Human Use and Wildlife of the El Dorado Nature Preserve, a Natural Area on Eastern Lake Ontario

By

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TABLE OF CONTENTS

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LIST OF APPENDICES

LIST OF TABLES

INTRODUCTION

The complex of dunes and wetlands along the eastern shore of Lake Ontario supports a tremendous diversity and abundance of wildlife. In fact, The Nature Conservancy (TNC) has identified the region as one of its top 20 sites for conservation in New York State. This 16,000-acre system encompasses the only significant stretch of Great Lakes dunes in New York. These dunes shelter an unusual diversity of wetlands, including rare fen communities. The complex includes 11 rare communities total and supports 16 rare plants and 8 rare animals. The wetlands sustain an abundance of waterfowl and warmwater fish, and the overall region provides important habitat for breeding and migrating waterbirds, shorebirds, raptors, and songbirds.

The associated barrier beaches also attract intensive human use. The eastern Lake Ontario shoreline is a popular destination for swimmers, sunbathers, campers, and other recreationists. One of the principal threats to the dune/wetland system arises when the activities of humans and their pets move from the beach to the dunes. The dunes are sensitive to erosion, and even light to moderate traffic can cause damage. As the level of human use increases, the potential for degradation of ecological and recreational values increases as well.

I worked as a dune steward for the Central and Western New York (CWNY) chapter of TNC from May to September, 1997, in partial fulfillment of the requirements to earn a Master of Professional Studies degree at the State University of New York College of Environmental Science of Forestry. This report reviews my professional

responsibilities as a seasonal employee of TNC, and details the projects I undertook in academic obligation to SUNY - CESF.

SUMMARY OF JOB RESPONSIBILITIES

Background

El Dorado Nature Preserve (EDNP) is a 360-acre site owned and managed by CWNY - TNC. It is located in the Town of Ellisburg, Jefferson County, New York, and is directly adjacent to the 700-acre Black Pond Wildlife Management Area (BPWMA), which is owned and administered by the New York State Department of Environmental Conservation (NYSDEC). Together, these 2 properties protect the northernmost mile of the eastern Lake Ontario dune/wetland system, and the southernmost mile of Stony Point.

EDNP is composed of a diverse mosaic of habitats including redcedar woodlands, cattail marsh, pavement barrens, and sedge meadows. Many factors yield the wide assortment of habitats including geographic position, climate, and historic land use. One of the primary influences stems from the geologic history of the site. EDNP straddles 2 distinctly different geologic formations that were created during the last glaciation. The northern half of the preserve is representative of much of the rest of Stony Point, where the soil is very thin and the limestone bedrock is exposed in many areas. In contrast, the southern half includes the barrier beaches and sand dunes, which shelter Black Pond and its associated wetlands.

EDNP protects a valuable patch of the eastern Lake Ontario shoreline. TNC (1996, unpublished report) has identified 11 Element Occurrences for the preserve,

including 3 rare habitats and 8 rare species. The varied shoreline of EDNP includes one of the least disturbed and best preserved sections of Great Lakes Dunes (G3G4 S1S2) in the region, as well as Calcareous Shoreline Outcrop (G3G4 S3?). The second largest Silver Maple–Ash Swamp (G3G4 S2S3) in the state is also present here. Rare species include starwort (*Stellaria longipes*, G5T? S1), sand dune willow (*Salix cordata*, G5 S1), rough avens (*Geum virginianum*, G5 S1), sand cherry (*Prunus pumila* var. *pumila*, G5T? S1), Houghton's sedge (*Carex houghtoniana*, G5 S1), a noctuid moth (*Euxoa pleurotica*, G4 S2S3), northern harrier (*Circus cyaneus*, G5 S3), and black tern (*Chlidonias niger*, G4 S2). See Appendix A for a description of New York Natural Heritage Program (NYNHP) codes.

EDNP has several other significant natural features. It is one of the primary staging areas for shorebirds (Charadriidae, Scolopacidae) in eastern Lake Ontario. The preserve's shoreline sandbars and limestone outcrops provide important loafing and preening areas for significant concentrations of gulls and terns (Laridae), and waterfowl (Anatidae). Its meadows, shrublands, and woods provide important resting and feeding habitat for a wide variety of migrating songbirds (Passeriformes) and raptors (Falconiformes), and Black Pond is an important spawning area and nursery for warmwater fish.

EDNP is also strategic area from which TNC launches its efforts to preserve and restore the dune/wetland system. The CWNY chapter has employed and stationed dune stewards at EDNP and Sandy Pond Beach Natural Area for several years. The dune steward facilitates TNC's many approaches to conservation, including research.

management, restoration, and education. TNC's dune stewards serve as a prototype for the proposed barrierwide Dune Steward Program.

I was employed as a dune steward by CWNY-TNC from May 19 to September 6, 1997. The purpose of the position was to assist in effecting the goals and objectives of the organization in the eastern Lake Ontario dune/wetland system. The majority of my duties were focussed at TNC's EDNP; however, I was also responsible for efforts at NYSDEC's adjacent BPWMA. In addition, the position required completion of tasks at Sandy Pond Beach Natural Area (SPBNA, CWNY-TNC), Southwick Beach State Park (SBSP, New York State Office of Parks Recreation and Historic Preservation), and Lakeview Marsh WMA (LWMA, NYSDEC).

Public Education, Community Support, and Preserve Patrol

The primary responsibilities of my position were (1) to educate the public on the value of EDNP, the dune/wetland complex, and the importance of minimizing human traffic on the dunes, (2) to develop community support for EDNP and the efforts of TNC along eastern Lake Ontario, and (3) to patrol EDNP and BPWMA to monitor human use and encourage compliance with visitor use guidelines.

These responsibilties were interrelated, as were the methods used to complete them. The principal method of achieving all 3 responsibilities entailed spending several hours per day on the preserve trails and the barrier beach. Through this approach, I was able to directly interact with hundreds of visitors and answer countless questions about TNC, EDNP, and the dunes. Indeed, I was getting the organization's message directly to

the people TNC most wanted to inform. Furthermore, I was building community support, for an integral part of attaining this goal is public education. In addition, this approach allowed me to monitor the activities of visitors on the site and ensure that they were using the area in a responsible manner.

A major portion of each day was spent speaking with visitors. The subject that most visitors inquired about were the dunes and their surrounding issues. Many people wanted to know how walking on the dunes could damage them and what the negative affects were. This type of question was an optimal opportunity to discuss the development of footpaths into dune "blowouts." Discussion often proceeded to such topics as dune succession, restoration, and values. Many asked if the dunes were eroding further or were being restored. Several long-time visitors offered their perception of the changing condition of the dunes. Interestingly, just as many believed the dunes were retreating as advancing.

Many visitors sought clarification of preserve rules. Several asked if specific activities (e.g. horseback riding, picnicking, sunbathing, collecting driftwood) were allowed. Similarly, several visitors expressed dissatisfaction and asked why various activities were not permitted. Answering these questions was an important opportunity to alleviate resentment toward CWNY-TNC. Typically, visitors were very understanding after being informed of the basis for different rules.

Ownership and purpose of the protected areas were subjects of significant confusion among visitors, especially visitors of BPWMA. Visitors here usually believed

they were on EDNP or Southwick Beach State Park. At EDNP, people frequently asked if it was state land, despite the abundance of signs indicating that it is property of TNC.

My daily presence on the preserve's trails and the barrier beach to interact with the public were a corresponding means to monitor the site and ensure that observed activities were compatible with the objectives of EDNP and BPWMA. TNC welcomes visitors to enjoy the preserve but advocates low-impact use of the site.

The specific activity of most concern to TNC and the NYSDEC is trespass on and disturbance of the sand dunes. TNC also strongly discourages pedestrians from crossing the calcareous outcrop (a.k.a. limestone shelving sheetrock) shoreline of EDNP. This is the primary feeding and resting site on the preserve for shorebirds, waterfowl, and waterbirds, and these birds are particularly sensitive to disturbance. Additionaly, motor vehicles, bicycles, pets, jogging, camping, fires, alcoholic beverages, swimming, hunting, fishing, trapping, and plant collecting are not allowed on EDNP.

Interpretive nature walks were another principal approach toward informing the public and acquiring its support. I guided several over the season at EDNP for TNC members and the general public. The primary topic of walks was the diversity of habitats of the preserve, and its value to a diversity of wildlife. I also concentrated on showing attendants the many improvements TNC has made to the preserve in recent years, including interpretive displays, an information kiosk, the bird observation blind, boardwalks, and improved trails. I felt it very important that visitors see that the chapter is actively managing the preserve, and that the community is better off for its existence.

Other interpretive subjects at EDNP included the objectives of TNC, dune ecology, shorebird migration, and the negative effects of exotic species. Attendants always had numerous questions related to these subjects as well as preserve rules and the natural history and identification of plants and birds.

I also led walks at SBSP and the adjacent LWMA. The design of this site's trail system allowed greater focus of interpretation on the dune/wetland system. Topics presented included dune succession, the role of the dunes in sheltering the wetlands, the diversity and abundance of wildlife the complex sustains, the efforts of TNC and The Ontario Dune Coalition (TODC) to protect and restore the dunes, and the importance of minimizing traffic on the dunes.

I reinforced my public education efforts with informational pamphlets. I distributed a great quantity of printed educational material produced by CWNY-TNC, TODC, and New York Sea Grant (NYSG). Visitors responded with surprising gratitude and often remarked on the high quality of the material.

An important part of developing community support was cultivating relationships with preserve neighbors. I periodically visited the cottages and residences adjacent to EDNP and BPWMA to establish and maintain open lines of communication. These visits were a key means to listen to the opinions and concerns of preserve neighbors, and to exchange information. Furthermore, it was a valuable opportunity to present a positive image of the organization.

The final approach to public education and community support was collecting data via a visitor questionnaire. NYSG developed the questionnaire to gain information on

visitor use across the eastern Lake Ontario dune/barrier beach system. This data could then be analyzed to determine the success of previous public education efforts. and how to better direct them in the future. Questionnaire data could elucidate several specific questions of concern to TNC, including (1) if management of TNC properties shifts some user group activity to other protected sites, (2) if increased public relations attention to TNC activities in the region yields increased beach use, and (3) if patterns exist in the demographics of beach users. Appendix A is a copy of the NYSG questionnaire form.

I was required to enlist 50 visitors to fill out questionnaires at EDNP and BPWMA. The data have not yet been examined by NYSG; however. the project did indirectly yield significant positive results. Although many people were initially hesitant, many of the most fruitful educational interactions resulted from asking visitors to fill out survey form. Engaging visitors in this activity often elicited several questions or a lengthy discussion about dune issues, EDNP, and TNC.

Other Responsibilities

Public education, community support, and preserve monitoring were my highest priority responsibilities. However, extensive time and effort was dedicated toward maintaining preserve facilities, managing and restoring preserve habitats. supervising volunteers and inner city youth employees, and other activities.

Facilities maintenance

TNC has made several improvements to EDNP over the previous 2 years. The chapter has installed interpretive displays, an information kiosk, entrance gates, and a bird observation blind. These and other facilities require periodic maintenance.

Suppression of overgrown vegetation required a significant and continuous investment of time and labor. The herbaceous vegetation of the preserve driveway, parking area, and trails needed regular mowing to keep them traversable. The same areas also required frequent cutting of encroaching woody vegetation. Tree and shrub removal was also an important task to maintain visibility of preserve displays and signs, and to maintain visibility from the bird observation blind.

Cleaning the beach and trailsides of litter was another principal task. Each section of EDNP shoreline was cleaned of litter at least once during the season. In fact, the 1,000 feet of preserve sand beach was cleaned 4 times. Most of BPWMA's barrier beach was cleaned as well. Approximately 50 bags of garbage and several tires were collected over the season.

Other significant facilities maintenance tasks included, posting the preserve boundary, and moving and leveling several sections of boardwalk. I removed 3 generations of TNC boundary marker, each with a different variation of preserve use guidelines. I replaced these with new TNC signs designed especially for EDNP. The boardwalk cannot be set permanently in place, because limestone bedrock lies just below the preserve's soil surface. Annual spring adjustments are required because low areas become flooded, causing the boardwalk to float and drift out of place.

Habitat management and restoration

The primary objectives of habitat management actions at EDNP were the preservation and restoration of the dunes, maintenance of shorebird habitat, and control of invasive exotic plants. Patrolling the preserve to discourage activities incompatible with preserve objectives was a significant part of the strategies to achieve all 3 habitat management goals. Deterring trespass on the dunes and the calcareous shoreline outcrop prevents further erosion of the dunes and disturbance of the shorebirds, respectively. Patrolling the preserve also created an opportunity to monitor all areas of the preserve for alien plants. Thus, invasions are more likely to be discovered early, and they are more effectively controlled.

Maintenance of a psychological rope barrier between the barrier beach and the foredune was another significant part of the chapter's dune preservation and restoration strategy. This barrier provided little physical inhibition to anyone wishing to cross it. However, it did significantly reinforce the message of TNC signs asking visitors to stay out of the dunes. I never saw anyone cross the psychological barrier, and I only twice found footprints of someone who did. In contrasting, there was no rope barrier segregating the foredunes at BPWMA, and dune trespass was much greater here. Indeed, the presence of the rope barrier and watchful dune stewards has yielded significant recovery of large stretches of dunes at EDNP.

I rehabilitated several hundred yards of rope barrier over the season. The surf of an unusually high Lake Ontario had knocked down many continuous sections. Most of the driftwood posts, and some lengths of rope, were old and rotten and required replacement.

I was able to replace most of the decayed, makeshift posts with taller, larger diameter, wooden fenceposts that had washed up on the beach. The chapter also invested in several heavy-duty metal posts. I placed these in the locations most sensitive to erosion to circumvent likely damage to the dunes from stewards replacing posts.

Various factors have caused a degradation of the shorebird habitat at EDNP over recent decades. The primary controllable factor is encroachment of tall vegetation toward the shoreline. Before the preserve was established, the site was grazed by cattle and kept open. In the absence of grazing, vegetational succession has yielded trees and shrubs of various species, as well as tall, thick stands of purple loosestrife (*Lythrum salicaria*), reed canary-grass (*Phalaris arundinacea*), and common reed (*Phragmites australis*) growing close to the water's edge.

A suite of cultural, mechanical, and chemical methods was used to preserve and reclaim shorebird habitat. Reed canary grass and common reed root propagules and whole plants had washed up on more pristine stretches of shoreline over the spring. These were collected and destroyed to inhibit further invasion. Also, some small patches of rooted and growing plants could be completely pulled and removed. Over 22 garbage bags full of these plant parts and whole plants were collected and delivered to the landfill.

Extensive amounts of time were spent cutting shoreline stands of purple loosestrife, reed canary-grass, and common reed. The smallest, most eradicable patches were given highest priority and were completely cut as low as possible. Larger, more troublesome tracts received less attention. However, mowing efforts of large stands were concentrated at the end of points, where the effect was greatest.

I noted that soon after mowing, the stubble of the cut vegetation effectively caught clumps of algae, which virtually smothered the regrowth of vegetation. However, I do not believe that this, in fact, killed any patches of undesirable vegetation. I also soon observed flocks of Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), common merganser (*Mergus merganser*), Bonaparte's gull (*Larus philadelphia*) ring-billed gull (*L. delawarensis*), herring gull (*L. argentatus*), great black-backed gull (*L. marinus*), Caspian tern (*Sterna caspia*), and common tern (*S. hirundo*) loafing and preening on recently mowed shoreline areas that they did not previously use. These sites were also used by several species of foraging shorebirds. Thus, there was a direct benefit to the preserve's avifauna from mowing.

Cut and uncut purple loosestrife, reed canary-grass, and common reed stands were treated with glyphosate herbicide. A special permit was required because the herbicide was applied in a wetland. The herbicide was applied by other TNC staff after the end of my employment.

Also, several dozen large trees and shrubs were cut down to improve shorebird habitat. Those closest to the shoreline and on points received the highest priority. After being felled, the trees and shrubs were cut into small pieces to lay flat on the ground and to speed decay.

Actions to control invasive, exotic plants overlapped significantly with those to enhance shorebird habitat. Most actions to achieve both were directed at the purple loosestrife and common reed stands along the shoreline. However, reducing the extent of these species should yield benefits beyond improved shorebird habitat. These efforts

should also reduce the rate of colonization of the other wetland habitats of the preserve. and prevent (or at least slow) their degradation.

TNC also harbors great concern over the invasion and spread of swallow-wort (*Cynanchum vincetoxicum*) into the eastern Lake Ontario system. I searched for swallow-wort across the preserve. However, much of EDNP is covered with very dense vegetation, and thus detection was greatly inhibited. In fact, I did not find 1 particular patch of approximately 15 swallow-wort plants which was only 50 to 100 feet off the trail, until the last day of my employment.

I found 2 other patches of swallow-wort besides that mentioned above. One patch was composed of 3 plants, which I pulled immediately. The other patch consisted of a few hundred plants. The 2 larger patches were found late in the season, and the aboveground parts of the plants were turning yellow and dying. Thus, it was too late to kill the plants with glyphosate herbicide. However, a chapter employee visited the sites and collected the swallow-wort seedpods to inhibit the spread of the species.

Supervisory responsibilities

I was responsible for supervising volunteers at EDNP. The focus of this activity was the coordination of 3 "CWNY-TNC Volunteer Stewardship Days." These work days harnessed the enthusiasm and commitment of TNC members to help accomplish a variety of tasks at EDNP and BPWMA.

The chief aspect of planning for these days was safeguarding against personal injury and ensuring readiness in response to an emergency. The volunteers often used

potentially dangerous tools such as handsaws, pruners, and chainsaws. Part of my responsibility was to make sure that there was an adequate supply of protective gear (e.g., gloves, goggles). I also carried a first aid kit, cellular phone, and emergency response telephone numbers during these events.

Another primary aspect of preparation was guaranteeing enough work, supplies, and tools for all the attendees. Many of the volunteers drove for hours to provide their services. Hence, neither I nor they wanted their time wasted. A crucial goal was to provide tasks that both benefitted the preserve and its wildlife and motivated the volunteers. I strongly felt that if the attendees left uninspired by what their efforts accomplished, they would not return for other stewardship days. Further, I devoted a portion of each stewardship day toward interpreting the natural highlights of the preserve to demonstrate to participants that their contributions were valuable and appreciated.

The dedication of the volunteers was truly impressive. They deserve a large part of the credit for the completion of many of the facility maintenance and habitat management tasks. For example, the volunteers cleaned 1000 feet of shoreline of reed canary-grass and common reed root propagules and whole plants in 1 afternoon! They also cut down several shoreline trees, cleared shrubs blocking the view from the bird observation blind, and removed over 1 ton of garbage from the site's shoreline.

I was also responsible for supervising the activities of high school youth at EDNP. The CWNY chapter participates in an inner-city youth program coordinated by TNC's New York City office. The purpose of the program is to increase human diversity within the ranks of future TNC staff. TNC employed 3 individuals from the High School for the

Environment in New York City. The employees (2 students and one mentor) help fulfill stewardship tasks at various chapter preserves. Hopefully, their exposure to the organization will foster a desire to build a career with TNC.

The inner-city youth worked several days at EDNP. Supervisory duties for the students were similar to those for volunteers during stewardship days, with the exception their mentor provided assistance. The students helped in many facility maintenance and habitat management tasks, including trail maintenance, beach cleanup, exotic vegetation control, and shoreline tree and shrub removal.

PROJECTS TO FULFILL ACADEMIC REQUIREMENTS OF GRADUATE DEGREE

I completed the following projects to complete the academic requirements to earn a Master of Professional Studies degree: (1) summary of human use of barrier beach at EDNP and BPWMA, (2) inventory of the vascular plants, amphibians, reptiles, breeding birds, and mammals of EDNP, and (3) summary of the shorebird migration at EDNP.

HUMAN USE OF BARRIER BEACH AT EL DORADO NATURE PRESERVE AND BLACK POND WILDLIFE MANAGEMENT AREA

Introduction

One of the primary goals of TNC in eastern Lake Ontario is to preserve and restore the region's complex of barrier beaches, dunes, and wetlands. Increasing recreational pressure may be one of the greatest direct threats to this sensitive system. Human use data has been collected and analyzed from several sites along the eastern Lake Ontario shore (Bonanno 1988 and Schrader 1989, unpublished reports). However, no data exists from the northern end of this complex. My objective was to gather baseline data on the human use of the contiguous barrier beach area of EDNP and BPWMA. This information may then be used by relevant organizations to make qualified management decisions. Subsequent surveys may be conducted to detect shifts in human use patterns as management and development patterns change.

Methods

I established a line transect along the Lake Ontario shoreline from the outlet of Black Pond to the northern border of Jefferson Park. The transect was 1 mile long and encompasses the barrier beach that stretches contiguously across EDNP and BPWMA. The west side of the foredune, all of the barrier beach, and the adjacent waters of the lake are visible from the transect.

Sampling occurred between May 19 and September 6, 1997. Data were generally collected 5 days/week, from Thursday to Monday. There was significant variation of sampling time and duration between days because data were collected while fulfilling routine job responsibilities. Sampling times ranged from 10:00 to 20:00 EDT, with the bulk of the data collected during the 11:00 to 17:00 EDT period of peak human activity. Sample duration ranged from 0.50 to 6.25 hr. Data were separated into weekdays and weekend days. Holidays were included as weekend days.

I recorded the number of people visible from the transect and the length of time necessary to complete each survey. People were assorted according to the activity they participated in, including walking, swimming/sunbathing, biking, fishing, dune climbing, and birdwatching. Those taking part in multiple activities were categorized according to the one in which they appeared to spend the most time.

I also cataloged the origin of visitors and their means of access to the site. Categories included; pedestrians/bicyclists from the cottages north of EDNP, pedestrians/bicyclists from the cottages south of BPWMA, boaters/jet-skiers from points north, boaters/jet-skiers from points south, boaters/jet-skiers of unknown origin, and those who drove long distances and accessed the barrier beach via EDNP's parking area.

Results

A summary of all the human use data appears in Appendix C. Data were collected on 66 days, including 34 weekdays and 32 weekend days. A total of 168 hr of data were collected, including 76.25 hr during weekdays, and 91.75 hr during weekend days.

Changes in the level of human use over the season are summarized in Table 1. The greatest calculated level of human use was 7.12 people/hr/mi. The greatest level was measured during the period from September 1 to 6. The next 2 highest levels were measured during the periods from August 1 to 15 (6.43 people/hr/mi), and from July 1 to 15 (6.23 people/hr/mi). The lowest level was calculated for the period from May 19 to 31 (0.49 people/hr/mi). The 2 succeeding periods, June 1 to June 15 and June 16 to 30, yielded the second and third lowest totals, 0.75 people/hr/mi and 2.06 people/hr/mi, respectively. Level of use was more than 3.5 times greater on weekend days (6.15 people/hr/mi) than on weekdays (1.72 people/hr/mi).

Pedestrians/bicyclists from the cottages to the south constituted the highest percentage of visitors to the study area (32.81) (Table 2). The second largest percentage found was for boaters/jet-skiers from areas north of the site (23.45). Boaters/jet-skiers from south of the site comprised the lowest percentage of visitors (5.32). There was little difference in the percentage in the remaining groups: boaters/jet-skiers of unknown origin (13.53), pedestrians/bicyclists from cottages north of the site (12.52), and visitors from longer distances (12.37).

Just over half (50.64%) of the visitors came to the site to swim and sunbathe. Just under half (43.05%) visited the site to walk. The lowest percentage of visitors was observed biking (0.72%). Biking, fishing, dune climbing, and birdwatching combined, composed 6.31% of the observed activity.

Table 1. Level of human use through season on barrier beach at El Dorado Nature Preserve and Black Pond Wildlife Management Area

	No. people			No. hr			People/hr/mi		
Period	Week-days	Week-ends	Total	Week-days	Week-ends	Total	Week-days	Week-ends	Total
5/19-31	0	8	8	6.75	9.50	16.25	0.00	0.84	0.49
6/1-15	0	13	13	7.25	10.00	17.25	0.00	1.30	0.75
6/16-30	21	34	55	16.75	10.25	26.75	1.25	3.32	2.06
7/1-15	11	144	155	9.50	15.25	24.75	1.16	9.44	6.26
7/16-31	17	32	49	7.25	7.50	14.75	2.34	4.27	3.32
8/1-15	73	136	209	19.75	12.75	32.50	3.70	10.67	6.43
8/16-31	9	124	133	9.00	16.25	25.25	1.00	7.63	5.27
9/1-6	0	73	73	0.00	10.25	10.25	0.00	7.12	7.12
All periods	131	564	695	76.25	91.75	168.00	1.72	6.15	4.14

Table 2. Origin of visitors and means of access to barrier beach at El Dorado Nature Preserve and Black Pond Wildlife Management Area

	Boat/jet ski			Foot/bicycle		Car
Period	From n.	From s.	Unknown	From n.	From s.	Long dist.
5/19-31	0	0	0	0	2	6
6/1-15	0	0	0	1	5	7
6/16-30	12	2	15	13	11	2
7/1-15	30	8	0	24	59	34
7/16-31	8	1	24	8	8	0
8/1-15	60	11	41	11	69	17
8/16-31	17	11	10	25	52	18
9/1-6	36	4	4	5	22	2
All periods	163	37	94	87	228	86
% of total	23.45	5.32	13.53	12.52	32.81	12.37

Table 3. Observed activities of visitors on barrier beach at El Dorado Nature Preserve and Black Pond Wildlife Management Area

	Percentage of total					
Period	Walking	Swim/sunning	Biking	Fishing	Climbing	Birding
5/24-31	25.00	75.00	0.00	0.00	0.00	0.00
6/1-15	69.23	15.38	0.00	0.00	0.00	15.38
6/16-30	29.09	63.64	0.00	7.27	0.00	0.00
7/1-15	59.35	34.84	1.29	0.00	4.52	0.00
7/16-31	12.24	83.67	0.00	4.08	0.00	0.00
8/1-15	39.23	58.37	1.44	0.00	0.00	0.96
8/16-31	45.86	41.35	3.01	4.51	2.26	3.01
9/1-6	64.38	32.88	0.00	2.74	0.00	0.00
All periods	43.05	50.64	0.72	2.33	0.85	2.42

Discussion

From late May to early July the level of human use of the barrier beach followed a progression that is probably most affected by the temperature of Lake Ontario. The number of recreationists was lowest from late May until the middle of June. However, human activity increased significantly in the second half of June, when the lake water became warm enough to comfortably swim.

Once the lake warmed, weekend weather conditions appeared to have the greatest effect on human use. Visitor numbers approached their highest level in the the first half of July. Recreational use remained steady from this point to the end of the season, except for a notable decrease in the second half of July. Although this interval was dominated by hot, dry weather, 2 poor weather days fell on weekends when the site normally receives almost 80% of its use.

The highest human use figure was obtained in early September. This figure may be somewhat deceptive, however, because sampling only took place on 2 weekend days. However, I noted in my journal that the midafternoon period of September 1 (Labor Day) was the busiest 2-hr stretch of the season.

The information collected on the level of human use of the study site demonstrates well that warm lake temperatures combined with good weekend weather will yield the highest recreational pressure on the barrier beach. From a different perspective, this combination also provides the greatest potential for interaction with, and education of, the public.

About 45% of the visitors accessed the barrier beach on foot or bicycle. However, the number originating from the cottages south of the site was over 2.5 times greater than those from cottages to the north. Pedestrians and bicyclists from south of the transect accounted for almost a third of the total visitors. The great majority of these people owned or rented sites in Jefferson Park. However, I did speak to a few individuals that came from further sites, including Sunset Bluff and Southwick Beach State Park.

Approximately 42% of the visitors to the site arrived via boat or jet ski. I could not determine the origin of a significant portion of these boats (32%), but the number originating from the north was about 4.4 times greater than from the south. Just less than 25% of the total visitors came via boat or jet-ski from north of the study area. These visitors launched from the Stony Point State Boat Launch, Stony Creek marina, and private docks. Boaters and jet-skiers from south of the study area composed the smallest percentage of the total visitors (5.32).

The remainder of the visitors (12.37%) accessed the barrier beach by driving longer distances to the EDNP. Here they left their cars in the parking lot and made the half-mile walk, through the preserve, to the beach. Most individuals from this group came from places such as Ellisburg, Henderson and Watertown, but many came from further locations including Syracuse, Seneca Falls, and Rochester.

Information gathered on the origin and means of transport of visitors can lend insight toward developing public education strategies. TNC has made a strong effort to provide displays and signage on its property to educate visitors on the value of the area to wildlife and the importance of minimizing human traffic on the dunes. Every visitor to

EDNP has the opportunity to learn about these topics. However, about 90% of this barrier beach/dune complex is part of the state owned BPWMA, and approximately 75% of its visitors bypass these education efforts by accessing the site by boat or through Jefferson Park.

The data collected on the activities of visitors may be useful in deciding where to target education efforts. Over 93% of the visitors to the barrier beach participated in just 2 of the 6 recorded activities: swimming/sunbathing and walking. These activities have little or no long-term negative effect on the dune complex as long as visitors remain on the barrier beach. Climbing represented only 0.85% of the recorded activity. However, this activity is among the most destructive to the dunes.

INVENTORY OF THE WILDLIFE OF EL DORADO NATURE PRESERVE

Introduction

TNC has an active program to monitor the rare and unique elements of their preserves. Few TNC preserves, however, have complete lists of their flora and fauna. Inventories can lend valuable incite toward the development of preserve management plans. A catalog of species found at EDNP could prove especially useful considering its rich diversity of habitats. I compiled an inventory of several taxa using EDNP, including the vascular plants, fish, amphibians, reptiles, and breeding birds.

Methods

My responsibilities as a TNC employee generally required my presence at EDNP 5 days/week, from May 19 to September 6, 1997. While performing my assignments, I traversed extensive areas of the preserve on a daily basis. Consequently, I was able to visit all habitats of the preserve numerous times throughout the period. I maintained a list of the species encountered for each group, and consulted it semidaily to add new species and review potential additions.

The plant list is primarily a compilation of my findings and those of Gilman (1976), T. Carrolan (1981, unpublished report), and Bonanno (1992). Generally, Bonanno surveyed the preserve's barrier beach/dune complex, and Gilman concentrated on the plants of Black Pond and the surrounding wetland. Carrolan (under the supervision of Dr. Mildred Faust) focussed on the thin-soiled, limestone bedrock area of the preserve. Voucher specimens from Gilman and Bonanno's surveys are held in the herbarium at SUNY - CESF. The plant list is annotated to indicate which authors identified each species.

Many methods were used to develop the fish inventory. The primary technique used minnow and turtle traps. I placed 3 minnow traps and 2 turtle traps in shallow water near the shore of Black Pond, and baited them with chicken livers. The traps were in place from June 16 to September 6, and were checked frequently. The entrance holes of the minnow traps were slightly enlarged to increase the potential of catching specific herptiles.

Other fish survey methods included visual searches of the shoreline and adjacent shallow water for large fish and identifiable fish remains throughout the season. Fish

detected near the shoreline of Lake Ontario were included since TNC's property extends to the mean low water mark. I assisted Doug Carlson (NYSDEC) in extensive sampling of Black Pond with a purse seine on July 12. I also dip-netted the relict beaver pond near the southeast corner of the preserve on August 3.

To find amphibians and reptiles, I primarily listened for calling anurans and searched under rocks, logs, and boards throughout the season. I also used minnow and turtle traps in Black Pond, as described in the fish section.

The breeding bird list was produced solely by recording species incidentally detected while fulfilling job responsibilities. I categorized each species according to the highest level of breeding evidence observed. The breeding criteria and codes of Andrle and Carroll (1988) were followed with one modification. I added the Xa code to the "possible breeding" category to designate species that used the preserve during the breeding season but located their nests off the property. Please see Appendix D for a description of the breeding bird criteria codes.

I followed the taxonomic order and nomenclature of Mitchell and Tucker (1997) for vascular plants, Robins et al. (1991) for fish, Collins (1997) for amphibians and reptiles, and the American Ornithologists' Union (1983) for breeding birds. Species native to New York State appear in bold type. NYNHP rankings for plants follow Young (1997). New York State rarity statuses for plants follow NYSDEC (1989). Effective state rarity listings for animals follow NYSDEC (1987). NYNHP rankings for animals are from NYNHP (1998).

Results

The vascular flora of EDNP includes 100 families, 290 genera, and 516 species. The fish list include 12 families, 19 genera, and 24 species. Four families, 5 genera, and 8 species of amphibians were found, as well as 3 families, 7 genera, and 7 species of reptiles. The breeding bird total includes 30 families, 75 genera, and 88 species.

Vascular Plants

BAG = species recorded in Gilman (1976); TC = species recorded in T. Carrolan (1981, unpublished report); SEB = species recorded in Bonanno (1992); SFK = species located during this survey; *adjacent to initials = species reported via personal communication; *adjacent to species name = subtaxa identification required to verify native status.

Lycopodiaceae - clubmoss family

Huperzia lucidula (Michx.) Trev. - shining firmoss, shining fir clubmoss; SEB.

Lycopodium obscurum L. - ground-pine, tree clubmoss; BAG.

Equisetaceae - horsetail family

Equisetum arvense L. - field horsetail, common horsetail, bottlebrush, scouring rush; BAG, TC, SEB, SFK.

Equisetum fluviatile L. - water horsetail, pipes; BAG.

Equisetum variegatum Schleich. ex Weber & Mohr - variegated horsetail; SEB.

Osmundaceae - royal-fern family

Osmunda cinnamomea L. - cinnamon fern; BAG, TC, SFK.

Osmunda regalis L. - royal fern, flowering-fern; BAG, SFK.

Pteridaceae - maidenhair family

Adiantum pedatum L. - maidenhair fern, northern maidenhair; TC, SFK.

Dennstaedtiaceae - bracken family

Pteridium aquilinum (L.) Kuhn ex Decken - bracken, brake-fern, brake; BAG, SFK.

Thelypteridaceae - marsh fern family

Thelypteris noveboracensis (L.) Nieuwl. - New York fern; BAG, SEB, SFK.

Thelypteris palustris Schott - marsh fern; BAG, TC, SEB, SFK.

Aspleniaceae - spleenwort family

Asplenium platyneuron (L.) BSP. - ebony spleenwort; SFK.

Dryopteridaceae - wood fern family

Athyrium filix-femina (L.) Roth ex Mertens var. ***asplenioides*** (Michx.) Farw. – southern lady-fern; BAG, TC, SEB, SFK.

Cystopteris bulbifera (L.) Bernh. - bulblet fern; TC.

Dryopteris carthusiana (Vill.) Fuchs - spinulose wood fern; BAG, TC, SEB.

Dryopteris cristata (L.) A. Gray - crested wood fern, crested shield fern; BAG.

Dryopteris marginalis (L.) A. Gray - marginal wood fern; TC, SEB.

Matteuccia struthiopteris (L.) Todaro - ostrich fern, fiddleheads; BAG.

Onoclea sensibilis L. - sensitive fern; BAG, TC, SEB, SFK.

Polystichum acrostichoides (Michx.) Schott - Christmas fern, shield fern; BAG, TC, SFK.

Polypodiaceae - polypody family

Polypodium virginianum L. - rock polypody, common polypody; BAG, TC.

Taxaceae - yew family

Taxus canadensis Marsh. - American yew, ground-hemlock; BAG, SEB, SFK.

Pinaceae - pine family

Abies balsamea (L.) Mill. - balsam fir, Canada balsam, blisters; TC.

Picea abies (L.) Karst. - Norway spruce; BAG, SFK.

Picea glauca (Moench) Voss - white spruce, cat spruce; TC.

Pinus strobus L. - white pine; BAG, TC, SFK.

Pinus sylvestris L. - Scotch pine, Scots pine; SEB, SFK.

Tsuga canadensis (L.) Carr. - hemlock, eastern hemlock, northern hemlock, hemlock-spruce, tanbark; BAG, TC, SFK.

Cupressaceae - cypress family

Juniperus communis L. - common juniper, ground-juniper, gorst, horse-savin, hackmatack; BAG, TC, SEB, SFK.

Juniperus virginiana L. - eastern red cedar, Virginia redcedar, savin; BAG, TC, SEB, SFK.

Thuja occidentalis L. - northern white cedar, arbor-vitae; BAG, TC, SEB, SFK.

Lauraceae - laurel family

Lindera benzoin (L.) Blume - spicebush, benzoin-bush, benjamin-bush; TC, SFK.

Saururaceae - lizard's-tail family

Saururus cernuus L. - lizard's-tail; BAG, SFK.

Aristolochiaceae - birthwort family

Asarum canadense L. - wild ginger, asarabacca; TC, SFK.

Nymphaeceae - waterlily family

Nuphar variegata Engelm. ex Durand in Clinton - common yellow cowlily, yellow pondlily, spatterdock; BAG, SFK.

Nymphaea odorata Dryand. ex Ait. ssp. ***tuberosa*** (Paine) Wiersma & Hellquist – white waterlily, pondlily, fragrant waterlily, rose-colored water-lily, lilypads; BAG, SFK.

Ceratophyllaceae - hornwort family

Ceratophyllum demersum L. - coontail, hornwort; BAG, SFK.

Ranunculaceae - crowfoot family

Actaea pachypoda Ell. - white baneberry, white cohosh, doll's-eyes; BAG, SEB, SFK.

Actaea spicata L. ssp. ***rubra*** (Ait.) Hulten - red baneberry, snakeberry; BAG, TC, SEB, SFK.

Anemone canadensis L. - Canada anemone, wind-flower; BAG, SEB, SFK.

Anemone virginiana L. - thimbleweed, tall anemone; SEB.

Aquilegia canadensis L. - wild columbine, red columbine, rock-bells, meetinghouses; BAG, TC, SEB, SFK.

Caltha palustris L. - marsh marigold, cowslip, may-blob, king-cup; BAG, SFK.

Clematis virginiana L. - virgin's-bower, traveller's-joy, devil's darning-needle; TC, SEB, SFK.

Hepatica nobilis Mill. var. ***acuta*** (Pursh) Steyerm. - sharp-lobed hepatica; BAG, TC, SFK.

Ranunculus abortivus L. - kidney-leaf crowfoot, chicken-pepper, small-flowered crowfoot; TC.

Ranunculus acris L. - common buttercup, tall buttercup, field buttercup, field crowfoot; TC, SFK.

Ranunculus pensylvanicus L. f. - bristly buttercup, bristly crowfoot; TC.

Ranunculus sceleratus L. - cursed crowfoot, blisterwort; BAG, TC.

Ranunculus trichophyllus Chaix ex Vill. - white water-crowfoot, limp water-crowfoot; BAG.

Thalictrum dioicum L. - early meadow-rue; BAG, TC.

Thalictrum pubescens Pursh - tall meadow-rue, late meadow-rue; BAG, TC, SEB.

Berberidaceae - barberry family

Berberis thunbergii DC. - Japanese barberry; SEB.

Caulophyllum thalictroides (L.) Michx. - blue cohosh, papoose-root; BAG, TC, SEB, SFK.

Podophyllum peltatum L. - may-apple, wild mandrake; TC, SFK.

Papaveraceae - poppy family

Sanguinaria canadensis L. - bloodroot, red puccoon, white puccoon; SEB.

Fumariaceae - fumitory family

Dicentra canadensis (Goldie) Walp. - squirrel-corn, turkey-corn; BAG.

Dicentra cucullaria (L.) Bernh. - Dutchman's-breeches; BAG.

Ulmaceae - elm family

Ulmus americana L. - American elm, white elm; BAG, TC, SEB, SFK.

Ulmus thomasii Sarg. - rock elm, cork elm, winged elm; TC.

State Rarity Status: U NYNHP Rank: G5 S2S3.

Urticaceae - nettle family

Boehmeria cylindrica (L.) Sw. - false-nettle, bog-hemp; BAG, TC, SEB.

Pilea fontana (Lunell) Rydb. - emerald-fruited clearweed, coolwort, richweed; SEB.

Pilea pumila (L.) A. Gray - richweed, clearweed; SEB.

Urtica dioica L. ssp. ***gracilis*** (Ait.) Selander - stinging nettle, great nettle; TC, SEB.

Juglandaceae - walnut family

Carya cordiformis (Wang.) Koch - bitternut, swamp hickory; BAG, TC, SFK.

Carya ovata (Mill.) Koch - shagbark hickory, shellbark hickory; BAG, TC, SFK.

Juglans cinerea L. - butternut, white walnut, oilnut, lemon-walnut; TC, SFK.

Myricaceae - bayberry family

Myrica gale L. - sweet-gale, meadow-fern; SEB.

Fagaceae - beech family

Fagus grandifolia Ehrh.- American beech, beechnut; BAG, SEB, SFK.

Quercus bicolor Willd. - swamp white oak; TC.

Quercus macrocarpa Michx. - mossy-cup oak, bur oak, northern overcup oak; BAG, TC, SFK.

Quercus rubra L. - red oak; BAG, TC, SEB, SFK.

Quercus velutina Lam. - black oak, dyer's oak, yellow-bark oak; BAG.

Betulaceae - birch family

Alnus incana (L.) Moench ssp. ***rugosa*** (DuRoi) Clausen - hazel alder; BAG, SEB, SFK.

Betula alleghaniensis Britt. - yellow birch; BAG, TC, SFK.

Betula papyrifera Marsh. - paper birch, canoe birch, white birch; BAG, SEB, SFK.

Betula populifolia Marsh. - gray birch, fire birch, old-field birch, white birch; TC.

Carpinus caroliniana Walt. - hornbeam, blue beech, ironwood, water beech, musclewood; BAG, TC, SFK.

Ostrya virginiana (Mill.) Koch - hop hornbeam, ironwood; BAG, TC, SFK.

Chenopodiaceae - goosefoot family

Chenopodium album L. - lamb's-quarters, goosefoot, pigweed; TC, SFK.

Portulacaceae - purslane family

Claytonia caroliniana Michx. - Carolina spring-beauty; BAG, TC.

Portulaca oleracea L. - purslane, pussley; TC.

Caryophyllaceae - pink family

Arenaria serpyllifolia L. - thyme-leaf sandwort; TC.

Cerastium arvense L. - field chickweed, meadow chickweed; *BAG.

Cerastium semidecandrum L. - small mouse-ear chickweed, spring mouse-ear; TC.

Dianthus armeria L. - deptford pink; BAG, TC, SEB, SFK.

Minuartia michauxii (Fenzl) Farw. - rock sand-wort; SEB.

Moehringia lateriflora (L.) Fenzl - grove sandwort, blunt-leaf sandwort; TC, SEB.

Myosoton aquaticum (L.) Moench - giant chickweed, water mouse-ear, giant water-chickweed; TC.

Saponaria officinalis L. - bouncing-bet, soapwort, London-pride, bruisewort, fuller's-herb, sheepweed, sweet-betty, Boston-pink, old-maid's-pink, hedge-pink, chimney-pink; TC, SEB, SFK.

Silene latifolia Poir. - white campion, white cockle; TC, SFK.

Silene vulgaris (Moench) Garcke - bladder-campion, maiden's-tears; SEB.

Stellaria graminea L. - common stitchwort, lesser stitchwort; TC.

Stellaria longipes Goldie - starwort, stitchwort; *SEB, SFK.

State Rarity Status: R NYNHP Rank: G5 S2.

Polygonaceae - buckwheat family

Polygonum amphibium L. var. ***emersum*** Michx. - tall water smartweed, devil's shoestring; BAG, TC.

Polygonum arenastrum Jord. ex Bor. - knotweed, doorweed, knotgrass, sidewalk-weed; *BAG.

Polygonum aviculare L. - knotweed, knotgrass; TC.

Polygonum cilinode Michx. - fringed bindweed, false buckwheat; SEB.

Polygonum convolvulus L. - black bindweed, corn-bind, nimble will, ivy bindweed; SEB.

Polygonum cuspidatum Sieb. & Zucc. - Japanese bamboo, Japanese knotweed; TC.

Polygonum hydropiper L. - common smartweed, water-pepper, poor-man's pepper, eyebane; BAG, TC.

Polygonum persicaria L. - lady's-thumb, heart's-ease, smartweed; BAG, TC.

Rumex acetosella L. - sheep sorrel, red sorrel, sourgrass; TC, SEB.

Rumex crispus L. - curly dock, yellow dock, sour dock; TC.

Rumex verticillatus L. - swamp dock, water dock; BAG.

Clusiaceae - mangosteen family

Hypericum perforatum L. - common St. John's-wort, klamath-weed, goat-weed; BAG, TC, SEB, SFK.

Hypericum punctatum Lam. - St. John's-wort; TC.

Tiliaceae - linden family

Tilia americana L. - basswood, whitewood, American linden; BAG, TC, SEB, SFK.

Malvaceae - mallow family

Hibiscus moscheutos L. - rose-mallow, swamp-rose, marshrose, marsh-mallow, wild cotton; BAG, SFK.

Malva neglecta Wallr. - cheeses, common mallow; SFK.

Violaceae - violet family

Viola canadensis L. - tall white violet, canada violet; BAG.

Viola conspersa Reichenb. - American dog-violet; TC.

Viola pubescens Ait. - yellow violet, smooth yellow violet, downy yellow violet; BAG, TC.

Viola septentrionalis Greene - northern blue violet; TC.

Viola sororia Willd. - common violet, woolly violet, hooded violet (confederate violet); BAG.

Cucurbitaceae - gourd family

Echinocystis lobata (Michx.) Torrey & A. Gray - prickly cucumber, wild cucumber, wild balsam-apple; TC, SEB, SFK.

Salicaceae - willow family

Populus balsamifera L. - balsam poplar, tacamahac, hackmatack; TC, SFK.

Populus deltoides Bartr. ex Marsh. - cottonwood, poplar; BAG, TC, SEB, SFK.

Populus grandidentata Michx. - big-toothed aspen, large-toothed aspen; SEB, SFK.

Populus tremuloides Michx. - quaking aspen, trembling aspen; TC, SEB, SFK.

Salix alba L. - white willow; TC.

Salix x *rubens* Schrank - willow; SEB.

Salix amygdaloides Anderss. - peach-leaf willow; SEB.

Salix bebbiana Sarg. - beaked willow, livid willow; BAG, SEB.

Salix cordata Michx. - sand-dune willow, heartleaf willow, furry willow; SEB, SFK.

State Rarity Status: T NYNHP Rank: G5 S1.

Salix discolor Muhl. - pussy-willow, glaucous willow; BAG, SEB.

Salix exigua Nutt. - sandbar willow; TC, SEB.

Salix fragilis L. - crack-willow, brittle willow; BAG, TC.

Salix lucida Muhl. - shining willow, glossy willow; BAG, SEB.

Salix nigra Marsh. - black willow, swamp willow; BAG, SEB.

Salix petiolaris Sm. - slender willow, meadow willow; TC.

Salix purpurea L. - purple willow, basket willow; SEB.

Brassicaceae - mustard family

Alliaria petiolata (Bieb.) Cav. & Grande - garlic mustard; SFK.

Alyssum alyssoides (L.) L. - alyssum; TC, SEB.

Arabis canadensis L. - sicklepod, rock-cress; TC.

Arabis glabra (L.) Bernh. - tower-mustard, tower-cress; TC.

Berteroa incana (L.) DC. - hoary alyssum; SFK.

Cakile edentula (Bigel.) Hooker var. ***lacustris*** Fern. - shore-rocket, sea-rocket; SEB.

Capsella bursa-pastoris (L.) Medik. - shepherd's-purse, shepherd's-pouch, pick-pocket; TC.

Cardamine bulbosa (Schreb. ex Muhl.) BSP. - spring cress; BAG.

Cardamine concatenata (Michx.) Schwein. - cut-leaf toothwort, pepper-root; BAG, TC.

Cardamine diphylla (Michx.) Wood - two-leaf toothwort, pepperwort; BAG, TC.

Cardamine douglassii Britt. - purple cress; TC.

Cardamine pensylvanica Muhl. ex Willd. - Pennsylvania bittercress; TC.

Cardamine pratensis L. - cuckoo-flower, lady's-smock; TC, SEB.

Draba verna L. - whitlow-grass; TC.

Hesperis matronalis L. - dame's rocket, mother-of-the-evening; TC, SFK.

Lepidium campestre (L.) R. Br. ex Ait. - cow-cress, field-cress; TC.

Rorippa nasturtium-aquaticum (L.) Hayek - watercress; TC.

Rorippa palustris (L.) Besser ssp. *palustris* - marsh watercress, yellow watercress; TC.

Sinapis arvensis L. - charlock, wild mustard; TC.

Sisymbrium altissimum L. - tumble-mustard; TC.

Resedaceae - mignonette family

Reseda lutea L. - yellow mignonette, scrambling rocket; TC.

Ericaceae - heath family

Pyrola elliptica Nutt. - shinleaf, wild lily-of-the-valley; TC, SFK.

Vaccinium corymbosum L. - highbush blueberry, swamp blueberry, whortleberry; SEB, SFK.

Primulaceae - primrose family

Lysimachia ciliata L. - fringed loosestrife; BAG, SEB.

Lysimachia nummularia L. - moneywort, creeping loosestrife, creeping-charlie, creeping-jenny; BAG, TC, SFK.

Lysimachia terrestris (L.) BSP. - swamp-candles, yellow loosestrife, swamp loosestrife; BAG, TC.

Lysimachia thyrsiflora L. - tufted loosestrife; BAG, SFK.

Trientalis borealis Raf. - starflower, chickweed-wintergreen, star-of-seven; BAG. SEB.

Grossulariaceae - gooseberry family

Ribes americanum Mill. - wild black currant, eastern black currant; BAG, TC, SEB.

Ribes cynosbasti L. - wild gooseberry, dogberry, prickly gooseberry; TC.

Ribes hirtellum Michx. - northern gooseberry, currant; BAG.

Ribes rubrum L. - northern red currant, garden red currant, cherry-currant; SEB.

Crassulaceae - sedum family

Penthorum sedoides L. - ditch-stonecrop; TC.

Sedum acre L. - yellow sedum, wallpepper, wall-sedum, yellow stonecrop, mossy stonecrop; TC, SEB, SFK.

Sedum album L. - white-flowered sedum, stonecrop, orpine, live-forever; TC.

Sedum telephium L. - live-forever, garden orpine, garden stonecrop; BAG.

Saxifragaceae - saxifrage family

Mitella diphylla L. - coolwort, miterwort; BAG, TC.

Mitella nuda L. - miterwort, bishop's cap; TC.

Saxifraga virginiensis Michx. - early saxifrage; TC.

Tiarella cordifolia L. - foamflower, false miterwort; BAG, TC, SFK.

Rosaceae - rose family

Agrimonia gryposepala Wallr. - common agrimony, stickseed, cocklebur, harvest lice; BAG.

Amelanchier arborea (Michx. f.) Fern. - shadbush, serviceberry; TC.

Crataegus spp. - hawthorn; BAG, SFK.

Dalibarda repens L. - false-violet, robin-run-away, dewdrop; TC.

Fragaria vesca* L. - woodland strawberry, sow-teat strawberry; TC.

Fragaria virginiana Dcne. - wild strawberry, Virginia strawberry; BAG, TC, SEB, SFK.

Geum aleppicum Jacq. - yellow avens; BAG.

Geum canadense Jacq. - white avens; SEB.

Geum laciniatum Murr. - rough avens, herb-bennet; BAG.

Geum virginianum L. - rough avens, herb-bennet; SEB.

State Rarity Status: U NYNHP Rank: G5 S1.

Malus pumila Mill. - common apple, paradise apple; BAG, TC, SFK.

Potentilla anserina L. ssp. ***anserina*** - silverweed, goose-grass, goose-tansy; BAG, TC, SEB, SFK.

Potentilla argentea L. - silvery cinquefoil, hoary cinquefoil; SEB.

Potentilla canadensis L. - dwarf cinquefoil, five-fingers; TC.

Potentilla norvegica* L. - rough cinquefoil, three-leaf cinquefoil; TC.

Potentilla palustris (L.) Scop. - marsh cinquefoil, five-fingers, purple cinquefoil; BAG.

Potentilla recta L. - sulfer cinquefoil, five-fingers; BAG.

Potentilla simplex Michx. - common cinquefoil, old-field cinquefoil, five-fingers; TC.

Prunus pumila L. var. ***pumila*** - sand-cherry; BAG, SEB, SFK.

State Rarity Status: R NYNHP Rank: G5T? S1.

Prunus serotina Ehrh. - black cherry, wild cherry, rum-cherry, autumn cherry; BAG, SEB, SFK.

Prunus virginiana L. - choke-cherry; BAG, SEB, SFK.

Rosa blanda Ait. - smooth rose, meadow rose; BAG, SEB.

Rosa micrantha Borr. ex Sm. in Sowerby - sweetbrier; TC, SFK.

Rosa palustris Marsh. - swamp rose; BAG, TC, SEB, SFK.

Rubus allegheniensis Porter ex Bailey *sensu lato* - northern blackberry, sow-teat blackberry, highbush blackberry; SEB, SFK.

Rubus hispidus L. *sensu lato* - swamp dewberry, running blackberry; TC.

Rubus idaeus* L. - red raspberry; TC, SEB, SFK.

Rubus occidentalis L. - black raspberry, black-cap, black thimbleberry; TC, SEB, SFK.

Rubus odoratus L. - pink thimbleberry, purple flowering raspberry; TC, SFK.

Rubus pubescens Raf. - dwarf raspberry, plumboy; SEB.

Spiraea alba DuRoi var. ***alba***; BAG, TC, SEB, SFK

var. ***latifolia*** (Ait.) Dippel - meadow-sweet, Canada tea, quaker lady; BAG.

Waldsteinia fragarioides (Michx.) Tratt. - barren strawberry, false strawberry; TC.

Fabaceae - bean family

Amphicarpaea bracteata (L.) Rickett & Stafleu - hog-peanut; BAG, TC.

Apios americana Medik. - groundnut, wild bean, potato-bean, creek-potato; TC, SEB.

Lathyrus japonicus Willd. var. ***maritimus*** (L.) Kartesz & Gandhi - beach-pea; SEB.

Lathyrus palustris L. - vetchling, marsh-vetch, marsh-pea; TC, SEB.

Medicago lupulina L. - black medick, nonesuch, bur-clover; TC, SFK.

Melilotus alba Desr. ex Lam. - white sweet-clover, white melilotus; TC, SFK.

Melilotus officinalis (L.) Pallas - yellow sweet-clover; TC, SFK.

Robinia pseudo-acacia L. - black locust, false acacia; TC.

Trifolium aureum Pollich - yellow clover, hop-clover; TC, SFK.

Trifolium dubium Sibth. - small hop-clover; TC.

Trifolium hybridum L. - alsike clover; TC.

Trifolium pratense L. - red clover; BAG, TC, SFK.

Trifolium repens L. - white clover, lawn-clover, dutch-clover; TC, SFK.

Vicia cracca* L. - cow-vetch, tufted-vetch, Canada-pea; BAG, TC, SFK.

Haloragaceae - water milfoil family

Myriophyllum sibericum Komarov - water milfoil; BAG.

Myriophyllum verticillatum L. - water milfoil; BAG.

Lythraceae - loosestrife family

Decodon verticillatus (L.) Ell. - water-willow, water-oleander; BAG.

Lythrum salicaria L. - purple loosestrife, spiked loosestrife; BAG, TC, SEB, SFK.

Onagraceae - evening-primrose family

Circaea lutetiana L. - enchanter's nightshade; BAG, TC, SEB.

Epilobium ciliatum Raf. - willow-herb; TC.

Epilobium hirsutum L. - European fireweed, great willow-herb; TC.

Ludwigia palustris (L.) Ell. - water purslane, marsh purslane; BAG.

Oenothera biennis L. - common evening-primrose, garden evening primrose; BAG, TC, SEB, SFK.

Cornaceae - dogwood family

Cornus alternifolia L. f. - green osier, pagoda dogwood; TC, SFK.

Cornus amomun Mill. - silky dogwood, kinnikinnik; BAG, SEB, SFK.

Cornus foemina Mill. ssp. ***racemosa*** (Lam.) J. Wilson - gray dogwood, northern swamp dogwood; BAG, SFK.

Cornus sericea L. - red osier, red dogwood, American dogwood; BAG, TC, SEB, SFK.

Celastraceae - staff-tree family

Celastrus scandens L. - American bittersweet, wax-work, staff-vine, climbing bittersweet, false bittersweet; BAG, TC, SFK.

Aquifoliaceae - holly family

Ilex verticillata (L.) A. Gray - black alder, winterberry; BAG, SEB, SFK.

Euphorbiaceae - spurge family

Acalypha virginica L. var. ***rhomboidea*** (Raf.) Cooperrider - three-seeded-mercury; TC.

Chamaesyce polygonifolia (L.) Small - seaside spurge; BAG, TC, SEB.

Euphorbia esula L. - wolf's-milk, leafy spurge; TC, SEB, SFK.

Rhamnaceae - buckthorn family

Rhamnus cathartica L. - common buckthorn; TC, SEB, SFK.

Rhamnus frangula L. - smooth buckthorn, alder buckthorn; SEB.

Vitaceae - grape family

Parthenocissus quinquefolia (L.) Planch. ex DC. - Virginia creeper, woodbine; BAG, TC, SEB, SFK.

Vitis riparia Michx. - frost grape, riverbank grape, dune grape; SEB.

Vitis vulpina L. - winter grape, frost grape, chicken grape; TC.

State Rarity Status: U NYNHP Rank: G5 S2.

Polygalaceae - milkwort family

Polygala senega L. - seneca snakeroot, mountain flax; TC.

Staphyleacea - bladdernut family

Staphylea trifolia L. - bladdernut; TC, SFK.

Aceraceae - maple family

Acer negundo L. - box-elder, ash-leaf maple; TC, SEB, SFK.

Acer nigrum Michx. f. - black maple; TC, SEB, SFK.

Acer pensylvanicum L. - striped maple, moosewood, green-striped maple, whistlewood; SEB, SFK.

Acer rubrum L. - red maple, soft maple, scarlet maple, swamp maple; TC, SEB, SFK.

Acer x ***freemanii*** Murr. - soft maple; *SEB.

Acer saccharinum L. - silver maple, white maple, river maple; BAG, SEB, SFK.

Acer saccharum Marsh. - sugar maple, rock maple, hard maple; BAG, SEB, SFK.

Anacardiaceae - sumac family

Rhus aromatica Ait. - fragrant sumac, lemon sumac, polecat-bush; TC, SFK.

Rhus hirta (L.) Sudworth - staghorn sumac, velvet sumac; BAG, TC, SFK.

Toxicodendron radicans (L.) Kuntze - poison ivy, poison oak; BAG, TC, SFK.

Rutaceae - rue family

Zanthoxylum americanum Mill. - prickly ash, tooth-ache tree; BAG, TC, SFK.

Oxalidaceae - oxalis family

Oxalis stricta L. - lady's-sorrel; SEB.

Geraniaceae - geranium family

Geranium bicknellii Britt. - geranium, cranesbill; TC.

Geranium maculatum L. - wild geranium, spotted geranium, alumroot, purple cranesbill; BAG, TC, SFK.

Geranium robertianum L. - herb-robert; BAG, TC, SEB, SFK.

Balsaminaceae - touch-me-not family

Impatiens capensis Meerb. - spotted jewelweed, touch-me-not, snapweed; BAG, TC, SEB, SFK.

Araliaceae - ginseng family

Aralia hispida Vent. - bristly sarsaparilla, dwarf-elder; TC.

Aralia nudicaulis L. - wild sarsaparilla; SEB, SFK.

Apiaceae - carrot family

Cicuta bulbifera L. - water-hemlock; BAG, TC.

Cicuta maculata L. - water-hemlock, spotted cowbane, musquash-root, beaver-poison, poison hemlock; BAG, TC.

Daucus carota L. - queen-anne's-lace, wild carrot; BAG, TC, SFK.

Heracleum maximum Bartr. - cow-parsnip, masterwort; TC, SFK.

Sium suave Walt. - water-parsnip; BAG, TC, SEB.

Gentianaceae - gentian family

Gentiana andrewsii Griseb. - closed gentian, bottle gentian; BAG, TC, SFK.

Asclepiadaceae - milkweed family

Asclepias incarnata L. - swamp milkweed; TC, SFK.

Asclepias syriaca L. - common milkweed; BAG, TC, SEB, SFK.

Asclepias tuberosa L. - butterfly-weed, pleurisy-root, orange milkweed, tuber-root, chigger-flower, indian-paintbrush; SEB, SFK.

Cynanchum vincetoxicum (L.) Pers. - swallow-wort; SFK.

Solanaceae - nightshade family

Lycium barbarum L. - matrimony-vine.

Physalis heterophylla Nees - clammy ground-cherry; TC.

Solanum dulcamara L. - trailing nightshade, bittersweet, climbing nightshade; BAG, TC, SEB, SFK.

Convolvulaceae - morning-glory family

Calystegia sepium (L.) R. Br. - hedge-bindweed, wild morning-glory; TC, SFK.

Polemoniaceae - phlox family

Phlox divaricata L. - blue phlox, wild sweet-william; TC.

Hydrophyllaceae - waterleaf family

Hydrophyllum virginianum L. - Virginia waterleaf, shawnee-salad, indian salad, John's-cabbage; BAG, TC.

Boraginaceae - borage family

Echium vulgare L. - blue-devil, blue-weed, viper's bugloss; BAG, TC, SEB, SFK.

Myosotis verna Nutt. - spring forget-me-not; TC.

Verbenaceae - verbena family

Lithospermum officinale L. - European gromwell; *BAG.

Phryma leptostachya L. - lopseed; BAG, TC, SEB.

Verbena hastata L. - blue vervain, blue verbena, simpler's-joy; BAG, TC, SFK.

Lamiaceae - mint family

Acinos arvensis (Lam.) Dandy - mother-of-thyme; TC.

Clinopodium vulgare L. - basil, wild basil, basil-weed, dog-mint; BAG, SFK.

Collinsonia canadensis L. - richweed, stoneroot; SEB.

Galeopsis tetrahit L. - hemp-nettle; BAG.

Hedeoma pulegioides (L.) Pers. - mock-pennyroyal; SEB.

Leonurus cardiaca L. - motherwort; TC.

Lycopus americanus Muhl. ex Bart. - water-horehound, bugleweed; BAG, TC, SEB.

Lycopus uniflorus Michx. - water-horehound, bugle-weed; SEB.

Lycopus virginicus L. - water-horehound, bugle-weed; TC, SEB.

Mentha x *piperita* L. - peppermint, bergamot mint; TC.

Mentha arvensis L. - field mint; BAG, TC.

Mentha spicata L. - spearmint, curly mint; TC, SEB.

Nepeta cataria L. - catnip, catmint; BAG, TC.

Prunella vulgaris L. - self-heal, heal-all, prunella; BAG, TC, SFK.

Pycnanthemum tenuifolium Schrad. - mountain-mint; TC.

Scutellaria galericulata L. - hooded skullcap, common skullcap; BAG, TC, SEB.

Scutellaria lateriflora L. - common skullcap, mad-dog skullcap; SEB.

Scutellaria parvula Michx. var. ***parvula*** - small skullcap; *SEB.

Stachys palustris L. - woundwort; TC.

Stachys tenuifolia Willd. - creeping hedge-nettle; BAG, TC, SEB.

Teucrium canadense L. - wild germander, wood-sage; TC.

Trichostema brachiatum L. - false pennyroyal; TC, SFK.

Plantaginaceae - plantain family

Plantago lanceolata L. - buck-horn plantain, rib-grass, ripplegrass, ribwort, English plantain; TC, SFK.

Plantago major L. - common plantain, dooryard plantain, broad-leaf plantain, car(t)-track plant, white-man's foot; TC, SFK.

Oleaceae - olive family

Fraxinus americana L. - white ash, american ash; BAG, TC, SFK.

Fraxinus nigra Marsh. - black ash; SEB.

Fraxinus pennsylvanica Marsh. - red ash, green ash; BAG, TC, SEB, SFK.

Syringa vulgaris L. - lilac, purple lilac, white lilac; SFK.

Scrophulariaceae - figwort family

Agalinis tenuifolia (Vahl) Raf. var. ***tenuifolia*** - gerardia, false-foxglove; BAG.

Chaenorrhinum minus (L.) Lange - dwarf snapdragon; TC.

Chelone glabra L. - turtle-heads, balmony, snake-heads; TC, SFK.

Gratiola neglecta Torrey - mud-hyssop, hedge-hyssop; BAG, TC.

Linaria vulgaris Mill. - butter-and-eggs, wild snapdragon, common toadflax, ramstead; TC, SEB, SFK.

Mimulus ringens L. - common monkeyflower, purple monkeyflower, Allegheny monkeyflower; TC, SFK.

Odontites vernus (Bellardi) Dumort. ssp. *serotinus* (Dumort.) Corb. - eyebright, bartsia; SFK.

Penstemon digitalis Nutt. - false-foxglove, beard-tongue; TC.

Scrophularia lanceolata Pursh - hare-figwort; BAG.

Verbascum blattaria L. - moth-mullein; TC, SFK.

Verbascum thapsus L. - mullein, mule's-ear, flannel-plant, devil's-tobacco, velvet dock, mullein-dock; TC, SEB, SFK.

Veronica arvensis L. - corn speedwell; TC.

Veronica officinalis L. - speedwell, gypsy-weed; BAG, TC.

Veronica peregrina L. - neckweed, purslane-speedwell; TC.

Veronica serpyllifolia L. - thyme-leaf speedwell; TC.

Lentibulariaceae - bladderwort family

Utricularia macrorhiza LeConte - common bladderwort; BAG.

Campanulaceae - bluebell family

Campanula aparinoides Pursh - marsh bellflower; BAG, TC.

Campanula rapunculoides L. - creeping bellflower, roving bellflower; SFK.

Lobelia cardinalis L. - cardinal-flower, indian-pink; TC, SFK.

Lobelia inflata L. - indian-tobacco; TC, SFK.

Triodanis perfoliata* (L.) Nieuwl. - Venus' looking-glass; TC.

Rubiaceae - madder family

Cephalanthus occidentalis L. - buttonbush; BAG, TC, SEB, SFK.

Galium aparine L. - bedstraw, cleavers, goosegrass; TC.

Galium mollugo L. - white bedstraw, false baby's-breath, adder; BAG.

Galium obtusum Bigel. - marsh bedstraw, cleavers; BAG.

Galium palustre L. - ditch bedstraw, marsh bedstraw; TC.

Galium trifidum L. - small bedstraw, cleavers; TC, SEB.

Galium triflorum Michx. - sweet-scented bedstraw; SEB.

Caprifoliaceae - honeysuckle family

Diervilla lonicera Mill. - bush honeysuckle; BAG, SFK.

Lonicera canadensis Bartr. - fly honeysuckle; TC.

Lonicera morrowii A. Gray - fly honeysuckle; SEB, SFK.

Lonicera x *bella* Zabel - fly-honeysuckle; *SEB.

Lonicera oblongifolia (Goldie) Hooker - swamp fly honeysuckle; TC, SEB.

Lonicera tatarica L. - Tartarian honeysuckle; TC, SEB, SFK.

Sambucus canadensis L. - black elderberry, common elder; BAG, TC, SFK.

Sambucus racemosa L. ssp. *pubens* (Michx.) House - red elderberry, stinking elderberry; BAG, SFK.

Triosteum aurantiacum Bickn. - wild coffee, horse-gentian; TC.

Viburnum acerifolium L. - maple-leaf viburnum, arrowwood, dockmackie, purple-leaf viburnum; BAG, SEB, SFK.

Viburnum dentatum var. ***lucidum*** Ait. - southern arrowwod; BAG, TC, SEB, SFK.

Viburnum lantanoides Michx. - hobblebush, witch-hobble, moosewood, tanglewood; TC, SFK.

Viburnum lentago L. - sheepberry, sweetberry, nannyberry, black haw, cowberry, wild raisin, wild tea; BAG, TC, SEB, SFK.

Viburnum nudum L. var. ***cassinoides*** (L.) Torrey & A. Gray - wild raisin; BAG.

Viburnum opulus L. var. ***americanum*** Ait. - highbush cranberry, squawbush; SEB, SFK.

Dipsacaceae - teasel family

Dipsacus fullonum L. - common teasel, fuller's teasel, wild teasel; TC, SFK.

Asteraceae - aster family

Achillea millefolium L. - common yarrow, milfoil; BAG, TC, SEB, SFK.

Ambrosia artemisiifolia L. - ragweed, hogweed, bitterweed; TC, SEB, SFK.

Antennaria neglecta Greene - everlasting, pussy's-toes; TC, SFK.

Anthemis cotula L. - mayweed, stinking chamomile, stinkweed, dogweed; TC.

Arctium minus (Hill) Bernh. - common burdock, great burdock; TC, SFK.

Artemisia biennis Willd. - sage-weed; BAG.

Artemisia campestris L. ssp. ***caudata*** (Michx.) Hall & Clem. - wild sage, tall wormwood; TC, SEB, SFK.

Artemisia vulgaris L. - felon-herb; TC.

Aster acuminatus Michx. - mountain aster, wood aster, whorled aster; TC.

Aster cordifolius L. - blue wood aster; BAG, TC.

Aster lanceolatus Willd. var. ***simplex*** (Willd.) A. Jones - tall white aster; TC.

Aster lateriflorus (L.) Britt. - calico aster; BAG, TC, SFK.

Aster lowrieanus Porter - lowrie's aster; TC.

Aster macrophyllus L. - bigleaf aster; TC, SEB.

Aster novae-angliae L. - New England aster; BAG, TC, SFK.

Aster puniceus L. - purple-stemmed aster; BAG.

Aster umbellatus Mill. - flat-top white aster, peewee daisy; TC.

Bidens cernua L. - stick-tights, bur-marigold; BAG, TC.

Bidens frondosa L. - beggar-ticks, stick-tights; BAG, SEB.

Bidens laevis (L.) BSP. - smooth bur-marigold, beggar-ticks; TC.

State Rarity Status: R NYNHP Rank: G5 S2.

Carduus acanthoides L. - thistle; TC.

Centaurea maculosa Lam. - bushy knapweed; TC, SEB, SFK.

Cichorium intybus L. - chicory, blue-sailors, cornflower, succory, witloof; TC, SFK.

Cirsium arvense (L.) Scop. - Canada thistle; TC, SEB, SFK.

Cirsium vulgare (Savi) Tenore - bull-thistle, common thistle; BAG, TC, SFK.

Conyza canadensis (L.) Cronq. - horseweed, hogweed, butterweed; TC, SEB.

Erigeron annuus (L.) Pers. - daisy-fleabane, daisy, white-top, white scabious, sweet scabious; *BAG.

Erigeron philadelphicus L. - fleabane, daisy; BAG, TC, SEB.

Erigeron strigosus Muhl. ex Willd. - daisy-fleabane, white-top; TC.

Eupatorium maculatum L. - spotted joe-pye-weed; BAG, SEB, SFK.

Eupatorium perfoliatum L. - thoroughwort, boneset; TC, SEB, SFK.

Eupatorium rugosum Houtt. - white snakeroot, white sanicle; BAG, SFK.

Euthamia graminifolia (L.) Nutt. ex Cass. - bush goldenrod, flat-top goldenrod; BAG, TC, SEB.

Hieracium aurantiacum L. - orange hawkweed, devil's paintbrush; TC, SFK.

Hieracium piloselloides Vill. - king-devil; TC, SFK.

Lactuca biennis (Moench) Fern. - wild lettuce, blue lettuce; TC.

Lactuca canadensis L. - wild lettuce, giant lettuce; TC.

Leucanthemum vulgare Lam. - ox-eye daisy, white daisy, whiteweed, marguerite, field daisy; TC, SFK.

Matricaria discoidea DC. - pineapple-weed; TC.

Prenanthes altissima L. - rattlesnake-root; BAG.

Prenanthes serpentaria Pursh - lion's-foot, gall-of-the-earth, rattlesnake-root; TC.

Rudbeckia hirta L. - black-eyed-susan, yellow daisy; TC.

Solidago caesia L. - wreath goldenrod, blue-stem goldenrod; TC, SEB.

Solidago canadensis L. - Canada goldenrod, common goldenrod; BAG, TC, SEB, SFK.

Solidago flexicaulis L. - zig-zag goldenrod; BAG.

Solidago gigantea Ait. - late goldenrod; TC, SEB.

Solidago juncea Ait. - early goldenrod; TC.

Solidago nemoralis Ait. - rough goldenrod, gray goldenrod, old-field goldenrod; SEB.

Solidago rugosa Mill. ssp. ***rugosa*** - tall hairy goldenrod, butterweed; TC, SEB.

Sonchus arvensis L. - sow-thistle, hog-thistle, milk-thistle; TC.

Sonchus olereacus L. - sow-thistle, milk-thistle; TC.

Taraxacum officinale Weber ex Wiggers - common dandelion; TC, SEB, SFK.

Tragopogon pratensis L. - yellow goat's-beard; TC, SEB, SFK.

Tussilago farfara L. - coltsfoot, coltsfoot dandelion; SEB.

Xanthium strumarium L. var. ***canadense*** (Mill.) Torrey & A. Gray – common cocklebur, clotbur; TC, SEB, SFK.

Butomaceae - flowering rush family

Butomus umbellatus L. - flowering rush; TC.

Alismataceae - water-plantain family

Alisma triviale Pursh - water-plantain; BAG.

Sagittaria cuneata Sheldon - wapato, arrowhead; BAG.

Sagittaria latifolia Willd. - wapato, duck-potato; BAG, TC.

Sagittaria rigida Pursh - arrowhead; BAG.

Hydrocharitaceae - frog's-bit family

Elodea canadensis L. Rich. ex Michx. - waterweed, elodea, ditch-moss; BAG, SFK.

Hydrocharis morsus-ranae L. - frog's-bit; SFK.

Vallisneria americana Michx. - tapegrass, wild celery; BAG, SFK.

Potamogetonaceae - pondweed family

Coleogeton pectinatum (L.) D. Les & R. Haynes - sago pondweed; BAG.

Potamogeton crispus L. - pondweed, curly pondweed, muckweed; BAG, TC.

Potamogeton epihydrus Raf. - pondweed; BAG.

Potamogeton foliosus Raf. - pondweed; BAG.

Potamogeton natans L. - pondweed; BAG.

Potamogeton pusillus L. - pondweed; BAG.

Potamogeton richardsonii (Benn.) Rydb. - red-head pondweed; BAG.

Potamogeton zosteriformis Fern. - flat-stem pondweed; BAG.

Najadaceae - naiad family

Najas flexilis (Willd.) Rostk. & Schmidt - naiad, mermaid weed; BAG.

Araceae - arum family

Acorus americanus (Raf.) Raf. - sweetflag, flagroot; BAG, TC.

Arisaema triphyllum (L.) Schott ex Schott & Endl. ssp. ***triphyllum*** - jack-in-the-pulpit, indian-turnip; BAG, TC, SFK.

Peltandra virginica (L.) Schott ex Schott & Endl. - arrowleaf, tuckahoe; BAG, SEB, SFK.

Lemnaceae - duckweed family

Lemna minor L. - duckweed; BAG, TC, SFK.

Lemna trisulca L. - star duckweed; BAG, SFK.

Spirodela polyrhiza (L.) Schleid. - giant duckweed, water-flaxseed, greater duckweed; BAG.

Juncaceae - rush family

Juncus articulatus L. - jointed rush; BAG, TC.

Juncus balticus Willd. var. ***littoralis*** Engelm. - Baltic rush; TC, SEB, SFK.

Juncus effusus L. - common rush, smooth rush, soft rush; BAG.

Juncus filiformis L. - thread-rush; BAG.

Juncus inflexus L. - blue rush; SEB.

Juncus tenuis Willd. - slender yard-rush; TC.

Cyperaceae - sedge family

Carex arctata Boott ex Hooker - sedge; TC.

Carex bebbii (Bailey) Olney ex Fern. - sedge; TC.

Carex blanda Dewey - sedge; TC.

Carex houghtoniana Dewey - sedge; TNC (1996 unpublished report).

State Rarity Status: R NYNHP Rank: G5 S2.

Carex lacustris Willd. - sedge; BAG, SEB.

Carex lasiocarpa Ehrh. - sedge; TC.

Carex laxiflora Lam. var. ***laxiflora*** - sedge; *BAG.

Carex molesta Mackz. - sedge; *BAG.

State Rarity Status: R NYNHP Rank: G4 S2.

Carex pedunculata Muhl. ex Willd. - sedge; BAG, TC.

Carex pellita Muhl. - sedge; SEB.

Carex rosea - Schkuhr ex Willd. - sedge; TC.

Carex scoparia - Schkuhr ex Willd. - sedge; TC.

Carex stricta Lam. - tussock-sedge, hummock sedge; BAG, TC, SFK.

Carex virescens Muhl. ex Willd. - sedge; BAG.

Carex vulpinoidea Michx. - sedge; BAG, TC.

Cyperus diandrus Torrey - cyperus, flat sedge; BAG.

Cyperus esculentus L. - yellow nut-grass; TC.

Cyperus lupulinus (Spreng.) Marcks ssp. ***macilentus*** (Fern.) Marcks - cyperus, flat sedge; *SEB.

Cyperus strigosus L. - galingale, cyperus, flat sedge; BAG, TC.

Eleocharis obtusa (Willd.) Schultes var. ***ovata*** (Roth) Drap. & Mohl. - spikerush; BAG, TC.

State Rarity Status: R NYNHP Rank: G5T4Q S1S2.

Eleocharis palustris (L.) R. & S. - creeping spikerush; TC.

Scirpus americanus Pers. - three-square, swordgrass; BAG, TC.

Scirpus atrovirens Willd. - bulrush; BAG, TC.

Scirpus cyperinus (L.) Kunth - woolgrass, bulrush; TC.

Scirpus fluviatilis (Torrey) A. Gray - river bulrush; TC.

Scirpus tabernaemontani Gmel. - soft-stem bulrush, tule, great bulrush, southern bulrush; BAG, SEB.

Poaceae - grass family

Agrostis gigantea Roth - redtop, black bent; TC.

Agrostis perennans (Walt.) Tuckerm. - autumn bent, upland bent; BAG.

Agrostis stolonifera L. var. ***palustris*** (Huds.) Farw. - creeping bent, carpet bent; SEB.

Alopecurus aequalis Sobol. - short-awn foxtail; TC, SFK.

Ammophila breviligulata Fern. - beachgrass, dunegrass; BAG, SEB, SFK.

Anthoxanthum odoratum L. - sweet vernalgrass; TC.

Bromus inermis Leyss. - smooth brome, Hungarian brome, awnless brome; TC, SFK.

Calamagrostis canadensis (Michx.) Beauv. - bluejoint grass; BAG, TC, SEB, SFK.

Dactylis glomerata L. - orchard grass; SFK.

Echinochloa crusgalli (L.) Beauv. - barnyard grass; TC.

Elymus canadensis L. - Canada wild-rye; BAG, TC, SEB, SFK.

Elymus virginicus L. - Virginia wild-rye; TC.

Elytrigia repens (L.) Nevski - quackgrass, witch-grass, quickgrass; TC, SEB.

Festuca subverticillata (Pers.) Alexe'ev - nodding fescue; SEB.

Festuca trachyphylla (Hackel) Krajina - sheep fescue, hard fescue; TC, SEB.

Glyceria striata (Lam.) Hitchc. - fowl mannagrass; TC.

Leersia oryzoides (L.) Sw. - rice cutgrass; TC, SEB.

Panicum acuminatum Sw. *sensu lato* - panic grass; SEB.

Panicum capillare L. - witchgrass; TC.

Panicum virgatum L. - switchgrass; SEB, SFK.

Phalaris arundinacea L. - reed canary-grass; BAG, TC, SEB, SFK.

Phleum pratense L. - timothy, herd-grass; TC, SEB, SFK.

Phragmites australis (Cav.) Trin. ex Steud. - common reed, reedgrass; BAG, SEB, SFK.

Poa annua L. - speargrass, annual bluegrass; TC.

Poa compressa L. - Canada bluegrass, wiregrass; TC, SEB, SFK.

Poa palustris L. - fowl bluegrass, fowl meadowgrass; SEB.

Poa pratensis L. - Kentucky bluegrass; TC, SEB, SFK.

Poa trivialis L. - rough bluegrass; BAG.

Schizachne purpurascens (Torrey) Swallen - false melic; TC.

Sporobolus cryptandrus (Torr.) A. Gray - sand dropseed; TC, SEB.

Sparganiaceae - bur-reed family

Sparganium americanum Nutt. - bur-reed; BAG.

Sparganium androcladum (Engelm.) Morong - bur-reed; BAG.

Sparganium eurycarpum Engelm. ex A. Gray - bur-reed; BAG.

Typhaceae - cat-tail family

Typha angustifolia L. - narrow-leaf cat-tail; SEB, SFK.

Typha x ***glauca*** Godr. - cat-tail; BAG, SFK.

Typha latifolia L. - common cat-tail, broad-leaf cat-tail; BAG, SFK.

Pontederiaceae - pickerel-weed family

Heteranthera dubia (Jacq.) MacM. - water stargrass; BAG.

Pontederia cordata L. - pickerel-weed; BAG, SFK.

Liliaceae - lily family

Clintonia borealis (Ait.) Raf. - woodlily, bluebeads, cornlily; TC, SEB, SFK.

Erythronium americanum Ker - yellow adder's-tongue, troutlily, dog-tooth violet; BAG, TC, SFK.

Hemerocallis fulva (L.) L. - orange day-lily; SFK.

Leucojum aestivum L. - summer snowflake; BAG, TC, SFK.

Lilium philadelphicum L. - woodlily, orange-red lily; BAG.

Maianthemum canadense Desf. - false lily-of-the-valley, two-leaf Solomon's-seal, wild lily-of-the-valley; TC, SEB, SFK.

Maianthemum racemosum L. - false Solomon's-seal, false spikenard; BAG, SEB.

Maianthemum stellatum L. - starflower; BAG, SEB.

Polygonatum biflorum (Walt.) Ell. - small Solomon's-seal; BAG.

Polygonatum pubescens (Willd.) Pursh. - Solomon's-seal; SEB.

Trillium erectum L. - purple trillium, stinking benjamin; BAG, SEB.

Trillium grandiflorum (Michx.) Salisb. - white trillium, wakerobin; BAG, TC, SEB, SFK.

Uvularia perfoliata L. - strawbell, bellwort; TC.

Iridaceae - iris family

Iris pseudacorus L. - yellow iris, yellow flag; BAG, SFK.

Iris versicolor L. - blue flag, wild iris, poison flag; BAG, TC, SEB, SFK.

Sisyrinchium angustifolium Mill. - blue-eyed grass; TC.

Sisyrinchium montanum Greene - blue-eyed grass; BAG, SFK.

Smilaceae - greenbrier family

Smilax herbacea L. - Jacob's-ladder, carrion-flower; SEB.

Smilax hispida Muhl. ex Torrey - bristly greenbrier, hagbrier; TC, SEB.

Orchidaceae - orchid family

Epipactis helleborine (L.) Crantz - helleborine, weed orchid; BAG, TC, SEB, SFK.

Fish

Amiidae - bowfins

Amia calva Linnaeus, 1766 - bowfin.

Anguillidae - freshwater eels

Anguilla rostrata (Lesueur, 1817) - American eel.

Cyprinidae - carps and minnows

Cyprinus carpio Linnaeus, 1758 - common carp.

Notemigonus crysoleucas (Mitchill, 1814) - golden shiner.

Notropis bifrenatus (Cope, 1869) - bridle shiner.

Notropis heterodon (Cope, 1865) - blackchin shiner.

State Rarity Status: SC NYNHP Rank: G5 S1.

Catostomidae - suckers

Catostomus commersoni (Lacepede, 1803) - white sucker.

Ictaluridae - bullhead catfishes

Ameiurus nebulosus (Lesueur, 1819) - brown bullhead.

Noturus gyrinus (Mitchill, 1817) - tadpole madtom.

Esocidae - pikes

Esox americanus vermiculatus Lesueur, 1846 - grass pickerel.

Esox lucius Linnaeus, 1758 - northern pike.

Umbridae - mudminnows

Umbra limi (Kirtland, 1840) - central mudminnow.

Salmonidae - trouts

Oncorhynchus kisutch (Walbaum, 1792) - coho salmon.

Oncorhynchus mykiss (Walbaum, 1792) - steelhead.

Salvelinus namaycush (Walbaum, 1972) - lake trout.

Gadidae - cods

Lota lota (Linnaeus, 1758) - burbot.

Gasterosteidae - sticklebacks

Culaea inconstans (Kirtland, 1841) - brook stickleback.

Centrarchidae - sunfishes

Ambloplites rupestris (Rafinesque, 1817) - rock bass.

Lepomis gibbosus (Linnaeus, 1758) - pumpkinseed.

Lepomis macrochirus Rafinesque 1819 - bluegill.

Micropterus dolomieu Lacepede, 1802 - smallmouth bass.

Micropterus salmoides (Lacepede, 1802) - largemouth bass.

Percidae - perches

Perca flavescens (Mitchill, 1814) - yellow perch.

Stizostedion vitreum (Mitchill, 1818) - walleye.

Amphibians and Reptiles

Plethodontidae - lungless salamanders

Plethodon cinereus (Green, 1818) - redback salamander.

Bufonidae - toads

Bufo americanus americanus Holbrook, 1836 - eastern American toad.

Hylidae - treefrogs and their allies

Hyla versicolor LeConte, 1825 - gray treefrog.

Pseudacris crucifer crucifer (Wied-Neuwied, 1838) - northern spring peeper.

Ranidae - true frogs

Rana catesbeiana Shaw, 1802 - bullfrog.

Rana clamitans melanota (Rafinesque, 1820) - green frog.

Rana pipiens Schreber, 1782 - northern leopard frog.

Rana sylvatica LeConte, 1825 - wood frog.

Chelydridae - snapping turtles

Chelydra serpentina serpentina (Linnaeus, 1758) - common snapping turtle.

Emydidae - box and water turtles

Chrysemys picta marginata Agassiz, 1857 - midland painted turtle.

Clemmys guttata (Schneider, 1792) - spotted turtle.

State Rarity Status: SC

Colubridae - colubrids

Lampropeltis triangulum triangulum (Lacepede, 1788) - eastern milk snake.

Nerodia sipedon sipedon (Linnaeus, 1758) - northern water snake.

Storeria dekayi dekayi (Holbrook, 1836) - northern brown snake.

Thamnophis sirtalis sirtalis (Linnaeus, 1758) - eastern garter snake.

Breeding Birds

Phalacrocoracidae - cormorants

Phalacrocorax auritus (Lesson) - double-crested cormorant - PO-Xa.

Ardeidae - bitterns and herons

Ixobrychus exilis (Gmelin) - least bittern - PO-X.

Ardea herodias Linnaeus - great blue heron - PO-Xa.

Butorides striatus (Linnaeus) - green-backed heron - PR-S.

Nycticorax nycticorax (Linnaeus) - black-crowned night-heron - PR-S.

Anatidae - swans, geese and ducks

Branta canadensis (Linnaeus) - Canada goose - CO-FL.

Aix sponsa (Linnaeus) - wood duck - CO-FL.

Anas platyrhynchos Linnaeus - mallard - CO-FL.

Anas discors Linnaeus - blue-winged teal - PO-X.

Mergus merganser Linnaeus - common merganser - PR-S.

Cathartidae - American vultures

Cathartes aura (Linnaeus) - turkey vulture - PR-S.

Accipitridae - kites, eagles, hawks and allies

Circus cyaneus (Linnaeus) - northern harrier - PR-S.

Accipiter striatus Vieillot - sharp-shinned hawk - PR-S.

Buteo jamaicensis (Gmelin) - red-tailed hawk - PO-X.

Phasianidae - partridges, grouse, turkeys and quail

Bonasa umbellus (Linnaeus) - ruffed grouse - CO-NE.

Meleagris gallopavo Linnaeus - wild turkey - CO-FL.

Rallidae - rails, gallinules and coots

Rallus limicola Vieillot - Virginia rail - PO-X.

Charadriidae - plovers and lapwings

Charadrius vociferus Linnaeus - killdeer - PO-Xa.

Scolopacidae - sandpipers, phalaropes and allies

Actitis macularia (Linnaeus) - spotted sandpiper - CO-FL.

Scolopax minor Gmelin - American woodcock - PR-S.

Laridae - skuas, gulls, terns and skimmers

Larus delawarensis Ord - ring-billed gull - PO-Xa.

Larus argentatus Pontoppidan - herring gull - PO-Xa.

Larus marinus Linnaeus - great black-backed gull - PO-Xa.

Sterna caspia Pallas - Caspian tern - PO-Xa.

Sterna hirundo Linnaeus - common tern - PO-Xa.

Chlidonias niger (Linnaeus) - black tern - PR-S.

Columbidae - pigeons and doves

Zenaida macroura (Linnaeus) - mourning dove - PR-D.

Cuculidae - cuckoos, roadrunners and anis

Coccyzus erythropthalmus (Wilson) - black-billed cuckoo - PR-S.

Strigidae - typical owls

Bubo virginianus (Gmelin) - great horned owl - PO-X.

Apodidae - swifts

Chaetura pelagica (Linnaeus) - chimney swift - PO-Xa.

Trochilidae - hummingbirds

Archilocus colubris (Linnaeus) - ruby-throated hummingbird - PR-S.

Alcedinidae - kingfishers

Ceryle alcyon (Linnaeus) - belted kingfisher - CO-ON.

Picidae - woodpeckers and allies

Picoides pubescens (Linnaeus) - downy woodpecker - CO-FL.

Picoides villosus (Linnaeus) - hairy woodpecker - PO-X.

Colaptes auratus (Linnaeus) - northern flicker - PR-S.

Dryocopus pileatus (Linnaeus) - pileated woodpecker - PR-S.

Tyrannidae - tyrant flycatchers

Contopus virens (Linnaeus) - eastern wood-pewee - PR-S.

Empidonax trailii (Audubon) - willow flycatcher - PR-S.

Sayornis phoebe (Latham) - eastern phoebe - CO-UN.

Myiarchus crinitus (Linnaeus) - great crested flycatcher - PR-S.

Tyrannus tyrannus (Linnaeus) - eastern kingbird - PR-S.

Hirundinidae - swallows

Progne subis (Linnaeus) - purple martin - PO-Xa.

Tachycineta bicolor (Vieillot) - tree swallow - CO-ON.

Stelgidopteryx serripenis (Audubon) - northern rough-winged swallow - CO-ON.

Riparia riparia (Linnaeus) - bank swallow - PO-Xa.

Hirundo rustica Linnaeus - barn swallow - PO-Xa.

Corvidae - jays, magpies and crows

Cyanocitta cristata (Linnaeus) - blue jay - PR-S.

Corvus brachyrhynchos Brehm - American crow - CO-FL.

Corvus corax Linnaeus - common raven - PO-Xa.

Paridae - titmice

Parus atricapillus Linnaeus - black-capped chickadee - CO-FL.

Sittidae - nuthatches

Sitta carolinensis Latham- white-breasted nuthatch - PR-S.

Troglodytidae - wrens

Troglodytes aedon Vieillot - house wren - CO-FL.

Cistothorus palustris (Wilson) - marsh wren - PR-S.

Muscicapidae - muscicapids

Catharus fuscescens (Stephens) - veery - PR-S.

Hylocichla mustelina (Gmelin) - wood thrush - PR-S.

Turdus migratorius Linnaeus - American robin - CO-NE.

Mimidae - mockingbirds, thrashers and allies

Dumetella carolinensis (Linnaeus) - gray catbird - CO-FL.

Toxostoma rufum (Linnaeus) - brown thrasher - PO-X.

Bombycillidae - waxwings

Bombycilla cedrorum Vieillot - cedar waxwing - PR-S.

Sturnidae - starlings and allies

Sturnus vulgaris Linnaeus - European starling - PR-P.

Vireonidae - vireos

Vireo gilvus (Vieillot) - warbling vireo - PR-S.

Vireo olivaceus (Linnaeus) - red-eyed vireo - PR-S.

Emberizidae - emberizids

Vermivora ruficapilla (Wilson) - Nashville warbler - PO-X.

Dendroica petechia (Linnaeus) - yellow warbler - CO-FL.

Dendroica magnolia (Wilson) - magnolia warbler - PR-S.

Dendroica coronata (Linnaeus) - yellow-rumped warbler - CO-FL.

Dendroica virens (Gmelin) - black-throated green warbler - PO-X.

Mniotilta varia (Linnaeus) - black-and-white warbler - PR-S.

Setophaga ruticilla (Linnaeus) - American redstart - CO-FL.

Seiurus aurocapillus (Linnaeus) - ovenbird - PR-S.

Seiurus noveboracensis (Gmelin) - northern waterthrush - PO-X.

Geothlypis trichas (Linnaeus) - common yellowthroat - CO-FL.

Piranga olivacea (Gmelin) - scarlet tanager - PR-S.

Cardinalis cardinalis (Linnaeus) - northern cardinal - CO-FL.

Pheucticus ludovicianus (Linnaeus) - rose-breasted grosbeak - PR-S.

Passerina cyanea (Linnaeus) - indigo bunting - PR-S.

Pipilo erythrophthalmus (Linnaeus) - rufous-sided towhee - CO-FL.

Spizella passerina (Bechstein) - chipping sparrow - CO-FY.

Spizella pusilla (Wilson) - field sparrow - CO-FL.

Melospiza melodia (Wilson) - song sparrow - CO-FY.

Melospiza georgiana (Latham) - swamp sparrow - PR-S.

Zonotrichia albicollis (Gmelin) - white-throated sparrow - CO-FL.

Agelaius phoeniceus (Linnaeus) - red-winged blackbird - CO-FS.

Quiscalus quiscula (Linnaeus) - common grackle - PR-S.

Molothrus ater (Boddaert) - brown-headed cowbird - CO-FL.

Icterus galbula (Linnaeus) - northern oriole - PR-S.

Fringillidae - fringilline and cardueline finches and allies

Carpodacus purpureus (Gmelin) - purple finch - PR-B.

Carduelis tristis (Linnaeus) - American goldfinch - PR-S.

Discussion

Of the 516 species included in the vascular plant inventory, 10 are ranked from S1 to S3 by the NYNHP and 7 are listed as rare or threatened by the NYSDEC. These species include *Ulmus thomasii* (G5 S2S3), *Stellaria longipes* (G5 S2/R), *Salix cordata* (G5 S1/T), *Geum virginianum* (G5 S1), *Prunus pumila* var. *pumila* (G5T? S1/R), *Vitis vulpina* (G5 S2), *Bidens laevis* (G5 S2/R), *Carex houghtoniana* (G5 S2/R), *C. molesta* (G4 S2/R), and *Eleocharis obtusa* var. *ovata* (G5T4Q S1S2/R). The NYSDEC lists *U. thomasii, G. virginianum, and V. vulpina* as unprotected.

The plant list also includes 25 species protected under the New York State Environmental Protection Law as exploitably vulnerable. These include *Huperzia lucidula, Lycopodium obscurum*, 14 of the 16 species of ferns (does not include *Pteridium aquilinum* and *Onoclea sensibilis*), *Asclepias tuberosa, Celastrus scandens, Gentiana andrewsii, Ilex verticillata, Lilium philadelphicum, Lobelia cardinalis, Sanguinaria canadensis, Trillium erectum*, and *T. grandiflorum*

Survey efforts produced 1 rare fish species previously unrecorded for the preserve. Doug Carlson found and identified blackchin shiner during his search for rare minnows in Black Pond. The NYNHP ranks this species as G5 S1, and it is on the NYSDEC's species of special concern list.

The search for herptiles revealed a significant diversity of species. The NYSDEC (1998) expects 15 species in a moderately covered, herp atlas mapping unit (U.S. Geological Survey 7.5 minute quadrangle). Surveys at EDNP uncovered an equal number of species in roughly 1% of the area. Observation cards were submitted to the New York State Amphibian and Reptile Atlas Project for all species detected at EDNP and BPWMA.

Amphibian and reptile surveys located one rare species. A spotted turtle was captured and photographed between the dunes near the south border of the preserve. This species is on the NYSDEC's special concern list. EDNP is one of the northernmost sites for this turtle in New York State.

The search for breeding birds yielded a rich diversity of species. Andrle and Carroll (1988) considered a 5-km × 5-km breeding bird atlas block to be adequately covered if surveyors found 76 species, with half (38) confirmed as breeders. I found 88 species,

including 23 possible, 37 probable, and 28 confirmed as nesting. If I subtract the 13 species I categorized as "Xa," the adjusted totals are 10 possible, 37 probable, 28 confirmed, and 75 total nesting species. Thus, 99% of the total species and 74% of the confirmed species required to adequately survey a breeding bird atlas block were found in approximately 6% of the area.

Several breeding bird species are included on state and federal lists of rare species. The NYSDEC's provisional list of endangered, threatened, and special concern species includes black tern (endangered), least bittern, northern harrier (threatened), and sharp-shinned hawk (special concern). Least bittern, northern harrier, and black tern are considered species of management concern in the Northeast by the U.S. Fish and Wildlife Service (Schneider and Pence 1992).

Smith (1989) analyzed data from North American Breeding Bird Survey routes conducted in New York, and listed several species showing statistically significant population declines. Many of these species displayed evidence of breeding at EDNP, including spotted sandpiper, black tern, northern flicker, eastern phoebe, brown thrasher, rufous-sided towhee, field sparrow, song sparrow, red-winged blackbird, common grackle, and brown-headed cowbird. Because of their significant declining population trends, Smith recommended the addition of eastern phoebe, brown thrasher, rufous-sided towhee, and field sparrow to the NYSDEC's list of special concern species. Smith also suggested black tern be added to the state threatened species list, because of the species' significant declining trend and restricted geographic distribution.

SUMMARY OF THE SHOREBIRD MIGRATION AT EL DORADO NATURE PRESERVE

Introduction

EDNP was established in 1969, primarily because of its significance as a staging site for fall migrant shorebirds. Unfortunately, the intensity of shorebird monitoring at the site has been inconsistent over the subsequent decades. Scheider (1969) gave a detailed description of the chronology of the shorebird migration here, but he gave incomplete estimates of maxima of individual species. Regional editors of *The Kingbird* have only given sporadic attention to shorebird use of EDNP (e.g., Chamberlaine 1979, Crowell 1982, Crowell and Smith 1984, Smith 1992, etc.). A comprehensive dataset does exist from shorebird censuses at EDNP from 1981 to 1990 (G.A. Smith, CWNY-TNC, unpublished data). However, the Lake Ontario ecosystem has since changed significantly, and area birdwatchers report far fewer shorebirds using the preserve. I conducted systematic counts at EDNP to facilitate more accurate future interpretation of trends in the populations of shorebirds at the preserve.

Methods

I censused shorebirds on 32 days at EDNP from July 3 to August 31, 1997. Censuses were conducted 3 to 5 days/week. Data were segregated between early, middle, and late month periods to determine changes in abundance within and between species over the season. In early, mid, and late July I collected data on 5, 7, and 5 days,

respectively. In early, mid, and late August I conducted 6, 4, and 5 censuses, respectively. Timing of censuses varied between days because they had to be conducted around higher priority job responsibilities. However, data were generally collected between 10:00 and 13:00 EDT.

I selected three sites on the calcareous outcrop shoreline of EDNP from which to count birds. One site was at the intersection of the Lake Ontario shore and the preserve's north boundary, and another was at the southernmost end of the shelving limestone shoreline, at the mouth of Black Pond Outlet. The third was at the bird observation blind, approximately two-thirds of the way south of the first point to Black Pond Outlet. I could view approximately 90% of the calcareous outcrop shoreline most used by shorebirds from these three points. I counted birds for 10 min/point and 30 min/survey.

A linear transect along the entire 3,500 feet of this type of shore would have permitted a total census. However, CWNY-TNC only allows access to this part of the preserve at the selected sites. This policy was established to minimize disturbance of the shorebirds, waterfowl, and waterbirds. Further, periodic investigations of the areas not visible from the 3 count points revealed few, if any, shorebirds.

Results

Spotted sandpiper (*Actitis macularia*) and killdeer (*Charadrius vociferus*) were the only shorebird species counted during the first third of July. Their respective means were 5.6 and 0.80/day (Table 4).

Spotted sandpiper and killdeer were first and second most abundant shorebirds found in mid-July, with respective means of 5.57 and 2.86/day. The only other shorebird to appear on counts during this period was lesser yellowlegs (*Tringa flavipes*), averaging 0.86/day (Table 4).

Spotted sandpiper and killdeer were also the first and second most abundant shorebirds counted in late July, with respective means of 6.6 and 4.2/day. Lesser yellowlegs was third in abundance (1.40/day). Species diversity increased for this period, with observations of semipalmated plover (*Charadrius palmatus*), sanderling (*Calidris alba*), semipalmated sandpiper (*Calidris pusilla*), and short-billed dowitcher (*Limnodromus griseus*) (Table 4).

The most abundant shorebird in early August was semipalmated sandpiper (14.83/day). The abundance value for semipalmated sandpiper was the highest for all species for 1 period. Spotted sandpiper (6.00/day), lesser yellowlegs (5.00/day), and killdeer (4.67/day) were clustered as the second to fourth most abundant species. The only greater yellowlegs (*T. melanoleuca*) found for the season appeared during this period (0.67/day). Daily shorebird species richness was third highest during this period, with a mean of 5.17 species/day (Table 5).

Semipalmated sandpiper was the most abundant species recorded during the middle third of August (8.00/day). Semipalmated plover (5.50/day) and spotted sandpiper (4.25/day) were the next most abundant species. Killdeer and least sandpiper (*Calidris minutilla*) tied for fourth in abundance (3.00/day). Daily shorebird species richness was greatest during this period with a mean of 6.50 species/day (Table 5).

Semipalmated sandpiper was the most abundant shorebird recorded in late August as well (7.40/day). Lesser yellowlegs was second most abundant (5.80/day), and sanderling was third (3.60/day). Semipalmated plover and killdeer tied for fourth most abundant species (3.40/day). Daily species richness was the third highest during this period (5.6 species/day) (Table 5).

Table 4. Shorebird census data from El Dorado Nature Preserve - July 1997

	No. Birds/date																
Species	3	4	5	7	10	11	13	14	17	18	19	20	25	26	27	28	31
Semipalmated Plover	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Killdeer	1	3	0	0	0	4	4	1	2	0	5	4	4	4	3	6	4
Greater Yellowlegs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lesser Yellowlegs	0	0	0	0	0	2	0	0	1	3	0	0	3	1	3	0	0
Spotted Sandpiper	4	5	6	6	7	7	8	5	6	6	3	4	7	5	7	7	7
Sanderling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Semipalmated Sandpiper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Least Sandpiper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Baird's Sandpiper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Short-billed Dowitcher	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0

Table 5. Shorebird census data from El Dorado Nature Preserve - August 1997

	No. birds/date														
Species	1	2	3	4	7	8	14	15	16	18	22	23	24	30	31
Semipalmated Plover	0	2	0	4	1	1	4	8	6	4	0	3	1	7	6
Killdeer	4	4	4	6	5	5	2	2	2	6	1	0	5	5	6
Greater Yellowlegs	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0
Lesser Yellowlegs	3	2	6	11	4	4	1	5	2	3	1	4	8	8	8
Spotted Sandpiper	7	6	7	6	5	5	2	4	5	6	1	2	3	5	2
Sanderling	0	0	0	0	0	0	0	5	0	0	0	0	0	10	8
Semipalmated sandpiper	12	2	16	33	13	13	8	14	6	4	0	10	5	12	10
Least Sandpiper	0	0	0	0	5	5	0	8	2	2	2	1	6	0	0
Baird's Sandpiper	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
Short-billed Dowitcher	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Discussion

The purpose of this study was to document the level of shorebird use at EDNP in a manner that will allow more accurate future determination of population trends here. In particular, I believe the most meaningful comparison of these results can most likely be made with the unpublished data of G.A. Smith.

There is some value in comparing my findings with those of Scheider (1969) and of the region 6 editors of *The Kingbird*, for the months that correspond with this study. The strength of comparisons are significantly weakened, however, by the differing methods of data collection and sketchiness of the regional reports.

In the species accounts below, I omit those that do not typically arrive at EDNP until September 1, or later, according to Scheider. These include lesser golden plover (*Pluvialis dominica*), purple sandpiper (*Calidris maritima*), dunlin (*Calidris alpina*), and red phalarope (*Phalaropus fulicaria*).

Semipalmated Plover: Scheider states that numbers of this species may reach 20-35/day through early August, but I found significantly less. The daily maximum for this count was 8 birds on August 15. They were most abundant through the middle third of August, but only averaged 5.5/day.

Killdeer: Scheider reports that the peak seasonal numbers of this species reach 60-100/day in late August. I found a daily maximum of only 6 birds on 4 dates in late July and through August. They were most abundant during mid-August, with a mean of 4.67/day.

Greater Yellowlegs: Scheider states that this species usually occurs in small numbers, 2-5/day, but present from about July 20 to the end of the period. I found 4 total, on August 4.

Lesser Yellowlegs: Scheider reports this species as being most abundant during the last week of July and the first week of August, with numbers of 20-30/day. The greatest period of abundance that I found was during late August with a mean of 5.8/day. My daily maximum was 11, recorded on August 4.

Spotted Sandpiper: Scheider only describes this species as being present in the dozens by mid-July, and building to a peak in the first half of August. This species was the most abundant shorebird at EDNP throughout July on this count, but still only peaked at 6.60/day in the last third of the month. The daily maximum of 8 was tallied on July 13.

Sanderling: Scheider relates that this species arrives "15-25 July in numbers, but numbers vary widely; greatest numbers in late August." The period of greatest abundance during this study was also late August, with a mean of 3.60/day, and a daily maximum of 10 on August 30.

Semipalmated Sandpiper: Two of the highest fall, inland maxima for this species in New York State, were recorded at EDNP. Bull (1985) records 1,100 here on August 4, 1966 and 600 on August 17, 1970. Scheider is rather vague in his description of this species, stating that "numbers ...swell to the hundreds by late July." However, this description is still astonishing in comparison to contemporary numbers. The daily maximum during this survey was 33 on August 4. The highest mean for a period was merely 14.83/day during early August.

Least Sandpiper: Again, the comparison is astounding. Scheider reports that numbers vary considerably between years, but that 40-100/day can be found from the first week of July to the end of the month. I only found a peak of 3.00/day during mid-August, and a daily maximum of 8 on August 15.

Baird's Sandpiper (*Calidris bairdii*): Scheider describes this species as never common at EDNP, with peaks of abundance usually occurring during the first half of September. I recorded singles of this species on 3 daily counts from mid to late August.

Short-billed Dowitcher: Scheider states that this bird usually arrives at EDNP between July 7 and 10, and can be found through the period in flocks of 3 to 12. I recorded 1 individual on July 25.

Twelve species that regularly occur at EDNP and arrive before September 1 were not recorded at all during my counts. These included black-bellied plover (*Pluvialis squatarola*), solitary sandpiper (*T. solitaria*), whimbrel (*Numenius phaeopus*), ruddy turnstone (*Arenaria interpres*), red knot (*Calidris canutus*), western sandpiper (*Calidris mauri*), white-rumped sandpiper (*Calidris fuscicollis*), pectoral sandpiper (*Calidris melanotos*), stilt sandpiper (*Calidris himantopus*), common snipe (*Gallinago gallinago*), Wilson's phalarope (*Phalaropus tricolor*), and red-necked phalarope (*Phalaropus lobatus*).

EDNP was one of the most important staging sites for fall migrant shorebirds in upstate New York. A cursory inspection of the regional reports from *The Kingbird* reveals seasonal maxima of several hundred semipalmated sandpipers, even until the late 1980's. However, shorebird use of the site has dropped dramatically. Causal factors may be

related to changes in the nutrient and water level of Lake Ontario, which affects the deposition of algae on the preserve's shore.

The presence of shorebirds appears quite dependant on the presence of algae at EDNP. Historically, thick mats of *Cladophora* algae collected on the shelving sheetrock shoreline, as the water level of Lake Ontario dropped during summer and fall. The algal pan harbored an abundance of macroinvertebrates that the shorebirds exploited as a food resource. The abundance of algae was augmented by phosphate effluent from municipalities surrounding the lake (Scheider 1969).

Presently, far less algae accumulates on the EDNP shoreline because of a combination of apparent reasons. The level of phosphates and other nutrients discharged into Lake Ontario has decreased as water treatment plants have improved. Furthermore, the introduced and well-established zebra mussel (*Dreissena polymorpha*) is a filter-feeding organism that removes nutrients, as well as algae, from the water.

Also, the level of Lake Ontario is maintained at an articially higher and more stable level via dams built on the St. Lawrence River. Consequently, the limestone outcrops that the algae historically collected upon as the lake water dropped, now stay submerged. See also the "Habitat restoration and management" section under "Other Responsibilities" in this report.

I believe this site deserves further intensive monitoring, for the set of circumstances affecting shorebird use here are occurring throughout the Great Lakes. Consequently, important staging sites for shorebirds may be in jeopardy across a vast area of the continent.

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APPENDICES

Appendix A: Explanation of New York Natural Heritage Program codes

Global Rank

G1 = Critically imperiled throughout its range due to extreme rarity (5 or fewer sites or very few remaining individuals) or extremely vulnerable to extinction due to biological factors.
G2 = Imperiled throughout its range due to rarity (6-20 sites or few remaining individuals) or highly vulnerable to extinction due to biological factors.
G3 = Either very rare and local throughout its range (21-100 sites), with a restricted range (but possibly locally abundant), or vulnerable to extinction due to biological factors.
G4 = Apparently secure throughout its range (but possibly rare in parts).
G5 = Demonstrably secure throughout its range (but possibly rare in parts).
GH = No extant sites known but it may be rediscovered.
GX = Species believed extinct.
TU & T? = Status of the subspecies or variety unknown.

State Rank

S1 = Critically imperiled in New York State (NYS) because of extreme rarity (5 or fewer sites or very few remaining individuals) or extremely vulnerable to extirpation from NYS due to biological factors.
S2 = Imperiled in NYS because of rarity (6-20 sites or few remaining individuals) or highly vulnerable to extirpation from NYS due to biological factors.
S3 = Rare in NYS (usually 21-100 extant sites).
S4 = Apparently secure in NYS.
S5 = Demonstrably secure in NYS.
SH = No extant sites known in NYS but it may be rediscovered.
SE = Exotic, not native to NYS.
SR = Reported from NYS, but existence has not been documented.
SU = Status uncertain because of the cryptic nature of the species.

Double Ranks

The first of double ranks indicates rarity based upon current documentation. The second rank indicates the probable rarity after all historic records and likely habitats have been checked. Double ranks denote species that need additional field surveys.

A "Q" indicates a question exists whether or not the taxon is a good taxonomic entity. A "?" indicates that an identification question exists about known occurrences. A "?" also indicates that the rank presumably corresponds to actual occurrences even though the information has not yet been documented in heritage files or historical records. A "?" also serves to indicate species that need more field studies or specimen identification.

Appendix B:

Sample New York Sea Grant visitor questionnaire sheet

VISITOR QUESTIONNAIRE

1. **Please circle the name of the dune area you are visiting right now:**
   a. Deer Creek Wildlife Management Area
   b. Sandy Pond Beach Natural Area
   c. Eldorado Beach Preserve
   d. Lakeview Marsh Wildlife Management Area
   e. Southwick Beach State Park
   f. Black Pond Wildlife Management Area

2. **How many times have you visited this area?** (Circle which applies.)
   1-4 times 5-10 times over 10 times

3. **Where are you from?** (Provide the city and state.) _____

4. **Which of the following are you?** [ ] a resident [ ] on vacation [ ] passing through

5. **Who are you here with?** [ ] friends [ ] family [ ] by myself [ ] other _____

6. a. **How many people are in your group?** (Provide number.) _____
   b. **How many of them are in each of the following age categories?** (Write in the number.)
   12 years old or younger _____ 13 to 19 years _____ 20 to 59 years _____ 60+ years_____

7. **How did you find out about this dune area?** (Check one answer only.)
   [ ] a. From living in the area (resident)
   [ ] b. Friend/family
   [ ] c. Other (Specify:_____)

8. **What activities are you doing while in the area?** (Check all that apply.)
   [ ] a. Beach use
   [ ] b. Biking
   [ ] c. Bird watching
   [ ] d. Boating
   [ ] e. Picnicking
   [ ] f. Camping
   [ ] g. Hiking
   [ ] h. Swimming
   [ ] I. Traveling the Seaway Trail (a scenic byway along Route 3)
   [ ] j. Other (specify: _____)

9. a. **Have you seen the small signs posted along the beach?** [ ] Yes [ ] No (Go to #10)
   b. **Have they made you want to stay out of the dunes?** [ ] Yes [ ] No
   c. **How do you feel about having the signs posted on the beach?** _____
   _____

10. **What other types of educational materials did you use while visiting this area?** (Check all that apply.)
   [ ] a. "Sand, wind, and water" guidebook
   [ ] b. Brochure for the specific area you are visiting
   [ ] c. Educational signs along the wooden walkovers
   [ ] d. Directory signs at parking and trail access areas
   [ ] e. Other (specify) _____
   [ ] f. None

11. **What types of facilities have you used while in the area?** (Check all that apply.)
   [ ] a. Boat launches
   [ ] b. Trails
   [ ] c. Observation towers
   [ ] d. Camp sites
   [ ] e. Wooden dune walkovers

12. **Why is it important that beach grass and other plants grow on the sand dunes?**
   _____

13. **Can you list two activities that people do that cause erosion of the sand dunes?**
   (a) _____
   (b) _____

Thank you for your time! Enjoy your visit!

Appendix C. Human use data for El Dorado Nature Preserve/Black Pond Wildlife Management Area barrier beach transect - 1997. n = Originating from north of the transect. s = Originating from south of the transect. unk = Of unknown origin.

	No. people														
	Boat			Foot				Sun-						Total	
Date	n	s	unk.	n	s	Car	Walk	Swim	Bike	Fish	Climb	Bird	people	hr
5/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0.50
5/22	0	0	0	0	0	0	0	0	0	0	0	0	0	0.50
5/24	0	0	0	0	0	6	0	6	0	0	0	0	6	2.00
5/25	0	0	0	0	0	0	0	0	0	0	0	0	0	1.25
5/26	0	0	0	0	2	0	2	0	0	0	0	0	2	4.50
5/29	0	0	0	0	0	0	0	0	0	0	0	0	0	2.00
5/30	0	0	0	0	0	0	0	0	0	0	0	0	0	3.75
5/31	0	0	0	0	0	0	0	0	0	0	0	0	0	1.75
6/1	0	0	0	0	2	0	0	0	0	0	0	2	2	2.25
6/2	0	0	0	0	0	0	0	0	0	0	0	0	0	2.00
6/5	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00
6/6	0	0	0	0	0	0	0	0	0	0	0	0	0	1.50
6/7	0	0	0	1	0	0	1	0	0	0	0	0	1	1.50
6/8	0	0	0	0	3	0	3	0	0	0	0	0	3	2.00
6/10	0	0	0	0	0	0	0	0	0	0	0	0	0	1.25
6/11	0	0	0	0	0	0	0	0	0	0	0	0	0	1.75
6/14	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00
6/15	0	0	0	0	0	7	5	2	0	0	0	0	7	3.00
6/16	0	0	0	0	0	0	0	0	0	0	0	0	0	2.25
6/19	0	0	0	0	0	0	0	0	0	0	0	0	0	3.00
6/20	0	0	1	0	2	0	2	1	0	0	0	0	3	2.50
6/21	0	0	0	0	3	0	1	0	0	2	0	0	3	3.00
6/22	0	0	0	8	1	2	3	8	0	0	0	0	11	3.25
6/23	0	0	0	3	0	0	3	0	0	0	0	0	3	2.75
6/26	6	0	0	2	5	0	7	6	0	0	0	0	13	3.00
6/27	0	0	2	0	0	0	0	2	0	0	0	0	2	2.00
6/28	6	2	12	0	0	0	0	18	0	2	0	0	20	4.00
6/30	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00
7/3	0	0	0	0	1	0	1	0	0	0	0	0	1	1.25
7/4	0	0	0	0	12	1	8	0	0	0	5	0	13	1.50
7/5	6	0	0	2	24	29	53	6	0	0	2	0	61	4.75
7/6	15	6	0	6	5	2	11	21	2	0	0	0	34	4.25
7/7	0	0	0	0	2	0	2	0	0	0	0	0	2	4.25
7/10	0	0	0	2	2	0	2	2	0	0	0	0	4	1.25
7/11	0	0	0	0	4	0	4	0	0	0	0	0	4	1.25
7/12	9	2	0	5	5	0	5	16	0	0	0	0	21	2.75

	No. People														
	Boat			Foot				Sun-					Total	
Date	n	s	unk.	n	s	Car	Walk	swim	Bike	Fish	Climb	Bird	people	hrs
7/13	0	0	0	9	4	2	6	9	0	0	0	0	15	2.00
7/14	0	0	0	0	0	0	0	0	0	0	0	0	0	1.50
7/17	0	0	0	0	1	0	1	0	0	0	0	0	1	1.25
7/18	0	0	0	0	0	0	0	0	0	0	0	0	0	1.25
7/19	0	0	0	0	2	0	2	0	0	0	0	0	2	0.75
7/20	0	0	8	3	0	0	0	11	0	0	0	0	11	1.25
7/25	8	1	0	2	2	0	0	11	0	2	0	0	13	1.25
7/26	0	0	6	0	2	0	2	6	0	0	0	0	8	2.75
7/27	0	0	10	0	1	0	1	10	0	0	0	0	11	2.75
7/28	0	0	0	3	0	0	0	3	0	0	0	0	3	2.25
7/31	0	0	0	0	0	0	0	0	0	0	0	0	0	1.25
8/1	0	0	0	3	1	1	1	3	0	0	0	1	5	3.25
8/2	0	0	0	0	0	0	0	0	0	0	0	0	0	1.50
8/3	4	0	8	4	4	2	6	16	0	0	0	0	22	2.25
8/4	2	0	3	0	0	0	0	5	0	0	0	0	5	2.00
8/7	0	0	0	0	4	0	4	0	0	0	0	0	4	3.50
8/8	9	0	0	0	6	11	17	9	0	0	0	0	26	4.75
8/9	43	11	0	4	19	1	17	57	3	0	0	1	78	6.25
8/10	2	0	30	0	4	0	4	32	0	0	0	0	36	2.75
8/14	0	0	0	0	10	0	10	0	0	0	0	0	10	2.50
8/15	0	0	0	0	21	2	23	0	0	0	0	0	23	3.75
8/16	0	0	0	3	7	4	7	7	0	0	0	0	14	2.75
8/18	0	0	0	0	3	1	0	3	0	0	0	1	4	2.25
8/22	0	0	0	0	0	5	5	0	0	0	0	0	5	1.25
8/23	0	0	0	0	4	4	7	0	0	0	0	1	8	2.00
8/24	0	0	0	11	10	0	14	3	4	0	0	0	21	3.50
8/30	17	11	10	9	9	2	8	42	0	6	0	2	58	4.75
8/31	0	0	0	2	19	2	20	0	0	0	3	0	23	3.25
9/1	36	4	4	5	4	2	47	8	0	0	0	0	55	5.50
9/6	0	0	0	0	18	0	0	16	0	2	0	0	18	4.75

Appendix D: Explanaition of breeding bird criteria codes

Criteria are listed in order of increasing certainty of breeding.

PO = POSSIBLE BREEDING
X = Species observed in breeding season in possible nesting habitat but no other indication of breeding noted. Singing male(s) present (or breeding calls heard) in breeding season.
Xa = Species used preserve during breeding season but located nest off the property.

PR = PROBABLE BREEDING
P = Pair observed in suitable habitat in breeding season.
S = Singing male present (or breeding calls heard) in the same place, on more than one date, a week or more apart.
T = Bird (or pair) apparently holding territory as evidenced by territorial singing or chasing of other individuals of the same species.
D = Courtship and display or agitated behavior or anxiety calls from adults suggesting probable presence of a nest or young.
B = Nest building or excavation of a nest hole.

CO = CONFIRMED BREEDING
UN = Used nest found. Nest must be carefully identified if it is to be used as evidence.
FL = Recently fledged young, including downy young of such precocious groups as waterfowl and shorebirds.
ON = Adult(s) of cavity nesting species entering or leaving site indicating occupied nest hole.
FS = Adult carrying fecal sac.
FY = Adult with food for young or feeding young.
NE = Identifiable nest and eggs, bird setting on nest, identifiable eggshells beneath nest, or identifiable dead nestling(s).

Appendix E: Sample report from El Dorado Nature Preserve dune steward daily journal

5/19/97 - 6/7/97

5/19 - Most of morning spent receiving Dune Steward training. Given tour of Sandy Pond Beach Preserve (SPBP), El Dorado Beach Preserve (EDBP), Southwick Beach State Park (SBSP), Lakeview Wildlife Management Area (LWMA) and other eastern Lake Ontario sites by Sandra Bonanno (SB) and Gerald A. Smith (GAS). Introduced to Laurel Mattrey (LM), Tom Jones, Peter Gibbs and Ron and Emmi Fisher. Given boat tour of Sandy Pond by Ron Fisher. Ran many errands with GAS in preparation for summer at EDBP, including picking up supplies and tools from GAS' residence and hardware store and delivering to EDBP. Throughout day received much information and had many questions answered.

5/22 - General information and training day with GAS. Walked shoreline and trails making note of various jobs to be done. Received a great deal of information and had many questions answered. Delivered boat to Black Pond outlet. Introduced to Bruce Gilman. Picked up and delivered tools and supplies for EDBP.

5/23 - Most of morning spent on "team building" training at SBSP and LWMA with SB, GAS and LM. Introduced to Jim Farquar, Irene Mazzochi and volunteer dune stewards. Assisted LM in erecting psychological barrier around south and east sides of Sensitive Bird Area at SPBP.

5/24 - First full day alone at EDBP. Removed brush growing at ends of interior gate to allow visitors to walk around when closed. Added to nearby brushpile to create migratory songbird habitat. Introduced myself to EDBP neighbor Mike (Rusho) Moreland. Spent much of day combining monitoring trails and shoreline with investigating preserve to become more familiar with it. Two jet skiers approached Black Pond outlet but did not enter. Retreated because water is very low and a sandbar is forming to close off outlet, and there are also two large trees that have fallen from north shore across outlet. Twenty-two visitors - 15 lichen people (found first state record of a species), one birder and six college-age men and women that I met in parking lot as they were walking out. They were down at BPWMA picnicking, sunbathing, swimming, etc. I explained that EDBP is not an access point to BPWMA for those purposes. They were polite but I wrote down their license plate number just in case.

5/25 - Day of TNC Work Party. Attended by Scott Bloom, Charlie Bender, George Gardner, Al Gilbert and Tina Ross. Lasted from 12:00PM to 5:00PM. Four hours actual labor per person, equalling 20 man-hours of labor. During first half of party Al, Scott, Tina and Charlie worked on exotic species control on stony beach. Were able to pick up 19 garbage bags full of common reed (*Phragmites australis*) and reed canary grass (*Phalaris arundinacea*) roots, rhizomes and whole plants washed up on beach. Over

1000 feet of shoreline cleaned. Also, George felled 10-15 trees along shoreline, six of which were especially impactive on northernmost point on stony beach. During second half of party all attendees worked on clearing brush and small trees near bird blind. Waterbird habitat was improved and field of view from blind was enlarged greatly. Gave interpretive tour halfway through party. Afterwards monitored shoreline and trails. One of the jet skiers from yesterday again approached outlet of Black Pond. After idling for a minute or two he turned around and rode away. Four visitors - senior couple (from Central Square "looking for good place to go walking" and enjoyed walk here) and two birders. Introduced myself to EDBP neighbors Fred and Barb Shuler.

5/26 - Worked most of day on rope fence along sandy beach where it parallels lake. Close to half of it knocked down (apparently by ice). Re-mounted using taller, thicker poles and boards (some pressure-treated) found on beach. Remaining fence was still standing, but rope was limp and hanging only a few inches above sand. Improved by adding many sturdy poles and twisting rope around them to make taught. Also worked on maintenance of signage along barrier paralleling lake. Removed few remaining intact, old "Posted" signs and all damaged signs, and mounted new ones. Put up a few additional "Dune Fragile" signs and re-erected those that were knocked down. Monitored shoreline and trails. Three visitors - Charlie Mackey (stroller, EDBP volunteer, owns camp on Henderson Harbor, lives rest of year in VA) and two distant walkers (on stony beach near dune display, mother and very young daughter, walked down from north). Two very distant walkers on beach at Black Pond Wildlife Management Area (BPWMA).

5/29 - Spent most of day working on rope fence running parallel to south border of preserve. Almost all of it was intact but only elevated a few inches above the sand. Added many new poles and tightened rope, but I think this section needs more work. Position of barrier in relation to dunes makes it very difficult to dig hole deep enough to erect stable posts. Need metal garden stakes which can be pounded into sand. Also, clothesline barrier does not look like it will last much longer. Monitored shoreline and trails. Evidence of angler (footprints, leftover bait, plastic sixpack ring) at Black Pond at border between EDBP and BPWMA. Did not cross barrier onto EDBP. One set of footprints on sandy beach that went back along shore of Black Pond near outlet. Monitored trails and shoreline. Zero visitors.

5/30 - Spent most of day working on rope fence near Black Pond outlet. Fence intact but rope hanging only a few inches above sand. Moved whole section of fence. Dune advancing north thus burying fence and leaving forward edge unprotected. Mounted all new posts. All posts of taller, thicker wood (much of it pressure treated). Also extended length of fence (approximately 75 feet) to edge of Black Pond outlet. Also worked on maintenance of signage along this section of barrier. Removed old and damaged "Posted" signs and mounted new ones. Added two and moved one "Dune Fragile" signs. Zero visitors.

5/31 - Most of day spent moving and levelling first section of boardwalk on main trail. Cleaned debris from flood control structure at mouth of wetland near north border of EDBP. Cut down red cedar blocking main trail and added to brush pile near interior gate. Monitored shoreline and trails. One visitor - Matt Brown (birder from Watertown, wrote observations on white board).

6/1 - Most of morning spent reading and writing because of rain. Read information on EDBP, SPBP and eastern Lake Ontario. Wrote notes for bi-weekly report. Monitored shoreline and trails, looking especially for evidence of activity from night before. Four visitors - two from camp on Grandjean Road that were in parking lot. Appeared to have been drinking all night and morning (one was still carrying a beer). They asked about trails but I suspect they were more interested in finding a place to relieve themselves. They were friendly and so was I. Two others were birders/strollers from Middletown, NY. Staying in Jefferson Park and walked all the way to parking lot from there. Could determine from footprints on sandy beach that they stayed out of dunes. They wrote observations on white board.

6/2 - Spent most of day moving and levelling sections of boardwalk between main trail and bird blind. Found fourth dead or dying northern leopard frog (*Rana pipiens*) next to first section of boardwalk on main trail since I started position at EDBP. Monitored shoreline and trails, especially looking for signs of any activity Sunday evening. One new set of footprints each on sandy beach and stony beach. One set of dog tracks on sandy beach. No sign of dune trespass, anglers, etc.

6/5 - Walked shoreline and trails of EDBP with GAS. GAS assessed work completed and gave supervision on tasks to be carried out. Two new sets of footprints and one new set of dog tracks on sandy beach. Assisted GAS on miscellaneous errands, including making two trips to Henderson town dump, picking up garden stakes from hardware store and delivering to SPBP. Accompanied GAS and LM to SPBP Sensitive Bird Area and received supervision on moving psychological barrier around it. Retrieved navigation buoy washed up on beach and brought to Jones' Marina via Titanic II.

6/6 - First four hours spent with LM at SPBP moving psychological barrier around Sensitive Bird Area. Completed about half of task before thunderstorm drove us back to marina. Could overhear conversation of people on one boat as they passed through channel. Gentleman was pointing out caspian terns to others, calling attention to their "black heads" and how "neat they are." He pointed out that tip of spit is protected for the birds and patrolled. But, I believe he said it was patrolled by DEC. Alerted by SB that it was evidently "senior skip day" for local students, so went to EDBP to monitor. Two new sets of footprints and one set of dog tracks on sandy beach only evidence of activity. If it was senior skip day at Belleville-Henderson High School, there was no effect at EDBP.

6/7 - Spent first four hours with LM at SPBP. Finished adjusting psychological barrier around Sensitive Bird Habitat. Also mounted psychological barrier around nearby embryo dune. Drove boat to lake side of beach and retrieved steering column from a boat and two tires. Transported junk to Jones' marina. Enjoyed conversation with Tom Jones. Monitored trails and shoreline at EDBP. Met young man (17 years old) named Mitch Kelly from Wolcott, whose family owns a camp just a few doors down from EDBP. Had a couple questions and reported seeing deer and other creatures. He had already written sightings on white board. Invited him with me as I walked trails and shoreline. Had many thoughtful questions and observations and asked how someone gets involved with outdoor related activities and groups. Naturally I mentioned TNC, workdays, field trips, etc. I was able to give him a lot of information on TNC, EDBP, dunes, shorebirds and other related subjects.

VITA

NAME: Steven F. Kahl

DATE AND PLACE OF BIRTH: November 30, 1965, Auburn, NY

EDUCATION:

Degree	Name and Location	Dates
M.P.S.	SUNY - College of Environmental Science and Forestry	1996-98
B.S.	SUNY - CESF	1994-96
-----	Cayuga Community College, Auburn, NY	1992-94
Regents Diploma	Auburn High School, Auburn, NY	1980-84

EMPLOYMENT:

Employer	Position	Dates
The Nature Conservancy	Dune Steward	1997
NYS Dept. of Mental Retardation and Developmental Disabilities, Syracuse Developmental Center	Maintenance Assistant Painter	1990-pres.
Empire Agri-Systems	Warehouse Assistant	1989-90
Chris Kahl Painting	House Painter	1982-89