

Birds of the
[Flocks and Rocks 2018 Trek to Southeastern Arizona](#)

May 19-27, 2018

Part 2. Bird Lists

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Many range changes, almost all for the good, have occurred since I lived in the Chiricahuas in the 1970s. Most recently, Tufted Flycatcher and Slate-throated Redstart seem to be in the process of establishing themselves. A Pine Flycatcher nested unsuccessfully in 2016, so that is a wait-and-see situation. Such range expansions are probably happening everywhere, but they are especially likely to be noticed in southeastern Arizona, because the birds are moving from Mexico into the United States. That makes them newly “countable” according to the listing rules of the [American Birding Association](#) (ABA), and hundreds of resident birders search the deserts, canyons, and mountainsides for new arrivals on a daily basis.

This close scrutiny of new arrivals, and widespread reporting of all observations on [eBird.org](#), is contributing to scientific understanding of range expansion. Birding-based observations contribute to the hypothesis that range expansions may be led by females, and that hybridization may be a natural part of the early stages of the phenomenon. Perhaps we will be lucky enough to see a female Slate-throated Redstart in Pinery Canyon, where one bred successfully in 2017, probably with a genetic contribution from a local male Painted Redstart.

So, what do the efforts of Arizona birders tell us? A lot! I’ve prepared some spreadsheets from eBird data that tell us what to expect of the birds on our trek. First I’ll explain the sheets, then I’ll explain how I produced them, should you be interested.

The excel file is [FR2018AZbarcharts.xlsx](#). If you click the link, you can download it to your computer and open it with a spreadsheet application. It has 6 tabs.

PhyloTable presents 238 species in standard (official!) phylogenetic order. This is roughly the order in which the species appear in field guides. The 238 are species we have at least a 1% chance of encountering. Columns C through M cover the 11 general localities in which we will spend some time looking and listening for birds. (See the [detailed itinerary](#) for a description of the localities.) Below the locality-names are the days we will be there. Each cell contains the probability of encountering that species at that locality in late May. Column N is the probability of encountering the species at least once on the trip. The colors designate quartiles. Bright yellow is for 100% - 76%, Light Yellow for 75% - 51%, Faint Yellow for 50% - 26%, and white for 25% and below. As you see, many species have little chance of being seen, so...

MostLikely presents the same information as PhyloTable, sorted in descending order of column N. As you see, not only are we almost certain to see White-winged Dove, House Finch, and Turkey Vulture, we have 80% chances of seeing things as esoteric as Greater Pewee and Arizona Woodpecker. It will be fun to see how far we go down on that list without missing a species. Our chances of reaching each row without a miss are given in column O.

MostLikelyBySite is sorted by locality, in column A. Within site, the species (column B) are sorted by decreasing values of column I, which is the probability of encountering the species in that locality. This table is restricted to probabilities > .25, and so shows what you are most likely to see at each site. Pink designates > 50%, green is 26%-50%.

BestPlaceToSee returns to the big list of 238 species and lists for each species the place we are most likely to see it. If you have to have a Buff-collared Nightjar, our best shot is at Arivaca. But we won't be there at night, so you can just give up on that one right now. [secret: I plan to search for this bird after our trek is over.]

#GoodSites tabulates the number of columns from the master list in which the probability is > .25. It gives you a different dimension of abundance. I'm predicting we will encounter a Turkey Vulture on the trip.

LMSW4 and **Pivot** tabs are the raw data and pivot table derived from them. I won't be referring to these tabs.

Now, how did I come up with these numbers? The raw data were contributed by fellow birders who submitted complete checklists to eBird.org. The good folks at eBird, which is a project of [the Cornell Laboratory of Ornithology](#), have redirected the list-making tendencies of birders into the largest natural history data base in the history of the earth, half a billion observations of bird species from around the world. And their computer whizzes have produced some very powerful tools, most of which execute in a second or two.

I have generated "bar charts" from eBird data (see below for example) for each of the locations we will visit. The thickness of the bar on the Y-axis represents the probability of encountering the species. The X-axis depicts the span of a calendar year. An eBird user can choose the locations whose data go into the assembly of a bar chart, and the website generates the graph in real time. Links to bar charts for some of the places we will visit are below.



Figure 1. An eBird bar chart.

Links to some bar charts. These are not exactly the same as the localities I used for the spreadsheets.

[Arivaca Cienega and Creek](#)

[Patagonia, Sonoita Creek Area](#)

[Huachuca Mountains](#)

[Chiricahua Mountains](#)

[Huachuca Canyons \(Carr, Miller, Ramsey\)](#)

The time units of the X-axis are months and quarter-months (approximately a week). The raw data are probabilities of encountering the species during that quarter-month, calculated as the proportion of all complete eBird lists, for that time period, on which the target species occurs. Once a custom bar chart has been built on the eBird screen, the raw probabilities may be downloaded as a text file that is formatted for importation into Excel. I have prepared Excel spreadsheets for eleven sites we will visit, so we will have an idea of what to expect.

After exploring the data a little, I decided the best estimate of our probability of encountering a given species at a given location during the second half of May was a weighted average of the data as follows: $.25 * \text{first half of May} + .50 * \text{second half of May} + .25 * \text{first half of June}$. I calculated this probability for each species at each site and placed the results in the master spreadsheet (PhyloTable). If the cell is blank, the species has never been reported to eBird in that area in that 1.5 month period. The columns are arranged from left to right according to the order in which we will visit those locations. The overall likelihood of encountering the species (ProbSeeOnce), following probability theory, is $1 - \text{the product of the probabilities of missing the species at each location}$. As you see, we are “certain” to see quite a few species, ... if we go to all the sites on the itinerary and pay attention to the birds we encounter. On the other hand, many of the species at the bottom of the MostLikely list rarely come to southeastern Arizona, and our chances of seeing them are close to nil. It will be fun, however, to see how close to the bottom of the list our most unlikely species is.

This approach may be too numerical for some, so I have also assembled two simpler lists of bird species we are likely to encounter. One gives the single location at which each species is most likely to be seen. I will focus on finding each species at its “best” location. This information is of course embedded in the master list, as is the second synopsis. It gives the number of sites at which the probability of encountering the species is greater than 25% (0.25). This gives you an idea of how widely distributed a species is.

So, there it is. Get a field guide for the western half of the country, or a continent-wide treatment, and start learning the most common species. I recommend the Sibley guides, but even the old Golden Guide to North America will work, visually. A smart phone app is probably indispensable, though, for the simple reason that the official English names as well as the scientific names are being revised every year as more information comes in on the genealogy of the birds, known as phylogenetics. The older the book, the more obsolete names it contains. I will be using the 2017 names; the next change doesn't come until July 2018, after we are safely home. I have checked out Sibley's app and the Audubon app. Both have 2017 names, the latest available. The Sibley app of course is the industry standard, but in a brief review I found the Audubon app quite good. It is free, while Sibley costs \$19.95. [note added after Trek: iBird App also looks good. It has more sound clips than Sibley.]