March 14, 2023

Ref: 58122.02

Mr. Jon Kart
Vermont Fish and Wildlife Department
1 National Life Drive, Davis 2
Montpelier, VT 05620

Via electronic mail

Re: Green Mountain Power TL-105 Taftsville to Windsor Transmission Line Upgrade Project
Application for Endangered & Threatened Species Taking Permit

Dear Jon:

On behalf of Green Mountain Power ("GMP" or "Applicant"), VHB has prepared this application package to the Vermont Fish and Wildlife Department ("FWD") requesting an Endangered & Threatened Species Takings Permit ("Permit") per the Vermont Endangered Species Act, pursuant to 10 VSA §5408. GMP intends to conduct work required to support the proposed reconductoring and replacement of transmission structures along approximately 10.55 miles of existing 46kV transmission line from the GMP Taftsville Substation, the northern terminus, to the Vermont Electric Power Company ("VELCO") Windsor Substation, the southern terminus ("Project", or "TL-105). The Project is being undertaken by GMP. During natural resource field assessments conducted in 2018, GMP's consultant identified a potential occurrence of Fowlers toad, a state endangered species under the jurisdiction of the FWD, in the Town of Hartland. Based on this observation being confirmed by FWD through photograph review, and the nature of the proposed work, GMP is applying for a Takings Permit for potential incidental take that may occur during construction work within previously identified suitable habitat and during certain times of year when toads are not in hibernation. GMP is seeking this Permit pursuant to the terms of the Stipulation between GMP, and the Vermont Agency of Natural Resources.

Any potential taking of Fowler's toad would occur during Project construction, which is currently anticipated to commence on or about May 1, 2023, so GMP would ideally like to receive permit approval by this date. Construction monitoring activities will occur in accordance with protocols established in VHB's Fowler's Toad Identification, Survey, and Relocation Protocol ("ISR Protocol"), which was developed in coordination with FWD in March 2023. The anticipated need for permitted take is unlikely based on the Project location and design. However, through coordination with FWD, a robust set of monitoring protocols as outlined in the ISR Protocol was developed and will be instituted during construction. These protocols and the enclosed permit authorization request will help ensure protection of Fowler's toad in proximity to the identified habitats of discrete sections of the Project. Enclosed is a copy of the application with associated attachments and GMP proposes to remit payment, if necessary, at a rate of $250 per identified "take" during project activities at the end of construction.

40 IDX Drive, Building 100, Suite 200, South Burlington, Vermont 05403
P 802.497.6100 **F** 802.495.5130 www.vhb.com

Sincerely,

Melinda N. Squillace, CWB®
Wildlife Specialist, VHB

Tim Upton
Energy Market Leader – Vermont, VHB

cc: Kamran Hassan, GMP (electronic mail)
Debra Bouffard, Sheehey, Furlong, and Behm
David Cooper, VHB
Ryan Scott, VHB
Luke Groff, FWD
Andy Wood, FWD
Noel Dodge, FWD

Enclosures:
GMP TL105 Takings Permit Application for Fowler's Toad
GMP TL105 Fowler's Toad Identification, Survey, and Relocation Protocol
GMP TL105 Fowler's Toad Construction Monitoring Locations
GMP TL105 Daily Fowler's Toad Monitoring Form
GMP TL105 Fowler's Toad Identification Data Reporting Form
D. Cooper and M. Squillace Resumes

Agency of Natural Resources

1 National Life Drive, Davis 2
Montpelier, VT 05620-3702
802-828-1294

Application for Endangered & Threatened Species Taking Permits

Statutory Authority: 10 VSA §5408

Application Fees

$50 for permits issued for scientific, educational and noncommercial cultural or ceremonial purposes, to enhance the propagation or survival of a threatened or endangered species and for special purposes consistent with the federal Endangered Species Act.

$250 for each listed animal/plant taken up to a maximum of $25,000 for zoological and botanical exhibition purposes, and for incidental take. The Secretary may also require the implementation of mitigation strategies and may collect mitigation funds, in addition to the permit fees, to mitigate the impacts of a taking.

For research and survey projects for listed bats, please download the application form specifically for such projects from our endangered species permits page: https://vtfishandwildlife.com/conserve/conservation-planning/endangered-and-threatened-species/threatened-endangered-species-takings-permit

1. **Permittee/Applicant Name:** Green Mountain Power Corp.

   Institution (if applicable): N/A

   Principal Officer (CEO) of Institution: c/o Kamran Hassan, Leader of Engineering

   Physical Address/Town/St/Zip: 163 Acorn Ln. Colchester, VT 05446

   Mailing Address (if different): _____

2. **Name(s) & affiliation of subpermittee(s)**

David Cooper, VHB (resume attached)
Melinda Squillace, CWB®, VHB (resume attached)
Designee of Subpermittees (resume to be supplied upon request)

3. **Which species, and how many of each, will be collected or impacted**?
   (add additional rows if needed)

Common Name	Scientific Name	# of individuals to be collected/ impacted	% of population to be collected/ impacted
Fowler's toad	*Anaxyrus fowleri*	Moved as needed during construction	-

4 **Purposes for which you are applying for a takings permit** *(must meet one of the following)*:

___Scientific Purposes
___ Educational Purposes
___ Zoological Exhibition
___ Enhancing the propagation of a threatened or endangered species
___ Special purposes consistent w/ the federal Endangered Species Act
_X_ Incidental Take

Describe the purpose for which you seek a permit (1-2 sentences)

This permit relates to the proposed reconductoring and replacement of transmission structures along approximately 10.55 miles of existing 46kV transmission line from the Green Mountain Power ("GMP") Taftsville Substation, the northern terminus, to the Vermont Electric Power Company ("VELCO") Windsor Substation, the southern terminus ("Project" or "TL105"). The Project is being developed by GMP. During natural resource field assessments conducted in 2018, GMP's consultant identified a probable occurrence of Fowlers toad, a state-endangered species under the jurisdiction of the Vermont Fish and Wildlife Department ("FWD"), in the Town of Hartland. Based on this observation and the nature of the proposed construction work, GMP is applying for a Takings Permit for potential incidental take when construction work is occurring within the suitable habitat and when Fowler's toad are active. GMP is seeking this Permit pursuant to the terms of the 2/24/23 Stipulation between GMP, and the Vermont Agency of Natural Resources.

5. Detailed Explanation of Proposed Activities

Describe the proposed activity, why you want to do it, and how listed species and their habitats might be impacted.

Although entirely overland, the GMP TL105 corridor generally parallels U.S. Route 4 through Woodstock and Vermont Route 12 through northern Hartland for approximately 6 miles and continues its north-south alignment for an additional 4.55 miles through agricultural, residential, and forested land in southern Hartland and northern Windsor until it reaches its southern terminus. The Project consists of replacing aging utility pole structures and reconductoring the existing wire.

All construction activities will occur within the cleared rights-of-way ("ROW") and along pre-defined off-ROW access routes. Replacement structures will generally be installed at the same location or immediately adjacent to existing structures, however some structures will be in new locations based on engineering standards and to avoid or minimize impacts to natural resources. The Project will not include any widening of the existing ROW corridor, significant soil disturbance or earthwork that would result in the change of landform and will not include new tree clearing or cutting unless it is required to ensure safe working conditions near existing and proposed structures. The proposed TL105 project rebuilds approximately 10.55 miles of 46kV transmission line with 192 structures using vertical construction and 795 MCM ACSR within the existing transmission line corridor.

The potential taking of Fowlers toad would occur during Project construction, which is currently anticipated to commence in May 2023, subject to Vermont Public Utility Commission approval. Construction monitoring activities will occur in accordance with

protocols established in VHB's Fowler's Toad Identification, Survey, and Relocation Protocol ("ISR Protocol"), which was developed in coordination with FWD in March 2023 and is included as an attachment to this document. Take under this proposed permit may include the capture, handling, and transport and relocation (if necessary) of individual toads that are put in danger of injury or death by Project related construction activities. The anticipated need for realizing an actual permitted take is unlikely based on the Project location, design, and construction monitoring.

Though a take is not anticipated, permit authorization is being sought for the construction phase of the Project as the ROW traverses an area with a previously documented likely occurrence of this species. To minimize the potential for a direct take should individuals be present, construction monitoring will be conducted to identify and relocate, as necessary, any individuals that may be injured or disturbed by construction related activities (*i.e.*, heavy equipment moving, structure replacement, materials staging). Monitoring, handling, and relocation procedures are described in the ISR Protocol, attached.

The proposed monitoring activities would occur in the following locations and between March 16 and October 14 of a given year (based on hibernation of the species):

Map Sheet Number(s)*	Existing Structure Number	Nearby Wetland/Stream IDs	Nearby Roads / Landmarks	Town(s)
1	1, 2, 3	W01, W02	Hunt Road, VELCO Windsor Substation	Windsor
2	8, 9, 10, 11	W04, S02	Adjacent to I-91 Southbound	
3	16, 17	2021-SC-4, 2021-SC-5	Off-ROW Access, Access through farm on State Farm Road	
4	24, 25	W10, W11, S08	County Road, Chellis Road	
5-6	41, 42, 43, 44, 45, 46, 47, 48	W13, W14, W15, W15A, S09, S10, S11, S12	County Road, Rice Road	Windsor/Hartland
7	58, 59, 60, 61	W17, W18	County Road	Hartland
8	66, 67, 68	W01, S01	Brownsville Road	
9	77, 78, 79	W04	Town Farm Hill Road	
10	95, 96, 97, 98, 99	W18, W19, W20, S12, S13	VT Route 12, Fareham Farm Road	
11	107, 108, 109	W29, W30, S19, S20, S21	VT Route 12, Beaver Lane, Town Farm Hill Road	

12	121. 122. 208x, 209-1, 123, 124	W33, S23, S24	VT Route 12, Hartland Hill Road		
13-15	129, 130, 131, 132, 133, 136, 137, 138	W36, W37, W37A, W38, W40, W41, W41A, S25, S26, S27, S28, S29	VT Route 12, Chase School Road, Hideaway Hill Drive, Sportsmen Cove		
16-17	145, 230-4-2, 146, 147, 148, 149, 150, 151	W44, W45, W46, W47, S30	VT Route 12, Babcock Brook Lane, Barron Hill Road		
18-20	161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172	W49, W50, W51, W52, W53, W54, W55, W56, W57, W58, S31, S32, S33	VT Route 12, Forkbrook Road		

*For Map Sheet Number(s) and Existing Structure number reference, please see Attachment 1 of the ISR Protocol.

6. Is survey data available to indicate the size and/or extent of the impacted population for each species listed in section 3? No _X_, Yes ___.

Prior to commencing the proposed activities, a survey may be required to determine the extent and number of individuals of T&E species at the project location. The survey requires authorization from the Agency of Natural Resources (ANR) and shall be completed by an expert with experience/ qualifications acceptable to ANR.

For mapped habitat survey information on Fowler's toad, please refer to Attachment 1 of the ISR Protocol.

In general, field surveys for suitable Fowler's toad habitat were conducted during Fall 2022. No Fowler's toad were observed during field surveys, and areas with potentially suitable habitat were characterized and documented which will be used to inform areas subject to the construction monitoring efforts outlined in the ISR Protocol. Additional areas may be inspected opportunistically along the ROW while in the field if on-site staff feel it is appropriate based on professional judgment and discretion.

7. Provide a detailed explanation for the basis of the taking/impact.

For instance, if the basis is Scientific Purposes, demonstrate how the benefits of the proposed activities outweigh the impact(s) to the individuals and the populations.

If the basis is Incidental Take, explain:

A) Steps taken to avoid, minimize, and mitigate impact to listed species and/or critical habitat;

B) The benefits that would result if a permit is issued;

C) Why you believe the taking is necessary;

D) Why you believe the taking will not impair the conservation or recovery of T&E species;

E) Any alternative actions to the taking that you considered and the reasons that the alternative(s) were not selected.

Provide supporting documentation if applicable.

Per guidance from FWD, this permit authorization is being requested on the basis of Incidental Take. By implementing the construction monitoring protocols described in the ISR Protocol, the Applicant will be supplying FWD with weekly data logs (see ISR Protocol for the exact data to be gathered) regarding all encounters with toads. Data will also be provided to the Vermont Reptile and Amphibian Atlas (https://www.vtherpatlas.org/) for their database.

As described herein and in the ISR Protocol, the proposed impacts to individual toads will be limited to only those instances where entrapment or risk of injury from construction related activities occurs. There will be no purposeful harvest of individuals and no mortality is anticipated by the Project. The comprehensive monitoring procedures outlined in the ISR Protocol define acceptable actions in the case of an encounter and any necessary handling or relocation, therefore there are no anticipated impacts to the Fowler's toad population.

8. What is the time frame of proposed activities: May 1, 2023 to November 30, 2023*

*See answer to Question 15.

9. What are the qualifications & experience of person(s) conducting the proposed activities?

GMP will engage VHB to conduct the monitoring, handling, and relocation steps proposed in this application. The sub-permittees listed below are selected based on their experience with the species, or general experience with wildlife identification, study, and handling. In addition to the sub-permittees described below, VHB will train an environmental professional in the identification and handling of toads, which is also described in the ISR Protocol, to act as their designee during Project construction. The resumes of any individuals identified as designees will be provided to FWD prior to them implementing any work described in this application or the ISR Protocol.

David Cooper, lead Herpetologist on this permit, brings a wealth of knowledge, information and experience working directly with Fowler's toad in the eastern United States. David's experience with herpetology and other natural resources work is extensive, spanning over 20 years and consists of research, outreach, education, and conservation advocacy for reptiles, amphibians, and numerous other protected species.

Melinda Squillace is a professionally Certified Wildlife Biologist with a diverse skill set in wildlife research, monitoring, and management. She has worked with a multitude of North American wildlife species and is extremely experienced with optimizing survey and handling techniques for wildlife.

10. Which methods and equipment will you use?
If, for example, you seek authorization to translocate/transplant Threatened & Endangered Species, attach a translocation/transplanting plan identifying how specimens will be found and moved, where to, and how you propose to monitor the effectiveness of the translocation/transplanting.

For detailed information regarding capture, handling, and translocation protocol for the Project, please refer to the attached Fowler's toad ISR Protocol.

In general, the translocation of individual Fowler's toads will only occur if necessary to protect the animal from disturbance, harm, or death from construction related activities. Although unlikely, this would occur in cases such as when heavy equipment is being moved along the Project alignment, when replacement a structure, or staging material in an area where a Fowler's toad is observed foraging or traveling.

If a Fowler's toad is found to be in danger of being hit by equipment, on-site staff would look for an opportunity to reroute construction equipment around the identified individual. If it is determined that construction activity cannot successfully be diverted away from an observed toad, it would be captured by hand and relocated to the nearest similar habitat of the Project area outside of construction and access zones.

11. Where is your project location? Be as specific as possible and identify the town(s) and county. If field-based activities are proposed, attach a detailed map of project site(s).

For detailed information regarding the locations where toad monitoring will occur for the Project, please refer to Attachment 1 of the of the ISR Protocol.

In general, the field surveys conducted by VHB in September 2022 identified certain areas exhibiting suitable habitat for Fowler's toad. These areas, along with the 200-meter buffered general location where the individual Fowler's toad was found by a previous consultant will be monitored under this permit during construction activities when toads are not in hibernation. In addition, while on-site staff walk through portions of the ROW not highlighted in the map in the ISR Protocol, they will be encouraged to use their professional judgement and discretion in deciding if additional surveying is warranted.

12. **What are the possible impacts of the proposed activities on the target species or habitat?**
Include details about the numbers of plants and/or animals that will be taken/impacted, and/or the extent and nature of habitat alteration or destruction and efforts to minimize impact.

No takings of Fowler's toad are anticipated. It is possible, though unlikely, that toads will be moved out of construction areas for their protection (per ISR protocol). Injury or mortality of Fowler's toad is remotely possible but all feasible efforts will be made to avoid such impacts. If injury to a toad were to occur as a result of Project activities, veterinary treatment would be arranged in consultation with Luke Groff of FWD.

13. **What is your plan for conservation or mitigation of species or habitat impacted?**

The permittee proposes to avoid possible disturbance Fowler's toad to the extent practicable, with interaction (handling, relocation) used only to allow for clear photo analysis and as a last resort for protection of an individual animal.

For any Fowler's toad encounters, when it is determined that construction activity cannot successfully be diverted away from an observed toad without the likelihood of harming it or altering its behavior, it will be relocated to the nearest similar habitat of the Project area outside of construction and access zones and at a great enough distance that returning into the Project area during construction is unlikely. Specific location(s) for release would be at the discretion and professional judgement of trained individuals approved by David Cooper, Melinda Squillace and FWD.

14. **Final disposition of the specimens you collect (if any)?**

We do not anticipate any dead specimens being generated by our Project activities or collected unless they were found dead on the adjacent roadways as a result of non-Project activity (traffic). If that were the case, final disposition of specimens would be at the discretion of VTFWD. In the very unlikely instance of a mortality because of GMP TL105 Project activities, final disposition would also be decided by FWD.

Any living toads would be relocated to a location of suitable habitat and without risk to further disturbance by the Project. Final disposition of living specimens will therefore be in a safe area with appropriate habitat characteristics for success of the individual.

15. **If your project is proposed for a time of year that is more likely to impact listed species than other times of year, please explain why a permit should be granted during your proposed time-period.**

To ensure for timely and orderly completion of the Project, to avoid other resource impacts, and to minimize disturbance to surrounding property owners, once the CPG is issued, construction is proposed to commence in May 2023 - and be completed by November 2023. This schedule requires portions of the Project to occur when Fowler's toads are expected to be in hibernation (October 15 through March 15) at which time the Permit will not be utilized; and predominantly occur when Fowler's toads are active and there is the slight risk of take from March 16 through October 14. Although construction is expected to be complete by November 2023, if scheduling conflicts or a similar issue require construction to continue into 2024, this permit should maintain its validity for a total period of five years.

16. **Impacts to Migratory Birds:** Federal authorization is required for activities which might take birds (alive or dead, feathers, eggs and even nests). Federal migratory bird permits are issued by the US Fish & Wildlife Service Migratory Bird Office: 413-253-8643, https://www.fws.gov/birds/policies-

and-regulations/permits.php.

My proposed project will impact migratory birds, feathers, eggs or nests: _X__No, ____ Yes?

If yes: My migratory bird permit # is_____, it is valid until _____
(please include a copy with your application)

I don't have a migratory bird permit but will apply for one ____ Yes.

17. **Institutional Animal Care & Use Committee (IACUC) Protocol #** (if applicable)**:** _NA__

18. **Required attachments**

___ **Permit fees:** Make checks payable to: "**VFWD T&E Permit Fund 20345"**
$50 for permits for scientific, educational, and noncommercial cultural or ceremonial purposes, for enhancing the propagation of a listed species and for special purposes consistent with the federal Endangered Species Act.
$250 for each listed animal/plant taken up to $25,000 for zoological exhibition and incidental take.

_X_ **Map/Site Plan:** For field-based activities attach a map, of appropriate scale, identifying the location where field-based activities will occur.

___ **Scientific Research**: Include a research proposal/description and IACUC review and approval application or report with any T&E permit application for scientific research.

___ **Translocation/Transplanting Plan**: If you seek authorization to translocate/transplant listed species, attach a plan identifying how specimens will be found and moved, where to and how you propose to monitor the effectiveness of the translocation/transplantation.

___ **Importation**: For permits authorizing the importation of live specimens of threatened or endangered species a Veterinary Health Inspection report is required certifying the disease-free status of the specimens to be imported.

18. **Certification by signature:** I hereby affirm, under penalty of perjury, that the information, as well as any exhibits, documentations, and maps, are truthful to the best of my knowledge, that I am not delinquent in any obligation to pay child support or that I am in good standing with respect to any unpaid judgment issued by the judicial bureau or district court for fines and penalties for a civil violation or criminal offense. I also understand that false statements made on this application are punishable pursuant to 10 V.S.A. 4267 of Vermont state law.

Signature: Kamran A. Hassan **Date**: 3/14/2023

Submit signed application via email to jon.kart@vermont.gov or mail c/o "Permit Specialist" Vermont Fish & Wildlife Department, 1 National Life Drive, Davis 2, Montpelier, VT 05620-3702.

Endangered and threatened species taking permits are issued under the authority of 10 VSA §5408. Permits are issued for the purposes of taking (including collecting, disturbing, or possessing) individuals (or parts of) of species listed as Endangered or Threatened by the State of Vermont. Collection on lands posted according to 10 VSA §5201 or 13 VSA §3705 is unlawful without landowner permission.

ISR Protocol

Memorandum

To: GMP TL-105 Project Folder

Date: March 14, 2023

Project #: 58122.02

From: D. Cooper, Senior Environmental Scientist and M. Squillace, MS, CWB®, Wildlife Specialist

Re: GMP TL-105 Fowler's Toad Identification, Survey, and Relocation Protocol

In conjunction with in-person and/or virtual training, this document will provide resources and set protocols for approved VHB staff to utilize to successfully perform visual encounter surveys and appropriately handle individual Fowler's toads (*Anaxyrus fowleri*), should they be observed, during the reconductoring and reconstruction of approximately 10.55 miles of 46kV transmission line from the GMP Taftsville substation to the VELCO Windsor substation, in the towns of Woodstock, Windsor, and Hartland, Vermont ("Project"). The Fowler's toad is a protected species in Vermont and the intent of these surveys is to minimize and ideally avoid disturbance to toads during construction. This Protocol is to be used for construction activities that occur between March 16 through October 14 only and does not apply to construction activities from October 15 through March 15.

The Fowler's Toad vs. The American Toad

Habitat: Fowler's toads and American toads (Anaxyrus americanus) are both found in Vermont, and these two species can be difficult to distinguish, especially juveniles. Fowler's toads typically inhabit dry, sandy or rocky, poorly vegetated areas with well-drained soils, while American toads typically inhabit moist, forested areas. Both species breed in permanent or temporary water bodies (for the purposes of this Project, those bodies of water are designated Class I or II Wetlands, as well as any encountered open water features as identified by VHB).

Vocalizations: The breeding calls of the two species should easily be distinguishable, as the Fowler's toad produces a relatively short, harsh, nasal WAAAAAAANK, and the American toad produces a more melodious, prolonged trill.

Eggs: Eggs of the two species are similar in appearance, and are deposited in long, double strands.

Tadpoles: In early stages of development, tadpoles of both species are uniformly black. Later-stage tadpoles of the American toad remain almost uniformly black, and may have gold flecks, especially concentrated around the dorsum of the tail, while later-stage tadpoles of the Fowler's toad become more bronze and mottled in overall appearance.

Adults: Adults can be distinguished based on a suite of characters, which should be considered together when observing a specimen, and photo documented. The two species are known to hybridize, and hybrid specimens appear intermediate between the two species and may not be identifiable as one or the other.

- ***Postorbital ridge / parotoid gland position:*** American toads have prominent postorbital ridges (behind each eye) that are either separated from the parotoid gland or connected by a short spur extending back to the parotoid gland. Fowler's toads have less prominent, sometimes indistinct postorbital ridges that are typically contiguous with the front of the parotoid glands.
- ***Tibia (calf):*** American toads have larger warts on their tibias, with some tibial warts appearing distinctly larger than others. Fowler's toads generally have smaller, similarly sized tibial warts.

Memorandum

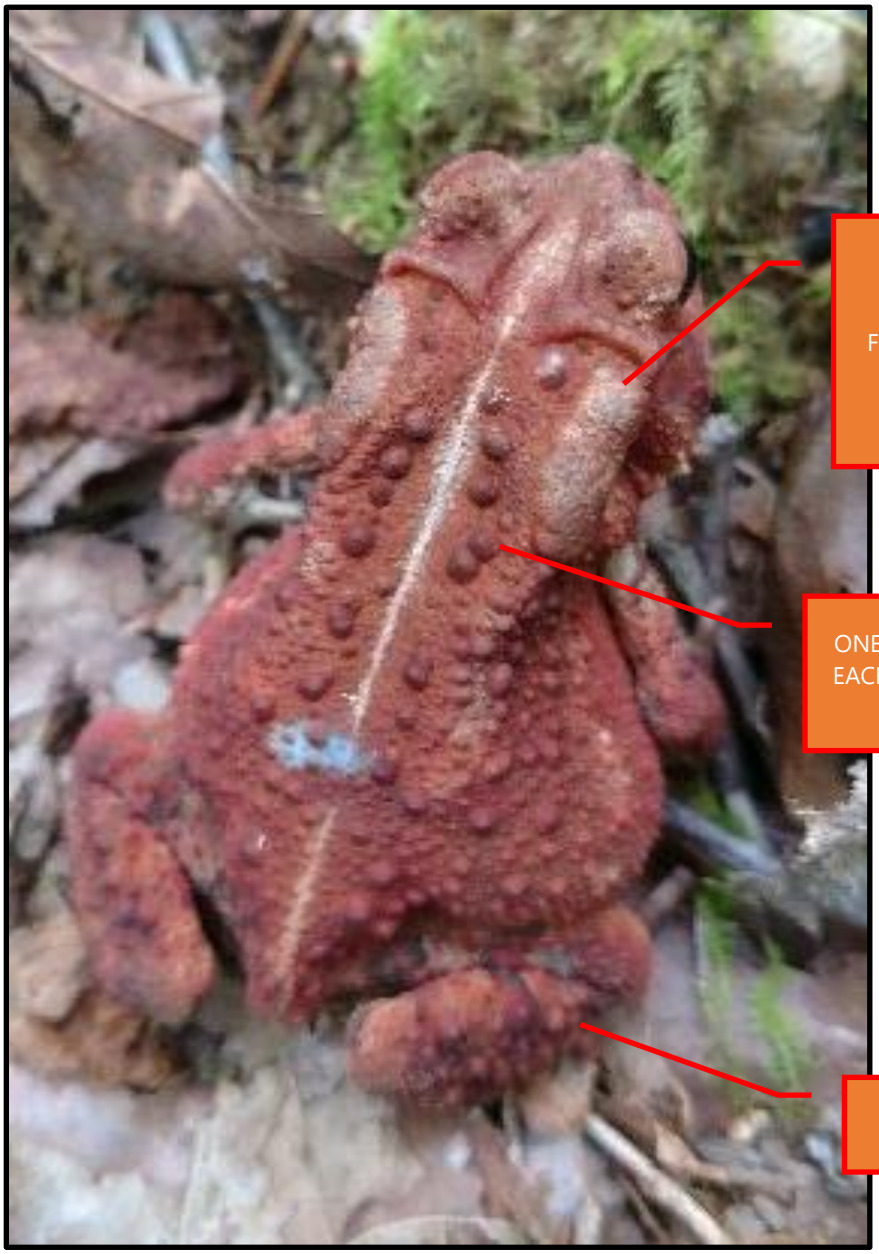
- ***Venter (belly) coloration:*** American toads typically have dark spots on the chest and anterior portion of the abdomen, while Fowler's toads usually have a uniformly light-colored venter, which may have one dark spot just below the throat. Adult males of both species have black or dark colored throats.
- ***Snout:*** When viewed from above, the snout of American toads is slightly broader and more rounded than that of the Fowler's toad, which is slightly more pointed.

See also these excellent resources:

- Virginia Herpetological Society Fowler's Toad Webpage: https://www.virginiaherpetologicalsociety.com/amphibians/frogsandtoads/fowlers-toad/fowlers_toad.php
- Virginia Herpetological Society American Toad vs. Fowler's Toad ID Guide: https://www.virginiaherpetologicalsociety.com/education/edu-graphics/toads/american_vs_fowler_toad.jpg

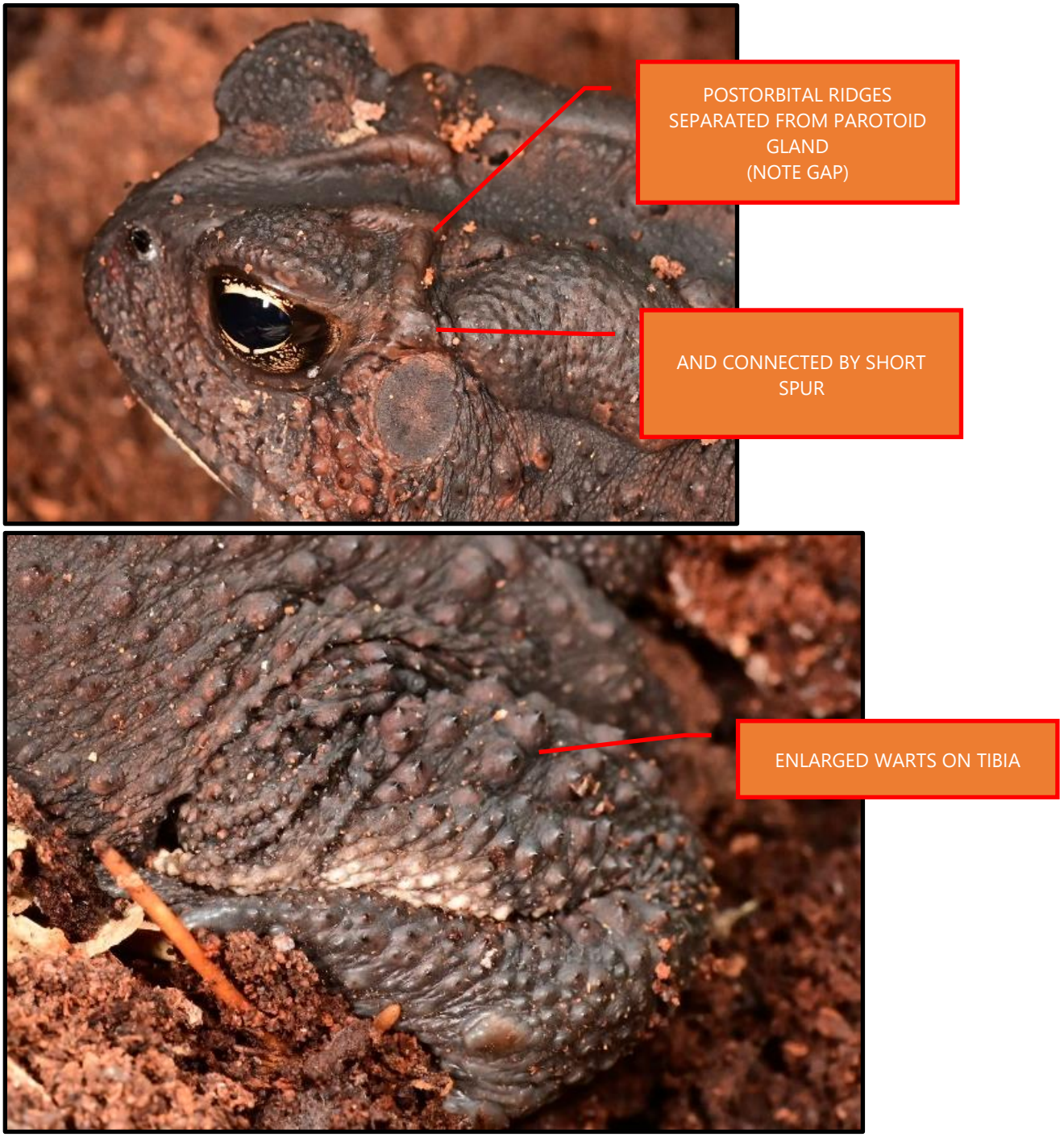
Memorandum

AMERICAN TOAD



Memorandum

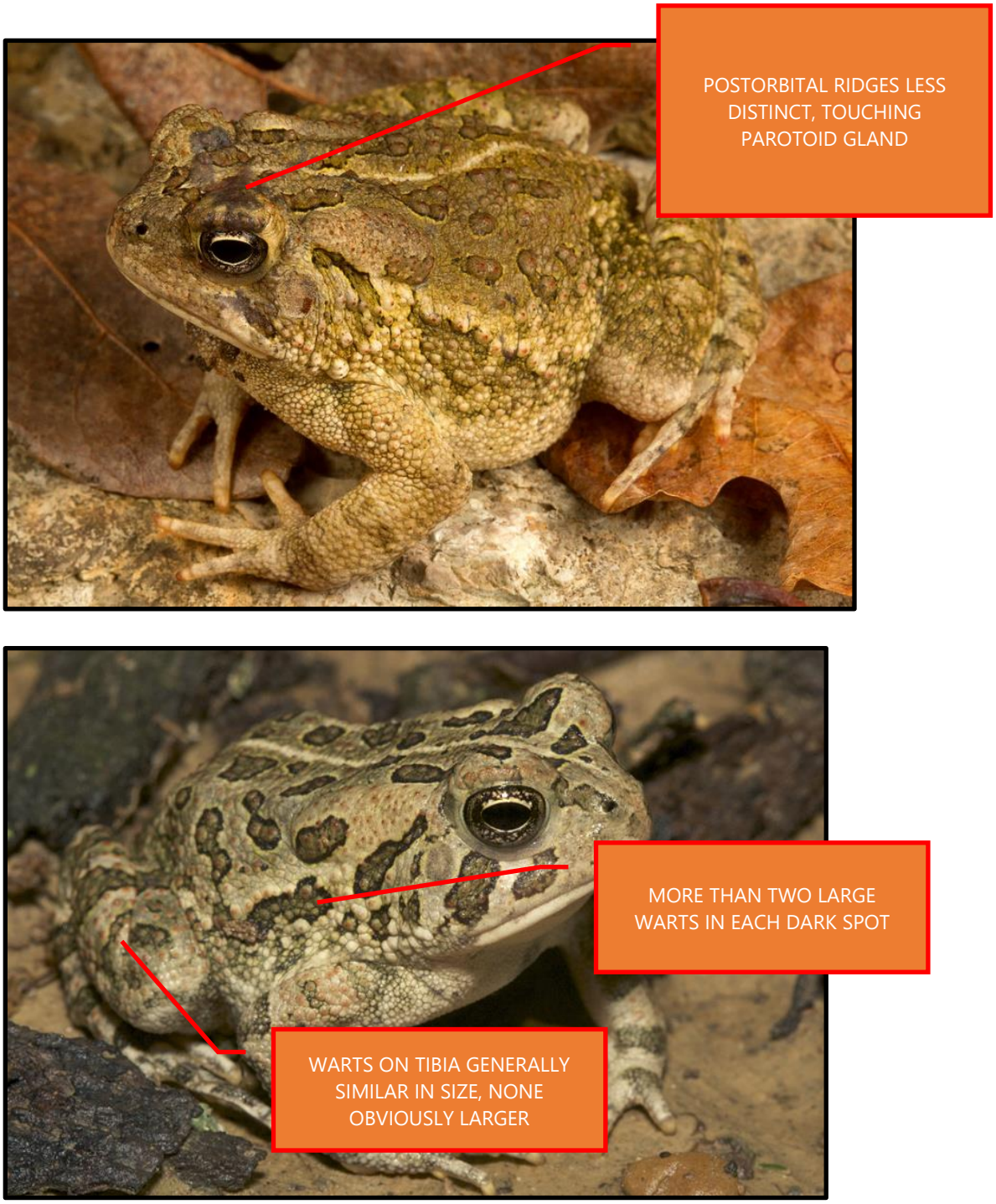
AMERICAN TOAD



Photos: David Cooper

Memorandum

FOWLER'S TOAD



Photos: Todd Pierson, from www.herpsofnc.org

Mitigation Measures

Exclusion fencing: Project implementation does not call for creation of excavated trenches, pits, or soil piles that would be in place for more than one day; however, if any of these are necessary to be used, and for more than one single day, barrier fencing will be installed. Barrier fencing will consist of silt fence buried at least four inches below ground which would fully surround pits, trenches, and soil piles.

Survey Protocol

Coordination with Biologists: If there is any uncertainty as to a specific decision or judgement that needs to be made in the field, please immediately contact Melinda Squillace at (802) 338-6180 or David Cooper (919) 741-5784 (office), (919) 906-3859 (cell, text preferred).

Coordination with construction and monitoring staff: Prior to the commencement of construction, hold an in-person or virtual training for monitoring and/or construction staff, and present a PowerPoint presentation that includes survey plans, goals, and photographs of Fowler's toad. While on site, communicate clearly with all construction staff, especially equipment operators, to advise them of the protected status of Fowler's toads and your role in the construction project. You are there both to ensure the project remains in compliance with the state's protected species laws and to facilitate the construction.

Field Monitors: The sub-permittee, as indicated in the Vermont Takings Permit, or their designee will conduct all field work related to Fowler's toad as outlined in this protocol. VHB anticipates that toad survey requirements can be conducted by the environmental professional contracted to conduct general environmental compliance monitoring and/or to provide Erosion Prevention and Sediment Control ("EPSC") Specialist services. All training and oversight will be conducted by the takings permit sub-permittee; however, daily sweeps may be conducted by their designee/environmental compliance inspector. The Project requires the environmental compliance inspector / EPSC Specialist conduct daily inspections of all on-going construction, provide recommendations for the Project to remain in compliance with applicable permits, and document restoration activities amongst other responsibilities. The daily presence and coordination with construction crews provide opportunity for the inspector to conduct sweeps ahead of equipment operation or movement, record daily records of progress and findings, coordinate outreach to FWD to satisfy the requirements of this protocol and the anticipated Takings Permit. The resume of the individual conducting oversight services will be provided to FWD prior to their work commencing on site.

Survey: Immediately prior to and during construction, as appropriate, conduct a walking, visual encounter survey of open, sandy areas within 100 meters of potential breeding wetlands previously identified by VHB or within 200 meters of the location of the previously encountered Fowler's toad (Attachment 1). However, if you end up walking through areas not highlighted as focal areas in the Monitoring locations map, you are encouraged to use your professional judgement and discretion in deciding if additional areas warrant possible attention for surveying. If a Fowler's toad is found, the survey protocol applies whether it is in an area highlighted on the map or not. All survey activities must be limited to the Project construction/Right-of-Way ("ROW") boundary though in order to avoid trespass onto private property. If any toads are encountered, all possible efforts should be made to achieve identification without handling the individual. Whether toads are observed or not, fill out a Monitoring Report Form (Attachment 2) daily for

submission to FWD the following Tuesday of the work week. Submitted reports should be succinct and with detailed information.

- Any such areas to be used for vehicle access or which will undergo ground disturbance should be surveyed prior to use, ideally daily.
- Binoculars can be handy in observing toads from a distance without disturbance.
- Look closely and carefully in any burrows or holes found, as toads may be visible in them. A strong light (or hand mirror, if sunny) is helpful for this.
- In addition to passive, visual encounter surveys, use a snake stick, potato rake, or your hands protected by sturdy work gloves to turn over any cover objects within the survey area. Use proper lifting technique to avoid injury, and do not attempt to lift anything heavier than you are comfortable lifting. Turn cover objects by reaching in front of them and lifting them up towards you, thus placing the cover object between you and any animals encountered.
- Any observed toads should be highly scrutinized to conclusively identify the species and subsequently documented using tablets with the corresponding map and survey template downloaded to them (Attachment 3). Don't be afraid to handle them using proper techniques in order to optimize photographs.
- While following all handling instructions to ensure protection of toads, take high-quality photos. At a minimum, the following photos should be taken to document suspected Fowler's toads.
    - From above: Postorbital ridge / parotoid gland / snout
    - Close-up of tibia
    - Venter / under throat

Handling and Relocation Protocol

In the event of a suspected Fowler's toad being identified in the Project area, notify the Vermont Fish and Wildlife Department ("FWD") within 24 hours. All efforts should be made to divert construction activity away from the observed individual. If a toad is found within a right-of-way ("ROW") access point, an adjacent access point should be utilized if feasible, and surveyed. If an individual is observed directly in the ROW, a wooden grade stake or similar marker should be placed at the toad and observers should survey the area immediately surrounding for possible presence of additional toads. If observers can determine there are no toads in the area surrounding the observed individual, construction equipment should be allowed to move around the individual while providing a wide berth. If the above conditions cannot be met and toad handling and possible relocation is deemed unavoidable, the following protocol should be strictly adhered to.

Toad handling:

- Prior to handling toads, put on disposable latex or similar gloves, as their skin is highly absorbent and the natural oils and any insecticides, perfumes, etc. on our skin are harmful to them.
- Support toads fully when handling; do not handle or grab toads by one or two legs as that could cause injury.

Toad Relocation:

When it is determined that construction activity cannot successfully be diverted away from an observed toad without the likelihood of harming it or altering its behavior, it should be relocated to the nearest similar portion of the Project area outside of construction and access zones. If no such areas are available, it should be temporarily held in a nearby

Memorandum

secure location. Every effort should be made to minimize handling and retention time and relocate the toad to a suitable nearby area as soon as possible.

- An ideal relocation area should be of similar temperature, substrate, and moisture as the area where the toad was found.
- Place relocated toads in a similar microhabitat to where they were found (under cover, out in the open, etc.). If placing under cover, lift the cover object, dig out a shallow depression underneath it and extending to its edge, and lower the cover object. Place the toad on the ground at the edge of the cover object, facing towards the excavated "burrow." Do not place cover objects on top of toads.
- Do not move toads more than 100 meters from capture site.
- Make sure construction staff are aware of the toad's new location and avoid the area with equipment.

Short-term Holding/Care:

If necessary to keep toads in captivity due to extensive, ongoing disturbance to the site of capture and surrounding area within 100 meters:

- Notify FWD within 24 hours.
- Adhere to handling techniques to capture toad,
- Toads should be held in a well-ventilated container, without inward facing jagged edges around ventilation holes/slots. If a screen lid is used, container should be tall enough to avoid toad rubbing its snout on the screen or jumping and injuring its snout on the screen,
- Secure container lid to avoid escape,
- Container should be kept in the shade, out of the sun,
- Provide about two inches of substrate from the place of capture in the bottom of the container,
- If it is deemed necessary to hold the individual more than 1 day, provide a shallow water dish, which may be of similar size to the lid of a peanut butter jar, turned upside down, filled with bottled spring water, non-chlorinated well water, or water from a local natural water source. Do not use chlorinated (or chloramined) tap water,
- Do not feed toads unless they are held for more than 2 days. Consult David Cooper (dcooper@vhb.com), if needed, regarding appropriate foods. Ideal foods are locally sourced crickets, worms, and small, non-stinging, non-aromatic arthropods from the study area. If fed crickets, ensure the toad eats them and remove any uneaten crickets. Crickets and other arthropods in captive enclosures may injure toads by biting them.

Disease Transmission Prevention:

- If handling multiple toads, discard gloves between toads to avoid inadvertent pathogen transmission.
- House only one toad per container.
- Disinfect containers between use for different toads. Refer to Horner et al. 2016 for full disinfection protocol.
- Fully rinse and dry equipment and containers after disinfection and prior to their next use.

Toad injury or mortality:

In the event of a Fowler's toad injury or mortality event, follow the steps below.

- Stop construction in the vicinity and ensure that no additional toads may be injured or killed.
- Place an injured toad in a holding container with only a damp paper towel as substrate.

Memorandum

- If a mortality event, place the toad in a sealed, clear plastic bag and place on ice in a cooler or in a refrigerator. Label the bag with the lat/long of the site where the animal was found, date, and collector.
- Contact Melinda Squillace or David Cooper to discuss the injury or mortality event and fill out the reporting form.
- Melinda or David will contact FWD to discuss how to provide veterinary care for an injured toad or disposition of specimens.

Attachments

1. GMP TL105 Fowlers Toad Construction Monitoring Locations
2. GMP TL105 Daily Fowler's Toad Monitoring Form
3. GMP TL105 Fowler's Toad Identification Data Reporting Form

References

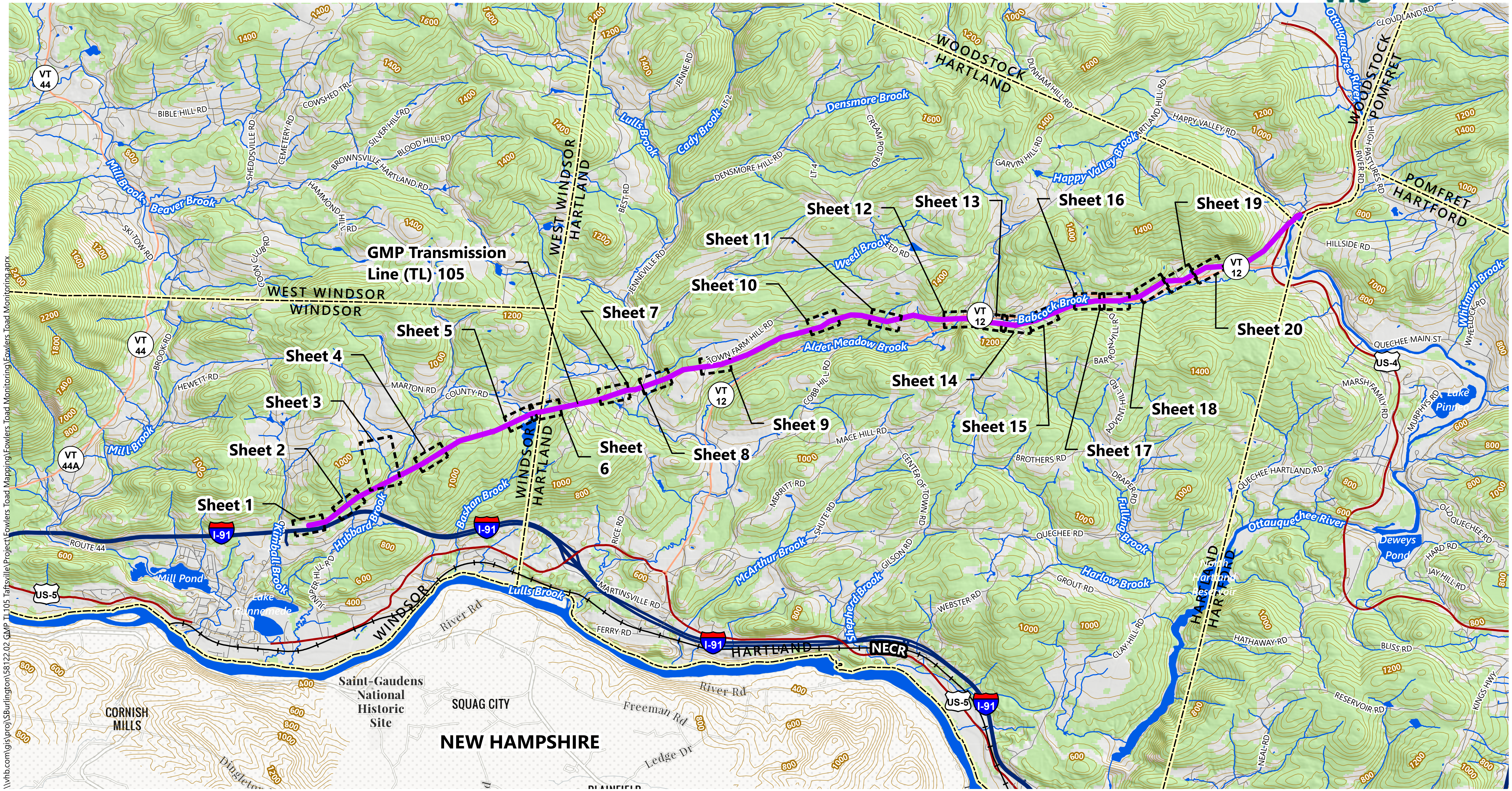
- GUIDELINES FOR USE OF LIVE AMPHIBIANS AND REPTILES IN FIELD AND LABORATORY RESEARCH Second Edition, Revised by the Herpetological Animal Care and Use Committee (HACC) of the American Society of Ichthyologists and Herpetologists, 2004. (Committee Chair: Steven J. Beaupre, Members: Elliott R. Jacobson, Harvey B. Lillywhite, and Kelly Zamudio). https://ssarherps.org/wp-content/uploads/2014/07/guidelinesherpsresearch2004.pdf
- Horner, A. A., Miller, D. L., and M. J. Gray. 2016. Disinfection of Field Equipment and Personal Gear, Southeastern Partners in Amphibian and Reptile Conservation, Disease, Pathogens and Parasites Task Team, Information Sheet #10R. https://drive.google.com/file/d/0B0RIvato4N7peFhxVHFMU2lSQUE/view?resourcekey=0-pO_v5E9SlTqLC55GiX9fvw
- Virginia Herpetological Society Fowler's Toad Webpage: https://www.virginiaherpetologicalsociety.com/amphibians/frogsandtoads/fowlers-toad/fowlers_toad.php
- Virginia Herpetological Society American Toad vs. Fowler's Toad ID Guide: https://www.virginiaherpetologicalsociety.com/education/edu-graphics/toads/american_vs_fowler_toad.jpg

Engineers | Scientists | Planners | Designers
40 IDX Drive, Building 100, Suite 200, South Burlington, Vermont 05403
P 802.497.6100 **F** 802.495.5130 www.vhb.com

Attachment 1

GREEN MOUNTAIN POWER

vhb March 08, 2023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Sheet 1
Sheet 2
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Sheet 5
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Sheet 15
Sheet 16
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Sheet 18
Sheet 19
Sheet 20
WEST WINDSOR
WINDSOR
WEST WINDSOR
HARTLAND
WINDSOR
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WOODSTOCK
HARTLAND
WOODSTOCK
POMFRET
POMFRET
HARTFORD
HARTLAND
HARTFORD
NEW HAMPSHIRE
CORNISH MILLS
SQUAG CITY
Saint-Gaudens National Historic Site
NECR
I-91
US-5
US-4
VT 12
VT 44
VT 44A
Mill Pond
Lake Runnemede
Lake Pinneo
Deweys Pond
Ottauquechee River
Densmore Brook
Happy Valley Brook
Babcock Brook
Alder Meadow Brook
Weed Brook
Lulls Brook
Cady Brook
Mill Brook
Beaver Brook
Kimball Brook
Hubbard Brook
Bashan Brook
McArthur Brook
Shepherd Brook
Harlow Brook
Rollins Brook
Whitman Brook

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Green Mountain Power TL105 Rebuild Project

Towns of Windsor, Hartland, and Woodstock, Vermont

- Right of Way (GMP)
- Sheet Outline (VHB)
- Railroad (VTrans)
- Town Boundary (VCGI) Town Boundary (VCGI)

Roads (VTrans)
- Interstate
- US Highway
- State Highway
- Town Road

Land Cover Mapping (VCGI)
- Open
- Developed
- Forested
- VHD Stream (VCGI)

- VHD Waterbody (VCGI)
- 50 ft Contour (VCGI)

Sources:
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GMP (Green Mountain Power - 2016-2017).
SGC (SGC Engineering - 2021)
NAI (Normandeau Assocates, Inc. - 2021)
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Fowler's Toad Monitoring Locations Map Series

Index Map

GREEN MOUNTAIN POWER

vhb

February 24, 2023

Buckland loam, 35 to 60 percent slopes, very stony (26E)

Glover-Vershire complex, 35 to 60 percent slopes, very rocky (20E)

TOWN OF WINDSOR

Vershire-Dummerston complex, 8 to 15 percent slopes, rocky (19C)

Start Project
Latitude: 43.49032
Longitude: -72.40837

W01 (2)

W02 (2) A

A

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0 50 100 200 Feet

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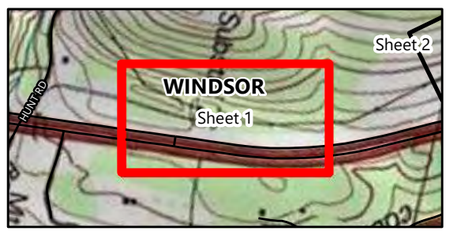

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Fowler's Toad Monitoring Locations Map Series

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GREEN MOUNTAIN POWER

vhb February 24, 2023

Glover-Vershire complex, 35 to 60 percent slopes, very rocky (20E)

Buckland loam, 8 to 15 percent slopes (25C)

Vershire-Dummerston complex, 15 to 25 percent slopes, rocky (19D)

TOWN OF WINDSOR

W03 (2)

S01 (I)

S01 (I)

W04 (2)

S02 (P)

S02 (P)

W05 (3)

7 7 8 9 8 10 9 11 10 11 12

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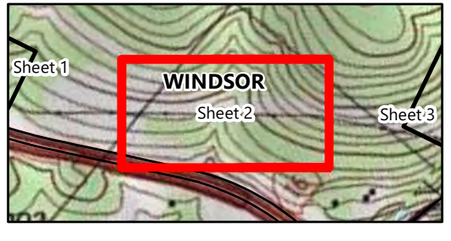

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Fowler's Toad Monitoring Locations Map Series

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GREEN MOUNTAIN POWER

vhb

February 24, 2023

Buckland loam, 15 to 25 percent slopes (25D)

Vershire-Dummerston complex, 15 to 25 percent slopes, rocky (19D)

Buckland loam, 35 to 60 percent slopes, very stony (26E)

TOWN OF WINDSOR

Vershire-Dummerston complex, 8 to 15 percent slopes, rocky (19C)

Buckland loam, 8 to 15 percent slopes (25C)

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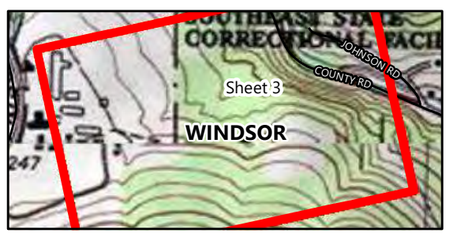

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February 24, 2023

TOWN OF WINDSOR

Vershire-Dummerston complex, 15 to 25 percent slopes, rocky (19D)

Glover-Vershire complex, 15 to 35 percent slopes, very rocky (20D)

Glover-Vershire complex, 35 to 60 percent slopes, very rocky (20E)

W11 (2) E

E

S08 (E)

S08 (E)

W10 (2)

22 22 23 23 24 24 25 25 26 26 27 27

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GREEN MOUNTAIN POWER

vhb February 24, 2023

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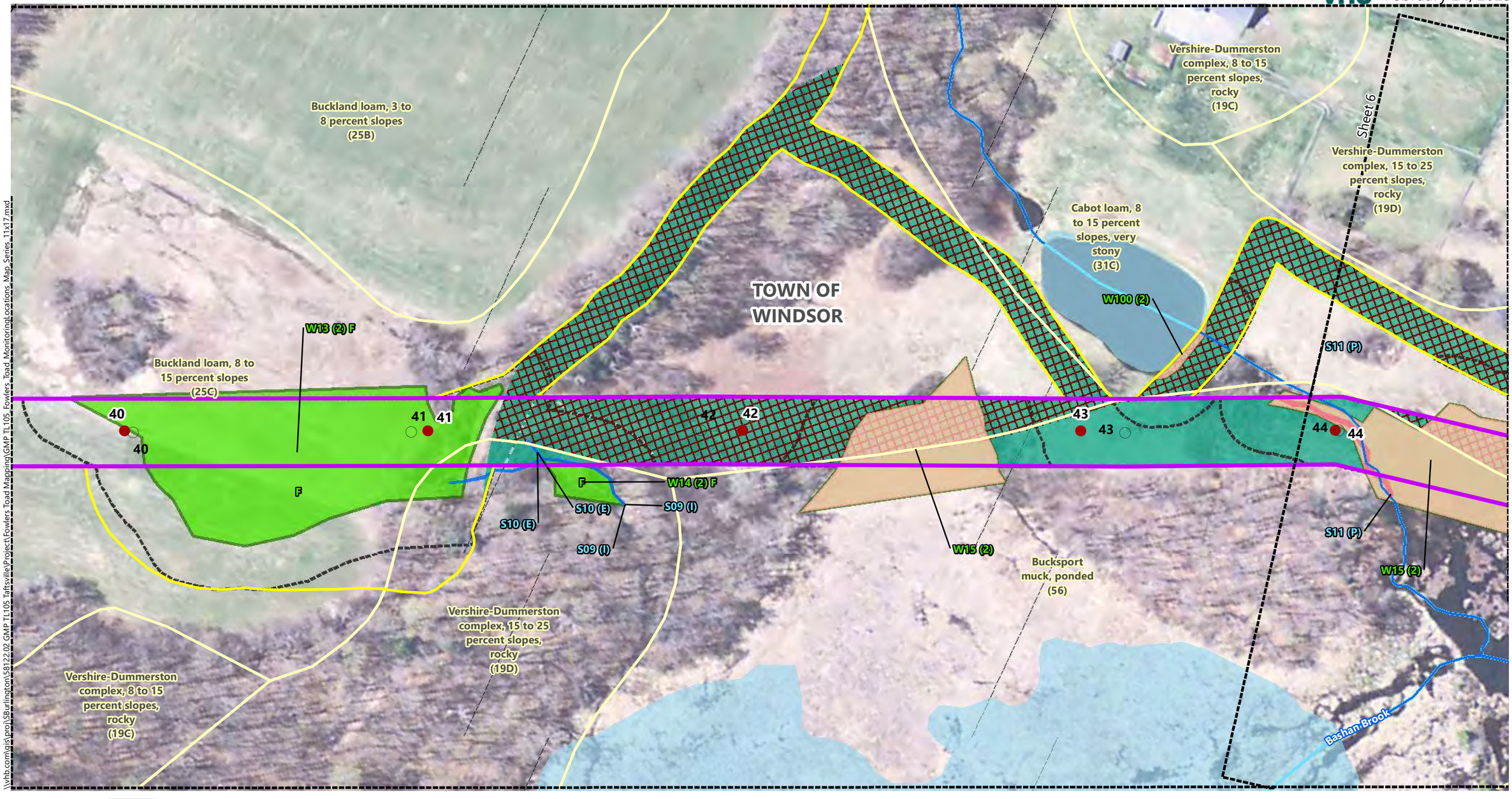

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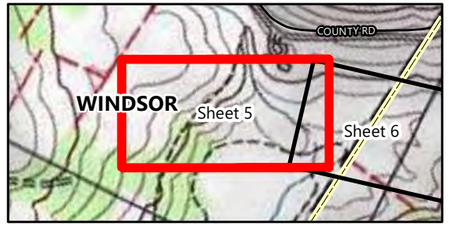

Green Mountain Power
TL105 Rebuild Project

Towns of Windsor, Hartland, and Woodstock, Vermont

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Fowler's Toad Monitoring Locations Map Series

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GREEN MOUNTAIN POWER

vhb February 24, 2023

Vershire-Dummerston complex, 15 to 25 percent slopes, rocky (19D)

Sheet 5

TOWN OF WINDSOR

W15A (2)

S12 (P)

S12 (P)

Cabot loam, 8 to 15 percent slopes, very stony (31C)

W15A (2)

TOWN OF HARTLAND

44 44

45 45

46 46

47 47

48 48

S11 (P)

S11 (P)

Bashan Brook

Bucksport muck, ponded (56)

W15 (2)

Glover-Vershire complex, 15 to 35 percent slopes, very rocky (20D)

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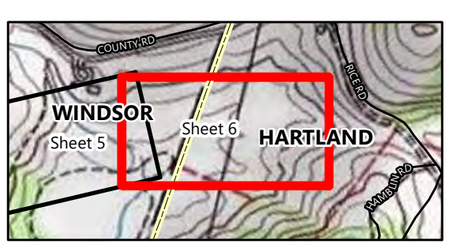

Green Mountain Power
TL105 Rebuild Project

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Fowler's Toad Monitoring Locations Map Series

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GREEN MOUNTAIN POWER

vhb February 24, 2023

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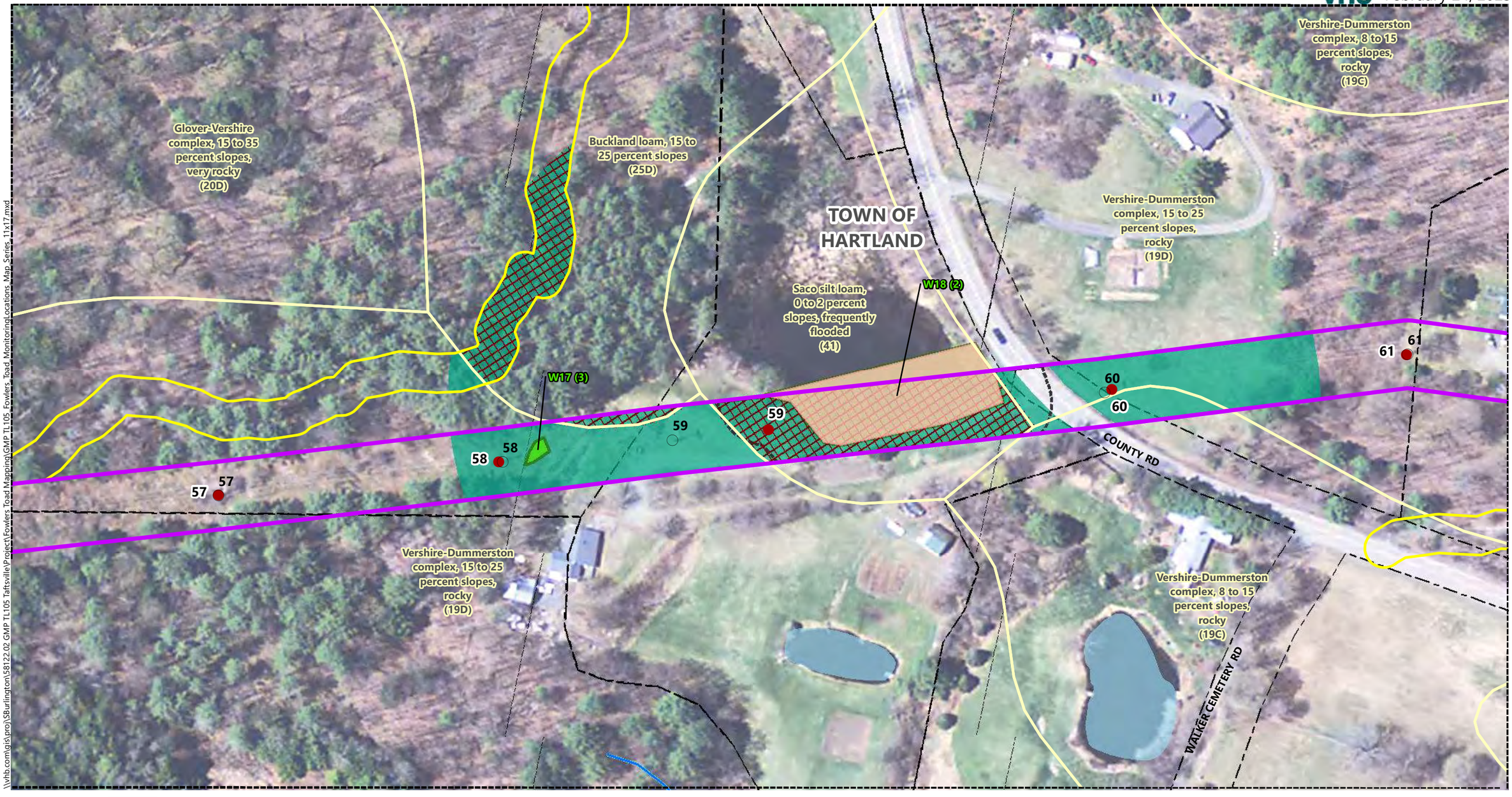

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Fowler's Toad Monitoring Locations Map Series

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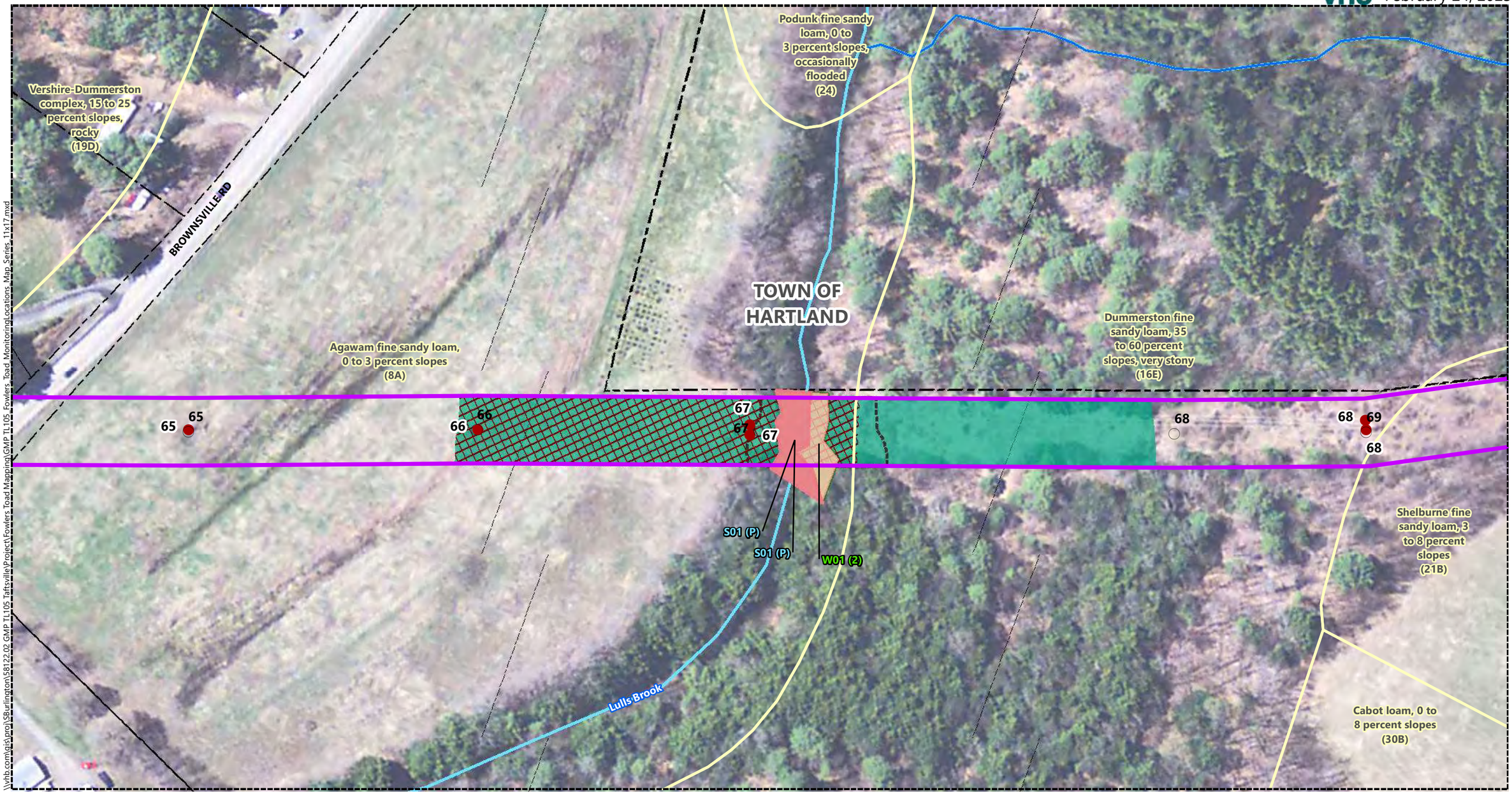
GREEN MOUNTAIN POWER

vhb

February 24, 2023



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TL105 Rebuild Project | Towns of Windsor, Hartland, and Woodstock, Vermont

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Fowler's Toad Monitoring Locations Map Series

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GREEN MOUNTAIN POWER

vhb February 24, 2023

Buckland loam, 3 to 8 percent slopes (25B)

TOWN FARM HILL RD

Vershire-Dummerston complex, 3 to 8 percent slopes, rocky (19B)

Shelburne fine sandy loam, 8 to 15 percent slopes (21C)

TOWN OF HARTLAND

Buckland loam, 15 to 25 percent slopes (25D)

G

75 76 76 77 77 78 78 79 79

S100 (I)

S100 (I)

Cabot loam, 0 to 8 percent slopes (30B)

W04 (2)

W03 (2) G

Buckland loam, 8 to 15 percent slopes (25C)

Buckland loam, 35 to 60 percent slopes, very stony (26E)

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0 50 100 200 Feet

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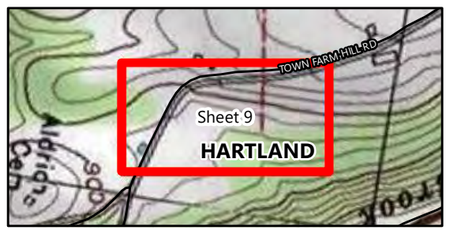

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TL105 Rebuild Project

Towns of Windsor, Hartland, and Woodstock, Vermont

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Fowler's Toad Monitoring Locations Map Series

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GREEN MOUNTAIN POWER

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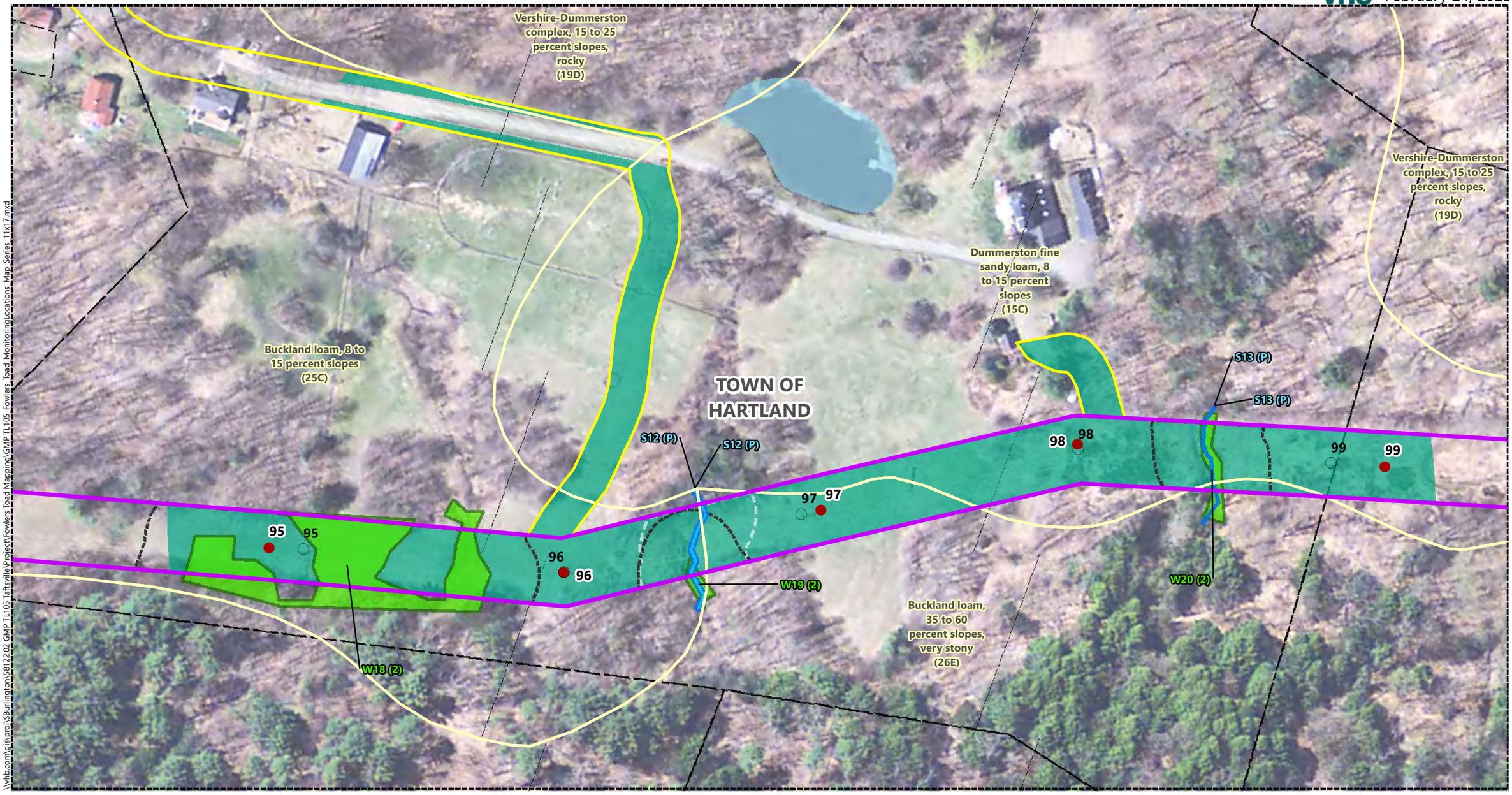

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GREEN MOUNTAIN POWER

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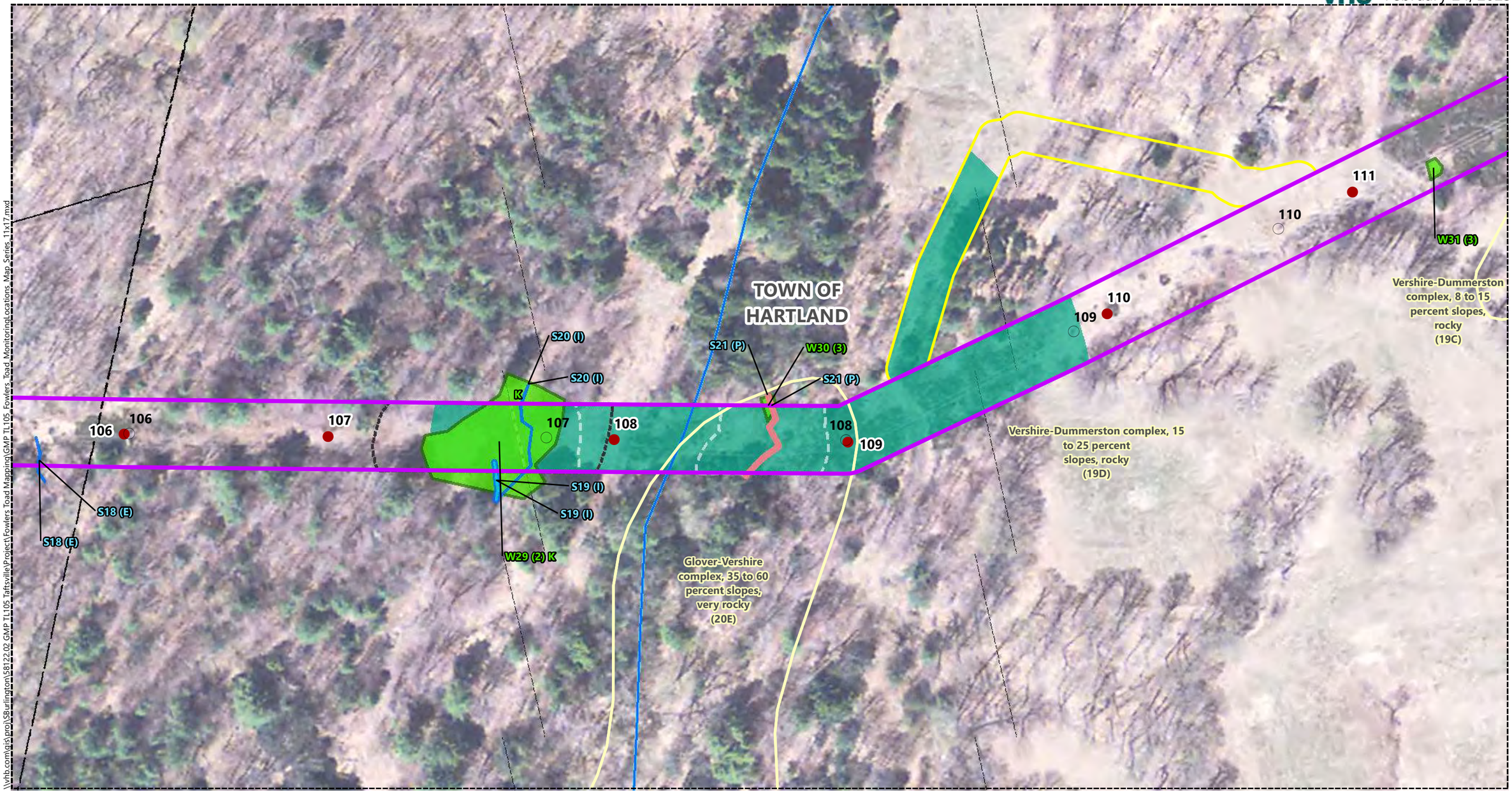

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Towns of Windsor, Hartland, and Woodstock, Vermont

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GREEN MOUNTAIN POWER

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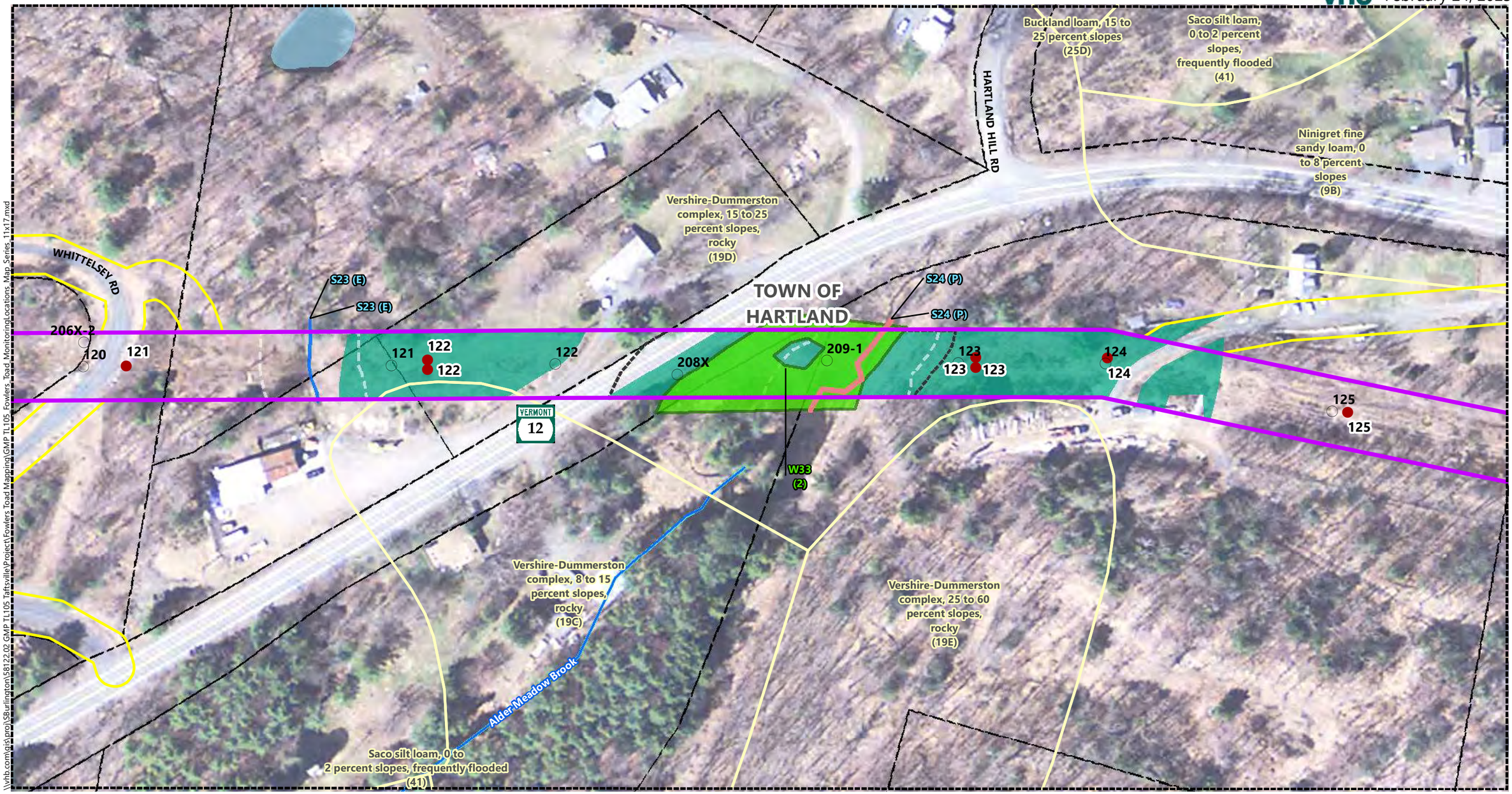
February 24, 2023



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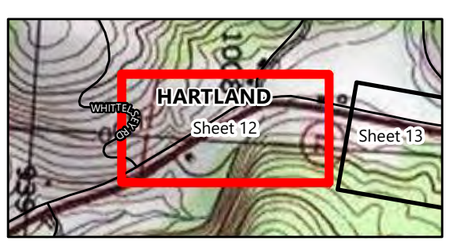

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TL105 Rebuild Project

Towns of Windsor, Hartland, and Woodstock, Vermont

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Fowler's Toad Monitoring Locations Map Series

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GREEN MOUNTAIN POWER

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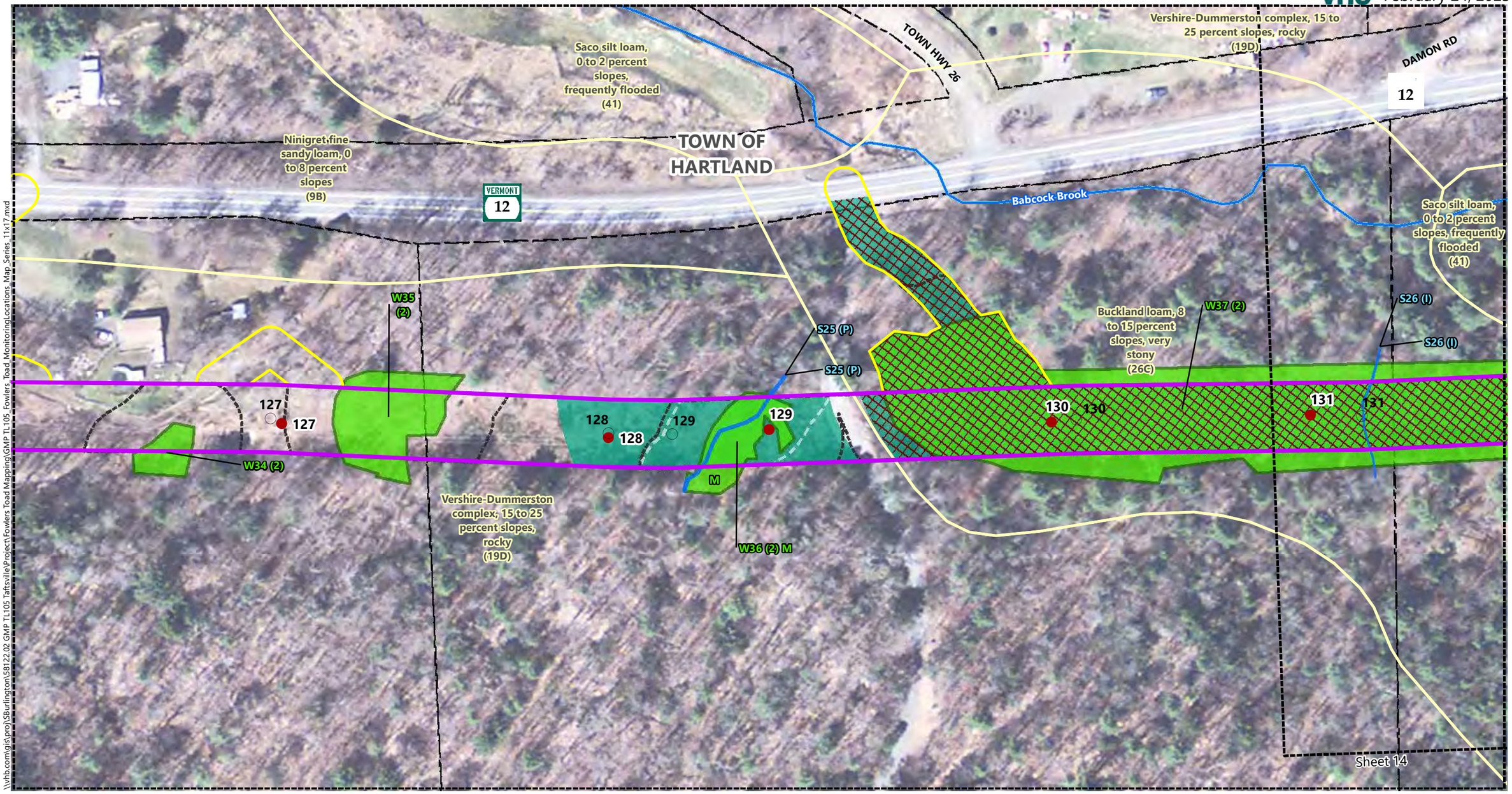
February 24, 2023



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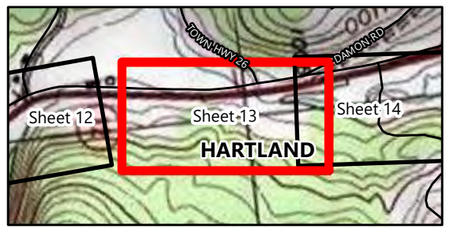

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GREEN MOUNTAIN POWER

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Sheet 13

DAMON RD

VERMONT 12

Vershire-Dummerston complex, 15 to 25 percent slopes, rocky (19D)

Babcock Brook

Saco silt loam, 0 to 2 percent slopes, frequently flooded (41)

TOWN OF HARTLAND

Sheet 15

Saco silt loam, 0 to 2 percent slopes, frequently flooded (41)

S28 (I)

S28 (I)

Windsor loamy fine sand, 15 to 25 percent slopes (5D)

136

136

N

W39 (3)

135

135

W41 (2) N

S26 (I)

W37 (2)

S26 (I)

134

134

4

W40 (2)

S27 (P)

131

131

132

132

133

133

133

133

W38 (3)

W37A (2)

S27 (P)

Buckland loam, 8 to 15 percent slopes, very stony (26C)

Dummerston fine sandy loam, 15 to 35 percent slopes, very stony (16D)

HIDEAWAY HILL DR

Vershire-Dummerston complex, 15 to 25 percent slopes, rocky (19D)

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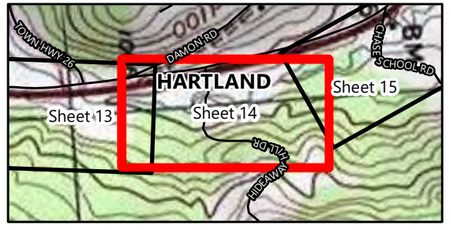

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GREEN MOUNTAIN POWER

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February 24, 2023

Vershire-Dummerston complex, 15 to 25 percent slopes, rocky (19D)

Sheet 14

VERMONT 12

Teago-Pomfret complex, 8 to 15 percent slopes, rocky (36C)

Saco silt loam, 0 to 2 percent slopes, frequently flooded (41)

Babcock Brook

Babcock Brook

Saco silt loam, 0 to 2 percent slopes, frequently flooded (41)

S28 (I)

W40 (2)

W41 (2) N

S29 (P)

S29 (P)

136

136

N

S28 (I)

137

137

138

138

Windsor loamy fine sand, 15 to 25 percent slopes (5D)

139

139

140

140

N

W41A (2) N

TOWN OF HARTLAND

CHASE SCHOOL RD

225-3-2

225-3-1

W42 (2)

Dummerston fine sandy loam, 15 to 35 percent slopes, very stony (16D)

Vershire-Dummerston complex, 15 to 25 percent slopes, rocky (19D)

SPORTSMEN CL

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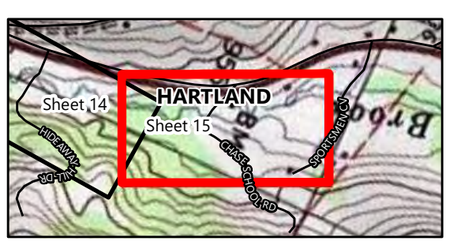

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Fowler's Toad Monitoring Locations Map Series

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GREEN MOUNTAIN POWER

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Sheet 17

VERMONT 12

Vershire-Dummerston complex, 15 to 25 percent slopes, rocky (19D)

Ninigret fine sandy loam, 0 to 8 percent slopes (9B)

BABCOCK BROOK LN

Babcock Brook

TOWN OF HARTLAND

Saco silt loam, 0 to 2 percent slopes, frequently flooded (41)

W44 (2)

Dummerston fine sandy loam, 8 to 15 percent slopes (15C)

S30 (P)

W46 (2)

W45 (2)

S30 (P)

148 147

148 149

149

Rumney fine sandy loam, 0 to 2 percent slopes, frequently flooded (33)

146 147

145 146

230-4-2

W43 (3)

Windsor loamy fine sand, 15 to 25 percent slopes (5D)

230-3

145 144

230-4-1

BARRON HILL RD

Vershire-Dummerston complex, 15 to 25 percent slopes, rocky (19D)

Buckland loam, 8 to 15 percent slopes, very stony (26C)

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GREEN MOUNTAIN POWER

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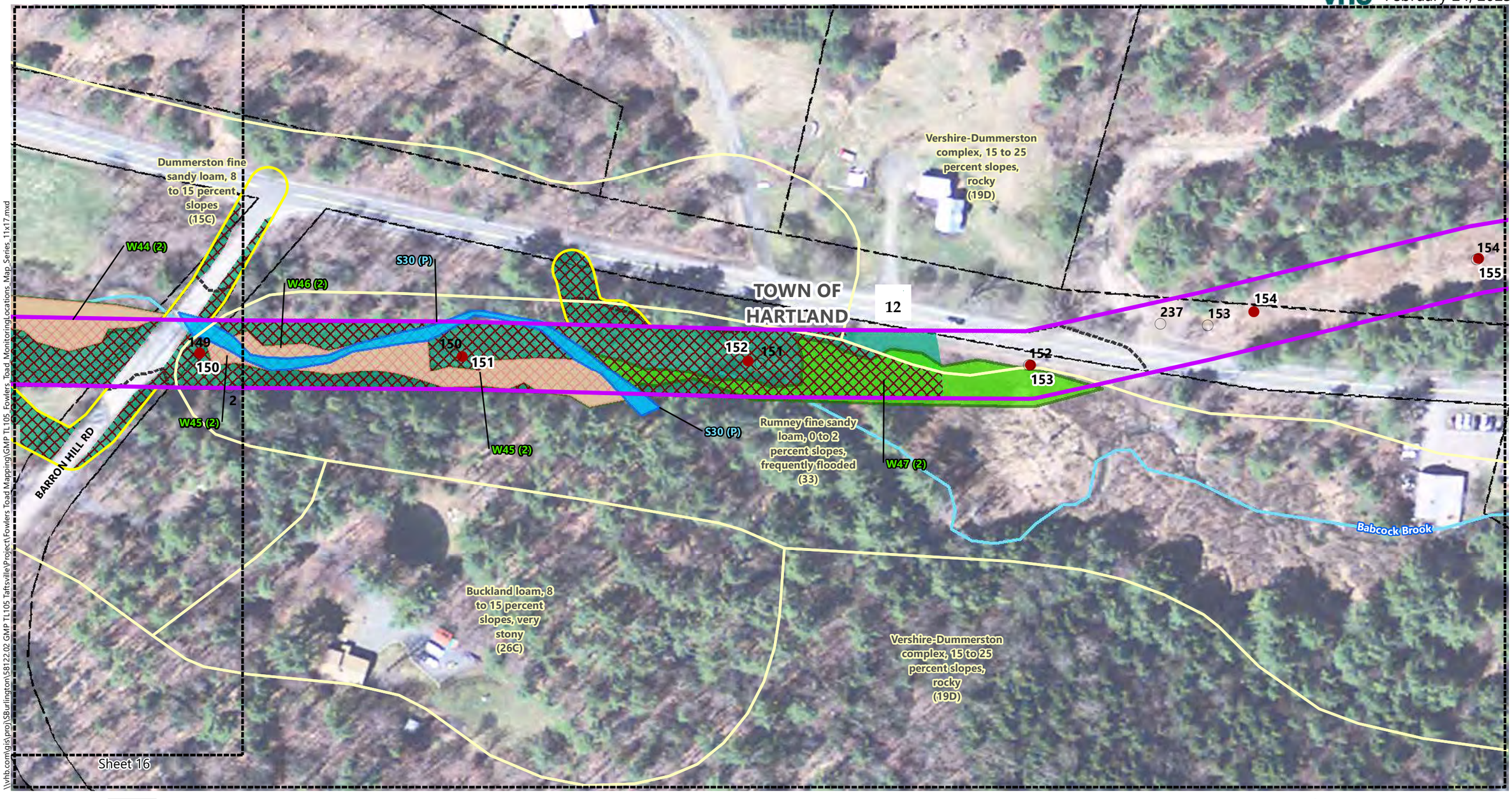

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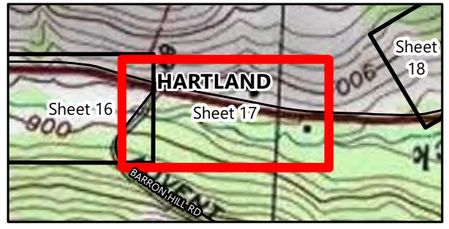

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Fowler's Toad Monitoring Locations Map Series

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GREEN MOUNTAIN POWER

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Berkshire-Tunbridge complex, 15 to 35 percent slopes, very stony (58D)

Vershire-Dummerston complex, 15 to 25 percent slopes, rocky (19D)

TOWN OF HARTLAND

Berkshire and Monadnock fine sandy loams, 15 to 25 percent slopes (68D)

Sheet 19

157 157 157 157 158 158 159 159 160 241-2 160 161 162 161 162 163

W48 (3)

W49 (3)

W50 (2) O

Ninigret fine sandy loam, 0 to 8 percent slopes (9B)

Rumney fine sandy loam, 0 to 2 percent slopes, frequently flooded (33)

Babcock Brook

VERMONT 12

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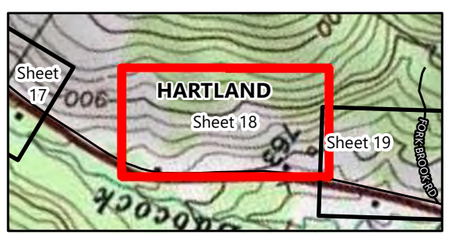

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VCGI (Vermont Center for Geographic Information - Various Dates)
ANR (Vermont Agency of Natural Resources - Various Dates)
FWD (Vermont Department of Fish and Wildlife - Various Dates)
GMP (Green Mountain Power - 2016-2017).
SGC (SGC Engineering - 2021)
NAI (Normandeau Assocates, Inc. - 2021)
VHB (2021-2023)

Fowler's Toad Monitoring Locations Map Series

Sheet 18 of 20

GREEN MOUNTAIN POWER

vhb

February 24, 2023

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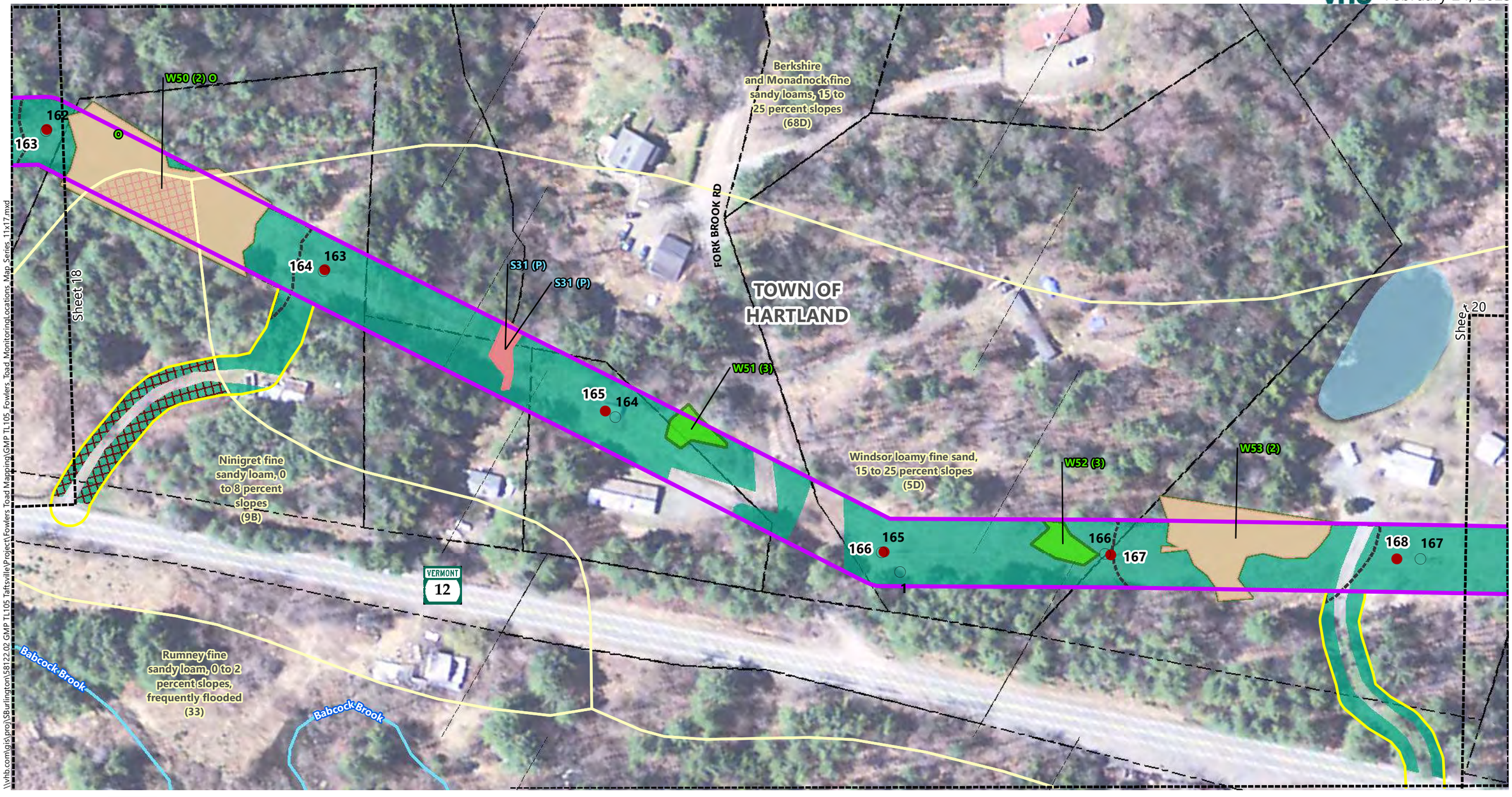
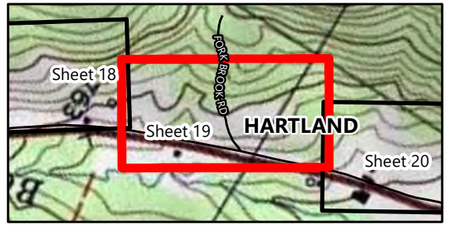


0 50 100 200 Feet

- Fowler's Toad Potential Breeding Habitat (VHB)
- Fowler's Toad Potential Overwintering Habitat (VHB)
- Fowler's Toad Potential Upland Habitat (VHB)
- Sheet Set (VHB)
- Right of Way (GMP)
- Study Area (NAI)
- Resource Buffer (VHB)
- Existing Structure (GMP)
- Proposed Structure (SGC)
- Vernal Pool (NAI)
- Small Streams - 50 ft Setback (NAI)
- Delineated Stream (VHB)
- Delineated Stream (NAI)
- Delineated Wetland (NAI)
- Observed RTE Occurrence (VHB)
- Class II Wetland Buffer (NAI)
- Riparian Buffer (NAI)
- NRCS Soil Boundary (VOGP)
- VHD Stream (VCGI)
- VHD Waterbody (VCGI)
- Parcel Boundary
- County Boundary (VCGI)
- Town Boundary (VCGI)



Green Mountain Power
TL105 Rebuild Project

Towns of Windsor, Hartland, and Woodstock, Vermont

Sources:
Background Imagery by VCGI
VCGI (Vermont Center for Geographic Information - Various Dates)
ANR (Vermont Agency of Natural Resources - Various Dates)
FWD (Vermont Department of Fish and Wildlife - Various Dates)
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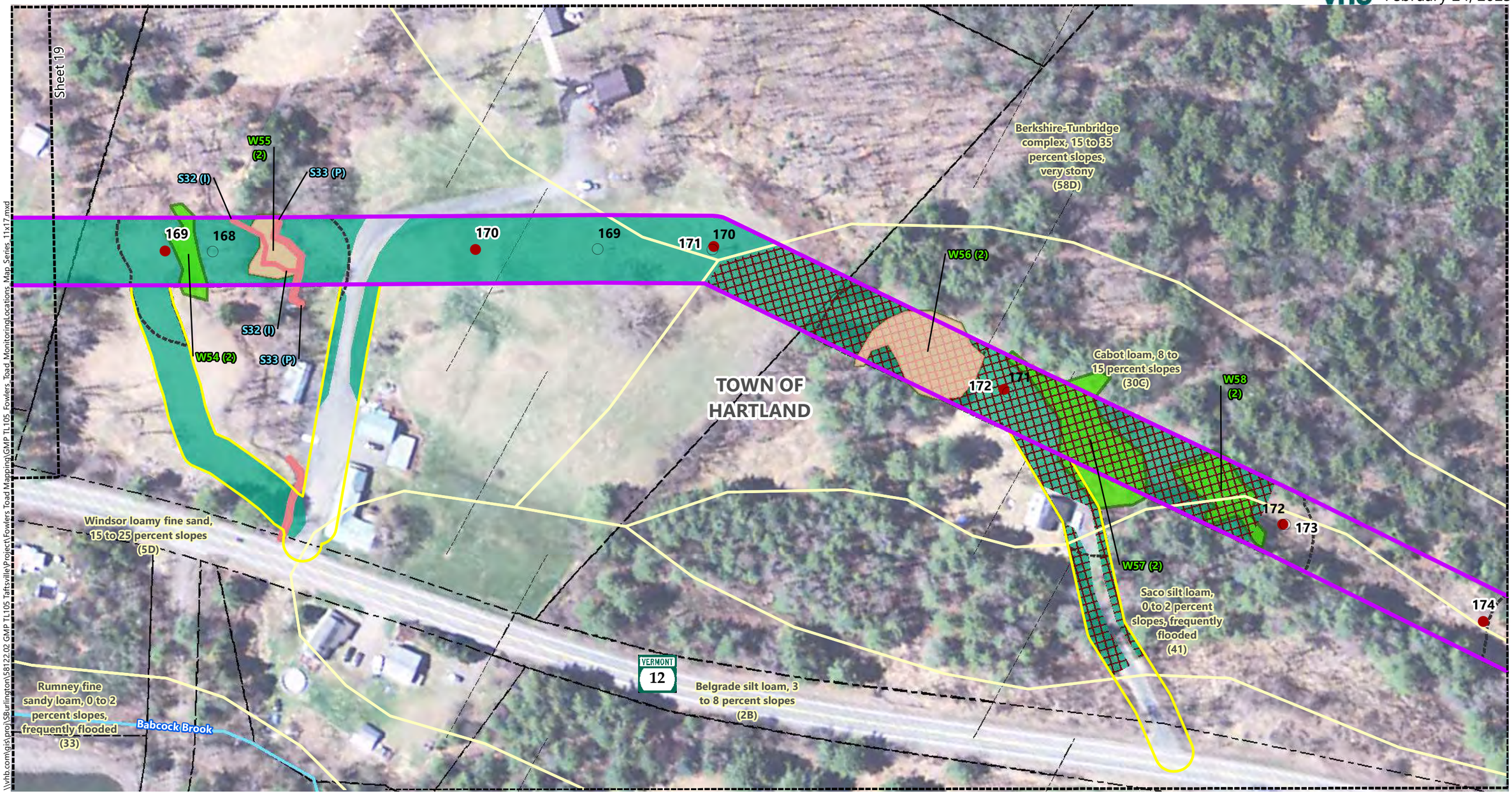
Fowler's Toad Monitoring Locations Map Series

Sheet 19 of 20



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0 50 100 200 Feet

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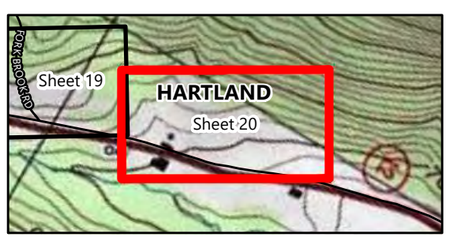

Green Mountain Power
TL105 Rebuild Project

Towns of Windsor, Hartland, and Woodstock, Vermont

Sources:
Background Imagery by VCGI
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VHB (2021-2023)

Fowler's Toad Monitoring Locations Map Series

Sheet 20 of 20

Attachment 2

GMP Taftsville Reconductoring
Daily Fowler's Toad Monitoring Report – VHB

Date: Time on Site (Start / End Times): _____

Observer(s):

Location(s) of Inspection(s):

Activities Conducted:

Fowler's Toads Found? (Yes or No, Complete Observation Data Reporting Form for Each):

Provide all daily reports, any toad observation data reports and a summary of weekly project work to the Department of Fish & Wildlife the following Tuesday at 4:00 p.m..

Engineers | Scientists | Planners | Designers
40 IDX Drive, Building 100, Suite 200, South Burlington, Vermont 05403
P 802.497.6100 **F** 802.495.5130 www.vhb.com

Attachment 3

Ref: 58122.02

Fowler's Toad (*Anaxyrus fowleri*) Observation Data Reporting Form – VHB

Project: _____

Observer(s): _____

Date: _____ Time of Observation: _____

Latitude / Longitude (decimal degrees): _____

General Habitat: _____

Microhabitat / Activity: _____

Suspected Toad Species (Circle One): **A. fowleri or A. americanus**

Other Species Observed with Toad: _____

Average Temperature: _____ Approximate Wind Speed: _____

Cloud Cover: _____ Precipitation: _____

Apparent Sex (Circle One): **M, F, or Unk** Life Stage (Circle One): **Adult, Juv., Tadpole**

Photographs

☐ Photos from above, showing postorbital ridge, parotoid gland, and snout
Photo Numbers: _____

☐ Photo close-up(s) of tibial warts
Photo Numbers: _____

☐ Photos of venter / under throat area
Photo Numbers: _____

Disposition (Circle One): **Relocated or Left in Situ**

If Relocated, Latitude / Longitude (decimal degrees) of Relocation Spot: _____

If Temporarily Held, for How Long?: _____

Notes or Comments: _____

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Species Identity Verified by: (Species Determination / Staff Full Name): _____

Engineers | Scientists | Planners | Designers
40 IDX Drive, Building 100, Suite 200, South Burlington, Vermont 05403
P 802.497.6100 **F** 802.495.5130 www.vhb.com

David Cooper

Senior Environmental Scientist

David is a Senior Environmental Scientist in VHB's Raleigh, North Carolina, office. With extensive experience working with natural resources, David has performed stream and wetland delineations across North Carolina and has overseen protected species assessments and inventories, habitat assessments, and associated environmental documentation. He is very familiar with jurisdictional determinations, including assessment protocols and methodology, coordination, and reporting. David has assisted with the publishing of several papers and provided presentations on a variety of fauna and flora-related issues.

Tailored Bio 1

David uses his extensive experience working with natural resources to perform stream and wetland delineations across North Carolina, overseeing protected species assessments and inventories, habitat assessments, and associated environmental documentation. He is very familiar with jurisdictional determinations, including assessment protocols and methodology, coordination, and reporting. David has assisted with the publishing of several papers and provided presentations on a variety of fauna and flora-related issues. He served as President of the NC Herpetological Society from 2011 – 2014. He is also a member of the NC Association of Environmental Professionals and serves on the steering committee of the NC Partners in Amphibian and Reptile Conservation. David is permitted to survey for amphibians and reptiles in multiple states, and is very experienced at safely working with native venomous snakes. David's field training includes the Intermittent and Perennial Stream ID Refresher, Total Station Survey Applications for Stream Restoration, Vegetation Monitoring and Surveying Protocol, NC Natural Communities Identification Workshop, Identification of Freshwater Mussels Workshop, and Part I Basic Processes in Hydric Soils.

22 years of professional experience

Education

BS, Zoology, North Carolina State University, 1999

Affiliations/Memberships

North Carolina Association of Environmental Professionals

North Carolina Herpetological Society

North Carolina Partners in Amphibian and Reptile Conservation

Professional Development

NC Natural Communities Identification Workshop, 2008

Acoustic Bat Survey Techniques and Analysis, 2015

Part I Basic Processes in Hydric Soils, 2007

Identification of Freshwater Mussels Workshop, 2014

Vegetation Monitoring and Surveying Protocol, 2008

Intermittent and Perennial Stream ID Refresher, 2010

NCDENR, Division of Mitigation Services, UT Altamahaw Creek Stream and Buffer Mitigation Site, Alamance County, NC

David is assisting with annual monitoring for a Piedmont stream enhancement project for the North Carolina Department of Environment and Natural Resources. Tasks include annual stream assessments, vegetation assessments, and reporting.

Completion Date: Ongoing

NCDEQ, Charles Williams (Sandy Creek) Stream, Wetland, and Buffer Mitigation, Randolph County, NC

Environmental Scientist

For the North Carolina Department of Environmental Quality (NCDEQ), David assisted with annual monitoring for a Piedmont stream and wetland enhancement project. The project includes approximately 2,000 linear feet of degraded streams, 2 acres of degraded wetlands, and 8 acres of riparian buffers in rural Randolph County. Project

features included enhancement of channel profile through the installation of in-stream cross vanes and j-hooks, extensive stream bank stabilizations through the construction of floodplain benches, the installation of rootwads, sod mats, sod mats, and stream bank vegetation, and wetland and riparian enhancements through the installation of ditch plugs, eradication of invasive vegetation, and native plant installations within the 18-acre project area.

Total project cost ~= $114,761

Completion Date: Ongoing

NCDOT B-4943, Durham County, NC

For the North Carolina Department of Transportation (NCDOT) Division 5, David was responsible for natural systems studies for the replacement of bridge number 20 on SR 1616 (Bahama Road) over Lake Michie (Dial Creek Arm). Services performed included wetland and stream delineations, Threatened and Endangered Species surveys, and preliminary Jurisdictional Determination package. This information, along with supporting documentation, was presented in an updated Natural Resource Technical Report and provided to the Department.

Completion Date: Ongoing

NCDOT B-5166, Granville County, NC

For the North Carolina Department of Transportation (NCDOT) Division 5, David was responsible for Threatened and Endangered Species studies for the replacement of bridge number 138 on SR 1300 (Cornwall Road) over Grassy Creek. Services performed included surveys for smooth coneflower (Echinacea laevigata) and harperella (Ptilimnium nodosum). A biological conclusion of "No effect, but Habitat Present", along with supporting documentation, was presented in a Protected Species update letter and provided to the Department.

Completion Date: Ongoing

NCDOT R-5847, US 64 Widening, Cherokee and Clay Counties, NC

Environmental Scientist

David served as Environmental Scientist and Task Manager for the North Carolina Department of Transportation (NCDOT) project R-5847 that involved widening an approximately 9.2-mile stretch of US-64 between Murphy and Hayesville. David was responsible for natural resources assessments, wetland and stream delineations, Threatened and Endangered plant and habitat surveys, regulatory agency coordination, preliminary jurisdictional determinations, and a Natural Resources Technical Report. Forty-nine jurisdictional streams and 71 wetlands were identified as part of this study.

Total project cost ~= $105,809

Completion Date: Ongoing

NCDOT, 17BP.5.R.63, Vance County, NC

For the North Carolina Department of Transportation (NCDOT) Division 5, David was responsible for Natural Resources Technical Report for the replacement of bridge number 52 on SR 1518 (Stewart Farm Road) over Weaver Creek. Services performed included biological community mapping, wetland and stream delineations, Threatened

and Endangered Species surveys and preliminary Jurisdictional Determination package. This information, along with supporting documentation, was presented in a Natural Resource Technical Report and provided to the Department.

Completion Date: Ongoing

NCDOT, Complete 540 (Triangle Expressway Southeast Extension), Wake and Johnston Counties, NC

Senior Scientist

For environmental permitting efforts for the $2.2B expressway around the southern part of greater Raleigh for the North Carolina Department of Transportation (NCDOT), David is a Senior Scientist assisting with completion of the Individual Section 404 Permit for over 20 miles of the new location roadway in the central part of the state. Responsibilities include completion of permit drawings, documentation, and coordination with the regulatory agencies.

Total project cost ~= $885,674

Completion Date: Ongoing

NCDOT, Endangered Bat Surveys, US 17, Onslow, Jones, and Craven Counties, NC

For the North Carolina Department of Transportation (NCDOT), David is assisting with habitat assessments, acoustic surveys, mist-net surveys, banding, and radio telemetry to determine the presence/ absence of the northern long-eared bat along 16 miles of proposed new location and existing widening of highway. Reports denoting our findings will be prepared at the end of the survey season and provided to NCDOT.

Completion Date: Ongoing

NCDOT, Group D Planning Bridges Natural Resources Evaluations, NC

For the North Carolina Department of Transportation (NCDOT) Division 2, David developed natural resources assessments, preliminary jurisdictional determinations, protected species assessments, and Natural Resources Technical Reports for B-4485 and B-4593 in Pamlico and Craven Counties. B-4593 required surveys for the Red-cockaded Woodpecker.

Completion Date: Ongoing

NCDOT, Group F Planning Bridges Natural Resources Evaluations, NC

For the North Carolina Department of Transportation (NCDOT) Division 4, David developed natural resources assessments, preliminary jurisdictional determinations, protected species assessments, and Natural Resources Technical Reports for 4501, B-4502 and B-5534 in Duplin County.

Completion Date: Ongoing

NCDOT, Group I Planning Bridges Natural Resources Evaluations, NC

For the North Carolina Department of Transportation (NCDOT) Division 6, David developed natural resources assessments, preliminary jurisdictional determinations, protected species assessments, and Natural Resources Technical Reports for B-4479, B-5505, B-5511, B-5513 and B-5529 in Columbus, Harnett, and Robeson Counties.

Completion Date: Ongoing

NCDOT, Group U Planning Bridges Natural Resources Evaluations, NC
For the North Carolina Department of Transportation (NCDOT) Division 13, David developed natural resources assessments, preliminary jurisdictional determinations, protected species assessments, and Natural Resources Technical Reports for B-4812, B-4986, B-5517, and B-5869 in Burke and Rutherford Counties.

Completion Date: Ongoing

NCDOT, Guilford County Bridge #225 Replacement, Guilford County, NC
Environmental Scientist

For the North Carolina Department of Transportation (NCDOT) Division 7, David was responsible for natural systems studies for the replacement of bridge #225 on SR 1115 (Rehobeth Church Road) over I-85 Business. Services performed included wetland and stream delineations, Threatened and Endangered Species surveys, a preliminary jurisdictional determination package, and a Natural Resources Technical Report.

Total project cost ~= $36,843

Completion Date: Ongoing

NCDOT, Northern Long-eared Bat Research Study, Eastern NC
Environmental Scientist

For the North Carolina Department of Transportation (NCDOT), David assisted in conducting portions of a research study of the northern long-eared bat (Myotis septentrionalis) (NLEB) in eastern North Carolina. Nine individual sites were surveyed on two separate survey sessions, with four sites surveyed with mist nets. Results of the NLEB surveys were presented to NCDOT in report format and documented the methodologies and findings of the two survey sessions.

Total project cost ~= $390,406

Completion Date: Ongoing

Town of Cary, Mills Park & Panther Creek Greenway Project, Wake County, NC
Environmental Scientist

This project for the Town of Cary required the assessment of natural resources along a 2.0 +/- mile corridor for the proposed multi-use trail along Panther Creek and the adjoining Mills Park in Cary. David's responsibilities included inventory of natural resources, stream and wetland delineation, Jordan Lake riparian buffer determination, regulatory agency coordination, threatened and endangered species investigations, Natural Resources reporting for PCE, initial environmental permitting (404, 401), and a subsequent design-necessitated permit modification on behalf of client.

Total project cost ~= $1,800

Completion Date: Ongoing

Town of Clayton, Sam's Branch Greenway Project, Johnston County, NC
This 2.0-mile long Town of Clayton project required natural resources evaluations for a proposed multi-use trail along Sam's Branch from O'Neil Street to City Road. David provided natural resources inventory, stream and wetland delineation, Threatened and Endangered species investigations including assisting in presence/absence screening

for mussels, Neuse riparian buffer determination, regulatory agency coordination, natural resources reporting for PCE, and 401/404 environmental permitting.

Completion Date: Ongoing

UNC Hospitals, Rex Healthcare Cancer Center, Raleigh, NC

Environmental Scientist

VHB provided natural resources investigations and environmental compliance services at the 27-acre parcel that is proposed to house a new Rex Healthcare Cancer Center in north Raleigh. David's responsibilities included stream and wetland delineations, Neuse riparian buffer determinations, regulatory agency coordination, and environmental permitting (Sections 404 and 401).

Total project cost ~= $4,775

Completion Date: Ongoing

Natural Resource Inventories, Southeastern United States

Senior Environmental Scientist

VHB was contracted by a private land holding company to conduct natural resource inventories and prepare detailed reports for a total of 53 properties throughout the southeastern United States. David designed, oversaw, and conducted seasonal amphibian and reptile field surveys, prepared and edited the overall natural resources inventory reports, and provided expert testimony for these large-scale projects. Field surveys were designed and timed to target the broadest diversity of herpetofauna and locate rare species on the properties over the course of a year. Projects were located in South Carolina, Georgia, Alabama, and Florida, and ranged in size from less than 100 acres to over 800 acres.

Total project cost ~= more than $1 million

Completion Date: Ongoing

Melinda Squillace, CWB

Ecologist Wildlife Specialist

Education

MS, Forest Resources, University of Georgia, 2013

BS, Animal Science, University of Vermont, 2008

Registrations/Certifications

Certified Wildlife Biologist, 01/2025

Wilderness First Aid and CPR; May 2015

Chemical immobilization certification – Safe Capture International; February 2013

Affiliations/Memberships

The Wildlife Society, New England, 2022

Melinda is a professionally Certified Wildlife Biologist with a diverse skill-set in wildlife research, monitoring, and management. She has worked with a multitude of North American wildlife species including various small mammals, numerous bird species, as well as ungulates, furbearers, and large carnivores. Her career interests focus on understanding the complexities surrounding human-wildlife interactions and aiding the public in their enjoyment of our natural resources and co-existence with wildlife.

12 years of professional experience

Carinthia Mine Bat Mitigation, Dover, VT

Melinda conducted Year 3 monitoring coordination and memorandum finalization which included fall 2022 fieldwork for this project. Project included coordination with the client, staff from the Vermont Agency of Natural Resources and coworkers to complete annual efforts.

Green Mountain Power TL105 Taftsville, Woodstock, VT

Melinda provided field assistance during surveys for Rare, Threatened and Endangered species on the Project site. For the Fowler's toad habitat survey, she coordinated survey design and execution on the Project site with the assistance of expert staff out of a regional office as well as local office and field staff. Involved working collaboratively with a regional staff expert to detail guidelines for non-expert client employees to be able to successfully identify and respond appropriately to the presence of Fowler's toad on the Project site. Summarized survey results in a technical memorandum working collaboratively with a regional staff expert and the Client.

Granville Bear Habitat Mitigation, Granville, VT

For this project, Melinda conducted a comprehensive site visit to view relevant characteristics and focal points for mitigation, extensively reviewed the Project background and all supporting documentation, and summarized the Project background, detailed survey findings, and mitigation recommendations in a technical memorandum.

PREVIOUS EXPERIENCE

South Dakota Game, Fish, and Parks, October 2016 – July 2022
Resource Biologist

Seasonal wildlife population surveys:

- Conducted regional coordination, field data collection, and organization of fall deer classification surveys and spotlight surveys, seasonal wild turkey surveys including winter flock counts and summer poult counts, and summer elk herd composition surveys.
- Assisted with field data collection and data organization of region-wide seasonal bighorn sheep classification surveys, mountain goat surveys and prairie grouse surveys.
- Engaged in coordination and planning efforts associated with performing winter aerial deer and elk surveys.

- Assisted with field data collection and organization of region-wide aerial spring antelope surveys and fall ground classification surveys. Gained extensive experience flying at low altitudes for long periods of time counting wildlife.
- Assisted with mountain lion biopsy research which included gaining experience tracking and treeing adult mountain lions using hounds.

Wildlife capture, collaring, and monitoring:

- Oversaw and/or assisted with wildlife captures using chemical immobilization as well as lethal removal of individuals to mitigate human-wildlife conflicts.
- Assisted with chemical immobilization of bighorn sheep to further state funded graduate student research.
- Engaged in group capture of adult bighorn sheep at Badlands National Park and in Pennington County, SD using a helicopter without immobilization to further state funded graduate student research.
- Engaged in neonatal bighorn sheep capture. Capture methods included monitoring adult females fitted with Vaginal Implant Transmitters (VITs), and hiking in extremely rugged terrain in order to potentially capture and collar neonates.
- Oversaw numerous events which involved chemically immobilizing adult bobcats and fitting them with VHF radiocollars which in most instances took place in the presence of trappers and/or landowners.
- Engaged in region-wide neonatal deer capture. Capture methods included observing adult female deer exhibiting parturition behavior, as well as visually searching for newborns.
- Assisted with recovery used VHF radiocollars in the field using radiotelemetry based upon locations from identified mortality signals.

Wildlife damage abatement:

- Organized and oversaw large capture events to remove and transport wild turkeys from private properties complaining of damage. This involved coordination with Tribal members, public volunteers, private landowners and other GF&P staff.
- Assisted regional wildlife damage management biologists as well as wildlife conservation officers with responding to requests for damage assistance. This involved delivering and placing physical barriers around cropland, feed storage, or haystack areas receiving damage from deer and/or turkeys and placing effigies to be used as wildlife deterrents.
- Assisted with facilitation of regional deer pool hunts for the purposes of damage abatement on private ranching properties.

Wildlife harvest registration and data collection:

- Performed mountain lion harvest registrations which included overseeing biological data collection and proper public notification of harvest limit adjustments.
- Oversaw proper registration and data management during and after the bobcat harvest season. This included but was not limited to corresponding with statewide staff regarding registration needs as well as ensuring for proper submission and management of collected biological samples from carcasses.

- Assisted with the preparation and distribution of contacts regarding head submission for CWD sampling during elk harvest season. Also assisted with the collection of submitted heads, extracting lymph nodes for testing, and aging submitted teeth.

Wildlife disease testing and monitoring:

- Assisted with region-wide monitoring and biological sample collection from mule deer, white-tailed deer, pronghorn, coyote and raccoon carcasses collected for bovine tuberculosis surveillance in Harding, and Tripp County, South Dakota.
- Performed pneumonia disease monitoring and biological sampling on individuals within 2 bighorn sheep herds in Pennington County, South Dakota.
- Sampled numerous elk, mule deer and white-tailed deer heads submitted by hunters for chronic wasting disease.
- Worked directly with employees within local city municipalities in order to sample removed deer for Chronic Wasting Disease.

Hiring and supervision of seasonal interns:

- Crafted outreach form and oversaw position advertising and screening of submitted applications.
- Oversaw scheduling and completion of position interviews followed by offering positions and bringing on successful candidates.
- Oversaw the organization and distribution of field gear and work vehicles to interns.
- Provided work direction and constructive feedback to interns with the goal of maintaining an efficient and effective workplace as well as providing them with critical experience needed to eventually work as a state wildlife biologist.

Nebraska Game and Parks Commission, January 2016 – September 2016
Conservation Technician II

Wildlife capture, collaring, and monitoring:

- Conducted chemical immobilization, sample collection and processing of >10 adult male and female bighorn sheep using drug BAM. Collected samples including fecal, DNA, and nasal and tonsillar swabs for detection of pneumonia and other microbes.
- Assisted with radiotelemetry monitoring and visual identification of previously radio-collared bighorn sheep in order to identify pneumonia symptomatic individuals.
- Assisted state mountain lion biologist with mountain lion bait site selection and monitoring. Assessed sites for mountain lion sign, checked motion-triggered infrared cameras for lion visitation, and replenished bait and scent lure at sites when necessary.
- Set cage traps at mountain lion bait sites when evidence of lion visitation was detected.
- Assisted in capture, chemical immobilization and processing of > 2 mountain lions using drug BAM. Monitored for body temperature, collected DNA samples, body weight and assisted with proper handling and release.

- Took part in the capture, processing and translocation of > 100 adult male and female wild turkeys using live traps baited with cracked corn and sunflower seeds.

Big Game population monitoring:

- Engaged in an aerial population census via helicopter for mule deer and other game species such as white-tailed deer, elk, pronghorn and coyote. Assisted in spotting and subsequently counting individuals.
- Engaged in aerial telemetry monitoring of GPS and VHF radiocollared mountain lions and bighorn sheep via fixed-wing aircraft.
- Used four-wheel drive and all-terrain vehicles and hiked long distances in difficult terrain and variable climactic conditions consistent with the Pine Ridge region of the Nebraska Panhandle.
- Gained experience measuring horns and antlers of various wildlife species in order to assess trophy status using Boone and Crockett Club and Pope and Young Club standards.

Big Game spatial analysis and management:

- Created maps of bighorn sheep GPS collar locations using ArcGIS software for data analysis and both public and administrative dissemination.
- Took part in download and spatial analysis of >20 GPS collars previously placed on mature male and female elk using ArcGIS software.
- Created maps using downloaded GPS collar data and provided information such as elk home range size, dispersion and interactions using ArcGIS software for public and administrative dissemination.

Big Game disease identification and monitoring:

- Helped oversee appropriate collection, organization and processing of biological samples for disease testing in white-tailed deer, mule deer, and bighorn sheep.
- Organized 2015 state Chronic Wasting Disease database for deer.
- Organized state collected DNA samples from hunter harvested elk, as well as captured bighorn sheep and mountain lions using chemical immobilization.
- Conducted extensive inventory and subsequently organized materials to be used for biological sample collection including laboratory supplies and personal protective equipment (PPE).

Wisconsin Department of Natural Resources, October 2013-April 2015
Assistant Deer and Elk Ecologist

Provided assistance to the Deer and Elk Specialist with the implementation of the Deer Trustee Report which resulted in numerous changes to Wisconsin's white-tailed deer program. This included disseminating these changes to other DNR employees and the public including 600,000 passionate and vocal hunters. Specific changes included:

- Reformation of Deer Management Units;
- Variation in carcass tag availability;
- Change in deer season structure;
- Change from in-person deer registration to electronic registration;
- Change in quota setting process;
- Creation of citizen involved County Deer Advisory Councils; and

- Implementation of the Deer Management Assistance Program.

Gained extensive experience communicating and working with deer program partners and stakeholders including NGOs and local sporting groups, members of the hunting community, members of the general public including non-hunters as well as political appointees.

- Assisted the Big Game Section Chief with creation and statewide implementation of the Deer Management Assistance Program.
    - Disseminated information on the Deer Management Assistance Program and similar habitat management programs to private land owners.
- Assisted the Deer and Elk Specialist with logistics involved in Wisconsin's Elk Management Program including a reintroduction effort.
- Ran a deer hunting check station during the traditional 9-day gun deer season prior to electronic registration being fully implemented in 2016.
- Gained extensive experience aging and removing lymph nodes for Chronic Wasting Disease Testing from harvested deer.
- Assisted with the formation of deer population goals for each Deer Management Unit and subsequently setting antlerless deer quotas to help achieve each goal.
- Worked extensively with the state's administrative law enforcement officer to assist in the drafting of administrative and legislative rules pertaining to deer hunting regulations, the Deer Management Assistance Program and subsequently drafting the deer hunting rules booklet.
- Obtain a strong knowledge and understanding of political and social issues surrounding large carnivore management; specifically relating to black bear and wolf populations.

The Joseph W. Jones Ecological Research Center, Newton, GA
January-August 2011

Hourly Worker/Research Assistant

- Small mammal response to prescribed fire:
    - Trapped >100 small rodents with Sherman traps and took biological samples.
- Wild Turkey nesting ecology:
    - Trapped >10 male and female wild turkeys with rocket nets.
    - Performed radio telemetry to ascertain suitable nesting habitat and roosting behavior.
- White-tailed deer parturition and fawn mortality study:
    - Assisted with capture of 10 female white-tailed deer and implanting with VITs.
    - Captured >20 neonatal deer using VITs and thermal IR cameras.
- Trapping and lethal removal of >30 mesocarnivores (bobcat, raccoon, opossum, coyote, gray fox) in support of bobwhite quail management
- Tick population response to prescribed fire:
- Performed field necropsies on multiple animal species (bobcat, coyote, gray fox, opossum, raccoon), and sampled for tick abundance in burned and unburned habitat.

RESEARCH EXPERIENCE

The University of Wyoming
April -August 2015

Research Assistant
Predation on neonatal mule deer in the Wyoming Range

Principal Investigators: Dr. Kevin Monteith, Gary Fralick, Jill Randall

- Organized and oversaw capture, handling and VHF radiocollaring of >50 neonatal mule deer within the Wyoming and Salt River Mountain Ranges of Western Wyoming.
- Corresponded daily with a fixed wing pilot and numerous field crewmembers concerning recovery of newborn fawns at sites where Vaginal Implant Transmitters were expelled from pregnant mule deer females and previously captured fawns were determined to have died.
- Organized and oversaw collection of biological and vegetation data at fawn parturition sites and mortality sites.
- Gained extensive experience hiking and navigating in back country situations using a handheld GPS, topographical map and compass.
- Interacted on a daily basis with numerous professionals from both state and federal agencies as well as stakeholders including ranchers, hunters, and other property owners.

The Joseph W. Jones Ecological Research Center, Newton, GA
August 2011-August 2013

Graduate Research Assistant
Habitat selection and survival of white-tailed deer fawns in a longleaf pine ecosystem

Principal Investigators: Dr. Robert J. Warren and Dr. L. Mike Conner

- Captured 15 adult pregnant females via rocket net and chemical immobilization and fitted them with vaginal implant transmitters to facilitate neonate capture.
- Captured 40 neonates and fitted them with radio-collars to monitor for survival and habitat selection.
- Documented parturition site selection in captured adult females.
- Performed radio-telemetry on captured neonates daily to monitor for survival.
- Estimated cause-specific mortality of neonates using evidence recovered at mortality sites.
- Estimated Kaplan-Meier survival rate of monitored neonates.
- Performed triangulations on neonates and estimated UTM locations based on triangulations using the program LOAS (Location of a Signal) in order to later quantify habitat selection.
- Assessed vegetation characteristics at known animal locations using statistical software R.
- Documenting neonate bed-site and habitat selection via ArcGIS and statistical software such as R and SAS.

- Assisted with white-tailed deer population monitoring including performing spotlight counts (using thermal infrared cameras), track counts and motion-sensor camera surveys
- Assisted with capture and monitoring of >10 coyotes using foot-hold traps
- Assisted with selective harvest and collection of harvest information of white-tailed deer at local check station during hunting season.
- Summarized research findings via at least two manuscripts to be submitted to peer-reviewed journals.
- Supervised a number of field research volunteers and technicians on techniques involved in carrying out research objectives.

The Colorado Division of Wildlife, Walden, CO
March- September 2010

Wildlife Technician
Habitat use and demographics of the greater sage-grouse

Supervisor: Liza Rossi (Principal Investigator)

- Performed night capture on 95 greater sage-grouse adult and yearling females.
- Netted and then fitted grouse with GPS Collars and leg bands.
- Performed telemetry to quantify habitat use.
- Identified nests and then brood locations on successful nests.
- Performed vegetation sampling (daubenmire method) to identify potential nesting and brood habitat preference.
- Performed outreach in collaboration with state game wardens to increase landowner knowledge of conservation practices.
- Gained a small amount of experience with the WHIP and EQIP programs in the context of greater-sage grouse conservation.
- Gained experience hiking in remote, rugged environments and surveying for bighorn sheep.

The Savannah River Site-USDA Forest Service, New Ellenton, SC
August-December 2009

Biological Technician
Effects of wildlife corridors on wind mediated seed dispersal patterns

Supervisor: Dirk Baker (Post-doctoral researcher); Washington University, St. Louis MO

- Provided field assistance during the daytime and at night for research examining seed dispersal patterns of select grass and forb species.
- Quantified and monitored plant seed productivity and dispersal patterns.
- Research was conducted in an ecological unit where three different artificial wildlife corridors were located in longleaf pine stands with “patch”, “edge”, and “matrix” habitat.
- Constructed simulated seeds from light cloth, which were dusted with UV powder and released into the ecological unit when an optimum wind speed was obtained; mapped seed dispersal using ultra-violet lights.
- Recorded, organized and analyzed observational and biological data.

The Savannah River Site- USDA Forest Service, New Ellenton, SC
January-August 2009

Wildlife Technician
Assessment of the impact of coyote predation on white-tailed deer populations and fawn survival

Supervisor: Dr. John Kilgo (Research Wildlife Biologist)

- Helped capture 30 adult female white-tailed deer using rocket net and chemical immobilization; fitted with radio collars and vaginal implant transmitters; continuously monitored does until spring when the VIT's were used to locate and capture 45 neonates.
- Neonates were monitored continuously to gather habitat selection and mortality data.
- When a captured neonate died, the remains were recovered and an initial cause of death was determined by the surrounding evidence, which was later confirmed by DNA swabs of the carcass.
- Collected coyote scat for four months; helped analyze and quantify two years of scat to assess food preferences, specifically searching for white-tailed deer hair/remains.
- Conducted vegetation surveys (vegetation profile board) according to previously estimated animal locations; subsequently identified habitat preferences, especially in comparison with parturition and predation sites.
- Assisted with feral hog control using lethal means.
- Interacted with and assisted hunters at a check-station during wild turkey season.

INTERNSHIP EXPERIENCE

Fire Island National Seashore, Patchogue, NY
June-October 2008

Wildlife Management Intern under the Student Conservation Association
Supervisor: Jordan Raphael (Park Biologist)

- Assisted in the implementation of white-tailed deer immuno-contraception program;
    - Performed distance sampling with standardized population count methods
    - Darted >140 does with an immuno-contraceptive, PZP (Porcine Zona Pellucida) for population management study.
    - Collaborated with community members; educated public on the park's white-tailed deer management program.
- Endangered piping plover population monitoring
    - Constructed nesting predatory exclosures
    - Searched, identified, monitored and documented nesting activities
    - Mapped and spatially analyzed nests using GPS and GIS technology
- Long Island Colonial Waterbird and Vegetation Surveys
    - Identified several different species of colonial waterbirds and quantified colony sizes

- Seabeach amaranth and knotweed monitoring
- Identified, quantified and mapped listed plant species.

VOLUNTEER EXPERIENCE

Wyoming Game and Fish Department
July –October 2015

- Black bear capture in the Wyoming Range near Alpine:
  - Checked sites set with snare or culvert traps for bear activity.
  - Replenished bait when necessary.
  - Assisted with immobilization and processing of mature black bear using drug BAM.
- Daily animal monitoring at the Tom Thorne and Beth Williams Wildlife Research Center at Sybille near Wheatland:
  - Helped bottle feed neonatal elk being hand reared for research purposes.
  - Helped measure and provide feed rations for captive elk, bighorn sheep, bison, and moose.
- Vegetation monitoring at aspen regeneration sites near Saratoga:
  - Helped identify and measure aspen regeneration sites on private property for mule deer management purposes.
- Pronghorn movements, survival and recruitment in the Red Desert,
  - Volunteered with a University of Wyoming M.S. Graduate Student to obtain pronghorn recruitment indices from radiocollared females using radiotelemetry, binoculars, and a spotting scope.

The Joseph W. Jones Ecological Research Center, Newton, GA
Prior to joining VHB, Melinda was a Research Assistant supporting small mammal response to prescribed fire; wild turkey nesting and gobbling ecology; white-tailed deer parturition and fawn mortality study; trapping and lethal removal in support of bobwhite quail management; tick population response to prescribed fire; and performed field necropsies on multiple animal species.

PUBLIC OUTREACH AND TEACHING
Participated in annual Women in Science Conference as a representative of South Dakota GFP by running an educational booth devoted to teaching middle school girls about being a state employed wildlife biologist.

Worked to communicate deer program changes at a booth run by the Wisconsin DNR at a "Deer and Turkey" exposition in Madison, Wisconsin.

Met with local Wisconsin DNR law enforcement section to discuss Deer Program Changes.

Taught 60, 9th grade students how to age deer "on the hoof" and using jaw bones; January 2012.

Lectured to three consecutive classes of 20+ students; used their outdoor experiences and interest in hunting to aid in their understanding of the presented material.

Taught Warnell School undergraduate students how to perform radio-telemetry; January 2012.

Invited speaker in Wildlife Physiology and Nutrition taught by Dr. Robert J. Warren; discussed my experience with urban deer management and immuno-contraception; February 2012.

Authored an informational internet blog on fawn survival research; sponsored by The Quality Deer Management Association; May 2012-August 2012.

SELECTED PROFESSIONAL PRESENTATIONS

Nelson, M. A., and T. Nordeen. 2016. Nebraska's Bighorn Sheep Management Program. Meeting of the Nebraska Audubon Society, Scottsbluff, Nebraska.

Nelson, M.A., M. J. Cherry, R. J. Warren, M. Brent Howze, and L. M. Conner. 2014. Coyote and Bobcat Predation on White-tailed deer Fawns in a Longleaf Pine Ecosystem in Southwestern Georgia. Annual Proceedings of the Southeastern Association of Fish and Wildlife Agencies, Destin, Florida.

Nelson, M. A. 2014. Wisconsin's Deer Management Assistance Program. Meeting of the Dane County Conservation League, Madison, Wisconsin.

Nelson, M. A. 2014. Wisconsin's Deer Trustee Report: Program updates and the Deer Management Assistance Program. Annual statewide meeting of the Wisconsin DNR Bureau of Forestry, Appleton, Wisconsin.

Nelson, M. A. 2013. Habitat selection and survival of white-tailed deer fawns in a longleaf pine ecosystem. Graduate thesis research seminar, The Joseph W. Jones Ecological Research Center, Newton, Georgia.

Nelson, M. A., M. J. Cherry, R. J. Warren, and L. M. Conner. 2012. Bed-site selection by white-tailed deer fawns in a longleaf pine ecosystem. Annual Meeting of the Southeastern Deer Study Group, Greenville, South Carolina.

Nelson, M, M. J. Cherry, L. M. Conner and R. J. Warren. 2012. Movements, habitat selection and survival of white-tailed deer fawns in a longleaf pine ecosystem. Georgia Dept. of Natural Resources, Wildlife Resources Division Research Meeting. Forsyth, Georgia.

PUBLICATIONS

Lehman, C, P., and M. A. Nelson; M. N. Squillace. Years 2017-2021. Bobcat Harvest Report. South Dakota Game, Fish, and Parks, Rapid City, USA.

Nelson, M. A., and T. Nordeen. 2016. Elk population research update: Fort Niobrara National Wildlife Refuge. Nebraska Game and Parks Commission, Alliance, USA.

Nordeen, T., M. Ellstrom, J. Powell, and M. A. Nelson. 2016. Mule deer aerial survey report. Nebraska Game and Parks Commission, Alliance, USA.

Nordeen, T., K. Decker, and M. A. Nelson. 2016. W-106-R-1 Wildlife Restoration progress report: Big Game population research and translocations in Nebraska. Nebraska Game and Parks Commission, Alliance, USA.

Nelson, M.A., M. J. Cherry, M. Brent Howze, R. J. Warren, and L. M. Conner. 2015. Coyote and Bobcat Predation on White-tailed deer Fawns in a Longleaf Pine Ecosystem in Southwestern Georgia. Journal of the Southeastern Association of Fish and Wildlife Agencies.

Kaminski, D., K. Wallenfang, and M. A. Nelson. 2014. Moose Observations 2013. Wisconsin Department of Natural Resources, Madison, USA.

Kaminski, D., K. Wallenfang, M. A. Nelson, and M. Penthorn. 2014. 2014 Deer Season Forecast. Pages 46-57 in 2014 Fall Hunting & Trapping Forecast. Wisconsin Department of Natural Resources, Madison, USA.

Dhuey, B., K. Wallenfang, M. A. Nelson, and D. Kaminski. 2014. The 2013 Wisconsin Deer Hunting Summary. 1-62 in B. Dhuey, editor. Big Game Harvest Summary. Wisconsin Department of Natural Resources PUB-WM-284-2014, Madison, USA.

Cherry, M. J., M. A. Nelson, R. J. Warren, and L. M. Conner. 2013. Photo sensors increase likelihood of detection of expelled vaginal implant transmitters. Wildlife Society Bulletin 37: 846-850.