May 30, 2014

VIA E-MAIL
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Re: Comments on Draft Amendment of the Jay Mountain Wilderness Unit Management Plan and Draft Temporary Revocable Permit for Mineral Sampling in Jay Mountain Wilderness

Dear Chairwoman Ulrich, Mr. Frank, and Mr. Alberga:

On behalf of Adirondack Wild: Friends of the Forest Preserve, Atlantic States Legal Foundation, Protect the Adirondacks!, and the Atlantic Chapter of the Sierra Club, we respectfully submit to the Adirondack Park Agency ("APA") and the New York State Department of Environmental Conservation ("DEC") these comments on the Draft Amendment of the Jay Mountain Wilderness Unit Management Plan ("Draft UMP Amendment") and the draft Temporary Revocable Permit ("Draft TRP") released by DEC on April 2, 2014. According to the Draft UMP Amendment, the Draft TRP contains the terms and conditions governing mineral sampling operations to be conduced by NYCO Minerals, Inc. ("NYCO") within approximately 200 acres of Adirondack Forest Preserve land contained in Lot 8, Stowers Survey, Town of Lewis, Essex County ("Lot 8").[1] The Draft UMP Amendment also purports to recognize an implicit repeal of the Adirondack Park State Land Master Plan ("APSLMP") Wilderness guidelines that preclude

[1] *See* Draft UMP Amendment at 2.

such operations on Lot 8 and to make the UMP consistent with the constitutional amendment that allegedly repealed those guidelines.[2]

We outline in these comments a number of legal and policy concerns. Most significantly, tree removal under the current Work Plan almost certainly will have adverse environmental effects on designated Wilderness land *outside of* Lot 8, because of the failure to account for edge effect from tree cutting close to the Lot 8 border.[3] Adverse impacts on vernal pools also may have affect areas *outside* of Lot 8.[4] Wilderness land outside Lot 8 unquestionably retains full protection under the article XIV, section 1, of the New York Constitution, including the "forever wild" and anti-removal provisions, regardless of the passage of Proposal Number 5. For that reason alone, APA and DEC should withdraw the current proposal from consideration. Our further objections to the approval procedure and to the substance of the Draft UMP Amendment, the Draft TRP, and the attachments thereto are set forth below.

I. There Can Be No Meaningful Public Participation or Rational Agency Action without Clear Legal Standards to Govern Administrative Decisions.

In our previously filed letters dated January 17, 2014, and April 9, 2014, which are incorporated by reference herein, we have set forth at length our objections to DEC's claim that the constitutional amendment approved by the voters in 2013 implicitly repealed the APSLMP Wilderness guidelines applicable to Lot 8. For the purposes of these comments, we reiterate only that protection of the Forest Preserve, including Lot 8, predated the 1895 effective date of Article XIV, section 1, of the New York Constitution, and the voters' passage of Proposal Number 5 in 2013 did nothing more than suspend that layer of constitutional protection pending further State legislative and administrative action. Without the constitutional protection, the State now has the choice whether (1) to continue protection of the Forest Preserve under unaltered statutory and regulatory requirements or (2) to amend those non-constitutional provisions to permit NYCO's exploratory drilling. The State may not choose to authorize mineral sampling without revising applicable law, which plainly bars industrial activities on Wilderness land.

DEC's theory of implicit repeal forces DEC, APA, and the public to operate in an unprecedented legal vacuum. Under that theory, Lot 8 remains part of the Forest Preserve, but the APSLMP Wilderness guidelines otherwise applicable to Lot 8 disappear without a trace.[5] The public is left with no criteria by which the Draft UMP Amendment can be evaluated in comments, and the agencies have no standard for their conformance determinations or potential permitting. To allow for meaningful public comment and rational agency action, either APA and DEC should abide by current law (which precludes mineral sampling) or the Legislature should adopt clear legal guidelines to replace those claimed to be repealed by implication (and thereafter initiate a

[2] *See id.*
[3] *See infra* at 3-4.
[4] *See infra* at 8 & n.16.
[5] *Id.* at 4.

transparent permitting process compliant with the new law). In light of the 125-year history of public investment in safeguarding the state Forest Preserve on Lot 8, the most protective possible standards should govern proposed activities in preparation for, during, and after mineral sampling.

II. DEC Should Not Ignore Its Own TRP Policy.

In 1986, DEC adopted a formal program policy governing the issuance of TRPs, the most recent version of which was approved in 2011 (the "TRP Policy"). The TRP Policy states in pertinent part:

> The Department issues TRPs in its sole discretion for the temporary use of State Lands . . . only for activities that are in compliance with all constitutional, statutory and regulatory requirements; the Adirondack and Catskill State Land Master Plans; adopted Unit Management Plans . . . ; the APA/DEC MOU; Department policies; approved work plans and guidance documents; and that have negligible or no permanent impact on the environment.[6]

The TRP Policy reiterates specifically: "Non-Routine TRPs will be issued only where they will result in negligible or no permanent impacts if conducted in compliance with the terms and conditions of the TRP."[7] The Draft TRP, which is a Non-Routine TRP, should not be issued because it both fails to comply with applicable law and authorizes activities with significant and permanent impacts.

As we note above and have explained in our prior letters, current statutes, regulations, plans, and policies preclude mineral sampling on Lot 8. Notwithstanding those non-constitutional prohibitions, the State evidently has chosen to authorize NYCO's exploratory drilling without amending any of the governing law. The activities contemplated by the Draft TRP thus will not be "in compliance with all . . . statutory and regulatory requirements" or other applicable legal provisions, and the permit should be denied on this ground alone.

Moreover, site maps prepared by NYCO suggest that some of the proposed drill pads are located fewer than 100 meters from the Lot 8 boundary, meaning that edge effect will extend into Wilderness areas unaffected by the November ballot measure.[8] The Draft TRP wholly ignores the potential impacts on designated Wilderness adjacent to Lot 8 and, as a result, neither provides protections for that land nor proposes mitigation for the predictable adverse effects on habitat, wildlife, and the values otherwise protected by the official Wilderness

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[6] *See* DEC, DEC Program Policy, ONR-3, Temporary Revocable Permits for State Lands and Conservation Easements 1 (last revised May 26, 2011), http://www.dec.ny.gov/lands_forests_pdf/trppolicyfinal.pdf.
[7] *Id.* at 4.
[8] *See* Draft TRP (Work Plan, Attach. A).

classification. Unless DEC prohibits the construction of any drill pads or access corridors within at least 100 meters of the Lot 8 boundary, adverse impacts on Wilderness bordering Lot 8 will be unavoidable. Because *none* of the legal protections for Wilderness land *outside* Lot 8 have been suspended (even under DEC's theory of implicit repeal), the activities contemplated by the Draft TRP will violate the law, and the TRP Policy precludes issuance of the permit.

Finally, the exploratory drilling that would be authorized by the Draft TRP would have both significant and permanent negative impacts on the environment. The Draft TRP reveals that as many as 1, 254 trees would be cut for mineral sampling operations, including more than 50 trees that are 14-20 inches in diameter. Even the one-day assessment of the Lot 8 Forest Preserve conducted by the New York Natural Heritage Program ("NHP"), which took only three core samples, found trees more than a century old and one as much as 180 years old.[9] The large trees cut down for mineral sampling operations will be lost forever, even if NYCO ultimately decides not to proceed with wollastonite mining on Lot 8. To make matters worse, even without mining, the forest gaps and edge effect created by as many as 21 drilling pads and associated access corridors will alter water resources and wildlife habitat for decades to come. The TRP Policy thus precludes approval of the Draft TRP.

Because the TRP Policy forecloses issuance of the Draft TRP, DEC could approve the draft only by ignoring its own longstanding guidance or by insisting that the TRP Policy (along with all other applicable law) was implicitly repealed. In either case, DEC would proceed without establishing an alternative policy by which agency action could be evaluated in meaningful public comments. Instead of departing so radically from its own practice and norms, we urge DEC to deny the TRP. At the very least, DEC should withdraw the Draft TRP from public comment until after the agency has amended the TRP Policy or otherwise published guidance applicable to mineral exploration in Lot 8.

III. The Draft TRP and Work Plan Are Insufficiently Protective of Designated Wilderness in the Adirondack Forest Preserve.

If the current public comment process moves forward (notwithstanding the lack of legally revised statutes, regulations, plans, and policies authorizing mineral sampling on Wilderness land), APA and DEC should adopt the most rigorous test available to govern their decisions. The TRP, Work Plan, and attachments thereto should be required to minimize adverse environmental impacts to the extent technically feasible and fully mitigate any remaining adverse effects. After all, as DEC admits, "Lot 8 is still part of the Forest Preserve."[10] Lot 8 has not been reclassified and therefore also is still part of a designated Wilderness Area. Under these circumstances, DEC should not permit the proposed mineral sampling to cause any adverse impacts on Lot 8, unless NYCO demonstrates that such injuries cannot be avoided with the best available technologies and management practices and that mitigation or compensation

[9] *See* Draft UMP Amendment, App. B, at 2.
[10] Draft UMP Amendment at 4.

will be provided for any unavoidable impacts. Any lower standard is incompatible with more than a century of public protection of the Adirondack Forest Preserve.

To meet that test and to provide evidence in support of its ultimate determination, DEC must conduct additional study and analysis of existing conditions in and potential adverse impacts on the relevant area—including designated Wilderness both within and adjacent to Lot 8—and submit the new documentation to public scrutiny. DEC also must: (a) eliminate inconsistencies in the current draft TRP and Work Plan (described below); (b) set forth concrete, objective standards in the special terms and conditions for proposed work; (c) clarify precisely when and how the activities will be conducted; and (d) develop detailed requirements for site restoration and mitigation of direct and indirect impacts of construction and operations. Without maximal protection from the consequences of activities normally prohibited in Wilderness, DEC's issuance of a TRP will be arbitrary and capricious and an abuse of discretion.

A. The Studies Submitted with the Draft UMP Amendment, Draft TRP, and Work Plan Do Not Provide an Adequate Basis for Development of TRP Terms and Conditions.

The Draft UMP Amendment, Draft TRP, and attachments thereto do not provide an accurate and comprehensive description of existing conditions on Lot 8. That description is necessary to provide a baseline against which to measure the environmental impacts that must be avoided or mitigated and a benchmark for future restoration efforts, if mining does not go forward.[11] Without documenting that baseline and benchmark for restoration, DEC cannot demonstrate that the terms and conditions of the TRP will provide the requisite protection for Forest Preserve land. That information also is essential to an adequate analysis under the State Environmental Quality Review Act, which has yet to be released to the public.

To develop the required account of existing conditions, field studies and photographs should be prepared by a qualified professional ecologist, certified forester, or landscape architect with demonstrated experience in restoration ecology, documenting at least the following parameters:

- Land contours,
- Drainage patterns,
- Soil characteristics,
- Extent and location of wetlands, streams, vernal pools, and other water resources during relevant periods of the annual hydrological cycle,

[11] A reliable baseline description of the resources that will be destroyed also is essential for valuation of the property, including monetization of lost ecosystem services and Wilderness values, if the State ultimately seeks a land exchange.

- Identity, numbers, and location of threatened and endangered ("T&E") species, including plant species; other species of special concern; and location of key wildlife habitats,
- Identity, numbers, and location of migratory birds, during both migration and breeding seasons, and location of their habitat and nests,
- Type and density of native plant community, including a full census of mature trees, and
- All nine components of DEC's criteria for "old growth" forest, including a comprehensive inventory, with statistically based tree sampling and core-aging of large trees of each species.

The field studies should examine potentially affected areas both on and within 100 meters of the footprint of access corridors and drilling pads, to account for new forest edge created by the sampling operations. As is explained in more detail below, the documents released for comment on April 2 do not begin to provide the requisite baseline data.

1. The Wetlands Assessment Performed by APA Staff Does Not Adequately Document Existing Water Resources in Lot 8.

Neither the Draft UMP Amendment nor the Draft TRP contains an adequate delineation of wetlands, streams, and vernal pools that may be affected by NYCO's proposed mineral sampling. APA staff used aerial photography to map jurisdictional wetlands and "smaller wet areas," which showed "possible locations of vernal pools," but no field studies were performed to confirm the presence or extent of any of these resources.[12] The special terms and conditions proposed by DEC and the Work Plan submitted by NYCO barely mention these water resources—some of which are crucial for the reproductive success of local wildlife—except by reference to NYCO's Stormwater Pollution Prevention Plan ("SWPPP"). Contrary to representations in the SWPPP, neither stormwater discharge locations nor surface water bodies are clearly identified in Attachments A or B to the Work Plan. Moreover, a SWPPP is not designed to address the negative effects on water and wildlife from sources other than stormwater, including spills of potentially toxic chemicals used in drilling. These omissions must be cured in a revised draft of the Draft TRP, which should submitted for public review before DEC authorizes any activities required for exploratory drilling.

The "wetlands assessment" performed by APA staff cannot supply an adequate basis for Draft TRP conditions protecting water resources from the impacts of mineral sampling. That assessment involved only aerial photography, which was conducted on January 29, 2014.[13] Aerial photography may be useful for determining whether there are any wetlands in Lot 8, but

[12] Draft UMP Amendment at 7.
[13] *See id.*

accurate delineation requires field surveys, as the staff readily admits directly on the maps.[14] Aerial photography is particularly inappropriate for delineating vernal pools, which are often small and difficult to detect from the air, especially in mid-winter, when they are dry.

As the U.S. Army Corps of Engineers recognized in its 1987 *Wetlands Delineation Manual*, "[w]etlands classified as having a temporarily flooded or intermittently flooded water regime . . . are among the most difficult plant communities to map accurately from aerial photography."[15] The APA staff photographs thus must be supplemented with on-the-ground study during periods after snowmelt when water resources, including vernal pools, reach their full extent. Spring field sampling and biological surveys of the pools also should be performed late in April and early May, to locate amphibian, reptile, and herpetofaunal species, including rare, threatened, and endangered salamanders that breed and forage within vernal pools. Although some of these unmapped water resources may not rise to the level of jurisdictional wetlands under the Freshwater Wetlands Act, they are crucial parts of the forest ecosystem and should be protected features of Wilderness land on Lot 8.

There can be no question that Lot 8 contains wetlands, including vernal pools and streams, which have not been described in the Draft UMP Amendment, Draft TRP, or attachments thereto. Daniel Plumley, a long-time wilderness advocate with a Bachelors Degree in Forestry, Wildlife and Park Management, has conducted six resource assessment surveys of Lot 8 since August 16, 2013. As he reports in his attached Affidavit, sworn to on May 29, 2014 (the "Plumley Aff.," annexed hereto as Exhibit A), the surveys revealed:

- Several vernal pools, including one that measured at least 130 feet by 65 feet, as well as wet depressions and both intermittent and permanent streams;
- Numerous large northern hardwood trees of many species, including a Sugar Maple of 34 inches in diameter at breast height ("DBH"); and
- Evidence of wildlife, including Black Bear markings on trees, tadpoles in a large vernal pool, and choruses of likely wood frogs.

On May 22, 2014, Mr. Plumley accompanied Dr. David Patrick, Assistant Professor of Fisheries and Wildlife Science and Director of the Center for Adirondack Biodiversity at Paul Smith's College, on a herpetofaunal survey of Lot 8. In only one day of field study, Dr. Patrick identified five species of amphibians, three of which breed in wetland habitat identified during the survey, and a vernal pool serving as an amphibian breeding site. Dr. Patrick's more

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[14] *Id.* at 10 (noting that the wetlands map is "[s]ubject to field verification"); *see* R.W. Tiner, *Practical Considerations for Wetland Identification and Boundary Delineation, in Wetlands: Environmental Gradients, Boundaries and Buffers* 128 (George Mulamoottil et al. eds., 1996) (noting that field verification of wetland boundaries generally is "necessary to establish the line on the ground where projects are encroaching on wetlands").

[15] U.S. Army Corps of Engineers, *Corps of Engineers Wetlands Delineation Manual* 37 (1987) [hereinafter "*Corps Manual*"].

detailed field notes and curriculum vitae are annexed hereto as Exhibit B. Photographs of resources observed during these surveys are included in the field notes and the Plumley Aff.

Dr. Michael Klemens, a herpetologist and expert in conservation biology, has reviewed the report prepared by Dr. Patrick. Dr. Klemens notes with respect to the vernal pool and other wetlands that Dr. Patrick observed:

> These wetlands do not exist in ecological isolation from one another. Their ecological connections extend through and beyond Lot 8 into the adjacent Jay Mountain Wilderness Area. The impacts of the proposed quarry expansion, located in a saddle between higher elevations, will extend far beyond the footprint of the proposed quarry expansion, far beyond Lot 8, into the heart of the Jay Mountain Wilderness Area.[16]

The expert comments of both Dr. Patrick and Dr. Klemens confirm that far more study of on-site and potential off-site impacts is needed before mineral exploration proceeds on Lot 8.

Given the evidence of wetlands and wildlife habitat on Lot 8, it would be inappropriate to proceed with the public comment process on the Draft UMP Amendment and Draft TRP. To provide an adequate basis for public comment and agency decision-making, DEC should conduct field studies of wetlands in Lot 8 in conformance with recognized scientific protocols. Many state agencies and universities defer to the Army Corps *Wetlands Delineation Manual* in determining procedures and protocols for characterizing wetlands. The manual provides that, even when conducting a routine wetlands determination—rather than the comprehensive determination required for Lot 8—onsite inspection is essential, unless available information "is sufficient for making a determination for the entire project area."[17] No such information is available for Lot 8.

The Regional Supplement to the Army Corps Protocol for the Northcentral and Northeast Region (which includes New York) acknowledges that vernal pools are part of a category of "[w]etlands subject to seasonal hydrology in the region."[18] Such habitats exhibit variability in their vegetation over the year and are "difficult wetland situation(s)" subject to unique guidance and procedures.[19] Protocol in these cases is to evaluate the site, using field examination, "during the normal wet portion of the growing season."[20] If aerial photography or

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[16] Report of Michael W. Klemens, Ph.D., dated May 30, 2014, at 1. Dr. Klemens' report and his curriculum vitae are annexed hereto as Exhibit C. Two studies referred to in his report are too large to filed as attachments to these comments and are being submitted on a CD under separate cover.

[17] *Corps Manual* at 45.

[18] U.S. Army Corps of Engineers, Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0) 16 (2012).

[19] *See id.* at 114.

[20] *Id.* at 114-44.

other off-site data sources were used initially, a follow-up "on-site investigation should be made to verify the preliminary determination and complete the wetland delineation."[21]

The U.S. Fish and Wildlife Service ("FWS") also has recognized the limitations of aerial photography for mapping wetlands.[22] According to FWS: "The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the ancillary data, and the *amount of ground truth verification work conducted*."[23] FWS recommends caution with respect to seasonal wetlands in particular:

> Aerial imagery typically reflects conditions during the specific year or season when it was captured. Precise description of hydrologic characteristics requires detailed knowledge of the duration and timing of surface inundation, both yearly and long-term as well as an understanding of groundwater fluctuations. … Assigning water regime based on a single point-in-time image can lead to misrepresentations, especially in times of drought or extreme high water conditions.[24]

DEC should not ignore guidance from two federal agencies charged with protecting water resources and freshwater-dependent species.

Other northeastern states have recognized the ecological significance of vernal pools and the limitations of mapping by aerial photography. For example, New Jersey adopted rules in 2001 to protect vernal pools as essential habitats. To implement the rules, the New Jersey Department of Environmental Protection teamed with Rutgers University Center for Remote Sensing and Spatial Analysis ("CRSSA") to develop a database of vernal pools throughout the state. CRSSA used visual interpretation of digital orthophotography to identify over 13,000 potential vernal pools. Subsequent field verification highlighted some of the limitations with off-site methods for mapping vernal pools.

The CRSSA field surveys found that off-site mapping carried with it a 30 percent omission error.[25] As the authors noted: "The ability to discern a potential vernal pool on digital orthophotography is dependent upon the size and shape of individual pools and the surrounding landscape context/contrast as well as the spatial resolution and radiometric

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[21] *Id.* at 22.
[22] U.S. Fish & Wildlife Serv., Data Collection Requirements and Procedures for Mapping Wetland, Deepwater and Related Habitats of the United States 31 (2009).
[23] *Id.* at 30 (emphasis added); *see also id.* at 31 ("Certain wetland habitats may not be consistently mapped because of the limitations of aerial imagery as the primary data source used to detect wetlands.").
[24] *Id.*
[25] Richard G. Lathrop et al., *Statewide Mapping and Assessment of Vernal Pools: A New Jersey Case Study*, 76 J. Envtl. Mgt. 230, 234 (2005).

characteristics of the imagery."[26] The authors also observed a relationship between the quality of mapping and the weather conditions prior to image acquisition.[27] They found that the accuracy of photography in mapping wetlands had less to do with the resolution of the image and more to do with precipitation prior to image acquisition.[28] Analyzing climate records, they found vernal pools to be more readily recognizable in a photoset from 1995, as compared with a similar photoset from 2002, and they attributed the difference to a major drought prior to image acquisition for the latter set.[29] Mapping of vernal pools from aerial photography requires representative rainfall in the preceding months.

Researchers at the University of Massachusetts Amherst also drew a connection between rainfall and accuracy in mapping vernal pools. The scientists compared three databases of potential vernal pools derived from aerial photography against field surveys. The study found commission error rates as high as 61 percent.[30] The authors were unable to calculate precise omission error rates using their methodology, but their results "indicate[d] that individual photo-interpreters mapped very different sets of potential seasonal pools, and substantial numbers of seasonal pools [we]re probably missed by photo-interpreters."[31] In analyzing errors, the authors considered discrepancies in "the average spring rainfall amount (March-May) for the 30-year mean" between image sources and noted that it is likely that a lower precipitation figure preceding image acquisition would reduce the number of pools mapped.[32] Other sources of omission error include pool depth and size, type of forest (deciduous versus evergreen), tree density and canopy cover.[33] Looking at their study in the context of prior analyses, they concluded: "Overall, the omission rates . . . suggest that substantial numbers of seasonal pools are missed by photo-interpretation, many for no apparent reason."[34]

When photo-interpretation is followed by field studies, the timing of surveys is crucial. Timing is especially important when assessing biological indicators of wetlands, including vernal pools. The University of Massachusetts Amherst researchers found that many potential vernal pools were dry by the end of their investigation.[35] The presence of biological indicators is "highly dependent on seasonal hydroperiods of seasonal pools and may occur for only relatively short periods of time."[36] Complicating matters further, the authors noted that "biological indicators

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[26] *Id.* at 235.
[27] *Id.*
[28] *Id.* at 234-35.
[29] *Id.*
[30] Laurel Carpenter et al., *Accuracy of Aerial Photography for Locating Seasonal (Vernal) Pools in Massachusetts,* 31 Wetlands 573, 573 (2011).
[31] *Id.* at 580.
[32] *Id.*
[33] *Id.* at 580. *See also* Aram J. K. Calhoun et al., *Evaluating Vernal Pools as a Basis for Conservation Strategies: A Maine Case Study*, 23 Wetlands 70, 74 (2003).
[34] *Id.* at 580-81.
[35] *Id.*
[36] *Id.*

are not consistently present in a seasonal pool every year" and that accuracy would increase with multiple monitoring visits "within and between years."[37] The authors also noted their "inability to detect the [Massachusetts Natural Heritage and Endangered Species Program] biological criteria on aerial photos."[38] Any assessment neglecting the precise timing of hydrological, biological and ecological patterns is likely to underestimate the number of vernal pools.[39]

In sum, the January 2014 aerial photography cannot possibly provide an adequate account of wetland resources on Lot 8. Because wetlands, vernal pools, and streams have not been delineated in accordance with accepted scientific standards and do not appear clearly on maps of the proposed drill pads and access corridors, the Draft UMP Amendment, Draft TRP, and attachments thereto make it impossible to determine whether the mineral sampling will permanently destroy hydrological integrity or habitat for amphibians and reptiles. To remedy those deficiencies, field surveys for all water resources in Lot 8 should be completed at the appropriate times during the year, a comprehensive analysis of potential impacts on those resources should be developed, avoidance strategies and mitigation measures for unavoidable impacts should be incorporated into special terms and conditions for the Draft TRP, and the revised draft permit should submitted for public comment. Only then, should DEC consider whether to authorize NYCO's mineral sampling.

2. The Natural Heritage Program Assessment Does Not Adequately Document Existing Forest Condition on Lot 8.

To assess Forest condition on Lot 8, DEC and NHP staff visited Lot 8 on July 25, 2013. The NHP memorandum reporting its methods and findings also is seriously flawed. Under New York law:

> The term "old-growth forest" shall mean a parcel of at least ten acres which includes all of the following: an abundance of late successional tree species, at least one hundred eighty to two hundred years of age in a contiguous forested landscape that has evolved and reproduced itself naturally, with the capacity for self-perpetuation, arranged in a stratified forest structure consisting of multiple growth layers throughout the canopy and forest floor, featuring canopy gaps formed by natural disturbances creating an uneven canopy and conspicuous absence of multiple stemmed

[37] *Id.*
[38] *Id.*
[39] *See, e.g.,* Annie E. Curtis and Peter W. C. Paton, *Assessing Detection Probabilities of Larval Amphibians and Macroinvertebrates in Isolated Ponds*, 30 Wetlands 901, 901 (noting that "based on seasonal variation in detection probabilities, rapid assessment methods would not be effective to monitor overall biodiversity of isolated ponds" and concluding that "multiple visits would be required to estimate occupancy rates" of impacted species).

> trees and coppices. Typically, old-growth forest sites are also characterized by an irregular forest floor containing an abundance of coarse woody materials which are often covered by mosses and lichens, show limited signs of human disturbance since European settlement, have distinct soil horizons that include definite, organic, mineral, alluvial accumulation, and unconsolidated layers, and have an understory that displays well developed and diverse herbaceous layers.[40]

The NHP staff parsed this definition into nine components, characterizing old-growth forest as forest: (1) at least 10 acres in size, (2) with an abundance of late successional tree species, at least 180-200 years old, (3) in contiguous forested landscape with natural, self-perpetuating reproduction, (4) with stratified forest structure, (5) featuring a mosaic of canopy gaps and mature patches, (6) characterized by an abundance of coarse woody debris, often covered with mosses and lichens, (7) limited signs of human disturbance, (8)distinct soil horizons, and (9) diverse herbaceous understory.[41] The staff's analysis, using these criteria, is at odds with its conclusion that Lot 8 does not qualify as old-growth forest.

The staff concluded that the forest on Lot 8 unquestionably satisfied six of the nine criteria for old-growth forest, including items (1), (3), (4), (5), (7), and (9). In addition, the staff found that "late-successional species are the most abundant species at [their] observation points," but they core-sampled only three trees and missed significant sections of the site.[42] The photographs annexed to our letter of April 9, 2014, suggest that a more complete survey would reveal trees at least 180 years of age, in satisfaction of item (2). The staff also found "some indicator species for old-growth forests" on tree trunks and admitted that the methodologies they used to measure coarse woody debris with moss and lichens resulted in a "potential loss in accuracy and complete representativeness," suggesting that a more scientifically defensible examination would show satisfaction of item (6). There was little assessment of soil characteristics at the site, so there was no basis for any determination with respect to item (8). With clear satisfaction of six criteria, and inadequate study with respect to the final three, Lot 8 cannot be ruled out as old-growth forest. The five additional core samples taken on March 4, 2014, from four random points spaced across Lot 8, do not rectify the inadequacies of the NHP analysis.[43]

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[40] N.Y. Envtl. Conserv. Law § 45-0105(6).

[41] Draft UMP Amendment, App. B, at 1.

[42] *Id.* at 2. The additional five core samples taken in March 2014 from four randomly chosen locations in Lot 8 do not cure this problem. A scientifically designed comprehensive survey is required to assess forest stand age in this rich, high quality, northern hardwood forest ecosystem with levels of biological integrity rarely seen in the Forest Preserve.

[43] *See* Draft UMP Amendment at 6.

New York has recognized the significance of old-growth forest. Most recently, the Legislature added protection for old growth forests even outside the Forest Preserve counties.[44] The minimal core sampling performed by the NHP and DEC staff found a tree more than 180 years of age, and others might well be found with a scientifically designed and implemented study. Even if the entire site does not qualify as old-growth forest, there may be patches of trees that meet the requirements. In view of the recognized public importance of old-growth forest, the Draft UMP Amendment and Draft TRP should disclose comprehensive information about the potential damage even to patches of old-growth trees.

The site visits conducted by Mr. Plumley revealed numerous very large trees of a variety of species. Photographs included in his affidavit document Sugar Maple, Amercian Beech, White Ash, and Basswood ranging 22-32 inches DBH. Even if the forest on Lot 8 qualifies only as "mature forest," it offers a superb example of a northern hardwood ecosystem in a Wilderness area that deserves maximal protection.

A thorough investigation should be completed to provide an accurate account of existing conditions at Lot 8. APA and DEC should conduct the site inventories and science-based assessments needed to get good baseline data on the ecological quality, richness, and vulnerabilities of the tract. Only after completion of that study, can permit terms and conditions be developed to avoid or to mitigate adverse impacts on the Forest, whether or not it qualifies as old growth in whole or in part. At that point, at the very least, the proposed sites of drilling pads should be relocated to avoid felling of any trees likely to be more than 100 years old, given the DBH and growth factor for the species.

B. More Stringent Terms and Conditions Must Be Included in the TRP and Associated Documents to Protect Forest Preserve Ecosystems and Wilderness Values.

The Draft TRP, Work Plan, and Attachments to the Work Plan (collectively, "Draft TRP Documents") are deficient in numerous respects. They fail completely to address a wide range of probable adverse impacts on Wilderness land, especially on wildlife, directly from industrial activities and indirectly through the introduction of invasive and destructive species. The Draft TRP is outdated and information is missing from the Work Plan that is alleged to be included. The Draft TRP Documents contain inaccurate statements, inconsistent factual representations, illegible maps, and vague terms and conditions. All of these problems should be cured in revised drafts, which should be issued for further comment before any decision is made with respect to the UMP Amendment or the TRP.

[44] N.Y. Envtl. Conserv. Law § 45-0101 (amended in 2008 to add protection specifically for old-growth forests).

1. The Terms and Conditions of the Draft TRP Do Not Address a Wide Range of Likely Adverse Impacts.

The Draft TRP Documents do not include any analysis of many important features of Lot 8 and therefore offer no protection for them. For example, there is no mention of the fact that Lot 8 overlies or is in close proximity to one of the largest stratified aquifers in the eastern Adirondacks, serving northern New Russia, all of Elizabethtown, and areas northward into Lewis. NYCO seeks approval to use potentially toxic additives (including organic compounds) in the drilling process, which will produce holes of 200-400 feet in depth, but there are no special conditions imposed to protect the aquifer from blowouts, spills, or other accidents, which could result in seepage of toxic fluids to groundwater.

The Draft TRP and Work Plan also omit any mention of migratory birds that may use Lot 8 for feeding, resting, or breeding. Indeed, there is no evidence that any research was undertaken to establish the likely presence in and adjacent to Lot 8 of birds covered under the Migratory Bird Treaty Act or that any analysis was performed to identify likely impacts on those birds from the activities contemplated under the Draft TRP. The risk that NYCO will kill or wound birds (including nesting young) during the clearing of vegetation or drilling operations is exacerbated by the fact that there also is nothing in the Draft TRP Documents to prevent NYCO from proceeding with that work during the primary breeding season of migratory birds in the Jay Mountain Wilderness, which occurs from mid-May to mid-July.[45]

To document the presence of breeding migratory birds on Lot 8, David Gibson, former President and Conservation Chair of the Audubon Society of the Capital Region and participant in the latest New York State Breeding Bird Survey, visited Lot 8 on May 22, 2014. His one-day survey of the eastern portion of the site revealed a number of important species, even though it was conducted in mid-day, past the peak period of daily birdsong. As Mr. Gibson reports in his affidavit, sworn to on May 28, 2014 (annexed hereto as Exhibit D), he clearly identified more than a dozen species, including Black-throated Blue Warbler, Veery, Scarlet Tanager, and Wood Thrush.

According to *The Second Atlas of Breeding Birds in New York State*, these four species in particular are sensitive species with declining populations.[46] The Black-throated Blue Warbler is identified by Partners in Flight as a priority species because of its very high area importance—the Adirondack Mountains region contains five percent of the world population of this species.[47] The New York State Breeding Bird Atlas shows that the Black-throated Blue Warbler in the Adirondack Mountains region has suffered a significant decline of 2.3 percent per year from

[45] The only limit on timing of operations is that work not proceed on Saturday nights, Sundays, or federal holidays. *See* Draft TRP at 4 (Special Term No. 24).
[46] *See The Second Atlas of Breeding Birds in New York State* 440, 448, 488, 540 (Kevin J. McGowan & Kimberley Corwin eds., 2008).
[47] *Id.* at 488.

1980-2006.[48] The Veery is identified by the U.S. Fish and Wildlife Service as a bird of "conservation concern"—in other words, one that, without additional conservation actions, likely will become a candidate for listing under the Endangered Species Act.[49] The Scarlet Tanager and Wood Thrush are both classified as "species of greatest conservation need" by the 2005 New York State Comprehensive Wildlife Conservation Strategy.[50] The Wood Thrush also is classified by the U.S. Fish and Wildlife Service as a bird of conservation concern.[51]

To ensure that migratory birds are not taken unlawfully as a result of operations in Lot 8, the TRP Special Terms and Conditions should require a written forest and migratory bird protection and mitigation plan, prepared by a qualified expert, prohibiting construction or operations during the primary breeding season and articulating other requirements for protection of migratory birds and their habitat. DEC also should require that, before construction of any access road or drill pad commences, NYCO create a fund for purchase of land that will add to the Adirondack Park interior forest blocks and provide high value habitat equivalent to that impaired by NYCO's activities.

Birds may be harmed not only by direct loss of trees but also by the alteration of habitat caused by increased forest edge. Some birds will breed only in interior forest, and the reduction of interior tract size, as access corridors and drill sites are carved into Lot 8, could affect those species. In addition, nest predators that favor edge habitat can increase their reach into previously out-of-reach interior forest. The creation of new forest edge also presents threats to native vegetation. "In forested areas such as the Adirondack Park, edges tend to be sunnier, warmer, drier, and more favorable to invasive exotic species, shade-intolerant plants, and generalist predators at the expense of many native species . . . ."[52] Notwithstanding these risks, the Draft UMP Amendment and Draft TRP contain no documentation of the current tract size of interior forest; of the extent to which it will be reduced, dissected, or perforated by access corridors and drilling sites; or of the corresponding extent of new forest edge and clear-cut pathways for invasive or otherwise destructive species.

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[48] *Id.*

[49] U.S. Fish & Wildlife Serv., *Birds of Conservation Concern 2008* iii, 86 (2008) (discussing definition of "bird of conservation concern"); *id.* at 32 (listing the Veery on Birds of Conservation Concern 2008 list) http://www.fws.gov/migratorybirds/NewReportsPublications/SpecialTopics/BCC2008/BCC2008.pdf.

[50] DEC, *New York State Comprehensive Wildlife Conservation Strategy*, App. D1 at 4 (2005), http://www.dec.ny.gov/docs/wildlife_pdf/cwcs2005.pdf.

[51] *Birds of Conservation Concern* at 29-30, 86.

[52] Pre-Filed Testimony of Michale J. Glennon, Ph.D. and Heidi E. Kretser, Ph.D., *Matter of the Application to Construct the Adirondack Club and Resort*, APA Project No. 2005-100, at 13 (citing Richard T. T. Forman, *Land Mosaics: The Ecology of Landscapes and Regions* (1995); Karen A. Harper et al., *Edge Influence on Forest Structure and Composition in Fragmented Landscapes*, 19 Conserv. Biology 768 (2005); Jeffrey C. Milder et al., *Conserving Biodiversity and Ecosystem Function through Limited Development: An Empirical Evaluation*, 22 Conserv. Biology 70 (2008)).

In addition to the significant omissions described above, there is no documentation or analysis of the following existing conditions and impacts to be avoided or mitigated:

- soil conditions along access roads and on the pads, where compaction will exacerbate stormwater runoff and impede reforestation following the completion of NYCO's operations,
- noise levels, which will significantly increase with drilling and other motorized equipment, human presence during operations, and the clearing of forest, with potential adverse impacts on neighbors, Park visitors, and wildlife, including Black Bear that forage in Lot 8 and may have winter dens within earshot of NYCO's activities,
- light levels, which may increase if artificial illumination is needed for operations, with potential adverse impacts on wildlife,
- visual and scenic assets of undisturbed Wilderness, which will be degraded by the planned tree-felling for dirt roads and well pads and will be visible from within Lot 8, from major roadways and the scenic Northway corridor (I-87), and from viewshed destinations, such as the bluffs and peaks of Slip, Bald and Seventy Mountains, and
- recreational, aesthetic, and experiential opportunities for solitude and sense of remoteness in a Wilderness setting, which will be eliminated entirely in and near Lot 8 during construction and mineral sampling operations.

In the long term, even if mining does not proceed, there will be adverse water quality and ecosystem impacts from deforestation and reduced scenic and recreational values, especially from the loss of century-old and older trees. The terms and conditions of the Draft TRP and Work Plan cannot adequately protect the Wilderness on and adjacent to Lot 8, when qualified experts have not even analyzed these direct and indirect impacts of the mineral sampling.

2. The Draft TRP Documents Must Be Revised to Provide Correct and Consistent Information, Clear and Concrete Performance Standards, and Comprehensive Protection of Affected Wilderness Land.

The Draft TRP Documents require substantial revision in addition to those identified above. As a preliminary matter, the Draft TRP states that the Start Date of Use is May 16, 2014. As is explained above, the start date should be deferred until after the primary nesting season of migratory birds in the affected area. In addition, the "Special Terms and Conditions" that currently are included in the Draft TRP do not establish the clear and protective standards appropriate for Wilderness land and should be revised and supplemented as follows:

- No. 11: The statement that "disruption of vegetation shall be kept to a minimum" is too vague to offer a basis for public comment, to provide guidance to NYCO, or to be enforceable by DEC. DEC should provide clear and concrete content for this requirement by specifying practices that must be avoided and protective steps that must be taken to prevent all avoidable disruption of vegetation.

- Nos. 14, 17, and 18: These requirements refer to the required restoration or reclamation of soils and drill pads. As is explained above, genuine restoration is impossible without clear delineation of the baseline conditions at each site. In addition to requiring the requisite documentation of existing conditions, the TRP Special Terms and Conditions should require submission of a comprehensive written restoration plan, prepared by an independent qualified professional, detailing measures designed to return the site to baseline conditions to the extent technically feasible, including lists of required tree species and specification of stem counts needed for forest recovery.
- No. 16: Sterilization of tools and equipment alone is insufficient to prevent spread of invasive plants. Moreover, the clearance of vegetation opens opportunities for invasive and otherwise destructive wildlife as well. The TRP Special Terms and Conditions should require submission of a written invasive species plan, prepared by an independent qualified professional, detailing measures designed to protect long-term viability of native vegetation and wildlife.
- No. 19: It is not sufficient simply to state that "[n]oise and/or lighting impacts associated with this project will need to be mitigated to the greatest extent possible," particularly in the absence of documentation of existing noise and light conditions. The TRP Special Terms and Conditions should require submission of written noise and lighting mitigation plans, prepared by qualified experts, addressing impacts not only on neighboring landowners but also on Park visitors and wildlife, including bats and birds.
- No. 20: Specifics need to be provided to ensure that the required safety barrier does not disturb land, vegetation, or wildlife. If land, vegetation, or wildlife unavoidably will be disturbed, the Draft TRP should disclose the full extent of additional disturbance, and the Special Terms and Conditions should identify mandatory mitigation measures.

For the following reasons, the Work Plan, including the SWPPP, also should be revised, and new TRP Special Terms and Conditions should be imposed, to protect Wilderness land in and around Lot 8:

- Page 1 of the Work Plan states that Phase 2 of proposed drilling "comprises a group of holes closer to Lot 8's existing boundary." In fact, three of the five holes to be drilled during Phase 2 (numbers 9-11) extend access corridors further toward the center of the tract. This misstatement should be corrected.
- Because there has been inadequate documentation of existing conditions, there is no legitimate benchmark for restoration. In addition, there is inadequate detail provided with respect to restoration requirements. Page 1 of the Work Plan simply states: "Upon completion of the project, all drilling sites and corridors will be cleared of equipment, disturbances reclaimed, seeded, and mulched." The TRP Special Terms and Conditions should require submission of a written restoration plan, prepared by a qualified professional, describing the work that will be done on a site-specific basis. The plan should address in detail all of the parameters listed on page 5, above, including regrading, soil de-compaction, plantings and seeding, removal of tree cuttings, and

long-term monitoring and maintenance to ensure successful reforestation with native species. At the very least, all of these details should be provided for a sample drilling site.

- The area of disturbance is described inconsistently. Page 1 of the Work Plan states that maximum disturbance is expected to be less than 7.3 acres. The SWPPP states that "approximately 5.35 acres will be disturbed" by mineral sampling activities. A single, correct figure for the extent of disturbed areas for purposes of the SWPPP should be provided. The calculation of disturbed area for purposes of a potential conveyance of land to the State, in compensation for the land disturbed by NYCO, should not be limited to land cleared of vegetation but rather should include all areas adversely affected by construction and operations, including forest within at least 100 meters of cleared land. The Special Terms and Conditions should prohibit any adverse impacts outside of Lot 8.
- The timing of restoration is described inconsistently. Page 2 of the Work Plan indicates that restoration will follow each phase of drilling, whereas page 4 states that drill sites will be reclaimed within three days after drill departure. The Work Plan should state consistently that site-by-site restoration of each drilling site will be completed in its entirety immediately following conclusion of drilling activity and that access corridors will be restored completely as soon as they are not needed to reach drilling sites.
- Tree removal limitations are described inconsistently. For access corridors, page 2 of the Work Plan states that trees to be cleared must be identified specifically and may be removed only "if unavoidable." The Draft TRP, on the other hand, authorizes the cutting of "up to 1254 tallied trees within the permitted access corridors," in three phases. It is unclear from the document whether the 1,254 trees that may be cut include trees to be cleared for drilling sites. For drill site preparation, the Work Plan states that tree removal is to be "minimized to maximum extent practical." NYCO should not be the arbiter of what qualifies as "practical." The TRP Special Terms and Conditions should require that NYCO identify every tree greater than three inches DBH that NYCO proposes to remove for corridors or drill sites and to provide proof that preserving each such tree is not technically feasible, including by relocating drill sites or reducing their number. The TRP Special Terms and Conditions also should require location of drilling sites so as to avoid felling of any tree likely to be more than 100 years old, given the DBH and species-specific growth factor, unless it is not technically feasible to avoid cutting those trees. A DEC forester should mark and tally all trees for which there allegedly is no technically feasible alternative to felling, and a map of such trees should be prepared for public review and comment. NYCO should be required to implement appropriate mitigation for all cut trees.
- The width of access paths is described inconsistently. Page 3 of the Work Plan states that the paths must be 15 feet wide to accommodate transportation of the drilling machine masts past trees, even though track-mounted equipment often can navigate paths only 10 feet wide. The Site Details included as Attachment B to the Work Plan show 20-foot access corridors. Corridor sections should be only as wide as necessary to

permit passage of equipment; if trees may be pruned to avoid interference, corridor widths should be reduced. In any event, no corridor should be wider than 15 feet. The Site Details should be corrected accordingly.

- The hours of drilling operations are described inconsistently. Page 3 of the Work Plan contemplates 24-hour drilling during the winter but also mentions a 12-hour shift. Page 5 of the Work Plan specifies a 10-hour day for drilling. To limit the duration of noise and light impacts on neighboring landowners and wildlife, the TRP Special Terms and Conditions should state that drilling is limited to no more than 10 hours/day.

- The type of drilling additives that may be used are described inconsistently. Page 3 of the Work Plan states: "It is anticipated that drilling contractors will introduce biodegradable additives into its cooling/flushing water to assist with drilling operations." The Material Safety Data Sheets ("MSDSs") included in Attachment C to the Work Plan make it clear, by contrast, that the following potential additives are *not* readily biodegradable or there is no information available about their degradability:
    - EZ-MUD
    - EZ-MUD GOLD

  The TRP Special Terms and Conditions should prohibit use on Lot 8 of the foregoing additives or any other drilling additives that have not been demonstrated to be readily biodegradable and should state that DEC will revoke the permit immediately if a prohibited drilling additive is used.

- The following products identified in Attachment C to the Work Plan contain ingredients that are known to be toxic or have not been tested for toxicity:
    - AMC CR-650, which contains acrylamide, a neurotoxin;[53]
    - EZ-MUD, which contains hydrotreated light petroleum distillate, which is an eye, skin, and respiratory irritant and may cause neurological problems.[54]

  The TRP Special Terms and Conditions should prohibit use on Lot 8 of the foregoing additives, other additives that are toxic when dissolved or suspended in water, or additives that have not been tested for toxicity and should state that DEC will revoke the permit immediately if a prohibited drilling additive is used.

- If DEC chooses not to prohibit the use on Lot 8 of drilling additives the toxicity of which is currently unknown, DEC should require that toxicity data be obtained for the range of possible concentrations of the toxic constituent that could reach a water of the state, for at least one vertebrate and one invertebrate species indigenous to receiving waters on Lot 8. Following toxicity testing, DEC should deny authorization to use any additive that is shown to be toxic when dissolved or suspended in water.

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[53] U.S. Envtl. Protection Agency, *Technical Factsheet on Acrylamide*, http://www.epa.gov/ogwdw/pdfs/factsheets/voc/tech/acrylami.pdf.

[54] *See* Envtl. Working Group, *Drilling Around the Law* 4 & nn. 7-8 (2010) (noting that hydrotreated light distillate is a synonym for kerosene).

- Page 4 of the Work Plan states that NYCO will submit MSDSs for drilling additives *after* drilling contractor selection. The TRP Special Terms and Conditions should prohibit the use of any drilling additive not previously authorized by DEC. All information about the chemical identity of each ingredient, concentration of each ingredient, and quantities used of any authorized drilling additive should be disclosed to DEC and be available to the public. DEC should decline to authorize use of any drilling additive for which full information is not available to the public. The TRP Special Terms and Conditions should state that DEC will revoke the permit immediately if an unauthorized drilling additive is used.
- Page 2 of the Work Plan states: "Drilling waters will be recycled to the maximum extent practical." DEC should require that *all* drilling waters be recycled. If complete recycling is not technically feasible, the Work Plan should state that a waste transporter permitted under Title 6, Part 360, of the New York Codes, Rules and Regulations ("NYCRR") will haul any leftover fluids to a waste disposal facility permitted under the State Pollution Discharge Elimination System ("SPDES"), 6 NYCRR Part 750.
- The Draft TRP Documents appear to contemplate that NYCO will proceed without a SPDES permit, because there is no plan for discharge of drilling waters or wastewater to waters of the state. The TRP Special Terms and Conditions should prohibit onsite discharge of any drilling fluids, wastewater, or industrial wastes to waters of the state, including ground water, unless NYCO first obtains a SPDES permit to do so.
- Page 3 of the Work Plan states: "Drill water remaining in the 1,000 gal. tank at Seventy Road Mine will be disposed by a licensed sanitary service hauler." The Work Plan should provide that a waste transporter permitted under 6 NYCRR Part 360 will haul any water remaining in the tank to a SPDES-permitted disposal facility. The TRP Special Terms and Conditions should require use only of waste transporters permitted under 6 NYCRR Part 360 for haulage of any wastes, including both wastewater and solid wastes, for offside disposal.
- There appears to be no plan for secondary containment to prevent spills on access corridors or unlined drill pads from reaching soil and leaching through to ground water or running off into surface water. If liners cannot be used because tree stumps create an uneven surface, DEC should require alternative measures to prevent spills on drill pads. At a minimum, the TRP Special Terms and Conditions should require secondary containment for toxic fluids or semi-fluids, including mandatory use of drip pans for all parked equipment.
- There is no prevention or emergency response plan for spills of used drilling water, drilling muds, cement, or fuel. NYCO should be required to submit a spill prevention and emergency response plan for public review and DEC approval. DEC should mandate that all spills be reported immediately to DEC and cleaned up completely as soon as possible. The TRP Special Terms and Conditions should state that DEC will revoke the permit if a spill is not reported immediately or cleaned up completely within 24 hours.

- Page 3 of the Work Plan states: "Drill cuttings from operation [will be] removed from portable sediment trough and containerized and disposed at NYS approved landfill." The Work Plan should describe how the drill cuttings will be containerized and disposed of, and NYCO should identify the landfills permitted under 6 NYCRR Part 360 that are expected to accept the drill cuttings. The TRP Special Terms and Conditions should prohibit NYCO from directly disposing of any drill cuttings or other solid waste, onsite or offsite, unless it first obtains a permit to do so under 6 NYCRR Part 360.
- Page 3 of the Work Plan provides for installation of four-foot steel standpipe at each core hole but there is no discussion of what happens to the standpipe upon completion of drilling. The TRP Special Terms and Conditions should require removal of any above-grade pipe so that evidence of human activity is not visible on the surface of the Wilderness land.
- The SWPPP should be revised to state that all best management practices ("BMPs") and stormwater control measures will comply with the New York State Stormwater Design Manual.
- The SWPPP should include engineering plans showing site-specific or "typical" drawings of silt fencing, hay bailing, and other means of implementing proposed BMPs. The SWPPP also should show cut and fill locations, stock pile locations, stormwater containment areas, access corridors, impervious areas, vehicle parking areas, chemical storage areas, and other areas which may potentially come into contact with stormwater.
- The SWPPP should include specific drainage plans (drawings) showing the existing and modified flow paths of the storm water.
- Maps should be provided showing, on an expanded scale, the proximity of each proposed drilling site to surface waters of the state (including wetlands), as evidence that potentially contaminated stormwater will not reach such areas.
- The revised SWPPP should be reviewed and approved by the DEC Regional Office, as is standard practice with proposed SWPPPs, statewide.

The TRP Special Terms and Conditions also should require the following measures, if mining is not anticipated after the sampling is complete:

- Implementation of mitigation measures for impairment of wetlands, streams, vernal pools, and other water resources; degradation of soils; and harms to native vegetation, wildlife, habitat, and ecosystems,
- Implementation of the invasive species plan,
- Implementation of the written restoration plan,
- Quarterly inspection for the first three years and annual inspection for the following ten years, of all mitigation measures, invasive species control measures, and restoration measures to ensure successful implementation and ecosystem recovery and, where necessary, prompt repair, replacement, or redesign of any unsuccessful measures, and

- Where adverse impacts cannot be fully mitigated, or resources cannot be fully restored, payment of natural resources damages, including for loss of habitat and injury to species from the creation of new forest edge and for loss of ecosystem services.

IV. Conclusion

The Draft UMP Amendment and Draft TRP should not be approved. As currently drafted, they unconstitutionally allow adverse impacts on Wilderness land outside Lot 8. They also are incompatible with applicable non-constitutional law and unacceptable as a matter of policy. The inadequate description of existing conditions and impacts, lack of scientifically supported analysis, internal inconsistencies, and failure to provide adequate protection and mitigation all suggest an unnecessarily rushed and ill-considered process. The Forest Preserve and public deserve better.

There is no reason to rush to judgment with respect to mineral sampling on Lot 8. Already, NYCO has submitted plans to expand its existing Lewis mine by approximately 50 percent, and it owns another mine at Oak Hill that should be ready for full-scale mining by 2016. Even if APA and DEC will not reconsider their legal position, they should go back to the drawing board while NYCO taps the extensive wollastonite reserves on its private property. Lot 8 has been protected since 1885, and the agencies should take the time necessary to evaluate comprehensively the natural resources and Wilderness values that will be lost before releasing a draft TRP for public comment.

Should you have any questions about these comments, you may call me at 212-845-7377 or reach me via e-mail at dgoldberg@earthjustice.org. Thank you for your consideration.

Respectfully,

Deborah Goldberg

Deborah Goldberg
Managing Attorney

Exhibit A

AFFIDAVIT OF DANIEL R. PLUMLEY

STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

Daniel R. Plumley, being duly sworn, deposes and says:

1. I am employed as a Partner of Adirondack Wild: Friends of the Forest Preserve, Inc. I have a B.S. in Forestry, Wildlife and Park Management from Virginia Polytechnic Institute and State University. I have worked in professional wilderness management policy development, wilderness unit management planning, and regional planning; and have practiced ecological forestry and natural resource management in the Adirondack Park region since 1982.

2. Over the past nine months, I have undertaken six separate forest and natural resource assessment surveys of Lot 8, a 200-acre tract in the eastern portion of the Jay Mountain Wilderness Area within the Adirondack Park in the Town of Lewis in Essex County. My findings are catalogued and set forth in this affidavit, along with some photographs that I took during my site visits to document my findings. I have over 90 photographs from these visits and can make all of them available upon request. Unless otherwise indicated, each observed feature catalogued below is discrete and was not previously identified. I have made every attempt to avoid duplicate identifications.

3. During my visits, I measured select individual trees for Diameter Breast Height (DBH), which is the diameter of the bole of the tree at 4.5 feet above the ground. I also measured some trees for girth, or circumference, at the same height and, in a few cases, I estimated tree height to the top of the tree crown. The equipment I used for recording and measurements included:

- Nikon D-7000, 18 – 200 mm lens

- Apple iPhone compass and slope degree application
- Sunto M-2 Standard compass, 13 degree westerly declination
- Stanley 100-foot-long cloth measuring tape for vernal pool dimensions, tree girth circumference, and tree height calculations
- Irwin metal 36-inch straight edge for diameters
- Irwin 45-degree angle for crown height estimates

4. Based on my extensive observations of Lot 8, I have concluded that Lot 8 is an incredibly rich, unique, and exemplary site representative of the northern hardwood ecosystem. Lot 8 contains many large northern hardwood trees from 11 to 34 inches in DBH, with crown heights up to 100 feet tall. A number of possible old growth tree patches are evident in Lot 8. Lot 8 also contains an extensive network of potential and actual vernal pools, wet pools, water-holding depressions, and intermittent and permanent streams – all of which require further inventory and assessment. Many, if not all, of these likely serve critical ecological functions.

Survey One: August 16, 2013

5. I undertook my first survey of Lot 8 on August 16, 2013. I entered Lot 8 from its southeast corner and surveyed the lot's southeast quadrant, which covers approximately 50 acres. I photo-documented natural resource conditions and large trees, and took DBH and some girth and height measurements of the trees. I also located and measured vernal pools and other notable features.

6. Immediately upon entering the state land boundary of Lot 8, I noted a markedly older, more ecologically intact northern hardwood forest ecosystem. The ecosystem of Lot 8 is very different from that found on the adjacent un-posted private lands which are comprised of

forests timbered or exploited for hardwood, leaving younger pine, hemlock, and beech forests fragmented by roads, log-landings, and skid trails.

Photo 1. As I entered onto Lot 8 from the southeastern corner, I observed a more ancient, ecologically intact northern hardwood ecosystem

7. Several large, high quality, single-bole stemmed northern hardwood species are prominent in the forest and dominant in the forest canopy of Lot 8, including Sugar Maple (*Acer saccharum*), American Beech (*Fagus grandifolia*), Eastern Hop Hornbeam (*Ostrya virginiana*), Red Maple (*Acer rubrum*), Paper Birch (*Betula Paperifera*), Big-tooth Aspen (*Populus grandidentata*), and Striped Maple (*Acer pensylvannicum*). Among the larger trees, Sugar Maple and American Beech are the most dominant. Although the woods were dry from a drought at that time, the southeast quadrant of Lot 8 represented a good moisture-balanced Beech-Maple mesic forest habitat.

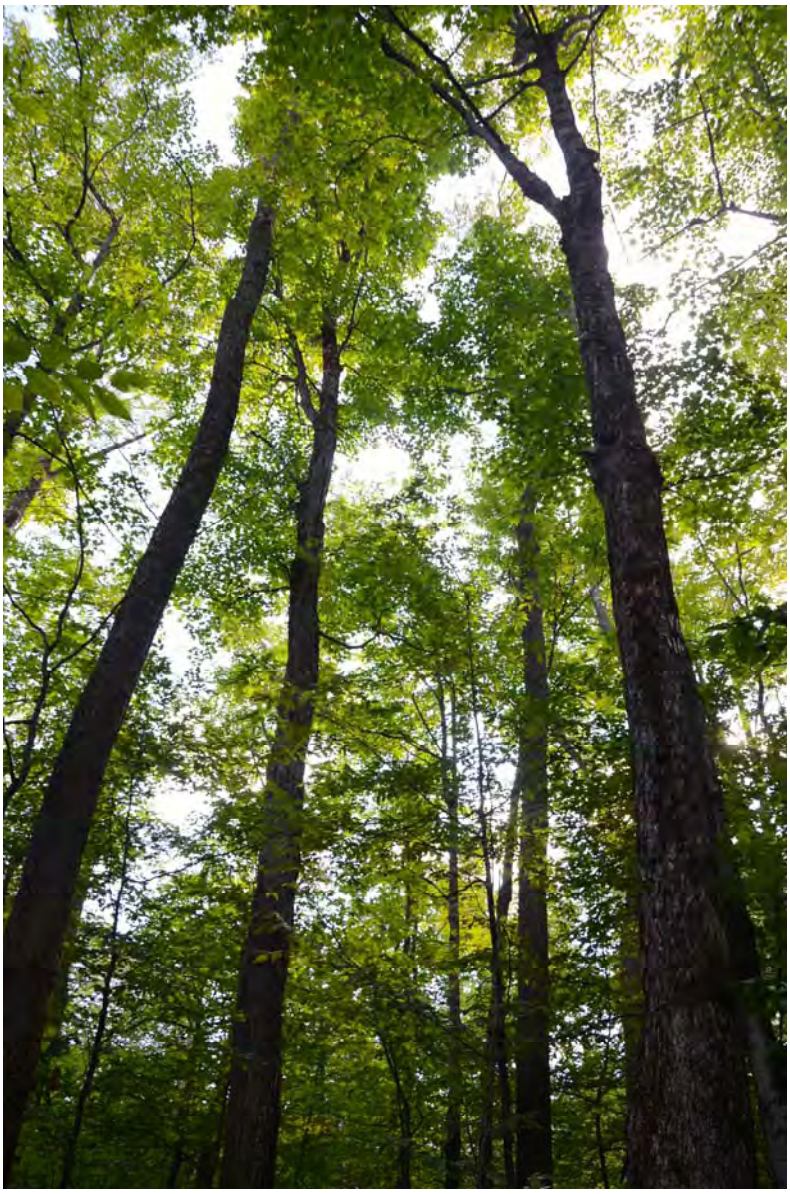

Photo 2. Near the southeast corner of Lot 8, co-dominant hardwoods reach 85 to 100 feet or more in a high canopy that heavily shades the understory, as is typical in mature and old growth hardwood stands that have been left undisturbed for 130 years or more

8. I also observed some softwood and boreal species, including Hemlock (*Tsusga Canadensis*), Balsam Fir (*Abies balsamea*) and Red Spruce (*Picea rubens*), although these trees were far fewer in quantity than the northern hardwood species.

9. The site had an open and park-like quality due to the high canopy and was typified by pit and mound topography. I crossed large coarse woody debris in the form of old,

fallen logs. Several such fallen logs were greater than 10 to 25 inches in diameter and covered by rich, green mosses. Trees recently felled by wind added to the coarse woody debris on the forest floor. Significant moss-laden old logs and pit and mound topography are characteristic of long-matured, older-growth northern hardwood forest ecosystems that have felt little or no impact by humans.

10. The understory and terrestrial plants appeared diverse and included what appeared to be very strong northern hardwood regeneration, including Sugar Maple, American Beech, and other canopy hardwoods in good number, as well as calcium-rich soil species, such as:

- Maidenhair Fern (*Adiantum spp*.)
- Christmas Fern (*Polystichum acrostichoides*)
- Bellworts (*Uvalaria spp*.)
- Blue Cohosh (*Caulophyllum thalictroides*)

In many northern hardwood stands in the Adirondack Park, over-browsing by deer can reduce or eliminate native hardwood regeneration, but this does not appear to be the case in Lot 8 despite a robust number of whitetail deer signs in the form of buck scrapes and scat.

11. There was no visible sign of human historical interference: no roads or skidding tracks, no cut stumps, no tire ruts, no rock walls, no old brush piles, no construction of any kind, no decaying boards or building materials, no garbage, and no visible evidence of forest fire on the site. The only visible sign of human presence I saw was along Lot 8's eastern border, where safety fencing and posted signs signal the vicinity of the NYCO Lewis Mine.

12. I saw no double or multiple stand hardwood trees in the high canopy or middle canopy position as might be found if the site had been lumbered for hardwood in the mid- to late-1800s; thus, there were no stump-sprout trees visible, making this site very rare and unique in the

Forest Preserve as an undisturbed eastern aspect site with naturally seeded, single-stem native northern hardwoods in excellent condition and with a largely closed high crown canopy.

13. Within the southeast quadrant of Lot 8, I walked north within 25 to 150 feet of Lot 8's border with NYCO lands. During this walk, I observed the following:

- Sugar Maple – 11-inch DBH
- White Ash (*Fraxinus americana*) – 14 inch DBH
- Sugar Maple – 17 inch DBH
- Sugar Maple – 18 inch DBH
- White Ash – 17 inch DBH
- Sugar Maple – 26 inch DBH
- Sugar Maple – 15 inch DBH
- Sugar Maple – 17 inch DBH
- Sugar Maple – 18 inch DBH
- Sugar Maple – 17 inch DBH
- Paper Birch – 19 inch DBH
- Sugar Maple – 18 inch DBH
- White Ash – 20 inch DBH
- Sugar Maple – 22 inch DBH, 70 inch girth circumference at breast height, 96 feet tall (see photo on next page)

Photo 3. In the east central portion of Lot 8, this 22 inch DBH Sugar Maple with 70 inch circumference at breast height and at 96 feet tall represents the high quality of the site. As is typical for Lot 8 and consistent with mature and old growth conditions, large, old trees such as this one are interspersed with younger middle crown canopy trees that are also mostly hardwood.

Survey Two: August 30, 2013

14. I undertook a second survey of Lot 8 on August 30, 2013, with David Gibson, a Partner of Adirondack Wild. First, we surveyed the visual character of the NYCO Lewis mine and Lot 8 as visible from the Elizabethtown-Wadhams Road at a distance of approximately 11 miles. The mine was clearly visible and the upland Lot 8 forest to the ridgeline was also visible from approximately 20 feet from the roadside's northern edge.

15. We entered Lot 8 from the southeast corner and walked along its eastern border for approximately 3,000 feet to Lot 8's northeast corner. There, we found two large vernal pools. The smaller of the two pools was visible on NYCO property and loosely connected to a larger vernal pool on state land within Lot 8. Consistent with the ecology of vernal pools in August, the pool in Lot 8 was dry, but its natural depression was visible. The bottom of the depression was deep in discolored northern hardwood leaf matter that clearly had been

submerged at length under water, and the site was rich in wetland ferns and grasses, including Sensitive Fern (*Onoclea sensibilis*).

Photo 4. Rich, large vernal pool site identified during the August 2013 dry period, with ferns, grasses, and wetland plant species.

16. The vernal pool boundary measured at least 130 feet long by 65 feet wide and appeared to be close to 2 feet deep in its depression. Wet muds were visible and the leaf mats resembled paper mâché and were thickly layered. The vernal pool was within 60 feet of the border with NYCO lands and the existing mine.

17. After surveying this pool in the northeast corner of Lot 8, we headed west and surveyed the northern border of Lot 8. We took photos approximately every 300 feet. We made the following observations of each 300 foot section heading west along Lot 8's northern border:

- Section 1 was comprised of an extensive Sugar Maple stand, including one Sugar Maple with 15 inch DBH. Older northern hardwood high canopy trees, predominantly Sugar

Maples, were consistently interspersed throughout this section, spaced 15 to 20 feet apart and surrounded by smaller, younger trees and diverse understory. We identified a second possible vernal pool measuring 15 feet by 12 feet, which was dry with leaf matting. We also identified a possible vernal pool with a wet depression measuring 6 feet by 5 feet.

- Sections 2 and 3 had forest stands similar to those in Section 1. The leaf litter layer duff was deep, undisturbed, and comprised of leaves from northern hardwood trees.
- Section 4 contained Sugar Maple mixed with a few Big-tooth Aspen, American Beech, and Paper Birch.
- In Sections 5 through 10, we saw several Sugar Maples with 15 to 20 inch DBH. We identified individual Sugar Maples with 20 inch DBH, 22 inch DBH, and 26 inch DBH. We also identified a Sugar Maple with 29 inch DBH and a 102 inch girth circumference at breast height (see photo below).

Photo 5. Sugar Maple with 29 inch DBH and a 102 inch girth circumference at breast height, located near the northern border of Lot 8 and possibly over 300 years in age.

We also identified a large American Beech with extensive bear claw marking (see photo below). We observed coarse woody debris with moss, maidenhair ferns, and large single-stem Sugar Maples with multiple-layered canopies and an upper canopy blocking sunlight from the forest floor.

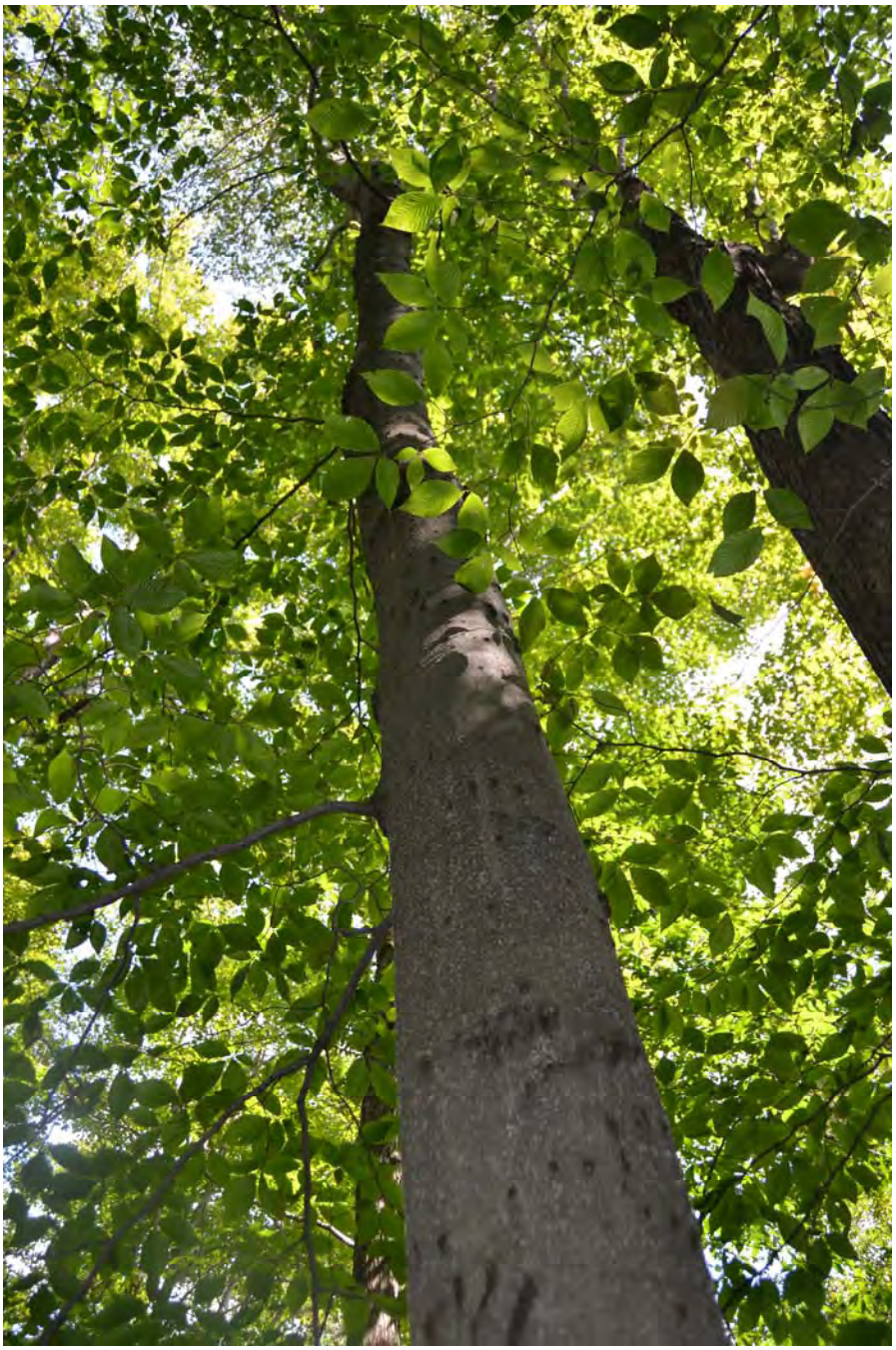

Photo 6. This American Beech has been deeply marked by black bears over generations as they seek the fall harvest of beechnuts in the crown above.

18. We then climbed Bald Peak in the northwest corner of Lot 8, and from it, observed the contiguous wilderness stretching from Bald Peak across the rich extent of Lot 8 towards the eastern Boquet Valleys and Lake Champlain region.

Photo 7. In this photo, I am near the summit of Bald Peak overlooking the southern section of Lot 8. In the eastern Adirondacks, wilderness and scenic vistas such as this one are rare and in decline due to increasing development and land fragmentation.

Photo 8. Lot 8's wild northern hardwood ecosystem lies between the bottom of the photo and the NYCO Lewis Mine, the denuded area near the center of the photo.

19. We then walked from Bald Peak in the northwest corner of Lot 8 to the southeast corner of the tract. Along the way, we observed multiple large-stem northern hardwood trees – principally Sugar Maple and American Beech, with some interspersed Paper Birch and Big-tooth Aspen. One Big-tooth Aspen was 28 inch DBH.

Survey Three: January 17, 2014.

20. I returned to Lot 8 for a third survey on January 17, 2014. I was accompanied by Tate Conner, a forester with the New York State Department of Environmental Conservation, and Brian Shutts, a NYCO Geological Associate.

21. We noticed red, orange, and blue survey tape in the southeastern portion of Lot 8, marking out NYCO's potential exploratory drilling site. Large Sugar Maple, White Ash, Paper Birch, and other trees were marked with tape as an indication that they would be cut during NYCO's proposed exploratory drilling.

22. We identified large glacial erratic and erratic boulder fields in the northeastern central portion of Lot 8, where Mr. Conner and Mr. Shutts indicated that large boulders would need to be moved to facilitate NYCO's mineral exploration.

23. We observed many large northern hardwood trees that I had seen previously and one new, very large, old Sugar Maple in the northeast quadrant of the site, not measured, but approximately 32 inches DBH (see photo on next page).

Photo 9. Approximately 32 inch DBH Sugar Maple in northeast quadrant of Lot 8.

24. We also identified two separate stream sections; recent tree tip-overs, as occur in long mature and older growth forests; and a 26 inch DBH American Beech marked by black bear claws.

Survey Four: April 28, 2014

25. On April 28, 2014, I conducted a fourth survey of Lot 8 specifically to assess vernal pools and wet depressions (holding water), intermittent and permanent streams, and other water features on the site.

26. Traveling from the southeast portion of Lot 8 to the center and eastern aspect of Lot 8's northern border, I observed the following features:

- Wet depression, 12 feet by 6 feet
- Coarse woody debris with moss
- Wet depression, 12 feet by 7 feet
- Wet depression, 3 feet by 3 feet
- Intermittent stream with heavy leaf mat that likely dries out
- Erratic boulders with deep green moss
- Several large Sugar Maple at 12 inch to 18 inch DBH
- Coarse woody debris – American Beech, 20 inch diameter
- White Ash – 16 inch DBH
- Sugar Maple – 24 inch DBH
- Intermittent stream
- Wet depression, 3 feet by 3 feet
- Wet depression containing 8 inches of water
- Permanent stream (2 feet wide), rocky with moss
- Multiple single coarse woody debris with moss
- Sugar Maple – 22 inch DBH
- American Beech with fresh claw marks of black bear
- Coarse woody debris – American Beech
- White Ash – 26 inch DBH (see photo below)

Photo 10. This straight-bole, high form class (meaning little taper from base to upper tree stem) 26 inch DBH White Ash, is one of hundreds of large, old White Ash across Lot 8.

- Sugar Maple – 24 inch DBH
- Intermittent stream
- Wet depression, 3 feet by 3 feet
- Wet depression containing 8 inches of water
- Permanent stream (2 feet wide), rocky with moss
- Multiple single coarse woody debris with moss
- Sugar Maple – 22 inch DBH
- American Beech with fresh claw marks of black bear
- Coarse woody debris – American Beech
- Sporadic wet interconnected depressions 30 feet in length

- Multiple wet depressions, some linear and meandering in form
- Multiple coarse woody debris with moss
- Sugar Maple with rich basal moss
- Sugar Maple – 20 inch DBH
- Large coarse woody debris with moss
- White Ash – 20 inch DBH
- Yellow Birch (*Betula alleghaniensis*) – 20 inch DBH
- Sugar Maple – 22 inch DBH

27. I came upon the large vernal pool I had previously identified in the northeastern corner of Lot 8 (see Photo 4). It was no longer dry and was approximately 130 feet long by 65 feet wide with water over 12 inches deep. There, I heard and recorded frog choruses that seemed to be coming from several hundred Wood Frogs. The recording is in my possession and is available upon request.

28. Traveling from the northeast central to southwest central border of Lot 8, I further identified the following distinct features:

- More coarse woody debris with moss
- Wet depression, 30 feet by 12 feet
- Wet tree pit depression
- Large Sugar Maple patch
- Wet meandering depression
- Tree pit depression
- American Beech marked by black bears
- Lycopodium patch

- Large potential vernal pool, 30 feet by 25 feet
- Long, meandering potential vernal pool, 90 feet by 25 feet
- Linear, meandering potential vernal pool, 70 feet long (see photo below)

Photo 11. A 70 foot-long, linear and meandering potential vernal pool. This pool is one of more than 40 such water-holding pools encountered during six surveys across Lot 8.

- Meandering wet depression, 12 feet by 22 feet
- Permanent stream
- High quality Sugar Maple forest looking west

- Permanent stream
- Large vernal pool, 45 feet by 15 feet
- Wet depression, 3 feet by 3 feet
- Potential vernal pool, 17 feet by 9 feet
- Open park-like northern hardwood canopy looking southwest towards Slip Mountain
- Eastern Hop Hornbeam – 11 inch DBH
- Meandering wet depression, 20 feet by 5 feet
- Vernal pool with rock, 20 feet by 10 feet
- White Ash – 12 inch DBH
- Large erratic with moss
- Coarse woody debris with moss
- Wet depression, 10 feet by 8 feet
- Meandering wet depression, 30 feet by 8 feet
- Sugar Maple – 22 inch DBH
- Park-like princess pine lycopodium forest floor with 2 acres of understory
- Wet depression, 8 feet by 4 feet
- Wet depression, 20 feet by 12 feet
- Sugar Maple clump – 19 inch DBH
- Sugar Maple – 34 inch DBH, on or near the southern border of Lot 8
- Large meandering vernal pool, 90 feet by 18 feet (see photo on next page)

Photo 12. Large 90 feet by 18 feet meandering boreal and hardwood vernal pool with rich mossed boulders within 800 feet of the southern boundary of Lot 8.

Survey Five: May 10, 2014

29. On May 10, 2014, I conducted a fifth survey of Lot 8. I was accompanied by Roger Gray, a member of the Sierra Club Atlantic Chapter's Adirondack Committee, and two other Sierra Club chapter members.

30. We traveled from the southeast corner of Lot 8 to the northeast corner and then back south more centrally through the tract. We identified the following previously unidentified specimens:

- Sugar Maple – 20 inch DBH
- Sugar Maple – 19 inch DBH
- Unidentified tree – 19 inch DBH
- Yellow Birch – 30 inch DBH
- Sugar Maple – 29 inch DBH with rare interior fire scars
- White Ash – 26 inch DBH
- Sugar Maple – 24 inch DBH
- White Ash – 21 inch DBH
- White Ash – 26 inch DBH
- White Ash – 20 inch DBH

Survey Six: May 22, 2014

31. On May 22, 2014, I undertook a sixth survey of Lot 8. I was joined by David Gibson and David Patrick, a herpetologist and Assistant Professor of Fisheries and Wildlife Science and Director of the Center for Adirondack Biodiversity at Paul Smith's College.

32. We entered Lot 8 from the southeast corner and traveled due north to the northeast corner and returned on a central, angled interior transect line to the southern border. We then traveled east along Lot 8's southern border and headed north into the lot following a stream. We then traveled southeast to exit the site. Our findings included:

- Vernal pool in the northeast corner (see photo on next page), which was previously identified in Survey Two, now teeming with Wood Frog tadpoles and Spotted Salamander egg masses

Photo 13. Vernal pool previously identified in Survey Two (see Photo 4) and Survey Four, where I had heard frog choruses.

- Basswood – 23 inch DBH, 6 feet, 2-inch girth at Breast Height, over 100 feet tall
- Basswood – 25 inch DBH; 6 feet, 10-inch girth at Breast Height; 85 feet tall

Photo 14: This 25 inch DBH Basswood in the central portion of Lot 8 is approximately 85 feet tall and is one among many individual and group Basswood sites in that portion of the tract approximately 200 years or older.

Daniel Plumley

Sworn to before me this
29 day of May, 2014

Notary Public

BRIDGET M. LEE
Notary Public, State of New York
No. 02LE6215997
Qualified in New York County
Commission Expires 1/11/2018

Exhibit B

REPORT ON HERPETOFAUNAL SURVEY OF LOT 8, JAY MOUNTAIN WILDERNESS

Prepared by: David Patrick, Ph.D

Background

On Thursday, May 22, 2014, I conducted a partial survey of Lot 8 in the Jay Mountain Wilderness. My survey focused on quantifying the diversity of amphibian species on the site and evaluating potential aquatic breeding habitat.

Lot 8 is primarily a well-drained upland northern hardwood forest. It is a square tract approximately 3,000 feet on any side aligned north-south, east and west on its side boundaries. I entered Lot 8 from its southeast corner and surveyed the entire eastern boundary of Lot 8, which is adjacent to an existing wollastonite mine. At the northeast corner of Lot 8, I surveyed a large vernal pool. I then walked in a southwesterly line from the northeast corner of Lot 8 to the southern boundary of Lot 8, locating other small and medium vernal pools and brooks. On the southern boundary of Lot 8, I followed a small stream north approximately 1,500 feet before traveling southeast to exit Lot 8.

Findings

I identified five species of amphibians in my survey of Lot 8:

- wood frog (*Lithobates sylvaticus*)
- green frog (*L. clamitans*)
- spring peeper (*Pseudacris crucifer*)
- eastern red-spotted newt (*Notophthalmus viridescens*)
- spotted salamander (*Ambystoma maculatum*)

Three of these species – wood frogs, spring peepers, and spotted salamanders – breed in the wetland habitat found in Lot 8. The two other species – green frogs and eastern red-spotted newts – require wetlands with longer hydroperiods than I identified during my survey. These two species are thus likely transitory on Lot 8, although the wetland habitat in Lot 8 likely serves as important foraging habitat for green frogs. Given the habitat found on Lot 8, eastern red-backed salamanders (*Plethodon cinereus*), a ubiquitous species in mature woodlands in the region, are almost certainly present as well, although they were not active on the ground surface at the time of surveying. Recent heavy rainfall made it difficult to gauge the permanence of first-order streams on the site, which are breeding habitat for salamanders.

I identified one amphibian breeding site during my survey: a large vernal pool in the northeastern corner of Lot 8, adjacent to the site of the existing mine (UTM Zone 18N 0610093E 4906915N). This pool was approximately 25 meters in length and 15 meters in width at the time of sampling, with a maximum depth of approximately 0.8 meters. Vegetation in the pond depression indicated that the site dried regularly. Such regular drying of the pool creates conditions that favor the survival of the eggs and larvae of both wood frogs and spotted salamanders. Approximately 65 spotted salamander egg masses were present in the vernal pool at the time of sampling. Wood frog egg masses had already hatched, and hence could not be enumerated. However, the high density of wood frog tadpoles (approximately 200 per square meter across the entire surface area of the wetland), coupled with the large area covered by the remnants of the egg masses, is indicative of a minimum of 100 breeding females and likely considerably more.

Surveying large vernal pool in northeast corner of Lot 8

This vernal pool is almost certainly a source breeding habitat, rather than a sink (*i.e.*, a location that attracts more amphibian adults from elsewhere than it produces through successful reproduction). Sink habitats are often found close to productive breeding sites when individuals spill out to breed in the unproductive "sink" sites. In the case of this vernal pool in the northeast corner of Lot 8, the large size of the breeding populations of spotted salamanders and wood frogs, the loss of connectivity to the east of the pool due to existing mining operations, and the absence of any other suitable breeding sites within 500 meters of the pool, are strong indicators that this vernal pool is a source breeding pool producing critical amphibian biomass.

Wood frog tadpoles in large vernal pool in northeast corner of Lot 8

Conclusion

Lot 8 contains a vernal pool that appears to be one of the few, if not the only, productive wetland habitats for amphibians in the 200 acres of the tract. Amphibians such as wood frogs and spotted salamanders play an important role in driving ecosystem structure and function through their high local abundances, their role as predators of invertebrate organisms, and their role as a food source for higher trophic level organisms. If this vernal pool is lost, either through direct destruction or alteration of the hydrological regime that maintains it, a significant hotspot of productivity for wood frogs and spotted salamanders will also be lost, with its attendant indirect impacts on the ecosystem of Lot 8 and the surrounding wilderness.

DAVID ANDREW GRAHAM PATRICK *Curriculum Vitae*

Paul Smith's College
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Paul Smith's, NY, 12970
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Office. 518 327 6174

RESEARCH INTERESTS

Conservation biology; community-based approaches to conservation; population biology; applied population modelling using GIS and Matlab; effects of habitat change on movement of animals and plants; road ecology; herpetology; wetland ecology and conservation

TEACHING INTERESTS

Conservation biology; spatial ecology; population biology; applied conservation modeling; community-based conservation; sustainable resource use

EDUCATION

2007	Ph.D. *Wildlife Ecology*, University of Maine
2000	MSc. *Conservation Biology* (1st class honours), Durrell Institute of Conservation and Ecology
1999	BSc, *Zoology and Animal Ecology*, Bangor University College of North Wales
1997	Oregon State University, exchange visit for 1 year

PROFESSIONAL APPOINTMENTS

Current	Assistant Professor of Fisheries and Wildlife Science and Director of the Center for Adirondack Biodiversity, Paul Smith's College, NY, USA

2007 Post-doctoral Research Associate/visiting instructor. State University of New York College of Environmental Science and Forestry, NY, USA

AWARDS

2007 Outstanding Graduate Student Award, Dept. of Wildlife Ecology, University of Maine

2006 Society for Conservation Biology student award finalist, San Jose, CA

1997 Guinness Earth Science Award (one of ten places offered internationally by Guinness)

FELLOWSHIPS AND GRANTS

Faculty Research and Development Grant, Paul Smith's College, Patrick, D. A., $1200 (2013)

Sterling-Tomkins International Travel Fellowship, Patrick, D. A. $800 [2013]

Environmental Protection Agency "Detecting climate change in wetlands in the Adirondack Park. Phase II", Rooks, M., Beier, C., Hai, P., Howard, T., McNulty, S., and Patrick, D. A. $173,168 [2013]

Northeastern States Research Consortium "Assessing the mechanisms driving climate-induced range reductions in amphibians in the Northern Forest: The Mink Frog, Rana septentrionalis, as a case study", Patrick, D. A., Harper, E. B., and Popescu, D. V. $10,639 [2012]

The Joseph and Joan Cullman Conservation Foundation "Educational materials for Adirondack ATBI". Patrick D. A. $500 [2012]

Environmental Protection Agency "Detecting climate change in wetlands in the Adirondack Park. Phase I", Spada D. M., Beier, C., Hai, P., Howard, T., McNulty, S., and Patrick, D. A. $227,000 [2011]

Sterling-Tomkins International Travel Fellowship, Patrick, D. A. $1017 [2011]

Faculty Research and Development Grant, Paul Smith's College, Patrick, D. A., $1200 (2011)

Northeastern States Research Consortium "Assessing the potential effects of changes in climate on the range and long-term persistence of the

Mink Frog, *Lithobates septentrionalis*, in the Northern Forest" Patrick, D. A., Harper, E. B. H., and Popescu, D. V., $53,169 (2010)

Faculty Research and Development Grant, Paul Smith's College, Patrick, D. A., $1200 (2010)

Northeastern States Research Consortium "Assessing biodiversity, forest condition and the effects of management in the Northern Forest" Patrick, D. A., McNulty, S., $15,000 (2009)

Lake George Conservancy, support for Paul Smith's College student research (salary and accommodation for Nathaniel Child for summer research) (2009)

Joseph and Joan Cullman Foundation Northern New York Audubon Awards "Monitoring avian productivity and survivorship" Favreau, J., and Patrick, D. A., $1,200 (2009)

Shingle Shanty Preserve, "Assessing biodiversity, forest condition and the effects of management in the Northern Forest" funding for undergraduate research through the Center for Adirondack Biodiversity, Patrick D. A., and McNulty, S., $7,404 (2009)

Faculty Research and Development Grant, Paul Smith's College, Patrick, D. A., $862 (2009)

National Geographic, **"**Assessing the sustainability of harvesting endemic chameleons: Integrating land-use and harvesting patterns with species-specific demography*",* Harper, E. B., Patrick, D. A., and Vonesh, J. R., $20,000 (2008)

Critical Ecosystem Partnership Fund, Conservation International, "a bilingual field guide to the amphibians of the East Usambara Mountains, Tanzania", Harper, E. B., Patrick, D. A., and Vonesh, J. R., $20,000 (2007)

Society of Wetland Scientists, New England Chapter Grant, "the effects of forest practices on a Maine amphibian community", Patrick, D. A. $500, (2005)

University of Maine Green Endowment travel award, conference travel, submitted on behalf of a group of graduate students, $1400, 2006

AV Stout Fund Research Award, "the effects of forest practices on a Maine amphibian community", Patrick D. A. $988, (2004)

PROFESSIONAL EXPERIENCE

2002-2003	Birdwatch Ireland roseate tern project, Rockabill Island, Ireland (senior warden, 2003, warden 2002)
2001-2002	University of Illinois at Chicago research team leader: East Usambara Mountains, Tanzania (research team leader 2002, research assistant 2001)
2000	MSc research: Monitoring populations of pond-breeding tree frogs in the East Usambara Mountains, Tanzania
2000	Seed dispersal agents of *Maesopsis eminii* in the East Usambara Mountains, Tanzania. Independent research
1998	U.S.D.A Wilderness Ranger, Eagle Cap Wilderness, Oregon

TEACHING EXPERIENCE

Program Coordinator

Current	Natural Resources Sustainability, Paul Smith's College

Instructor

2011	Paul Smith's College: Introduction to Fisheries and Wildlife Science, Dendrology Lab., Group Research Capstone [FOR 499]; Landscape Ecology (NRS 432)
2010	Paul Smith's College: Introduction to Fisheries and Wildlife Science, Dendrology Lab., Group Research Capstone [FOR 499]
2010	Paul Smith's College: Landscape Ecology (NRS 432)
2009	Paul Smith's College: Introduction to Fisheries and Wildlife Science, Dendrology Lab., Capstone Planning
2009	Tropical Biology Association, Amani, Tanzania.
2008	SUNY ESF EFB 202: Introduction to herpetology and supervising independent study projects Cranberry Lake Biological Station, NY. Undergraduate research program with 68 students

2008 SUNY ESF EFB 414 (3 cr): Senior synthesis in conservation biology. Senior undergraduate course with 24 students (including supervising individual capstone projects)

2007 SUNY ESF EFB 797 (1 cr): Adaptive peaks graduate seminars. Graduate seminar with 16 students

2007 SUNY ESF EFB 202: Introduction to herpetology Cranberry, Lake Biological Station, NY. Undergraduate research program with 60 students

2006 University of Maine WLE 440 (2 cr): Advanced problem solving in conservation biology. Undergraduate/graduate course with 12 students

1995 Teaching English in Nepal: 6-month placement based in a remote village

Teaching assistant

2005 University of Maine WLE 455 Wildlife-habitat relationships. Undergraduate course with 40 students

UNDERGRADUATE ADVISING

Current *Academic advisor for 31 undergraduate students at PSC*

2008 *Christopher Schalk* [SUNY ESF]

2005-07 *Catherine Amy Kropp, Sarah Spencer, Molly Castles, and Ben Wasserman* (Department of Wildlife Ecology, University of Maine)

2004-05 Undergraduate REU Committee member and research advisor. *David Veverka*

PROFESSIONAL PRESENTATIONS

Invited seminars/training workshops

2014 *North Eastern Association of Fisheries and Wildlife Agencies.* Coyote abundance and patterns of ungulate browsing in the Adirondack Park, NY (presented by Lewis Lolya as part of the NSF S-STEM program)

2014 *UpYonda Farm, Bolton Landing, NY.* Ecology and conservation of Adirondack Amphibians

2014 *Adirondack Research Forum, Old Forge, NY.* The effects of climate change on a cold-adapted amphibian

2013 *Adirondack Research Consortium, Lake Placid, NY.* Assessing stated values, attitudes, and actions by stakeholders in the Adirondack Park towards conservation of biodiversity (invited presentation)

2013 *North Eastern Natural History Conference, Springfield, MA.* The effects of climate change on a cold-adapted amphibian (invited presentation)

2013 *North Eastern Association of Fish and Wildlife Associations, Saratoga Springs, NY.* Climate change and mink frog ecology

2013 *North Eastern Association of Environmental Biologists, Lake Placid, NY.* Climate change and mink frog ecology

2012 New York State Museum, Albany, NY. The Center for Adirondack Biodiversity and student-centred research at Paul Smith's College

2012 *Virginia Commonwealth University Vernal Pool Symposium.* Conserving amphibians in an intact landscape: A case study with the Adirondack Park, NY

2011 *The Lodge on Lake Clear, Philosopher's Pub.* Adirondack Biodiversity

2011 *SUNY Potsdam, Paul Smith's College, and the Lake George Association.* Amphibian monitoring in the Adirondacks

2011 *Clarkson University, New York.* Assessing Interactions Between Invasive Aquatic Plants, Climate Change, and Aquatic Communities: A Case Study with Water Milfoil in the North Adirondacks, New York

2010 *Northeastern Ecosystems Research Cooperative, Saratoga Springs, NY.* The challenges of scale: Translating mechanistic studies to the landscape scale

2010 *Alfred University, New York.* Why we find what we find where we find it: Scale and applied ecology

2010 *University of Maine, Orono*. Using spatially-explicit habitat resistance models to guide mitigation of road effects on amphibian and reptile populations

2008 *State University of New York, College of Environmental Science and Forestry.* Population monitoring workshop for Lower Kihansi Monitoring Program (guided Tanzanian researchers in approaches to ecological monitoring)

2008 *Onondaga County Planning Federation*. Landscape and planning issues of animal movement.

2007 *York State Department of Transportation*. Effects of New York State roadways on populations of amphibians and reptiles

2004 *University of Maine.* Department of Wildlife Ecology Seminar

Scientific meetings (2004 onwards only)

2014 *Mohawk River Drainage, NYSDEC*, Schenectady, NY

2013 *Society for Conservation Biology,* Baltimore, MD. Mink frog ecology and climate change

2012 *The Northeast Natural History Conference*, Syracuse, NY (invited to introduce symposium on Pollution and Forest Biodiversity)

2012 *The New York Chapter of the Wildlife Society*, Bronx, NY (attended with 11 undergraduate students from the Paul Smith's College Chapter of the Wildlife Society)

2011 *Africa Section of the Society for Conservation Biology,* Arusha, Tanzania. The road less travelled. Applying knowledge of amphibian and reptile road ecology to help in pro-actively transportation networks in the developing world.

2011 *Adirondack Research Consortium*, Lake Placid, NY. Assessing interactions between invasive plants, climate change, and aquatic communities: a case study with water milfoil in the Northern Adirondacks, New York.

2010 Ecological Society of America, Pittsburgh, PA

2010 Society for Conservation Biology, Edmonton, Alberta

2010 The New York Chapter of the Wildlife Society, Alexandria Bay, NY

2008 Society for Conservation Biology, Chattanooga, TA (talk)
2007 SSAR and ASIH Joint Meeting, St Louis, MO (poster)
2006 Society for Conservation Biology, San Jose, CA (talk)
2006 Midwest Ecology and Evolution Conference, St Louis University, MO (talk)
2005 SSAR and ASIH Joint Meeting, Tampa, FL (poster)
2005 Land use effects on amphibian populations, University of Missouri, Columbia, MO (talk)
2004 NEBGSC University of Maine, Orono, ME (talk)
2004 Society for Conservation Biology, Columbia University, NY
2004 SSAR and ASIH Joint Meeting, Norman, Oklahoma.

PUBLICATIONS

* Denotes undergraduate co-author

Journal articles

*Pierce, J. L., *Dalinsky, S. A., *Chenaille, A., *Lolya, L. M., *Maguder, J. L., *Mattilio, C., *Mayhew, E., *Regan, E., and Patrick, D. A. Scale-dependent effects of coyote predation risk on patterns of white-tailed deer browse along linear forest edges. *In review.*

Harper, E. B., Patrick, D. A., and Gibbs, J. P. Forest disturbance and the dynamics of regional amphibian populations. *In review*

Patrick, D. A., Popescu, D. V., and Harper, E. B. Can we predict the distribution of local populations of a "cold-adapted" amphibian on the retracting edge of its range? *In review*

Patrick, D. A. Effects of decoupled phenology on interspecific interactions between two syntopic species of spring breeding amphibians. *In review*

Steen, D. A., Osborne, P. A., Dovčiak, M., Patrick, D. A., and Gibbs, J. P. Short-term effects of a prescribed fire on habitat quality for a snake assemblage. *In review*

Shirk, P. L., Linden, D. W., Patrick, D. A., Howell, K. M., Harper, E. B., and Vonesh, J. R. Impact of habitat alteration on endemic Afromontane chameleons: evidence for historic population declines using hierarchical spatial modeling. *In review*

*Dalinsky, S. A., *Lolya, L. M., *Maguder, J. L., *Pierce, J. L. B., Kelting, D. L., Laxson, C. L., and Patrick, D. A. Comparing the effects of aquatic stressors on model temperate aquatic communities. Water, Air, and Soil Pollution. *In press*

*Eck, B., *Byrne, A., Patrick, D. A., Popescu, D. V., and Harper, E. B. The effects of variation in water temperature for larval amphibian predator-prey dynamics. Herpetological Conservation and Biology *In press*

Patrick, D. A., *Laxton, C., *Ball, D., *Collins, S., *Korzec, S., *Langevin, C., and *Vimislik, J. 2013. A multi-scale evaluation of the effects of forest harvesting for woody biofuels on mammalian communities in a northern hardwood forest. Northeastern Naturalist 20(4): 678-693

Dovčiak, M., Osborne, P. A., Patrick, D. A., and Gibbs, J. P. 2013. Conservation potential of prescribed fire for maintaining habitats and populations of an endangered rattlesnake *Sistrurus c. catenatus*. Endangered Species Research 22: 51-60

Patrick, D. A., Popescu, D. V., Gibbs, J. P., and Nelson, D. 2012. Multi-scale habitat-resistance models for predicting road mortality "hotspots" for reptiles and amphibians. Herpetological Conservation and Biology 7(3): 407-426

Patrick, D. A., Harper, E. B., Popescu, D. V., *Bozic, Z., *Byrne, A., *Daub, J., *LeCheminant, A., and *Pierce, J. 2012. The ecology of the Mink Frog, *Lithobates septentrionalis*, in the Adirondack Park, NY, with notes on conducting experimental research. Herpetological Review 43(3): 396-398

Patrick, D. A., *Boudreau, N., *Bozic, Z., *Carpenter, G. S., *Langdon, D. M., *LeMay, S. R., *Martin, S. M., *Mourse, R. M., *Prince, S. L., and *Quinn, K. M. 2012. Climate change, native-invasive competition, and implications for ecosystem change: a case study with watermilfoil species. Aquatic Botany 103: 83-88

Popescu, V. D., Patrick, D. A., Hunter, M. L., and Calhoun, A. J. K. 2012. The role of forest harvesting and subsequent vegetative regrowth in determining patterns of amphibian habitat use. Forest Ecology and Management. 270: 163-174

Patrick, D. A., Shirk, P., Vonesh, J. R., Harper, E. B., and Howell, K. M. 2011. Abundance and roosting ecology of chameleons in the East Usambara Mountains, Tanzania and the potential effects of harvesting. Herpetological Conservation and Biology 6(3): 422-431

Patrick, D. A., and Gibbs, J. P. 2010. Population structure and movements of freshwater turtles across an urban-rural gradient. Landscape Ecology 25: 791-801

Patrick, D. A., Gibbs, J. P., *Schalk, C., and Woltz, H. 2010. Effective culvert placement and design to facilitate passage of amphibians across roads. Journal of Herpetology 44: 618-626

R. D. Semlitsch, S. M. Blomquist, A. J.K. Calhoun, J. W. Gibbons, J. P. Gibbs, G. J. Graeter, E. B. Harper, D. J. Hocking, M. L. Hunter, Jr., D. A. Patrick, T.A.G. Rittenhouse, B. B. Rothermel, and B. D. Todd. 2009. Effects of timber management on amphibian populations: understanding mechanisms from forest experiments. BioScience. 59(10): 853-862

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Books and Book Chapters

Harper, E. B., Measey, G. J., Patrick, D. A., Menegon, M., and Vonesh, J. R. 2010. Field guide to the amphibians of the Eastern Arc Mountains and Coastal Forests of Tanzania and Kenya. Camerapix Publishers International.

Campbell, S., Patrick, D. A., and Gibbs, J. P. 2011. Biodiversity, conservation biology and forest health. *In* Forest Health. Cambridge University Press

Scientific reports

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Patrick, D. A., Bailley, C., Crowe, O., and Newton, S. Rockabill Tern Report 2003 No. 03/5. IWC Birdwatch Ireland. 2003

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Theses

Patrick, D. A. 2007. The effects of forest practices on a Maine amphibian community. PhD. Thesis. University of Maine, Orono

Patrick, D. A. 2000. Decibel Levels as a Method of Measuring Abundance of Pond-breeding Frogs. MSc thesis. University of Kent at Canterbury

Patrick, D. A. 1999. The effect of microclimatic variation on the feeding ecology of Titmice in Britain. BSc thesis. University of Wales, Bangor

MEDIA AND OUTREACH

2010 Presented the Follensby Pond Bioblitz, a documentary shown at The Wild Center, Tupper Lake www.rgproductions.com/ATBI2010.wmv

GRANT AND JOURNAL REVIEW AND EDITING

2012 Member of the peer review panel for AFRI A6123 Sustainable Bioenergy (SBE): Wildlife and Pollinators Panel of USDA, National Institute of Food and Agriculture (NIFA), Institute of Bioenergy, Climate and Environment (IBCE).

Current Assistant Editor, Herpetological Conservation and Biology

Current	Reviewer: Ecology, Conservation Biology, Oecologia, Journal of Herpetology, Wetlands, Forest Ecology and Management, Biological Conservation, Copeia, Herpetological Conservation and Biology, American Midland Naturalist, Herpetologica.
2010	Reviewer: Central Valley Project Conservation Program, United States Department of the Interior
Current	Reviewer: Society for Conservation Biology. Smith Postdoctoral Fellowship
	Reviewer: Adirondack Research Consortium Student Awards
2004	Reviewer: Amphibian and Reptile Monitoring Initiative. USGS

OUTREACH AND PROFESSIONAL SOCIETIES

2014	Steering committee member, Vernal Pool Data Cooperative
2011	Lake Placid and North Elba Arbour Day Presentation: Wildlife and Forestry
2011	Adirondack Research Consortium. Co-organized the 2011 Student Juried Paper Awards
Current	Member of the Society for Conservation Biology and the Ecological Society of America
Current	Member of the education committee for the Society for Conservation Biology.
Current	Organizer of the Student Awards for the Society for Conservation Biology
Current	Director of the Adirondack All-Taxa Biodiversity Inventory
2006-09	Chair of the Student Affairs Committee of the Society for Conservation Biology (responsible for increasing global student involvement in the society)
2006-09	Ex officio member of the Board of Governors of the Society for Conservation Biology
2005-06	Organization of vernal pool identification workshops and community outreach with townships in southern Maine
2006	Chair of the Student Affairs Committee (SAC) for the North American section of the Society for Conservation Biology

2006 Committee member, Student Chapters and North American section of the Society for Conservation Biology

REFERENCES

Andrew Egan
Dean of the Faculty of Science
John R. Brodie Science Centre
Brandon University, Brandon
Manitoba
egana@brandonu.ca
(204)-727-9675

Professor James P. Gibbs
State University of New York College of Environmental Science and Forestry
1 Forestry Drive
Syracuse
jpgibbs@esf.edu
(315) 470-6764

Professor Malcolm L. Hunter Jr.
Wildlife Ecology
210 Nutting Hall
University of Maine, Orono
hunter@umenfa.maine.edu
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Exhibit C

Michael W. Klemens, PhD
POB 506
Salisbury, Connecticut 06068

May 30, 2014

I have reviewed the report prepared by David Patrick, PhD entitled "Report of Herpetofaunal Survey of Lot 8 Jay Mountain Wilderness" of a single-day field visit conducted on May 22, 2014. Dr. Patrick provides an excellent snapshot of a single highly productive vernal pool located in a portion of Lot 8. Given the size of the landscape, and the challenging topography, one must realize that this is but the tip of the iceberg. There must undoubtedly be other wetlands of similar value and importance located on Lot 8 as well as in adjacent areas of the Jay Mountain Wilderness Area. These wetlands do not exist in ecological isolation from one another. Their ecological connections extend through and beyond Lot 8 into the adjacent Jay Mountain Wilderness Area. The impacts of the proposed quarry expansion, located in a saddle between higher elevations, will extend far beyond the footprint of the proposed quarry expansion, far beyond Lot 8, into the heart of the Jay Mountain Wilderness Area.

There has been an astounding lack of comprehensive biological and ecological inventory and analysis to determine what those impacts may be. To illustrate my point, I refer you to a document entitled "2012-2013 Herpetological Survey Results, Galasso Quarry, East Granby CT," which I am sending on a CD under separate cover. We are now in our third year (2014) of studying this proposed quarry expansion *and not a single road has been cut or tree felled*. The study area is 300 acres, of which a significant amount is on adjacent lands not owned by Galasso. This due diligence is being conducted to expand an active ridgeline quarry southward onto lands owned by Galasso on a ridge zoned for trap rock quarry expansion. I state this to make a point that three years of study, encompassing hundreds of person hours have been already undertaken to ensure that the proposed mine expansion is conducted in a manner that does not damage environment. This stands in stark contrast to the 200 acres of the Jay Mountain Wilderness that have been so cursorily studied.

Vernal pools serve as stepping stones through forested habitat. Examination of Figure 2 of the Galasso report illustrates the proposed mine expansion area in red, the limits of clearing in green, and the intersection and connectivity of vernal pools and their associated habitat through and well beyond the proposed quarry expansion site. Vernal pools are important reservoirs of biomass and food production, which fuel the larger forested ecosystem. Area-sensitive carnivores (including various Mustelids and bobcats) which have large home ranges stop at vernal pools to feed on the abundant amphibian biomass, and the associated small mammals and birds that are attracted to these wetlands. In the springtime, black bear feast on wood frog eggs, which serve as a high protein post-hibernation meal for these wide ranging omnivores.

Open-pit mining is one of the most ecologically challenging impacts to manage. Another aspect of the Galasso project, which was conducted by a team of hydro-geologists, was the effects of excavating a pit

into the ground, which will alter the surficial and groundwater flows and recharge patterns. This impact is also one that would extend far beyond the actual mine site into the adjacent Jay Mountain Wilderness and will forever alter the hydrology of the surrounding forest. This hydro-geological report also is too large to be filed electronically but will be submitted on a CD under separate cover.

In conclusion, it is my professional opinion, as a herpetologist, ecologist, wetlands biologist, and a researcher that has spent the last three years studying a proposed expansion of an open pit mining operation, that the data upon which any robust determination of ecological impacts beyond Lot 8 by the proposed mining operations are completely absent. The ecological impact foot print of the proposed mine expansion will have significant impacts extending well beyond the boundaries of Lot 8. Absent detailed data such as was collected at Galasso, it is impossible to assess the magnitude of these impacts, nor suggest ways that those impacts could be mitigated. Furthermore, significant damage to the ecosystem will occur by constructing roads, felling trees, compacting earth, and creating multiple breaks in the continuous forest canopy for the exploration of the mineral yield of the site. Such exploration of Lot 8 should not be permitted until a full ecological/hydro-geological understanding of the site has been achieved, much in the manner of the Galasso mine. As regards the Galasso mine expansion, we are in now (2014) in our third year of study before any intrusion into the forested habitat proposed to be mined has occurred.

Sincerely,

Michael W. Klemens, PhD

Attachments: Curriculum Vitae

2012-2013 Galasso Herpetological Report (to be submitted on a CD under separate cover)

Rob Good/LBG/ Galasso Hydro-Geological Report (to be submitted on a CD under separate cover)

MICHAEL W. KLEMENS

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EDUCATION

PhD Ecology/Conservation Biology
University of Kent at Canterbury, U.K. (1990)
Dissertation: The herpetofauna of southwestern New England.

MSc Zoology
University of Connecticut (1978)
Thesis: Variation and distribution of the turtle, Chrysemys picta (Schneider) in Connecticut.

BSc Education
University of Connecticut (1975)

CURRENT CONSERVATION, RESEARCH, AND EDUCATION POSTS

Adirondack Wild: Friends of the Forest Preserve

Consulting Conservation Biologist, March 2011-April 2013
Landscape Conservation Advisor May 2013-2present

Adirondack Wild advocates for the core wilderness values of one of the Northeast's largest intact forests. Dr. Klemens provided expert testimony on behalf of Adirondack Wild in an adjudicatory hearing concerning the largest-ever proposed resort within the Adirondack Park and in conjunction with that testimony conducted rapid biological assessments of streams and wetlands. He is continuing his role as conservation science advisor to this advocacy group, integrating conservation biology to their efforts to protect the biological integrity and wilderness values of the Adirondack Park.

Cary Institute of Ecosystem Studies

Research and Policy Conservationist & Founding Director, Metropolitan Conservation Alliance, July 1, 2008-June 30, 2011

Effective July 1, 2008, the Metropolitan Conservation Alliance (MCA) moved from WCS to the Cary Institute of Ecosystem studies where MCA provides leadership and education to communities in the New York's Hudson valley, Adirondack region, and Connecticut on the integration of complex ecological information into the local land-use

decision-making process. MCA produces multi-town biodiversity conservation strategies and best development and management practices, using scientific information as the under-pinning of policy recommendations. MCA works with communities to implement those strategies into their local land use practices capitalizing on the broad authority available to local jurisdictions devolved from the state land-use enabling legislation.

Scenic Hudson

Director of Conservation Science, 2007—April 2008
Conservation Science Advisor, April 2008--current

Responsibilities include the scientific accuracy of the organization's core programs of land use advocacy, land acquisition, parks, and policy as well as representing the organization at the regional level concerning issues and opportunities of biodiversity conservation. Developed adaptive, precautionary strategies to address climate change in the Hudson Valley. These adaptive strategies included climate change precautionary zoning, brown-field mitigation, and carbon footprint reduction.

Wildlife Conservation Society (WCS)

Senior Conservationist, 2002–June 30, 2008 &
Founding Director, Metropolitan Conservation Alliance, 1998-June 30, 2008.

The Metropolitan Conservation Alliance (MCA) provides leadership and education to more than 89 communities in the New York tri-State area on the integration of complex ecological information into the local land-use decision-making process. MCA produces multi-town biodiversity conservation strategies and works with communities to implement those strategies into their local land use practices through the adoption of innovative best management practices, capitalizing on the broad authority available to local jurisdictions devolved from the state land-use enabling legislation.

Director for Program Development, 1994-1998.

Worked with the various divisions of WCS to produce programs that united field conservation, facilities (i.e., zoo), and veterinary services to address complex field conservation problems. Sought financial support (both corporate and foundation) for these programs and developed methodologies that more equitably divided responsibilities for seeking/reporting on grants between project scientists and the development and financial offices of WCS.

Research Fellow, 1992-1994.

In partnership with the American Museum of Natural History, developed a multi-year program (that continued through 1998) of biodiversity assessment and monitoring in the National Parks of Tanzania. This program received multi-year consecutive funding from the John D. and Catherine T. Mac Arthur Foundation. The goals of the program were to build national capacity in biodiversity assessment, specimen collection, and data management. This program was conducted in partnership with the University of Dar es Salaam and several Tanzanian government agencies charged with wildlife and parks management. The program also provided academic training to promising Tanzanian nationals and professional development opportunities for faculty at the University of Dar es Salaam. This program was expanded to train MSc level students in the UK through

the Darwin Initiative at the University of Kent. This joint program of the University of Kent and WCS selected promising students from WCS field sites in three African nations, Malagasy Republic, Tanzania, and Zaire. A total of nine students received scholarships to attend university in the UK through the Darwin Initiative component of the program.

American Museum of Natural History (AMNH)

Research Associate in Herpetology, May 1994-current.

After leaving AMNH to join WCS, I continued my strong relationship with the Museum, including biodiversity assessment and expeditionary studies in Africa and the eastern United States, which resulted in significant collections of more than 18,000 specimens that have been added to the permanent research collections. Publications focus on African amphibians, biogeography and conservation of northeastern US amphibians and reptiles, and biochemical studies of polyploid and unisexual salamanders.

Director, Special Projects, Center for Biodiversity and Conservation, 1993-1994 & Director, Environmental Initiatives, 1990-1993.

Envisioned and created the Museum's Center for Biodiversity and Conservation to make available to policy and decision-making, as well as public information, the accumulated data contained in more than 30 million samples of biodiversity collected around the globe. Worked with Museum scientists to enable them to become disseminators of that data, to secure funding for these endeavors, and to maintain the scientific integrity of the information while recognizing that the requirements for information to inform decision-making is at times different from that of more traditional scientific inquiry. Since its inception, the Center has continued to be a voice for biodiversity conservation, treading carefully the interface between scholarly investigation and the need for scientific engagement in the ever-growing biodiversity crisis.

Senior Scientific Assistant/Scientific Assistant, Herpetology, 1979-1989.

Joining the AMNH as a technical officer in 1979, my responsibilities were assisting curators in their research and the management (cataloging and data retrieval) of the preserved collection of amphibians and reptiles, which at that time included about 300,000 specimens.

Michael W. Klemens, LLC

Managing Director, 2002-current.

Provides technical services on a for-profit basis to NGO's, government agencies, municipalities, and private entities on the integration of biodiversity conservation and best management practices as they pertain to land-use decision making and ecologically-appropriate (i.e., "green") development. Client list available upon request.

Center for Humans and Nature

Senior Consultant, 2007-2008.

Developed a program to link the Consortium of Colleges and University of the Hudson Valley, American Museum of Natural History, New York Historical Society, and the Center for Human and Nature in a multi-year exploration of the cultural norms that

underlie our collective relationship with the natural world. The ultimate goal of this program is to create a forum that will allow communities (broadly defined) to envision their sustainable future free from the traditional encumbrances of positional arguments and pre-conceived outcomes. The project seeks to develop a culture of democratic ecological citizenship through engagement and participation within the Hudson Valley region. Current work with the CHN focuses on a project that examines the interfaces between ecological systems and human economic models.

Pace University, School of Law, Land Use Law Center

Course Lecturer, Land Use Leadership Alliance (LULA) Training Program, 1998-current

This innovative program seeks to instill a different culture in land-use decision-making, by making information available to local leaders, and training them in how to use that information in a conflict-neutral manner. My involvement in the program is teaching modules on biodiversity conservation at the local level, integration of sustainable development techniques, and community visioning techniques.

University of Maine, Department of Plant, Soil, and Environmental Sciences

Adjunct Graduate Faculty, 2003-current

Co-supervising and advising MSc and PhDstudents.

Columbia University, Center for Environmental Education and Conservation

Research Associate, 1998-present.

PAST CONSERVATION, RESEARCH, AND EDUCATION POSTS

University of Massachusetts, Amherst

Adjunct Assistant Professor, 1996-2002.

IUCN -The World Conservation Union

Editor, Species, Journal of the World Conservation Union, Species Survival Commission, 1999-2000.
Vice Chairman, Tortoise and Freshwater Turtle Specialist Group, 1991-1998.
Action Plan Director, Tortoise and Freshwater Turtle Specialist Group, 1989-1998.
Member, African Amphibian and Reptile Specialist Group, 1992-current.
Member, Repatriation and Relocation Specialist Group, 1993-current.

University of Kent, Durrell Institute of Conservation and Ecology

Visiting Research Fellow, 1990-1995.

Turtle Recovery Program
Founder/Director, 1989-2000.

Simon's Rock College
Adjunct Faculty, 1986-1988.

Massachusetts Division of Fisheries and Wildlife
Cooperating Wildlife Researcher, 1984-1990.

United States Department of the Interior, National Park Service
Herpetologist, Roosevelt-Vanderbilt National Historic Site, 1988.

University of Michigan, Museum of Zoology
Curatorial Assistant, 1978-1979.

University of Connecticut, Museum of Natural History
Curatorial Assistant, 1975-1978.

Town of Vernon, Connecticut
Environmental Educator, Valley Falls Park, 1975-1977.

CURRENT APPOINTMENTS: COMMISSIONS, BOARDS & PANELS

State of Connecticut, Connecticut Siting Council
Gubernatorial appointment October 2013-present

State of Connecticut, Council on Environmental Quality
Gubernatorial appointment April 2013-present

State of Connecticut Department of Environmental Protection
Non-harvested Wildlife--Amphibian and Reptile Expert Advisory Committee

Town of Salisbury, Connecticut Planning and Zoning Commission
Elected (municipal elections) November 2007
Chairman -November 2010--present

Westchester Land Trust
Advisory Board

The Bay Foundation and the Josephine Bay Paul and C. Michael Paul Foundation, Inc.
Biodiversity Leadership Awards Elector

The H. John Heinz III Center for Science, Economics and the Environment

Urban and Suburban Work Group Member, Designing a Report on the State of the Nation's Ecosystems Project

PAST APPOINTMENTS: COMMISSIONS, BOARDS & PANELS

New Jersey Highlands Water Protection and Planning Council

New Jersey Landscape Project
Technical Advisory Committee

City of Rye, NY
Chairman, Master Plan Update Task Force, 2000-2003.
Chairman, Planning Commission, 1997-2003.
Vice Chairman, Planning Commission, 1996-1997.
Member, Planning Commission, 1992-1996.

New York League of Conservation Voters, Westchester Chapter Board
Board Member, 2000-2001.

American Rivers
Science and Technical Advisory Board, 1992-2001.

Stewart Airport Lands Citizens Advisory Committee (gubernatorial appointment)
1998-1999.

Hudsonia, Ltd.
Board of Directors, 1995-1999.

The Jay Heritage Center, Rye, New York
Interpretive Planning Panel, 1998.

Westchester Land Trust
Board of Directors, 1997-1999.

PROFESSIONAL DISTINCTIONS

Herpetological Journal
Editorial Board, 1992-1994.

Chelonian Conservation and Biology
Editorial Board, 1993-2006.

Nature in Fragments: The Legacy of Urban Sprawl, Spring Symposium, 2000
Conference Co-organizer, 2000.

Society for the Study of Amphibians and Reptiles
Conservation Committee Chairman, 1998-1999.

Land Use Law Center, Pace University School of Law
Community Leadership Alliance Graduate, 1997.

Catalogue of American Amphibians and Reptiles
Editor, Testudines, 1991-1994.

Conservation, Restoration, and Management of Tortoises and Turtles-
An International Conference
Chairman and Conference Organizer, 1993.

AWARDS & TRIBUTES

Friends of Hudsonia-Dover NY
2010 Award for two decades of assistance to the Town of Dover in assessing and protecting their biological resources.

American Planning Association, Connecticut Chapter
2007 Award for excellence in "integrating complex ecological processes into local land-use decisions.

Resolution from the City of Rye
Commending Michael Klemens for his service to the City (Conservation Commission Advisory Committee/Planning Commission/Chair of Planning Commission.) March 10, 2004.

Office of the County Executive Certificate of Appreciation
Westchester County, October 2003. In grateful appreciation for service rendered to the County of Westchester.

Science and Technical Advisory Committee Achievement Award
American Rivers, October 2001. In recognition of outstanding contribution and commitment to river conservation.

21 New Yorkers to Watch in the 21st Century
Daily News, January 1, 2000, p. 22.

Orange Environment Award
November 13, 1999.

The Edith G. Read Conservation Award
For drafting Rye City's Wetlands Ordinance, 1991.

The Nature Conservancy, Connecticut Chapter
Recipient, White Oak Award for Conservation Research, 1980.

American Museum of Natural History
Associate Patron

PUBLICATIONS

Klemens, M. W., E. R. Davison, B. K Oko. 2012. **Ridgefield Natural Resources Inventory.** Ridgefield Conservation Commission pp.1-112.

Davison, E.R. & M.W. Klemens. 2010. **Town of Barkhamsted: Amphibian and Reptile Biodiversity Study.** MCA Technical Paper No. 16. Metropolitan Conservation Alliance.

Davison, E.R. & M.W. Klemens. 2010**. Eastern Westchester Biotic Corridor: Northern Terminus Addendum North Salem and Southeast, New York.** MCA Technical Paper No 4-C. Metropolitan Conservation Alliance.

Osmond, D.L., N.M. Nadkarni, C.T. Driscoll, E. Andrews, A.J. Gold, S.R. Broussard-Allred, A.R. Berkowitz, M.W. Klemens, T.L. Loecke, M.A. McGarry, K. Schwarz, M.L. Washington & P.M. Groffman. 2010**. The role of interface organizations in science communication and understanding**. *Frontiers in Ecology and the Environment* 8(6):306-313.

Davison, E.R. & M.W. Klemens. 2009. **Haines Pond Biodiversity Study.** MCA Technical Paper No. 15. Metropolitan Conservation Alliance.

Davison, E.R. & M.W. Klemens. 2009. **Eastern Westchester Biotic Corridor**: Titicus Reservoir Addendum. MCA Technical Paper No 4-B. Metropolitan Conservation Alliance.

Bogart, J. P. and M. W. Klemens. 2008. **Additional distributional records of *Ambystoma laterale, A. jeffersonianum* (Amphibia: Caudata) and Their Unisexual Kleptogens in Northeastern North America.** American Museum of Natural History Novitates: 3627: 58 pp., 8 figures, 7 tables.

Mahaney, Wende S. and M. W. Klemens. 2008. **Vernal pool conservation policy: The federal, state, and local context.** pp. 193-212 *In*: Calhoun A. J. K and P. G deMaynadier. Science and Conservation of Vernal Pools in Northeastern North

America. CRC Press, Taylor & Francis Group, Boca Raton, London & New York.

LaBruna, D. T. and M. W. Klemens. 2007. **Northcastle BiodiversityPlan.** MCA Technical Paper 14, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, NY.

LaBruna, D. T. and M. W. Klemens. 2007. **Croton-to-Highlands Biodiversity Plan: Somers Addendum**. MCA Technical Paper 7-A, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, NY.

LaBruna, D. T. and M. W. Klemens. 2007. **Eastern Westchester Biotic Corridor: Bedford Addendum**. MCA Technical Paper 4-A, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, NY.

Klein, M. S., M. W. Klemens, and D. H. Merriam. 2006. **Where's Waldo? Finding federal wetlands after the *Rapanos* decision**. Zoning and Planning Law Report 29(8):1-16.

LaBruna, D. T., M. W. Klemens, J. D. Avery, and K. J. Ryan. 2006. **Pocantico Hills Biodiversity Plan, Rockefeller State Park Preserve and Associated Private Lands: A Public-Private Land Stewardship Initiative.** MCA Technical Paper 12, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, NY.

Gruner, H. J., M. W. Klemens, and A. Persons. 2006. **Farmington Valley Biodiversity Strategy.** MCA Technical Paper No. 11, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, NY.

Klemens, M. W., M. Shansky, and H. J. Gruner. 2006. **From Planning to Action: Biodiversity Conservation in Connecticut Towns.** MCA Technical Paper No. 10, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, NY.

Johnson, E. and M. W. Klemens (eds). 2005. **Nature in Fragments: The Legacy of Sprawl.** Columbia University Press, NY 382 pp.

Johnson, E. and M. W. Klemens. 2005. **The Impacts of Sprawl on Biodiversity.** Pp. 18-53 *In* Johnson, E. A. and M. W. Klemens. Nature in Fragments: The Legacy of Sprawl. Columbia University Press, NY.

Miller, N. A., and M. W. Klemens. 2005. **Freshwater Wetland Biodiversity in an Urbanizing World.** Pp. 57-89 *In* Johnson, E. A. and M. W. Klemens. Nature in Fragments: The Legacy of Sprawl. Columbia University Press, NY.

Daly, J. and M. W. Klemens. 2005. **Integrating Conservation of Biodiversity into Local Planning.** Pp. 313-334 *In* Johnson, E. A. and M. W. Klemens. Nature in Fragments: The Legacy of Sprawl. Columbia University Press, NY.

Klemens, M. W. and E. A. Johnson. 2005. **Creating a Framework for Change.** Pp. 349-362 *In* Johnson, E. A. and M. W. Klemens. Nature in Fragments: The Legacy of Sprawl. Columbia University Press, NY.

Calhoun, A. J. K., Miller, N., and Klemens, M. W. 2005. Conservation strategies for pool-breeding amphibians in human-dominated landscapes. Wetlands Ecology and Management 13: 291-304.

Miller, N. A., M. W. Klemens, and J. E. Schmitz. 2005. **Biodiversity Conservation through Local Land Use Planning: An Assessment of Needs and Opportunities in the New Jersey Townships of Chester, Lebanon, and Washington.** MCA Technical Paper No. 9, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, NY.

Miller, N. A., M. W. Klemens, and J. E. Schmitz. 2005. **Southern Wallkill Biodiversity Plan: Balancing Development and the Environment in the Hudson River Estuary Watershed.** MCA Technical Paper No. 8, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, NY.

Miller, N. A. and M.W. Klemens. 2004. **Croton-to-Highlands Biodiversity Plan: Balancing Development and the Environment in the Hudson River Estuary Catchment.** MCA Technical Paper No. 7, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, NY.

Klemens, M.W. 2003. Keynote Address: **New Directions for Turtle Conservation.** Pp. 1-3 *In* Conservation and Ecology of Turtles of the Mid-Atlantic Region: A Symposium ed. by C. Swarth, W. Roosenburg, and E. Kiviat. Bibliomania!, Salt Lake City, UT

Calhoun, A. J. K. and M. W. Klemens. 2002. **Best Development Practices (BDPs) for Conserving Pool-breeding Amphibians in Residential and Commercial Developments.** MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, NY.

Klemens, M.W. 2002. **Conserving Vernal Pools for Biodiversity and Public Health.** Pp. 71-74 *In* Proceedings of the 48th Annual Meeting: Northeastern Mosquito Control Association, Inc.

Klemens, M.W. April-May 2002. **Intelligent Planning for Wildlife and Wild Places**, Westchester Environment, Vol. 2002 No. 2. Federated Conservationists of Westchester County, Inc.

Miller, N. A. and M.W. Klemens. 2002. **Eastern Westchester Biotic Corridor**. MCA Technical Paper No. 4, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, NY.

Klemens, M. W. 2001. **Bog Turtle (*Clemmys muhlenbergii*)—Northern Population Recovery Plan**, U.S. Fish and Wildlife Service, Northeast Region, Hadley, MA, 103 pp.

Lawson, D. P. and M. W. Klemens. 2001. **Herpetofauna of the African Rain Forest: Overview and Recommendations for Conservation.** Pp. 291-307 *In* Vedder, A., W. Weber, L. White, and L. Naughton-Treves (eds.). African Rain Forest Ecology and Conservation: An Interdisciplinary Perspective. Yale University Press, New Haven, CT.

Platt, S. G., R. J. Lee, and M. W. Klemens. 2001. **Notes on the distribution, life history, and exploitation of turtles in Sulawesi, Indonesia, with emphasis on *Indotestudo forstenii* and *Leucocephalon yuwonoi***. Chelonian Conservation and Biology 4:154-159.

Klemens, M. W. 2000. **Amphibians and Reptiles in Connecticut: A Checklist with Notes on Conservation Status and Distribution**. Connecticut Department of Environmental Protection. Hartford, Connecticut Bulletin 32:1-90.

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INVITED PAPERS & PRESENTATIONS

Ecological Stewardship: Empowering Communities to Protect the Commons.

Ramapo College of New Jersey April 11, 2013. *Re-invited by popular demand to give the same lecture that was given in February 2012.*

Ecological Sustainability and Economic Development: Can they Work Together?

Keynote Address. CACIWC's 35th Annual Meeting and Environmental Conference. Meriden, CT. November 17, 2012.

Ecological Stewardship: Empowering Communities to Protect the Commons.

Creating a Sustainable World: Voices of Key Practitioners. Ramapo College of New Jersey. February 23, 2012

Ecological Stewardship and Economic Development: Do We Have To Choose?

Keynote Address, CT Association of Wetland Scientists 14th annual Meeting, North Haven, CT. February 23, 2011

Ecological Thinking: A Toolbox for Landscape Professionals.

NOFA Annual Gathering-Storrs, CT December 7, 2010.

Biodiversity and Land Use Policy at the Urban/Suburban Frontier—Westchester Copunty (NY).

The Pocantico River Watershed Conservancy at Pace University. September 17, 2012.

Our Land, Air and Water

A Symposium on Sustainable Development and Western Connecticut's Future. Co-moderated by Congressmen Earl Blumenauer (OR) and Christopher Murphy (CT). June 26,2010.

Ecological Stewardship and Economic Development: Do We Have to Choose?

Millbrook Garden Club, Millbrook, NY, April 14, 2010

Eastern Westchester Biotic Corridor: A Ten Year Retrospective: 2000 – 2010

North Salem Improvement Society, April 11, 2010

Ridgefield's Prospect

Ridgefield Conservation Commission, April 7, 2010

Keynote Address: Ecological Stewardship and Economic Development: Do We Have to Choose?

Cary Institute of Ecosystem Studies, March 6, 2010

Keynote Address: Can We Have Both: Conservation and Economic Development?

Mahopac Library, Mahopac NY, February 25, 2010

Ridgefield's Prospect

Ridgefield Garden Club, January 26, 2010

Biodiversity Inventory of Headwaters and Vernal Pools: Barkhamsted, CT

Barkhamsted, CT January 11 & January 20, 2010

Where the Wet Things Are!!: Citizen Science Vernal Pool Survey

Town of Washington, New York, December 2, 2009

Managing the Ecological Footprint: Creating Human Communities in Harmony with Nature

South West Regional Planning Agency (SWRPA)Lecture Series – Stamford Government Center, November 4, 2009

Bridging the Gap Between Conservation Science and Land-use Planning: Where Science Ends and Policy Begins

Connecting our Landscape: A Roundtable on Integrating Connectivity into Land Use Planning, Two Countries-One Forest- Lake Clear, New York, October 5-6, 2009

Ecologically-informed Land Use Planning: Local Opportunities and Responsibilities.

6th Annual Town Board Breakfast, Dutchess Land Conservancy, Millbrook, NY. May 18, 2009.

Where the Wet Things Are: Citizen-science Vernal Pool Surveys/Public Policy.

Town Board of Washington, Washington, NY. February 12, 2009

Where the Wet Things Are: Citizen-science Vernal Pool Surveys/Public Policy.

Cornell Cooperative Extension, Washington, NY. February 9, 2009.

Eastern Westchester Biotic Corridor.

Town of Bedford Environmental Summit. Bedford, NY. January 31, 2009.

Status of Amphibians and Reptiles in the Tri-State New York Metro Region.

Highstead Arboretum, Redding, CT. October 18, 2008.

Mediation: Wood Turtle (*Clemmys insculpta*) Research/Conservation and Agriculture: Great Swamp. Pawling NY August 4, 2008.

Effective Preservation of Biological Communities: Local and Regional Strategies.

Keynote Speaker. Annual Meeting of the Winnakee Land Trust. Norrie Point Environmental Center, Staatsburg, NY. July 30, 2008

Effective Preservation of Biological Communities: Local and Regional Strategies. Lake George Watershed Conference: 4th Annual Forum on Water Quality & Resource Conservation, Fort William Henry Conference Center, Lake George, NY, June 18, 2008,

Planning and Designing for Biodiversity

Adirondack Research Consortium, 15th Annual Conference on the Adirondacks, Lake Placid, NY May 21-22, 2008.

Effective Preservation of Biological Communities: Local and Regional Strategies. Keynote Address: Planning for Biodiversity: Strategies for Developers and Municipalities sponsored by the Hudson Valley Smart Growth Alliance, Marist College, April 29, 2008.

Status of Amphibians and Reptiles in the Tri-State New York Metro Region. The Hotchkiss School, Lakeville, CT. February 14, 2008.

Effective Preservation of Biological Communities: Local and Regional Strategies. Yale University, New Haven, CT. February 5, 2008.

The North Castle Biodiversity Plan. Town Hall, Armonk, NY. January 9, 2008.

Planning and Designing for Biodiversity. Bedford-Somers Continuing Education Course for Land-use Decision Makers: Biodiversity Lecture Series. Katonah Library, Katonah, NY . December 6, 2007

Effective Preservation of Biological Communities: Local and Regional Strategies. Keynote Address, Connecticut Association of Inland Wetlands and Conservation Commissions (CACIWC) 30th Annual Meeting and Environmental Conference, Wallingford, CT. November 10, 2007.

Keeping Connected: Securing Biodiversity in a Changing Landscape. New York City Bar Association Annual Conference on Animals and the Law. NY, NY. September 29, 2007.

Stream Pirates, Clones and Island Hoppers: A Herpetological View of Coastal New England. Henry L. Ferguson Museum. Fishers Island, NY August 19, 2007.

Nature in Fragments: Confronting Sprawl Through Enlightened Land Use Planning. United States Society for Ecological Economics, 4th Biennial Conference. Pace University NY City Campus. June 25, 2007.

The Metropolitan Conservation Alliance: Confronting Sprawl Through Enlightened and Use Planning in the NYC Watershed. Open Space Institute Lunch Seminar. NY, NY May 9, 2007.

The Metropolitan Conservation Alliance: Confronting Sprawl Through Enlightened Land Use Planning in the NYC Watershed. Presented in conjunction with Nature-Network to Ted Kheel and Nurture New York's Nature. NY, NY. May 9, 2007.

Keynote Address: Dutchess County Planning Federation: Annual Awards Dinner. Bridging the Gap Between Conservation Science and Land-use Planning. Poughkeepsie, NY. April 30, 2007.

Bedford Biodiversity Study. Bedford Town Hall, Bedford, NY. April 4, 2007.

Biodiversity Conservation in a Rapidly Developing Environment. Penn State Schuylkill Library. Co-sponsored by the Schuylkill Conservation District, Schuylkill County Sportsmen's Advisory Board, DCNR-Bureau of Forestry, and the Schuylkill County Conservancy. March 28, 2007.

Local Land Use Planning and Herpetofauna Conservation. NYTTS Seminar, American Museum of Natural History, NY, NY. March 25, 2007.

Biodiversity Planning and Agriculture. Marlborough, NY. February 28, 2007.

Nature in Fragments: Confronting Sprawl Through Enlightened Land Use Planning. Ridgefield Conservation Commission. Ridgefield, CT. April 6, 2006.

Nature in Fragments: Confronting Sprawl Through Enlightened Land Use Planning. Great Swamp Biodiversity Partnership Workshop. Dover, NY. March 30, 2006.

Nature in Fragments: Confronting Sprawl Through Enlightened Land Use Planning. Philipstown Town Council. Philipstown, NY. March 9, 2006.

Nature in Fragments: Confronting Sprawl Through Enlightened Land Use Planning. University of Chicago. Chicago, IL. February 9, 2006.

Nature in Fragments: Confronting Sprawl Through Enlightened Land Use Planning. Chicago Wilderness. Peggy Notebaert Nature Museum. Chicago, IL. February 8, 2006.

Nature in Fragments: Confronting Sprawl Through Enlightened Land Use Planning. Lake Forest College. Chicago, IL. February 7, 2006.

Nature in Fragments: Confronting Sprawl Through Enlightened Land Use Planning. Professor Caleb Gordon's Conservation Biology Class. Lake Forest College. Chicago, IL. February 7, 2006.

Our Extraordinary Backyards: Realizing the Croton-to-Highlands Biodiversity Plan. Keynote address. *Our Extraordinary Backyards.* Workshop co-sponsored by WCS/MCA, Westchester Land Trust, and Cortlandt Land Trust. Cortlandt, NY. January 21, 2006.

Gotham's Footprint: Can Science and Planning Save our Biological Heritage? CUNY Nature of New York Course. New York, NY. November 29, 2005.

The Wild Choice: Intelligent Planning for Wildlife and Wild Places. South Carolina Coastal Conservation League. Charleston, SC. November 28, 2005.

The Wild Choice: Intelligent Planning for Wildlife and Wild Places. Humans, Nature, and Democracy Conference. Graduate Center, New School for Social Research, New York, NY. November 17-18, 2005.

The Wild Choice: Intelligent Planning for Wildlife and Wild Places. Scenic Hudson. Poughkeepsie, NY. October 31, 2005.

The Wild Choice: Intelligent Planning for Wildlife and Wild Places. Association of New Jersey Environmental Commissions 32nd Annual Environmental Congress. The Conference Center at Mercer. Mercer Community College, West Windsor, NJ. October 21, 2005.

The Link Between Intact Ecosystems and Livable Human Communities. Association of New Jersey Environmental Commissions 32nd Annual Environmental Congress. The Conference Center at Mercer. Mercer Community College, West Windsor, NJ. October 21, 2005.

The Wild Choice: Intelligent Planning for Wildlife and Wild Places. Washington, CT Environmental Council. Washington, CT. July 14, 2005.

Gotham's Footprint: Can Science and Planning Save our Biological Heritage? CUNY Nature of New York Course. New York, NY. June 13, 2005.

Integrating Biodiversity Principles into Land Use Decisions. Connecticut Land Use Leadership Alliance (LULA). June 3, 2005.

Wildlife Conservation in an Urbanizing World. WCS International Conservation Committee. Bronx Zoo. May 5, 2005.

Wildlife Conservation in an Urbanizing World. WCS Lunchtime Lecture Series. Central Park Zoo. May 4, 2005.

Integrating Biodiversity Principles into Land Use Decisions. Connecticut Land Use Leadership Alliance (LULA). Ellington, CT. April 29, 2005.

Finding the Forest between the Trees: The Challenges of Ecologically Scaling Land Use Decisions. *Conserving our Local Landscapes: Build Your Tool-Kit of Land Management Practices.* Symposium funded by The Henry Philip Kraft Family Memorial Fund of the Westchester Community Foundation. Edith May Conference Center, Briarcliff Manor, NY. April 28, 2005.

Biodiversity & Local Land Use Planning. *Southern Wallkill Biodiversity Meeting* – Towns of Chester, Goshen, and Warwick. Warwick Town Hall, Warwick, NY. April 27, 2005.

The Ecological Basis for Conservation Overlay Districts. Dutchess County Environmental Management Council. Farm and Home Center, Millbrook, NY. April 21, 2005.

Postcards from the Edge: Nature at the Suburban-Rural Frontier. *Nature Network Launching Conference.* The Graduate Center, City University of New York, New York, NY. April 14, 2005.

Status of Amphibians and Reptiles in the Tri-State New York Metro Region. *Nature Network Launching Conference.* The Graduate Center, City University of New York, New York, NY. April 13, 2005.

Planning with Nature in New Jersey. *Biodiversity & Land Use Planning Workshop* – New Jersey Townships of Chester, Washington, and Lebanon. Lebanon Township Municipal Building, Glen Gardner, NJ. March 19, 2005.

Moving Forward: The Eastern Westchester Biotic Corridor and Beyond. *Our Extraordinary Backyards*. Lewisboro Land Trust & Waccabuc Landowners Council. Waccabuc County Club, Waccabuc, NY. March 5, 2005.

Planning for Nature and **Wetlands, Biodiversity.** *Planning for Nature Workshop*. Connecticut Southwest Conservation District. The Center Building, Woodbridge, CT. February 19, 2005.

Tools for Local Land Use Planning. *Planning for Nature Workshop*. Connecticut Southwest Conservation District. The Center Building, Woodbridge, CT. February 19, 2005.

The Wild Choice: Intelligent Planning for Wildlife and Wild Places. New Jersey Intermunicipal Meeting – Chester, Lebanon, and Washington Townships. Lebanon Township Municipal Building, Glen Gardner, NJ. January 27, 2005.

Planning for Nature. *Planning for Nature Workshop*. Connecticut North Central Conservation District. Tolland County Agricultural Center, Vernon, CT. January 22, 2005.

Wetlands, Biodiversity, and Tools for Local Land Use Planning. *Planning for Nature Workshop*. Connecticut North Central Conservation District. Tolland County Agricultural Center, Vernon, CT. January 22, 2005.

The Wild Choice: Intelligent Planning for Wildlife and Wild Places. Falls Village Inland Wetlands/Conservation Commission. Housatonic Valley Regional High School, Falls Village, CT. January 21, 2005.

Gotham's Footprint: Can Science and Planning Save our Biological Heritage? . CUNY *Nature of New York* course. The School of Professional Studies at the University Center, New York, NY. December 12, 2004.

Natural Systems, Human Systems, Planning and Design. American Institute of Architects – *Conservation, Planning and Architecture: Biodiversity at Home and Abroad Session One: The MCA.* Center for Architecture, New York, NY. November 15, 2004.

The Wild Choice: Intelligent Planning for Wildlife and Wild Places. Warwick Valley Chamber of Commerce Annual Membership Dinner. Warwick Valley Country Club, Warwick, NY. November 12, 2004.

Croton-to-Highlands Biodiversity Plan. Town of New Castle Town Board Meeting. New Castle, NY Town Hall. November 9, 2004.

Gaining Ground Clinics: Celebrating Successful Local Leaders. Natural Resource Protection. The New York State Judicial Institute, Pace University School of Law. White Plains, NY. November 6, 2004.

The Wild Choice: Intelligent Planning for Wildlife and Wild Places. Rockefeller Brothers Fund. Tarrytown, NY. November 4, 2004.

Protecting Biodiversity While Planning for Growth. Pace University Land Use Law Center, Land Use Leadership Alliance. Hudson Valley Center, New Windsor, NY. October 29, 2004.

Moving Forward: The Eastern Westchester Biotic Corridor and Beyond. Eastern Westchester Biotic Corridor Implementation Meeting. North Salem, NY. October 21, 2004.

Assembling the Pieces: A Bricks and Mortar Approach to Conservation. Association of New Jersey Environmental Commissions (ANJEC), *Beyond Home Rule: Protecting the Environment through Regional Planning*. Mercer County Community College, West Windsor, New Jersey. October 15, 2004.

Creative Planning to Conserve Wildlife*:* An Update from the Bronx Zoo's Backyard. WCS International, Bronx Zoo. Bronx, NY. September 15, 2004.

Croton-to-Highlands Biodiversity Plan. Town of Putnam Valley Town Board Meeting. Putnam Valley, NY Town Hall. September 22, 2004.

Croton-to-Highlands Biodiversity Plan. Town of Yorktown Town Board Meeting. Yorktown, NY Town Hall. September 7, 2004.

Will Better Land Use Decisions Protect our Region's Biodiversity? Society for Conservation Biology 18th Annual Meeting. Columbia University, New York, NY. July 30 – August 2, 2004.

Extreme Frogs: A Celebration of the Second Plague. American Museum of Natural History. *Extreme Frogs*. Kaufman Theater, New York, NY. June 29, 2004.

Croton-to-Highlands Biodiversity Plan: Implementation Phase. Meeting with the towns of Cortlandt, New Castle, Putnam Valley, and Yorktown to discuss implementation strategies and priorities. Town of New Castle, NY. June 14, 2004.

Assembling the Pieces: A Bricks and Mortar Approach to Conservation. Westchester Land Trust & Westchester Community Foundation Conference. *Smart Growth from the Ground Up: How Community-Based Planning is Reshaping our Region's Land Use Policies.* Manhattanville College, Purchase, NY. May 18, 2004**.**

Assembling the Pieces: A Bricks and Mortar Approach to Conservation. *Norfolk Inland Wetlands Agency***.** Norfolk, CT. April 24, 2004.

Croton-to-Highlands Biodiversity Plan Press Conference. Turkey Mountain Nature Preserve, Town of Yorktown, NY. April 22, 2004.

Assembling the Pieces: A Bricks and Mortar Approach to Conservation. Annual meeting of the *Goshen Land Trust*. St. Thomas Church, Goshen, CT. April 16, 2004.

Assembling the Pieces: A Bricks and Mortar Approach to Conservation. Meeting of the *Association of New Jersey Environmental Commissions (ANJEC)*. March 29, 2004.

Keeping Connected: Securing Biodiversity in a Changing Landscape. Conference of New England Governors and Eastern Canadian Premiers, Suffolk University Law School, Boston, MA. March 15-16, 2004.

Assembling the Pieces: A Bricks and Mortar Approach to Conservation in Connecticut. The Hotchkiss School, Lakeville, CT. March 2, 2004.

Amphibians & Reptiles of Connecticut: 1975-Present. Hotchkiss School. Lakeville, CT. March 2, 2004.

Assembling the Pieces: A Bricks and Mortar Approach to Conservation in the Wallkill Valley. Inter-Municipal Biodiversity Project Meeting, Goshen Town Hall, Goshen NY. February 2, 2004.

Assembling the Pieces: A Bricks and Mortar Approach to Conservation in the Wallkill Valley. Inter-Municipal Biodiversity Project Meeting, Lloyd Town Hall, Lloyd, NY. February 4, 2004.

Intelligent Planning for Wildlife and Wild Places. The Linnaean Society of New York. New York, NY. January 13, 2004.

Linking Conservation to Scale in Westchester County. Manhattanville College, Purchase, NY. December 10, 2003.

Assembling the Pieces: A Bricks and Mortar Approach to Conservation. Connecticut Land Trust, Norwalk, CT. November 18, 2003.

Wetlands: Is there life after Avalon? Connecticut Association of Conservation and Inland Wetland Commissions, Wallingford, CT. November 15, 2003.

Assembling the Pieces: A Bricks and Mortar Approach to Conservation. Connecticut Association of Conservation and Inland Wetland Commissions, Wallingford, CT. November 15, 2003.

Assembling the Pieces: A Bricks and Mortar Approach to Conservation. CERC – Graduate Seminar, Columbia University, New York, NY. November 11, 2003.

Assembling the Pieces: A Bricks and Mortar Approach to Conservation. Croton-to-Highlands Corridor Meeting – Towns of Cortlandt, New Castle, Putnam Valley, & Yorktown, NY. October 27, 2003.

Whose Water Is It? Dutchess County Environmental Management Council, Vassar College, NY.

What is Biodiversity? Audubon Greenwich, Greenwich, CT. October 24, 2003.

Wetlands and Vernal Pools. Westchester County Park Curators Vernal Pool Walk/Lecture, Rye, NY. October 10, 2003.

Assembling the Pieces: A Bricks and Mortar Approach to Conservation. Eastern Connecticut District Workshop, Norwich, CT. September 29, 2003.

Assembling the Pieces: A Bricks and Mortar Approach to Conservation. New York Bar Association, Fall Meeting, Hancock, MA. September 20, 2003

Assembling the Pieces: A Bricks and Mortar Approach to Conservation. The Society for Conservation Biology, Annual Meeting, Duluth, MN. June 28 – July 1, 2003.

Planning for Nature: Integrating Biodiversity into Local Land-Use Decisions. CT River Coastal Conservation District, Inc. – Planning for Nature Workshop, Haddam, CT. June 14, 2003.

Intelligent Planning For Wildlife and Wild Places. Sherman Conservation Commission – Conservation and Responsible Growth Workshop, Sherman, CT. June 7, 2003.

Planning for Nature: Integrating Biodiversity into Local Land-Use Decisions. Torrington, CT. May 17, 2003.

Intelligent Planning for Wildlife and Wild Places. Pomperaug River Watershed Coalition, Inc., Southbury, CT. April 30, 2003.

Conservation Practices and Strategies in the New York City Region. Society Wide Educator Meeting: Conservation Update – "WCS, leading the fight to save and protect our planet's Living Landscapes", Bronx Zoo, Bronx, NY. April 21, 2003.

Sustaining Biodiversity at the Suburban-Rural Frontier. Knollwood Garden Club, Greenwich, CT. April 8, 2003.

Intelligent Planning for Wildlife and Wild Places. CT Green Building Council; CT Chapter American Society of Landscape Architects – "Let Nature Do the Work!", New Haven, CT. March 21, 2003.

Planning for Nature. Planning For Nature Workshop, New Paltz, NY. March 19, 2003.

MCA Program and FoSA Analysis. Town of Lloyd Town Board Workshop, Lloyd, NY. March 5, 2003.

Intelligent Planning for Wildlife and Wild Places. Shawangunk Biodiversity Partnership: Eighth Annual Winter Lecture Series. SUNY New Paltz, New Paltz, NY. February 27, 2003.

Local Conservation Issues. The Little Garden Club of Rye, Rye, NY. February 11, 2003.

Biodiversity and the Empire State: Conserving our Landscapes. TNC, CERC, & SIPA – "Biodiversity on the Brink: Challenges in Science and Policy." Columbia University, New York, NY. February 6, 2003.

Assessing the Needs of the Towns Within the Croton-to-Highlands Corridor. Meeting of towns within the Croton-to-Highlands Corridor. Cortlandt, New Castle, Putnam Valley, and Yorktown, NY. January 16, 2003.

Conserving Vernal Pools for Biodiversity and Public Health. Northeastern Mosquito Control Association Annual Meeting. Mystic, CT. December 2, 2002.

Discovering and Defending the City's Wildlife: A Conversation with Conservationists. New York Public Library Public Program. Urban Neighbors, Urban Neighborhoods: Celebrating and Protecting New York's Wildlife and Green Spaces. New York, NY. November 7, 2002.

Intelligent Planning for Wildlife and Wild Places. Let Nature Do the Work. Federated Conservationists of Westchester County Informational Seminar. Pace University, Pleasantville, NY. October 18, 2002.

Conservation at the Suburban-Rural Frontier. Litchfield County Conservation District Annual Meeting. Bridgewater, CT. October 17, 2002.

Connecticut Chapter of the American Planning Association Meeting. Biodiversity Protection and Conservation Area Overlay Districts. Rocky Hill, CT. June 21, 2002.

Land Trusts, Public Officials and Scientists: Collaborating on Quality Communities. Tenth Anniversary New York Land Trust Conference. Saratoga Springs, NY. June 1, 2002.

Biodiversity Protection: New Opportunities for Land Trusts and Public Agencies. Tenth Anniversary New York Land Trust Conference. Saratoga Springs, NY. June 1, 2002.

Eastern Westchester Biotic Corridor. North Salem Town Board Meeting. North Salem, NY. May 28, 2002.

Defenders of Wildlife National Workshop on Land-Use Planning &

Biodiversity Conservation. Aspen Wye River Conference Center, Maryland. February 28-March 1, 2002.

Sustaining Ecosystems in Westchester County: Making Smart Growth Work for Wildlife. Backyard Biodiversity: Conservation at the Community Level. Irvington Garden Club. February 19, 2002.

Uncovering and Covering: The Region's Unexplored Environmental Stories - Society of Environmental Journalists 2002 Boston-to-Baltimore Briefing. Sponsored by SEJ, EOHSI, the Hudson River Foundation and the New Jersey Center for Environmental Indicators. January 18, 2002.

Biodiversity and Land-Use Advisory Meeting. Island Press, Washington, DC. December 17-18, 2001.

Examples of Regional Biodiversity Initiatives. Farmington River Watershed Workshop, Simsbury, CT. November 30, 2001.

Sustaining Ecosystems in Westchester County: Making Smart Growth Work for Wildlife. PACE University Lecture, Anna Giorgeou class, White Plains, NY. November 29, 2001.

Sustaining Ecosystems in Westchester County: Making Smart Growth Work for Wildlife. Westchester Land Trust Conference: Growing Smarter: How to Plan for Quality Communities, White Plains, NY. November 17, 2001.

Sustaining Ecosystems in a Changing Landscape. Farmington River Watershed Association (FRWA) Meeting, Simsbury, CT. November 15, 2001.

Sustaining Ecosystems in a Changing Landscape. PACE University Seminar, Dr. Josh Schwartz class, Pleasantville, NY. October 19, 2001.

Sustaining Ecosystems in a Changing Landscape. Stamford Land Conservation Trust Annual Meeting, Stamford, CT. October 16, 2001.

Biodiversity and Agriculture. Wallkill Valley Community Leadership Alliance Training Program. Cold Spring, NY. October 15, 2001.

The Metropolitan Conservation Alliance: Protecting Wildlife at the Rural/Suburban Frontier. Conservation Medicine in the New York Bioscape: A Research, Education, and Policy Agenda - Wildlife Trust, Tarrytown, NY. October 5, 2001.

Conservation Strategies Combined with Local Land-Use Planning. Tools for Watershed Management Workshop. Brooklyn, NY. October 3, 2001.

The Geological and Ecological Framework of the Wallkill Valley. Wallkill Valley Community Leadership Alliance Training Program. Cold Spring, NY. October 1, 2001.

Wise Use in the Absence of Wisdom. Property and the Commons: Rights and Responsibilities, Humans and Nature Consortium, July 17-18, 2001. Sponsored by The Hastings Center. Chicago, IL. July 18, 2001.

Wallkill Valley Conservation: Placing Growth in an Ecological Context. Informative Slideshow & Public Discussion: Wildlife in the Wallkill Valley - How we can learn about and protect it. Sponsored by the Wallkill River Task Force - Ulster Branch. New Paltz, NY. July 11, 2001.

Sustaining Ecosystems in a Changing Landscape. Orange County Land Trust Dinner. Warwick Center, Warwick, NY. June 14, 2001.

Stormwater Design and Its Impact on Biodiversity. 2001 Southeast NY Stormwater Conference and Trade Show, June 13-14. Sponsored by the Lower Hudson Coalition of Conservation Districts and Hudson Valley Regional Council. Fishkill, NY. June 13, 2001.

Repatriation, Relocation, and Translocation: Real Solutions. 57th Annual Northeast Fish and Wildlife Conference, April 22-25, 2001. Sponsored by the New York State Department of Environmental Conservation. Saratoga Springs, NY. April 24, 2001.

Biodiversity and Agriculture. 2001 APA National Planning Conference, March 10-14, 2001. Sponsored by the American Planning Association. New Orleans, LA. March 12, 2001.

Wildlife-Friendly Transportation Planning. 2001 APA National Planning Conference, March 10-14, 2001. Sponsored by the American Planning Association. New Orleans, LA. March 11, 2001.

Sustaining Biodiversity in a Changing Landscape. Massachusetts Association of Conservation Commissions - 2001 Annual Meeting. Worcester, MA. March 3, 2001.

Strategies for Providing Biodiversity Data to Key Decision-Makers (panel speaker). Status of the States: Innovative State Strategies for Biodiversity Conservation. National Biodiversity Symposium. Sponsored by the Environmental Law Institute, January 17-18, 2001. Washington, DC. January 18, 2001.

Justice: Humans, Nature and Time. Humans, Nature, and Environmental Justice, Humans and Nature Consortium, January 15-16, 2001. Sponsored by The Hastings Center. St. Helen Island, SC. January 16, 2001.

Biodiversity Conservation at the Suburban-Rural Frontier: New Opportunities for Land Trusts. National Land Trust Rally 2000, October 12-22, 2000. Sponsored by the Land Trust Alliance. Portland, OR. October 22, 2000.

Sustaining Biodiversity in a Changing Landscape. Presentation to the Selectmen and interested public officials in the towns of Granby, East Granby, Simsbury, Avon, Canton, and Farmington Towns, Farmington Valley, CT. September 21, 2000.

Sustaining Biodiversity in a Changing Landscape-Special Multi-Town Meeting. Hosted by the Planning & Zoning Board/Inland Wetland Commission, Ridgefield Town Hall Annex, Ridgefield, CT. June 21, 2000.

Biodiversity at the Rural Suburban Frontier: A U.S. Perspective. The Consultative Group on Biological Diversity 2000 Annual Meeting, The Colony Hotel, Kennebunkport, ME. June 15, 2000.

Wild New York: Local Conservation Strategies in the Metropolitan Region. Wine and Cheese Evenings with Experts, Wild New York Speaking Engagement, Central Park Zoo New York, NY. May 3, 2000.

Sustaining Biodiversity in a Changing Landscape. The Institute of Ecosystem Study and the Conservation Committee of the Millbrook Garden Club Lecture, Millbrook, NY. April 28, 2000.

No Place Like Home – The Metropolitan Conservation Alliance. Wildlife Conservation Society Annual Meeting 2000, Lincoln Center, New York, NY. April 17, 2000.

Ecological Effects of Poorly Planned Development. Nature in Fragments: The Legacy of Urban Sprawl, Spring Symposium, American Museum of Natural History, New York, NY. April 13, 2000.

Conservation of Wetland Landscapes in the NY Metropolitan Region: Science, Awareness, Policy, and Practice. Environmental Protection Agency, Vernal Pools of the Northeast Conference, University of Rode Island, Kingston, RI. April 1, 2000.

Keynote Address: Wetlands and Wildlife: Conservation Issues. Connecticut Association of Wetland Scientists 2000 Annual Meeting, Ramada Plaza Hotel, Meriden, CT. February 17, 2000.

Keynote Address: Landscape Conservation: Implications for the Protection and

Management of Reptiles and Amphibians. Conservation and Ecology of Turtles of the Mid-Atlantic Region Conference, National Wildlife Visitor Center, Patuxent Research Refuge, Laurel, MD. October 30, 1999.

Linking Conservation, Land-Use Regulation, and Science. American Planning Association Symposium, Chicago, IL. September 17-18, 1999.

The Big Apple's Biodiversity: Prospects for Survival in the Post-Eisenhowerian Era. Biodiversity and Climate Change: Center for Biodiversity and Conservation Spring Symposium, American Museum of Natural History, New York, NY. May 1, 1999.

Conservation of Amphibians and Reptiles in the Northeast. Fifty-fifth Annual Northeast Fish and Wildlife Conference, Holiday Inn, Manchester, NH. April 13, 1999.

Sustaining Biodiversity in a Changing Landscape. The Colebrook Land Conservancy Annual Meeting, YMCA Camp Jewel, Colebrook, CT. April 8, 1999.

The Role of Veterinarians in Monitoring the Health Status of Free-Ranging Chelonians. Association of Reptilian and Amphibian Veterinarians Fifth Annual Conference, Crowne Plaza, Kansas City, MO. September 28, 1998.

Keynote Address: Ephemeral Wetlands – Ephemeral Protection? Our Hidden Wetlands: A Symposium on Vernal Pools in Connecticut, Wesleyan University, Wesleyan, CT. November 15, 1997.

Urban Growth and Biodiversity: Can They Co-Exist? Lecture for the Westchester Environmental Management Council and Federated Conservationists of Westchester County, Texaco, Inc. October 27, 1995**.**

Post-glacial Landscape Ecology of the Long Island Sound Basin: A Herpetological Perspective. Jay Heritage Center Annual Meeting, Rye, NY. June 7, 1995.

Global Conservation in a Changing Environment. Biotechnologies for the Ecological, Evolutionary and Conservation Sciences Earth Day Symposium, University of Florida, Gainesville, FL. April 29, 1995.

From Kilimanjaro to Storm King: International Perspectives on Conserving Local Biodiversity. Environmental Problem Solving in Dutchess County Lecture Series, Vassar College, Poughkeepsie, NY. January 26, 1995.

Local Wetlands and Their Associated Uplands: A Conservation Challenge. Wetlands Watch Lecture (Sierra Club), Chappaqua, NY. November 1, 1994.

Turtle at the Crossroads. A Symposium on the Status and Conservation of Florida Turtles, Eckerd College, St. Petersburg, FL. April 3, 1994.

Reptiles and Amphibians of the Metropolitan Region: Threats, Causes, Solutions. Eco Impact Lectures, American Museum of Natural History, New York, NY. February 24, 1994.

Conservation of Amphibians and Reptiles in the Hudson Valley. Our Own Backyard. The Hudson River and New York Harbor: A Natural History, American Museum of Natural History, New York, NY. February 9, 1994.

The Role of Museums and Systematics in the Biodiversity Crisis. Durrell Institute of Conservation and Ecology, University of Kent, U.K. November 11, 1993.

Conservation Action Planning. World Conservation Monitoring Centre, Cambridge, U.K. November 9, 1993.

The Biological Significance of Aquatic Ecosystems. The Future of America's Rivers/A Celebration of the 25th Anniversary of the National Wild and Scenic Rivers Act, Washington, DC. November 5, 1993.

Preserving Local Biodiversity: Lessons from Herpetology. 1993 New York State Conference on the Environment, White Plains, NY. October 23, 1993.

Baseline Health Parameters of Free-ranging Pancake Tortoises*, Malacochersus tornieri*, in Tanzania. Conservation, Restoration, and Management of Tortoises and Turtles-An International Conference, Purchase, NY. July 11-16, 1993.

Status and Exploitation of the Pancake Tortoise (*Malacochersus tornieri)* in Tanzania. Eighteenth Annual Symposium, Desert Tortoise Council, Palm Springs, CA. May 14-16, 1993.

Conservation Efforts: Past Experiences, Future Needs. Symposium on the Status and Conservation of Turtles of the Northeast, Worcester College. March 20, 1993.

At Risk-Local Biodiversity. Millbrook Garden Club, Salisbury, CT. October 19, 1992.

Worldwide Turtle and Tortoise Conservation Efforts by the Turtle Recovery Program. Minnesota Herpetological Society, Saint Paul, MN. May 1, 1992.

Worldwide Turtle and Tortoise Conservation Efforts. University of Minnesota, Conservation Biology Program, Minneapolis, MN. April 30, 1992.

Turtles in Crisis-The Problems and Possible Solutions. Brookfield Zoological Society, Brookfield, IL. April 29, 1992.

Tortoise and Fresh Water Turtle Recovery Program. Chicago Herpetological

Society, Chicago, IL. April 28, 1992.

Tortoise and Fresh Water Turtle Recovery Program. 633rd Meeting of The Kennicott Club, Chicago, IL. April 27, 1992.

Building Conservation Partnerships to Conserve Turtles. 17th Annual Symposium. Desert Tortoise Council, Las Vegas, NV. March 6-9, 1992.

Nonmarine Turtle Decline. Northeast Nongame Technical Committee Meeting, Luray, VA. September 26, 1991.

Conservation Status of the Amphibians and Reptiles of Connecticut. 71st Annual Meeting of the American Society of Ichthyologists and Herpetologists, New York, NY. June 15-20, 1991.

Building a Coalition for Conserving Chelonian Biodiversity: The IUCN/SSC Action Plan. 71st Annual Meeting of the American Society of Ichthyologists and Herpetologists, New York, NY. June 15-20, 1991.

Massachusetts and Connecticut Bog Turtle Situations and Projects. Bog Turtle Research Symposium, Moravian College, Lehigh, PA. April 27, 1991.

Turtle Action Plan Initiative (IUCN). Bog Turtle Research Symposium, Moravian College, Lehigh, PA. April 27, 1991.

The IUCN's Tortoise and Freshwater Turtle Conservation Action Plan: Reporting the First Year of Progress. Seminar, Middlebury College, VT. April 4, 1991.

The IUCN/Tortoise and Freshwater Turtle Specialist Group Conservation Action Plan: Report of the First Year's Progress. 16th Annual Symposium. Desert Tortoise Council. Las Vegas, NV. March 8-11, 1991.

Tortoises and Freshwater Turtles: An Action Plan for Their Conservation. Joint initiative of the American Museum of Natural History and the World Conservation Union Species Survival Commission (IUCN/SSC), Special Members Lecture, American Museum of Natural History, New York, NY. February 6, 1991.

IUCN Global Action Plan for the Conservation of Freshwater Turtles and Tortoises and **Recommendations on an Upland Habitat Acquisition Program for the Gopher Tortoise Council**. Twelfth Annual Meeting of the Gopher Tortoise Council, Brooksville, FL. October 26-28, 1990.

Implementing the International Union for the Conservation of Nature Tortoise and

Freshwater Turtle Action Plan. Symposium on Turtles and Tortoises: Conservation and Captive Husbandry. Chapman College, Orange, CA. August 9-12, 1990.

Think Globally Act Locally: The Importance of Maintaining Local Wildlife Populations. Long Island's Natural Habitat Management Series: Managing and Protecting Long Island's Endangered Species, Suffolk Community College, Long Island, NY. June 8, 1990.

The IUCN Global Action Plan for the Conservation of Tortoises and Freshwater Turtles. New York Turtle and Tortoise Society Fifth Annual Seminar, Fordham University, Bronx, NY. April 28, 1990.

Postglacial Hybridization of *Ambystoma jeffersonianum* and *Ambystoma laterale* (Amphibia: Caudata) in the northeastern United States. First World Congress of Herpetology, Canterbury, UK. September 11-19, 1989.

FUNDRAISING EXPERIENCE: AWARDS RECEIVED

State of Connecticut Department of Environmental Protection

Support for "Barkhamsted Low Impact Development Project 2010
Support for “Planning for Nature in Connecticut” workshop series, Wildlife Conservation Society, Metropolitan Conservation Alliance, 2003 – 2005.
Support for “Farmington Valley Biodiversity Project” and “From Planning to Action: Biodiversity Conservation in Connecticut Towns”, Wildlife Conservation Society, Metropolitan Conservation Alliance, 2004 – current.

New York State Department of Environmental Conservation

Funding for “Integrating Biodiversity Conservation into Municipal Planning Goals and Pracitces”, Wildlife Conservation Society, Metropolitan Conservation Alliance, 2004 – 2007.
Funding for “Integrating Biodiversity Conservation into Municipal Planning Goals and Pracitces for Target Communities”, Wildlife Conservation Society, Metropolitan Conservation Alliance, 2001 – 2003.

Geraldine R. Dodge Foundation

Support for "A Cooperative, Science-Based Approach to Improving Wildlife Management in New Jersey", Wildlife Conservation Society, Metropolitan Conservation Alliance, 2003, renewal grant 2005.

Westchester Community Foundation

Renewed support for Westchester Biotic Corridor projects, Wildlife Conservation Society, Metropolitan Conservation Alliance Program. 1999 - 2010.

Gage Fund

Renewed annual support for Eastern Westchester Biotic Corridor. 2002-2010

Surdna Foundation, Inc.

Funding for Wildlife Conservation Society, Metropolitan Conservation Alliance Program, 1998-2000.
Funding for Wildlife Conservation Society, NY Metro Program, 1997.

Sweet Water Trust

Support for "Wetland Landscapes of the Northeast," 1999-2000.
Support for "Inventory, Information, and Research Accomplishments in the Great Swamp," Wildlife Conservation Society, NY Metro Program, 1997.

Doris Duke Charitable Foundation

Funding for Wildlife Conservation Society, Metropolitan Conservation Alliance Program, 1999, 2001.

Leo Model Foundation

Wildlife Conservation Society, Tanzania Biodiversity and Training Program, 1997.

The Bay Foundation

Support for "Assessment of Amphibian and Reptile Biodiversity in Tanzania's National Parks," 1995-1997.
Support for integrating conservation science into Scenic Hudson 2008
Support for MCA at Cary Institute, 2010-2011.

Geoffrey Hughes Foundation

Support for Massachusetts/Connecticut bog turtle ecosystem study, 1995-1997.

The Norcross Wildlife Foundation

Funding for the Wildlife Conservation Society, International Programs, 1995-1997.
Support for the publication of "Amphibians and Reptiles of Connecticut and Adjacent Regions," 1993.
Funding for Turtle Recovery Program, American Museum of Natural History, 1991-1992.

Field Day Foundation

Support for Metropolitan Conservation Alliance 2009-2011.

United States Department of Agriculture (Forest Service)

Support for "Conservation, Restoration, and Management of Tortoises and Freshwater Turtles-An International Conference," 1993.

United States Department of Defense (Legacy Program)

Support for "Conservation, Restoration, and Management of Tortoises and Freshwater Turtles-An International Conference," 1993.

National Science Foundation

Support for "Conservation, Restoration, and Management of Tortoises and Freshwater Turtles-An International Conference", 1993.

United State Department of the Interior (Bureau of Land Management)

Support for preparing conference proceedings "Conservation, Restoration, and Management of Tortoises and Freshwater Turtles-An International Conference," 1993.

Support for "Conservation, Restoration, and Management of Tortoises and Freshwater Turtles-An International Conference", 1992.

Wildlife Conservation International (Now WCS International Programs)

Field Assessment of the Status and Exploitation of the Pancake Tortoise *(Malacochersus tornieri)* in Tanzania, 1992.

John D. and Catherine T. MacArthur Foundation

Tropical Rainforests: Can We Regain Paradise Lost? (educational programming grant), 1990.

Capacity building in Tanzanian National Parks: Biodiversity assessment and monitoring, 1994-1998.

FUNDRAISING EXPERIENCE: NGO, COPORATE & INDIVIDUAL SUPPORT

Acorn Foundation

American Federation of Herpetoculturists

Aquarion Co.

Bay and Paul Foundation *(multiple awards to support conservation and biodiversity activities)*

Roland Betts

Brystie, Inc.

California Turtle and Tortoise Club

Camden House Publishing

Chelonia Institute

Chicago Zoological Society

Conservation and Research Foundation

Conservation International *(2 grant awards)*

Desert Tortoise Council *(2 grant awards)*

Martin Diamond *(multiple grant awards)*

Doris Duke Charitable Trust

Dorothy R. Donnelley Charitable Trust *(6 grant awards)*

Gordon and Jean (Phipps) Douglas (*multiple awards to support policy activities*)

Field Day Foundation

Robert and Alexandra Goelet (*multiple awards to support conservation activities*)

Institute for Herpetological Research.

J. P. Morgan & Co

IUCN/SSC Trade Specialist Group

Jersey Wildlife Preservation Trust *(2 grant awards)*

Knoxville Zoological Gardens

Leyland Alliance

John D. and Catherine T. MacArthur Foundation

Model Foundation

New York Return A Gift to Wildlife *(2 grant awards)*

New York Turtle and Tortoise Society *(3 grant awards)*

Norcross Wildlife Foundation *(3 grant awards)*

Oklahoma City Zoological Park

Peter Scott Fund-IUCN *(3 grant awards)*

Sabin Conservation Fund *(7 grant awards)*

Saint Augustine Alligator Farm

Surdna Foundation (*2 grant awards*)

Sweet Water Trust *(2 grant awards)*

Tampa Bay Herpetological Society

Tennessee Aquarium

Tipton and Maglione

US Fish and Wildlife Service

Dr. Lucy (Rockefeller) Waletzky (*multiple awards to support conservation activities*)

Westchester Community Foundation (*multiple awards to support biodiversity research*)

Exhibit D

AFFIDAVIT OF DAVID H. GIBSON

STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

David H. Gibson, being duly sworn, deposes and says:

1. I am a member of the National Audubon Society and was formerly volunteer Board President and Conservation Chair of the Audubon Society of the Capital Region, an area chapter of the National Audubon Society. I am currently employed as a staff Partner of Adirondack Wild: Friends of the Forest Preserve.

2. I have been birding since 1982 and have birded in the Adirondacks since 1987. I worked as program assistant for the New York State Office of Parks and Recreation from 1984 to 1986 and, in that capacity, I regularly led field programs and assisted park visitors in identifying and appreciating birds in various park habitats. In my role as former chair of the Audubon Society of the Capital Region, I also frequently led and participated in bird walks for the public. I recently participated in the Century Run, an all-day breeding bird survey in New York's greater Capital District. Also, just this past week, I assisted a Union College vertebrate zoology professor in identifying birds at the Vischer Ferry Nature Preserve in Clifton Park, NY. I annually retrain my ears to bird calls by listening to Cornell Laboratory of Ornithology tapes of breeding bird song.

3. From 2000 to 2005 I served as a volunteer for the Breeding Bird Survey of New York State. The Breeding Bird Survey of New York State is a program sponsored by the New York State Department of Environmental Conservation and New York State Ornithological Association, in cooperation with New York Cooperative Fish and Wildlife Research Unit at Cornell University, Cornell University Department of Natural Resources, and the Cornell

Laboratory of Ornithology. Breeding Bird Survey volunteers select specific blocks of habitat in which to conduct an intensive birding survey over a five-year period. The results of this five-year survey are published in the New York State Breeding Bird Atlas. The results from the most recent 2000-2005 survey in which I participated as a volunteer are published in The Second Atlas of Breeding Birds in New York State. *See* http://www.dec.ny.gov/animals/7312.html.

4. On Thursday, May 22, 2014, from 10:45 A.M. to 3:00 P.M, I undertook a breeding bird survey on Lot 8 in the Jay Mountain Wilderness Area. I entered Lot 8 from its southeast corner and walked along its entire eastern boundary; at the northeast corner of Lot 8, I walked back through Lot 8 in a southwesterly direction until I reached the center portion of the southern boundary of Lot 8. I listened for singing male neotropical migratory birds, but did not confirm birds by sight because of the emerging hardwood leaves. Identification by song is an accepted survey technique. I identified the following birds:

- Black-throated Blue Warbler
- Yellow-Rumped Warbler
- Veery
- Chestnut-Sided Warbler
- Black-throated Green Warbler
- Yellow-bellied Sapsucker
- Red-eyed Vireo
- Ovenbird
- Scarlet Tanager
- Least Flycatcher
- White-breasted Nuthatch

- Black-capped Chickadee
- Wood Thrush
- Hermit Thrush
- American Robin
- Blue Jay

5. I also believe I heard, although could not clearly identify, the Bay-breasted Warbler, which is identified in the 2005 New York State Comprehensive Wildlife Conservation Strategy as a "species of greatest conservation need."

6. Of the 16 species that I identified with certainty, four are sensitive species. The Black-throated Blue Warbler is identified by Partners in Flight as a priority species because of its very high area importance—the Adirondack Mountains region contains five percent of the world population of this species. The New York State Breeding Bird Atlas shows that the Black-throated Blue Warbler in the Adirondack Mountains region has suffered a significant decline of 2.3 percent per year from 1980-2006. The Veery is identified by the U.S. Fish and Wildlife Service as a bird of "conservation concern"—in other words, one that, without additional conservation actions, likely will become a candidate for listing under the Endangered Species Act. The Scarlet Tanager and Wood Thrush are both classified as "species of greatest conservation need" by the 2005 New York State Comprehensive Wildlife Conservation Strategy. The Wood Thrush also is classified by the U.S. Fish and Wildlife Service as a bird of conservation concern.

7. All of the birds I identified would be expected in the habitat characteristic of Lot 8, with its mature or maturing, century-plus-long undisturbed and contiguous mixed forest. A few of these birds are more closely associated with low or no canopy, patchy, second growth

woods and shrubs, which is characteristic of the eastern edge of Lot 8 close to the existing wollastonite mine owned and operated by NYCO, Inc. Some of the warblers and the Red-eyed Vireo in Lot 8, particularly Black-throated Green Warbler, Ovenbird, Black-throated Blue Warbler, and Scarlet Tanager, require mostly unfragmented, undisturbed, interior mature forests, including large canopy hardwoods and, for some, a mixture of evergreens and deciduous trees.

8. My brief birding survey likely did not capture the full range of birds that rely on Lot 8 for habitat. I covered only a portion of Lot 8, likely only one-third of the 200-acre tract, in my approximately five-hour survey. Moreover, most birdsong drops off significantly by mid-morning, which is when I first entered Lot 8. A survey in the early morning, at 6:00A.M., for instance, likely would have permitted the identification of many more species. Finally, only some neotropical migratory birds would have arrived in the Adirondacks as of May 22. Migration peaks in the Adirondack region in early June.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

David Gibson

Sworn to before me this
28 day of May, 2014

HANNAH CHANG
NOTARY PUBLIC-STATE OF NEW YORK
No. 02CH6235969
Qualified In New York County
My Commission Expires February 22, 2015

Notary Public