

ALL ABOUT BINOCULARS

Image: 4theBirds/Shutterstock

Hi, I'm Kevin McGowan! I'm an ornithologist and course instructor here at the Cornell Lab of Ornithology. As you probably already know, binoculars are the most important tool for watching birds. But no one is born knowing how to use them. I'm here to help you understand the basics of how to fit, adjust, and use binoculars to look at birds, and to introduce some other tools that people might use as well.



Dr. Kevin J. McGowan

Getting Started

One of the great joys of birding is seeing birds clearly through binoculars. Here are a few tips how to set them up and a couple of ways to use them.

If you are picking up binoculars for the first time, there are a couple things you might want to think about before you even look at a bird. First, check to make sure that the distance between the barrels lines up with your eyes. You're shooting for one circular image when you look through the lenses.

Next, take a look at the eyecups. If you are wearing glasses, you'll want the eyecups rolled down. If you don't wear glasses, keep them rolled up.

One last thing that can cause trouble, is the diopter. It's a feature to help compensate for the differences between your eyes, but if it's not set correctly you're not going to get the clear view you are looking for. Find the diopter adjustment, usually near the right eyecup—You can either make sure it's in the center, or set it for your eyes.

Set the diopter by covering the right eye and turning the focus wheel so that your left eye is focused on a fixed object. Make sure it's nice and sharp. Then cover your left eye and look at the same object through the right eye. If it's not sharp adjust the right eye diopter accordingly. And you're set!

From that point forward, you will not need to make this adjustment again, but make note of where you set it in case it gets moved out of place.

When you spot a bird, keep looking at it and lift the binoculars to your eyes. Then turn the focus wheel until the image becomes clear. It's not a bad idea to practice this a few times even if you aren't looking at a bird.

Scanning is another great way to find birds. Even if you don't already see a bird, you can use your binoculars to help.

Let's say you are searching a lake for water birds. Lift your binoculars and focus them on the horizon or the far side of the lake. Then slowly pan across the landscape. But be ready for the unexpected bird to pop up. You want to be able to dial that focus in quickly and enjoy the view.

A good pair of binoculars is your most important tool for spotting birds, so find a pair you like and take them with you on your next adventure.



Image: Marilu Lopez Fretts/Celebrate Urban Birds

How to Fit Binoculars to Your Eyes

Step 1: Adjust the eyecups (down if you wear glasses; up if you don't).

Step 2: Squeeze the barrels together and spread them apart. You need to get them adjusted to the width of your eyes. Find the distance where you see a single image with no black areas.

Step 3: With your right eye closed, adjust the focus. Focus on something by turning the central wheel between the two barrels.

Step 4: With your left eye closed, adjust the diopter correction wheel (usually near where you look into your binoculars with your right eye) to correct for any differences in your eyes.

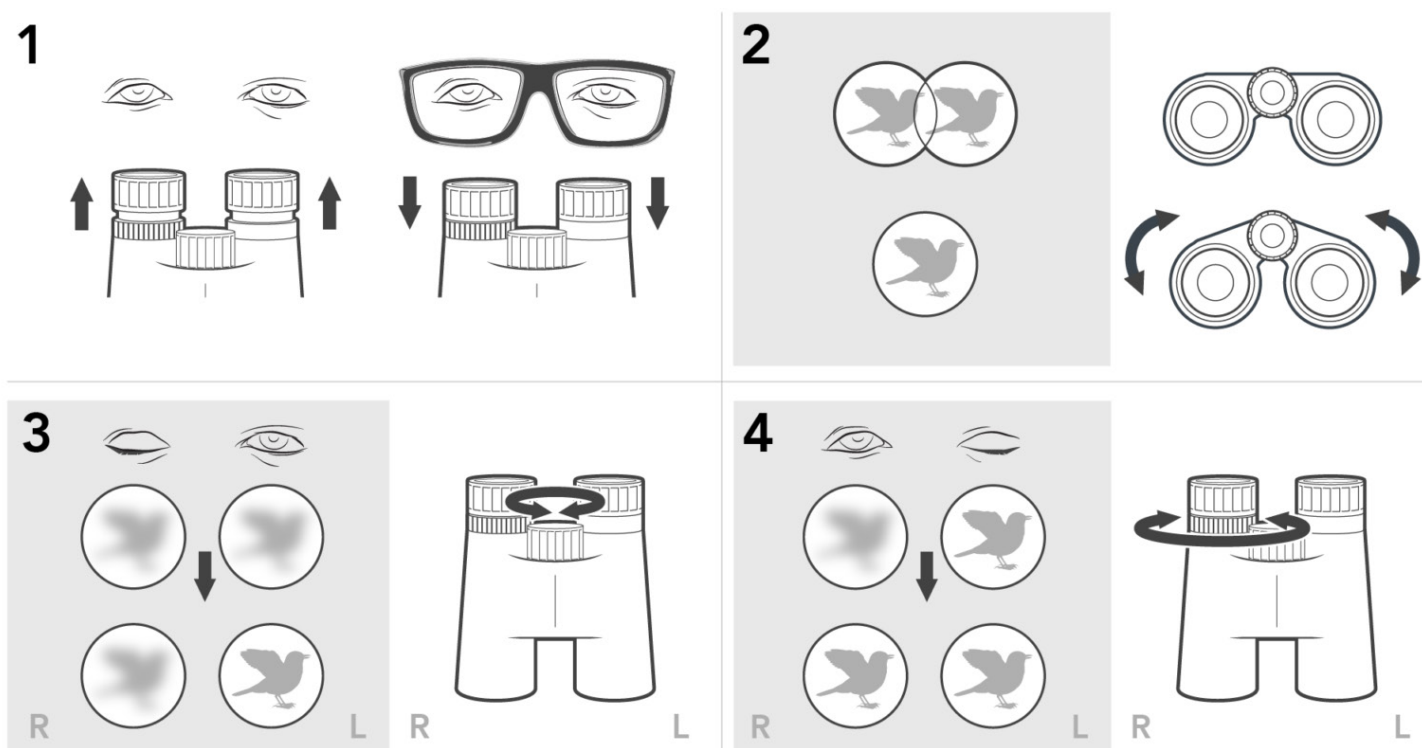


Image: Jeff Szuc

Binocular-borrowing Etiquette

If I quickly lend you my binoculars to see a bird, I expect you to squeeze the barrels together and to change the focus. You have to do that! You couldn't see anything if you didn't. Don't be shy about doing these things. I also figure you're going to pull up the eyecups if you don't wear glasses (I do). But I would be surprised if you changed the diopter adjustment without asking. If I was lending you a pair of binoculars for an extended period of time, say for an entire bird walk or field trip, then I would figure you would adjust everything, including the diopter correction.

How to Find a Bird in Binoculars

After you have adjusted your binoculars to fit your eyes, you are ready to look at things (birds!) through them. But it's not always easy to find birds in binoculars. The simplest way to do it is to find a bird or other object of interest with your bare eyes. Stare at it. While you're staring at it, raise your binoculars with both hands and move them between your eyes and the bird. Look at the bird through the binoculars and adjust the focus wheel to get the image sharp. Don't look at the binoculars, just get them up to your eyes while you're still keeping your eyes on the bird.

It can also be helpful to look for a landmark near your bird, like the tree trunk or an odd-shaped branch. Then, if you don't land on your bird at first, you can find the landmark and use it to locate your bird. If finding a moving bird is too challenging at first, practice on a still object, like a tree or a bird feeder. Some birds are rarely still, like warblers, but slower-moving birds like waterbirds and crows are good for beginners. Using binoculars with ease takes practice. But, it's a little bit like driving a car; once you get it down, it becomes second nature.

In most situations, trying to find birds by looking through your binoculars first and then scanning around is just not going to work. Scanning is, however, a useful technique for finding birds in places like a pond, mudflat, or beach. Focus your binoculars on the far side of the pond at one end and slowly scan to the other end, watching for birds along the way. Be ready to adjust your focus to look at something in the middle of the pond or on the far side. If I'm birding with a companion and they start scanning first from the right side, I will start at the left end. That way, we have a better chance of finding any obvious "good" bird quickly before it has a chance to fly away.



Troubleshooting Your Binoculars

I look inside my binoculars and all I see is black! Try moving the barrels closer or farther away from each other.

It looks foggy when I look through my binoculars. If there's condensation on your lenses, you can gently wipe them clean with a lens cloth (or a sleeve if you're in a real pinch). But be careful with your lenses!

Oh no, I think I see a scratch on my lens! A scratch is only a problem if you're noticing an issue with the image quality. One of my favorite pairs of binoculars has a visible scratch on the right lens, but to my eyes they still work just fine. But if you're noticing you can't get a nice clear image in that eye, it may be time to repair or replace your binoculars.

The image in my binoculars looks different in my left eye than in my right eye, like it's in two different places. Your binoculars may be out of alignment, meaning your lenses are magnifying two slightly different fields of view. This can usually be fixed, but it should be done by a professional.

Looking through binoculars gives me a headache. It sounds like your binoculars are giving you eye strain, which is usually the result of your brain trying to make the images from your two different eyes match up with one another. Eye strain can be relieved by adjusting the diopter. It might also be caused by a scratch on the lens, or your lenses could be out of alignment.





What the Numbers Mean

There are two numbers that are used to describe the main optics of binoculars: magnification, and lens diameter.

Magnification means how much bigger a bird appears when you look through your binoculars. The bigger the number, the bigger the magnification. A magnification of 8 means the bird looks 8 times bigger than it would with the naked eye. Almost all binoculars are 8x or 10x magnification.

Lens diameter is the size of the lenses at the front of your binoculars. The bigger the number, the bigger the lens diameter. The bigger the lenses, the more light that can come through the binoculars. More light is helpful if you are in a low-light setting, like early dawn or in deep woods. The higher the magnification, the lower the light-gathering ability, and the narrower the field of view. My rule of thumb is a factor of 5 or greater between magnification and lens diameter. Divide the lens diameter by the magnification, and if the result is less than 5, the image will be slightly dark. If it is at least 5, the binocular will be brighter.

These numbers are usually expressed as (magnification)x(lens diameter). So, my 8×42 binoculars have an 8x magnification, with 42mm lenses. 42 divided by 8 is 5.25, so the images in these binoculars are bright.

Choosing a Pair of Binoculars

Everybody has different preferences when it comes to their favorite binoculars, but there are a few main points to consider when weighing your options:

Price: As soon as you start shopping for binoculars, you'll find you can spend anywhere from under \$100 to well over \$1000. In general, very inexpensive binoculars won't be very good, but once you get up into the \$200-300 range, there are lots of very good options for the beginning birdwatcher.

Size: Some binoculars are very small and meant for taking on a hike, while others are much more substantial and best suited for less meandering birding. In general, larger binoculars will have more optical power (brighter and higher resolution), but you may be willing to sacrifice that if a smaller pair is important to you. I happen to like mid-size to large binoculars, even if I'm going out on a long hike to look for birds. But that's because I prefer the best image I can get, and I don't mind carrying large binoculars (I wear a harness). Some larger binoculars may be too big for people with small hands, or whose eyes are fairly close together.

Weight: One factor that often makes binoculars less expensive is providing performance at a lighter weight. Larger lenses will generally increase the weight of binoculars, so you'll need to decide how heavy is too heavy if you're going for bigger lenses.

Clarity/crispness: Image quality is huge when it comes to identifying birds. Binoculars with smaller lenses and lower quality optics will have less crisp images, making color and pattern difficult to discern on your target bird. But that doesn't mean you need the most expensive binoculars on the market! Lots of mid-range binoculars are perfectly adequate for beginning, and even more seasoned, birders.



Magnification and lens diameter: We discussed these in the previous section, but these two factors can make a big difference when choosing binoculars. Buy a pair of binoculars that you will take with you. The best binoculars in the world that you leave at home or in the hotel are worse than a poor pair of binoculars you actually take with you. Get a pair that is right for your lifestyle.

There's really no substitute for trying out different pairs of binoculars. If you can, try some out at a store, or borrow a couple of different pairs from friends. Binoculars are an investment, so you want to get ones that work well for you.

How to Care for Your Binoculars

Remember that your binoculars are a piece of optical equipment. Too much rough handling and jostling can throw the lenses out of whack and make them pretty useless. But binoculars are field equipment and meant to put up with a bit of rough handling, so don't worry about being ultra careful with them.

The most important thing you can do, or rather not do, is not touch the lenses! If you seriously scratch the lens, that's difficult or impossible (or not worth it) to repair. That also means keeping other objects from scratching your lenses. When you can, cap your lenses, especially if you're putting them inside a bag without their case.

If your lenses get dirty, first blow away any dust or debris you can, then you can wipe them gently with a lens cloth. Be gentle, and be sure the cloth itself is pretty clean. What you want to avoid is scratching the lens with bits of dirt. People who spend a lot of time birding in a dry, dusty environment might find this particularly challenging; just be careful when you clean your lenses.

When you are done using your binoculars for the time being, put the lens caps back on, and put the pair inside its case if you have it available.



There's Much More to Learn!

Bird Academy's self-paced, online course [Joy of Birdwatching](#) is designed to help beginners get going and learning how to appreciate birds. Whether you're interested in learning to identify the different kinds of birds you see or if you want to find out more about what they're doing, this course will help you learn how to go about it.

The course describes interesting things birds do and places they live. It will help you learn to keep track of the birds you've seen and how to share your sightings. Who knows? Your observations might just help conserve birds around the world.



Photo: Arvo Poolar

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