

# avian photography

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An image on a photograph can be only as good as the lens on the camera. Perhaps a better understanding of the camera lens and other associated factors would be a help when deciding which lens to buy.

A good working knowledge of *Focal Lengths* of lenses is necessary to avoid making mistakes when selecting the proper lens. To begin with, *One Focal Length* is the distance from subject to film when the subject is very distant and the lens focused sharply. Another term for this is infinity focus, and is the closest distance possible between lens and image. If we come any closer there is no image at all, and to focus on subjects closer to the camera than infinity, the lens-to-film distance must be extended. The concept of focal lengths is difficult to grasp and I have tried to explain it very basically. Those of you who wish to go deeper into this concept can do so with any physics book that describes the laws of optics.

The focal length determines image scale, picture angle and depth-of-field. The longer the focal length, the bigger the image and the narrower the angle of the field (the entire picture area that the camera lens can see). The shorter the focal length the broader the angle of the field but the smaller the image. In 35 mm photography normal focus (standard focus) lenses range from 50 to 58 mm. The film format is 24 x 36 mm and the diagonal of the frame is 43.2 mm. The 50 mm focal length covers a field of 47 degrees. By comparison the medium format camera lenses (6x6 or 2 1/4 square) have a diagonal

of 79 mm and at its normal lens format (focal length of 75 or 80 mm) covers a field of 56 degrees. The normal format of a 6x6 would be wide angle for a 35 mm lens.

Longer lenses for 35 mm cameras fall into two general groupings, medium telephotos with focal lengths from about 85 to 180 mm and extreme telephotos that range from 200 to 2000 mm.

The following are examples focal length to angular field relationships.

focal length	angular field
85 mm	29 degrees
135	18
200	12
500	5

**Additional Information:** The longer the lens, the bigger the image size and the greater the danger of freehand camera shake. From the same subject distance a 100 mm lens will give twice the image size of a 50 mm lens. One of the good rules of thumb for estimating the longest exposure times that are likely to be steadily hand-holdable is to divide the focal length by two. Example: 1/25 of a second for a 50 mm lens and 1/250 for a 500 mm lens.

It is now time to discuss briefly *Depth-of-Field*. Many people have trouble with this concept and it should therefore be as simply stated as possible. Depth-of-field is that part of the picture that is in focus. So many inches or feet in front of the subject and so many inches or feet behind the subject are in focus when the subject is in focus. All other parts of the picture are blurred, and these blurry portions of the

photograph are not part of the depth-of-field. It is important to understand depth-of-field when doing any type of photographic work since all lenses have depth-of-field scales and picture composition depends on depth-of-field.

The *F Stop Numbers* are a series of internationally accepted units that express the lens speed. Lens speed is the light-transmitting or exposure capability of a lens.

The focal length of the lens divided by the effective diameter of its free aperture is the calculated f-stop. Example: An f/2 for a 50 mm lens with an aperture opening of 25 mm. An f/4 is an aperture whose diameter is 1/4 of the focal length and an f/16 is 1/16 of the focal length etc.

As we have just calculated the bigger the diameter or opening of the aperture the smaller the f/stop number. Refer to the following table where we will assign a dose of light to each opening. F/16 will begin the table with a light dose of one unit.

f-stop nr	f/16	f/11	f/8	f/5.6	f/4	f/2.8
light dose	1	2	4	8	16	32

We can see from the table that each f-stop number passes half as much light as the next smaller opening and twice as much light as the next larger one.

Remember that when you are trying to decide which lens to buy just keep in mind what type of photography you will be doing (close-up or long distant shooting) and most probably you will have very little difficulty.

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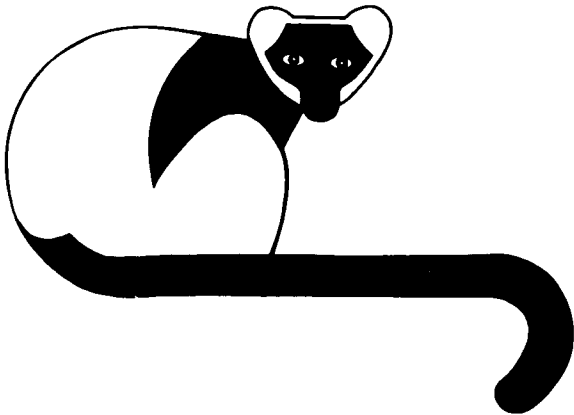
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