



## **Marin County Breeding Bird Atlas II**

### **Annual Report: 2022**

Daphne Hatch, Diana Humpre, and Will Wiskes

November 2022



*This report is dedicated to Joan Lamphier (1942-2022)*

*Marin County Breeding Bird Atlas II Steering Committee Member (2021-2022), Regional Coordinator (Point Reyes Region, 2022), Block Leader, stalwart advocate, and friend*



Photo by: Beach Watch/NOAA/Greater Farallones Association

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**Cover photo:** A Mourning Dove on its nest nestled in an abalone shell in Novato. Photo credit: David Sexton / Atlas Story Map.

Check out the photo **Story Map** of volunteer photos from the 2022 season at <https://mcbba.github.io/storymap22>. To contribute additional photos to blocks that don't have any yet, do so directly [here](#), or via the MCBBA2 website by navigating to *MCBBA Data Explorer > Notes > Story Maps > Google Submission Form 2022*.

**MCCBA2 Website:** <https://marinaudubon.org/birds/marin-county-breeding-bird-atlas/>

# Project Contributors

## **Acknowledgements**

We express our gratitude to the many who made the Marin County Breeding Bird Atlas II effort possible this year and continue to contribute to its success. We are so grateful to all the Block Leaders, as well as to the other observers who helped or conducted surveys, and those who reported incidental observations: your dedication and observation skills are inspiring! We thank former Regional Coordinators Alex Merritt and David Wimpfheimer for their efforts prior to this season, and current Regional Coordinators Susan Kelly and Mark Dettling for their hard work. We thank those who helped with the immense task of cleaning up data, notably Susan Kelly, David Sexton, and Ron Brown in 2022, and additionally thank Susan Kelly for assisting with so many levels of this effort, including our e-blasts. We are grateful to Elyse Omernick and Charles Fox from Marin Audubon Society for website assistance, and Doug Moody from Point Blue for assistance with the California Avian Data Center (CADC) database. We thank Deb Etheridge for the beautiful logo she created and her patience working with us to come up with it. We thank Lisa Hug for her excellent field trainings. We are grateful for programmatic data that have been provided by David Lumpkin (Audubon Canyon Ranch), Lisa Michl (Marin County Flood Control & Water Conservation District), Serena Hubert (Marin County Parks), and Melanie Piazza (WildCare). We thank Susan Kelly for reviewing an earlier version of this report, and all the contributing photographers to our Story Map, including those whose photos are included in this report. We are grateful to those whose work beforehand made this possible, especially Dave Shuford and those involved in the original Atlas effort; Juan Garcia for developing this second Atlas effort; and Dave DeSante, to whom the birding and avian conservation communities said goodbye to this fall, for his contributions to both Atlas efforts. We are deeply grateful to the many donors to this project (see below). We also thank the board of Marin Audubon Society (especially Barbara Salzman, Doug Waterman, and Ann Thomas) for their support and sponsorship of this project and their helpful guidance. And finally, we are deeply grateful to, and for, our recently departed friend, Joan Lamphier, to whom this report is dedicated, for her extensive contributions as Steering Committee member, Point Reyes Regional Coordinator, Block Leader, and constant cheerleader and innovator.

## **Donors**

We are especially thankful for our financial donors, including \$5,000 donations from Marin Audubon Society and one anonymous donor. The Marin Audubon donation will help support our efforts in 2023. We thank the following donors for their generosity:

Anonymous	Bill and Kate Jones	Jane Medley
Bob Battagin	Susan Kelly	Rusty Scalf
Natalie Clark	Marin Audubon Society	David Sexton
Barbara Gaman	Joan Lamphier	Meryl Sundove and Roger Harris
Daphne Hatch	Carolyn Longstreth	Joyce and Doug Waterman
Robert Hinz and Barbara Benson	Ron Mallory	

### ***Steering Committee***

Daphne Hatch (daphnehatch@gmail.com)

Diana Humble (dhumble@pointblue.org)

Joan Lamphier (until early November 2022)

### ***Regional Coordinators***

Susan Kelly (Novato Region, mbbanovato@icloud.com)

Mark Dettling (Tamalpais Region, mdettling@pointblue.org)

Diana Humble (new interim coordinator for Point Reyes Region; coordinated by Joan Lamphier until early November 2022; dhumble@pointblue.org)

Daphne Hatch (interim coordinator for Tomales Region, daphnehatch@gmail.com)

*Please see MCBBA2 website (<https://marinaudubon.org/birds/marin-county-breeding-bird-atlas/>) for current coordinators and their contact info, and for a map showing the regional divisions.*

### ***GIS Analyst – Project Contractor and Volunteer***

Will Wiskes



Northern Flicker nest in a fence post at Point Reyes where people walked by it all day in Block 3-15. Photo credit: Ron Brown / Story Map

## Project Updates

The Marin County Breeding Bird Atlas II (MCBBA2) is a multi-year project that is a follow-up to an earlier county Atlas whose field work was completed 40 years ago (Shuford 1993). MCBBA2 field work was initiated in 2021, and our second year of data collection, done by an impressive cadre of regional observers, was completed in 2022.

This year, the project officially came under the non-profit sponsorship of the Marin Audubon Society, which has been instrumental in the project's success to date.

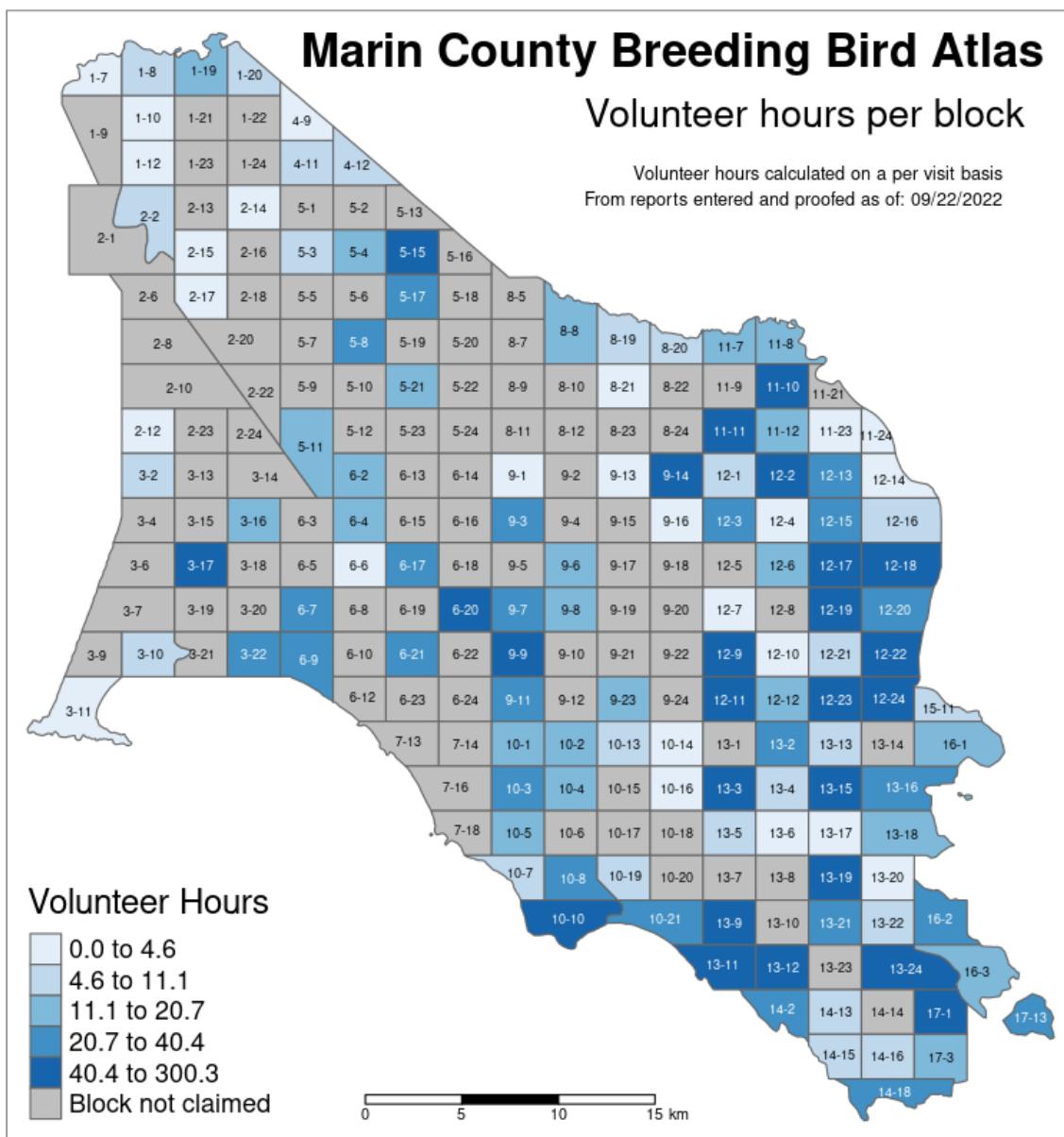
In spring 2022, the project's web-based Data Explorer was heavily overhauled. Some of the products are visible in this report, many others are meant to be explored online by volunteers and others interested in what is being documented through the Atlas project. To check it out, go to the [MCBBA2 website](#), and navigate to *MCBBA Data Explorer*. Navigate through the Species Explorer, Map Explorer, Block Resources, and Notes.

In this report we share the status of various aspects of the project, along with some of its findings as of fall 2022 (in many cases for 2021-2022 combined, representing the current status of these findings for the effort to date). Please note that because the version of the maps on our website are "live" (regularly updated), the static versions in this report represent a point in time in the project. For live versions, check out the website's *Data Explorer*.

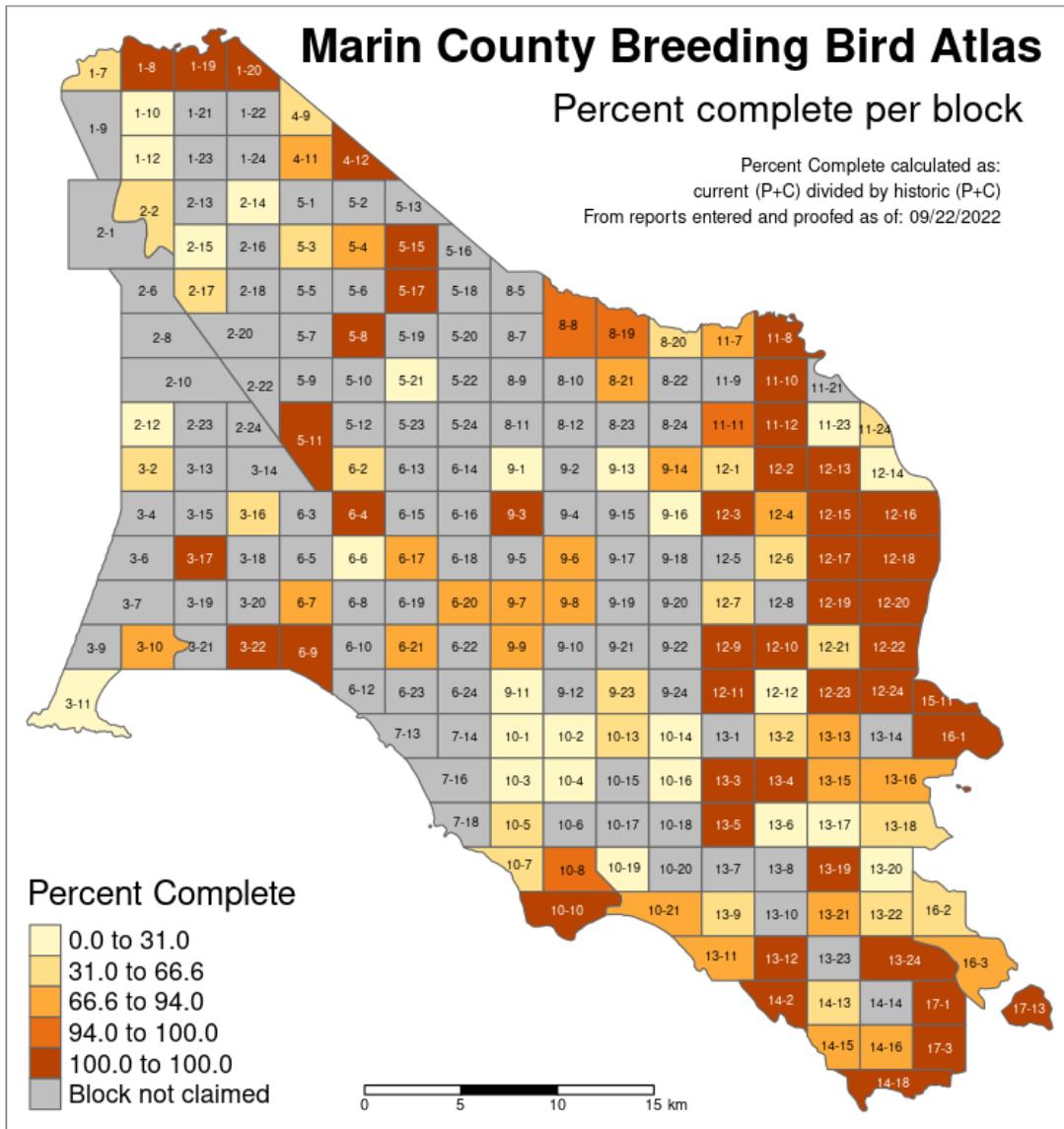
In 2022, we had 63 Block Leaders, and a total of 130 observers who submitted records or observations (Block Leaders and additional observers who conducted or helped on official Atlas surveys, submitted incidental observations, or shared observations with Atlas volunteers for them to submit; see Appendix A). Block Leader participation was similar to the number (66) in 2021, with many of the same volunteers participating across both years as well as some turnover. A total of 3182 volunteer hours were documented in 2021-2022; see Figure 1 for a map showing volunteer hours to date by individual block.

Across both years of the project combined, observers submitted over 45,000 observations. This included 44,184 observations submitted to the California Avian Data Center database (CADC) as part of official Atlas surveys, with 20,926 of those submitted in 2022. In CADC, observations are not just breeding records, and one observation = one or more observations of a species with the same breeding behavior code on a given survey day (i.e., one record does not equal to one observation of a breeding bird). In addition to the survey data in CADC, observers submitted 882 incidental observations of probable or confirmed breeding records across both years, with 560 submitted in 2022. The remaining 2021 submissions, which had previously not been processed, were incorporated into the project this year.

These numbers are tremendous and encouraging. In fact, as of the completion of the 2022 field season, 45 blocks (20% out of 221) were given the preliminary designation of 'complete' (see Figure 2). This designation was based on that block having as many species with confirmed (C) or probable (P) breeding codes as during the original Atlas (Shuford 1993). This designation allows the Block Leader to cease or severely curtail future surveys in that block (except perhaps of targeted species/areas), and to instead focus on other blocks in need of attention.



**Figure 1. Volunteer hours map for MCBBA2 for 2021-2022 and distribution of unclaimed blocks.** For a more current version of this data (but a different map interface), and especially to see a live map of blocks not claimed that are available to observers interested in claiming them as Block Leaders, go to the [MCBBA2 website](#), navigate to *MCBBA Data Explorer > Map Explorer*, and check out *Volunteer Coverage* and *Volunteer Hours*.



**Figure 2. Preliminary assessment of ‘percent complete’ of all blocks for MCBBA2 after 2021-2022 seasons.** The 100% complete designation means that as many species have been determined probable (P) or confirmed (C) breeders during the current Atlas project as during the historic effort. For most current version of the data (but a different interface for the map), go to the [MCBBA2 website](#), and navigate to *MCBBA Data Explorer > Map Explorer > Percent Complete*.

## Preliminary Results

We present here some preliminary results for the first two years (2021-2022) of the current Marin County Breeding Bird Atlas effort. As existing data get cleaned up further, and more data are collected and submitted, these results and associated maps will continue to evolve. We encourage all interested parties to explore the Data Explorer on the [MCBBA2 website](#) for current maps, and to explore any species you do not find here.

In total, 132 species have been confirmed to be breeding in the county to date, as determined through the current Atlas effort (2021-2022; see Appendix B for full list).

We have documented 154 species so far across all three breeding categories (possible, probable, and confirmed); the historic Atlas documented 157 species (Shuford 1993). For a comprehensive list comparing species documented across all breeding categories and comparing across both Atlas efforts (historic versus the current effort to date), see Appendix C.

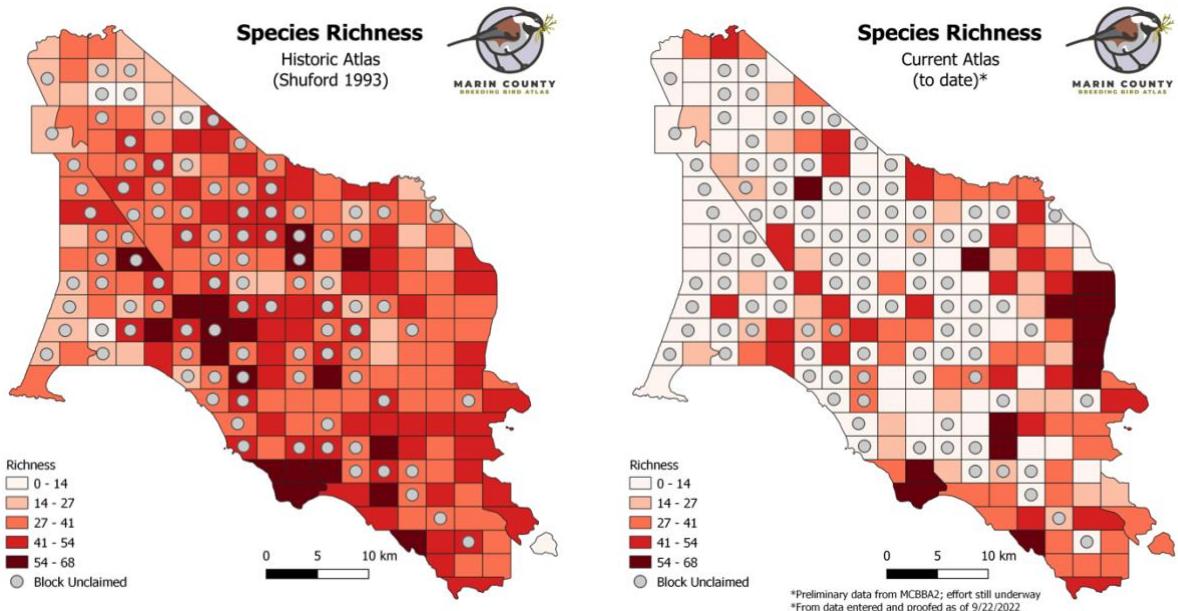
Species richness is a metric representing the total number of species in a defined area. Maps comparing species richness detected in each block between the current (2021-2022) and historic (Shuford 1993) Atlas efforts give a sense of species and effort distribution (Figure 3). Given we are only two years into this project, results for the current effort likely reflect distribution of effort to date more than species richness distribution, but may reveal preliminary patterns.

We also present a sampling of species maps comparing the status and distribution of blocks in which the species has been given a probable or confirmed designation between the current (2021-2022) and historic (Shuford 1993) Atlas efforts. We present these for a few species that are new to the county since the historic effort (Figure 4); show an expanded distribution (Figure 5); show a potential decline or reduction in distribution, although this is quite preliminary given the effort is still underway (Figure 6); as well as examples of some common species to get a sense of how we have tracked their breeding distribution to date (Figure 7).

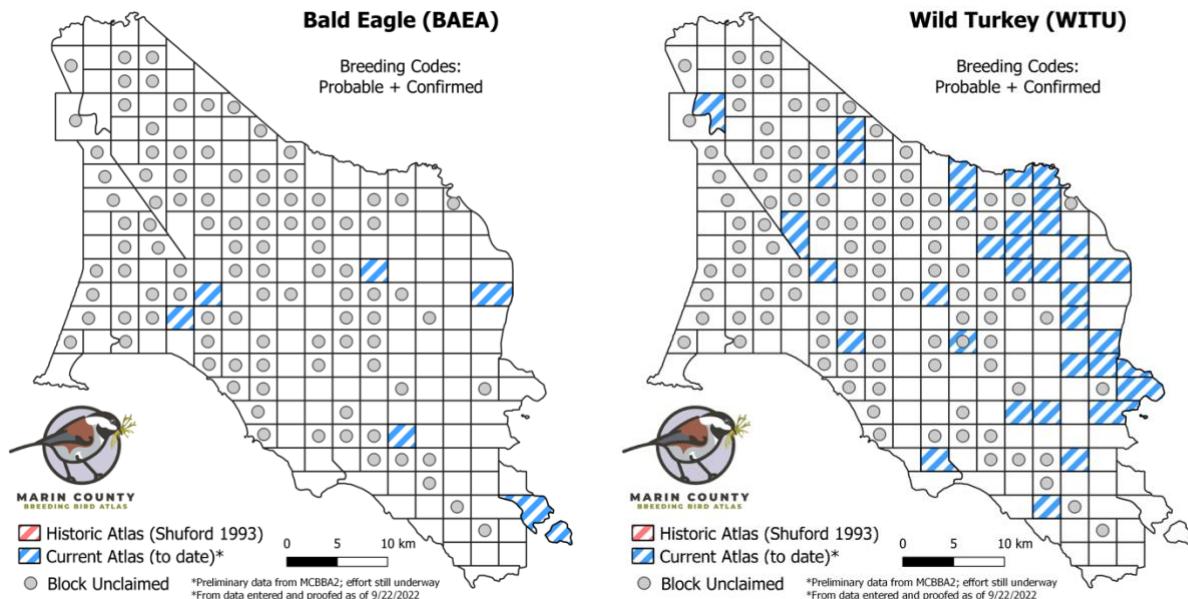
To date, 17 species have not been detected (as possible, probable, or confirmed breeders) in the current Atlas effort, but were detected as such in the historic Atlas (Shuford 1993); see Table 1. It should be noted that targeted surveys for owls and other early breeders, including some raptors and hummingbirds, have not yet been conducted for the current effort, nor have data from most partner researchers been requested or incorporated yet.

Additionally, 14 species not detected (as possible, probable, or confirmed breeders) in the historic Atlas (Shuford 1993) have been detected as such in the current effort (Table 2). Four of those species are either non-native to the United States (Mute Swan, Indian Peafowl, and Eurasian Collared-Dove) or were introduced in Marin County (Wild Turkey). While the Indian Peafowl (called Common Peafowl in CADC and the Data Explorer maps until the recent name change is incorporated) is currently included in the list and may be naturalized in Marin County, some sources do not consider it to be a naturalized species here or in northern California (i.e., consider or assume it to be dependent on humans), a status which may impact how a species is handled in a Breeding Bird Atlas.

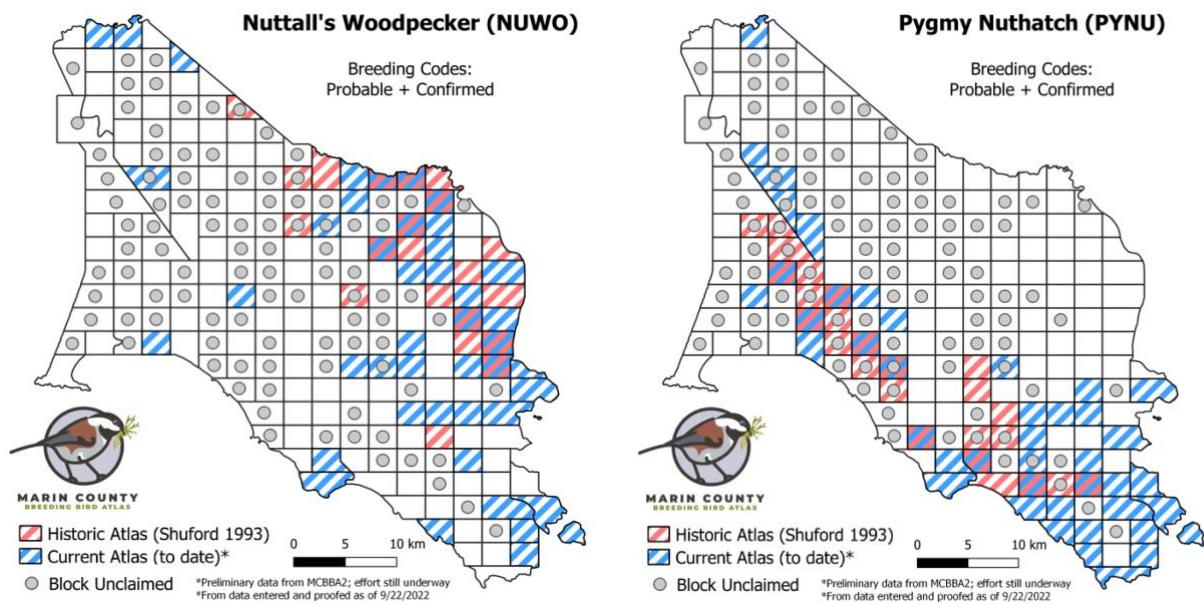
Finally, in 2022, an additional 4 species were confirmed breeding that were not yet confirmed as of the first year (2021) of this current effort (Table 3).



**Figure 3. Preliminary species richness maps** comparing the number of species detected in each block in the historic (left map; per Shuford 1993) Marin County Breeding Bird Atlas effort versus the current effort to date (right map; MCBBA2, 2021-2022).



**Figure 4. Examples of new species** in the current effort to date (MCBBA2, 2021-2022) detected as confirmed or probable breeders that were not detected as such during the historic Marin County Breeding Bird Atlas (Shuford 1993).

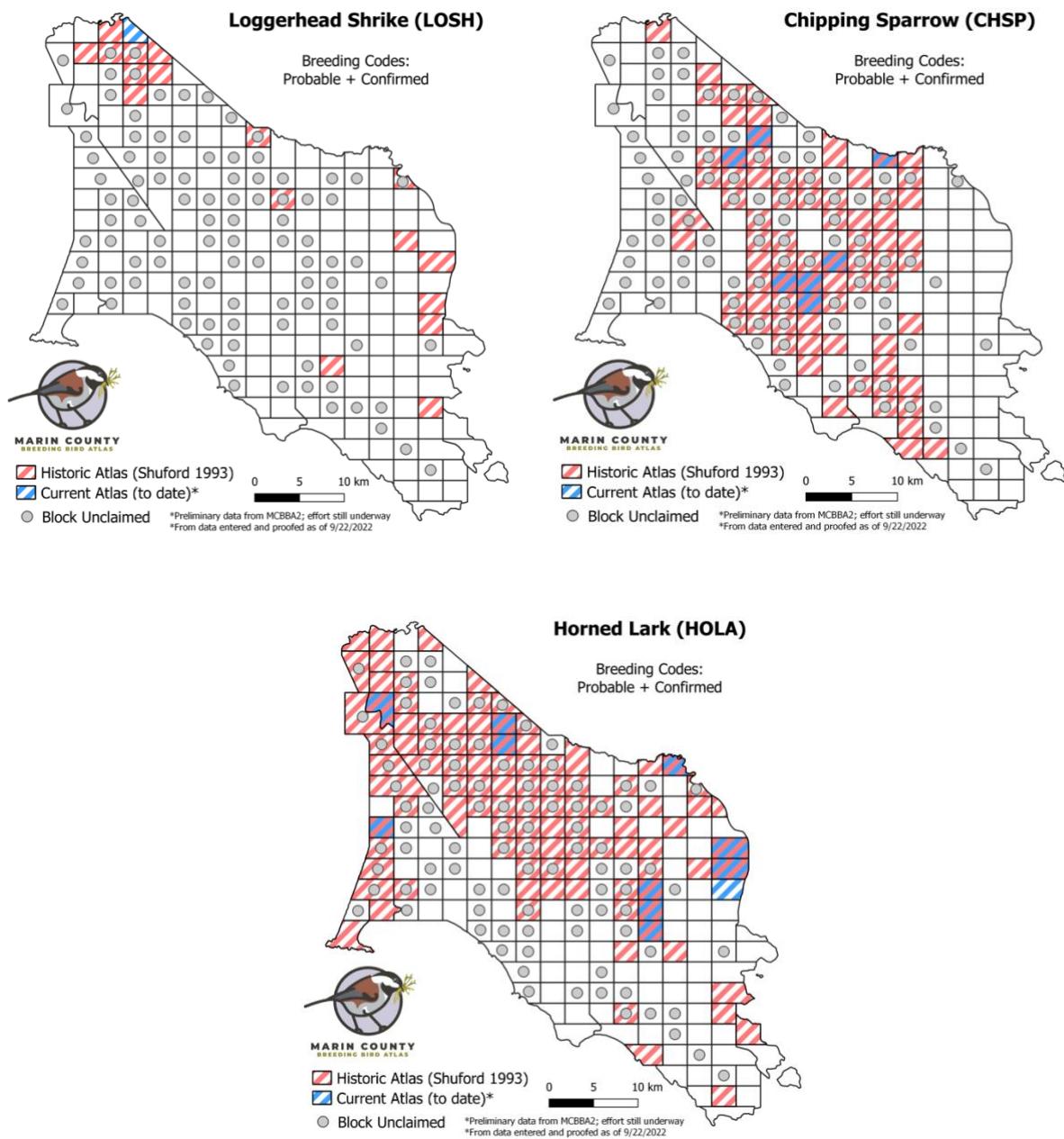


**Figure 5. Examples of species showing expanded distribution of confirmed or probable breeding in the current effort to date (MCBBA2, 2021-2022) compared to the historic Marin County Breeding Bird Atlas (Shuford 1993).**

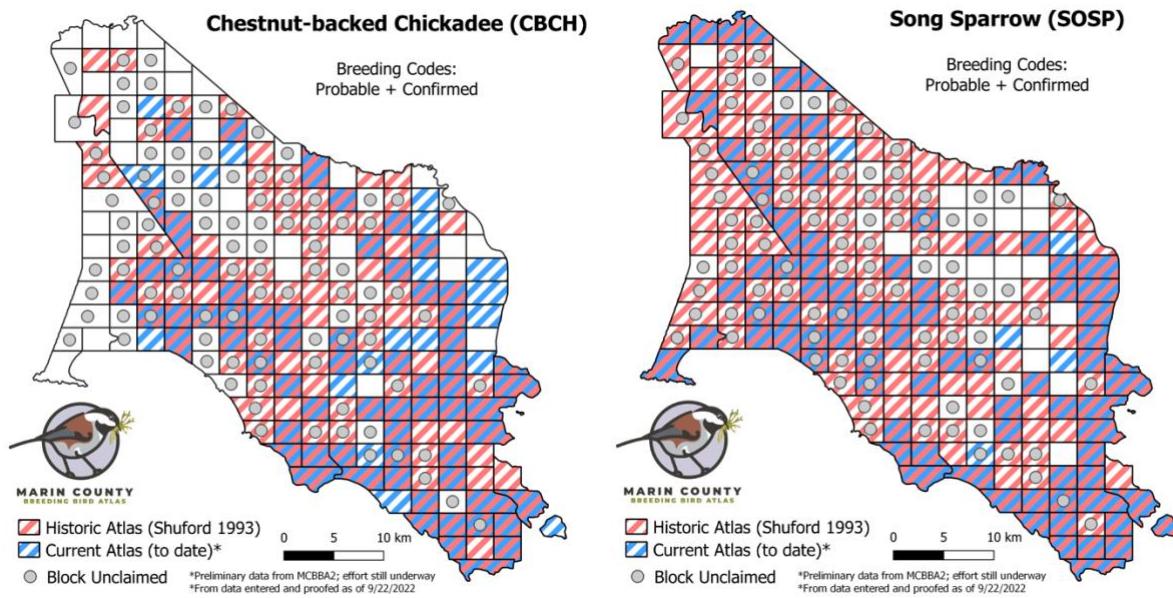


Wild Turkey hen and her nest at Stafford Lake in Block 9-14.

Photo credit: Daphne Hatch / Story Map



**Figure 6. Examples of species potentially showing a reduced or declining distribution of** confirmed or probable breeding in the current effort to date (MCBBA2, 2021-2022) compared to the historic Marin County Breeding Bird Atlas (Shuford 1993). Note that since our results and effort are not yet complete, with additional years of this study to take place, these maps should be interpreted with caution.



**Figure 7. Examples of two common species, comparing distribution of confirmed or probable breeding in the current effort to date (MCBBA2, 2021-2022) to the historic Marin County Breeding Bird Atlas (Shuford 1993).**



A family group of Bushtits, another common species, at a backyard feeder in Indian Valley.  
Photo credit: Kris Wiskes / Story Map

**Table 1. Species recorded in the historic Marin County Breeding Bird Atlas (Shuford 1993) but not yet in the current atlas effort to date (MCCBA2; 2021-2022).**

Confirmed	Probable	Possible
Ring-necked Pheasant	Tufted Puffin	Common Poorwill
Ashy Storm-Petrel	Burrowing Owl	Rhinoceros Auklet
Long-eared Owl	Rock Wren	Northern Pygmy-Owl
Short-eared Owl	California Thrasher	
Northern Saw-whet Owl	Black-chinned Sparrow	
Say's Phoebe	Yellow-breasted Chat	
Sage Sparrow		
Northern Parula		

**Table 2. Species recorded to date in the current Marin County Breeding Bird Atlas effort (MCCBA2; 2021-2022) but not in the historic atlas (Shuford 1993).**

Confirmed	Probable	Possible
Mute Swan		Green-winged Teal
Wild Turkey		California Gull**
Indian Peafowl		Caspian Tern**
Eurasian Collared-Dove		
American Avocet*		
Forster's Tern		
Least Bittern		
Bald Eagle		
Peregrine Falcon*		
Cedar Waxwing		
Great-tailed Grackle		

\*denotes species noted in Shuford (1993) as found before or after the historic atlas surveys.

\*\*although one or more records of these species are technically designated as 'possible' in the current Atlas effort, other observations of these species were determined to be likely nonbreeders and excluded. Due to Marin being outside of their known breeding range, it is possible that the records included here may not end up in the final Atlas as possible breeding species unless their breeding is confirmed in the coming years.

**Table 3. Species confirmed breeding in the 2022 Marin County Breeding Bird Atlas effort that were not confirmed during the first year (2021) of the current effort.**

<b>Confirmed</b>
Indian Peafowl
Least Bittern
Cedar Waxwing
Great-tailed Grackle



Least Bittern fledgling at Las Gallinas wildlife pond in Block 12-22.

Photo credit: Becky Matsubara / Atlas Story Map.

## Future Direction and Next Steps

Wondering what's next? The following sections are intended to communicate some of what is to come for this multi-year effort now that we have completed the end of its second year of data collection.

### **Five-year Strategy**

See Figure 8 for a sketch of where we are in the larger Atlas timeline and what is still to come, as we enter what we are calling the “Expand” phase in the Atlas project.

This winter will bring a season of volunteer recruitment, protocol evaluation, fundraising, and preparations for next spring, while we adjust to having just lost a core member of our team, the estimable Joan Lamphier.

In 2023 we expect to have an even more extensive cadre of Block Leaders and other volunteers on the ground in the spring, covering sections of the county not yet covered and completing some of the blocks where surveys began in 2021-2022. We anticipate this will all be done with the help of a part-time Project Manager (a new position), committee volunteers who will be critical to our success, and likely new member(s) of the Steering Committee and Regional Coordinator team; please see the coming pages for more information. In 2023 we will be reaching out to various monitoring projects that take place throughout the county to solicit the contribution of their data to this effort (many have already volunteered to contribute, and some already have), and after the 2023 survey season we will integrate these datasets in with the volunteer Atlas data to give us a solid understanding of what gaps we need to focus on in 2024.



**Figure 8. Preliminary sketch of MCBBA2 five-year strategy**

### ***Recruiting for Volunteer Committees and Positions***

We are initiating four committees (i.e., volunteer ‘working groups’) that each focus on one of the four key thematic areas critical for this stage in the MCBBA2 project and for moving forward. Please consider if you can help!

The four volunteer committees are:

- Fundraising
- Volunteer Engagement and Recruitment
- Data Integrity
- Science Advisory

We will be reaching out to specific individuals to help and would also love to hear from you if you think any of these might be an area in which you have the time, interest, and in some cases (but not all!) specialized experience to contribute.

We are recruiting for 1-2 Regional Coordinator positions, and for 1-2 new members our Steering Committee.

Please reach out to any of the Steering Committee members (see page 1 for contact info) if you are interested in any of these or have a candidate in mind.

Also, a big thanks to the many of you who have already contributed in any of the above ways to this effort.

### ***Hiring a Project Manager***

In 2023 we hope and plan to have a part-time project manager who helps the Steering Committee with project momentum. Stay tuned! Note that we need to fundraise for this position, which will be the primary expense during the next phase of the Atlas project.

If you can help - donations both large and small really do make a difference! - please see our webpage to donate or contact our Steering Committee (see page 1). We will be reaching out when our fundraising campaign is in its next stage; meanwhile, we are receiving donations to help support this position and other costs.

Much appreciation goes out to our donors to date (see page 2).

### ***What's next for your active blocks?***

We are excited for pre-existing Block Leaders to continue surveying their blocks in 2023 in which they already did surveys in 2021 and/or 2022. We encourage this especially for any blocks that have not yet reached the preliminary “100% complete” designation (see Figure 2).

For blocks that are preliminary designated “100% complete”: we will be reassessing this designation this winter, and will reach out if there is any additional focused effort we may want to ask of Block Leaders (e.g., certain taxa or focal areas). Otherwise, we have been encouraging Block Leaders from these blocks (there are many - 45!) to focus on their other blocks or take on a new block or blocks. However, additional data can still be collected in these blocks in a few specific scenarios (e.g., to submit incidental observations for species not previously documented or at a higher precision than previously documented; if a Block Leader decides to survey a

habitat or unrepresentative segment that has yet to receive adequate attention; or to document an observation of a breeding behavior that isn't eligible in the incidental database).

Expect to hear more from us on this topic, including for taxa not well documented with our current survey method and timing.

We acknowledge that life transitions happen and that a volunteer's capacity may change over time. Block Leaders who currently have a block that is not preliminarily designated as complete, and who for whatever reason do not plan to collect data there in 2023, are strongly encouraged to contact their Regional Coordinator (see report page 3) and relinquish the block to another observer, if they have not yet done so. We appreciate any contributions they were previously able to make.

We also are excited to see how many blocks have recently been assigned to new Block Leaders and look forward to them collecting data there in 2023.

### ***Recruiting Volunteers for Unclaimed Blocks***

We are actively recruiting volunteers for our unclaimed blocks!

This includes existing volunteers, who may want to take on new or switch blocks. And it also includes prospective new volunteers who are skilled birders who can commit their time and energy, and who may be interested in seeing if they can join this effort.

We currently have 93 unclaimed blocks, including blocks that may have been initiated by another observer who could not complete them, or (in most cases) blocks that have yet to be claimed or have much if any standardized data collected in them.

If you are interested in a specific block that is currently unclaimed, you may want to try to grab it while you still can. See below for details for evaluating what blocks are still available and which might be a good fit for you.

Please see Figure 1 in this report to see which blocks were unclaimed as of September 2022. However, since these are being claimed on a regular basis, if you are interested in picking up a block, see our website and navigate to *MCBBA 2 Data Explorer > Map Explorer > Volunteer Coverage map* to see what blocks are currently available.

Want to know more information about the blocks currently available to help make your decision? You can expand the map and zoom in to check out the details of each block; look for this symbol in the upper right of the maps to make it easier to navigate:



Aren't sure? You can ask the Regional Coordinators about blocks or areas you might be interested in and they can help set you up with the block to match your interests and capacity.

See a block you are interested in? Reach out to Daphne Hatch or the Regional Coordinator associated with the region that block is in (see report page 3).

## **Summary**

This report provided an overview of what we have accomplished and learned after just two years of this Atlas project, and its results provide an insightful prelude – with some patterns already becoming evident – to all we will learn by the end of this ambitious endeavor to repeat a comprehensive Breeding Bird Atlas of the birds of Marin County. The number of participants, survey data, and sightings of breeding behaviors to date is impressive. It is a testament to the dedication of the many volunteers and supporters involved in this effort; to all of you, we again express our profound appreciation, and hope you are as proud of what has been accomplished to date as we are. We are excited for the next phase of this adventure and look forward to working with many of you on it, including in many of the ways outlined above.

## **Literature Cited**

Shuford, W. D. 1993. *The Marin County Breeding Bird Atlas: A Distributional and Natural History of Coastal California Birds*. California Avifauna Series 1. Bushtit Books, Bolinas, Calif.

**Appendix A List of observers** in Marin County Breeding Bird Atlas II in 2022, including Block Leaders, additional surveyors, and submitters/reporters of incidental observations.  
 (Please accept our sincere apologies to anyone we missed and for any misspelled names, and reach out to the Steering Committee so we can correct this going forward)

Alex Merritt	David Hudson	Joan Lamphier	Patricia DiLuzio
Andy Medley	David Lumpkin	Joe Eaton	Patrick Ford
Angelina Pavlosky-Anton	David MacKenzie	Joe Medley	Patti Blumin
Ann Linder	David Sexton	Joel Hedgpeth	Pauline Grant
Anne Kelley	David Wimpfheimer	John King	Peter Colasanti
Anne Menke	Dawn Lemoine	John Longstreth	Rachel Lawrence
Anne Todd	Dean Hanson	Joseph Zeno	Rasia Holzman Smith
Arthur Meader	Dede Sabbag	Joyce Waterman	Renee Cormier
Barbara Wechsberg	Derek Lecy	Julian Wood	Richard Bradley
Ben DeDominic	Diana Humple	Karina White	Richard Cimino
Beth Schriock	Doug Waterman	Kate Hudson	Richard Diluzio
Betty Rappaport	Dustin Deminna	Kati Malabed	Robert Chilvers
Bill Jones	Eli Likover	Kris Wiskes	Robert Hinz
Bob Atwood	Ellen Blustein	Kyle Verblaauw	Ronald Brown
Bob Battagin	Emilie Strauss	Larry Nigro	Rusty Scalf
Bobbi Likover	Ethan Okamura	Lisa Hug	Ryan DiGaudio
Bonnie Marks	Eugene Hunn	Lisa Michl	Sally Gale
Brandy Ford	Evan Weissman	Liz Lewis	Sally Peacock
Brian Browne	Everett Clark	Luanna Helfman	Sandra Chilvers
Carla Parkinson	Harriot Manley	M. McClaskey	Scott Buchanan
Carleton Eyster	Heather Clapp	Maggie Brown	Scott Jennings
Carol Cuneo	Heller Stanton	Maggie Montenegro	Stephanie Romano
Carol Hunt	Jack Gedney	Maggie Rufo	Steve Howell
Carolyn Longstreth	Jakob Stanton	Mark Dettling	Susan Kelly
Cate Merritt	Jane Hicks	Mark Schulist	Sylvie Silverstein
Catherine Hickey	Jane Medley	Mary Burke	Tim Weed
Christyne Davidian	Janet Bodle	Matt Lau	Vicens Vila-Coury
Connor Cochrane	Janet Burnham	Mike Mecham	William Legge
Daniel Edelstein	Jasper Smith	Molly Donahue	William Wiskes
Daniel Stanton	Jeanine Starritt	Nancy Hanson	Wlm van Dam
Daphne Hatch	Jeanne Hammond	Nancy Hunn	Yvette MacDonald
David Gregoire	Jim Crumpler	Natalie Clark	
David Herlocker	Jim White	Nina Sullivan	

**Appendix B Complete list of confirmed breeding species** to date (2021-2022) through the current Marin County Breeding Bird Atlas II effort, in taxonomic order.

Canada Goose	Red-tailed Hawk	Bewick's Wren
Mute Swan	Barn Owl	Blue-gray Gnatcatcher
Wood Duck	Western Screech-Owl	Golden-crowned Kinglet
Cinnamon Teal	Great Horned Owl	Wrentit
Gadwall	Spotted Owl	Western Bluebird
Mallard	Belted Kingfisher	Swainson's Thrush
California Quail	Acorn Woodpecker	Hermit Thrush
Wild Turkey	Downy Woodpecker	American Robin
Indian Peafowl	Nuttall's Woodpecker	Northern Mockingbird
Pied-billed Grebe	Hairy Woodpecker	European Starling
Rock Pigeon	Northern Flicker	Cedar Waxwing
Band-tailed Pigeon	Pileated Woodpecker	House Sparrow
Eurasian Collared-Dove	American Kestrel	House Finch
Mourning Dove	Peregrine Falcon	Purple Finch
White-throated Swift	Ash-throated Flycatcher	Red Crossbill
Anna's Hummingbird	Western Kingbird	Pine Siskin
Allen's Hummingbird	Olive-sided Flycatcher	Lesser Goldfinch
Virginia Rail	Western Wood-Pewee	American Goldfinch
Common Gallinule	Pacific-slope Flycatcher	Grasshopper Sparrow
American Coot	Black Phoebe	Lark Sparrow
Black Rail	Loggerhead Shrike	Chipping Sparrow
Black-necked Stilt	Hutton's Vireo	Dark-eyed Junco
American Avocet	Warbling Vireo	White-crowned Sparrow
Black Oystercatcher	Steller's Jay	Savannah Sparrow
Killdeer	California Scrub-Jay	Song Sparrow
Snowy Plover	American Crow	California Towhee
Pigeon Guillemot	Common Raven	Rufous-crowned Sparrow
Western Gull	Horned Lark	Spotted Towhee
Forster's Tern	Tree Swallow	Western Meadowlark
Brandt's Cormorant	Violet-green Swallow	Hooded Oriole
Pelagic Cormorant	Northern Rough-winged Swallow	Bullock's Oriole
Double-crested Cormorant	Purple Martin	Red-winged Blackbird
Least Bittern	Barn Swallow	Tricolored Blackbird
Great Blue Heron	Cliff Swallow	Brown-headed Cowbird
Great Egret	Chestnut-backed Chickadee	Brewer's Blackbird
Green Heron	Oak Titmouse	Great-tailed Grackle*
Black-crowned Night-Heron	Bushtit	Orange-crowned Warbler
Turkey Vulture	Red-breasted Nuthatch	Common Yellowthroat
Osprey	White-breasted Nuthatch	Yellow-rumped Warbler
White-tailed Kite	Pygmy Nuthatch	Black-throated Gray Warbler
Northern Harrier	Brown Creeper	Hermit Warbler
Cooper's Hawk	House Wren	Wilson's Warbler
Bald Eagle	Pacific Wren	Black-headed Grosbeak
Red-shouldered Hawk	Marsh Wren	Lazuli Bunting

## Appendix C Historic and current species by breeding category

Comprehensive list comparing species documented across all breeding categories and comparing across both Marin County Breeding Bird Atlas efforts (historic versus the current effort to date, 2021-2022)

● = Confirmed      ◉ = Probable      ○ = Possible      --- = not detected as potential breeder

	Species	Shuford (1993)	MCBBA2 (2021-2022)
1	Canada Goose	●	●
2	Mute Swan	---	●
3	Wood Duck	●	●
4	Blue-winged Teal	◉	◉
5	Cinnamon Teal	●	●
6	Northern Shoveler	○	◉
7	Gadwall	●	●
8	Mallard	●	●
9	Northern Pintail	●	◉
10	Green-winged Teal	---	○
11	Common Merganser	●	◉
12	Ruddy Duck	●	◉
13	California Quail	●	●
14	Wild Turkey	---	●
15	Ring-necked Pheasant	●	---
16	Indian Peafowl	---	●
17	Pied-billed Grebe	●	●
18	Rock Pigeon	●	●
19	Band-tailed Pigeon	●	●
20	Eurasian Collared-Dove	---	●
21	Mourning Dove	●	●
22	Common Poorwill	○	---
23	Vaux's Swift	○	○
24	White-throated Swift	●	●
25	Anna's Hummingbird	●	●
26	Allen's Hummingbird	●	●
27	Ridgway's Rail	●	◉
28	Virginia Rail	●	●
29	Sora	●	○
30	Common Gallinule	●	●
31	American Coot	●	●
32	Black Rail	●	●
33	Black-necked Stilt	●	●

	Species	Shuford (1993)	MCBBA2 (2021-2022)
34	American Avocet	---	●
35	Black Oystercatcher	●	●
36	Killdeer	●	●
37	Snowy Plover	●	●
38	Common Murre	●	◐
39	Pigeon Guillemot	●	●
40	Rhinoceros Auklet	○	---
41	Tufted Puffin	◐	---
42	Western Gull	●	●
43	California Gull	---	○
44	Caspian Tern	---	○
45	Forster's Tern	---	●
46	Ashy Storm-Petrel	●	---
47	Brandt's Cormorant	●	●
48	Pelagic Cormorant	●	●
49	Double-crested Cormorant	●	●
50	American Bittern	●	○
51	Least Bittern	---	●
52	Great Blue Heron	●	●
53	Great Egret	●	●
54	Snowy Egret	●	○
55	Green Heron	●	●
56	Black-crowned Night-Heron	●	●
57	Turkey Vulture	●	●
58	Osprey	●	●
59	White-tailed Kite	●	●
60	Golden Eagle	●	○
61	Northern Harrier	●	●
62	Sharp-shinned Hawk	●	◐
63	Cooper's Hawk	●	●
64	Bald Eagle		●
65	Red-shouldered Hawk	●	●
66	Red-tailed Hawk	●	●
67	Barn Owl	●	●
68	Western Screech-Owl	●	●
69	Great Horned Owl	●	●
70	Northern Pygmy-Owl	○	---
71	Burrowing Owl	◐	---
72	Spotted Owl	●	●

	<b>Species</b>	<b>Shuford (1993)</b>	<b>MCBBA2 (2021-2022)</b>
73	Long-eared Owl	●	---
74	Short-eared Owl	●	---
75	Northern Saw-whet Owl	●	---
76	Belted Kingfisher	●	●
77	Acorn Woodpecker	●	●
78	Red-breasted Sapsucker	●	○
79	Downy Woodpecker	●	●
80	Nuttall's Woodpecker	●	●
81	Hairy Woodpecker	●	●
82	Northern Flicker	●	●
83	Pileated Woodpecker	●	●
84	American Kestrel	●	●
85	Peregrine Falcon	---	●
86	Ash-throated Flycatcher	●	●
87	Western Kingbird	●	●
88	Olive-sided Flycatcher	●	●
89	Western Wood-Pewee	●	●
90	Pacific-slope Flycatcher	●	●
91	Black Phoebe	●	●
92	Say's Phoebe	●	---
93	Loggerhead Shrike	●	●
94	Hutton's Vireo	●	●
95	Cassin's Vireo	●	●
96	Warbling Vireo	●	●
97	Steller's Jay	●	●
98	California Scrub-Jay	●	●
99	American Crow	●	●
100	Common Raven	●	●
101	Horned Lark	●	●
102	Tree Swallow	●	●
103	Violet-green Swallow	●	●
104	Northern Rough-winged Swallow	●	●
105	Purple Martin	●	●
106	Barn Swallow	●	●
107	Cliff Swallow	●	●
108	Chestnut-backed Chickadee	●	●
109	Oak Titmouse	●	●
110	Bushtit	●	●
111	Red-breasted Nuthatch	●	●

	Species	Shuford (1993)	MCBBA2 (2021-2022)
112	White-breasted Nuthatch	●	●
113	Pygmy Nuthatch	●	●
114	Brown Creeper	●	●
115	Rock Wren	◐	---
116	House Wren	●	●
117	Pacific Wren	●	●
118	Marsh Wren	●	●
119	Bewick's Wren	●	●
120	Blue-gray Gnatcatcher	●	●
121	Golden-crowned Kinglet	●	●
122	Wrentit	●	●
123	Western Bluebird	●	●
124	Swainson's Thrush	●	●
125	Hermit Thrush	●	●
126	American Robin	●	●
127	California Thrasher	◐	---
128	Northern Mockingbird	●	●
129	European Starling	●	●
130	Cedar Waxwing	---	●
131	House Sparrow	●	●
132	House Finch	●	●
133	Purple Finch	●	●
134	Red Crossbill	○	●
135	Pine Siskin	●	●
136	Lesser Goldfinch	●	●
137	Lawrence's Goldfinch	●	◐
138	American Goldfinch	●	●
139	Grasshopper Sparrow	●	●
140	Lark Sparrow	●	●
141	Chipping Sparrow	●	●
142	Black-chinned Sparrow	◐	---
143	Dark-eyed Junco	●	●
144	White-crowned Sparrow	●	●
145	Sage Sparrow	●	---
146	Savannah Sparrow	●	●
147	Song Sparrow	●	●
148	California Towhee	●	●
149	Rufous-crowned Sparrow	●	●
150	Spotted Towhee	●	●

	<b>Species</b>	<b>Shuford (1993)</b>	<b>MCBBA2 (2021-2022)</b>
151	Yellow-breasted Chat	●	---
152	Western Meadowlark	●	●
153	Hooded Oriole	●	●
154	Bullock's Oriole	●	●
155	Red-winged Blackbird	●	●
156	Tricolored Blackbird	●	●
157	Brown-headed Cowbird	●	●
158	Brewer's Blackbird	●	●
159	Great-tailed Grackle		●
160	Orange-crowned Warbler	●	●
161	MacGillivray's Warbler	●	●
162	Common Yellowthroat	●	●
163	Northern Parula	●	---
164	Yellow Warbler	●	○
165	Yellow-rumped Warbler	●	●
166	Black-throated Gray Warbler	●	●
167	Hermit Warbler	●	●
168	Wilson's Warbler	●	●
169	Western Tanager	●	○
170	Black-headed Grosbeak	●	●
171	Lazuli Bunting	●	●