Santa Cruz County Breeding Bird Atlas II

Year 1 Summary

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With contributions from

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19 December 2017

SUMMARY OF THE ATLASING SEASON

After a month of testing atlasing methods and materials in March, the field season officially began April 1. Over ten training field trips were held in the following four months, which produced 43 trained atlasers. Training field trips focused on navigating the datasheets, interpreting bird behavior and assigning a corresponding breeding code, and the background of why this project was undertaken. After this instruction, atlasers were given one or two types of datasheets depending on the type of atlasing they chose to participate in, a list of breeding codes, and a map of Santa Cruz County with transposed atlas gridlines and block numbers.

Block atlasers were assigned a 25 square kilometer (9 square mile) atlas block to cover throughout the breeding season. Their goal was to find 90% of the species thought to be breeding in the block and confirm 60% of those. When those two thresholds were met, the block could be considered "complete" meaning no further atlasing was required. A list of bird species thought to be breeding in each block was compiled to allow evaluation of progress toward this goal of completion. The eleven blocks formally atlased by block atlasers this year are outlined in thick black lines in Figure 1.

Casual atlasers were not assigned a block nor asked to meet any particular goals, but instead had the freedom to atlas at their leisure. However, some casual atlasers volunteered to assist in a greater capacity by focusing their atlasing efforts on a specific assignment. With these extra efforts, we were able to test methods of monitoring nesting colonial waterbirds we plan to implement in future years, confirm the breeding of specific rare or local species that may have otherwise been unattained, and ensure completion of several blocks that would have otherwise fallen short of the 90%-60% block goal.

Many atlasers also submitted incidental observations of breeding evidence found while not atlasing. Submitters of incidental observations contributed considerably to the number of records that were collected.

Interesting breeding records turned up throughout the season. A summary of highlights can be found in previous issues of the Albatross and on the Monterey Bay Birders listserv. Perhaps the most important takeaway from all the interesting breeding records from this year is that many would not have been found without atlasing. Atlasing tended to take many birders away from the well worked hotspots to new frontiers that receive little or no coverage each breeding season, and to pursue specific species and individuals difficult to confirm, leading to new and unusual record.

At the end of the season, August 31, atlasers submitted their datasheets with breeding records. Datasheets were directly imported or transcribed then imported into the atlas database, a relational database built using FileMaker Pro. The database stores both breeding records and effort data recorded on the datasheets, and allows data to be exported for mapping and analysis. All breeding records in the atlas database were reviewed for errors. If a correctable error was found, the record was changed and considered valid; if the error was not correctable, the record was considered invalid and excluded from data used in mapping and analysis. Most invalidated records were the result of the atlaser incorrectly using a breeding code, often discovered from a additional notes about the observation provided by the atlaser. The most common type of error found was the breeding code "Precocial Young" being attributed to young of species that are altricial or semi-altricial. Another common error was using the breeding codes "Carrying Food" and "Carrying Nest Material" for species such as Common Raven, California Scrub-Jay, and other species these codes do not apply to because of their different life history. Nevertheless, only 104 (3.1%) of the total records received were invalidated, leaving a high proportion of records available for mapping and analysis.

RESULTS

Records from throughout 2017 were considered within the scope of the pilot year, however, in this report only records from March through mid-September were used in mapping and analysis. Additional records from 2017 before or after the main six and a half month period of atlasing are being entered into the database and will be included in future reports. Records were received from 35 atlasers and one project, the Quail Hollow Ranch Nest Box Project. Most atlasers submitted 10-100 breeding records, but a few submitted a hundreds to 1,000 records.

A total of 3,223 breeding records were received, a majority of which (72%) were considered "confirmed" breeding evidence (Table 1). Atlasers reported breeding evidence for 127 species; 111 (87%) of those species were confirmed breeding. The number of species

confirmed breeding this year represents about two-thirds of the species thought to breed in the county.

The number of species breeding in a block varies, largely due to habitat composition, but most blocks are expected to have 60-80 breeding species. Figure 2 shows the distribution of breeding species found and those confirmed in each block during Year 1. Interpretation of these maps is currently limited by incomplete coverage of the county from only one year of atlasing, but interpretation will improve in subsequent years as more areas are atlased and coverage goals are reached for more blocks. Despite the current limitations of these maps it is clear more breeding species were found in blocks formally atlased than blocks only receiving casual atlasing and incidental effort. This does not come as a surprise as block atlasers were instructed to record possible and probable evidence in addition to confirmations which captured species possibly or probably breeding, but were not actually confirmed to do so. Casual atlasers and submitters of incidental observations were recommended to only submit confirmed evidence as their efforts may span many blocks making recording and tracking lower levels of breeding evidence tedious for a large number of species.

An encouraging result from this year was 9 of the 11 blocks formally atlased blocks were completed or nearly completed by the end of the season. On top of that, two blocks (8090 and 8590) not formally atlased were nearly competed entirely from casual atlasing and incidental efforts! That means in Year 1 we came close to completing 11 of roughly 61 (18%) blocks that will be atlased throughout the project. This result is especially impressive as many atlasers were not fully trained until June, half way through the breeding season, and were still becoming accustomed to atlasing methods and recording data. Casual atlasers and submitters of incidental observations also made substantial contributions by chipping away at 31 blocks not formally atlased in Year 1. Their efforts give block atlasers in subsequent years a head start on reaching the goal of finding 90% of the species thought to be breeding in a block and confirming 60% of those.

Atlasers recorded the number of hours they spent atlasing in each block each day providing a metric which could be used to assess the adequacy of coverage in each block at the end of the season. Mapping the number of hours atlased in each block allows visualization of where coverage was highest (Figure 3). While popular blocks expectedly received high coverage (e.g., 125 hours in 8090), many blocks (e.g., 7510) in the mountains only visited by one or a few atlasers received proportionally high coverage. These mountain blocks were covered by block atlasers, demonstrating the effectiveness of repeated visits by one or a few atlasers to attain adequate coverage in a block. Conversely, some mid-county coast blocks (e.g., 8090 and 8590) not formally atlased received very high coverage from many casual atlasers, demonstrating blocks with popular attractions such as birding hotspots, rare birds, or high accessibility due to many parks and being close to where many birders live can be effectively completed without formal block atlasing.

Block popularity—how many atlasers visited a block—can also be used to visualize how effort was distributed. While block popularity does not necessarily indicate the adequacy of coverage in a block as one or a few prolific atlasers could accumulate many hours of coverage in a block over the course of a season, block popularity does show which blocks were visited by the most atlasers. This is of interest from the perspective of planning for future years as well as visualizing which blocks the most atlasers visited. If atlasers are visiting a block for its inherent attractions, then there may not be a need to formally atlas in it and atlasers can be diverted to more underserved blocks. Atlasing occurred across much of the county but some regions were more popular than others (Figure 3). Examining the distribution of unique atlasers that visited each block reveals the most popularly atlased area was the coast between Wilder Ranch State Park and Manresa State Beach. Popular birding hotspots (e.g., Quail Hollow Ranch County Park in block 8000) or rare birds (e.g., Least Bittern in 0590) were the likely drivers of block popularity away from popular coastal blocks.

The distribution and breeding phenology of some species were mapped and graphed to illustrate the type of information that may be presented in the atlas publication (Figure 4). Breeding maps of two species, Violet-green Swallow and Warbling Vireo, were chosen as representatives due to the variety of breeding evidence and substantial number of records collected in Year 1. The breeding phenology of Oak Titmouse was graphed as well. These maps and graph are of course only an incomplete representation of the species' breeding distribution and phenology, and will be improved with more field work in future years, but they give a taste of what may appear in the atlas publication.

COMPARISON WITH OTHER ATLASES

While the results from Year 1 demonstrate considerable progress toward completion of the project's field work, it is worth examining how our effort this year compares to the efforts of other breeding bird atlases in the region. I chose the breeding bird atlases of Santa Clara County (Bousman 2007) and Monterey County (Roberson 1993) to make a course evaluation against. Field work for both the Santa Clara and Monterey atlases was undertaken in the late 1980s and early 1990s, and the methods used to collect breeding records were similar to those implemented in Year 1 of the Santa Cruz County Breeding Bird Atlas II. Overall our Year 1 was close to or exceeding the average effort in each year of the Santa Clara and Monterey atlases (Table 2).

LOOKING FORWARD

Based on the results of the pilot year, field work for the atlas is expected to last 3-4 more years. However, the project began well-into the breeding season and many atlasers were not fully trained until June, so less data was collected early in the breeding season than would be

expected. In future years, an experienced corps of atlasers will be ready to begin field work early in the breeding season which will in theory lead to more data collected over the course of the season.

Looking forward, what can be expected by atlasers in Year 2? The general methods of atlas events will remain the same, but improvements based on what was learned in Year 1 are being planned. Data recording will become easier with a simplified universal datasheet, atlaser trainings will be held in late winter to allow more time for atlasers to cover their assigned block, and a document describing the basics of atlasing and recording data will be provided to atlasers. We also plan to increase the scale and effort of monitoring nesting colonial waterbirds in the county so all current and historic nesting sites are regularly monitored over the course of the breeding season. Collaboration with people and projects that collect breeding records for other purposes will be pursued. We hope to attract more atlasers with these improvements and increased collaborative and participatory opportunities.

ACKNOWLEDGEMENTS

Throughout the year many people have generously volunteered their time, expertise, and support to the project. I want to specially thank the atlas steering committee—Stephanie Singer, Nick Levendosky, Rusty Scalf, Matthew Strusis-Timmer, and Lisa Sheridan—for assisting with planning, collaboration, fundraising, and serving as the main source of logistic support during the breeding season. David Suddjian provided helpful guidance and perspective from the first Santa Cruz County atlas and Steve Gerow offered valuable advice in the early stages of the project. Jenny Anderson with the Quail Hollow Ranch Nest Box Program and John Ellis graciously shared nest box data from their respective projects. Thanks to Ruth McGurk's editorial eyes that improved the atlas articles and reports this year, and Lisa Larson was especially patient with my submissions to the Albatross. This report would not have come together without Rusty Scalf's professional mapping and Simon Thornhill's skillful database building and analysis. I would also like to express appreciation for all those who have donated to the atlas as well as the Santa Cruz Bird Club board for sponsoring field work this year. Last but not least, a sincere thank you to the atlasers who attended trainings and submitted breeding records.

CITATIONS

Bousman, W. G. 2007. *Breeding Bird Atlas of Santa Clara County, California*. Cupertino, CA: Santa Clara Valley Audubon Society.

Roberson, D. and C. Tenney (Eds.). 1993. *Atlas of the Breeding Birds of Monterey County California*. Monterey, CA: Monterey Peninsula Audubon Society.

TABLES

Table 1. Breeding Records by Atlasing Type.

Breeding Evidence	**Block Atlasing**	**Casual Atlasing**	**Incidental Observations**	**Total Records**
Confirmed	776	1013	535	2324
Probable	188	145	23	356
Possible	499	26	5	530
Observed	12	1	0	13
Total Records	**1475**	**1185**	**563**	**3223**

Table 2. A Comparison with Two Other Breeding Bird Atlases.

Average Yearly Effort	**Santa Cruz** *2017*	**Santa Clara** *1988-93*[a]	**Monterey** *1988-92*[b]
# Atlasers	34	24.3	(49 throughout project)
# Hours Atlased	1138	899.5[c]	712.2
# Breeding Confirmations	2324	2424.8	1197.6
# Initial Breeding Confirmations[d]	767	1085.5	—

a) Data from the 1987 pilot year was excluded from the project average. b) Some records and effort from 1987 were included in the project average. c) The author notes the number of hours reported represents a minimum amount of time spent atlasing, and that the actual amount is probably more. d) An initial confirmation is the first breeding confirmation for a species in a block.

FIGURES

Figure 1. Atlas Map.

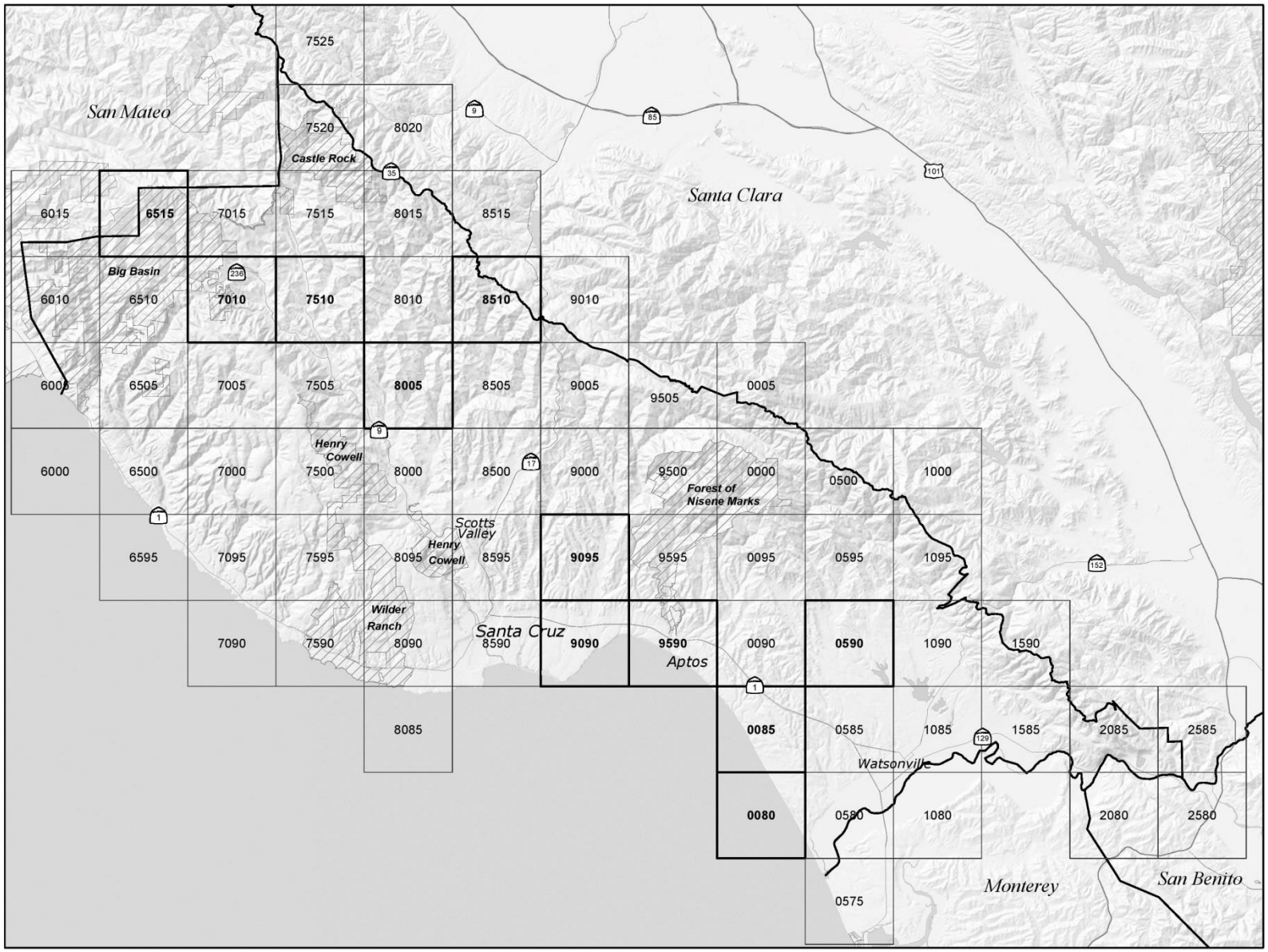

Figure 2. Distribution of Species in Year 1.

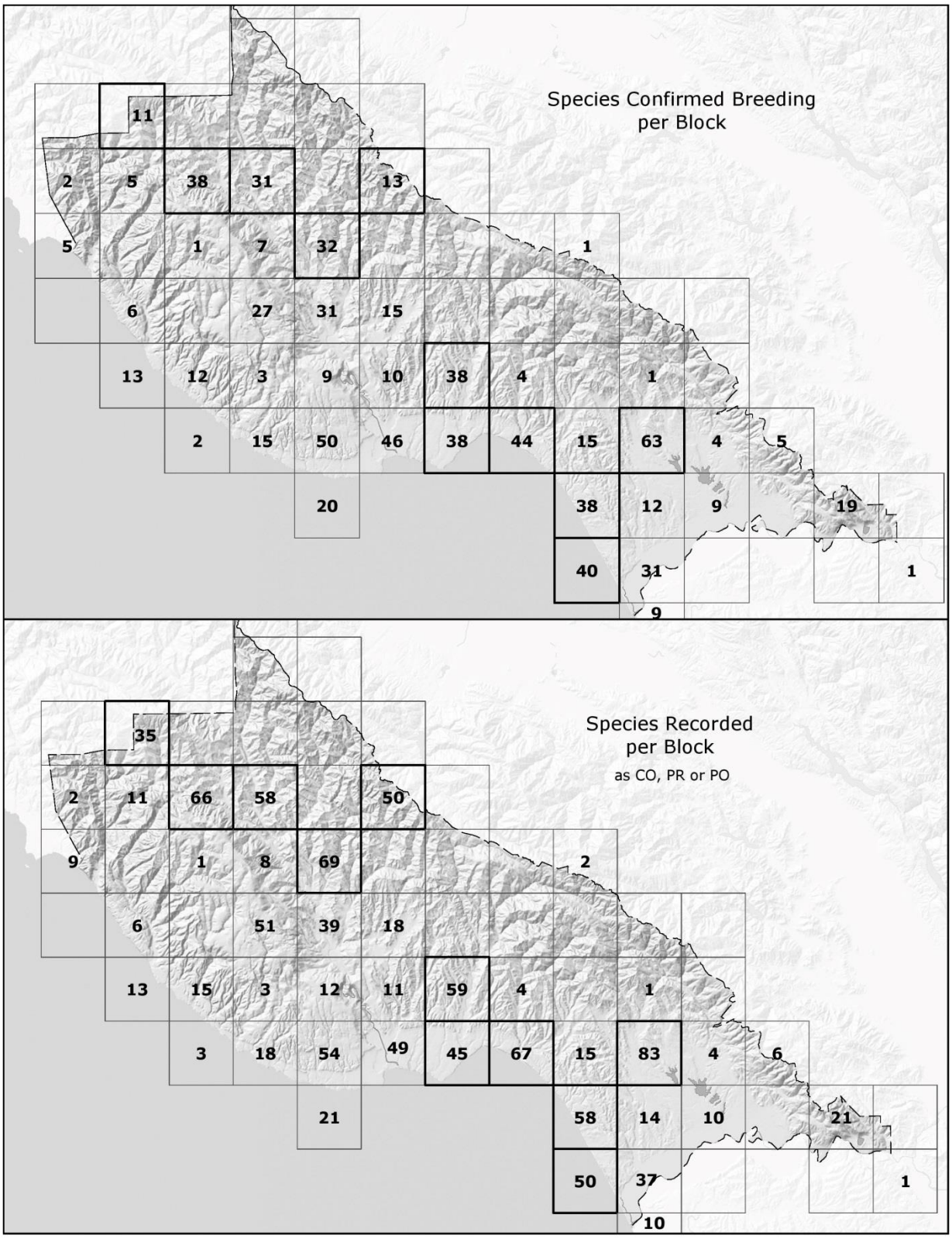

Figure 3. Distribution of Effort in Year 1.

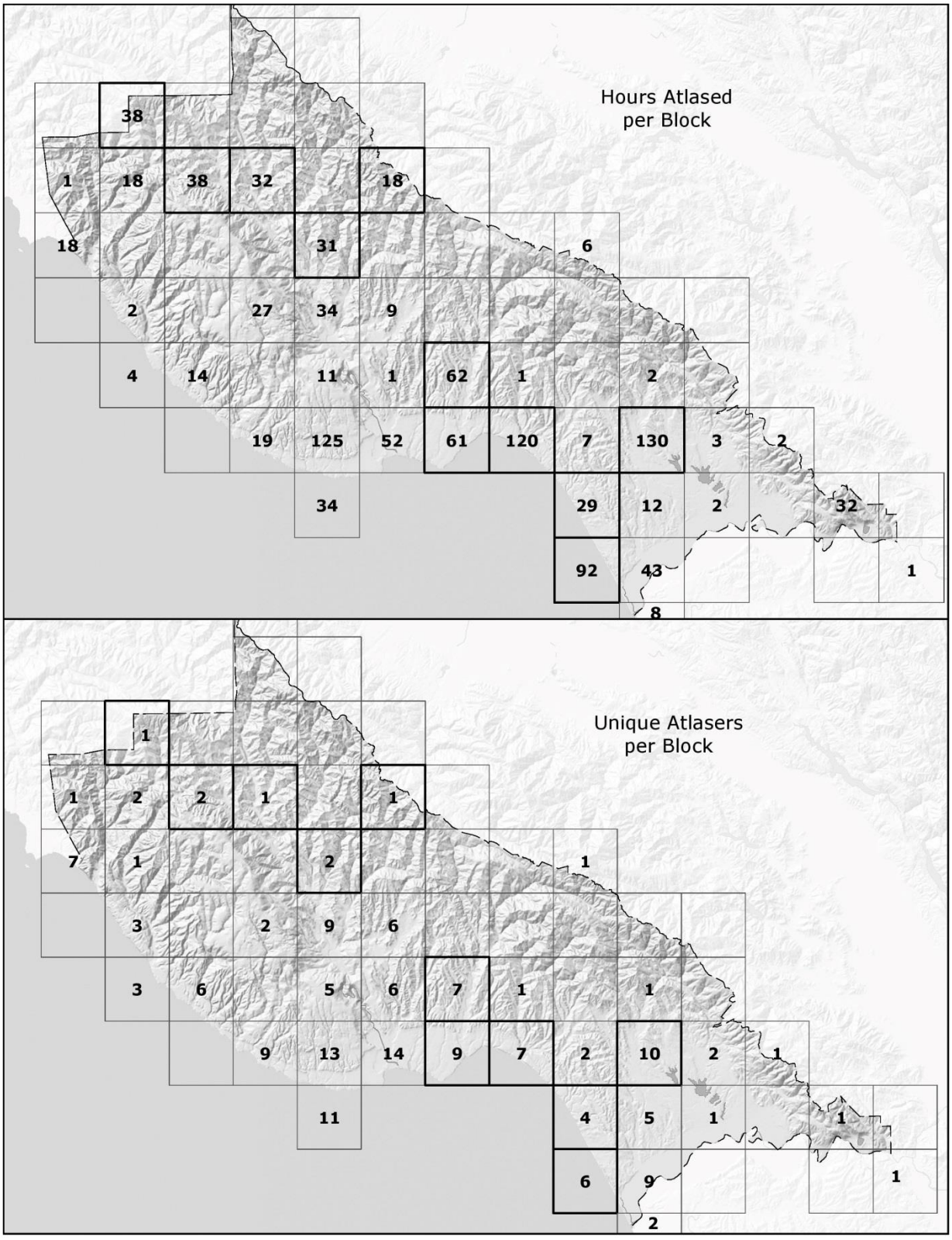

Figure 4. Breeding Distributions of Two Selected Species.

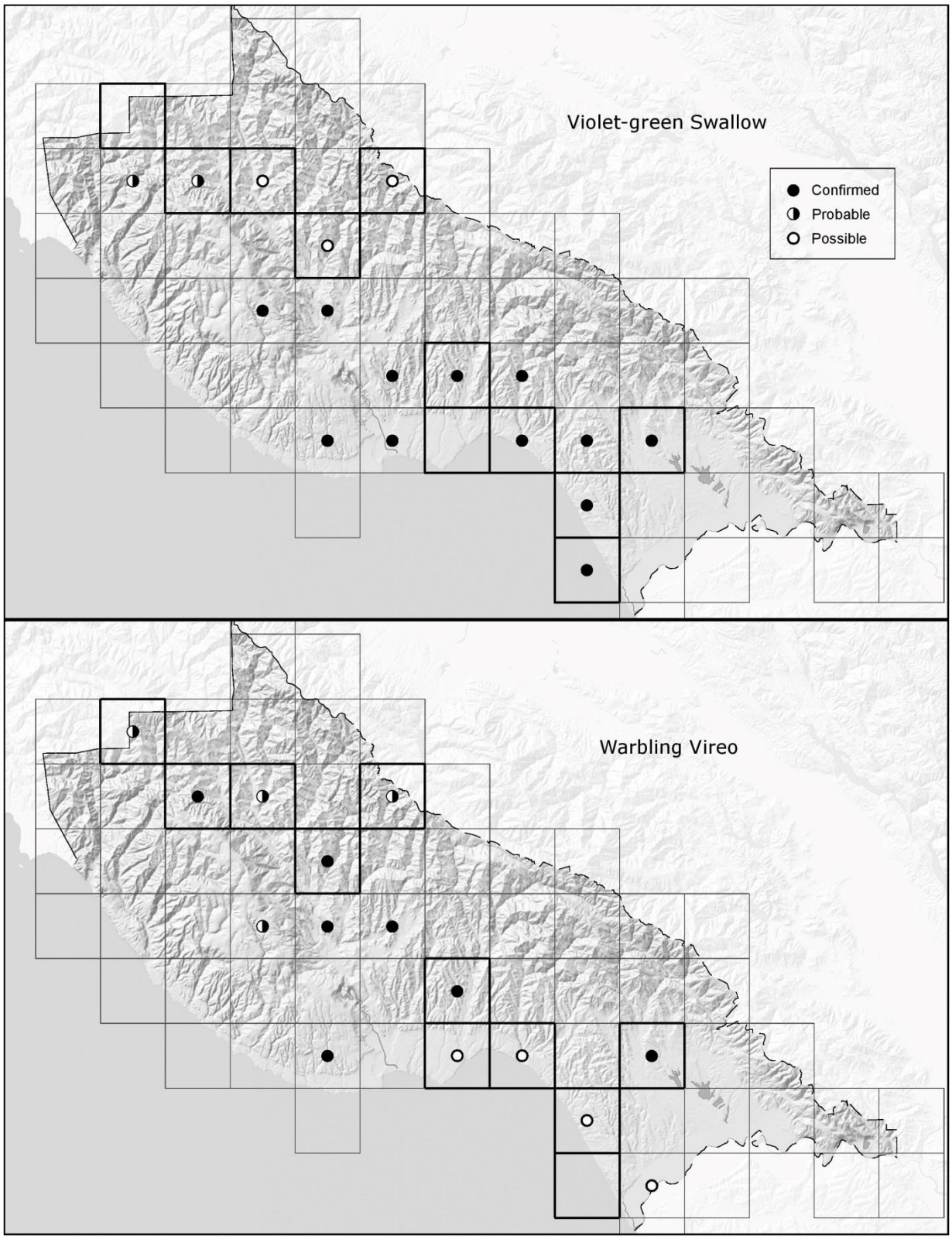

Figure 5. Breeding Phenology of Oak Titmouse (*Baeolophus inornatus*).