North Carolina Calling Amphibian Survey Program (CASP) Training Manual

North Carolina Wildlife Resources Commission
Division of Wildlife Management
Wildlife Diversity Program

North American Amphibian Monitoring Program (NAAMP)

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Introduction

Why Monitor Frogs and Toads?

Frogs and toads are essential components of the ecosystem that exploit the abundance of invertebrates in our environment while at the same time serving as sustenance for other animals. Scientists have discovered frog and toad populations have been undergoing population declines worldwide because of habitat loss, ultraviolet radiation, pollution, disease, and introduced (exotic) species. These changes are hard to detect, quantify, or diagnose without standardized, long-term monitoring systems in place. The North American Amphibian Monitoring Program (NAAMP) is filling this need by creating and coordinating a continent wide monitoring program that relies on participation by individual states to monitor their frog and toad populations. Long-term tracking of frog and toad distributions and relative abundance over time will serve as an early warning system for any changes so that action can be taken if necessary. Our North Carolina data will be pooled with data from other states to consider regional and national trends in species distributions and detect changes in frog and toad populations. Understanding these trends will provide us a better understanding of the status and health of our frog and toad populations, and will enable us to protect critical habitats for our frog and toad species. This is a monumental task that can only be accomplished by dedicated volunteer citizens (citizen science).

What is CASP?

In 2005 the Wildlife Diversity Program of the North Carolina Wildlife Resources Commission (NCWRC) initiated the Calling Amphibian Survey Program (CASP) in order to establish a frog and toad monitoring program and participate in NAAMP. NAAMP and its interactive website are administered by the Biological Resources Division of the United States Geological Survey (USGS). In 2006, NC had sixty-one original random routes generated through NAAMP. Due to perceived high demand of routes from observers and a need to cover more areas of the state not covered by previous routes, seventy-four additional random routes were created for NC. Along with four nonrandom routes, this brings the total number of routes in the state to 139.

There are 30 species of frogs and toads in North Carolina. Six species are rare with two being state-listed as Special Concern and one as Threatened. Frogs and toads have species-specific vocalizations that allow them to be identified and monitored much like birds. However, you cannot count individual frogs and toads and instead must rely on an index of abundance. The following pages will provide all of the information you will need to conduct a CASP route at least three times per year safely and enjoyably. Thank you for making CASP possible!

Equipment Checklist

Required Items for the Survey

1. **NAAMP Datasheet ***
2. **Route Maps** *
3. **VOLUNTEER windshield poster ***
4. **Official CASP Volunteer Letter of Explanation**
5. **NAAMP Unified Protocol Notes ***
6. Pencils
7. Scratch paper or field notebook
8. Clipboard or writing surface
9. Flashlight/headlamp with good batteries
10. Watch with second hand or timer
11. Thermometer
12. Bright colored clothing or blaze orange

Optional Items for the Survey

1. Cell Phone
2. Frog and Toad distribution maps *
3. Tape or digital recorder for unexpected or unidentifiable frogs
4. GPS unit
5. Rain gear

Items to be Returned to State Coordinator

1. Completed datasheets (make copies for your records!)
2. Completed volunteer forms showing all of your contributions to CASP *
3. Scratch paper with notes about route and suggestions for making the survey better
4. Route map with needed modifications (if any)

* All of these items can be downloaded either from the CASP volunteer webpage (http://www.ncparc.org/casp/casp-volpage.htm) or from the CASP mapping tool (http://216.27.39.120/caspmaps/).

Running a Route

Getting Started

Before you begin your route, you should drive it at least once during the daylight hours and note all of the stops (scouting). Because errors could exist within the coordinates and site descriptions

developed during ground-truthing, please make note of any deviations from the reported routes that you observe during scouting. You may also want to take your own notes to help with running the route at night (safe places to pull off the road, noisy guard dogs present, etc). Furthermore, notes about habitat and land use can be helpful in documenting changes in habitat in the coming years.

Maps of ground-truthed routes, stop descriptions and more can be viewed and downloaded from the new CASP on-line web tool: http://216.27.39.120/caspmaps/. You can access the NAAMP online database (http://www.pwrc.usgs.gov/NAAMP/database/) using your observer number and route number before conducting your route. You will be able to download stop descriptions and familiarize yourself with the protocol, data entry, and the data that will be requested. It is helpful to do this while looking over both sides of your NAAMP Datasheet and Unified Protocol. Some states differ slightly in protocol based upon climate.

Frog Call Quiz

Once you have familiarized yourself with the protocol, the online database, and datasheet, you should prepare for the online frog call quiz. North Carolina is subdivided into three regional quizzes; Coastal Plain, Piedmont, and Mountains (Appendix A). All Volunteers must pass their appropriate regional quiz each year before running their route (Appendix B). The NAAMP website has a public quiz to help you prepare. In addition, NCWRC is providing ***The Frogs and Toads of North Carolina*** CD and booklet by Mike Dorcas, Sarah Cross, Steve Price, and Jeff Beane for all route-assigned volunteers.

Sampling Windows

There are three sampling windows that should each be sampled at least once per year. More runs within each window can add valuable data. Two runs should be conducted within the first sampling window in the Mountains in order to detect wood frogs (*Rana sylvatica*). In North Carolina, the three sampling windows may vary each year due to longer or shorter seasonal weather patterns, but they correspond with the major breeding times (phenology) of frogs and toads in the state. The sampling periods are created to target the peak vocalization times for early-, mid- and late-season breeding amphibians and to assist observers in understanding when to collect data. The State Coordinator may establish different sampling dates within each quiz region. Sampling periods within each region may not overlap, but can be separated by an interval or begin and end on adjoining dates. Sampling windows for the current year are posted on the CASP webpage.

Your First Run

Running a route usually takes about two hours. It is particularly important for those who have routes that have never been sampled to assess whether or not all stops are adequate during their first run. Although every effort was made to place stops in safe, viable locations, problems arise during sampling that were not present during ground-truthing such as excessive traffic. Stops that need to be changed because of these problems should be done as soon as possible so that stops are less likely to be changed later. Please refer to the **Stop Relocation** section below and contact the state coordinator if you believe you need to change the location of a stop on your route.

Safety

We are concerned with all of our volunteers having an enjoyable and SAFE survey. Please wear bright colors, reflective gear or blaze orange so that you are easily seen by other motorists. Use your hazard lights liberally to warn other motorists that you could be pulling over at any moment. It is always a good idea to use the buddy system to help you run your route. If you conduct your survey alone, it is a good idea to be prepared for anything! A flashlight with good batteries is a must, and a cell phone can really help if you pull over too far on the shoulder and get stuck. Safe parking with a little walking can save you from a frustrating night in the mud. Law enforcement may stop you and you should be courteous and present the officer your Official CASP Volunteer Letter of Explanation.

Data Collection

Initial Conditions

Start at least 0.5 hour after sunset and make sure you end by 01:00 (1:00AM). In addition, the following weather variables must be met:

- Beaufort Wind Code less than or equal to three
- No moderate or heavy rain (light rain OK); preferable after recent rain event.
- Run 1 at least 42° F (5.6° C) air temperature (Mountain region is exempt)
- Run 2 at least 50° F (10° C) air temperature (Mountain region is exempt)
- Run 3 at least 55° F (12.8° C) air temperature

Datasheets

Stops are conducted in numerical order, in one night by one observer. **Please be sure to only run the route in the order of the stops – do not run the route in reverse.** We encourage, but do not require, that one observer conduct all surveys of a route in a given year. Because some routes have secondary observers assigned and primary observers have assistants who may also wish to collect data, multiple observers are instructed to each fill out their own datasheet, separately and **independently**; ***only one observer is the official recorder of the route whose data will be entered into the NAAMP database***. However, all datasheets are returned to the State Coordinator for archival purposes. This "one observer per datasheet" rule allows each survey conducted to be of equal effort. Please use the datasheets provided with your Volunteer Packet when conducting your surveys.

Route and observer information and index and code explanations are on page 1 of the datasheet. Observers record the time, sky code, and wind code at the beginning and end of each survey to verify that the sampling conditions were met on the evening of the survey. Please record the number of days since rainfall if known. **At the minimum, the first and last stop air temperature is recorded to verify that required sampling conditions were met on the sampling night.**

At each stop the observer gets out of his/her vehicle and finds a safe spot to stand. The observer listens for five minutes writing the amphibian calling index for each species heard. The five minute listening period has no initial waiting period. The observer indicates whether background noise impaired his/her ability to hear. If there is a major noise disturbance, lasting one minute or longer, the observer may break the listening period to avoid sampling during the excessive noise. If such a "timeout" is taken, this is noted on the datasheet. After the major disturbance ends, the observer resumes listening for the time remaining. The "timeout" should not be used for background noise. The observer also records the number of cars that passed during the listening period and whether the moon or moonlight was visible at the bottom of the datasheet. Car counting may be conducted by an assistant.

The ***additional notes*** portion of the datasheet at the bottom of page 1 is useful for pieces of data that are not recorded elsewhere. This information can be extremely valuable and should indicate the causes of noise disturbances, habitat notes, and species observed but not recorded, including species from other taxa (e.g. insects, birds, mammals, reptiles, and other amphibians).

Stop Problems

Stop Inaccessibility

Temporary stop inaccessibility may occur for some transient reason (i.e. traffic accident blocks road access). If only one stop will be missed, then the route can be considered complete. The observer should write on the datasheet which stop was missed and note why in the ***additional notes*** section. When entering the data into the database, mark the checkbox indicating which stop was missed. If more than one stop is missed, the route should be re-run on another night.

Stop Relocation

Stop relocation occurs when a stop needs to be shifted to a new location after the ground-truthing phase has occurred. The permanent stop locations are set during ground-truthing (Appendix C). Stop relocations should be a rare event.

- Stop relocation should only occur for safety reasons (i.e. route was safe before, or appeared to be, but perhaps a homeowner fired a gun in the air as warning to observer).

- Stops should NOT be relocated because of habitat loss or lack of calling amphibians at the site.

- To relocate (for safety reasons) a stop, the Regional Coordinator will use his/her best judgment on when it is necessary and where to relocate. If the stop can be moved a short distance away and not impact the 0.5 mile rule, this is preferable. If that is not possible, then relocate by creating a new stop at the end of the route and renumbering all the stops.

- Keep a written record of when, why, and how a stop relocation occurred. If time permits the database managers will build into the database a checkbox or some way to indicate that a route has had some post-ground-truthing alteration. When data are analyzed, all

the stops of a route are considered one unit (the route), so it is okay that the individual stops are renumbered.

Stop Retirement

Once the route has been ground-truthed and listening stations established, these locations are permanent and locations may not be changed unless a safety issue arises. If habitat destruction occurs at a listening station, and a local extinction of amphibians occurs, this is important information. To document habitat destruction the location should be surveyed for three seasons beyond the destruction date. After three seasons of non-activity, the listening station may be retired, and null data will be assumed for this site. A listening station cannot be retired merely because the wetlands are uninhabited by anurans. Retired stops should be visited periodically to verify that no suitable habitat exists, but five minutes of listening is no longer required.

Data Entry and Review

Datasheets will be entered "as they appear" and then "checked" for any errors. This pattern should be followed, even for datasheets that the State Coordinator will enter. That way, all data goes through the same data review process. Also, the database documents changes. By entering the data "as is" and then making the correction, the database will have a record of the correction and why it occurred. The only exceptions are "simple obvious errors" such as the observer wrote 70 degrees and then marked Celsius. The database wouldn't let you enter such an error anyway, so the State Coordinator may make that "correction" during the data entry process. **If any such corrections are made to data, then these changes should be marked on the datasheet**. **The change should be initialed on the datasheet and the reason noted.** An example of an error that should not be changed during data entry is the observer wrote down they heard a species that you know was highly unlikely they heard.

After data are entered (by volunteer or State Coordinator), there will be a manual check comparing the electronic entry to the physical datasheet. This will help catch any data entry errors. If a data entry error is found and the correction is made, the database keeps track of who did the change and why. If there are questions about misidentification, the State Coordinator will contact the volunteer. If the volunteer agrees that there was a misidentification, then the data may be changed. If not, the State Coordinator will flag the data and submit it. All datasheets should be copied for the volunteers' own files and the originals sent to the state coordinator by **OCTOBER 1ST**. After final review of all data by the State Coordinator, the data will be available to the public on the NAAMP website.

Volunteer Forms

Filling out the NCWRC volunteer forms is necessary to document the hard work our volunteers do to make CASP a success and insure continued matching federal funds. Please fill out the application once and submit the reporting form periodically to the state coordinator. The reporting form has four main columns for entering hours, mileage, meals, and expenses incurred while participating in CASP. Gas expense is calculated from mileage, so gas expense is not entered in the expenses column. U.S. dollar amounts should be entered into the meals and expenses columns. Please submit these every month or so when you have spent time on CASP. Spending time on CASP includes learning the protocol, learning the frog calls, taking the quiz,

scoping and running your route, etc. Thank you for monitoring North Carolina's frog and toad populations and, have fun!

Notes:

Appendix A

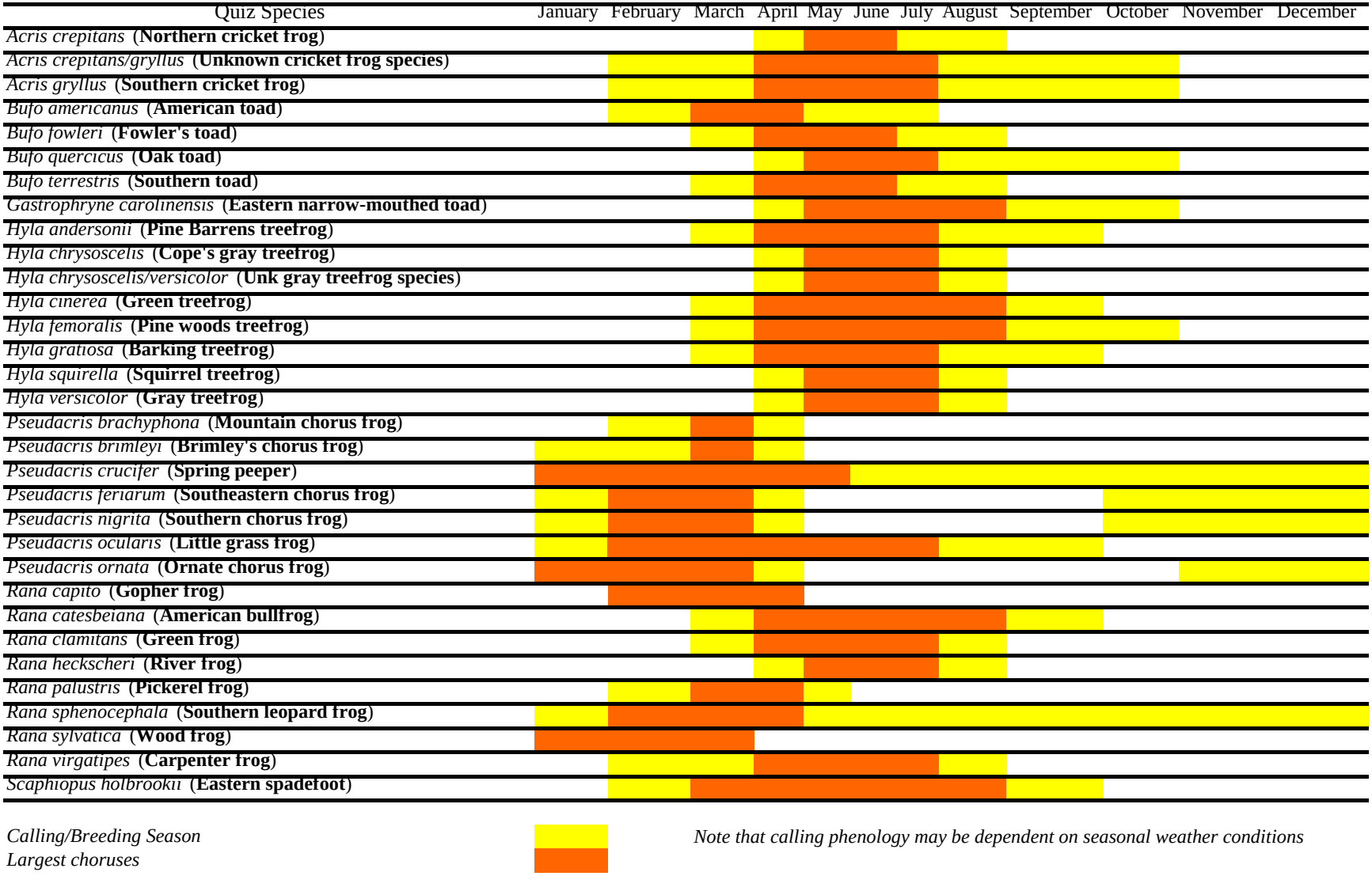
Anuran Species Occurrences and Breeding Phenology for North Carolina Physiographic Regions

Anuran Species Occurrences for North Carolina Physiographic Regions

Quiz Species	Occurrence		
	Mountains	Piedmont	Coastal Plain/ Sandhills
Acris crepitans (**Northern cricket frog**)	y	y	y
Acris crepitans/gryllus (**Unknown cricket frog species**)	y	y	y
Acris gryllus (**Southern cricket frog**)		y	y
Bufo americanus (**American toad**)	y	y	y
Bufo fowleri (**Fowler's toad**)	y	y	y
Bufo quercicus (**Oak toad**)		y	y
Bufo terrestris (**Southern toad**)		y	y
Gastrophryne carolinensis (**Eastern narrow-mouthed toad**)	m	y	y
Hyla andersonii (**Pine Barrens treefrog**)		y	y
Hyla chrysoscelis (**Cope's gray treefrog**)	y	y	y
Hyla chrysoscelis/versicolor (**Unk gray treefrog species**)	y	y	y
Hyla cinerea (**Green treefrog**)		y	y
Hyla femoralis (**Pine woods treefrog**)		y	y
Hyla gratiosa (**Barking treefrog**)		y	y
Hyla squirella (**Squirrel treefrog**)	m	y	y
Hyla versicolor (**Gray treefrog**)		y	
Pseudacris brachyphona (**Mountain chorus frog**)	y		
Pseudacris brimleyi (**Brimley's chorus frog**)		m	y
Pseudacris crucifer (**Spring peeper**)	y	y	y
Pseudacris feriarum (**Southeastern chorus frog**)	y	y	y
Pseudacris nigrita (**Southern chorus frog**)		m	y
Pseudacris ocularis (**Little grass frog**)		m	y
Pseudacris ornata (**Ornate chorus frog**)		m	y
Rana capito (**Gopher frog**)		m	y
Rana catesbeiana (**American bullfrog**)	y	y	y
Rana clamitans (**Green frog**)	y	y	y
Rana heckscheri (**River frog**)		m	y
Rana palustris (**Pickerel frog**)	y	y	y
Rana sphenocephala (**Southern leopard frog**)	m	y	y
Rana sylvatica (**Wood frog**)	y	y	m
Rana virgatipes (**Carpenter frog**)		m	y
Scaphiopus holbrookii (**Eastern spadefoot**)	y	y	y

"y" = reported occurrence in a region
"m" = possible or edge of region occurrence (mountain region edited in spring 2006)
For the purposes of the NAAMP database, species with an "m" occurrence will be included in the possible choices for that region.

Calling/Breeding Phenology of North Carolina Anurans



Appendix B

Frog Call Quiz: Participant Information

Frog Call Quiz: Participant Information

What is the Frog Call Quiz?

The Frog Call Quiz is a website (address: www.pwrc.usgs.gov/frogquiz) for learning or refreshing frog call identification skills. Part of the website is available to all people, including the Public Quiz and Frog Call Lookup. The Public Quiz allows anyone to take a 10 question quiz for species within a chosen state. Frog Call Lookup provides example calls, descriptions, and state species lists. Other sections of the website are only available to frog call survey participants. The "NAAMP Quiz" is for participants of the North American Amphibian Monitoring Program (NAAMP). Your state calling survey is a member of NAAMP and has helped in the development of this resource.

Who has to take the NAAMP Quiz?

All NAAMP participants are being asked to take the quiz. If you collect data, we want you to take the quiz. Participants are encouraged to make the quiz part of their pre-season practice each year.

Why are we being asked to take the NAAMP Quiz?

NAAMP participants are being asked to take the quiz for a variety of reasons. The Frog Call Quiz website was created to provide a self-assessment tool for NAAMP participants. By taking the quiz, you will also help us to improve training materials by understanding what species are confusing, assess observer differences over time, and understand what species are difficult to detect in multiple species choruses. By asking all participants to achieve a minimum detection index of 65, NAAMP is the first long-term large-scale monitoring program to incorporate a standard for participants involved in data collection.

How do I login to the NAAMP Quiz?

From the Frog Call Quiz website (address: www.pwrc.usgs.gov/frogquiz), click on the "NAAMP Quiz" image. At the next webpage, you will be asked to enter your Observer Number and Route Number. If you do not know your Observer Number or Route Number, ask your State Coordinator for assistance. If you have more than one route, you can use any of your route numbers to login to the website.

Some of you may be using route maps with our former 5 digit route numbers. All route numbers are now 6 digits long. The extra number is a zero inserted after the second digit. For example, old route number 44102 would now be route number 440102.

Can I take the quiz more than once?

Yes. We ask participants to achieve a detection index of 65 or better and participants can take the NAAMP quiz as many times as needed to achieve this goal.

Am I allowed to use reference materials?

Yes, any reference materials that you use during your calling surveys are acceptable to use while taking the quiz. You can also play the sound files multiple times before submitting your answer.

What computer resources are needed?

The computer will need to have access to the Internet and be capable of playing sounds (i.e. has a sound card and speakers) in order to hear the frog call sound files. The quiz is designed to work with 56k modems and faster connections. The sound files can only be played by a Real player (sometimes called a RealOne player). This software is available for free and can be downloaded from a link provided on the Frog Call Quiz website.

What happens to my data if I don't take the quiz or don't meet the minimum detection index?

States agreed that beginning with the 2006 field season volunteers need to take the quiz and achieve a detection index of 65 or better. Data will not be used for population trend analyses unless observers have met the quiz requirements.

Appendix C

NAAMP Groundtruthing Guidelines

NAAMP Groundtruthing Guidelines

(From the NAAMP website)

Placement of Stops Along Routes

You have a new route that has never been run. A provided map shows a set of initial roads, randomly chosen by the computer, but to complete the route 10 stops need to be established. The route needs to be groundtruthed during an early spring/late winter day to locate potential amphibian breeding sites that are within 200 meters of the road.

If the starting point is a potential amphibian-breeding site, then that is Stop # 1. If not, then travel along the marked roads until a potential breeding site is found, this would be Stop # 1. To find Stop # 2, look at your car odometer and travel 0.5 miles. After traveling 0.5 miles begin looking for the next appropriate potential breeding site (which could actually be right there at this point); that becomes Stop # 2. This continues until all 10 stops are in place, described, and marked on the map.

The USGS NAAMP office has mapped each route; routes are approximately 15 miles long, which allows plenty of room for the placement of 10 stops, at least 0.5 miles apart. Once the route has been groundtruthed, please send a copy of any revisions to the USGS NAAMP office for re-mapping.

When might routes need to be altered?

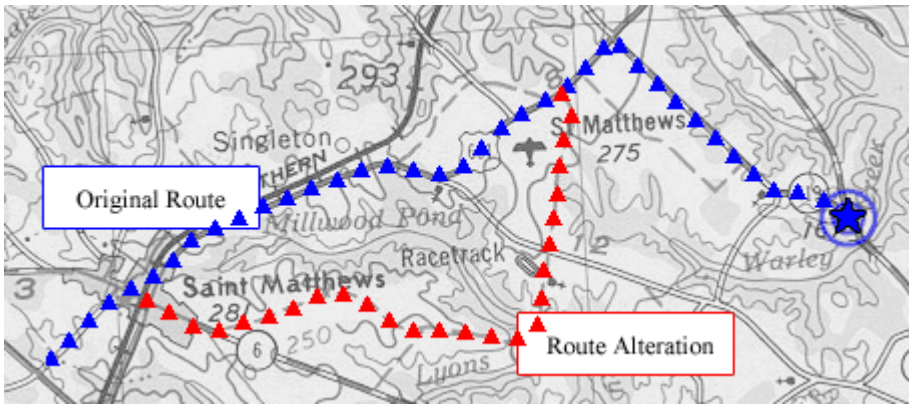
Some example problems: road does not exist, road is private (no entry allowed), road too dangerous (due to traffic levels), or inability to hear (due to traffic or industry noise). All of these problems would require alterations to the route. Ideally, the Regional Coordinator would make any necessary alterations. When this is not possible, it is necessary for the Regional Coordinator to work with the volunteers to ensure the alteration guidelines are followed and to ensure duplicate use of roadways does not occur.

How to alter routes

When a route has been determined to require alteration due to reasons listed above, please follow the guidelines listed here to ensure proper substitution. The site generation includes a starting point and direction of travel, to maintain these parameters please alter routes by shifting to the nearest set of appropriate roads that travel in the same direction. Busy connecting roads can be used to bridge sections of “good” roads. Some hypothetical examples are included with this guideline to help interpret the flexibility and intent of route alterations.

Example #1 Partial Alteration

Sometimes it is determined that only a part of the original route needs adjustment. In this case, preserve the portion of the route that is appropriate and then look for an intersection or adjoining road with suitable conditions that allows the observer to avoid the inappropriate portion of the original route. This more suitable road may or may not reconnect with the original route. Remember that the same general direction of the original route must still be followed and that the route must be at least 10 miles long.



Example #2 Complete Alteration

During groundtruthing, it is sometimes found that the entire assigned route is placed on roads that are either too busy or too dangerous to listen for amphibians. In this case it is necessary to completely alter the route. Look for a smaller road that is close to the original road in order to alleviate the traffic noise/danger issues. It is very important that the new route run in the same general direction and have a starting location that is as near as possible to the starting location of the original route. The new route does not have to be 15 miles long, but it must run at least 10 miles to allow enough space for the 10 stops.