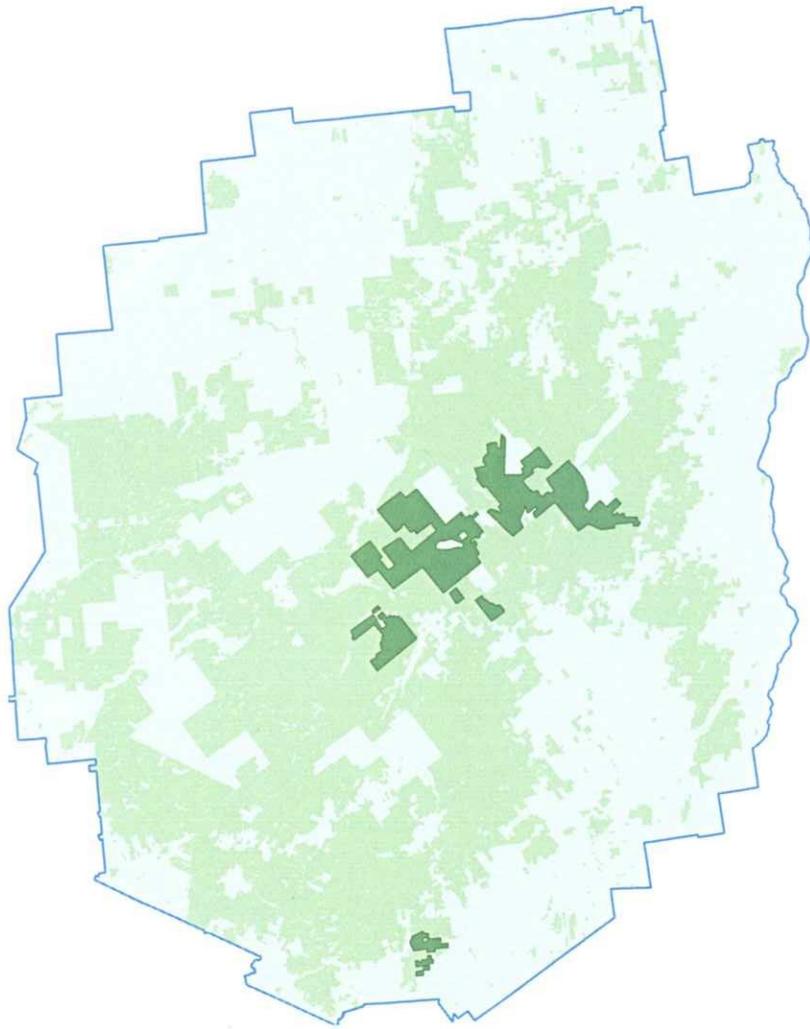


# FINCH-PRUYN BIOLOGICAL SURVEY

2000 - 20001

## SUMMARY OF RESULTS

Jerry Jenkins, November 2001



## CONTENTS

---

|      |   |    |
|------|---|----|
| 1    | GEOGRAPHY   | 2  |
| 1.1  | <i>Size, Location, Boundaries</i>   | 2  |
| 1.2  | <i>Topography &amp; Relief</i>  | 4  |
| 1.3  | <i>Rivers &amp; Lakes</i>   | 4  |
| 2    | SUMMARY OF FIELD STUDIES  | 6  |
| 2.1  | <i>Significant Plants</i>   | 6  |
| 2.2  | <i>Exceptional Communities</i>  | 8  |
| 2.3  | <i>Exceptional Scenery</i>  | 8  |
| 2.4  | <i>Bird Studies</i>   | 9  |
| 3    | THE MAJOR COMMUNITIES   | 10 |
| 3.1  | <i>Deciduous Forests</i>  | 10 |
| 3.2  | <i>Conifer Forests</i>  | 10 |
| 3.3  | <i>Mountain Conifers</i>  | 11 |
| 3.4  | <i>Conifer Swamps</i>   | 11 |
| 3.5  | <i>Alluvial Forests</i>   | 12 |
| 3.6  | <i>Sphagnum Bogs</i>  | 12 |
| 3.7  | <i>The Cedar Glade Fen</i>  | 15 |
| 3.8  | <i>Beaver flows and Other Open Wetlands</i>                                   | 16 |
| 3.9  | <i>Importance of the Open Wetlands</i>  | 18 |
| 3.10 | <i>Outcrops</i>   | 19 |
| 4    | IMPORTANCE AND CONNECTION OF THE FINCH<br>LANDS TO THE ADIRONDACKS AS A WHOLE | 22 |
| 5    | SUMMARY OF FINDINGS   | 23 |

## 1 GEOGRAPHY

### 1.1 Size, Location, Boundaries

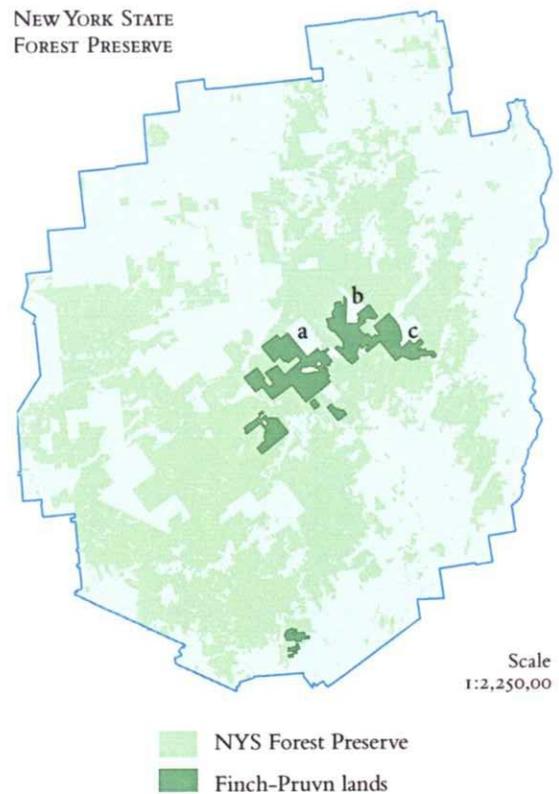
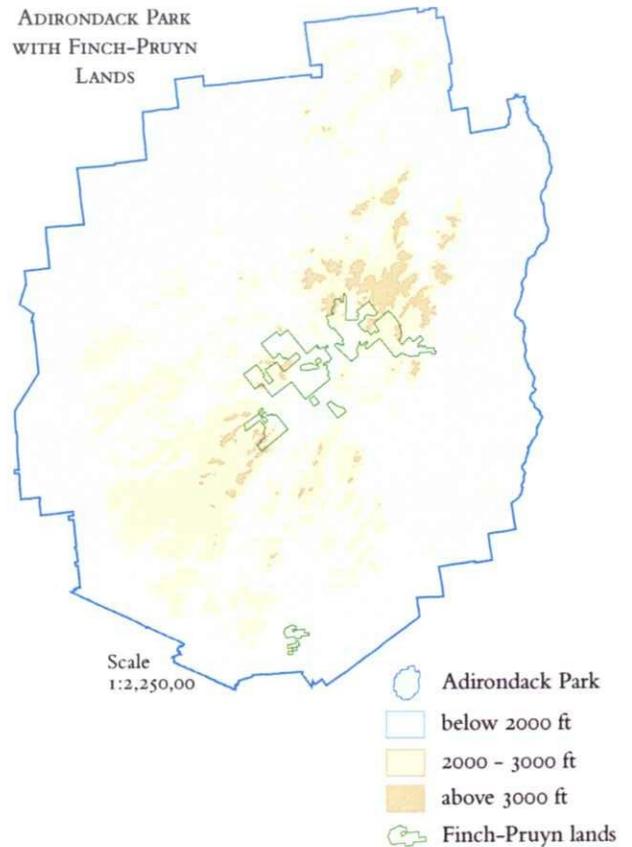
Finch Pruyn's Adirondack land consists of nine tracts, totaling approximately 167,000 acres, grouped into a northern unit of 137,000 acres and a southern unit of 29,000 acres.

The northern unit, which in turn contains three main tracts of land, is located in the center of the Adirondack Park, just to the south of the High Peaks. Its most northern tract lies on the southwest flank of the High Peaks, just south of Marcy and between the Boreas and Santanoni mountains. Its southern tract is at the edge of the Park's main southern mountains, which lie on two ridges trending southwest from Indian Lake that do not have a collective name. The middle tract lies in a high, fairly swampy watershed divide between Blue Mt Lake and the Hudson River.

The southern unit consists of four fairly small tracts centered on a group of rolling hills just west of the Sacandaga Reservoir, almost at the southern edge of the Park. It is quite pretty forest land but without the biological distinction of the northern unit, and will only occasionally be mentioned in this summary.

The northern unit is centered in, and almost completely surrounded by, the New York State Forest preserve. The only major private landholdings adjacent to it are the Huntington Forest (a), owned by Syracuse University; the National Lead lands (b), a former iron and titanium mine; and the Elk Lake tract (c), a private resort and club.

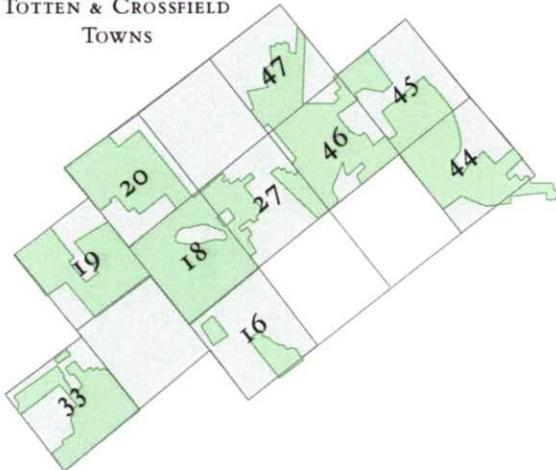
The Finch-Pruyne lands are, after the International Paper Company lands, the second largest private landholding in the Adirondack Park, and the one most centrally located within the Forest Preserve.



The northern unit lies mostly in the modern towns of Long Lake and Indian lake (Hamilton County), and Newcomb, Minerva, and North Hudson (Essex County). There is also a tiny piece in the town of Keene. The acreages shown are from our GIS maps, and are only approximate.

The property lines and some of the modern town lines are rotated about 38 degrees counterclockwise from true north. They follow the lot lines of the Totten & Crossfield, bought from the Indians and then forfeited to the King by Edward and Ebenezer Jessup in 1771, forfeited by the King to New York in 1882, and sold or granted by New York to a series of owners over the next fifty years.

TOTTEN & CROSSFIELD TOWNS

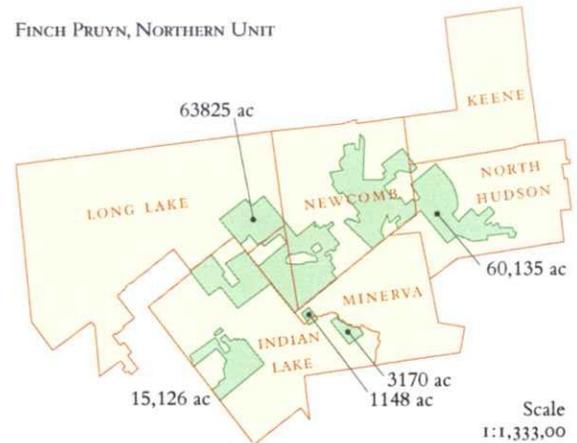


Much of Finch-Pruyn's northern unit was acquired in the mid- and late nineteenth century, when New York and Albany lumber- and railroad-men were trading Adirondack land by the town. Finch currently owns most of seven of the original towns – Totten & Crossfield 18, 19, 20, 33, 44, 45 & 46 – and substantial parts of 16, 27, and 47 as well.

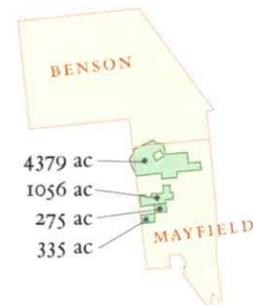
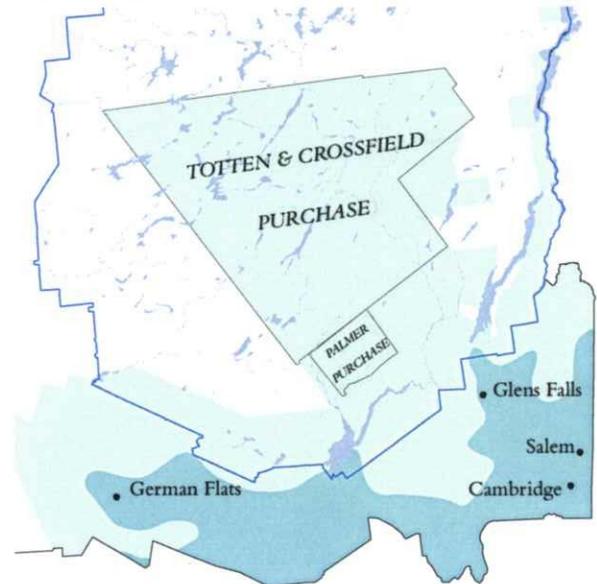
The southern unit, about a fifth the size of the northern, includes 7,016 acres in Fulton County, 8,250 acres in Saratoga County, 8,950 acres in Warren County, and 4,722 acres in Washington County.

[THE MAP IS INCOMPLETE: I NEVER HEARD ABOUT THE OTHER SOUTHERN LANDS UNTIL THIS MOMENT!]

FINCH PRUYN, NORTHERN UNIT



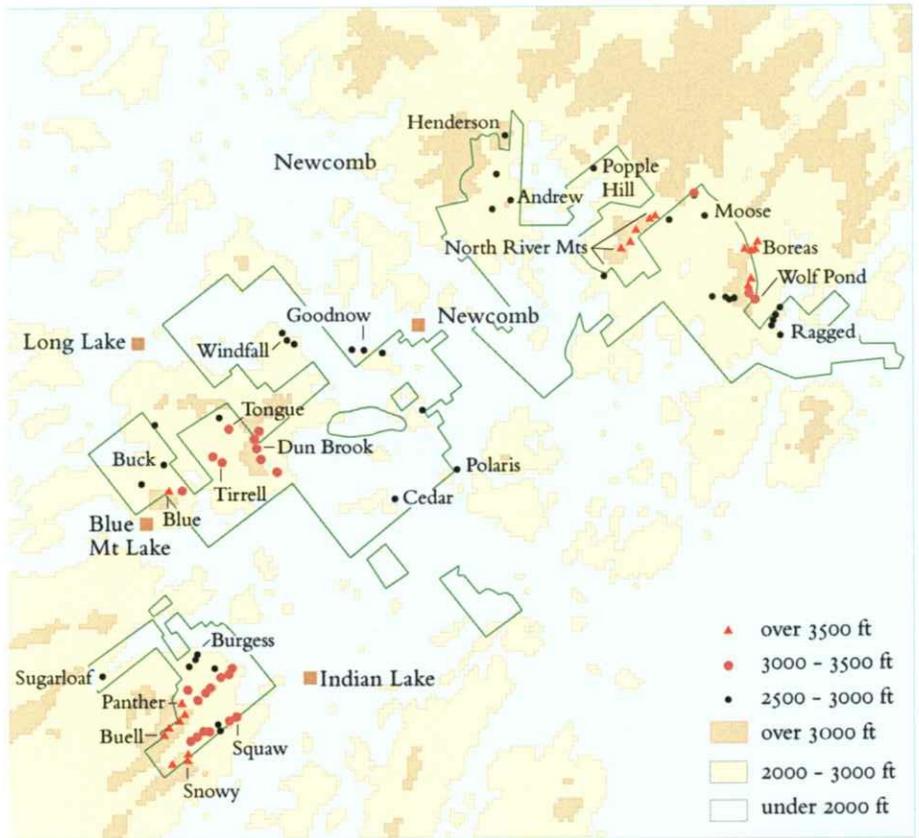
NORTHERN NEW YORK IN 1775



## HIGHLANDS & SUMMITS

### 1.2 Topography & Relief

The Adirondacks are a topographic dome, believed to have been created by a local hot spot somewhere deep below them. The center of the dome is in the High Peaks, in the northeast corner of the map. The northern unit lies just southeast of the High Peaks. Most of it is a high and rolling but not rugged plateau, between 1500 and 2500 ft elevation. The lowest points, both about 1300 ft, are at the far eastern end of the property, along the Blue Ridge Road, and near the eastern end of the Hudson River Gorge, east-northeast of Indian Lake. The highest points, between 3900 and 4000 ft, are on the slopes of Snowy and Panther Mountains in the southwest, and in the North River Mountains in the northeast. Roughly half of the property is between 1500 and 2000 ft, and most of the remainder between 2000 and 3000 ft. Only a few percent are above 3000 ft.



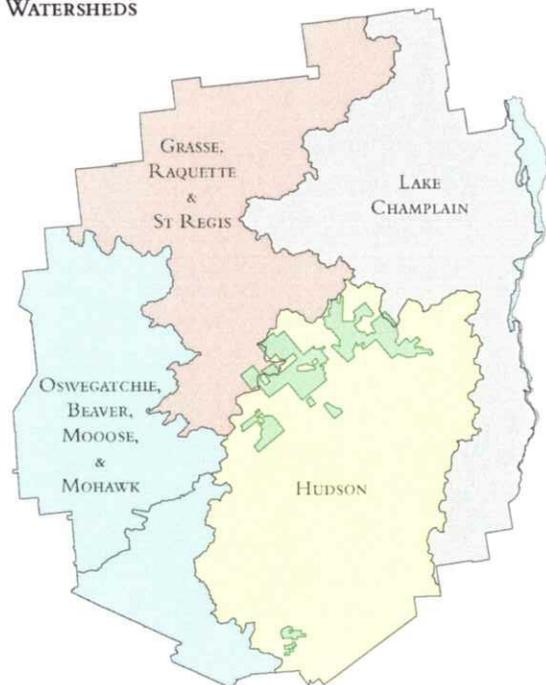
Scale 1:534,000

There are 22 named mountains with summits on or at the edge of the property, plus at least another sixty unnamed ones, the exact number depending on how separate you require a bump to be before you count it. Roughly 19 summits, in six named groups, rise above 1300 ft. All are continuously wooded, at least in the portions on Finch lands: no large open cliffs or alpine summits occur on Finch property.

### 1.3 Rivers & Lakes

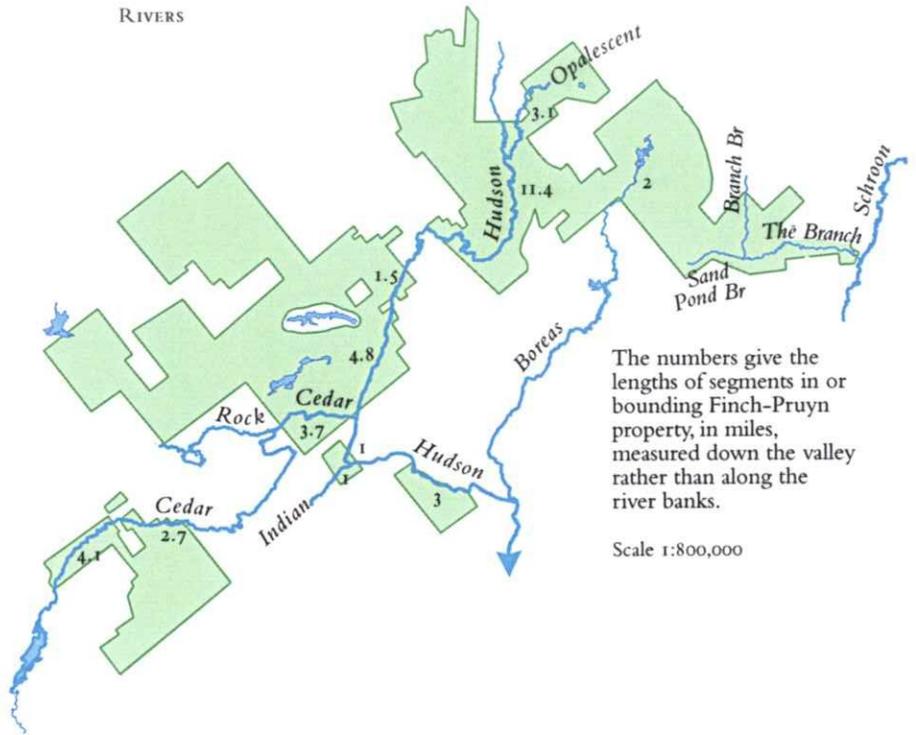
Much of the northern unit is drained by the Hudson and its tributaries the Opalescent, Cedar, and Indian. A small part in the far east drains east into the Schroon, and then south to the Hudson. A small part in the northwest drains west into the Raquette and then north to the St. Lawrence. The southern unit is next to, and drains into, the Sacandaga Reservoir, and then into the Hudson.

## WATERSHEDS



Four major rivers run through the property. All are important biologically and scenically. The Hudson, with about 22 miles, measured down-valley, in or bounding Finch lands, is the largest, longest, most central, and probably the most important in all respects. The Cedar, with about 11 miles within Finch lands, is much less used and known than the Hudson, but both extremely beautiful and of considerable biological interest. The Indian, of which only the last mile is in Finch lands, is heavily used recreationally and has a small but exceptional biological site at its mouth. The Opalescent, with 3 miles in Finch, has no outstanding individual biological features, but is very pretty, and, because of its position on the edge of the High peaks and the large amount of spruce in its flood plain, is perhaps the most boreal of the group.

RIVERS



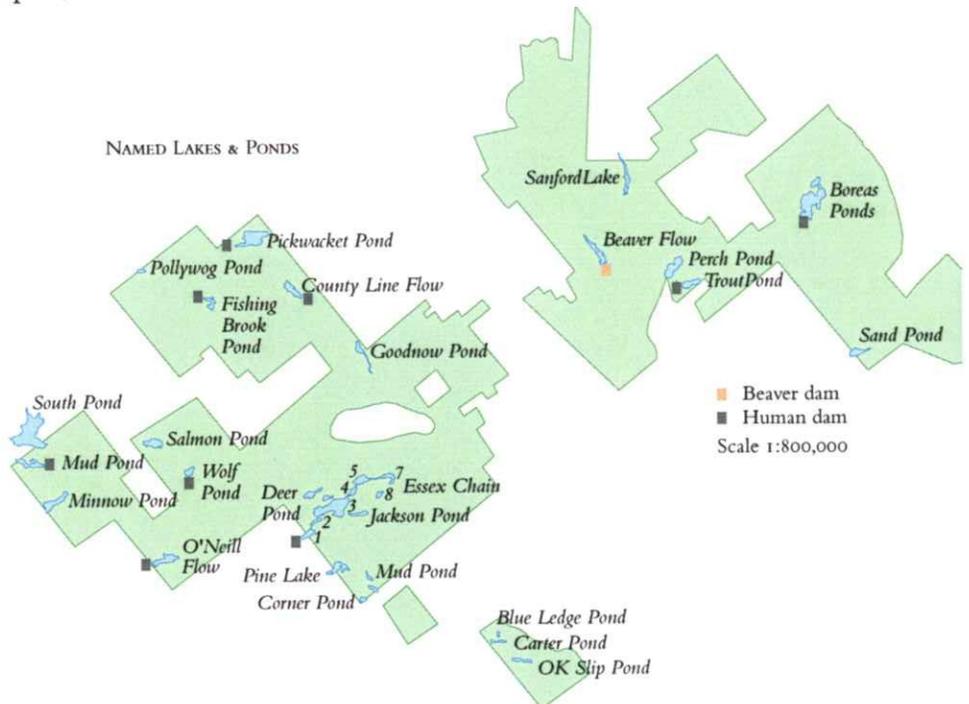
The numbers give the lengths of segments in or bounding Finch-Prun property, in miles, measured down the valley rather than along the river banks.

Scale 1:800,000

Of the smaller streams, the Boreas River and Sand Pond Brook are the most interesting, the Boreas because it drains a large wetland complex, and Sand Pond Brook because it has several hundred acres of undisturbed alluvial forest.

There are about 30 named lakes and ponds and at least 40 other small ponds on the Finch property. At least 16 of the named ponds, including the Boreas Ponds and the Chain Lakes, the two largest groups of ponds on the property, have had their water levels raised by people or beavers. Many of the dams were built over a century ago, to supply water for log drives. All are small – always less than 15 ft high and many less than 5 ft high – and none are currently used for power generation or to regulate flows.

NAMED LAKES & PONDS



■ Beaver dam  
■ Human dam  
Scale 1:800,000

## 2 SUMMARY OF FIELD STUDIES

I have spent a total of 35 working field days on this project, 20 in 2000 and 15 in 2001. In addition, 22 person-days were put in by Bryan Pfeiffer, Sarah Cooper-Ellis, and Sue Willams. Bryan did 10 days of bird survey work with me, 5 in 2000 and 5 in 2001. Sarah and Sue worked with me for 5 days each survey mosses and liverworts in 2000, and Sue worked another 2 days with me in 2001.

In addition there have been four field days when I have been visiting and discussing sites with Nature Conservancy staff, but only doing limited amounts of new field work.

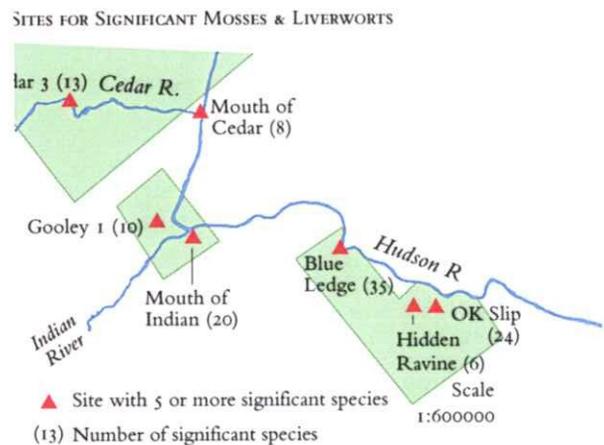
On 10 of our 35 working days we did both bird and plant work; on the other 25 days we did only plants.

In 2000 we did biological work at about 63 primary sites. Most were visited only once, but several of the interesting ones were visited two or three times. In 2001 we added about 31 new sites, and revisited 10 from the previous year.

### 2.1 Significant Plants

I count as significant those species that are either a) rare or uncommon in New York as a whole; b) rare or uncommon in the Adirondacks; or c) frequently encountered in the Adirondacks but rare elsewhere in the state. The latter I call regional specialties. Because our knowledge of the abundance of many uncommon species is very sketchy, and even more because there is no reason that the rarer of two species is automatically more vulnerable or more valuable, the differences between the different levels of rarity are probably not all that important. Any significant species, whatever the level of rarity, is a species that you have and a lot of other people don't have, and so worth being aware of.

We examined both vascular plants (everything from trees to ferns) and bryophytes, the mosses and liverworts. Altogether we found 95 significant species, of which about 37 are believed to be rare in New York State and 20-22 uncommon in New York State. Another 30 appear be rare or uncommon in the



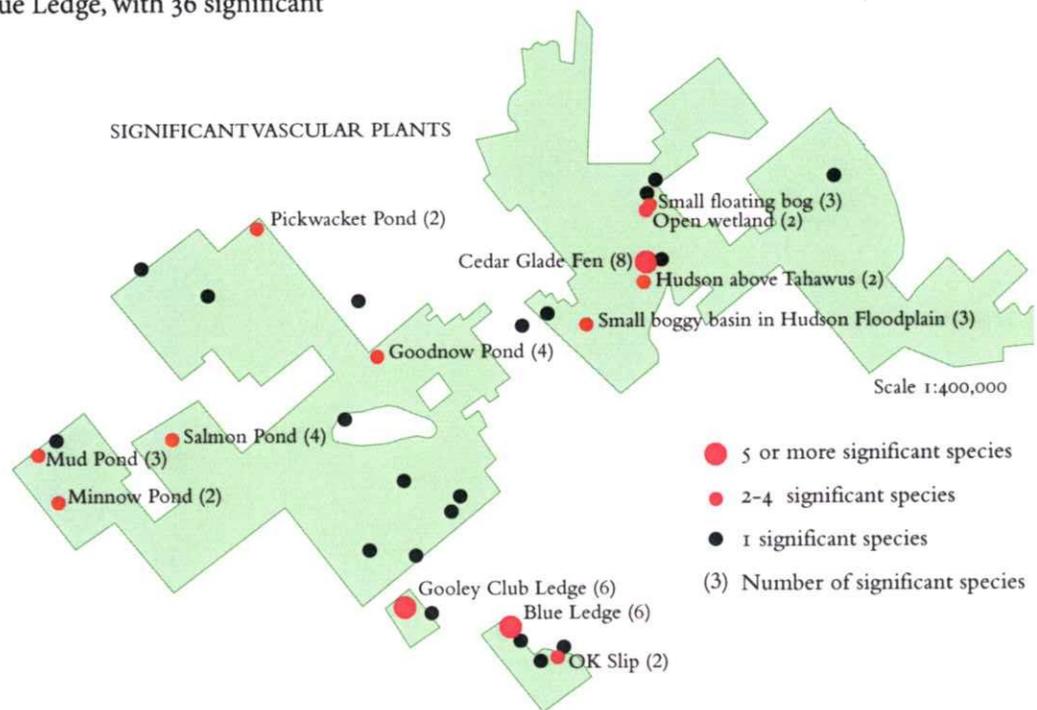
Adirondacks, but not in New York. This is, by a factor of several times, the largest number of significant species I have ever encountered on a single Adirondack survey.

*Bryophytes* We had approximately 142 individual records of 62 significant species of mosses and liverworts from 15 sites. Eight sites had six significant species or more. Seven of these eight were limy outcrops along the Cedar and Hudson Rivers; the other was the Cedar Glade Fen shown on the map of significant vascular plants. Blue Ledge, with 36 significant species, had the largest number of significant species in our study, and one of the largest we have encountered in any study.

The significant mosses we encountered, were almost entirely limited to limy cliffs and wetlands. Other significant Adirondack species can occur on large wet granitic ledges and in the alpine zone, but neither habitat occurs on the Finch property.

*Vascular plants* Significant records of vascular plants were more widely distributed but less numerous. We had approximately 62 records of significant vascular plants from 29 sites. Three of these sites – two limy ledges and a limy fen – had 6-9 significant species each. Another 10 sites had 2-5 significant species each, and the remaining sites had one significant species each.

The largest numbers of significant species, and virtually all the rare species were at limy sites: three limy ledges a small slightly limy bog, and a limy cedar fen. The remainder of the records, which were mostly regional specialties rather than rare or uncommon

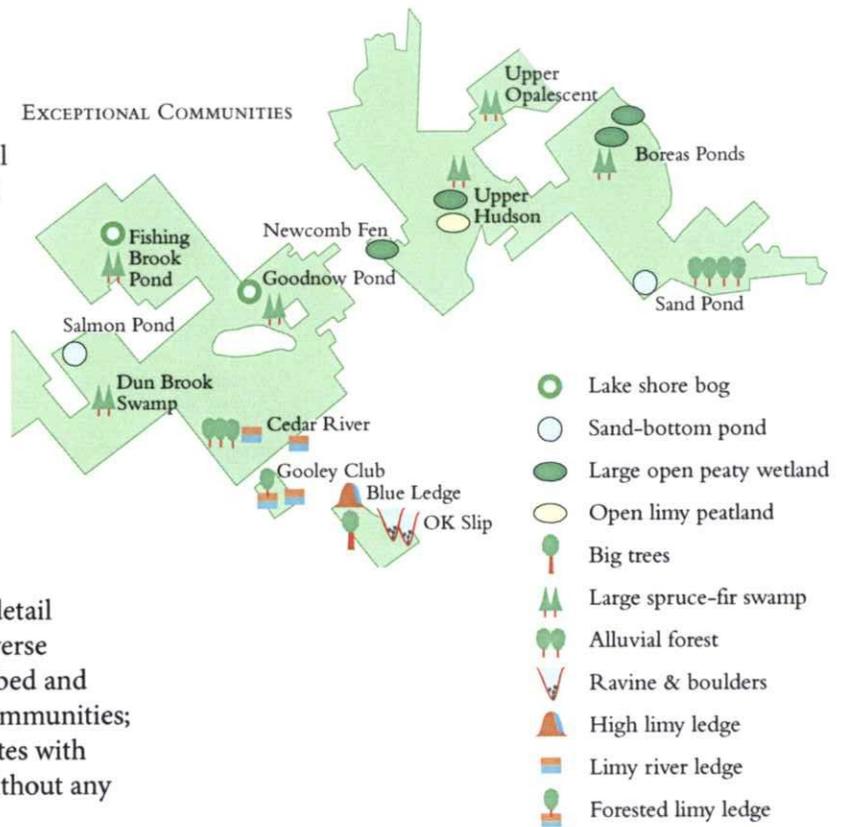


## 2.2 Exceptional Communities

By an exceptional community I mean one which is either particularly large, or unusual in composition or structure, or pristine and little modified by human activity.

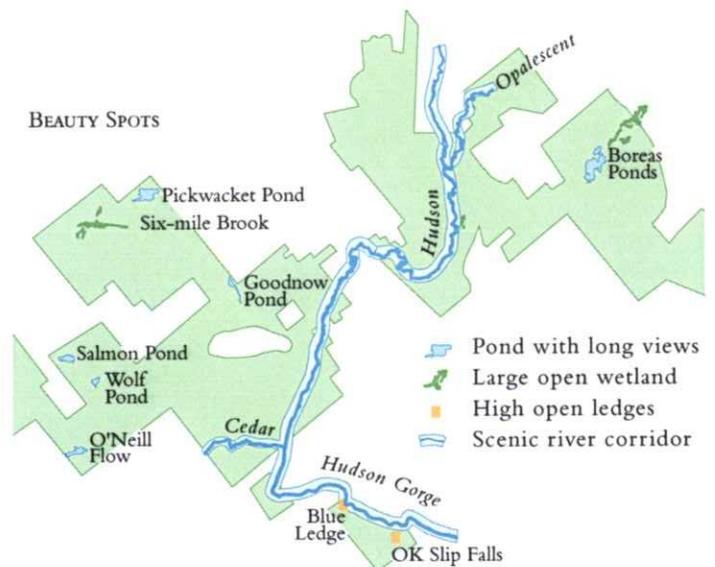
The selection of communities given here is of course arbitrary in that a number of others could have been included as well. But while others could certainly be included, all of the ones shown here have enough exceptional features that I think it would be hard to *exclude* them from any comprehensive list of special sites.

The individual sites are discussed in more detail in the next few sections. They are a very diverse group. There are small and large and disturbed and undisturbed sites; common and unusual communities; high and low diversity communities; and sites with large numbers of rare species and others without any rare species at all.



## 2.3 Exceptional Scenery

As with exceptional communities the choice is arbitrary. Beautiful places occur throughout the property. I have chose to map four particular types: pristine ponds which offer views of surrounding hills and mountains; large open wetlands, which are the largest, and most varied open vegetated landscapes on the property; two areas of high ledges which are spectacular in themselves and also have fine views; and the whole of the Cedar-Opalescent-Hudson corridor, which has both beautiful shore scenery and many long views of adjacent hills. The Hudson Gorge is certainly the most spectacular part of the river corridor, but the other parts are fine as well.



## 2.4 Bird Studies

Bryan Pfeiffer and I did a total of 10 days of breeding-bird study, five days in late June 2000 and five days in early June 2001. We visited about 22 sites for dedicated bird work in 2000, and made casual observations at a number of others. In 2001 we visited 15 new sites and revisited a number of sites from the previous year.

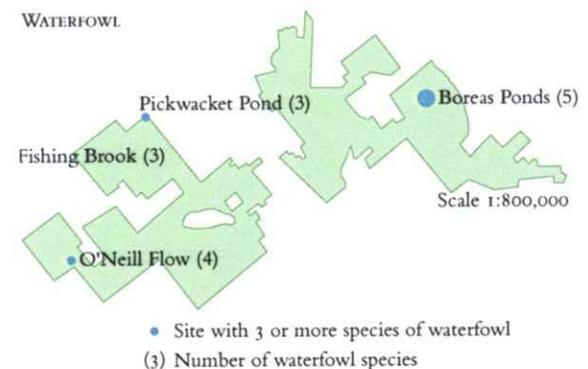
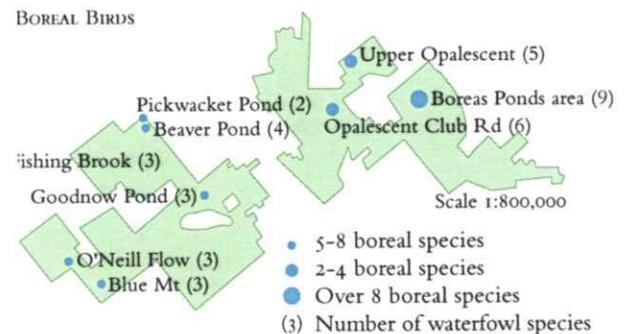
We found a total of 91 species, 75 in 2000 and 81 in 2001. The rarest species, both in this study and likely in the Adirondacks as whole, were the merlin, rusty black-bird, and bay-breasted warbler. In each case a single individual was seen once.

Because our time and coverage was limited, we could not make a full breeding bird list or search thoroughly for rarities. Instead we concentrated on the boreal birds. This is a group of about 15 northern species that require conifers to nest and are rare outside of the Adirondacks. Twelve of the 15 species were found to be widely distributed in the Adirondacks in the 1980's and were found near or on the Finch property during the Breeding Bird Atlas Project of the mid 1980's. Our goal was to see if they had persisted, and, if so, which habitats had the most species.

We found a total of 12 boreal species, 11 of them relatively widespread in the Adirondacks, and one, the bay-breasted warbler, uncommon or rare. Most of our observations were of individual birds or pairs; the only areas where we observed substantial numbers of individuals were near the Boreas Ponds and near the summit of Blue Mt.

The Boreas Ponds and associated wetlands also seemed to have the highest diversity, with 9 of the 12 boreal species we observed occurring there. The boreal corridor along the upper Hudson and Opalescent was also quite good, with a total of seven species there. The diversity of boreal species seemed lower to the west, consistent with the smaller and less continuous stands of spruce, but we did relatively less work there and there may in fact be more species than we found.

Our scattered observations of waterfowl suggest that all the large ponds have a number of breeding species, and that the Boreas Ponds, which are large and well vegetated, have the largest number.



### 3 THE MAJOR COMMUNITIES

#### 3.1 *Deciduous Forests*

Except for waterbodies and open wetlands – which together are less than 10% of the property – the Finch lands are continuously wooded. Somewhere between half and three-quarters of the property is hardwood forest and hardwood-dominated mixed forests, typically with beech, yellow birch, sugar maple, red maple, red spruce, and hemlock as the common canopy trees. White birch and aspens are common in disturbed or regenerating sites, balsam fir in the swamps and on ridges, white pine on sandy terraces and rocky slopes, and ash and black cherry here and there, mostly at lower elevations and on more fertile sites.

The hardwood forests do not have rare species or, with one exception, unusual communities and so were not studied deliberately in this project. My casual observations, based on a few transects taken while on route to other sites, are that:

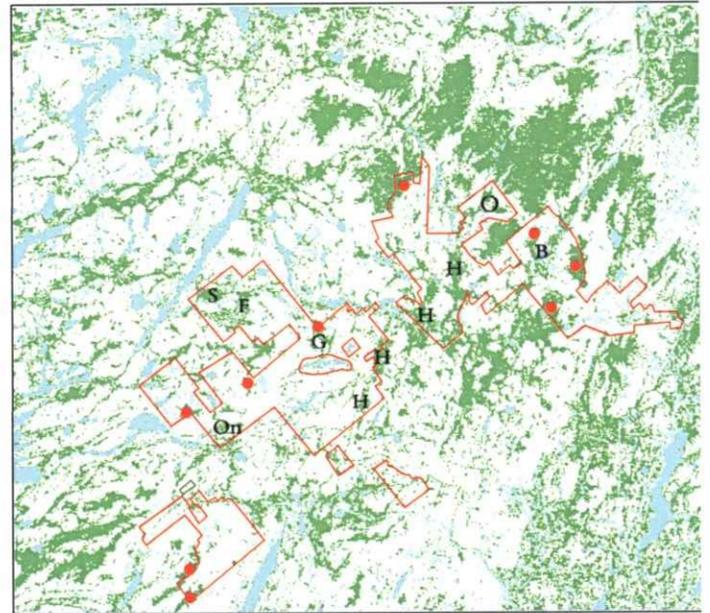
- The forests here are typical of those elsewhere in the eastern Adirondacks: forest condition is generally good, most trees over 14 in diameter have been removed from most stands, and herb and understory diversities are average or low, reflecting the acid bedrock.
- Larger and presumably older trees occur only rarely. The best examples we saw were on the trail to Blue Ledge, and along the shore of the Hudson between Blue Ledge and OK Slip. Some of the stands along the Blue Ledge trail were very handsome and may deserve preservation.
- Excepting of course the diseased beech, the quality of the young canopy trees was often quite high and attests to very careful forest management in the last 30 years.
- Amounts of sugar maple advance regeneration ranged from good to quite low, and it is possible that some of the same kinds of advance regeneration failure and apparent conversion of maple to beech stands that I have been researching elsewhere in the Adirondacks are occurring here.

- With one exception, a talus forest below a limy ledge on the Gooley Club property, and despite a moderate amount of searching, no examples of rich forests, characterized by fertility-requiring trees and a high-diversity herb flora, were found.
- The common birds of deciduous forests (ovenbird, wood thrush, scarlet tanager, rose-breasted grosbeak, black-throated blue warbler ...) were all present but relatively uncommon. The common birds of mixed woods (hermit thrush, solitary vireo, black-throated green warbler, blackburnian warbler ...) on the other hand, were common everywhere.

#### 3.2 *Conifer Forests*

Conifers and conifer-dominated hardwood stands are common at all elevations above about 1800 ft, and probably cover between a quarter and a third of the property. We do not have a good way to map them. The map below, based on an interpretation of a Landsat Thematic Mapper image prepared by the Adirondack

CONIFER & MIXED FORESTS



- |    |                        |   |                        |
|----|------------------------|---|------------------------|
| B  | Boreas Ponds           | ■ | Conifer & mixed forest |
| F  | Fishing Brook          | □ | Hardwood forests       |
| G  | Goodnow Pond           | ■ | Water                  |
| H  | Hudson River corridor  | ● | Upland conifer stand   |
| O  | Opalescent River basin |   |                        |
| On | O'Neil Flow            |   |                        |

Park Agency, gives a general sense of where conifer and conifer-dominated forests occur, but does not distinguish upland and swamp forests, and can't be relied on for either the extent of the forests or their exact placement. I have indicated some of the major upland conifer stands on the Finch property by red dots; much, but not all, the rest are lowland stands.

Our study suggests, as indicated by the annotations on the map, that while upland and wetland conifers are both common on the Finch lands, the wetland conifers, found along the rivers and in large flat basins adjacent to lakes, are more extensive. It also suggests that while conifer stands in the High Peaks, some of the lowland basins to the west, and along the ridges to the southwest are fairly continuous, those on the Finch lands, both upland and swamp, tend to occur as stands of 20 to a few hundred acres, separated from each other by deciduous forests. For animals that refused to cross the intervening hardwoods this might be an important barrier. But the conifer stands here are not separated by settled land or large waterbodies or deep desert valleys, but only by comparatively short segments of hardwoods forest. Whether these interruptions constitute a significant level of biological isolation is, so far as I know, as yet unstudied.

### 3.3 *Mountain Conifers*

Upland conifer forests, between about 2000 ft where they start and 3500 or 4000 ft where they become subalpine forests, are extremely common, both here and elsewhere. Our experience elsewhere is that they are important for several boreal bird species but tend to be highly uniform, generally quite low in diversity, and without distinctive plants or plant communities. We usually consider them a low-priority habitat for field study, both because they are not currently subject to much human use and because we never find anything there. With the exception of a single trip up Blue Mt where we looked for, and found, a small population of Bicknell's thrush, they were not studied in this project.

### 3.4 *Conifer Swamps*

Conifer swamps may be dominated by red spruce and

balsam fir, or white cedar, or, at the edges of bogs, by black spruce and tamarack. The cedar swamps, which are often associated with limy groundwater, are the most biologically distinctive. They are often higher in plant diversity than other conifer swamps and can contain a moderate number of rare or specialized plants. The spruce-fir swamps tend to be on acid soils and are of medium or low diversity and generally without rare nor specialized plants. The tamarack-black spruce swamps are typically found on deep peat and tend to be very low in diversity. They typically lack rare species but have a predictable group of bog species that we consider regional specialties.

Conifer swamps are common on the Finch property, and are found in all the major lake basins and as continuous bands along the upper parts of the Hudson and Opalescent Rivers. The largest areas are marked with letters on the map on page 10. Almost all are spruce-fir swamps, which, true to the regional and in fact the continental pattern, are pretty and extremely mossy but low in diversity and without unusual species or communities. Most have been cut for spruce at some time in the past, and have relatively small trees.

Only a few unusual swamps were found in this survey. These include:

- Small patches of cedar swamp at the southwest end of Trout Pond, with several uncommon mosses.
- A spruce swamp with some cedar, located about a half mile southeast of Trout Pond, with a fairly diverse moss flora and occasional large trees.
- Narrow bands of spruce-tamarack bog forest along the edges of the outlet channel below Goodnow Pond, or at the edges of other lake shore bog mats.

### 3.5 Alluvial Forests

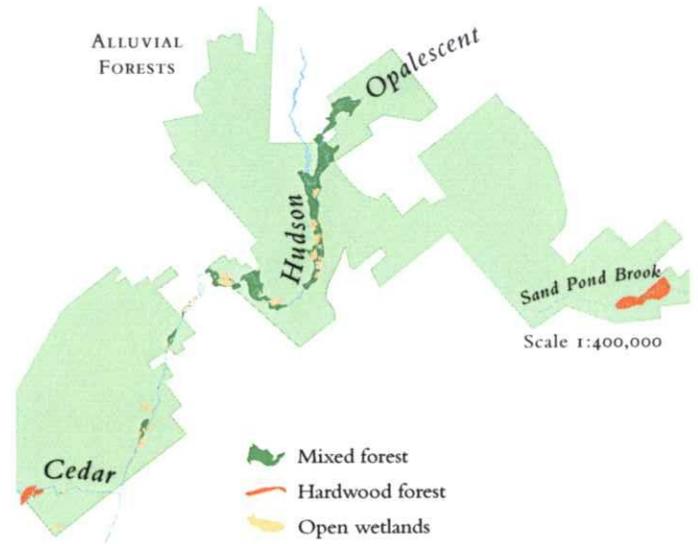
An alluvial forest is any forest on river-deposited soils. Some flood annually and differ substantially in structure and composition from adjacent upland forests. Others rarely flood, and are essentially just upland forests on richer and flatter soils. Three sorts of alluvial forests occur on the Finch lands.

1 Along the upper Hudson and Opalescent rivers there are open red spruce-white cedar-red maple forests with an understory of grasses, ferns, a few shrubs (especially red raspberry and beaked hazelnut), and tall herbs. They typically occur on sandy banks and terraces 2-5 yards above the summer water level. The canopies are quite open, often more like alluvial glades than continuous forest. The flora is a mixture of moist-forest and river-shore species. Diversity is fairly low, and there are no uncommon or specialized plants.

The principal importance of these forests is as scenery and animal habitat. They often contain large trees, and are a very attractive mixture of forest and openings. They often have good den and nest trees, and, like all edge habitats, are much used by animals and birds.

2 Along the Cedar River, starting about two miles above the Hudson and extending upstream for a mile or more, are open, alluvial hardwood glades with sugar and red maples and yellow birch, on a flat terrace several yards above the stream. Many of the trees are quite large and handsome; I do not know whether the open structure is maintained by flooding or beaver or both. So far as I know this community is unique on the Finch property. I was not able to get into it to do a transect, and cannot comment on its composition or diversity.

3 Along Sand Pond Brook, at the far east end and one of the lowest elevations on the property, there are about two miles of low alluvial forest dominated by silver maples. The soils are low and mucky, with much clay, quite unlike the sandy terraces of the Opalescent and Hudson. The trees are very large and spreading, and the forest understory is moderately diverse, with a number of common lowland herbs (jack-in-the-pulpit, hellebore, ostrich fern) that are otherwise scarce on the



Finch lands. No rare species occur.

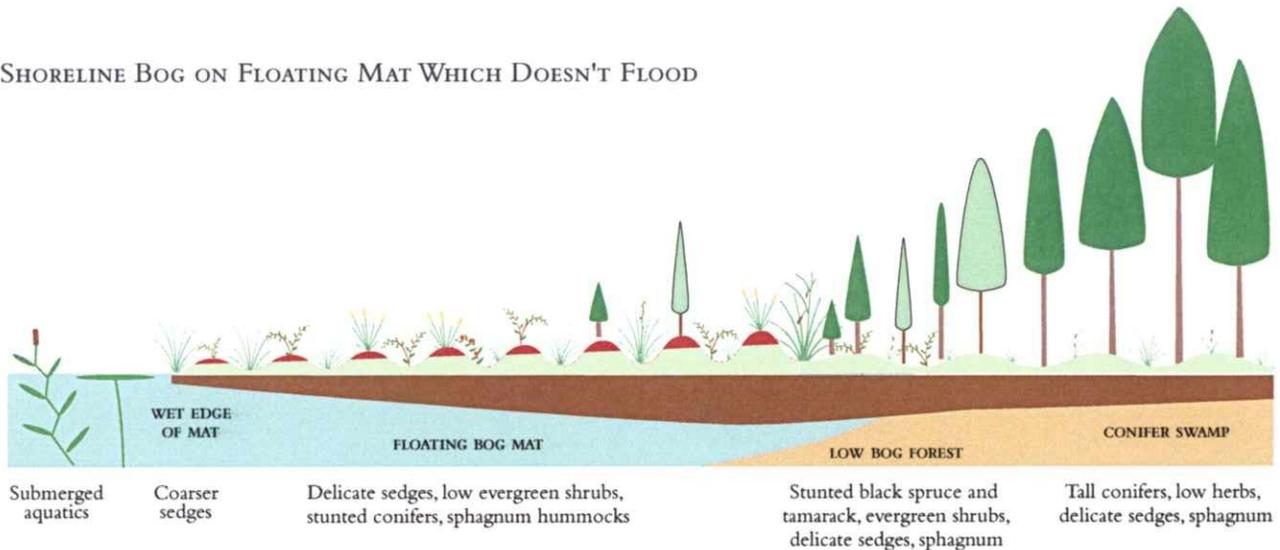
This sort of forest is common along the streams of the Champlain Valley. Good examples are rare in the interior Adirondacks, though a large example does occur on the Raquette River southeast of Tupper Lake. (It is on land briefly flooded 130 years ago by the ill-fated Setting Pole Dam, and may depend on sediments deposited when the waters were impounded.) The Sand Pond Brook forest is a particularly fine example: largely undisturbed, several hundred acres in extent, and with large trees and handsome woods.

I consider all three types of alluvial forests quite valuable: all are unusual and very attractive themselves, all are much used by animals, all have unusually large trees compared to the rest of the property, and all contribute to the scenic beauty of the streams on which they occur.

### 3.6 Sphagnum Bogs

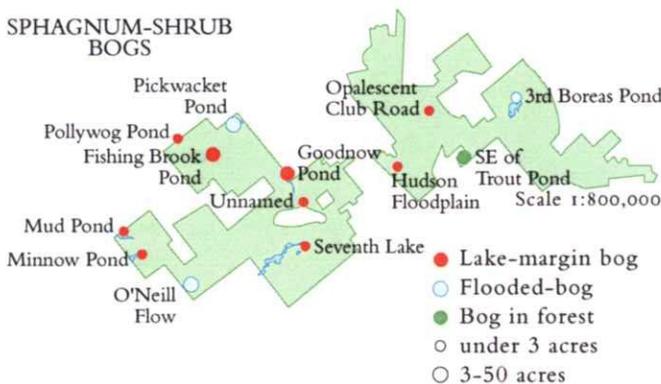
By a sphagnum bog, in which category I include what some ecologists call *poor fens*, I mean a low-nutrient wetland, isolated from

SHORELINE BOG ON FLOATING MAT WHICH DOESN'T FLOOD



mineral-rich ground water and receiving most of its water from rainfall, on deep peaty soils, dominated by a mixture of sphagnum moss, low, small-leaved evergreen shrubs, and narrow-leaved sedges. The characteristic bog plants are all northern; many are at their southern range limits here and are rare or uncommon outside the Adirondacks.

SPHAGNUM-SHRUB BOGS



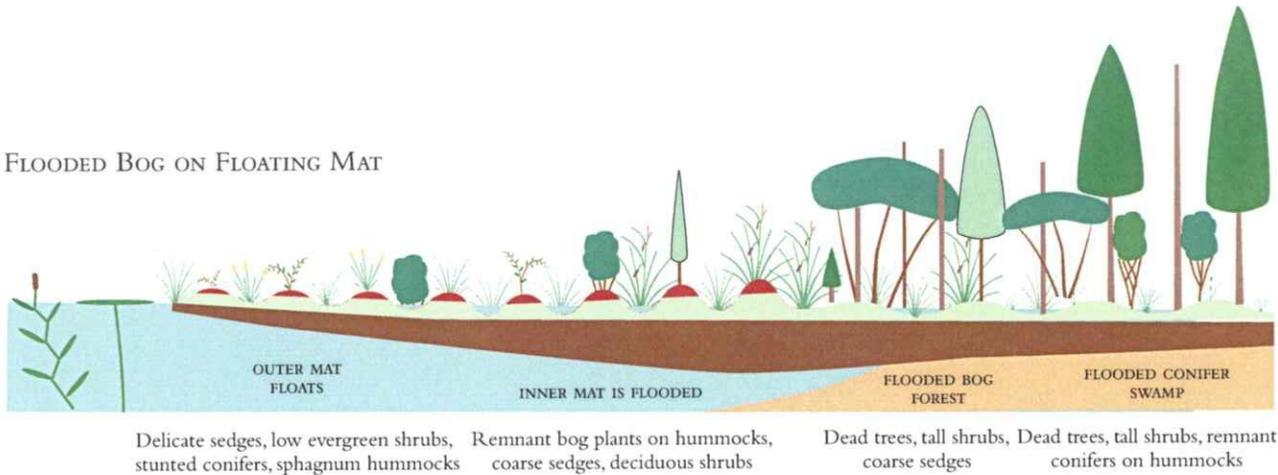
Because bogs are slow-growing communities which contain a significant number of uncommon northern species, they are in many cases relic communities, able to persist and in some cases to expand, but not easily or often created. Small bog mats, a few meters in extent, can and do form in a few decades; but I know of no instance in the Adirondacks, or indeed in the northeast United States, where a large bog has formed within historical times. Our supply of bogs, unlike our supply of ponds or beaver meadows or forests, is fixed; we can alter them or destroy them, but not make new

ones. This suggests that it is important that the existing ones be carefully conserved, and it is why I try to map them carefully in all my wetland inventories.

We mapped thirteen bogs or bog ponds in the survey, and were told of one more, at Deer Pond northeast of the Boreas Ponds, that we were not able to inspect. Nine are relatively undisturbed lake margin bogs, ranging in size from a few tenths of an acre at Mud and Minnow Ponds to about 20 acres at Fishing Brook Pond and 50 acres at Goodnow Pond. These last two are both the largest and in many ways the finest on the property, and are biological features of great importance.

Three lakes with altered water levels have *flooded bogs*. When a bog is flooded the shoreward parts, which are usually not free to float, become converted into sedge meadows, while the center parts, which can float, become bog islands. This is a very common alteration of Adirondack bogs, and can be caused either by people or beaver. Because the resulting bog islands are only a part of the original bog, and because they are often partly altered by flooding, flooded bogs are not usually as diverse as lake shore bogs. But they are still interesting landscape features, and refuges for species that don't grow elsewhere in the pond.

### FLOODED BOG ON FLOATING MAT



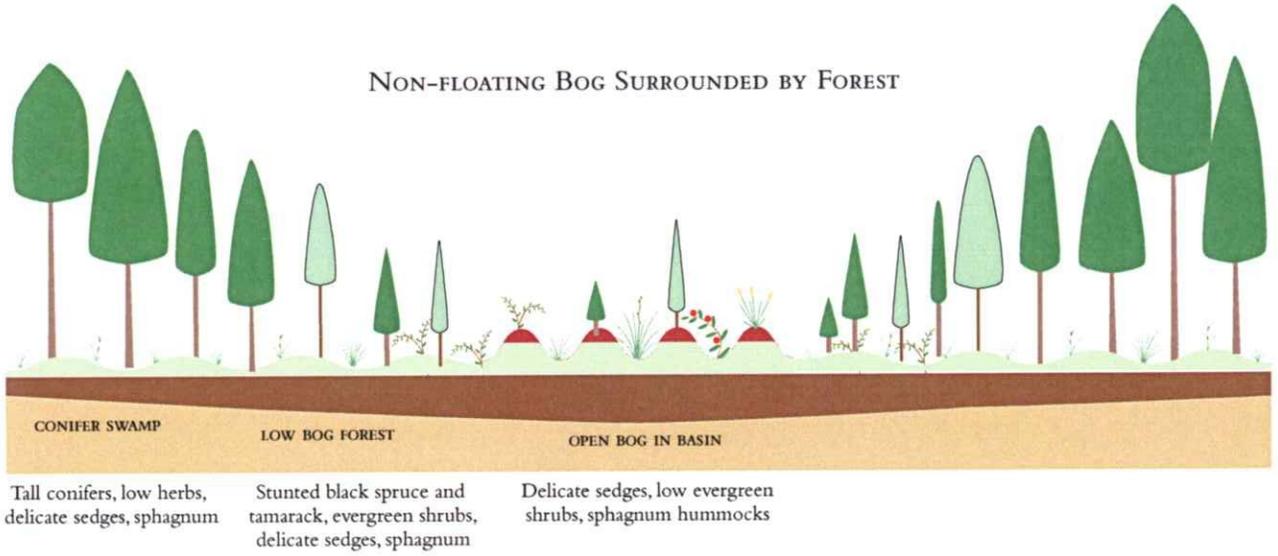
Of the three flooded bogs on the Finch property, the ones at the third Boreas Pond are small but in good condition and with a number of significant species. The ones at O'Neill have been simplified by flooding, and contain very few species. The ones at Pickwacket, which are long and slender, like reefs or barrier islands, are in good condition and a very striking feature of the pond.

One of the bogs, southeast of Trout Pond, is a relatively dry, forest-interior bog something like the one diagrammed below. Such bogs, like the muskegs of the north, can form directly by the development of a thick sphagnum peat layer within a forest and may never have a floating mat. They are typically fairly dry and shrubby, with conspicuous hummocks; they can be very pretty landscapes (unless, as in parts of the north, they are all you have seen for days), but are

usually less diverse than floating bogs.

Because bogs are low diversity communities, and because all the bog plants are wide-ranging northern species, Adirondack bogs tend to have uncommon or regionally significant species, but not rare species. This was true here, where we had 23 records for 7 significant vascular plants – roughly a quarter of all of the significant species and a third of all records – in bogs. None of the seven significant bog species are rare in either the Adirondacks or New York. Two (two-seeded sedge, white-fringed orchis) are uncommon in the Adirondacks. The other five (Pickering's reedgrass, few-flowered sedge, bog aster, twin-scape bladderwort and humped bladderwort) are regional specialties, widely distributed here but rare everywhere else.

### NON-FLOATING BOG SURROUNDED BY FOREST



Although mosses, particular *Sphagnum*, are abundant in bogs, all the species we observed were common and widespread, and no rare or regionally significant species occurred.

The 13 bogs on the Finch property probably total less than 100 acres, under 1% of the total area, and somewhere between 5 and 10% of the wetland area. This is probably about average for the Adirondacks as a whole. In the boreal core of the Adirondacks, north-west of here, bogs are somewhat commoner and significantly larger. Across the hill and mountain areas of the south and northeast, they are much less common. Overall they are a widespread Adirondack community, but nowhere a particularly common one.

In summary: the 13 bogs and bog ponds on the property are of considerable conservation value because:

- They are a characteristic community of the boreal Adirondacks, and very rare roadside the Adirondacks.
- They are, even within the Adirondacks, a relatively uncommon community.
- They are unusual and beautiful places.
- They are to some extent a relic community, forming at most very slowly under the current climate.
- They contain at least seven significant plant species.
- Many Adirondack bogs have been altered by human or beaver flooding, making unflooded bogs, of which there are at least 9 here, uncommon and of particular value.
- Most bogs, both on the Finch lands, and in the Adirondacks as a whole are fairly small, making the two relatively large ones, at Goodnow Pond and on Fishing Brook Pond, of particular value.

### 3.7 The Cedar Glade Fen

One peatland, located between the Tahawus road and the Hudson River, in a floodplain basin near the river,

apparently receives limy seepage, and has a very different flora from the acid sphagnum bogs described above. While there are still sphagnums, dwarf shrubs, and sedges, the spe-

BASINS IN THE FLOODPLAIN OF THE HUDSON  
SOUTH OF TAWAHUS



Scale 1:25,000

-  Limy cedar fen
-  Other open wetlands

cies differ from those of acid bogs. Similar, the larch and spruce that are so common in acid bogs are absent, and white cedar is common.

Bogs of this sort are usually called fens and I have called this site the Cedar Glade Fen. But be aware that *fen*, like *bog*, is a broad term and can include both wetlands with some groundwater influence, and wetlands with specifically limy groundwater. The former are common and rarely have significant species; the latter, as is the case with the Cedar Glade Fen, are uncommon, and often have significant species

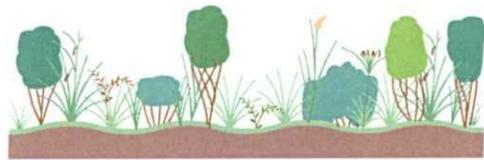
This wetland is the most unusual that we have encountered in our study, and one of the most unusual that we know of in the Adirondacks. It has eight significant plants. Two, the adder's tongue orchid and slender-flowered sedge, are rare in New York; three, the bog honeysuckle, alder buckthorn, and two-seeded sedge, are at least uncommon and possible rare in the Adirondacks; and three, Pickering's reedgrass, Michaux's sedge, and few-flowered sedge, are Adirondack specialties, frequent here but rare elsewhere.

The population of Pickering's reedgrass here is noteworthy. It is an eastern north American endemic, found from Maine to Minnesota. So far as I have been able to determine, it is uncommon or rare everywhere except in the Adirondacks. And even here it is not common; on the Finch lands I found it at only four out of the roughly 45 wetlands I examined. Further, most of the Adirondack colonies I have seen are small, usually less than a few dozen plants, and often only one or two. The colony in the cedar fen, is in contrast, the largest I have seen anywhere, with many hundreds of plants scattered over a few hundred yards of bog.

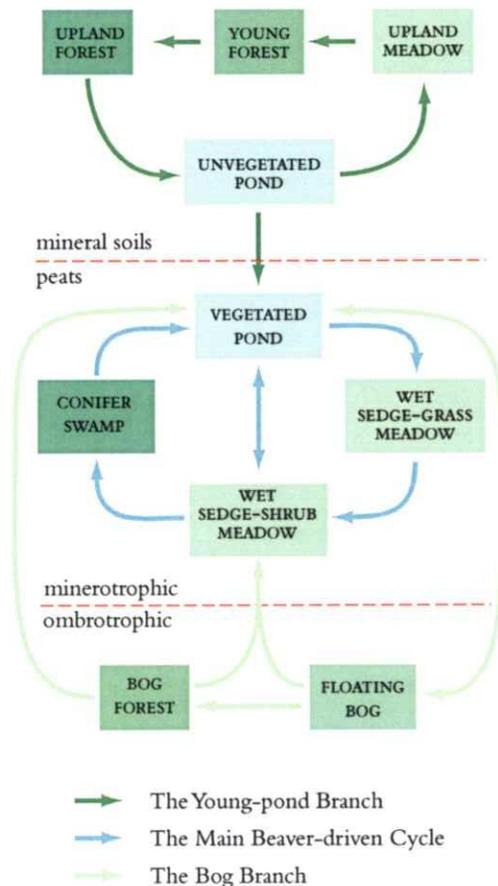
### 3.8 Beaver flows and Other Open Wetlands

The remaining open wetlands are mostly sedge-shrub marshes. As a group they differ from bogs in having less peat and more contact with groundwater, and so in being more fertile. In consequence of their fertility they have a taller, broader-leaved leaved, and less ever-green flora - typically some mixture of sedges, herbs, and medium-sized to tall shrubs. The mixture varies with fertility, history, and water level. The result

### LOW SHRUB-SEDGE MEADOW



### THE ADIRONDACK WETLAND CYCLE



### TALL SHRUB-SEDGE MEADOW



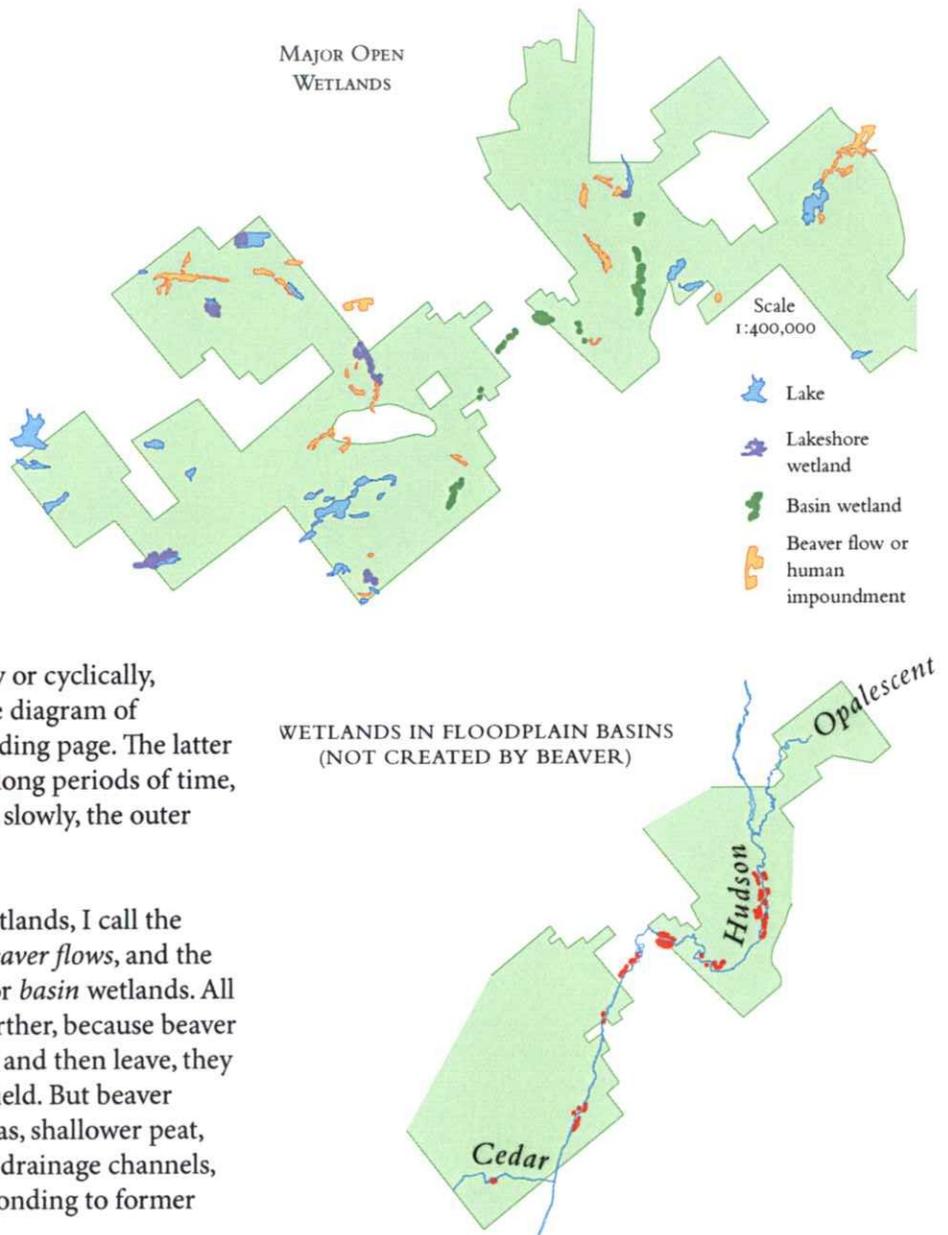
is a complex, but basically intelligible set of permutations – the same basic group of ten or twenty common plants, but in different combinations and with different abundances. Describing these variations can be a minor ecological industry. I treat them very simply here.

For me, the most important distinction is between those wetlands that result from the filling and draining of impoundments, and those whose basins and waterlevels are more or less permanent. The former move, casually or cyclically, around the central blue loop in the diagram of Adirondack wetlands on the preceding page. The latter tend to remain where they are for long periods of time, or to follow, more rarely and more slowly, the outer green paths.

In the case of open, non-boggy wetlands, I call the impoundment-related wetlands *beaver flows*, and the stable-water level ones *lake shore* or *basin* wetlands. All three types can be very similar. Further, because beaver can modify a pre-existing wetland and then leave, they can be hard to disentangle in the field. But beaver flows commonly have simpler floras, shallower peat, less sphagnum moss, well-defined drainage channels, and often a clear zonation corresponding to former water levels.

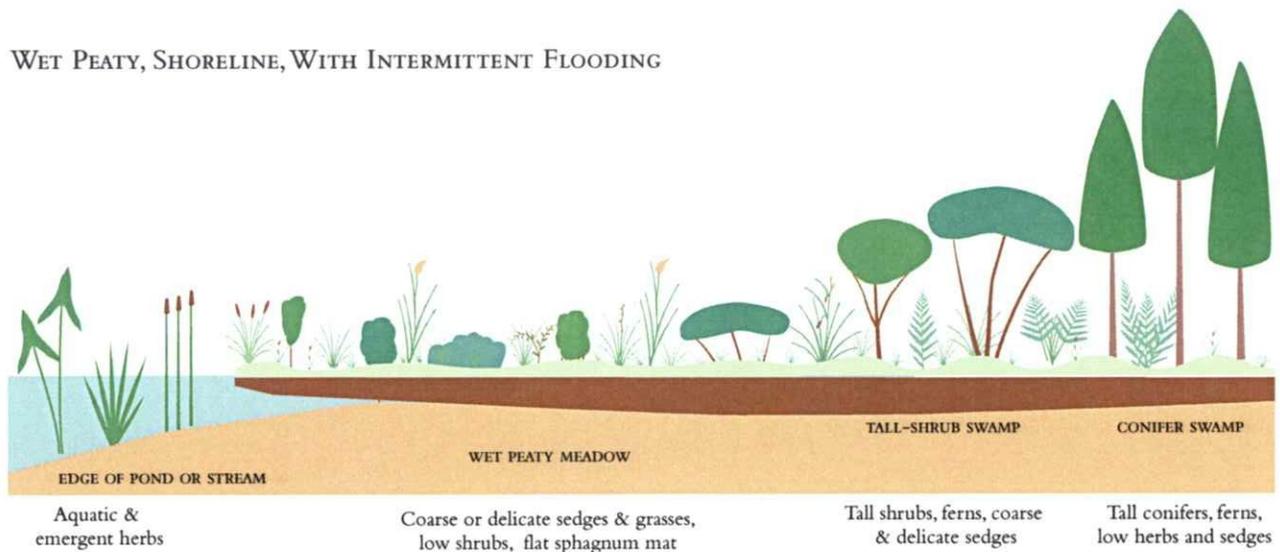
Beaver flows occur throughout the Finch property; they come in all sizes and our map shows only the largest ones. In several cases where the beaver flow was probably created in a pre-existing open wetland I have still mapped it as a beaver flow, even though traces of the old wetland have persisted and the vegetation may be more complex than that of most beaver flows.

Human impoundments that have drained, like the Shadow Dam west of Goodnow Flow and possibly some of the large meadows on Fishing Brook, much resemble beaver flows, and are mapped with them.



Floodplain basin wetlands are restricted to low gradient segments of the Hudson and Cedar Rivers. (Several more, some of which are large, occur upstream on the Cedar River on New York State land.) They range in size from a few 10ths of an acre to the Newcomb Fen which is three-quarters of a mile long and contains several hundred acres. They tend to be shallow basins behind levees that flood at high water. The commonest vegetation type is a mixture of low sedges, aquatic herbs, and low to medium-sized deciduous shrubs. Only

## WET PEATY, SHORELINE, WITH INTERMITTENT FLOODING



two (the Cedar Fen and a tiny bog pond near the pumping station in Newcomb) are boggy. They can be very like beaver ponds, differing more in their structure than composition; they have a less developed drainage system and less separation of herbs and shrubs into zones. In addition, some of them seem slightly influenced by mineral-rich groundwater, and have marginal rings of white cedar and several herbs suggesting a higher nutrient status than is true in most beaver ponds.

Floodplain basins like these seem to be unusual in the eastern Adirondacks, but commoner on the low-gradient northwestern rivers like the Oswegatchie, Grasse and St. Regis that run through large areas of glacial outwash. I believe that this is the only segment of the Hudson where they occur, and do not know any on the Ausable, Sacandaga, or Schroon. I regard them as transitional wetlands, intermediate between those of deciduous forest rivers where the floodplain wetlands are all forested, and boreal forest rivers like the St. Regis where the scattered open wetlands we see in the Hudson floodplain seem to have coalesced to form a continuously open wetland floodplain.

Despite their differences, all of these open wetlands share a basic vascular flora of perhaps 40-50 species and a basic moss flora of 10-15 species. Most of the species are widespread and common. Only a few of the species are uncommon or regionally specialized and

none are rare.

### 3.9 Importance of the Open Wetlands

Because non-boggy open wetlands are quite common throughout the Adirondacks, and because only few of them contain significant plants or birds, I tend to think of them as having collective importance, but, in most cases, not individual uniqueness. Their collective importance derives from three features:

- They have a considerable number of plants, especially sedges, shrubs, and flowering herbs, that do not occur in forests or forested wetlands. In deciduous forest areas the open wetlands typically contain about a third of the flora. In northern landscapes where the plant diversity of forests is quite low, the open wetlands may contain between a half and two-thirds of the flora.
- They are used, at one time and another, by almost all of the animals and birds of the surround forests, and in addition contain animals and birds that don't use the forests. They are thus the best sites for bird diversity, and likely for mammal diversity as well, that we have. This is

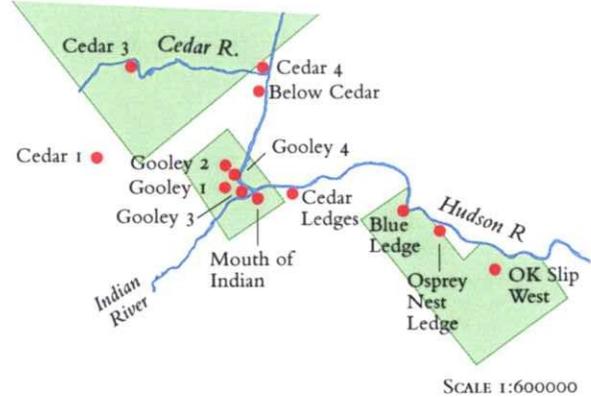
especially true of the boreal birds, many of which are cavity nesters and use the snags at the edges of wetlands. Our best sites for boreal birds on the Finch property were all open wetlands; we picked up essentially all the woodland species like Swainson thrush and boreal chickadee at their edges, plus obligate wetland species like Lincoln's sparrow and olive-sided flycatcher in their interiors.

- The open wetlands, and especially the large ones, are both extremely beautiful in themselves, and characteristic regional features. All boreal landscapes have large open wetlands. The Adirondacks are the first mountains with lowland boreal valley that you encounter as you go north, and are the first mountains to have large open wetlands.

In spite of their overall similarity, some of the open wetlands have individual distinctions worth mentioning. The most noteworthy features are probably:

- The relative abundance of boreal birds, and particularly Lincoln's sparrow, in the large open beaver flows northeast of the Boreas Ponds and near the Opalescent Club Road.
- The boggy, and very boreal looking lake shore wetlands that line the southern part of Goodnow Pond and first mile of its outlet channel.
- The extremely large floodplain basin in Newcomb.
- The series of floodplain basins along the Hudson between the Newcomb bridge and the south end of Blackwell Stillwater; these are a very pretty and distinctive part of the landscape of the river, and also have a few species (Atlantic sedge, Robin's spikerush...) that are either uncommon or regional specialties.

#### MARBLE LEDGES



#### 3.10 Outcrops

The small outcrops of granitic rocks that occur on steep terrain throughout the Finch property are not, so far as we can tell, biologically distinctive. Their floras, both vascular and bryophyte, are of low or at most only moderate diversity, and do not contain uncommon species.

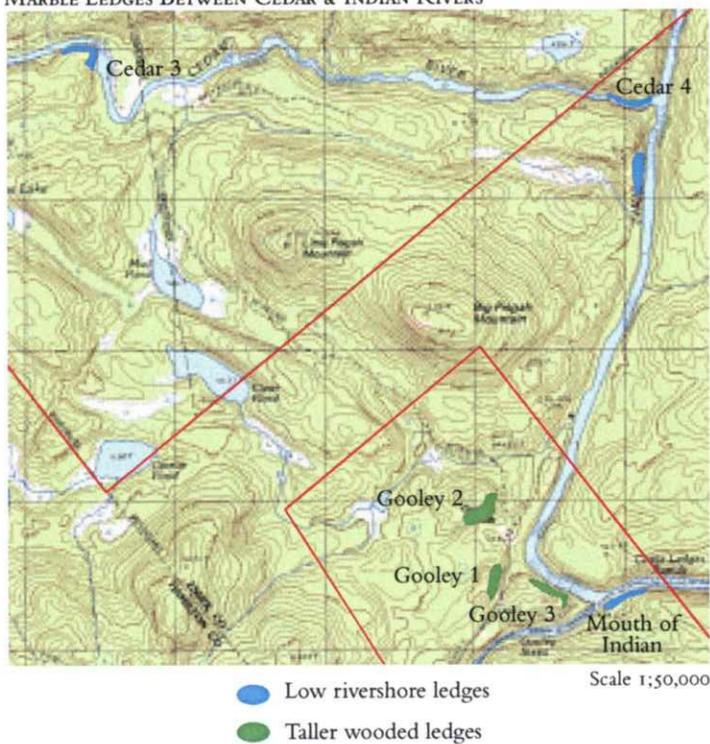
The limestone outcrops, all found within about two miles of the mouth of the Indian River, are a different story. They have extremely diverse bryophyte and vascular floras and the largest concentrations of rare and unusual species that we have encountered in this study, or, indeed, in any Adirondacks study.

The rock making these outcrops is the Grenville Marble, a white, crystalline, granular, often crumbly, calcitic marble about 1.0 billion years old that occurs as narrow, interrupted bands among the ubiquitous Adirondack granites and anorthosites. It outcrops in many parts of the Adirondacks, but usually in limited amounts. Mostly it is covered by or mixed with soil or found as bands in other rocks and only rarely forms significant outcrops by itself. The longest and highest known exposures are along the Hudson River, in or near the Hudson Gorge. Five of the six best are on Finch land.

Besides the outcrops described here, small outcrops occur along Lake Harris and Rich Lake in Newcomb, off the Finch property. In addition the presence of lime-requiring plants in several wetlands along the upper Hudson suggests that there may be marble bedrock nearby, or marble fragments incorporated in the till. We made several trips in this area searching for outcrops, but found none.

The known outcrops on the Finch property are probably all part of the same layer of rock. They are very similar in color and texture, and occur in a fairly narrow altitude band, between 1400 and 1600 ft.

MARBLE LEDGES BETWEEN CEDAR & INDIAN RIVERS



These outcrops fall into three groups.

1 The first, and most numerous, are low ledges, commonly much weathered and ice-scoured, along the river shores. These are usually less than 3 yards high, often undercut by river erosion, and often capped by harder non-limy rocks. When they are neither too dry nor too scoured by the river they can be extremely mossy. They commonly have a variety of microhabitats, depending on wetness, exposure, shade,

and height above the channel, and have some of the most diverse moss floras we have ever encountered in areas of this size. They are, however, probably too near the river channel and too subject to floods and ice to support rare vascular plants.

Altogether we know perhaps 8-10 of these river ledges, four along the Cedar River and the rest on the Hudson. The best three appear to be:

- Ledge 3 on the Cedar River, about 1.8 miles above the mouth, on Finch property, with about 57 species of mosses and liverworts, of which 13 are uncommon or rare.
- Ledge 4 the Cedar River, on the north shore where the Cedar meets the Hudson and just outside of Finch property, with about 58 species of mosses and liverworts of which 7-8 are rare or uncommon.
- A ledge at the mouth of the Indian River, extending onto the north shore of the Hudson, on Finch land, with 59 species of bryophytes, of which 20 are rare or uncommon.

Each of these sites has a single significant vascular plant: Steller's cliffbrake, a small limestone fern, rare in the Adirondacks, at the two on the Cedar, and the hairy honeysuckle, an Adirondack specialty, at the mouth of the Indian.

2 The second group includes 3 wooded ledges, all about 50 ft high but interrupted and not sheer, in the woods near the Gooley Club. The ones we call Gooley 1, on the road, about a quarter mile before the club, are the largest and best. They are our only example on the Finch lands of a rich hardwoods forest, with a diverse canopy and rich herb layer with lime-requiring species. The canopy contains sugar maple, ash, elm, basswood, hop hornbeam, and, as at other rich sites in the north, white

spruce. The total vascular flora is at least 73 species, and a 30 m transect yielded 51 species, remarkable high for a shaded site. At least a third of the species are lime-indicators like maidenhair fern rattlesnake fern, leatherwood and prickly gooseberry. There are six significant vascular plants at this site, by far the most we encountered at any woodland site. Four – leatherwood, Goldie's fern, and the grasses *Milium* and *Schizachne* –are probably rare in the Adirondacks; a fifth, Braun's holly fern is either uncommon or rare in the adirondacks; and the sixth, hairy honeysuckle, is a regional specialty.

The mosses at this site, while not quite as diverse as those at the river sites, were also very good: we found 48 species of mosses and liverworts, of which 10 were uncommon or rare.

3 The last group of outcrops are the high cliffs at Blue Ledge and to its east and on the walls of the ravine near OK Slip Falls. Both sites are spectacularly scenic. Blue ledge is a tall marble ledge, several hundred feet high, partly wooded and partly open, that overlooks a beautiful pool in the Hudson Gorge, with rapids above and below. It is a wet cliff with large amounts of ice in the winter and much rockfall and treefall. OK-Slip Falls is in a recessional gorge about a half mile from the Hudson. It has sheer cliffs granitic cliffs on three sides, a talus of large, vegetated and very slippery boulders below the falls, and small marble outcrops on the north side.

Both are important, though to this point largely unknown botanical sites.

Blue Ledge is the more important of the two. It is all marble, and because it faces northwest and remains wet through the summer it is has functioned as a refuge – a small, detached piece of an arctic mountain – and allowed a relic community of northern plants to persist.

The most notable are six rare vascular plants:



● Marble outcrops ● Fertile ravines

Scale 1:25,0

purple mountain saxifrage, hair-like sedge, wild chives, hyssop-leaved fleabane, smooth woodsia, and Steller's cliffbrake. The first three, so far as I know, currently grow nowhere else in New York; the fleabane also grows on the ledge above the Osprey Nest Rapids just to the east; the Woodsia is currently known from one other site in New York; and the cliffbrake is uncommon in New York and rare in the Adirondacks, though known from two nearby river ledges that we studied, as well as a cave mouth near the boreas River.

Because the vascular plants at Blue Ledge are extremely rare, I made several trips to evaluate their abundance and distribution. The fleabane is the most common, found all over the ledge and reproducing abundantly; the saxifrage is also found scattered at various heights on the ledge, though in much smaller quantities.

The other four, as best I could tell with making a full roped descent, are only found at or near

the wet base of the main ledge. The cliffbrake occurs in several populations with a moderate number of plants; chives are represented by a few dozen plants on a single small shelf; the Woodsia by perhaps 4-6 small scattered clumps in recesses of the cliff base; and the sedge, despite much searching, by a single clump.

Populations this small are, of course, threatened both by chance events and environmental change; how much longer they can persist here is impossible to predict.

The mosses at Blue Ledge are equally striking. We found a total of 96 species, of which 36 species are uncommon or rare and 4-6 of these known from very few other places in the state.

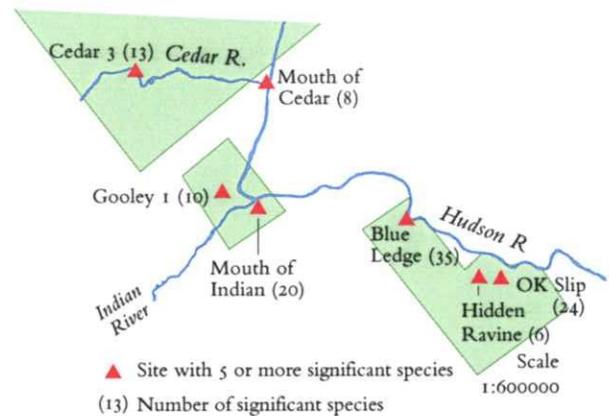
The combination of rare plants and rare mosses make Blue Ledge a unique site; the only place that I know that comes close to it are the cliffs of Smugglers Notch in northern Vermont.

The ledges and talus at OK-Slip Falls, which are much less limy and don't have as much rockfall as Blue Ledge, are none the less biologically significant. We found a total of 69 mosses and liverworts there, of which 22 species are uncommon or rare; and also two vascular plants, Braun's holly fern and Pennsylvania buttercup, which are uncommon or rare. This makes it both the second most diverse area for mosses that we examined, and the one with the second most rarities.

Several small ravines that we examined between Blue ledge and OK Slip, while not having marble outcrops, have a richer than normal flora, often with Braun's and Maidenhair ferns, and sometimes with interest mosses. The one we have called the Hidden Ravine is in many ways like a small version of OK Slip. It has a boulder-filled floor, and is doubtless a stream ravine whose stream was captured and diverted. There are ice caves below the boulders and I have found at least 6 uncommon or rare mosses on the walls of the ice caves.

Both the total number of rare species here and their distribution is significant. At the sites I have been studying in eastern New York and Vermont over the last ten years, it is exceptional, even in good areas, to

MAJOR SITES FOR SIGNIFICANT MOSSES & LIVERWORTS



have a single site with five or more significant species. Here we have, within a circle of two miles radius, seven sites with five or more significant species, and three of these with twenty or more significant each, is unheard of.

#### 4 IMPORTANCE AND CONNECTION OF THE FEATURES OF THE FINCH LANDS TO THE ADIRONDACKS AS A WHOLE

I was asked to evaluate the contribution of the Finch lands to the biological and scenic resources of the Adirondacks as a whole and the extent to which the Finch lands are connected biologically to the state and other private lands around them.

The first is difficult because we do not have good inventories, and in some cases not even bad inventories, of any important feature of Adirondack biology except birds. But I have been able to do it in a relative way by creating a four-category scale of importance.

The second proved impossible, because I could think of no realistic way to measure biological connection or the lack of it from the information on hand.

To rate the contribution of the Finch Lands to the Adirondacks as a whole I divided the most important biological and landscape resources into 18 categories. I then compared the *total* of the features in each category – say all the beaver flows – on the Finch lands to what I know of the rest of the Adirondacks and then rated

the them as either:

*Unique*, if there were no other comparable places in the Adirondacks

*Tops*, if they were as good as the very best anywhere else in the Adirondacks, and better than most of the rest.

*Highly Significant to the Park* if the resource was relatively better represented here than on average, or if the Finch Lands probably hold 10% or more of the total resource in the Park.

*Locally Significant Only* if the resource, while important here, is no better represented here than on most other lands of comparable size in the Park, and if the Finch Lands probably hold 5% or less of the total resource in the Park.

The percentages are only a conceptual tool; lacking park-wide inventories, no exact comparisons are possible.

Using those categories, my ratings of the 18 features of the Finch lands that I judge most important are:

*Unique*

- Hudson River corridor
- Rare limestone vascular plants
- Rare limestone mosses
- High-diversity limy ledge moss communities

*Tops*

- Large floodplain wetlands
- OK-Slip fertile ravine community
- Gooley Club rich woods & ledge community
- Cedar Glade Fen community & rare fen vascular plants

*Highly Significant to Park*

- Corridors of Opalescent & Cedar Rivers
- Alluvial woods along Sand Brook
- Boreal plant communities of undisturbed bogs and bog ponds
- Ensemble of lowland boreal forest around ponds and along rivers
- Ensemble of undeveloped ponds with views of hills
- Small fertile ravines and pockets near Hudson

*Locally Significant Only*

- Flooded bog ponds
- Beaver flows and ponds
- Larger older trees near Hudson
- Mid-elevation conifer woods

5 SUMMARY OF FINDINGS

Our conclusions, after two years of fascinating work on a very impressive property, are that:

1 The Finch property, so far as can be determined from a brief examination, is in good shape. The natural vegetation of essentially all the wetlands and waterbodies is intact; past cutting has been widespread but not exceptionally intense; the upland forest canopies are largely continuous and contain trees of medium ages; and clearing and development has been confined to a few areas, leaving most of the property undeveloped.

2 There are major areas of great natural beauty and scenic value. The most important, at least to me, are the corridors of the Hudson, Cedar and Opalescent Rivers, some of the large open wetlands like those along the Goodnow River

and Fishing Creek, and a number of the ponds, which are both beautiful in themselves and afford spectacular views of nearby mountains.

3 The Finch property contains examples of all major types of Adirondack wetlands except large sphagnum bogs.

34 The commonest and largest wetlands are forested spruce-fir swamps and open shrub-coarse sedge-sphagnum meadows. These two types together make up what has been called the lowland boreal biome or lowland boreal forest. They are home to a number of plants and animals, particularly the bog plants and boreal birds, which are common farther north but local and very much Adirondack specialties this far south.

5 Prior to this survey it was generally assumed that significant lowland boreal forest communities were restricted to the northern and western Adirondacks. Their presence here in the east-central Adirondacks, in substantial amounts, indicates that they are more widely distributed than previously thought, and that Finch and neighboring landowners hold a significant amount of the total Adirondack habitat.

6 Our examination of these examples of lowland boreal habitats indicates that while they differ from the northern and western Adirondack examples in several ways, particularly in absence of large bogs and the smaller amounts of spruce-tamarack bog forest, they still contain almost all the standard boreal birds and boreal plants, and so are biologically equivalent to the communities of the west and north.

7 The largest concentration of lowland boreal habitat is around the Boreas Ponds and in the floodplains of the upper Hudson and Opalescent Rivers, above the Tahawus Club. Smaller but still quite significant amounts occur westward to Long Lake and south to Blue Mt Lake.

8 The commonest types of waterbodies on the Finch property are steep-gradient wooded streams; low-gradient streams with boggy, floating margins; major rivers with wooded banks; beaver ponds; and natural

ponds whose levels have been altered by beaver or humans. Streams with broad, continuously open floodplains, common in the northwestern Adirondacks, do not occur here. But there are streams with shorter segments of open floodplain, as well as two other uncommon types of waterbody: large bog ponds with stable water levels, and large, meandering rivers with broad floodplains containing alluvial conifer glades and large open wetlands.

9 Precambrian Grenville marbles underlie a substantial part of the upper Hudson valley between Tahawus and Warrensburg. Where these outcrop or influence the chemistry of the groundwater they produce distinctive plant communities that are unusual in the Adirondacks. The Finch lands contain a number of examples of such communities.

10 The most spectacular of these are tall ledges at Blue Ledge, which have seven rare or uncommon vascular plants and some 35 rare or uncommon mosses. But the smaller outcrops along the Cedar River, near the Gooley Club, at the mouth of the Indian, and on the west side of OK Slip Ravine are also of great biological significance and have many rare species as well. In addition a number of the wetlands show the influence of lime, and one, which we call the Cedar Glade Fen, is quite unusual and has a number of rare species.

11 We have seen 33 significant vascular plants. We estimate that 7-8 are rare in New York, 8-9 uncommon in New York, and an additional 11 rare or uncommon in the Adirondacks. There are also 7 additional Adirondack specialties (species widespread here but rare elsewhere).

12 Five of the significant vascular plants are listed as S1 species (highly rare) by the New York Natural Heritage Program, and are legally protected as New York endangered species. One is listed as an S2 species (moderately rare) by the New York Natural Heritage Program, and legally protected as New York threatened species. Five are listed as S3 (somewhat rare, which I call uncommon) species by the New York Natural Heritage Program, but do not have legal protection.

13 We saw what we think is a remarkable total of 62

significant mosses and liverworts. The relative abundance of bryophytes in New York is very poorly known. My best, but still provisional, estimate of their status is that at least 30 are rare in New York, 12-14 uncommon in New York, and additional 16-18 rare in the Adirondacks, and one additional species uncommon in the Adirondacks. At least one species, while not uncommon or rare is clearly an Adirondack specialty.

14 So far as we know, our records of the majority of the significant species are new discoveries. Five of the vascular plants have been previously reported on or near the Finch lands, and about four of the mosses have been previously reported from elsewhere in the Hudson River Gorge.

15 Shamefully but perhaps for the better in the long run, mosses and liverworts are not interesting to New York biobureaucrats, and are not officially listed Heritage Program nor protected in New York. There was a Heritage provisional moss list in 1993, but it omitted many rare species and has not been updated.

16 With the exception of one or two mosses on tree bark, all our significant plant species were found in wetlands or on river shores or on limestone outcrops.

17 While many sites had one or two significant species, the majority of our significant species and almost all the real rarities were concentrated at a few limy sites. Our best sites for rare vascular plants were Blue Ledge and the Cedar Bog on the upper Hudson; our best sites for rare mosses and liverworts were Blue Ledge, OK Slip Falls, the limy cobble near the Gooley Club and the river ledges along the Cedar and at the mouth of the Indian. The ledges at the mouth of the Cedar, just off Finch property, were also very good, and it is quite possible that some of the species here extend upstream onto Finch land.

18 These last five sites taken together probably have a greater number of rare bryophytes than any other group of sites in a comparable area I know in New York; indeed they are more than comparable to Smugglers Notch (northern Vermont), which is probably the most famous site for northern, limy mosses and liverworts in the northeast U.S.

19 In our breeding bird work we found a total of 91 species in two years, 75 in 2000 and 81 in 2001; these included all the usual northern forest and wetland species, plus 12 more specialized boreal forest species, plus the merlin, a rare species that was seen only once.

20 Nine of the twelve boreal birds were moderately widespread, and observed several times or more, in different parts of the property. Three - rusty blackbird, bay-breasted warbler, and Bicknell's thrush, are apparently rare and were observed once each.

21 Every suitable habitat we examined in the property had at least one species of boreal bird. The greatest concentrations of species that we saw were in the northeastern unit, where we had nine species at the Boreas Ponds, 6 along the upper Hudson, and 5 along the Opalescent. None of the other areas to the south and west had more than four. This may be because the spruce stands are larger or more continuous in the northeast, or because, since they were the best habitat, we spent more time there.

22 We found breeding waterfowl at every one of the larger ponds we visited. The most diverse sites were the Boreas Ponds with five species and O'Neill Flow with four.

23 In a very approximate evaluation of the significance of the features of the Finch lands relative to the Adirondack Park as a whole, four groups of features (the Hudson River corridor, rare limestone vascular plants, rare limestone mosses, and the high-diversity limy ledge moss communities) were rated as unique in the Adirondacks.

24 Another four (the large floodplain wetlands along the Hudson, the OK-Slip fertile ravine community, the Gooley Club rich woods & ledge community, and the Cedar Glade Fen community & rare fen vascular plants) were rated as good as any similar features in the Park.

25 In addition, six groups of features (the corridors of Opalescent & Cedar Rivers, the alluvial woods along Sand Brook, boreal plant communities of undisturbed bogs and bog ponds, the ensemble of lowland boreal forest around ponds and along rivers, the ensemble of undeveloped ponds with views of hills, and the small fertile ravines and pockets near Hudson) were rated highly significant to the Park as a whole, though neither unique, nor as good or as extensive as the best Adirondack examples in their categories.

26 While I have not rated other Adirondack properties using this scale, a quick survey of the park suggests that, except for the High Peaks, there may be no other Adirondack property with this many unique and good-as-the-best features.

27 So far as we know, alien plants and animals are not affecting the natural communities on the Finch lands. Alien plants are common in settled areas and follow all the summer roads, but are scarce on trails and winter roads and essentially absent from forest interiors, waterbodies, outcrops, shores, and wetlands. Starlings and English sparrows certainly occur near the towns, but were not seen in our survey

28 The lack of alien plants and animals noted on the Finch property is generally true in much of the Adirondacks outside the Champlain Valley and reflects the low nutrient status of many communities and the lack of an agricultural history. It contrasts sharply with the situation in much of the rest of the New York, where the invasion of native communities by alien plants and animals is a major conservation problem.

29 With the exception of some ruts from an ATV in the bog at Goodnow Pond in August 2000, no damage to any unusual habitat or significant species from human activity was observed.

30 My summary of these findings is that the Finch property contains remarkable biological resources. The resources are currently in excellent condition, and are important not only locally but at the Adirondack and New York State scales. In two respects, the uniformly high quality of the forest management and the remarkable scenic assets it exceeds any other commercial forest lands (now totaling, with the Finch property,

some 400,000 acres) that I have examined. In another two respects, the presence of numerous rare plant species and unusual high diversity plant communities, it exceeds any other Adirondack property, public or private, that I have examined.