Technical Memorandum
Niagara Falls Storage Site (NFSS)
Ecological Reconnaissance Report

Contract DACW-49-97-D-0001

Prepared For:

U.S. Army Corps of Engineers
Buffalo District
1776 Niagara Street
Buffalo, New York 14207-3199

November 2001

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November 5, 2001

Dr. Judith Leithner
USACE, Buffalo District
1776 Niagara
Buffalo, NY 14207-3199
716-879-4234

Dear Dr. Leithner:

Enclosed please find 5 copies of the Ecological Reconnaissance Report for the Niagara Falls Storage Site (NFSS) Contract DACW-49-97-D-0001, Delivery Order 12. Please feel free to contact me at the address and phone number on this letterhead if you have any questions or comments.

Sincerely,

Brian Mulhearn – Toxicologist
bmulhear@maximusa.com
Maxim Technologies, Inc.

Technical Memorandum # 1
Ecological Reconnaissance of the Niagara Falls Storage Site

During the week August 21 through 25, 2001, biologists Greg Dawdy, Brian Mulhearn, and Max Gricevich of Maxim Technologies performed an ecological reconnaissance of the Niagara Falls Storage Site. The objective of the reconnaissance was to develop an ecological understanding and description of the site sufficient for preparation of a site conceptual model for use in ecological risk assessment. The method used was site observation and completion of USEPAs "Ecological Reconnaissance Checklist". The following summarizes site observations. Attachment 1 is the completed site checklist. Attachment 2 includes contact information for threatened and endangered species.

The Niagara Falls Storage Site, located in Lewiston Township, Niagara County, NY, comprises 191 acres that were previously part of the Lake Ontario Ordnance Works. In general, the site is flat-to-gently-rolling and relatively poorly drained. Soils are in the "Rhinebeck-Ovid-Madalin Association". They are described in *Soil Survey of Niagara County, NY (USDA SCS, 1972)* as "somewhat poorly drained to very poorly drained soils". Included in this association and mapped on the NFSS site are Madalin Silt Loam, listed as a "hydric soil of Niagara County" in the 1992 listing and 2 soil types listed on that same list as "soils with potential hydric inclusions". These latter two soils are "Made Land" and "Rhinebeck Silt Loam". The native poor drainage of the area has been exacerbated by the extensive landform manipulation that has occurred through the years on the NFSS site. While a series of ditches installed during site operations does serve to convey surface drainage through and off the site, extensive rubble, broken concrete, and debris scattered in piles throughout the site contributes to numerous areas of poor drainage. As is described under "surface drainage" in a subsequent section of this memorandum, drainage in many areas of the site is poorly defined.

Ecosystems on the site are terrestrial and wetland. The site is drained by a series of ditches but no perennial streams or impoundments are present. The predominant vegetation on the site is elm-ash forest with Phragmites and cattails predominating in low-lying areas. In areas of the site where clearing or landform manipulation has taken place, mowed bluegrass, fescue, and "old field"* vegetation dominate. Table 1 lists the predominant plant species on the site. These include the "dominant" species and the other "commonly-occurring" species.

* *"Old Field" is generally used to describe a vegetative association developing when an agricultural field or other disturbance has resulted in clearing of the "natural" vegetation of an area and the area is then left fallow. This association in temperate regions of the United States is usually dominated by forbs which are aggressive colonizers. Typical plants are goldenrod, Queen Anne's Lace, bull thistle, and poison ivy.*

Table 1
Predominant Plant Species on NFSS

Common Name	Scientific Name
Green Ash	*Fraxinus pennsylvanica*
American Elm	*Ulmus americana*
Northern Red Oak	*Quercus rubra*
White oak	*Quercus alba*
Silver maple	*Acer saccharinum*
White Ash	*Fraxinus americana*
Quaking aspen	*Populus tremuloides*
Black walnut	*Juglans nigra*
Sugar maple	*Acer saccharum*
Black willow	*Salix nigra*
Gray dogwood	*Cornus racemosa*
Red-osier dogwood	*Cornus stolonifera*
Blue-fruited dogwood	*Cornus rugosa*
Cottonwood	*Populus deltoides*
Cattail	*Typha latifolia*
Narrow-leaved cattail	*Typha angustifolia*
Common reed	*Phragmites communis*
Poison ivy	*Rhus toxicodendron*
Virginia Creeper	*Parthenocissus quinquefolia*
Hawthorne	*Crataegus sp.*
Queen Anne's Lace	*Daucus carota*
Goldenrod	*Solidago canadensis*
Bull thistle	*Cirsium vulgare*
Black oak	*Quercus velutina*
Curly Pondweed	*Potamogeton crispus*
Polk	*Phytolacca americana*
Japanese honeysuckle	*Lonicera japonica*
Shingle oak	*Quercus imbricaria*
Basswood	*Tilia americana*

AREAS OF INVESTIGATION---"AREAS".

The reconnaissance considered the site in terms of eight sections or "areas". These areas are shown on Figure 1. Most of these areas have been subjected to a great deal of disturbance both historically and recently. Historic disturbance includes clearing, landform manipulation, construction of roads, railroads, buildings, and process structures, installation of sewerage, and digging of ditches for drainage alteration. Recent disturbance includes mowing of grass and clearing for remediation or study of contamination. Due largely to this disturbance, vegetative associations on the site are interspersed in a "patchy" pattern which is not amenable to mapping. Therefore, no attempt has been made to precisely delineate vegetative associations on site. Rather, different vegetative associations within the 8 areas are

designated on Figure 1 by means of letters. These vegetative associations are described in Table 2.

Table 2
Vegetative Associations on NFSS Site

Letter Designation on Figure 1	Vegetative Association
A	*Mowed grass*
B	*Elm-ash-maple*
C	*Common reed*
D	*Cattail*
E	*Old field*
F	*Mixed hardwoods—elm-ash-oak*
G	*Sedges, rushes*
H	*Scrub-shrub---elm saplings, dogwoods, sumacs*
I	*Ash-cottonwood-willow*
J	*Oaks, locusts*

Area 1 is that part of the site containing the Interim Waste Containment Structure. The area extends from approximately 200 feet north of "R" Street on the south to 250 feet south of "O" Street on the north. In the east-west direction, the area extends from approximately Campbell Street on the east to the NFSS property boundary on the west. Most of the area is in bluegrass and fescue and is mowed and irrigated regularly. Approximately 300 feet from the eastern boundary of this area, running in a south-north direction is the "Central Ditch", the primary surface drainage feature at the NFSS. Vegetation in this ditch is predominantly Phragmites communis , or "common reed". A dense band of elm-maple forest runs in a north-south direction along the western edge of the area. Other primary components of this area are gray dogwoods, Vitis sp., green ash, poison ivy, and Queen Anne's Lace.

Area 2 is bounded by Campbell Street on the west and the eastern site boundary on the east. In a south-north direction, it extends from approximately 600 feet north of the NFSS southern boundary for a distance of another 600 feet. About 150 feet from the northern border of this Area is an east-west ditch which is about 15 feet in width. The dominant vegetation in this swale is cattails. The ditch is bounded on both the north and south by approximately 10-foot wide bands of old field vegetation, predominantly Queen Anne's Lace and goldenrod. This area of the site contains building 401, the sole building on the site remaining from the NFSS' operational period. Vegetation in this area may be described in terms of 3 types. They are:

- mowed grass, covering approximately two-thirds of Area 2;
- elm-ash-maple forest (with many trees greater than 14 inches in diameter at breast height [dbh]) covering the northern approximately 150 feet of Area 2, and;

- an association of common reed and *Carex sp.* in low-lying areas of the eastern half of Area 2, appearing in "patches" separated by mown areas and areas of old field vegetation* in the southeast quarter of the Area.

Area 3 extends approximately 400 feet from the northern boundary of Area 2 to approximately 50 feet to the south of "O" Street. It has the same boundaries on the east and west as Area 2. Vegetation is primarily moist mixed hardwoods with common reed in low-lying areas and old field vegetation where the woods have been cleared some time ago. Corridors through the woods for access by geophysical equipment have been cleared very recently.

Area 3 seems to be the most ecologically complex area of the site. It contains significant sections of wet woods, wetlands, old fields mowed grass, old field, and mixed hardwoods. The southwest corner of the site is mixed moist hardwoods dominated by green ash and cottonwood with a gray dogwood understory. Along the southern boundary of the AOC is a drainage ditch with cattails and common reed. The ditch is a shallow swale (not entrenched) and is bordered by goldenrod, wild carrot, and other old-field vegetation . To the west side of Campbell Road, this ditch is dominated by common reed. Immediately east of area , the cottonwood/willow components of this wet woods are replaced by elm and hawthorne. From approximately 125 feet south of Z Street to Z Street itself along the western edge of Area 3, the area is predominantly old field with scattered dogwoods and cottonwoods . In this western part of Area 3 along the north side of Z Street, silver maples and ashes predominate. A ditch runs along Z Street on its north side. The ditch contains green bulrush, rushes, fescue, fox sedge, and several other species of sedges . Approximately 150 feet from the western edge of Area 3 is a cyclone fence running north-south throughout Area 3. A cleared area extends eastward from the fence for approximately 150 feet . This cleared area contains predominantly scattered common reed, cottonwoods, and ashes among building rubble. Just east of this section is a band of wet woods. Just east and south of this area, ground elevation drops 1 to 2 feet. This area is wetter and more open than area H. Vegetation is predominantly ash and elm intermixed with white oaks and hard maples , many over 14" diameter at breast height (dbh). The remaining 200' of Area 3 on its southeast corner is a relatively open stand of mixed hardwoods intermixed with old field vegetation and common reed. The substrate in this section of Area 3 is mostly railroad ballast and construction concrete rubble.

Area 3 is bounded on the east by Castle Garden Road running north-south and a north-south fence separating the NFSS from Modern Landfill. There are ditches along both sides of Castle Garden Road. The primary vegetation in these ditches is common reed. The ditch along the east side of Castle Garden Road runs along the entire eastern boundary of Area 3. At the time of the reconnaissance, water was flowing into NFSS from Modern Landfill via this ditch. Along the west side of Castle Garden Road in the northern half of Area 3 is a stand of 30- to 50-yr old mixed hardwoods, primarily red oaks, elms, and hard maples with a dogwood and poison ivy understory. This stand extends westward from the road for approximately 175'. Immediately west of this stand along the north and central parts of Area 3 , is a stand of younger (5-to-10-yr. old) mixed hardwoods with isolated 30-yr-old red oaks. To the west of this stand, covering most of the north-central part of Area 3 is an area where

small paved areas are common. Vegetation in this area is scrub-shrub in aspect with small elms, dogwoods, and sumacs predominating. Based on the predominance of common reed in the understory, this area has a water table extending upward into the root zone for a good part of the year.

Area 4 is a very large area covering most of the north-central part of the NFSS. Because it is so large, it is discussed herein in 3 sections, designated 4-1, 4-2, and 4-3.

Area 4-1 is in the north-central part of the site. It is bounded on the south by O Street and on the north by the NFSS site boundary fence. It extends approximately 1000 feet from east to west. The eastern part of Area 4-1, for about 250 feet west of its eastern boundary, is a wet elm woods . This woods extends across the entire southern half of Area 4-1. The northern half of Area 4-1 is a sparse forest of 6-to-10-inch dbh elms and ashes with poison ivy understory . N Street crosses Area 4-1 in an east-west direction, bisecting the northern half of the Area. Just south of N Street is a 20 yard band of cattails and common reed. Immediately north of N Street on the extreme western edge of Area 4-1 is a 50 foot-square stand of large staghorn sumac, approximately 6-10"dbh and 20 feet tall.

Area 4-2 extends for about 600 feet immediately to the west of Area 4-1. Area 4-2 contains the ruined foundations of several buildings and other structures and rubble is evident throughout the area but is most predominant in the western half of Area 4-2 . In the western half of Area 4-2, rubble and ruined foundations make up most of the surface substrate. The predominant vegetation is common reed, old field species, Virginia creeper, poison ivy, and milkweed. In a 250-foot band just north of O street in the southern third of 4-2, elms, ashes, and dogwoods predominate . To the north of this band, the eastern half of Area 4-2 is in elms, ashes, cottonwoods and locusts with a dogwood understory . Area C is a 150-foot square stand of locusts and cottonwoods in the east-central part of 4-2.

Area 4-3 lies immediately to the west of Area 4-2. It is also approximately 600 feet square. It is bounded on the south by O Street and on the north by the NFSS site boundary fence. The site is bisected in a north-south direction by a cyclone fence. Throughout most of the western half of the area and in the area's southeast corner is ash-cottonwood forest , approximately 10-14" dbh, with an understory of dogwood and smooth sumac. The substrate throughout this part of the Area is silt loam with a great deal of rubble and ballast. In the west-central part of Area 4-3 is a cleared area of approximately 50 yards square around several wells . This area is in old field vegetation , primarily Queen Anne's Lace and thistle. Three patches of common reed, each approximately 75 feet square, occur in the Area . Most of the eastern half of the Area has been recently cleared and is in red clover, Queen Anne's Lace, and fescue.

Area 5 is in the northwest corner of the NFSS. It is bounded on the north by the NFSS site boundary fence, on the east by the West Ditch, and on the south and west by a fence which parallels O Street about 50 feet from O Street, which curves from an east-west to a south-north street in Area 5. Much of Area 5 has been recently cleared and much of the substrate is rubble and ballast. Along the east and north boundaries of Area 5 in a 100-foot band are cottonwoods, ashes, and elms . Most of the central and western parts of Area 5 have been

cleared and trees appear in isolated "groves" of 12-16" dbh cottonwoods and red oaks with a ground cover of old field vegetation .

Area 6 is the northeast corner of the NFSS. It is bounded on the south by O Street, on the east by Macarthur Street, and on the north by the NFSS northern fenceline. From Macarthur Street, the Area extends westward for about 900 feet. Along the north side of O Street for the entire length of Area 6 is a 20-yard low-lying band of elms, cottonwoods, and maples with an understory of common reed . Just to the north of this band on the east side of Area 6 (C) is a patch of elm and ash, approximately 6 to 8 inches dbh, with a dogwood understory. To the north of this patch is a cleared area with patches of common reed predominating. To the north of this area is a 250-foot band of elm-ash woods, approximately 8 to 12" dbh, with an understory of dogwood, small ashes, and bush honeysuckle and scattered 30-to-50-yr.old red oaks extending across the entirety of Area 6. Immediately south of N Street, which bisects Area 6, running in an east-west direction, is a 50-foot wide swale with common reed predominating. This swale runs the entire width of Area 6 along N Street. In the center of the southern half of Area 6 is a mown area with old field vegetation such as clover, Queen-Anne's Lace, and fescue predominating with patches of common reed in low-lying areas . The southwest corner of Area 6 is a wet elm woods. The elms are 8-12" dbh. Red oaks are scattered throughout this area. The understory is sparse and composed primarily of poison-ivy and grape vines.

Area 7 is the southeast corner of the NFSS. It is approximately 900 feet in the east-west direction and 600 feet north to south. It is bounded on the east by Castle Garden Road, on the west by Campbell Street, on the south by the NFSS site boundary fence, and on the north by a ditch separating Area 7 from Area 2. Most of Area 7 is mowed old field and grasses with patches of dogwoods. 4 ditches are present in the Area, running near Area 7's boundaries. These ditches are described under "Site Drainage" below. Vegetation in these ditches includes common reed, cattails, soft-stemmed bulrush, rough barnyard grass, duckweed, and several species of sedges. The west-central portion of this area was used as a borrow area for cover material for the Interim Waste Containment Structure.

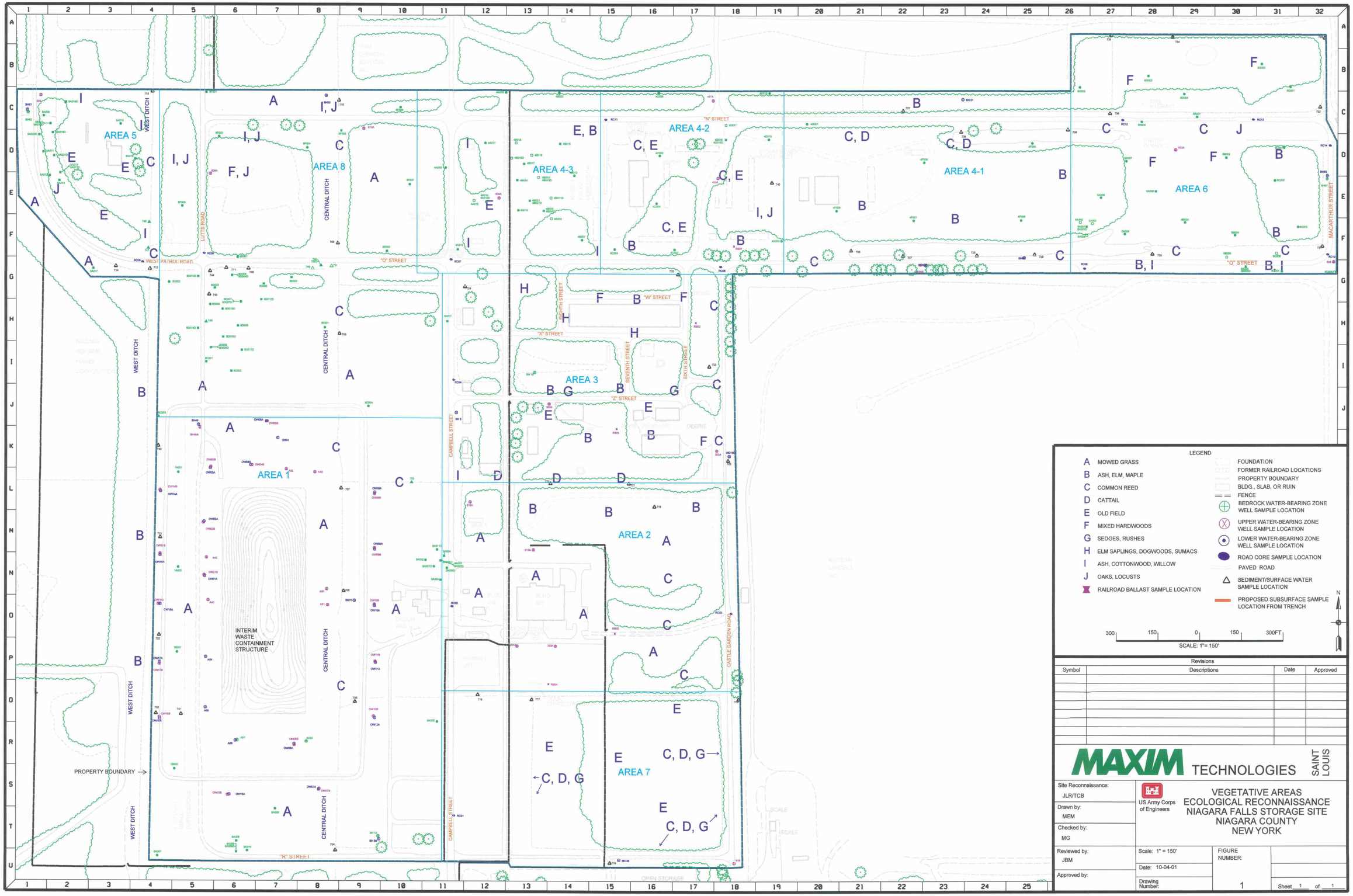
Area 8 is in the northwest part of the NFSS between Area 5 and Area 4-3. It is a large area of approximately 1000 feet in the east-west direction and 1200 feet in the north-south direction. It is bounded on the north by the NFSS boundary fence and on the south by the road around the Interim Waste Containment Structure. It is bounded on the West by the West Ditch and on the east by Areas 4-3 and 3. Most of the southern half and the northeastern part of the area is grassed, mowed area. Strips along the western and northern boundaries of the site, approximately 150 feet wide are in an ash-cottonwood, locust association . In the west-central part of the Area is a grove of 10 to 40-yr old oaks and locusts. Both the west and Central ditches in this Area are dominated by common reed .

SITE SURFACE DRAINAGE

The site area is nearly level to gently sloping and soils are predominantly poorly drained to very poorly drained. The *Soil Survey of Niagara County, New York(1972)* states that "natural drainage is the major limitation to use" of area soils. While surface drainage on the site has

been provided through a series of ditches, landform manipulation through the years has, in some cases, interrupted drainage. Site surface drainage is shown on Figure 2.

The regional direction of surface drainage in the area is northward toward Lake Ontario. Three main south-to-north ditch systems drain the site. The primary ditch draining the site is the Central Ditch. The Central Ditch flows south-to-north from off site through the site to the west of Campbell Road immediately east of the Temporary Waste Containment Area. Most of the east-west drainage for the site eventually drains to the Central Ditch. The Central Ditch is entrenched to a depth of over 10 feet through most of the site and supports common reed and cattails throughout most of its length. The West Ditch flows along the western boundary of the NFSS and receives drainage from the west side of the Temporary Storage Area as well as drainage from off-site. It is rather heavily vegetated with ash, maple, and elm. A third ditch flows along the east side of the site. It receives drainage from Modern Landfill to the east of the site ands drainage from the eastern third of the site itself.



LEGEND

- A MOWED GRASS
- B ASH, ELM, MAPLE
- C COMMON REED
- D CATTAIL
- E OLD FIELD
- F MIXED HARDWOODS
- G SEDGES, RUSHES
- H ELM SAPLINGS, DOGWOODS, SUMACS
- I ASH, COTTONWOOD, WILLOW
- J OAKS, LOCUSTS
- RAILROAD BALLAST SAMPLE LOCATION

- FOUNDATION
- FORMER RAILROAD LOCATIONS
- PROPERTY BOUNDARY
- BLDG., SLAB, OR RUIN
- FENCE
- BEDROCK WATER-BEARING ZONE WELL SAMPLE LOCATION
- UPPER WATER-BEARING ZONE WELL SAMPLE LOCATION
- LOWER WATER-BEARING ZONE WELL SAMPLE LOCATION
- ROAD CORE SAMPLE LOCATION
- PAVED ROAD
- SEDIMENT/SURFACE WATER SAMPLE LOCATION
- PROPOSED SUBSURFACE SAMPLE LOCATION FROM TRENCH

300 150 0 150 300FT

SCALE: 1"= 150'

N

Revisions

Symbol	Descriptions	Date	Approved

MAXIM TECHNOLOGIES SAINT LOUIS

Site Reconnaissance: JLR/TCB

Drawn by: MEM

Checked by: MG

Reviewed by: JBM

Approved by:

US Army Corps of Engineers

VEGETATIVE AREAS ECOLOGICAL RECONNAISSANCE NIAGARA FALLS STORAGE SITE NIAGARA COUNTY NEW YORK

Scale: 1" = 150'

Date: 10-04-01

Drawing Number:

FIGURE NUMBER: 1

Sheet 1 of 1

AREA 5
AREA 8
AREA 4-3
AREA 4-2
AREA 4-1
AREA 6
AREA 3
AREA 1
AREA 2
AREA 7
WEST DITCH
CENTRAL DITCH
DEBRIS
SCALE
OPEN STORAGE

LEGEND

- WATER FEATURE
- WETLANDS
- CULVERT
- SWAMP
- UNPAVED ROAD/TRAIL
- PAVED ROAD
- DRY DITCH
- SITE SURFACE DRAINAGE DIRECTION
- FOUNDATION
- FORMER RAILROAD LOCATIONS
- PROPERTY BOUNDARY
- BLDG., SLAB, OR RUIN
- FENCE

N

300 150 0 150 300FT

SCALE: 1"= 150'

Revisions

Symbol	Descriptions	Date	Approved

MAXIM TECHNOLOGIES SAINT LOUIS

Site Reconnaissance: JLR/TCB	US Army Corps of Engineers	SITE SURFACE DRAINAGE NIAGARA FALLS STORAGE SITE NIAGARA COUNTY NEW YORK
Drawn by: MEM		
Checked by: GCD		
Reviewed by: MG	Scale: 1" = 150'	FIGURE NUMBER: 2
Approved by:	Date: 10-31-01	
	Drawing Number:	Sheet 1 of 1

Attachment 1

Contents:

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

I. SITE DESCRIPTION Date: September, 2001

1. Site Name: **Niagara Falls Storage Site**

   Location: Lewiston, NY

   County: **Niagara** City: **Lewiston** State: **New York**

2. What is the approximate area of the site? **190 ACRES**

3. Is this the first site visit? Yes **No** If no, attach trip report of previous site visit(s) if available.

   Part of a remedial investigation.

   Date(s) of previous site visit(s): **Periodic visits since spring of1999. This is first visit specifically for ecological reconnaissance.**

4. Please attach USGS topographic map(s) of the site, if available.

5. Are aerial or other site photographs available? **Yes** No If yes, please attach any available photo(s) to the site map at the conclusion of this section.

   YES. PHOTOS ATTACHED.

6. The land use on the site is: **MILITARY RESERVATION The area surrounding the site is rural residential.--- a sanitary landfill abuts site on the east and a hazardous waste landfill abuts the northeastern portion of the site. The northwestern portion of the site is bounded by a former TNT production facility (Lake Ontario Ordnance Works known as the LOOW). The LOOW is currently under investigation by the USACE- Buffalo District: (3 mile radius).**

   0 % Urban

   100 % Rural

   30 % Residential

   15 % Industrial ---LANDFILLS

   55 % Agricultural

   0 % Recreational
   (Describe; note if it is a park, etc.)

   0 % Undisturbed

7. Has any movement of soil taken place at the site? YES If yes, please identify the most likely cause of this disturbance:

   _____ Agricultural Use

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

x Heavy Equipment ____ Mining

____ Natural Events ____ Erosion ____ Other

Please describe: **Construction of Lake Ontario Ordnance Works in the 1940s. Site grading and construction of buildings and process structures. Ditching for site drainage. From 1979—1991, site remediation involving soil removal.** _____

8. Do any potentially sensitive environmental areas exist adjacent to or in proximity to the site, e.g., federal and state parks, national and state monuments, wetlands, prairie potholes, etc.? Describe. *Remember, flood plains and wetlands are not always obvious; do not answer "no" without confirming information.*

Wetlands present in site area.

8a. Please provide the source(s) of information used to identify these sensitive areas, and indicate their general location on the site map.

Reconnaissance by Maxim biologists; NRCS county soils maps; National Wetlands Inventory maps.

9. What type of facility is located at the site?

Federal government controlled-access radioactive waste storage facility operated by the US Army Corps of Engineers, Buffalo District under the Formerly Used Site Remedial Action Program (FUSRAP).

10. What are the suspected contaminants of concern at the site? If known, what are the maximum concentration levels?

Heavy metals, Uranium and Thorium-series radionuclides.

11. Check any potential routes of off-site migration of contaminants observed at the site:

Being investigated as part of Remedial Investigation. Potential routes include surface and groundwater, windblown particulates, movement via biota.

12. If known, what is the approximate depth to the water table?

Highly seasonally variable. Saturated to surface at many areas of site. Highly affected by drainage ditches. _____

14. Is the direction of surface runoff apparent from site observation? **Yes.** If yes, to which of the following does the surface runoff discharge? Indicate all that apply.

Surface water

15. Is there a navigable waterbody or tributary to a navigable waterbody?

No navigable waterway. Discharge is to a small creek tributary to Lake Ontario.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

16. Is there a waterbody anywhere on or in the vicinity of the site? If yes, also complete Section III: Aquatic Habitat Checklist - Non-Flowing Systems and/or Section IV: Aquatic Habitat Checklist - Flowing Systems.

No permanent water bodies on or proximate to site. Intermittent drainage ditches throughout site. Some wetlands areas.

17. Is there evidence of flooding? **Site subject to interior ponding—wetland areas present.** Complete Section V: Wetland Habitat Checklist.

18. If a field guide was used to aid any of the identifications, please provide a reference. Also, estimate the time spent identifying fauna. [Use the back of this page if additional space for text is needed.]

Field Guide to the Birds; A Completely New Guide to All the Birds of Eastern and Central North America, Peterson, R.T. Fourth Edition 1980.

19. Are any threatened and/or endangered species (plant or animal) known to inhabit the area of the site?

Drummond's Rock Cress, Arabis Drummondi. Listed as "Endangered" by the State of New York; Rated by NY Natural Heritage Program as "S1 and S2"—very few occurrences; very to especially vulnerable in New York State. Rated globally by NY Natural Heritage program as "G5=Demonstrably secure globally". Presence of this species on the NFSS site has not been documented.

20. Weather conditions at the time this checklist was prepared.

DATE: **August 21-25, 2001** _____

55-85 F Temperature (°C/°F) — **85 F** - Normal daily high temperature

Light, variable - Wind (Direction/Speed) — **None** - Precipitation (rain, snow)

Clear to partly cloudy - Cloud cover

IA. SUMMARY OF OBSERVATIONS AND SITE SETTING

Refer to attached Technical Memorandum #1—Ecological Reconnaissance of the Niagara Falls Storage Site.

191 acres of flat-to-gently-rolling terrain with poorly drained soils. Primarily elm-ash-forest with common reed and cattails predominating in low-lying areas.

Completed by Max Gricevich, Maxim Technologies _____

Additional Preparers **Greg Dawdy, Brian Mulhearn, Maxim Technologies.**

DATE: 10-01-01

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

II. TERRESTRIAL HABITAT CHECKLIST

IIA. WOODED

1. Are there any wooded areas at the site? **Yes.**

2. What percentage or area of the site is wooded? **40%** Indicate the wooded area on the site map attached to a copy of this checklist. Please identify what information was used to determine the wooded area of the site.

   On-site observation during reconnaissance. Visual estimate viewing site map. Much of the site's wooded area was cleared in 1940s for site construction and operation. Other areas were cleared during the period 1970—1990 during site remediation. Still other areas were cleared in 2001 to provide access for site studies. Some of this clearing is extensive but recovery of elm-ash forest is rapid so any estimate of forest cover on site is a "snapshot" at best.

3. What is the dominant type of vegetation in the wooded area? (Circle one: Evergreen **Deciduous** Mixed) Provide a photograph, if available.

   Dominant plant, if known: **List of dominants attached—Green ash, American Elm and associated understory.**

4. What is the predominant size of the trees at the site? Use diameter at breast height.

   Varies with recency of clearing. See memorandum attached. Ranges from 4" dbh to over 20" dbh.

5. Specify type of understory present, if known. Provide a photograph, if available.

   Small dogwoods, poison ivy, sumacs, common reed. See attached memorandum.

IIB. SHRUB/SCRUB

1. Is shrub/scrub vegetation present at the site?

   No true scrub/shrub. Young elm-ash-maple forests and "old field" vegetation in recently cleared areas. See attached memorandum.

IIC. OPEN FIELD

1. Are there open (bare, barren) field areas present at the site? **Yes. Old field and mowed grass.**

   2. What percentage of the site is open field? 40 %

2. What is/are the dominant plant(s)?

   See attached memorandum. Dominants are goldenrod, Queen Anne's Lace, Virginia creeper, poison ivy, and Japanese honeysuckle.

   4. What is the approximate average height of the dominant plant? Goldenrod—36—48".

5. Describe the vegetation cover: **Patchy. Forest, cleared forest, wetland, mowed grass, old field intermixed.**

IID. MISCELLANEOUS

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

1. Are other types of terrestrial habitats present at the site other than woods, scrub/shrub, and open field?
   No.

2. Describe the terrestrial miscellaneous habitat(s) and identify these area(s) on the site map. **See attached memorandum.**

3. What observations, if any, were made at the site regarding the presence and/or absence of insects, fish, birds, mammals, etc.?

   See attached observed species table.

4. Review the questions in Section I to determine if any additional habitat checklists should be completed for this site.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

III. No non-flowing water systems on site.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

IV. AQUATIC HABITAT CHECKLIST - FLOWING SYSTEMS

Note: Aquatic systems are often associated with wetland habitats. Please refer to Section V, Wetland Habitat Checklist.

1. What type(s) of flowing water system(s) is (are) present at the site? **Ditches and shallow seasonally-ponded areas.**

2, 3 do not apply.

4. What is the general composition of the substrate? Check all that apply.

   Silt, clay, debris, detritus all apply in ditches at various points on site. _____

6. What is the condition of the bank (e.g., height, slope, extent of vegetative cover)?

   Three main ditches running south-north through site. Several shallow swales and smaller ditches running east-west. Shallow swales, small ditches dominated by common reed and cattails. Banks of these smaller ditches indistinguishable from surrounding land. Main ditches entrenched. The easternmost and smallest main ditch with shallow banks, a swale in aspect with phragmites dominating. The Western and Central ditches entrenched from 5 to 15 feet with steep silty banks in some areas. Dominant vegetation in Central Ditch is common reed and cattails. Dominant vegetation in Western Ditch is floodplain ash-elm forest. See attached memorandum.

7. Is the system influenced by tides?**No.**
8. Is the flow intermittent? **Yes. Observed for many seasons by Maxim field personnel.**

9. Is there a discharge from the site to the waterbody? **Yes. Site ditches discharge to "Four-Mile Creek and thence to Lake Ontario. See attached memorandum.**

9. Is there a discharge from the waterbody? **Yes** No If yes, and the information is available, please identify what the waterbody discharges to and whether the discharge is on site or off site. **YES. Offsite to Four-Mile Creek – Four Mile Creek to Lake Ontario.**

10. Identify any field measurements and observations of water quality that were made. For those parameters for which data were collected provide the measurement and the units of measure in the appropriate space below: **See attached table of water quality data collected during past site activities.**

    _____ Width (ft.)
    _____ Depth (ft.)
    _____ Velocity (specify units: _____)
    _____ Temperature (depth of the water at which the reading was taken _____)
    _____ pH
    _____ Dissolved oxygen
    _____ Salinity
    _____ Turbidity (clear, slightly turbid, turbid, opaque) (Secchi disk depth _____)
    _____ Other (specify)

11. Describe observed color and area of coloration.

Variable depending upon location. Following rain events water tends to be turbid, light brown to brown.

12. Is any aquatic vegetation present? **Yes. Common reed, cattails, green bulrush, fox sedge. Emergent.**

13. Mark the flowing water system on the attached site map. **See attached.**

13. What observations were made at the waterbody regarding the presence and/or absence of benthic macroinvertebrates, fish, birds, mammals, etc.?

Several species of frogs, toads, mallard ducks, Great blue heron and green herons have been observed. Also numerous species of damselflies, midges, dragonflies. Mosquitoes are extremely prevalent during wet springs and summers.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

V. WETLAND HABITAT CHECKLIST

1. Based on observations and/or available information, are designated or known wetlands definitely present at the site? **A review of the NWI for the did not indicate the presence of mapped wetlands on-site. Areas of the site do meet the definition of wetlands based on soil, hydrology and vegetation.**

   Please note the sources of observations and information used (e.g., USGS Topographic Maps, National Wetland Inventory, federal or state agency, etc.), to make this determination.

   USACE Buffalo District has indicated that no Federally jurisdictional wetlands are present at the NFSS. _____

2. Based on the location of the site (e.g., along a waterbody, in a floodplain, etc.) and site conditions (e.g., standing water; dark, wet soils; mud cracks; debris line; water marks), are wetland habitats suspected? **Yes.** If yes, proceed with the remainder of the wetland habitat identification checklist.

3. What type(s) of vegetation are present in the wetland?

   Emergent. Dominants are common reed and cattails. Other species with high frequency are green bulrush, fox sedge, several other Carex species.

4. Provide a general description of the vegetation present in and around the wetland (height, color, etc.). Provide a photograph of the known or suspected wetlands, if available.

   Both "wet woods", dominated by elms, ashes, cottonwoods, dogwoods and emergent wetlands dominated by cattails and common reed are common on site. _____

5. Is standing water present? **Interior ponding exists on site seasonally. Interior drainage is poor. The site is drained by a series of ditches but landform manipulation has contributed to additional ponding. No permanent standing water is present on site.** _____

6. Is there evidence of flooding at the site? What observations were noted? **Mud lines, debris lines, and buttressing are common on site.**

7. If known, what is the source of the water in the wetland? **Groundwater—high water table. In the three main south-to-north ditches on site, source is off-site as well as on-site.**

8. . Is there a discharge from the site to a known or suspected wetland? **Yes** No If yes, please describe. **Site ditches discharge to off-site creek.**

9. Is there a discharge from the wetland? **On-site ditches discharge to off-site creek.**

10. If a soil sample was collected, describe the appearance of the soil in the wetland area. Circle or write in the best response. **Not collected.**

11. Mark the observed wetland area(s) on the attached site map.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

EXPLANATION OF TERMS USED IN THIS CHECKLIST

Arroyo	Dry gulch, brook, or creek. A deep gully cut by an intermittent brook or stream.
Benthic	Pertaining to the bottom of a waterbody.
Detritus	Loose fragments or particles formed by the disintegration of rocks.
Marl	A mixture of clays, carbonates of calcium and magnesium and remnants of shells.
Riparian	Of, or on the bank of a natural course of water.
Secchi (disk)	Basic measure of turbidity, visibility or transparency of water.
Submergent Vegetation	Hidden, obscure vegetation which is inundated with water.
Swales	Low traces of land which are often moist or marshy.

Area of Interest 1

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

I. SITE DESCRIPTION Date: September, 2001

1. Site Name: **Niagara Falls Storage Site - Area of Investigation (AOI) 1**

   Location: Lewiston, NY

   County: **Niagara** City: **Lewiston** State: **New York**

2. What is the approximate area of the site? **Total site size is 191 acres.**

3. Is this the first site visit? Yes **No** If no, attach trip report of previous site visit(s) if available.

   Part of a remedial investigation.

   Date(s) of previous site visit(s): **Periodic visits since spring of 1999. This is first visit specifically for ecological reconnaissance.**

4. Please attach USGS topographic map(s) of the site, if available.

5. Are aerial or other site photographs available? **Yes** No If yes, please attach any available photo(s) to the site map at the conclusion of this section.

   YES. PHOTOS ATTACHED.

6. The land use on the site is: **MILITARY RESERVATION Currently High and low level radioactive material is buried in the Waste Containment Structure (WCS) which occupies the majority of this AOI. The area surrounding the site is rural residential.--- a sanitary landfill abuts site on the east and a hazardous waste landfill abuts the northeastern portion of the site. The northwestern portion of the site is bounded by a former TNT production facility (Lake Ontario Ordnance Works known as the LOOW). The LOOW is currently under investigation by the USACE- Buffalo District: (3 mile radius).**

   0 % Urban

   100 % Rural

   0 % Residential

   75 % Industrial ---LANDFILLS

   0 % Agricultural

   0 % Recreational
   (Describe; note if it is a park, etc.)

   0 % Undisturbed

7. Has any movement of soil taken place at the site? YES If yes, please identify the most likely cause of this disturbance:

   ____ Agricultural Use

   x Heavy Equipment ____ Mining

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

_____ Natural Events _____ Erosion _____ Other

Please describe: **Construction of Lake Ontario Ordnance Works in the 1940s. Site grading and construction of buildings and process structures. Ditching for site drainage. From 1979—1991, site was used for the construction of the WCS. Several existing buildings were demolished, some structures were buried, and portions of other structures were used for the storage of radioactive materials which were collected during the remediation.** _____

8. Do any potentially sensitive environmental areas exist adjacent to or in proximity to the site, e.g., federal and state parks, national and state monuments, wetlands, prairie potholes, etc.? Describe. *Remember, flood plains and wetlands are not always obvious; do not answer "no" without confirming information.*

Areas which meet the definition of wetlands are present in the Central Drainage Ditch, which is a portion of this AOI.

8a. Please provide the source(s) of information used to identify these sensitive areas, and indicate their general location on the site map.

Reconnaissance by Maxim biologists; NRCS county soils maps; National Wetlands Inventory maps.

9. What type of facility is located at the site?

Federal government controlled-access radioactive waste storage facility operated by the US Army Corps of Engineers, Buffalo District under the Formerly Used Site Remedial Action Program (FUSRAP).

14. What are the suspected contaminants of concern at the site? If known, what are the maximum concentration levels?

Heavy metals, Uranium and Thorium-series radionuclides.

15. Check any potential routes of off-site migration of contaminants observed at the site:

Being investigated as part of Remedial Investigation. Potential routes include surface and groundwater, windblown particulates, movement via biota.

16. If known, what is the approximate depth to the water table?

Highly seasonally variable. Saturated to surface at many areas of site. Highly affected by drainage ditches. _____

14. Is the direction of surface runoff apparent from site observation? **Yes.** If yes, to which of the following does the surface runoff discharge? Indicate all that apply.

Surface water, limited surface ponding and infiltration.

18. Is there a navigable waterbody or tributary to a navigable waterbody?

No navigable waterway. Central ditch discharges is to a small creek which is tributary to Lake Ontario.

19. Is there a waterbody anywhere on or in the vicinity of the site? If yes, also complete Section III: Aquatic Habitat Checklist - Non-Flowing Systems and/or Section IV: Aquatic Habitat Checklist - Flowing Systems.

No permanent water bodies on or proximate to site. Intermittent drainage ditches throughout site. Some wetlands areas.

20. Is there evidence of flooding? **No** . Complete Section V: Wetland Habitat Checklist.

18. If a field guide was used to aid any of the identifications, please provide a reference. Also, estimate the time spent identifying fauna. [Use the back of this page if additional space for text is needed.]

Field Guide to the Birds; A Completely New Guide to All the Birds of Eastern and Central North America, Peterson, R.T. Fourth Edition 1980.

19. Are any threatened and/or endangered species (plant or animal) known to inhabit the area of the site?

Drummond's Rock Cress, Arabis Drummondi. Listed as "Endangered" by the State of New York; Rated by NY Natural Heritage Program as "S1 and S2"—very few occurrences; very to especially vulnerable in New York State. Rated globally by NY Natural Heritage program as "G5=Demonstrably secure globally". Presence of this species on the NFSS site has not been documented.

20. Weather conditions at the time this checklist was prepared.

DATE: **August 21-25, 2001** _____

55-85 F Temperature (°C/°F) — 85 F - Normal daily high temperature

Light, variable - Wind (Direction/Speed) — None - Precipitation (rain, snow)

Clear to partly cloudy - Cloud cover

IA. SUMMARY OF OBSERVATIONS AND SITE SETTING

Refer to attached Technical Memorandum #1—Ecological Reconnaissance of the Niagara Falls Storage Site.

This AOI is almost entirely vegetated by grass which is frequently mowed.

Completed by Max Gricevich, Maxim Technologies _____

Additional Preparers **Greg Dawdy, Brian Mulhearn, Maxim Technologies.**

DATE: 10-01-01

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

II. TERRESTRIAL HABITAT CHECKLIST

IIA. WOODED

1. Are there any wooded areas at the site? **NO.**

2. What percentage or area of the site is wooded? **0%** Indicate the wooded area on the site map attached to a copy of this checklist. Please identify what information was used to determine the wooded area of the site.

   On-site observation during reconnaissance.

3. What is the dominant type of vegetation in the wooded area? (Circle one: Evergreen Deciduous Mixed) Provide a photograph, if available. None present.

   Dominant plant, if known: **NA**

9. What is the predominant size of the trees at the site? Use diameter at breast height.

   NA.

10. Specify type of understory present, if known. Provide a photograph, if available.

    NA

IIB. SHRUB/SCRUB

3. Is shrub/scrub vegetation present at the site?

   No true scrub/shrub. Young elm-ash-maple forests and "old field" vegetation in recently cleared areas. See attached memorandum.

IIC. OPEN FIELD

1. Are there open (bare, barren) field areas present at the site? **Yes. Mowed grass.**

   2. What percentage of the site is open field? **90** %

4. What is/are the dominant plant(s)?

   See attached memorandum. Dominants are fescue, bluegrass

   4. What is the approximate average height of the dominant plant? **4inches**

5. Describe the vegetation cover: **Completely vegetated.**

IID. MISCELLANEOUS

1. Are other types of terrestrial habitats present at the site other than woods, scrub/shrub, and open field? **No.**

2. Describe the terrestrial miscellaneous habitat(s) and identify these area(s) on the site map. **See attached memorandum.**

3. What observations, if any, were made at the site regarding the presence and/or absence of insects, fish, birds, mammals, etc.?

   See attached observed species table.

4. Review the questions in Section I to determine if any additional habitat checklists should be completed for this site.

III. No non-flowing water systems on site.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

IV. AQUATIC HABITAT CHECKLIST - FLOWING SYSTEMS

Note: Aquatic systems are often associated with wetland habitats. Please refer to Section V, Wetland Habitat Checklist.

1. What type(s) of flowing water system(s) is (are) present at the site? **Ditches.**

2, 3 do not apply.

4. What is the general composition of the substrate? Check all that apply.

Silt, clay, debris, detritus all apply in ditches at various points on site. _____

11. What is the condition of the bank (e.g., height, slope, extent of vegetative cover)?

Two main ditches running south-north through site. Several shallow swales and smaller ditches running east-west. Shallow swales, small ditches dominated by common reed and cattails. Banks of these smaller ditches indistinguishable from surrounding land. Main ditches entrenched. The easternmost and smallest main ditch with shallow banks, a swale in aspect with phragmites dominating. The Western and Central ditches entrenched from 5 to 15 feet with steep silty banks in some areas. Dominant vegetation in Central Ditch is common reed and cattails. Dominant vegetation in Western Ditch is floodplain ash-elm forest. See attached memorandum.

12. Is the system influenced by tides?**No.**
13. Is the flow intermittent? **Yes. Observed for many seasons by Maxim field personnel.**

9. Is there a discharge from the site to the waterbody? **Yes. Site ditches discharge to "Four-Mile Creek and thence to Lake Ontario. See attached memorandum.**

9. Is there a discharge from the waterbody? **Yes** No If yes, and the information is available, please identify what the waterbody discharges to and whether the discharge is on site or off site. **YES. Offsite to Four-Mile Creek – Four Mile Creek to Lake Ontario.**

10. Identify any field measurements and observations of water quality that were made. For those parameters for which data were collected provide the measurement and the units of measure in the appropriate space below: **See attached table of water quality data collected during past site activities.**

_____ Width (ft.)
_____ Depth (ft.)
_____ Velocity (specify units: _____)
_____ Temperature (depth of the water at which the reading was taken _____)
_____ pH
_____ Dissolved oxygen
_____ Salinity
_____ Turbidity (clear, slightly turbid, turbid, opaque) (Secchi disk depth _____)
_____ Other (specify)

11. Describe observed color and area of coloration.

Variable depending upon location. Following rain events water tends to be turbid, light brown to brown.

12. Is any aquatic vegetation present? **Yes. Common reed, cattails, green bulrush, fox sedge. Emergent.**

13. Mark the flowing water system on the attached site map. **See attached.**

17. What observations were made at the waterbody regarding the presence and/or absence of benthic macroinvertebrates, fish, birds, mammals, etc.?

Several species of frogs, toads, Great blue heron and green herons have been observed. Also numerous species of damselflies, midges, dragonflies. Mosquitoes are extremely prevalent during wet springs and summers.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

V. WETLAND HABITAT CHECKLIST

1. Based on observations and/or available information, are designated or known wetlands definitely present at the site? **A review of the NWI for the did not indicate the presence of mapped wetlands on-site. Areas of the site do meet the definition of wetlands based on soil, hydrology and vegetation.**

   Please note the sources of observations and information used (e.g., USGS Topographic Maps, National Wetland Inventory, federal or state agency, etc.), to make this determination.

   USACE Buffalo District has indicated that no Federally jurisdictional wetlands are present at the NFSS.

2. Based on the location of the site (e.g., along a waterbody, in a floodplain, etc.) and site conditions (e.g., standing water; dark, wet soils; mud cracks; debris line; water marks), are wetland habitats suspected? **Yes.** If yes, proceed with the remainder of the wetland habitat identification checklist.

3. What type(s) of vegetation are present in the wetland?

   Emergent. Dominants are common reed and cattails. Other species with high frequency are green bulrush, fox sedge, several other Carex species.

4. Provide a general description of the vegetation present in and around the wetland (height, color, etc.). Provide a photograph of the known or suspected wetlands, if available.

   Emergent wetland vegetation is present dominated by cattails and common reed.

5. Is standing water present? **Interior ponding exists on site seasonally. Interior drainage is poor. The site is drained by a series of ditches. No permanent standing water is present on site.**

6. Is there evidence of flooding at the site? **NO.** What observations were noted? **NA**

7. If known, what is the source of the water in the wetland? **Groundwater—high water table. In the Central Ditch, source is off-site as well as on-site.**

8. . Is there a discharge from the site to a known or suspected wetland? **Yes** No If yes, please describe. **Site ditches discharge to off-site creek.**

9. Is there a discharge from the wetland? **On-site ditches discharge to off-site creek.**

10. If a soil sample was collected, describe the appearance of the soil in the wetland area. Circle or write in the best response. **Not collected.**

11. Mark the observed wetland area(s) on the attached site map.
    See Attached Map.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

EXPLANATION OF TERMS USED IN THIS CHECKLIST

Arroyo	Dry gulch, brook, or creek. A deep gully cut by an intermittent brook or stream.
Benthic	Pertaining to the bottom of a waterbody.
Detritus	Loose fragments or particles formed by the disintegration of rocks.
Marl	A mixture of clays, carbonates of calcium and magnesium and remnants of shells.
Riparian	Of, or on the bank of a natural course of water.
Secchi (disk)	Basic measure of turbidity, visibility or transparency of water.
Submergent Vegetation	Hidden, obscure vegetation which is inundated with water.
Swales	Low traces of land which are often moist or marshy.

Area of Interest 2

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

I. SITE DESCRIPTION Date: September, 2001

1. Site Name: **Niagara Falls Storage Site - Area of Investigation (AOI) 2**

   Location: Lewiston, NY

   County: **Niagara** City: **Lewiston** State: **New York**

2. What is the approximate area of the site? **Total site size is 191 acres.**

3. Is this the first site visit? Yes **No** If no, attach trip report of previous site visit(s) if available.

   Part of a remedial investigation.

   Date(s) of previous site visit(s): **Periodic visits since spring of 1999. This is first visit specifically for ecological reconnaissance.**

4. Please attach USGS topographic map(s) of the site, if available.

5. Are aerial or other site photographs available? **Yes** No If yes, please attach any available photo(s) to the site map at the conclusion of this section.

   YES. PHOTOS ATTACHED.

6. The land use on the site is: **AOI 2 is part of a military reservation. Buildings in this portion of the site remain from the period when the NFSS was a part of the LOOW. Building 401 was used for the storage of radioactive material which resulted from the extraction of radioactive isotopes from ores and from the storage of other radioactive materials which resulted from the Manhattan project.**

   The area surrounding the site is rural residential.--- a sanitary landfill abuts site on the east and a hazardous waste landfill abuts the northeastern portion of the site. The northwestern portion of the site is bounded by a former TNT production facility (Lake Ontario Ordnance Works known as the LOOW). The LOOW is currently under investigation by the USACE- Buffalo District: (3 mile radius).

   0 % Urban

   100 % Rural

   0 % Residential

   10 % Industrial ---Building

   0 % Agricultural

   0 % Recreational
   (Describe; note if it is a park, etc.)

   0 % Undisturbed

7. Has any movement of soil taken place at the site? **YES** If yes, please identify the most likely cause of this disturbance:

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

_____ Agricultural Use

x___ Heavy Equipment _____ Mining

_____ Natural Events ____ Erosion _____ Other

Please describe: **Construction of Lake Ontario Ordnance Works in the 1940s. Site grading and construction of buildings and process structures. Ditching for site drainage. Manhattan Project wastes were stored at the facility following World War II. From 1979—1991, portion of the site were remediated as part of an effort by the USDOE.** _____

8. Do any potentially sensitive environmental areas exist adjacent to or in proximity to the site, e.g., federal and state parks, national and state monuments, wetlands, prairie potholes, etc.? Describe. *Remember, flood plains and wetlands are not always obvious; do not answer "no" without confirming information.*

Areas which meet the definition of wetlands are present in this AOI.

8a. Please provide the source(s) of information used to identify these sensitive areas, and indicate their general location on the site map.

Reconnaissance by Maxim biologists; NRCS county soils maps; National Wetlands Inventory maps.

9. What type of facility is located at the site?

Federal government controlled-access radioactive waste storage facility operated by the US Army Corps of Engineers, Buffalo District under the Formerly Used Site Remedial Action Program (FUSRAP).

18. What are the suspected contaminants of concern at the site? If known, what are the maximum concentration levels?

Heavy metals, Uranium and Thorium-series radionuclides.

19. Check any potential routes of off-site migration of contaminants observed at the site:

Being investigated as part of Remedial Investigation. Potential routes include surface and groundwater, windblown particulates, movement via biota.

20. If known, what is the approximate depth to the water table?

Highly seasonally variable. Saturated to surface at many areas of site. Highly affected by drainage ditches. _____

14. Is the direction of surface runoff apparent from site observation? **Yes.** If yes, to which of the following does the surface runoff discharge? Indicate all that apply.

Surface water, limited surface ponding and infiltration.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

21. Is there a navigable waterbody or tributary to a navigable waterbody?

No navigable waterway. Ditches present on this AOI discharge to the Central Drainage Ditch which discharges is to a small creek which is tributary to Lake Ontario.

22. Is there a waterbody anywhere on or in the vicinity of the site? If yes, also complete Section III: Aquatic Habitat Checklist - Non-Flowing Systems and/or Section IV: Aquatic Habitat Checklist - Flowing Systems.

No permanent water bodies on or proximate to site. Intermittent drainage ditches throughout site. Some wetlands areas.

23. Is there evidence of flooding? Complete Section V: Wetland Habitat Checklist.

Site is subject to interior ponding – wetland areas are present.

18. If a field guide was used to aid any of the identifications, please provide a reference. Also, estimate the time spent identifying fauna. [Use the back of this page if additional space for text is needed.]

Field Guide to the Birds; A Completely New Guide to All the Birds of Eastern and Central North America, Peterson, R.T. Fourth Edition 1980.

19. Are any threatened and/or endangered species (plant or animal) known to inhabit the area of the site?

Drummond's Rock Cress, Arabis drummondi. Listed as "Endangered" by the State of New York; Rated by NY Natural Heritage Program as "S1 and S2"—very few occurrences; very to especially vulnerable in New York State. Rated globally by NY Natural Heritage program as "G5=Demonstrably secure globally". Presence of this species on the NFSS site has not been documented.

20. Weather conditions at the time this checklist was prepared.

DATE: **August 21-25, 2001** _____

55-85 F Temperature (°C/°F) **85 F** - Normal daily high temperature

Light, variable - Wind (Direction/Speed) **None** - Precipitation (rain, snow)

Clear to partly cloudy - Cloud cover

IA. SUMMARY OF OBSERVATIONS AND SITE SETTING

Refer to attached Technical Memorandum #1—Ecological Reconnaissance of the Niagara Falls Storage Site.

This AOI is almost entirely vegetated by grass which is frequently mowed.

Completed by Max Gricevich, Maxim Technologies _____

Additional Preparers Greg Dawdy, Brian Mulhearn, Maxim Technologies.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

DATE: 10-01-01

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

II. TERRESTRIAL HABITAT CHECKLIST

IIA. WOODED

1. Are there any wooded areas at the site? **Yes.**

2. What percentage or area of the site is wooded? **45%** Indicate the wooded area on the site map attached to a copy of this checklist. Please identify what information was used to determine the wooded area of the site.

On-site observation during reconnaissance.

3. What is the dominant type of vegetation in the wooded area? (Circle one: Evergreen **Deciduous** Mixed) Provide a photograph, if available. **See attached.**

Dominant plant, if known: **Green Ash, maple, American elm and associated understory.**

14. What is the predominant size of the trees at the site? Use diameter at breast height.

Varies with recency of clearing. See attached memorandum. Ranges form approximately 4" dbh to over 20" dbh.

15. Specify type of understory present, if known. Provide a photograph, if available.

Small dogwoods, poison ivy, sumacs, common reed. See attached memorandum.

IIB. SHRUB/SCRUB

5. Is shrub/scrub vegetation present at the site?

No true scrub/shrub. Young elm-ash-maple forests and "old field" vegetation in recently cleared areas. See attached memorandum.

IIC. OPEN FIELD

1. Are there open (bare, barren) field areas present at the site? **Yes. Old field and mowed grass.**

2. What percentage of the site is open field? 35 %

6. What is/are the dominant plant(s)?

See attached memorandum. Dominants are goldenrods, Queen Annes's lace, Virginia creeper, poison ivy, and Japanese honeysuckle, fescue, bluegrass

4. What is the approximate average height of the dominant plant? Goldenrod 36 – 48inches.

5. Describe the vegetation cover: **Completely vegetated except for roads and parking areas.**

IID. MISCELLANEOUS

1. Are other types of terrestrial habitats present at the site other than woods, scrub/shrub, and open field? **No.**

2. Describe the terrestrial miscellaneous habitat(s) and identify these area(s) on the site map. **See attached memorandum.**

3. What observations, if any, were made at the site regarding the presence and/or absence of insects, fish, birds, mammals, etc.?

   See attached observed species table.

4. Review the questions in Section I to determine if any additional habitat checklists should be completed for this site.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

III. No non-flowing water systems on site.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

IV. AQUATIC HABITAT CHECKLIST - FLOWING SYSTEMS

Note: Aquatic systems are often associated with wetland habitats. Please refer to Section V, Wetland Habitat Checklist.

1. What type(s) of flowing water system(s) is (are) present at the site? **Ditches.**

2, 3 do not apply.

4. What is the general composition of the substrate? Check all that apply.

Silt, clay, debris, detritus all apply in ditches at various points on site. _____

16. What is the condition of the bank (e.g., height, slope, extent of vegetative cover)?

Several shallow swales and smaller ditches running east-west. Shallow swales, small ditches dominated by common reed and cattails. Banks of these smaller ditches indistinguishable from surrounding land. Main ditches entrenched. The easternmost and smallest main ditch with shallow banks, a swale in aspect with phragmites dominating. See attached memorandum.

17. Is the system influenced by tides?**No.**
18. Is the flow intermittent? **Yes. Observed for many seasons by Maxim field personnel.**

9. Is there a discharge from the site to the waterbody? **Yes. Site ditches discharge to "Four-Mile Creek and thence to Lake Ontario. See attached memorandum.**

10. Is there a discharge from the waterbody? **Yes** No If yes, and the information is available, please identify what the waterbody discharges to and whether the discharge is on site or off site. **YES. Offsite to Four-Mile Creek – Four Mile Creek to Lake Ontario.**

11. Identify any field measurements and observations of water quality that were made. For those parameters for which data were collected provide the measurement and the units of measure in the appropriate space below: **See attached table of water quality data collected during past site activities.**

_____ Width (ft.)
_____ Depth (ft.)
_____ Velocity (specify units: _____)
_____ Temperature (depth of the water at which the reading was taken _____)
_____ pH
_____ Dissolved oxygen
_____ Salinity
_____ Turbidity (clear, slightly turbid, turbid, opaque) (Secchi disk depth _____)
_____ Other (specify)

12. Describe observed color and area of coloration.

Variable depending upon location. Following rain events water tends to be turbid, light brown to brown.

13. Is any aquatic vegetation present? **Yes. Common reed, cattails, green bulrush, fox sedge. Emergent.**

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

14. Mark the flowing water system on the attached site map. **See attached.**

15. What observations were made at the waterbody regarding the presence and/or absence of benthic macroinvertebrates, fish, birds, mammals, etc.?

Several species of frogs, toads, Great blue heron and green herons have been observed. Also numerous species of damselflies, midges, dragonflies. Mosquitoes are extremely prevalent during wet springs and summers.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

V. WETLAND HABITAT CHECKLIST

1. Based on observations and/or available information, are designated or known wetlands definitely present at the site? **A review of the NWI for the did not indicate the presence of mapped wetlands on-site. Areas of the site do meet the definition of wetlands based on soil, hydrology and vegetation.**

   Please note the sources of observations and information used (e.g., USGS Topographic Maps, National Wetland Inventory, federal or state agency, etc.), to make this determination.

   USACE Buffalo District has indicated that no Federally jurisdictional wetlands are present at the NFSS.

2. Based on the location of the site (e.g., along a waterbody, in a floodplain, etc.) and site conditions (e.g., standing water; dark, wet soils; mud cracks; debris line; water marks), are wetland habitats suspected? **Yes.** If yes, proceed with the remainder of the wetland habitat identification checklist.

3. What type(s) of vegetation are present in the wetland?

   Emergent. Dominants are common reed and cattails. Other species with high frequency are green bulrush, fox sedge, several other Carex species.

4. Provide a general description of the vegetation present in and around the wetland (height, color, etc.). Provide a photograph of the known or suspected wetlands, if available.

   Emergent wetland vegetation is present dominated by cattails and common reed.

5. Is standing water present? **Interior ponding exists on site seasonally. Interior drainage is poor. The site is drained by a series of ditches. No permanent standing water is present on site.**

6. Is there evidence of flooding at the site? **Yes.** What observations were noted? **Mudlines on trees, debris piles in drainages, encrusted detritus, buttressing on trees.**

7. If known, what is the source of the water in the wetland? **Groundwater—high water table. Precipitation**

8. . Is there a discharge from the site to a known or suspected wetland? **Yes** No If yes, please describe. **Site ditches discharge to off-site creek.**

9. Is there a discharge from the wetland? **On-site ditches discharge to off-site creek.**

10. If a soil sample was collected, describe the appearance of the soil in the wetland area. Circle or write in the best response. **Not collected.**

11. Mark the observed wetland area(s) on the attached site map.
    See Attached Map.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

EXPLANATION OF TERMS USED IN THIS CHECKLIST

Arroyo	Dry gulch, brook, or creek. A deep gully cut by an intermittent brook or stream.
Benthic	Pertaining to the bottom of a waterbody.
Detritus	Loose fragments or particles formed by the disintegration of rocks.
Marl	A mixture of clays, carbonates of calcium and magnesium and remnants of shells.
Riparian	Of, or on the bank of a natural course of water.
Secchi (disk)	Basic measure of turbidity, visibility or transparency of water.
Submergent Vegetation	Hidden, obscure vegetation which is inundated with water.
Swales	Low traces of land which are often moist or marshy.

Area of Interest 3

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

I. SITE DESCRIPTION Date: September, 2001

1. Site Name: Niagara Falls Storage Site - Area of Investigation (AOI) 3

   Location: Lewiston, NY

   County: Niagara City: Lewiston State: New York

2. What is the approximate area of the site? **Total site size is 191 acres.**

3. Is this the first site visit? Yes No If no, attach trip report of previous site visit(s) if available.

   Part of a remedial investigation.

   Date(s) of previous site visit(s): **Periodic visits since spring of 1999. This is first visit specifically for ecological reconnaissance.**

4. Please attach USGS topographic map(s) of the site, if available.

5. Are aerial or other site photographs available? Yes No If yes, please attach any available photo(s) to the site map at the conclusion of this section.

   YES. PHOTOS ATTACHED.

7. The land use on the site is: **AOI 3 is part of a military reservation. The buildings in this portion of the site from the operational period of the LOOW have been demolished and removed. Only building pads remain.**

   The area surrounding the site is rural residential.--- a sanitary landfill abuts site on the east and a hazardous waste landfill abuts the northeastern portion of the site. The northwestern portion of the site is bounded by a former TNT production facility (Lake Ontario Ordnance Works known as the LOOW). The LOOW is currently under investigation by the USACE- Buffalo District: (3 mile radius).

   0 % Urban

   100 % Rural

   0 % Residential

   0 % Industrial ---Building

   0 % Agricultural

   0 % Recreational
   (Describe; note if it is a park, etc.)

   0 % Undisturbed

7. Has any movement of soil taken place at the site? **YES** If yes, please identify the most likely cause of this disturbance:

_____ Agricultural Use

x___ Heavy Equipment _____ Mining

_____ Natural Events ____ Erosion _____ Other

Please describe: **Construction of Lake Ontario Ordnance Works in the 1940s. Site grading and construction of buildings and process structures. Ditching for site drainage. Manhattan Project wastes were stored at the facility following World War II. From 1979—1991, portion of the site were remediated as part of an effort by the USDOE.** _____

8. Do any potentially sensitive environmental areas exist adjacent to or in proximity to the site, e.g., federal and state parks, national and state monuments, wetlands, prairie potholes, etc.? Describe. *Remember, flood plains and wetlands are not always obvious; do not answer "no" without confirming information.*

Areas which meet the definition of wetlands are present in this AOI.

8a. Please provide the source(s) of information used to identify these sensitive areas, and indicate their general location on the site map.

Reconnaissance by Maxim biologists; NRCS county soils maps; National Wetlands Inventory maps.

9. What type of facility is located at the site?

Federal government controlled-access radioactive waste storage facility operated by the US Army Corps of Engineers, Buffalo District under the Formerly Used Site Remedial Action Program (FUSRAP).

21. What are the suspected contaminants of concern at the site? If known, what are the maximum concentration levels?

Heavy metals, Uranium and Thorium-series radionuclides.

22. Check any potential routes of off-site migration of contaminants observed at the site:

Being investigated as part of Remedial Investigation. Potential routes include surface and groundwater, windblown particulates, movement via biota.

23. If known, what is the approximate depth to the water table?

Highly seasonally variable. Saturated to surface at many areas of site. Highly affected by drainage ditches. _____

14. Is the direction of surface runoff apparent from site observation? **Yes.** If yes, to which of the following does the surface runoff discharge? Indicate all that apply.

Surface water, limited surface ponding and infiltration.

24. Is there a navigable waterbody or tributary to a navigable waterbody?

No navigable waterway. Ditches present on this AOI discharge to the Central Drainage Ditch which discharges is to a small creek which is tributary to Lake Ontario.

25. Is there a waterbody anywhere on or in the vicinity of the site? If yes, also complete Section III: Aquatic Habitat Checklist - Non-Flowing Systems and/or Section IV: Aquatic Habitat Checklist - Flowing Systems.

No permanent water bodies on or proximate to site. Intermittent drainage ditches throughout site. Some wetlands areas.

26. Is there evidence of flooding? Complete Section V: Wetland Habitat Checklist.

Site is subject to interior ponding – wetland areas are present.

18. If a field guide was used to aid any of the identifications, please provide a reference. Also, estimate the time spent identifying fauna. [Use the back of this page if additional space for text is needed.]

Field Guide to the Birds; A Completely New Guide to All the Birds of Eastern and Central North America, Peterson, R.T. Fourth Edition 1980.

19. Are any threatened and/or endangered species (plant or animal) known to inhabit the area of the site?

Drummond's Rock Cress, Arabis drummondi. Listed as "Endangered" by the State of New York; Rated by NY Natural Heritage Program as "S1 and S2"—very few occurrences; very to especially vulnerable in New York State. Rated globally by NY Natural Heritage program as "G5=Demonstrably secure globally". Presence of this species on the NFSS site has not been documented.

20. Weather conditions at the time this checklist was prepared.

DATE: **August 21-25, 2001** _____

55-85 F Temperature (°C/°F) — **85 F** - Normal daily high temperature

Light, variable - Wind (Direction/Speed) — **None** - Precipitation (rain, snow)

Clear to partly cloudy - Cloud cover

IA. SUMMARY OF OBSERVATIONS AND SITE SETTING

Refer to attached Technical Memorandum #1—Ecological Reconnaissance of the Niagara Falls Storage Site.

This AOI is almost entirely vegetated by grass which is frequently mowed.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

Completed by Max Gricevich, Maxim Technologies _____

Additional Preparers __Greg Dawdy, Brian Mulhearn, Maxim Technologies.__

DATE: 10-01-01

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

II. TERRESTRIAL HABITAT CHECKLIST

IIA. WOODED

1. Are there any wooded areas at the site? **Yes.**

2. What percentage or area of the site is wooded? **45%** Indicate the wooded area on the site map attached to a copy of this checklist. Please identify what information was used to determine the wooded area of the site.

   On-site observation during reconnaissance.

3. What is the dominant type of vegetation in the wooded area? (Circle one: Evergreen **Deciduous** Mixed) Provide a photograph, if available. **See attached.**

   Dominant plant, if known: **Green Ash, maple, American elm and associated understory.**

19. What is the predominant size of the trees at the site? Use diameter at breast height.

    Varies with recency of clearing. See attached memorandum. Ranges form approximately 4" dbh to over 20" dbh.

20. Specify type of understory present, if known. Provide a photograph, if available.

    Small dogwoods, poison ivy, sumacs, common reed. See attached memorandum.

IIB. SHRUB/SCRUB

7. Is shrub/scrub vegetation present at the site?

   No true scrub/shrub. Young elm-ash-maple forests and "old field" vegetation in recently cleared areas. See attached memorandum.

IIC. OPEN FIELD

1. Are there open (bare, barren) field areas present at the site? **Yes. Old field and mowed grass.**

   2. What percentage of the site is open field? 35 %

8. What is/are the dominant plant(s)?

   See attached memorandum. Dominants are goldenrods, Queen Annes's lace, Virginia creeper, poison ivy, and Japanese honeysuckle, fescue, bluegrass

   4. What is the approximate average height of the dominant plant? **Goldenrod 36 – 48inches.**

5. Describe the vegetation cover: **Completely vegetated except for roads and parking areas.**

IID. MISCELLANEOUS

1. Are other types of terrestrial habitats present at the site other than woods, scrub/shrub, and open field? **No.**

2. Describe the terrestrial miscellaneous habitat(s) and identify these area(s) on the site map. **See attached memorandum.**

3. What observations, if any, were made at the site regarding the presence and/or absence of insects, fish, birds, mammals, etc.?

   See attached observed species table.

4. Review the questions in Section I to determine if any additional habitat checklists should be completed for this site.

III. **No non-flowing water systems on site.**

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

IV. AQUATIC HABITAT CHECKLIST - FLOWING SYSTEMS

Note: Aquatic systems are often associated with wetland habitats. Please refer to Section V, Wetland Habitat Checklist.

1. What type(s) of flowing water system(s) is (are) present at the site? **Ditches.**

2, 3 do not apply.

4. What is the general composition of the substrate? Check all that apply.

Silt, clay, debris, detritus all apply in ditches at various points on site. _____

21. What is the condition of the bank (e.g., height, slope, extent of vegetative cover)?

Several shallow swales and smaller ditches running east-west. Shallow swales, small ditches dominated by common reed and cattails. Banks of these smaller ditches indistinguishable from surrounding land. Main ditches entrenched. The easternmost and smallest main ditch with shallow banks, a swale in aspect with phragmites dominating. See attached memorandum.

22. Is the system influenced by tides?**No.**
23. Is the flow intermittent? **Yes. Observed for many seasons by Maxim field personnel.**

9. Is there a discharge from the site to the waterbody? **Yes. Site ditches discharge to "Four-Mile Creek and thence to Lake Ontario. See attached memorandum.**

10. Is there a discharge from the waterbody? **Yes** No If yes, and the information is available, please identify what the waterbody discharges to and whether the discharge is on site or off site. **YES. Offsite to Four-Mile Creek – Four Mile Creek to Lake Ontario.**

11. Identify any field measurements and observations of water quality that were made. For those parameters for which data were collected provide the measurement and the units of measure in the appropriate space below: **See attached table of water quality data collected during past site activities.**

_____ Width (ft.)
_____ Depth (ft.)
_____ Velocity (specify units: _____)
_____ Temperature (depth of the water at which the reading was taken _____)
_____ pH
_____ Dissolved oxygen
_____ Salinity
_____ Turbidity (clear, slightly turbid, turbid, opaque) (Secchi disk depth _____)
_____ Other (specify)

12. Describe observed color and area of coloration.

Variable depending upon location. Following rain events water tends to be turbid, light brown to brown.

13. Is any aquatic vegetation present? **Yes. Common reed, cattails, green bulrush, fox sedge. Emergent.**

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

14. Mark the flowing water system on the attached site map. **See attached.**

15. What observations were made at the waterbody regarding the presence and/or absence of benthic macroinvertebrates, fish, birds, mammals, etc.?

Several species of frogs, toads, Great blue heron and green herons have been observed. Also numerous species of damselflies, midges, dragonflies. Mosquitoes are extremely prevalent during wet springs and summers.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

V. WETLAND HABITAT CHECKLIST

1. Based on observations and/or available information, are designated or known wetlands definitely present at the site? **A review of the NWI for the did not indicate the presence of mapped wetlands on-site. Areas of the site do meet the definition of wetlands based on soil, hydrology and vegetation.**

   Please note the sources of observations and information used (e.g., USGS Topographic Maps, National Wetland Inventory, federal or state agency, etc.), to make this determination.

   USACE Buffalo District has indicated that no Federally jurisdictional wetlands are present at the NFSS.

2. Based on the location of the site (e.g., along a waterbody, in a floodplain, etc.) and site conditions (e.g., standing water; dark, wet soils; mud cracks; debris line; water marks), are wetland habitats suspected? **Yes.** If yes, proceed with the remainder of the wetland habitat identification checklist.

3. What type(s) of vegetation are present in the wetland?

   Emergent. Dominants are common reed and cattails. Other species with high frequency are green bulrush, fox sedge, several other Carex species.

4. Provide a general description of the vegetation present in and around the wetland (height, color, etc.). Provide a photograph of the known or suspected wetlands, if available.

   Emergent wetland vegetation is present dominated by cattails and common reed.

5. Is standing water present? **Interior ponding exists on site seasonally. Interior drainage is poor. The site is drained by a series of ditches. No permanent standing water is present on site.**

6. Is there evidence of flooding at the site? **Yes.** What observations were noted? **Mudlines on trees, debris piles in drainages, encrusted detritus, buttressing on trees.**

7. If known, what is the source of the water in the wetland? **Groundwater—high water table. Precipitation**

8. . Is there a discharge from the site to a known or suspected wetland? **Yes** No If yes, please describe. **Site ditches discharge to off-site creek.**

9. Is there a discharge from the wetland? **On-site ditches discharge to off-site creek.**

10. If a soil sample was collected, describe the appearance of the soil in the wetland area. Circle or write in the best response. **Not collected.**

11. Mark the observed wetland area(s) on the attached site map.
    See Attached Map.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

EXPLANATION OF TERMS USED IN THIS CHECKLIST

Arroyo	Dry gulch, brook, or creek. A deep gully cut by an intermittent brook or stream.
Benthic	Pertaining to the bottom of a waterbody.
Detritus	Loose fragments or particles formed by the disintegration of rocks.
Marl	A mixture of clays, carbonates of calcium and magnesium and remnants of shells.
Riparian	Of, or on the bank of a natural course of water.
Secchi (disk)	Basic measure of turbidity, visibility or transparency of water.
Submergent Vegetation	Hidden, obscure vegetation which is inundated with water.
Swales	Low traces of land which are often moist or marshy.

Area of Interest 4

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

I. SITE DESCRIPTION Date: September, 2001

1. Site Name: **Niagara Falls Storage Site - Area of Investigation (AOI) 4-1, 4-2**

   Location: Lewiston, NY

   County: **Niagara** City: **Lewiston** State: **New York**

2. What is the approximate area of the site? **Total site size is 191 acres.**

3. Is this the first site visit? Yes **No** If no, attach trip report of previous site visit(s) if available.

   Part of a remedial investigation.

   Date(s) of previous site visit(s): **Periodic visits since spring of 1999. This is first visit specifically for ecological reconnaissance.**

4. Please attach USGS topographic map(s) of the site, if available.

5. Are aerial or other site photographs available? **Yes** No If yes, please attach any available photo(s) to the site map at the conclusion of this section.

   YES. PHOTOS ATTACHED.

8. The land use on the site is: **AOI 4 is part of a military reservation. The buildings in this portion of the site from the operational period of the LOOW have been demolished and removed. Only building pads remain, underground piping, tank cradles and roads remain.**

   The area surrounding the site is rural residential.--- a sanitary landfill abuts site on the east and a hazardous waste landfill abuts the northeastern portion of the site. The northwestern portion of the site is bounded by a former TNT production facility (Lake Ontario Ordnance Works known as the LOOW). The LOOW is currently under investigation by the USACE- Buffalo District: (3 mile radius).

   0 % Urban

   100 % Rural

   0 % Residential

   0 % Industrial ---Building

   0 % Agricultural

   0 % Recreational
   (Describe; note if it is a park, etc.)

   0 % Undisturbed

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

7. Has any movement of soil taken place at the site? **YES** If yes, please identify the most likely cause of this disturbance:

_____ Agricultural Use

x___ Heavy Equipment _____ Mining

_____ Natural Events ____ Erosion _____ Other

Please describe: **Construction of Lake Ontario Ordnance Works in the 1940s. Site grading and construction of buildings and process structures. Ditching for site drainage. Manhattan Project wastes were stored at the facility following World War II. From 1979—1991, portion of the site were remediated as part of an effort by the USDOE.** _____

8. Do any potentially sensitive environmental areas exist adjacent to or in proximity to the site, e.g., federal and state parks, national and state monuments, wetlands, prairie potholes, etc.? Describe. *Remember, flood plains and wetlands are not always obvious; do not answer "no" without confirming information.*

Areas which meet the definition of wetlands are present in this AOI.

8a. Please provide the source(s) of information used to identify these sensitive areas, and indicate their general location on the site map.

Reconnaissance by Maxim biologists; NRCS county soils maps; National Wetlands Inventory maps.

9. What type of facility is located at the site?

Federal government controlled-access radioactive waste storage facility operated by the US Army Corps of Engineers, Buffalo District under the Formerly Used Site Remedial Action Program (FUSRAP).

24. What are the suspected contaminants of concern at the site? If known, what are the maximum concentration levels?

Volatile compounds, PAHs, Heavy metals, Uranium and Thorium-series radionuclides.

25. Check any potential routes of off-site migration of contaminants observed at the site:

Being investigated as part of Remedial Investigation. Potential routes include surface and groundwater, windblown particulates, movement via biota.

26. If known, what is the approximate depth to the water table?

Highly seasonally variable. Saturated to surface at many areas of site. Highly affected by drainage ditches. _____

14. Is the direction of surface runoff apparent from site observation? **Yes.** If yes, to which of the following does the surface runoff discharge? Indicate all that apply.

Surface water, Some surface ponding and infiltration.

27. Is there a navigable waterbody or tributary to a navigable waterbody?

No navigable waterway. Ditches present are roadside drainage ditches which discharge to the Central Drainage Ditch which discharges is to a small creek which is tributary to Lake Ontario.

28. Is there a waterbody anywhere on or in the vicinity of the site? If yes, also complete Section III: Aquatic Habitat Checklist - Non-Flowing Systems and/or Section IV: Aquatic Habitat Checklist - Flowing Systems.

No permanent water bodies on or proximate to site. Intermittent drainage ditches throughout site. Some wetlands areas.

29. Is there evidence of flooding? Complete Section V: Wetland Habitat Checklist.

Site is subject to interior ponding - wetland areas are present.

18. If a field guide was used to aid any of the identifications, please provide a reference. Also, estimate the time spent identifying fauna. [Use the back of this page if additional space for text is needed.]

Field Guide to the Birds; A Completely New Guide to All the Birds of Eastern and Central North America, Peterson, R.T. Fourth Edition 1980.

19. Are any threatened and/or endangered species (plant or animal) known to inhabit the area of the site?

Drummond's Rock Cress, Arabis drummondi. Listed as "Endangered" by the State of New York; Rated by NY Natural Heritage Program as "S1 and S2"—very few occurrences; very to especially vulnerable in New York State. Rated globally by NY Natural Heritage program as "G5=Demonstrably secure globally". Presence of this species on the NFSS site has not been documented.

20. Weather conditions at the time this checklist was prepared.

DATE: **August 21-25, 2001** _____

55-85 F Temperature (°C/°F) — **85 F** - Normal daily high temperature

Light, variable - Wind (Direction/Speed) — **None** - Precipitation (rain, snow)

Clear to partly cloudy - Cloud cover

IA. SUMMARY OF OBSERVATIONS AND SITE SETTING

Refer to attached Technical Memorandum #1—Ecological Reconnaissance of the Niagara Falls Storage Site.

This AOI is almost entirely vegetated by grass which is frequently mowed.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

Completed by Max Gricevich, Maxim Technologies _____

Additional Preparers __Greg Dawdy, Brian Mulhearn, Maxim Technologies.__

DATE: 10-01-01

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

II. TERRESTRIAL HABITAT CHECKLIST

IIA. WOODED

1. Are there any wooded areas at the site? **Yes.**

2. What percentage or area of the site is wooded? **50%** Indicate the wooded area on the site map attached to a copy of this checklist. Please identify what information was used to determine the wooded area of the site.

On-site observation during reconnaissance.

3. What is the dominant type of vegetation in the wooded area? (Circle one: Evergreen **Deciduous** Mixed) Provide a photograph, if available. **See attached.**

Dominant plant, if known: **Green Ash, maple, American elm and associated understory.**

24. What is the predominant size of the trees at the site? Use diameter at breast height.

Varies with recency of clearing. See attached memorandum. Ranges form approximately 4" dbh to over 20" dbh.

25. Specify type of understory present, if known. Provide a photograph, if available.

Small dogwoods, poison ivy, sumacs, common reed. See attached memorandum.

IIB. SHRUB/SCRUB

9. Is shrub/scrub vegetation present at the site?

No true scrub/shrub. Young elm-ash-maple forests and "old field" vegetation in recently cleared areas. See attached memorandum.

IIC. OPEN FIELD

1. Are there open (bare, barren) field areas present at the site? **Yes. Old field and mowed grass.**

2. What percentage of the site is open field? 35 %

10. What is/are the dominant plant(s)?

See attached memorandum. Dominants are goldenrods, Queen Annes's lace, Virginia creeper, poison ivy, and Japanese honeysuckle, fescue, bluegrass

4. What is the approximate average height of the dominant plant? Goldenrod 36 – 48inches.

5. Describe the vegetation cover: **Completely vegetated except for roads and building pad areas.**

IID. MISCELLANEOUS

1. Are other types of terrestrial habitats present at the site other than woods, scrub/shrub, and open field? **No.**

2. Describe the terrestrial miscellaneous habitat(s) and identify these area(s) on the site map. **See attached memorandum.**

3. What observations, if any, were made at the site regarding the presence and/or absence of insects, fish, birds, mammals, etc.?

   See attached observed species table.

4. Review the questions in Section I to determine if any additional habitat checklists should be completed for this site.

III. No non-flowing water systems on site.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

IV. AQUATIC HABITAT CHECKLIST - FLOWING SYSTEMS

Note: Aquatic systems are often associated with wetland habitats. Please refer to Section V, Wetland Habitat Checklist.

1. What type(s) of flowing water system(s) is (are) present at the site? **Ditches.**

2, 3 do not apply.

4. What is the general composition of the substrate? Check all that apply.

Silt, clay, debris, detritus all apply in ditches at various points on site. _____

26. What is the condition of the bank (e.g., height, slope, extent of vegetative cover)?

Several shallow swales and smaller ditches running east-west. In area 4-1 there are two large areas approximately 20-30 feet wide and several hundred feet in length which exhibit wetland characteristic. These and other wetland areas are often completely dry in summer. Shallow swales, small ditches dominated by common reed and cattails. Banks of these smaller ditches indistinguishable from surrounding land. See attached memorandum.

27. Is the system influenced by tides?**No.**

28. Is the flow intermittent? **Yes. Observed for many seasons by Maxim field personnel.**

9. Is there a discharge from the site to the waterbody? **Yes. Site ditches discharge to "Four-Mile Creek and thence to Lake Ontario. See attached memorandum.**

10. Is there a discharge from the waterbody? **Yes** No If yes, and the information is available, please identify what the waterbody discharges to and whether the discharge is on site or off site. **YES. Offsite to Four-Mile Creek – Four Mile Creek to Lake Ontario.**

11. Identify any field measurements and observations of water quality that were made. For those parameters for which data were collected provide the measurement and the units of measure in the appropriate space below: **See attached table of water quality data collected during past site activities.**

_____ Width (ft.)
_____ Depth (ft.)
_____ Velocity (specify units: _____)
_____ Temperature (depth of the water at which the reading was taken _____)
_____ pH
_____ Dissolved oxygen
_____ Salinity
_____ Turbidity (clear, slightly turbid, turbid, opaque) (Secchi disk depth _____)
_____ Other (specify)

12. Describe observed color and area of coloration.

Variable depending upon location. Following rain events water tends to be turbid, light brown to brown.

13. Is any aquatic vegetation present? **Yes. Common reed, cattails, green bulrush, fox sedge. Emergent.**

14. Mark the flowing water system on the attached site map. **See attached.**

15. What observations were made at the waterbody regarding the presence and/or absence of benthic macroinvertebrates, fish, birds, mammals, etc.?

Several species of frogs, toads, Great blue heron and green herons have been observed. Also numerous species of damselflies, midges, dragonflies. Mosquitoes are extremely prevalent during wet springs and summers.

V. WETLAND HABITAT CHECKLIST

1. Based on observations and/or available information, are designated or known wetlands definitely present at the site? **A review of the NWI for the did not indicate the presence of mapped wetlands on-site. Areas of the site do meet the definition of wetlands based on soil, hydrology and vegetation.**

Please note the sources of observations and information used (e.g., USGS Topographic Maps, National Wetland Inventory, federal or state agency, etc.), to make this determination.

USACE Buffalo District has indicated that no Federally jurisdictional wetlands are present at the NFSS.

2. Based on the location of the site (e.g., along a waterbody, in a floodplain, etc.) and site conditions (e.g., standing water; dark, wet soils; mud cracks; debris line; water marks), are wetland habitats suspected? **Yes.** If yes, proceed with the remainder of the wetland habitat identification checklist.

3. What type(s) of vegetation are present in the wetland?

Emergent. Dominants are common reed and cattails. Other species with high frequency are green bulrush, fox sedge, several other *Carex* species.

Forested - Several areas of "wet woods" dominated by green ash, elm and dogwoods are present within AOI 4-1 and 4-2.

4. Provide a general description of the vegetation present in and around the wetland (height, color, etc.). Provide a photograph of the known or suspected wetlands, if available.

Emergent wetland vegetation is present dominated by cattails and common reed and some sedges (*Carex, Cyperus*).

5. Is standing water present? **Interior ponding exists on site seasonally. Interior drainage is poor. The site is drained by a series of ditches. No permanent standing water is present on site.**

6. Is there evidence of flooding at the site? **Yes.** What observations were noted? **Mudlines on trees, debris piles in drainages, encrusted detritus, buttressing on trees.**

7. If known, what is the source of the water in the wetland? **Groundwater—high water table. Precipitation.**

8. . Is there a discharge from the site to a known or suspected wetland? **Yes** No If yes, please describe. **Site ditches discharge to off-site creek.**

9. Is there a discharge from the wetland? **On-site ditches discharge to off-site creek.**

10. If a soil sample was collected, describe the appearance of the soil in the wetland area. Circle or write in the best response. **Not collected.**

11. Mark the observed wetland area(s) on the attached site map.
See Attached Map.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

EXPLANATION OF TERMS USED IN THIS CHECKLIST

Arroyo	Dry gulch, brook, or creek. A deep gully cut by an intermittent brook or stream.
Benthic	Pertaining to the bottom of a waterbody.
Detritus	Loose fragments or particles formed by the disintegration of rocks.
Marl	A mixture of clays, carbonates of calcium and magnesium and remnants of shells.
Riparian	Of, or on the bank of a natural course of water.
Secchi (disk)	Basic measure of turbidity, visibility or transparency of water.
Submergent Vegetation	Hidden, obscure vegetation which is inundated with water.
Swales	Low traces of land which are often moist or marshy.

Area of Interest 5

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

I. SITE DESCRIPTION Date: September, 2001

1. Site Name: **Niagara Falls Storage Site - Area of Investigation (AOI) 5**

   Location: Lewiston, NY

   County: **Niagara** City: **Lewiston** State: **New York**

2. What is the approximate area of the site? **Total site size is 191 acres.**

3. Is this the first site visit? Yes **No** If no, attach trip report of previous site visit(s) if available.

   Part of a remedial investigation.

   Date(s) of previous site visit(s): **Periodic visits since spring of 1999. This is first visit specifically for ecological reconnaissance.**

4. Please attach USGS topographic map(s) of the site, if available.

5. Are aerial or other site photographs available? **Yes** No If yes, please attach any available photo(s) to the site map at the conclusion of this section.

   YES. PHOTOS ATTACHED.

9. The land use on the site is: **AOI 5 is part of a military reservation. Known as the Baker-Smith Area. The buildings in this portion of the site from the operational period of the LOOW have been demolished and removed. Only building pads remain, underground piping and roads remain.**

   The area surrounding the site is rural residential.--- a sanitary landfill abuts site on the east and a hazardous waste landfill abuts the northeastern portion of the site. The northwestern portion of the site is bounded by a former TNT production facility (Lake Ontario Ordnance Works known as the LOOW). The LOOW is currently under investigation by the USACE- Buffalo District: (3 mile radius).

   0 % Urban

   100 % Rural

   0 % Residential

   0 % Industrial ---Building

   0 % Agricultural

   0 % Recreational
   (Describe; note if it is a park, etc.)

   0 % Undisturbed

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

7. Has any movement of soil taken place at the site? **YES** If yes, please identify the most likely cause of this disturbance:

_____ Agricultural Use

x___ Heavy Equipment _____ Mining

_____ Natural Events ____ Erosion _____ Other

Please describe: **Construction of Lake Ontario Ordnance Works in the 1940s. Site grading and construction of buildings and process structures. Ditching for site drainage. Manhattan Project wastes were stored at the facility following World War II. From 1979—1991, portion of the site were remediated as part of an effort by the USDOE.** _____

8. Do any potentially sensitive environmental areas exist adjacent to or in proximity to the site, e.g., federal and state parks, national and state monuments, wetlands, prairie potholes, etc.? Describe. *Remember, flood plains and wetlands are not always obvious; do not answer "no" without confirming information.*

Areas which meet the definition of wetlands are present in this AOI.

8a. Please provide the source(s) of information used to identify these sensitive areas, and indicate their general location on the site map.

Reconnaissance by Maxim biologists; NRCS county soils maps; National Wetlands Inventory maps.

9. What type of facility is located at the site?

Federal government controlled-access radioactive waste storage facility operated by the US Army Corps of Engineers, Buffalo District under the Formerly Used Site Remedial Action Program (FUSRAP).

27. What are the suspected contaminants of concern at the site? If known, what are the maximum concentration levels?

PAHs, Heavy metals, Uranium and Thorium-series radionuclides.

28. Check any potential routes of off-site migration of contaminants observed at the site:

Being investigated as part of Remedial Investigation. Potential routes include surface and groundwater, windblown particulates, movement via biota.

29. If known, what is the approximate depth to the water table?

Highly seasonally variable. Saturated to surface at many areas of site. Highly affected by drainage ditches. _____

14. Is the direction of surface runoff apparent from site observation? **Yes.** If yes, to which of the following does the surface runoff discharge? Indicate all that apply.

Surface water, Some surface ponding and infiltration.

30. Is there a navigable waterbody or tributary to a navigable waterbody?

No navigable waterway. Ditches present are roadside drainage ditches which discharge to the Central Drainage Ditch which discharges is to a small creek which is tributary to Lake Ontario.

31. Is there a waterbody anywhere on or in the vicinity of the site? If yes, also complete Section III: Aquatic Habitat Checklist - Non-Flowing Systems and/or Section IV: Aquatic Habitat Checklist - Flowing Systems.

No permanent water bodies on or proximate to site. Intermittent drainage ditches throughout site. Some wetlands areas.

32. Is there evidence of flooding? Complete Section V: Wetland Habitat Checklist.

Site is subject to interior ponding – wetland areas are present.

18. If a field guide was used to aid any of the identifications, please provide a reference. Also, estimate the time spent identifying fauna. [Use the back of this page if additional space for text is needed.]

Field Guide to the Birds; A Completely New Guide to All the Birds of Eastern and Central North America, Peterson, R.T. Fourth Edition 1980.

19. Are any threatened and/or endangered species (plant or animal) known to inhabit the area of the site?

Drummond's Rock Cress, Arabis drummondi. Listed as "Endangered" by the State of New York; Rated by NY Natural Heritage Program as "S1 and S2"—very few occurrences; very to especially vulnerable in New York State. Rated globally by NY Natural Heritage program as "G5=Demonstrably secure globally". Presence of this species on the NFSS site has not been documented.

20. Weather conditions at the time this checklist was prepared.

DATE: **August 21-25, 2001** _____

55-85 F Temperature (°C/°F) — **85 F** - Normal daily high temperature

Light, variable - Wind (Direction/Speed) — **None** - Precipitation (rain, snow)

Clear to partly cloudy - Cloud cover

IA. SUMMARY OF OBSERVATIONS AND SITE SETTING

Refer to attached Technical Memorandum #1—Ecological Reconnaissance of the Niagara Falls Storage Site.

This AOI is almost entirely vegetated by grass which is frequently mowed.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

Completed by Max Gricevich, Maxim Technologies _____

Additional Preparers __Greg Dawdy, Brian Mulhearn, Maxim Technologies.__

DATE: 10-01-01

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

II. TERRESTRIAL HABITAT CHECKLIST

IIA. WOODED

1. Are there any wooded areas at the site? **Yes.**

2. What percentage or area of the site is wooded? **50%** Indicate the wooded area on the site map attached to a copy of this checklist. Please identify what information was used to determine the wooded area of the site.

On-site observation during reconnaissance.

3. What is the dominant type of vegetation in the wooded area? (Circle one: Evergreen **Deciduous** Mixed) Provide a photograph, if available. **See attached.**

Dominant plant, if known: **Green Ash, maple, American elm and associated understory. Site has been recently cleared to allow Gamma survey of the area. Very few trees remaining.**

29. What is the predominant size of the trees at the site? Use diameter at breast height.

Varies with recency of clearing. See attached memorandum. Ranges form approximately 4" dbh to over 20" dbh.

30. Specify type of understory present, if known. Provide a photograph, if available.

Small dogwoods, poison ivy, sumacs, common reed. See attached memorandum.

IIB. SHRUB/SCRUB

11. Is shrub/scrub vegetation present at the site?

No true scrub/shrub. Young elm-ash-maple forests and "old field" vegetation in recently cleared areas. See attached memorandum.

IIC. OPEN FIELD

1. Are there open (bare, barren) field areas present at the site? **Yes. Old field and mowed grass.**

2. What percentage of the site is open field? **85** %

12. What is/are the dominant plant(s)?

See attached memorandum. Dominants are goldenrods, Queen Annes's lace, Virginia creeper, poison ivy, and Japanese honeysuckle, fescue,

4. What is the approximate average height of the dominant plant? **Goldenrod 36 – 48inches.**

5. Describe the vegetation cover: **Completely vegetated except for roads and building pad areas.**

IID. MISCELLANEOUS

1. Are other types of terrestrial habitats present at the site other than woods, scrub/shrub, and open field? **No.**

2. Describe the terrestrial miscellaneous habitat(s) and identify these area(s) on the site map. **See attached**

memorandum.

3. What observations, if any, were made at the site regarding the presence and/or absence of insects, fish, birds, mammals, etc.?

   See attached observed species table.

4. Review the questions in Section I to determine if any additional habitat checklists should be completed for this site.

III. **No non-flowing water systems on site.**

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

IV. AQUATIC HABITAT CHECKLIST - FLOWING SYSTEMS

Note: Aquatic systems are often associated with wetland habitats. Please refer to Section V, Wetland Habitat Checklist.

1. What type(s) of flowing water system(s) is (are) present at the site? **Ditches.**

2, 3 do not apply.

4. What is the general composition of the substrate? Check all that apply.

Silt, clay, debris, detritus all apply in ditches at various points on site. _____

31. What is the condition of the bank (e.g., height, slope, extent of vegetative cover)?

Several shallow ditches and smaller ditches running east-west. These ditches and other wetland areas are often completely dry in summer. Shallow swales, small ditches dominated by green bulrush, common reed and cattails. Banks of these smaller ditches indistinguishable from surrounding land. See attached memorandum.

32. Is the system influenced by tides?**No.**

33. Is the flow intermittent? **Yes. Observed for many seasons by Maxim field personnel.**

9. Is there a discharge from the site to the waterbody? **Yes. Site ditches discharge Central Ditch which discharges to "Four-Mile Creek and thence to Lake Ontario. See attached memorandum.**

10. Is there a discharge from the waterbody? **Yes** No If yes, and the information is available, please identify what the waterbody discharges to and whether the discharge is on site or off site. **YES. Offsite to Four-Mile Creek – Four Mile Creek to Lake Ontario.**

11. Identify any field measurements and observations of water quality that were made. For those parameters for which data were collected provide the measurement and the units of measure in the appropriate space below: **See attached table of water quality data collected during past site activities.**

_____ Width (ft.)
_____ Depth (ft.)
_____ Velocity (specify units: _____)
_____ Temperature (depth of the water at which the reading was taken _____)
_____ pH
_____ Dissolved oxygen
_____ Salinity
_____ Turbidity (clear, slightly turbid, turbid, opaque) (Secchi disk depth _____)
_____ Other (specify)

12. Describe observed color and area of coloration.

Variable depending upon location. Following rain events water tends to be turbid, light brown to brown.

13. Is any aquatic vegetation present? **Yes. Common reed, cattails, green bulrush, fox sedge. Emergent.**

14. Mark the flowing water system on the attached site map. **See attached.**

15. What observations were made at the waterbody regarding the presence and/or absence of benthic macroinvertebrates, fish, birds, mammals, etc.?

Several species of frogs, toads, Great blue heron and green herons have been observed. Also numerous species of damselflies, midges, dragonflies. Mosquitoes are extremely prevalent during wet springs and summers.

V. WETLAND HABITAT CHECKLIST

1. Based on observations and/or available information, are designated or known wetlands definitely present at the site? **A review of the NWI for the did not indicate the presence of mapped wetlands on-site. Areas of the site do meet the definition of wetlands based on soil, hydrology and vegetation.**

Please note the sources of observations and information used (e.g., USGS Topographic Maps, National Wetland Inventory, federal or state agency, etc.), to make this determination.

USACE Buffalo District has indicated that no Federally jurisdictional wetlands are present at the NFSS.

2. Based on the location of the site (e.g., along a waterbody, in a floodplain, etc.) and site conditions (e.g., standing water; dark, wet soils; mud cracks; debris line; water marks), are wetland habitats suspected? **Yes.** If yes, proceed with the remainder of the wetland habitat identification checklist.

3. What type(s) of vegetation are present in the wetland?

Emergent. Dominants are common reed and cattails. Other species with high frequency are green bulrush, fox sedge, several other *Carex* species.

4. Provide a general description of the vegetation present in and around the wetland (height, color, etc.). Provide a photograph of the known or suspected wetlands, if available.

Emergent wetland vegetation is present dominated by cattails and common reed and some sedges (*Carex, Cyperus*).

5. Is standing water present? **Interior ponding exists on site seasonally. Interior drainage is poor. The site is drained by a series of ditches. No permanent standing water is present on site.**

6. Is there evidence of flooding at the site? **Yes.** What observations were noted? **Mudlines on trees, debris piles in drainages, encrusted detritus, buttressing on trees.**

7. If known, what is the source of the water in the wetland? **Groundwater—high water table. Precipitation**

8. . Is there a discharge from the site to a known or suspected wetland? **Yes** No If yes, please describe. **Site ditches discharge to off-site creek.**

9. Is there a discharge from the wetland? **On-site ditches discharge to off-site creek.**

10. If a soil sample was collected, describe the appearance of the soil in the wetland area. Circle or write in the best response. **Not collected.**

11. Mark the observed wetland area(s) on the attached site map.
See Attached Map.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

EXPLANATION OF TERMS USED IN THIS CHECKLIST

Arroyo	Dry gulch, brook, or creek. A deep gully cut by an intermittent brook or stream.
Benthic	Pertaining to the bottom of a waterbody.
Detritus	Loose fragments or particles formed by the disintegration of rocks.
Marl	A mixture of clays, carbonates of calcium and magnesium and remnants of shells.
Riparian	Of, or on the bank of a natural course of water.
Secchi (disk)	Basic measure of turbidity, visibility or transparency of water.
Submergent Vegetation	Hidden, obscure vegetation which is inundated with water.
Swales	Low traces of land which are often moist or marshy.

Area of Interest 6

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

I. SITE DESCRIPTION Date: September, 2001

1. Site Name: **Niagara Falls Storage Site - Area of Investigation (AOI) 6**

Location: Lewiston, NY

County: **Niagara** City: **Lewiston** State: **New York**

2. What is the approximate area of the site? **Total site size is 191 acres.**

3. Is this the first site visit? Yes **No** If no, attach trip report of previous site visit(s) if available.

Part of a remedial investigation.

Date(s) of previous site visit(s): **Periodic visits since spring of 1999. This is first visit specifically for ecological reconnaissance.**

4. Please attach USGS topographic map(s) of the site, if available.

5. Are aerial or other site photographs available? **Yes** No If yes, please attach any available photo(s) to the site map at the conclusion of this section.

YES. PHOTOS ATTACHED.

10. The land use on the site is: **AOI 6 is part of a military reservation. This area was the location of the former water silo used as a storage site for the K-65 wastes remediated by USDOE in the mid to late 1980. The buildings in this portion of the site from the operational period of the LOOW have been demolished and removed.**

The area surrounding the site is rural residential.--- a sanitary landfill abuts site on the east and a hazardous waste landfill abuts the northeastern portion of the site. The northwestern portion of the site is bounded by a former TNT production facility (Lake Ontario Ordnance Works known as the LOOW). The LOOW is currently under investigation by the USACE- Buffalo District: (3 mile radius).

0 % Urban

100 % Rural

0 % Residential

0 % Industrial ---Building

0 % Agricultural

0 % Recreational
(Describe; note if it is a park, etc.)

0 % Undisturbed

7. Has any movement of soil taken place at the site? **YES** If yes, please identify the most likely cause of this disturbance:

_____ Agricultural Use

x___ Heavy Equipment _____ Mining

_____ Natural Events ____ Erosion _____ Other

Please describe: **Construction of Lake Ontario Ordnance Works in the 1940s. Site grading and construction of buildings and process structures. Ditching for site drainage. Manhattan Project wastes were stored at the facility following World War II. From 1979—1991, portion of the site were remediated as part of an effort by the USDOE.** _____

8. Do any potentially sensitive environmental areas exist adjacent to or in proximity to the site, e.g., federal and state parks, national and state monuments, wetlands, prairie potholes, etc.? Describe. *Remember, flood plains and wetlands are not always obvious; do not answer "no" without confirming information.*

Areas which meet the definition of wetlands are present in this AOI.

8a. Please provide the source(s) of information used to identify these sensitive areas, and indicate their general location on the site map.

Reconnaissance by Maxim biologists; NRCS county soils maps; National Wetlands Inventory maps.

9. What type of facility is located at the site?

Federal government controlled-access radioactive waste storage facility operated by the US Army Corps of Engineers, Buffalo District under the Formerly Used Site Remedial Action Program (FUSRAP).

30. What are the suspected contaminants of concern at the site? If known, what are the maximum concentration levels?

PAHs, Heavy metals, Uranium and Thorium-series radionuclides.

31. Check any potential routes of off-site migration of contaminants observed at the site:

Being investigated as part of Remedial Investigation. Potential routes include surface and groundwater, windblown particulates, movement via biota.

32. If known, what is the approximate depth to the water table?

Highly seasonally variable. Saturated to surface at many areas of site. Highly affected by drainage ditches. _____

14. Is the direction of surface runoff apparent from site observation? **Yes.** If yes, to which of the following does the surface runoff discharge? Indicate all that apply.

Surface water, Some surface ponding and infiltration.

33. Is there a navigable waterbody or tributary to a navigable waterbody?

No navigable waterway. Ditches present are roadside drainage ditches which have no apparent outfall or discharge point.

34. Is there a waterbody anywhere on or in the vicinity of the site? If yes, also complete Section III: Aquatic Habitat Checklist - Non-Flowing Systems and/or Section IV: Aquatic Habitat Checklist - Flowing Systems.

No permanent water bodies on or proximate to site. Intermittent drainage ditches throughout site. Some wetlands areas.

35. Is there evidence of flooding? Complete Section V: Wetland Habitat Checklist.

Site is subject to interior ponding – wetland areas are present.

18. If a field guide was used to aid any of the identifications, please provide a reference. Also, estimate the time spent identifying fauna. [Use the back of this page if additional space for text is needed.]

Field Guide to the Birds; A Completely New Guide to All the Birds of Eastern and Central North America, Peterson, R.T. Fourth Edition 1980.

19. Are any threatened and/or endangered species (plant or animal) known to inhabit the area of the site?

Drummond's Rock Cress, Arabis drummondi. Listed as "Endangered" by the State of New York; Rated by NY Natural Heritage Program as "S1 and S2"—very few occurrences; very to especially vulnerable in New York State. Rated globally by NY Natural Heritage program as "G5=Demonstrably secure globally". Presence of this species on the NFSS site has not been documented.

20. Weather conditions at the time this checklist was prepared.

DATE: **August 21-25, 2001** _____

55-85 F Temperature (°C/°F) — **85 F** - Normal daily high temperature

Light, variable - Wind (Direction/Speed) — **None** - Precipitation (rain, snow)

Clear to partly cloudy - Cloud cover

IA. SUMMARY OF OBSERVATIONS AND SITE SETTING

Refer to attached Technical Memorandum #1—Ecological Reconnaissance of the Niagara Falls Storage Site.

This AOI is almost entirely vegetated by grass which is frequently mowed.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

Completed by Max Gricevich, Maxim Technologies _____

Additional Preparers __Greg Dawdy, Brian Mulhearn, Maxim Technologies.__

DATE: 10-01-01

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

II. TERRESTRIAL HABITAT CHECKLIST

IIA. WOODED

1. Are there any wooded areas at the site? **Yes.**

2. What percentage or area of the site is wooded? **30%** Indicate the wooded area on the site map attached to a copy of this checklist. Please identify what information was used to determine the wooded area of the site.

On-site observation during reconnaissance.

3. What is the dominant type of vegetation in the wooded area? (Circle one: Evergreen **Deciduous** Mixed) Provide a photograph, if available. **See attached.**

Dominant plant, if known: **Green Ash, maple, American elm and associated understory. Site has been recently cleared to allow Gamma survey of the area. Very few trees remaining.**

34. What is the predominant size of the trees at the site? Use diameter at breast height.

Varies with recency of clearing. See attached memorandum. Ranges form approximately 4" dbh to over 20" dbh.

35. Specify type of understory present, if known. Provide a photograph, if available.

Small dogwoods, poison ivy, sumacs, common reed. See attached memorandum.

IIB. SHRUB/SCRUB

13. Is shrub/scrub vegetation present at the site?

No true scrub/shrub. Young elm-ash-maple forests and "old field" vegetation in recently cleared areas. See attached memorandum.

IIC. OPEN FIELD

1. Are there open (bare, barren) field areas present at the site? **Yes. Old field and mowed grass.**

2. What percentage of the site is open field? **85** %

14. What is/are the dominant plant(s)?

See attached memorandum. Dominants are goldenrods, Queen Annes's lace, Virginia creeper, poison ivy, and Japanese honeysuckle, fescue,

4. What is the approximate average height of the dominant plant? **Goldenrod 36 - 48inches.**

5. Describe the vegetation cover: **Completely vegetated except for roads and some portions of wetland areas.**

IID. MISCELLANEOUS

1. Are other types of terrestrial habitats present at the site other than woods, scrub/shrub, and open field? **No.**

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

2. Describe the terrestrial miscellaneous habitat(s) and identify these area(s) on the site map. **See attached memorandum.**

3. What observations, if any, were made at the site regarding the presence and/or absence of insects, fish, birds, mammals, etc.?

   See attached observed species table.

4. Review the questions in Section I to determine if any additional habitat checklists should be completed for this site.

III. **No non-flowing water systems on site.**

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

IV. AQUATIC HABITAT CHECKLIST - FLOWING SYSTEMS

Note: Aquatic systems are often associated with wetland habitats. Please refer to Section V, Wetland Habitat Checklist.

1. What type(s) of flowing water system(s) is (are) present at the site? **Ditches.**

2, 3 do not apply.

4. What is the general composition of the substrate? Check all that apply.

Silt, clay, debris, detritus all apply in ditches at various points on site. _____

36. What is the condition of the bank (e.g., height, slope, extent of vegetative cover)?

Several shallow ditches and smaller ditches running east-west. These ditches and other wetland areas are often completely dry in summer. Shallow swales, small ditches dominated by green bulrush, common reed and cattails. Banks of these smaller ditches indistinguishable from surrounding land. See attached memorandum.

37. Is the system influenced by tides?**No.**

38. Is the flow intermittent? **Yes. Observed for many seasons by Maxim field personnel.**

9. Is there a discharge from the site to the waterbody? **Yes. Site ditches have no apparent discharge location.**

10. Is there a discharge from the waterbody? Yes No If yes, and the information is available, please identify what the waterbody discharges to and whether the discharge is on site or off site. **Undetermined No obvious discharge to ditch or water body. See attached site drainage map.**

11. Identify any field measurements and observations of water quality that were made. For those parameters for which data were collected provide the measurement and the units of measure in the appropriate space below: **See attached table of water quality data collected during past site activities.**

_____ Width (ft.)
_____ Depth (ft.)
_____ Velocity (specify units: _____)
_____ Temperature (depth of the water at which the reading was taken _____)
_____ pH
_____ Dissolved oxygen
_____ Salinity
_____ Turbidity (clear, slightly turbid, turbid, opaque) (Secchi disk depth _____)
_____ Other (specify)

12. Describe observed color and area of coloration.

Variable depending upon location. Following rain events water tends to be turbid, light brown to brown.

13. Is any aquatic vegetation present? **Yes. Common reed, cattails, green bulrush, fox sedge. Emergent.**

14. Mark the flowing water system on the attached site map. **See attached.**

15. What observations were made at the waterbody regarding the presence and/or absence of benthic macroinvertebrates, fish, birds, mammals, etc.?

Several species of frogs, toads, Great blue heron and green herons have been observed. Also numerous species of damselflies, midges, dragonflies. Mosquitoes are extremely prevalent during wet springs and summers.

V. WETLAND HABITAT CHECKLIST

1. Based on observations and/or available information, are designated or known wetlands definitely present at the site? **A review of the NWI for the did not indicate the presence of mapped wetlands on-site. Areas of the site do meet the definition of wetlands based on soil, hydrology and vegetation.**

Please note the sources of observations and information used (e.g., USGS Topographic Maps, National Wetland Inventory, federal or state agency, etc.), to make this determination.

USACE Buffalo District has indicated that no Federally jurisdictional wetlands are present at the NFSS.

2. Based on the location of the site (e.g., along a waterbody, in a floodplain, etc.) and site conditions (e.g., standing water; dark, wet soils; mud cracks; debris line; water marks), are wetland habitats suspected? **Yes.** If yes, proceed with the remainder of the wetland habitat identification checklist.

3. What type(s) of vegetation are present in the wetland?

Emergent. Dominants are common reed and cattails. Other species with high frequency are green bulrush, fox sedge, several other *Carex* species.

4. Provide a general description of the vegetation present in and around the wetland (height, color, etc.). Provide a photograph of the known or suspected wetlands, if available.

Emergent wetland vegetation is present dominated by cattails and common reed and some sedges (*Carex, Cyperus*).

5. Is standing water present? **Interior ponding exists on site seasonally. Interior drainage is poor. The site is drained by a series of ditches. No permanent standing water is present on site.**

6. Is there evidence of flooding at the site? **Yes.** What observations were noted? **Mudlines on trees, debris piles in drainages, encrusted detritus, buttressing on trees.**

7. If known, what is the source of the water in the wetland? **Groundwater—high water table. Precipitation**

8. . Is there a discharge from the site to a known or suspected wetland? **Yes** No If yes, please describe. **Site ditches discharge to off-site creek.**

9. Is there a discharge from the wetland? **On-site ditches discharge to off-site creek.**

10. If a soil sample was collected, describe the appearance of the soil in the wetland area. Circle or write in the best response. **Not collected.**

11. Mark the observed wetland area(s) on the attached site map.
See Attached Map.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

EXPLANATION OF TERMS USED IN THIS CHECKLIST

Arroyo	Dry gulch, brook, or creek. A deep gully cut by an intermittent brook or stream.
Benthic	Pertaining to the bottom of a waterbody.
Detritus	Loose fragments or particles formed by the disintegration of rocks.
Marl	A mixture of clays, carbonates of calcium and magnesium and remnants of shells.
Riparian	Of, or on the bank of a natural course of water.
Secchi (disk)	Basic measure of turbidity, visibility or transparency of water.
Submergent Vegetation	Hidden, obscure vegetation which is inundated with water.
Swales	Low traces of land which are often moist or marshy.

Area of Interest 7

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

I. SITE DESCRIPTION Date: September, 2001

1. Site Name: **Niagara Falls Storage Site - Area of Investigation (AOI) 7**

   Location: Lewiston, NY

   County: **Niagara** City: **Lewiston** State: **New York**

2. What is the approximate area of the site? **Total site size is 191 acres.**

3. Is this the first site visit? Yes **No** If no, attach trip report of previous site visit(s) if available.

   Part of a remedial investigation.

   Date(s) of previous site visit(s): **Periodic visits since spring of 1999. This is first visit specifically for ecological reconnaissance.**

4. Please attach USGS topographic map(s) of the site, if available.

5. Are aerial or other site photographs available? **Yes** No If yes, please attach any available photo(s) to the site map at the conclusion of this section.

   YES. PHOTOS ATTACHED.

11. The land use on the site is: **AOI 7 is part of a military reservation. No structures were present in the portion of the LOOW.**

    The area surrounding the site is rural residential.--- a sanitary landfill abuts site on the east and a hazardous waste landfill abuts the northeastern portion of the site. The northwestern portion of the site is bounded by a former TNT production facility (Lake Ontario Ordnance Works known as the LOOW). The LOOW is currently under investigation by the USACE- Buffalo District: (3 mile radius).

    0 % Urban

    100 % Rural

    0 % Residential

    0 % Industrial ---Building

    0 % Agricultural

    0 % Recreational
    (Describe; note if it is a park, etc.)

    0 % Undisturbed

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

7. Has any movement of soil taken place at the site? **YES** If yes, please identify the most likely cause of this disturbance:

_____ Agricultural Use

x___ Heavy Equipment _____ Mining

_____ Natural Events ____ Erosion _____ Other

Please describe: **Construction of Lake Ontario Ordnance Works in the 1940s. Site grading and construction of buildings and process structures. Ditching for site drainage. Manhattan Project wastes were stored at the facility following World War II. From 1979—1991, portion of the site were remediated as part of an effort by the USDOE.** _____

8. Do any potentially sensitive environmental areas exist adjacent to or in proximity to the site, e.g., federal and state parks, national and state monuments, wetlands, prairie potholes, etc.? Describe. *Remember, flood plains and wetlands are not always obvious; do not answer "no" without confirming information.*

Areas which meet the definition of wetlands are present in this AOI.

8a. Please provide the source(s) of information used to identify these sensitive areas, and indicate their general location on the site map.

Reconnaissance by Maxim biologists; NRCS county soils maps; National Wetlands Inventory maps.

9. What type of facility is located at the site?

Federal government controlled-access radioactive waste storage facility operated by the US Army Corps of Engineers, Buffalo District under the Formerly Used Site Remedial Action Program (FUSRAP).

33. What are the suspected contaminants of concern at the site? If known, what are the maximum concentration levels?

PAHs, Heavy metals, Uranium and Thorium-series radionuclides.

34. Check any potential routes of off-site migration of contaminants observed at the site:

Being investigated as part of Remedial Investigation. Potential routes include surface and groundwater, windblown particulates, movement via biota.

35. If known, what is the approximate depth to the water table?

Highly seasonally variable. Saturated to surface at many areas of site. Highly affected by drainage ditches. _____

14. Is the direction of surface runoff apparent from site observation? **Yes.** If yes, to which of the following does the surface runoff discharge? Indicate all that apply.

Surface water, Some surface ponding and infiltration.

36. Is there a navigable waterbody or tributary to a navigable waterbody?

No navigable waterway. Ditches are present which discharge to the Central Ditch.

37. Is there a waterbody anywhere on or in the vicinity of the site? If yes, also complete Section III: Aquatic Habitat Checklist - Non-Flowing Systems and/or Section IV: Aquatic Habitat Checklist - Flowing Systems.

No permanent water bodies on or proximate to site. Intermittent drainage ditches throughout site. Some wetlands areas.

38. Is there evidence of flooding? Complete Section V: Wetland Habitat Checklist.

Site is subject to interior ponding - wetland areas are present.

18. If a field guide was used to aid any of the identifications, please provide a reference. Also, estimate the time spent identifying fauna. [Use the back of this page if additional space for text is needed.]

Field Guide to the Birds; A Completely New Guide to All the Birds of Eastern and Central North America, Peterson, R.T. Fourth Edition 1980.

19. Are any threatened and/or endangered species (plant or animal) known to inhabit the area of the site?

Drummond's Rock Cress, Arabis drummondi. Listed as "Endangered" by the State of New York; Rated by NY Natural Heritage Program as "S1 and S2"—very few occurrences; very to especially vulnerable in New York State. Rated globally by NY Natural Heritage program as "G5=Demonstrably secure globally". Presence of this species on the NFSS site has not been documented.

20. Weather conditions at the time this checklist was prepared.

DATE: **August 21-25, 2001** _____

55-85 F Temperature (°C/°F) — **85 F** - Normal daily high temperature

Light, variable - Wind (Direction/Speed) — **None** - Precipitation (rain, snow)

Clear to partly cloudy - Cloud cover

IA. SUMMARY OF OBSERVATIONS AND SITE SETTING

Refer to attached Technical Memorandum #1—Ecological Reconnaissance of the Niagara Falls Storage Site.

This AOI is almost entirely vegetated by grass which is frequently mowed.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

Completed by Max Gricevich, Maxim Technologies _____

Additional Preparers __Greg Dawdy, Brian Mulhearn, Maxim Technologies.__

DATE: 10-01-01

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

II. TERRESTRIAL HABITAT CHECKLIST

IIA. WOODED

1. Are there any wooded areas at the site? **Yes.**

2. What percentage or area of the site is wooded? **70%** Indicate the wooded area on the site map attached to a copy of this checklist. Please identify what information was used to determine the wooded area of the site.

On-site observation during reconnaissance.

3. What is the dominant type of vegetation in the wooded area? (Circle one: Evergreen **Deciduous** Mixed) Provide a photograph, if available. **See attached.**

Dominant plant, if known: **Green Ash, maple, American elm and associated understory.**

39. What is the predominant size of the trees at the site? Use diameter at breast height.

Varies with recency of clearing. See attached memorandum. Ranges form approximately 4" dbh to over 20" dbh.

40. Specify type of understory present, if known. Provide a photograph, if available.

Small dogwoods, poison ivy, sumacs, common reed. See attached memorandum.

IIB. SHRUB/SCRUB

15. Is shrub/scrub vegetation present at the site?

No true scrub/shrub. Young elm-ash-maple forests and "old field" vegetation in recently cleared areas. See attached memorandum.

IIC. OPEN FIELD

1. Are there open (bare, barren) field areas present at the site? **Yes. Old field and mowed grass.**

2. What percentage of the site is open field? 30 %

16. What is/are the dominant plant(s)?

See attached memorandum. Dominants are goldenrods, Queen Annes's lace, common reed, Virginia creeper, poison ivy, and Japanese honeysuckle, fescue,

4. What is the approximate average height of the dominant plant? **Goldenrod 36 – 48inches.**

5. Describe the vegetation cover: **Completely vegetated except for roads.**

IID. MISCELLANEOUS

1. Are other types of terrestrial habitats present at the site other than woods, scrub/shrub, and open field? **No.**

2. Describe the terrestrial miscellaneous habitat(s) and identify these area(s) on the site map. **See attached memorandum.**

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

3. What observations, if any, were made at the site regarding the presence and/or absence of insects, fish, birds, mammals, etc.?

   See attached observed species table.

4. Review the questions in Section I to determine if any additional habitat checklists should be completed for this site.

III. No non-flowing water systems on site.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

IV. AQUATIC HABITAT CHECKLIST - FLOWING SYSTEMS

Note: Aquatic systems are often associated with wetland habitats. Please refer to Section V, Wetland Habitat Checklist.

1. What type(s) of flowing water system(s) is (are) present at the site? **Ditches.**

2, 3 do not apply.

4. What is the general composition of the substrate? Check all that apply.

Silt, clay, debris, detritus all apply in ditches at various points on site. _____

41. What is the condition of the bank (e.g., height, slope, extent of vegetative cover)?

Several ditches and smaller ditches running east-west. These ditches and other wetland areas are often completely dry in summer. Dominated by green bulrush, common reed and cattails, water plantain. Banks of smaller ditches indistinguishable from surrounding land. See attached memorandum.

42. Is the system influenced by tides?**No.**

43. Is the flow intermittent? **Yes. Observed for many seasons by Maxim field personnel.**

9. Is there a discharge from the site to the waterbody? **Yes. Ditches discharge to the Central ditch.**

10. Is there a discharge from the waterbody? **Yes** No If yes, and the information is available, please identify what the waterbody discharges to and whether the discharge is on site or off site. **Central Ditch discharges to Four mile creek to Lake Ontario. See attached site drainage map.**

11. Identify any field measurements and observations of water quality that were made. For those parameters for which data were collected provide the measurement and the units of measure in the appropriate space below: **See attached table of water quality data collected during past site activities.**

_____ Width (ft.)
_____ Depth (ft.)
_____ Velocity (specify units: _____)
_____ Temperature (depth of the water at which the reading was taken _____)
_____ pH
_____ Dissolved oxygen
_____ Salinity
_____ Turbidity (clear, slightly turbid, turbid, opaque) (Secchi disk depth _____)
_____ Other (specify)

12. Describe observed color and area of coloration.

Variable depending upon location. Following rain events water tends to be turbid, light brown to brown.

13. Is any aquatic vegetation present? **Yes. Common reed, cattails, green bulrush, fox sedge. Emergent.**

14. Mark the flowing water system on the attached site map. **See attached.**

15. What observations were made at the waterbody regarding the presence and/or absence of benthic macroinvertebrates, fish, birds, mammals, etc.?

Several species of frogs, toads, Great blue heron and green herons have been observed. Also numerous species of damselflies, midges, dragonflies. Mosquitoes are extremely prevalent during wet springs and summers.

V. WETLAND HABITAT CHECKLIST

1. Based on observations and/or available information, are designated or known wetlands definitely present at the site? **A review of the NWI for the did not indicate the presence of mapped wetlands on-site. Areas of the site do meet the definition of wetlands based on soil, hydrology and vegetation.**

Please note the sources of observations and information used (e.g., USGS Topographic Maps, National Wetland Inventory, federal or state agency, etc.), to make this determination.

USACE Buffalo District has indicated that no Federally jurisdictional wetlands are present at the NFSS.

2. Based on the location of the site (e.g., along a waterbody, in a floodplain, etc.) and site conditions (e.g., standing water; dark, wet soils; mud cracks; debris line; water marks), are wetland habitats suspected? **Yes.** If yes, proceed with the remainder of the wetland habitat identification checklist.

3. What type(s) of vegetation are present in the wetland?

Emergent. Dominants are common reed and cattails. Other species with high frequency are green bulrush, fox sedge, several other *Carex* species.

Forested - Several areas of "wet woods" dominated by green ash, elm, hawthorn and dogwoods are present.

4. Provide a general description of the vegetation present in and around the wetland (height, color, etc.). Provide a photograph of the known or suspected wetlands, if available.

Emergent wetland vegetation is present dominated by cattails and common reed and some sedges (*Carex, Cyperus*).

5. Is standing water present? **Interior ponding exists on site seasonally. Interior drainage is poor. The site is drained by a series of ditches. No permanent standing water is present on site.**

6. Is there evidence of flooding at the site? **Yes.** What observations were noted? **Mudlines on trees, debris piles in drainages, encrusted detritus, buttressing on trees.**

7. If known, what is the source of the water in the wetland? **Groundwater—high water table. Precipitation**

8. . Is there a discharge from the site to a known or suspected wetland? Yes No If yes, please describe. **Site ditches discharge to off-site creek.**

9. Is there a discharge from the wetland? **On-site ditches discharge to off-site creek.**

10. If a soil sample was collected, describe the appearance of the soil in the wetland area. Circle or write in the best response. **Not collected.**

11. Mark the observed wetland area(s) on the attached site map.
See Attached Map.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

EXPLANATION OF TERMS USED IN THIS CHECKLIST

Arroyo	Dry gulch, brook, or creek. A deep gully cut by an intermittent brook or stream.
Benthic	Pertaining to the bottom of a waterbody.
Detritus	Loose fragments or particles formed by the disintegration of rocks.
Marl	A mixture of clays, carbonates of calcium and magnesium and remnants of shells.
Riparian	Of, or on the bank of a natural course of water.
Secchi (disk)	Basic measure of turbidity, visibility or transparency of water.
Submergent Vegetation	Hidden, obscure vegetation which is inundated with water.
Swales	Low traces of land which are often moist or marshy.

Area of Interest 8

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

I. SITE DESCRIPTION Date: September, 2001

1. Site Name: **Niagara Falls Storage Site - Area of Investigation (AOI) 8**

   Location: Lewiston, NY

   County: **Niagara** City: **Lewiston** State: **New York**

2. What is the approximate area of the site? **Total site size is 191 acres.**

3. Is this the first site visit? Yes **No** If no, attach trip report of previous site visit(s) if available.

   Part of a remedial investigation.

   Date(s) of previous site visit(s): **Periodic visits since spring of 1999. This is first visit specifically for ecological reconnaissance.**

4. Please attach USGS topographic map(s) of the site, if available.

5. Are aerial or other site photographs available? **Yes** No If yes, please attach any available photo(s) to the site map at the conclusion of this section.

   YES. PHOTOS ATTACHED.

12. The land use on the site is: **AOI 8 is part of a military reservation. No structures are present in this portion of the NFSS.**

    The area surrounding the site is rural residential.--- a sanitary landfill abuts site on the east and a hazardous waste landfill abuts the northeastern portion of the site. The northwestern portion of the site is bounded by a former TNT production facility (Lake Ontario Ordnance Works known as the LOOW). The LOOW is currently under investigation by the USACE- Buffalo District: (3 mile radius).

    0 % Urban

    100 % Rural

    0 % Residential

    0 % Industrial ---Building

    0 % Agricultural

    0 % Recreational
    (Describe; note if it is a park, etc.)

    0 % Undisturbed

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

7. Has any movement of soil taken place at the site? **YES** If yes, please identify the most likely cause of this disturbance:

_____ Agricultural Use

x___ Heavy Equipment _____ Mining

_____ Natural Events ____ Erosion _____ Other

Please describe: **Construction of Lake Ontario Ordnance Works in the 1940s. Site grading and construction of buildings and process structures. Ditching for site drainage. Manhattan Project wastes were stored at the facility following World War II. From 1979—1991, portion of the site were remediated as part of an effort by the USDOE.** _____

8. Do any potentially sensitive environmental areas exist adjacent to or in proximity to the site, e.g., federal and state parks, national and state monuments, wetlands, prairie potholes, etc.? Describe. *Remember, flood plains and wetlands are not always obvious; do not answer "no" without confirming information.*

Areas which meet the definition of wetlands are present in this AOI.

8a. Please provide the source(s) of information used to identify these sensitive areas, and indicate their general location on the site map.

Reconnaissance by Maxim biologists; NRCS county soils maps; National Wetlands Inventory maps.

9. What type of facility is located at the site?

Federal government controlled-access radioactive waste storage facility operated by the US Army Corps of Engineers, Buffalo District under the Formerly Used Site Remedial Action Program (FUSRAP).

36. What are the suspected contaminants of concern at the site? If known, what are the maximum concentration levels?

PAHs, Heavy metals, Uranium and Thorium-series radionuclides.

37. Check any potential routes of off-site migration of contaminants observed at the site:

Being investigated as part of Remedial Investigation. Potential routes include surface and groundwater, windblown particulates, movement via biota.

38. If known, what is the approximate depth to the water table?

Highly seasonally variable. Saturated to surface at many areas of site. Highly affected by drainage ditches. _____

14. Is the direction of surface runoff apparent from site observation? **Yes.** If yes, to which of the following does the surface runoff discharge? Indicate all that apply.

Surface water, Some surface ponding and infiltration.

39. Is there a navigable waterbody or tributary to a navigable waterbody?

No navigable waterway. Ditches present which discharge to the a ditch which runs from east to west and discharge to the Central Ditch.

40. Is there a waterbody anywhere on or in the vicinity of the site? If yes, also complete Section III: Aquatic Habitat Checklist - Non-Flowing Systems and/or Section IV: Aquatic Habitat Checklist - Flowing Systems.

No permanent water bodies on or proximate to site. Intermittent drainage ditches throughout site. Some wetlands areas.

41. Is there evidence of flooding? Complete Section V: Wetland Habitat Checklist.

Site is subject to interior ponding – wetland areas are present.

18. If a field guide was used to aid any of the identifications, please provide a reference. Also, estimate the time spent identifying fauna. [Use the back of this page if additional space for text is needed.]

Field Guide to the Birds; A Completely New Guide to All the Birds of Eastern and Central North America, Peterson, R.T. Fourth Edition 1980.

19. Are any threatened and/or endangered species (plant or animal) known to inhabit the area of the site?

Drummond's Rock Cress, Arabis drummondi. Listed as "Endangered" by the State of New York; Rated by NY Natural Heritage Program as "S1 and S2"—very few occurrences; very to especially vulnerable in New York State. Rated globally by NY Natural Heritage program as "G5=Demonstrably secure globally". Presence of this species on the NFSS site has not been documented.

20. Weather conditions at the time this checklist was prepared.

DATE: **August 21-25, 2001** _____

55-85 F Temperature (°C/°F) — 85 F - Normal daily high temperature

Light, variable - Wind (Direction/Speed) — None - Precipitation (rain, snow)

Clear to partly cloudy - Cloud cover

IA. SUMMARY OF OBSERVATIONS AND SITE SETTING

Refer to attached Technical Memorandum #1—Ecological Reconnaissance of the Niagara Falls Storage Site.

This AOI is almost entirely vegetated by grass which is frequently mowed.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

Completed by Max Gricevich, Maxim Technologies _____

Additional Preparers __Greg Dawdy, Brian Mulhearn, Maxim Technologies.__

DATE: 10-01-01

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

II. TERRESTRIAL HABITAT CHECKLIST

IIA. WOODED

1. Are there any wooded areas at the site? **Yes.**

2. What percentage or area of the site is wooded? **45%** Indicate the wooded area on the site map attached to a copy of this checklist. Please identify what information was used to determine the wooded area of the site.

On-site observation during reconnaissance.

3. What is the dominant type of vegetation in the wooded area? (Circle one: Evergreen **Deciduous** Mixed) Provide a photograph, if available. **See attached.**

Dominant plant, if known: **Green Ash, maple, American elm and associated understory.**

44. What is the predominant size of the trees at the site? Use diameter at breast height.

Varies with recency of clearing. See attached memorandum. Ranges form approximately 4" dbh to over 20" dbh.

45. Specify type of understory present, if known. Provide a photograph, if available.

Small dogwoods, poison ivy, sumacs, common reed. See attached memorandum.

IIB. SHRUB/SCRUB

17. Is shrub/scrub vegetation present at the site?

No true scrub/shrub. Young elm-ash-maple forests and "old field" vegetation in recently cleared areas. See attached memorandum.

IIC. OPEN FIELD

1. Are there open (bare, barren) field areas present at the site? **Yes. Old field and mowed grass.**

2. What percentage of the site is open field? 50 %

18. What is/are the dominant plant(s)?

See attached memorandum. Dominants are goldenrods, Queen Annes's lace, common reed, Virginia creeper, poison ivy, and Japanese honeysuckle, fescue,

4. What is the approximate average height of the dominant plant? Goldenrod 36 – 48inches.

5. Describe the vegetation cover: **Completely vegetated except for roads.**

IID. MISCELLANEOUS

1. Are other types of terrestrial habitats present at the site other than woods, scrub/shrub, and open field? **No.**

2. Describe the terrestrial miscellaneous habitat(s) and identify these area(s) on the site map. **See attached memorandum.**

3. What observations, if any, were made at the site regarding the presence and/or absence of insects, fish, birds, mammals, etc.?

   See attached observed species table.

4. Review the questions in Section I to determine if any additional habitat checklists should be completed for this site.

III. **No non-flowing water systems on site.**

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

IV. AQUATIC HABITAT CHECKLIST - FLOWING SYSTEMS

Note: Aquatic systems are often associated with wetland habitats. Please refer to Section V, Wetland Habitat Checklist.

1. What type(s) of flowing water system(s) is (are) present at the site? **Ditches.**

2, 3 do not apply.

4. What is the general composition of the substrate? Check all that apply.

Silt, clay, debris, detritus all apply in ditches at various points on site. _____

46. What is the condition of the bank (e.g., height, slope, extent of vegetative cover)?

Several ditches and smaller ditches running east-west. The ditches, which discharge to the Central Ditch and other wetland areas are often completely dry in summer. Dominated by green bulrush, common reed and cattails. Banks of smaller ditches indistinguishable from surrounding land. See attached memorandum.

47. Is the system influenced by tides? **No.**

48. Is the flow intermittent? **Yes. Observed for many seasons by Maxim field personnel.**

9. Is there a discharge from the site to the waterbody? **Yes. Ditches discharge to the Central ditch.**

10. Is there a discharge from the waterbody? **Yes** No If yes, and the information is available, please identify what the waterbody discharges to and whether the discharge is on site or off site. **Central Ditch discharges to Four mile creek to Lake Ontario. See attached site drainage map.**

11. Identify any field measurements and observations of water quality that were made. For those parameters for which data were collected provide the measurement and the units of measure in the appropriate space below: **See attached table of water quality data collected during past site activities.**

_____ Width (ft.)
_____ Depth (ft.)
_____ Velocity (specify units: _____)
_____ Temperature (depth of the water at which the reading was taken _____)
_____ pH
_____ Dissolved oxygen
_____ Salinity
_____ Turbidity (clear, slightly turbid, turbid, opaque) (Secchi disk depth _____)
_____ Other (specify)

12. Describe observed color and area of coloration.

Variable depending upon location. Following rain events water tends to be turbid, light brown to brown.

13. Is any aquatic vegetation present? **Yes. Common reed, cattails, green bulrush, fox sedge. Emergent.**

14. Mark the flowing water system on the attached site map. **See attached.**

15. What observations were made at the waterbody regarding the presence and/or absence of benthic macroinvertebrates, fish, birds, mammals, etc.?

Several species of frogs, toads, Great blue heron and green herons have been observed. Also numerous species of damselflies, midges, dragonflies. Mosquitoes are extremely prevalent during wet springs and summers.

V. WETLAND HABITAT CHECKLIST

1. Based on observations and/or available information, are designated or known wetlands definitely present at the site? **A review of the NWI for the did not indicate the presence of mapped wetlands on-site. Areas of the site do meet the definition of wetlands based on soil, hydrology and vegetation.**

Please note the sources of observations and information used (e.g., USGS Topographic Maps, National Wetland Inventory, federal or state agency, etc.), to make this determination.

USACE Buffalo District has indicated that no Federally jurisdictional wetlands are present at the NFSS.

2. Based on the location of the site (e.g., along a waterbody, in a floodplain, etc.) and site conditions (e.g., standing water; dark, wet soils; mud cracks; debris line; water marks), are wetland habitats suspected? **Yes.** If yes, proceed with the remainder of the wetland habitat identification checklist.

3. What type(s) of vegetation are present in the wetland?

Emergent. Dominants are common reed and cattails. Other species with high frequency are green bulrush, fox sedge, several other *Carex* species.

Forested – Several areas of "wet woods" dominated by green ash, maple, elm, hawthorn and dogwoods are present.

4. Provide a general description of the vegetation present in and around the wetland (height, color, etc.). Provide a photograph of the known or suspected wetlands, if available.

Emergent wetland vegetation is present dominated by cattails and common reed and some sedges (*Carex, Cyperus*).

5. Is standing water present? **Interior ponding exists on site seasonally. Interior drainage is poor. The site is drained by a series of ditches. No permanent standing water is present on site.**

6. Is there evidence of flooding at the site? **Yes.** What observations were noted? **Mudlines on trees, debris piles in drainages, encrusted detritus, buttressing on trees.**

7. If known, what is the source of the water in the wetland? **Groundwater—high water table. Precipitation**

8. . Is there a discharge from the site to a known or suspected wetland? Yes No If yes, please describe. **Site ditches discharge to off-site creek.**

9. Is there a discharge from the wetland? **On-site ditches discharge to off-site creek.**

10. If a soil sample was collected, describe the appearance of the soil in the wetland area. Circle or write in the best response. **Not collected.**

11. Mark the observed wetland area(s) on the attached site map.
See Attached Map.

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

EXPLANATION OF TERMS USED IN THIS CHECKLIST

Arroyo	Dry gulch, brook, or creek. A deep gully cut by an intermittent brook or stream.
Benthic	Pertaining to the bottom of a waterbody.
Detritus	Loose fragments or particles formed by the disintegration of rocks.
Marl	A mixture of clays, carbonates of calcium and magnesium and remnants of shells.
Riparian	Of, or on the bank of a natural course of water.
Secchi (disk)	Basic measure of turbidity, visibility or transparency of water.
Submergent Vegetation	Hidden, obscure vegetation which is inundated with water.
Swales	Low traces of land which are often moist or marshy.

Observed Species

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

Common Name	Species
Barn Swallow	*Hirundo rustica*
Blue Jay	*Cyanocitta cristata*
Bluebird (eastern)	*Sialia sialis*
Brown-headed Cowbird	*Molothrus ater*
Cardinal	*Argynnis pandora*
Chipmunk	*Sciuridae sp.; Tamias striatus*
Chipping Sparrow	*Spizella passerina*
Coyote	*Canis latrans*
Crow	*Corvus brachyrhynchos; Covidae sp.*
Feral Cat	*Felis catus*
Flicker (yellow-shafted)	*Colaptes aurtus*
Fox (Red)	*Vulpes vulpes*
Frog	*Rana blairi; Rana sp.*
Frog (Spring Peeper)	*Pseudacris crucifer*
Goldfinch	*Carduelis tristis*
Goose (Canada)	*Branta canadensis*
Groundhog	*Marmota monax*
Grouse (ruffed)	*Bonasa umbellus*
Hawk (Cooper's)	*Accipiter cooperi*
Hawk (red-tailed)	*Buteo jamaicensis*
Heron (great blue)	*Ardea herodias*
Heron (green)	*Butorides virescens*
Horseflies	*Tabanus sp.*
Kildeer	*Charadrius vociferus*
Kingbird	*Tyrannus tyrannus*
Kingfisher (Belted)	*Ceryle alcyon*
Mallard	*Anas platyrhynchos*
Meadow Lark (eastern)	*Sturnella magna*
Mosquito	*Culicidae sp.*
Mourning Dove	*Zenaida macroura*
Mouse	*Microtus pennsylvanicus*
Opossum	*Didelphis virginiana*
Owl (Screech)	*Otus sp.*
Pheasant (ring-necked)	*Phasianus colchicus*
Pigeon	*Columbidae sp.*
Praying Mantis	*Mantis religiosa*
Rabbit	*Silvilagus floridanus*
Racoons	*Procyon lotor*
Red-Winged Blackbird	*Agelaius phoeniceus*
Robin	*Turdus migratorius*
Rock Bass	*Ambloplites rupestris*
Seagull	*Laridae sp.*

CHECKLIST FOR ECOLOGICAL RISK ASSESSMENT/SAMPLING

Common Name	**Species**
Snail	*Pulmonata sp.*
Snake (black racer)	*Coluber constrictor*
Snake (dekay)	*Storeria dekayi*
Snake (Garter)	*Thamnophis sirtalis*
Snake (redbelly)	*Storeria occipitomaculata*
Sparrow	*Passeridae sp.; Emberizidae sp.*
Squirrel (gray)	*Sciurus caroliniensis*
Starling	*Sturnus vulgaris*
Toad	*Bufo Americanus*
Turkey Vulture	*Cathartes aura*
Turtle (painted)	*Emydidae sp.*
White-tailed Deer	*Odocoileus virginianus*
Woodcock	*Scolopax minor*
Woodpecker (Downy)	*Picoides pubescens*
Woodpecker (red-bellied)	*Melanerpes carolinus*

Attachment 2

Contents:

New York Department of Environmental Conservation Natural Heritage Program Contact Letter

MAXIM
TECHNOLOGIES INC

July 24, 2001

Information Services
New York Natural Heritage Program
625 Broadway, 5th Floor
Albany, NY 12233-4757

VIA FACSIMILE 518-402-8925

RE: Request for rare species information from the New York Natural Heritage Program (NYNHP)

Maxim Technologies is performing a remedial investigation for the Buffalo District US Army Corps of Engineers (USACE) at the former Niagara Falls Storage Site. Species information is needed to complete the ecological reconnaissance at the site. The NYNHP requests information on the following topics to obtain a copy of rare species information for a specified area. Answers to NYNHP's questions are provided below:

1. The information will be used in a remedial investigation performed by the USACE.
2. The proposed project is completion of a remedial investigation.
3. The site is in Niagara County. The towns included are Lewiston and Porter.
4. The site is on the Ransomville 7½ minute USGS topographical map.
5. Site boundaries are shown on the attached photocopy of the USGS map.

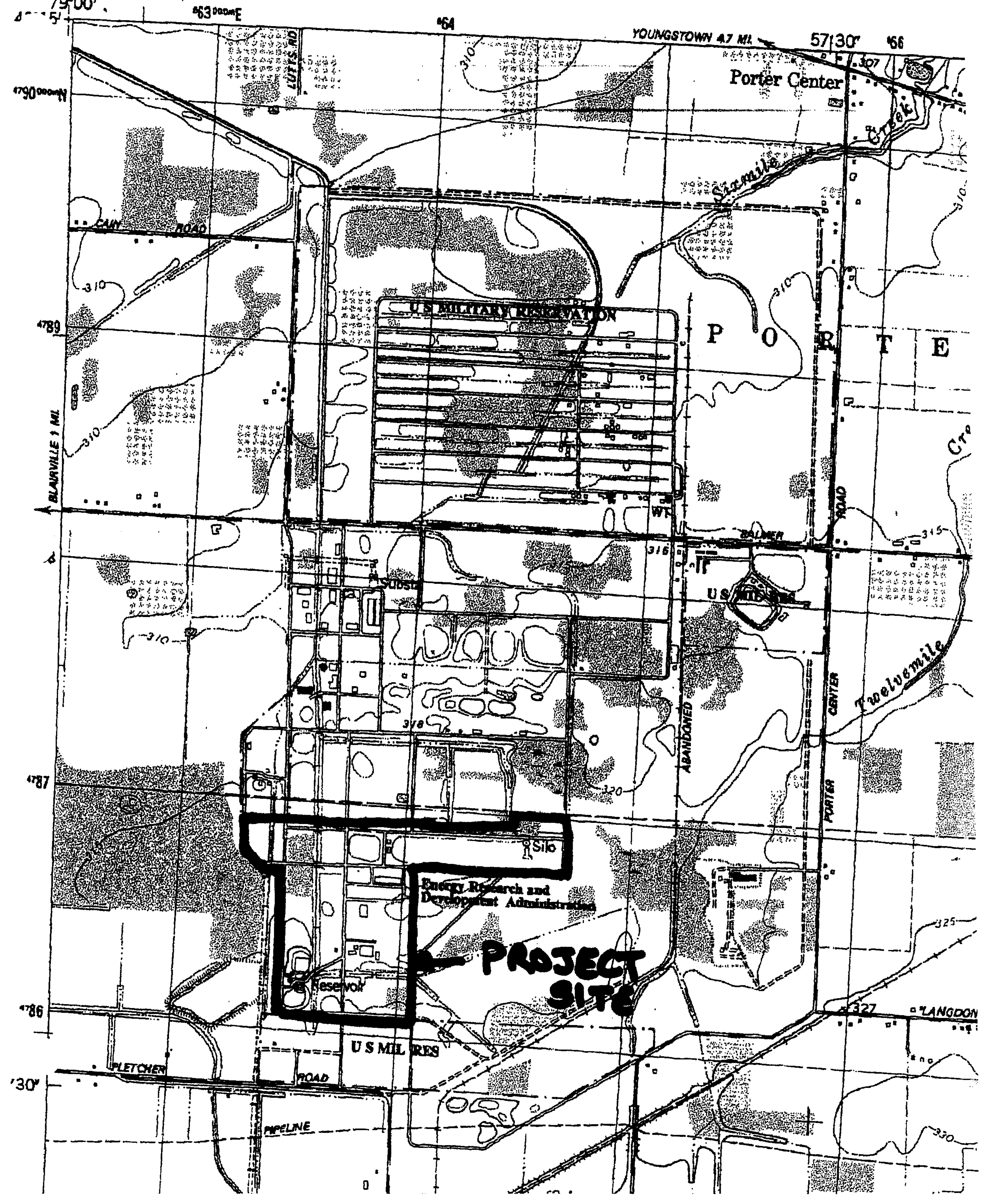
Please fax/mail the information to me at the address on this letterhead, or contact me with any questions or concerns.

Thank you,

Brian Mulhearn
attachment

1908 Innerbelt Business Center Drive • St. Louis, MO 63114-5700 • 314-426-0880 • 314-426-4212 FAX

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



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-MAXIM TECHNOLOGIES -

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New York Natural Heritage Program and Ecological Communities

About the New York Natural Heritage Program

Program Overview

The New York Natural Heritage Program is an ongoing scientific inventory whose goal is to compile and maintain systematic information on New York State's native rare plants and animals and significant ecological communities. A joint venture of the Department of Environmental Conservation (DEC) and The Nature Conservancy (TNC) since 1985, the program is housed in Bureau of Wildlife offices in Latham, New York. The Heritage Program receives the majority of its financial support from Return a Gift to Wildlife contracts, private contributions to TNC, and a various number of small subsidiary contracts from private and government sources.

The New York Natural Heritage Program is part of an international network of state natural heritage programs and conservation data centers located throughout the 50 United States, Canada, Latin America, and the Caribbean. Each data center or "node" in the network employs standardized methods, researched and developed by The Nature Conservancy, for gathering and storing data. Each operates within a local institution, usually as part of a government agency like DEC, where the data are most effectively used to manage and conserve natural resources.

Although the Heritage Program is best known for locating and documenting rare species and significant ecological communities, the data system that stores this information, the Biological and Conservation Data System (BCD), actually does much more. Its developer, The Nature Conservancy, describes BCD as a powerful, comprehensive data management tool for identifying, tracking, protecting and managing biological diversity. The information is managed in more than 30 interrelated computer databases, supported by extensive topographic map and manual files and a library.

In New York, the Heritage Program contributes data to about 15 of these databases which include information on ecological communities and rare species, their biology, habitats, locations, status, management needs, and data sources. A unique feature of BCD is the fact that it was explicitly designed to be used as a conservation tool. Thus, there are a whole host of databases that link rare element locations to sites, tracts, public lands, legal transactions, etc. Many of these BCD databases are populated by The Nature Conservancy or cooperatively by both TNC and the Heritage Program.

Data Coverage

The New York Natural Heritage Program surveys and monitors rare animals, rare plants, and significant ecological communities throughout the state. Animals include rare species of all vertebrate groups and selected rare species from the invertebrate groups of butterflies and moths, beetles, dragonflies and damselflies, mayflies, and freshwater bivalve molluscs. In addition the program collects data on significant animal concentration areas including bat hibernacula, anadromous fish, warm and cold water fish, waterfowl, raptors and nesting areas of terns, herons, and gulls. All rare flowering plants, ferns and fern allies are actively

surveyed and monitored. A rare moss list has been developed but the program does not have an active survey program for mosses. Significant ecological communities surveyed include all rare ecological communities as well as the best examples of common communities.

How You Can Contribute

To continue building a comprehensive, up-to-date database of information on the locations of rare species and significant natural communities, we invite your contributions. If you have information on a rare species, please fill out a Natural Heritage Reporting Form (PDF*) and return it to the New York Natural Heritage Program.

*This file is in PDF format and can only be viewed using Adobe Acrobat Reader which can be downloaded free of charge.

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	vacant	

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Requesting Information from the New York Natural Heritage Program

Information regarding the locations of rare species is considered sensitive. The distribution of information which identifies the locations of rare species or their habitats may lead to the collection or disturbance of the animals and plants at those locations. The New York State Department of Environmental Conservation (DEC) has the legal authority, under New York State Environmental Conservation Law, to restrict access to such information. The DEC has adopted a policy regarding the release of information compiled by the New York Natural Heritage Program. Under this policy, information on the locations and identities of rare species is provided to requesters at the level of detail necessary to enable fully informed decision-making while protecting the sensitive resource. For general information, or for information on a large geographic area, please contact us at the address below.

How to Request Information for a Project Site

The New York Natural Heritage Program will review locations of sites of projects, activities, and SEQR-subject actions for any records of rare species or significant natural communities in our databases which may be impacted by the project or action. To request a review of a specific project site, please write to the address below, and include the following information.

- Why you need the information (i.e., environmental assessment under SEQR, management plan)
- Brief description of the proposed project or activity (i.e., residential development, landfill siting)
- Name of all counties and towns where the proposed project is located
- Name of all 7 ½ minute U.S.G.S. topographical maps where the proposed project is located
- Photocopy of the appropriate part of the 7 ½ minute U.S.G.S. topographical map where the project is located
- Boundary of the proposed project clearly marked or highlighted on the U.S.G.S. map photocopy

Requests for data on specific project sites are processed in the order in which they are received. Average response time is 2 weeks from the date your request is received in our office, but it may be longer if there is a backlog or if your request does not contain all the needed information. Since our office receives many requests each day, we strongly encourage you to submit your request during the early stages of a project. Please note that Heritage information is also available at each regional office of the New York State Department of Environmental Conservation.

Currently there are no fees for this service.

Please send requests for information in writing to:

Information Services
New York Natural Heritage Program
625 Broadway, 5th Floor
Albany, NY 12233-4757

Phone: (518) 402-8935
Fax: (518) 402-8925

Ecological Communities of New York State (Reschke 1990)

A book (96 p.) describing the classification of ecological communities in New York State with descriptions of each type of community. This publication should be cited as follows:

> Reschke, C. 1990. *Ecological Communities of New York State*. New York Natural Heritage Program. New York State Department of Environmental Conservation. Latham, N.Y. 96p. +xi.

The following files together comprise the book, "Ecological Communities of New York State." All the files are in PDF format and can only be viewed using Adobe Acrobat Reader which can be downloaded free of charge.

Title Page, Acknowledgements, Contents, and Introduction (717 kb)

- Marine (138 kb)
- Estuarine (588 kb)
- Riverine (296 kb)
- Lacustrine (756 kb)
- Palustrine (1498 kb)
- Terrestrial
  - Open Uplands (731 kb)
  - Barrens and Woodlands (832 kb)
  - Forested Uplands (890 kb)
  - Terrestrial Cultural (441 kb)
- Subterranean (88 kb)

References (584 kb)
Appendix A: Heritage Program Element Ranks (45 kb)
Appendix B: Glossary (576 kb)
Appendix C: Key to Systems and Subsystems (244 kb)
Index (212 kb)
Ecozone Map (59 kb)
County Map (31 kb)

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Newly Described Communities

Newly Described Communities

The following natural communities have been described by the New York Natural Heritage Program since the publication of Ecological Communities of New York State (Reschke 1990).

Brackish interdunal swales: temporarily tidally flooded temperate marshes in interdunal swales dominated by halophytic graminoids. Individual swales occur as small patches positioned between fore-, primary and secondary dunes in a maritime dunes system, typically on barrier islands. Swales experience dynamic fluctuations in water levels and salinity. Water levels are highest after infrequent and sporadic overwash that occurs when tides or waves overtop the berm, transporting water and suspended sand through the foredune into low-lying areas within the dune system, usually during spring tides, full moons or major storms. Flood frequency can vary from several times per year to as little as once every 25 years. At this time the groundwater levels rise, vegetation may float and water pools into temporary ponds. During the driest times, ponds evaporate, surface sands are no longer saturated, salt concentrates then enters the groundwater, and salt deposits form on the surface. Salinity is typically mixohaline, water being derived from a mix of saline ocean overwash and freshwater groundwater lens. However, it can vary greatly at certain times of the year from oligohaline (0 ppt) to supersaline (70 ppt) in response to the salinity of the groundwater and accumulation of salt during evaporation. The dominant flora are mostly grasses, sedges and rushes including *Spartina patens*, *Eleocharis parvula, Scirpus pungens, Cyperus polystachyos* and *Juncus articulatus*. The abundance of any one dominant can vary widely year to year in response to salinity fluctuations. Other characteristic flora includes halophytes such as *Diplachne maritima, Scirpus maritimus, Juncus bufonius var. halophila, Juncus scirpoides, Ptilimnium capillaceum, Rumex maritimus, Aster subulatus, Chenopodium rubrum, Pluchea odorata, Hibiscus palustris, Polygonum ramosissimum* and *Iva frutescens*. *Amaranthus pumilus* is a characteristic plant at the upper edge of the community in drift lines. *Phragmites australis* is questionably native in this community. The community is known for its importance to wildlife. Characteristic fauna include piping plovers, oyster catchers, yellowlegs and Canada geese (which use the community as a foraging ground), abundant salt marsh mosquitoes, fiddler crabs, odonates and other insects. Mud turtle and eastern spadefoot toad reportedly use this habitat (US ACOE, 1995). Soils are deep sands, often become anaerobic but lack peat accumulation. The surface is often rusty colored from a coating of blue-green algae. Community variants include semi-permanent pools, long-lived wet swales with perennial graminoids and newly-formed sparsely-vegetated damp swales with early successional annual forbs. Occurrences of this community are sometimes ephemeral representing the early stages of salt marsh or coastal

salt pond formation or rapidly transforming into reed grass marshes.

Distribution: Restricted to estuarine portion of Coastal Lowlands Ecozone, probably only on the south shore of Long Island. Known occurrences restricted to barrier islands from Jones Beach Island West to Westhampton Beach. Additional occurrences possible west to Gateway National Recreation Area and east to Montauk Point.

Rank: G3G4 S1S2

Examples: Jones Beach Island East, Jones Beach Island West Suffolk County.

Sources: NHP field surveys, Sneddon, et. al. 1996.

Coastal oak-beech forest: a hardwood forest with oaks (*Quercus* spp.) and beech (*Fagus grandifolia*) codominant that occurs in dry well-drained, loamy sand of morainal coves of the Atlantic Coastal Plain. Some occurrences are associated with Maritime Beech Forest. Beech can range from nearly pure stands to as little as about 25% cover. The forest is usually codominated by two or more species of oaks usually black oak (*Quercus velutina*) and white oak (*Q. alba*). Scarlet oak (*Quercus coccinea*) and chestnut oak (*Q. montana*) are common associates. Red oak (*Quercus rubra*) may be present at low density and is a key indicator species along with sugar maple (*Acer saccharum*) and paper birch (*Betula papyrifera*). There are relatively few shrubs and herbs. Characteristic groundlayer species are Swan's sedge (*Carex swanii*), Canada mayflower (*Maianthemum canadense*), white wood aster (*Aster divaricatus*), beech-drops (*Epifagus virginiana*), and false Solomon's seal (*Smilacina racemosa*). Typically there is also an abundance of tree seedlings, especially of beech; beech and oak saplings are often the most abundant 'shrubs' and small trees. Characteristic fauna include white-tailed deer (*Odocoileus virginianus*).

Distribution: restricted to interior portions of Coastal Lowlands Ecozone, concentrated on north-facing slopes on the moraines. Known examples range from Montauk Point (Brodo 1968) west to the Big Woods along the south shore of Long Island and from Route 48 Southold to Camp Baiting Hollow along the north shore of Long Island. Numerous examples occur in the Riverhead portion of the north shore. The community is also reported from necks of Long Island Sound (Greller 1977). It may occur in small patches farther west on Long Island to western Suffolk, Nassau and eastern Queens Counties (cf. Greller 1977). The community was also apparently reported from New York City by Harper (1917) (cf Brodo 1968).

Rank: G4 S3

Examples: Mashomack, Friars Head, Wildwood State Park, Suffolk County.

Sources: Greller 1977, Rosza and Metzler 1982, Taylor 1923, Sneddon, et. al. 1996, Brodo 1968.

Coastal oak-heath forest: a large patch to matrix low diversity hardwood forest that typically occurs on dry, well-drained, sandy soils of glacial outwash plains or moraines of the Atlantic Coastal Plain. The forest is usually codominated by two or more species of oaks: scarlet oak (*Quercus coccinea*), white oak (*Q. alba*) and black oak (*Q. velutina*). Chestnut oak (*Quercus montana*) is also a common associate. Pitch pine (*Pinus rigida*) and trees of other genera, if present, typically occur at less than 1% cover each in the canopy. American chestnut (*Castanea dentata*) may have been a common associate in these forests prior to the chestnut blight; chestnut sprouts are still found in some stands. The shrublayer is well-developed typically with a low nearly continuous cover of dwarf heaths such as

blueberries (*Vaccinium pallidum, V. angustifolium*) and black huckleberry (*Gaylussacia baccata*). The herbaceous layer is very sparse; characteristic species are bracken fern (*Pteridium aquilinum*), wintergreen (Gaultheria procumbens), and Pennsylvania sedge (*Carex pensylvanica*). Herb diversity is greatest in natural and artificial openings with species such as frostweed (*Helianthemum canadense*), false-foxlglove (*Aureolaria* spp.), bearberry (*Arctostaphylos uva-ursi*), goat's-rue (*Tephrosia virginiana*), bush-clovers (*Lespedeza* spp.), and pinweeds (*Lechea* spp.). Characteristic animals include eastern towhee (*Pipilo erythrophthalamus*) and white-tailed deer (*Odocoileus virginianus*). This community can occur with several types of barrens and woodland communities as part of the broadly defined ecosystem known as the Pine Barrens.

Distribution: Restricted to the interior portions of Coastal Lowlands Ecozone, concentrated on outwash plains and possibly knolls and mid to upper slopes of moraines. Known examples range from Hither Hills and Montauk Mountain west probably to the morainal hills of northwestern Suffolk County. Numerous examples occur in the central portion of this range (the periphery of the Long Island Pine Barrens) south of the Ronkonkoma Moraine (Greller 1977). Occurrences are more sparse in the eastern and western portions of the range. The community range possibly extends westward into eastern Nassau County on the end moraine of western Long Island and has been reported from a narrow strip of outwash on the north shore of Long Island.

Rank: G4 S3

Examples: Long Pond Greenbelt, Hither Woods, Suffolk County.

Sources: Greller 1977, Sneddon, et. al. 1996, Brodo 1968, Reschke 1990.

Coastal oak-hickory forest: a hardwood forest with oaks (*Quercus* spp.) and hickories (*Carya* spp.) codominant that occurs in dry well-drained, loamy sand of knolls, upper slopes, or south-facing slopes of glacial moraines of the Atlantic Coastal Plain. The forest is usually codominated by two or more species of oaks, usually white oak (*Q. alba*), black oak (*Quercus velutina*) and chestnut oak (*Q. montana*). Scarlet oak (*Quercus coccinea*) is also a common associate. Mixed with the oaks, usually at moderate densities, are one or more of the following hickories: pignut (*Carya glabra*), mockernut (*C. tomentosa*), and sweet pignut (*C. ovalis*). These hickories can range from nearly pure stands to as little as about 25% cover. There is typically a subcanopy stratum of small trees and tall shrubs including flowering dogwood (*Cornus florida*) and highbush blueberry (*Vaccinium corymbosum*). The shrublayer and groundlayer flora may be diverse. Common low shrubs include maple-leaf viburnum (*Viburnum acerifolium*), blueberries (*Vaccinium angustifolium, V. pallidum*) and huckleberry (*Gaylussacia baccata*). Characteristic groundlayer herbs are Swan's sedge (*Carex swanii*), panic grass (Panicum dichotomum), poverty grass (*Danthonia spicata*), cow-wheat (*Melampyrum lineare*), spotted wintergreen (*Chimaphila maculata*), rattlesnake weed (*Hieracium venosum*), white wood aster (*Aster divaricatus*), false Solomon's seal (*Smilacina racemosa*), Pennsylvania sedge (*Carex pensylvanica*), and white goldenrod (*Solidago bicolor*). Characteristic animals include eastern towhee (*Pipilo erythrophthalamus*), vireos (*Vireo* spp.), woodpeckers, and white-tailed deer (*Odocoileus virginianus*). Two or more topoedaphic variants are possible.

Distribution: Restricted to the interior portions of Coastal Lowlands Ecozone, concentrated on knolls and mid to upper slopes of the moraines. Known examples range from Mashomack west to the morainal hills of northwestern Suffolk County. Numerous examples occur in the western portion of this range while occurrences are sparse in the eastern portion. The community range possibly extends westward into northeastern Nassau County and on the end moraine of western Long Island (Greller 1977).

Rank: G4 S3

Examples: Mashomack, Wildwood State Park, Caleb Smith State Park, Suffolk County.

Sources:Greller 1977, Rosza and Metzer 1982, Sneddon, et al. 1996, Reschke 1990.

Coastal oak-holly forest: a semi-deciduous to mixed deciduous-evergreen broadleaf forest that occurs on somewhat moist and moderately well drained silt and sandy loams in low areas on morainal plateaus. The elevation afforded by the raised plateau protects these areas from overwash and salt spray. In New York State this forest is best developed on the narrow peninsulas of eastern Long Island. The trees are usually not stunted, and are far enough removed from the pruning effects of severe salt spray. The canopy of a mature stand is usually up to about 65 ft (20 m) tall. The dominant canopy trees are black oak (*Quercus velutina*), black gum (*Nyssa sylvatica*), red maple (*Acer rubrum*) and beech (*Fagus grandifolia*). Holly (*Ilex opaca*) is abundant in the subcanopy and tall shrub layers. Other characteristic trees at lower density include sassafras (*Sassafras albidum*), shadbush (*Amelanchier canadensis*), and white oak (*Quercus alba*). Vines such as Virginia creeper (*Parthenocissus quinquefolia*), poison ivy (*Toxicodendron radicans*), and greenbrier (*Smilax rotundifolia*), sawbrier (*S. glauca*), and grape (*Vitis* spp.) are at very low abundance in the understory, and usually do not grow up into the canopy. Shrubs such as highbush blueberry (*Vaccinium corymbosum*), witch hazel (*Hamamelis virginiana*), mountain laurel (*Kalmia latifolia*) and arrowwood (*Viburnum recognitum*) are common in the understory. Characteristic groundlayer herbs include New York fern (*Thelypteris noveboracensis*), star flower (*Trientalis borealis*) and Swan's sedge (*Carex swanii*). There may be small, damp depressions that are somewhat boggy; species found in these depressions include black gum (*Nyssa sylvatica*), shadbush, highbush blueberry, and chokeberry (*Aronia melanocarpa*). Characteristic fauna include white-tailed deer (*Odocoileus virginianus*) and red-eyed vireo (*Vireo olivaceus*).

Distribution: Restricted to eastern extreme of Coastal Lowlands Ecozone, concentrated on Montauk Peninsula, a morainal plateau. Known and suspected examples limited to this peninsula. Very unlikely to be found elsewhere.

Rank: G2 S1

Examples: Montauk Point, Suffolk County.

Sources: Greller 1977, Sneddon, et. al. 1996, Taylor 1923, Reschke 1990.

Coastal oak-laurel forest: a large patch low diversity hardwood forest with broadleaf canopy and evergreen subcanopy that typically occurs on dry well-drained, sandy and gravelly soils of morainal hills of the Atlantic Coastal Plain. This forest is similar to the Chestnut oak forest of the Appalachian Mountains; it is distinguished by lower abundance of chestnut oak (*Quercus montana*) and absence of red oak (*Quercus rubra*), probably correlated with the difference between the sand and gravel of glacial moraines versus the bedrock of mountains. The dominant tree is typically scarlet oak (*Quercus coccinea*). Common associates are white oak (*Q. alba*), black oak (*Q. velutina*), and chestnut oak. The shrub layer is well-developed typically with a tall, often nearly continuous cover of the evergreen heath, mountain laurel (*Kalmia latifolia*). Other characteristic shrubs include black huckleberry (*Gaylussacia baccata*) and blueberry (*Vaccinium pallidum*). The herbaceous layer is very sparse; characteristic species are bracken fern (*Pteridium aquilinum*), wintergreen (*Gaultheria procumbens*), and Pennsylvania sedge (*Carex pensylvanica*). Characteristic animals include white-tailed deer (*Odocoileus virginianus*). This forest is often associated with coastal oak-heath forest forming a forest complex on morainal hills.

Distribution: Restricted to interior portions of Coastal Lowlands Ecozone, concentrated on knolls and mid to upper slopes of moraines. Known examples range from Hither Hills west possibly to the morainal hill of northwestern Suffolk County. Several examples occur along the eastern half of the Ronkonkoma Moraine. The community range possibly extends westward into eastern Nassau County on the end moraine of western Long Island.

Rank: G3G4 S3

Examples: Hither Woods, Suffolk County.

Sources: Greller 1977, Sneddon, et. al. 1996, Reschke 1990, Thompson 1997.

Maritime beech forest: (description in progress)

Distribution: Currently known only from the town of Riverhead, Suffolk County. Historically may have occurred along the north-facing coastal bluffs of Long Island, in the Coastal Lowland Ecozone of Suffolk County.

Rank: G2 S1

Examples: Friars Head Forest, Suffolk County.

Sources: Good and Good 1970, Greller 1977.

Maritime holly forest: a broadleaf evergreen maritime strand forest that occurs in low areas on the back portions of maritime dunes. The dunes protect these areas from overwash and salt spray enough to allow forest formation. In New York State this forest is best developed and probably restricted to the barrier islands off the south shore of Long Island. The trees are usually stunted and flat-topped because the canopies are pruned by salt spray and exposed to winds; the canopy of a mature stand may be only 16 to 23 ft (5 to 7 m) tall. The dominant tree is holly (*Ilex opaca*). Other characteristic trees at lower abundance include sassafras (*Sassafras albidum*), shadbush (*Amelanchier canadensis*), postoak (*Quercus stellata*) and black oak (*Quercus velutina*). Vines such as Virginia creeper (*Parthenocissus quinquefolia*), poison ivy (*Toxicodendron radicans*), greenbrier (*Smilax rotundifolia*), sawbrier (*S. glauca*), and grape (*Vitis* spp.) are common in the understory, and they often grow up into the canopy. Shrubs such as highbush blueberry (*Vaccinium corymbosum*), bayberry (*Myrica pensylvanica*) and black huckleberry (*Gaylussacia baccata*) are common in the understory, especially at the margins of the forest. Characteristic groundlayer herbs include wild sarsaparilla (*Aralia nudicaulis*), starflower (*Smilacina stellata*), and Canada mayflower (*Maianthemum canadense*). There may be small, damp depressions that are somewhat boggy; species found in these depressions include black gum (*Nyssa sylvatica*), shadbush, highbush blueberry, and chokeberry (*Aronia melanocarpa*). More data on characteristic animals are needed.

Distribution: Restricted to southern fringe of Coastal Lowlands Ecozone, concentrated on maritime dunes of barrier islands. Known and suspected examples limited to Fire Island. Very unlikely to be found elsewhere.

Rank: G1G2 S1

Examples: Sunken Forest, Suffolk County.

Sources: Greller 1977, Sneddon, et. al. 1996, Art 1976, Reschke 1990

Red maple-sweetgum swamp: a hardwood swamp that occurs on somewhat poorly drained seasonally wet flats, usually on somewhat acidic gleyed to mottled clay loam or sandy loam. Sweetgum (*Liquidambar styraciflua*) is often the dominant tree or may be codominant with red maple (*Acer rubrum*). Other codominant trees include pin oak (*Quercus palustris*) and black gum (*Nyssa sylvatica*). Other trees occurring at lower densities include swamp white oak (*Quercus bicolor*), red oak (*Quercus rubra*) and black ash (*Fraxinus nigra*). Willow oak (*Quercus phellos*) and sweet-bay (*Magnolia virginiana*) are often present in larger occurrences where they may occur at very low density. Trees often have buttressed trunks and exposed roots from hydrological influences. The shrublayer is usually fairly well-developed. Characteristic shrubs are sweet pepperbush (*Clethra alnifolia*), swamp azalea (*Rhododendron viscosum*), arrowwood (*Viburnum recognitum*), spicebush (*Lindera benzoin*), highbush blueberry (*Vaccinium corymbosum*), black chokeberry (*Aronia melanocarpa*) and possibly fetterbush (*Leucothoe racemosa*). Vines such as greenbrier (*Smilax rotundifolia*), sawbrier (*S. glauca*), grape (*Vitis* spp.),

Virginia creeper (*Parthenocissus quinquefolia*) and poison ivy (*Toxicodendron radicans*), are present at low amounts in the understory. The herbaceous layer is often dominated by ferns, including netted chain fern (*Woodwardia aereolata*), cinnamon fern (*Osmunda cinnamomea*) and sensitive fern (*Onoclea sensibilis*). Characteristic herbs include lizard's-tail (*Saururus cernuus*), Canada mayflower

(*Maianthemum canadense*), jumpseed (*Polygonum virginianum*), skunk cabbage (*Symplocarpus foetidus*) and jewelweed (*Impatiens capensis*). State-reported Southern red oak (*Quercus falcata*) and state-extirpated mistletoe (*Phoradendron flavescens*) occur in this community south of New York and may have been historically present in this community in New York. Characteristic animals include woodpeckers and cicadas. More data on characteristic fauna are needed.

Distribution: Probably restricted to Manhattan Hills Ecozone and western part of Coastal Lowlands Ecozone (Bray, 1915). Possibly also in the Triasic Lowlands Ecozone. Known examples range from Hylan Boulevard and Bedell Avenue in the Tottenville portion of Staten Island (southernmost point in New York) north to Quaker Ridge Woods Scarsdale, Westchester County. The later site is undoubtedly the northernmost occurrence in the state (Stevens, 1992). Most occurrences are apparently concentrated in Richmond County. The community may occur or was historically present in very small patches farther east in Queens, Kings and Nassau Counties. Also likely to have been present historically in Bronx and New York Counties.

Rank: G4G5 S1S2

Examples: Magnolia Swamp, Richmond County.

Sources: Greller 1977, Sneddon, et. al. 1996, Grossman, et. al. 1994, Reschke 1990, Breden 1986, Stevens 1992, Robichaud and Buell 1973, Bray 1915.

Sea level fen: a small patch sedge-dominated fen community that occurs at the upper edge of salt marsh complexes just above sea level where there is adjoining freshwater seepage. These fens are fed by acidic and oligotrophic freshwater seepage which mixes with salt or brackish water from tidal overwash at infrequent intervals, reportedly only during unusually high tides. Thus, by definition this fen is a palustrine, rather than an estuarine, community. Soils are those of a peatland with deep sedgy peat underlain by deep sand or gravel. The fen is herb dominated but can have trees and shrubs at low percent cover. There is usually nearly 100% cover of herbaceous plants with high species diversity. Dominant plants in New York include *Eleocharis rostellata, Cladium mariscoides* and *Scirpus pungens*. Other characteristic species in New York include *Carex hormathodes, Iris prismatica, Juncus*

canadensis, Rhynchospora alba, Sanguisorba canadensis, Teuchrium canadense, Toxicodendron radicans and *Vaccinium macrocarpon*. Typical trees and shrubs include *Juniperus virginiana, Pinus rigida, Myrica pensylvanica, Baccharis halimifolia* and *Iva frutescens*.

Distribution: Restricted to estuarine portion of Coastal Lowlands Ecozone. Known examples confined to a small area in the Peconic Bay Estuary Region. Other examples expected from the large bays on the south shore of Long Island.

Rank: G1G2 S1

Examples: Northwest Creek, Suffolk County.

Sources: Ludwig 1995, NHP field surveys.

Other Conservation Links of Interest

The Natural Heritage Network: Natural Heritage Programs and Conservation Data Centres represent the largest ongoing effort in the western hemisphere to gather standardized data on endangered plants, animals, and ecosystems.

The Nature Conservancy: The Nature Conservancy is the world's leading private, international conservation group. We preserve habitats and species by saving the lands and waters they need to survive.

Association for Biodiversity Information: ABI is an independent nonprofit organization created in collaboration with the Network of Natural Heritage Programs and Conservation Data Centers and The Nature Conservancy, and is a leading source of reliable information on species and ecosystems for use in conservation and land use planning.

Biodiversity Research Institute: The New York State Biodiversity Research Institute (BRI) was created during a time of increasing awareness of the urgent need to preserve global and local biodiversity. State Education Law (Section 235-a (2,3)) of 1993 mandated the establishment of the BRI within the New York State Museum to meet these demands. The BRI is funded through the Environmental Protection Fund and includes a number of collaborators, including the Department of Environmental Conservation, the Natural Heritage Program and the Office of Parks, Recreation and Historic Preservation.

New York Natural Heritage Program Lists of Species Actively Inventoried

ANIMAL SPECIES ACTIVELY INVENTORIED
NY NATURAL HERITAGE PROGRAM - BIOLOGICAL AND CONSERVATION DATA SYSTEM

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	STATE STATUS	FED. STATUS
* GASTROPODS (SNAILS)					
NOVISUCCINEA CHITTENANGOENSIS	Chittenango ovate amber snail	G1	S1	E	LT
* BIVALVE MOLLUSKS					
ACTINONAIAS LIGAMENTINA	Mucket	G5	S1S2	U	
ALASMIDONTA HETERODON	Dwarf wedgemussel	G1G2	S1	E	LE
ALASMIDONTA VARICOSA	Brook floater	G3	S1	T	
ALASMIDONTA VIRIDIS	Slippershell	G4G5	S1S2	U	
AMBLEMA PLICATA	Threeridge	G5	S1	U	
ANODONTA IMPLICATA	Alewife floater	G5	S1S2	U	
EPIOBLASMA TORULOSA RANGIANA	Northern rifflefshell	G2T2	SP	U	LE
EPIOBLASMA TRIQUETRA	Snuffbox	G3	SH	U	
FUSCONAIA FLAVA	Wabash pigtoe	G5	S2	U	
LAMPSILIS ABRUPTA	Pink mucket	G2	SH	E	LE
LAMPSILIS CARIOSA	Yellow lampmussel	G3G4	S3	U	
LAMPSILIS FASCIOLA	Wavyrayed lampmussel	G4	S1	T	
LAMPSILIS OVATA	Pocketbook	G5	S2S3	U	
LAMPSILIS TERES	Yellow sandshell	G5	SH	U	
LASMIGONA COMPLANATA	White heelsplitter	G5	SH	U	
LASMIGONA SUBVIRIDIS	Green floater	G3	S1S2	T	
LEPTODEA FRAGILIS	Fragile papershell	G5	S3	U	
LEPTODEA OCHRACEA	Tidewater mucket	G4	S1	U	
LIGUMIA NASUTA	Eastern pondmussel	G4G5	S2S3	U	
LIGUMIA RECTA	Black sandshell	G5	S2S3	U	
MARGARITIFERA MARGARITIFERA	Eastern pearlshell	G4	S2	U	
OBOVARIA OLIVARIA	Hickorynut	G4	SH	U	
OBOVARIA SUBROTUNDA	Round hickorynut	G4	SH	U	
PLEUROBEMA CLAVA	Clubshell	G2	SH	E	LE
PLEUROBEMA SINTOXIA	Round pigtoe	G4	S1	U	
POTAMILUS ALATUS	Pink heelsplitter	G5	S2S3	U	
POTAMILUS CAPAX	Fat pocketbook	G1	SH	E	LE
POTAMILUS OHIENSIS	Pink papershell	G5	SR	U	
PTYCHOBRANCHUS FASCIOLARIS	Kidneyshell	G4G5	S2	U	
QUADRULA PUSTULOSA	Pimpleback	G5	SH	U	
QUADRULA QUADRULA	Mapleleaf	G5	SH	U	
SIMPSONAIAS AMBIGUA	Salamander mussel	G3	SH	U	
TOXOLASMA PARVUM	Lilliput	G5	SH	U	
TRUNCILLA DONACIFORMIS	Fawnsfoot	G5	SH	U	
TRUNCILLA TRUNCATA	Deertoe	G5	S1	U	
UTTERBACKIA IMBECILLIS	Paper pondshell	G5	SH	U	
VILLOSA FABALIS	Rayed bean	G1G2	S1	E	
VILLOSA IRIS	Rainbow	G5	S2S3	U	
* MAYFLIES					
SIPHLONISCA AERODROMIA	Tomah mayfly	G2	S1	E	
* DRAGONFLIES AND DAMSELFLIES					
AESHNA CLEPSYDRA	Mottled darner	G4	S3	U	
AESHNA MUTATA	Spatterdock darner	G3G4	S2	U	
AESHNA SUBARCTICA	Subarctic darner	G5	S1?	U	
ANAX LONGIPES	Comet darner	G5	S2	U	
ARGIA BIPUNCTULATA	Seepage dancer	G4	SH	U	
ARGIA TIBIALIS	Blue-tipped dancer	G5	S1	U	
ARGIA TRANSLATA	Dusky dancer	G5	S2	U	
CALOPTERYX AMATA	Superb jewelwing	G4	S3	U	
CALOPTERYX ANGUSTIPENNIS	Appalachian jewelwing	G4	SH	U	
CALOPTERYX DIMIDIATA	Sparkling jewelwing	G5	SH	U	
CORDULEGASTER ERRONEA	Tiger spiketail	G4	S1	U	
CORDULEGASTER OBLIQUA	Arrowhead spiketail	G4	S2S3	U	
ENALLAGMA LATERALE	New england bluet	G3	S2	U	
ENALLAGMA MINUSCULUM	Little bluet	G3G4	S1	T	
ENALLAGMA PICTUM	Scarlet bluet	G3	S1	T	
ENALLAGMA RECURVATUM	Pine barrens bluet	G3	S1S2	T	

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ANIMAL SPECIES ACTIVELY INVENTORIED
NY NATURAL HERITAGE PROGRAM - BIOLOGICAL AND CONSERVATION DATA SYSTEM

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	STATE STATUS	FED. STATUS
* DRAGONFLIES AND DAMSELFLIES (continued)					
GOMPHAESCHNA ANTILOPE	Taper-tailed darner	G4	S1	U	
GOMPHUS ABBREVIATUS	Spine-crowned clubtail	G3G4	S2S3	U	
GOMPHUS FRATERNUS	Midland clubtail	G5	S1S3	U	
GOMPHUS QUADRICOLOR	Rapids clubtail	G3G4	S1S2	U	
GOMPHUS ROGERSI	Sable clubtail	G4	S1	U	
GOMPHUS SEPTIMA	Septima's clubtail	G2	S1	U SC	
GOMPHUS VASTUS	Cobra clubtail	G5	SH	U	
GOMPHUS VENTRICOSUS	Skillet clubtail	G3	SH	U	
GOMPHUS VIRIDIFRONS	Green-faced clubtail	G3	S1	U	
HETAERINA AMERICANA	American rubyspot	G5	S2S3	U	
ISCHNURA KELLICOTTI	Lilypad forktail	G5	S2	U	
ISCHNURA RAMBURII	Rambur's forktail	G5	S2	U	
LANTHUS PARVULUS	Northern pygmy clubtail	G4	S3S4	U	
LIBELLULA AURIPENNIS	Golden-winged skimmer	G5	SR	U	
LIBELLULA FLAVIDA	Yellow-sided skimmer	G5	SH	U	
LIBELLULA NEEDHAMI	Needham's skimmer	G5	S2S3	U	
NEHALENNIA INTEGRICOLLIS	Southern sprite	G5	S1	U SC	
OPHIOGOMPHUS ANOMALUS	Extra-striped snaketail	G3	S1	U SC	
OPHIOGOMPHUS ASPERSUS	Brook snaketail	G3G4	S2	U	
OPHIOGOMPHUS COLUBRINUS	Boreal snaketail	G5	S1	U	
OPHIOGOMPHUS HOWEI	Pygmy snaketail	G3	S1	U SC	
PROGOMPHUS OBSCURUS	Common sanddragon	G5	S1	U SC	
SOMATOCHLORA ALBICINCTA	Ringed emerald	G5	SH	U	
SOMATOCHLORA CINGULATA	Lake emerald	G5	S1	U	
SOMATOCHLORA FORCIPATA	Forcipate emerald	G5	S1	U	
SOMATOCHLORA HINEANA	Hine's emerald	G2G3	SP	U	LE
SOMATOCHLORA INCURVATA	Incurvate emerald	G4	S1	U	
SOMATOCHLORA KENNEDYI	Kennedy's emerald	G5	SR	U	
SOMATOCHLORA LINEARIS	Mocha emerald	G5	S2S3	U	
SOMATOCHLORA MINOR	Ocellated emerald	G5	S2S3	U	
STYLURUS AMNICOLA	Riverine clubtail	G3	SH	U	
STYLURUS NOTATUS	Elusive clubtail	G3	SH	U	
STYLURUS PLAGIATUS	Russet-tipped clubtail	G5	S1	U	
STYLURUS SCUDDERI	Zebra clubtail	G4	S3	U	
STYLURUS SPINICEPS	Arrow clubtail	G5	S2	U	
SYMPETRUM DANAE	Black meadowhawk	G5	S2S3	U	
TACHOPTERYX THOREYI	Gray petaltail	G4	S2	U SC	
TETRAGONEURIA SEMIAQUEA	Mantled baskettail	G4	SH	U	
WILLIAMSONIA FLETCHERI	Ebony boghaunter	G3G4	S1	U	
WILLIAMSONIA LINTNERI	Ringed boghaunter	G2	SH	U	
* BEETLES					
CICINDELA ABDOMINALIS	A tiger beetle	G5	SH	U	
CICINDELA ANCOCISCONENSIS	A tiger beetle	G3	S1	U	
CICINDELA DORSALIS	A tiger beetle	G4	SX	U	(PS)
CICINDELA DORSALIS DORSALIS	Northeastern beach tiger beetle	G4T2	SX	T	LT
CICINDELA MARGINIPENNIS	Cobblestone tiger beetle	G2G3	S1	U	
CICINDELA PATRUELA	A tiger beetle	G3	SH	U	
CICINDELA PATRUELA CONSENTANEA	A tiger beetle	G3T2	SH	U	
CICINDELA PURITANA	Puritan tiger beetle	G1G2	SR	U	LT
CICINDELA UNIPUNCTATA	A tiger beetle	G4	SH	U	
HYGROTUS SYLVANUS	Sylvan hygrotus diving beetle	G1	SH	U	
LORDITHON NIGER	Black lordithon rove beetle	G1	SH	U	
NICROPHORUS AMERICANUS	American burying beetle	G1	SH	E	LE

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SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	STATE STATUS	FED. STATUS
* MOTHS					
ABAGROTIS CRUMBI BENJAMINI	Coastal heathland cutworm	G4T3	S1S3	U	
ACRONICTA ALBARUFA	Barrens dagger moth	G3G4	S1	U	
AGROTIS OBLIQUA	A noctuid moth	G?	S1	U	
AMPHIPOEA EREPTA RYENSIS	A noctuid moth	GUT1Q	S1	U	
ANISOTA STIGMA	Spiny oakworm	G5	SU	U	
APAMEA BURGESSI	A noctuid moth	G4	SU	U	
APHARETRA DENTATA	A noctuid moth	G4	S1S2	U	
CATOCALA CONSORS SORSCONI	The consort	G4T2T4	SH	U	
CATOCALA HERODIAS GERHARDI	Herodias underwing	G3T3	S2S3	U	
CATOCALA JAIR SSP 2	Jair underwing	G4T4	S1S2	U	
CATOCALA PRETIOSA PRETIOSA	Precious underwing	G4T2T3	SR	U	
CATOPYRRHA COLORARIA	Broad-lined catopyrrha	G4	S2S3	U	
CERMA CORA	Bird dropping moth	G3G4	S1S3	U	
CHAETAGLAEA CERATA	A noctuid moth	G3G4	S1S2	U	
CHYTONIX RUPERTI	A noctuid moth	GUQ	S1	U	
CHYTONIX SENSILIS	A noctuid moth	G4	S1S3	U	
CISTHENE PACKARDII	Packard's lichen moth	G5	SU	U	
CITHERONIA REGALIS	Regal moth	G5	S1	U	
CITHERONIA SEPULCRALIS	Pine devil	G5	S1	U	
DATANA RANAECEPS	A hand-maid moth	G3G4	S1	U	
DERRIMA STELLATA	Pink star moth	G4	SP	U	
EACLES IMPERIALIS IMPERIALIS	Imperial moth	G5T5	SU	U	
EUCOPTOCNEMIS FIMBRIARIS	A noctuid moth	G4	S1	U	
EUXOA DREWSENI THANATOLOGIA	A noctuid moth	G4T4	SH	U	
EUXOA PLEURITICA	A noctuid moth	G4	S2S3	U	
EUXOA VIOLARIS	Violet dart	G4	SU	U	
FAGITANA LITTERA	A noctuid moth	G4	S2S3	U	
FARONTA RUBRIPENNIS	The pink streak	G3G4	SU	U	
GLENA COGNATARIA	Blueberry gray	G4	S1S3	U	
GRAMMIA ANNA	Anna tiger moth	G5	SU	U	
GRAMMIA PHYLLIRA	Phyllira tiger moth	G4	SH	U	
HEMARIS GRACILIS	Graceful clearwing	G3G4	S2?	U	
HEMILEUCA MAIA MAIA	Coastal barrens buckmoth	G4T2T3	S2	U	SC
HEMILEUCA MAIA SSP 3	Inland barrens buckmoth	G4T1T2	S1	U	SC
HEMILEUCA SP 1	Bog buckmoth	G1Q	S1	E	
HETEROCAMPA VARIA	A notodontid moth	G3G4	S1S2	U	
HYDRAECIA STRAMENTOSA	A noctuid moth	G4	S1S3	U	
HYPERSTROTIA FLAVIGUTTATA	Yellow-spotted graylet	G4	SU	U	
ITAME SP 1	Barrens itame	G3	S1	U	
LAMBDINA CANITIARIA	A looper moth	GH	SH	U	
LEPTOSTALES RUBROMARGINARIA	Dark-ribboned wave	G?	SU	U	
LITHOPHANE LEPIDA LEPIDA	A noctuid moth	G4T3T4	S1	E	
LITHOPHANE THAXTERI	Thaxter's pinion moth	G4	SU	U	
LITHOPHANE VIRIDIPALLENS	Pale green pinion moth	G4	SH	U	
MACROCHILO BIVITTATA	A noctuid moth	G3G4	SU	U	
MEROLONCHE DOLLI	Doll's merolonche	G3G4	SH	U	
METALECTRA RICHARDSI	Richard's fungus moth	G4	SU	U	
METARRANTHIS APICIARIA	Barrens metarranthis moth	GU	SH	U	
MONOLEUCA SEMIFASCIA	A slug moth	G4G5	S1	U	
MORRISONIA MUCENS	Gray woodgrain	G4G5	S1S3	U	
ORGYIA DETRITA	A tussock moth	G4	SH	U	
ORTHODES OBSCURA	A notodontid moth	G4	S1?	U	
PAECTES ABROSTOLELLA	A notodontid moth	G4	S1	U	
PAPAIPEMA APPASSIONATA	Pitcher plant borer	G4	SU	U	
PAPAIPEMA AWEME	Aweme borer	GH	SH	U	
PAPAIPEMA MARGINIDENS	A borer moth	G4	SH	U	
PAPAIPEMA MARITIMA	Maritime sunflower borer	G4	SH	U	
PAPAIPEMA SP 2	Ostrich fern borer	G3G4	S1?	U	
PAPAIPEMA STENOCELIS	Chain fern borer moth	G4	S1?	U	
PSECTRAGLAEA CARNOSA	Pink sallow	G3	S2	U	
PYREFERRA CEROMATICA	Annointed sallow moth	GU	SX	U	

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* MOTHS (continued)					
RHODOECIA AURANTIAGO	Aureolaria seed borer	G4	SU	U	
RICHIA ACCLIVIS	A noctuid moth	G4G5	S2S3	U	
SCHINIA TUBERCULUM	Golden aster flower moth	G4	S2	U	
SCHIZURA APICALIS	Plain schizura	GU	SU	U	
SEMIOTHISA BANKSIANAE	A geometrid moth	G4	S1	U	
SEMIOTHISA DENTICULATA	A geometrid moth	G?	S1	U	
SEMIOTHISA MELLISTRIGATA	Honey-streak	G?	SU	U	
SYNANTHEDON CASTANEAE	Chestnut clearwing moth	G3G5	SH	U	
SYNEDOIDA ADUMBRATA	A noctuid moth	G?	S1S2	U	
XYLENA THORACICA	Acadian swordgrass moth	G4	S1S2	U	
ZALE CUREMA	A noctuid moth	G3G4	SU	U	
ZALE LARGERA	A noctuid moth	G4	S1	U	
ZALE SP 1	Pine barrens zale	G3Q	SU	U	
ZANCLOGNATHA MARTHA	Pine barrens zanclognatha	G4	S1S2	U	
* BUTTERFLIES AND SKIPPERS					
ASTEROCAMPA CLYTON	Tawny emperor	G5	S3	U	
ATRYTONE AROGOS AROGOS	Arogos skipper	G3G4T1T	SH	E	
ATRYTONOPSIS HIANNA	Dusted skipper	G4G5	S3	U	
CALEPHELIS BOREALIS	Northern metalmark	G3G4	SH	U	
CALLOPHRYS HENRICI	Henry's elfin	G5	S2S3	U	
CALLOPHRYS HESSELI	Hessel's hairstreak	G3G4	S1	E	
CALLOPHRYS IRUS	Frosted elfin	G3	S1S3	T	
CALLOPHRYS LANORAIEENSIS	Bog elfin	G3G4	SR	U	
CALPODES ETHLIUS	Brazilian skipper	G5	SH	U	
CALYCOPIS CECROPS	Red-banded hairstreak	G5	SU	U	
CELASTRINA NEGLECTAMAJOR	Appalachian blue	G4	S3	U	
CHLOSYNE GORGONE	Gorgone checkerspot	G5	S1	U	
ERYNNIS MARTIALIS	Mottled duskywing	G3G4	S1S3	U	
ERYNNIS PERSIUS PERSIUS	Persius duskywing	G5T2T3	SH	E	
EUCHLOE OLYMPIA	Olympia marble	G4G5	S1	U	
FIXSENIA FAVONIUS ONTARIO	Northern hairstreak	G4T4	S1S3	U	
GLAUCOPSYCHE LYGDAMUS LYGDAMUS	Silvery blue	G5T4	SH	U	
LYCAEIDES MELISSA SAMUELIS	Karner blue	G5T2	S1S2	E	LE
OENEIS JUTTA	Jutta arctic	G5	S1	U	
PANOQUINA PANOQUIN	Salt marsh skipper	G5	SU	U	
PAPILIO CRESPHONTES	Giant swallowtail	G5	SZN	U	
PARRHASIUS MALBUM	White-m hairstreak	G5	SU	U	
PHYCIODES BATESII BATESII	Tawny crescent	G4T1	SH	U	
PIERIS VIRGINIENSIS	West virginia white	G3G4	SU	U	
POANES VIATOR VIATOR	Broad-winged skipper	G5T4	S3	U	
POLYGONIA GRACILIS	Hoary comma	G5	S3	U	
PONTIA PROTODICE	Checkered white	G5	SA	U	
PYRGUS WYANDOT	Southern grizzled skipper	G2	SH	E	
SATYRIUM EDWARDSII	Edwards' hairstreak	G4	S3S4	U	
SPEYERIA IDALIA	Regal fritillary	G3	SH	E	
* FISH					
ACANTHARCHUS POMOTIS	Mud sunfish	G5	S1	T	
ACIPENSER BREVIROSTRUM	Shortnose sturgeon	G3	S1	E	LE
ACIPENSER FULVESCENS	Lake sturgeon	G3	S1	T	
ACIPENSER OXYRINCHUS	Atlantic sturgeon	G3	S1	P	(LT-C)
ALOSA MEDIOCRIS	Hickory shad	G5	S2	U	
APHREDODERUS SAYANUS	Pirate perch	G5	S1	U	
APLODINOTUS GRUNNIENS	Freshwater drum	G5	S2	U	
CARPIODES CYPRINUS	Quillback	G5	S2	U	
COREGONUS HOYI	Bloater	G4	SX	U	
COREGONUS KIYI	Kiyi	G3	SX	U	
COREGONUS REIGHARDI	Shortnose cisco	G1	SX	U	
COREGONUS ZENITHICUS	Shortjaw cisco	G2	SX	U	
COTTUS RICEI	Spoonhead sculpin	G5	SX	E	

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* FISH (continued)					
ENNEACANTHUS GLORIOSUS	Bluespotted sunfish	G5	S2	U	
ENNEACANTHUS OBESUS	Banded sunfish	G5	S2	T	
ERIMYSTAX DISSIMILIS	Streamline chub	G4	S1	U SC	
ERIMYSTAX X-PUNCTATUS	Gravel chub	G4	S1	T	
ERIMYZON SUCETTA	Lake chubsucker	G5	S1	T	
ETHEOSTOMA CAMURUM	Bluebreast darter	G4	S1	E	
ETHEOSTOMA EXILE	Iowa darter	G5	S2	U	
ETHEOSTOMA FUSIFORME	Swamp darter	G5	S1	T	
ETHEOSTOMA MACULATUM	Spotted darter	G2	S1	T	
ETHEOSTOMA PELLUCIDUM	Eastern sand darter	G3	S1	T	
ETHEOSTOMA VARIATUM	Variegate darter	G5	S2	U	
EXOGLOSSUM LAURAE	Tonguetied minnow	G4	S2	U	
FUNDULUS LUCIAE	Spotfin killifish	G4	S1	U	
HIODON TERGISUS	Mooneye	G5	S1	T	
ICHTHYOMYZON BDELLIUM	Ohio lamprey	G3G4	S1	U	
ICHTHYOMYZON FOSSOR	Northern brook lamprey	G4	S1	U	
ICHTHYOMYZON GREELEYI	Mountain brook lamprey	G3G4	S1	U SC	
LEPISOSTEUS OCULATUS	Spotted gar	G5	S1	U	
LEPOMIS MEGALOTIS	Longear sunfish	G5	S1	T	
LYTHRURUS UMBRATILIS	Redfin shiner	G5	S2	U SC	
MACRHYBOPSIS STORERIANA	Silver chub	G5	SX	E	
MENIDIA BERYLLINA	Inland silverside	G5	S2S3	U	
MENIDIA MENIDIA	Atlantic silverside	G5	S2S3	U	
MOXOSTOMA CARINATUM	River redhorse	G4	S2?	U	
MOXOSTOMA DUQUESNEI	Black redhorse	G5	S2	U SC	
MOXOSTOMA VALENCIENNESI	Greater redhorse	G3	S2	U	
MYOXOCEPHALUS THOMPSONI	Deepwater sculpin	G5	SX	E	
NOTROPIS AMBLOPS	Bigeye chub	G5	S2	U	
NOTROPIS ANOGENUS	Pugnose shiner	G3	S1	E	
NOTROPIS BUCCATUS	Silverjaw minnow	G5	S1	U	
NOTROPIS CHALYBAEUS	Ironcolor shiner	G4	S1	U SC	
NOTROPIS HETERODON	Blackchin shiner	G5	S1	U	
NOTROPIS PHOTOGENIS	Silver shiner	G5	S2	U	
NOTROPIS PROCNE	Swallowtail shiner	G5	S2	U	
NOTURUS MIURUS	Brindled madtom	G5	S1	U	
PERCINA COPELANDI	Channel darter	G4	S2	U	
PERCINA EVIDES	Gilt darter	G4	SH	E	
PERCINA MACROCEPHALA	Longhead darter	G3	S1	T	
POLYODON SPATHULA	Paddlefish	G4	SX	EP	
PROSOPIUM CYLINDRACEUM	Round whitefish	G5	S1	E	
STIZOSTEDION CANADENSE	Sauger	G5	S1	U	
STRONGYLURA MARINA	Atlantic needlefish	G5	S2S3	U	
* AMPHIBIANS					
ACRIS CREPITANS	Northern cricket frog	G5	S1	E	
AMBYSTOMA TIGRINUM	Tiger salamander	G5	S2S3	E	(PS)
CRYPTOBRANCHUS ALLEGANIENSIS	Hellbender	G4	S2	U SC	
EURYCEA LONGICAUDA	Longtail salamander	G5	S2S3	U SC	
RANA SPHENOCEPHALA	Southern leopard frog	G5	S2S3	G SC	
* REPTILES					
CARETTA CARETTA	Loggerhead	G3	SZN	T	LT
CHELONIA MYDAS	Green turtle	G3	SZN	T	(LE-LT)
CLEMMYS MUHLENBERGII	Bog turtle	G3	S2	E	(LT-T(S/A))
CROTALUS HORRIDUS	Timber rattlesnake	G4	S3	T	
DERMOCHELYS CORIACEA	Leatherback	G3	SZN	E	LE
EMYDOIDEA BLANDINGII	Blanding's turtle	G4	S2S3	T	
ERETMOCHELYS IMBRICATA	Hawksbill	G3	SR	E	LE
ERETMOCHELYS IMBRICATA IMBRICATA	Atlantic hawksbill	G3T3	SR	E	(LE)
EUMECES ANTHRACINUS	Coal skink	G5	S2S3	U	

ANIMAL SPECIES ACTIVELY INVENTORIED
NY NATURAL HERITAGE PROGRAM - BIOLOGICAL AND CONSERVATION DATA SYSTEM

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	STATE STATUS	FED. STATUS
* REPTILES (Continued)					
KINOSTERNON SUBRUBRUM	Eastern mud turtle	G5	S1	E	
LEPIDOCHELYS KEMPII	Kemp's or atlantic ridley	G1	S1N	E	LE
REGINA SEPTEMVITTATA	Queen snake	G5	S1	E	
SCELOPORUS UNDULATUS	Fence lizard	G5	S1	T	
SISTRURUS CATENATUS CATENATUS	Eastern massasauga	G3G4T3T	S1	E	
TRIONYX SPINIFERUS	Spiny softshell	G5	S2S3	U SC	
* BIRDS					
AMMODRAMUS HENSLOWII	Henslow's sparrow	G4	S3B,SAN	T	
AMMODRAMUS MARITIMUS	Seaside sparrow	G4	S2S3	P SC	(PS)
AQUILA CHRYSAETOS	Golden eagle	G5	SHB,S1N	E	
ARDEA ALBA	Great egret	G5	S2	P	
ARDEA HERODIAS	Great blue heron	G5	S5	P	
ASIO FLAMMEUS	Short-eared owl	G5	S2	E	
BARTRAMIA LONGICAUDA	Upland sandpiper	G5	S3B	T	
BUBULCUS IBIS	Cattle egret	G5	S2	P	
CAPRIMULGUS CAROLINENSIS	Chuck-will's-widow	G5	S2	P	
CATHARUS BICKNELLI	Bicknell's thrush	G4	S2S3B	P SC	
CHARADRIUS MELODUS	Piping plover	G3	S3B	E	(LE-LT)
CHLIDONIAS NIGER	Black tern	G4	S2B	E	
CIRCUS CYANEUS	Northern harrier	G5	S3B,S3N	T	
CISTOTHORUS PLATENSIS	Sedge wren	G5	S3B,SAN	T	
DENDROICA CASTANEA	Bay-breasted warbler	G5	S2	P	
DENDROICA DOMINICA	Yellow-throated warbler	G5	S1	P	
DENDROICA PALMARUM	Palm warbler	G5	S1	P	
DENDROICA TIGRINA	Cape may warbler	G5	S2	P	
EGRETTA CAERULEA	Little blue heron	G5	S2	P	
EGRETTA THULA	Snowy egret	G5	S2S3	P	
EGRETTA TRICOLOR	Tricolored heron	G5	S2	P	
EMPIDONAX FLAVIVENTRIS	Yellow-bellied flycatcher	G5	S3	P	
FALCIPENNIS CANADENSIS	Spruce grouse	G5	S2	E	
FALCO PEREGRINUS	Peregrine falcon	G4	S3B,SZN	E	
GAVIA IMMER	Common loon	G5	S3S4	P SC	
GUIRACA CAERULEA	Blue grosbeak	G5	S1	P	
HALIAEETUS LEUCOCEPHALUS	Bald eagle	G4	S2S3B,S	T	(PS)
IXOBRYCHUS EXILIS	Least bittern	G5	S3B,S1N	T	
LANIUS LUDOVICIANUS	Loggerhead shrike	G5	S1B,SZN	E	(PS)
LARUS ATRICILLA	Laughing gull	G5	S1	P	
LATERALLUS JAMAICENSIS	Black rail	G4	S1B,SZN	E	
NYCTANASSA VIOLACEA	Yellow-crowned night-heron	G5	S2	P	
OPORORNIS FORMOSUS	Kentucky warbler	G5	S2	P	
OXYURA JAMAICENSIS	Ruddy duck	G5	S1	G	
PICOIDES TRIDACTYLUS	Three-toed woodpecker	G5	S2	P	
PLEGADIS FALCINELLUS	Glossy ibis	G5	S2	P	
PODILYMBUS PODICEPS	Pied-billed grebe	G5	S3B,S1N	T	
PROTONOTARIA CITREA	Prothonotary warbler	G5	S2	P	
QUISCALUS MAJOR	Boat-tailed grackle	G5	S1	P	
RALLUS ELEGANS	King rail	G4G5	S1B,SZN	T	
RYNCHOPS NIGER	Black skimmer	G5	S2	P SC	
SPIZELLA PALLIDA	Clay-colored sparrow	G5	S2	P	
STERNA ANTILLARUM	Least tern	G4	S3B	T	(PS)
STERNA CASPIA	Caspian tern	G5	S1	P	
STERNA DOUGALLII	Roseate tern	G4	S1B	E	(PS)
STERNA FORSTERI	Forster's tern	G5	S1	P	
STERNA HIRUNDO	Common tern	G5	S3B	T	
STERNA NILOTICA	Gull-billed tern	G5	S1	P	
STURNELLA NEGLECTA	Western meadowlark	G5	S1	P	
TYTO ALBA	Barn owl	G5	S3	P	
VERMIVORA PEREGRINA	Tennessee warbler	G5	S2	P	
WILSONIA PUSILLA	Wilson's warbler	G5	S1	P	

cb: a.list.pub

ANIMAL SPECIES ACTIVELY INVENTORIED
NY NATURAL HERITAGE PROGRAM - BIOLOGICAL AND CONSERVATION DATA SYSTEM

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	STATE STATUS	FED. STATUS
* MAMMALS					
BALAENOPTERA PHYSALUS	Fin whale	G3G4	S1	E	LE
CRYPTOTIS PARVA	Least shrew	G5	SH	U	
FELIS CONCOLOR COUGUAR	Eastern cougar	G5TH	SX	E	LE
MUSTELA NIVALIS	Least weasel	G5	SH	G	
MYOTIS LEIBII	Eastern small-footed myotis	G3	S2	U SC	
MYOTIS SODALIS	Indiana or social myotis	G2	S1	E	LE
NEOTOMA MAGISTER	Allegheny woodrat	G3G4	SH	E	
PHOCA VITULINA	Harbor seal	G5	S3	P	
SYLVILAGUS TRANSITIONALIS	New england cottontail	G4	SH	G SC	
TURSIOPS TRUNCATUS	Bottle-nosed dolphin	G5	S3	U	
* OTHERS					
ANADROMOUS FISH CONCENTRATION AREA	Anadromous fish concentration area		S3	U	
BAT HIBERNACULUM	Bat hibernaculum		S?	U	
COLD WATER FISH SPAWNING AREA	Cold water fish spawning area		S?	U	
GULL NESTING COLONY	Gull nesting colony		S?	U	
RAPTOR CONCENTRATION AREA	Raptor concentration area		S?	U	
WARM WATER FISH CONCENTRATION AREA	Warm water fish concentration area		S4	U	
WATERFOWL CONCENTRATION AREA	Waterfowl concentration area		S3S4	U	
WESTERN HEMISPHERE ROOKERY	Western hemisphere rookery	G5	S3	U	

358 Records Processed

EXPLANATION OF NEW YORK NATURAL HERITAGE RANKS AND CODES

NY NATURAL HERITAGE GLOBAL AND STATE RANKS:

Each element has a global and state rank as determined by the NY Natural Heritage Program. These ranks carry no legal weight. The global rank reflects the rarity of the element throughout the world and the state rank reflects the rarity within New York State. Infraspecific taxa are also assigned a taxon rank to reflect the infraspecific taxon's rank throughout the world.

GLOBAL RANK:

G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences), or very few remaining acres, or miles of stream) or especially vulnerable to extinction because of some factor of its biology.

G2 = Imperiled globally because of rarity (6 - 20 occurrences, or few remaining acres, or miles of stream) or very vulnerable to extinction throughout its range because of other factors.

G3 = Either rare and local throughout its range (21 to 100 occurrences), or found locally (even abundantly at some of its locations) in a restricted range (e.g. a physiographic region), or vulnerable to extinction throughout its range because of other factors.

G4 = Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.

G5 = Demonstrably secure globally, though it may be quite rare

GH = Historically known, with the expectation that it might be rediscovered.

GX = Species believed to be extinct.

GU = Status unknown.

STATE RANK:

S1 = Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology making it especially vulnerable in New York State.

S2 = Typically 6 to 20 occurrences, few remaining individuals, acres, or miles of stream, or factors demonstrably making it very vulnerable in New York State.

S3 = Typically 21 to 100 occurrences, limited acreage, or miles of stream in New York State.

S4 = Apparently secure in New York State.

S5 = Demonstrably secure in New York State.

SH = Historically known from New York State, but not seen in the past 15 - 20 years.

SX = Apparently extirpated from New York State.

SE = Exotic, not native to New York State.

SR = State report only, no verified specimens known from New York State.

SU = Status unknown.

TAXON (T) RANK:

The T-ranks (T1 - T5) are defined the same way the Global ranks (G1 - G5) are, but the T-rank only refers to the rarity of the subspecific taxon.

T1 through T5 = see Global Rank definitions above.

Q = Indicates a question exists whether or not the taxon is a good taxonomic entity.

? = Indicates a question exists about the rank.

NEW YORK STATE LEGAL STATUS - ANIMALS:

Categories of Endangered and Threatened species are defined in New York State Environmental Conservation Law section 11-0535. Endangered, Threatened, and Special Concern species are listed in regulation 6NYCRR 182.5.

E = Endangered Species: any species which meet one of the following criteria:

1. Any native species in imminent danger of extirpation
2. Any species listed as endangered by the United States Department of the Interior, as enumerated in the Code of Federal Regulations 50 CFR 17.11.

T = Threatened Species: any species which meet one of the following criteria:

1. Any native species likely to become an endangered species within the foreseeable future in New York.
2. Any species listed as threatened by the U.S. Department of the Interior, as enumerated in the Code of the Federal Regulations 50 CFR 17.11.

SC = Special Concern Species: those species which are not yet recognized as endangered or threatened, but for which documented concern exists for their continued welfare in New York. Unlike the first two categories, species of special concern receive no additional legal protection under Environmental Conservation Law section 11-0535 (Endangered and Threatened Species).

P = Protected Wildlife (defined in Environmental Conservation Law section 11-0103): wild game, protected wild birds, and endangered species of wildlife.

U = Unprotected (defined in Environmental Conservation Law section 11-0103): the species may be taken at any time without limit; however a licence to take may be required.

G = Game (defined in Environmental Conservation Law section 11-0103): any of a variety of big game or small game species as stated in the Environmental Conservation Law; many normally have an open season for at least part of the year, and are protected at other times.

NEW YORK STATE LEGAL STATUS - PLANTS:

The following catagories are defined in regulation 6NYCRR part 193.3 and apply to New York State Environmental Conservation Law section 9-1503.

(blank) = no state status

E = Endangered Species: listed species are those with:

1. 5 or fewer extant sites, or
2. Fewer than 1,000 individuals, or
3. Restricted to fewer than 4 U.S.G.S. 7 1/2 minute topographical maps, or
4. Species listed as endangered by U.S. Department of Interior, as enumerated in Code of Federal Regulations 50 CFR 17.11.

T = Threatened: listed species are those with:

1. 6 to fewer than 20 extant sites, or
2. 1,000 to fewer than 3,000 individuals, or
3. Restricted to not less than 4 or more than 7 U.S.G.S. 7 1/2 minute topographical maps, or
4. Listed as threatened by U.S. Department of Interior, as enumerated in Code of Federal Regulations 50 CFR 17.11.

R = Rare: listed species have:

1. 20 to 35 extant sites, or
2. 3,000 to 5,000 individuals statewide.

V = Exploitably vulnerable: listed species are likely to become threatened in the near future throughout all or a significant portion of their range within the state if causal factors continue unchecked.

FEDERAL STATUS (PLANTS and ANIMALS):

The catagories of federal status are defined by the United States Department of the Interior as part of the 1974 Endangered Species Act (see Code of Federal Regulations 50 CFR 17). The species listed under this law are enumerated in the Federal Register vol. 50, no. 188, pp. 39526 - 39527. The codes below without parentheses are those used in the Federal Register. The codes below in parentheses are created by Heritage to deal with species which have different listings in different parts of their range, and/or different listings for different subspecies or varieties.

(blank) =	No Federal Endangered Species Act status.
LE =	The element is formally listed as endangered.
LT =	The element is formally listed as threatened.
E/SA =	The element is treated as endangered because of similarity of appearance to other endangered species or subspecies.
PE =	The element is proposed as endangered.
PT =	The element is proposed as threatened.
C =	The element is a candidate for listing.
(LE) =	If the element is a full species, all subspecies or varieties are listed as endangered; if the element is a subspecies, the full species is listed as endangered.
(LE-LT) =	The species is formally listed as endangered in part of its range, and as threatened in the other part; or, one or more subspecies or varieties is listed as endangered, and the others are listed as threatened.
(LT-C) =	The species is formally listed as threatened in part of its range, and as a candidate for listing in the other part; or, one or more subspecies or varieties is listed as threatened, and the others are candidates for listing.
(LT-(T/SA)) =	One or more subspecies or populations of the species is formally listed as threatened, and the others are treated as threatened because of similarity of appearance to the listed threatened subspecies or populations.
(PS) =	Partial status: the species is listed in parts of its range and not in others; or, one or more subspecies or varieties is listed, while the others are not listed.

New York Natural Heritage Program Report

New York State Department of Environmental Conservation
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **FAX:** (518) 402-8925
Website: www.dec.state.ny.us

Erin M. Crotty
Commissioner

August 30, 2001

Brian Mulhearn
Maxim Technologies Inc
1908 Innerbelt Business Center Dr.
St. Louis, MO 63114-5700

Dear Mr. Mulhearn:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the proposed Niagara Falls Storage Site Remedial Investigation, site as indicated on the map you provided, located in the Towns of Lewiston and Porter, Niagara County.

Enclosed is a report of rare or state-listed animals and plants, significant natural communities, and other significant habitats, which our databases indicate occur, or may occur, on your site or in the immediate vicinity of your site. The information contained in this report is considered sensitive and may not be released to the public without permission from the New York Natural Heritage Program.

The presence of rare species may result in your project requiring additional permits, permit conditions, or review. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, at the enclosed address.

For most sites, comprehensive field surveys have not been conducted, the enclosed report only includes records from our databases. We cannot provide a definitive statement on the presence or absence of all rare or state-listed species or significant natural communities. This information should not be substituted for on-site surveys that may be required for environmental impact assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

Sincerely,
Heidi Krahling jp
Heidi J. Krahling, Information Services
NY Natural Heritage Program

Encs.
cc: Reg. 9, Wildlife Mgr.
Reg. 9, Fisheries Mgr.

* * * * * PLEASE NOTE THE ABOVE NEW ADDRESS * * * * *

Natural Heritage Report on Rare Species and Ecological Communities

Prepared 27 August 2001 by NY Natural Heritage Program, NYS DEC, Albany, New York

This report contains SENSITIVE information that should be treated in a sensitive manner -- Please see cover letter. Refer to the Users' Guide for explanations of codes, ranks, and fields.
We do not always provide maps of locations of species most vulnerable to disturbance, nor of some records whose locations and/or extents are not precisely known or are too large to display.

* County
** Town

Scientifc Name, COMMON NAME, & Group Name	NY Legal Status, Heritage Ranks, & Federal Status	EO Rank, Last Seen, & Acreage	Detailed Location	General Habitat and Quality	Office Use
NIAGARA LEWISTON					
Arabis drummondii DRUMMOND'S ROCK CRESS Vascular Plant	ENDANGERED G5; S1S2	H 1893-05-27 0.00	LEWISTON (LEWISTON).		4307828

1 Records Processed

DIVISION OF ENVIRONMENTAL PERMITS

June 2001

REGION	COUNTIES	REGIONAL PERMIT ADMINISTRATORS
1	Nassau & Suffolk Telephone: (631) 444-0365	John Pavacic NYS-DEC BLDG. 40 SUNY at Stony Brook Stony Brook, NY 11790-2356
2	New York City (Boroughs of Manhattan, Brooklyn, Bronx, Queens, & Staten Island Telephone: (718) 482-4997	John Cryan NYS-DEC One Hunters Point Plaza 47-40 21st Street Long Island City, NY 11101-5407
3	Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster & Westchester Telephone: (845) 256-3054	Margaret Duke (Peg) NYS-DEC 21 South Putt Corners Road New Paltz, NY 12561-1696
4	Albany, Columbia, Greene, Montgomery, Rensselaer & Schenectady Telephone: (518) 357-2069	William Clarke NYS-DEC 1150 North Wescott Road Schenectady, NY 12306-2014
4 (sub-office)	Delaware, Otsego & Schoharie Telephone: (607) 652-7741	John Feltman NYS-DEC Route 10 HCR#1, Box 3A Stamford, NY 12167-9503
5	Clinton, Essex, Franklin & Hamilton Telephone: (518) 897-1234	Richard Wild NYS-DEC Route 86, PO Box 296 Ray Brook, NY 12977-0296
5 (sub-office)	Fulton, Saratoga, Warren & Washington Telephone: (518) 623-3671	Thomas Hall* NYS-DEC County Route 40 PO Box 220 Warrensburg, NY 12885-0220
6	Jefferson, Lewis & St. Lawrence Telephone: (315) 785-2245	Brian Fenlon NYS-DEC State Office Building 317 Washington Street Watertown, NY 13601-3787
6 (sub-office)	Herkimer & Oneida Telephone: (315) 793-2555	J. Joseph Homburger* NYS-DEC State Office Building 207 Genesee Street Utica, NY 13501-2885

7	Broome, Cayuga, Chenango, Cortland, Madison, Onondaga, Oswego, Tioga & Tompkins Telephone: (315) 426-7438	Ralph Manna NYS-DEC 615 Erie Blvd. West (Env.Permits Room 206) Syracuse, NY 13204-2400
7 (sub-office)	 Telephone: (607) 753-3095	Michael Barylski* NYS-DEC 1285 Fisher Avenue Cortland, NY 13045-1090
8	Chemung, Genesee, Livingston, Monroe, Ontario, Orleans, Schuyler, Seneca, Steuben, Wayne & Yates Telephone: (716) 226-5390	Peter Lent NYS-DEC 6274 East Avon Lima Road Avon, NY 14414-9519
9	Allegany, Cattaraugus, Chautauqua, Erie, Niagara & Wyoming Telephone: (716) 851-7165	Steve Doleski NYS-DEC 270 Michigan Avenue Buffalo, NY 14203-2999
9 (sub-office)	 Telephone: (716) 372-0645	Ken Taft* NYS-DEC 182 East Union, Suite 3 Allegany, NY 14706-1328

* Deputy Regional Permit Administrator

USERS GUIDE TO NY NATURAL HERITAGE DATA

New York Natural Heritage Program, 700 Troy-Schenectady Road, Latham NY 12110-2400 phone: (518) 783-3932

NATURAL HERITAGE PROGRAM: The Natural Heritage Program is an ongoing, systematic, scientific inventory whose goal is to compile and maintain data on the rare plants and animals native to New York State, and significant ecological communities. The data provided in the report facilitate sound planning, conservation, and natural resource management and help to conserve the plants, animals and ecological communities that represent New York's natural heritage.

DATA SENSITIVITY: The data provided in the report are ecologically sensitive and should be treated in a sensitive manner. The report is for your in-house use and should not be released, distributed or incorporated in a public document without prior permission from the Natural Heritage Program.

NATURAL HERITAGE REPORTS (may contain any of the following types of data):

COUNTY NAME: County where the occurrence of a rare species or significant ecological community is located.
TOWN NAME: Town where the occurrence of a rare species or significant ecological community is located.
USGS 7 ½' TOPOGRAPHIC MAP: Name of 7.5 minute US Geological Survey (USGS) quadrangle map (scale 1:24,000).

SIZE (acres): Approximate acres occupied by the rare species or significant ecological community at this location. A blank indicates unknown size.
SCIENTIFIC NAME: Scientific name of the occurrence of a rare species or significant ecological community.
COMMON NAME: Common name of the occurrence of a rare species or significant ecological community.
ELEMENT TYPE: Type of element (i.e. plant, animal, significant ecological community, other, etc.)

LAST SEEN: Year rare species or significant ecological community last observed extant at this location.

EO RANK: Comparative evaluation summarizing the quality, condition, viability and defensibility of this occurrence. Use with LAST SEEN.
A-E = Extant: A=excellent, B=good, C=marginal, D=poor, E=extant but with insufficient data to assign a rank of A - D.
F = Failed to find. Did not locate species, but habitat is still there and further field work is justified.
H = Historical. Historical occurrence without any recent field information.
X = Extirpated. Field/other data indicates element/habitat is destroyed and the element no longer exists at this location.
? = Unknown.
Blank = Not assigned.

NEW YORK STATE STATUS (animals): Categories of Endangered and Threatened species are defined in New York State Environmental Conservation Law section 11-0535. Endangered, Threatened, and Special Concern species are listed in regulation 6NYCRR 182.5.
E = Endangered Species: any species which meet one of the following criteria:
1) Any native species in imminent danger of extirpation or extinction in New York.
2) Any species listed as endangered by the United States Department of the Interior, as enumerated in the Code of Federal Regulations 50 CFR 17.11.
T = Threatened Species: any species which meet one of the following criteria:
1) Any native species likely to become an endangered species within the foreseeable future in NY.
2) Any species listed as threatened by the U.S. Department of the Interior, as enumerated in the Code of the Federal Regulations 50 CFR 17.11.
SC = Special Concern Species: those species which are not yet recognized as endangered or threatened, but for which documented concern exists for their continued welfare in New York. Unlike the first two categories, species of special concern receive no additional legal protection under Environmental Conservation Law section 11-0535 (Endangered and Threatened Species).
P = Protected Wildlife (defined in Environmental Conservation Law section 11-0103): wild game, protected wild birds, and endangered species of wildlife.
U = Unprotected (defined in Environmental Conservation Law section 11-0103): the species may be taken at any time without limit; however a license to take may be required.
G = Game (defined in Environmental Conservation Law section 11-0103): any of a variety of big game or small game species as stated in the Environmental Conservation Law; many normally have an open season for at least part of the year, and are protected at other times.

NEW YORK STATE STATUS (plants): The following categories are defined in regulation 6NYCRR part 193.3 and apply to NYS Environmental Conservation Law section 9-1503.
E = Endangered Species: listed species are those with:
1) 5 or fewer extant sites, or
2) fewer than 1,000 individuals, or
3) restricted to fewer than 4 U.S.G.S. 7 ½ minute topographical maps, or
4) species listed as endangered by U.S. Department of Interior, as enumerated in Code of Federal Regulations 50 CFR 17.11.
T = Threatened: listed species are those with:
1) 6 to fewer than 20 extant sites, or
2) 1,000 to fewer than 3,000 individuals, or
3) restricted to not less than 4 or more than 7 U.S.G.S. 7 and ½ minute topographical maps, or
4) listed as threatened by U.S. Department of Interior, as enumerated in Code of Federal Regulations 50 CFR 17.11.
R = Rare: listed species have:
1) 20 to 35 extant sites, or
2) 3,000 to 5,000 individuals statewide.

continued on next page

V = Exploitably vulnerable: listed species are likely to become threatened in the near future throughout all or a significant portion of their range within the state if causal factors continue unchecked.
U = Unprotected; no state status.

NEW YORK STATE STATUS (communities): At this time there are no categories defined for communities.

FEDERAL STATUS (plants and animals): The categories of federal status are defined by the United States Department of the Interior as part of the 1974 Endangered Species Act (see Code of Federal Regulations 50 CFR 17). The species listed under this law are enumerated in the Federal Register vol. 50, no. 188, pp. 39526 - 39527.

(blank) = No Federal Endangered Species Act status.
LE = The element is formally listed as endangered.
LT = The element is formally listed as threatened.
E/SA = The element is treated as endangered because of similarity of appearance to other endangered species or subspecies.
PE = The element is proposed as endangered.
PT = The element is proposed as threatened.
C= The element is a candidate for listing.
(LE) = If the element is a full species, all subspecies or varieties are listed as endangered; if the element is a subspecies, the full species is listed as endangered.
(LE-LT) = The species is formally listed as endangered in part of its range, and as threatened in the other part; or, one or more subspecies or varieties is listed as endangered, and the others are listed as threatened.
(LT-C) = The species is formally listed as threatened in part of its range, and as a candidate for listing in the other part; or, one or more subspecies or varieties is listed as threatened, and the others are candidates for listing.
(LT-(T/SA)) = One or more subspecies or populations of the species is formally listed as threatened, and the others are treated as threatened because of similarity of appearance to the listed threatened subspecies or populations.
(PS) = Partial status: the species is listed in parts of its range and not in others; or, one or more subspecies or varieties is listed, while the others are not listed.

GLOBAL AND STATE RANKS (animals, plants, ecological communities and others): Each element has a global and state rank as determined by the NY Natural Heritage Program. These ranks carry no legal weight. The global rank reflects the rarity of the element throughout the world and the state rank reflects the rarity within New York State. Infraspecific taxa are also assigned a taxon rank to reflect the infraspecific taxon's rank throughout the world. ? = Indicates a question exists about the rank. Range ranks, e.g. S1S2, indicate not enough information is available to distinguish between two ranks.

GLOBAL RANK:
G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences), or very few remaining acres, or miles of stream) or especially vulnerable to extinction because of some factor of its biology.
G2 = Imperiled globally because of rarity (6 - 20 occurrences, or few remaining acres, or miles of stream) or very vulnerable to extinction throughout its range because of other factors.
G3 = Either rare and local throughout its range (21 to 100 occurrences), or found locally (even abundantly at some of its locations) in a restricted range (e.g. a physiographic region), or vulnerable to extinction throughout its range because of other factors.
G4 = Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.
G5 = Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
GH = Historically known, with the expectation that it might be rediscovered.
GX = Species believed to be extinct.

STATE RANK:
S1 = Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology making it especially vulnerable in New York State.
S2 = Typically 6 to 20 occurrences, few remaining individuals, acres, or miles of stream, or factors demonstrably making it very vulnerable in New York State.
S3 = Typically 21 to 100 occurrences, limited acreage, or miles of stream in New York State.
S4 = Apparently secure in New York State.
S5 = Demonstrably secure in New York State.
SH = Historically known from New York State, but not seen in the past 15 years.
SX = Apparently extirpated from New York State.
SZ = Present in New York State only as a transient migrant.

SxB and SxN, where Sx is one of the codes above, are used for migratory animals, and refer to the rarity within New York State of the breeding (B) populations and the non-breeding populations (N), respectively, of the species.

TAXON (T) RANK: The T-ranks (T1 - T5) are defined the same way as the Global ranks (G1 - G5), but the T-rank refers only to the rarity of the subspecific taxon.
T1 through T5 = See Global Rank definitions above.
Q = Indicates a question exists whether or not the taxon is a good taxonomic entity.

OFFICE USE: Information for use by the Natural Heritage Program.

New York Department of Environmental Conservation List of Endangered, Threatened and Special Concern Species

List of Endangered, Threatened and Special Concern Fish & Wildlife Species of New York State

Endangered

Molluscs:	
♦ Dwarf Wedgemussel	*Alasmidonta heterodon*
♦Pink mucket	*Lampsilis abrupta*
♦Clubshell	*Pleurobema clava*
♦Fat pocketbook	*Potamilus capax*
Rayed Bean	*Villosa fabalis*
♦ Chittenango Ovate Amber Snail	*Novisuccinea chittenangoensis*
Insects:	
Tomah Mayfly	*Siphlonisca aerodromia*
*♦ American Burying Beetle	*Nicrophorus americanus*
Hessel's Hairstreak	*Callophrys hesseli*
♦ Karner Blue	*Lycaeides melissa samuelis*
Regal Fritillary	*Speyeria idalia*
Persius Duskywing	*Erynnis persius*
Grizzled Skipper	*Pyrgus centaureae wyandot*
Arogos Skipper	*Atrytone arogos arogos*
Bog Buckmoth	*Hemileuca species 1*
Pine Pinion Moth	*Lithophane lepida lepida*
Fishes:	
♦ Shortnose Sturgeon	*Acipenser brevirostrum*
*Silver Chub	*Macrhybopsis storeriana*
Pugnose Shiner	*Notropis anogenus*
Round Whitefish	*Prosopium cylindraceum*
Bluebreast Darter	*Etheostoma camurum*
*Gilt Darter	*Percina evides*
* Spoonhead Sculpin	*Cottus ricei*
Deepwater Sculpin	*Myoxocephalus thompsoni*
Amphibians:	
Tiger Salamander	*Ambystoma tigrinum*
Northern Cricket Frog	*Acris crepitans*
Reptiles:	
Mud Turtle	*Kinosternon subrubrum*
♦Bog Turtle	*Clemmys muhlenbergii*
♦ Atlantic Hawksbill Sea Turtle	*Eretmochelys imbricata*

♦ Atlantic Ridley Sea Turtle	*Lepidochelys kempii*
♦ Leatherback Sea Turtle	*Dermochelys coriacea*
Queen Snake	*Regina septemvittata*
Massasauga	*Sistrurus catenatus*
Birds:	
* Golden Eagle	*Aquila chrysaetos*
Peregrine Falcon	*Falco peregrinus*
Spruce Grouse	*Falcipennis canadensis*
Black Rail	*Laterallus jamaicensis*
♦♦ Piping Plover[1]	*Charadrius melodus*
*♦ Eskimo Curlew	*Numenius borealis*
♦ Roseate Tern	*Sterna dougallii dougallii*
Black Tern	*Chlidonias niger*
Short-eared Owl	*Asio flammeus*
Loggerhead Shrike	*Lanius ludovicianus*
Mammals:	
♦ Indiana Bat	*Myotis sodalis*
* Allegheny Woodrat	*Neotoma magister*
♦ Sperm Whale	*Physeter catodon*
♦ Sei Whale	*Balaenoptera borealis*
♦ Blue Whale	*Balaenoptera musculus*
♦ Finback Whale	*Balaenoptera physalus*
♦ Humpback Whale	*Megaptera novaeangliae*
♦ Right Whale	*Eubalaena glacialis*
*♦ Gray Wolf	*Canis lupus*
*♦ Cougar	*Felis concolor*

Threatened

Molluscs:	
Brook Floater	*Alasmidonta varicosa*
Wavy-rayed Lampmussel	*Lampsilis fasciola*
Green Floater	*Lasmigona subviridis*
Insects:	
Pine Barrens Bluet	*Enallagma recurvatum*
Scarlet Bluet	*Enallagma pictum*
Little Bluet	*Enallagma minisculum*
*♦ Northeastern Beach Tiger Beetle	*Cicindela dorsalis dorsalis*
Frosted Elfin	*Callophrys irus*
Fishes:	
Lake Sturgeon	*Acipenser fulvescens*
Mooneye	*Hiodon tergisus*
*Lake Chubsucker	*Erimyzon sucetta*
Gravel Chub	*Erimystax x-punctata*

*Mud Sunfish	*Acantharchus pomotis*
Banded Sunfish	*Enneacanthus obesus*
Longear Sunfish	*Lepomis megalotis*
Longhead Darter	*Percina macrocephala*
Eastern Sand Darter	*Ammocrypta pellucida*
Swamp Darter	*Etheostoma fusiforme*
Spotted Darter	*Etheostoma maculatum*

Amphibians:

None Listed

Reptiles:

Blanding's Turtle	*Emydoidea blandingii*
• Green Sea Turtle	*Chelonia mydas*
• Loggerhead Sea Turtle	*Caretta caretta*
Fence Lizard	*Sceloporus undulatus*
Timber Rattlesnake	*Crotalus horridus*

Birds:

Pied-billed Grebe	*Podilymbus podiceps*
Least Bittern	*Ixobrychus exilis*
• Bald Eagle	*Haliaeetus leucocephalus*
Northern Harrier	*Circus cyaneus*
King Rail	*Rallus elegans*
Upland Sandpiper	*Bartramia longicauda*
Common Tern	*Sterna hirundo*
Least Tern	*Sterna antillarum*
Sedge Wren	*Cistothorus platensis*
Henslow's Sparrow	*Ammodramus henslowii*

Mammals:

*• Canada Lynx	*Lynx canadensis*

Special Concern

Molluscs:

Buffalo Pebble Snail	*Gillia altilis*
Fringed Valvata	*Valvata lewisi*
Mossy Valvata	*Valvata sincera*

Insects:

Unnamed Dragonfly Species	*Gomphus spec. nov.*
Southern Sprite	*Nehalennia integricollis*
Extra Striped Snaketail	*Ophiogomphus anomalus*
Pygmy Snaketail	*Ophiogomphus howei*
Common Sanddragon	*Progomphus obscurus*
Gray Petaltail	*Tachopteryx thoreyi*
Checkered White	*Pontia protodice*
Olympia Marble	*Euchloe olympia*

Henry's Elfin	*Callophrys henrici*
Tawny Crescent	*Phyciodes batesii*
Mottled Duskywing	*Erynnis martialis*
Barrens Buckmoth	*Hemileuca maia*
Herodias Underwing	*Catocala herodias gerhardi*
Jair Underwing	*Catocala jair*
A Noctuid Moth	*Heterocampa varia*

Fishes:

Mountain Brook Lamprey	*Ichthyomyzon greeleyi*
Black Redhorse	*Moxostoma duquesnei*
Streamline Chub	*Erymystax dissimilis*
Redfin Shiner	*Lythrurus umbratilis*
Ironcolor Shiner	*Notropis chalybaeus*

Amphibians:

Hellbender	*Cryptobranchus alleganiensis*
Marbled Salamander	*Ambystoma opacum*
Jefferson Salamander	*Ambystoma jeffersonianum*
Blue-spotted Salamander	*Ambystoma laterale*
Longtail Salamander	*Eurycea longicauda*
Eastern Spadefoot Toad	*Scaphiopus holbrookii*
Southern Leopard Frog	*Rana sphenocephala utricularius*

Reptiles:

Spotted Turtle	*Clemmys guttata*
Wood Turtle	*Clemmys insculpta*
Eastern Box Turtle	*Terrapene carolina*
Eastern Spiny Softshell	*Apalone spinifera*
Eastern Hognose Snake	*Heterodon platyrhinos*
Worm Snake	*Carphophis amoenus*

Birds:

Common Loon	*Gavia immer*
American Bittern	*Botaurus lentiginosus*
Osprey	*Pandion haliaetus*
Sharp-shinned Hawk	*Accipiter striatus*
Cooper's Hawk	*Accipiter cooperii*
Northern Goshawk	*Accipiter gentilis*
Red-shouldered Hawk	*Buteo lineatus*
Black Skimmer	*Rynchops niger*
Common Nighthawk	*Chordeiles minor*
Whip-poor-will	*Caprimulgus vociferus*
Red-headed Woodpecker	*Melanerpes erythrocephalus*
Horned Lark	*Eremophila alpestris*
Bicknell's Thrush	*Catharus bicknelli*
Golden-winged Warbler	*Vermivora chrysoptera*
Cerulean Warbler	*Dendroica cerulea*

Yellow-breasted Chat	*Icteria virens*
Vesper Sparrow	*Pooecetes gramineus*
Grasshopper Sparrow	*Ammodramus savannarum*
Seaside Sparrow	*Ammodramus maritimus*
Mammals:	
Small-footed Bat	*Myotis leibii*
New England Cottontail	*Sylvilagus transitionalis*
Harbor Porpoise	*Phocoena phocoena*

♦ Currently listed as "endangered" by the U.S. Department of the Interior.

• Currently listed as "threatened" by the U.S. Department of the Interior.

* Species is extirpated from New York State.

1. Piping Plover is listed as federally endangered in the Great Lakes Region, and as federally threatened in the Atlantic Coastal Region.

Definitions
Extinct - Species is no longer living or existing.
Extirpated - Species is not extinct, but no longer occurring in a wild state within New York, or no longer exhibiting patterns of use traditional for that species in New York (e.g. historical breeders no longer breeding here).
Endangered - Any native species in imminent danger of extirpation or extinction in New York State.
Threatened - Any native species likely to become an endangered species within the foreseeable future in New York State.
Special Concern - Any native species for which a welfare concern or risk of endangerment has been documented in New York State.

Authority: Environmental Conservation Law of New York, Section 11-0535 and 6 NYCRR (New York Code of Rules and Regulations) Part 182 - effective (last promulgated in state regulation) December 4, 1999.

Revision History

Effective April 24, 2000 - Canada Lynx (*Lynx canadensis*) was added to the Threatened list.

This page was last modified July 2, 2001

U.S. Fish and Wildlife Threatened and Endangered Species for New York

U.S. Fish & Wildlife Service

Threatened and Endangered Species System (TESS)

Listings by State and Territory, as of 11/5/2001

Notes:
- ***Displays one record per species or population.***
- ***Includes experimental populations and similarity of appearance listings.***
- ***The range of a listed population does not extend beyond the states in which that population is defined.***
- ***Includes non-nesting sea turtles and whales in State/Territory coastal waters.***
- ***Includes species or populations under the sole jurisdiction of the National Marine Fisheries Service.***

Go to the Threatened and Endangered Wildlife and Plants Page
Go to the TESS Home Page
Back to Table of Contents

- ***Click on the highlighted scientific names below to view a Species Profile for each listing.***

New York -- 26 listings

Animals -- 20

Status	*Listing*
E	Bat, Indiana (*Myotis sodalis*)
E	Butterfly, Karner blue (*Lycaeides melissa samuelis*)
T	Eagle, bald (lower 48 States) (*Haliaeetus leucocephalus*)
T	Lynx, Canada (lower 48 States DPS) (*Lynx canadensis*)
E	Plover, piping (Great Lakes watershed) (*Charadrius melodus*)
T	Plover, piping (except Great Lakes watershed) (*Charadrius melodus*)
E	Puma (=cougar), eastern (*Puma (=Felis) concolor couguar*)
T	Sea turtle, green (except where endangered) (*Chelonia mydas*)
E	Sea turtle, hawksbill (*Eretmochelys imbricata*)
E	Sea turtle, Kemp's ridley (*Lepidochelys kempii*)
E	Sea turtle, leatherback (*Dermochelys coriacea*)
T	Sea turtle, loggerhead (*Caretta caretta*)
T	Snail, Chittenango ovate amber (*Succinea chittenangoensis*)
E	Sturgeon, shortnose (*Acipenser brevirostrum*)
E	Tern, roseate (northeast U.S. nesting pop.) (*Sterna dougallii dougallii*)
T	Turtle, bog (=Muhlenberg) (northern) (*Clemmys muhlenbergii*)
E	Wedgemussel, dwarf (*Alasmidonta heterodon*)
E	Whale, finback (*Balaenoptera physalus*)
E	Whale, humpback (*Megaptera novaeangliae*)
E	Whale, right (*Balaena glacialis (incl. australis)*)

Plants -- 6

Status	*Listing*
T	Monkshood, northern wild (*Aconitum noveboracense*)
E	Gerardia, sandplain (*Agalinis acuta*)
T	Amaranth, seabeach (*Amaranthus pumilus*)

T	Fern, American hart's-tongue (*Asplenium scolopendrium* var. *americanum*)
T	Roseroot, Leedy's (*Sedum integrifolium* ssp. *leedyi*)
T	Goldenrod, Houghton's (*Solidago houghtonii*)