

Analysis of potential development on Lot 9 of the Deerwood Subdivision

- In relation to ecological communities and wetland values and functions

Saranac Inn, Town of Santa Clara, Franklin County, New York



May 2, 2021

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I. Summary of primary findings

The Adirondack Park Agency (APA) approved a 10 lot Deerwood Subdivision in 1988 and recognized the vulnerability and sensitivity of many resources on the property. The Agency addressed those concerns by incorporating specific permit conditions which continue to have merit in 2021.

Creation of the subdivision, and most especially Lot 9, was contingent on limiting the scale and scope of development to protect natural resources. Development on Lot 9 did and continues to pose the most threat to the wetland and water resources of any part of the housing development.

The special natural resources which were addressed by the APA review and permit approval include, among others:

- Very high water quality of Upper Saranac Lake which is used for swimming, recreation, fishing;
- Hydrologically active and diverse wetland straddling and protecting water quality of several streams draining into the NE bay of Upper Saranac Lake;
- Biologically rich and diverse 19-20 acre wetland and its associated natural habitats and communities. The wetlands are sensitive to impacts from runoff and nutrients. Nitrogen is specifically mentioned in Permit Finding No. 28, as are other "nutrients;"
- Undeveloped and aesthetically pleasing shoreline of Upper Saranac Lake impinging upon a shallow bay. This shoreline is especially important habitat lying on an ecotone between two important community complexes, lying between the palustrine wetland complex and the lacustrine complex as it does;
- The site and area is habitat for endangered and unusually charismatic wildlife species such as bald eagle, loon, bobcat, among others, including interesting and regionally rare plant species, such as orchids;
- The wetland extends beyond the shoreline, and an active freshwater exchange occurs between the lake and the wetland. Water lilies are often observed on the shoreline of Lot 9 (See images) and are often associated with a "deep water marsh;"
- New York State Department of Environmental Conservation (DEC) has designated significant natural communities that overlap the site.

Also of historical as well as ecological interest, the site was a part of the water supply to the Saranac Inn; antique water cisterns, water conveyances and ice house are still on the premises. (See images).

Those ecological communities that are impacted by the Deerwood Subdivision and protected by the 1988 permit are primarily as follows.

1. Bog pond
2. Inland poor fen
3. Medium fen
4. Northern white cedar swamp
5. Mesotrophic dimictic lake

Each are discussed in more detail following. These ecological communities help comprise the "Deerwood Fen." A fen is a type of wetland. The Deerwood Fen wetland complex is identified as at least 19-20 acres (although permit says it is 23 acres). Most of Lot 9 (3.2 acres in size) is a significant part of this designated wetland. By permit, no vegetative cutting or disturbance within the wetlands was to occur.

The Northern end of Upper Saranac Lake, and the immediate watershed, has a record of being vulnerable. People have worked hard to improve water quality and protect the remaining wetland and wildlife resources. Vast amounts of resources have been expended over the past 30 years to maintain water quality and protect charismatic wildlife. Site visits in 2021 confirmed these resources continue to be present, and more.

The 1988 permit called the value rating to be "2" but this new information shows that not to be accurate. The wetland requires more diligent protections than previously noted.

However the wetland called “Deerwood Fen” is a Category “1” wetland under the governing regulations (See Appendix “Summary of Information Related to Wetland Value Rating and Standard for Permit Issuance”) and the proposed anticipated development activities do not meet the statutory test for approval.

The wetland immediately down-slope of the contemplated expansion of development on Lot 9 is hydrologically active. Several open water channels of permanent streams were found within the common wetland area, one of which is 23 feet to the edge of the property line, and approximately 200 feet from the proposed development site. These streams lead directly to Upper Saranac Lake. These stream channels are fed by sub-surface freshwater springs, surface flows and direct hydrologic inputs. Lot 9 is mostly composed of wetland and the upland portion is proximal to significant portions of the wetland complex.

Also of significance, but not obviously apparent, is the network of inter-digitated streams that sometimes run beneath the wetland surface, and were observable on the shoreline on April 15, 2021 and emptying into the upper bay.

In the 1988 permit future development on Lot 9 was limited by conditions addressing:

- clearing trees on the wetland and impacts to the fragile wetland substrate;
- habitat change;
- waste-water disposal;
- shoreline protection;
- limiting the footprint of development into a small thumb-shaped portion of high land distant from the lake and at a minimum distance from the wetland edge, but with required setbacks for buffering.

Reviewing the 1988 permit, those resources and the related analysis are still valid and of equal or more concern 33 years later.

The proposal for development of Lot 9 and significant amendment of the existing permit involves:

- Installation of an on-site septic system that would accommodate a house utilizing at least 5 bedrooms;
- Construction of a garage apartment with another bedroom (6 total bedrooms);
- Construction of a boat house and dock along the shoreline and in the protected wetlands on the shore of Upper Saranac Lake;
- Clearing of the forested wetland for direct views of Upper Saranac Lake from the house site;
- Expansion and hardening of trails, and building boardwalks, or some combination of the three, through the wetland;
- Clearing and construction on the house site that would replace vegetation with impervious surfaces in most of the upland woodland close to the wetland complex.

Eliminating protective conditions and relaxing of required setbacks upsets the conclusion to prevent “undue adverse impacts.” Such proposed actions set a negative precedent for relaxing controls on previously written permits meant to protect the shoreline of Upper Saranac Lake and its integrated wetlands near the shoreline. These areas are arguably the most vulnerable portion of the Upper Saranac Lake watershed to degradation and impact. Without these special conditions, it is likely that the Deerwood Subdivision would never been approved. However, with these special conditions, including the off-site septic location, development could occur without harm.

The already permitted and designated location for waste water (in 1988 permit) is up-slope and away from sensitive wetlands and streams, and is at a location posing much less impact (i.e., at the old tennis courts, near the intersection of Kimpton Road and Rt. 30. This originally proposed location is much less likely to be impacted by future unforeseen changes in hydrology or run-off within the wetland, and is reputedly at a location more than 1000 feet from the currently proposed location.

All other lots within the Deerwood Subdivision have been developed in compliance with all the permit conditions and no detrimental adverse impacts have been observed as a result.

Disregarding the protections in the original review and conditions for development will lead to direct and severe impacts to the wetland complex and Upper Saranac Lake. Proceeding without those protections pose great risk to specific natural resources.

The following impacts of Lot 9's proposed developments are of major concern for the following reasons:

- Clearing of wetland vegetation on Lot 9 will result in direct habitat loss and loss of wetland values and functions and will result in hydrologic changes leading to indirect impacts to adjoining resources, such as Upper Saranac Lake, to on-site streams, and to the other wetland habitats. Excessive clearing will make Lot 9 susceptible to invasion by non-native species, such as knotweed.
- Nutrient run-off from the Lot 9 uplands (both impervious surfaces and any poor performance of the on-site septic system) will enter the nearby oligotrophic fen (bog) and impact its species composition, possibly resulting in loss of some types of "bog" plants and susceptibility to invasion by non-native species. Both nitrogen and phosphorous loading are of concern to Upper Saranac Lake water quality.
- Development of structures along the shoreline of Lot 9, as well as in the wetlands, will result in direct loss of wetland habitat functions and values. Additionally, the shoreline aesthetic value will be impacted significantly by the size and scale of structures.

NYS DEC Environmental Resource Mapper shows Lot 9 to fall within a zone designated to interact with rare plants, wildlife and significant natural communities.

Also please note in 1988 the permit holder was to undertake, within 6 months of June 8, and submit, a detailed botanical survey. To my knowledge this did not happen and it is not available to benefit this review and analysis.

II. Background

The Adirondack Park Agency (APA) approved a 10 lot Deerwood Subdivision in 1988 and recognized the vulnerability and sensitivity of many resources on the property. The Agency addressed those concerns by incorporating specific permit conditions.

The APA is moving ahead with steps that would allow the owner of Lot 9 of the Deerwood Subdivision to develop the site without following the permit conditions found in the 1988 authorization of the 10 lot subdivision.

This includes alterations to the protected wetlands and lakeshore of Upper Saranac Lake, and placement of an on-site septic system much closer to the protected wetlands and streams, construction of structures in the protected wetland, more intensive human use in the wetlands and clearing of wetland vegetation.

The proposal for development of Lot 9 and significant amendment of the existing permit involves:

- Installation of an on-site septic system that would accommodate a house utilizing at least 5 bedrooms;
- Construction of a garage apartment with another bedroom (6 total bedrooms);
- Construction of a boat house and dock along the shoreline and in the protected wetlands on the shore of Upper Saranac Lake;
- Clearing of the forested wetland for direct views of Upper Saranac Lake from the house site;
- Expansion and hardening of trails, and building boardwalks, or some combination of the three, through the wetland;
- Clearing and construction on the house site that would replace vegetation with impervious surfaces in most of the upland woodland close to the wetland complex.

The purpose of this report is to analyze the impacts of developing Lot 9, without key provisions of the 1988 permit in force, to the wetland, and overall ecological communities in the area. This ecological analysis encompasses of the site and the nearby natural resources, such as Upper Saranac Lake, streams flowing out of the wetland, and fish and wildlife resources dependent upon the site.

During the review of this proposed project in 1987 and 1988 the Agency made the following observations incorporated into the project permit:

Quote From APA Permit No. 87-74; issued June 6, 1988
Finding 28 on Page 8

"Because of the excessively drained nature of the soils surrounding the wetland and the acidic/bog character of the wetland complex, the effect of potential nutrient loading on the bog wetland complex is a matter of concern. Bogs are thought to be deficient in available nitrogen and adaptations of bog plants seek to conserve, accumulate, rapidly recycle, and attract other sources of nitrogen in order to obtain the required amounts. Research has demonstrated the addition of nitrogen to bogs as a fertiliser treatment at medium rates adversely affects the vegetation.....Decreases in species diversity of wetland systems after enrichment by nutrients has been observed in many wetlands including Lake Champlain marshes."

Furthermore, in the 1988 permit future development on Lot 9 was limited by conditions addressing:

- Clearing trees on the wetland and impacts to the fragile wetland substrate;
- waste-water disposal;
- shoreline protection;
- limiting the footprint of development into a small thumb-shaped portion of high land distant from the lake and at a minimum distance from the wetland edge, but with required setbacks for buffering..

After reviewing the 1988 permit, these permit conditions are still valid and of equal or more concern some 33 years later.

III. Approach

This report and analysis is based on:

- Existing topographic maps, current and historical;
- Series of aerial photographs showing the surface features of the site and vicinity;
- Past botanical and wildlife surveys from landowners, scientists and NYS DEC;
- Site visit of Lot 9 perimeter and further site investigation work around the broader area of the Deerwood Subdivision on April 15, 2021;
- Facts and descriptions from the permit for project APA #87-84, issued June 8, 1988;
- Letter from Gregory Allen Esq. and submitted on January 22, 2021,

As part of the record a letter from Greg Allen, Esq to John Burth (APA staff) dated January 22, 2021 was submitted. This report relied on some factual information related to landowner observations of natural resource conditions, particularly wildlife sightings and water quality issues, and information about the proposed development on Lot 9.

IV. Ecological Communities

The project site is mainly composed of a wetland complex with a surrounding upland fringe. The wetland abuts Upper Saranac Lake which forms the southern border of the site, and may extend further out into the lake as an emergent and deepwater marsh wetland as indicated by photo evidence. The wetland extent may only be ascertained at the height of the growing season. The wetland, as delineated by remotely sensed measurements, is approximately 19 – 20 acres in size although the 1988 permit describes it as 23 acres in size. Depending on extent into the lake, it could be significantly larger.

The subject Lot 9 on the eastern side of the wetland complex has a narrow thumb of upland that thrusts itself into the wetland complex from the eastern edge. Most of Lot 9 is wetland, a portion of the overall wetland complex, and is primarily the northern white cedar swamp community.

This description and ecological community inventory for the Deerwood Project is based on review of information, primarily findings of fact in the 1988 permit, field observations and review of available natural resource information. This available information was applied to the New York Natural Heritage Classification system for Ecological Communities, which is the current standard for assessment in New York State.

Overall the wetland complex is diverse, biologically rich in species and highly significant for its functions, use and values. Topographically and hydrologically the wetland is situated in a lowland that gently slopes to Upper Saranac Lake. It is fed by surface water, groundwater and precipitation.

A stream enters from the north flowing under State Route 30, entering the wetland in the center. Deducing from the nature of the vegetation, the eastern portion of the wetland is fed by somewhat minerotrophic ground water, while the eastern side of the wetland is fed by more acid and oligotrophic ground water and direct precipitation. Streams coalesce and inter-digitate in the center and southern part of the wetland, which then breach the berm along the shoreline to enter Upper Saranac Lake. Water from Upper Saranac Lake also flows into the wetland, with which there is a free water exchange at the surface, depending upon the hydrologic conditions.

A. The wetland and its physical parameters are very dynamic, both seasonally and over the decades of recorded observations. Hydrologically and functionally, the wetland is in a key position along the shore of Upper Saranac Lake to impact overall surface water quality in the north eastern bay. Using the APA wetland value rating system, and because of its influence on water quality, the wetland triggers many important features that signify high value and qualifies the wetland for the top rating as value “1” while applying the system required by law. Associated with that rating of value “1” are very strict standards for permit approval which are not being achieved with the current string of permit amendments. See the attached appendix “Summary of Information Related to Wetland Value Rating and Standard for Permit Issuance); Value Rating of Deerwood Fen.”

Qualitatively and from a natural history eye, the wetland complex is beautifully interesting and very unusual because of the diverse habitats, location and species of plants and animals that utilize it. Some of the features are described below:

- 1) There are five primary ecological communities on the project site, associated with the wetland and located on the Lot 9, 10 and the common protected lot. Lot 9 and 10 also have upland areas, which have been disturbed and developed, that are not described in this ecological community inventory.
- 2) The information presented includes the assessment of the general description, typical species and primary threats from the Natural Heritage database describing these communities. The threats are particularly interesting since they specifically relate to activities proposed on Lot 9.

Those ecological communities are primarily as follows:

- 1) Bog pond
- 2) Inland poor fen

- 3) Medium fen
- 4) Northern white cedar swamp
- 5) Mesotrophic dimictic lake

The bog pond community is located on the eastern edge of the wetland complex. The inland poor fen surrounds the bog pond and grades into the medium fen. The medium fen is in the western edge of the wetland complex and is hydrologically fed by ground water, probably minerotrophic in nature, arising from the watershed lying to the north of the site. The northern white cedar swamp is in the south of the wetland complex, toward Upper Saranac Lake. It is hydrologically fed by groundwater that forms and then coalesce into stream channels that lead into Upper Saranac Lake. Upper Saranac Lake makes the southern boundary of the complex and is classified as a mesotrophic dimictic lake community. Because this bay of Upper Saranac Lake is so shallow, and as has been noted previously, there may be additional wetlands associated with the waterbody and contiguous with the palustrine wetlands.

See attached appendix, a figure "Ecological Communities of Deerwood Fen," that shows the relative position and size of the ecological communities in relation to key physical features. Also see a recent aerial image from Google Earth showing the surface features of the area and upon which key ecological boundaries have been annotated in the accompanying appendix.

NYS DEC Environmental Resource Mapper shows Lot 9 to fall within a zone designated to interact with rare plants, wildlife and significant natural communities.

Significantly, in 1988 the permit holder was to undertake, within 6 months of June 8, and submit, a detailed botanical survey. To date, no survey of record was conducted, and has not been available for this review and analysis.

The following interesting herbaceous plants of wetlands – fens have been observed in Deerwood Fen over the years. While not rare they are indicative of the diversity status and signal that other rare plant species might be present should a comprehensive survey be undertaken.

- | | |
|----------------------------------|-------------------------|
| • <i>Carex echinata</i> | star sedge |
| • <i>Carex intumescens</i> | bladder sedge |
| • <i>Carex gynandra</i> | nodding sedge |
| • <i>Carex lasiocarpa</i> | woolly-fruited sedge |
| • <i>Carex leptalea</i> | bristle-stalked sedge |
| • <i>Carex magellanica</i> | tall bog-sedge |
| • <i>Carex scabrata</i> | eastern rough sedge |
| • <i>Rhynchospora alba</i> | white beak rush |
| • <i>Eleocharis elliptica</i> | elliptic spikerush |
| • <i>Pogonia ophioglossoides</i> | pink pogonia |
| • <i>Corallorhiza trifida</i> | yellow coralroot |
| • <i>Neottia cordata</i> | heartleaf twayblade |
| • <i>Platanthera clavellata</i> | small green wood orchid |

The descriptions listed below for the 5 ecological communities are excerpted and adapted from the on-line information provided by the New York Natural Heritage Program. Included are typical species and threats to the communities and rare species that are typically found in such habitats.

A. Bog Lake/Pond

General Description (adapted from NY Natural Heritage Program information)

The aquatic community of a dystrophic lake (an acidic lake with brownish water that contains a high amount of organic matter).

These lakes occur in areas with non-calcareous bedrock or glacial till; many are fringed or surrounded by a floating mat of vegetation (in New York usually either bog or poor fen).

Characteristic features of a dystrophic lake include the following: murky water that is stained brown, with low transparency; water that is low in plant nutrients (especially low in calcium), with naturally low pH (less than 5.4); and the lake may have oxygen deficiencies in deeper water (the profundal zone). The lack of calcium blocks bacterial action, reducing the rate of decay of organic matter with subsequent accumulation of peat or muck sediments.

Typical species are listed below.

Floating-leaved aquatics	<i>Brasenia schreberi</i> (water-shield) <i>Nuphar microphylla</i> (small-leaved yellow pond-lily, small-leaved spatter-dock) <i>Nuphar variegata</i> (common yellow pond-lily, common spatter-dock) <i>Nymphaea odorata</i> ssp. <i>odorata</i> (fragrant white water-lily) <i>Potamogeton epihydrus</i> (ribbon-leaved pondweed) <i>Potamogeton oakesianus</i> (Oakes's pondweed) <i>Sparganium angustifolium</i> (narrow-leaved bur-reed)
Emergent aquatics	<i>Dulichium arundinaceum</i> var. <i>arundinaceum</i> (three-way sedge) <i>Juncus</i> spp. <i>Sparganium fluctuans</i> (floating bur-reed)

Threats

Bog lakes and ponds are threatened by development in the surrounding landscape and its associated run-off (e.g., agricultural, residential, roads, railroads, golf courses, campgrounds), recreational overuse (e.g., boating, shoreline camping), and habitat alteration in the adjacent landscape (e.g., excessive logging, pollution, nutrient loading). Alteration to the natural hydrology is also a threat to this community (e.g., impoundments, blocked culverts). Bog lakes and ponds are threatened by invasive species, such as Eurasian milfoil (*Myriophyllum spicatum*).

Rare Species

- *Acris crepitans* (Northern Cricket Frog)
- *Enallagma laterale* (New England Bluet)
- *Gavia immer* (Common Loon)
- *Hippuris vulgaris* (Mare's Tail)
- *Potamogeton pulcher* (Spotted Pondweed)
- *Sparganium natans* (Small Bur-reed)

B. Inland Poor Fen

General Description (adapted from NY Natural Heritage Program information)

A weakly minerotrophic, flat peatland in which the substrate is peat composed primarily of peat mosses (*Sphagnum* spp.) with admixtures of graminoid or woody peat. The dominant plants are peat mosses (*Sphagnum* spp.), with scattered sedges, shrubs, and stunted trees.

Poor fens are fed by waters that are weakly mineralized, and have low pH values, generally between 3.5 and 5.0. This community typically develops where water moves through the peat mat, thus it often forms linear patches closely associated with open water.

Typical species are listed below.

Trees > 5m	<i>Larix laricina</i> (tamarack) <i>Picea mariana</i> (black spruce)
Shrubs 2 - 5m	<i>Larix laricina</i> (tamarack) <i>Picea mariana</i> (black spruce)
Shrubs < 2m	<i>Alnus incana</i> ssp. <i>rugosa</i> (speckled alder) <i>Andromeda polifolia</i> var. <i>glaucophylla</i>

	<i>Chamaedaphne calyculata</i> (leatherleaf) <i>Kalmia angustifolia</i> <i>Myrica gale</i> (sweet gale) <i>Photinia melanocarpa</i> <i>Rhododendron groenlandicum</i> (Labrador-tea) <i>Vaccinium oxycoccos</i> (small cranberry) <i>Viburnum nudum</i> var. <i>cassinoides</i> (northern wild-raisin)
Herbs	<i>Carex exilis</i> (meager sedge) <i>Carex lasiocarpa</i> <i>Carex paupercula</i> <i>Carex rostrata</i> <i>Carex stricta</i> (tussock sedge) <i>Carex trisperma</i> (three-fruited sedge) <i>Eriophorum virginicum</i> (tawny cotton-grass) <i>Rhynchospora alba</i> (white beak sedge) <i>Sarracenia purpurea</i> (purple pitcherplant) <i>Triadenum virginicum</i>
Nonvascular plants	<i>Sphagnum fuscum</i> <i>Sphagnum magellanicum</i> <i>Sphagnum papillosum</i> <i>Sphagnum recurvum</i> <i>Sphagnum rubellum</i>

Threats

Inland poor fens are threatened by development and its associated run-off (e.g., agricultural, residential, roads, railroads), recreational overuse (e.g., snowmobiles, hiking trails causing peat compaction), and habitat alteration in the adjacent landscape (e.g., logging, pollution, nutrient loading). Alteration to the natural hydrology is also a threat to this community (e.g., impoundments, blocked culverts, beaver). Several examples of inland poor fen are threatened by invasive species, such as reed grass (*Phragmites australis*).

C. Medium Fen

General Description (adapted from NY Natural Heritage Program information)

A moderately minerotrophic peatland (intermediate between rich fens and poor fens) in which the substrate is a mixed peat composed of graminoids, mosses, and woody species. Medium fens are fed by waters that are moderately mineralized, with pH values generally ranging from 4.5 to 6.5. Medium fens often occur as a narrow transition zone between an aquatic community and either a swamp or an upland community along the edges of streams and lakes. In medium fens, the herbaceous layer, dominated by the sedge *Carex lasiocarpa*, typically forms a canopy that overtops the low shrub layer. The physiognomy of medium fens may range from a dwarf shrubland to a perennial grassland, and be either shrub-dominated, herb dominated or have roughly equal amounts of shrubs and herbs.

Typical species are listed below.

Shrubs 2 - 5m	<i>Acer rubrum</i> (red maple)
Shrubs < 2m	<i>Alnus incana</i> <i>Andromeda polifolia</i> var. <i>glaucophylla</i> (bog rosemary) <i>Chamaedaphne calyculata</i> (leatherleaf) <i>Myrica gale</i> (sweet gale) <i>Photinia melanocarpa</i> (chokeberry) <i>Vaccinium macrocarpon</i> (cranberry)

Herbs	<i>Carex lasiocarpa</i> <i>Comarum palustre</i> (marsh-cinquefoil) <i>Drosera rotundifolia</i> (round-leaved sundew) <i>Menyanthes trifoliata</i> (buck-bean) <i>Osmunda regalis</i> (royal fern) <i>Pogonia ophioglossoides</i> (rose pogonia) <i>Sarracenia purpurea</i> (purple pitcherplant) <i>Solidago uliginosa</i> (bog goldenrod) <i>Thelypteris palustris</i> (marsh fern) <i>Triadenum virginicum</i> (marsh St Johnswort) <i>Typha latifolia</i> (wide-leaved cat-tail) <i>Utricularia intermedia</i> (flat-leaved bladderwort)
Nonvascular plants	<i>Sphagnum</i> spp. <i>Calliergonella cuspidata</i>

Threats

Medium fens are threatened by development and its associated run-off (e.g., residential, agricultural, roads, railroads), recreational overuse (e.g., hiking trails) and habitat alteration in the adjacent landscape (e.g., logging, clearing, mining, pollution). Alteration to the natural hydrology is also a threat to this community (e.g., impoundments, ditching, stream channelization, dredging, blocked culverts, beaver). Several examples of medium fen are threatened by invasive species, such as purple loosestrife (*Lythrum salicaria*), reed grass (*Phragmites australis*), and buckthorns (*Rhamnus* spp.).

Rare Species

- *Arethusa bulbosa* (Dragon's Mouth Orchid)
- *Calamagrostis stricta* (Northern Reed Grass)
- *Carex chordorrhiza* (Creeping Sedge)
- *Carex livida* (Livid Sedge)
- *Carex meadii* (Mead's Sedge)
- *Circus hudsonius* (Northern Harrier)
- *Cistothorus platensis* (Sedge Wren)
- *Cypripedium candidum* (Small White Lady's Slipper)
- *Equisetum palustre* (Marsh Horsetail)
- *Fagitana littera* (Marsh Fern Moth)
- *Glyptemys muhlenbergii* (Bog Turtle)
- *Hemileuca* sp. 1 (Bogbean Buckmoth)
- *Lycopus rubellus* (Stalked Bugleweed)
- *Phlox maculata* ssp. *maculata* (Wild Sweet William)
- *Salix pyrifolia* (Balsam Willow)
- *Scheuchzeria palustris* (Pod Grass)
- *Sparganium natans* (Small Bur-reed)
- *Sphagnum andersonianum* (Anderson's Peat Moss)
- *Sphagnum subfulvum* (Pale Peat Moss)
- *Symphyotrichum boreale* (Northern Bog Aster)
- *Trollius laxus* (Spreading Globeflower)
- *Williamsonia fletcheri* (Ebony Boghaunter)

D. Northern White Cedar Swamp:

General Description (adapted from NY Natural Heritage Program information)

A rich conifer or mixed swamp that occurs on organic soils in cool, poorly drained depressions in central and northern New York and along lakes and streams in the northern half of the state. These swamps are often spring fed or enriched by seepage of cold, minerotrophic groundwater, resulting in a stable water table and continually saturated soils.

The characteristic tree is northern white cedar (*Thuja occidentalis*), which makes up more than 30% of the canopy cover; characteristic short shrubs include dwarf raspberry and red osier dogwood.

The surface of the peatland typically has small mounds and depressions (hummocks and hollows) that are formed by decaying downed trees and tip-up mounds. Mosses and liverworts are diverse and abundant.

Typical species are listed below.

Trees > 5m	<i>Abies balsamea</i> (balsam fir) <i>Acer rubrum</i> (red maple) <i>Betula alleghaniensis</i> (yellow birch) <i>Fraxinus nigra</i> (black ash) <i>Larix laricina</i> (tamarack) <i>Picea mariana</i> (black spruce) <i>Pinus strobus</i> (white pine) <i>Thuja occidentalis</i> (northern white cedar, arbor vitae) <i>Tsuga canadensis</i> (eastern hemlock)
Shrubs 2 - 5m	<i>Alnus incana</i> <i>Cornus sericea</i> (red-osier dogwood) <i>Nemopanthus mucronatus</i>
Shrubs < 2m	<i>Rubus pubescens</i> (dwarf raspberry)
Herbs	<i>Aralia nudicaulis</i> (wild sarsaparilla) <i>Caltha palustris</i> (marsh-marigold) <i>Carex leptalea</i> (bristle-stalked sedge) <i>Carex trisperma</i> (three-fruited sedge) <i>Clintonia borealis</i> (blue bead-lily) <i>Coptis trifolia</i> (gold-thread) <i>Cornus canadensis</i> (bunchberry) <i>Glyceria striata</i> (fowl manna grass) <i>Gymnocarpium dryopteris</i> (oak fern) <i>Impatiens capensis</i> (spotted jewelweed, spotted touch-me-not) <i>Mitella nuda</i> (naked mitrewort, naked bishop's-cap) <i>Onoclea sensibilis</i> (sensitive fern) <i>Osmunda cinnamomea</i> (cinnamon fern) <i>Thelypteris palustris</i> <i>Trientalis borealis</i>
Nonvascular plants	<i>Bazzania trilobata</i> <i>Hylocomium splendens</i> <i>Ptilium crista-castrensis</i> <i>Sphagnum</i> spp. <i>Trichocolea tomentella</i>

Rare Species

- *Arethusa bulbosa* (Dragon's Mouth Orchid)
- *Bartonia paniculata* ssp. *paniculata* (Green Screwstem)
- *Betula pumila* (Swamp Birch)

- *Carex arcta* (Northern Clustered Sedge) .
- *Carex gynocrates* (Northern Bog Sedge) .
- *Carex livida* (Livid Sedge)
- *Carex sartwellii* (Sartwell's Sedge)
- *Carex schweinitzii* (Schweinitz's Sedge) .
- *Carex sychnocephala* (Many-headed Sedge) .
- *Carex tenuiflora* (Sparse-flowered Sedge) .
- *Carex vaginata* (Sheathed Sedge) .
- *Corallorhiza striata* var. *striata* (Striped Coralroot)
- *Cypripedium arietinum* (Ram's Head Lady's Slipper)
- *Emydoidea blandingii* (Blanding's Turtle)
- *Neottia auriculata* (Auricled Twayblade)
- *Neottia convallarioides* (Broad-lipped Twayblade)
- *Pyrola asarifolia* ssp. *asarifolia* (Pink Shinleaf)
- *Sparganium natans* (Small Bur-reed)
- *Symphyotrichum boreale* (Northern Bog Aster)
- *Trollius laxus* (Spreading Globeflower)
- *Valeriana uliginosa* (Marsh Valerian)

Threats

Northern white cedar swamps are threatened by development and its associated run-off (e.g. agricultural, residential, roads, railroads), habitat alteration and recreation overuse.

E. Mesotrophic Dimictic Lake:

General Description

This is Upper Saranac Lake and it is trophically and biologically in-between an eutrophic and an oligotrophic lake.

In the past several decades Upper Saranac Lake has been impacted by algal blooms, excessive nutrient inputs and invasive aquatic plants. Recently, concerted community efforts have sought to reverse those disturbing negative trends. However, the lake has experienced recent algal blooms. As a mesotrophic lake, Upper Saranac Lake is vulnerable to impacts from increased nutrient inputs.

V. Application of some wetlands regulations- Value

Attached is a supplemental appendix (Summary of Information Related to Wetland Value Rating and Standard for Permit Issuance) describing the characteristics of this wetland complex and the value ratings (by functional type) that this wetland complex possesses. See attached appendix.

In summary, it has 6 value ratings of "2" that raise it to a value rating of "1" plus the presence and use by listed rare species (bald eagle and loon) that alone raise it to value rating of "1."

The 1988 permit called the value rating to be "2" but this new information shows that not to be accurate.

The standard for review of development activities as a "1" are so strict as to preclude approval of the proposed action.

VI. Discussion Findings

A. Significance of wetland value rating

The standard for review of development activities as a "1" are so strict as to preclude approval of the proposed action. To be specific, the entire wetland complex will not be preserved and loss and degradation of some part of the wetland will occur.

B. Potential Impacts Identified Common Threats and impacts

More specifically, should the outcomes of the proposed development of Lot 9 occur consider the following.

The Natural Heritage Site identifies a series of common threats to these communities that are relevant and appropriate to consider under the anticipated circumstances of development of Lot 9 and which can be summarized in the following list:

- Development (placement of structures, filling and clearing for intensive uses)
- Nutrient inputs (from sediment, pollution, run-off)
- Habitat alteration (filling and trash dumping and in the case of cedar swamps - excessive logging, planting tree plantations)
- Alteration to the natural hydrological regime (e.g., impoundments, blocked culverts, beaver)
- Recreational overuse (e.g., hiking trails, ATVs).
- Invasive species (human activities help to introduce them to natural communities)

Please note each community type has special sensitivities, but the 1988 APA permit sought to address many of these concerns which were at the time an issue and continue to be of concern, if not more pressing, in May, 2021.

Based on the review these are the proposed development activities of great concern on Lot 9, and include:

- Clearing of wetland vegetation on Lot 9 will result in direct loss of wetland values and functions and will result in hydrologic changes leading to indirect impacts to adjoining resources, such as Upper Saranac Lake, to on-site streams, and to the other wetland habitats. Clearing and maintenance of this clearing will lead to susceptibility to invasion by non-native species
- Nutrient run-off from the Lot 9 uplands (both impervious surfaces and an inappropriately placed, on-site septic system) will enter the nearby oligotrophic fen (bog) and impact its species composition, possibly resulting in loss of some types of "bog" plants and susceptibility to invasion by non-native species.
- Development of structures along the shoreline of Lot 9 will result in direct loss of wetland habitat functions and values. Additionally the shoreline aesthetic value will be impacted significantly by the size and scale of structures.

To emphasize, these impacts are still of concern; perhaps more so as climate change effects become more pronounced, leading to hydrologic changes and increased temperatures and stress on current fish and wildlife populations.

C. Rare species

Following is a preliminary list the species using information from the DEC Natural Heritage Site about these communities) with potential for harm .

- Common Loon
- Bald eagle

Surveys may find other species such as sedges and orchids and native pollinators that inhabit this wetland complex.

VII. Conclusions

Based on this information, the APA should not proceed and the existing permit conditions should be upheld pending development of conclusive information that would show "no undue adverse impacts" to the natural resources.

By fast tracking this project in a process that may be called a "Permit Amendment Checklist," the Agency is developing a deficient and inconclusive public record.

The 1988 permit conditions are still very relevant. Although some of the septic system technology has changed over the years, nutrient additions to the wetland, and to streams emptying into and Upper Saranac Lake are still likely. Furthermore, over the years, these resources which the original permit sought to protect have become more precious and valued. Threats and pressures to the resource have increased, not decreased, since 1988.

The APA must certainly secure more detailed cultural, aesthetic, hydrological, water quality and wildlife , plant species observations to inform decision-making on this unique and protected parcel. As more information is available on the resources, this scientific information will lead to more certainty about the analysis of adverse impacts identified in this report.

Additional observations and data prior to development of Lot 9 must include:

Cultural and aesthetic

- Value of historic and archeological features in and near the wetland, such as water source for the Music Camp and subsequent development of Saranac Inn;
- Simulation of shoreline development to determine visual impacts;
- Survey of the Upper Saranac Lake to determine importance of the present shoreline aesthetics;

Hydrological:

- Location and flow of all streams on Lot 9, and on adjacent parcels;
- Ground water elevations and seasonal fluctuation;
- Freshwater replenishment between the lake and the wetland;

Water quality

- Groundwater transects across the wetland complex;
- Water quality data from the shallow bay in Upper Saranac Lake;

Biological

- Seasonal species occurrence in wetland and along Upper Saranac Lake shoreline;
- Feeding, nesting and nesting information for raptors, water birds, and shorebirds in wetland and along Upper Saranac Lake shoreline;
- Observations of mammal use of wetland complex;

Wetland

- Mapping of vegetation cover types to correlate with species occurrence information;
- Mapping during July or August to show the location of wetland plant species in the shallow bay and on the edge of the mapped palustrine Deerwood Fen out into Upper Saranac Lake;
- Assessment of invasive aquatic plants in this bay.

VIII. Appendices

- B. Ecological Communities
- C. Annotated Deerwood and Vicinity
- D. Summary of Information Related to Wetland Value Rating and Standard for Permit Issuance); Value Rating of Deerwood Fen
- E. List of some photos (with digital filenames)
- F. Photo Contact Sheet (these 27 images are available in digital files)

Appendix: Ecological Communities of Deerwood Fen

Pond – bog pond

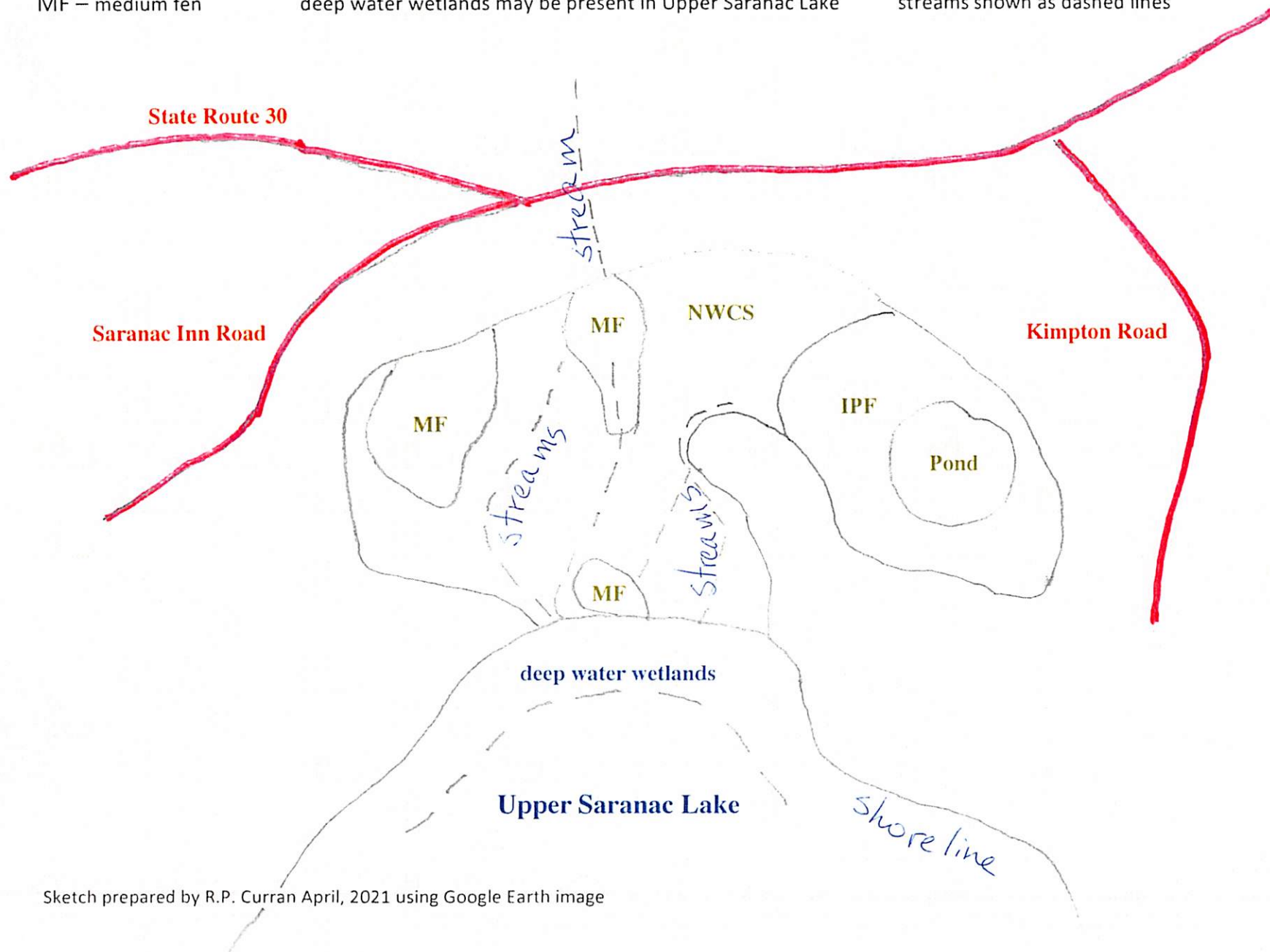
NWCS – northern white cedar swamp

IPF – inland poor fen

MF – medium fen

deep water wetlands may be present in Upper Saranac Lake

streams shown as dashed lines



Sketch prepared by R.P. Curran April, 2021 using Google Earth image

Deerwood and vicinity

unnotated

Legend



Google Earth

© 2021 Google

1000 ft

Summary of Information Related to Wetland Value Rating and Standard for Permit Issuance.

From Adirondack Park Agency Rules and Regulations

Section 578.5

Method for determining the overall value of the "Deerwood" wetland, a complex approximately 19 acres in size.

The appropriate reference from the applicable rule (from Section 578.5) is highlighted.

ITEM	"Value"	NOTES
Category: Related to Values of Particular Wetland Covertypes		
(a) bogs	2	
(c) emergent marsh	2	
(f) shrub swamp	3	
(g) two or more structural types	2	"Trees and shrubs" plus low grass like community (in this case rushes and sedges) and open water; equals 3 structural types.
Category: Wetlands Related to Surface Water Systems		
(k) Wetlands associated with open water	2	Presence of both the bog pond and the inter-digitated streams flowing directly into Upper Saranac Lake, with which there is a direct surface contact. If there were more than 20 acres it would automatically raise this value to "1". It remains to be investigated during the growing season whether additional wetlands in the shallow water of the bay will increase the acreage of wetlands related to surface water systems and therefore increase the value rating of the wetland to "1".
Category: Wetlands with Values due to Productivity or Diversity		
(m) Wetlands with unusual species abundance or diversity	2	Unusual diversity of both plants and wildlife. See diverse list of orchids and sedges
Category: Wetlands with Values due to Presence of Threatened or Endangered Species		
(p) Wetlands with significant evidence of use as key habitat for endangered or threatened wildlife species	1	Documented use by bald eagle (Threatened) and common loon (Special Concern)
(q) Wetlands containing an endangered or threatened plant species	1	Presence of listed plant species is unknown, but probable, if a detailed botanical survey had been accomplished. See Natural Heritage List in this report of likely listed species.
Category: Wetlands with Values due to Social Factors		
(w) Wetlands of demonstrable historical significance	2	There are remnants of structures that indicate the historical use for the old ice industry, either for local subsistence use or commercial production. Probably more than 100 years old.
(x) Wetlands that contribute significantly to open space or aesthetic values in a hamlet, moderate intensity or low intensity use area	3	Unusually the Low Intensity classified wetland (mainly) provides aesthetically significant shoreline for this portion of Upper Saranac Lake. The shoreline of the project site is approximately 1500 feet.

Number of Value ratings as "3" = 2

Number of Value ratings as "2" = 6

Section 578.6 Method for determining overall wetland value.

Where a wetland contains multiple values based upon more than one factor listed in section 578.5 of this Part:

- (a) The overall wetland value will be no lower than its highest associated value.
- (b) Three or more medium value characteristics (3) will raise a wetland associated value to high (2).
- (c) Three or more high value characteristics (2) will raise a wetland associated value to highest (1).

Additive benefit of multiple Value Ratings of "2" raises the Overall Wetland Value to "1," Irrespective of the presence and use by "listed" plants and wildlife which also give an Overall Wetland Value of "1." Similarly with respect to wetlands in "open water" which may as noted raise it to "1" automatically.

Section 578.10 Issuance of permits.

(a) Unless the economic, social and other benefits to be derived from the activity proposed compel a departure from these guidelines, the agency shall not issue a permit for regulated activities in the following wetlands unless the findings set forth below are made.

(i) Wetlands rated 1.

The proposed activity:

- (i) would be compatible with preservation of the entire wetland; and
- (ii) would not result in degradation or loss of any part of the wetland or its associated values.

Photo Image Index with Description

FILENAME	DESCRIPTION	
Deerwood_ - 25.jpeg	Bog pond, leatherleaf, black spruce, larch	1
Deerwood_ - 26.jpeg	Bog, sheep laurel; bog rosemary, black spruce,	2
Deerwood_ - 1.jpeg	Platanthera clavellata, SMALL GREEN WOOD ORCHID	3
Deerwood_ - 21.jpeg	Deerwood Fen and lake shore	4
Deerwood_ - 22.jpeg	Deerwood Fen with stream and lake shore	5
Deerwood_ - 23.jpeg	HoA foot trail in Fen	6
Deerwood_ - 8.jpeg	Ice House 1909	7
Deerwood_ - 6.jpeg	Deerwood cistern	8
Deerwood_ - 24.jpeg	Stream along Lot 9 line	9
Deerwood_ - 15.jpeg	stream through northern white cedar swamp	10
Deerwood_ - 11.jpeg	Carex echinata, star sedge	11
Deerwood_ - 9.jpeg	Carex echinata, star sedge	12
Deerwood_ - 16.jpeg	Carex gynandra , nodding sedge	13
Deerwood_ - 17.jpeg	Carex gynandra , nodding sedge	14
Deerwood_ - 1 (1).jpeg	Carex intumescens, bladder sedge	15
Deerwood_ - 2.jpeg	Carex leptalea (Bristle-stalked Sedge);	16
Deerwood_ - 19.jpeg	Carex magellanica, bog sedge	17
Deerwood_ - 20.jpeg	Carex magellanica, bog sedge	18
Deerwood_ - 3.jpeg	Carex magellanica, tall Bog-Sedge	19
Deerwood_ - 4.jpeg	Carex magellanica, tall Bog-Sedge	20
Deerwood_ - 10.jpeg	Carex scabrata, rough sedge	21
Deerwood_ - 7.jpeg	Carex scabrata; rough sedge;	22
Deerwood_ - 5.jpeg	Corallorhiza trifida, yellow coralroot	23
Deerwood_ - 12.jpeg	Eleocharis elliptica elliptic spikerush	24
Deerwood_ - 18.jpeg	Plagiomnium cuspadatum; bright penny moss	25
Deerwood_ - 13.jpeg	Pogonia ophioglossoides , rose pogonia	26
Deerwood_ - 14.jpeg	Rhynchospora alba , white beak-rush	27

NYSCEF DOC. NO. 8



Deerwood fen

Carex intumescens, bladder sedge

June 11, 2020 at 2:24:24 PM

Deerwood_ - 1.jpeg



Deerwood_ - 1 (1).jpeg

Platanthera clavellata, SMALL GREEN WOOD ORCHID

June 11, 2020 at 2:35:55 PM

Deerwood_ - 1 (1).jpeg



Deerwood fen

Carex leptalea (Bristle-stalked Sedge); Deerwood

June 11, 2020 at 2:49:38 PM

Deerwood_ - 2.jpeg



Deerwood fen

Tall Bog-Sedge *Carex magellanica*

June 11, 2020 at 2:51:04 PM

Deerwood_ - 3.jpeg

NYSCEF DOC. NO. 8



Deerwood fen

Tall Bog-Sedge *Carex magellanica*

June 11, 2020 at 2:56:00 PM

Deerwood_ - 4.jpeg



Deerwood Fen Corallorhiza trifida

Deerwood Fen Corallorhiza trifida

June 11, 2020 at 3:09:53 PM

Deerwood_ - 5.jpeg

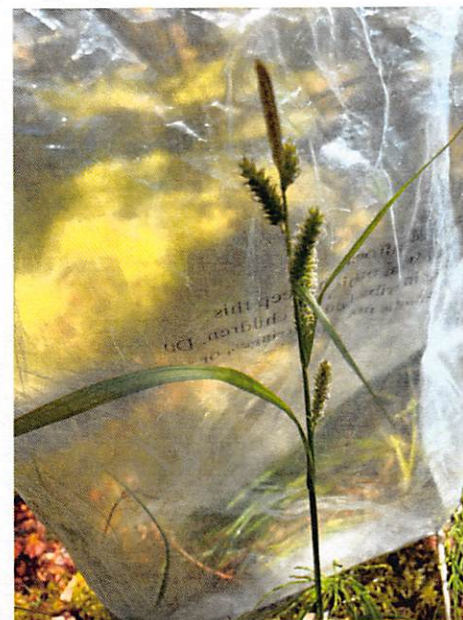


Deerwood fen

Deerwood cistern

June 11, 2020 at 3:14:36 PM

Deerwood_ - 6.jpeg



Deerwood fen

Carex scabrata; rough sedge; Deerwood Fen

June 11, 2020 at 3:17:17 PM

Deerwood_ - 7.jpeg

NYSCEF DOC. NO. 8

RECEIVED NYSCEF: 07/26/2021

**Deerwood fen**

Deerwood; Ice House 1909

June 11, 2020 at 3:26:24 PM

Deerwood_ - 8.jpeg

**Deerwood_ - 10.jpeg**

Deerwood Fen; Carex scabrata

June 21, 2020 at 8:53:09 AM

Deerwood_ - 10.jpeg

**Deerwood_ - 9.jpeg**

Carex echinata; Deerwood Fen

June 21, 2020 at 8:16:51 AM

Deerwood_ - 9.jpeg

**Deerwood_ - 11.jpeg**

June 21, 2020 at 12:17:19 PM

Deerwood_ - 11.jpeg



Deerwood_ - 12.jpeg

Deerwood Fen; *Eleocharis elliptica*

June 26, 2020 at 8:39:27 AM

Deerwood_ - 12.jpeg



Deerwood_ - 13.jpeg

Deerwood Fen; *Pogonia ophioglossoides*

June 26, 2020 at 8:45:20 AM

Deerwood_ - 13.jpeg



Deerwood_ - 14.jpeg

Deerwood Fen; *Rhynchospora alba*

June 26, 2020 at 8:51:34 AM

Deerwood_ - 14.jpeg



Deerwood_ - 15.jpeg

Deerwood Fen; stream through northern white cedar swamp

June 26, 2020 at 8:55:22 AM

Deerwood_ - 15.jpeg



Deerwood_ - 16.jpeg

Deerwood Fen; *Carex gynandra*

June 26, 2020 at 9:10:30 AM

Deerwood_ - 16.jpeg



Deerwood_ - 17.jpeg

June 26, 2020 at 9:11:12 AM

Deerwood_ - 17.jpeg



Deerwood_ - 18.jpeg

Plagiomnium cuspadatum; Deerwood Fen

June 26, 2020 at 9:11:51 AM

Deerwood_ - 18.jpeg



Deerwood_ - 19.jpeg

July 11, 2020 at 2:34:34 PM

Deerwood_ - 19.jpeg

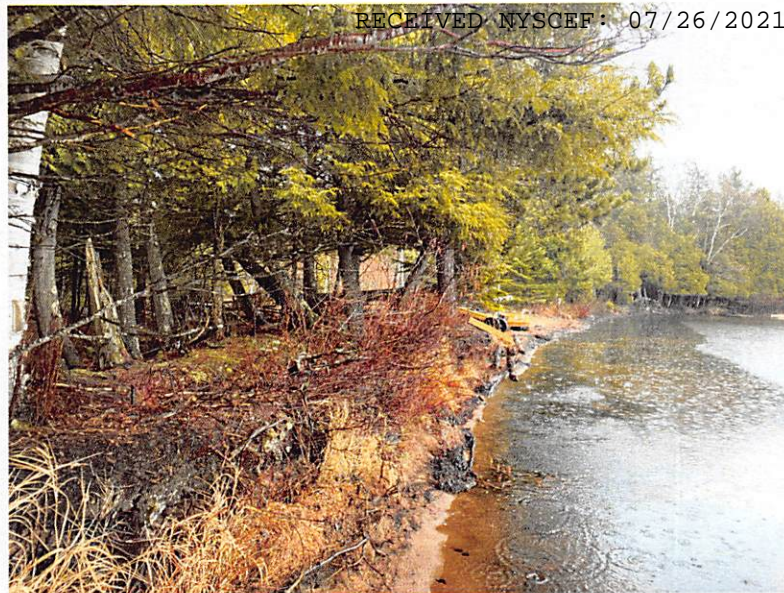


Deerwood_ - 20.jpeg

Deerwood Fen; Carex magellanica

July 11, 2020 at 4:17:08 PM

Deerwood_ - 20.jpeg



Deerwood_ - 21.jpeg

Deerwood Fen and Lake

April 15, 2021 at 9:46:34 AM

Deerwood_ - 21.jpeg



Deerwood_ - 22.jpeg

Kern Deerwood Road

April 15, 2021 at 9:52:39 AM

Deerwood_ - 22.jpeg



Deerwood_ - 23.jpeg

Deerwood Fen; HoA foot trail

April 15, 2021 at 9:52:56 AM

Deerwood_ - 23.jpeg

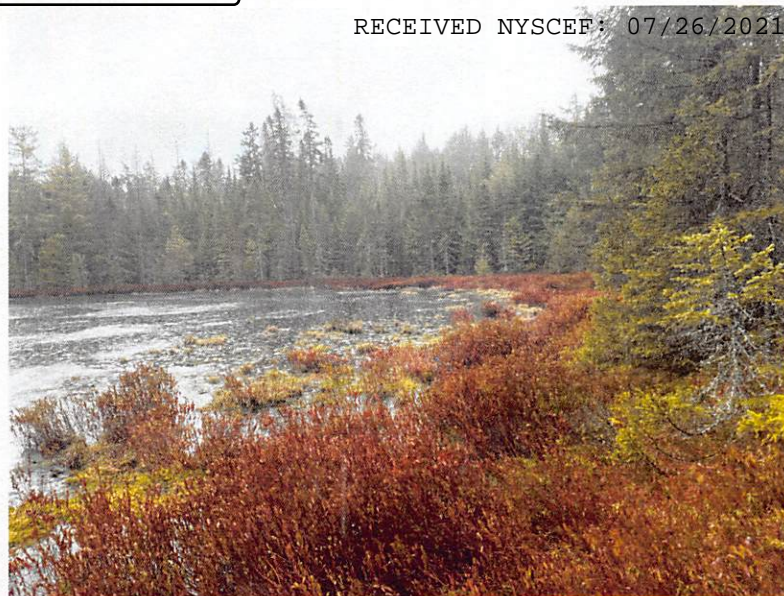


Deerwood_ - 24.jpeg

Deerwood Fen; stream along Lot 9

April 15, 2021 at 10:11:34 AM

Deerwood_ - 24.jpeg



Deerwood_ - 25.jpeg

Deerwood Fen; bog pond, leatherleaf, black spruce, larch

April 15, 2021 at 10:22:02 AM

Deerwood_ - 25.jpeg



Deerwood_ - 26.jpeg

Deerwood; sheep laurel; bog rosemary, black spruce, creeping snowberry

April 15, 2021 at 10:22:05 AM

Deerwood_ - 26.jpeg

RESUME**Raymond Powers Curran**

416 Park Avenue, Saranac Lake, NY 12983 USA (518) 524-2446 (mobile)

RCURRAN@ADKIG.COM**Educational Background**

M.S. (Plant Ecology) - 1974. SUNY- College of Environmental Science and Forestry. Thesis Subject - "Vegetational Development of the Plains of the Oswegatchie." Major Professor - Dr. Edwin H. Ketchledge.

M.S. Forestry - 1974. Syracuse University.

Career Interests

Bringing ecological science into community development, land use analysis and environmental interpretation. Promoting mapping technology (GIS) to assist in designing and communicating appropriate sustainable development strategies, especially landscape level conservation strategies.

Employment**Adirondack Information Group, LLC (www.adkig.com)**

November, 2004 to Present

Ecologist and President of this consultancy to provide GIS, environmental interpretation, environmental analysis, and information management services.

Working on land use issues for the Henry and Mildred Uihlein Foundation at Lake Placid's Heaven Hill Farm, including a comprehensive community trail system and enhancement of environmental footprint in ongoing activities at the Farm.

Projects include ecological assessment for a large sustainable development / open space protection subdivision, a windfarm, a residential subdivision, and for the Lake Placid Shoreowner's Association in conjunction with new development on the Lake. I am also involved in promoting environmental interpretation and "green" development that enhances the appreciation and use of Adirondack resources and builds community sustainability.

Clients include private landowners (both industrial and residential), several not-for-profit organizations, science based research organizations, and local and State government.

Adirondack Park Agency

August, 1973 to October, 2004.

Title: Natural Resource Supervisor - Duties include executive and program management of the Resource Analysis and Scientific Services Unit (RASS), project analysis, State land planning, wetland/watershed protection planning, GIS analysis, and environmental impact assessment.

Projects: State Land, Local Planning and community outreach through information and technology transfer and training. Team Leader for interdisciplinary effort to implement a plan for conducting a trend analysis of key cultural and natural resource factors for strategic planning purposes.

Executive Director – Acting Executive Director for many months during absence of Executive Director. Complete budgeting, staffing, legislative and public relations responsibilities.

Agency project administrator for ten EPA funded wetland protection projects; awards made since 1993 total \$1.7 million.

Participant in inter-agency technical working groups on subjects including: cumulative impacts from development; regulatory reform; agency outreach, enforcement, invasive plant dynamics, landscape wildlife species, nature reserve planning, climate change, and citizen and stakeholder action teams, including the Lake Champlain Eco-team.

SUNY – Plattsburgh

Member of the Adjunct Faculty, Center for Earth and Environmental Science, State University of New York - Plattsburgh, 1988 to present. Assistant in the instruction of a senior level image processing/GIS course at SUNY Plattsburgh - Spring semester, 1988. Instructor 1993, 1994, 1995, 1996, 1999, 2000, 2005 for upper level course: "Wetlands Ecology and Management."

Skidmore College

Adjunct faculty with the college, "University Without Walls."

SUNY - College of Environmental Science and Forestry

Graduate Teaching Assistant for courses in Ecology of Forest Communities, Plant Classification, and Dendrology - September, 1971 to June, 1973.

ActivitiesNorthern Current

Treasurer / Secretary and board member for community based annual music festival.

Northern Forest Atlas Foundation

Treasurer / Secretary and Director of this nonprofit corporation that seeks to advance ecological and taxonomic descriptions of the Northern forest biome of Eastern North America.

Town of Wilmington Planning Board

Appointed to a term on the Planning Board -- 2015-2016.

Adirondack Recreation Strategy Committee

An informal group to devise and promote an Adirondack wide strategy to enhance Park recreational opportunities. This committee is under the auspices of the Adirondack Association of Towns and Villages and organized by James McKenna and Bill Farber. It reports to AATV and to the Regional Economic Development Councils (three that cover the Park), the Executive Chamber and New York State legislators.

Common Ground Alliance

A core team committee member of this coalition of local government and non-profit groups seeking to empower communities to care for the people, the land and the future of the Adirondacks, an urgent priority to assure lasting Park protection and management. Recognition March 2009 award from the Adirondack Association of Towns and Villages, Local Government Review Board, Adirondack Park Agency for efforts.

Adirondack Sustainable Communities, Inc.

Currently Senior Advisor, founding Director, past President, and Chairperson of this nonprofit corporation that seeks to advance sustainable development issues in order to promote economic development and environmental conservation.

Adirondack Research Consortium, Inc.

Founding Director of this non-profit institution that promotes Adirondack research and information exchange, including the publication: *Adirondack Journal of Environmental Studies*. In 2017 given the Thorndike Adirondack Achieve

Annual Meeting of the Ecological Society of America

For the 90th Annual ESA meeting in Montreal on August 7, 2005, organized a GIS workshop on "Community to the Globe: Landscape Analysis using Geospatial Tools." Paper presentation entitled "Utilisation de GIS pour la protection de parc dans Adirondacks." "Use of GIS for park protection in Adirondacks."

Lake Champlain Basin Program Technical Assistance Committee

Member of this committee that advises the LC Basin Program Steering Committee.

Smithsonian Institution

Lecturer to the Smithsonian's Summer field seminar entitled "Exploring the Adirondacks" on natural history and ecologic topics with Dr. E. H. Ketchledge. July 1992, 1993.

New York Times

Naturalist accompanying Nathan Farb (noted photographer and author) on a *New York Times* sponsored photo expedition to Ecuador and the Galapagos Islands, July, August 2002.

Clean Air/ Clean Water Institute

Instructor for the Institute. using field and lab techniques, we attempted to describe the interaction of acid precipitation on watershed properties, including impact on wetland dynamics. Sessions were held at Shelburne, VT. Montreal, PQ and Paul Smiths, NY. This program is sponsored by the Adirondack Teachers Institute and accredited by the New York State Education Department for graduate teaching credits to fulfill continuing education requirements.

Community Experience

Past President of the Ausable Valley Chapter of Habitat for Humanity and served on the Board of Directors for 8 years. Recently worked with the Town of Wilmington on a community visioning process and now on a community revitalization project. Recipient of the Eagle Scout Award and, as an adult, continued participation with the Boy Scouts of America as a Troop Committeeman and Member of the District Advancement Committee.

Past volunteer trustee of the Adirondack Nature Conservancy (a chapter of The Nature Conservancy) and director of the Adirondack Land Trust, based in Keene Valley, New York. Vice-Chair of the Conservation Committee and Chair of the Communications and Education Committee.

Other Relevant Experience

Expedition member on FAART Alaskan Noatak River trip to explore and observe the reaches of North America's largest undeveloped watershed, including portions of the Gates of the Arctic National Park. My specialty with this quasi-scientific expedition was as terrestrial ecologist. July, August 1991.

Consultant to New York Governor Mario Cuomo's Commission on the Adirondacks in the 21st Century. Author of three technical papers. April 1989 - May 1990.

Experienced lecturer on wetlands ecology, GIS, natural area management, and park ecology topics.

Selected Publications

1. "How Much is Enough? Distribution and Protection Status of Habitats in the Adirondacks" Michale J. Glennon and Raymond P. Curran. *Adirondack Journal of Environmental Studies*, 2013.
2. "Adirondack GIS: Resources, Wilderness, and Management." E. Allen, R. Curran, S.. Halasz, J. Barge, S. McNulty, A. Keal, and M. Glennon. Pages 1135-1168 in the "ASPRS Manual of Geographic Information Systems." Marguerite Madden, ed. American Society of Photogrammetry and Remote Sensing, Bethesda, MD. 2009. 1352pp.
1. "A spatially-explicit watershed-scale analysis of dissolved organic carbon in Adirondack lakes." Charles D. Canham, Michael L. Pace, Michael J. Papaik, Avram G. B. Primack, Karen M. Roy, Roxanne J. Maranger, Raymond P. Curran, and Daniel M. Spada. *Ecological Applications*, 14(3), 2004, pp. 839-854.
2. "A research agenda for the Adirondacks." Ross Whaley, Ray Curran, and Steve Erman. *Adirondack Journal of Environmental Studies*, 2004.
3. "Cover Type Wetlands GIS Data for the Park - Almost There" Sunita S. Halasz, Raymond P. Curran, Daniel M. Spada, John W. Barge. 10th Annual Meeting Adirondack Research Consortium. May 28,29, 2003. Saranac Lake, NY.
4. "A Grass Roots Initiative To Protect the Adirondacks from Non-Native, Invasive Plants: The Adirondack Park Invasive Plant Program" Hilary Oles, Sean Connin, Raymond Curran, Daniel Spada, Kenneth Kogut, John Falge, Bill Brown. 10th Annual Meeting Adirondack Research Consortium. May 28,29, 2003. Saranac Lake , NY.

5. "Watershed Protection of the Saint Lawrence River Watersheds with Special Consideration to Large Tracts of Land. Part Two: The Salmon/Trout, and Grasse Watersheds" Leslie Karasin, R. P. Curran, S. Halasz, D. M. Spada, J. W. Barge, E. B. Allen, D. J. Bogucki, K. M. Roy, C. Burkett, and C. C. Cheeseman. New York State Adirondack Park Agency, Ray Brook, NY. November, 2002. 95 pp.
6. "Adirondack Park Trends Analysis" Adirondack Journal of Environmental Studies, Vol. 9 No. 2, pages 5-6. 2002.
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