

A Special Area Management Plan (SAMP) For Vernal Pools in Maine



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The Maine Vernal Pool Special Area Management Plan was developed through collaboration between the:

US Army Corps of Engineers
US Environmental Protection Agency
US Fish and Wildlife Service
Maine Department of Environmental Protection
Maine Department of Agricultural, Conservation, and Forestry
Maine Department of Inland Fisheries and Wildlife
Topsham Economic and Community Development
Town of Orono, ME
Town of Topsham, ME
Topsham RE/Development Inc.

And representatives from the following groups:

Real estate sales
Real estate development
Real estate appraisal
Land trusts both local and regional

Introduction

This document constitutes the Maine Vernal Pools Special Area Management Plan (VP SAMP) for use in permitting impacts to vernal pools in municipally designated development areas in exchange for compensation in municipally identified rural areas.

The University of Maine developed the Maine VP SAMP in partnership with the Regulatory Division of the New England District of the U.S. Army Corps of Engineers (Corps); the Maine Departments of Inland Fisheries and Wildlife, Environmental Protection, and Agriculture, Conservation and Forestry; the US Fish and Wildlife Service; the US Environmental Protection Agency; the Maine towns of Orono and Topsham; and representatives of the real estate, development, and land trust communities. The University and its partners initiated this long-term regulatory planning process to develop an alternate mitigation mechanism to address anticipated permitting and compensatory mitigation needs to improve the long-term management of vernal pools (see Levesque et al. 2016). Public comment on the Maine VP SAMP was solicited via a Corps Public Notice issued on March 8, 2016 with the public notice comment period extending through April 8. A second public notice was issued on April 26, 2016 announcing a public meeting on May 12, 2016 at which time additional comments could be provided. In response to comments received through these outreach strategies, revisions have been made to this final document.

The Maine VP SAMP will improve the agencies' capacity to protect the natural resource functions and values of vernal pools at a landscape scale while supporting municipal goals for growth. The Maine VP SAMP supports municipal growth by allowing vernal pool impacts in municipally Designated Development Areas (DDAs) in exchange for conservation activities in municipally identified Rural Areas. The Maine VP SAMP promotes the meaningful conservation of vernal pools and surrounding habitat by applying landscape level conservation principles and assessment criteria to identify high value conservation targets in Rural Areas.

In this way, the Maine VP SAMP promotes the strategic management of aquatic resources, proactively applying conservation principles at the landscape level rather than reactively addressing impacts case-by-case as projects are submitted for authorization on the federal, state, and/or local levels.

What is a SAMP?

The Coastal Zone Management Act of 1980 (16 USC 1453 [17]) defines a SAMP as a comprehensive plan regulating natural resource protection and reasonable economic growth that contains a detailed and comprehensive statement of policies, standards, and mechanisms to implement a SAMP. The Corps has partnered with the University of Maine to undertake a SAMP for vernal pool resources in Maine.

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I. EXECUTIVE SUMMARY

The Maine Vernal Pool Special Area Management Plan (VP SAMP) is an innovative, voluntary mitigation tool developed by a unique partnership of stakeholders. It is a conservation-based mitigation option that acknowledges the biological and ecological functions of vernal pools surrounded by development will be less likely to persist, recognizes the importance of local involvement in the long-term protection of vernal pools, understands that natural resources in rural areas are still under the threat of degradation from low-density sprawl, and respects that the economics of development is very location specific. Representatives of the research, regulatory, development, and non-profit communities worked for five years on the development of this alternate mitigation mechanism. The US Army Corps of Engineers, University of Maine, Maine Departments of Inland Fisheries and Wildlife, Environmental Protection, and Agriculture, Conservation and Forestry, the US Fish and Wildlife Service and US Environmental Protection Agency, along with municipal planners, town managers, land trusts, and representatives from the real estate and development community began discussing vernal pool regulation and its perceived impact on development after a contentious legislative session on the topic in 2009.

The Maine Vernal Pools Special Area Management Plan represents the outcome of this collaborative process. Informed by current research, responsive to local plans for growth and development, incorporating a market-based fee mechanism, the Maine VP SAMP represents an ecologically meaningful approach to the protection of a unique wetland habitat. The Maine VP SAMP is grounded in the following elements:

- Recognition that vernal pools surrounded by development are less likely to support and maintain healthy habitat and ecosystem functions over time;
- Local involvement in permitting and protection is essential for the long-term viability of this wetland habitat due to its size and ephemeral nature, its occurrence mostly on private property, and its sensitivity to surrounding land uses;
- A market-driven in lieu fee mechanism that is sensitive to local economic conditions is appealing to the real estate and development communities; and
- Long-term conservation and monitoring is best accomplished by non-profit organizations focused on those tasks.

Through the use of the Maine VP SAMP, impacts to any vernal pool in municipally designated development areas (DDAs) are compensated for by conservation of vernal pools and surrounding terrestrial post-breeding amphibian habitat in municipally identified Rural Areas. The Maine VP SAMP is administered at the municipal level through a statutory mechanism that allows the Maine Department of Environmental Protection to delegate permitting authority through the Maine Natural Resources Protection Act and language in the Maine State General Permit authorizing use of the Maine VP SAMP. An applicant choosing to use the Maine VP SAMP pays the town a mitigation fee based on current, local market conditions. The municipality maintains an agreement with a 3rd party to undertake the required vernal pool conservation. Pool conservation is driven by the Maine Vernal Pool Conservation Criteria (VPCC)(Appendix 2a) that support protection of high functioning vernal pools, pool complexes and terrestrial post-breeding amphibian habitat embedded in a relatively undeveloped landscape. The programmatic conservation goal is the protection of two pools and 70 acres of associated terrestrial post-breeding amphibian habitat protected for each pool impacted.

A. Purpose

The primary purpose of the Maine VP SAMP is to increase the mitigation options available for vernal pool protection using an approach that balances aquatic resource protection and economic development. The background leading to development of the Maine VP SAMP is found in Appendix 4 of this document. The underlying goal is to preserve a network of vernal pools embedded in a relatively undeveloped landscape that supports the life history needs of pool-breeding amphibians through a strategic approach coordinating permitting and mitigation. This approach relies on:

- municipalities receiving Delegated Authority from the Maine Department of Environmental Protection (DEP) for issuing vernal pool permits in specified areas,
- identification and conservation suitability assessment of vernal pools in Rural Areas,
- municipal partnership with a 3rd party organization that will undertake long-term conservation of high functioning vernal pools and surrounding terrestrial landscape.

Based on the robust stakeholder collaboration that has led to the development of the Maine VP SAMP, we believe these goals will be reached through continued partnerships among the US Army Corps of Engineers (Corps), the Maine Department of Inland Fisheries and Wildlife (MDIFW), Maine Department of Environmental Protection, University of Maine, local government and landowners, real estate interests and developers, and non-profit land protection groups.

B. Objectives

The purpose of the Maine VP SAMP is furthered by the following two objectives:

- To establish a municipally based permitting framework acknowledging that vernal pools embedded in a developed landscape within municipally designated development areas may persist over time but will not continue to support ecosystem functions and values at the same level and may be perceived as presenting a hindrance to economic development; and
- To increase the pace and quality of vernal pool protection in Rural Areas by preserving high functioning vernal pools and associated terrestrial post-breeding amphibian habitat embedded in a relatively undeveloped landscape at the programmatic level of 2 pools and 70 acres of terrestrial post-breeding amphibian habitat conserved for each pool impacted.

C. Tasks

The key tasks identified and performed in furtherance of the Maine VP SAMP objectives are briefly described below and described in more depth in other sections of this document:

Performed by the municipality:

- To apply the Maine Vernal Pool Conservation Criteria (VPCC) to vernal pools in municipally identified Rural Areas and to identify high functioning pools, pool complexes and adjacent terrestrial habitat suitable for conservation through this mechanism;
- To receive partial delegated authority from the Maine Department of Environmental Protection for vernal pool permitting in DDAs;
- To form a partnership with a non-profit land protection organization;
- To inform applicants of the Maine VP SAMP, a voluntary alternate mitigation mechanism for impacts to vernal pools in DDAs; and

To undertake annual review of permitting and mitigation completed through use of the Maine VP SAMP.

Performed by the 3rd Party land conservation organization:

- To develop relationships with willing land owners of high value vernal pool conservation opportunities;
- To undertake conservation in perpetuity of high value vernal pools and surrounding terrestrial habitat;
- To undertake annual monitoring of conserved areas to insure that easement conditions are being met and management plans implemented appropriately;
- To undertake biological monitoring of conserved vernal pools every five years for the first ten years after the vernal pools are placed in conservation;
- To provide data from the annual monitoring and biological monitoring to the team reviewing the Maine VP SAMP.

II. ALTERNATIVES

A. Federal regulation

Federal jurisdiction over vernal pools is limited to projects where there is a discharge of dredged or fill materials and where the vernal pool is considered a water of the United States. Many activities are not regulated including, but not limited to, removal of above-ground vegetation, and certain types of draining activities. In addition, some vernal pools are not considered a water of the United States according to the to the currently applicable definition of waters of the U.S., 33 CFR part 328.3, and/or the Clean Water Rule: Definition of “Waters of the United States regulations (33 CFR part 328, issued August 28, 2015 and currently stayed nationwide by the U.S. Court of Appeals for the Sixth Circuit).

B. State regulation

In 1996, the State of Maine amended the Natural Resources Protection Act ([NRPA](#)) to include regulation of vernal pools. In 2005, the NRPA was amended again directing the Maine Department of Inland Fisheries and Wildlife to adopt rules defining ‘significant vernal pool habitat’ as Significant Wildlife Habitat ([38 M.R.S.A. §480-BB](#)). In 2006, the Maine Department of Inland Fisheries and Wildlife (MDIFW) amended [Chapter 10 Significant Wildlife Habitat](#) to add language defining ‘Significant Vernal Pools’ (SVPs) based on hydroperiod and presence of indicator species and number of egg masses. The Maine Department of Inland Fisheries and Wildlife oversees Significant Wildlife Habitat in Maine, including SVPs. They manage data on vernal pools and maintain a GIS database of SVPs reported to them through permitting activities.

In 2011, an Act to Amend the Laws Governing Significant Wildlife Habitat (L.D. 1031) was enacted. The most significant change to the original vernal pool legislation made by this amendment was that a landowner proposing to cause an impact on the regulatory zone defined for a SVP habitat is not subject to regulation pursuant to the law if the SVP habitat depression is not on property owned or controlled by that landowner.

As of 2014, studies have shown that current state legislation provides regulatory protection for less than 20% of Maine’s vernal pools that are catalogued by MDIFW and does not give adequate protection for the associated terrestrial post-breeding amphibian habitat. The 250-ft regulatory zone around each SVP is a small percentage of the critical terrestrial habitat (or post-breeding habitat) necessary to support Maine's pool breeding amphibians.

C. Challenges and Unresolved Issues with the Current Situation

Conserving the broader vernal pool ecosystem functions, including nutrient transformations and export (Capps et al. 2014; Cohen et al. 2016) and providing resources to other wildlife (e.g., Hunter 2008, Mitchell et al. 2008) is challenging in that it requires maintaining connectivity among pools and other wetlands in a matrix of forest often crossing properties owned by multiple landowners. It also requires the understanding and cooperation of diverse stakeholders (Calhoun et al. 2014).

1. Ecological Challenges

An intact vernal pool habitat includes the amphibian breeding pool and non-breeding terrestrial habitat often extending hundreds of feet from the breeding pool (Semlitsch 2002; Baldwin et al. 2006). Conserving the ecological functions of any given pool or cluster of pools requires more protections than just the pool footprint or the area of adjacent terrestrial habitat currently regulated at either the state or federal level. Pool-breeding amphibians are present in breeding pools for, at most, a few weeks in the spring; adults and juveniles spend the majority of their lives in the adjacent forests and often use other pools during migration to and from summer and winter habitats in the forest. The post-breeding habitat used for foraging in the summer and hibernating in winter may encompass large blocks of forested habitat. The juveniles are the key dispersal agents as they colonize new breeding pools thereby maintaining the genetic integrity of pool-breeding populations. Their dispersal distances are often measured in miles (Rittenhouse and Semlitsch 2007). In addition, these amphibians export nutrients and energy to the surrounding forest and hence connectivity among pools and forests is essential for conserving the full suite of vernal pool ecosystem functions and abundance of wildlife species that rely on them.

Vernal pools, because they are small and hard to identify remotely, often are absent from National Wetland Inventory maps or town natural resource maps (Dibello et al. 2016). Significant Vernal Pools (SVPs) (a regulated subset [$<25\%$ to date] of known vernal pools) have not been proactively mapped as are other Significant Wildlife Habitats due to their small size, distribution across the landscape, and temporal nature. The level of effort required to survey the State for the location of vernal pools and to determine if they are ‘Significant’ according to state regulation is daunting. Because they are ephemeral, they cannot be easily identified except in the spring and fall during high water and hence jurisdictional determinations must be made in the spring when amphibian indicator species and their egg masses are present. The majority of pools fall on private property and not uncommonly, the pool and/or its critical terrestrial habitat, fall on more than one property. There is much confusion from the public regarding which pools are regulated and beyond that, how they are regulated. There is a broad misconception that no development is allowed near SVPs, for example. It is incumbent upon landowners to determine whether or not they have a SVP before they develop near a pool, costing them in time as well as money because pool surveys are season-specific. Vernal pool management is further complicated because of differences between local, state, and federal definitions and requirements, and because there is no pre-existing comprehensive map of vernal pool locations or their level of significance.

2. Gaps in federal and state regulations

Vernal pool regulatory language is a compromise between political realities and the best-available science on maintaining populations of pool breeding amphibians and as such does not fully protect terrestrial habitat to maintain water quality of vernal pools or to meet the life-cycle requirements of pool-breeding amphibians. As a result, there is concern that the long-term viability of vernal pool ecosystems in Maine landscapes will not be ensured given the current regulatory framework. This reality is now well-supported in the scientific literature (see Mushet et al. 2015; Cohen et al. 2016, Rains et al. 2016). Both federal and state regulations are largely reactive, case-by-case decisions with no proactive planning for conserving vernal pool landscapes (a group of pools embedded in a matrix of suitable post-breeding habitat e.g., forests) with linkages to other resources in the landscape.

Additionally, some vernal pools may not be considered waters of the United States according to the currently applicable definition of water of the U.S., 33 CFR part 328.3, and/or the Clean Water Rule: Definition of “Waters of the United States regulations (33 CFR part 328, issued August 28, 2015 and currently stayed nationwide by the U.S. Court of Appeals for the Sixth Circuit). Lastly, the Corps does not regulate activities in the adjacent uplands and can only review and condition project design within lands adjacent to vernal pools if a jurisdictional wetland or waterway receives dredged or fill material. As a result, a significant number of pools may not receive federal regulation.

On the state scale, NRPA only regulates a subset of vernal pools, considered Significant Vernal Pools. The egg mass thresholds established for determining significance were not based on biological criteria or information on spatial distribution of pools needed to conserve healthy populations of pool-breeding amphibians. Rather, they were based on an attempt to regulate a predetermined subset of all pools in Maine. To date, the actual number that fall under state jurisdiction is almost less than half than had been originally anticipated. Of the regulated pools, protections are further affected by rules governing pools with joint ownerships. For example, if a pool depression is located on a single ownership and the adjacent 250-foot zone around the pool is on a different ownership, this zone is not subject to regulation even though it is part of the critical terrestrial habitat of that pool. Similarly, if a pool is bisected by ownership, only the egg masses in the ownership in question may be counted toward state Significance. There are also dry-down time restrictions which further influence regulatory protection. Research completed since the regulations went into effect has shown that the 250-foot zone of management is ecologically insufficient to conserve abundant amphibian populations over time (Windmiller and Calhoun 2008).

Moreover, federal and state regulatory actions on a project-level alone may not provide adequate protection for these complex systems. For example, we know that the pool matrix and surrounding landscapes are critical to pool function. Pools surrounded by forest provide better quality habitat than pools surrounded by lawn, fields, or agricultural lands (Cline and Hunter 2014). A decision for a permit that impacts a vernal pool may not effectively consider these landscape scale issues. Will the surrounding habitat support the vernal pool ecosystem processes over time? Does the vernal pool have strategic value in a larger regional context as part of a vernal pool or wetland network or as part of contiguous large habitat blocks that provide connectivity among aquatic resources for a diverse array of wildlife?

3. Inventory and mapping

It is challenging to effectively manage a natural resource without a resource inventory (Dibello et al. 2016). The absence of a pre-existing state-wide inventory and comprehensive map of significant vernal pools presents challenges to proactive landscape-scale planning for long-term viability of the myriad functions of vernal pools. Vernal pools are challenging to identify remotely and assessments of state Significance, which are based on egg mass counts and species presence, require site visits in spring. This is not economically or strategically possible to do on a statewide scale. As a result, landowners and applicants are not certain when or where they will encounter a vernal pool that triggers

permitting requirements. Because egg mass surveys must be completed during a specific window of time, projects initiated after that window may have to wait until the following spring to complete the survey to determine the pool's state Significance which determines whether or not state regulation comes into play. If the spring window is missed, the applicant does not have the ability to assume the pool is Significant at the state level and proceed through the permitting process accordingly.

Experience with municipal mapping of vernal pools has shown that these volunteer-based efforts are expensive, require a substantial amount of organizing time, may not consistently yield high quality data, and do not result in SVP determination in a timely fashion due to limited time and resources at the state level. The Maine VPCC (Appendix 2a) were developed to screen conservation opportunities for suitability. Those municipalities that have already undertaken a vernal pool mapping process will be able to use that data to guide selection of potential pools for conservation.

4. Economic challenges

There are two primary challenges with the existing vernal pool regulation regarding socio-economic issues: (1) the additional regulatory burden and related costs for developers inherent in identification of vernal pools and their nexus to waters of the US for federal regulations and determination of their state Significance which drives the level of state regulation and (2) when applicants choose to develop outside of the Growth Area a municipality has identified through the comprehensive planning process because the impact of vernal pool regulation makes some parcels that contain Significant Vernal Pools more complicated to develop because of the need to modify the scope or extent of development.

First, as with other regulated natural resources, the regulations require additional surveying, permit application, and bring about a perceived uncertainty associated with how vernal pools will impact development potential. This has caused some applicants to avoid proposing development on parcels within the municipal Growth Area that may contain vernal pools. In other cases, applicants have invested money into site and resource surveys and begun the permit process only to find vernal pools on the property requiring modification of the project. Withdrawal of development applications at this point rather than investing more funds into the proposed development is not uncommon (Pers. Comm. R. Roedner, Topsham; E. Richert, Orono). In both situations, local communities miss a potential economic development opportunity located within their Growth Area.

Second, vernal pools within a municipality's Growth Area as defined in the comprehensive plan may reduce the development envelope on a parcel below the threshold where development is feasible; applicants may look to outlying areas where they can find larger parcels with larger development envelopes that allow them to avoid regulated resources. This can impact economic development in Growth Areas. It can also impact pools in otherwise less developed landscapes effectively disconnecting them from the terrestrial habitat essential for pool breeding amphibians. This relocation of development outside of a municipality's Growth Area contributes to development sprawl and undercuts municipal goals that encourage compact development and growth in designated areas. Sprawl

imposes numerous costs to the municipal government and local citizens (Bengston et al. 2004; Wu 2006), infringes on the goals of the Maine Land Use Planning and Regulation Act also known as Maine's Growth Management Act (30-A M.R.S.A. Chapter 6-A§ 4312), and has the potential of greater ecological impact than would destruction of a vernal pool situated within a developed growth area where the pool may already be degraded or where access to the adjacent terrestrial habitat may already be insufficient. This provides the basis for the Maine Vernal Pools Special Area Management Plan.

III. CONTEXT AND STRUCTURE OF THE MAINE VERNAL POOL SPECIAL MANAGEMENT AREA PLAN (VP SAMP)

The Maine VP SAMP is the outcome of a lengthy stakeholder process informed by municipal intentions for growth and resource protection, current research and science on how best to promote economic development while protecting the ecological functions and values of vernal pool ecosystems, and the need for regulatory predictability on the part of the development community. The stakeholders included members of the development and land trust communities, municipal planners and economic development staff, federal and state regulators, resource agencies, a real estate appraiser, and faculty from the University of Maine (UME) School of Economics and Department of Wildlife, Fisheries, and Conservation Biology.

A. Definition of Vernal Pools

The Maine VP SAMP uses the definition of vernal pools found in the 2015 Maine General Permit (GP).

US Army Corps of Engineers, 2015 Maine GP:

Vernal pools (VPs): For the purposes of this GP, VPs are depressional wetland basins that typically go dry in most years and may contain inlets or outlets, typically of intermittent flow. Vernal pools range in both size and depth depending upon landscape position and parent material(s). Pools usually support one or more of the following obligate indicator species: wood frog, spotted salamander, blue-spotted salamander, marbled salamander, Jefferson's salamander and fairy shrimp. However, they should preclude sustainable populations of predatory fish.

B. Relationship to Federal and State Regulation

Language included in the 2015 Maine GP allows for use of the Maine VP SAMP. This Maine VP SAMP will apply to subsequent Maine GPs in effect at the time of an application provided the terms of the Maine GP permit the use of the VP SAMP and provided the VP SAMP has not been terminated by the Corps, the Municipality or Maine DEP.

Use of the Maine VP SAMP is limited to vernal pool impacts. The applicant is still responsible for receiving all other necessary federal, state, and local permits. Additionally, the Maine VP SAMP cannot be used if the single and complete project includes more than 3 acres of impact to aquatic resources including vernal pools. This is the upper limit of the current Maine GP. It is not the intent of the Maine VP SAMP to alter the upper threshold of the Maine GP. If a single and complete project includes impacts to vernal pools and other wetland aquatic resources, the Category 1 Self Verification Form will not suffice unless the non-vernal pool impact qualifies on its own for Category 1 Self Verification. However, the Maine VP SAMP may still be used as mitigation for the vernal pool impacts on Maine GP Category 2 projects and Individual Permit projects.

The Maine VP SAMP may be invoked under the following conditions:

1. Vernal pools as defined by Maine 2015 GP are located within the approved DDAs (see Responsibilities of the Municipality, Section IV.A).
2. The impact occurs within the pool or within a 250-foot zone around the pool.
3. Total impacts to aquatic resources of a single and complete project fall below 3 acres.
4. The vernal pool does not support state or federal threatened or endangered species unless there is a determination of no effect or not likely to adversely affect is made by the Corps in consultation with USFWS.
5. All other local, state and federal permits must be obtained.

The Maine VP SAMP applies a landscape level approach to avoidance, minimization and mitigation by limiting its use to those pools in the DDAs. Implementation of the Maine VP SAMP will increase the likelihood that impacts to vernal pools from “leap frog development” (development that is moved outside the Growth Area to avoid permitting challenges) outside of the DDAs will be avoided and minimized. Conservation undertaken in the Rural Area will provide benefits not only for vernal pool depressions and the species that rely on them but will also support protection of large blocks of unfragmented forest and travel corridors used by many different species.

At the same time, the Maine VP SAMP meets the conditions of the Federal Mitigation Rule, 33 C.F.R. 332.3(h), for preservation only projects as follows:

- a) The resources to be preserved provide important physical, chemical, or biological functions for the watershed;
Vernal pools are not only essential to pool-breeding amphibians, they also provide key habitat for many other species. Research clearly shows that vernal pools provide important physical, chemical and biological functions that persist over time when the pools are embedded in a relatively undeveloped, unfragmented landscape.
- b) The resources to be preserved contribute significantly to the ecological sustainability of the watershed. In determining the contribution of those resources to the ecological sustainability of the watershed, use appropriate quantitative assessment tools, where available;
The conservation targets will be determined using the Maine VPCC (Appendix 2a). The criteria were developed by wetland scientists and vernal pool ecologists using the most current science on characteristics essential to insure the persistence of highly functioning vernal pools.
- c) Preservation is determined by the district engineer to be appropriate and practicable;
By signing the Maine VP SAMP, the District Engineer will be deeming the use of preservation to be appropriate and practicable. Also, district staff has been involved with the development of the document and has had input into the structure of the Maine VP Conservation Criteria as well as the process of preserving conservation targets through a 3rd Party.
- d) The resources are under threat of destruction or adverse modification; and
Maine’s rural areas continue to be under threat from single family residential development most of which does not involve site review or permitting. Large forest blocks continue to be chewed into and fragmented from this type of development. Vernal pools are frequently small, difficult to identify ‘out of season’ and are filled unknowingly under the current regulatory protocols. Adverse modification from nearby

development restricts travel corridors, impacts water quality, and introduces invasive species and domestic predators. All of these modifications threaten not only the pools and the wildlife using the pools but also the adjacent terrestrial habitat.

- e) The preserved site will be permanently protected through an appropriate real estate or other legal instrument.

The 3rd Party will hold the property in conservation in perpetuity via fee or easement. In the latter case, easement conditions will insure that conditions on site that led to its conservation suitability are not degraded.


The Maine VP SAMP does not alter buffer requirements for State Significant Vernal Pools that are not impacted on a site.

C. Mitigation

The Maine VP SAMP mitigation requirement of 2 pools and 70 acres of adjacent terrestrial habitat embedded in an unfragmented landscape was determined by wildlife biologists and wetland ecologists to provide landscape level conservation that would support an abundance of vernal pool species over time. Although not the likely configuration of areas conserved through the Maine VP SAMP, 70 acres represents a circle with a radius of approximately 1,000 feet. This is larger than the 250 foot State ‘zone of consultation’; and almost double the required 40 acres of mitigation generally required by the Corps for vernal pool impacts. The additional criteria used to assess conservation suitability (VPCC, Appendix 2a) including an undeveloped 100 foot water quality buffer and an undeveloped travel corridor from the pool to adjacent amphibian habitat insure that the pools conserved are embedded in a landscape that provides habitat and access to it for all the life cycle stages of vernal pool breeding amphibians.

The Maine VP SAMP allows a local, proactive approach that prioritizes pool resources based on both breeding pool quality and the likelihood that the surrounding landscape will support the post-breeding habitat needs of the amphibian target species (all of which live in terrestrial environments for greater than 95% of their lives). Using the Maine VP SAMP, only the highest priority pools embedded in suitable post-breeding habitat (not simply the 250-foot State Zone of Consultation or the 750-foot Federal regulatory radius of permitting) will be targeted for conservation. Local knowledge and an incentivized program will result in far better vernal pool conservation for the long-term than does the status quo, top-down, one-size fits all approach (Jansujwicz et al. 2013b). This approach will ensure connectivity among wetlands and other resources thereby providing wildlife corridors in an otherwise developing town. This can be achieved by adherence to the Maine VPCC for identification of high priority vernal pool conservation opportunities and through the proactive planning of land trusts or other third party holders who are dedicated to linking undeveloped properties at many scales. A local, landscape level approach also protects broader pool ecosystem functions such as carbon transport to forests, water storage, and oases of food and moisture for signature wildlife such as moose, deer, and bear.

FIGURE 1. ROLES AND RESPONSIBILITIES

Creating the VP SAMP	Preparing to use the SAMP		Using the SAMP for Development	Using the SAMP for Conservation	Evaluation of the SAMP
USACE DEP	TOWN 3 rd PARTY	IFW DEP	TOWN APPLICANT	TOWN 3 RD PARTY USACE DEP	USACE DEP APPLICANT TOWN IFW 3 RD PARTY
-Approve SAMP mechanism -Add language to General Permit	-Establish Growth Areas as part of Comprehensive Plan process -Adopt consistent Comprehensive Plan and Land Use Ordinance -Identify Designated Development Areas -Map and field check vernal pools in Growth and Rural Areas -Adopt ordinance language to allow use of SAMP	-Run vernal pool conservation suitability assessment for pools in Rural Areas -Submit vernal pool assessment to IFW for comment -Establish relationship with 3 rd party -Request partial designated authority from DEP			
	Support development of DDA's and VP Conservation Suitability Assessment				
	Review and approve partial delegated authority				
	Apply to USACE and DEP to become SAMP signatory and to DEP to obtain partial delegated authority.				
			Proposes to use SAMP; submits notification form, pays fee; receives all other permits		
			Collects fee, issues vernal pool permit, submits permit to DEP	Transfers fee to third party	
			Reviews permit	-Undertakes conservation of vernal pools -Produces annual audit and submits to town	 <p>Annual review includes all parties along with the US EPA and US Fish and Wildlife Service.</p>
				Reviews and submits annual report to USACE and DEP	

IV. THE PREFERRED ALTERNATIVE: THE MAINE VERNAL POOL SPECIAL MANAGEMENT AREA PLAN (VP SAMP)

The Maine VP SAMP is an alternate mitigation mechanism for impacts to vernal pools based on a signed agreement between the Corps, Maine DEP, and a Maine municipality. The Maine VP SAMP brings multiple levels of government, applicants, and non-profit organizations together in a collective approach to the management and protection of vernal pools. This approach focuses on long-term, landscape-level conservation to insure the persistence of an abundance of vernal pool species as well as other species that use vernal pools and the habitat surrounding them. As part of the adoption of the Maine VP SAMP, the municipality must receive regulatory authority from the State for issuing NRPA vernal pool permits in targeted areas contained within the Growth Area identified in the municipality's comprehensive plan. If an applicant proposing to develop in this targeted area (Designated Development Area or DDA) chooses to use the Maine VP SAMP, they pay a fee to the municipality which is then used to conserve exemplary vernal pools embedded in high quality amphibian post breeding habitat based on the VPCC (Appendix 2a) in the Rural Area established in the municipality's comprehensive plan. This incentivizes development where the municipality has decided it wants to concentrate development; provides certainty for applicants; acknowledges that protection of vernal pools embedded within DDAs is not ecologically meaningful over time; and protects vernal pools embedded in a landscape that provides the best chance that the pools and the animals that rely on them will persist in abundance. Each partner has specific roles and responsibilities that are described briefly here and spelled out in more detail below and portrayed graphically in Figure 1.

The Corps and Maine DEP will sign the Maine VP SAMP agreement. Municipalities must meet certain institutional benchmarks, apply for and receive partial Delegated Authority from the Maine DEP and must enter into an agreement with a 3rd Party to which they will transfer fees collected from the applicant. Once the Municipality has met the benchmarks, developed a relationship with a 3rd Party, and received Delegated Authority from the Maine DEP, it makes an official proposal to the Corps and Maine DEP to become a signatory of the Maine VP SAMP. Once the Municipality has signed the Maine VP SAMP with the Corps and Maine DEP, the Municipality is able to receive a fee from applicants for impacts to vernal pools within DDAs and to issue a NRPA vernal pool permit. This relieves the Applicant from having to determine the level of state Significance for any vernal pools within their proposed development parcel. The fee is transferred to the 3rd party who undertakes conservation of vernal pools in the Rural Area of the Municipality. The 3rd party is responsible for annual monitoring of the areas conserved and provides an annual report to the Municipality.

A Maine VP SAMP Review Team will be constituted to track the implementation and effectiveness of the Maine VP SAMP. It will review annual reports on the use of the Maine VP SAMP in the DDAs and the selection and conservation of vernal pools in the Rural Area. It will also oversee the five-year evaluation of the program in order to make a determination to continue, revise, or discontinue the use of the Maine VP SAMP. Data used in the five-year evaluation will include the number of towns using the Maine VP SAMP, the number of times the Maine VP SAMP has been used in each town, the fees collected in each town, the number of vernal pool conservation projects that have been completed in each town, the number of vernal pools protected in each town, the amount of upland adjacent to vernal pools protected

in each town, and results of biological monitoring of conserved vernal pools. Using this data, the Review Team will be able to analyze how well the goal of protecting 2 pools and 70 acres in the Rural Area for each pool impacted in the DDAs is being met on a town-by-town basis. This Team will, at a minimum, be made up of representatives from the Maine Departments of Inland Fisheries and Wildlife and Environmental Protection, the Corps, US Fish and Wildlife Service, US Environmental Protection Agency, a University or other vernal pool ecologist, the 3rd party, and other key stakeholders.

A. Responsibilities of the Municipality

In order to establish the Maine VP SAMP as an alternate mitigation mechanism for impacts to vernal pools, a municipality must complete Steps 1-5 as described below; these steps lay the legal framework for a municipality to offer use of the Maine VP SAMP for development(s) within its designated development area (DDA). Steps 6-9 are related to actual implementation of the Maine VP SAMP.

1. Adopt a Consistent Comprehensive Plan and Land Use Ordinance

In order to participate in the Maine VP SAMP, a municipality must demonstrate a strong commitment to vernal pool conservation and landscape-scale planning, be committed to compact development, and have identified a reasonable delineation of rural and growth areas. This is accomplished by developing and adopting a comprehensive plan and land use ordinance that are found to be consistent with Maine's Growth Management Act by the Municipal Planning and Assistance Program, Department of Agriculture, Forestry and Conservation ([Ch. 208 Comprehensive Plan Review Criteria Rule](#)).

Public process and participation are at the core of the comprehensive planning and land use ordinance development processes. These two land use planning tools provide an indication and measure of a municipality's ability to take part as a full partner in the Maine VP SAMP in that the municipality has developed a vision, identified Growth and Rural areas, inventoried its resources, identified those of significance, and developed policies and implementation strategies to insure the protection of those resources.

2. Identify Designated Development Areas

The Maine Land Use Planning and Regulation Act (30-A M.R.S.A. Chapter 6-A§ 4312) along with Chapter 208: Comprehensive Plan Review Criteria Rule identify the required elements of a comprehensive plan. One of the elements requires identification of a Growth Area in which the municipality intends to encourage more growth and into which it intends to make the majority of its capital investments in the ten years following the adoption of the comprehensive plan. The remainder of the municipality is placed in the Rural Area or Transitional Area. These are all general land use divisions which are then refined through the land use ordinance. For example, not all of the Growth Area is likely to be zoned for high density or commercial development; there may be areas within the Growth Area that remain undeveloped or lightly developed for the lifespan of the comprehensive plan (currently twelve years). Therefore, the Maine VP SAMP can only be used to mitigate impacts to vernal pools on parcels that are explicitly identified by the municipality within the Growth Area, that meet specific criteria and are zoned accordingly;

these areas are referred to as Designated Development Areas (DDAs) in the Maine VP SAMP. An area within the Growth Area may only be designated as a DDA if the area is zoned for moderate to high density development, will be infill, is adjacent to existing development within the Growth Area, or is served by municipal sewer and water, adjacent to existing development and zoned for moderate or high density development. The municipality will seek input from the MDIFW on the location of DDAs. A map showing the DDAs will be submitted to the Corps for approval before the municipality requests Delegated Authority from Maine DEP. A map showing the DDAs will be part of the municipality's submittal for partial Delegated Authority.

3. Adopt VP SAMP Ordinance or Modify an Existing Ordinance

Following the development and adoption of a consistent comprehensive plan, zoning ordinance, and identification of DDAs, a community must adopt ordinance language that allows them to participate in the Maine VP SAMP. In addition, the municipality must codify, through ordinance or other mechanism, its ability to assess a vernal pool mitigation fee. The ordinance will include language establishing the municipality's ability to become a signatory to the Maine VP SAMP, reference the fee mechanism including the process of fee determination that may also include setting a minimum fee requirement, fee collection by the municipality, process of transfer to a 3rd Party to undertake the vernal pool conservation, and submission of an annual report to the Maine DEP and US Army Corps of Engineers. This can be done through an independent ordinance or through amending existing ordinance language. Model language for use in existing ordinances and creation of a vernal pools overlay district is found in Appendix 1.

4. Fee Determination

The municipality will assess a fee equal to 40% of the difference between the appraised value of the property as currently impacted by the existing vernal pool(s) with a 250' buffer that can be developed no more than 25% and the value under the hypothetical condition that the property is no longer impacted by the vernal pool(s). The appraisal will be completed using the Uniform Standards of Professional Appraisal Practice by a Certified General Appraiser licensed in the State of Maine. The municipality shall collect the fee each time the Maine VP SAMP is implemented in order to accomplish the goal of vernal pool conservation at the programmatic level of two pools plus 70 acres of terrestrial amphibian post-breeding habitat for each impacted pool. A municipality may opt to adopt a minimum fee in its ordinance if the programmatic conservation goals cannot be met with the differential fee mechanism.

5. Identify a 3rd Party

The Municipality enters into an agreement with a non-profit land conservation organization as the 3rd Party entity which will hold mitigation funds and undertake vernal pool conservation projects. These projects will be based on the results of the application of the Maine VP SAMP CC (Appendix 2a) and the baseline vernal pool conservation suitability assessment. The agreement with the 3rd Party will spell out roles and responsibilities, will direct that funds be used for vernal pool conservation projects within three years of receipt, and will allow the 3rd Party to collect up to 10% of the fees to cover

their project implementation, administrative and monitoring costs. This agreement will be based on the model 3rd Party agreement (under development, February, 2016) and will be submitted to the Board of Environmental Protection and the Corps for approval if any changes are made to the model to insure compliance with the Mitigation Rule. Each project will be conserved in perpetuity and will include conditions that prohibit any additional commercial or residential development including roads and require that forestry activities be low impact and follow the Forestry Habitat Management Guidelines for Vernal Pool Wildlife (Calhoun and deMaynardier, 2004).

6. Identify Candidate Vernal Pool Conservation

The Maine VPCC (Appendix 2a) will be applied to all known pools in the municipality's Rural Area to create a baseline vernal pool conservation suitability assessment. Through this process the Municipality will develop a list of target conservation pools and conservation actions in the Rural Area. The targets for conservation actions will be vernal pools and surrounding amphibian post-breeding habitat found embedded within relatively unfragmented forest tracts within the Municipality's Rural Area. Each candidate conservation target must be field-checked for suitability using the Maine VP SAMP Site Checklist (Appendix 2b) or other substantially similar form.

Because conservation opportunities may arise that were not part of the town's initial conservation suitability assessment of vernal pools in the Rural Area and because mapping techniques often miss vernal pools due to their small size, ephemeral nature, and location under forest canopy, the town and their identified 3rd party (Step 5) may also identify vernal pool conservation options by applying the Maine VP SAMP Conservation Criteria to pools not included in the municipality's initial process of assessing the conservation suitability of pools in the Rural Area.

Final decisions on the suitability of projects for conservation will be made by the 3rd Party in consultation with wetland or amphibian ecologists and MDIFW (as their resources allow).

7. Apply to the Maine Board of Environmental Protection for Delegated Authority under 38MRSA Chapter 3 Section 480-F.

The Municipality submits an application to the Board of Environmental Protection and receives partial Delegated Authority under 38 MRSA §480-F to cover the issuance of NRPA vernal pool permits within the identified DDAs. The DDAs for use in the Maine VP SAMP will only include infill areas, areas adjacent to existing development, or areas served by municipal water and sewer adjacent to development within areas zoned for moderate or high density development. The request for partial delegated authority will include the following elements:

- a map of the Municipality's Growth and Rural Areas as defined in its Comprehensive plan,
- a map showing the DDAs,
- the ordinance language used to facilitate implementation of the Maine VP SAMP including date of adoption by the Municipality,

- a narrative description of the Municipality’s financial, technical and legal resources to adequately review the permit applications, accept and transfer the in lieu fee, and enforce the permit requirements,
- a copy of the letter from the Municipal Planning Assistance Program, Maine Department of Agriculture, Conservation and Forestry (or Maine State Planning Office) showing the date the comprehensive plan was found consistent with the Maine Growth Management Act,
- and a copy of the contract between the Municipality and the 3rd Party land conservation organization.

8. Sign the VP SAMP along with the Corps and Maine DEP

9. Collect the VP SAMP Fee and Issue Maine NRPA Vernal Pool Permit

The Municipality receives the Maine VP SAMP fee from the applicant based on the appraisal difference method or based on the minimum fee set in ordinance. The appraisals must be done under the Uniformed Standards of Professional Appraisal Practice by a Certified General Appraiser licensed in the State of Maine. The Municipality records the fee along with the location of the impacted vernal pool(s). The Municipality issues the NRPA Vernal Pools permit to the applicant and forwards the permit to the Maine DEP.

10. Transfer Fee to 3rd party

Thirty days after the permit is sent to DEP, the Municipality will transfer the Maine VP SAMP fee to the 3rd Party.

11. Annual Reporting

The Municipality will provide an annual report to the Corps and ME DEP. This report will incorporate the annual reporting submitted by the 3rd party and include:

- An accounting of the number of times that the Maine VP SAMP has been used;
- The location of pools within the DDAs that were impacted and the corresponding conservation in the Rural Area;
- A balance sheet showing the amount of funds collected by project and the amount expended by project;
- Annual monitoring reports on the condition of the conservation pools and surrounding landscape along with documentation that all easement conditions are being met.

B. Responsibilities of the 3rd Party

1. Agreement with Municipality

The 3rd party enters into a signed agreement with the municipality to receive funds to undertake vernal pool conservation projects. These projects will be based on the results of the application of the Maine VPCC (Appendix 2a). The agreement with the Municipality will spell out roles and responsibilities, will direct that funds be used for vernal pool

conservation projects within three years of receipt, and will allow the 3rd party to collect up to 10% of the fees to cover their project implementation, administrative and monitoring costs.

2. Management of Funds

The 3rd party accepts funds collected by the Municipality for vernal pools impacts. The 3rd Party maintains a separate account for these funds and uses them only for conservation based on the Maine VPCC (Appendix 2a).

3. Identification of Conservation Targets and Conservation Actions

The 3rd Party will develop a portfolio of potential vernal pool mitigation projects. This will be accomplished through use of the Municipal vernal pool suitability for conservation assessment (see A-6 above) and application of the Maine VPCC to conservation opportunities not part of the Municipal vernal pool suitability for conservation assessment. As part of the process to develop vernal pool conservation projects the 3rd Party will conduct a vernal pool site visit to ensure that the Maine VPCC are still being met. The 3rd Party will provide notification of and the option to participate in the site visit to MDIFW and MDEP. Working with willing landowners, the 3rd Party purchases conservation targets via fee or easement to conserve pools and adjacent terrestrial post breeding amphibian habitat to meet the programmatic goal of conservation of 2 pools and 70 acres of surrounding habitat for each pool impacted in the DDA.

It is anticipated that vernal pool conservation opportunities may arise in adjacent towns or other areas within the 3rd Party's 'sphere of influence.' In the order of preference, the in lieu fee funds collected for impacts to vernal pools in the DDAs shall be used first within the Rural Area of the town within which the impacts occurred, secondly in the Rural Areas of adjacent towns that have consistent comprehensive plans and land use ordinances, and thirdly within the geographic area of interest of the 3rd Party. If the funds are not used for vernal pool conservation within three years of their collection and no active projects for vernal pool conservation are underway, the funds shall be transferred to the Maine Natural Resources Conservation Program (MNRCP), the statewide in lieu fee program run by the Maine DEP and used for vernal pool conservation within the biophysical region in which the impacts occurred. The transfer of funds to the MNRCP will allow the funds to be pooled with other funds mitigating vernal pool impacts and provide for a larger geography within which appropriate mitigation can be found. More information on the MNRCP can be found on the Maine DEP's website (www.maine.gov/dep).

The 3rd Party will also be responsible for making a recommendation to the Town on permittee responsible mitigation (PRM) project proposals in the instance an applicant chooses to undertake development of the vernal pools conservation project instead of paying a fee. The third party will apply the Maine VPCC to the proposed conservation project and visit the site in order to complete the Maine Vernal Pool SAMP Site Checklist (Appendices 2a and 2b) before issuing its recommendation to insure that the project provides the functions and values of a high value vernal pools conservation project. The 3rd Party will provide notification of and the option to participate in the site visit to MDIFW and MDEP.

4. Monitoring

The 3rd Party will be responsible for annual monitoring of all vernal pool conservation projects undertaken with funds collected through the Maine VP SAMP. Annual monitoring will include visual assessment of the condition of the pool and surrounding landscape along with documentation that all easement conditions are being met. The Maine VP SAMP Site Checklist (Appendix 2b) or other substantially similar form will be used. In the event that easement conditions are not being met, the 3rd Party will work with the landowner to rectify the situation. Every five years from the date the conservation project is completed, the 3rd Party will undertake biological monitoring of the conserved vernal pools during the spring breeding season to count egg mass numbers and species. All monitoring visits will be documented with photos and a report will be produced that describes the condition of the pool, surrounding landscape, numbers and species of egg masses when biological monitoring occurs and other relevant factors. In the year that biological monitoring takes place, the documentation of that monitoring will be included in the annual report to the town.

5. Record keeping and annual reporting

The 3rd Party maintains records of funds received through the Maine VP SAMP, funds expended, location of conservation actions taken with the mitigation funds, and annual monitoring visits. The 3rd Party will maintain a database to account for location of projects that generated the mitigation funds and locations and description of vernal pool conservation projects undertaken with the funds. The 3rd Party will supply an annual report to the Town with an accounting of funds received, funds expended, acres impacted and conserved, and monitoring documentation collected during the year under review.

C. Responsibilities of the Applicant

1. Municipal Vernal Pools Permit Application, Appraisal, Fee

The applicant submits a vernal pool permit application to the Town for a project located in a DDA. Permit materials shall include (1) project plans that delineate or show the approximate location of potential vernal pools to meet Condition 23(f) of the Maine General Permit; (2) an appraisal of the property that includes the (a) as-is value of the parcel as currently impacted by the existing vernal pool(s) surrounded by a 250' buffer that can be no more than 25% developed and (b) the as-is value under the hypothetical condition that the property is no longer impacted by the vernal pool(s) and the 250' buffer. The applicant pays for the appraisal as well as a peer review of said appraisal should a peer review be required by the town. The applicant pays the VP SAMP Fee determined by the municipality's ordinance to the municipality.

2. US Army Corps of Engineers Category 1 Self-Verification form

The applicant submits a [Corps Category 1 Self-Verification Form](#) and all required attachments and supporting material to the Corps as notification of use of the Maine VP SAMP, assuming vernal pool impacts are the only impacts, and there are no other impacts

which would trigger the need for a Category 2 or Individual Permit. The Corps will make the final determination of Category 1 or Category 2 eligibility within 10 days of receiving the Category 1 Self-Verification Form and will notify applicants accordingly. If no determination is received within the 10-day period, the applicant may proceed under the Category 1 Self-Verification Form.

If the project being proposed includes impacts to other aquatic resources, all of the impacts must be considered as part of a single and complete project. If the impacts to other aquatic habitat(s) do not qualify for Category 1 Self-Verification, the applicant will need to determine if the project proceeds under the Corps Category 2 or Individual Permit. However, the Maine VP SAMP may still be used to mitigate for vernal pool impacts in any case.

3. The applicant is responsible for all other state, federal and local permits.

4. Option: Applicant undertakes permittee responsible mitigation (PRM)

The permittee may undertake the vernal pool(s) conservation triggered by her use of the Maine VP SAMP in place of paying the in lieu fee to the municipality. The applicant pays for peer review of the proposed conservation project and submits the peer review to the Town and to the 3rd Party. The applicant receives confirmation from the 3rd Party that the 3rd party will accept the responsibility of managing the conservation project in perpetuity. Before the Municipality issues the Vernal Pools permit, the permittee's mitigation project must be completed, peer reviewed for conservation suitability, and accepted by the 3rd Party. Permittee responsible mitigation must meet all the same conservation suitability criteria and receive the same level of conservation protection as vernal pools conservation undertaken by the 3rd Party through the Maine VP SAMP including protection in perpetuity.

D. Responsibilities of the Corps

1. Public comment

The Corps puts the Maine VP SAMP framework out for public comment. A public notice for the VP SAMP was issued on March 8, 2016 with the public notice comment period extending through April 8. A second public notice was issued on April 26, 2016 announcing a public meeting on May 12, 2016 at which time additional comments could be provided.

2. Maine VP SAMP approval

After the public comment period the Corps approves the Maine VP SAMP for use by signing the document along with Maine DEP. The Corps and Maine DEP will also be signatories with individual municipalities for implementation of the Maine VP SAMP at the municipal level. This will follow DDA approval by the Corps and DEP for each municipality.

3. DDA approval

The Corps reviews and approves DDA location prior to submittal as part of the request for Partial Delegated Authority.

4. Determination of permit category status

The Corps will make a determination that the project may proceed under the Category 1 Self-Verification Form within 10 days of receiving the form.

5. Maine VP SAMP Review Team

The Corps participates on Maine VP SAMP Review Team to approve the baseline municipal vernal pool conservation suitability assessment and will not be involved on case by case review of conservation actions.

6. Annual Review

The Corps takes part in annual review of use of the Maine VP SAMP as a member of the Maine VP SAMP Review Team.

E. Responsibilities of the Maine DEP

1. Maine VP SAMP approval

After the public comment period, Maine DEP approves the Maine VP SAMP for use by signing the document along with the Corps. The Corps and Maine DEP will also be signatories with individual municipalities for implementation of the Maine VP SAMP at the municipal level. This will follow DDA approval by the Corps and Maine DEP for each municipality.

2. Partial delegated authority

Maine DEP reviews the municipal request for partial Delegated Authority to issue NRPA Vernal Pool permits in DDAs. Upon finding that the municipality meets the criteria in 38 MRSA §480-F, the Maine Board of Environmental Protection issues a finding that the Municipality has partial delegated authority for vernal pool permits.

3. Permit review

Maine DEP reviews municipal vernal pool permits within 30 days pursuant to 38 MRSA §480-F.

4. Maine VP SAMP annual review

Maine DEP takes part in annual review of Maine VP SAMP as a member of the Maine VP SAMP Review Team.

F. Responsibilities of Maine DIFW

1. Municipal Conservation Suitability Assessment

Maine DIFW supports, as their time and resources allow, municipal application of Maine VP Conservation Criteria to vernal pools in the Rural Area to identify high value conservation targets (i.e., vernal pools and surrounding terrestrial habitat).

2. Designated Development Areas

Maine DIFW provides support as their time and resources allow to the Municipality in identification of DDAs based on the criteria found in the Maine VP SAMP before submission of materials to Maine DEP for partial Delegated Review.

3. Conservation opportunities

Maine DIFW provides support as their time and resources allow to the 3rd party in the identification and selection of vernal pool conservation projects.

4. Annual Review

Maine DIFW takes part on the Maine VP SAMP review team as a member of the Maine VP SAMP Review Team.

G. Termination

At the Program Level

The Corps or the Maine DEP, may terminate this SAMP by giving ninety (90) days written notice to the other parties. Prior to termination, the Municipality and 3rd Party shall provide an accounting of funds and shall complete payment on contracts for approved projects and any expenses incurred on behalf of the program. In the event the program is closed, the 3rd Party is responsible for fulfilling any remaining obligations, unless the obligation is specifically transferred to another entity as agreed upon by the Corps, Maine DEP, and the Municipality. Notification will be provided to MDIFW by Maine DEP or the Corps. In the event the VP SAMP is terminated, funds not already committed for conservation actions (including fee or easement purchase, long-term monitoring of projects and related administrative activities) shall be transferred to the MNRCP for preservation of vernal pools and their associated critical terrestrial habitat. Termination of the Maine VP SAMP does not terminate the 3rd Party's responsibility for conservation in perpetuity of projects completed in part or in total with funds acquired through use of the Maine VP SAMP.

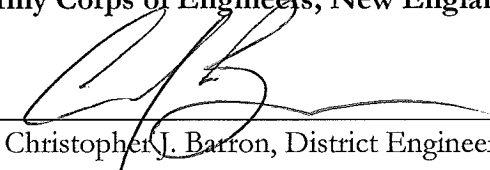
At the Municipal Level

A municipality may terminate its participation in the Maine VP SAMP by giving 90 days written notice to the Corps, Maine DEP, and 3rd Party. Notification will be provided to MDIFW by Maine DEP or the Corps. Prior to termination of participation, the Municipality and 3rd Party shall provide an accounting of funds received and expended, vernal pools impacted and conservation projects completed and shall complete payment on contracts for approved projects and any expenses incurred on behalf of the program. The Maine DEP will determine whether unexpended funds shall remain with the 3rd Party or be transferred to the MNRCP for vernal pool conservation. Termination of a municipality's participation in the Maine VP SAMP does not terminate the 3rd Party's responsibility for conservation in perpetuity of projects completed in part or in total with funds acquired through use of the Maine VP SAMP.

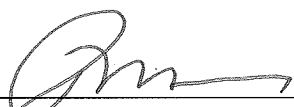
H. Signatures

IN WITNESS WHEREOF, the parties hereto have executed this Maine Vernal Pool Special Area Management Plan Framework this 6th day of SEPTEMBER, 2016.

U.S. Army Corps of Engineers, New England District:

By:  _____ Date: 20 AUG 2016
Christopher J. Barron, District Engineer

Maine Department of Environmental Protection:

By:  _____ Date: 9.4.2016
Paul Mercer, Commissioner

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APPENDIX 1: MODEL ORDINANCE LANGUAGE

July 18, 2016

Model Vernal Pools Overlay Provisions

Section __. Vernal Pools Overlay District

1. PURPOSE

The Vernal Pools Overlay District is intended to provide owners of property located within the overlay district that is subject to state or federal regulation with respect to vernal pools the option of developing and using the property in accordance with: 1) the applicable state and federal wetland regulations and associated requirements for the protection of vernal pools, or 2) the provisions of this section including the enhanced protection of other vernal pools through payment of a “vernal pools mitigation fee” or by undertaking “permittee-responsible mitigation activities.” Mitigation fees collected under this section shall be used only for the purpose of protecting other vernal pools within the community or in other nearby communities identified through the application of the Maine Vernal Pool Conservation Criteria in the (Town)(City) Vernal Pool Special Area Management Plan (SAMP) and the conservation priorities of the Maine Vernal Pool SAMP.

2. APPLICABILITY

The provisions of this section apply only to land located within the Vernal Pools Overlay District as shown on the Official Zoning Map (or Zoning Overlay District Map). These provisions are optional. An applicant may choose to invoke the provisions of this section under the following conditions in accordance with the Maine Vernal Pools SAMP:

1. The impact occurs within the vernal pool or within a 250 foot zone around the pool.
2. The total impacts to aquatic resources of a single and complete project fall below 3 acres.
3. The vernal pool does not support state or federal threatened or endangered species unless a determination of no effect or not likely to adversely affect is made by the U. S. Army Corps of Engineers in consultation with the U. S. Fish and Wildlife Service.

With respect to any application to develop land within the Overlay District that is subject to state or federal regulation with respect to wetlands and vernal pools, the applicant shall indicate at the time of application whether he/she intends to develop the project in accordance with those applicable state and federal requirements or to utilize the provisions of this section. If the applicant invokes the provisions of this section, he/she must still obtain all other local, state and federal permits and provide appropriate notice to the U.S. Army Corps of Engineers. Applicants that elect to opt out of this program should continue to consult with state and federal regulatory agencies for project-specific requirements.

3. EFFECTIVE DATE OF THIS SECTION

Notwithstanding the adoption of this section as part of the ordinance, the provisions of this section shall be effective only when the Maine Department of Environmental Protection has certified in writing to the Code Enforcement Officer that (Town)(City) has been granted partial delegated authority with respect to the issuance of vernal pools permits in accordance with the Maine Vernal Pools Special Area Management Plan (SAMP). If the Maine Department of Environmental Protection notifies the Code Enforcement Officer in writing that the (Town)(City) is no longer in compliance with the SAMP, or if the (Town)(City), Maine Department of Environmental Protection, or U.S. Army Corps of Engineers terminates the SAMP, this section shall no longer be in effect.

4. DEFINITIONS

For definitions of words or phrases in this section that are contained in quotation marks, see Section ___, Definitions, of this Ordinance.

5. VERNAL POOL MITIGATION

As an alternative to complying with the applicable state vernal pool regulations and/or the U.S. Army Corps of Engineers general permit for the state, the applicant for any development approval or building permit with respect to land located within the overlay district that elects to develop or build in accordance with the provisions of this section shall either: a) pay a “vernal pools mitigation fee”, or b) undertake “permittee-responsible mitigation activities” in accordance with the provisions of this section and the SAMP.

A. Vernal Pool Mitigation Fee

1. Regulatory Flexibility: An applicant that elects to pay a “vernal pools mitigation fee” in accordance with the following provisions will have to comply with the provisions of this section rather than the otherwise applicable vernal pool provisions found in 38 MRSA Section 480 Chapter 3, DEP Rules- Chapter 335 and federal vernal pool provisions found in the Maine General Permit. This provision of the Maine VP SAMP shall not extend to other state and federal wetland regulations or other natural resource regulations that may apply to the development.

2. Amount of the Mitigation Fee: The amount of the mitigation fee is the greater of: a) forty percent (40%) of the difference in the appraised value of the parcel proposed to be developed if it is subject to applicable state regulations and/or the U.S. Army Corps of Engineers general permit for the state with respect to vernal pools and the appraised value of the parcel if those state and federal vernal pool regulations no longer apply, or b) the minimum mitigation fee if such a minimum is established by the (Town)(City). The minimum mitigation fee shall be adequate to accomplish vernal pool preservation at the programmatic level of two pools plus 70 acres of terrestrial amphibian post-breeding habitat conserved for each impacted pool.

The difference in the appraised value of the parcel with and without the applicable state and federal vernal pool regulations shall be determined by a Certified General Appraiser (CGA) currently licensed in Maine. The appraiser shall be employed by the applicant subject to approval by the (Town)(City). The appraisal shall meet the Uniform Standards of Professional Appraisal Practice (USPAP) and will be subject to a peer review by a CGA selected by the (Town)(City).

3. Appraisal Review Fee: If the applicant elects the difference in appraised value approach, the applicant shall deposit the estimated cost for the peer review of the appraisal with the (Town)(City). The (Town)(City) shall hold the fee in a separate account and shall use the fee only for the purpose of compensating the review appraiser. Should the amount of the initial deposit not cover the full costs for the review, the applicant shall be responsible for the difference and shall pay the (Town) (City) prior to the issuance of any permits or approvals for the project. If the amount of the initial deposit exceeds the full costs for the review, the (Town)(City) shall refund the balance to the applicant within thirty (30) days of paying the peer review appraiser.

4. Payment of the Mitigation Fee: The mitigation fee shall be payable to the (Town) (City) and submitted to the Code Enforcement Officer as part of a Site Plan Review application or a Subdivision Plan Review application, if such review is required for the proposed development; or, if no such review is required, prior to the commencement of any site work on the parcel or the issuance of any building or plumbing permits for the project whichever occurs first.

B. Permittee-Responsible Mitigation Activities

1. Regulatory Flexibility: An applicant that elects to undertake “permittee-responsible mitigation activities” in accordance with the following provisions will have to comply with the provisions of this section rather than the otherwise applicable vernal pool provisions found in 38 MRSA Section 480 Chapter 3, DEP Rules- Chapter 335 and federal vernal pool provisions found in the Maine General Permit. This relief shall not extend to other state and federal wetland regulations or other natural resource regulations that may apply to the development.

2. Acceptable Mitigation Activities: The applicant shall arrange for the protection of other vernal pools and associated amphibian terrestrial post-breeding habitat within designated “Rural Areas” of the community or in other communities in accordance with the municipality’s “Vernal Pool Conservation Plan” and the conservation priorities of the SAMP. The compensation activities shall be adequate to accomplish vernal pool preservation at the programmatic level of two pools plus 70 acres of amphibian terrestrial post-breeding habitat conserved for each impacted pool. The adequacy of the mitigation shall be determined by the Planning Board in consultation with the (Town’s)(City’s) “designated third party conservation organization.”

3. Verification: An applicant that elects to undertake “permittee-responsible mitigation activities” shall include in his or her Site Plan Review or Subdivision Plan application evidence of title, right or interest in the property or properties subject to the proposed compensation activities, if the proposed development requires such review. In all cases, the “designated third party conservation organization” must certify to the Code Enforcement Officer that the “permittee-responsible mitigation activities” have occurred prior to the commencement of any site work on the parcel or the issuance of any building or plumbing permits for the project, whichever occurs first.

6. MANAGEMENT OF COLLECTED MITIGATION FEES

All “vernal pool mitigation fees” shall be accounted for in a separate financial account maintained by the municipality. All revenue and disbursements shall be posted to this account and an annual report of the financial status of the account shall be provided to the Maine Department of Environmental Protection and the Army Corps of Engineers, New England District, within ninety (90) days of the end of the (Town’s)(City’s) fiscal year as part of the annual report as described in

the SAMP. These funds are subject to audit by the Maine Department of Environmental Protection and the Army Corps of Engineers, New England District.

7. USE OF MITIGATION FEES

“Vernal pool mitigation fees” collected by the (Town)(City) shall be used only to fund vernal pool conservation projects carried out by the “designated third party conservation organization” in accordance with the (Town’s)(City’s) approved “Vernal Pool Conservation Plan” or other vernal pool conservation in accordance with the conservation priorities set forth in the SAMP. Any third party receiving mitigation funds shall enter into a formal agreement with the (Town)(City) spelling out its roles and responsibilities with respect to the management and use of the funds, administrative fees, monitoring of conservation projects, and annual reporting requirements in accordance with the requirements of the SAMP. No funds shall be provided to the “designated third-party conservation organization” from the Vernal Pools Mitigation Fees account until such an agreement is in place.

8. ANNUAL REPORTING

The (Planning) Department shall prepare an annual report on the use of the Vernal Pools Overlay District and provide the report to the (Town Council) (City Council)(Board of Selectmen), Maine Department of Environmental Protection, and Army Corps of Engineers within ninety (90) days of the end of each fiscal year covering the prior fiscal year. The report shall document the number of times the mitigation provisions were utilized, the permittees’ and projects’ names, the permit/authorization numbers or other identifiers, the number and location of vernal pools within the Overlay District that were involved, the conservation projects undertaken with mitigation fees or through permittee-responsible mitigation activities, the financial accounting for all collected mitigation fees, and the documentation of ongoing monitoring of properties conserved through the use of the mitigation fees. Documentation of monitoring visits shall include photos and a report describing the condition of each pool, the surrounding landscape, and other relevant factors.

Definitions Related to the Model Vernal Pools Overlay Provisions

The following definitions should be added to the appropriate definitions section in the community's ordinance in the form of the other definitions in the ordinance:

Designated Third Party Conservation Organization: A conservation organization which has a formal agreement with the (Town)(City) to carry out vernal pool conservation in accordance with the provisions of the Vernal Pool Overlay District and the (Town)(City) Vernal Pools Special Area Management Plan (SAMP) and the conservation priorities of the SAMP.

Permittee-Responsible Mitigation Activities: Vernal pool conservation carried out by an applicant for a development approval or permit in accordance with the provisions of the Vernal Pool Overlay District as an alternative to paying a vernal pool mitigation fee to the (Town)(City).

Rural Areas: The portion of the (Town)(City) designated as Rural in the adopted comprehensive plan.

Vernal Pool: Depressional wetland basins that typically go dry in most years and may contain inlets or outlets, typically of intermittent flow. Vernal pools range in both size and depth depending upon landscape position and parent material(s). Pools usually support one or more of the following obligate indicator species: wood frog, spotted salamander, blue-spotted salamander, marbled salamander, Jefferson's salamander and fairy shrimp. However, they should preclude sustainable populations of predatory fish.

Vernal Pool Conservation Plan: A plan developed by the (Town)(City) that assesses the known vernal pools in the community's Rural Area and establishes a list of target conservation pools and conservation actions in accordance with the Vernal Pool Conservation Criteria in the (Town)(City) Vernal Pools Special Area Management Plan (SAMP).

Vernal Pool Mitigation Fee: A fee paid by an applicant for a development approval or permit in accordance with the provisions of the Vernal Pool Overlay District.

APPENDIX 2a: Maine Vernal Pool SAMP Pool Conservation Criteria (June 2016 Version)

The Vernal Pool Conservation Criteria (VPCC) were developed to identify vernal pools suitable for conservation under the Vernal Pool Special Area Management Plan. The criteria are designed to be applied to pools on a landscape/municipal scale or on an individual pool basis. Use of a Geographic Information System (GIS) is the most efficient method for applying the criteria, especially on a town-wide scale. There is potential for dramatic landscape change (e.g., clearing, grading, timber harvest, development) between VPCC application and the time of conservation. Prior to conservation action, the VPCC should be applied (or reapplied) to reflect current landscape conditions and verified in an on-the-ground evaluation.

A Vernal Pool found within the rural area as identified in a municipality's comprehensive plan is considered a suitable conservation target if the vernal pool meets either criterion A (NRPA SVP) **or** criterion B (SAMP specific biological criteria) **in addition to** landscape context criterion C **and** one of the criteria from section D.

A vernal pool may be considered for conservation if it:

A. Meets the Maine Natural Resource Protection Act Significant Vernal Pool definition according to Significant Wildlife Habitat Rules (Significant Wildlife Habitat 06-096 Chapter 335 Section 9)

Or

B. Supports egg mass numbers in any pool or cluster of pools¹ (regardless of pool origin) for any single species from the list below that are greater than the mean egg mass numbers in the Maine Department of Inland Fisheries and Wildlife Vernal Pool database. Current numbers should be requested from MDIFW.²

AND

C. Surrounded by a 1000 foot zone that is at least 75% natural land cover (e.g., forest, wetlands) and includes an undeveloped, forested 100 foot water quality buffer around the pool and an undeveloped, forested travel corridor from the pool to adjacent amphibian habitat.³

AND

D. One or more of the following landscape considerations will elevate pool suitability:

1. Falls within MDIFW mapped Undeveloped Habitat Blocks (http://www.beginningwithhabitat.org/the_maps/map3-undev_habitat.html);
2. Is on a parcel abutting other permanently protected conservation properties;⁴
3. Overlaps with other state-recognized Significant Wildlife Habitats, MDIFW Focus Areas of Statewide Ecological Significance, or rare or exemplary natural communities and ecosystems as depicted on MDIFW Maps (http://www.beginningwithhabitat.org/the_maps/map2-high_value_habitat.html) and/or as available from the Maine Natural Areas Program or Maine Department of Inland Fisheries and Wildlife;
4. Falls within a municipally designated Shore Land Resource Protection Zone⁵.

¹ A cluster or chain of three or more pools each within 500 feet from one to the next without travel barriers may meet the high egg mass criteria collectively; travel barriers include, but are not limited to, a stream or river greater than 25 feet, and roads classified as principal arterials, minor arterials and major/urban collectors.

² As of Winter, 2016 the mean egg mass numbers were as follows: Wood Frog >23, Spotted Salamander > 21, Blue-spotted Salamander > 5.

³ A preliminary habitat evaluation may be done using aerial photography but current habitat suitability requires an on the ground field evaluation.

⁴ Not to include properties separated by a stream or river greater than 25 feet, or roads classified as principal arterials, minor arterials or major/urban collectors.

⁵ This varies by municipality. The municipal shore land zoning map should be requested from the Municipal Code Enforcement Officer.

APPENDIX 2b: MAINE VP SAMP SITE CHECKLIST

Vernal Pool Special Area Management Plan Site Checklist (June 2016 Version)

Field Evaluator(s)		Date of site visit:
Current Owner(s)		Owner address:
Pool location	Town:	Parcel address:
	Map/lot	Coordinates:

A Vernal Pool found within the rural area as identified in a municipality's comprehensive plan is considered a high priority conservation target if the vernal pool meets either criterion A (NRPA SVP) or criterion B (SAMP specific biological criteria) in addition to landscape context criterion C and one of the criteria in Section D.

The Vernal Pool Conservation Criteria (VPCC) were developed to help identify vernal pools suitable for conservation under the Maine Vernal Pool Special Management Area Plan. Because there is potential for dramatic landscape change (e.g., clearing, grading, timber harvest, development) from the time the VPCC are applied to the time of conservation, field verification that pools identified by the VPCC remain suitable for conservation is an essential element of the process. This form should be completed in order to determine whether a pool and surrounding landscape is eligible for conservation. The completed form and accompanying materials will be submitted to the *third party*.

For more information please visit: <http://www.vernalpools.me/> or contact: Aram Calboun calboun@maine.edu with the subject line "SAMP conservation"

Materials to include with Site Visit Form:

- Recent aerial photograph readily available at time of site visit (Google, Bing, ESRI, etc.)
- Photo-documentation from field evaluation including:
 - Pool depression from each of 4 cardinal directions
 - Variation in natural land cover within 1000 feet of pool
 - Human disturbances within 1000 feet of pool
 - Any human disturbance to pool or pool perimeter

Maine's Significant Vernal Pool definition (Criterion A) requires that pools be of natural origin. However, pools that are not of natural origin but otherwise meet the vernal pool definition and support egg mass numbers greater than the state mean may be eligible as conservation targets.

Pool is: Natural _____

Not natural, check type:

- Abandoned sand/gravel pit or borrow pit
- Old farm pond now located within forested landscape
- Abandoned quarry
- Natural wetland or depression made suitable for breeding via human change to landscape and hydrology
- Pools remaining after beaver abandonment
- Other: _____

The Vernal Pool at this site meets A or B of the following biological criteria:

A.

- Pool meets Significant Vernal Pool (SVP) status according to Significant Wildlife Habitat 06-096 CMR 335 section 9 and has been determined to be significant by MDIFW biologists.

Check all biological criteria for Significant Vernal Pool definition that apply:

- \geq 40 wood frog egg masses
- \geq 20 spotted salamander egg masses
- \geq 10 blue-spotted salamander egg masses
- Presence of fairy shrimp
- Presence of state-listed rare, threatened or endangered species

-- OR --

B.

- Individual pool supports egg mass numbers for *any one* species greater than the mean egg mass numbers in the MDIFW vernal pool database.

Total number of egg masses for:

Mean # from MDIFW:

Wood frog:	_____	_____
Spotted salamander:	_____	_____
Blue-spotted salamander:	_____	_____

- In locations where egg mass numbers for individual species do not meet the mean criteria above, you may sum the egg mass numbers within a cluster of 3 or more pools if they occur within 500 feet of each other without significant travel barriers.

Travel barriers include, but are not limited to, a stream or river greater than 25 feet, and roads classified as principal arterials, minor arterials and major/urban collectors.

Wood frog egg mass count in pool cluster:	_____
Spotted salamander egg masses in pool cluster:	_____

Blue-spotted salamander egg masses in pool cluster: _____

-- AND --

C.

Current conditions surrounding pool include all three of the following:

- A minimum of 75% of the landscape surrounding the pool within 1000 feet consists of natural land cover (e.g., forest or wetland) and
- Site includes an undeveloped 100 foot water quality buffer around the pool and
- An undeveloped travel corridor exists between the pool and adjacent non-breeding amphibian habitat

--AND 1 or more of the following--

D.

- Pool occurs within an MDIFW mapped Undeveloped Habitat Block**
Use most recent "Undeveloped Habitat Block" data layer available from MDIFW to make this determination (http://www.beginningwithhabitat.org/the_maps/map3-undev_habitat.html).
- Pool occurs on parcel that abuts other permanently protected conservation properties**
Use most recent "Conserved Lands" data layer available from MDIFW and/or MEGIS website in conjunction with current status of local conservation efforts to make this determination
- Pool located within/overlapping with other state-recognized Significant Wildlife Habitats, Focus Areas of State-wide Ecological Significance, or rare or exemplary natural communities and ecosystems**
Use most recent MDIFW Maps and/or data layers available from the Maine Natural Areas Program or Maine Department of Inland Fisheries and Wildlife to make this determination (http://www.beginningwithhabitat.org/the_maps/map2-high_value_habitat.html).
- Falls within a municipally designated Shoreland Resource Protection Zone**
This varies by municipality. The municipal shore land zoning map should be requested from the Municipal Code Enforcement Officer.

APPENDIX 3: How Will the SAMP Affect Conservation Goals?

A. Likelihood of attaining implementation of changes

Because Maine is a home-rule state, major decisions regarding where development will occur and how it will occur are controlled at the local level. Recognition of a community's plans and goals for how it grows as part of the regulatory structure aimed at protecting vernal pools brings the municipality into the process as a full partner. This will result in an improved partnership between municipalities, regulators, and resource agencies. Through the partnership approach in which the town identifies where and how it wants to grow and the regulators agree to the town-specific VP SAMP, there is much higher likelihood that meaningful protection, for both the physical location of vernal pools and persistence of pool functions and values through time, will be achieved.

Adopting a VP SAMP also becomes an economic development tool for municipalities supporting a 'business friendly' approach through regulatory streamlining. It develops more certainty for applicants choosing to develop within a town's designated development area(s) by reducing uncertainties, time delays and costs associated with site assessment and alternatives analyses for vernal pools (BenDor and Riggsbee, 2011). It also creates an economic benefit for willing landowners in the rural areas to maintain the rural character of their property. Maintaining rural character is one of the most frequently cited goals in comprehensive plans. The Maine VP SAMP adds another tool for accomplishing this goal by remunerating landowners for protecting an asset valued by the entire community.

B. Likely benefits resulting from implementation

A local, bottom-up approach can improve conservation of these small wetlands, particularly because their small size means that these features can usually be protected while allowing some traditional activities such as forestry, fishing, and agriculture to continue nearby. Similarly, because these features typically are small enough to be owned by a single landowner, local approaches to conservation on private land are likely to reduce coordination efforts and management costs when compared to higher-level management (Hunter 2008; Jansujwicz et al. 2013a). Furthermore, collaborating with individual landowners can empower local government, ideally in a way that complements environmental management driven by state and national governments (Jansujwicz et al. 2013b).

1. Ecological

The proposed Maine VP SAMP better meets the spirit of the existing federal and state natural resources regulations to protect and maintain our resources for the long term. The Maine VP SAMP allows a local, proactive approach that prioritizes pool resources based on both breeding pool quality and the likelihood that the surrounding landscape will support the post-breeding habitat needs of the amphibian target species (all of which live in terrestrial environments for greater than 95% of their lives). Using the Maine VP SAMP, only the highest priority pools embedded in suitable post-breeding habitat (not simply the 250 foot State Zone of Consultation or the 750 foot Federal regulatory radius of permitting) will be targeted for conservation. Local knowledge and an incentivized program will result in far better vernal pool conservation for the long-term than does the

status quo, top-down, one-size fits all approach (Jansujwicz et al. 2013b). This approach will ensure connectivity among wetlands and other resources thereby providing wildlife corridors in an otherwise developing town. This can be achieved by adherence to the Maine VPCC to identify high priority vernal pool conservation opportunities and through the proactive planning of land trusts or other third party holders who are dedicated to linking undeveloped properties at many scales. A local, landscape level approach also protects broader pool ecosystem functions such as carbon transport to forests, water storage, and oases of food and moisture for signature wildlife such as moose, deer, and bear.

2. Economic

There are numerous economic benefits to this approach. Regulators spend less time processing permit applications. Applicants have a transparent market-based mechanism when impacting vernal pools in growth areas that speeds up the approval process and reduces uncertainty. This can improve investors' confidence and attract economic development to participating municipalities (BenDor and Riggsbee, 2011). Rural landowners will be compensated for protecting vernal pool habitat thus receiving economic benefits while maintaining the rural character of their property in perpetuity. Conservation of vernal pools through this mechanism may provide land trusts with matching funds to leverage larger conservation initiatives. Such a partnership with land trusts will provide the expertise needed to carry out conservation deals involving multiple landowners.

3. Social

The social benefits are rich. This program would put control of town character back into the hands of the citizens and empower local governments to make planning decisions that buoy both economic development and maintenance of the ecological richness or rural character of the municipality. The SAMP increases predictability and reduces risk for applicants. Local land trusts or other conservation organizations strengthen their partnership with municipalities, improving civic capacity for conservation and an integrated approach to resource management.

4. Regulatory

Adoption of the Maine VP SAMP by local government will reduce the permitting load of both federal and state regulators. Currently, the burden on regulators who are faced with assessing and regulating impact on multiple resources on a project-by-project basis is resulting in reduced efficiency in resource protection given high regulatory workloads and limited funds and personnel for enforcement.

C. Potential adverse ecological and economic impacts

This novel mitigation approach is not without its uncertainties. In this approach, the town would collect a fee from a landowner who intends to develop on or around a vernal pool in the designated growth area, transfer the fee to a third party land conservation organization, and, when enough money has been raised, the third party would purchase via fee or conservation easement land in the rural area where high value vernal pool habitat is located. There is a risk pool loss will not be compensated for in the same time frame as the impacts to them. However, mechanisms can be put in place to address this concern including the requirement

that the mitigation funds be spent within three years of their capture. Finally, the science for predicting how many pools, and in what spatial configuration in any given area, are needed to support pool-breeding amphibians is ongoing (see below under VI(B)(3)Research).

From an economic perspective, it is vital that this program is at the best scale to be economically viable. There must be (1) enough demand for development in the growth area to generate sufficient fees for conserving land in the rural area, (2) landowners in the rural area willing to ‘supply’ land to be conserved, and (3) sufficient funds to cover transaction costs of the regulatory scheme so that neither landowners nor the town find it too expensive to engage in the program. Research on wetland mitigation banks and transferable development rights (TDRs) suggest that there be a ‘thick’ market (as determined by the size of the area and the number of participating actors) to encourage the amount of buying and selling of credits/development rights for the program to remain active and viable (McConnell et al., 2006; Robertson & Hayden, 2008; Womble & Doyle, 2012). For example, TDR programs rely on a strong demand for additional density in receiving areas, and the lack of demand is probably the biggest problem for many TDR programs (McConnell et al., 2006). In addition, wetland banks themselves (the ‘supply’ of conservation) tend to be located in areas with lower land values (Robertson & Hayden, 2008), indicating the role that economics plays in trading schemes. As Womble and Doyle (2012) explain, thick markets enhance competition; more efficiently allocate resources, and make prices more predictable and less volatile. However, these same studies indicate that offering larger, more flexible markets also result in more fragmented development. It is expected that a vernal pool regulatory scheme that relied on market forces would be subject to many of the same economic factors that influence the success of wetland banks and TDR programs. It is uncertain if a town could provide a thick enough market; there may only be a handful of parcels in a town’s growth area that contain vernal pools, greatly limiting the demand for the program. Similarly, some towns may only have a few areas in their rural areas with high quality vernal pools, greatly limiting the supply of conservation options and potentially encouraging those landowners to hold out and increase the price of their land when approached for purchase of a conservation easement. In order to try to control for these issues, this Maine VP SAMP allows for funds to be used for shared vernal pool priority areas in contiguous towns and has been designed with the following safeguards:

- Appropriate fees –high enough to contribute meaningfully to a conservation bank, but not too high to dissuade the applicant from utilizing the program. The Maine VP SAMP is a voluntary mechanism; the applicant need not choose to use it.
- A meaningful role for local land trusts in the program – from helping to identify high conservation priorities (based on local knowledge), to negotiating conservation deals with rural landowners (they have more experience with this than the towns), to fundraising (either through member drives or grant applications). Those land trusts, serving as the ‘third party’ in this SAMP will be allowed to receive a small percentage of the fees collected to cover their administrative costs in a fashion similar to Maine’s Natural Resource Conservation Program. In exchange, the land trusts would be taking some of the administrative costs away from towns, and adding value to the applicant fees collected to allow for larger vernal pool conservation efforts through fundraising.

APPENDIX 4: BACKGROUND

A. The Resource

In glaciated northeastern and mid-western North America, vernal pools are temporary to semi-permanent waters occurring in shallow depressions in forested landscapes. They typically fill in spring with snow melt and precipitation or in fall with rising water tables, and typically are dry by summer's end. Vernal pools are typically embedded in a forested landscape containing other wetlands; connectivity with other wetlands and relatively undisturbed forest is important because pool-breeding amphibians require these habitats for migrating, dispersing, foraging, and hibernation (Semlitsch 2002; Faccio 2003). Vernal pools occur in a diversity of landscape settings including upland and floodplain depressions, as part of headwater streams and seepage systems, or embedded in larger wetland complexes, particularly wooded wetlands (Calhoun and deMaynadier 2008). They are free of permanent fish populations and provide ideal breeding habitat for invertebrate and amphibian species sensitive to depredation by fish and other predators associated with permanent waters. Indicator species in our region include mole salamanders (*Ambystoma* spp.), wood frogs (*Lithobates sylvaticus*), and fairy shrimp (*Eubranchipus* spp.) (Colburn 2004). Additionally, vernal pools are important habitat for a number of endangered and threatened species such as Blanding's turtles (*Emydoidea blandingii*) and rare dragonflies (e.g., ringed boghaunter (*Williamsonia lintneri*; Calhoun and deMaynadier 2008).

Vernal pools provide functions that extend well beyond their physical footprint; that is, their small size understates their significance (Hunter 2008). The spring migration of breeding amphibian adults to pools provides a predictable food supply for many animals including New England signature wildlife such as bear, deer, and moose along with many species of small mammals (e.g., raccoon, mink, weasels), waterfowl, turtles, and other amphibians. This spring influx of amphibian biomass is followed by a nutrient and protein-rich resource of egg masses, embryos, and developing larvae within the pool providing an array of protein resources for wildlife feeding in pools throughout the growing season. As fall approaches, juvenile amphibian and invertebrate emergence from the pool provides an important export of nutrients to forest wildlife and soils (Gibbons et al. 2006). At a broader scale, vernal pools often serve as "stepping stones" among other wetland types and aquatic habitats. Maintaining habitat connectivity among vernal pools and wetlands provides wildlife corridors for diverse species beyond pool-dependent amphibians.

Vernal pools potentially provide important hydrologic and biogeochemical services that link aquatic and terrestrial ecosystems through carbon transfer and nutrient cycling. Pools may be biogeochemical hotspots in an upland matrix (e.g., enhanced levels of decomposition, nutrient cycling and transport) (Capps et al. 2014, Marton et al. 2014).

B. The History

1. Legislation

Maine, like many New England states, has struggled with providing effective protection for smaller wetlands including vernal pools. Vernal pools were designated as "Significant Wildlife Habitat" in 1995 by the State of Maine; however, the requirement that Significant Vernal Pools be defined and mapped by MDIFW before they could be regulated was never

acted on due to lack of agency resources, the difficulty of pre-identifying small wetlands using aerial photography, and an agency position that vernal pool protection might better be accomplished through non-regulatory efforts. At that time, neither the public nor regulators knew much about vernal pool ecology or about their distribution in Maine.

In 1998, a Vernal Pool Working Group (VPWG) comprising federal and state agency representatives, wetland ecologists, consultants, and forestry interests was formed by the Maine State Planning Office to develop a statewide strategy for addressing vernal pool resources. The group worked for ten years to fill four key gaps needed to be addressed before any regulatory action would be acceptable to the public: (1) public outreach and education about the resource; (2) research on pool breeding amphibians' post-breeding habitat needs; (3) an evaluation of the feasibility of both voluntary and regulatory approaches in terms of implementation and desired outcome for the resource; and (4) a preliminary inventory and assessment of the resource.

2. Public outreach and education

Using the best available information on vernal pool ecology, including informational documents produced by other New England states, Maine Audubon Society (MAS) and the University of Maine produced *The Maine Citizen's Guide to Identifying and Documenting Vernal Pools* in 1999, with a second edition in 2003. MAS also initiated the Very Important Pool (VIP) program, a citizen-science project to inventory and assess a sample of vernal pools across in southern, central, and northeastern Maine. The program continued for 5 years with trained citizens collecting data on pool-breeding amphibians (including egg mass counts) in pools. The strategy was to raise the profile of vernal pools, engage the media to help to introduce vernal pool ecology and the importance of these small wetlands to the public (through newspaper articles, magazine features, and public television segments), and to gather some baseline inventory and assessment data on vernal pools in the most developed areas of Maine. Trained citizen scientists collected amphibian breeding data for up to five years on 97 pools (see Calhoun et al. 2003 for project outcomes). The data from this citizen-based initiative and ongoing University of Maine research initiatives were used to help the VPWG craft a vernal pool conservation strategy that explored both voluntary and regulatory approaches and to draft a definition of vernal pools and a subset of ecologically exemplary pools called Significant Vernal Pools.

Many members of the VPWG believed that a voluntary approach to vernal pool protection, piggy-backing on the broad educational initiative that had been established in the late 1990s, would be sufficient to protect Maine's vernal pool resources. As a result, members of the VPWG produced two practitioner manuals to provide management guidelines for development and forestry practices. *Best Development Practices* (Calhoun and Klemens 2002) and *Habitat Management Guidelines for Forestry* (Calhoun and deMaynadier 2004) were published and dozens of workshops were given around the State to introduce the concepts developed in these voluntary guidelines (see Jansujwicz and Calhoun 2010 for a description of this process).

3. Research

In response to VPWG request for research to fill information gaps on vernal pool functions and pool-breeding amphibian habitat requirements, and in the time since, the University of Maine vernal pool lab (run by Drs. Aram Calhoun and Malcolm Hunter) has authored over 70 peer-reviewed journal papers and 3 books on vernal pools; over 30 graduate students have and continue to conduct research on vernal pool amphibian breeding and post-breeding habitat needs as relevant to forestry and development interests. The results of this research have been considered in Maine's regulatory policies. In 2009, the lab received, with other UMaine colleagues and sustainability projects, a National Science Foundation EPSCoR grant (2010-2014) to engage stakeholders in developing solutions to complex natural resource issues. One of the focus research teams was a Vernal Pool team (headed by Calhoun) focusing on addressing both ecological and economic solutions to vernal pool conservation at the local level. In 2013 the team received another four year grant from the National Science Foundation's Coupled Natural Human systems program (CNH) to continue the work with economists, biologists, and local municipalities to study conservation of natural resources on private lands (using vernal pools as a model) to help create innovative policy mechanisms to facilitate this while maintaining pool breeding amphibian populations in urbanizing landscapes. The simulation models that will be produced from this project will help towns to test the effects of different development scenarios on the vernal pool resource and economic outcomes under different conservation scenarios. Graduate students on this grant are looking at the biogeochemical functions of pools along an urban gradient, responses of amphibians to development along an urban gradient, and the economic impact of the status quo regulations and different policy scenarios.

4. Voluntary and regulatory approaches

The forestry community was receptive to the guidelines produced by Calhoun and deMaynadier (2004) and continues to implement the habitat management guidelines as best they can. These guidelines have been adopted by state agencies (e.g., Maine Forest Service [MFS]) and by a number of the private commercial forest interests. However, losses due to development, more detrimental to vernal pool habitat including uplands adjacent to pools, were not being addressed by a strictly voluntary approach (Calhoun et al. 2014). The working group ultimately decided that while voluntary approaches were appropriate for managing pool resources in commercial forests, a regulatory approach was better suited for the development community. Members of the group helped to craft legislation and guide it through the legislature. As a result, the Maine legislature passed regulations specifically pertaining to vernal pools in 2006 which took effect in 2007. The Maine Natural Resources Protection Act (NRPA) now protects a *subset* of ecologically outstanding vernal pools (known as Significant Vernal Pools or SVPs) as Significant Wildlife Habitat. "Significance" is determined by threshold egg mass counts of pool-breeding amphibians (i.e., wood frogs, spotted salamanders, and blue-spotted salamanders), or the presence of fairy shrimp and/or an endangered or threatened species. Under NRPA, landowners must consult with the Maine Department of Environmental Protection and obtain a permit before they can alter the area within 250 feet of a SVP. A *permit by rule* option expedites the review process and enables landowners to develop up to 25% of the area within 250 feet. Further impetus for a stronger state voice was given in 2000 after the New England

District of the U.S. Army Corps of Engineers included review of impacts to vernal pools of any size in its renewal of state programmatic permits.

5. Resource inventory and assessment and proactive management

There was a lot of concern from the public after the SVP regulation passed. There is no statewide inventory of potential vernal pools and the burden is upon the landowner to determine whether or not they have a SVP before they can develop land adjacent to a vernal pool. To assist landowners and communities in mapping and assessing vernal pools in advance of development, the University of Maine and Maine Audubon Society initiated the community based Vernal Pool Mapping and Assessment Program (VPMAP) in 2007. VPMAP works collaboratively with Maine towns to develop vernal pool databases (see Jansujwicz et al. 2013a). To date, this program has trained hundreds of citizen scientist volunteers and with their help, proactively mapped potential vernal pools in 13 Maine towns, largely in the rapidly developing mid-coast region.

Specific goals of the VPMAP were to:

- Engage interested towns as partners to proactively map potential vernal pools;
- Assess vernal pools for state Significance under the NRPA regulations;
- Raise awareness of vernal pools through citizen participation and collaboration;
- Reduce uncertainty for applicants and landowners through pre-identification;
- Provide lay-friendly information on vernal pool resources and regulations.

In association with this program, the University of Maine team has created a web page that provides all the training materials and videos that a town or regional organization would need to undertake a vernal pool mapping and assessment program (See <http://vernalpools.me> and the Maine municipal guide to mapping and conserving vernal pool resources [Morgan and Calhoun 2013]) and has hired a consultant to develop other social media (facebook, blogs, twitter, see <http://ofpoolsandpeople.weebly.com/>).

In a continued attempt to increase awareness and alleviate public confusion, the University of Maine vernal pool researchers, Maine Audubon, and state biologists and regulators have been regularly featured in news articles, on public radio and in public television programs such as Maine Watch and Sustainable Maine. The UMaine team has also produced an informational documentary on vernal pools, Pools of Life, which is available on the website (<http://vernalpools.me>).

APPENDIX 5: LITERATURE CITED

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