

**STATE OF NEW HAMPSHIRE
SITE EVALUATION COMMITTEE**

Docket No. 2015-06

**Joint Application of Northern Pass Transmission, LLC
and Public Service Company of New Hampshire
d/b/a Eversource Energy for a Certificate of Site and Facility**

**SUPPLEMENTAL PREFILED DIRECT TESTIMONY OF RICK VAN DE POLL ON
BEHALF OF THE CITY OF CONCORD**

April 17, 2017

Background and Qualifications – Rick Van De Poll

Q. Please state your name and business address.

A. Rick Van de Poll, 30 North Sandwich Road, Center Sandwich, NH 03227

Q. In addition to the educational background and work experience you reference in your pre-filed testimony, have you provided a Curriculum Vitae?

A. Yes. During discovery, I was asked to provide my Curriculum Vitae. It is attached as Exhibit A to this pre-filed testimony.

Q. In your pre-filed testimony from December 30, 2017, you discuss impacts to the Karner Blue butterfly and wild lupine. Could you provide additional detail about your past experience working with the Karner Blue butterfly and wild lupine?

A. Yes. During my technical session and in a follow-up data request, I was asked to specify information about my work with the Karner Blue butterfly. The following provides an overview of my experience.

In 1986, I worked during my graduate degree work for the New Hampshire Natural Heritage Program under the auspices of then Director, Ms. Frankie Brackley. Part of the work experience during the summer was to conduct surveys of the Karner blue butterfly (Kbb) in the Concord Pine Barrens area. This assessment primarily entailed the net sweep capture of flying adults, the marking of these individuals on the forewing with magic marker, and their recapture for the purposes of standard capture-mark-recapture sampling. The principal investigator was Dr. Dale Schweitzer of the (then) Nature Conservancy, who instructed us in capture and marking

1 methods as well as in tallies and sampling error. This survey also included the identification and
2 tally of wild lupine (*Lupinus perennis*).

3 In the early 1990's, I also tallied Kbb and wild lupine as part of certain development
4 projects in the Concord Pine Barrens while working for New England Environmental Associates.
5 At the time, there was a requirement for all Alteration of Terrain permits to conduct rare species
6 surveys to provide information to the New Hampshire Natural Heritage Bureau and New
7 Hampshire Fish & Game. Both Kbb and wild lupine was discovered and tallied at three
8 locations during this time, the results of which were submitted to the respective agencies. In one
9 instance, a small population of wild lupine was transplanted as partial mitigation for the impacts
10 to Kbb habitat.

11 Most recently, in 2012, I accompanied Ms. Heidi Holman of the New Hampshire Fish &
12 Game Department in monitoring Kbb at the "Main Site" near the Concord Airport subsequent to
13 a prescribed fire that had taken place earlier in the spring. This survey included net sweep and
14 digital photograph surveys of previously numbered individuals. An exploration was also made
15 of a secondary site to search for wild lupine coverage. Based on this and several years of
16 butterfly and moth sampling by me, I was then invited to participate in the rare Lepidoptera
17 (moths and butterflies) review by New Hampshire Fish & Game, notably for the preparation for
18 the latest Wildlife Action Plan. I also currently sit on the Regional Review Team for
19 Lepidoptera sponsored by Nature Serve.

1 **Purpose of Testimony**

2 **Q. What is the purpose of this supplemental pre-filed direct testimony?**

3 A. My supplemental testimony is to address the findings of field visits that I
4 performed on March 10, 2017 to further investigate the wetlands impacts associated with the
5 proposed Northern Pass project in the City of Concord, as well as to provide clarification about
6 my earlier testimony to the extent that such information was requested in data requests and/or
7 raised during technical sessions.

8 **Wetland Impacts**

9 **Q. You were asked in data requests and during technical sessions about the**
10 **statement in your pre-filed testimony (Page 2) that a review of the 28 map sheets pairs for**
11 **Concord resulted in a tally of 38 errors representing approximately 71,610 s.f. (1.64 acres)**
12 **of additional, probable wetland impacts. Could you provide additional information about**
13 **how you made this determination?**

14 A. Yes. As discussed in response to data requests and during my technical session, I
15 have provided a spreadsheet that specifically identifies all of these areas. It is attached as Exhibit

16 B. This review was based on an aerial photo interpretation of the location of wetlands and other
17 surface waters along the proposed Northern Pass Transmission project's right-of-way in the City
18 of Concord. This was performed on an ArcGIS 10.x platform using 12015 color infrared field
19 sheets from the NH GRANIT data server, as maintained and made available by Complex
20 Systems research center at UNH, Durham, NH. These 1-foot pixel, orthophotographs allow for
21 the assessment of "cool" landscape features such as surface waters, wet soils, and 'cool' conifer

1 leaf cover. Beginning with the first NPTP field sheet prepared by Normandeau Associates and
2 included as a part of the Wetlands Application to NH DES (# 586), I compared the wetland
3 mapping and mapping temporary and permanent wetland impacts on the NPTP map sheets
4 against the 2015 color infrared aerial photographs. Based on evidence in the latter
5 orthophotographs I discovered that the wet soils and surface waters did not necessarily line up
6 with the mapped wetlands provided in the wetland application map sheets. Using a scale of
7 1:1000 on the desktop, I determined the approximate differences between the two map sources.

8 **Q. You were also asked in data requests about the calculations used for the**
9 **statement in your pre-filed testimony (Page 5, Lines 13-14) that wetland mitigation will not**
10 **be required for 99.7% of the impacts. Could you also provide this information to the Site**
11 **Evaluation Committee?**

12 A. The basis of this statement was made on the amount of permanent impacts versus
13 those that are temporary or secondary. The amount of permanent impacts for the City of
14 Concord has been stated as 501 square feet, versus temporary impacts of 319,701 square feet.
15 The ratio here is actually over 99.8%. That said, an arbitrary but approved plan exists for
16 mitigating some of the direct temporary impacts at a ratio of 15% for conversion impacts to
17 palustrine forested wetlands within the ROW, and 20% for the same outside of the ROW. This
18 equates to another 704 s.f. of mitigation required. Similarly, the approved ratio for stream and
19 vernal pool impacts is 15% within and 20% outside of the ROW, with a variable amount
20 depending on the type of stream. According to the wetland application and the Concord
21 Summary this has added 8,471 s.f. of impacts taken for mitigation. Combined with the

1 permanent impacts that require mitigation, the total is slightly more than 3%, and so the Pre-filed
2 testimony on Page 5 *should have read “97%” and not “99.7%.”*

3 **Q. Have you had an opportunity to perform field work since your pre-filed**
4 **testimony was filed?**

5 A. Yes, I performed field work on March 10, 2017. The purpose of the field work
6 was to conduct a semi-randomized field assessment of some of the “error” sites determined as
7 described above.

8 **Q. What were the results of this field work?**

9 A. I prepared a report with an overview of the field work, which is attached Exhibit
10 C. This document has already been produced in discovery.

11 **Q. Your pre-filed testimony (Page 3) discusses some of the long-term effects**
12 **resulting from a wetlands impact that has been classified as temporary. You were asked in**
13 **data requests and during your technical session about the statement that “in spite of the**
14 **claim that the access roads and construction pads will only create ‘temporary’ impacts, it is**
15 **clear that the use of 50 – ton pieces of equipment over soft hydric soils will have a**
16 **permanent, compacting effect regardless of the protective mats that are intended to be**
17 **used.” Please also provide this information to the Site Evaluation Committee.**

18 A. A short list of weights of typical construction equipment used in transmission line
19 work includes some of the following:

20 a. Logging feller-buncher, e.g. John Deere 903J: 63,340 lb; attachment: 7,300 lb

21 b. Skidder – e.g. John Deere 848H Grapple: 39,300 lb

1 c. Cat D10 bull-dozer: 170,000 – 180,000 lb depending on blade

2 d. Crane – e.g. 100-ton Telescopic Boom Crawler: 202,300 lb

3 e. 10-yard Concrete Truck, loaded: 66,000 lb

4 During the assessment of the proposed Kinder Morgan gas pipeline in southern New
5 Hampshire, I investigated recently replaced transmission poles along the existing Eversource
6 Right of Way. The following photographs demonstrate the unreliability of the stated
7 “Temporary Impacts” associated with mat placement and removal during a transmission pole
8 installation effort:





1
2 The photographs were taken from off of Middle Winchendon Road on December 9, 2015. The
3 photographs show drag marks from the mats that were placed, and they illustrate the difference
4 between the upland (this side of the pink flag) and the wetland where the equipment used to pull
5 the mats out left ruts and created more of a permanent disturbance. The new pole, visible in the
6 distance, was placed approximately two weeks earlier.

7 **Q. You were also asked in data requests about the statement in your pre-filed**
8 **testimony (Page 3) that the “scenic quality function” of wetlands will be impacted. Please**
9 **also provide this information to the Site Evaluation Committee.**

10 A. Scenic Quality is a well-recognized wetland function (see for example, *Method*
11 *for Inventorying and Evaluating Freshwater Wetlands in New Hampshire* (Stone, Mitchell, Van
12 de Poll, and Rendall 2015, available at www.nhmethod.org). Based on the evaluation questions

1 included in this method, it appears that 48 – 125 feet high transmission towers would qualify as
2 “severe visual detractors” in Q.6. I also addressed this issue in my doctoral dissertation, “Natural
3 and Cultural Resource Inventories for Private Landowners in New England” (UMI Press, 1996),
4 which included a chapter on “Visual Quality Assessments.” This document included assessment
5 criteria provided and was peer-reviewed by Tom Kokz, who drafted the first Visual Impacts
6 Assessment protocol for the National Park Service in the early 1990’s.

7 **Q. You were asked in data requests about the statement in your pre-filed**
8 **testimony (Page 4) that the “temporary [wetland] impacts will affect a number of wildlife**
9 **species in Concord, especially nesting amphibians, reptiles, and birds that will be displaced**
10 **by the construction activities” and the statement that “[a]lthough temporally short in**
11 **nature, these impacts could cause irreparable long-term harm to habitat sensitive species**
12 **such as grassland and marsh-nesting birds.” Please also provide this information to the**
13 **Site Evaluation Committee.**

14 **A.** The proposed direct temporary impacts of 7.3 acres will necessarily eliminate all
15 natural vegetation within the impact areas during the construction phase. This will effectively
16 remove all opportunity for nesting by both grassland and marsh-nesting birds. Some of these
17 areas are proposed to be restored to their original topography, and all are to be stabilized by mat-
18 netting, hydro-seeding and conservation and/or wetland seed mixes, yet none are proposed to be
19 replanted at the level of density or height that currently supports these bird species. Therefore,
20 there will be a period of time where the vegetation structure is lacking in these impact areas for
21 recolonization. While there will be obvious opportunities for re-nesting in areas adjacent to the

1 temporary impact areas, many of these will suffer the deterrence effects on ongoing construction
2 for a minimum of one growing season. Further, the temporary impacts to marshlands and deep
3 organic soils, as noted above, may *never* recover the structure and diversity of plant life that
4 currently supports many of the bird species currently found there. This will be particularly true
5 for Turkey Pond, where extensive organic mats support a number of waterfowl nesters and
6 wetland-dependent passerines.

7 The same can be said for amphibians and reptiles, who will lose fossorial denning
8 opportunities, some of which are historic, traditional, and difficult to replace without a long
9 period of small mammal excavation and predator avoidance.

10 **Impacts to Natural Resources – Wildlife Fragmentation**

11 **Q. You were asked in data requests about your statement on your pre-filed**
12 **testimony (Page 6, Lines 4-5) that removal of 10-11 acres of vegetation will add to the**
13 **fragmenting effects of the proposed NP project on residential wildlife. Please provide this**
14 **information to the Site Evaluation Committee.**

15 **A.** Fragmentation is a well-documented effect on the loss of certain species of
16 wildlife across the United States (see for example, *Saving Nature's Legacy* (Ross & Cooperider
17 1994). The loss of 10 – 11 acres of forest canopy will have a deleterious effect on forest nesting
18 birds, some of which may be neo-tropical migrant species that are entirely reliant on closed
19 canopy forests in which to feed and breed (e.g. scarlet tanager, myrtle warbler, Blackburnian
20 warbler). Forest fragmentation also contributes to the introduction of invasive species, as noted
21 in the wetland application. Such alteration of native vegetation cover exacerbates the

1 fragmenting effects of canopy conversion from one layer (i.e. tree) to another (i.e. shrub). While
2 the amount of canopy loss is relatively small compared to the overall size of the existing ROW
3 (252 acres), it is nonetheless significant.

1 **Q. Have you received additional information about the Karner Blue butterfly**
2 **since the submission of your pre-filed testimony on December 30, 2017?**

3 A. The information I received on Kbb was the two pages field notes by Dr. Michael
4 Amaral that was requested at the April 5, 2017 technical session, and which he provided to the
5 applicant. This information was provided to me by Attorney Danielle Pacik via an email that she
6 received from Attorney Elijah Emerson on April 7, 2017.

7 **Q. Does this end your testimony?**

8 A. Yes.

EXHIBIT A

Rick Van de Poll, Ph.D.
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Center Sandwich, NH 03227

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CURRENT EMPLOYMENT:

Principal, Ecosystem Management Consultants of New England, LLC (since 1988)
Center Sandwich, NH

EDUCATIONAL EXPERIENCE:

1996: **(Ph.D.)** The Union Institute - Cincinnati, OH Specialization: Natural Resource Management; Dissertation: "Natural and Cultural Resource Inventories: A Guide to Comprehensive (Level III) Methods for Private Landowners in New England"

1985-86: **(MST)** Antioch New England Graduate School - Keene, NH Emphasis: Environmental Science; Natural Resource Inventory; Conservation Biology

1984-85: **(MS in part)** San Francisco State University - San Francisco, CA
Emphasis: Mycology and Lichenology

1974-77: **(BA)** The Evergreen State College - Olympia, WA Emphasis: Outdoor Education and Counseling.

Additional Training:

2014 – Ecological Integrity Assessment Method, NHHNB, Concord, NH
2012 – Advanced use of ArcGIS 10.x, UNH, Durham
2012 – Rehabilitation for Stream Stability & Function, US ACOE, ERDC, Henniker, NH
2008 – Electroshock Fish Sampling Techniques, NH Fish & Game
2007 – Wildlife Habitat GIS Mapping, Wildlife Action Plan, NH Fish & Game
2006 – Conservation Easement Options, LTA Rally, Nashville, TN
2005 – Strategic Planning for Land Trusts, LTA Rally, Madison, WI
2004 – Wetland Functional Assessment Using Highway Methodology, Exeter, NH
2002 – Advanced Hydric Soils in Disturbed Sites, UNH, Durham
2002 – Eagle Hill Seminar on Dragonflies & Damselflies, Steuben, ME
2001 – Army Corps Wetlands Delineation – Section F Training, Concord, NH
2000 – Color Infrared Aerial Photo Interpretation, NH DFL, Hillsboro, NH
1998 - Land Use Planning, Antioch New England Graduate School, Keene, NH
1995 - GIS Using ArcView, Antioch New England Graduate School, Keene, NH
1995 - Wetland Delineator Certificate Program, UNH, Manchester, NH
1994 - Statistics for Environmental Biologists, Antioch New England, Keene, NH
1992 - Ecological Research Methods, Wells N.E.R.R., Wells, ME
1987 – Introduction to Soils, UNH

ACADEMIC POSITIONS:

2003 – 2007: Adjunct Faculty, Plymouth State University, Plymouth, NH Courses developed and taught: Freshwater Biology Seminar, Summer Science Institute in Freshwater Ecology, Mycology, Wetlands (Graduate Division)

1990 - July, 2001: Core Faculty, Antioch New England Graduate School, Keene, NH. Courses offered: Wetlands Flora, Wetlands Delineation, Natural Resource Inventory, New England Flora, Mycology, Non-flowering Plants, Alpine Flora, Coastal Ecology, Tropical Ecology, Desert Ecology, Ecology of the Pacific Northwest, Tropical Ecology of the Galapagos and the central Andes.

1990 – July, 2001: Director, Field Studies Program, Antioch New England Graduate School, Keene, NH. Oversee and administer off-campus Field Ecology courses: Agroecology of the Italian Alps, Galapagos Ecology, Tropical Ecology (Costa Rica), Coral Reef Ecology (Caribbean), Wolf Ecology (MN), Desert Ecology (US/MEX), Ecology of the Pacific Northwest (WA), Coastal Birds (MA), Coastal Ecology (ME, MA), Pine Barrens Ecology (NJ), Marine Ecology (ME).

1985 - 1990: Associate Faculty, Antioch New England Graduate School, Keene, NH. Courses offered: Natural Resource Inventory, various Field Ecology courses

1980 - 1981: Assistant Professor, Lane Community College, Eugene, OR. Courses offered: Wildflowers of Oregon, Natural History of Baja California, Mexico

CONSULTING POSITIONS:

1988 - present: Principal, Ecosystem Management Consultants of New England, LLC, Center Sandwich, NH. Oversee operation of small environmental consulting firm that provides natural resource inventories and land use planning for the public and private sector. Conduct wetland delineations & evaluations; provide written and oral testimony on municipal issues; supervise employees in research and education.

2010 - present: Land Trust Monitor, Sweet Water Trust, MA. Provide long-term monitoring investigations, reports and management plan updates for 15,000-acre preserve in the Adirondacks, 1400-acre preserve in Northeast Vermont, and 11,500-acre preserve in northern New Hampshire (transferred in 2015)

1998 – present: Land Trust Contracts, Lakes Region Conservation Trust, Center Harbor, NH, and Squam lakes Conservation Trust, Holderness, NH. Provide regular ecological inventory & monitoring to support grant applications, funding campaigns, baseline documentation reports, and management of new and existing preserves; consult with Executive Directors, staff, and Lands Committees on land protection projects

SELECTED CONTRACT EXPERIENCE:

- *2016 – present: Ecos Energy Bennington Solar Array Project** – completed site assessment and wetlands mapping (with CVES) of rare & endangered species at 78-acre proposed solar array site in Bennington, VT; assisting with wetland permitting
- *2016 – present: Town of Rindge Wetland Impact Corridor Study** - conducted office and field-based assessment of proposed Kinder Morgan Pipeline along Eversource Right-of-Way across town; assessed wetland impacts; identified vernal pools & rare species; completed potential assessment of on-site mitigation property
- *2015 – present: Town of Fitzwilliam Prime Wetlands Protection Project** – completed API mapping of all contiguous wetland in and adjacent to Fitzwilliam; provided point-rank assessment of 114 wetland evaluation units; completed NH Method assessment of highest value sites for consideration at prime wetlands under RSA 482-A:15; revised local ordinance and advised BOS on warrant and submission to state; see http://fitzwilliam-nh.gov/index.asp?SEC=4527C6AB-B79C-4459-AD03-0746A4D8A5EB&Type=B_BASIC
- *2014 – present: Balsams Resort Expansion Project** – completed assessment for the Society for the Protection of NH Forests of their Balsams Easement relative to the proposed expansion of the Balsams Resort; identified rare species, old growth forest, and assisted in crafting an easement amendment; assessed mitigation parcels; provided written testimony; completed field assessment of residual easement area and submitted final report, December 2016 (under review)
- *2015 – 2016: NED Pipeline Assessment, Pelham, NH** – assisted town in assessing wetland impacts associated with proposed Kinder Morgan gas pipeline; delineated wetlands, identified mitigation sites, helped craft response to Km re: wetland mitigation sites; coordinated objection response to Army Corps of Engineers and NH DES regarding temporary versus permanent impacts
- * 2014 – 2016: Municipal Wetlands Consulting for proposed NED (Kinder Morgan) Pipeline** - provided pipeline information workshops through NHACC for affected towns in southwestern NH; worked directly with four towns along proposed ROW by mapping wetlands, assessing wetland function, identifying vernal pools, and helping prepare mitigation plans; submitted written and oral testimony to SEC
- * 2014 – present: Society for the Protection of NH Forests Balsams Project** - provided ecological assessment of areas affected by for proposed Balsams Ski Area Expansion; identified suitable mitigation sites, old growth areas, recreational use areas; also conducted Rapid Ecological Assessment of 5400-acre easement area for future management purposes, final report pending review

- * **2014 – 2016: Mount Sunapee Resort West Bowl Expansion** – worked for Mount Sunapee Resort in assessing old growth and exemplary natural community presence in proposed West Bowl expansion area; provided testimony at hearings and written reports in support of expanded conservation-mitigation for minimal ski area impacts; see NH DPR final decision at:
http://www.mountsunapee.com/mtsunapeewinter/aboutsunapee/MountSunapeeMDP_Final%20Approval_3-17-2016.pdf

- * **2014 – 2016: City of Lebanon Wildlife Corridor Analysis** - conducted Phase II, site specific assessment of major wildlife crossing areas in City; performed track intercept tallies and habitat suitability analyses to assist City in designing ‘Green Infrastructure’ approach to planning and zoning; assisted in updating city-wide habitat map; see:
<https://lebanonnh.gov/853/Lebanons-Wildlife-Corridors>

- * **2013 – present: Northwood Area Land Management Collaborative** – conducted “current condition summary” of 2646 acres of land in Northwood and Deerfield, NH for public-private collaborative of 18 landowners; prepared background documents for ecosystem-based management plan to assist landowners in joint stewardship of critical upper Lamprey River watershed area; currently assisting in outreach and presentations regarding the project; see: <http://nalmc.net/publications/cpn-report/>

- * **2013 – 2016: Pembroke Natural Resource Inventory** – conducted comprehensive mapping and field inventory of the town of Pembroke; completed water resource mapping update; devised point-rank system for evaluating all wetlands and completed NH Method assessment of candidate prime wetlands; updated conservation land database and assessed all natural resources

- * **2013 – 2014: Springfield Wetlands Project** – completed comprehensive mapping of wetlands in town of Springfield; assisted with revisions to the existing wetlands ordinance; identified 161 probable vernal pools & provided guidance on recognizing vernal pools; provided wetland education at regional high school; currently providing rapid evaluation of major wetland complexes
http://www.uvlsrc.org/project/Springfield_Community_Planning_Grant_Wetlands_Project_128/

- * **2012 – 2016: Wetland Assessments for ARM Funding (SPNHF)** – completed office and field-based assessments and mapping of wetlands on four projects proposed for funding under the Aquatic Resources Mitigation Fund: Olsen Property, Boscawen; Brown Property, Sutton; Goss Property, Madbury & Durham; Manchester Water Works Property, Candia & Auburn; completed written reports and assisted in ARM Fund applications

- * **2011 – 2014: Ossipee Mountain Preserve Ecological Monitoring** – completed baseline documentation reports on two expansion tracts in Ossipee Mountains for Lakes

Region Conservation Trust; conducted 10-year interval monitoring of wildlife and natural communities on entire 3,400 acre preserve

- *2013 – 2014: Squam Uplands Rapid Ecological Assessment** – completed 9-month assessment of 1465 acres in uplands region NW of Squam Lake for Squam Lakes Conservation Society; coordinated project review, completed BDR's, wrote case statement for expansion of conservation focus area
- * 2011 – 2016: Town of Center Harbor, NH Prime Wetlands Mapping Update** - utilized NRI completed in 2011 to update prime wetlands mapping for six additional prime wetlands; presented at Town hearings and assisted in registering wetlands with state of NH; <http://www.centerharbornh.org/primewet2012.pdf>; assisted with rewrite and passage of Water Resources Ordinance
- *2011 – 2013: Grantham Wetland Inventory & Assessment Project** – completed comprehensive aerial and roadside survey of all wetlands in Grantham, NH, as well as revised NH Method evaluation of 54 significant wetlands; coordinated 22 town volunteers and conservation commission members; prepared and presented final report; testified at several town hearings regarding proposed prime wetlands http://www.granthamnh.net/index.asp?SEC=5B98A9B7-9736-4FF5-92CF-F634A2CDEE54&DE=6E82493A-7674-49CB-AFBF-A6543631F155&Type=B_BASIC
- *2011 – 2013: Twin Pines Housing Trust Rivermere Affordable Housing Project** – Assisted TPHT to obtain grant assistance through the Northern New England Housing Investment Fund by providing wetlands and shorelands permitting guidance in Lebanon, NH; performed delineation & site assessment for project; completed storm damage assessment and assisted with restoration plan
- * 2010 – 2012: Wildwood Property NRI & Management Plan, Dublin, NH** – completed 20-year monitoring of natural resources at 1400-acre property; updated comprehensive, compartment-based management plan for private landowner
- *2010 – 2011: Pleasant Mountain Preserve EA, Bridgton & Denmark, ME** - completed comprehensive ecological assessment of wildlife, rare plants, and ecological communities on 1500-acre Phase I property and 736-acre Phase II (pending sale) property of the Loon Echo Land Trust; found one new and one state historic rare plant for Maine; documented 28 occurrences of 16 rare plants on mountain <http://www.loonecholandtrust.org/places-we-protect/preserves/pleasant-mountain-preserve/>
- *2010 – 2011: Hebron Town Forest NRI & Management Plan, Hebron, NH** – conducted rapid ecological assessment of 453-acre public property; presented findings to town;

worked with town forester to compile management plan
<http://www.hebronn nh.org/hebron-town-forest.html>

- * **2009 – present: Wetlands Restoration & Conservation Project, Webster Lake, NH** – completed 850-acre conservation easement on four parcels through Wetlands Reserve Program (NRCS); currently coordinating flood storage and aquatic life passage restoration on all properties to improve WQ of impaired Webster Lake
- * **2008 – 2009: City of Lebanon Natural Resources Inventory Phase II** – mapping and assessing all wetlands, documenting wildlife species & corridors, determining high-value co-occurrence areas, assessing steep slopes, presenting findings to the City
<https://lebanonnh.gov/646/Natural-Resources-Inventory>
- * **2008 – 2009: Town of Hanover Mink Brook Highlands Assessment** – conducting NRI assessment of 650-acre area that is currently subject to development proposals; performing 4-season wildlife and natural communities assessment, mapping wetlands
- * **2007 – 2009: Effingham Wildlife Action Plan Implementation Project** – wrote grant proposal and received funding to conduct comprehensive review of wildlife and wildlife habitats in Effingham with the goal of updating the Wildlife Action Plan and coordinating the conservation of significant wildlife habitat in Effingham
[https://extension.unh.edu/resources/resource/1558/Wildlife Action Plan Study - Effingham Conservation Commission](https://extension.unh.edu/resources/resource/1558/Wildlife_Action_Plan_Study_-_Effingham_Conservation_Commission)
- * **2007 – Present: Environmental Education & Monitoring Project, Peterborough** – using the 2004-5 NRI assessment of the 1800-acre Dubois property to establish permanent monitoring plots for education purposes; coordinating use of property by area schools; assisting with farm and forest management; helping place land under conservation by overseeing surveys, working with land trusts, writing the CE
- * **2006 – 2009: New Hampton NRI** – performed GIS mapping and roadside reconnaissance survey of natural resources in New Hampton through Plymouth State University's Center for the Environment; provided updated wetlands mapping and recommendations for wetland conservation; supervised graduate intern
- * **2006 – 2009: Meredith NRI Phase II** – mapped all prime wetlands and helped revise wetlands ordinance to reflect same; also conducted wildlife habitat assessment of all co-occurrence areas defined by NRI Phase I and made recommendations regarding conservation overlay districts on this basis; assisted in protecting Page Pond Forest
<http://www.meredithnh.org/Joomla/index.php/town-departments-26/community-development/138-community-development/planning-documents/586-natural-resources-inventory>

- * **2006 – 2008: Squam Range Ecological Inventory and Conservation Planning** – wrote 3 grant proposals and received funding for 2-year EA in 20,000-acre area north of Squam Lake; working with Plymouth State University graduate students and the Squam Lakes Conservation Society to monitor permanent plots, conduct primary research on threatened species, identify significant ecological areas, and make recommendations for management and conservation of land resources.

- * **2006 – 2007: Rockywold-Deephaven Camp Ecological Assessment** – conducted ecological assessment of the 95-acre camp plus 150 acres of adjoining properties; identified invasive species concerns, hazard trees, erosion and sedimentation issues, and general land management concerns

- * **2005 – 2007: Effingham Wetlands Protection Project** – mapped 90% of the wetlands in Effingham using 1998 digital aerial photographs and field surveys, identifying them by cover class, and assessing them in the field using the ‘N.H. Method.’ Project included the creation of a strategic wetland conservation plan for the Town

- * **2004 – 2007: Lake Waukegan Watershed Project** – completed NRI and helped draft watershed management plan for Waukegan Watershed Committee; received EPA grant to complete water quality and bio-monitoring in watershed for NH DES Pilot Watershed Assessment Program; worked as project manager for Plymouth State University

- * **2004 – 2005: Dubois Property NRI**– completed comprehensive NRI of 1649-acre property in southern N.H. Project included natural community mapping, wetlands mapping, and field-based inventories of mammals, birds, reptiles, amphibians, fungi, and selected invertebrates. Strategic conservation plan also provided.

- * **2004 – 2006: Towns of Amherst, Goffstown, Hooksett, Keene, Ossipee, Strafford, Wakefield** – providing consulting services as certified wetland scientist regarding proposed subdivisions in each town.

- * **2003 – 2007: Focus Tamworth** – provided consulting services as wetland expert to citizens group seeking to regulate a proposed racetrack facility in Tamworth. Testified as expert witness regarding impacts to water quality, wildlife, and wetlands.

- * **2003 – 2006: Town of Meredith Natural Resource Inventory** – Phase I - conducted comprehensive GIS map review and ‘windshield survey’ of town’s natural resources, completed API of all wetlands, developed GIS ‘co-occurrence’ overlays and attribute assessment model; Phase II – conducting field verification of NRI data.

- * **2004, 2007 - Portland Water District EE Planning** - conducted biological assessment of 4 PWD parcels (362 acres) for the purposes of developing environmental education training and programming to area water users

- * **2004 – Kusumpe - Intervale Ponds Ecological Assessment** – provided Lakes Region Conservation Trust with 12-month ecological inventory of the 855-acre wetland-upland area surrounding two undeveloped ponds near Squam Lake in Sandwich.

- * **2003 – 2004: Lake Umbagog National Wildlife Refuge** - conducted biological assessment of macro-invertebrates of 19,000-acre refuge for the U.S. Fish & Wildlife Service, assessed effects of annual drawdown of 8900-acre lake, and provided assistance in the development of the Comprehensive Conservation Plan.

- * **2002 – 2004: Castle-in-the-Clouds Bio-Inventory** – performed a comprehensive inventory and assessment of the 5600-acre Castle property in Moultonborough and Tuftonboro, NH for the Lakes Region Conservation Trust; identified old growth areas, rare & endangered species, plus flora and fauna for management purposes.

- * **2001 – 2002: Squam Lakes Watershed Bio-Inventory** – conducted first year of long-term monitoring project in the 41,000-acre Squam Lakes area of central NH; compiled data base and annotated review of existing literature; prepared long-term ecological monitoring plan for 35 permanent plots, completed comprehensive assessment of plants, animals, water quality, and ecosystems for Squam Lakes Association.

- * **2001 – 2002: Remick Museum Ecological Inventory** – completed a comprehensive natural resource inventory of the 410-acre Remick Museum properties in Tamworth, N.H. Wrote management plan and nature trail guide for 2.5-mile nature trail. Assisted Farm staff in managing land and offering educational workshops.

- * **2001 – 2002: Holt Pond Preserve Rapid Ecological Assessment** – conducted a GIS and field survey of the 400+ acre Holt Pond Preserve in western Maine for the Lakes Environmental Association (LEA) of Bridgton. Established monitoring plots, wetland assessment, species accounts, and educational materials for outreach efforts of LEA.

- * **2001 - 2002: Great Meadow Water Resource Assessment, Tuftonboro** – completed Track III LCHIP study of largest wetland along Melvin River in Tuftonboro for the Tuftonboro Conservation Commission. Established water quality monitoring wells and stations for monthly monitoring; delineated wetland (Army Corps method); conducted wetland assessment of 512-acre wetland and presented findings to Town.

- * **2000 – 2001 Nelson Priority Conservation Plan** – Prepared GIS review of all natural and cultural resource attributes of the 14,452-acre town; drafted attribute assessment model based on LCIP & LCHIP criteria; assessed 38 parcels within high quality ecological areas; advised on conservation initiatives for selected parcels.

- * **1999 - 2001: Ossipee Mountain Preserve Bio-Inventory** – Completed two-year natural resource inventory of the +/- 3000 acre Lakes Region Conservation Trust land on part

of the Ossipee ring dike; conducted rare & endangered species assessments, mammal tracking, natural community mapping, relevé plot analysis, and bird, reptile and amphibian surveys; prepared management plan for this wildlands area

* **1999 – 2000: Amherst Wetlands Assessment** – Completed 'NH Method' evaluation of all wetlands > 1 acre in Amherst, NH; trained 28 volunteers, supervised 4 Antioch interns; prepared and presented summary analysis for nominating prime wetlands through the NH DES Wetlands Bureau; assisted Town in preparing ordinance revision requiring water resource management plans for all proposed impacts in project area (passed 3/12/01)

* **1998 - 2001: Hersey Mountain Forest Inventory & Plan** - Completed 3-year bio-inventory of 4,200 acre land reserve in central N.H. to develop model management plan for the New England Forestry Foundation and The Sweet Water Trust, with goal of integrating timber and wildlands preserve management; helped establish forever wild easement area and protected with Northeast Wilderness Trust

CERTIFICATIONS

Certified Wetland Scientist #110, State of NH, Joint Board of Natural Scientists
Wetland Delineator Certification – Army Corps of Engineers (1987 Manual)

PROFESSIONAL SERVICE - INVITED POSITIONS:

2016 – present: IUCN Higher Fungi Red List Working Group, New England representative
2015 – present: EPA Wetland Buffer Working Group
2015 – 2016: NHANRS Wetland Buffer Scientific Work Group, Chair
2007 – present: New Hampshire Method Wetland Assessment Working Group
2007 – present: NH Fish & Game Department Wildlife Action Plan Revision Task Force
2005 – present: Chair of Governor-appointed member of Site Selection Committee for Aquatic Resource Mitigation Fund, NHACC representative
2005 – 2009: Land Trust Alliance Rally Program Committee
1998 - 2008: Governor appointed member, NH Board of Natural Scientists (Chair)
1998 - 2004: Wetlands Bio-monitoring Assessment Working Group, US Environmental Protection Agency, Region 1.
2003 - 2004: Squam Lakes Natural Science Center Advisory Board
1998 - 2001: Board of Directors, NH Association of Conservation Commissions
1996 - 1998: Army Corps HGM Wetlands Assessment Work Group
1996 - 2000: Ecological Reserves Steering Committee (NH) of the UNH Cooperative Extension Living Legacy Project, Scientific Advisory Group

PROFESSIONAL SERVICE - VOLUNTEER POSITIONS:

2016 – present: NH Wildlife Coalition, Steering Committee

2016 – present: Sandwich Conservation Commission
2015 – present: Squam Lakes Conservation Society, Lands Committee
2014 – present: Member, Outreach & Education Committee, NH Land Trust Coalition
2001 – present: founder, Director of Sandwich Area Mushroom Club
1992 - present: Member, NH Task Force, New England Plant Conservation Association
1991 - present: Board of Trustees, Northeast Mycological Federation
2007 – 2015: NH Association of Natural Resource Scientists, Legislative Comm.
2007 – 2011: Forest Society's Ecological Reserves Committee
2002 – 2010: Chair, Sandwich Conservation Commission
2002 – 2008: Board of Directors, Northeast Wilderness Trust (President 2002-2007)
1997 - 2001: Ashuelot River Watershed Association Steering Committee
1992 - 2001: Natural Resources Advisory Comm., SW Reg. Planning Commission, NH
1992 - 2000: Vice-President, New England Chapter, Society of Wetland Scientists
1989 - 1994: Board of Directors, NH Association of Wetland Scientists
1988 - 1998: Chairperson, Town of Sullivan Conservation Commission
1988 - 1998: Co-founder & President, Monadnock Mushroomers Unlimited

PROFESSIONAL ASSOCIATIONS:

Society of Wetland Scientists (Life)
NH Association of Natural Resource Scientists (Life)
North American Mycological Association (Life)

OTHER MEMBERSHIPS:

Conservation Law Foundation, Defenders of Wildlife, Environmental Defense Fund, Green Mountain Conservation Group, Hubbard Brook Research Foundation, Monadnock Conservancy, Natural Resource Defense Council, The Nature Conservancy, Sierra Club, Society for the Protection of NH Forests, Squam Lakes Conservation Society, Squam Lakes Natural Science Center, Tin Mountain Conservation Center, World Wildlife Federation

AUTHORSHIPS (Selected)

Van de Poll, R.D. 2016. Newfound Water Trail Guidebook. Bristol: Newfound Lake Region Association (final draft under review)
Stone, Mitchell, Van de Poll & Rendall. 2015. *Method for Inventory & Evaluating Freshwater Wetlands in New Hampshire (aka the 'NH Method')*. Durham: UNH Cooperative Extension. Updated in 2013, 2015.
Van de Poll, R.D. 2007. "Wetlands" – Chapter V of the *Natural Resource Guidebook*, published by the Green Mountain Conservation Group and Region 9, U.S. EPA
Van de Poll, R.D. 1998. *Natural and Cultural Resource Inventories: a Guide to Comprehensive (Level III) Methods for Private Landowners in New England*. UMI Publishers.

PRESENTATIONS:

- "Riparian Zone Management – Keys to Conservation Success," with Ammy Heiser, NHACC Annual Meeting, Pembroke Academy, Pembroke, November 12, 2016
- "Understanding the Basis and Use of Wetland Evaluations" with Amanda Stone, UNH Cooperative Extension Training Series, Pease Tradeport, Portsmouth, NH October 4, 2016
- "Rare & Endangered Species of the Lakes Region," Red Barn Lecture Series, NHAS, August 2, 2016
- "Born to Be (forever) Wild," Saving Special Places Conference, Alton, NH April 9, 2016
- "Aquatic Resource Mitigation Fund – Collaborating for Success, with Lori Sommer & Mindy Bubier; Saving Special Places Conference, Alton, NH April 9, 2016
- "Recognizing and Protecting Vernal Pools," GSDI Annual Meeting, Manchester, NH March 14, 2016
- "Making the Most of Wetland Restoration Opportunities," Annual Meeting of the NHACC, Laconia, NH, November 7, 2015
- "Wetland Buffers – To Cut or Not To Cut?" Saving Special Places Conference, Johnathan Stark High School, Hopkinton, NH, April 11, 2015
- "Six Years of Biomonitoring as a Citizen Science Tool in the ConVal School District of NH," New England Association of Environmental Biologists Annual Meeting, Bartlett, NH March 18, 2015
- "Wetland Ecosystems – the Seats of Biodiversity," Annual Meeting of the NHACC, Laconia, NH, November 1, 2014
- "Star Island Natural Communities," Star Island Natural History Week, Isles of Shoals, NH June 24-25, 2014
- "Aerial Photo Interpretation for Wetland Mapping," Quarterly workshop of the NH Association of Natural Resource Scientists, Plymouth, May 30, 2014
- "Towards a Better Understand of Wildlife Corridors in New Hampshire," Quarterly Workshop of the NH Association of Natural Resource Scientists, Lebanon, NH March 27, 2014
- "Improving Wetland Regulations to Reflect Community Values," with Michael McCrory, Annual Water & Watershed Conference, Plymouth State, Plymouth, March 21, 2014
- "Growing Season Indicators for Wetland Hydrology Determinations," Annual Meeting of GSDI, Manchester, March 14, 2014
- "Connecting People and Nature: Making Conservation Lands Work for You," with Carl Wallman, Annual Meeting of the NHACC, Concord, November 2, 2013
- "The Mysterious and Misunderstood World of Mushrooms," Star Island Natural History Week, Isles of Shoals, NH, June 22-29, 2013
- "Pond Ecology & Monitoring," Seminar for Tin Mountain Conservation Center, Albany, NH, June 2, 2013
- "Vernal Pool Ecology," Seminar for Tin Mountain Conservation Center, Albany, NH, May 9 & 11, 2013

"Its All Connected – Farm & Forest-based Education," Annual Spring Conference of the NH Science Teachers Association, Keene State College, Keene, March 10, 2013
 "It's a Wild, Wild World – The Basics of Scientific Inquiry," Annual Meeting of the NH Science Teachers Association, Meredith, November 6, 2012
 "The 'New' NH Method – Using Wetland Assessments as a Core Conservation Tool," Saving Special Places Annual Conference, Weare, NH April 14, 2012
 "Analyzing, Interpreting, and Evaluating Data Derived from the 2011 NH Method," Annual Meeting of the NH Association of Natural Resource Scientists, Concord, January 28, 2012
 "The 2011 NH Method and the NEW New Hampshire Wetlands Mapper," Annual Meeting of the NH Association of Conservation Commissions, Concord, Nov. 2011
 "The 'New' NH Method – Using Wetland Assessments as a Core Conservation Tool," Land Trust Alliance Rally, Milwaukee, October 14, 2011
 "Small Mammal Trapping & Ecology," Quarterly meeting of the NH Association of Natural Resource Scientists, Peterborough, September 16, 2011
 "Fabulous Fungi of the Lakes Region," Day-long workshop at Quincy Bog, Rumney, NH September 11, 2011
 "Wetland Plants of Disturbed Sites," Field presentation for the Annual Meeting of the Granite State Designers & Installers, Hopkinton, NH June 28, 2011
 "Long-term Ecological Monitoring at a Private Nature Preserve – Trends in Soil pH and Plant Dominance," 2011 Northeast Natural History Conference, Troy, NY, April
 "The New NH Method for Wetland Evaluation," with Amanda Stone, NH Water & Watershed Conference, Plymouth, NH, March 25, 2011
 "Winter Botany & Fall Remnants," Winter workshop for the NH Association of Natural Resource Scientists, Concord, December 6, 2010
 "The New Revised NH Method," With Amanda Stone & Frank Mitchell; NHACC Annual Meeting, Concord, NH November 2010
 "Fantastic Fungi I have Loved and Known," Annual Fungus Fair of the Monadnock Mushroom Club, Athol, September 18, 2010
 "Lichens of the Temperate Forest," Workshop offered for Rumney Ecological Systems, Quincy Bog, Rumney, May 1, 2010
 "Going Beyond the Line – Wetland Wildlife Function," Annual Meeting of GSDI, Manchester, March 29, 2010
 "Using Bio-Inventories to Verify and Implement State Wildlife Action Plans," Land Trust Alliance Rally, Portland, OR, October 16, 2009
 "Phase II Natural Resource Inventory of the City of Lebanon, NH," Final Report to the City Council, Conservation Commission and invited public, September 30, 2009
 "Mycology – Understanding the Basis of Terrestrial Ecosystems," seminar taught at High Pond Institute, Plymouth, NH September 2009
 "Town of Effingham Wildlife Action Plan Implementation Project – Final Report," Town of Effingham, June 8, 2009
 "Wetland Growing Season Indicators and the Use of GIS," One day workshop offered to the NH Association of Natural Resource Scientists, April 24, 2009, Plymouth, NH

"Mink Brook Natural Resources Inventory, Town of Hanover, NH," Interim Report to the Town, April 8, 2009
 "Challenging Wetland Delineations," GSDI Annual Conference, Manchester, NH March 23, 2009
 "Bio-Inventory Basics – How a Little Knowledge can go a long way" – NHACC Annual Meeting, Concord, NH November 2008
 "Final Report on the Natural Resources and Land Use Management Recommendations for the 500-acre Spaulding Youth Center Property, Northfield, NH" – Spaulding Youth Center Foundation Board, Northfield, NH, August 2008
 "Flora and Fauna of the Lakes Region" – Loon Preservation Center, May 2008
 "Conservation Value of the Squam Range of New Hampshire" – Land Trust Alliance Rally, Denver, October 2007
 "Meredith Natural Resource Inventory – Phase II, Final Report" - April 30, 2007
 "Hersey Mountain Joint Partnership Project" – Concord, NH, April 2007
 "Effingham Wetlands Inventory & Protection Project – Final Report" – Town of Effingham, NH February 28, 2007
 "Applications of Natural Community Classification Systems – Integration with NWI Cowardin Wetland Classification Types" – Annual Meeting of the NH Association of Natural Resource Scientists, Concord, NH February 2007
 "Mammal Tracks & Sign" – Loon Preservation Center, January 2007
 "Waukegan Watershed Project – Preliminary Findings" – Waukegan Watershed Committee Annual Meeting, Meredith, December 2006
 "Functions & Values of Wetlands" – Keene Open Space Committee Forum on Wetlands, November, Keene, NH
 "Temple-Crotched Greenway and the Wapack Wilderness Area" – Friends of the Wapack Trail Annual Meeting, Peterborough, NH, October 2006
 "Fascinating World of Fungi - A Tribute to Ben Allison" – Harris Center for Conservation Education, Hancock, NH, October 2006
 "Sedges and Rushes of the Wetlands of New Hampshire" – NH Association of Natural Resource Scientists Fall seminar Series, Holderness, September 2006
 "Secrets of the Squam Range" – Annual Meeting of the Squam Lakes Conservation Society, Holderness, August 2006
 "Natural Resource Inventory of Meredith – Phase I Final Report" – Meredith Community Center, Meredith, NH, July 2006
 "Maintaining Ecological Integrity – What do we Need in a Managed Forest?" – Annual Meeting of the Forestry Guild, Keene, NH, May 2006
 "Nutritional Value and Toxic Side Effects of Mushroom Consumption" – Annual Meeting of the Association of NH Veterinarians, March 2006
 "Wetlands Complexes of Effingham and Their Value" - Interim Report of the Wetlands Inventory & Protection Project for the Town of Effingham, NH, November 2005
 "Ecological Value of the Babine-Wheeler Lots" – Meeting of the Peterborough Conservation Commission, November 2005
 "Rapid Ecological Assessments – Tools for Setting Conservation Priorities" – Annual Meeting of the Land Trust Alliance, Madison, Wisconsin, October 2005

“Wetland Plant Communities in Disturbed Sites” – 2-day technical training session for NH-VT Wetland Bureaus, NEIWPC, Concord, NH, July 2005
 “Mushroom Toxicity in Domestic Animals” – keynote address, Annual Meeting of the Veterinary Medical Association of New Hampshire, Concord, February 2005
 “Old Growth Forests of the Lakes Region of New Hampshire” – Audubon Society, Loon Preservation Center, Moultonborough, NH, November 2004.
 “Functions and Values of Vegetated Riparian Buffers” – Keynote address, Annual Meeting of the NH Association of Conservation Districts, Laconia, NH, November 2004
 “Nuts and Bolts of Bio-Inventories” – Annual Land Trust Alliance Rally, Providence, RI, October 2004
 “Functions and Values of Old Growth Forests” – 6th Eastern Old Growth Forest Conference, Moultonborough, NH, September, 2004
 “1000 Lakes Region Fungi in 20 Minutes – A Review of the Mycoflora of Central New Hampshire” – 10th Annual Samuel Ristich Foray, Northeastern Mycological Federation, Moultonborough, NH, September, 2004
 “Wetland Ecosystems and Their Importance on the Landscape” – Keynote address, Annual Meeting of the Green Mountain Conservation Group, Ossipee, NH, July, 2004
 “Bio-Inventories for Conservation Planning” – 2nd annual Northeast Regional Land Trust Alliance Conference, Saratoga Springs, NY, June 2004
 “Freshwater Macro-Invertebrates of the Lake Umbagog National Wildlife Refuge” – Annual Meeting of the Northeast Association of Environmental Biologists, Jiminy Peak Resort, Mass., March 2004
 “Freshwater Macro-Invertebrates of the Squam Lakes Watershed” – 3rd Annual Freshwater Biology Symposium, Plymouth State College, Plymouth, NH, December 2003
 “Getting Natural Resource Inventories to Work for You” – 32nd Annual Meeting of the NH Association of Conservation Commissions, Concord, November, 2003
 “Using Freshwater Macro-Invertebrates for Water Quality Assessment” – Society of Wetland Scientists annual summer series workshop, Rindge, July, 2003
 “Using Bio-Inventories for Compiling Natural Resource Management Plans” – 11th Northeast Land Trust Conference, Saratoga Springs, NY, June 2003
 “Bio-Inventories for Conservation Planning” – Saving Special Places: Conservation Tools for a Growing State, Annual Land Conservation Conference, Concord, NH, April 2003
 “Aquatic Landscapes of the Squam Lakes” – 2nd Annual Freshwater Biology Symposium, Plymouth State College, Plymouth, NH, December 2002
 “Natural Resources of the Unsworth Wildlife Refuge” – Annual Meeting of the Squam Lakes Conservation Society, Holderness, NH, August 2002
 “The Biodiversity of Squam Lakes” – Annual Meeting of the Squam Lakes Association, Holderness, NH, August 3, 2002
 “The Mt. Everett Mycoflora Project” – monthly meeting of the Boston Mycological Club, Cambridge, MA, January 16, 2002
 “Old Growth Wetlands: A Case for Documenting Wetland Reference Sites” – Annual meeting of the Society of Wetland Scientists, Worcester, MA Oct. 19, 2001

- "Creating and Using Municipal Natural Resource Inventories" – Regional meetings of the Lakes and Upper Valley Regions of the NH Association of Conservation Commissions, Oct. 6 & 13, 2001
- "Creating and Using the Municipal Natural Resources Inventory" – Annual Meeting of the Monadnock Regional Conservation Commissions, Dublin, NH, Mar. 3, 2001
- "Natural Revegetation of Wetland Mitigation Sites" – Annual Meeting of the NH Association of Natural Resource Scientists, Concord, NH, Feb. 10, 2001
- "Functions and Values of Old Growth Forests" – Annual Meeting of the NH Association of Conservation Commissions, Concord, NH, Nov. 4, 2000
- "Hersey Mountain Ecological Assessment – Results of a Two-Year Bio-Inventory" – Annual Meeting of the New England Forestry Foundation, Lowell, MA, Oct. 16, 2000
- "Observations of a Late Successional Forest Fungal Community – Implications for Forest Managers (and Mushroom Enthusiasts!) – 500-year Forest Foundation, Sweet Briar College, Lynchburg, VA, May 19, 2000
- "Wetlands Evaluations Using Citizen Volunteers – Amherst Case Study" – New England Biological Assessment of Wetlands Working Group, Volunteer Monitoring Conference, Antioch New England Graduate School, Keene, NH, Feb. 16, 2000
- "Natural Resource Inventories: Options for Local Landowners" – N.H. Association of Conservation Commissions Annual Meeting, November 6, 1999
- "Mushrooms and Old Growth: An Assessment of Viable Indicators" – 2nd Meeting of the Eastern Old Growth Advisory Group, Harvard Forest, Petersham, MA. Nov. 7, 1998
- "Wetland Indicators of Hydric A & B Soils" - Annual Meeting of the Granite State Designers and Installers Association, Oct. 8, 1997
- "The Use of Critical Habitat Assessments in Natural Resource Management Plans" - Annual Meeting of the Natural Areas Association, June 7, 1996
- "Indigenous Wetland Vegetation in New England" - Annual meeting of the New England Chapter of the Soil and Water Conservation Association, Oct. 27, 1995.
- "Ecological Site Characterizations of Non-tidal Wetland Types in New England" - New England Conference on On-site Wastewater Treatment, Aug. 30, 1990

PEER REVIEWED PUBLICATIONS:

- "Method for Inventorying and Evaluating Freshwater Wetlands in New Hampshire" (The NH Method) – UNH Cooperative Extension, 2011. Updated in 2013, 2015.
www.nhmethod.org
- "Natural Lebanon – Results of the Phase II NRI of the City of Lebanon" - Submitted to the City of Lebanon Planning Department and the Lebanon Conservation Commission. January 2010.
- "Wetlands" – Chapter V of the *Natural Resource Guidebook*, published by the Green Mountain Conservation Group and Region 9, U.S. EPA, October 2007
- "Integrating the Cowardin Wetlands Classification Types into the Natural Community System" – NHANRS newsletter and web site <<http://www.nhanrs.org>>
- "Natural Resource Inventory of the Town of Meredith, New Hampshire" – 2006
<<http://www.meredithnh.org>>

"On Moving Towards a Global Plant Community Landscape in New England" –
Conservation Notes of the New England Wildflower Society vol. 4:2, April, 2000
"Natural and Cultural Resource Inventories: a Guide to Comprehensive (Level III)
Methods for Private Landowners in New England." UMI pub.s, 1997.
"Wetlands: Our Vanishing Resource" - Slide-tape show; NH Fish & Game Dept., 1988.

NON-PEER REVIEWED PUBLICATIONS:

Van de Poll, R. 2017. Fitzwilliam Prime Wetlands Project – Final Report. Submitted to the Town of Fitzwilliam. March (under review)
Van de Poll, R. 2017. Management Plan for the Fogg Hill Property. Submitted to the Lakes Region Conservation Trust and the NHDES Aquatic Resources Mitigation Fund, January.
Van de Poll, R. 2016. Lebanon Wildlife Corridor Project – Final Report. Submitted to the Lebanon Planning Department. November.
Van de Poll, R. 2016. Rare, Threatened, and Endangered Species of the Brunault Property – Preliminary Report. Submitted to the NH Nature Conservancy. September.
Van de Poll, R. 2016. Natural Resources of the Smith-Sargent Road Property, Final Report. Submitted to the Holderness Conservation Commission. June 20.
Van de Poll, R. 2016. Hancock Land, Bridgton, Maine Rapid Ecological Assessment Report. Submitted to the Lakes Environmental Association. June.
Van de Poll, R. 2016. Natural Resources of Pembroke, NH. Final Report. Submitted to the Pembroke Conservation Commission and Planning Department. April.
Van de Poll, R. 2016. Natural and Social Inventory and Assessment of the Northwood Area Land Management Collaborative (NALMC) Lands. Submitted to the NALMC Steering Committee, October. Updated February.
Van de Poll, R. 2016. Conservation Priority Areas Near the Great Meadow, Tuftonboro, NH – Update Report. Presented to the Tuftonboro Conservation Commission. February.
Van de Poll, R. 2016. Water Resources Ordinance for Center Harbor, NH. Co-authored with Lakes Region Planning Commission. Submitted to Center Harbor Planning Board and Conservation Commission. Passed by town vote, March 2016.
Van de Poll, R. 2015. Ecological Impact Assessment Report of the Proposed Balsams Area Ski Resort Expansion, Columbia, Colebrook, Dixville, and Stewartstown, NH. Submitted to the Forest Society Board. November.
Van de Poll, R. 2015. Natural Resource Inventory and Assessment of the Yeaton Town Land for the Town of Northwood, NH. April.
Van de Poll, R. 2015. Natural Resources of Center Harbor, Chapter 6 of the Center Harbor Master Plan. Reviewed and approved by the Center Harbor Planning Board, March.
Van de Poll, R. 2015. Baseline Documentation Report-Fogg Hill Conservation Area for the Lakes Region Conservation Trust, Center Harbor, NH. February.

- Van de Poll, R. 2015. Baseline Documentation Report for the 48.75-acre High Mowing School Easement, Wilton, NH prepared for Yggsdrasil Foundation and the Natural Resource Conservation Service. January.
- Van de Poll, R. 2014. Natural Resources of Center Harbor, NH for the Center Harbor Conservation Commission, Center Harbor, NH. December.
- Van de Poll, R. 2014. Natural Resources Inventory and Environmental Education Programming, Yearly Update for Otter Brook Farm, Peterborough and Greenfield, NH. July.
- Van de Poll, R. 2014. Baseline Documentation Report, Alice Bemis Thompson Wildlife Refuge, Sandwich NH, for the Northeast Wilderness Trust, Montpelier, Vt. April.
- Van de Poll, R. 2014. Final Report-Springfield Wetland Project for the Upper Valley Lake Sunapee Regional Planning Commission and Springfield Planning Board. March.
- Van de Poll, R. 2014. Rapid Ecological Assessment of the Squam Uplands for the Squam Lakes Conservation Society, Holderness and Campton, NH. January.
- Van de Poll, R. 2013. Natural Resources Inventory and Environmental Education Programming, Yearly Update for Otter Brook Farm, Peterborough and Greenfield, NH. July.
- Van de Poll, R. 2013. Prime Wetlands Completion Project, Phase III for the Center Harbor Conservation Commission and NH DES Wetlands Bureau, Center Harbor, NH. January.
- Van de Poll, R. 2013. Rapid Ecological Assessment of the Belknap Range Lots, Alton, Gilford, NH for the Lakes Region Conservation Trust and the Society for the Protection of NH Forests. January.
- Van de Poll, R. 2012. Final Report - Grantham Wetland Inventory and Assessment Project for the Grantham Conservation Commission, Grantham, NH. October.
- Van de Poll, R. 2012. Update on the Natural Resources Inventory and Environmental Education Programming for Otter Brook Farm, Peterborough and Greenfield, NH. August.
- Van de Poll, R. 2012. Rapid Ecological Assessment of the Charles L. Bean Sanctuary and the Newfound Lake Region Association Marina Property for the Hebron Conservation Commission, Hebron, NH. July.
- Van de Poll, R. 2012. Prime Wetlands Completion Project, Snake River for the Center Harbor Conservation Commission and NH DES Wetlands Bureau, Center Harbor, NH. February.
- Van de Poll, R. 2011. Rapid Ecological Assessment of Hebron Town Forest for the Hebron Conservation Commission, Hebron, NH. March.
- Van de Poll, R. 2011. Update on The Natural Resources Inventory and Environmental Education Programming for Otter Brook Farm, Peterborough and Greenfield, NH. August.
- Van de Poll, R. 2011. Summer Rapid Ecological Assessment of the Hebron Town Forest for the Hebron Conservation Commission, Hebron, NH. July.
- Van de Poll, R. 2010. Natural Resources Inventory and Environmental Education Programming, Yearly Update for Otter Brook Farm, Peterborough and Greenfield, NH. July.

- Van de Poll, R. 2010. Natural Lebanon – Results of the Phase II NRI of the City of Lebanon. Submitted to the City of Lebanon Planning Department and the Lebanon Conservation Commission. January.
- Van de Poll, R. 2009. Natural Resources Inventory of the Mink Brook Highlands Area, Hanover, NH, prepared for the Town of Hanover Planning Department and the Hanover Conservation Commission. November.
- Van de Poll, R. 2009. Natural Resources Inventory and Environmental Education Programming, Yearly Update for Otter Brook Farm, Peterborough and Greenfield, NH. July.
- Van de Poll, R. 2009. Final Report on the 2007-2009 Wildlife Action Plan Implementation Project for the Town of Effingham, Carroll County, NH. June.
- Van de Poll, R. 2009. Center Harbor Prime Wetlands Completion Project. Prepared for the Center Harbor, NH Conservation Commission. May.
- Van de Poll, R. 2008. Natural Resources Inventory and Environmental Education Programming, Yearly Update for Otter Brook Farm, Peterborough and Greenfield, NH. December.
- Van de Poll, R. 2008. Final Report on the Natural Resources Inventory of the +/- 500-acre Spaulding Youth Center Property, Northfield, NH. July.
- Hoffmann, Chris and R. Van de Poll. 2007. Natural Resource Inventory of the Portland Water District Barstow Property, Final Report. Prepared for the PWD. December.
- Van de Poll, R. 2007. Final Report on the Ecological Assessment of the Colony Memorial Trust's Perry Property, Swanzey, NH. October.
- Van de Poll, R. 2007. Ecological Assessment of the Rockywold-Deephaven Camps, Holderness, NH. July.
- Van de Poll, R. 2007. Final Report on the 2005-2007 Wetlands Inventory and Assessment Project of Effingham, NH. Prepared for the Town of Effingham. June.
- Van de Poll, R. 2007. Sanborn Farms Subdivision – Site Analysis Plan. Submitted to the Goffstown Planning Board. April.
- Van de Poll, R. 2006. Hocking Family Property Field Survey Reports. Submitted to the Hocking Family Trust, Madison, NH. April, May, June, July, August.
- Van de Poll, R. 2005 Natural Resources Inventory of the Dubois Property, Peterborough & Greenfield, N.H. Prepared for the Philip Dubois Family of Peterborough. November.
- Van de Poll, R. 2005. Natural Resources Inventory of the Babine & Wheeler Lots, Peterborough, N.H. Completed for the Peterborough Conservation Commission. October.
- Van de Poll, R. 2005. Natural Resources Inventory of the Town of Meredith, N.H. Prepared for the Town of Meredith Planning Department and the Meredith Conservation Commission. August.
- Van de Poll, R. 2005. Final Report on a Partial Natural Resources Inventory of the Bear Pond Natural Area, Canaan, NH. Prepared for the New England Institute of Landscape Ecology and the Mascoma Watershed Conservation Council. June.
- Van de Poll, R. 2004. Ecological Assessment of the Kusumpe – Intervale Pond Area, Sandwich, NH. Prepared for the Lakes Region Conservation Trust. December.

- Van de Poll, R. 2004. Natural Resources Inventory of Three Portland Water District Parcels (Sebago Lake Ecology Center, Chaffin Pond, Lower Bay Boat Ramp). Written for the Portland Water District, Standish, ME. December.
- Van de Poll, R. 2004. Rapid Ecological Assessment of the Thurley Mountain Property, Ossipee, NH. Written for the Dan Hole Pond Watershed Trust. October.
- Van de Poll, R. 2004. Bio-Inventory of the Castle-in-the-Clouds property, Moultonborough and Tuftonboro, NH – Final Report. Prepared for the Lakes Region Conservation Trust, Meredith, NH. May.
- Van de Poll, R. 2004. Final Report of the 2003 Vegetation Analysis of the 415-acre Horatio Colony Preserve, Keene, NH. Prepared for the Colony Memorial Trust, Keene, NH. February.
- Van de Poll, R. 2004. Lake Umbagog NWR Macro-Invertebrate Assessment Report. U.S. Fish & Wildlife Service, Errol, NH. January.
- Van de Poll, R. 2003. Rapid Ecological Assessment of the Intervale Pond Area, Sandwich NH. Intervale Pond Association, November.
- Van de Poll, R. 2003. Ecological Assessment of the 406-acre Wood Property, Andover, NH. May.
- Van de Poll, R. 2003. Furbearer Assessment of the Castle-in-the-Clouds Property, Moultonborough and Tuftonboro, NH. Lakes Region Conservation Trust, May.
- Van de Poll, R. 2003. Great Meadows Water Quality and Bio-Assessment Final Report, Town of Tuftonboro, NH. January.
- Van de Poll, R. 2002. Year-end Report on the Castle-in-the-Clouds Bio-Inventory, Moultonborough and Tuftonboro, NH. Lakes Region Conservation Trust. December.
- Van de Poll. 2002. Ecological Inventory and Assessment of the 410-acre Remick Museum Properties, Tamworth, NH. Remick Country Doctor Museum and Farm, Tamworth, NH. December.
- Van de Poll. 2002. Final Report of the Hersey Mountain Bio-Inventory, Sanbornton & New Hampton, NH. New England Forestry Foundation, Orange, MA. November.
- Van de Poll, R. and C. Hoffmann. 2002. Bio-Inventory of the Holt Pond Preserve, Bridgton and Naples, Maine, Final Report. Lakes Environmental Association, Bridgton, Maine. September.
- Van de Poll, R. 2002. Bio-Inventory of the Squam Lakes watershed – Final Report, Squam Lakes Association, Holderness, NH. August.
- Van de Poll, R. 2002. Old Growth Areas and Rare & Endangered Species of the Castle-in-the-Clouds property, Moultonborough and Tuftonboro, NH. Lakes Regional Conservation Trust, Meredith. June.
- Van de Poll, R. 2001. Holt Pond Bio-Inventory Interim Report. Lakes Environmental Association, Bridgton, ME. December.
- Van de Poll, R. 2001. Kusumpe-Intervale Pond Bio-Assessment Report. Lakes Region Conservation Trust, Meredith, NH. November.
- Van de Poll, R. 2001. Bio-Inventory of the Proposed California Brook Natural Area, Southwestern, New Hampshire. National Park Service, Rivers and Trails Program, Woodstock, VT. October.

- Van de Poll, R. 2001. Ossipee Mountain Preserve, Lakes Region Conservation Trust, Meredith, NH. Interim Report. February.
- Van de Poll, R. 2001. Town of Nelson Priority Conservation Plan, Nelson, NH. January.
- Van de Poll, R. 2000. Brush Brook Prime Wetlands Assessment, Town of Dublin, NH. Final Report. December.
- Van de Poll, R. 2000. Biological and Conservation Assessment of the 228-acre Rufus S. Frost Property, Marlborough, NH. Prepared for the Rufus. S. Frost Trust. November.
- Van de Poll, R. 2000. Natural Resource Inventory of the Beech Hill Property, Keene, New Hampshire. Final Report. City of Keene, NH. April.
- Van de Poll, R. 2000. Overall Site Design and Management Plan of the Stoddard Properties, Stoddard and Windsor, New Hampshire. Final Report to the Sweet Water Trust and the Society for the Protection of NH Forests. March.
- Van de Poll, R. 2000. Amherst Wetland Assessment and Prime Wetland Designation Project. Final report to the Town of Amherst, State of New Hampshire Department of Environmental Services Water Resources Bureau, and the Pennichuck Water Works Corporation. January.
- Van de Poll, R. 2000. Vernal Pool Survey of the Hersey Mountain Preserve. First year report to the New England Forestry Foundation, Groton, Mass. January.
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- Van de Poll, R., and K. Maloney. 1993. Vascular Plant Inventory of The Wildwood, Dublin, NH. Final Report. Prepared for David F. Putnam Family, Keene, NH.
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SUPERVISED GRADUATE RESEARCH (Committee Member):

Expansion of Lionfish in Coastal Estuaries of Southeast United States, Master's Thesis by Emily Dark. Antioch New England Graduate School. 2014.

Chemical and Biological Indicators of Water Quality in the Lake Waukewan Watershed. Master's Thesis by Melissa Greenawalt-Yelle. Plymouth State University. 2008

Bobcat (*Felix rufus*) Winter Habitat Utilization Preferences and Extent of Bobcat Presence in the proposed California Brook Natural Area, Cheshire County, NH. Master's Thesis by Scott Maslansky. Antioch New England Graduate School. 2001

Medium to Large Furbearer Assessment of the 2500-acre Wildcat Hollow Natural Area, Stoddard and Marlow, New Hampshire. Master's Thesis by Steven Cox. Antioch New England Graduate School. 2000.

Analysis of Vernal Pool Communities in the MDC Wachusett Reservoir Watershed. Master's Thesis by Rick Paquette. Antioch New England Graduate School. 2000.

Plant Community Inventory at the Princeton Nature Trail, Princeton, Worcester County, Massachusetts. Master's Thesis by Mary Marro. Antioch New England Graduate School. 2000.

Composition and Structure of an Old-Growth Northern Hardwood Forest Stand in Stoddard, New Hampshire. Master's Thesis by James Siriano. Antioch New England Graduate School. 1999.

An Investigation of Wood Turtle (*Clemmys insculpta*) Nest Success in Southwestern Massachusetts. Master's Thesis by Leeanne Siart. Antioch New England Graduate School. 1999.

Relative Abundance of Terrestrial Salamanders in Forests of Different Age Classes in Western Massachusetts. Master's Thesis by Darrell DeTour. Antioch New England Graduate School. 1999.

An Inventory of the Vegetation in Cedar Swamp, Manchester-by-the-Sea, Essex County, Massachusetts. Master's Project by Erika Sonder. Antioch New England Graduate School. 1998.

Vegetative Inventory and Classification of Martha's Vineyard's Coastal Pond Cove Wetlands. Master's Thesis by Leah Tofte-Dorr. Antioch New England Graduate School. 1998.

Correlation Between Soil Temperature and Growing Season in Eight New Hampshire Wetlands. Master's Thesis by Timothy Coultas. Antioch New England Graduate School. 1997.

Common Plants and Their Uses of the Community Baboon Sanctuary, St. Paul's Bank, Belize. Master's Project by Gianna Scaralia. Antioch New England Graduate School. 1997.

The Effects of Prescribed Burning on a Population of Northern Blazing Star (*Liatris borealis*) at the Amherst, New Hampshire WalMart. Master's Project by Alain Peteroy. Antioch New England Graduate School. 1997.

Evaluating the Effectiveness of ArcView 2.1 as a Tool for Predicting Rare Natural Communities at the Stoddard Properties, Stoddard, New Hampshire. Master's Thesis by Michael Duffy. Antioch New England Graduate School. 1997.

Soil Evaluation for West Eugene Wetlands Restoration Site, Eugene, Oregon. Special Project by Allison Cowie. Antioch New England Graduate School. 1997.

An Examination of the Relationship Between Vegetation Types and Environmental Factors in a Rich Fen with Recommendations for Monitoring and Management. Master's Project by M. Anne Reed. Antioch New England Graduate School. 1997.

Estimating the Effectiveness of Monitoring Least Tern (*Sterna albifrons*) Population Size in Massachusetts. Master's Thesis by Diane LeHaise. Antioch New England Graduate School. 1997.

Natural Resource Inventory and Potential Wildlife Conservation Value: Bittersweet Farm Property, Winchendon, Massachusetts. Master's Project by Carlen Rigrod. Antioch New England Graduate School. 1997.

The Ecology and Natural History of the Wood Turtle (*Clemmys insculpta*) in Southern New Hampshire. Master's Thesis by Sheila Frye Tuttle. 1996. Resource Inventory of the Cold River Corridor. Special Project by Douglas Payne. Antioch New England Graduate School. 1996.

Cover Type and Preliminary Investigation of Ecologically Significant Areas on Land of the Mount Grace Land Conservation Trust, Massachusetts. Antioch New England Graduate School. 1996.

Contoocook River Floodplain Forest Vegetation Composition. Master's Project by Jeff Osgood. Antioch New England Graduate School. 1996.

GPS Utilization in the Determination of Submerged Aquatic Vegetation in the Lower Connecticut River. Master's Project by Susan Mickolyzck. Antioch New England Graduate School. 1995.

Connecticut River Salmon Pools: Inventory and Protection Options. Master's Project by Chris Davis. Antioch New England Graduate School. 1995.

The Landscape of Home: Three Essays on the Land, History, and Life in a Connecticut River Valley Neighborhood Near Northampton, Massachusetts. Master's Project by Karl Meyer. Antioch New England Graduate School. 1995.

A Land Conservation Strategy for the Mahoosic Land Trust. Master's Project by Marcel Polak. Antioch New England Graduate School. 1994.

Butter Island Master Plan, Butter Island, Maine. Master's Project by Robert Cabot. Antioch New England Graduate School. 1994.

Water Resource Management and Protection Plan for the Town of Peterborough, New Hampshire. Master's Project by James McCartney. Antioch New England Graduate School. 1993.

The Use of Multiattribute Utility Analysis for Evaluating Alternative Protected Area Management Strategies. Master's Project by Zachary Boyajian. Antioch New England Graduate School. 1993.

Trilha Apicatu: A Walking Guide through the Atlantic Coastal Rain Forest Ecosystem. Master's Project by Judith Ross. Antioch New England Graduate School. 1992.

Development of a Quantitative Procedure to Assign a Value Rating to Beech Stands as Black Bear Habitat. Master's Project by Daniel Wolfson. Antioch New England Graduate School. 1992.

Windsor Wildlife Corridor Study. Master's Project by Caleb Mitchell. Antioch New England Graduate School. 1992.

Septic System Study of Forest Lake, Winchester, New Hampshire. Special Project by Aaron Richer. Antioch New England Graduate School. 1991.

MEETINGS ORGANIZED:

2016 Northeast Mycological Federation Annual Foray, Fitchburg State University, Fitchburg, MA.

2016 'Furthering the Science and Policy Protection of Wetland Buffers in New England,' EPA & all New England state agencies, April.

- 2016 'Alternative Energy Systems and Conservation Easements,' Fall Workshop of the NH Land Trust Coalition, Concord. October 13.
- 2007 Andrews Foray, Annual Meeting of the Josselyn Botanical Club
- 2007 Northwood Area Land Management Collaborative, Northwood, NH. March
- 2006 Annual Meeting of the N.H. Association of Natural Resource Scientists, Concord, N.H. February.
- 2005 Quarterly Meetings of the N.H. Association of Natural Resource Scientists, Concord, N.H.
- 2004 Conference Director: 6th Eastern Old Growth Conference, Geneva Point Conference Center, Moultonborough, NH. September.
- 2004 Conference Director: 10th annual Samuel Ristich Mycological Foray (NEMF), Geneva Point Conference Center, Moultonborough, NH. September.
- 2002 2nd Annual Freshwater Ecology Symposium. Plymouth State College, Plymouth, NH. December.
- 2001 Planning for Wildlife and Other Natural Resources, UNH Cooperative Extension and the NH Association of Conservation Commissions, Regional Workshop Series, September – October, 2001
- 2001 Intensive Wetlands Monitoring Workshop for Trainers and Staff, New England Biological Assessment Working Group, USEPA. Franklin Pierce College, July 12-14.
- 2001 Annual Spring Regional Workshops of the NH Association of Conservation Commissions, March - May
- 2000 Volunteer Wetlands Monitoring Conference. New England Biological Assessment Working Group, USEPA. . Antioch New England Graduate School, February 19.
- 1999 Community, Nature & Spirit Conference. Antioch New England Graduate School, April 22-6.
- 1995 22nd Annual Meeting of the Society of Wetland Scientists, Royal Sonesta Motel, Boston, Massachusetts, May 12-18.
- 1990 Wetlands Mitigation - Current Issues & Concerns. 3rd Annual Meeting of the NH Association of Wetland Scientists, Portsmouth, NH. February 5.

LANGUAGES: French (level II written); Spanish (level II written, dialogue)

REFERENCES: Available on request.

EXHIBIT B

Additional Impacts along NPT in Concord, NH (North to South)

Prepared by R. Van de Poll

No.	Type - Prop	Type - Act	Reason	Infra. Code Ref.	Wetland code	Amt-Prop (sq. ft.)	Amt-Act (sq. ft.)	Net Additional Amt - Temp	Net Additional Amt - Perm	Notes	Additional concerns
1	Temp	Perm	Crane pad	3132.83	CD 49	4106	4106	0	4106?	Not temp; steep slopes, fill in marsh, compaction	loss of wildlife; wood turtle habitat; 100-year flood zone
2	Temp	Perm	Access Rd, crane pad	F139-178	CD 49, CD 47S	1753	1853	100	1853?	Not temp; fill in marsh, impacts to TOB (35% grade)	loss of wildlife; wood turtle habitat; 100-year flood zone
3	None	Temp	Access Rd, pole placement	3132.85	near CD 49	0	5500	5440	60	Unmarked wetland along access road and at pole	
4	None	T/P	pole placement	3132.89	CD 45	0	3600	3540	60	20 s.f perm; 3580 s.f. temp additional	12,488 s.f. temp already mapped for CD 45
5	Temp	Perm	pad & pole placement	3132.90	CD 45	12,488	12,488	0	7200?	+/- 7200 s.f. perm impacts, fill/compaction in marsh est. 5720 s.f. for access road & 6,000 s.f. for pad & pole placement in unmapped PEM1E; also both poles perm.	loss of wildlife; wood turtle habitat; 100-year flood zone
6	None	Temp	pole placement; access rd	3132.92	CD 1	0	11,760	11,680	120	Impact 60 s.f. ea.	based on API of color infrared; Routine Method does not apply
7	None	Temp	access rd for pole move	F139-170	CD 1	0	2,400	2400		Temp. impacts for access rd & pad in unmapped PEM1/SS1E	based on API of color infrared photo (pasture)
8	None	Temp	pad & pole placement	3132-93	CD 42	0	2,600	2600		Temp. impacts to unmapped PEM1E	based on API of color infrared photo (pasture)
9	None	Temp	pole & pad placement	F139-169	CD 42	0	900	900		Temp. impacts to unmapped PEM1E	based on API of color infrared photo (pasture)
10	None	Temp	pole & pad placement	F139-164	unmarked	0	2400	2400		Temp. impacts to unmapped PSS1E	based on API of color infrared photo
11	None	Temp	pad placement	3132.97	CD 51	0	940	940		Temp. impacts to extension of mapped PSS1E	
12	None	Temp	pad placement	3132.98	CD 16	0	3300	3300		Additional impacts to extension of mapped ditch	2500 s.f. for pad; 800 s.f. for pole removal
13	Temp	Perm	pad placement	P145-160	CD 34	689	1700	1011		Additional impacts to extension of mapped ditch	loss of wildlife in stream buffer area
14	None	Temp	access road & pad	318-08	near CD 39	0	4000	4000		Temp. impacts to unmarked PSS1B	mostly along access road, used Lidar contours & API
15	Temp	Temp	pad & access road	P145-155	CD 39	3663	4663	1000		Est. add impacts for more extensive PSS1E	900 s.f. in pad area, 100 s.f. in access road
16	None	Temp	pad placement	3132-102	unmarked	0	1500	1440	60	Est. impacts in lower part of pad for new pole	
17	None	Temp	access road & pad	3132-103	CD 37	0	2500	2500		Unmarked crossing of PEM1E	south of pole along access road (API)
18	None	Temp	access road & pad	318-24	CD 36	704	2500	1796		Additional temp. impacts to existing PSS1/EM1B	based on API & 2-foot LiDAR
19	None	T/P	pole & pad placement	3132-105	unmarked	0	650	590	60	One pole & part of pad in PSS1/EM1B	based on API & contours
20	None	T/P	pole & pad placement	3132-107	unmarked	0	1600	1540	60	One pole and part of access road in unmarked PSS1E	based on API & contours
21	Temp	Temp	pole & pad placement	P145-140	CD 25	6,176	6,176	0	6176?	Unmarked perm. Impacts to adjacent vernal pool	API, soil map (Henniker); loss of wildlife
22	None	Temp	Pad placement	3132-109	CD 25	0	1200	1200		pad shown to include wetland impacts but not marked	Map sheet 597 shows portion but not all impacts
				3132-113, 3132-114, 3132-115,						Only 121 s.f. indicated as permanent yet entire crossing and pad placement area in deep organic soils without any possibility of complete freezing below surface; impacts	
23	Perm	Perm?	Pad, pole, access rds	3132-116	CD 19	121	67,500		67,500?	therefore estimated to be permanent Estimated permanent impacts from disturbance of deep	Loss of wildlife; change of habitat; alteration of soil morphology
25	Perm	Perm?	Pad, pole, access rds	3132-117	CD 14	85	16,500		16,500?	muck along 2nd order stream	Alteration of stream channel, banks, loss of aquatic habitat
26	None	Temp	pad placement, access rd	318-71	near CD 19	0	1200	1200		Impacts to unmarked PSS1E & ditch near Appleton St.	based on API & LiDAR
27	Temp	Temp	access roads	318-78,79 P145-125, 318-84, 3132-	CD 18	7,325	8,425	1100		Greater impacts in PEM1/SS1E near field	based on API & LiDAR
28	Temp	Temp	pole & pad placement	120	CD 18	21,810	24,460	2590	60	More extensive wetlands than mapped in impact areas	based on API & LiDAR
29	None	Temp	pole & pad placement	3132-121	unmarked	0	2,600	2540	60	Apparent PSS1E on deeper hardpan later in SE part	based on API & LiDAR
30	None	Temp	pole & pad placement	3132-122	unmarked	0	2,040	1980	60	Isolated PSS1E unmarked	based on API & LiDAR
31	None	T/P	pole & pad placement	318-102	unmarked	0	800	740	60	Unmarked PSS1/EM1E near Curtisville Rd	based on API & LiDAR
32	Temp	Temp	pole & pad placement	3132-127	CD 10	24,233	25,683	1450		Larger extent of PSS1E than mapped	based on API & LiDAR
33	Perm	Perm	pole placement	3132-127	CD 10	75	135		60	Additional pole appears to be in wetland	based on API & LiDAR
34	Temp	Temp	pad placement	3132-131	unmarked	0	750	750		Part of pad in PSS1E	based on API & LiDAR
35	None	Temp	pad placement	318-116 318-118,	unmarked	0	850	850		PSS1E near CD 9S	based on API & LiDAR
36	Temp	Temp	pad & pole placement	3132-135	CD 8	27,878	29,448	1570		Additional PSS1/EM1E area, including ditch	based on API & LiDAR near Portsmouth St.
37	None	Temp	pad placement	318-125	unmarked	0	250	250		part of pad in PSS1E ditch	based on API & LiDAR
38	None	Temp	pad placement, access rd	P145-126 3132-157,	unmarked	0	650	650		part of pad in unmarked PSS1E	based on API & LiDAR
39	None	Temp	pad & pole placement	P145-75	unmarked	0	1150	1150		Part of pad crosses into wet detention basin	based on API & LiDAR
40	None	Temp	pad & pole placement	3132-158	unmarked	0	750	750		Part of pad includes wet basin (created)	based on API & LiDAR
New Additional Temporary Impacts (est.)								65,947			
New Additional Permanent Impacts (est.)									720		
Change from Temporary to Permanent (est.)									103,335		

EXHIBIT C

Short Report
On the March 10, 2017 Site Visit
Concord, NH Eversource ROW
R. Van de Poll, CWS #110

Date: March 10, 2017

Time: (1115 – 1345)

Location(s): 1) Portsmouth Street
2) Turtle Pond, Oak Hill Road
3) Maplewood Farm, Shaker Road
4) Off Snow Pond Road
5) Sanborn Road

Description: Somewhat randomized site checks were completed at the above-cited sites for the purpose of ascertaining the accuracy of wetland delineations performed by Normandeau Associates for the Northern Pass Transmission Project (NPTP). Field materials included an aerial photo base map created on an ArcGIS 10.x platform (2015 CIR Orthophoto), a set of NPTP map sheets from the AOT permit application, a Garmin 12XL hand-held GPS unit, a Canon PowerShot SX20IS digital camera, a Dutch soil auger and Munsell color chart, and clipboard and pencil.

Portsmouth Street: This site had been recently disturbed by equipment associated with the installation of a new sub-station along an access road that crosses under the Eversource ROW and lies just to the east. Grading in the general area yielded disturbed soil auger results. Exposed beds of new tree chips were frozen and disallowed penetration by the auger in certain areas. Auger tests were taken in relatively undisturbed areas (i.e. only cleared of vegetation) between the parking pull-off and the outflow ditch and culvert that passes under the sub-station access road. Vegetation and soil checks north of the road confirmed the presence of a PSS1/EM1E wetland just above the outflow ditch, part of which was shown in the AOT maps¹ (GPS#71). Soil auger and vegetation checks south of the road confirmed a small PSS1/R4SB3Ed that was not mapped on the AOT map sheets (GPS#70). This wetland was roughly 790 s.f. and was within a planned temporary work pad area.



Above: unmapped outflow stream and ditch between Portsmouth St. and the new sub-station access road

¹ It should be noted that the latter sheets indicated wetlands with lines roughly 8 feet wide, and that no flags indicating the wetland boundary were found in the field.

Turtle Pond: This area was surveyed on the southeast side of Oak Hill Road (GPS#74-77). No soil auger tests were performed since the entire area was clearly wetland (PEM1F and PSS1E near the road). The ground was frozen near the roadside but at roughly 20 feet of the road, the ice thinned and the subsoil was completely unfrozen. Groundwater seepage in the area appeared to have provided permanently unfrozen conditions since this was effectively mid-winter and there was no ice or snow build-up in the vicinity. Further down in the basin (roughly 50 feet off the road), there some surface ice but too thin to support any weight without breaking through. After over-topping one boot, I returned to the road. It appeared that the entire wetland was comprised of unstable, deep, organic soils.



Left: Turtle Pond sign at Oak Hill Road side; Right: unfrozen seepage area off roadway with deep organic soils

Maplewood Farm, Shaker Road: This area was surveyed owing to apparent wet soils that were visible on the aerial photograph and the presence of an open water body that appeared to be an unmarked vernal pool (GPS#79-84). Unmapped hydric soils and hydrophytic vegetation were found at the corner of the agricultural field and the cleared ROW at the approximate location of a proposed NPTP temporary construction pad (pole removal site). A second unmapped wetland (PSS1/EM1E) was found further to the southeast near CD 23, although this site did not appear to be within any construction pad or road. The wetland surrounding the open water pool appeared to be correctly delineated, although the pool itself contained features that suggested it was capable of supporting obligate amphibians in the spring. The planned removal of a pole and the placement of a proposed access road was within 25 feet of the open water area of the pool yet no provision for minimizing impacts of altered hydrology was noted in the wetland application (i.e. no vernal pool impacts were listed for Concord).



Left above: beginning of small, unmarked 1806 s.f. PSS1/EM1E at corner of agricultural field off Shaker Road; pole to be removed is just beyond; Right: soil auger sample #2 showing histic epipedon and depleted matrix of mineral subsurface.



Left: open water pool next to pole to be removed at GPS#84; Right: this pool area had sufficient water depth, pit-and-mound topography, and shrub cover to suggest it supports obligate vernal pool breeding amphibians

Off Snow Pond Road: This area was checked owing to possible wetland soils and plants uphill of the mapped wetland (GPS#86). Owing to the shading and aspect, the ground was snow-covered and frozen and did not allow for confirmation of this mapping estimate. Hydrophytes were observed immediately below the existing access road, however, within the path of the proposed access road re-alignment.

Right: frozen ground off Snow Pond Road; hydrophytes were found right off access road in new road alignment



Sanborn Road: This final site was checked because of the likelihood of a direct wetland connection between CD 44 and CD 48 at proposed pole 3132.91 (GPS#88-95). Unfrozen ground was auger-tested and hydrophytes identified. The edge of wet was determined to extend from Sanborn Road through the proposed temporary construction pad and pole removal area, neither of which mapped for wetland impacts. Wetlands appeared to be mostly PEM1E and PEM1/SS1E, although some soil disturbance near Sanborn Road masked certain soil attributes (i.e. mixed layers). These soil auger results are shown below.



Above: view NW from Sanborn Rd of wetland area



Left: disturbed soil profile near Sanborn Road in an area of 100% hydrophytes; Right: more typical hydric soil auger test near the edge of wet in an unmapped area north CD 48; plants included *Spirea alba* spp. *Latifolia*, *Vaccinium corymbosum*, *Onoclea sensibilis*, *Scirpus cyperinus*, and *Carex stricta*



Left: hydric soil (Pipestone series) showing sandy matrix, redox features in upper Bg horizon, and mucky surface layer; this soil sample was taken in the foreground of the picture at right near the middle of the proposed pole 3132-91 construction pad; herbaceous hydrophytes included *Calamagrostis canadensis*, *Agrostis stolonifera*, and *Solidago gigantea*

Summary

In four of the five test areas along the proposed Northern Pass route in Concord errors to the existing wetland mapping were found. Most of these included unmapped wetland areas with field-confirmed hydric soils, hydrology, and hydrophytes, although in one area a suspected vernal pool was found that was not noted as such in the NPTP wetland permit application. It appears that the initial cause for concern, which was preliminarily identified by the aerial photointerpretation mapping and confirmed in the field, was born out.

Respectfully submitted;

Rick Van de Poll

Rick Van de Poll, CWS #110

