

NESTWATCH DIGEST

NESTING SEASON 2022

The Cornell Lab of Ornithology



A Historic Year!

Welcome to our annual report in which we celebrate the accomplishments made possible by NestWatchers who participated in 2022. Last year, we received 32,077 nest attempts from 36 countries. We also fulfilled seven external requests for data, and welcomed seven new chapters to our global community. Additionally, we uploaded 75,227 nest records from our historic North American Nest Record Card Program, which were digitized via the Zooniverse platform (see pages 4-5 for details). We further uploaded a total of 3,596 nest records in addition to the Nest Record Cards in our ongoing efforts to capture vulnerable datasets. Three scientific papers were published using NestWatch data in 2022 (see page 14 for a summary of one of them).

In this report you will find regional data highlights for the 2022 breeding season, interesting observations from NestWatchers like you, and new stories from our staff. We hope you enjoy this retrospective on the 2022 season, and we invite you to share this report with friends and family who might be interested in joining us for the current 2023 nesting season. As always, we appreciate the efforts and contributions of our dedicated NestWatchers who make this long-term research project so valuable to science.

With gratitude,



Robyn Bailey
NestWatch Project Leader

COVER: AMERICAN ROBINS BY ANGELA WILKINS; BELOW: BARROW'S GOLDENEYES BY SUSAN GOWER

BEWICK'S WREN BY JULIE BREKKE



Focus on Citizen Science is a publication highlighting the contributions of citizen scientists. This issue, *NestWatch Digest*, is brought to you by NestWatch, a research and education project of the Cornell Lab of Ornithology. The NestWatch project is made possible by the efforts and support of thousands of citizen scientists. This document has accessibility features for those with visual impairments; for assistance contact nestwatch@cornell.edu.

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Join NestWatch!

Anyone, anywhere, who finds a nest is welcome to join. Help scientists monitor nesting birds while you support bird conservation in your own community. To join, visit [NestWatch.org](https://www.nestwatch.org) and get certified as a nest monitor. Certification is free and ensures that nest monitoring activities follow our code of conduct designed to protect birds and their nests.

The **Cornell** Lab of Ornithology

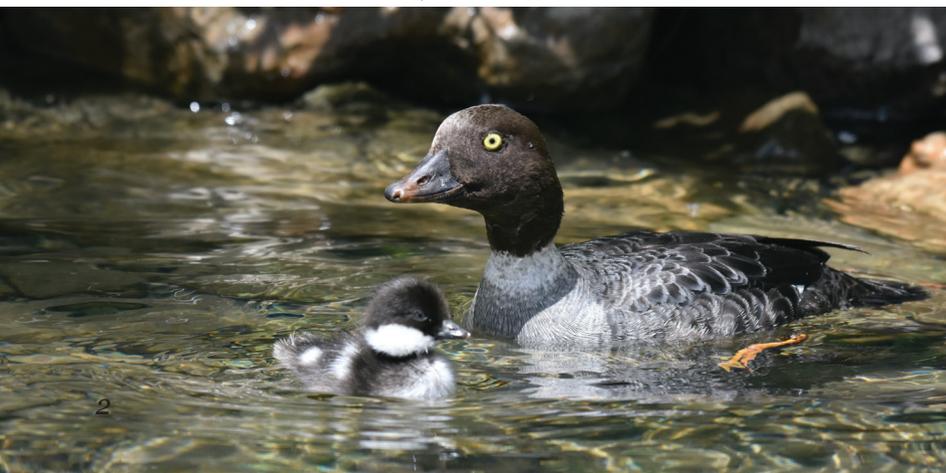
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Canyon Wrens Do Use Nest Boxes

BY ROBYN BAILEY, NESTWATCH PROJECT LEADER

In 2022, a researcher contacted me to ask if we had any records of Canyon Wrens using nest boxes. I wasn't sure, so I searched the database to answer this question. It turned out that of our 32 total Canyon Wren attempts, NestWatch has 26 coded as "nest box" sites, all from Colorado or Texas. There are 15 unique sites, meaning some boxes were used more than once. These have been submitted by just five different participants, so you could literally count them all on one hand.

Jo Roberts has submitted the most records for Canyon Wren in a nest box, along with photos. Jo says that her neighbor gave her the idea for creating a nest box for Canyon Wrens, having attracted them with an unconventional nest box design. Unfortunately, the neighbor did not submit to NestWatch and has since moved away. We are lucky that Jo replicated that success and has contributed the data to NestWatch so we could answer the researcher's question.



Four recently-hatched nestlings huddle in their homemade nest box.

Jo attributes the success of her unconventional nest boxes to placement. She has had luck attracting Canyon Wrens when the boxes are on or near the house, but not when they are out in the scrub. In fact, Jo cannot leave the household doors open without a Canyon Wren inevitably venturing inside. If you're looking to give it a try, consider placing your "Canyon Wren nest box" under the eaves of a building in the appropriate habitat (arid lands with steep slopes in western states from southern British Columbia to southern Mexico). Be sure to report any nesting activity to NestWatch, and try to include photos where possible. ●



This DIY nest box has successfully sheltered numerous broods of Canyon Wrens.



Jo Roberts of Edwards County, Texas, has provided several photos of Canyon Wrens using nest boxes on her property. While the box in this photo was inspected, this pair was ultimately chased away from the box by a Scott's Oriole nesting nearby.

Nest Quest Go!

By the numbers

BY BECCA RODOMSKY-BISH, NEST QUEST GO! PROJECT LEADER

The Nest Quest Go! project endeavors to digitize, transcribe, and integrate hundreds of thousands of historical nest records from the North American Nest Record Card collection into the NestWatch database. Nest Quest Go! uses the Zooniverse platform to crowdsource nest record card transcription, and we organize these cards into individual projects.

The successes of Nest Quest Go! have snowballed this past year! In 2022, we finished scanning all 290,863 nest cards with viable data. These digital images of the cards are now uploaded into Zooniverse. Of

SUMMER TANNAGERS BY JILL PRIVETT



The Tanagers project was one of the 25 Nest Quest Go! datasets that were uploaded to the NestWatch database in 2022.

those cards, only 100,532 still need to be transcribed. At our current rate, we anticipate this will happen by 2025.

Perhaps the most exciting news is we added 75,227 nest attempts for almost 100 species into the NestWatch database (see graphic below). These historical data can now be accessed by researchers. We look forward to seeing how these records expand our understanding of birds over the past 60 years. Let's keep the snowball rolling and perhaps we'll wrap up this work earlier than 2025! Log into [Zooniverse](#) to be a part of this historic endeavor.

Nest Quest Go! Progress

Last year we were able to upload data from 25 Nest Quest Go! projects to the NestWatch database. These data—now available to researchers—represent more than a quarter of our total of 290,863 nest record cards!

Top 10 Largest Datasets Uploaded



Sparrows



Mourning Doves



Mimics



Raptors



Warblers



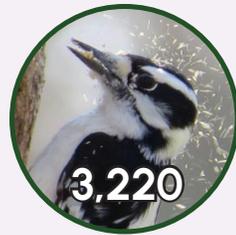
Starlings & House Sparrows



Northern Cardinals & Pyrrhuloxia



Night Birds



Woodpeckers



Mountain Bluebirds

...with many more to be added in 2023!

CHIPPING SPARROW BY BRENDA BULL, MOURNING DOVE BY JOEY JOHNSON, NORTHERN MOCKINGBIRD BY SUJATA ROY, BALD EAGLE BY KELLY MARTIN, YELLOW WARBLER BY MICHAEL HAYES, EUROPEAN STARLING BY GALE ULSAMER, NORTHERN CARDINAL BY DEBORAH BIFULCO, NORTHERN SAW-WHET OWL BY JANET BAUER, DOWNY WOODPECKER BY CHESNA DUFFY ADAMS, MOUNTAIN BLUEBIRD BY MARK FULLER.

Nest Quest GO!

Good Words

“I find it's a joy, a great way to relax, and a fabulous way to learn about different species of birds. I recognize the same observers across various bird species. I spot their handwriting & style and they have become like good friends. The earliest card that I've transcribed was from 1919!”

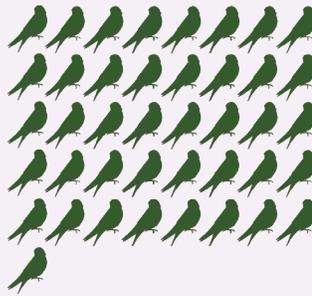
-Faye Nennig, Zooniverse transcriber



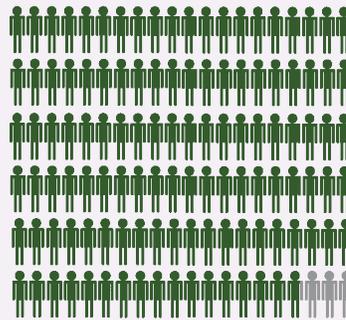
VIOLET-GREEN SWALLOW BY CHRISTINE HAINES

Transcription Progress 2019 - 2022

41 projects launched in Zooniverse



11,673 people transcribed data



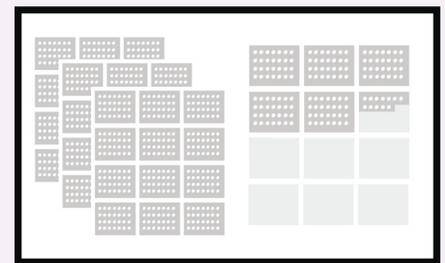
= 100 people

1,258 days of transcription



&

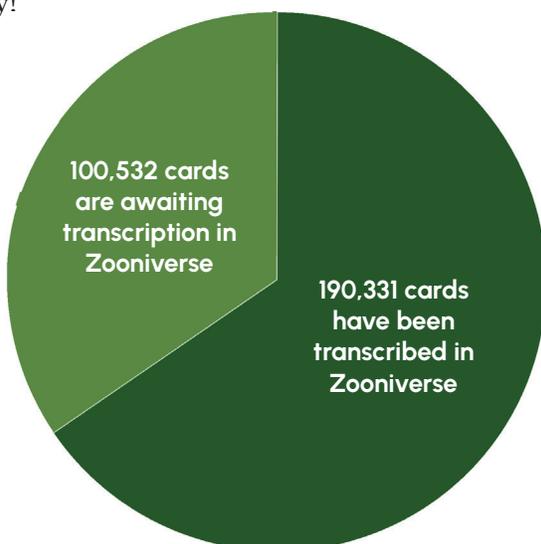
30,192 volunteer hours



That's more than 3 years and 5 months of effort!

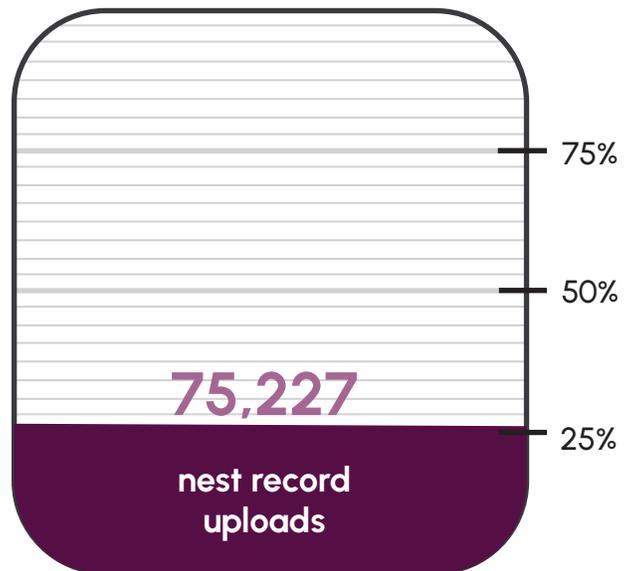
Major Accomplishment

We finished scanning all eligible* nest record cards in 2022, and we're more than halfway through transcription! You can help us cross the finish line by visiting the [Nest Quest Go!](#) project on Zooniverse.org or downloading the Zooniverse app. Start transcribing today!



* In sorting through cards during the scanning process, there were some that were ineligible for transcription due to missing or incomplete data. The final total for cards with usable data is 290,863.

Upload Progress



Thanks a Bunch

The success of Nest Quest Go! is due in large part to a group of devoted Cornell students and volunteers, as well as to all of our dedicated transcribers on Zooniverse. Thank you all for bringing your talents and energy to this project! 🐣

Celebrating 10 Years of NestWatch Chapters

BY HOLLY GRANT, NESTWATCH PROJECT ASSISTANT

NestWatch Chapters are hosted by nature centers, parks, wildlife refuges, zoos, and other nature-minded organizations anywhere in the world. These groups help recruit and train NestWatchers in their local communities while using NestWatch to monitor nesting birds as part of each organization's mission. Our Chapter program turned 10 in 2022!

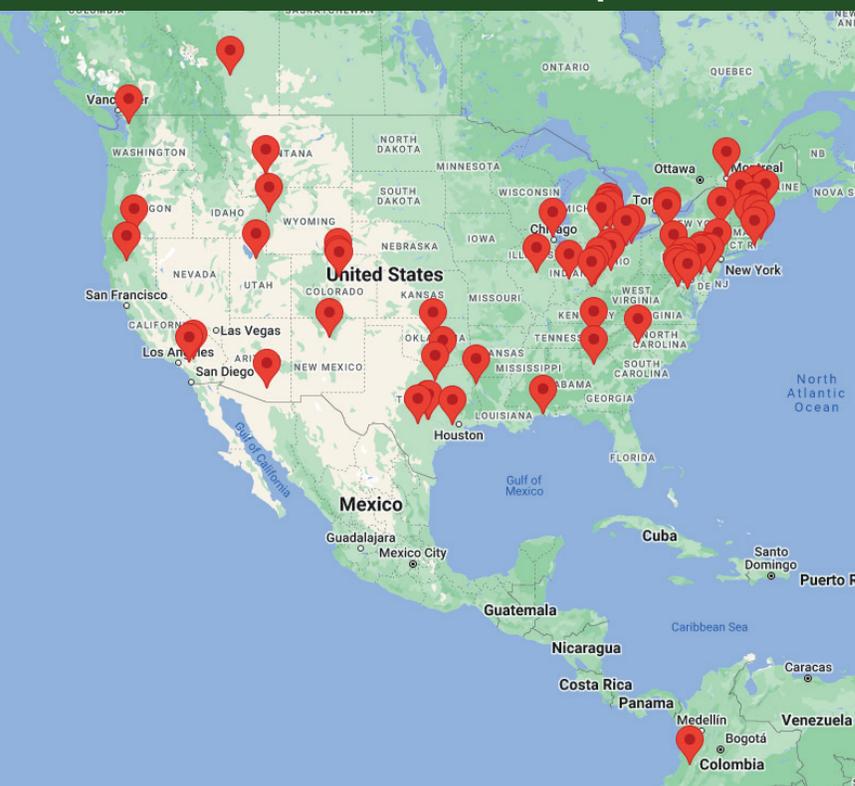
Some reasons that an organization might want to become a chapter include adding a citizen science component to your volunteer engagement portfolio, or expanding your focal species monitoring with the help of trained volunteers. Your data will be safely stored by NestWatch where it can be accessed at any time. Training materials are provided by NestWatch to help you get started. NestWatch Chapters have different goals, so there is no prescribed set of activities that must be accomplished. You may be interested in monitoring a single species, a collection of nest boxes, or even a habitat improvement area. Being a chapter also means being included on a private listserv which can be used to ask questions and discuss strategy with other chapter coordinators and NestWatch staff directly.

Chrisula Stone, of Kenton County Parks in Kentucky says, "Being a NestWatch chapter coordinator has allowed me to meet new people and form new friendships and has opened so many doors for me." Congratulations to all of the chapters listed below who hit their 10-year enrollment mark in 2022!



COLORADO BLUEBIRD PROJECT

Current NestWatch Chapters



Chapters Celebrating 10 years:

- Big Bear Discovery Center; **Fawnskin, CA**
- Colorado Bluebird Project; **Centennial, CO**
- Jefferson County Open Space; **Golden, CO**
- Morgan County Soil & Water Conservation District; **Martinsville, IN**
- Maryland Master Naturalists/University of Maryland Extension; **Ellicott City, MD**
- Maryland-National Capital Park and Planning Commission/Prince George's County; **Upper Marlboro, MD**
- Friends of Myles Standish State Forest; **Middleboro, MA**
- Massachusetts Audubon - Drumlin Farm Sanctuary; **Lincoln, MA**
- Oakland County Parks & Recreation; **Waterford, MI**
- Seven Ponds Nature Center; **Dryden, MI**
- Beaver Meadow Audubon Center; **North Java, NY**
- Wild Spirit Education; **Delevan, NY**
- Mecklenburg County Parks & Recreation/Central Carolinas Division of Nature Preserves & Natural Resources; **Charlotte, NC**
- Cleveland MetroParks - North Chagrin and Rocky River Nature Centers; **Cleveland, OH**
- Cleveland MetroParks Zoo; **Cleveland, OH**
- Holden Arboretum; **Kirtland, OH**
- Ohio Bluebird Society - Delaware County; **Powell, OH**
- Ohio Bluebird Society/Columbus Audubon; **Powell, OH**
- Oklahoma Master Naturalists; **Edmond, OK**
- Tellico Village Birders Club; **Loudon, TN**
- Friends of Hagerman NWR; **Sherman, TX**
- Texas Bluebird Society - Buda; **Buda, TX**
- Texas Bluebird Society - Mountain City; **Mountain City, TX**
- Tracy Aviary; **Salt Lake City, UT**
- North Cascades Institute; **Sedro Woolley, WA**
- Teton Science Schools; **Jackson, WY**

For more information, including how to become a NestWatch Chapter, email nestwatch@cornell.edu.

House Wrens and Tree Swallows: A Family Affair

BY ROBYN BAILEY, NESTWATCH PROJECT LEADER

NestWatcher Dave Curry reported an interesting mixed-species nest in West Virginia in July 2022.

This nest began with a House Wren laying two eggs, but it was soon taken over by a Tree Swallow who added four of her own eggs to the nest. The Tree Swallow incubated all six eggs to hatching. In the end, both House Wren nestlings and three of the Tree Swallow nestlings fledged. The House Wrens fledged 3-4 days earlier than the Tree Swallows, consistent with their shorter development period. Thanks, Dave for sharing your interesting observations with us! 🍷



DAVE CURRY



DAVE CURRY



DAVE CURRY



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Photo by Jane Gamble

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Regional Roundup

Highlights from the 2022 season

BY ROBYN BAILEY, NESTWATCH PROJECT LEADER

In 2022, participants reported 32,077 nest attempts by 271 species. In the pages that follow, you'll find data summaries from the United States and Canada; however, we also received data on 286 nests of 68 species from an additional 34 countries in 2022! Great job, NestWatchers!

Note that for calculations of nesting success in this report, we only use nests for which the nest fate was reported. We defined nesting success as the percentage of nests fledging at least one young. We only report results for species having a minimum of 10 nests with known outcomes per year. We used only successful nests to estimate average number of fledglings as a measure of productivity; therefore, average number of fledglings may exceed average clutch size in our regional tables. The “change” column indicates how 2022 nesting success was different from the previous 10-year average (2012–2021). This can help you interpret whether 2022 was a “good year” or a “bad year” for a species in your region, but it’s not necessarily an indication of a long-term trend. One arrow signifies a change of 5–10%, and two arrows signify a change of more than 10%. No arrow is given for changes less than 5%, and an asterisk (*) indicates insufficient data for a region.

2022 NestWatch Season Totals

32,077 NEST ATTEMPTS
2,561 PARTICIPANTS
271 SPECIES
102,723 EGGS
70,553 FLEDGLINGS

International

We received data for a total of 286 nests from 34 countries outside of the United States and Canada in 2022. Bermuda topped the list with 94 nests, followed by Spain with 69, and Portugal with 39. We are excited to see international participation growing!



Hawaii

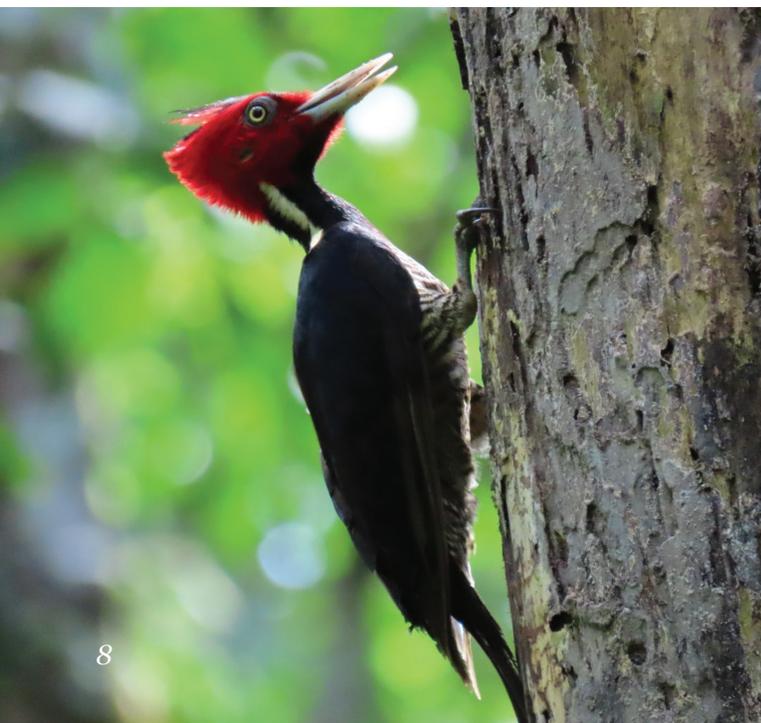
We received four nest reports from Hawaii this year, including two Laysan Albatross nests and one each of feral Rock Pigeon and Red Junglefowl. If you live in Hawaii, and find nesting birds, please share your observations!

Alaska and Northern Canada

There were 92 nests reported from Alaska and Northern Canada in 2022. We had enough data on Tree Swallows in this region (n = 77) to report that the average clutch size was 5.7 eggs, average fledglings was 5.2, and nesting success rate was 89.3% (up from 82.5% in 2021). The northernmost nest of 2022 was a Tree Swallow nest reported by new participants at Inspiration Ridge Preserve in Alaska.

ALASKA AND NORTHERN CANADA: 92 NESTS

Rank	Species	2022 Total nests reported
1	Tree Swallow	77
2	Violet-green Swallow	9
3	Yellow Warbler	2
4	American Robin	1
4	Black-capped Chickadee	1
4	Dark-eyed Junco	1
4	Semipalmated Sandpiper	1



PALE-BILLED WOODPECKER BY DAVID LANCASTER, COSTA RICA



Southwest Region

In the southwestern region, Mourning Dove nesting success was higher than usual at 73.9%. All other species in the Top 10 had a nesting success rate near their 10-year average. The region saw a 30% increase in the number of Western Bluebird nests and a 24% increase in Mountain Bluebird nests reported compared to last year.

The southwestern region is the region with the most reported hummingbird nests, and we wondered if NestWatch data could give us any insights into how their nests are faring. Combining data from Allen's, Anna's,

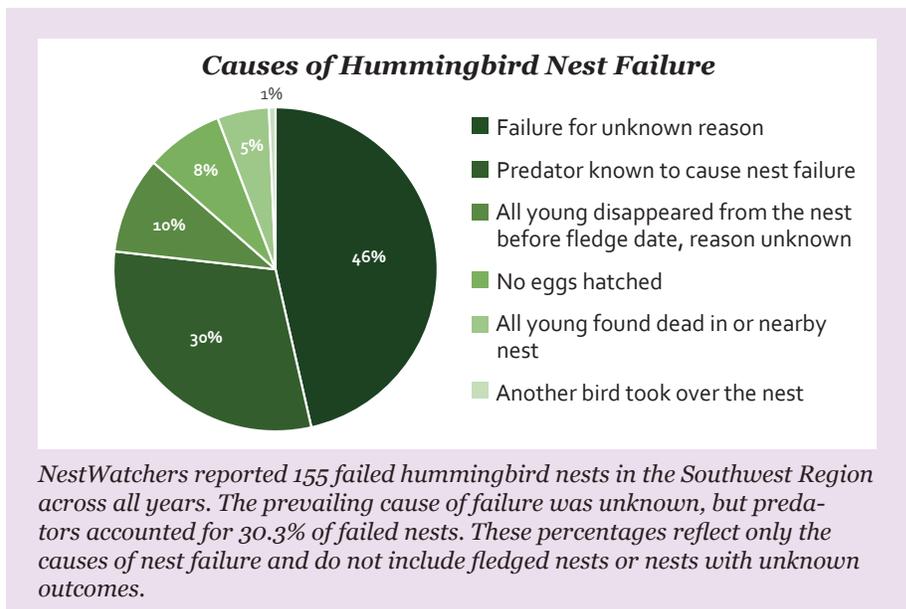
Costa's, Black-chinned, and Broad-tailed Hummingbirds across all years, we found that 50.8% of nests with a known outcome were successful (n = 315). In a majority of failed nests, the reason for failure was unknown (46.5%), but predators accounted for 30.3% of failures. Because jays and crows are a common nest predator of hummingbirds, avoid checking a hummingbird nest when they are around, and avoid feeding jays or crows near a hummingbird nest.



COSTA'S HUMMINGBIRD BY ANGEL POE



MOURNING DOVE BY IMRAN AHMED



SOUTHWEST TOP-10 LIST: 3,685 NESTS REPORTED FOR ALL SPECIES

Rank	Species	2022 Total nests reported	2022 Average clutch size	2022 Average fledglings	2022 Average nesting success (%)	Previous 10-year average success (%)	Change from previous
1	Tree Swallow	1,099	4.9	4.3	81.0	80.4	
2	Western Bluebird	976	4.8	4.1	76.0	78.0	
3	Mountain Bluebird	591	5.0	4.5	74.5	78.0	
4	House Wren	162	5.8	5.4	84.5	82.9	
5	Violet-green Swallow	102	4.2	3.7	79.1	81.6	
6	Dark-eyed Junco	69	3.1	2.3	76.0	*	
7	Oak Titmouse	60	5.7	5.2	82.0	77.6	
8	Ash-throated Flycatcher	54	4.1	3.5	84.0	82.8	
9	House Finch	49	4.2	4.2	66.7	64.1	
10	Mourning Dove	42	1.9	1.9	73.9	61.0	▲▲

*INSUFFICIENT DATA



Southeast and Gulf Coast Region

Most species in the Top 10 were at or above their 10-year average in terms of nesting success in 2022, with American Robins and Tree Swallows having a particularly good year. Only Black-crested Titmouse and Barn Swallow were slightly less successful than usual.

According to eBird trend maps, the Tufted Titmouse is declining throughout the southeastern states while the Black-crested Titmouse

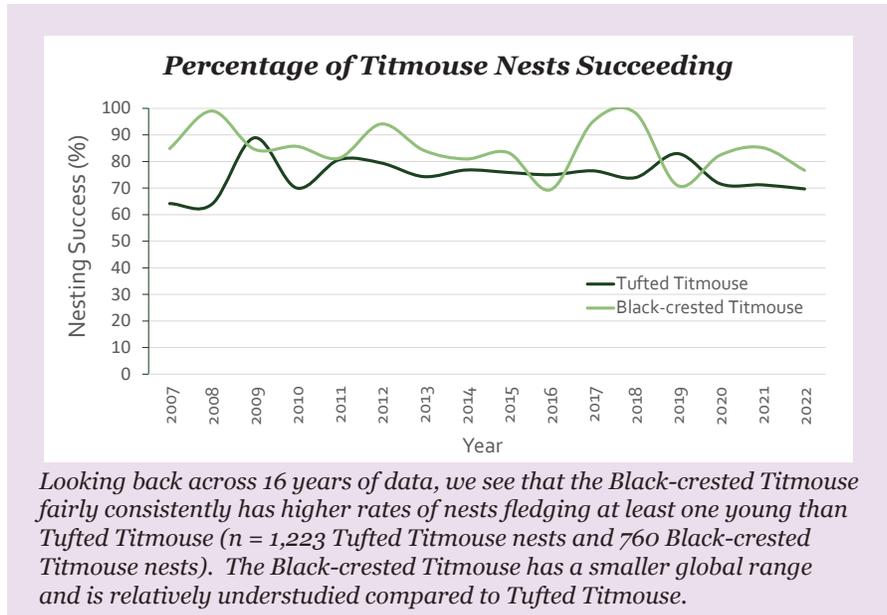
is increasing. Their ranges do not overlap very much, but they share a similar life history. Interestingly, our data show that Black-crested Titmice consistently have a higher proportion of nests succeeding than Tufted Titmice. However, scientists know very little about Black-crested Titmouse nesting ecology, so this would be a fruitful area for future research.



CAROLINA WREN BY HARRIET NEILL



BLACK-CRESTED TITMICE BY ANALETTE ROWE



SOUTHEAST TOP-10 LIST: 5,883 NESTS REPORTED FOR ALL SPECIES

Rank	Species	2022 Total nests reported	2022 Average clutch size	2022 Average fledglings	2022 Average nesting success (%)	Previous 10-year average success (%)	Change from previous
1	Eastern Bluebird	3,856	4.4	3.7	79.2	77.3	
2	Carolina Chickadee	451	5.1	4.6	79.2	75.8	
3	Carolina Wren	246	4.6	4.4	77.0	78.7	
4	Tree Swallow	177	5.0	4.5	86.6	78.9	▲
5	Bewick's Wren	116	5.4	5.0	77.3	82.0	
6	Tufted Titmouse	94	5.5	5.3	75.0	79.7	
7	Purple Martin	78	5.0	4.4	83.6	84.2	
8	Black-crested Titmouse	74	4.9	4.1	76.7	84.6	▼
9	Barn Swallow	63	4.3	4.0	73.3	80.5	▼
10	American Robin	55	3.6	3.1	70.8	52.4	▲▲



Northwest Region

Mountain Bluebirds, Western Bluebirds, and Black-capped Chickadees had a much higher-than-average nesting success rate in 2022, while Tree Swallow nesting success was moderately higher.

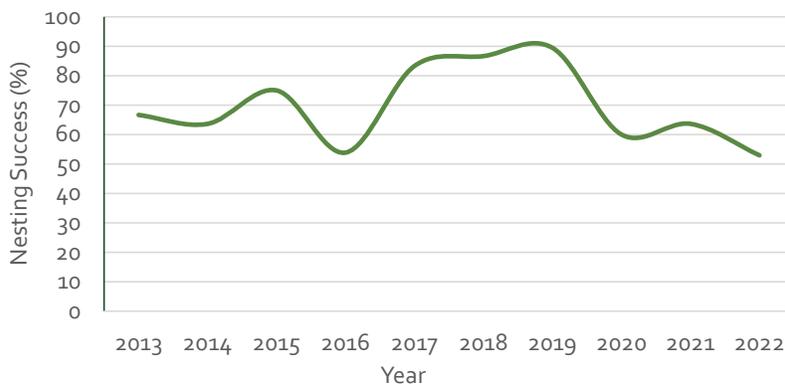
Unfortunately, American Robin nesting success was low for the third year in a row and was the lowest reported in 10 years (52.9%, see graph below). To help American Robins rebound, avoid using lawn chemicals in your yard.

House Sparrow nesting success dropped markedly from the decadal average, indicating that more people are managing against the non-native species in the region.

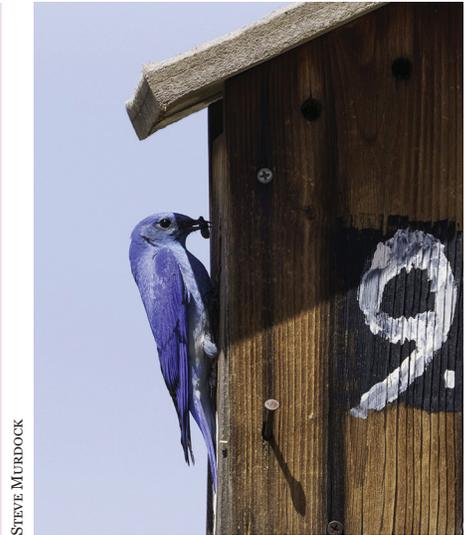
AMERICAN ROBINS BY BARR CHRIST



American Robin Nesting Success Lowest in Decade



American Robin nesting success reached a 10-year low in the Northwest Region in 2022 (52.9%).



STEVE MURDOCK

Mountain Bluebirds had higher than average nest success in 2022.

NORTHWEST TOP-10 LIST: 1,977 NESTS REPORTED FOR ALL SPECIES

Rank	Species	2022 Total nests reported	2022 Average clutch size	2022 Average fledglings	2022 Average nesting success (%)	Previous 10-year average success (%)	Change from previous
1	Tree Swallow	714	5.7	5.3	82.8	75.4	▲
2	Mountain Bluebird	628	5.4	4.8	84.9	69.2	▲▲
3	Western Bluebird	98	5.5	4.9	85.7	70.5	▲▲
4	House Wren	82	6.7	6.3	85.2	82.7	
5	Barn Swallow	52	4.0	4.0	74.4	*	
6	House Sparrow	43	4.1	*	5.9	15.7	▼
7	Violet-green Swallow	42	5.0	3.8	76.9	77.3	
8	American Robin	40	*	*	52.9	74.2	▼▼
9	Black-capped Chickadee	36	5.7	6.0	94.1	80.8	▲▲
10	Chestnut-backed Chickadee	35	6.0	4.0	77.3	*	

*INSUFFICIENT DATA



Northeast Region

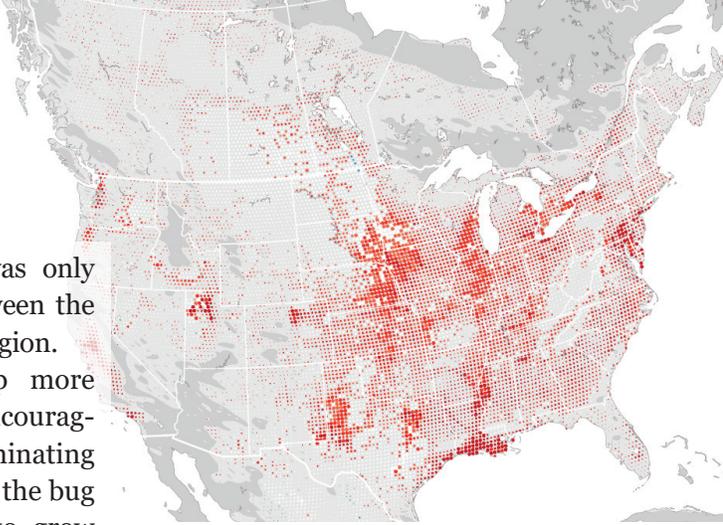
NestWatchers in the Northeast again reported a record-setting number of nests—19,025! Amazing work.

For the second consecutive year, only the American Kestrel seemed to have a lower-than-usual rate of nest success (71.9%) in the region’s Top-10 list.

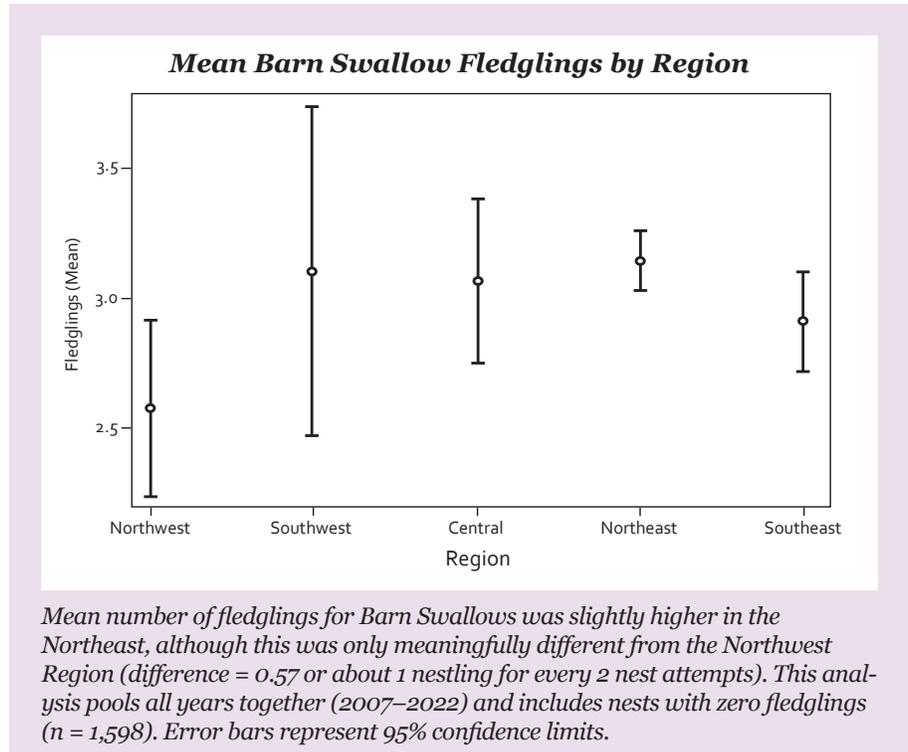
While not a Top-10 species for the region, some NestWatchers reported seeing fewer Barn Swallows in their barns, and the Cornell Lab of Ornithology’s eBird program shows declining trends throughout the eastern United States and Canada (see map above right). We noticed that the mean number of fledglings was highest in the Northeast,

although this difference was only statistically significant between the Northeast and Northwest region.

NestWatchers can help more Barn Swallows fledge by encouraging more insects (e.g., eliminating insecticide use, unplugging the bug zapper, allowing grasses to grow taller).



Population **trend map** for Barn Swallows. Red areas indicate decline in abundance.



Mean number of fledglings for Barn Swallows was slightly higher in the Northeast, although this was only meaningfully different from the Northwest Region (difference = 0.57 or about 1 nestling for every 2 nest attempts). This analysis pools all years together (2007–2022) and includes nests with zero fledglings (n = 1,598). Error bars represent 95% confidence limits.



BARN SWALLOW FLEDGLINGS BY MARG CARPENTER

NORTHEAST TOP-10 LIST: 19,025 NESTS REPORTED FOR ALL SPECIES

Rank	Species	2022 Total nests reported	2022 Average clutch size	2022 Average fledglings	2022 Average nesting success (%)	Previous 10-year average success (%)	Change from previous
1	Eastern Bluebird	5,862	4.2	3.8	76.9	77.3	
2	Tree Swallow	5,252	5.0	4.4	81.1	76.6	
3	House Wren	2,578	5.4	5.0	78.2	78.2	
4	House Sparrow	1,492	3.6	3.6	5.9	5.8	
5	Purple Martin	1,044	4.9	4.1	87.4	85.8	
6	American Robin	422	3.3	2.9	61.3	61.6	
7	American Kestrel	373	4.8	4.1	71.9	84.0	▼▼
8	Black-capped Chickadee	267	5.7	5.4	63.3	66.7	
9	Carolina Chickadee	205	5.1	4.5	59.5	61.9	
10	Carolina Wren	175	4.5	3.9	73.3	75.5	

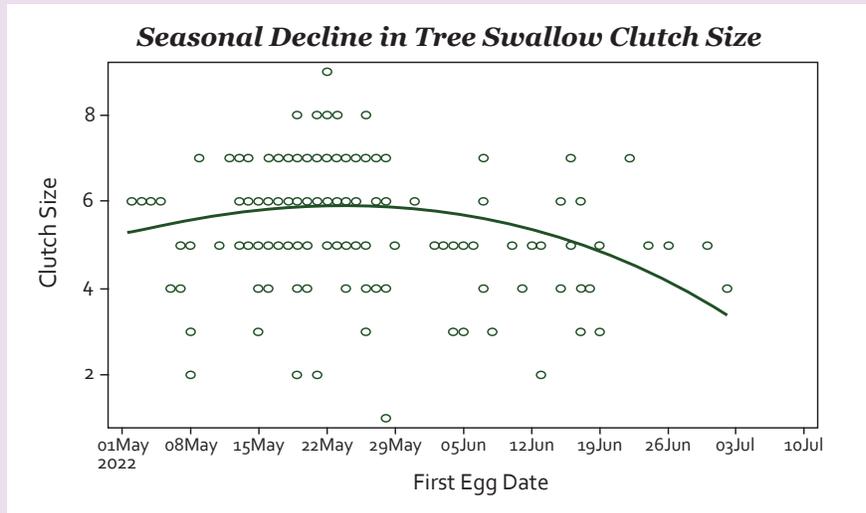


Central Region

In the Central Region, most Top-10 species had a nesting success rate near their 10-year average with the exception of Barn Swallow, which was slightly decreased (73.3%). This was heartening to see given that the Central Region struggled with a number of severe weather events in May and June of 2022, from hail and thunderstorms to

high winds. Some NestWatchers did report nest failures due to these events. Interestingly, birds that lose their first nest early on can often lay a second—usually smaller—clutch to try to compensate. The graph below shows a typical seasonal decline in clutch size for Tree Swallows in the Central Region.

TREE SWALLOW BY MASSACRE RIDGE



Tree Swallows exhibit a seasonal decline in clutch size as can be seen in these 2022 data ($n = 214$ nests with known first egg dates and clutch sizes). Reduced clutch sizes may enable birds to speed up the incubation and brood-rearing periods so that young can fledge that much sooner and be better prepared for migration.

CAROLINA WREN BY HARRIET NEILL



HOUSE FINCH EGGS BY JENNY TEMME



CENTRAL TOP-10 LIST: 1,125 NESTS REPORTED FOR ALL SPECIES

Rank	Species	2022 Total nests reported	2022 Average clutch size	2022 Average fledglings	2022 Average nesting success (%)	Previous 10-year average success (%)	Change from previous
1	Tree Swallow	310	5.6	4.9	78.8	79.5	
2	Eastern Bluebird	308	4.4	4.3	75.9	76.2	
3	Purple Martin	125	5.0	4.3	92.7	92.3	
4	House Wren	107	5.6	5.3	72.5	73.8	
5	American Robin	46	3.7	3.1	70.4	72.7	
6	Black-capped Chickadee	41	5.4	5.3	75.0	74.1	
7	House Sparrow	29	4.5	*	15.0	3.8	▲▲
8	Carolina Chickadee	28	5.8	4.5	81.0	*	
9	Barn Swallow	17	4.2	3.7	73.3	80.1	▼
10	House Finch	12	*	*	*	*	

*INSUFFICIENT DATA

It Pays to Stay In Sync With Spring

BY ROBYN BAILEY, NESTWATCH PROJECT LEADER

Most birds have evolved so that their nesting season coincides with the peak abundance of food on their breeding grounds. For most North American species, that's spring-time. Some species are nesting earlier in response to earlier peaks in food availability, likely resulting from a changing climate. While many studies of changes in nesting phenology have focused on birds that eat insects, what do birds with other types of diets do when spring arrives earlier than anticipated? American Kestrels are small falcons that don't rely on one specific type of food; they eat insects, small mammals, birds, and lizards. They also have a longer incubation and nestling period than a small songbird, so they need resources to be more stable, longer.

To study the effects of earlier spring conditions on American Kestrel nesting success, the authors of a recent study combined records from two nationwide citizen science databases (the Cornell Lab of Ornithology's NestWatch program and The Peregrine Fund's American Kestrel Partnership program) with data from a professional multi-state study conducted on Department of Defense lands and a long-term study from southwestern Idaho (Callery et al. 2022). This produced a dataset of 2,144 nests spanning nearly 25 years from around the contiguous United States and southern Canada.

How to measure spring when spring keeps changing?

If you've lived in a very seasonal environment, you may have observed that "spring" arrives earlier or later in different years depending on when warmer weather starts becoming more consistent. Warmer weather and longer days, in turn, trigger things like bird migration, leaf out, and insect emergence. So, phenological "first day of spring" is more relevant to birds than the actual calendar date. In order to see things from a kestrel's perspective, the researchers used an index of spring conditions (based on

flowering plants and surface temperatures) as an indicator of when spring started in a given year (i.e., as opposed to using the calendar date). Then, they calculated the difference between this index and when kestrels started laying eggs. They found that kestrels start laying eggs 12 days (median) before phenological spring's onset (Callery et al. 2022).

Early bird advantage

According to this new study, American Kestrels that delayed egg laying until after spring had sprung were more likely to have failed nests, and this was particularly true for kestrels in the highly-seasonal environment of the Northeast. Conversely, when nesting earlier than the onset of spring, kestrels in the Northeast had an advantage; they produced more young per brood than kestrels in the West, Southwest, and Southeast with similar timing. Rangelwide, the more out-of-sync they got with the onset of spring, the fewer young they could fledge, which was again most pronounced in the Northeast. This problem of spring mismatch was not as bad



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for kestrels in the Southwest (e.g., a nest begun 30 days outside of the peak could still fledge 4 young), indicating that southwestern kestrels might be more resilient to spring's fluctuations.

Nest cams reveal a possible adaptation

Interestingly, kestrels may be able to perceive the disadvantage of delayed nesting and adjust for it by changing their incubation behavior. A subset of the boxes were monitored with nest cams which revealed that “late-starting” males would begin incubating sooner, joining with the female to incubate almost continuously. This behavior speeds up egg development so that the eggs hatch asynchronously (i.e., on different days). With this strategy, there would be some older and some younger siblings within the brood. Spreading out the nestlings' hatch dates could give the kestrels the opportunity to spread out the risk of starvation—that is, they would have at least some nestlings which were more mature and might survive if conditions were poor. The males have been previously shown to employ this strategy in poor food years, suggesting it helps reduce the amount of provisioning required per day. Males at “early” nests did not join in the incubation process as quickly, making it more likely that



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their young would be closer together in age and increasing the potential for more young to fledge.

A narrow window of opportunity

In summary, waiting until after phenological spring's arrival to start nesting was a disadvantage for kestrels, particularly those in the Northeast. “Late” nesters had decreased nest success overall and those that did succeed produced fewer fledglings. If you are a kestrel living in the Northeast, it pays to be on time. Why do northeastern kestrels need to be especially timely? The authors hypothesized that the Northeast does not have the prolonged growing season that other regions may have, which could give other kestrels more flexibility in when they decide to breed. Milder winters, earlier plant bloom dates, and longer growing seasons mean that kestrels in the West and Southwest have about a 4-month window in which to initiate their clutches while those in the Northeast have only about a 2-month window (after which productivity declines sharply). This is consequential for a bird whose incubation and brooding period can

take around two months, not to mention post-fledging care.

American Kestrels are in a long-term population decline across much of North America, and evidence suggests that climate change will affect them (McClure et al. 2017), regardless of their generalist diet. Can they make up some losses by changing their behavior? Researchers aren't sure yet if the “speed it up” behavioral change actually results in fledglings that survive well after they leave the nest. One thing the public can do to help out is to continue reporting on kestrel nest success as contributors to citizen science; we know that without you all, this study would not have been possible! ●

References:

Callery, K., S. E. Schulwitz, A. R. Hunt, J. M. Winiarski, C. J. W. McClure, R. A. Fischer, and J. A. Heath. 2022. Phenology effects on productivity and hatching-asynchrony of American Kestrels (*Falco sparverius*) across a continent. *Global Ecology and Conservation* 36: e02124. <https://doi.org/10.1016/j.gecco.2022.e02124>

McClure, C. J. W., S. E. Schulwitz, R. Van Buskirk, B. P. Pauli, and J. A. Heath. 2017. Commentary: Research recommendations for understanding the decline of American Kestrels (*Falco sparverius*) across much of North America. *Journal of Raptor Research* 51(4): 455-464. <https://doi.org/10.3356/JRR-16-73.1>



BIRD HOUSING RURAL DEVELOPMENT

World's Fastest Bird Gets New Nest Box Plan

BY HOLLY GRANT, NESTWATCH PROJECT ASSISTANT

NestWatch strives to provide the best resources for creating safe habitat for birds to nest. One of our most popular resources is our [Right Bird, Right House](#) tool which offers construction plans to build nest boxes and other similar structures for birds, tailored to your region and local habitat. In fall of 2022, we were able to add our 60th nest box plan to the tool, for Peregrine Falcons, thanks to valuable input from Amy and Ken Ries from the Raptor Resource Center in Iowa. These raptors can be challenging neighbors, and undertaking the construction and installation of the box will likely involve collaboration with others in your community. An appropriately-placed nest box can help increase the availability of nesting options for the raptors and gives NestWatchers a chance to get a better idea of what goes on in peregrine nests.

Peregrine Falcons can be found on all continents except Antarctica and, like many bird species, they have adapted fairly well to our increasingly urbanizing planet. Peregrines nest naturally on rocky cliffs and ledges, but data show that successful nests have also been built on skyscrapers, electrical towers, and other tall buildings. If you're looking to install a nest box, we recommend doing so on one of these types of structures, but exercise caution on exact placement of the box. It's imperative to be in contact with building owners, and you may also want to reach out to local conservation offices for any advice they may have that's specific to your



ANDREA ZINKUS

region. The boxes are best installed away from maintenance areas, power lines, and other places that humans frequent, both to avoid invoking the birds' aggressive nest defense behavior and reducing overall disturbance to the nest.

You might be wondering how Peregrine Falcon nesting success is affected by their population expansion into more urbanized areas. Thanks to the recent influx of Nest Quest Go! data to the NestWatch database (pages 4-5), which brought our total nest records for Peregrine Falcons to more than 500, we can start to see how their nests are faring on skyscrapers and other built structures and compare that to the nests in natural nest sites.

Table 1. Nest outcomes according to the four most common substrate types where nest attempts occurred.

Substrate	Success	Fail	Unknown
Cliff/Ledge (n = 314)	19%	3%	78%
Building (n = 25)	52%	8%	40%
Bridge (n=21)	62%	29%	10%
Nest box (n = 11)	55%	0%	45%



ANGELA SPICHT

From Table 1, we can see that there are four main nest substrates where Peregrine Falcons have been recorded nesting. Of these, the peregrines seemed to have the most recorded success when nesting on bridges (67%), buildings (52%), or while using nest boxes (55%). By far, most nests monitored were located on cliffs and ledges, yet they showed fewer successful nests (19%). As you can see, cliff nests were most likely to have unknown outcomes, so 19% is likely a low estimate for actual breeding success. The high rate of unknown outcomes in all substrates could be due to the simple fact that Peregrine Falcon nests are difficult to monitor, but for determined individuals, installation of a nest camera nearby can be a great solution to bring the

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activities of the box into view. We're hopeful that the new nest box plans will help encourage more people to monitor Peregrine Falcons in the coming years; more data are needed to further understand the many facets of breeding success.

The NestWatch database welcomes data from all bird species, but if you'd like to help bump up our numbers for Peregrine Falcon nests in particular, and you have prepared the necessary resources and maintenance plans, placing a nest box can be a great way to get a better look into the lives of the world's fastest bird. We encourage you to [download our nest box plans today.](#)



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VIOLET-GREEN SWALLOW BY BOB GUNDERSON

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—Julia Ecklar





CHIPPING SPARROW NEST BY RED WING BIRDING

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