

Vermont Breeding Bird Atlas

Discovering and Conserving Biodiversity

2003-2007

A project of the VERMONT INSTITUTE OF NATURAL SCIENCE



Manual for Participants

Sponsors and Supporters



The Vermont Breeding Bird Atlas (VBBA) is sponsored by the **Vermont Institute of Natural Science (VINS)** with the cooperation of the following organizations or institutions:

Vermont Department of Fish and Wildlife

Audubon Vermont

School of Natural Resources at the University of Vermont

National Wildlife Federation

VBBA Steering Committee

Cedric Alexander, *District Wildlife Biologist, Vermont Department of Fish and Wildlife*

David Capen, *Professor, School of Natural Resources, University of Vermont*

Mark LaBarr, *Conservation and Stewardship Director, Audubon Vermont*

Sally Laughlin, *Director of Development and Alumni Relations, Johnson State College*

Chris Rimmer, *Director, Conservation Biology Department, Vermont Institute of Natural Science*

Wayne Scott, *Science Teacher, Crossroads Academy; co-chair, Vermont Bird Records Committee; Coordinator, Vermont Bird Alert*

The Vermont Breeding Bird Atlas thanks The Vermont Fish and Wildlife Department and the members and trustees of the Vermont Institute of Natural Science for providing the foundation for a successful Atlas.

VBBA Staff

Rosalind Renfrew, *Atlas Project Director, Vermont Institute of Natural Science*

VBBA Advisor

Steve Parren, *Director, Nongame and Natural Heritage Program, Vermont Department of Fish and Wildlife*

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A project of the
VERMONT INSTITUTE
OF NATURAL SCIENCE

27023 Church Hill Road
Woodstock, VT 05091

Tel: (802) 457-2779 x127

Fax: (802) 457-1053

rrenfrew@vinsweb.org

<http://www.uvm.edu/~vbba>

Manual Version 1.0 – January 2003



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The Vermont Breeding Bird Atlas (VBBA) is a five-year (2003-2007) census to document the distribution of breeding birds across Vermont. Carried out every 25 years, the resulting "snapshot" of the status of all of the species in the state provides priceless information for managers, landowners, and local and regional conservation projects. Maps and data bases describing the distribution of every species breeding in the state will be published and available to anyone free of charge on the Internet. Field work will rely heavily on volunteers, for whom this manual has been prepared.

Project Overview

The beauty, diversity, and accessibility of birds have made birding one of the fastest growing hobbies, enjoyed by people of all ages. Despite our love for our feathered friends, it has become increasingly important to track bird populations because environmental pressures can compromise their stability. The Vermont Breeding Bird Atlas harnesses the collective efforts of birders and uses it for bird conservation. As a birdwatcher, simply by going out and doing what you love to do, you can help conserve the creatures you love to watch.

Over twenty-five years ago, we knew relatively little about many of the birds breeding within our borders. The Vermont Institute of Natural Science (VINS) was in its infancy, and its founder, Sally Laughlin, recognized that if we were to help conserve our birds, we needed to better understand what species Vermont harbored and where they occurred. Sally gathered up a handful of fellow birders, and embarked on an ambitious journey: to map the distribution of every bird species breeding in Vermont.

The Atlas of Breeding Birds of Vermont was published in 1985 and has been a pivotal tool to guide conservation and enhance our understanding of Vermont's bird fauna. It was the first such atlas published in North America, and it represents the single largest citizen science project in Vermont's history. Hundreds of volunteers carried out a systematic survey of breeding birds between 1977 and 1981 to create this landmark reference document. The ultimate goal of the North American Ornithological Atlas Committee (NORAC), which coordinates Atlases around the continent, was to repeat the Atlas every 25 years to update our knowledge of bird distribution and to evaluate any changes.

The time has come for a new Vermont Breeding Bird Atlas. In the last 25 years, we have seen changes in our landscape and in our climate that can affect the status and location of breeding birds. As we forge ahead with conservation in this new century, we need to consistently update the information we use to provide effective conservation strategies that are adaptive, incorporating crucial new information about where birds are breeding. Vermont's second-generation atlas promises to involve an even larger cadre of committed amateur birders than its inaugural effort 25 years ago. Cooperating with VINS in the effort are: Vermont Department of Fish and Wildlife Nongame and Natural Heritage Program, Audubon Vermont, and the National Wildlife Federation

The objectives of the Vermont Breeding Bird Atlas are to:

- ❖ Repeat coverage of the first atlas with fieldwork between 2003 and 2007.
- ❖ Gather distribution and abundance data for every species breeding in Vermont.
- ❖ Identify rare species and important breeding areas for birds.

- ❖ Enhance public awareness of birds through presentations, workshops, and field trips focused on avian identification, ecology, and conservation.
- ❖ Expand the existing network of citizen scientists in Vermont by encouraging participation in an important and popular conservation project.

The outcomes of the Vermont Breeding Bird Atlas will be:

- ❖ Detailed distribution maps.
- ❖ Contour maps of abundance.
- ❖ Analysis of range changes since the first bird atlas.
- ❖ A benchmark for comparison to future bird atlases.
- ❖ Conservation recommendations based on distribution of rare species and hotspots of avian diversity.
- ❖ Increased public awareness and appreciation of birds, bird habitat, and principles of bird conservation.
- ❖ An interactive web site, published book, and database available for research and conservation purposes.

County Coordinators

The Vermont Breeding Bird Atlas is fueled by volunteer participants like you. For each county, there are one to three people coordinating Atlassing. They will help you to establish your survey area, answer questions, follow up with you on reporting of your results, and follow up on sightings of rare species. In some cases, for less experienced birders, they may be able to assist you or pair you with more experienced birders to help get you started. They are there to support your Atlassing efforts, but please tap them as sparingly as possible, as they are volunteering their time and have many responsibilities.

ADDISON

Judy Peterson
458 Turkey Lane
Panton, VT 05491
475-2620
japete@together.net

BENNINGTON

Ruth Stewart
324 Morse Hill Road
E. Dorset, VT 05253
362-1185
rstewdor@pop.k12.vt.us

Bonnie Dundas
77 Chandlers Way
Bennington, VT 05201
447-7433
kinglet@sover.net

CALEDONIA

Libby Hillhouse
3625 N. Bailey Hazen Road
East Ryegate, VT 05042
592-3547
bobolink@kingcon.com

Lou Bushey
VT Dept of Forests, Parks and Recreation
1229 Portland St, Suite 201
St. Johnsbury, VT 05819
H: 633-2689
W: 751-0136
louis.bushey@anrmail.anr.state.vt.us
Home email: lbushey@kingcon.com

CHITTENDEN

Tom Barber
179 N Prospect St
Burlington, VT 05401
859-1822
gray.jay@verizon.net

ESSEX

Matt Langlais
1229 Portland Street
St. Johnsbury, VT 05819
H: 467-8593
W: 751-0134
matt.langlais@anrmail.anr.state.vt.us

FRANKLIN AND GRAND ISLE

Dave Capen
12 Adams Landing Road
Grand Isle, VT 05458
H: 372-4993
W: 656-3007
dcapen@zoo.uvm.edu

Liz Alton
PO Box 928
Milton, VT 05468
H: 893-7370 M,Tu,Su leave message
W: 862-7021 W,Th,F,Sat
emadvm@aol.com

LAMOILLE

Sally Laughlin
P.O. Box 157
Cambridge, VT 05444
644-5358
laughlin@sover.net

ORANGE

John Sutton
PO Box 463
Corinth, VT 05039
H: 802-439-5803 Weekday evenings 7-9pm,
weekends
JSutton@DARTWARE.COM

ORLEANS

Jayson Benoit and Jason Brueck
VT Leadership Center
PO Box 220
East Charleston, VT 05833
W: 723-6551
vlc@sover.net

RUTLAND

Sue Wetmore
14 Maple St.
Brandon, VT 05733
247-3037
gwetmore@SOVER.NET

RUTLAND (cont'd)

Sue Elliot
62 Heather Lane
Rutland, VT 05701
775-2415
ovenbird14@yahoo.com

WASHINGTON

Chip Darmstadt
VINS North Branch Nature Center
713 Elm St.
Montpelier, VT 05602
W: 229-6206
cdarmstadt@vinsweb.org

Ted Allen
Central VT Audubon
5 Allen Rowe
Montpelier, VT 05602
229-5819
tedallen@adelphia.net

WINDHAM

Hector Galbraith
Galbraith Environmental Sciences, LLC
289 Wiswall Hill Rd
Newfane, VT 05345
W: 365-9119
hg1@sover.net

Chris Petrak
408 Dover Road
South Newfane, VT 05351
W: 348-6301
chrsptrk@sover.net

Sylvia Harris
128 Green Street, Apt. 1
Brattleboro, VT 05301
257-7301
andysylvia@earthlink.net

WINDSOR

George Clark (northern half)
PO Box 1226
Norwich, VT 05055
649-2305
george.a.clark@valley.net

Hugh Putnam (southern half)
29 Meadow Drive
Springfield, VT 05156
886-8430
putnams@vermontel.net

Survey Instructions

Below are step-by-step instructions for establishing and documenting the presence of breeding birds for the Atlas. Before beginning any work, participants should read this section carefully, particularly advice on accurate record-keeping. You will then need to contact your county coordinator.

The Atlas mapping system

VBBA will accept bird records from anywhere in Vermont – your front yard, your workplace or a remote spruce bog. But to make sure we survey birds evenly and systematically across the state, the project has adopted a mapping system. The system relies on the 184 U.S. Geological Survey 1:24,000 quadrangle topographic maps (“7½-minute maps”) for Vermont.

Ideally, VBBA would like to survey within every block so we cover the whole state. But because it might be difficult to cover the entire state adequately with our corps of participants, we have a system for surveying a section of every quadrangle instead of the entire quadrangle. For the Atlas, we divided each of the quadrangles into six blocks of equal size and numbered as shown on the diagram to the right. That’s a total of 1,104 blocks, each about ten square miles (5 km X 5 km). Then we randomly selected one of these six blocks, for a total of **184 priority blocks**. These are the same blocks that were used in the first Atlas 25 years ago, and it’s important that we survey them again this year so we can make valid comparisons between the two Atlases.

1	4
2	5
3	6

The priority blocks are the *minimum* number of blocks that must be surveyed in order to obtain a valid sample of birds for the entire state. **VBBA prefers that you survey in a priority block.** Contact your County Coordinator to determine which blocks in your area are priority and are not yet being surveyed by someone else.

⇒ STEP 1: To request a block for your survey work, contact one of your county coordinators.

They have a list of blocks that are available and are not already being surveyed by somebody else. It is important that you cover a block that is not already assigned. The two of you can work together to find a block that needs to be covered and is conveniently located for you.

The coordinator will give you a blocks based on the name of the quadrangle name and the block number within the quadrangle based on the diagram above. For example, the southeastern block in the “Joe’s Pond” quadrangle would be called “Joespond6”. The northwestern block in the Woodstock North quadrangle is called “Woodstocknorth1”.

⇒ STEP 2: Obtain a map of your block.

If you have access to the web: If you have a priority block, visit the VBBA web page (www.uvm.edu/~vbba) for maps of the 184 priority blocks that can be downloaded and printed for field use. If you are surveying a different block, there are also links on the website for ordering USGS topo maps. If you do not have web access, you can acquire USGS 1:24,000

quadrangle topographic maps at book stores, outdoor shops, or some libraries, and divide them accurately into six blocks.

If you don't download a map of a block from our website, you will need to divide up your quadrangle map to delineate the 6 blocks. To divide your quadrangle(s) into six blocks, bisect the map vertically with a single pencil line (measure the midpoint as accurately as possible), and then divide the map horizontally into thirds. Number the six resulting blocks according to the diagram above.

⇒ STEP 3: Become familiar with your block and the species that may occur there.

Once you've selected a quadrangle and a block, get to know it if you're not already familiar with the area. This is a great way to get keyed up for your spring surveys!

Topographic maps provide considerable information about the variety of habitat in your block. Before visiting a block look over the map and note the location of forest openings and other sunny areas (often in white). By habitat we mean an area of similar habitat bound by physical features. Potential general categories of habitats include (but are certainly not limited to):

- ❖ Wetlands
- ❖ Overgrown fields
- ❖ Agricultural land
- ❖ Lakes, ponds, or rivers
- ❖ Urban or suburban areas
- ❖ Low, mid, and high elevation forests

There are many other categories, and several subcategories within each of these. Your block may be very diverse, containing several categories. Or you may have a block that is mostly one type of habitat. Drive around on your block where possible to get an idea of the types of habitat it contains, and to determine which areas will be easy versus difficult to access.

You can see what species were found on your block 25 years ago in the first Atlas, available at the VBBA website or from the Atlas office. This list can provide with a guide of what to potentially expect in your block, but by no means should be seen as a complete list. Remember, not all species were found, some of those that were may no longer occur in your block, and there may be new species you will find that are not on the list. So use the list more as a guide to the general groups of species you might find rather than as a checklist that must be duplicated. You can also see what was found on other blocks near your block, which could be present on your block as well.

⇒ STEP 4: Brush up on birds that breed in Vermont.

Appendix I lists some resources for learning birds, including recommended field guides, song cds, and reference books. One of the purposes of the VBBA is to provide an opportunity (excuse, motivation) to get outside and improve their birding skills!

⇒ STEP 5: Get landowner permission.

This is an important part of atlassing, and an opportunity to inform people of its significance. We have included a notice to put inside your vehicle windshield to let people know that you're atlassing. Please use this notice whenever you are atlassing.

Private Land – Consult the landowner for permission before visiting private property. If you explain the Atlas, you'll probably get permission to visit. There are two things a landowner usually wants to know: where will you be going, and how long will you be there for. Your participants' packet includes brochures you may use to introduce the Atlas and yourself to landowners. Show the landowner your map so they can see where you are going, and be prepared to give them an estimate of how long you'll be surveying that day. After your first contact with them, they may not require that you tell them every time you are on their land, especially if they can recognize your car. Some landowners might be interested in knowing what birds you find. You could give them a field card with the species you saw that day, or you could send them a little summary at the end of the season if you want. It's a little extra work, but they *are* the stewards of the land, and it's a great way to foster an appreciation for birds.

Some private land – reserves owned by The Nature Conservancy, for example, are fragile and require permits or permission to visit. When in doubt, contact the VBBA office or a county coordinator. You do not need to get permission from timber companies.

Public Land – The VBBA has permission to go onto state parks, wildlife management areas (WMAs), and state forest land. For town or city property, you should get permission before your visit. If you have any airports in your block, contact your coordinator.

⇒ STEP 6: Documenting Bird Presence and Evidence of Breeding: The heart of the Atlas!

When to survey

Time of day and weather

Timing and weather are critical to any visit to a block. Birds are most active between sunrise and 9 am. They're inactive and hard to find or hear on rainy or extremely windy days. So it's best to go in the early morning hours on calm days (<12 mph) with little precipitation. You can Atlas later in the day as well, particularly when you are focusing on obtaining evidence of breeding like adults bringing food to nests. Adequate coverage of a priority block is defined as the recording of a minimum of 75% of the species expected to occur in each block and the confirmation of breeding for at least half of those species found. Keep in mind that you need to confirm a species only once in the block for the entire 5-year Atlassing period. On average, a block takes approximately 50 hours or more per block to complete, whether you cover it in one year or five years. HOWEVER, this varies tremendously depending on the skill level of the participant, the complexity of habitat in a block, and ease of access/terrain. This time can be spread out over several years. You can also split a block with someone, as long as you update each other constantly so that one person doesn't spend a lot of time trying to confirm breeding for a species that the other already found!

Time of season

Most birds are breeding in Vermont in mid-May to mid-July. Late June and early July can be especially productive for Atlassing, because adults are feeding young and will make quite a racket, making confirmation of breeding relatively easy. But Atlassing shouldn't be completely limited to the spring and summer months. In fact, some species, such as owls are better detected in winter. Appendix II provides a list of the general period during which each species is breeding. These are called "safe dates", because it's the period during which you can safely assume that a species could be breeding (either nesting or with dependent young) at that time. Appendix III provides a general calendar of breeding schedules. Use these Appendices to guide you as to what to expect and in determining the Breeding Evidence code, described in sections below.

One year or multiple years?

Because the Atlas is a 5-year project, you will have the opportunity, especially if you are an experienced birder and are familiar with Atlassing, to complete more than one block. The best way to cover more than one block is spend some time in each of them each year. You will cover a block more completely this way given that some species, particularly rare ones, may not be present or may not be easily detected in every year. This requires that you carefully plan ahead of time how much time you can truly dedicate to Atlassing, so that you don't take on too much and then find that you are unable to finish all of your blocks. Another option is to spend two or three years at one or two blocks, finish them, and then begin another block or two for the next two or three years. We leave this decision up to you. People who are unable to predict their schedules very far in advance will probably prefer a shorter time frame for their blocks. If you only think you can survey for a couple of years, your contribution will still be substantial!

Where to survey in your block

You will not need to cover every square foot of your block. Instead, you need to survey areas in your block that are representative of the various habitat types present in the block. If your block contains forest, marsh, and agricultural lands, you will need to survey in each of these habitats until you think you've found most of the species that you would expect to find in each habitat. Habitats can vary within these categories too. If you have several types of agricultural lands (e.g., hayfields and crops) or forest lands (high elevation and lowland, or deciduous and coniferous), you will need to make sure you survey each of these habitat types because they will support some species that don't occur in other habitats.

Atlassing your block

This is the fun part! There are two objectives to Atlassing a block:

- Find as many species as possible
- Confirm breeding for as many species as possible

You can combine these two activities or do them separately – whatever works best for you. For example, you could spend the morning just finding birds since that is when they are active and singing. Then you could backtrack and try to find evidence of breeding for some of the birds you recorded. Another strategy is to spend May and the first half of June documenting as many species as you can, and then switch your focus to collecting breeding evidence. Of course, there will be times when you find evidence of breeding without even trying, for example if you flush a

bird from a nest or happen to see an adult carrying food for nestlings or fledglings. Walk your block and find birds, keeping careful track of everything you encounter, and record them on the **Field Sheet** (on page 7 and provided in the participants' packet). If you survey more than 1 block, you will use a separate Field Sheet for each block. Note that the Field Sheets are labeled as such, and they are also the only data sheets made of heavy stock paper – this will help you distinguish them from the Home Sheets and Master Sheet (discussed further below).

How you get around in your block is up to you. Some people will feel comfortable tromping around with their map and a compass (maybe even a GPS unit!). Others will stray from roads only when absolutely necessary. However, one of the goals of the Atlas is to survey birds everywhere, especially away from roads – areas that are often not covered by other bird surveys. If you are unable to get to these areas due to physical limitations or are worried that you will get lost, take someone with you or ask someone to survey that area for you.

See Appendix IV for a checklist of items to take with you.

Completing the Field Sheets

The success of the project depends on the accuracy of the data you supply. For that reason, VBBA has standard sheets for your use in the field. Great care must be taken when completing data sheets. Generally, the person assigned the square is responsible for completing and checking the data forms. An example of a completed data form is shown in the figure below.

- Field sheets should be filled out in **pencil** because when upgrading breeding evidence it is necessary to erase the previously recorded code.
- Breeding evidence sections should be filled out in **pencil** on ALL forms because you will be changing them as you gather better evidence of breeding
- Other information on the Home Sheet and Master Sheet should be entered in **pen**.

When birds are all around you, it may be tempting to leave the paperwork until later. But your data will be much better if it is completed **in the field** when fresh. Once you allow a backlog of material to accumulate you will find it difficult to catch up and avoid omissions and mistakes. When filling out a sheet, leave spaces blank rather than guess at any of the information requested. When in doubt about something take notes about it.

Example of how to fill out a Field Sheet:



**Vermont
Breeding Bird Atlas
FIELD SHEET**

Year: 2003
***Species in bold require a
Rare Species Form*

County: FRANKLIN Quad name: ST. ALBANS BAY Block #: 5

Atlaser Name: BIRD E. ADDICT Priority Block? Y

Additional Observers:
BINOC U. LER
IMA BIRD LOVER

Visit	Mo	Day	Time Start*	Time Finish*	Party Hrs*
1	4	28	07:15	09:15	2
2	5	10	07:00	08:30	1.5
3	5	28	06:30	09:30	3
4	6	09	09:30	10:30	3
5	6	21	14:30	16:45	2.25
6	7	05	06:45	08:00	3.75
7	7	16	12:15	15:30	5.5
8			:	:	
9			:	:	
10			:	:	
TOTAL PARTY HOURS					<u>21.0</u>

* Use 24-hour clock

Check this box when all info. from this sheet has been entered on website: ☐

Species	I*	O	PO	PR	CO	FD
Common Loon	5/28		X			5/28
Pied-billed Grebe	/					/
Double-crest Cormorant	5/28				N Y	7/05
American Bittern	6/09			S		6/21
Least Bittern	/					/
Great Blue Heron	5/10				N Y	6/21
Great Egret	/					/
Snowy Egret	/					/
Cattle Egret	/					/
Green Heron	6/09		X			6/09
Black-crown Night-Heron	/					/
Turkey Vulture	/					/
Canada Goose	6/21		X			6/21
Mute Swan	/					/
Wood Duck	5/10				N Y	7/05
Gadwall	/					/
American Wigeon	/					/
American Black Duck	5/28				N Y	7/05
Mallard	5/28				N Y	6/21
Blue-winged Teal	6/09				N Y	7/05
Northern Shoveler	/	0				/
Northern Pintail	/					/
Green-winged Teal	/					/
Ring-necked Duck	6/09	0				/
Bufflehead	/					/
Common Goldeneye	/					/
Hooded Merganser	/					/
Common Merganser	5/28				N Y	7/16
Red-breast Merganser	/					/
Osprey	5/10		X			5/10
Bald Eagle	/					/
Northern Harrier	/					/
Sharp-shinned Hawk	/					/
Cooper's Hawk	/					/
Northern Goshawk	/					/

Party hour computations: Note that for Visit 4, there is only one hour between start and finish times, but there are 3 hours logged for Party hours. That is because there were 3 observers surveying for 1 hour (3 observers X 1 hour = 3 party hours). For visit 6, there were also 3 observers (3 observes X 1.25 hours = 3.75 Party hours). For visit 7, there were 2 observers for 2.25 hours and one observer for 1 hour ((2 observers X 2.25 hours) + (1 observer X 1 hour) = 5.5 Party hours).

Below are directions for filling out the Field Sheet (these also apply to the Home Sheet and, for the most part, the Master Sheet). You will take your Field Sheet with you every time you go to your block(s). Please print clearly, in capital letters.

Year: You will have one Field Sheet and one corresponding Home Sheet for each year. On your Master Sheet, write all of the years in which you surveyed the block.

County: If your block spans more than one county, write both counties and put an asterisk next to the one your County Coordinator is responsible for (so we know who is responsible for that block).

USGS Quad Name: Record the proper USGS quadrangle map name.

Block number: This will be between 1 and 6

Atlasser name: Name of primary observer for the block.

Priority Block: Enter "1" if this is a Priority Block. Otherwise leave it blank. We may be covering a second tier of priority blocks. If this is a second tier block, enter a "2".

Additional observers: Other observers contributing data. If someone along is not helping, do not record that person's name.

Visit Number: (Already filled in for you)

Visit Date: Under the appropriate visit number, fill in the date of the visit.

Time Start/Finish: Under the appropriate visit number, record the time you begin observing, the time you finish (in 24-hour format, i.e., 1300 for 1 p.m.), and the total minutes surveying to the nearest quarter hour (15 minutes).

"Party Hours": is calculated by multiplying the number of people surveying by the time that they spend actively birding in the square on each date. When people are birding together, they only count as one party. For example, two people birding separately are two parties, one group of two people and one group of three people are still only two parties. Do not report time spent in the square which is spent on activities other than atlassing but during which observations are made. For example, if you were driving to work through your square and saw a Tree Swallow enter a nesting hole, you would enter the information on the Field Sheet but you would not fill out the date, start and end time, and Party Hours section.

Example: Two people atlas together for four hours, and they then split up for the next two hours. The total entered in the column headed "Party Hours" is 8, because $4 + (2 \times 2) = 8$. If more than 10 visits are made to the square, please list the visit number, start time, end time, and Party Hours in the Notes section of the Field Sheet, or on a separate sheet of paper and keep this with your Field Sheet.

Comments: Use the back of the Field Sheet for any additional information you wish to provide.

Completing the "Breeding Evidence" Section of the sheet

As you survey for birds, your main objective is to obtain the strongest defensible evidence that a species is breeding on that block. VBBA recognizes four levels of evidence:

1. Observed (O): species observed during the breeding season (no indication of breeding)

2. Possible breeding (PO)
3. Probable breeding (PR)
4. Confirmed breeding (CO)

Beginning on the next page, there are several categories of breeding evidence within breeding levels 3 and 4 above. You should familiarize yourself with the codes, categories and levels because you will be using the codes on the data form.

The Breeding Codes are entered on the data form. For each species, you will have either an "O" under the O column, an "X" under the PO column, one of the letter codes under the PR column, OR one of the letter codes under the "CO" column. If you have doubts about the appropriate code for a particular observation, ask your County Coordinator.

The first time you record breeding evidence (PO, PR, or CO column) for a species on your block, write the visit number under the "1st" column. THIS DATE WILL NEVER CHANGE. This information will be useful for further analysis of atlas data. By relating this information to the visit date and times, researchers can construct a species cumulation curve that shows how the number of species reported in your square increases with effort. That information can help determine the likelihood that a species not reported in the square actually did occur there, which will be useful for comparing data to future atlases.

Under the "FD" column (which stands for "Final Date"), write the visit during which you obtained the highest level of breeding evidence in pencil. This will change as you upgrade breeding evidence. So on your first visit, all of the species you find will have the same date. Many of these will be updated in subsequent visits. This information allows us to check your observations against the dates when we would expect a species to be breeding in the state. If your observation is outside of the expected dates, this is important information to add to our knowledge about the breeding chronology of species in Vermont. Ultimately, this information will be very useful in research on factors affecting breeding phenology (i.e., chronology), such as global warming.

BREEDING CODES

If you are uncertain of what code to assign an observation you make, take notes on it and contact your county coordinator.

OBSERVED COLUMN (O)

O Species observed in its breeding season (no evidence of breeding). Not in suitable nesting habitat.

POSSIBLE BREEDING COLUMN (PO)

X Species (male or female) observed in suitable nesting habitat during the breeding season.

PROBABLE BREEDING COLUMN (PR)

P Pair observed in suitable habitat during breeding season.

S Singing male present (or breeding calls heard) on more than one date, a week or more apart, at the same place during breeding season.

- T Permanent territory presumed through defense of territory (chasing individuals of the same species).
- D Courtship or display between a male and a female or 2 males, including courtship feeding or copulation.
- N Bird repeatedly visiting possible nest site (can't see nest, bird not carrying material).
- A Agitated behavior or anxiety calls of an adult that suggest probable presence of a nearby nest or young.
- B Nest-building or excavation of nest hole by wrens or woodpeckers. Wrens may build many fake nests, and woodpeckers drill roosting holes.

CONFIRMED BREEDING COLUMN (CO)

- CN Carrying nesting material (sticks, hay, not feathers), not heading outside of block.
- NB Nest building by any species except wrens and woodpeckers.
- PE Physiological evidence of breeding on bird in hand during breeding season (e.g., highly vascularized brood patch). To be used by experienced banders on local birds.
- DD Distraction display or injury feigning.
- UN Used nest found (occupied or laid within the period of the study). These must be carefully identified if they are to be used for confirmation. Some nests last through winter and most are difficult to accurately identify.
- PY Precocial young. Flightless young of precocial species restricted to the natal area by dependence on adults or limited mobility.
- FL Recently fledged young (either altricial or precocial) incapable of sustained flight, restricted to natal area by dependence on adults or limited mobility. This code used with caution for species such as blackbirds and swallows, which can move considerable distances soon after fledging.
- ON Occupied nest. Adults leaving or entering nest site in circumstances indicating occupied nest. Usually used for cavity nesters, not generally used for open-nesting birds. To be used for nests which are too high or enclosed for the contents to be seen. Used for cavity nesters only when a bird enters a hold and remains inside or leaves a hole after being inside for some time.
- CF Adult carrying food for young. Caution: birds such as gulls, terns, and birds of prey continue feeding their young long after they've fledged, and sometimes at considerable distances from natal site. Take care to avoid confusion with courtship feeding (D).
- FY Adult carrying food for recently fledged young.
- FS Adult carrying fecal sac.
- NE Nest containing eggs, bird sitting on eggs, or egg shells found below a nest. If cowbird eggs found NE used for both cowbird and host species. Shells must be carefully identified, many species look similar.
- NY Nest with young seen or heard, or downy young of waterfowl, quail, waders, etc. Because these precocial young may be led considerable distances by parents, care must be taken if they are found near a block edge. If a young cowbird is found with young of other species, NY used for both cowbird and host species.

IMPORTANT: Strengthening the Evidence for Breeding

This is a crucial component of a successful and meaningful Atlas and many Atlassers' favorite part. Collecting this information will provide some memorable moments and enhance your understanding of bird behavior. The best time to focus on this is during the latter half of the breeding season, when adults are feeding young.

Always seek higher evidence of breeding. Breeding evidence is upgraded when you record observations from a higher breeding category or level for that species. During the course of the

5-year survey, while looking for previously unrecorded species, you should also look for stronger evidence of breeding for previously recorded species.

For example, if you were to observe a Song Sparrow singing in the same location on several occasions during the breeding season, you would record the one-letter code "S" (in pencil) next to Song Sparrow in the "Breeding Evidence" column headed "PR". If later you were to find a Song Sparrow nest with eggs in it, you would erase "S" and fill in "NE" in the column headed "CO". You would then have upgraded the Song Sparrow from the "Probable" to the "Confirmed" level of breeding evidence. You should attempt to obtain probable or confirmed breeding evidence for as many species as possible. A species needs to be confirmed as breeding only once in five years for any block.

You should also upgrade within a level. The categories within each level of breeding evidence are listed in order of their importance. For example, if you had evidence for an "S" for Chipping Sparrow and then found a Chipping Sparrow exhibiting courtship behavior to another, you would upgrade the evidence by erasing "S" and filling in "D" next to Chipping Sparrow. Make sure that your data form shows the highest breeding evidence observed for each species.

Keep in mind that it is more important to find a high percentage of probable breeders than to locate only a few species and confirm breeding for all of them. Finally, **be conservative** – if you are not sure you observed a given piece of evidence or a given species, don't add it to your Field Sheet.

Rare Species

One of the most important functions of an Atlas is to gather information about where rare species are, particularly species that are of conservation concern in the state. The extensive coverage of land provided by the collective efforts of Atlas participants provides the most complete information in the state on all of the rare species. In Appendix II and on your Field Sheet, rare species that might be most easily confused with other species are in **bold**. If these species have been documented in your block before (available on the website), keep an eye out for them, and spend a little extra time in the appropriate habitats to try to find them. Keep in mind also that there may be rare species that haven't been found on your block before, and know how to identify rare species for the habitats you are surveying.

Rare species sightings are so important that there is a special **Rare Species Form** for those that could possibly be confused with other species. Although Appendix II indicates species in bold for which this form is recommended, ***your county coordinator might add or delete species from this list. Please fill out the rare species forms at the time of the observation(s) in the field, and notify your County Coordinator that day.*** They may need to go to your block and confirm your record. At the least, they need to sign off on your observations to verify them, as indicated on the form.

IMPORTANT: Some species are rare simply because they are at the edge of their range in Vermont. Others are rare because their populations have declined, and are of **conservation concern**. It is this second group that you should spend a little extra time looking for when in the appropriate habitat. These species are delineated with an "E" under the MET column in Appendix II. This group includes only those species that are not covered by other specific surveys in the state. In other words, we rely on Atlassers to document the presence and breeding status of these species of conservation concern. This information will be critical to conservation

plans! If you are in appropriate habitat for an “E” species, make sure you know how to identify it by sight AND sound, and spend a little extra time searching in that habitat.

Nocturnal and secretive species

To cover your block completely, you will want to do some surveying that focuses specifically on groups of species that you’re not likely to find during normal atlassing activity. **Appendix II includes special methods needed to detect these species.** It is important to employ these methods until you feel you have found most of the species you’d expect in your block. If we don’t survey for these species, the Atlas results will be inaccurate.

“Casual” Observations

These are observations of birds made outside of your blocks when you are not actively atlassing. **You are encouraged you to record breeding evidence of any species** regardless of where you are using a **Casual Observation Form**. Even if you are not in a priority block, these observations will be useful, and the data on the form can also be entered on the website. However, if you spend time atlassing in someone else’s square, you should complete a Field Sheet yourself following normal procedures. This will ensure we have a complete record of atlassing effort in that square for comparison to future and previous Atlases. You also need to notify the person responsible for that block (available from the County Coordinator).

⇒ STEP 7: Transfer the data to your Home Sheet

Your data represents your hard work and is valuable information, so be sure to treat it accordingly. You will be given a **Home Sheet** that looks almost like the Field Sheet but is made of regular paper. Every time you return from a visit on your block, transfer the new information you’ve collected from the Field Sheet onto the Home Sheet. That way, if anything happens to your field form (you never think it will happen to you, but forms get lost or ruined all the time!), you won’t lose the precious data you’ve already collected. The Home Sheet will be used for entering your data on line or sent to the County Coordinator in August of each year.

You will also be given a **Master Sheet** for each block you are allocated. This is for your own record-keeping that you will need to do because you will be surveying your block for more than one year. In August of each year, the highest recorded level of breeding evidence for each species in the square is entered onto the Master Sheet. Keep the Master Sheet as a record of progress within your square. Note that the Home Sheets that you enter or send in at the end of each breeding season has the information for one breeding season only. The Master Sheet may contain data from several years.

Additional forms can be obtained from your County Coordinator as needed.

⇒ STEP 8: Enter your data on the website and submit Sheets

The USGS Patuxent Wildlife Research Center has created an on-line database for entering the information you collect. This will greatly facilitate data administration, and it will allow you to carry out the entire process of data collection. Although it is not the exciting part of research that they show you on the nature shows, entering and double-checking data is a huge component of

any research project! **Please enter your data by August 31 of each year, and check the box on the Home Sheet when data entry is completed.** We will be compiling results after each summer and writing reports for our funders, newsletters, etc., so it is very important that we are able to report on our progress! Directions for data entry will be posted on the website (<http://www.uvm.edu/~vbba/>).

When you have finished entering your data or if you do not have internet access, send your completed Home Sheet to your County Coordinator. When your block is completed, send in your Master Sheet. You may keep your Field Sheet. Because you will likely be surveying your block for more than one year, you will need to transcribe any information from your Master Sheet to the new field sheet for that year. You may want to make a copy of your Master Sheet before sending it in, as a memoir of all of the species you found!

A Final Note: Birding Ethics

As an Atlas participant, you probably have great care for the welfare of birds. However, we can unintentionally disturb birds, especially when looking for evidence of breeding, and it is important to be aware of how our activities may be affecting them. Here are some important guidelines:

Keep a distance from nests. If you find one, leave the area as soon as possible; take any notes after you have left the area rather than standing near the nest while you write.

Threatened and endangered species: these are coded with a “!” in Appendix II. Do not play tapes for these species, approach them, or disturb in any way. It is against the law!

Playing tapes or cds to elicit calls: this method is useful and even necessary for detecting some species; we have indicated these species in Appendix II. However, please follow these rules when using this technique:

- ❖ Use recordings to elicit calls **only** for those species indicated with an “T” in Appendix II.
- ❖ Do not play a recording for more than 10 minutes in an area in a given year.
- ❖ Once a species responds, stop playing the recording immediately.

THANK YOU VERY MUCH FOR YOUR PARTICIPATION – HAPPY BIRDING!!

Appendix I

TIPS FOR IMPROVING YOUR BIRDING SKILLS

If you are not an experienced birder and want to participate in the Atlas, we strongly encourage you to start becoming familiar with the species that occur in Vermont by sight and sound. Even experienced birders often need some refreshing over the winter.

Field guides

If you don't already have a field guide you like, we recommend one of the following, which can be found at bookstores or on the web:

- The National Geographic Field Guide to the Birds of North America by Jon L. Dunn. For songs, National Geographic also puts out a "Guide to Bird Sounds" cd.
- A field guide to the Birds: A Completely New Guide to All the Birds of Eastern and Central North America (Peterson Field Guides) by Roger Tory Peterson (Illustrator). Peterson Field Guides also puts out a bird song cd for Eastern birds.
- "The Sibley Guide to Birds" by David Allen Sibley is more of a table top bird guide than a true "field guide" (it is fairly big and heavy). However, it has very complete information about the natural history, distribution, and various plumages of each species, and can be a very handy resource. It is generally considered the top field guide nowadays.

Learning birds by sight and sound – websites, cds and software

<http://www.virtualbirder.com/bbestu/index.html>

This website can help beginning birders get started - it offers helpful hints about how to remember bird songs, but only has a sampling of species.

"Birding by Ear" (Eastern/Central) by Peterson field guides is a cd with similar information and guides, and has all the species you might encounter in Vermont. It is available at most nature stores and bookstores, or you can order it on the web.

<http://www.thayerbirding.com/>

This is software for learning birds. We recommend you order the northeastern US guide.

<http://www.northbirding.com/idtraining/index.htm>

Sponsored by Northern Michigan Birding, this website allows you to quiz yourself on visual bird i.d.

<http://birding.about.com/>

This website has almost everything from reviews of field guides to where you can purchase song cds and other birding equipment.

Guide to birding in Vermont

For a very readable and informative treatment of all the bird species known to occur in Vermont and where to find them, make sure to add Ted Murin and Bryan Pfeiffer's new book "Birdwatching in Vermont" to your birding library. This is also available in most local bookstores.

Bird natural history

"Nests, eggs, and nestlings of North American Birds" by Baicich and Harrison can be helpful in the sometimes difficult task of identifying bird nests and eggs. Nest or egg i.d. isn't always fullproof for confirming the identification of many species, but this book will give you ideas as to what to look for and may help if you're trying to decide between a few different species.

"The Birder's Handbook" by Ehrlich, Dobkin, and Wheye gives a brief account of each species behavior, status, diet, and breeding information. A good encyclopedia of the basic facts about each species that field guides don't cover.

Appendix II

HABITATS, SAFE DATES, AND ADDITIONAL SURVEY METHODS FOR BIRD SPECIES

Species that may require a Rare Species Form are in **bold**; please consult with your county coordinator. Permanent residents are asterisked (*). **MET** = additional observation method needed to detect a species or gather evidence of breeding. Note that this list does not include species that migrate through or winter in Vermont without breeding in the state. Safe dates not provided when information was scarce or nonexistent.

E = spend extra effort looking for this species (conservation concern, not covered by other surveys in the state)

T = broadcast calls/songs on tape or cd to elicit a response

N = survey at night D= survey at dusk ! = endangered or threatened. Do not disturb!

SPECIES	PREFERRED BREEDING HABITAT	MET	SAFE DATES	
Common Loon !	Lakes and ponds		5/15	8/15
Pied-billed Grebe	Marshy or weedy ponds	E	5/1	7/31
Double-crested Cormorant	Large lakes, mostly Champlain area		5/1	8/15
American Bittern	Tall marshes, wet fields	T	5/15	7/31
Least Bittern	Fresh and brackish water marshes	E	5/25	7/31
Great Blue Heron	Wooded swamps, beaver ponds, islands		4/10	7/31
Great Egret	Shrubs, trees near water			
Snowy Egret	Shrubs, trees near water		5/10	7/31
Cattle Egret	Shrubs, trees near water		5/10	7/15
Green Heron	Woods near marshes or open water		5/10	7/31
Black-crowned Night-Heron	Shrubs, trees near tidal water		4/20	7/15
Turkey Vulture	Woods, cliffs, caves, buildings		5/10	8/31
Canada Goose	Shore or islands in any water body		4/10	7/31
Mute Swan	Shore or islands in any water body		4/10	7/31
Wood Duck	Wooded swamps, fresh marshes, streams		4/15	8/5
Gadwall	High ground near water		4/25	8/5
American Wigeon	River valleys, lakes, ponds, islands		5/1	8/10
American Black Duck*	High ground near water, often woods		4/10	8/5
Mallard*	High ground near water, often woods		4/10	8/5
Blue-winged Teal	High ground near water		4/25	8/5
Northern Shoveler	Shallow marshy ponds		4/15	8/5
Northern Pintail	Marshes, ponds, on ground		4/15	8/5
Green-winged Teal	High ground near water		4/25	8/5
Ring-necked Duck	Boreal ponds and bogs, near water		5/1	8/5
Bufflehead	Woodlands near small lakes, ponds			
Common Goldeneye*	Boreal lakes, hollow trees		4/10	8/5
Hooded Merganser	Wooded swamps, fresh marshes, streams		4/10	8/5
Common Merganser*	Islands, lakes margins, trees or ground		4/10	8/5
Red-breasted Merganser	Near water, ground		4/10	8/5

Osprey !	Marshes, tidal water bodies, channel markers		4/10	8/15
Bald Eagle !	Tall trees near lakes, marshes, rivers	E	3/1	8/31
Northern Harrier	Marshes, wet pastures and meadows	E	5/10	8/31
Sharp-shinned Hawk*	Conifers in extensive woodlands		5/10	7/31
Cooper's Hawk*	Mixed woodlands, groves		4/25	7/31
Northern Goshawk*	Large mature mixed woodlands		4/10	8/15
Red-shouldered Hawk	Wet mixed forests, swamps		4/10	7/15
Broad-winged Hawk	Hilly woodlands		4/25	7/25
Red-tailed Hawk*	Mature forests, often near edges		4/1	7/31
American Kestrel	Open country, scattered trees, edge		4/20	7/20
Merlin	Open woodland, savannah	E	4/20	7/20
Peregrine Falcon !	Cliffs, buildings		4/5	7/20
Gray Partridge*	Ag. areas, on ground		5/10	8/31
Ring-necked Pheasant*	Open country, pastures, fields		5/1	8/15
Ruffed Grouse*	Mixed upland woods		4/15	7/31
Spruce Grouse* !	Swampy coniferous forests, on ground		5/1	8/31
Wild Turkey*	Mature deciduous forests, edges		5/1	7/31
Virginia Rail	Fresh and brackish marshes	T	5/15	7/31
Sora	Fresh marshes, wet meadows		5/15	7/25
Common Moorhen	Marshes with open water		5/25	8/25
American Coot	Marshes with open water			
Killdeer	Most open, sparsely vegetated areas		4/15	8/5
Spotted Sandpiper	Rocky streams or lakeshores		5/15	8/5
Upland Sandpiper !	Open grasslands and meadows	E	5/5	7/15
Common Snipe	Marshy areas on ground	D	4/5	7/15
American Woodcock	Upland forest edges	D	4/1	7/15
Ring-billed Gull*	Islands on ground		4/15	7/31
Herring Gull*	Islands, on ground		4/15	7/31
Great Black-backed Gull*	Islands, on ground		4/15	7/31
Caspian Tern	Lake Champlain islands			
Common Tern !	Islands, on ground		5/5	8/15
Black Tern !	Marshes, in islets		5/25	7/31
Rock Dove*	Cities, suburbs, farms, bridges		3/1	10/31
Mourning Dove*	Suburbs, woodlots, farmland		4/1	8/15
Black-billed Cuckoo	Variety of forest habitats, edges		5/25	8/15
Yellow-billed Cuckoo	Variety of forest habitats, edges		5/25	8/15
Barn Owl*	Open country, near structures	T,N,E	4/1	8/1
Eastern Screech-Owl*	Open woods, orchards	T, N	4/1	8/1
Great Horned Owl*	Most upland woodland types	T, N	2/1	7/1
Barred Owl*	Bottomlands, swamps, moist woods	T, N	3/15	7/15
Long-eared Owl*	Evergreen forest	T,N,E	4/1	8/1
Short-eared Owl*	Open pastureland, marshes, meadows	T,N,E	4/15	7/15
Northern Saw-whet Owl*	Mixed, moist woods, with conifers	T, N	4/1	8/15
Common Nighthawk	Barren country and flat roofs	T,N,E	5/25	8/15
Whip-poor-will	Dry open upland woods	N,E	5/15	8/1
Chimney Swift	Primarily in towns	D	5/25	8/15
Ruby-throated Hummingbird	Open woodlands, edges		5/25	8/1
Belted Kingfisher	Along streams, or lakes with banks		5/1	8/10
Red-headed Woodpecker*	Open country with scattered trees	E	5/20	8/25
Red-bellied Woodpecker	Variety of woodland habitats	E	5/1	8/15

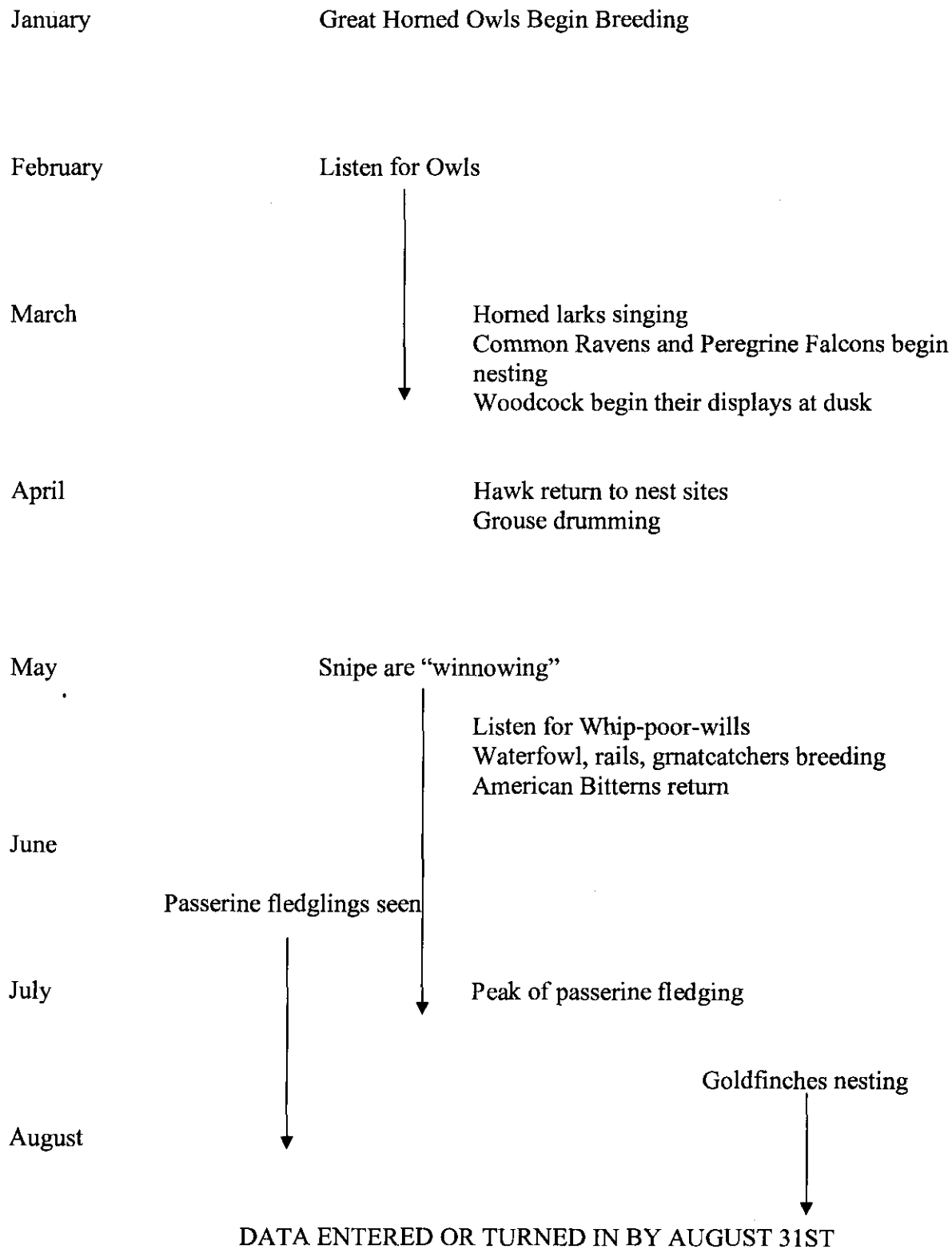
Yellow-bellied Sapsucker	Mixed woods, swamps, bogs		5/10	8/1
Downy Woodpecker*	Variety of woodlots. and edge habitats		5/10	7/25
Hairy Woodpecker*	Deep woods, primarily deciduous		4/25	7/20
Three-toed Woodpecker	Bogs and burns in conifers	E	5/15	7/25
Black-backed Woodpecker*	Bogs and burns in conifers	E	5/15	7/25
Northern Flicker	Open woods, scattered trees, edges		5/25	7/25
Pileated Woodpecker*	Deep woods, some secondary growth		4/25	7/20
Olive-sided Flycatcher	Northern conifers		6/5	8/1
Eastern Wood-Pewee	Variety of woodland habitats		6/5	8/1
Yellow-bellied Flycatcher	Bogs, wet coniferous forests, on ground		6/10	8/1
Alder Flycatcher	Wet brushy areas, prefers alders		6/1	8/10
Willow Flycatcher	Wet to fairly dry brushy areas		6/5	8/15
Least Flycatcher	Wood edges, open deciduous woods		5/15	8/5
Eastern Phoebe	Near water, bridges, buildings		4/25	8/15
Great Crested Flycatcher	Variety of woodland habitats		5/25	8/1
Eastern Kingbird	Open areas, edges, often near water		5/20	8/5
Loggerhead Shrike !	Open country, hedgerows, cedars		4/25	8/15
Yellow-throated Vireo	Tall deciduous trees		5/20	8/10
Blue-headed Vireo	Coniferous or mixed woodlands		5/20	8/10
Warbling Vireo	Open deciduous or riverside woods		5/20	8/10
Philadelphia Vireo	Mixed woods	E	6/1	8/10
Red-eyed Vireo	Variety of woodland habitats		5/20	9/1
Gray Jay*	Coniferous forests		3/10	7/1
Blue Jay*	Many woodland habitats, suburbs		4/15	8/15
American Crow*	Open areas, edges, farms, parks		3/25	7/15
Fish Crow	Wood edges, farms		3/25	7/15
Common Raven*	Mountainous, remote regions		3/20	7/20
Horned Lark*	Most short-grass areas		4/5	8/1
Purple Martin	Open country, colonial	E	5/25	8/1
Tree Swallow	Open country near water		4/25	8/5
N. Rough-winged Swallow	Near water with steep banks		5/15	7/25
Bank Swallow	Near water with steep banks, colonial		5/15	8/5
Cliff Swallow	Open country near buildings, bridges		5/20	8/10
Barn Swallow	Open country near buildings, bridges		5/10	8/31
Black-capped Chickadee*	Variety of woodland. habitats, suburbs		4/1	8/15
Boreal Chickadee*	Coniferous forests		5/5	8/5
Tufted Titmouse*	Variety of woodland. habitats, suburbs		4/5	8/1
Red-breasted Nuthatch*	Coniferous or mixed woods		5/1	8/10
White-breasted Nuthatch*	Variety of woodland habitats, suburbs		4/25	8/10
Brown Creeper*	Deep woods, flooded woods		5/20	8/1
Carolina Wren*	Wood edges, thickets, near residences		4/1	8/15
House Wren	Open woods, dead trees, suburbs		5/15	8/15
Winter Wren	Moist woods with hemlocks		5/20	8/5
Sedge Wren !	Wet meadows, marshes	E	6/1	8/1
Marsh Wren	Cattail and other tall marshes		5/25	8/15
Golden-crowned Kinglet*	Northern coniferous forests		5/25	8/1
Ruby-crowned kinglet	Coniferous forests		5/15	8/1

Blue-gray Gnatcatcher	Woodlands near streams		5/15	8/1
Eastern Bluebird	Wood edges, farmlands		4/10	9/1
Veery	Moist mixed woods		5/20	8/10
Bicknell's Thrush	Coniferous forests, > 2500' elevation		6/1	8/10
Swainson's Thrush	Northern conifers, esp. spruce		5/25	8/10
Hermit Thrush	Damp forests, with hemlocks		5/10	9/10
Wood Thrush	Variety of woodland habitats		5/15	8/10
American Robin*	Everywhere, except very urban areas		4/20	9/5
Gray Catbird	Dense thickets, shrubs, hedgerows		5/10	8/15
Northern Mockingbird*	Open country, hedgerows, suburbs		5/5	8/15
Brown Thrasher	Dense thickets, shrubs, hedgerows		5/15	8/10
European Starling*	Everywhere		4/15	8/15
Cedar Waxwing*	Open woodland, shade trees, streams		6/5	9/30
Blue-winged Warbler	Brushy fields, wood edges	E	5/15	8/15
Golden-winged Warbler	Damp, brushy fields, wood edges	E	5/15	8/15
Tennessee Warbler	Mixed Woods, on or near ground		6/1	8/5
Nashville Warbler	Swamp and bog areas		5/20	8/15
Northern Parula	Moist woods, bottomlands, spruces		5/20	8/10
Yellow Warbler	Wet brushy areas, farmlands		5/20	8/1
Chestnut-sided Warbler	Brushy, open second-growth, edges		5/20	8/15
Magnolia Warbler	Northern coniferous forests		6/1	8/15
Cape May Warbler	Coniferous forests		6/5	8/5
Black-throated Blue Warbler	Mixed woods with heavy understory		5/20	9/1
Yellow-rumped Warbler	Coniferous and mixed forests		5/20	8/25
Black-throated Green Warbler	Northern coniferous or mixed woods		5/20	8/15
Blackburnian Warbler	Northern coniferous or mixed woods		6/1	8/10
Pine Warbler	Variety of pine forests		5/5	8/5
Prairie Warbler	Brushy fields, edges, small pines		5/25	8/10
Palm Warbler	Bogs, on or near ground			
Bay-breasted Warbler	Coniferous forest		6/5	8/5
Blackpoll Warbler	Conifers		6/5	8/10
Cerulean Warbler	Mature moist or riverside forests	E	5/20	8/1
Black-and-white Warbler	Extensive deciduous or mixed woods		5/15	8/1
American Redstart	Moist, deciduous forest		5/20	8/10
Ovenbird	Open mature mixed upland forest		5/20	8/10
Northern Waterthrush	Swamps and bogs, pond edges		5/15	7/25
Louisiana Waterthrush	Rocky streams, sluggish backwaters		5/5	7/20
Mourning Warbler	Brushy areas in woodlands or edges		6/5	8/10
Common Yellowthroat	Brushy areas, preferably wet		5/20	8/20
Wilson's Warbler	Brushy boreal areas, on ground		6/1	8/10
Canada Warbler	Thick, moist forest undergrowth		5/25	8/10
Scarlet Tanager	Mature deciduous forests		5/20	8/10
Eastern Towhee	Dry open woodlands, edges, brush		5/20	8/10
Chipping Sparrow	Farms, open mixed woods, suburbs		5/15	8/30
Field Sparrow	Brushy, weedy fields, hedgerows		5/15	8/10
Clay-colored Sparrow	Grassy fields, groves		5/15	8/1
Vesper Sparrow	Short grass areas, cultivated fields		5/10	8/10
Savannah Sparrow	Hayfields, wet meadows, pastures		5/10	8/10
Grasshopper Sparrow !	Hayfields, grassy pastures	E	5/10	8/10
Henslow's Sparrow !	Weedy fields, wet meadows		5/20	8/1
Song Sparrow	Brushy fields, marsh edges, suburbs		4/25	9/1
Lincoln's Sparrow	Bogs, boreal openings, on ground		5/25	8/1
Swamp Sparrow	Marshes, wet brushy areas, bogs		5/20	8/5

White-throated Sparrow	Brushy openings		5/25	8/20
Dark-eyed Junco*	Edges of northern mixed forests		5/1	9/5
Northern Cardinal*	Edge, brush. parks, suburbs		5/1	8/20
Rose-breasted Grosbeak	Edges of moist deciduous woods		5/20	8/10
Indigo Bunting	Edges, open forest, brush areas		5/25	8/15
Bobolink	Fields, meadows, pastures		5/25	7/25
Red-winged Blackbird	Marshes, ponds, meadows, hayfields		5/10	8/1
Eastern Meadowlark	Hayfields, pastures		5/5	8/15
Rusty Blackbird	Bogs, in conifers and low bushes		4/25	7/25
Common Grackle	Suburbs, farmland		5/15	8/1
Brown-headed Cowbird	Everywhere, except urban areas		5/1	8/10
Orchard Oriole	Edges, hedgerows, scattered trees		5/25	8/10
Baltimore Oriole	Shade trees, open deciduous woods		5/20	8/1
Purple Finch*	Mixed woods, parklands, residential		5/20	8/15
House Finch*	Residential, especially evergreens		4/20	8/10
Red Crossbill	Coniferous forests		4/1	7/1
White-winged Crossbill	Coniferous forests		1/15	9/15
Pine Siskin*	Conifers		4/1	7/15
American Goldfinch*	Brushy fields, edges, hedgerows		6/25	10/5
Evening Grosbeak*	Coniferous forests		5/20	8/15
House Sparrow*	Cities, farms, parks, suburbs		4/10	8/15

Appendix III

CALENDAR OF BREEDING BIRD ACTIVITY IN VERMONT



VERMONT BREEDING BIRD ATLAS FIELD CHECKLIST

Before Visiting Your Block

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1. Get landowner permission.

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2. Be aware of protected areas that require special permission before visiting

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3. Let someone know where you're going

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4. Pack the appropriate survey gear (required items in bold):

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Clipboard

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Sunscreen, hat

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At least two pencils

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Landowner

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Field Sheet, Rare Species Forms

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Windshield notice

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Atlas brochures

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Notebook

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Field Guide

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Vermont Bird Checklist

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Wristwatch

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Maps

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DeLorme Gazetteer

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Compass or GPS Unit

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Binoculars

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Appropriate Clothing

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Food and Water

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Scope

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First Aid Kit

Vermont Breeding Bird Atlas
Vermont Institute of Natural Science
27023 Church Hill Road
Woodstock, VT 05091
Tel: 802-457-2779 x127
Fax: 802-457-1053
rrenfrew@vinsweb.org
<http://www.uvm.edu/~vbba>
