VERMONT CENTER FOR ECOSTUDIES
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Northeast Temperate Network
Inventory & Monitoring Program

Breeding Landbird Monitoring Program

Purple Finch pair. Ed Sharron photo

VOLUNTEER TRAINING MANUAL

Last Updated: May 2014

Summary of Changes to Landbird Procedures for 2014

Changes to Species codes:

- Yellow Warbler is now YEWA
- Eastern Gray Squirrel is now EGSQ

Field Mapping:

- If multiple individuals of the same species are detected at the same time and distance (but are not a flock), use CODExN, where CODE is the 4-letter species code and N is the number of individuals. For example, a pair of warblers might be "MYWAx2".
- If a flock is detected, use CODExNF. Example: a flock of 30 starlings is "EUSTx30F".

Data Coding Sheet:

- Redesigned to facilitate data entry into new online database.
- Mammals (CHIP, EGSQ, and RESQ) and birds are now entered on the same coding sheet.
- Flocks use code "FLK".
- Number of individuals seen is recorded in the column for the appropriate distance band, along with the detection code (see page 9 for an example).
- Use detection code "NR" if the detection type is not recorded (e.g., for flyovers).

Data Entry

- Mail data sheets to VCE by 1 Aug., regardless of whether online data entry is complete.
- New online database website and completely new procedures for data entry (see page 29).
- Observers who were registered in the USGS database will have an account in the new database, but will likely need to reset their password.

VOLUNTEER TRAINING MANUAL

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BREEDING LANDBIRD MONITORING PROGRAM

Background

Birds are an important component of park ecosystems – their high body temperature, rapid metabolism, and high ecological position in most food webs make them a good indicator of local and regional ecosystem change. Among the public, birds are a high profile taxa, and many parks provide information on the status and trends of the park's avian community through their interpretive materials and programs.

In developing comprehensive long-term monitoring plans, landbirds (a general term used to describe relatively small, terrestrial birds, excluding raptors and upland game birds) are among the best taxonomic groups to monitor because: 1) they are the most easily and inexpensively detected and identified vertebrate animals, 2) a single survey method is effective for many species, 3) accounting and managing for many species with different ecological requirements promotes conservation strategies at the landscape scale, 4) many reference datasets and standard methods are available, and 5) the response variability is fairly well understood.

In addition, birds are a useful biotic indicator of the effects of habitat fragmentation, an ecological stressor that all Northeast Temperate Network (NETN) parks are impacted by. Gaining insights into the long-term trends of avian species composition and relative abundance will provide one measure for assessing the ecological integrity and sustainability of northeastern temperate systems.

This training manual provides guidance to volunteer observers participating in the Northeast Temperate Network's (NETN) breeding landbird monitoring. In addition to providing an overview of study design, details on are provided on survey procedures, training exercises, and data management responsibilities.

Goals and Objectives

The overall goal of this program is to monitor the status and trends of breeding landbird populations, to assess changes in ecological integrity and the impacts of key stressors, and to guide management decisions affecting avian populations and other natural resources. The specific objectives of this protocol are to: 1) Determine annual changes in species composition and relative abundance of bird species during the breeding season; 2) Improve our understanding of the relationships between breeding birds and habitat; and 3) improve our understanding of the effects that management actions, such as silvicultural practices and mowing regimes, have on bird populations by correlating changes in bird communities with changes in specific habitat variables.

Sampling Design

Numerous sampling approaches have been used to quantify the status and trends of bird populations, and many different monitoring programs are currently in place throughout North America to determine local, regional, or national trends in bird numbers. Most survey methods allow simultaneous collection of information about species that share a common life history or habitat type, but no single method will

adequately sample either the diversity of habitats that birds occupy, or life history groups such as seabirds, songbirds, raptors, and shorebirds.

The sampling design used for this program involves a series of sampling stations laid out on a systematic grid that are sampled during 10-minute point counts. For landbirds, point counts are the most widely used quantitative method of monitoring bird populations. This technique involves using a standardized methodology to record all birds seen or heard during a fixed amount of time at many widely spaced count locations. For each bird observed, the time (minute of the count) and distance band (0-10 m, 10-25 m, 25-50 m, and >50 m) will be recorded. The methodology is largely based on songbird monitoring protocols developed for the Lower Mississippi Valley Joint Venture.

Within most parks there will be multiple study sites consisting of between 5 and 10 sampling points, called point count stations, spaced between 200 and 250 m apart. On a given survey date, each station is sampled for 10 minutes. Each observer will receive a map along with detailed instructions on how to reach the study site and locate each station. GPS coordinates will also be provided for each point. All point count stations will be marked with a small metal tree tag inscribed with, for example, "SH #1" (indicating Point 1 at the Sugar Hollow study site), as well as blue flagging tape and/or signs and reflectors, clearly marked with the same information.

Each observer should conduct a pre-survey visit to become familiar with his/her site. It is essential that observers bring with them a hand compass and know how to use it (see Appendix 2), as bearings between stations may change due to topographic obstacles, wetlands, or simply to coincide with the most suitable habitat. Unless noted otherwise, all bearings on the site directions sheets are magnetic, not true (so do not correct the declination on your compass – **but check your directions to be sure!**).

Survey Assumptions

The data being collected during point counts will be analyzed with two different methods (distance sampling and removal models), each of which is an independent approach to estimating the probability of detecting an individual. If we can accurately estimate this probability, we can estimate the number of birds that were NOT seen or heard during the point count, and derive a better estimate of bird abundance than we would get using only birds actually seen or heard. It is important to understand the assumptions of these methods, and to work to meet them. Both approaches assume that birds are correctly identified to species, and that each individual is only recorded once. The distance sampling approach further assumes that all birds within 10 meters of the observer (the first distance band) are always detected, and that the distance band recorded is the correct band. The removal modeling approach assumes that the time recorded for the individual bird is the time it was first heard or seen, and that observers are equally likely to hear a bird of a given species during every minute (e.g., the observer is just as likely to hear or see a Brown Creeper at minute one as he or she is at minute five).

When observers are collecting data, they should keep in mind that the most important assumptions are that **birds are correctly identified to species**, and that **each individual is recorded only once**. The next most important assumptions are that **all birds close to you (within 10 meters) are recorded**, and that **distance estimates are correct**. The removal modeling assumptions are less important, and all other data that are collected (e.g., nest location, and whether the bird is singing, calling, or seen) are secondary to the primary goals of getting accurate species and distance information. If observers feel that they are unable to meet the assumptions of the distance sampling or the removal modeling approaches, they should provide a written comment with as much detail as possible when they submit their data forms. This will be a tremendous help to the data analysis phase of the project!

Observer Training: Learn Your Route

If you will be surveying a route that you are not familiar with from previous years, you are strongly encouraged to walk the route during daylight hours a few weeks before your monitoring survey. This will give you the chance to familiarize yourself with the route and also update any faded or torn flagging (don't forget to carry out any trash). You may also find the NPS Northeast Temperate Network Google Earth portal (http://science.nature.nps.gov/im/units/NETN/googleMaps/parkMaps_GoogleEarth_flash.cfm) useful for getting an overview of your site; all of the point count locations and routes are displayed on top of recent aerial photography.

Observer Training: Estimating Distances to Birds Seen or Heard

As mentioned above, the most critical aspects of this monitoring program are to ensure that species are identified correctly and that double-counting individual birds is avoided. In addition, in order to estimate the abundance of birds within study plots, it is important that observers accurately estimate distances to detected birds. Practice can greatly improve observers' ability to correctly estimate distances. Participants should read through both the self-administered distance training exercises found in this section and the survey procedures described in the following section, and then practice distance estimation in a habitat similar to the one in which they will be surveying birds. All observers should "recalibrate" themselves by practicing these training exercises at the beginning of each field season.

1. In a habitat similar to the one in which you will be conducting point counts, begin by placing flagging at 10 m, 25 m and 50 m from a marked central point (e.g., the point count station). To do this, volunteers can either use a 25 m (or longer) tape measure, a measured length of rope, or estimate by measuring the length of their walking pace.

2. Remove the markers set up in step 1, and then walk around the "study site" placing flagging at four or five locations visible from the station. Return to the central point and estimate the distance band (e.g., 0-10m, 10-25m, 25-50m, >50m) that each flag falls within, recording them in a field book. Then, using a measuring device or pacing, measure the distance to each flag and compare your initial estimate to the actual distance. Repeat this exercise several times until you can consistently estimate distances.

3. The majority of birds are usually heard but not seen, and estimating distances to birds that are only heard is often the greatest source of error in VCP counts. Standing at the central point of your "point count station", listen for vocalizing birds. Choose one consistently vocalizing individual and estimate the distance band in which it is singing. Remember, the horizontal distance should be estimated, as if a plumb-bob was lowered to the ground from the bird's location. Try to visually identify the tree or branch where you think the bird is, and estimate the horizontal distance to an object that can be seen directly below where you think the bird is vocalizing from. Now, walk toward the vocalizing bird until you can either see it or accurately estimate its location. Using your measuring device or pacing, walk back to the point count station and compare your initial estimate to the actual distance. Repeat this exercise for several birds at various distances.

Note: These training exercises can be accomplished more quickly with the help of an assistant.

Survey Procedures

1. **Navigate to Point.** Use a GPS or map and compass to navigate to your points. The forest routes have been marked with blue flagging and/or signs and reflective markers every 25 to 100 m (depending on

the density of the vegetation). If any of the flagging is worn out, please collect it and replace it with fresh flagging. See Appendix B for tips on navigating with map and compass.

2. **Count Conditions.** Counts should be conducted early in the morning and during proper survey conditions. We recommend a 0500 hrs start time. Winds should be calm to light (< 7 mph; Code 2 or less on the Beaufort Scale, Table 1). Acceptable weather conditions for counting birds include a sky condition of 5 or less (although fog should not interfere with visual identification of birds; Table 2). Clear conditions or slightly damp are ideal. Counts should not be conducted in rain, unless it is very light. The rule is to conduct surveys only in weather that is unlikely to reduce count numbers. Generally, the more calm and clear the weather, the better the count. It is advisable to listen to the forecast the night before the survey and plan accordingly.

   Prior to the first point count, fill in the site name, date, and observer name on the field mapping card (Figure 1). Then, upon arriving at each sampling point, record the point number, wind speed (Table 1), wind direction, sky conditions (Table 2), and temperature (degrees Fahrenheit). Prior to beginning the count, orient the field mapping card (Figure 2) to a fixed direction, record the direction in the box at the top of the count circle, and record the current time.

3. **Use Count-down Timer.** As soon as possible, begin the count, using the National Park Service (NPS)-issued count-down timer to keep track of time. Alternatively, a smart phone with a timer function (NOT a stopwatch) can be used; set the timer for 10 minutes and verify that it counts towards zero when you start it. Although the data will be transcribed to coding sheets later, the field mapping card is the only true record of what was detected during the survey. Even during the rush of a busy point count survey, remember to record data clearly and in a firm hand. When filling out the mapping cards make notations in a consistent manner and use the bird codes (Appendix A) and standardized symbols as defined on the field mapping card.

4. **Count (record) All Birds and Squirrels.** All birds and squirrels (see box below) seen and heard during the 10-minute sampling period should be counted and recorded on the NPS-issued field mapping card. Be sure to note in which minute birds are first encountered. This will require close attention to your count-down timer. For each bird detected, record on the field mapping card its 4-letter code followed by the minute it was first encountered (i.e., 9 for birds encountered during the first minute counting down to 0 for encounters during the last minute of the 10-minute survey period). See Figure 2 for a sample field mapping card. Remember that the crucial information is species identification, distance band, and time of first detection (in that order). No other information is required, although recording type of detection (i.e. visual versus calling or singing) may help you track the individuals. If multiple individuals of the same species are detected at the same time and distance (but are not a flock), use CODExN, where CODE is the 4-letter species code and N is the number of individuals. If a flock is detected, use CODExNF. For example, a pair of warblers might be “MYWAx2”, while a flock of 30 starlings is “EUSTx30F”. Birds that fly through or over the point count location and do not stay within the area of the point count do not meet the assumptions of distance or removal models. For these birds, record the species code in the top-right corner of the map (these observations are still valuable for telling us that the species is in the area).

Red squirrels, gray squirrels, and eastern chipmunks are known to be effective nest predators. We want to monitor their populations as well as those of forest birds. Follow the same recording procedures for these vocal mammals as you would for birds using these 4-letter codes:

- RESQ - red squirrel
- EGSQ – Eastern gray squirrel
- CHIP - Eastern chipmunk

Table 1. Codes and descriptions for wind speeds (Beaufort Scale)[1]

Wind Speed Codes:

Code #	km/h	mph	Description
0	< 2	< 1	Smoke rises vertically
1	2 to 5	1 to 3	Wind direction shown by smoke drift
2	6 to 11	4 to 7	Wind felt on face; leaves rustle
3	12 to 20	8 to 12	Leaves, small twigs in constant motion; light flag extended
4	21 to 32	13 to 18	Small branches are moved
5	33 to 30	19 to 24	Small trees begin to sway

[1] These are the same codes used in the USGS Breeding Bird Survey. Acceptable conditions for counting birds include a wind speed of code 2 or less.

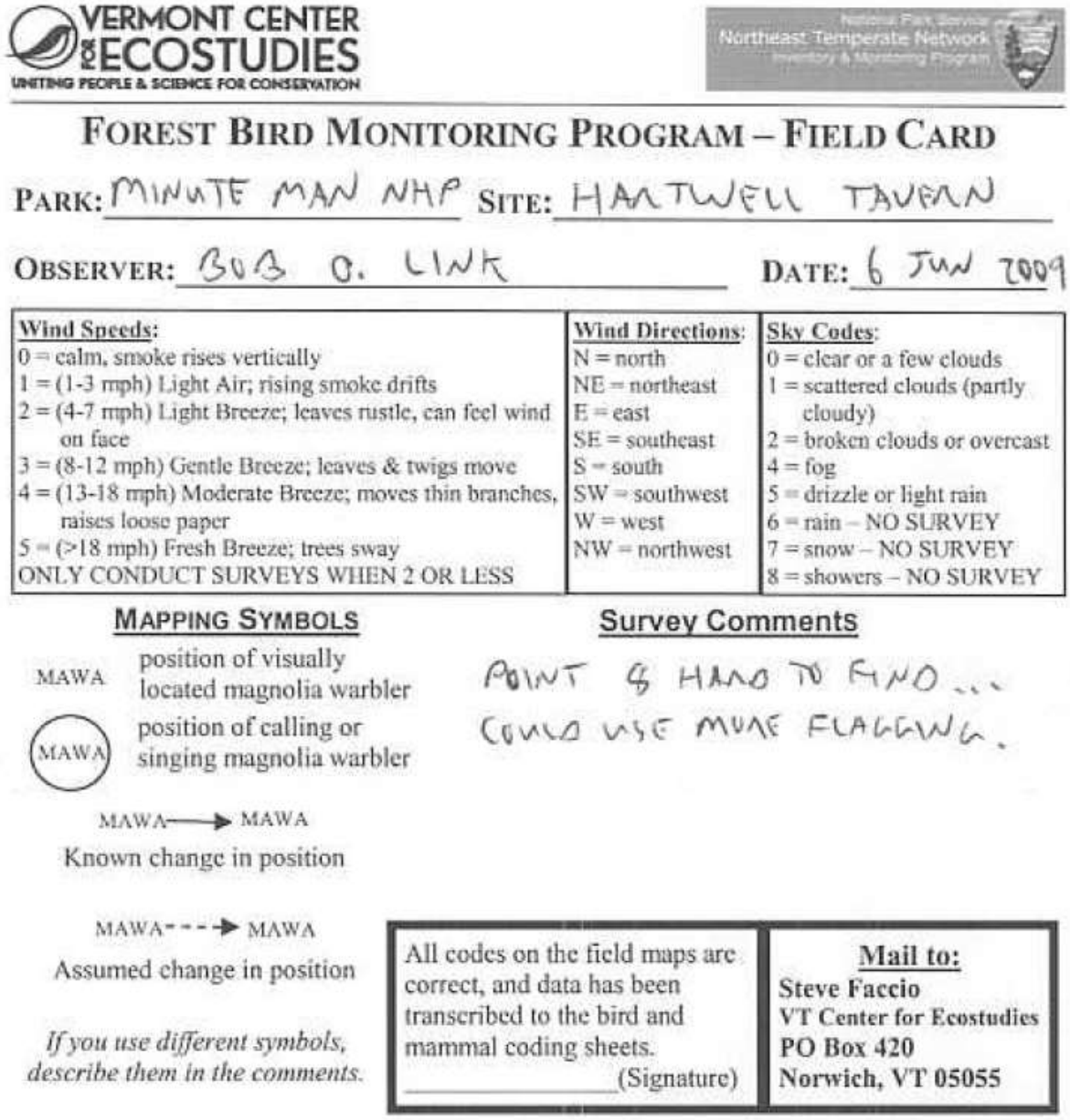
Table 2. Codes and descriptions for sky conditions[1]

Sky Conditions:

Code #	Description
0	Clear or a few clouds
1	Scattered clouds (partly cloudy)
2	Broken clouds or overcast
4	Fog
5	Drizzle or light rain
6	Rain
7	Snow
8	Showers

[1] These are the same codes used in the USGS Breeding Bird Survey. Acceptable conditions for counting birds include a sky condition of 5 or less (although fog should not interfere with visual identification of birds).

Figure 1. Example cover page of a field mapping card, including standardized symbols used to record observations made while conducting point counts.



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Northeast Temperate Network
Inventory & Monitoring Program

FOREST BIRD MONITORING PROGRAM – FIELD CARD

PARK: MINUTE MAN NHP SITE: HARTWELL TAVERN

OBSERVER: BOB O. LINK DATE: 6 JUN 2009

Wind Speeds:	Wind Directions:	Sky Codes:
0 = calm, smoke rises vertically	N = north	0 = clear or a few clouds
1 = (1-3 mph) Light Air; rising smoke drifts	NE = northeast	1 = scattered clouds (partly cloudy)
2 = (4-7 mph) Light Breeze; leaves rustle, can feel wind on face	E = east	2 = broken clouds or overcast
3 = (8-12 mph) Gentle Breeze; leaves & twigs move	SE = southeast	4 = fog
4 = (13-18 mph) Moderate Breeze; moves thin branches, raises loose paper	S = south	5 = drizzle or light rain
5 = (>18 mph) Fresh Breeze; trees sway	SW = southwest	6 = rain – NO SURVEY
ONLY CONDUCT SURVEYS WHEN 2 OR LESS	W = west	7 = snow – NO SURVEY
	NW = northwest	8 = showers – NO SURVEY

MAPPING SYMBOLS

MAWA — position of visually located magnolia warbler

(MAWA) — position of calling or singing magnolia warbler

MAWA ⟶ MAWA
Known change in position

MAWA - - - → MAWA
Assumed change in position

If you use different symbols, describe them in the comments.

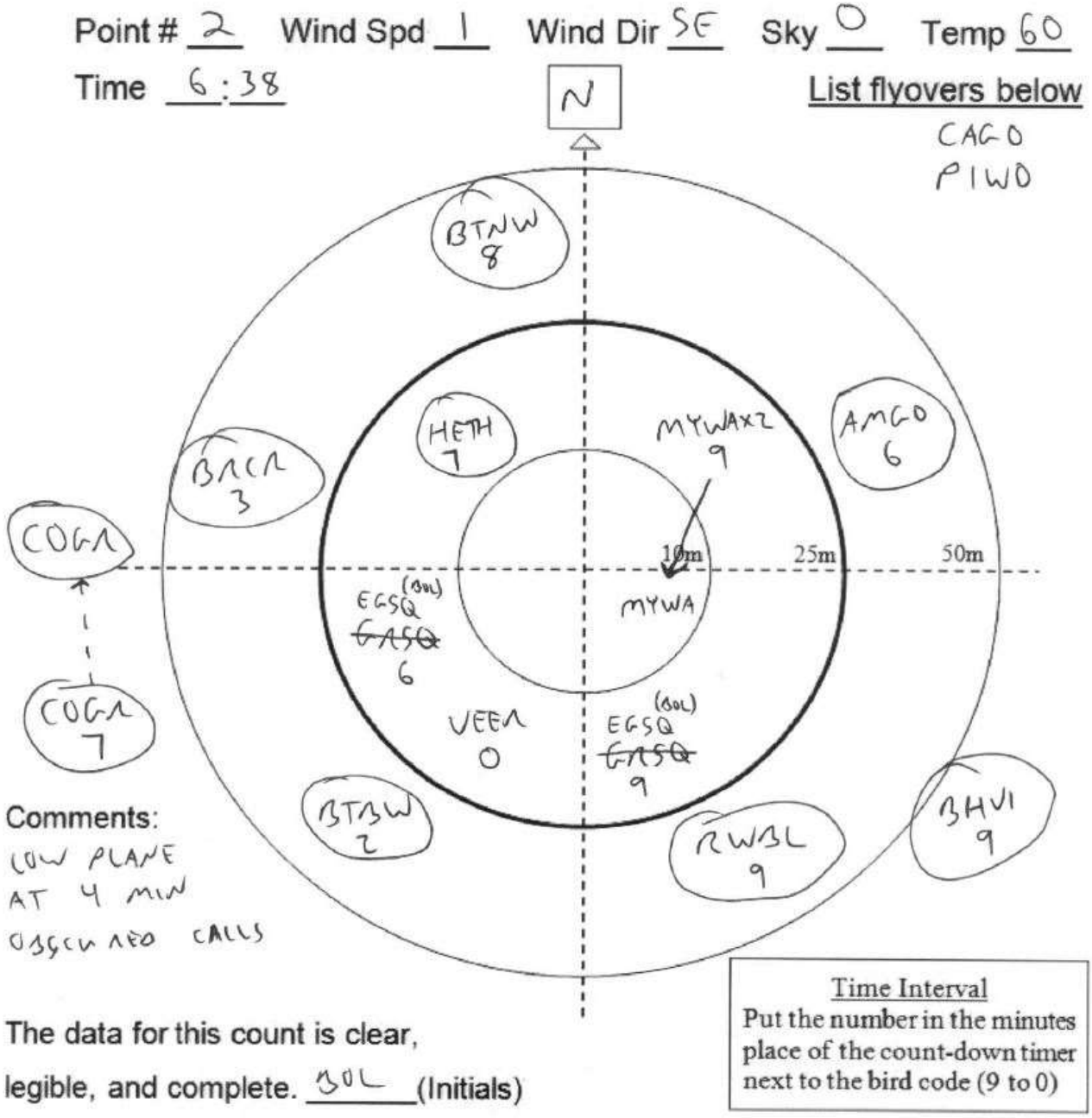
Survey Comments

POINT 4 HARD TO FIND...
COULD USE MORE FLAGGING.

All codes on the field maps are correct, and data has been transcribed to the bird and mammal coding sheets.
_____(Signature)

Mail to:
Steve Faccio
VT Center for Ecostudies
PO Box 420
Norwich, VT 05055

Figure 2. Example field mapping card



5. **Map Observations.** Counting is done by mapping all observations (both visual and auditory) on the field mapping cards provided. Keep track of movements as best you can. Mapping (marking the location and noting movements) is the best way to reduce duplicate records. Mark birds on the field card in the appropriate distance band and approximate spatial location. The recorded distance should be the horizontal distance between the location a bird was first detected and the plot center. Imagine dropping a plumb-bob down from a bird's location and estimating its distance from the plot center. For species that occur in flocks, record the flock (e.g., species) and flock size in the appropriate distance band (e.g., a flock of starlings might be "EUSTx30F"). There is no need to record each bird in a flock individually. Different symbols can be used to record the status of each

bird observation (i.e. visual observation, calling or singing, etc., Figure 1 and Figure 2). Use standard species AOU codes to identify species observed (4-letter codes can be found in Appendix A, or downloaded at http://www.vtecostudies.org/FBMP/materials.html).

6. **Orientation.** Holding the field mapping card in a fixed position, spend part of the time facing in each of the cardinal directions in order to better detect birds.
7. **Count Individuals Once.** Do not record any birds believed to have been counted at previous stations. All birds should be counted only once.
8. **When to Stop.** At the end of 10 minutes, stop recording bird observations. Do not record any new birds seen or heard after the 10 minutes have passed. Before leaving the point, check over the field mapping card thoroughly to make sure it is complete and legible. Remember, this is the only record of what happened during the survey. Take the time to clarify anything illegible or out of the ordinary, and then initial the card.
9. **Sampling Frequency.** Each site should be sampled at least once during the breeding season, but one or two follow-up, replicate surveys within two weeks of the initial visit are encouraged. The exception to this is the three smallest parks (Saint-Gaudens NHS, Saugus Iron Works NHS, and Weir Farm NHS), which, due to their small sizes, can only accommodate a few point count locations each. In order to reduce between-year variability at these three parks, survey these sites twice annually, with surveys about 7-14 days apart. In order to reduce within- or between-site bias due to time of day, survey each study site in the same order each time (e.g., do not reverse the order in which point counts are surveyed).
10. **Data Transcription.** Bird and mammal data from the field mapping card(s) should be transcribed to data coding sheets (Figure 3) before they are entered into the online database. Remember, only transcribe the record of a bird or mammal the first time you saw or heard it. Each individual you encounter should only be recorded once on the summary data coding sheets. After completing each coding sheet, conduct a 100% check to look for transcription errors. If you need to correct information on the mapping card or data coding sheet (e.g., the wrong bird code was used), draw a single line through the incorrect data and then enter the correct data next to the original data, along with your initials. Sign the data coding sheet indicating the 100% data transcription check has been completed. An overview of an observer's data management responsibilities can be found in Appendix C.
11. **Using the Online Database.** Once proofed, bird and mammal data recorded on data coding sheets should be entered into the Bird Point Count Database (http://data.prbo.org/science/biologists/index.php). Detailed instructions are provided in Appendix D. Verify each row of data as it is entered into the database and conduct a complete check of all data after finishing each data coding sheet.

Figure 3. Example of a Bird Data Coding Sheet

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Bird Data Coding Sheet – Landbird Monitoring Program

Park Name: MINUTE MAN NHP **Site Name:** HARTWELL TAVERN

Observer: BOB O. LINK **Initials:** BOL **Date:** 6 JUN 2014

Point #	Start Time	Species Code	Time Period	0-10 m	11-25 m	26-50 m	> 50 m	Distance Not Rec	Flyover
1	6:05	1. RBWO	9		C				
		2. ETTI	9	C					
		3. AMCR	6				C		
		4. BCCH	1	~~BOL~~ 1					
2	6:38	5. MYWA	9		21				
		6. AMGO	6			C			
		7. RWBL	9			C			
		8. BHVI	9				C		
		9. VEER	0		1				
		10. BTBW	2			C			
		11. COGR	7				C		
		12. HETH	7		C				
		13. BACR	3			C			
		14. BTNW	8			C			
		15. CAGO							NR
		16. PIWO							NR
		17. EGSO	9		1				
		18. EGSO	6		1				
3	7:02	19. ETTI	9	C					
		20. AMRO	8		C				
		21. OVEN	6			C			
		22. WOTH	1			C			
		23.							
		24.							
		25.							

Time Period – Enter the time code (minute when the bird or mammal was first observed). This is the digit displaying in the minutes place of your count-down timer (9 through 0; e.g. birds seen during the first minute of observation get a 9).

Codes used for bird numbers and occurrence – *Place the appropriate code from the list below in the appropriate distance field in the table above (**0-10 m, 11-25 m, 26-50 m, >50 m, Distance Not Rec, or Flyover**).*

Calling or singing = **C** Individual seen = **1** Flock or other group = **FLK** Not Recorded = **NR**

For more than one individual, precede code with number. For example: one bird singing is "C", two individuals seen (but not detected simultaneously) is "2I", and a flock of 15 is "15FLK".

For Flyovers, group size is optional (as is detection time), so flyovers can be denoted by "NR" in the Flyover column.

I proofed the transcription from the Field Mapping Cards: Signature: Robert O Link

I proofed data entered into database: Signature: Robert O Link

Page 1 of 1

Sign the data coding sheet indicating that the 100% data entry check has been completed.

12. **Mail Data.** After data have been entered into the online database and proofed, and within a month of data collection, mail the field mapping cards and the data coding sheets to:

    Forest Bird Monitoring Program
    Vermont Center for Ecostudies
    PO Box 420
    Norwich, VT 05055

    If it is not possible to enter the data online within a month of the field visit, the field map and data coding sheets (even if incomplete) should be mailed in for data entry

Thanks for participating! For questions or additional information contact:

Steve Faccio
Vermont Center for Ecostudies
PO Box 420
Norwich, VT 05055
(802) 649-1431
E-mail: *sfaccio@vtecostudies.org*

Appendix A. Safety Procedures and Recommendations

Safety First!

The Northeast Temperate Network considers the occupational health and safety of its employees, volunteers, cooperators, and contractors to be of utmost importance, and is committed to ensuring that all personnel receive adequate training on National Park Service (NPS) safety procedures, incident reporting, and emergency response prior to field work. This appendix provides a summary of safety procedures that all volunteers should be familiar with. The entire safety SOP and supporting appendices are available in the Landbird Monitoring Protocol available for download on NETN's Monitoring/Breeding Landbirds webpage.

Responding to an Incident

Life-Threatening Medical Emergency

1**. Call 9-1-1 or park emergency number.** Administer first aid to the best of your knowledge, ability and training. If appropriate, transport to emergency room. Park-specific emergency contacts and procedures will be provided to each volunteer by the Vermont Center for Ecostudies (VCE) Program Manager.

2. As soon as it is practical to do so, **inform the VCE Program Manager and the park's emergency contact** (provided by the VCE Program Manager). The VCE Program Manager will inform NETN staff.

3**. Complete Worker's Compensation paperwork** (contact NETN staff for assistance).

Non-Emergency Incidents

1. **Contact the VCE Program Manager immediately after incident**. The VCE Program Manager will inform NETN staff.

2**. Complete Worker's Compensation paperwork** (must be done within 48 hours of incident, contact NETN staff for assistance).

3. Seek medical attention, if needed.

Field Preparation

Everyone participating in breeding landbird monitoring is responsible for maintaining a safe work environment for themselves and others.

First Aid Kits and Training

NETN strongly encourages all monitoring staff to carry a backpacking first aid kit with them in the field. An inventory of first aid kits should be performed prior to each field season to ensure that all medical supplies are in sufficient quantity and haven't expired. Each first aid kit should have an inventory list of the supplies it should contain. Items in first aid kits that are used should be promptly replaced. If you do not have access to a first aid kit and want to carry one, let the

VCE Program Manager know and NETN will purchase one that can be borrowed from the park you are volunteering at.

NETN also strongly encourages all monitoring staff to obtain basic first aid and CPR training, particularly if they have not been certified in the past 5 years.

Teamwork

Since much of the monitoring for this protocol is off-trail in somewhat inaccessible areas, NETN recommends that people work in teams for monitoring. Working with another person makes it more likely that someone will be able to obtain help in the event of an accident, and working with someone else usually makes field work more enjoyable. If you are unable to find someone to walk your monitoring route with you and you would like to work with someone else, please notify the VCE Program Manager and he will contact the appropriate NPS staff to explore whether a field partner is possible.

Daily Communication and Planning

Monitoring staff are expected to carry a reliable communication device. In most NETN parks, a personal cell phone can be used. At ACAD, cell phones are not reliable and NETN has purchased a Personal Locator Beacon (PLB) and SPOT GPS Messenger that can be checked out by volunteers. The SPOT GPS Messenger can be used for checking in at the end of the field day (as well as sending an emergency signal if needed), while the PLB is a more reliable emergency signaling device. Monitoring staff must fully understand how to operate all communication devices before heading into the field. All modes of communication must be fully charged and tested at the beginning of each day.

Monitoring staff must notify the VCE Program Manager and the appropriate park resource manager (or a designated individual; RM/DI) with expected dates of field work; both of these individuals must have current maps of the routes to be surveyed. On each monitoring day, monitoring staff must know which route they will be monitoring and how they will get there before going into the field. The RM/DI must be contacted the day before field work will occur and provided with the monitoring staff name, cell phone number, vehicle license plate number, expected parking location(s), name of the monitoring route, and estimated time of arrival and departure from the park. Monitoring staff must also establish a check-in time for completion of field work. If monitoring staff do not check in on or before the planned check-in time for completion of field work, the RM/DI will immediately try to reach them by all available methods. If the monitoring staff have not been reached within 30 minutes, the RM/DI will notify emergency services and initiate a search.

At ACAD, when the NETN PLB and SPOT GPS Messenger are being borrowed by the monitoring staff the trip information must also be provided to the NETN staff members responsible for tracking messages from the devices. NETN must also be provided with the RM/DI name, phone number, and e-mail and the RM/DI must be provided with contact information for NETN staff.

If the survey is cancelled or if the plan changes while in the field, staff must notify the RM/DI immediately. At the end of the day, staff must notify the RM/DI that they have returned from the field. At ACAD, the SPOT Messenger can be used to notify NETN that more time is needed in the field or that field work is completed; NETN staff will relay this message to the RM/DI. If NETN staff are not contacted, they will assume that the monitoring staff checked in directly with the RM/DI.

All monitoring staff are responsible for being aware of the time and ensuring that end of day check-ins occur on schedule; the RM/DI will call emergency services if the monitoring staff misses their check in and cannot be located within 30 minutes of the check-in time.

Personal Gear

Monitoring staff are responsible for ensuring they are wearing field appropriate clothing and footwear such as long pants, a hat and hiking boots. Depending on the weather, rain gear or warm clothing should be taken into the field and it is recommended that an extra set of clothing be kept in the vehicle. Monitoring staff should take care to avoid over exposure to the sun by wearing sunscreen and/or protective clothing. Monitoring staff should always carry ample water (2-3 liters) and food when working in the field. Dehydration is a serious condition that can lead to more serious conditions if untreated, and should be avoided. It is important to drink liquid frequently to maintain hydration on a warm day, even if you don't feel thirsty.

Field Safety

Slip, Trip, Fall Prevention

Uneven terrain, slippery rocks, dense brush, and fatigue are all hazards that could result in a slip, trip, or fall. The following guidelines should be obeyed by monitoring staff to avoid injury from slips, trips, or falls:

- Always wear appropriate footwear such as sturdy hiking boots
- Pay attention to where you are going, and remain alert of potential hazards
- Walk at an appropriate pace and adjust pace for changes in terrain (e.g., slow down and take smaller steps on slippery surfaces)
- When hiking long distances, take breaks to avoid fatigue
- When navigating to a location off trail, choose the safest route (this may not be the shortest route). Avoid river crossings, excessively steep terrain and sudden drop-offs. Always be careful when navigating over piles of scree, and alert others of falling rocks.

Proper use of Backpacks

Monitoring staff will generally be carrying a day pack (with personal gear, water, and clipboard) that may weigh more than 20 pounds, and it is important for everyone to understand appropriate ways to pack, lift and carry a backpack to avoid back, neck and shoulder injuries. Monitoring staff should follow these guidelines, especially if carrying more than 30 pounds:

Appendix A. Safety Procedures and Recommendations (continued)

- Use a sturdy field pack with padded and adjustable hip and shoulder straps.
- Pack heavy items in the center of the pack and close to your back.
- Make sure weight is evenly distributed from side to side.
- Once equipment is packed, tighten the compression straps to minimize movement inside the pack during travel.
- When picking up a heavy pack, use your legs to do the lifting, and use slow, smooth movements. Keep your back straight, and keep the pack close to your body. Do not twist or bend at the waist, and do not swing the pack quickly over one shoulder.
- Always carry a pack with both shoulder straps and with the hip belt and chest straps secured.
- The pack should be positioned near the center of the back, and most of the weight should rest on your hips.
- Keep your pack organized, and only carry the necessary equipment, food and water to reduce weight.

Weather

Weather conditions in the eastern U.S. can be hazardous and can change quickly. Monitoring staff are responsible for planning their day according to the local weather forecast and for being aware of their surroundings and changing conditions.

Thunderstorms

Storms that produce strong winds and lightning are dangerous and should be avoided in the field. If caught in a lightning storm, seek shelter in a building or car as soon as possible. If no shelter is available, spread out and move to an open space. Squat low to the ground on the balls of your feet with your hands on your knees (do NOT lie flat on the ground). Avoid high elevations, conductive materials, and tall structures such as trees or telephone poles. If you are in the open and feel your hair stand on end (indicating lightning is about to strike), immediately make yourself the smallest target possible and minimize contact with the ground.

NOTE: A person struck by lightning can often be revived by prompt administration of CPR and oxygen.

Excessive Heat and Sun

Over exposure to heat and sun can cause dehydration, heat exhaustion, or heat stroke. All are serious conditions that can be life threatening, and should be avoided. When working in hot weather, be sure to drink plenty of water and eat foods that can replace electrolytes. Wear loose and light colored clothing, including a hat to block the sun's rays. It may help to shift the field schedule to avoid working outside during the hottest part of the day.

WARNING: Signs of heat stroke include hot, red or spotted (usually dry) skin, and the sufferer may be mentally confused, delirious, having convulsions, or unconscious. If heat stroke is suspected, seek immediate medical attention!

Poor Air Quality

Summer ozone and particulate matter levels occasionally exceed federal health standards. Young children, seniors, and those suffering from asthma, chronic bronchitis, and chronic obstructive pulmonary disease or heart problems are especially sensitive to poor air quality and

should minimize outdoor activity when poor air quality warnings are posted. The risks of occasional exposure to ozone and fine particulate matter are minimal for healthy individuals.

When poor air quality warnings occur, it is advisable for monitoring staff to avoid overly strenuous activity during the hottest part of the day (pollution levels tend to be lowest early in the morning), and to stick to lower elevations under a forest canopy.

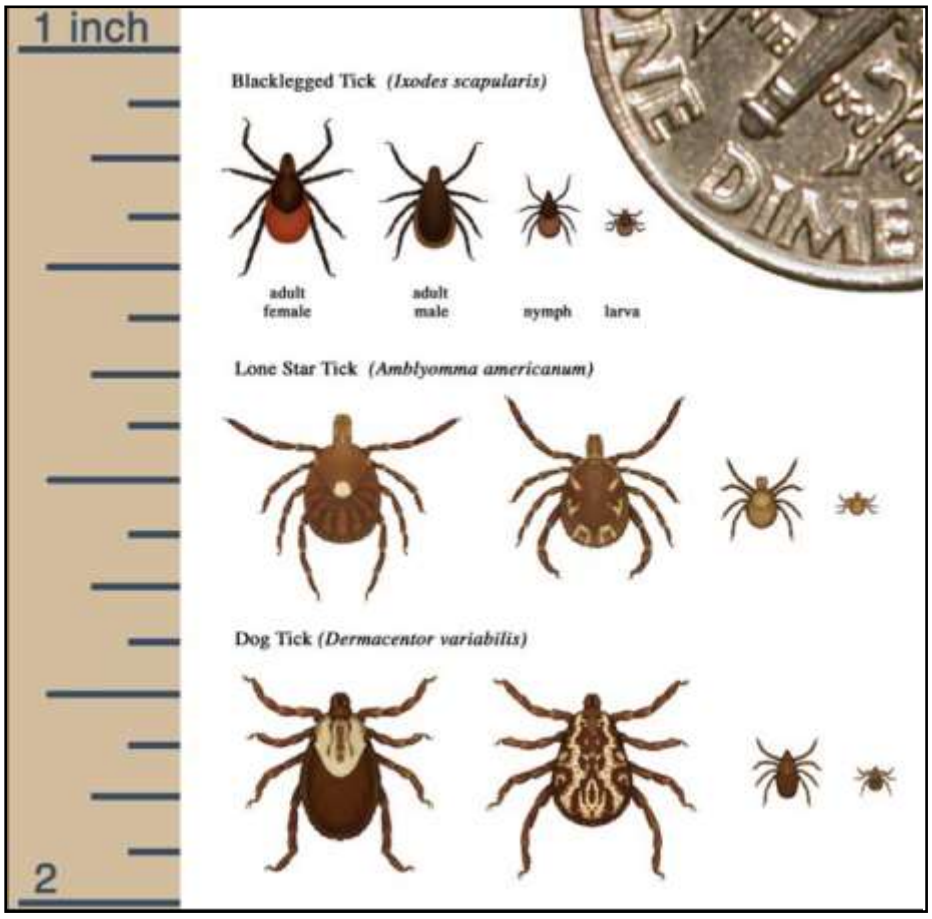
To check local air quality forecasts, or learn more about health risks of air pollution, visit the AIRNow intergovernmental agency website: http://www.airnow.gov/.

Deer ticks and Lyme Disease

Several species of ticks are commonly encountered in eastern U.S. parks while working in the field includes the deer tick (*Ixodes scapularis*), which is a known vector of Lyme disease and Ehrlichiosis. Monitoring staff must take the precautions outlined below to help minimize the chances of having an embedded tick that could lead to illness:

- Clothes treated with tick and insect repellents have been found to be fairly effective tick repellant. Monitoring staff are strongly encouraged to treat their clothing with permethrin prior to conducting monitoring. Monitoring staff should carefully follow the application instructions on the spray bottles to ensure their safety. Permethrin will remain active for several weeks and through several washings.
- Monitoring staff should take additional precautions to protect themselves from ticks, including tucking pants in socks and tucking in shirts. Long sleeves and gaiters have been found to help.
- Check clothes and skin for ticks at the end of every field day. Ticks typically need to be embedded for at least 24 hours for disease transmission to occur; therefore, the earlier ticks are found and removed, the lower your chances are of acquiring a tick-borne illness.
- If you find a tick that is already embedded, use fine-tipped tweezers to firmly grasp the tick close to your skin. Slowly and steadily pull the tick's body away from your skin. Be careful not to crush the tick's body to minimize the chances of it regurgitating fluids into the wound. Clean the bite area once the tick is removed with soap and water.
- If you receive a deer tick bite, notify the VCE program manager, who will put you in contact with NETN staff so you can start a worker's compensation claim. If you start to notice symptoms of a tick borne disease, follow instructions for getting medical treatment under worker's compensation.
- Keep an eye out for any early symptoms of tick borne diseases. Symptoms may include a bull's eye rash around the tick bite (doesn't always occur), tingling or numbness in extremities, a spotted rash on extremities, bad headaches, high fever, joint aches, stiff neck, fatigue, or swollen glands. If you develop a combination of these symptoms soon after a tick bite, seek medical attention.

Appendix A. Safety Procedures and Recommendations (continued)



More information on Lyme Disease and Ticks:
Center for Disease Control:
http://www.cdc.gov/lyme/
(also a free webinar on tickborne diseases)

American Lyme Disease Foundation:
http://www.aldf.com/

Tick Management Handbook:
http://www.ct.gov/caes/lib/caes/documents/publications/bulletins/b1010.pdf

Poisonous Plants and Animals

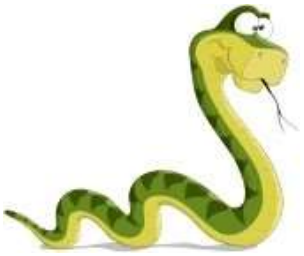
Both for safety and protection of park resources, it is never advisable for monitoring staff to eat wild plants while working in a National Park, regardless of their confidence in plant identification. Keep a safe distance from wildlife.

Poison Ivy

Poison ivy (*Toxicodendron* spp.) is present in most NETN parks, and can be very abundant in localized areas. When working in areas with poison ivy, it is advisable that monitoring staff learn to recognize this

plant and take precautions to avoid skin contact with any part of it. Using a pre-exposure cream and wearing long sleeves and long pants can help reduce the amount of skin contact with the plant. If needed, use poison ivy wipes after contact. Monitoring staff should be careful not to rub their faces when working around poison ivy. After working in an area with abundant poison ivy, monitoring staff should gently wash exposed skin in cool water with poison ivy soap, and should change into fresh field clothes. At the end of a field day, monitoring staff should also wash potentially contaminated equipment (e.g., backpack). If a severe allergic reaction occurs, the affected individual should seek medical attention, notify the VCE Program Manager as soon as possible, and file a workers compensation claim.

Venomous Snakes



The following species of venomous snakes may occur in some NETN parks: copperhead (*Agkistrodon contortrix*) and timber rattlesnake (*Crotalus horridus*). The best course of action is to avoid all snakes by keeping them at a safe distance. When in poisonous snake country, pay attention to where you put your hands and feet, and be aware around rock piles and bedrock outcrops. Note that many snake bites are purely defensive, and contain no venom. Bites from immature snakes are much more likely to contain a more dangerous amount of venom than bites from adult snakes. Should you receive a snake bite from a potentially poisonous snake, follow the procedure below:

- Treat all bites as if envenomation has occurred.
    - Time is of the essence
    - If working in a team, assign one person to use a cell phone to call for assistance. Identify the call as a snakebite incident, and identify the victim's location and the closest possible point of access for responders.
    - Quickly remove rings, watches, shoes etc., before swelling begins.
    - Immobilize the bitten limb firmly with a splinted elastic (Ace) bandage and get the victim out of the woods and to a hospital as quickly as possible.
    - **Do not** use thin circulation restrictive cords, pack with ice for long periods (more than five minutes) or attempt to cut open or otherwise enlarge the fang punctures.

- Reassure the victim that they will be OK and otherwise attempt to maintain the calm both for the victim and for all others involved.
    - In a crew situation, begin leading the victim slowly out of the woods as soon as the bitten limb has been immobilized. **Move as slow as necessary to maintain a normal heart rate for the victim.** Waiting for assistance will only prolong the process of getting proper medical treatment.
    - In a solitary situation, establish radio or telephone contact and relay the necessary information as you walk slowly out of the woods. Focus on remaining calm and maintaining a normal heart rate.

- It is better to spend your available time getting to proper medical treatment facilities than it is to fumble with field therapy and wait for assistance to reach you.

The range of the copperhead covers the following NETN parks: Morristown NHP (MORR), Roosevelt Vanderbilt NHS (ROVA), Saratoga NHP (SARA) and Weir Farm NHS (WEFA). The likelihood of encountering a copperhead is low in NETN parks. Copperhead bites are not typically considered life threatening, and in most cases antivenin is not administered.

The range of the timber rattlesnake covers all NETN parks except ACAD. This species is listed by NatureServe as "critically imperiled" (S1: New Hampshire, Vermont, Massachusetts, and Connecticut) or "vulnerable" (S3: New York, Pennsylvania) throughout NETN, and the likelihood of encountering a timber rattlesnake in NETN parks is very low. Adult timber rattlesnakes are capable of delivering a lethal dose of venom.

Bees, Wasps, and Yellow Jackets

If any monitoring staff are allergic to bee stings, they should alert their colleagues and make sure to carry appropriate medications. If they carry an epinephrine injector and are working in a team, they should make sure their colleague knows where it is carried. Be alert to potential hive and nest locations while hiking to plots and working on plots. Look for insects travelling in and out of one location (e.g., brush, ground holes, and hollow logs). If someone is stung, Benadryl and a cold compress may bring relief. If stinger is left behind, scrape it off of skin. Do not use tweezers as this squeezes the venom sack, worsening the injury. If the victim develops hives, asthmatic breathing, tissue swelling or a drop in blood pressure, seek medical help immediately.

Wildlife Encounters

Many species of wildlife, including black bears and coyotes, range throughout the Northeast, but encounters with them are a rare occurrence as they generally avoid people. Nevertheless, be alert for animals near dawn or dusk. Never approach any wildlife and calmly walk away from the area if you feel unsafe or threatened.

Vehicle Safety

Responsibilities of Vehicle Operators

Virtually all monitoring staff for the landbird protocol will be using their personal vehicles to get to and from their monitoring sites. Monitoring staff are responsible for inspecting their vehicles before every use to ensure the vehicles are in safe working condition. This includes visually checking tire pressure, adjusting mirrors, and making sure equipment is secure, as well as taking care of preventative maintenance in a timely manner. It is strongly recommended that monitoring staff obey the following rules (these rules are mandatory in government vehicles):

- Wear a seat belt.
- Do not use cell phones (both talking and texting) while driving.
- Adhere to all federal and state vehicle regulations, including all posted speed limits.

Procedures for reporting a motor vehicle accident

In the event of an automobile accident, volunteers and NPS staff should follow NPS accident reporting procedures. The NPS procedures are as follows:

1. Stop immediately and turn on emergency flashers.

2. Take steps to prevent another accident at the scene.

3. Call 911 or ambulance if necessary.

4. Notify police, NPS law enforcement (if at a park with law enforcement – ACAD, MIMA, MORR, and SARA) and the VCE Program Manager. The VCE Program Manager will notify NETN staff.

5. In the event of death, actual or potential serious injury, or significant property damage (damage greater than $2,500), the staff involved must convey this information as soon as is practical to NETN staff.

6. In reporting an accident, monitoring staff should state the facts to the best of his/her knowledge. **Conclusions as to fault or responsibility should not be stated.** Monitoring staff should report the accident only to authorized representatives of the Government, their insurance company, and police officers investigating the accident. Monitoring staff shall also file any report required by law.

7. Get name and address of witness (preferably two witnesses). Ask witness to complete Standard Form (SF) 94, Statement of Witness, if the form is available.

8. State/provide your name, address, place of employment (or park where volunteering), name of your supervisor (VCE Program Manager if a volunteer), and upon request show your driver's license and vehicle registration information.

9. Complete Standard Form (SF) 91, Motor Vehicle Accident Report as soon as practical. If conditions prevent this, make notes of the following:

    a. Registration information for other vehicle(s) (owner's name, owner's address, tag number, VIN, and vehicle description)

    b. Information on other drivers (name, address, operator's permit, and expiration date)

    c. Name and address of each person involved and extent of injury, in any.

    d. Name and address of company insuring other vehicle(s) and insurance policy number

    e. General information such as location, time, measurements, weather, damage, etc.

Appendix A. Safety Procedures and Recommendations (continued)

10. Encourage police to provide a Police Report and, if available, submit a copy with SF 91.

11. If you have a camera, take pictures of the accident scene and any damage to the vehicles involved. Submit along with SF 91.

12. If vehicle is unsafe to operate, arrange for towing services (if a government vehicle, pay using the vehicle gas card).

13. Submit all reports and data to the NETN Program Manager within one working day.

14. If a federal employee or volunteer is injured, the workers compensation process needs to be initiated within 48 hours of incident. NETN staff will assist with this process. It is important for injured monitoring staff to receive prompt medical treatment. Make sure the employee sees a doctor, not a nurse, nurse practitioner, or physician's assistant.

Appendix B. Alphabetical List of Vermont FBMP Species and 4-letter codes. Mammal species listed in bold.

COMMON NAME	CODE
ALDER FLYCATCHER	ALFL
AMERICAN CROW	AMCR
AMERICAN GOLDFINCH	AMGO
AMERICAN KESTREL	AMKE
AMERICAN REDSTART	AMRE
AMERICAN ROBIN	AMRO
BALTIMORE ORIOLE	BAOR
BANK SWALLOW	BANS
BARN SWALLOW	BARS
BARRED OWL	BDOW
BAY-BREASTED WARBLER	BBWA
BELTED KINGFISHER	BEKI
BICKNELL'S THRUSH	BITH
BLACK-AND-WHITE WARBLER	BAWW
BLACK-BACKED WOODPECKER	BBWO
BLACK-BILLED CUCKOO	BBCU
BLACKBURNIAN WARBLER	BLBW
BLACK-CAPPED CHICKADEE	BCCH
BLACKPOLL WARBLER	BLPW
BLACK-THROATED BLUE WARBLER	BTBW
BLACK-THROATED GREEN WARBLER	BTNW
BLUE JAY	BLJA
BLUE-GRAY GNATCATCHER	BGGN
BLUE-WINGED WARBLER	BWWA
BOBOLINK	BOBO
BOREAL CHICKADEE	BOCH
BROAD-WINGED HAWK	BWHA
BROWN CREEPER	BRCR
BROWN THRASHER	BRTH
BROWN-HEADED COWBIRD	BHCO
CANADA WARBLER	CAWA
CAPE MAY WARBLER	CMWA
CAROLINA WREN	CARW
CEDAR WAXWING	CEDW
CERULEAN WARBLER	CERW
CHESTNUT-SIDED WARBLER	CSWA
CHIMNEY SWIFT	CHSW
CHIPPING SPARROW	CHSP
CLIFF SWALLOW	CLSW
COMMON GRACKLE	COGR
COMMON NIGHTHAWK	CONI
COMMON RAVEN	CORA
COMMON YELLOWTHROAT	COYE
COOPER'S HAWK	COHA
DOWNY WOODPECKER	DOWO
EASTERN BLUEBIRD	EABL
EASTERN CHIPMUNK	**CHIP**
EASTERN GRAY SQUIRREL	**EGSQ**
EASTERN KINGBIRD	EAKI
EASTERN MEADOWLARK	EAME
EASTERN PHOEBE	EAPH
EASTERN SCREECH-OWL	EASO
EASTERN TOWHEE	EATO
EASTERN TUFTED TITMOUSE	ETTI
EASTERN WOOD-PEWEE	EAWP
EUROPEAN STARLING	EUST
EVENING GROSBEAK	EVGR
FIELD SPARROW	FISP
FISH CROW	FICR
GOLDEN-CROWNED KINGLET	GCKI
GOLDEN-WINGED WARBLER	GWWA
GRASSHOPPER SPARROW	GRSP
GRAY CATBIRD	GRCA
GRAY JAY	GRAJ
GREAT HORNED OWL	GHOW
GREAT-CRESTED FLYCATCHER	GCFL
HAIRY WOODPECKER	HAWO
HENSLOW'S SPARROW	HESP
HERMIT THRUSH	HETH
HOODED WARBLER	HOWA
HOUSE FINCH	HOFI
HOUSE SPARROW	HOSP
HOUSE WREN	HOWR
INDIGO BUNTING	INBU
LEAST FLYCATCHER	LEFL
LINCOLN'S SPARROW	LISP
LOUISIANA WATERTHRUSH	LOWA
MAGNOLIA WARBLER	MAWA
MARSH WREN	MAWR
MOURNING DOVE	MODO
MOURNING WARBLER	MOWA
MYRTLE WARBLER	MYWA
NASHVILLE WARBLER	NAWA
NORTHERN CARDINAL	NOCA
NORTHERN GOSHAWK	NOGO
NORTHERN HARRIER	NOHA
NORTHERN MOCKINGBIRD	NOMO

Appendix B. Alphabetical List of Vermont FBMP Species and 4-letter codes. Mammal species listed in bold (continued).

NORTHERN PARULA	NOPA
NORTHERN ROUGH-WINGED SWALLOW	NRWS
NORTHERN SAW-WHET OWL	NSWO
NORTHERN WATERTHRUSH	NOWA
OLIVE-SIDED FLYCATCHER	OSFL
ORCHARD ORIOLE	OROR
OVENBIRD	OVEN
PHILADELPHIA VIREO	PHVI
PILEATED WOODPECKER	PIWO
PINE SISKIN	PISI
PINE WARBLER	PIWA
PRAIRIE WARBLER	PRAW
PROTHONOTARY WARBLER	PROW
PURPLE FINCH	PUFI
PURPLE MARTIN	PUMA
RED CROSSBILL	RECR
RED SQUIRREL	**RESQ**
RED-BELLIED WOODPECKER	RBWO
RED-BREASTED NUTHATCH	RBNU
RED-EYED VIREO	REVI
RED-HEADED WOODPECKER	RHWO
RED-SHOULDERED HAWK	RSHA
RED-TAILED HAWK	RTHA
RED-WINGED BLACKBIRD	RWBL
ROSE-BREASTED GROSBEAK	RBGR
RUBY-CROWNED KINGLET	RCKI
RUBY-THROATED HUMMINGBIRD	RTHU
RUFFED GROUSE	RUGR
RUSTY BLACKBIRD	RUBL
SAVANNAH SPARROW	SAVS
SCARLET TANAGER	SCTA
SEDGE WREN	SEWR
SHARP-SHINNED HAWK	SSHA

SLATE-COLORED JUNCO	SCJU
SOLITARY VIREO	SOVI
SONG SPARROW	SOSP
SWAINSON'S THRUSH	SWTH
SWAMP SPARROW	SWSP
TENNESSEE WARBLER	TEWA
THREE-TOED WOODPECKER	TTWO
TREE SWALLOW	TRES
TURKEY VULTURE	TUVU
VEERY	VEER
VESPER SPARROW	VESP
WARBLING VIREO	WAVI
WHIP-POOR-WILL	WPWI
WHITE-BREASTED NUTHATCH	WBNU
WHITE-THROATED SPARROW	WTSP
WHITE-WINGED CROSSBILL	WWCR
WILD TURKEY	WITU
WILLOW FLYCATCHER	WIFL
WILSON'S WARBLER	WIWA
WINTER WREN	WIWR
WOOD THRUSH	WOTH
WORM-EATING WARBLER	WEWA
YELLOW PALM WARBLER	YPWA
YELLOW WARBLER	YEWA
YELLOW-BELLIED FLYCATCHER	YBFL
YELLOW-BELLIED SAPSUCKER	YBSA
YELLOW-BILLED CUCKOO	YBCU
YELLOW-SHAFTED FLICKER	YSFL
YELLOW-THROATED VIREO	YTVI

Appendix C. Finding Your Way with Map and Compass

USGS Fact Sheet 035-01 (March 2001)

Part of a 7.5-minute topographic map at 1:24,000 scale.

A topographic map tells you where things are and how to get to them, whether you're hiking, biking, hunting, fishing, or just interested in the world around you. These maps describe the shape of the land. They define and locate natural and manmade features like woodlands, waterways, important buildings, and bridges. They show the distance between any two places, and they also show the direction from one point to another.

Distances and directions take a bit of figuring, but the topography and features of the land are easy to determine. The topography is shown by contours. These are imaginary lines that follow the ground surface at a constant elevation; they are usually printed in brown, in two thicknesses. The heavier lines are called index contours, and they are usually marked with numbers that give the height in feet or meters. The contour interval, a set difference in elevation between the brown lines, varies from map to map; its value is given in the margin of each map. Contour lines that are close together represent steep slopes.

Natural and manmade features are represented by colored areas and by a set of standard symbols on all U.S. Geological Survey (USGS) topographic maps. Woodlands, for instance, are shown in a green tint; waterways, in blue. Buildings may be shown on the map as black squares or outlines. Recent changes in an area may be shown by a purple overprint, a road may be printed in red or black solid or dashed lines, depending on its size and surface. A list of symbols is available from the Earth Science Information Center (ESIC) at http://ask.usgs.gov/sils_index.html.

From Near to Far: Distance

Maps are made to scale; that is, there is a direct relationship, a ratio, between a unit of measurement on the map and the actual distance that same unit of measurement represents on the ground. If, for instance, 1 inch on the map represents 1 mile (which converts to 63,360 inches) on the ground, the map's scale is 1:63,360. Below is a listing of the scales at which some of the more popular USGS maps are compiled.

A convenient way of representing map distance is by the use of a graphic scale bar. Most USGS topographic maps have scale bars in the map margin that represent distances on the map in miles, feet, and kilometers.

Appendix C. Finding Your Way with Map and Compass (continued).

The table below shows the corresponding area of coverage for each scale and the linear distance that each scale represents in inches and centimeters.

Map Name Series	Scale	1 inch represents	1 centimeter represents	Map area (approximate square miles)
Puerto Rico 7.5 minute	1:20,000	1,667 feet	200 meters	71
7.5-minute	1:24,000	2,000 feet	240 meters	40 to 70
7.5- by 15-minute	1:25,000	2,083 feet	250 meters (about)	98 to 140
Alaska	1:63,360	1 mile	634 meters (about)	207 to 281
Intermediate	1:50,000	0.8 mile	500 meters (about)	County
Intermediate	1:100,000	1.6 mile	1 kilometer (about)	1,568 to 2,240
United States	1:250,000	4 miles	2. 5 kilometers (about)	4,580 to 8,669

From Here to There: Determining Direction

To determine the direction, or bearing, from one point to another, you need a compass as well as a map. Most compasses are marked with the four cardinal points—north, east, south, and west—but some are marked additionally with the number of degrees in a circle (360: north is 0 or 360, east is 90, south is 180, and west is 270). Both kinds are easy to use with a little practice. The illustrations on the next page show how to read direction on a map.

One thing to remember is that a compass does not really point to true north, except by coincidence in some areas. The compass needle is attracted by magnetic force, which varies in different parts of the world and is constantly changing. When you read north on a compass, you're really reading the direction of the magnetic north pole. A diagram in the map margin will show the difference (declination) at the center of the map between compass north (magnetic north indicated by the MN symbol) and true north (polar north indicated by the "star" symbol). This diagram also provides the declination between true north and the orientation of the Universal Transverse Mercator (UTM) grid north (indicated by the GN symbol). The declination diagram is only representational, and true values of the angles of declination should be taken from the numbers provided rather than from the directional lines. Because the magnetic declination is computed at the time the map is made, and because the position of magnetic north is constantly changing, the declination factor provided on any given map may not be current. To obtain current and historical magnetic declination information for any place in the United States, contact:

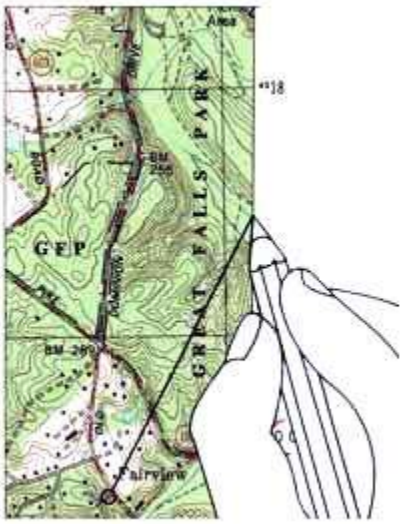
National Geomagnetic Information Center
Phone: 303-273-8486
E-mail: jcaldwell@usgs.gov
Web site: geomag.usgs.gov.
or
National Geophysical Data Center
Phone: 303-497-6826

Appendix C. Finding Your Way with Map and Compass (continued).

E-mail: info@ngdc.noaa.gov
Web site: www.ngdc.noaa.gov/ or www.ngdc.noaa.gov/seg/potfld/geomag.shtml.

Taking a compass bearing from a map:

1. Draw a straight line on the map passing through your location and your destination and extending across any one of the map borders.
2. Center the compass where your drawn line intersects the map border, align the compass axis N-S or E-W with the border line, and read on the compass circle the true bearing of your drawn line. Be careful to get the bearing in the correct sense because a straight line will have two values 180° apart. Remember north is 0, east is 90, and so on.
3. To use this bearing, you must compensate for magnetic declination. If the MN arrow on the map magnetic declination diagram is to the right of the true north line, subtract the MN value. If the arrow is to the left of the line, add the value. Then, standing on your location on the ground, set the compass so that "zero degrees or North" aligns with the magnetic north needle, read the magnetic bearing that you have determined by this procedure, and head off in the direction of this bearing to reach your destination.



(1) Drawing a straight line over the map edge

(2) Reading the compass on the map

Appendix C. Finding Your Way with Map and Compass (continued).

(3) Using the magnetic declination diagrams

NOTE: Unless otherwise noted, all compass bearings that are used as part of NETN forest bird monitoring point counts reference to magnetic north. As such, compensating for magnetic declination is not required.

A Word of Caution

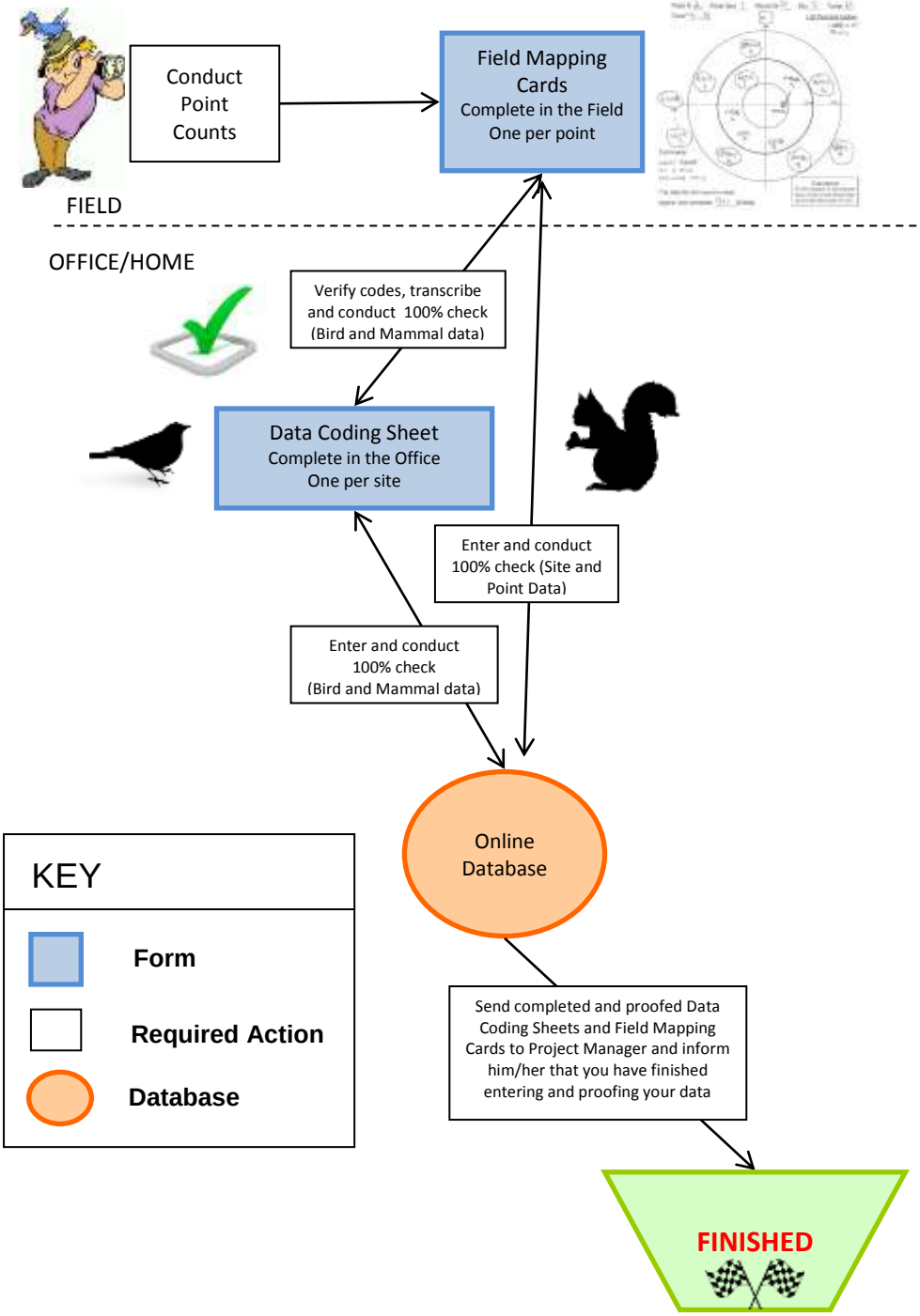
Compass readings are also affected by the presence of iron and steel objects. Be sure to look out for—and stay away from—pocket knives, belt buckles, railroad tracks, trucks, electrical lines, and so forth when using a compass in the field.

Information

For information on these and other USGS products and services, call 1-888-ASK-USGS, or visit the general interest publications Web site on mapping, geography, and related topics at erg.usgs.gov/isb/pubs/pubslists/.

For additional information, visit the ask.usgs.gov web site or the USGS home page at www.usgs.gov.

Appendix D. Flow chart of volunteer observers' data management responsibilities.



Appendix E. Instructions for entering data online.

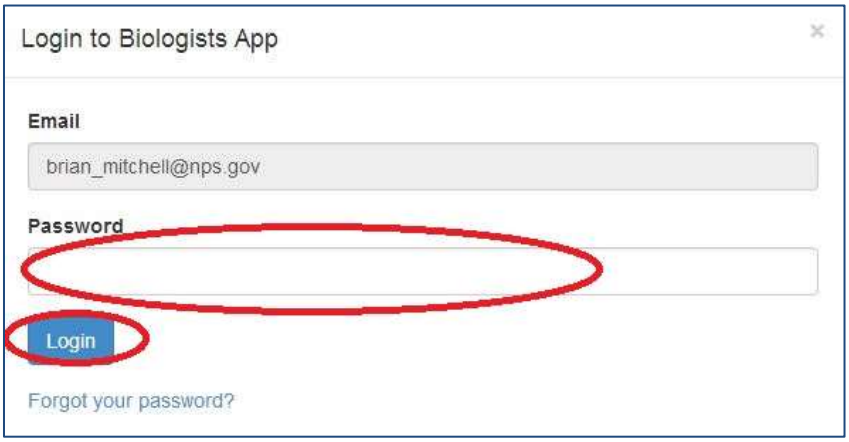
Entering Data into the Online Database

The recommended internet browser for working with the online database is Chrome. Firefox and Safari also work, but Internet Explorer is not recommended.

Logging in

1. The database is available at http://data.prbo.org/science/biologists.
2. Enter your e-mail address when prompted.

3. Enter your password and click "Login".

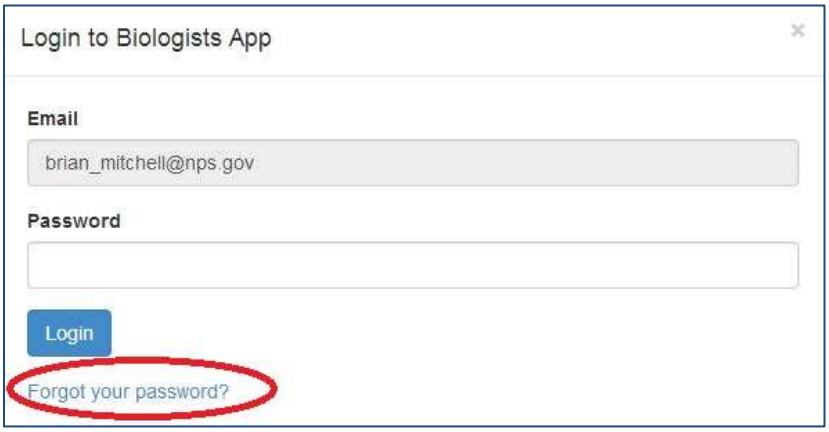


Lost Password

1. The database is available at http://data.prbo.org/science/biologists.
2. Enter your e-mail address when prompted.

Appendix E. Instructions for entering data online (continued).

3. If you don't know your password or want to change it, click "Forgot your password?".



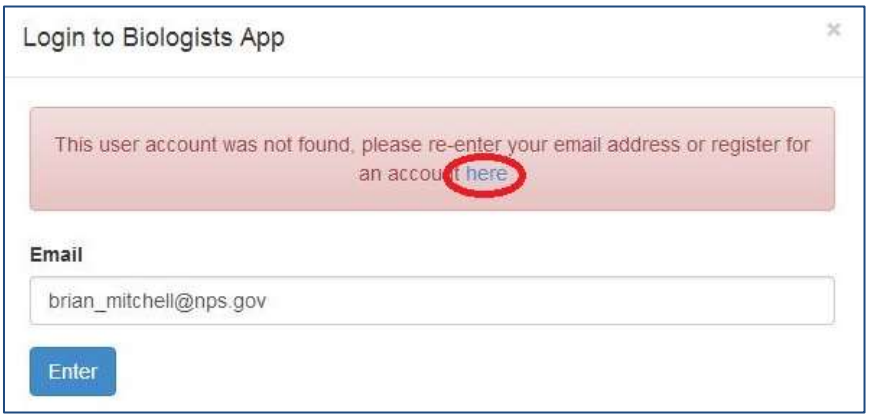
4. An e-mail will be sent to you with a link to reset your password. The link will take you to a "New Password" page where you need to enter a new password twice and then click "Save". Once you save your new password you should follow the steps above for "Logging In".

New Account

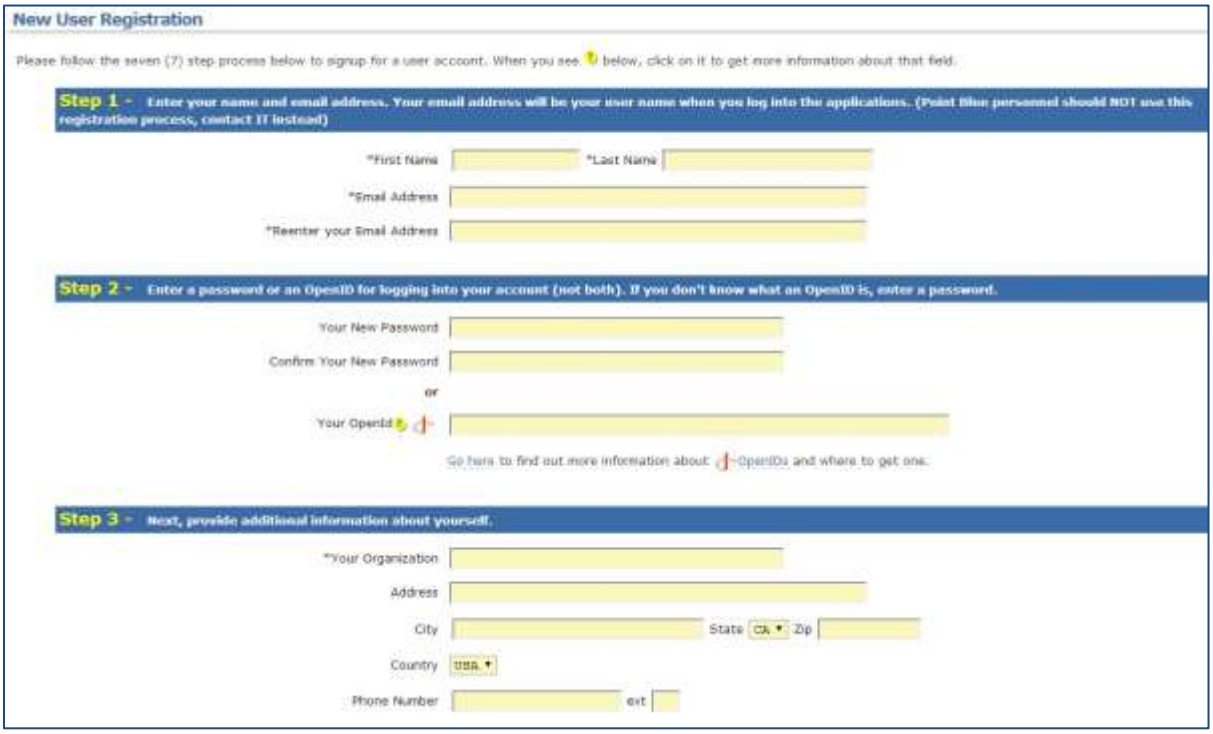
1. The database is available at http://data.prbo.org/science/biologists.
2. Enter your e-mail address when prompted.

Appendix E. Instructions for entering data online (continued).

3. If no account was found, click on the link to register for an account.

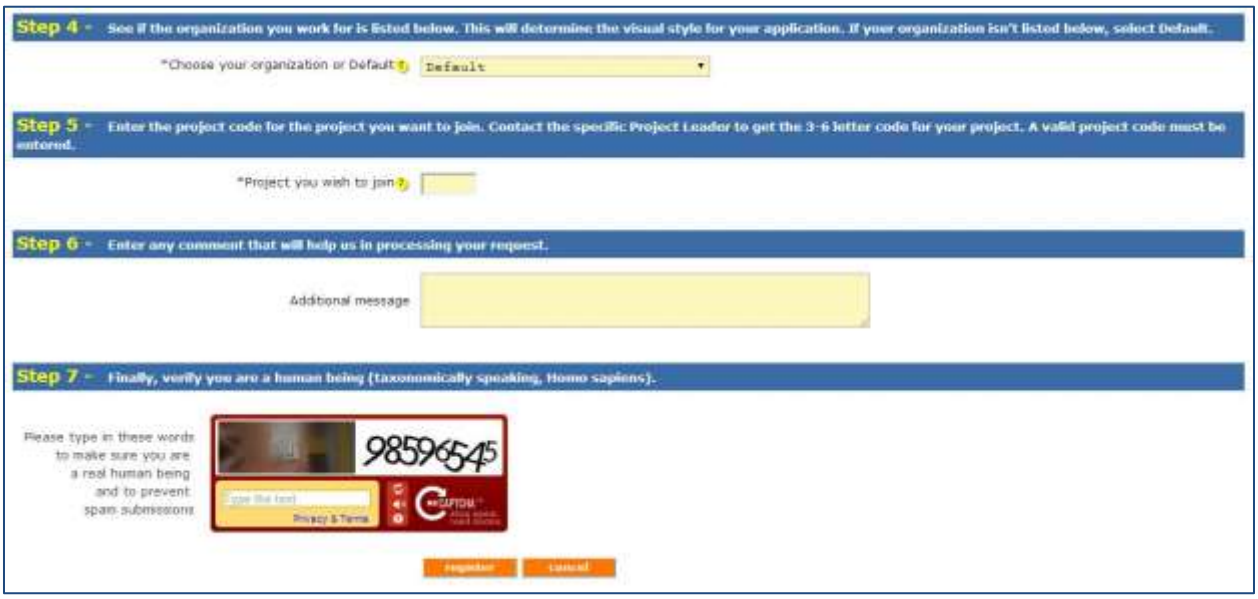


4. You'll be taken to a registration form with 7 parts. Steps 1 and 2 should be self-explanatory. For Step 3, you can enter "Northeast Temperate Network" for the Organization, with the following address: 54 Elm Street, Woodstock, VT, 05091. The phone number is 802-457-3368.



Appendix E. Instructions for entering data online (continued).

5. For Step 4, select "US National Park Service" from the options. For Step 5, type "NETN". Step 6 can remain blank, unless you are also an observer for VCE's Forest Bird Monitoring Program. In that case, type "Also an observer for project VTFBMP". For Step 7, type the numbers in the top of the "ReCaptcha" box into the text box. If you cannot read the numbers clearly, click the "Get a new challenge" button, which is the red button with two arrows in a circle. Once the form is completed, click "register".



6. You will receive an e-mail with a link. Clicking on the link in the e-mail will bring up a registration confirmation screen. The project leader will receive an e-mail asking him or her to approve your request for joining the project.

7. You will not be able to log in to enter data until the approval process is completed.

Appendix E. Instructions for entering data online (continued).

Enter Observation Data

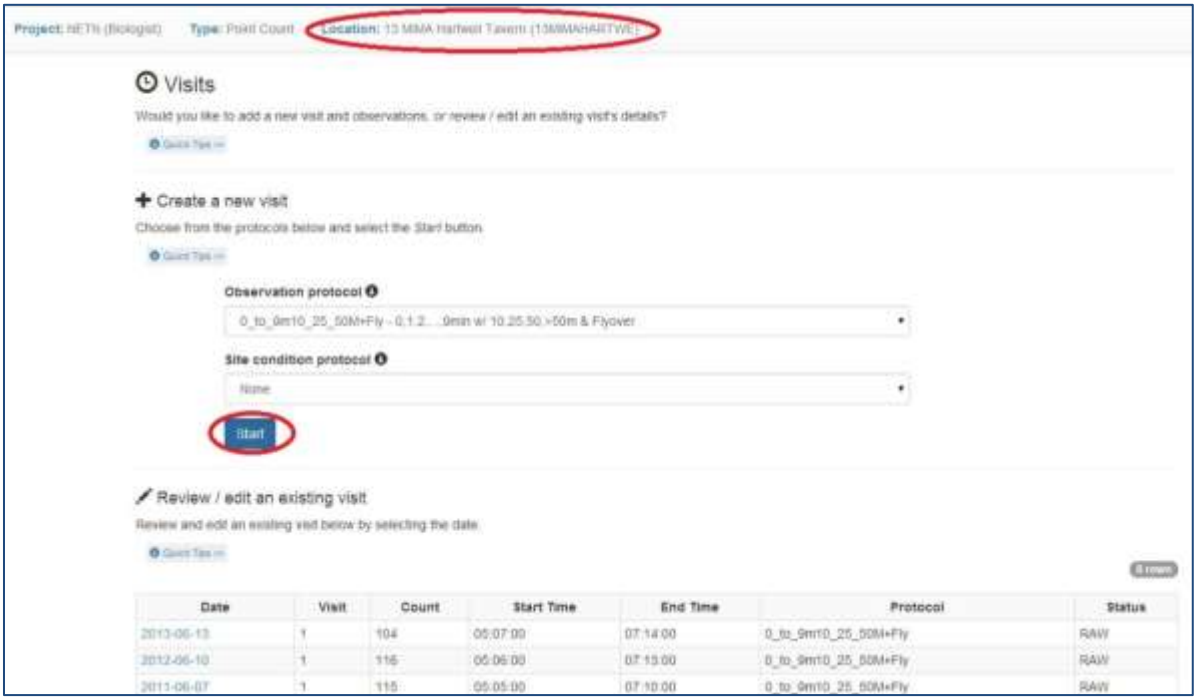
IMPORTANT: Plan to enter all of your data in one sitting. Data are cached to your internet browser during data entry, and not saved to the database until all data for a survey are entered and pass basic quality control checks. If you do have to take a break, your data will likely be saved on your computer and you should be able to start where you left off, but this is not guaranteed (it will depend on your local computer settings). If you need to resume data entry after an interruption, restart your process at Step 1, using the same internet browser (e.g., Chrome). When you get to Step 4 you should see your previously entered data.

1. After logging in, you will see a "Welcome" screen with projects you have access to as well as actions you can take. Make sure the project is highlighted ("NETN – NPS Northeast Temperate Network Landbird Monitoring Program") and click on "Point Count Events and Secretive Marshbird Surveys".

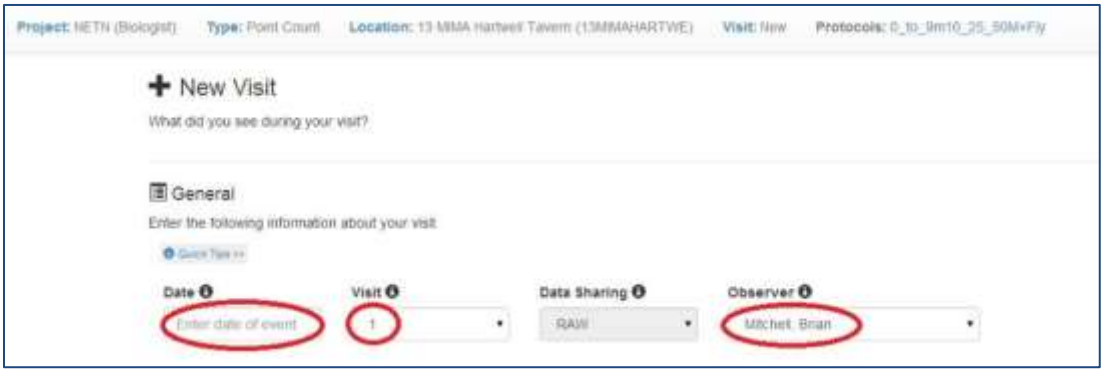
2. Choose your site from the list of landbird routes. The list is alphabetized by park name, then route number within each park. Note that the figure below only shows the top of the list of routes.

Appendix E. Instructions for entering data online (continued).

3. The next screen allows you to create a new visit (enter data) or review previous visits to the route. To get to the data entry screen, first verify the location at the top of the screen, then click "Start". The observation protocol ("0_to_9m10_25_50M+Fly") and site condition protocol ("None") should be set by default; do not change this (site conditions will be entered later). **Note:** if you got interrupted during data entry and need to resume where you left off, or are interested in scanning old data for the route (including viewing a list of species detected during a given survey), click on the date of the survey in the "Review/edit an existing visit" section.



4. You will be taken to a "New Visit" screen. Fill out the "General" section at the top with the date of the survey and visit number, and verify that the correct observer name is selected (the database will default to the person entering the data). The date can be entered in a variety of formats and will convert to the standardized format used by the database. The visit number should be "1" for the first visit of the year, and then increment for any additional visits. If two people collect data concurrently (double-observer point counts), the lead observer (official volunteer for the route) uses visit "1" and the other observer uses visit "2".

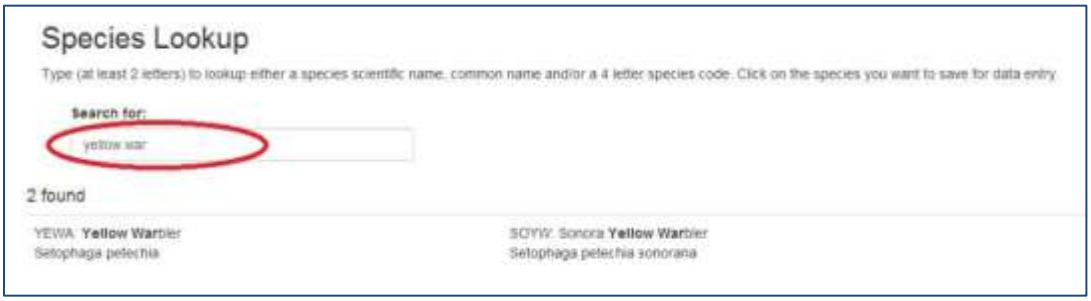


Appendix E. Instructions for entering data online (continued).

5. The next section is "Points Surveyed". For each point that was surveyed, place a check in the box to the left of the point name. Then provide the starting time for each count. If any of the point counts had NO birds detected, click in the circle next to "no" in the "Detections?" column. Finally, add any notes about the point count (e.g., comments about noise, or other unusual events). The image below shows the "Points Surveyed" section filled out for a partial survey of the first four points on a route, where the fourth point had no bird detections.

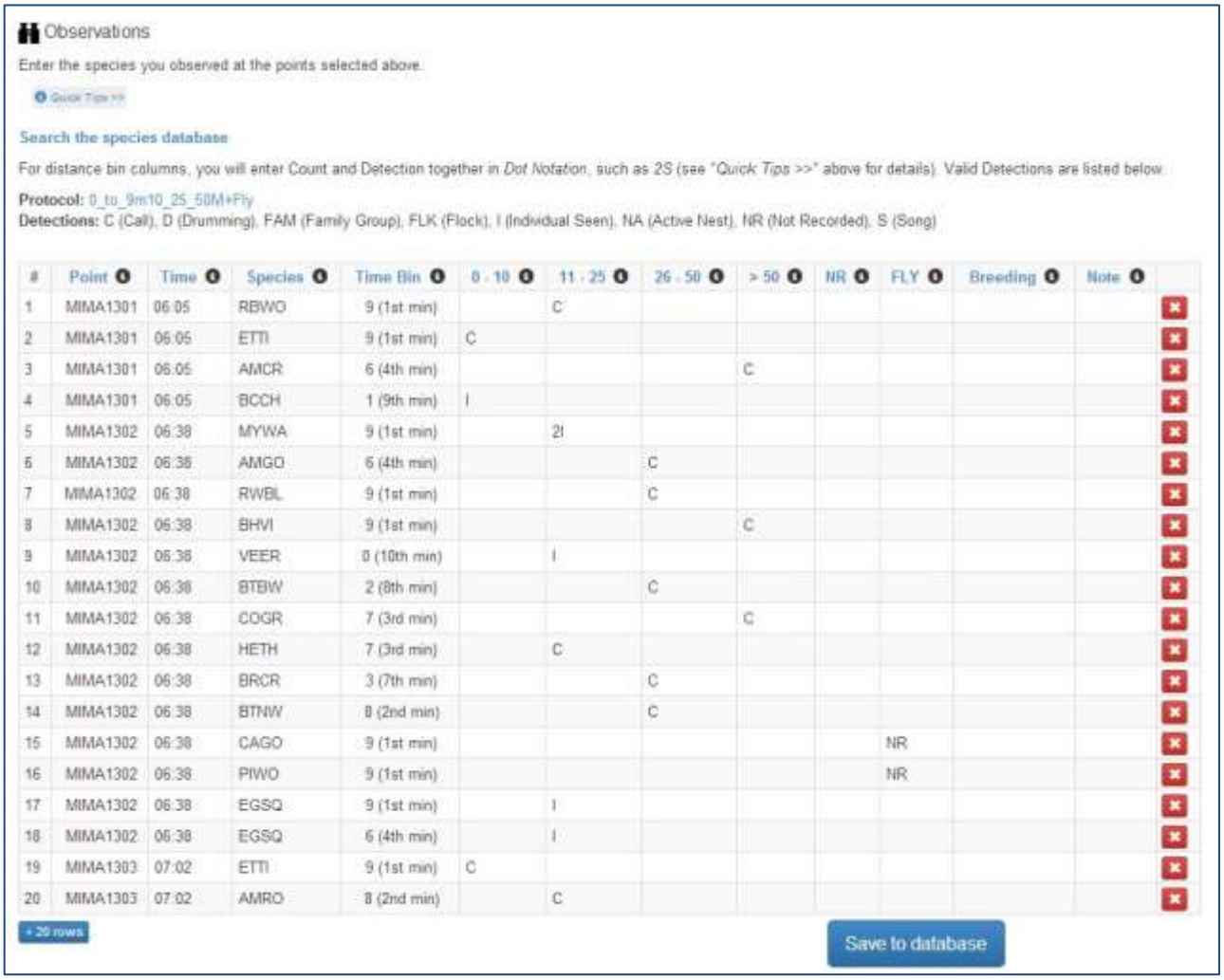
6. Before entering observations, verify any species codes on your coding sheet that you are unsure about; the database will not check your species codes for errors until you complete data entry, and data entry errors that accidentally produce a valid code (for an unintended species) will not be detected by the database. For example, the correct Yellow Warbler code is YEWA, not YWAR, and gray squirrel is EGSQ. To verify species codes, click on "Search the species database" in the "Observations" section of the data entry screen.

7. A new tab should open in your browser; begin typing a code, common name, or scientific name in the "Search for:" box to check your codes.



Appendix E. Instructions for entering data online (continued).

8. Once you are confident that your species codes are correct, enter data in the "Observations" section. The columns on the online form will match your data coding sheet, except that the online form has columns for "Breeding" (not used by this project, but available to document signs of breeding) and "Notes". Clicking "i" next to a column heading will provide a list of valid codes, and the "Quick Tips" link at the top of the Observations section has useful information about data entry. The data entry form will automatically convert entries to all caps, and you can use "Enter" to go to a new line, the up or down arrows to move vertically, and Tab and Shift-Tab to move forward and back. Note: If you did not record the time of detection of a species (e.g., for flyovers), select "NR" for the Time Bin.



Observations

Enter the species you observed at the points selected above.

Search the species database

For distance bin columns, you will enter Count and Detection together in *Dot Notation*, such as *2S* (see *"Quick Tips >>"* above for details). Valid Detections are listed below.

Protocol: 0_to_9m10_25_50M+Fly

Detections: C (Call), D (Drumming), FAM (Family Group), FLK (Flock), I (Individual Seen), NA (Active Nest), NR (Not Recorded), S (Song)

#	Point	Time	Species	Time Bin	0 - 10	11 - 25	26 - 50	> 50	NR	FLY	Breeding	Note
1	MIMA1301	06:05	RBWO	9 (1st min)		C						
2	MIMA1301	06:05	ETTI	9 (1st min)	C							
3	MIMA1301	06:05	AMCR	6 (4th min)				C				
4	MIMA1301	06:05	BCCH	1 (9th min)	I							
5	MIMA1302	06:38	MYWA	9 (1st min)		2I						
6	MIMA1302	06:38	AMGO	6 (4th min)			C					
7	MIMA1302	06:38	RWBL	9 (1st min)			C					
8	MIMA1302	06:38	BHVI	9 (1st min)				C				
9	MIMA1302	06:38	VEER	0 (10th min)		I						
10	MIMA1302	06:38	BTBW	2 (8th min)			C					
11	MIMA1302	06:38	COGR	7 (3rd min)				C				
12	MIMA1302	06:38	HETH	7 (3rd min)		C						
13	MIMA1302	06:38	BRCR	3 (7th min)			C					
14	MIMA1302	06:38	BTNW	8 (2nd min)			C					
15	MIMA1302	06:38	CAGO	9 (1st min)						NR		
16	MIMA1302	06:38	PIWO	9 (1st min)						NR		
17	MIMA1302	06:38	EGSQ	9 (1st min)		I						
18	MIMA1302	06:38	EGSQ	6 (4th min)		I						
19	MIMA1303	07:02	ETTI	9 (1st min)	C							
20	MIMA1303	07:02	AMRO	8 (2nd min)		C						

+ 20 rows

Save to database

Appendix E. Instructions for entering data online (continued).

9. You will need to click on "+20 rows" at the bottom-left of the data entry screen for each additional batch of 20 rows. Once all data rows are entered, review the data for errors and correct any mistakes you see. Pay particular attention to the species codes. The database will allow ANY 4-letter combination during data entry, and it will not catch mistakes that produce a 4-letter code for a different species than the one observed.

10. Once you are comfortable with the data accuracy, click "Save to database". The database will perform a number of data checks.

11. If an error message appears on the screen, review the data and correct the error. The most common errors are invalid species codes and invalid detection cues. Note that you can sort by species code by clicking the "Species" label, to facilitate locating problem codes. All other fields can also be sorted. Don't forget to correct your coding sheet as well if you used an incorrect species code.

12. If the data save successfully, you will see a message after clicking "Save to database". You can close the message by clicking the "X" to the far right of the message.

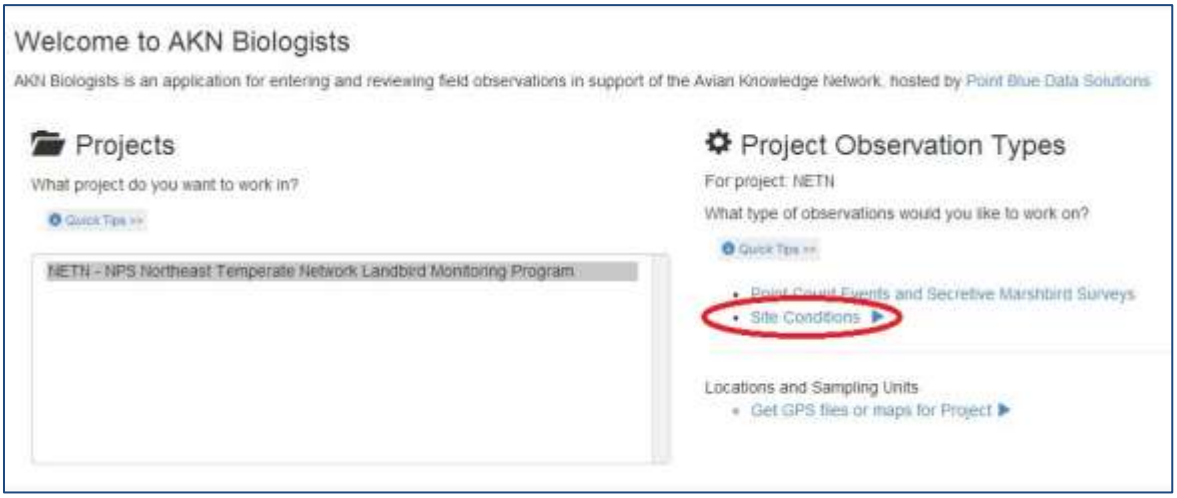
13. You will be taken to the "Review or Edit Visit" screen for proofing your data. This might be a good time to take a break if you need one!

Appendix E. Instructions for entering data online (continued).

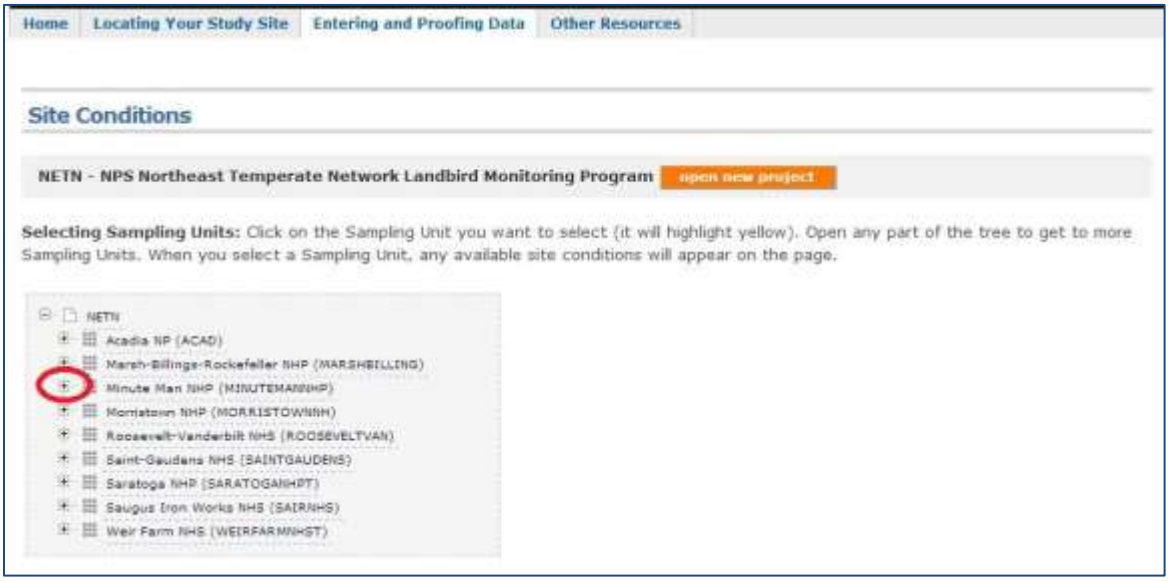
Enter Site Conditions

1. Log in to the database. If you are continuing from the previous session, click on "Project" at the top-left of the screen.

2. Click on "Site Conditions" under "Project Observation Types".

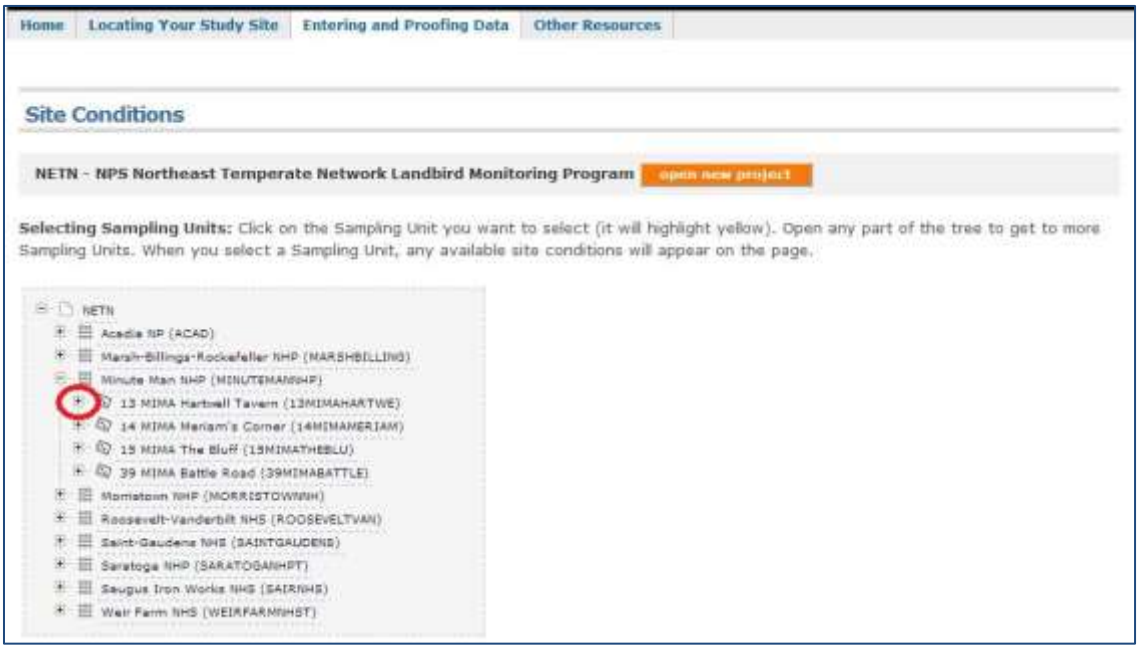


3. On the next screen, you will see a list of parks. Click on the "+" next to your park.

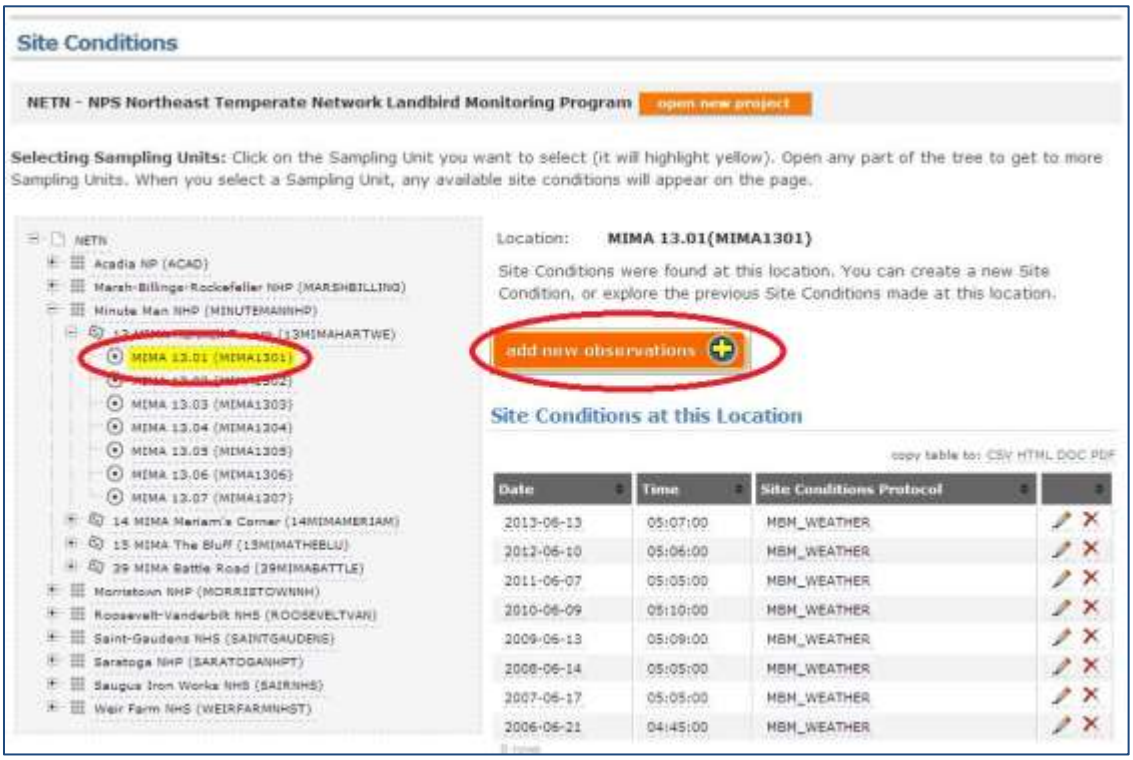


Appendix E. Instructions for entering data online (continued).

4. Click on the "+" next to your site to display the list of points.

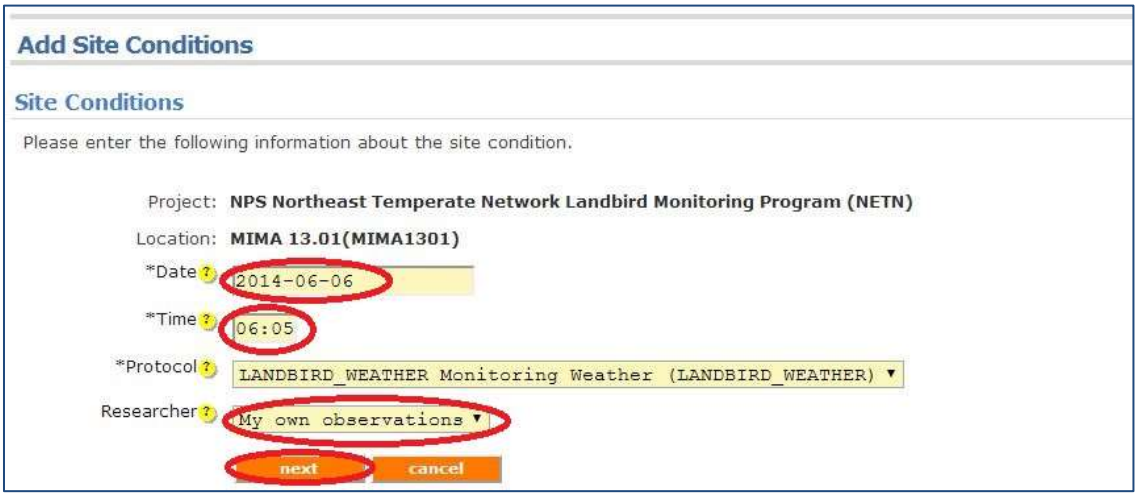


5. Click on the first point you sampled. A list of existing dates with site observations will appear, as well as an option to "add new observations". Click on "add new observations".



Appendix E. Instructions for entering data online (continued).

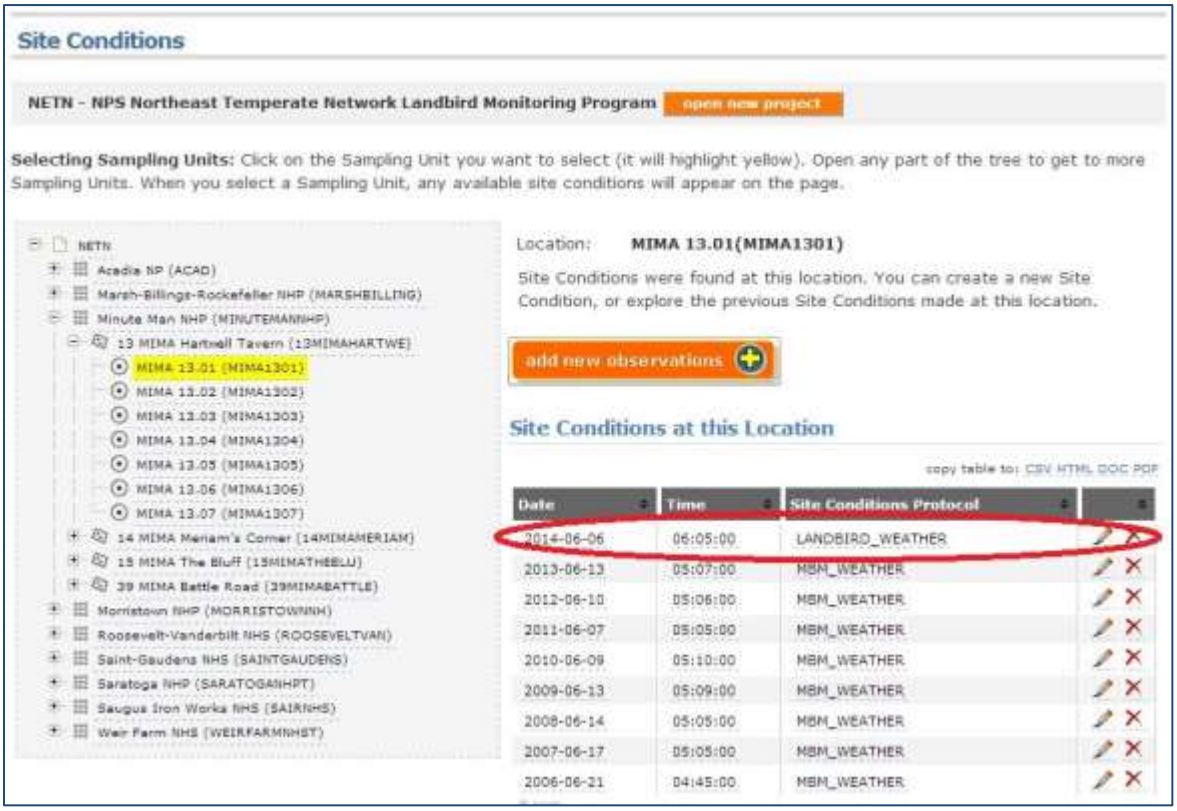
6. Enter the date (the database uses YYYY-MM-DD, but will attempt to convert other formats) and time of your observations. The researcher can be changed if the person entering data is different from the person collecting the data, but normally can be left at "My own observations". Click "next".



7. Enter the temperature, sky code, wind direction code, and wind speed code. Note that the database cannot handle alphabetical wind direction codes, so convert your codes as follows: 0 = No Wind, 1 = N, 2 = NE, 3 = E, 4 = SE, 5 = S, 6 = SW, 7 = W, 8 = NW, 9 = Not Recorded. Click Save after entering your condition codes.

Appendix E. Instructions for entering data online (continued).

8. You will be returned to the screen from Step 5, and your newly entered site conditions will be reflected on the table of existing site conditions. Repeat Steps 5 – 7 for each additional point that was sampled.



9. Once you have completed data entry of site conditions, log out of the database or close your browser. The site conditions are entered on an older application that does not connect back to the main application used for entering and reviewing observation data.

Appendix E. Instructions for entering data online (continued).

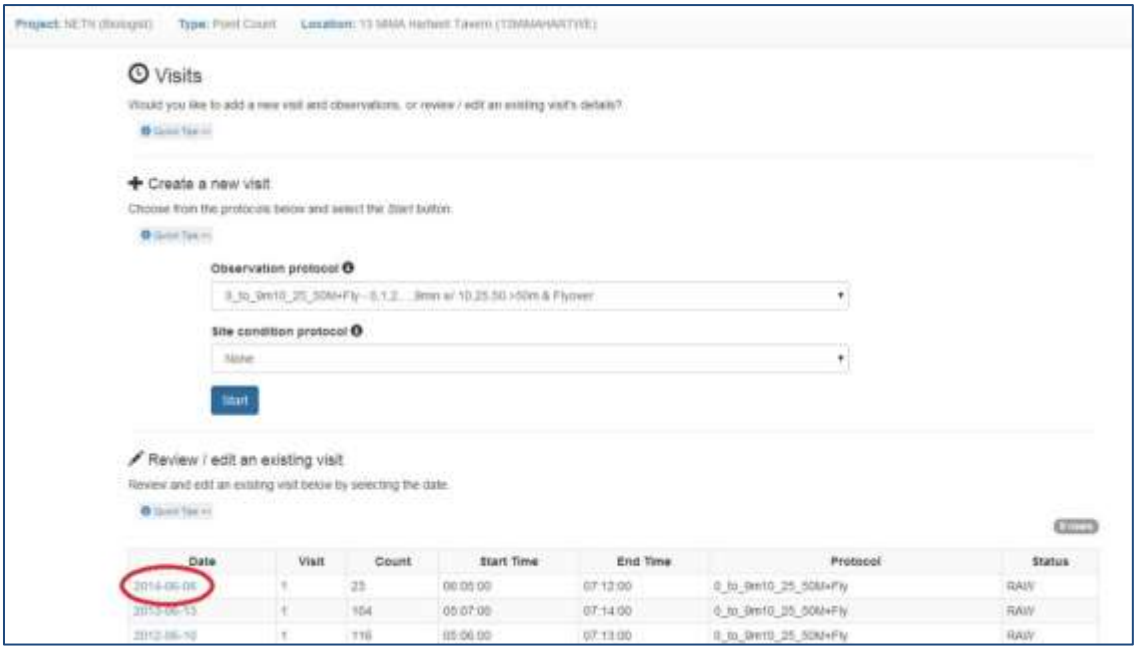
Proof Observation and Site Data

1. After logging back in (http://data.prbo.org/science/biologists; you may be logged in automatically) you will see the "Welcome" screen again. Make sure the project is highlighted ("NETN – NPS Northeast Temperate Network Landbird Monitoring Program") and click on "Point Count Events and Secretive Marshbird Surveys".

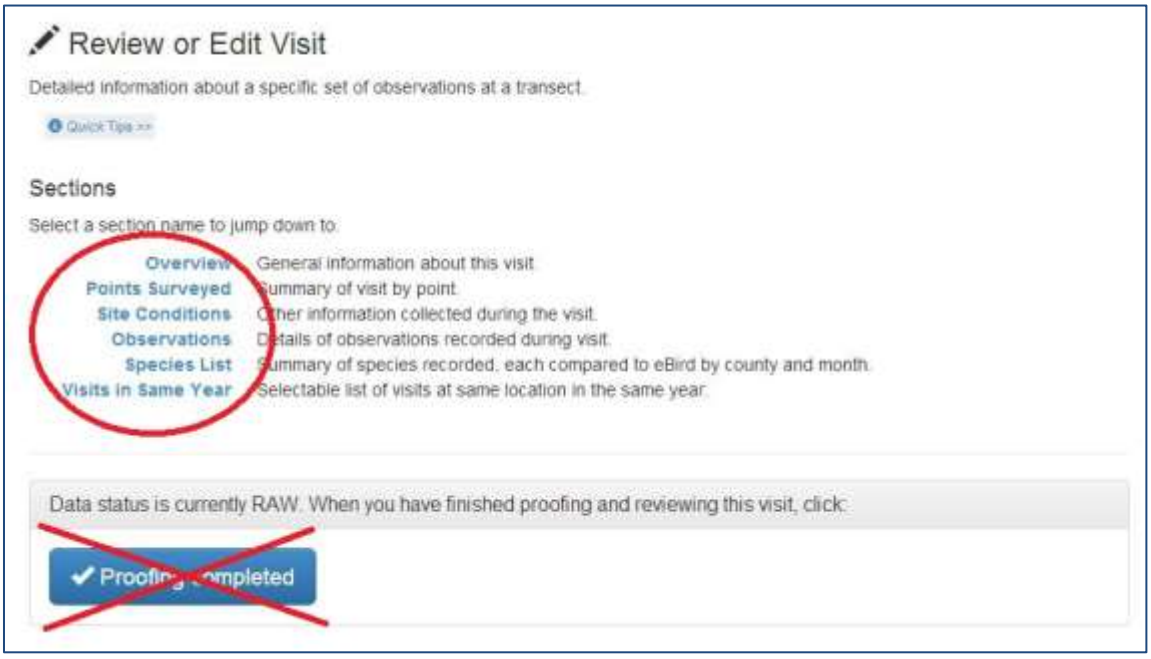
2. Choose your site from the list of landbird routes. The list is alphabetized by park name, then route number within each park. Note that the figure below only shows the top of the list of routes.

Appendix E. Instructions for entering data online (continued).

3. The next screen allows you to create a new visit (enter data) or review previous visits to the route. You want to "Review/edit an existing visit" rather than start a new visit, so click on the visit.



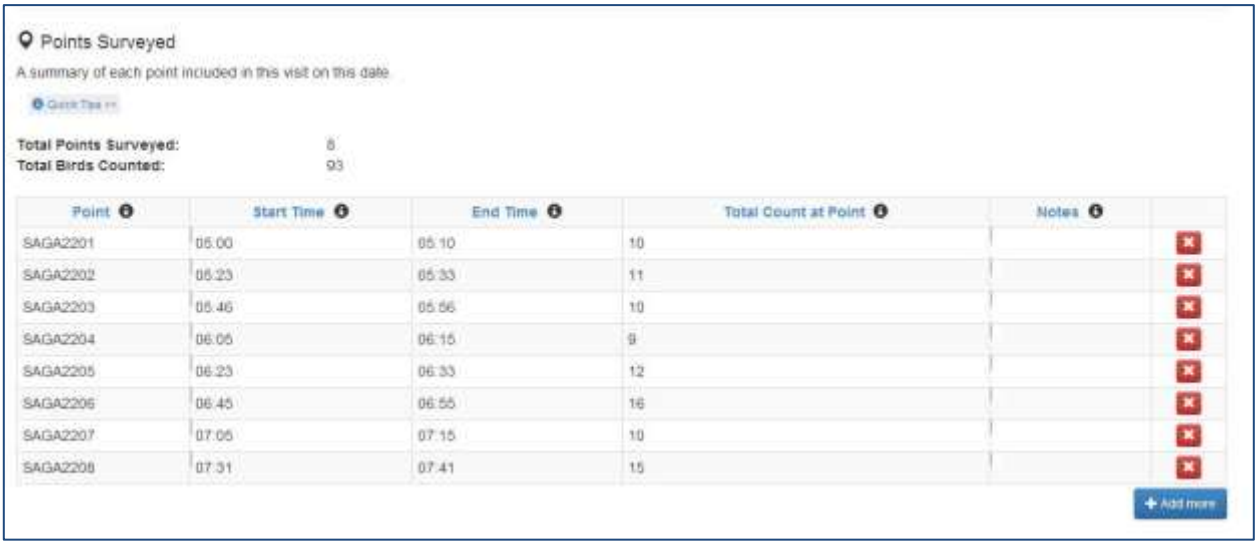
4. The next screen is long, and contains the data you entered as well as a species list. Clicking a link in the "Sections" portion will jump to a portion of the "Review or Edit Visit" screen. You will see a box that says "Proofing Completed". **DO NOT** click this box until the data have been reviewed according to the procedures below.



Appendix E. Instructions for entering data online (continued).

5. Begin by clicking the "Overview" link or scrolling to the Overview section. Verify the site ("Transect" in the database), Date, and Visit. These data cannot be changed; if there is an error contact the Project Manager for assistance.

6. Continue to the "Points Surveyed" section, either by scrolling down or using the link at the top of the page. Verify that all your points are listed, and that the Start Time for each point and any notes related to each point count are correct. If you need to edit a Start Time or Note, just double-click in the field and make your change. Unlike when entering observations, each change you make on this screen is saved to the database immediately after you leave the data field (by pressing enter or clicking outside of the field). This section also displays the number of species detected at each point ("Total Count at Point").



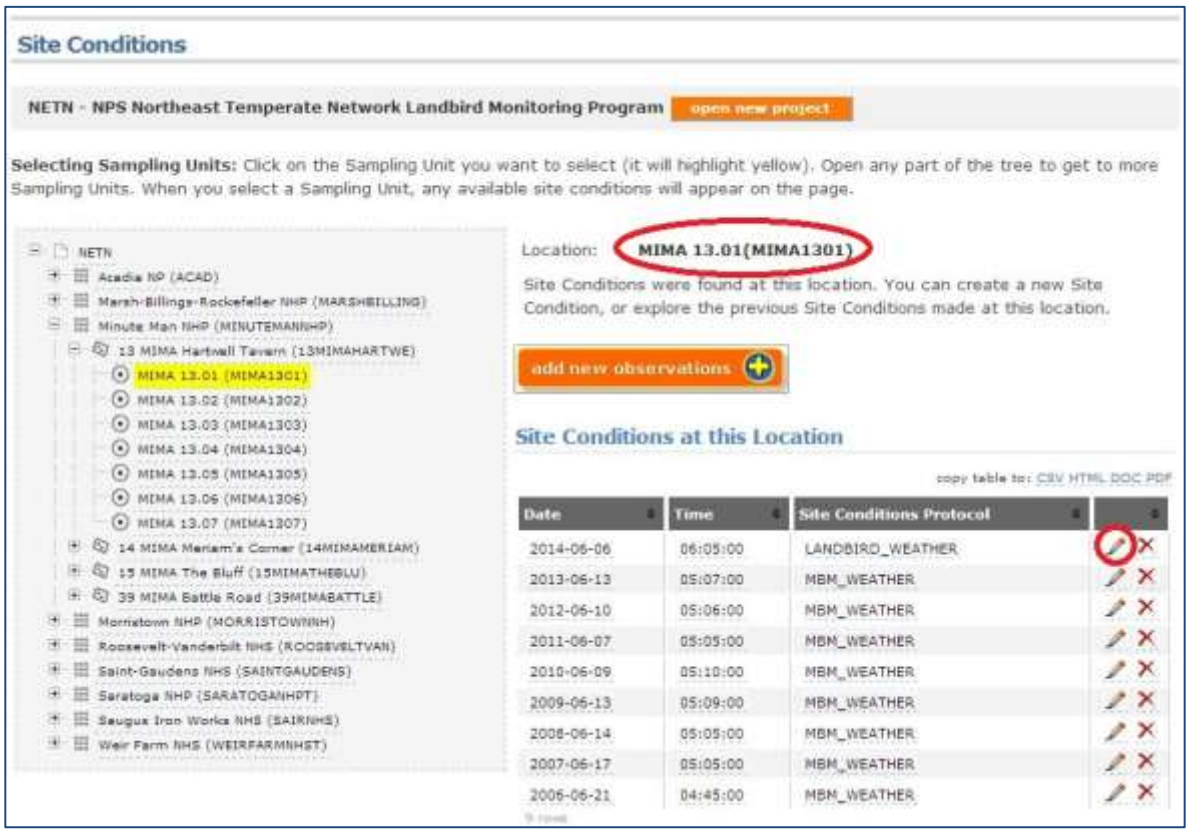
Appendix E. Instructions for entering data online (continued).

7. Continue to the "Site Conditions" section, either by scrolling down or using the link at the top of the page. Each point count station will be listed separately, and the stations might not be listed in order. For each station, verify the time, observer, temperature, wind direction, and wind speed (listed as "Wind"). The wind direction codes are: 0 = No Wind, 1 = N, 2 = NE, 3 = E, 4 = SE, 5 = S, 6 = SW, 7 = W, 8 = NW, 9 = Not Recorded.

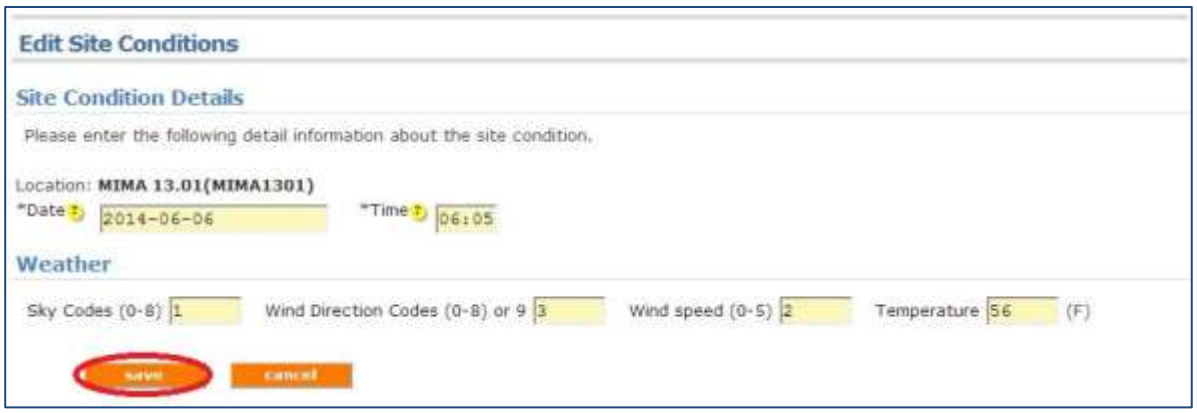
   a. IMPORTANT: If you discover an error in the site conditions, the errors cannot currently be fixed from this screen. Making changes generates an error message and the data are not actually corrected even though the data on the screen are altered. Review all the site condition data and create a list of the corrections needed, then click the "Add more" button below the site conditions for the first point needing correction.

Appendix E. Instructions for entering data online (continued).

b. Verify the point count station on the next screen, and click the pencil icon for the date that you need to edit.



c. On the next screen, correct the data and click "save".



d. If other points need correction, click the label for the next point on the left, and follow Steps 7b and 7c for each point.

Appendix E. Instructions for entering data online (continued).

e. Once you have completed correcting the site condition data, log out of the database or close your browser. The site conditions are entered on an older application that does not connect back to the main application used for entering and reviewing observation data.

f. Follow Steps 1-3 at the start of this section to get back to the data proofing screen for the correct visit.

8. Continue to the "Species List" section, either by scrolling down or using the link at the top of the page. This section will be below the "Observations" section. This section allows you to compare the species code used with the common name of the species. Please review the list carefully to ensure that you did not inadvertently use an incorrect species code. The Occurrence field is currently empty, but it will eventually provide information from eBird to indicate if the species is common, uncommon, rare, or never seen near the point count station and at the same time of year.

Species	Common Name	Scientific Name	Count for Species	Taxonomic Order	Occurrence
WISN	Wilson's Snipe	Gallinago delicata	1	496	
RBWO	Red-bellied Woodpecker	Melanerpes carolinus	1	1019	
PIWO	Pileated Woodpecker	Dryocopus pileatus	1	1056	
EAWP	Eastern Wood-Pewee	Contopus virens	3	1212	
EAPH	Eastern Phoebe	Sayornis phoebe	2	1239	
GCFL	Great Crested Flycatcher	Myiarchus crinitus	1	1254	

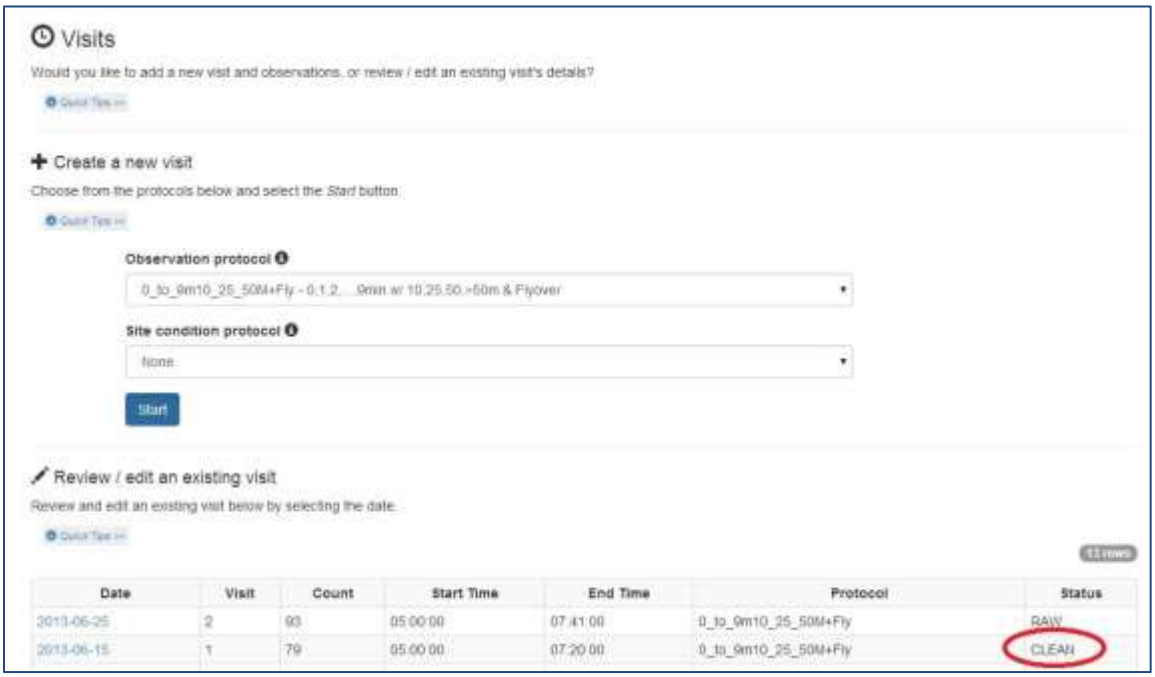
Appendix E. Instructions for entering data online (continued).

9. Once you are confident that your species codes are correct, scroll up to the "Observations" section. Review your data line by line, to ensure that the time, distance category, and detection type are correctly entered. Point and Time cannot be changed, and the "Singing?" column should be ignored. All other data can be corrected by double-clicking in the appropriate field. Each change you make on this screen is saved to the database immediately after you leave the data field (by pressing enter or clicking outside of the field).
   NOTE: If your data coding sheet has multiple individuals of the same species detected at the same time, the database will consolidate the data into one row. For example, REVI seen in distance band 2 and heard in band 3 will have "1I" in the 11-25 column and "1C" in the 26-50 column on a single row. If they were both in distance band 2, "1C1I" will be in the 11-25 column, and if they were both heard in distance band 2 then "2C" will be in the 11-25 column.

10. When you have completed reviewing all of your data, return to the top of the "Review or Edit Visit" screen and click on "Proofing completed".

Appendix E. Instructions for entering data online (continued).

11. You will be returned to the "Visits" screen, and the Status of your data will now be "CLEAN" instead of "RAW".



Congratulations! You've finished data entry. Please mail your field map and data coding sheets to the Project Manager.

Appendix F. Checklist of volunteer tasks.

Field Season Completion Checklist

The checklist below is an important part of our quality control procedures. Please initial and date each task as it is completed, and return this sheet once data entry is complete (by 15 August).

Name_____ Park_____

	Initials	Date	TASK	When to Accomplish
1			Read/review Volunteer Training Manual	Mid- to late-May
2			Complete and sign NPS *Agreement for Individual Voluntary Services* form and the separate Safety Acknowledgment; **Steve must have these documents before you can go into the field**	Mid- to late-May (if not on file from previous year)
3			Practice distance estimation as outlined in Volunteer Training Manual	Mid- to late-May
4			Brush-up on bird songs in the field or with recordings	Mid- to late-May
5			Conduct first field survey (last week of May surveys are acceptable at MORR and WEFA)	1-15 June
6			Conduct second field survey (optional at some parks)	15-30 June
7			Transcribe data from Field Mapping Cards onto Data Coding Sheets	Within 1 day of conducting field survey
8			Make photocopies of Field Mapping Cards and Data Coding Sheets and mail originals to VCE (address below). Retain copies for use in data entry.	Within 3 days of conducting last field survey.
9			Enter field data into Bird Point Count Database and return this sheet to VCE (address below).	No later than 31 July
10			Total up volunteer hours contributed to project this season and enter below.	No later than 31 July
TOTAL VOLUNTEER HOURS:				
Comments:				

Mail to: Steve Faccio, VCE, PO Box 420, Norwich, VT 05055

Revision History Log

Version	Date	Revised By	Changes	Justification
1.00	January 2006	Steve Faccio	Version associated with the Recruiting and Training Volunteer Observers SOP used beginning with the 2006 field season.	
1.01	April 2006	Brian Mitchell	Change to Recruiting and Training Volunteer Observers SOP	
1.02	December 2008	Steve Faccio Brian Mitchell	Recruiting and Training Volunteer Observers SOP	
1.03	February 2009	Steve Faccio	Volunteer Training Manual added as Appendix 2.2 of Recruiting and Training Volunteer Observers SOP	
1.04	August 2009	Sarah Lupis	Formatting, minor editorial changes.	
2.00	February 2010	Adam Kozlowski and Brian Mitchell	Significant revision to Volunteer Training Manual to reflect streamlined field procedures and updated data management procedures. Updated survey procedures and added mammal data coding sheet. Added volunteer data management responsibilities appendix.	Changes to reflect efforts to simplify field data collection and improve data management procedures.
2.01	March 2010	Steve Faccio	Minor editorial changes during review	
2.02	April 2010	Ed Sharron	Formatting, minor editorial changes.	
2.03	February 2011	Brian Mitchell	Added “Learning Your Route” section to training, and added note to completion checklist about early submission reward	Changes based on 2010 field season review.
2.04	March 2013	Ed Sharron	Added updated safety information with signature form.	
2.05	May 2014	Brian Mitchell	Routes may be marked with signs/reflectors Phones may be used as count-down timers Flocks and other groups should be noted on mapping card with x and the number (e.g., CORAx15) New codes for gray squirrel and yellow warbler Bird and mammal data now go on same data coding sheet and both are entered online New database location and instructions for online data entry New example coding sheets and field maps Data sheets must be returned within one month Shortened safety section to remove info not relevant to volunteers Revised Appendix D with new data flow Revised Appendix F – volunteer and safety forms due before field season, no longer allowed to give rewards	Changes based on 2014 protocol revision and conversion to AKN database

VERMONT CENTER FOR ECOSTUDIES
UNITING PEOPLE & SCIENCE FOR CONSERVATION

Inventory & Monitoring Program