Chapter 7: Preparing for the field season

Identify Landowners with Potential Vernal Pool(s) on their Property

Use your spatial data layer of potential vernal pools in conjunction with your town's tax maps to identify landowners. For a person experienced with GIS technology, this process will consist of joining the town's property ownership database to a digital spatial tax map data layer, identifying properties that contain potential vernal pools, and creating a list of landowners with potential vernal pools on their property. The resulting table should include the pool identification number, geographic coordinates for use by volunteers in the field, a parcel number, and the landowner's name and mailing address (Table x). This information may then be used to create mailing labels for the purpose of requesting landowner permission to access pools on private property. Towns without digitized tax maps and/or GIS capabilities in-house or on retainer may wish to solicit these services from the organization hired to identify potential vernal pools. It will be more time consuming to engage in this process without tax maps in a digitized format, but it is not impossible especially if you have a team of dedicated volunteers to share the workload. A hard copy of your tax map or zoning map may be scanned and georeferenced to your town boundary (seek help from consultant providing photo interpretation services); then the resulting georeferenced map overlain with PVPs may be printed, maplots identified for each pool, and landowner contact information retrieved from the assessors list.

Table X: Example of column headings in table resulting from spatial join between a property ownership database and Potential vernal pool layer.

PVP #	LATITUDE	LONGITUDE	MAPLOT	LANDOWNER	ADDRESS	TOWN	ZIP
145	44 ° 53' 0.66"	-68° 46' 8.42"	024-00-035	Jones, Omar	Pine St	-	-
132	44° 52' 48.89"	-68° 46' 6.24"	012-00-02	Kelly, Kirk	Stage Rd	-	-
17	44° 53' 24.63"	-68° 45' 56.08"	011-00-012	Gates, Ruth	Main St	-	-

Securing Landowner Permission

Once parcels containing potential vernal pools have been identified using the remote sensing and GIS steps, landowners with potential pools on their properties must be contacted to ask permission for volunteers to check the pools in the field. Each landowner should be mailed a Landowner Permission Packet containing background information about vernal pools in addition to clearly stating the town's objectives for participating in the project. Packets seeking permission from landowners should be sent by mid-February. This will provide you ample time to provide a reminder, either in the form of a post card or follow up phone call to non-responsive landowners (if you are requesting signed permission), and to prepare pool assignments and Field Packets for volunteers before the field season. At a minimum, please include a letter, map showing the location of potential pools (or website link to where a town-wide map has been

posted, map disclaimer, and landowner consent form. You may also consider including relevant fact sheets to inform citizens and hopefully alleviate questions directed to the municipal office. Templates for your use and modification and fact sheets are available on the Maine Vernal Pool website.

Letter to Landowner

This serves as an opportunity to clearly explain how the Significant Vernal Pool legislation may affect landowners, the process involved in a community based mapping project, objectives specific to your town, and the benefits to private landowners who choose to participate. We recommend that you describe the timing of field visits and anticipated duration of the project, the citizen scientist training, and credentials of trained volunteers, in addition to addressing topics of potential concern, such as landowner liability. To assist you, a template letter based upon letters drafted and sent by towns previously involved in this project is available for modification.

Landowner Consent Form

Request signed permission from landowners before surveys are conducted on private property. Include on this form a place for landowners to write their address, email, and phone number.

Map of Potential Vernal Pool(s)

A printed copy of a map showing the location of potential vernal pool(s) on that owner's parcel(s) (see next section for more details).

Disclaimer to Accompany Map of Potential Vernal Pools

This is an opportunity to insure that landowners understand that you are using the best available technique for remote identification of vernal pools, but it is not possible to identify ALL pools that occur on the landscape. The result of the survey will NOT be a complete map of all vernal pools, which means that prior to a new development, a survey should be made to locate any additional pools not already included on the town map. The disclaimer may be printed separately, displayed on the map sent to landowners, or incorporated into the landowner letter.

Map Disclaimer

Interpretation of aerial photographs is used as a first step in the process of mapping the locations of vernal pools. At a town-wide scale, this has proven to be the most effective technique for identifying vernal pools. Many pools (up to 30%) are not detectable through remote sensing owing to factors such as dense canopy cover and shadows. In contrast, not all wetlands identified on the map are vernal pools, and an even smaller subset of the pools identified will meet the criteria to be considered Significant Vernal Pools. A field visit to each potential vernal pool is required in order to determine the status of each wetland. In addition, pools identified in the field that were not pre-identified in the photo interpretation process should be added to the map of potential vernal pools and assessed for vernal pool significance.

Fact Sheet: *Vernal Pools - Conserving Maine Significant Wildlife Habitat*
This short publication provides ecological background pertaining to vernal pools and the animals that depend upon them, and makes a case for why these natural resources should be maintained on our landscape.

Fact Sheet: *Vernal Pools in Maine: What do landowners and towns need to know?*
This document briefly describes the Maine Significant Vernal Pool legislation, including criteria used to determine whether a vernal pool will be mapped as Significant Wildlife Habitat, and the seasonal constraints for when a pool may be surveyed. It also includes testimonials from towns who have mapped their vernal pools using this community based approach.

Prepare Maps for Landowners and for Volunteers

We recommend that you provide maps to landowners to make clear the location of potential vernal pools on their property(s). Trained volunteers will also need maps to navigate to their assigned pools for field assessments. One set of maps may be used for both purposes, however we suggest that you print your second set of maps after you hear back from landowners as it is more cost efficient to only produce field maps for parcels that will be part of the survey.

Once a template is established it should take a GIS specialist roughly 10-15 minutes to create each individual map. If your town does not have a GIS specialist on staff, or does not already contract with someone for other town mapping needs, you may wish to seek help from community members skilled in GIS, students at Universities, or local land trusts, or you can explore options with the organization completing your photo interpretation. If you provide tax maps in digital format, they may be able to create maps in either printed or electronic format.

Maps for landowners. Provide landowners with a map of potential vernal pools identified on their property (figure xx). We also recommend posting a municipal-wide map on the town website and suggesting that landowners access the site to view potential vernal pool locations on their property. Be sure to include a disclaimer explaining the process by which potential vernal pools were identified (Box x). Some landowners may be excited to learn about a potential resource of wildlife habitat value, some may alert you to additional pools on their property that were missed in the photo interpretation, and some may deny access. In any case, all the landowners know that PVPs are present and these are resources of potential state and town concern pending future development.

Maps for citizen scientists: Provide a map of each parcel that contains one or more pools to assist citizen scientists in locating pools assigned to them for field assessments. Critical information to portray on maps include: the aerial photo mosaic as a base layer, boundaries of potential vernal pools with their corresponding identification numbers, roads, and tax map data showing the parcel boundaries and lot numbers (figure xx). A small inset showing the approximate location of the pool(s) within the town boundaries will also be useful for volunteers conducting field assessments. It is important that maps be made at a scale appropriate for on-the-ground navigation, **and that they depict all options for entering the property from public access points**. In addition, consider creating 2 to 4 (depending upon town size and distribution of potential vernal pools) overview maps that show PVPs, tax map property boundaries, and roads (figure XXX) for ease of organizing and communicating with volunteers. Providing the coordinates for each pool will allow volunteers with access to GPS units to navigate to pools. It may be useful to provide pool coordinates in both Lat/Long (degrees, minutes, and seconds) and UTM units for use by field crews. All data submitted to MDIFW for official determination of Significance will need to include the coordinates for each pool recorded in UTM Zone 19 NAD83. Volunteers using recreational GPS units may be most comfortable entering coordinates in Lat/Long. It may also be helpful to list PVP coordinates on each map, or to provide a separate spreadsheet with landowner contact information, special instructions for volunteers and coordinates for each pool (table XXX).

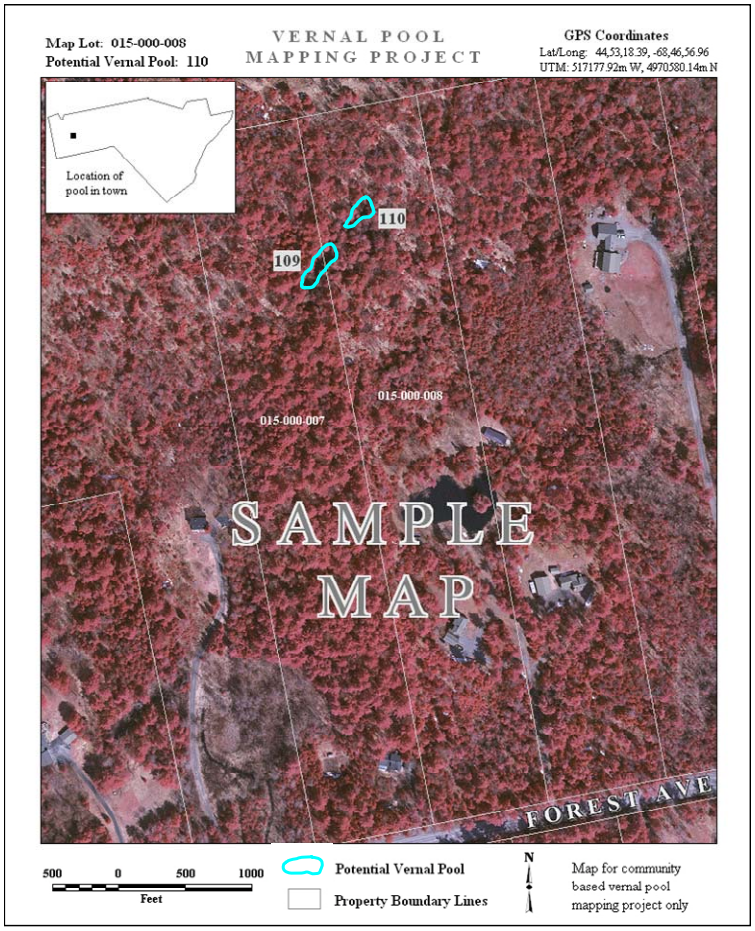

Figure xx: Example of map to be provided to volunteers for navigating purposes and to landowners to alert them to the location of potential vernal pools on their properties.

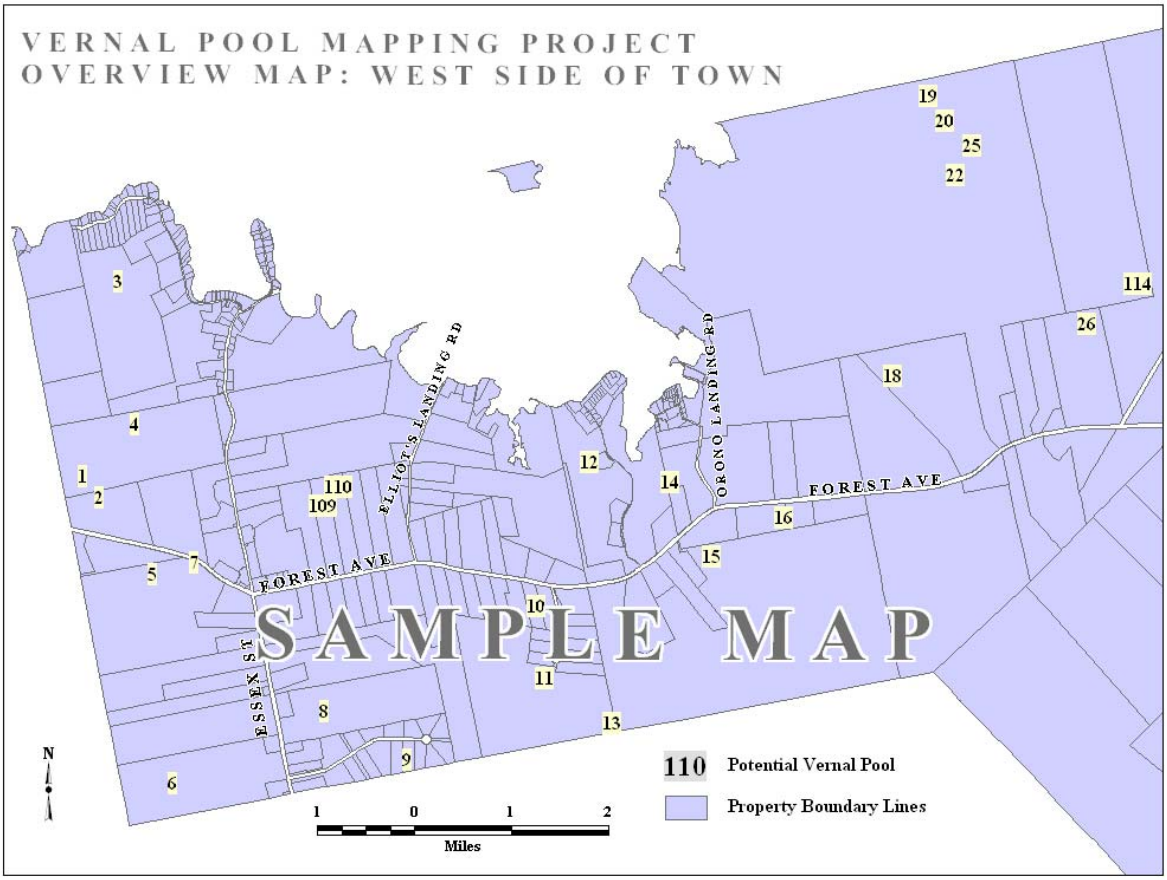

Figure xxx. Example of overview map to aid volunteers in locating potential vernal pools.

Table xxx: Example of column headings to include in spreadsheet for volunteers conducting field assessments.

PVP #	LAT.	LON.	MAPLOT	LANDOWNER	PHYSCIAL ADDRESS	PHONE	EMAIL	INSTRUCTIONS FOR VOLUNTEERS
145	44,53,0.6612	-68,46,8.421	024-00-035	Jones, Omar	6 Pine St	223-3104	ojone@gmail.com	park on road and walk up driveway
132	44,52,48.892	-68,46,6.247	012-00-02	Kelly, Kirk	45 Stage Rd	223-4585	kirkky@gmail.com	landowner would like to participate in survey
17	44,53,24.63	-68,45,56.08	011-00-012	Gates, Ruth	102 Main St	223-8973	rgates7@gmail.com	call first so we put the dog inside

Assigning Field Assessment Priority to Potential Vernal Pools

We highly recommend that you send letters to all landowners with potential vernal pools on their property(s). Once you have allowed sufficient time to hear back from and receive consent forms, you may wish to make personal contact with a subset of nonresponsive property owners. Ecological prioritization may also help to narrow down the number of property owners to follow up with using the suggested guidelines below:

High Priority Pools

- occur on large parcels of undeveloped land
- consist of multiple pools within close proximity (**clusters**) especially if all on same property
- occur in proximity to rivers, streams, lakes, or other protected natural resources
- occur in areas zoned as rural

Low Priority Pools

- occur in highly developed landscapes (in close proximity to busy roads, are associated with large parking lots, adjacent to commercial development, or in the middle of a golf course

Remind Community of Upcoming Survey and Offer Free Field Assessments for Pools not Identified during Photo Interpretation

Publicize the upcoming field assessments in a follow-up article in your local newspaper, town newsletter, or website. Reiterate that in the coming months, trained volunteers will be conducting vernal pool assessments on parcels with permitted access. Offer to conduct surveys for landowners who suspect they may have a pool on their property but did not receive a letter inviting them to participate in the survey. To simplify this process you may opt to list a date by which you will stop accepting requests for assessments.

It is important to make it very clear to your community that this mapping service provides free assessments for pools that are identified on aerial photographs (as well as those brought to the town's attention by landowners seeking an assessment) but does not constitute a complete survey of all vernal pools in the town. It is therefore incumbent upon any landowner pursuing development to arrange for assessment of all potential pools not assessed during this survey (See Appendix x; website icon). If adjacent or nearby towns are similarly engaged in a town wide mapping project, consider a joint press release, or the option of sharing resources for an infomercial on a local television station. Collaboration with other towns may serve to strengthen public perception of the project.

Chapter 8: Citizen Scientists: Recruitment and Training

Recruit Citizen Scientists (Volunteers)

A well organized group of citizen scientists can field check the town PVPs in two spring visits. We recommend recruiting 20 to 25 citizen scientists for the duration of the project (ideally, at least two years but this will vary with town objectives). Volunteers are more likely to participate if their responsibilities are clearly defined during the two 2-hour training sessions in spring. Each volunteer will need to visit a minimum of 3 to 5

Figure xxx: What to look for when scouting an outdoor training site.

potential vernal pools two times each spring (once in mid-to-late April and once in early-to-mid May), and must submit completed data forms with accompanying digital photographs. The two trainings will require participation on set dates, however the rest of the time commitment may be completed at the convenience of the volunteer. Some volunteers may opt to conduct one field assessment a day over the course of a week, while others might prefer to visit multiple pools in a single day. The amount of time required at each site will vary with pool size and complexity, with the number of egg masses, and with road access. Volunteers should expect to spend between 15 minutes to 1.5 hours at most pools.

Volunteers may be recruited from the general public; however, individuals with an interest in conservation or natural history, prior environmental monitoring experience, and/or map reading skills are favorable. The more engaged and committed your volunteers are the more reliable your data will be. Targeted recruitment tends to generate better results than does an open invitation through a newspaper or radio advertisement. You might consider requesting the help of conservation commission members or local land trusts (each member might be assigned to recruit 5 volunteers).

If there is a home school network or environmental club in your area, you might propose to the coordinator that a group of students and instructors incorporate the project into their spring time studies. Because these styles of education often have flexibility regarding curriculum, daily schedule, and transport of students, in the past, such groups have successfully completed a significant number of field assessments.

To ensure that field assessments run as smoothly as possible and that volunteers have adequate support, we recommend that you recruit 3-5 responsible ***volunteer coordinators*** who will help you with the organizational aspect of the project in addition to serving as local resources for volunteers. Ideally, volunteer coordinators will have more experience with field biology/ecology or mapping than will volunteers and therefore be able to assist volunteers with field

assessments when needed and ensure that data are turned in to the town office at the end of the season (Table x). Consultants, high school teachers, biologists, natural historians, members of environmental non-profits, the local land trust or conservation commission members often make good volunteer coordinators.

Volunteer Responsibilities (20 to 25 people)

- Attend both trainings
- Visit and assess 3 to 5 potential vernal pools each year for two years
- Complete a thorough pool assessment which will include getting wet and dirty
- Work with another volunteer or bring a buddy
- Refer to assigned Volunteer Coordinator with questions
- Be responsible for completing data forms and archiving digital photos for assigned pools

Volunteer Coordinator Responsibilities (3 to 5 people)

- Attend both trainings
- Assist Town in distributing maps and pool assignments to volunteers
- Serve as a local resource
- Be responsible for assisting up to 5 volunteers (on call)
- Make one field visit with each volunteer assigned to them
- Collect data forms from volunteers and submit to town office
- Possibly help with assessment of data and preparation for second season of field visits

Training Session 1 (Public Information) (2 Hours)

The first training (mid February to early March) for your citizen scientists may double as an information session for the public. It is an opportunity to inform town citizenry, including landowners and volunteers, about vernal pool ecology, the Significant Vernal Pool legislation, and the steps involved in the mapping project. This first training will provide background information that will engage, excite and inform volunteers, while also providing a forum to educate and interact with landowners. A mixed audience allows volunteers to understand the value of the project while witnessing the sensitivity that is required when working on private property. Landowners will see the depth of information provided to volunteers and professionalism of the project. We recommend that you encourage town officials to attend this meeting. Code Enforcement Officers, Planning Staff, Tax Assessors, and members of the Planning Board are all likely to encounter vernal pools in their work; it is to their benefit to understand the mapping project taking place in your town and to have a basic understanding of the science behind the legislation. This is also an opportunity to familiarize town officials, citizenry, and volunteers with the resources available to them on the Maine Vernal Pool Website. At this meeting, please encourage volunteers to review annotated slide presentations: *Vernal Pool Indicator Species, Vernal Pool Trivial Pursuit,* and *How to Fill out the Municipal Vernal Pool Data Form* prior to attending the second training. You may also wish to acquaint citizenry with the locations of potential vernal pools. To do this we recommend that you create a large-scale map of your town showing the potential vernal pools, roads, and landowner property lines, with an aerial photograph as a base layer.

First indoor training (annotated presentations are on the web site)

1. Show PowerPoint *Vernal Pool Ecology*
2. Show PowerPoint *What is Involved in a Municipal Vernal Pool Mapping Initiative?*
3. Open the floor for questions and discussion.

Training Session 2 (Citizen Scientists Training)
3 hours

The focus of the second training is to prepare volunteers and volunteer coordinators for their work in the field and should overlap with the first appearance of wood frog egg masses (see Fig. X. vernal pool phenology). This session provides hands-on experience with egg mass counts and filling out data forms. At a minimum you should plan for 2.5 hours for this session; we typically allow 1 hour for the indoor session, 15 minutes for questions, 15 minutes to travel to the training pool, 45 minutes in the field, and 15 minutes to distribute field packets. Some towns opt to host a longer session to build a sense of community among volunteers and to allow time to visit additional pools for practice. Consider holding the 2.5 hour training in the morning, having lunch together, then dividing into small groups led by volunteer coordinators to visit a few pools in the afternoon.

Indoor session:

1. Show the short *Egg Mass Identification Video* that details the differences among masses present in Maine vernal pools.
2. Show the slide presentation *How to Fill out the Municipal Vernal Pool Data Form.*
3. Review resources available to volunteers on the *Maine Vernal Pool* website.
4. Request that volunteers review annotated slides: *Vernal Pool Indicator Species* and *Vernal Pool Trivial Pursuit -- Test Yourself* before conducting field assessments
5. Distribute Field Packets and related materials to volunteers. A large printed map of the town that clearly depicts potential vernal pools, the parcels with permission from landowners, roads, with an aerial photograph as a base layer may be helpful at this training as well.
6. Assign pools to volunteers

Outdoor trainer preparation:

In preparation for your outdoor training, leaders should access the Maine Vernal Pool website, and view a short video entitled *Vernal Pool Outdoor Training.* This includes an outline of the key components to include in an outdoor session. You will have to locate an easily accessible vernal pool with adequate parking *prior* to the field visit. Pools with a soft mucky substrate do not make good training pools because they are difficult to walk in, and stirred up sediment may impact egg mass development. Look for a hard bottomed

pool that is relatively shallow and that contains a raft of wood frog egg masses (essential for learning how to count masses) and salamander spermataphores. The ideal pool for a field training will also contain egg masses from early arriving salamanders, and if you are really lucky, fairy shrimp and blue-spotted salamander egg masses as well (see Fig. x). Don't be afraid to encourage volunteers to bring a change of clothes so that they can get wet. We recommend that you spend some time in the pool just prior to the training in order to determine the locations of egg masses, spermataphores, and other features that should be highlighted and discussed with volunteers.

If you are not able to find an adequate training pool that contains anything more than wood frog eggs, it is worth searching other known pools for examples of spermataphores and salamander egg masses to share with volunteers at the indoor portion of the training. Fairy shrimp do not travel well; if you know of a pool on public property that contains fairy shrimp, set up an optional group outing, or encourage your volunteers to visit the pool on their own to see for themselves what fairy shrimp look like.

Outdoor training with the volunteers:

1. Begin by discussing vernal pool etiquette (see Appendix X)
2. Demonstrate methods for finding egg masses:
   a. Scan vegetation that likely serves as attachment sites for egg masses (often shrubs for wood frogs, emergent dead sedges, grasses for spotted salamanders, and even downed woody debris in pools for all species)
   b. Use polarized sun glasses for seeing egg masses below the water surface
   c. Gently lift submerged vegetation when searching for blue-spotted masses.
3. Point out identifying characteristics of any animals, egg masses, or spermataphores that were located when the pool was scouted before the training.
4. Demonstrate techniques for counting wood frog egg masses that are deposited in large rafts. Conditions permitting (be aware of impact your group is having on site), everyone should experience what it is like to count a raft by feeling the large globular masses that are often laid in multiple layers just below the water surface.
5. After an initial orientation, we highly recommend that you divide your volunteers into small groups to fill out the data form together. After about 15 minutes of small group work, reconvene to go over the data sheet as a large group with plenty of time for questions and answers.

Assign Pools to Volunteers

Consider whether you will allow volunteers to choose the pools that they will visit, or if you will make arbitrary pool assignments in advance of distributing Field Packets. A third option might allow volunteers to make special requests prior to a set date. Logistically it is more difficult to allow volunteers to choose the pools they will visit, however there are some advantages to this technique. Volunteers may be willing to assess more pools if they are located close to their home, they may be more comfortable visiting ones that they are already familiar with, or may see this survey as an opportunity to meet

and get to know neighbors. However, if you do allow volunteers to choose their own pool assignments, *please do not permit landowners to make assessments on their own properties.* A printed map on the wall, or projecting the final PVP town map on a screen will allow volunteers to see where permission has been granted and locate the pools that they will be assessing. This also provides a good format if you opt to allow volunteers to choose their pool assignments. You may also wish to share a map showing PVPs on properties without landowner permission, in case your volunteers are interested in taking the time to explain the project benefits to noncompliant landowners.

We encourage you to request that volunteers work in pairs with one person surveying in the pool while the other records notes. You might consider team assignments based upon who has access to waders/or are willing to bring a change of clothes and get wet. On occasion volunteers may encounter a pool where it is not physically possible or is unsafe to do a complete survey, but as a rule of thumb, at least one person in each pair **must** be willing to complete surveys by wading into the pools. Merely walking the perimeter is rarely an acceptable method for determining that a potential vernal pool is not a vernal pool.

Volunteer Field Packets

Organize field materials for each potential vernal pool in a 9x12 manila envelope that can be distributed to volunteers based on assigned PVP numbers. While it may be tempting to organize data by volunteer, you may not have the same volunteers both seasons and some potential vernal pools may not require visits during the second year of the survey. Use of a manila envelope for each potential vernal pool in your town will minimize potential confusion, make data entry from year to year much easier, and ensure consistency among the towns involved in the project. An envelope will also provide protection for the maps so they can be used for subsequent field visits. On the outside of the envelope include the potential vernal pool number, the lot number, and landowner's name. In each envelope you should provide data forms and maps (see below) to volunteers at the beginning of the field season, either at the second training session, at an additional planning meeting, or for pick up from a location convenient for your volunteers. Templates and samples of all materials listed below are available for download from the Maine Vernal Pool website.

Materials to include in each Field Packet envelope (organized by PVP number)

- Two Municipal Data Forms (volunteers will visit each pool two times each year)
- Map(s) for navigating to potential vernal pool and may need extra forms for newly encountered pools

Additional Materials to provide to each volunteer or pair of volunteers

- Town overview map(s) that show potential vernal pools with their identification numbers, tax map layer showing property boundaries, roads, and any other identifying features (figure XXX)

- Checklist for conducting field assessments
- Vernal Pool Field Etiquette
- Spreadsheet that provides PVP #, pool coordinates, landowner contact information, and any special instructions specific to individual pools*
- Project Information Sheet to be posted on dashboard
- Volunteer Responsibility Agreement
- Contact information for volunteer coordinators, town project coordinators, external resource people etc.
- Blank CD for submitting photo documentation
- Laminated Field Identification Cards (either provide or suggest that volunteers print from website and laminate themselves)

* Depending upon how you decide to request landowner permission, some property owners might prefer to be contacted prior to field visits, while others may appreciate the opportunity to assist with the survey (you may wish to provide a list of the PVPs with landowner contact information, the physical address of the property, pool coordinates, special instructions, etc.). For the sake of simplicity, consider providing a single spreadsheet for the entire town that each volunteer can use to reference their individual pool assignments (table xxx).

Chapter 9: Field Assessments

When do We Survey Pools?

Peak wood frog activity will differ from pool to pool depending on geographic location, weather, forest canopy cover, pool depth, and aspect. Once wood frogs begin calling monitor a few known pools in your town to see when egg masses first appear and then send volunteers out roughly one week later (may take longer if the temperature is very cold or it is exceptionally dry and windy) to ensure that assessments occur soon after **all** masses have been laid (see figure xxx). The Maine Department of Environmental Protection maintains a website that records vernal pool breeding activity by town (http://www.maine.gov/dep/blwq/docstand/nrpa/vernalpools/comments.shtml). Breeding will occur earliest in pools with southern exposure or little canopy closure; use pools in cool sites to gauge timing so that you do not send volunteers out too early.

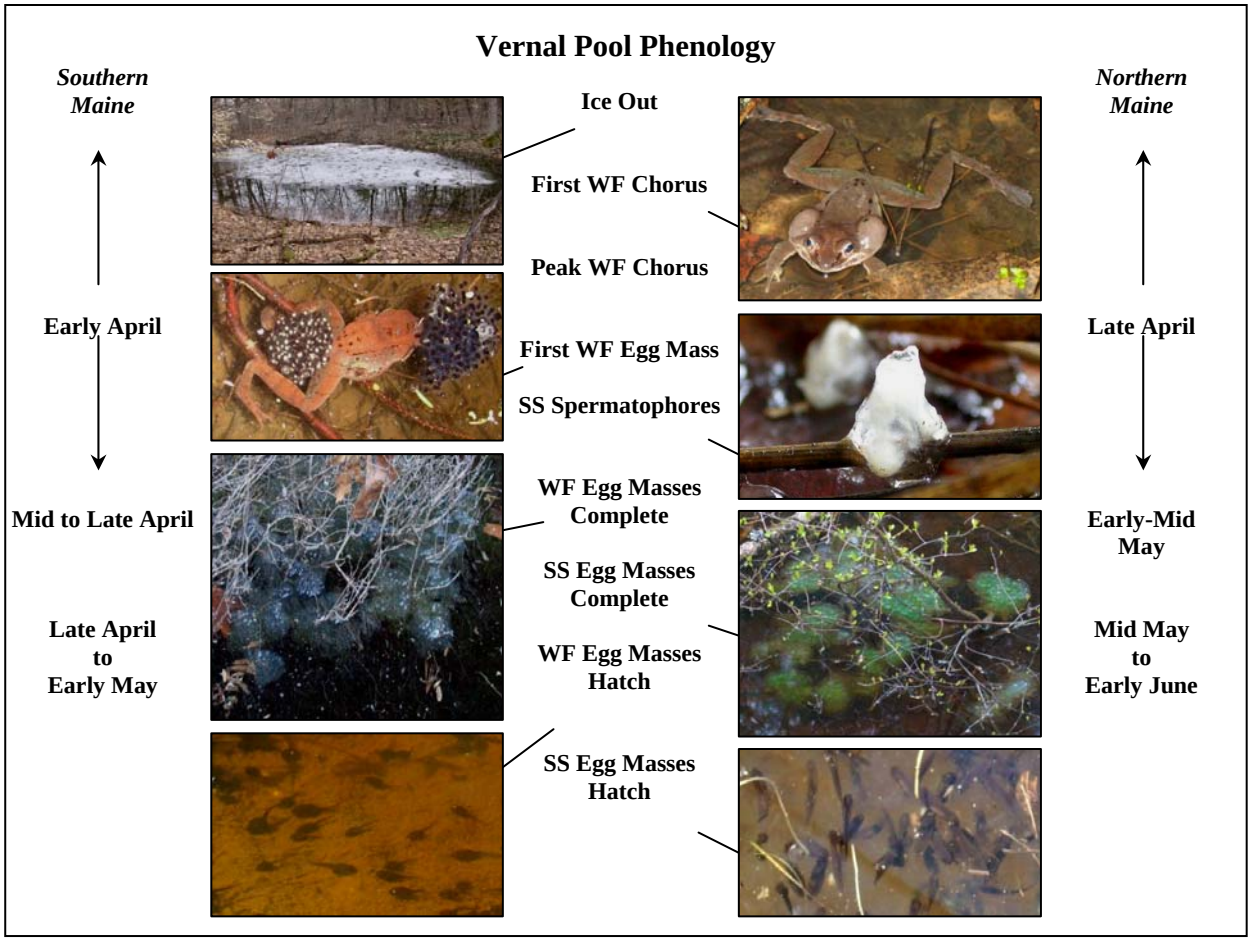

Figure xxx. Approximate timing of vernal pool breeding events. Adapted from Phillip deMaynadier, MDIFW.

How Many Times do We survey?

Volunteers must visit each potential vernal pool twice. The first count is conducted at the peak of wood frog breeding, once all masses have been laid. Instruct volunteers to count all wood frog egg masses, scan carefully for fairy shrimp, look for spermataphores, count any spotted salamander egg masses present, and carefully search for blue-spotted egg masses. During their second visit, roughly 2 to 3 weeks later, volunteers will do a final count of blue-spotted and spotted salamander egg masses. Salamanders may take up to six weeks to lay their eggs so the visits are staggered to capture the range of laying times. At each visit, volunteers should count *all* egg masses for all species present, even if the same masses were counted during a previous visit. The highest egg mass count should be recorded in the database for each species. If egg masses are difficult to count because they are close to hatching or are beginning to break-up, this should be noted on the data form.

What Should Volunteers Bring in Field?

- Data Forms
- Maps of assigned vernal pool location(s) and coordinates and overview of all town pools
- Landowner contact information
- Project Information Sheet to be posted on dashboard
- Clipboard
- Hip boots/waders/shoes and pants that can get wet
- Pen & pencil
- Digital Camera
- Frisbee or plastic plate or clipboard for photo backdrop
- Gazetteer (helpful to find pool location within town)
- Cell Phone (for emergencies or for technical assistance)
- Binoculars (optional)
- Polarized sunglasses
- GPS unit (optional)

Is it Okay to Walk in the Pool?

It is very rarely possible to accurately assess a pool without getting wet feet. Volunteers should expect to enter pools as part of the survey process (in teams of two, only one volunteer needs to be prepared to get wet). However, if a pool holds water for a relatively long time (through July) and has a soft mucky substrate, extra care should be made to avoid stirring up sediments or crushing obscured egg masses. In these mucky pools, volunteers should also be aware that getting stuck or possibly losing a boot is possible. Sometimes it is not feasible to walk in all portions of the pool and one needs to be creative. Some people float in inner tubes or use binoculars! If for some reason volunteers were not able to enter a pool for a complete assessmentl, this should be noted on the data form. Walk slowly and cautiously to ensure that all masses are counted and potential damage is minimized.

Counting Egg Masses

Counting egg masses during the times scheduled for your town is critical, especially for the first visit. Wood frog embryos develop quickly and the egg masses soon break down and merge making it hard to count individual masses. The infertile hybrid blue-spotted egg masses seem to deteriorate rapidly as well.

Wood frog egg masses deposited in large rafts at the water surface are often detectable without setting foot in a pool, but because not all masses are laid in rafts (some may occur singly, or in small clusters at the surface, within the water column, and even on the pool bottom) it is important that volunteers thoroughly and systematically search each pool. It is the volunteer's responsibility to count *all* egg masses and not just to determine whether the pool meets the biological criteria for significance based upon threshold egg mass numbers. Although often visible from shore, it is not possible to obtain an accurate count of wood frog masses without entering the pool. Often laid multiple layers deep, wood frog eggs require care in counting; it is often necessary to count by feeling each globular mass rather than by attempting a visual assessment.

Spotted salamander egg masses are not always clustered in one region and are frequently laid individually throughout the pool. Polarized sunglasses greatly improve detectability of these masses which are often found attached to vegetation below the water surface and may be in deeper parts of the pool than the rafts of wood frogs.

Blue-spotted salamander egg masses are deposited in small clusters, strings along submerged sticks, or individually. Their eggs often go unnoticed. Although time consuming, the best way to locate blue-spotted masses is by wading slowly through the pool and lifting submerged sticks just above the water surface. Often not otherwise visible, the loose jelly of blue-spotted masses will hang (or drip) from sticks that are lifted out of the water. Sometimes the white inviable eggs make them show up more clearly (see the egg mass identification video). It can be difficult to determine what constitutes a "mass." If eggs are laid singly, each is considered a mass whereas multiple eggs in a string are also considered a mass.

While it is possible and expected that volunteers count all egg masses present in a pool for wood frogs and spotted salamanders, blue-spotted egg masses are a different story. For the purposes of this study it is not necessary to attempt an exact count of blue-spotted masses. Exact numbers should be recorded if less than 20 masses are found in a pool, but for numbers larger than that, the following intervals may be used: greater than 20, greater than 50, greater than 100, greater than 500. Observers should be aware that where there is a healthy population of blue-spotted salamanders, there are typically hundreds to thousands of egg masses. If observers find fewer than 10 masses, they should be encouraged to re-visit the pool.

What Data Sheet Should We Use?

In Maine, determination of vernal pool regulatory status is done using the MDIFW Significant Vernal Pool Data Sheet (www.umaine.edu/vernalpools/DataForms.html). This in-depth form may be completed by qualified state agency personnel, environmental consultants, wildlife biologists, wetland ecologists, and trained citizen volunteers. The data form requires biological, hydrological, and habitat information necessary for determining whether or not a pool is Significant. This form was designed to be used on a pool by pool or parcel by parcel basis. At the scale of a town-wide mapping initiative where pools are remotely identified on aerial photographs and local citizens have limited time to volunteer to field check each pool, this may not be the most efficient method. With feedback from our town partners and MDIFW, we designed a simplified Municipal Data Form with emphasis on biological criteria. Using this form, volunteers can determine whether remotely identified potential pools are vernal pools and can record data on egg mass numbers. This information may then be used to determine if follow-up visits are necessary. For example, pools that *did not* meet the biological criteria (egg mass numbers) but had some breeding are visited a second year with the Municipal Data Form, and pools that *did* meet the biological criteria are re-visited with the state's Significant Vernal Pool Form. This strategy was designed to simplify volunteer data collection and to eliminate filling out Significant Vernal Pool State forms for pools that are not biologically significant. We recommend that you begin with the Municipal Data Form and then if you choose to do so, follow up with the Significant Vernal Pool Data Form for the subset of pools that are found to meet Maine's biological criteria for significance. For individuals, land trusts, or parties outside of Maine, the Municipal Data Form may be used as an indicator of productivity based upon use by pool breeding species. Both the Municipal and State forms may be subject to revisions, please make sure that the form you are using is current.

Significant Vernal Pool Assessments (MDIFW Form)

The Significant Vernal Pool (SVP) Data Form should be completed for the subset of pools that meet the biological criteria as identified by volunteers and recorded on the Municipal Data Form. Assessments using the SVP data form include data collection on hydrology, pool size, and surrounding habitat. This data may be collected any time during the summer months after egg mass data has been collected in the spring. Although training materials and step-by-step instructions are available on the Maine Vernal Pool website, this work may be challenging for some volunteers without field experience prior to this project. If feasible, consider hiring a summer intern to conduct SVP visits, or enlist the services of volunteers that are qualified and feel comfortable collecting the data required for the SVP form. If you choose to complete the Significant Vernal Pool data form, please make sure that you include the PVP number for each pool at the top of the data form.

Obtaining Data from Volunteers

At the end of each field season, volunteer coordinators should collect field packets from volunteers with completed data forms for each of the two visits, their maps, and photo-documentation for each pool. Information gathered during the first year of assessments will ultimately be used to inform the next steps in the field assessment process.
Collect forms as soon as feasible. If there are issues with the forms, it is best to contact volunteers as close to the field season as possible so they can recall what they did and /or locate missing data sheets or photographs.