least Tern, *Sterna a. antillarum* (Lesson), number 518547, banded as a fledgling by O. L. Austin, Jr., on July 15, 1929, at Poponesset Point, Cotuit, Mass., was reported as found dead on July 9, 1950, at Sampson's Island, Cotuit, Mass., within a mile of the place of banding. The band was sent in by the finder. While a number of older terns of other species are on record, this is believed to be the oldest Least Tern. The O. L. Austin Ornithological Research Station has in all probability banded 4,000 terns of other species on Cape Cod for every Least Tern banded.

Under the ringing scheme of the British Trust for Ornithology, the oldest Arctic Tern known is one banded on July 2, 1934, on the Farne Islands, Northumberland, and recovered there on June 12, 1950. However, the oldest known British tern of any species is a Sandwich Tern, *Sterna sandvicensis* Latham, just over 16 years old. It was banded on July 18, 1931, at Strangford Lough, County Down, Northern Ireland, as a young bird, and recovered dead at Addah, Gold Coast, on October 19, 1947.

By way of comparison, there is a record of a Herring Gull, *Larus argentatus* Pontoppidan, almost 26 years old in Germany (note in *Vogelzug*, 6:134, 1935). The oldest bird known under the British ringing scheme is a Black-headed Gull, *Larus ridibundus* Linnaeus, banded on June 13, 1910, and recovered in May, 1930.

It has not been possible to make an exhaustive check for the oldest birds known under other banding schemes, and I should be grateful for details of any individuals older than Dr. Drost's Arctic Tern.

I am indebted to Dr. Drost for calling this tern to our attention; to Drs. Ernst Schüz and R. Kuhk of Vogelwarte Radolfzell for writing us about this tern and the Herring Gull record; to Mr. Lincoln (now Assistant to the Director, U. S. Fish