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# Vernal Pool Assessments and Amphibian Surveys- Local Action to Preserve Biodiversity

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## PSU Integrated Cluster (IC) Project Funding Process & Proposal Form

**Project Proposal Submittal Process:** All IC projects requesting funding will require the completion and submittal of three (3) forms:

- ☒ **Project Proposal Form – project scope & outcomes** (*included in this document*)
- ☒ **Project Guidelines Form – reflective document outlining desirable IC project attributes**
- ☒ **Project Budget Form – Excel spreadsheet to facilitate budget planning**

### **Instructions for Submitting Project Proposals:**

- ✓ Download the 3 forms to your computer
- ✓ Complete the forms and save them; including the title of your project in the file name
- ✓ Forward the 3 files via email to the IC Project Manager, Ross Humer  
[rhumer@plymouth.edu](mailto:rhumer@plymouth.edu)
- ✓ Project Proposal will be logged & forwarded to the appropriate IC Guide Team

If not reviewed in advance of the submission, it is important to discuss the Project with the IC Guides to review, refine, and rework (if necessary) to obtain funding approval.

**Project Funding Review Process:** All proposed projects will be reviewed by the Cluster Guide team. Depending on the level of funding amounts being requested, the proposal request will follow the process outlined as follows:

- **Level 1:** Any project with a proposed budget of less than or equal to \$1,000 can be approved by the Cluster without additional review
- **Level 2:** Any project with a proposed budget of \$1,000 but less than \$5,000 can be approved by the IC Project Review Team, which is made up of representatives from each of the 7 Clusters (*see release time exception directly below*)
- **Level 3:** Any project with a proposed budget of \$5,000 or greater **or** requires faculty release time, must be first endorsed by the IC Project Review Team and submitted to the Academic Deans for review and approval

The project funding approvals are limited to one academic year; projects which require additional funding in subsequent years will need to be resubmitted annually for review and approval.

**Deliverables:** At the conclusion of the academic year, a deliverable to the Integrated Cluster Proposal Review Team and Academic Deans is required in order for the project director/coordinator, artist, or author and collaborator(s) to be eligible for future funding. This reporting requirement may be met by numerous means which will be identified as this process matures. It is anticipated that awardees will present their works before a wide public gathering to be scheduled during the upcoming Academic Year.

**Instructions for the PSU Integrated Cluster Project Proposal Form:** Please complete all of the elements of the following form in the spaces provided before saving and then submitting the document.

## **PSU Integrated Cluster Project Proposal Form**

**Title:** Vernal Pool Assessments and Amphibian Surveys- Local Action to Preserve Biodiversity

**Project Leadership:** Rachelle Lyons

The following proposal is a multi-phase project with potential for expansion to serve a larger geographic area and build upon the successes and structure that this innovative work will establish. This project is divided into three phases. Phase I work has already begun Spring '17 and, if funded, will continue into summer of 2017 to capture the peak amphibian migration and vernal pool activity. This is a critical period for collecting baseline data, providing student training and building structures and protocols to support successful work in the subsequent phases.

Phase II will begin in Fall 2017 and take advantage flurry of fall amphibian activity. This phase is critical for student research assistant to practice the necessary skills and build knowledge base and develop outreach communication materials in preparation for the Phase III.

Phase III is the largest and most demanding part of this project. Phase III, taking place in Spring 2018, will focus on a comprehensive effort to map vernal pool resources within the town of Plymouth and document the presence/absence of amphibian *species of special concern* and *species of greatest conservation need* as identified by the New Hampshire Wildlife Action Plan. This phase includes a significant outreach effort to cultivate community wide stewardship of vernal pool resources.

### **Project Description:**

Biodiversity declines are a major environmental concern. The current rate of species loss is comparable to that of previous mass extinctions (Cunningham,W.). Amphibians are suffering the highest rates of diversity loss, with nearly half of all amphibian species in decline (Johnson, P). Stressors and threats to amphibians include habitat fragmentation, disease, climate change and pollution. These threats are difficult to address due to the significant variation of impact specific threats pose at specific sites. This implies that local scale action is necessary to preserve populations. New Hampshire lacks sufficient presence/absence data of amphibian species which furthers hinders informed management and conservation strategies.

In collaboration with Plymouth municipal leadership, Plymouth Elementary School, Mountain Village Charter School, and private landowners; PSU faculty and students will perform on the ground assessments to identify critical amphibian habitats and breeding grounds, and document the presence/absence of amphibians in 'Greatest Need of Conservation' as identified by [2015 New Hampshire Wildlife Actin Plan](#). Through education, outreach and community engagement this project aims to document critical aquatic resources, preserve wildlife habitat, inform management practices and cultivate active resource stewardship.

This project engages students in exploration of world-wide biodiversity declines and nests the issue in local context. This approach engages PSU students in the process of perspective taking, navigating the concerns of multiple stakeholders and communication with diverse audiences. By documenting vernal pool habitats and amphibian presence/absence this project will fill data gaps; meeting an expressed need of New Hampshire Department of Fish and Game. This work will inform management decisions within the community and state agencies in an effort preserve biodiversity and protect critical aquatic habitats. Most importantly this project empowers students and landowners to be active agents of change fostering ecological diversity.

This effort would serve as a pilot to develop strategies for assisting communities with future amphibian species presence/absence surveys and vernal pool habitat documentation. There is potential to expand this project to other communities and run it consistently each spring with a team of PSU student experts, building the baseline documentation of amphibian status and advancing informed conservation action across the state.

Cunningham, W (2011) *Principals of environmental science*. New York, NY McGraw-Hill

Johnson, P. Amphibian diversity: Decimation by disease [Proc Natl Acad Sci U S A](#). 2006 Feb 28; 103(9): 3011–3012. Published online 2006 Feb 21. doi: [10.1073/pnas.0600293103](https://doi.org/10.1073/pnas.0600293103)

## **Project Goals and Outcomes:**

### **1. Project Goals – Briefly identify and describe the objectives of this project**

The project aims to cultivate community conservation action and ecological ethics right here in our backyards in an effort to preserve biodiversity. This work will engage and inspire collective action to address environmental challenges and opportunities. Wise resource management and stewardship, comes through developing understanding and appreciation of the natural world that surrounds and supports us. We will:

- Document critical aquatic habitats
- Identify presence/absence of amphibians
- Support local leadership by providing data for informed, prioritized stewardship actions
- Fill data gaps for state and regional agencies/organizations through the established [Reptile and Amphibian Reporting Program](#)
- Collect data to inform resource management actions that preserve biodiversity
- Promote sustainable development that is ecologically sensitive
- Raise landowners awareness of vernal pool resources and amphibian habitats
- Establish priority sites for amphibian monitoring and habitat conservation

## 2. Student Learning Outcomes – Outline the expected student learning outcomes

Students will:

- Gain field experience in assessment protocols and use of mapping technologies
- Describe the life history, range and conservation status of specific native amphibians
- Be able to identify amphibian species of Special Concern by sight
- Prepare communications materials for landowners interested in documenting vernal pools
- Serve as field mentors to K-12 science students
- Observe and participate in local scale conservation management
- Work with diverse stakeholders to put data into action
- Describe current threats to biodiversity
- Evaluate weaknesses in current amphibian conservation management strategies
- Analyze data to develop local scale conservation recommendations
- Plan, organize execute a multi-partner project

### **Rationale and Impact:**

Considering the questions below, please write your project rationale and impact statement.

#### **Project Rationale and Impact Statement:**

Loss of biodiversity is well documented as major concern the Anthropocene. We have garnered support for this project and participation from Plymouth Conservation Commission, Mountain Village Charter School, Plymouth Elementary School, three private landowners and New Hampshire Department of Fish and Game. There is an expressed lack of data for amphibian species occurrence across the state (see [NH Wildlife Action Plan](#)). Already, nine students from three majors and one international student are involved in this project, fostering transdisciplinary collaboration with external partners.

By conducting assessments and amphibian surveys students, landowners and municipal leaders have the opportunity to engage in active stewardship to address information gaps and foster ecological sustainability. This is a prime opportunity for PSU students to apply their studies to the significant concerns of biodiversity preservation while building their field skills, engaging in partnership and collaboration, and participating in the process of environmental decision making in context.

Opportunity for high impact learning for all participants is at the core of this project. Students will need to consider the concerns of multiple stake holders and recognize the fact that each situation is unique and comes with its own set of complications and opportunities; requiring them to think deeply and flexibly about possible solutions. This instigates an internal dialogue about norms and invites students to formulate questions about how and why the current circumstance came to be and sets the ground work for systems thinking. Decision making is complicated and requires deep understanding and breadth of knowledge in order to increase the likelihood of soundness. Decisions require collaboration and perspective taking. Decisions require accounting for time that extends beyond the immediate present. Hence, preparing students for problem solving that considers both current and anticipated contexts.

Our region faces environmental pressures from resource extraction, residential and commercial development and climate change. The area depends heavily on the health of natural resources to support recreation, tourism, and industry. An integral part of this project is the connection among researchers, landowners and municipal officials to promote informed stewardship of natural resources at the local level. In my past natural resource management work, on-the-ground assessments have proven to be an

effective method to educate and engage students, landowners and communities in the management of local resources. In order to encourage wise management and stewardship, a community must first be aware of the preciousness and complexity of the aquatic resources in their communities.

This project builds upon the informal volunteer efforts of nine PSU students and the vernal pool assessment lab that has been part of the ESP Field Studies course. This project provides opportunity for highly motivated students to dig more deeply into the exercise and pushes participants to expand their content knowledge and involvement in wildlife conservation. There is ample opportunity for additional student and faculty involvement.

## Project Team

PSU Project Participants (essential core team participants including faculty and staff)

Name	Position/ Title	Project Role	Discipline/ Specialty	Email
Rachelle Lyons	Research Assistant Professor	Project director	Natural Resources	rlyons@plymouth.edu
Dick Hage	PSU Retired	Volunteer Collaborating Landowner	Community liaison	Upon request
Zak Brohinski	Teaching Lecturer	Mapping mentor	Arc GIS collector	zabrohinsky@mail.plymouth.edu

Non-PSU Project Participants (stakeholders; partners; academic institution; etc.)

Name	Organization	Project Role	Discipline/ Specialty	Email
Chris Buckley	Plymouth Conservation Commission	Project collaborator	Municipal leader	Upon request
Jennifer Weatherbee	Plymouth Elementary School	Collaborating Educator	Science education	Upon Request
Allie Savage	Mountain Village Charter School	Collaborating Educator	Science Education	Upon request
Josh Megyesy	NH Fish & Game	State agency representative	Biologist	Upon Request

**Student Participant Profile** (Identify the student population/s to be engaged in the project. Identify if this has been or is planned to be incorporated into curricula)

PSU students from multiple disciplines are already active contributor to this project as volunteers. They have help conceptualize the future of this work and recruited addition student talents as needed. To date student participation has been voluntary and without incentive. These students have shown exceptional commitment and curiosity, working as an inter-disciplinary groups with community partners, elementary /middle school students and a state agency.

Class/ Student Organization/ Individuals	Role in Project	Academic Level (Undergraduate or Graduate)	Academic Discipline	Total Student Population
PSU student Volunteers	Field research and outreach coordination	UG	ESP, Undeclared, Environmental Planning	9
Intro to GIS	Field research and mapping	UG	GIS certificate candidates	5
Public School Volunteers	Field research team	K-12	science	28
ESP Field Studies	Data collection	UG	Enviro Science	15

### **IRB (Institutional Review Board) Compliance**

IRB Compliance: <http://www.plymouth.edu/office/institutional-review-board/>

- This project DOES NOT require IRB compliance
- This project DOES require IRB compliance (*complete below*)

IRB Approval Status: [Select an Option](#)

IRB Approval Date: [Click here to enter a date.](#)

Any funding approvals of IRB-required projects are contingent on obtaining IRB approval.

### **Project Management: Timeline and Milestones**

Identify the timeline for the project including start, completion, and major project milestones. A closing report will be required as a part of the project funding process.

**Project Start Date:** 4/14/2017

**Project Complete Date:** 6/29/2018

<b>Project Milestone</b>	<b>Milestone Description</b>	<b>Target Completion Date</b>
<b>Meet with PCC and external Partners</b>	<b>Write up project concept proposal</b>	<b>3/30/2017</b>
<b>Student RAARP training</b>	<b>PSU students develop Frog and Salamander ID proficiency</b>	<b>4/17/2017</b>
<b>Pilot PVP assessment</b>	<b>Conduct group site visit to practice PVP protocols</b>	<b>4/24/2017</b>
<b>Conduct 6 PVP assessments</b>	<b>Site visit assessments on public and private lands</b>	<b>6/5/2017</b>
<b>Develop Landowner PVP survey</b>	<b>Craft informative and inviting survey for Plymouth landowners interested in documented vernal pools on their property</b>	<b>6/30/2017</b>
<b>Develop ARC collector tool</b>	<b>Develop Vernal Pool specific ARC Collector application</b>	<b>6/30/17</b>
<b>Data submitted to NHF&amp;G and PCC</b>	<b>Submit Spring RAARP and assessment data to NHF&amp;G and PCC including map of documented vernal pools</b>	<b>6/30/2017</b>
<b>PHASE II</b>	<b>Fall 2017</b>	
<b>Pilot ARC Collector tool</b>	<b>Test and refine ARC Collector</b>	<b>9/30/17</b>
<b>Monitor fall amphibian activity</b>	<b>Visit prime habitats to document fall species activity /occurrence</b>	<b>10/30/17</b>
<b>Identify and document amphibian species occurrence</b>	<b>Report Amphibian Sights to NH Fish and Game</b>	<b>10/30/17</b>

<b>Draft outreach materials</b>	<b>Develop outreach strategy and draft communication materials</b>	<b>11/1/17</b>
<b>PHASE III</b>	<b>Spring 2018</b>	
<b>Spring Partner Relations Planning</b>	<b>Establish spring collaboration calendar with partners and identify events</b>	<b>4/30/2018</b>
<b>Student researcher trainings</b>	<b>Team to attend Vernal Pool Documentation training w/NHNRSA</b>	<b>3/15/2018</b>
<b>Community survey distributed</b>	<b>Invitation for landowner to have team assess PVP</b>	<b>3/15/2018</b>
<b>Publish informative outreach article on Vernal Pools</b>	<b>Describe project and how landowner can participate</b>	<b>4/1/2018</b>
<b>Survey results</b>	<b>Analyze and respond landowner survey</b>	<b>4/15/2018</b>
<b>Schedule &amp; assess PVP</b>	<b>Follow up with landowners interested in documenting vernal pools to schedule and conduct PVP assessment</b>	<b>5/10/18</b>
<b>Document/Map Confirmed Vernal Pools</b>	<b>Document confirmation evidence of confirmed vernal pools and create Vernal Resource Map</b>	<b>5/30/18</b>
<b>Map migration hotspots</b>	<b>Identify priority sites for amphibian monitoring and habitat conservation</b>	<b>5/30/2018</b>
<b>Publication in local and state media</b>	<b>Informative article on the Reptile and Amphibian occurrence in Plymouth and/or article on process and scaling up</b>	<b>6/1/2018</b>
<b>Identify and Prioritize Next Steps</b>	<b>Develop best approach for putting result into action</b>	<b>6/15/2018</b>

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Please identify any pre-project education or training for students, faculty, and staff that would be helpful for your project team to have in advance to begin work on a strong footing (e.g., skill training, concepts), and identify any training and education that you are willing to help provide during the preparatory period for the project team before team work formally begins.

Student Education/ Training Requirements: Frog and Salamander Identification and Vernal pool assessment training. (We have already started this. Next year it would be great for our students to attend the NHRSA vernal pool documentation training.)

ARC Collector application training for students and partners. Project team will need fluency with a specific ARC Collector application. PSU faculty member Zak Brohinski will provide this training.