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TERRESTRIAL ECOLOGY
OF
MILLSTONE POINT

ENVIRONMENTAL ANALYSTS INCORPORATED

224 SEVENTH STREET, GARDEN CITY, NEW YORK 11530

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TERRESTRIAL ECOLOGY

OF

MILLSTONE POINT

Prepared for

Northeast Utilities Service Company
P.O. Box 270
Hartford, Connecticut 06101

Prepared by

Environmental Analysts Incorporated
224 Seventh Street
Garden City, New York 11530

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I. INTRODUCTION

This report is a survey of the terrestrial flora and fauna of the Millstone Point, Connecticut, area. Data were gathered from library research as well as field observations during the period 1971 to 1973. Various organizations and individuals were contacted for information. A search of available reports and documents was also performed. Sources of information are listed in Appendix A.

Millstone Point lies in the town of Waterford, adjacent to Long Island Sound, about 5 miles southwest of New London. It is within 2 hours' driving time of such centers as Providence, Rhode Island, and Hartford and New Haven, Connecticut. Millstone Unit 1, a nuclear-powered generating plant, is presently operating on the site. Unit 2 is under construction, and a construction permit application for Unit 3 has been submitted.

Although New London County marshlands, birds, and plants have received a modest amount of attention in the literature, only one report was uncovered dealing specifically with the Millstone flora and fauna (NUSCO 1972). Lists of organisms compiled in this report are based on the ranges and habitats of organisms which occur in areas adjoining Millstone Point as well as on other lists of sightings in the actual point area. Appendix B includes a list of organisms observed in the Millstone area (Table B-1) and a list of organisms recorded in Connecticut which may frequent the Millstone area (Table B-2). Part IV of this report contains descriptions of the more important plants, mammals, and birds observed on the power plant site.

II. GEOGRAPHIC FEATURES OF MILLSTONE POINT

Millstone Point is oriented north and south in Niantic Bay (see Figure 1). The bay, in turn, is bounded by Black Point on the west and Goshen Point on the east. Plum Island and Orient Point, Long Island, lie 9 miles southwest of the point. Between Millstone and Black Points is a gently curved, crescent-shaped beach; north of this beach is the Niantic River valley and associated estuary. The estuary is approximately 3 miles long and a half mile wide.

Millstone Point is basically hard granite rock. The loose glacial deposits have been mostly eroded away, although the point is protected by jutting headlands to the east and west. On the northwest, inshore side of the area, the 10-foot high cliffs are eroding with the loose materials being deposited in Niantic Bay. The southern tip of Millstone Point is divided into a pair of parallel peninsulas by a slender, fjord-like bay. The bay, formerly the site of a granite quarry, is surrounded by piles of huge granite boulders. The southern face of the point overhangs Niantic Bay by about 15 feet. The north face is 5 feet above sea level and has a small bay. The point is protected from surf by a natural wall of boulders.

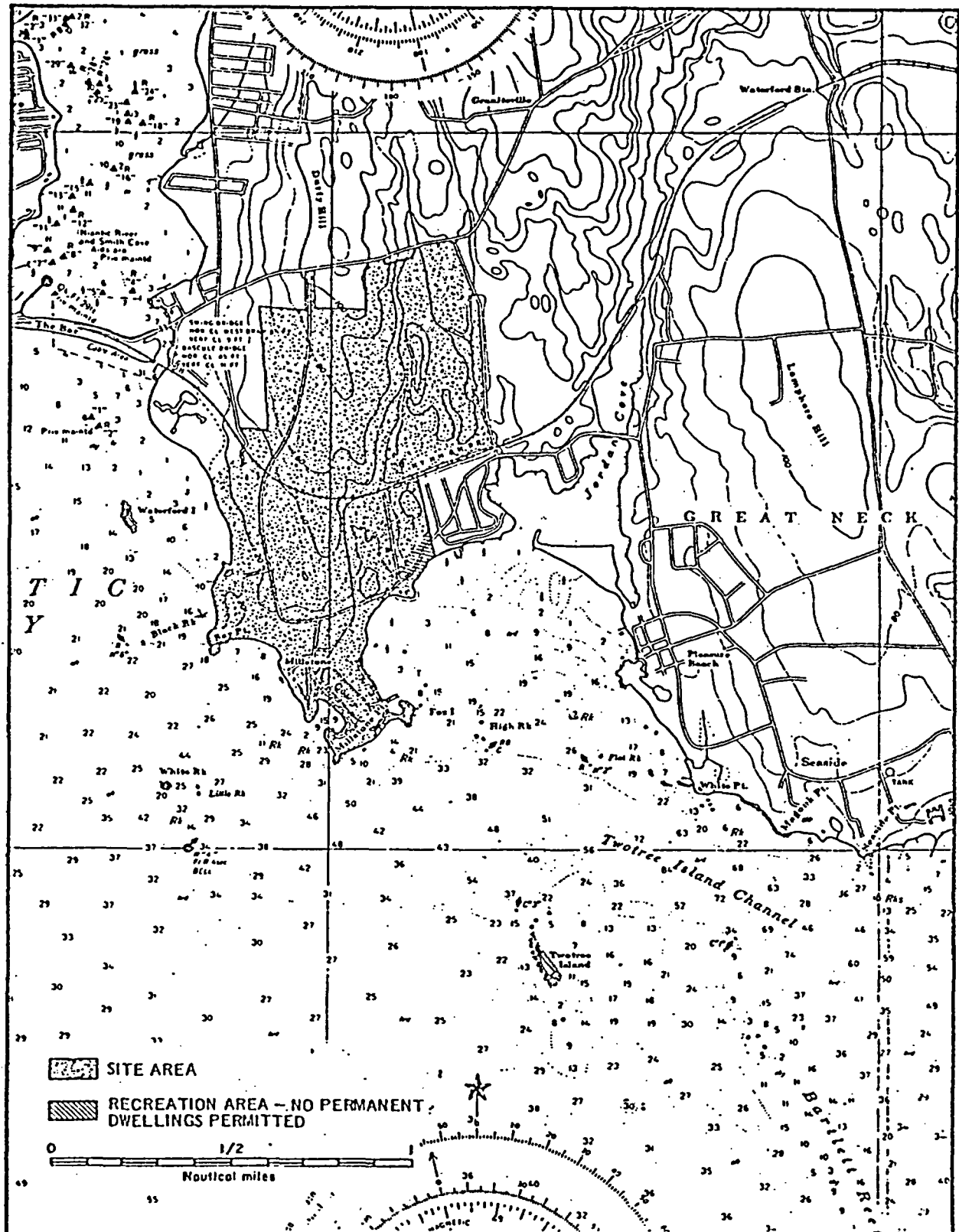


Figure 1. Millstone Point area map.

III. REGIONAL ECOLOGY OF THE MILLSTONE POINT AREA

A. SOUTHWEST TIP

The southwest point is distinguished by a high meteorological tower. On the south face, the point is edged with granite blocks arranged as a natural breakwater. On the north side of the point, a small bay separates the peninsula from the main reactor area. On the eastern side, an elongated bay divides the point into two peninsulas. The bay, now used by the United States Navy, was formerly a granite quarry.

The northern and eastern sectors of the meteorological point have been cleared of most vegetation and are presently used as a roadway and as a storage area for heavy materials and for granite blocks removed from the quarry. The existing vegetation now includes a large stand of sumac (Rhus glabra), interspersed with blackberries (Rubus sp.) and shadbush (Amelanchia canadensis). This provides cover for a number of birds such as wrens, mockingbirds, thrashers, catbirds, blackbirds, and sparrows. Deer mice, house mice, and rabbits also live in these thickets. Cottontail rabbits (Sylvilagus sp.) were noticed around the sumac in February. Few snakes or turtles are able to live in the area.

Several cherry trees (Prunus serotina and Prunus virginiana) line the crest of the point; birds favoring such trees include mourning doves, bluejays, tanagers, waxwings, vireos, orioles, and finches.

A number of red cedars (Juniperus virginiana) are scattered about the point, providing habitats for owls, flickers, jays, tufted titmice, nuthatches, waxwings, warblers, finches, and sparrows. Cedars and sparse

thickets are scattered on the north face of the peninsula.

Several other plants were noted in the area, such as bayberry, ragweed, mosses, lichens, and goldenrod. These could provide foods for small animals.

Crows, herring gulls, and the great black-backed gull were observed near the point. Broken shells evident in the area were no doubt smashed by gulls in order to eat the soft molluscs inside. Many microhabitats for mice and other small rodents are available among the rocks, broken soil, and bushes of the southern tip of Millstone Point.

B. FOX ISLAND AREA

The southeasternmost portions of Millstone Point have been made available to fishermen. A dirt road leads to the large granitic fishing rocks. Lining the road on the western side is a large stand of reeds (Phragmites communis), a plant characteristic of disturbed lands and one which is especially adaptable to both coastal and freshwater zones. This reed usually grows in pure stands, but is occasionally mixed with wild roses, poison oak, or other low shrubs. When in flower, the feathery tops are all about equal in height, between 6 and 10 feet tall. Phragmites provides cover and suitable habitats for deer mice, rabbits, snakes, and many species of birds, such as blackbirds, orioles, grackles, thrushes, mockingbirds, catbirds, brown thrashers, crows, and flycatchers.

Along the eastern side between the road and the beach, a small grove of trees has been left, which includes scarlet and white oaks, apple, chokecherry, and black cherry. Such a stand of deciduous trees would

provide nesting habitats for songbirds such as warblers, vireos, finches, and sparrows. Although small, this stand might also provide refuge for a very few small mammals, turtles, or snakes.

Low thickets of bayberry, blueberry, and roses are also in the area; a few yellow birch are recent transplants to the area. Many of the above species, together with shrews and moles and such birds as cedar waxwings, might have been found in the area where there is abundant food and cover. Crows, mute swans, sea gulls, and sapsuckers were predominant in the general area during late February.

C. REACTOR AREA

The reactor area has been cleared of most natural vegetation. The area fronting on the barge channel has been planted with red cedar and pines. They might be expected to contain a number of birds such as jays, chickadees, and nuthatches. Few mammals or reptiles would be expected here.

Although there is little vegetative cover in the reactor area, a number of animals might take up residence there. The buildings and equipment might provide shelter for such mammals as opossums, bats, skunks, rats, and mice. Birds such as pigeons, swallows, and sparrows often utilize eaves or flat-topped roofs as nesting sites.

D. VISITORS' AREA

A specially designated visitors' area, lying to the northwest of the reactor, provides public access to the beach. The area also

supports many species of plants and animals. Many red cedars, black cherries, and chokecherries provide shade and cover for organisms of the picnic area. Birds living in or visiting the area include owls, flickers, jays, chickadees, titmice, kinglets, waxwings, warblers, finches, and sparrows. The area is rich in honeysuckle which provides attraction for ruby-throated hummingbirds and honey bees.

Shadbushes are scattered throughout the area and clumps of grass dot the open field between the picnic area and the main compound, providing habitats for mockingbirds, catbirds, thrashers, vireos, and finches. Mammals of this area would include deer mice, house mice, rats, opossums, squirrels, chipmunks, rabbits, shrews, and possibly skunks.

Westward of the picnic area is a steep bank, leading down to the rocky beach 10 to 15 feet below. Along the bank is a variety of scrubby vegetation including wild rose, blackberry, sumac, and low shadbush. On the northern end of the picnic area is a large, tall stand of sumac and shadbushes interspersed with Japanese honeysuckle, bayberries, blackberries, and roses. Several red pines, dwarf pines, and red cedars enhance the cover and environmental quality of the region. In addition to the birds listed above for the picnic area, these pines and cedars afford habitats for such species as quail, ring-necked pheasant, woodcocks, pigeons, swallows, crows, nuthatches, wrens, and many other passerine birds.

Below the cliffs and along the beach, birds such as loons, grebes, cormorants, ducks, swans, herons, sandpipers, gulls, and terns may be expected.

Along the northern edge of the visitors' area is a low stone wall; beyond are nursery and grassy areas with many ornamentals, shrubs, and trees. Along the wall grow sumac, poison oak, cherry trees, and berry bushes. Weeping-willow trees, pines, birch, cedar, and berries are also found in the region.

A dirt road, Old Millstone Road, extending from the reactor area toward the railroad tracks, lies between this section of land and the new highway. Much of the property is separated from the road by a steel fence. Along the fence and the road are sumac, shadbushes, blackberries, raspberries, cherries, a few cedars, and vines. One would expect many small mammals such as deer mice, house mice, rats, squirrels, chipmunks, and rabbits. Because of the dense cover farther away from the reactor, larger mammals may be expected, such as deer, raccoon, fox, skunk, opossum, and weasels. Since there is abundant food for these herbivores and predators, ecological conditions are suitable for larger numbers than in the visitors' area further to the south. Birds likely to be encountered in the area are similar to the ones in the picnic area; additionally, woodcocks, hawks, ospreys, vultures, grouse, nighthawks, swallows, and meadowlarks may be seen. Turtles, snakes, frogs, toads, and salamanders may be encountered because of moist adjacent woodlots.

Closer to the railroad tracks are red cedars, pines, shadbush, oaks, sumacs, and other trees. Undercover includes bayberry, sumac, and vines, providing protection for small mammals and birds.

E. AREA BETWEEN RACE ROCK ROAD AND HIGHWAY 156

North of the compound area are scattered wood thickets and open fields. The fields contain juniper, hemlock, and mountain laurel. The woods are mainly oak and hickory. Many kinds of birds are expected in these zones: bobwhite quail, pheasants, pigeons and doves, crows, and many songbirds. Likely mammals in the area include opossum, skunk, squirrels, mice, rabbit, and possibly deer. A few amphibians should occur here, including the Eastern spadefoot toad and the common American toad. Box turtles and snakes are also to be expected.

North of the railroad tracks are woodlands composed mainly of oaks, pines, and junipers. The understory, consisting of sumac, briars and berry bushes, provides suitable habitat for many small animals: quail, woodcocks, cuckoos, small owls, crows, and many other birds, together with weasels, opossums, shrews, moles, rats, mice, and rabbits. The trees themselves harbor such birds as gnatcatchers, kinglets, mourning doves, owls, woodpeckers, flickers, sapsuckers, crows, and many other birds. Squirrels, chipmunks, mice, bats, woodchucks, rabbits, and deer are probably abundant here. Many snakes, toads, and salamanders are to be expected as well.

Closer to Highway 156 are moist, open fields where such animals as moles, shrews, skunks, and meadow mice should be commonly encountered, along with salamanders, turtles, and snakes. Such birds of open fields as hawks, crows, pipets, blackbirds, and meadowlarks are also to be expected here.

There are a number of houses in the area, close to the highway, producing a number of habitats--lawns, hedgerows, brick and stone fences, and gardens. Among the birds likely to be present here are doves, pigeons, swifts, starlings, crows, jays, wrens, robins, grackles, finches, and blackbirds. Toads, frogs, turtles, snakes, and salamanders are common in such areas. Small and medium-sized mammals are also likely: rats, mice, shrews, moles, opossums, skunks, and raccoons, as well as many rabbits.

East of Millstone Road, between the building compound and the railroad tracks, are scattered woodlands of alder, hemlock, oak, and juniper. Songbirds, swifts, quail, and small mammals would predominate.

F. WILDLIFE MANAGEMENT AREA

The wildlife management area is composed mostly of a thick, wooded stand of oak and hickory trees. At the southwestern end is a large, freshwater pond which empties into Niantic Bay; it is fed by a very small stream entering from the northeast. Surrounding the southern edge of the pond are shadbush, pussywillows, scarlet and white oaks, and alder. Between the pond and the bay to the east is a hardwood forest of oak and hickory. To the east of the forest and fringing the bay is a marshy area containing alders, Phragmites, and Spartina grass.

Within the pond live such animals as frogs and tadpoles, salamanders, sticklebacks, killifishes, and the sheepshead minnow. Flickers, crows, and gulls were also observed near the pond. Other animals that might be expected to occur in the pond are many kinds

of aquatic insects and crustaceans, newts, turtles, water snakes, and such birds as herons, bitterns, ibis, rails, coots, kingfishers, ducks, and other waterfowl. Raccoons would likely be found in this area, and possibly otter, muskrat, and voles (meadow mice).

Northwest of the pond are many berry bushes, greenbriar, cattails, Phragmites, and alder; this area would likely support such inhabitants as blackbirds, orioles, sparrows, starlings, ducks, rails, hawks, flycatchers, kingbirds, phoebes, wrens, catbirds, brown thrashers, mockingbirds, thrushes, gnatcatchers, and other such birds as normally feed upon nuts, acorns, berries, seeds, and the many types of insects associated with this habitat. Raccoons, weasels, rabbits, skunks, and shrews should be encountered in this area, as well as a number of salamanders, frogs, and snakes.

Wooded areas within the management area probably harbor a great many birds. Because of the abundance of acorns, berries, seeds, insects, and spiders, this habitat is preferred by cardinals, grosbeaks, vireos, woodwarblers, whippoorwills, nighthawks, cuckoos, cedar waxwings, gnatcatchers, kinglets, titmice, chickadees, wrens, brown creepers, owls, nuthatches, woodpeckers, flickers, and sapsuckers. These woods likely also contain a variety of small mammals, such as gray squirrels, flying squirrels, deer mice, bats, opossum, rabbits, and, where the woods contain looser soils with much ground cover, moles and shrews. Also, deer might be found within this area. Such woods provide an abundance of habitats and nesting sites preferred by these organisms, including cavities in trees, tree stumps, hollow logs, forest floor leaf litter, and tree tops.

IV. DESCRIPTIONS OF SELECTED PLANTS AND ANIMALS

A. FLORA

FAMILY ANACARDIACEAE

Rhus glabra, Sumac

Small trees or shrubs, with stout pithy branchlets, fleshy roots, and resinous, sometimes caustic juice. Leaves alternate, pinnate, pinnately trifoliate, or rarely simple. Flowers minute, white or greenish white, and usually produced on separate plants. Rhus is widely distributed in temperate regions. The glabra species produces acrid and astringent berries which were at one time used in treatment of wounds.

FAMILY ROSACEAE

Prunus virginiana, Choke Cherry (Wild Cherry)

A tree with strong scented bark and leaves, rarely 30 to 35 feet in height, with a short and often crooked inclining trunk a foot in diameter, small erect or horizontal branches, and stout branchlets which form a narrow irregular head, or more often, a low shrub. The bark is thick and irregularly fissured. First-year branches are light brown or green; thereafter, the branches are dark brown.

Prunus virginiana is the most widely distributed North American tree extending from Hudson Bay to Mexico. It is quite common in the eastern states, growing on forest margins generally in rich humid soil.

The wood is hard and heavy but not strong.

Prunus serotina, Rum Cherry (Wild Black Cherry)

A tree with bitter, aromatic bark and leaves sometimes attaining a height of 100 feet with a stout straight trunk 4 to 5 feet in diameter and small horizontal branches which form a narrow oblong head. Bark is fissured and scaly, usually dark red-brown.

P. serotina is widely distributed in the United States and grows in rich, moist soil. It is one of the most valuable timber trees of the American forests; the wood is light, strong, and hard with a close straight grain and satinlike surface. Its use for cabinet work and interior finishing has led to the destruction of many of the best stands. The wild cherry is one of the stateliest and most beautiful trees of the eastern woods.

FAMILY CUPULIFERAE

Quercus alba, White Oak

A tree growing to an average height of 80 to 100 feet with a 3- to 4-foot diameter trunk. The principal limbs are stout and spread irregularly from the stem at a broad angle in a slightly zigzag manner forming an open crown of rather slender, rigid branches. The tree shape and height depend on crowding by other trees. When closely pressed the oak will grow tall and slender to 150 feet. When growing alone it will appear squat and spreading with a trunk up to 12 feet in diameter.

Quercus alba is an inhabitant of sandy plains and ridges as well as moist bottom lands. It is one of the most valuable timber trees in North America. The wood is strong, very heavy, hard, tough, close grained, and durable. It is employed in shipbuilding, construction, and cooperage, as well as in interior finishing of houses.

Quercus coccinea, Scarlet Oak

A tree 70 to 80 feet in height with a trunk 2 to 3 feet in diameter and comparatively small branches which spread gradually and form a narrow open head. The scarlet oak inhabits light, dry, and usually sandy soil and is distributed widely in the eastern United States. It is particularly abundant along the east coast from Massachusetts to New Jersey.

The wood of Q. coccinea is heavy, hard, and strong, but coarse grained. It is commonly planted as an ornamental due to the characteristic red color of its leaves during the fall.

FAMILY JUGLANDACEAE

Hicoria laciniosa, (Corya cordiformis), Big Shellbark

A tree up to 120 feet in height with a straight slender trunk often free of branches for more than half its height and rarely exceeding 3 feet in diameter. The bark is from one to two inches thick and separates into thick broad plates 3 to 4 feet long. The branches are stout, orange-red in their first year, and ash grey thereafter.

H. laciniosa is distributed east of the Mississippi from New York to Arkansas. It is an inhabitant of rich deep bottom lands and can withstand periodic inundation of several weeks duration. The wood is heavy and extremely hard, tough, close grained, and very flexible. It is commonly used in the manufacture of tool handles. The nuts are sold in markets of some western states.

FAMILY MYRICACEAE

Myrica pennsylvanica, Bayberry

Aromatic resinous trees or shrubs, with watery juice, terete branches, and scaly leaf-buds. The species of Myrica, of which about 30 are known, are shrubs or small trees and are widely distributed through the temperate regions of the world. M. pennsylvanica grows on sand dunes and sterile hills in the neighborhood of the sea from Nova Scotia to Louisiana. Wax can be obtained from the fruit of this species and is used in candlemaking. The bark is astringent and is sometimes used as a stimulant, in tanning, or as a dye.

FAMILY CONIFERAE

Juniperus communis, Juniper (Ground Cedar)

A shrub with many short, slender stems prostrate at the base and then turning upward forming broad dense mats 15 to 20 feet across and 3 to 4 feet high or occasionally treelike 20 to 30 feet high with a trunk 1 foot in diameter and slender, erect branches forming an open head.

The bark is reddish brown, separating into loose, papery, and persistent scales.

J. communis is very widely distributed in the northern hemisphere ranging from Greenland to California. It is an extremely hardy tree, often growing at altitudes up to 14,000 feet. The wood is close-grained, durable, and resistant to decay.

Juniperus virginiana, Red Cedar

A tree, occasionally 100 feet tall with a long straight trunk 3 to 4 feet in diameter, often lobed and eccentric, and frequently buttressed toward the base, but usually much smaller averaging 40 to 50 feet in height with short, slender, horizontal branches. The bark is light brown, tinged with red, and separated into long, narrow scales, fringed on the margin and persistent for many years.

J. virginiana is the most widely distributed American conifer ranging from Nova Scotia to Arizona. In the northeast the tree is scattered over dry, gravelly slopes and rocky ridges often immediately on the sea coast. With its stunted stem and short, tough branches, it is capable of resisting fierce gales.

The wood is light, soft, close-grained and brittle, but not strong. It is resistant to decay and durable when in contact with the soil. It is widely used for posts, railway ties, interior finishing, and lining closets and chests. All lead (graphite) pencils are made of red cedar.

FAMILY ROSACEAE

Rubus pubescens, Dwarf Blackberry

This shrub has creeping stems from which arise erect herbaceous, generally spineless branches up to 20 inches tall, bearing from two to five long stalked leaves with blades divided into three segments. There may be a single flower at the end, or this may be accompanied by one or two others on stems from the axils of the leaves. The fruit is dark red. R. pubescens is in bloom from May to July, and is usually found in damp woods, bogs, or shores.

FAMILY CYPERACEAE

Typha augustifolia, Typha latifolia, Bulrush (Cattail, Reedmace)

The fifteen species constituting the genus Typhus are found in marshes almost throughout the entire world. Of the two species named above, T. latifolia, bulrush or reedmace, has 6- to 7-foot stems topped by a dense spike, divided into two parts, a slender male one on top, and a club-shaped female one beneath. In T. augustifolia, the narrow-leaved reedmace, which generally occurs beside streams and ponds, the two parts are separated by a 2-inch stalk. In both species, the individual flowers are surrounded by hairs that do not belong to the flower. The male spikes eventually dry up and the female clubs turn velvety-brown.

FAMILY GRAMINEAE

Spartina patens, Saltmeadow Cordgrass

This marsh grass is the principal plant on thousands of acres of meadowlike marsh just above the high tide line. It is found in coastal brackish marshes from Newfoundland to Texas, and rarely in inland marshes. The stems are 1 to 3 feet high with tapering leaves 1-1/2 feet long, usually with three to six branches. This species, along with S. alterniflora (see below), is responsible for the great majority of primary production in a marsh, and also serves to stabilize the soil and provide habitats for a wide variety of animals.

Spartina alterniflora, Saltmeadow Cordgrass

This grass is found in coastal salt marshes from Newfoundland to Texas growing in areas rarely inundated by high tides, e.g., immediately above S. patens. Stems range from 1 to 7 feet with leaves 1-1/2 feet long and 3/4 inch wide. Flower clusters range to 1 foot in length with long, upright branches.

B. FAUNA

1. Mammals

FAMILY DIDELPHIIDAE, Opossums

Only one species is found within the study area, but it may be found in large numbers. Opossums inhabit a wide variety of habitats, including

hollow logs, leaf-filled crevices, forested areas, and occasionally areas around human habitations. These small animals, which may be ferocious if cornered, feed on almost anything organic--eggs, insects, plants, mice, fruit, and vegetables. Although considered a pest by poultrymen, undoubtedly these animals are of importance as destroyers of mice and insects.

FAMILY TALPIDAE, Moles

Two species of moles, the star-nose mole and the eastern mole, may be found in the Millstone Point region, both of them usually restricted to underground tunnels in lawns, gardens, marshes, and fields where the earth is soft and loose. Damp meadows are often favored for this reason. Over 50 percent of the diet of moles consists of insects, both adults and grubs; about 31 percent is earthworms, and the remainder is mostly plant material. Although they may injure lawns and gardens slightly, this should be more than compensated by the number of insects they consume. The star-nose mole, however, may be considered more of a nuisance, as its burrow is often used by destructive mice and other rodents.

FAMILY SORICIDAE, Shrews

The ranges of three shrews--the masked shrew, the least shrew, and the shorttail shrew--overlap this area. They occur usually in fields and wooded areas where there is loose vegetation over the surface and meadows. Highly useful as destroyers of insects, shrews consume large quantities of these animals, as well as crustaceans, molluscs, salaman-

ders, and other small animals. Common shrews eat 3-1/2 times their weight daily. Nests are usually found in dry underground cavities, where some food may be stored. They are somewhat pugnacious if cornered, and capable of inflicting savage, if small, wounds to adversaries. Seldom seen by man because of their secretive habits, they deserve protection because of their insectivorous diet.

FAMILY VESPERTILIONIDAE, Bats

At least ten species of bats may be found in the Millstone Point area. They roost commonly in trees, buildings, over water, in rocky areas, and other hidden places, and come out at dusk to hunt for insects, on which they feed almost exclusively. They are thus quite valuable to man as destroyers of harmful pests. Some species roost together, returning as late as sunrise from hunting flying insects. Although known to infrequently transmit rabies to humans, this quality is more than offset by their insect-controlling abilities.

FAMILY PROCYONIDAE, Raccoons

The raccoon probably occurs within the study area. Favoring moist habitats and woodlands near streams, raccoons make use of hollow logs and trees, and caves for their dens, venturing out onto meadows, fields, and marshes to hunt ground-nesting birds and their eggs, large insects, toads, frogs, fish, and other aquatic creatures, as well as some plant material, such as fruits and grains. Highly inquisitive, they are known to search out garbage cans for their contents. A valuable fur-bearer, they are trapped in considerable numbers. In the study area, they are probably

valuable as destroyers of insects, although they do kill birds. The eggs and young of birds which nest on or near the ground are especially susceptible to destruction by raccoons. Nests of ducks, quail, herons, bitterns, and partridge are frequently raided.

FAMILY MUSTELIDAE, Weasels, Skunks, and Otters

This group of sharp-toothed mammals includes species highly valued by man as destroyers of harmful rodents. Weasels are of major importance as a control not only of mice, but of large insects; additionally, they consume rabbits, shrews, rats, frogs, snakes, and birds. Although pelts are of value in the fur trade, probably very little hunting is done in the Millstone Point area. Weasels prefer swampy areas, or lowlands where the undergrowth is thick, nesting in the holes of other mammals, tree stumps, or crevices in stone walls, or outcrops. Skunks, on the other hand, prefer open, rolling land, interspersed with low brush, or wooded areas; occasionally, they are found near wet pastures or human habitation. Nests are made in piles of stones, stumps, abandoned burrows of woodchucks or foxes, or under buildings. Probably because of their effective means of self-defense, skunks have become increasingly more involved with man's habitations. Preferred foods include insects (particularly grasshoppers, crickets, beetles, tobacco worms, cutworms), fruits such as cherries and raspberries, small mammals (mice, shrews, small rabbits), and turtle and bird eggs. Skunks have been greatly underrated by man as useful in pest destruction.

Otters are always found near stream banks, making their homes in hollow logs or in the banks themselves. This valuable fur-bearer (all other animals are rated against the otter for fur durability, the otter pelt being rated as 100 percent) feeds mainly on fish, but may kill muskrats, ducks, birds, and even poultry. It is unlikely that there would be more than one pair of otters in the vicinity of the Millstone Point area, as the stream in this area is too small to permit a larger population of these large animals.

FAMILY CANIDAE, Foxes

Two species of foxes, the red fox and the gray fox, may be found in Connecticut; they tend to have a wide territory, increasing the possibility of their presence at least part-time in the study area. Active mostly at night--during hunting activities for mice, rats, rabbits, and birds--foxes also consume quantities of fruit, vegetables, and carrion. Their occasional raids of poultry houses are more than offset by the large number of harmful rodents they consume. Foxes are found in wooded and farm lands, with little dense cover. Where rabbits, grouse, and quail are abundant, fox populations are larger. Dens may be in abandoned woodchuck holes, porcupine burrows, or in open fields.

FAMILY PHOCIDAE, Hair Seals

The Atlantic harbor seal may be an occasional visitor to the shoreline of the Millstone Point area, but is highly unlikely to be a permanent resident. This small seal feeds primarily on fish, squid, crustaceans,

and other forms of marine life. It is not one of the gregarious members of the carnivores; individuals do not congregate in large herds. This species has a wide range along the Atlantic, from the Carolinas north. Although of little ecological value to the terrestrial site, the seal may be of considerable interest and aesthetic value to visitors.

FAMILY SCIURIDAE, Squirrels and Woodchucks

The several species of squirrels--the eastern gray squirrel, red squirrel, flying squirrel, and the eastern chipmunk--may be found in the Millstone area. Squirrels are all predominantly herbivores, consuming quantities of nuts, acorns, twigs, fruits, mushrooms, and other plant material. Woodchucks also consume some mice and birds, as well as insects. Insects are also consumed by flying squirrels, although the bulk of their diet is plant matter. Red squirrels may consume large numbers of young birds each season, thereby being considered a pest by some ecologists. As with others of the family, however, these active animals are important as planters of trees; many thousands of "hidden" acorns and nuts sprout into needed woods. Additionally, squirrels provide many humans with considerable pleasure because of their friendly ways. Preferred habitats vary: squirrels occupy tree hollows or cavities, building loose nests of dead leaves in treetops during warm weather. Woodchucks are found burrowing in open farming country, or in woods, and occasionally up trees. Chipmunks, with their tendency to store garden bulbs and plants, may be injurious to cultivated lands they inhabit; generally, these animals prefer woodlands.

FAMILY CRICETIDAE, American Rats and Mice

These mammals have long been regarded, probably with justification, as harmful pests. Including the common house mouse, the meadow mouse, vole, and the common rat, these rodents do much damage to crops, orchards, dwellings, and food stores, and carry diseases transmissible to man. The white-footed, or deer-mouse, however, has at least partially redeemed the reputation of the family; in addition to eating considerable quantities of adult insects, it consumes grubs, caterpillars, and the larvae of gypsy moths. State forestry researchers are presently experimenting with increasing the population size of this beneficial rodent in Connecticut as an ecological alternative to pesticides. Habitats for this family include fields, woodlands, dwellings of all kinds, abandoned birds' nests, stone walls, grassy meadows, and gardens. Muskrats nest in marshes where they feed on aquatic plants, clams, frogs, and occasionally fish. Muskrats are one of the most valuable fur animals in North America.

FAMILY ZAPODIDAE, Jumping Mice

The only species of jumping mouse likely to be found in this area is the meadow jumping mouse. A very small rodent, it is found in a variety of woodland and meadow habitats, not usually a pest around human habitations. It feeds almost exclusively on plant material such as grain, seeds, nuts, and berries.

FAMILY LEPORIDAE, Hares and Rabbits

The two species of cottontail rabbits which may be found in the Millstone area are the eastern cottontail and the New England cottontail.

Rabbits can cause considerable damage to plants and crops in the area. They consume herbs, tree bark, vegetables, and garden plants. Cottontails make fur-lined nests in a wide variety of habitats-- fields, meadows, gardens, woodlands.

FAMILY CERVIDAE, Deer

White-tailed deer may be present in limited numbers in the woodland areas of the Millstone Point area, venturing out to feed in meadows and open fields in the early evening. Food is largely composed of tree twigs and leaves, water lilies, acorns, and often grasses. Deer may be destructive to orchards or garden fruit trees. Deer are one of the most important game animals in Connecticut and provide aesthetic pleasure to many people. However, the Millstone Point area is not used by deer hunters.

2. Birds

FAMILY GAVIIDAE, Loons

Loons are powerful swimming and diving birds preferring open water. At times they may inhabit the waters adjacent to the Millstone Point area; they come ashore to breed and nest. Larger than most ducks, they eat fish, crustaceans, and some aquatic plants. The common loon and the red-throated loon are known to exist in the general vicinity of the study area. The common loon can be found year-round in Connecticut, but the red-throated loon is only a winter resident in this area.

FAMILY PODICIPEDIDAE, Grebes

The red-necked grebe, horned grebe, and pied-billed grebe are found within the Millstone area. They are excellent swimmers and divers, smaller than loons, and distinguished from most other birds by their lobed toes. They generally dive for their food, preferring small crustaceans, fishes, tadpoles, and aquatic insects. The red-necked grebe and the horned grebe often winter along the Connecticut coastline among reeds and other marsh plants. The pied-billed grebe may nest in the vicinity of the freshwater pond.

FAMILY HYDROBATIDAE, Storm Petrels

The only member of this family to occur within the study area is Wilson's petrel, a medium-sized oceanic wanderer common along the Connecticut coast from June to September. These birds nest on sea islands, feeding on tiny fish, shrimp, and other planktonic animals at sea during the day and returning to their burrows at night. The females lay a single egg in the nest.

FAMILY PHALACROCORACIDAE, Cormorants

Cormorants are large, dark birds often seen perching upright on pilings, rocks, and buoys along the coast during the winter months. They are similar in appearance to loons, but form large flocks at times, flying in a wedge formation. Strictly fish-eaters, these excellent

swimmers almost always dive for their food. Two species, the great cormorant and the double-crested cormorant, are found along this coast; the double-crested cormorant is also found on inland lakes and rivers.

FAMILY ANATIDAE, Waterfowl

The many species of waterfowl found within the Millstone Point area are all heavy-bodied species with webbed feet, long necks, and flattened bills. The family is composed of such diverse types as swans, teals, ducks, mergansers, scoters, and geese. These inhabit a variety of habitats which include lakes, ponds, rivers, bays, estuaries, fields, mudflats, open ocean, and marshes. Most species feed on grasses, seeds, and such aquatic animals as crustaceans, insects, and molluscs. Waterfowl nest in tree cavities or hollows, marshes, grass, abandoned birds' nests, bushes, reeds, and tangled roots. Many species provide game for sportsmen in the Connecticut area. Mallards, black ducks, and possibly wood ducks breed in the vicinity of Millstone Point. Mallards and black duck are common all year in Connecticut. During the spring and fall migrations, pintails, American widgeons, teal, and redheads are found along Long Island Sound. During the winter, many water birds may frequent the Millstone area; these include Canadian geese, brant, canvasbacks, scaup, golden-eyes, buffleheads, and red-breasted mergansers.

FAMILY CATHARTIDAE, Vultures

Only one species of vulture is found in the study area, the ubiquitous turkey vulture. This species feeds almost exclusively on carrion found along roadsides and in fields, providing an important ecological service to the community. Females nest in hollow logs, stumps, or on the ground among brush and rocks, incubating one to three eggs.

FAMILY ACCIPITRIDAE, Kites, Hawks, and Eagles

The members of this family likely to be observed in the Millstone area include ospreys, marsh hawks, sparrow hawks (kestrels), and red-shouldered hawks. Our national bird, the bald eagle, is rarely seen, but occasional specimens may be observed along this shoreline during the fall, winter, and spring. Bald eagles are a rare and endangered species. They feed chiefly on dead fish. Ospreys, on the other hand, take live food just below the surface of sea, lake, and river waters. A pair of ospreys may be nesting within the Millstone Point site; the ecological plight of these birds has made them a subject of much discussion and concern in the area surrounding the site. Hawks are strong fliers; they eat a large number of harmful rodents, as well as other mammals, birds, and large insects. The marsh hawk is found in Connecticut only during the summer; the red-shouldered hawk and sparrow hawk are year-round residents.

FAMILY TETRAONIDAE, Grouse

Only the ruffed grouse is represented here and likely to be within the study area. Chicken-like in appearance, and weak fliers, grouse prefer clearings in open woods during the summer, retiring to coniferous woods in the winter. Much hunted as a game species, these birds feed mainly on seeds and ground-dwelling insects; they are mainly nonmigratory.

FAMILY PHASIANIDAE, Quails and Partridges

Bobwhite quail and the introduced ring-necked pheasant are both likely to occur within the Millstone area year-round. These are both game species with limited flight abilities, foraging on the ground for seeds and insects, as well as wild grains and berries. Bobwhite quail prefer brush, abandoned fields, and open pinelands, and may be found in coveys of up to 30 birds during winter. Pheasants prefer open woods, farmlands, hedgerows, and brush, roosting in low trees.

FAMILY ARDEIDAE, Herons and Bitterns

The several members of the family found in this area prefer a variety of habitats, including marshes, streams, shores, tideflats, irrigation ditches, lakes, ponds, and irrigated lands. They are generally medium to large wading birds which feed on fish, frogs, crayfish, and

occasionally on mice and insects. Most species nest in colonies, building nests of sticks in trees, dead brush, on water or in reeds. The common egret is an occasional in this area. The little blue heron, green heron, American bittern, and least bittern are present only during the summer. The great blue heron and the black-crowned night heron are year-round residents.

FAMILY THRESKIORNITHIDAE, Ibises

Only one species, the glossy ibis, is possibly but rarely found in this region during the summer. A long-legged marsh bird, the ibis feeds in small flocks on crustaceans, insects, leeches, and small fishes, in fresh or salt marshes, irrigated lands, and reeds. Females nest colonially in reeds, marshes, or bushes, making a nest of reeds or sticks, and laying three to five eggs.

FAMILY RALLIDAE, Rails and Coots

This family is composed of medium-sized to small, compact birds with short necks and long legs. Long toes enable these birds to walk on marshy vegetation, searching for tender aquatic vegetation, frogs, insects, crustaceans, molluscs, seeds, and buds. These birds prefer grassy areas, marshes (either freshwater or brackish), moist meadows, and reedy ponds, and are known for their secretive habits. Coots are often found throughout the year in this region, on both salt and fresh water. The Virginia

rail, sora, black rail, and clapper rail breed along the shore. The yellow rail may be present during the fall and spring migrations.

FAMILY CHARADRIIDAE, Plovers, Turnstones, and Surfbirds

These are small to medium-sized shore birds usually inhabiting shores, mudflats, sandy beaches, lake shores, fields, plains, lawns, bays, marshes, and surf-swept rocks. Most species are waders, feeding on small marine fishes, crustaceans, molluscs, some insects, and a small amount of vegetation. The killdeer is a year-round resident. Migrating semipalmated plovers and ruddy turnstones are common in this area. The black-bellied plovers may spend the winter in the Millstone Point area.

FAMILY SCOLOPACIDAE, Sandpipers, Woodcocks, and Snipes

These smallish birds are generally found along shores, in marshes and ponds, tidal flats, and, with the woodcocks and snipes, in marshes, bogs, river banks, moist woodlands, thickets, and irrigation ditches. They nest in meadows, open fields, marshes, under bushes, and behind sand dunes. Preferred foods are small crustaceans, molluscs, insects, worms, and some seeds and berries. Many of the species are extremely gregarious, forming large flocks by the shore. Woodcocks and snipes commonly nest in this area. Least sandpipers, knots, and semipalmated sandpipers pass through the vicinity during migration. Dunlins and sanderlings are known to winter along the Connecticut shore.

FAMILY PHALAROPODIDAE, Phalaropes

Similar to sandpipers in size and appearance, phalaropes are swimming birds with long bills and lobed toes. Only one species, the red phalarope, is seen in the study area, and usually during storms along the coast, as it is generally a pelagic species. Food consists of plankton, marine invertebrates, and insects and mosquito larvae when inshore. The red phalarope probably does not nest in this area, preferring tundra for this purpose.

FAMILY LARIDAE, Gulls and Terns

Six species of gulls and two terns are commonly seen in this area. The herring gull and great black-backed gull are common year-round. The laughing gull is also reported as a summer resident. The ring-billed gull, Bonaparte's gull, and the Iceland gull frequent the Connecticut shore in winter. Gulls are primarily scavengers, including in their diet all manner of marine life, plant and animal food found inshore, refuse, and carrion. Terns usually feed on marine fish and invertebrates, diving for their food from a hover several feet above the water's surface. Terns are smaller than gulls, and more streamlined; their preferred habitats are open ocean, bays, and beaches. The common tern is often seen in this area during the breeding season; however, the black tern is usually only seen during the spring and fall. Gulls occupy a great diversity of habitats, including beaches, bays, piers, boats, mudflats, rocks, dumps, fields, cities, farmlands, rivers, ponds, and marshes. Their nesting areas are usually in dunes, seaweed or grass, sea cliffs, islets, and

marshes; the females tend to be colonial. Seagulls serve as useful scavengers along the beaches and other coastal areas.

FAMILY RYNCHOPIDAE, Skimmers

The black skimmer is the only species found in this area. It is a very agile bird, skimming along the water surface with its lower beak in the water while searching out small fishes for food. Preferred habitats are in sheltered bays and coastal inlets; these birds are not usually found in as large numbers as the seagulls but are known to breed in the vicinity.

FAMILY ALCIDAE, Auks and Relatives

Occasionally, one species of this family may be found within the study area, the little penguin-like dovekie. Its usual habitat is the open sea, descending into the New England area in winter when it is blown ashore. This species nests in colonies far to the north of Connecticut, coming ashore only to breed. Small fishes are the preferred food.

FAMILY COLUMBIDAE, Pigeons and Doves

Two members of this family are present in the Millstone Point area year-round. The rock dove, or domestic pigeon, is familiar to city dwellers and residents of towns everywhere; it also inhabits farmlands and meadows, feeding on caterpillars, other insects, seeds, waste grain, and fruits. Mourning doves usually feed on seeds, fruit, and grains, and

inhabit farmlands, towns, aspen woods, coastal scrub, meadows and fields, where they nest on platforms in trees, shrubs, or on the ground. Rock doves nest on buildings or cliffs; both species usually lay two eggs.

FAMILY CUCULIDAE, Cuckoos, Roadrunners, and Anis

Yellow-billed cuckoos and black-billed cuckoos might be expected to occur in the Millstone area during the summer, inhabiting dense thickets, groves, willows, and wood edges. They are sluggish birds, feeding upon caterpillars and other insects, and may be of considerable use in controlling the gypsy moth presently causing much damage to New England. These cuckoos make twig nests in small trees and bushes, usually laying two to five eggs. They are most commonly found during outbreaks of tent caterpillars and other hairy caterpillars.

FAMILY STRIGIDAE, Owls

Several owls should be encountered in the study area. The saw-whet, short-eared, long-eared, great horned, screech, and barred owls are year-round residents in Connecticut. The snowy owl is an irregular winter visitor. These nocturnal birds of prey are of great benefit to mankind as a natural controller of vermin; they consume great quantities of mice and other rodents, birds, reptiles, fish, and large insects. Favored habitats include woodlands, farm groves, forest trees, thickets, streamsides, and

sand dunes. Nests may be found in tree cavities; woodpecker holes; hawk, heron, or crow's nests; trees; marshes; beaches; meadows; cliffs; or even on the ground.

FAMILY CAPRIMULGIDAE, Goatsuckers and Nighthawks

Members of this family found during the summer in the Millstone area are the common nighthawk and the whippoorwill. These nocturnal birds consume large numbers of flying insects, swooping down from the sky above farmlands, towns, oak or pine woods, gullies, and hills. They lay their two eggs on the ground or on flat roofs. Nighthawks, belying their name, are often found abroad during the day. They may be of great value to man as a destroyer of harmful moths and other large flying insects.

FAMILY APODIDAE, Swifts

One species is commonly found in this area during the summer, the chimney swift. It feeds almost exclusively on flying insects, and is found in flocks above towns and fields. Swifts appear much like bats in flight, but on closer examination, they seem to resemble swallows, with which they are often found; such similarity is only superficial.

FAMILY TROCHILIDAE, Hummingbirds

The only species of hummingbird found in the east, the ruby-throated hummingbird is well known to bird lovers and owners of carefully tended

gardens. It is found near tubular flowers, such as honeysuckle, in gardens or woods, where it feeds on the nectar; occasionally, hummingbirds feed on aphids, small insects, and spiders associated with these flowers. This species is only present in the Millstone area during the warm months of the year.

FAMILY ALCEDINIDAE, Kingfishers

The belted kingfisher, the only one north of Texas and Arizona, is a solitary, migratory bird which feeds mainly on fish. It is usually observed fishing from a perch above water, or hovering around rivers, ponds, lakes, bays, and coastal areas. Nests, made in burrows in riverbanks or sandbanks, are not usually found in this area.

FAMILY PICIDAE, Woodpeckers, Flickers, and Sapsuckers

Members of this family are well represented in the Millstone area and other regions containing groves, river woods, mixed and coniferous forest, scattered trees, farmlands, and semi-open country. These birds feed mainly on tree-boring insects; some acorns, berries, and sap are eaten additionally, and flickers are occasionally seen on the ground eating ants. Nests are made in tree cavities, posts, and buildings, or in a large branch. Most species are nonmigratory.

FAMILY TYRANNIDAE, Flycatchers, Kingbirds, and Phoebes

The seven species in this family which might be encountered in the Millstone Point region are large perching birds usually found on exposed

branches in orchards, farmlands, groves, on telephone wires and posts, and along wood edges and roadsides. They feed mainly on flying insects, and may be of considerable value as a destroyer of harmful pests. Nests are made in a variety of places, including trees, bushes, posts, and tree holes. The phoebe also nests under overhanging cliffs or banks, under bridges and eaves, or inside farm buildings. They usually migrate south for the winter.

FAMILY ALAUDIDAE, Larks

The horned lark is the only lark found throughout the United States. The family is represented by only one other member in the western hemisphere, the skylark of Vancouver, B.C. Horned larks are medium-sized perching birds inhabiting fields, airports, shores and meadows, and feeding mainly on seeds and small insects. The horned lark nests in a grass-lined depression on the ground, laying three to five eggs. During the winter, these birds may be found feeding in freshly manured fields.

FAMILY HIRUNDIDAE, Swallows

Swallows are slim, streamlined, sparrow-sized birds, inhabiting open forests, woods, cliffs, and towns; they are often seen perching on wires. Most swallows nest in colonies, and all are strong, swift fliers which capture flying insects on the wing. Tree swallows are also known to eat bayberries during cold weather. Bird boxes, buildings, tree cavities, cliffs, and sand or clay banks are usual nesting sites for this family. Six species are known in this area; these include the barn swallow, cliff swallow, tree swallow, bank swallow, rough-winged swallow, and purple martin. Swallows migrate south for the winter.

FAMILY CORVIDAE, Crows and Jays

The common crow, the fish crow, and the bluejay are all common year-round residents of the Millstone Point area. These birds are omnivorous, feeding on a wide variety of plant and animal matter, including grains, seeds, berries, insects, worms, garbage, crustaceans, and birds' eggs. They are raucous, noisy birds inhabiting woodlands, groves, farmlands, meadows, suburban areas, and beaches, where the fish crow, at least, scavenges on shore for dead or dying fishes. Jays are especially common in oak and pine woods, in loose flocks of 5 to 50 birds, and they make a bowl nest of twigs in trees. Crows and ravens make large nests of sticks, bones, wool, and other material in trees or on cliffs.

FAMILY PARIDAE, Chickadees and Titmice

Black-capped chickadees and tufted titmice are commonly observed within the study area. These small, plump songbirds are often found hanging upside-down from tree branches while feeding. They inhabit mixed and coniferous woods, willow thickets, groves, and suburban areas, and are a favorite of bird watchers with feeding stations and nest boxes. Nests are usually made in tree cavities and both species feed on insects, seeds, acorn mast, and berries. Both remain in the area during the winter, often flocking together.

FAMILY SITTIDAE, Nuthatches

The red-breasted and the white-breasted nuthatches are found within the Millstone area. These tree-climbing birds feed on bark insects, seeds,

and nuts, and often flock with chickadees and titmice. They prefer woodlands--deciduous for the white-breasted, coniferous for the red-breasted; both species are migratory. The females nest in tree cavities, laying four to nine eggs.

FAMILY CERTHIIDAE, Creepers

The only member of the family found in the United States, the brown creeper is a common but inconspicuous woodland bird preferring dense woods and forests. It creeps spirally up trees searching for insects, and nests behind a strip of loose bark. Adults are solitary; the females lay four to eight eggs in the nest and may be found year-round in Connecticut.

FAMILY TROGLODYTIDAE, Wrens

The house, Carolina, winter, and long-billed marsh wrens may be found in the study area. Wrens are small, stumpy birds often displaying a cocked tail. They feed mainly on insects and spiders, inhabiting thickets, woods, gardens, towns, streamsides (especially where there is undergrowth), marshes, and brackish water (in the case of the long-billed marsh wren). Carolina wrens and winter wrens may be found year-round; the other two species migrate south. Nests are made in tree holes and stubs, brushpile, bird boxes, exposed roots, crevices, and rocks; marsh wrens build nests lashed to stems in marshlands.

FAMILY MIMIDAE, Mockingbirds and Thrashers

These long-tailed, slender-billed birds are excellent singers and mimics. All prefer brushy habitats, wood margins, roadsides, farms,

towns, thorny thickets and residential areas. They feed on a variety of insects, fruits, and seeds, and make their nests in bushes, tangles, thickets, or low trees, laying three to six eggs at a time. The catbird, mockingbird, and brown thrasher are common during the summer; the catbird migrates south for the winter, but the brown thrasher may overwinter.

FAMILY TURDIDAE, Thrushes and Bluebirds

This family of fine singers is represented in the Millstone Point area by at least seven species. They are medium-sized, stout-legged songbirds inhabiting towns, lawns, farmlands, forests, streamside willows, and woods. Perhaps the best known is the common robin which can be seen year-round. Other common species are the wood thrush, hermit thrush, and beery. Swainson's thrush and the gray-cheeked thrush may be seen in the spring and fall. They are often seen standing or running on the ground, in search of worms, snails, seeds, insects, and fruits. Typically, they migrate at night, although robins in flocks migrate by day. Most members of this group build nests in crotches of trees or shrubs; bluebirds nest in tree cavities or bird boxes. This group of birds probably consumes large numbers of caterpillars and other harmful grubs, insects, and worms, and may thus be valuable in preserving a stable ecological balance.

FAMILY SYLVIIDAE, Gnatcatchers and Kinglets

This family of old world warblers is represented here by three species. The blue-grey gnatcatcher is present during the summer, but the golden-crowned and ruby-crowned kinglet may be present all year.

They are small, drab insectivores, eating insect larvae and eggs in addition to the adults. They usually inhabit forest treetops, the kinglets favoring coniferous woods. Gnatcatchers have lichen-coated nests on tree limbs or in low bush; kinglets nest in a large ball of mosses in conifers. These birds are quite small, but very active; they consume numbers of insects and thus aid in the control of pests in forested areas.

FAMILY MOTACILLIDAE, Pipits and Wagtails

The water pipit, the sole representative of this family in the study area, is a small bird usually feeding on ground insects, spiders, and some seeds. They are common in flocks during migration, migrating from this area in cooler weather. Inhabitants of bare fields, plains, and shores, pipits walk leisurely and wag their tails continually. Nests are made of grass on the ground.

FAMILY BOMBYCILLIDAE, Waxwings

A crested, gregarious bird, the cedar waxwing is the only one of the family in the Millstone area. These birds vary in abundance from one year to another, but are occasionally seen in large numbers in berry-bearing bushes, near fruiting trees, or catching insects "on the wing." They prefer open woodlands, bushes, and orchards, making their solitary nests of twigs, grass, and moss on tree or bush branches. Three to five eggs are laid in late summer. They overwinter in the area.

FAMILY LANIIDAE, Shrikes

The loggerhead shrike, although uncommon, may be seen occasionally

in the study area. A medium-sized bird, it pursues insects, lizards, smaller birds, and rodents, often impaling these on thorn trees or barbed wire. Shrikes are solitary birds, perching on treetops, telephone wires, and posts in open country. The loggerhead shrike builds a bulky nest in thorny scrub or in dense bushes.

FAMILY STURNIDAE, Starlings

Represented in this area only by the common starling, this gregarious, exceedingly common songbird may be found in almost any habitat--towns, cities, fields, groves, trees, bushes, and lawns year-round. They are aggressive, hardy birds, nesting in holes, buildings, and many other sites, and feeding on many kinds of seeds, insects, worms, and other plant and animal matter. Because they often displace more desirable bird species within an area, they are often looked upon unfavorably by human inhabitants of an area.

FAMILY VIREONIDAE, Vireos

Six vireos are to be found in the general vicinity of the Millstone area. The red-eyed vireo, white-eyed vireo, yellow-throated vireo, warbling vireo, and solitary vireo breed in Connecticut but migrate south in the fall. The Philadelphia vireo is occasionally sighted during the fall. These small, dull-colored songbirds inhabit woods, dense forest, and such areas of foliage as shade trees, aspens, and poplars. They pick insects from among leaves in the foliage, and are also found searching for this food item on the ground. Nests are usually shallow to medium-deep cups suspended from low branches of trees; the warbling vireo builds cups of birch bark in the forked twig of trees and bushes.

FAMILY PARULIDAE, Wood Warblers

This large group of songbirds is composed of tiny, brightly colored species inhabiting woodlands, groves, bushes, undergrowth, orchards, along streams and wooded swamps. Most nest in shallow cups on the ground and in tree stumps, but a few nest high in trees, in moss and grass, and a few, in shrubs. Preferred foods of the more than 30 species inhabiting the area around the Millstone Point area are the many types of insects and their larvae found in this habitat. During the nesting season, warblers remain close to their habitats, congregating in huge flocks during migration, along with other warblers, chickadees, and titmice; migrations are often at night. These sparrow-sized birds probably account for much of the insect control occurring within the Millstone area.

FAMILY PLOCEIDAE, Weaver Finches

Only one member of the family, the house sparrow, is found in the area, but it is exceedingly common and found in a wide variety of habitats: towns, cities, farms, fields, trees, groves, and suburban areas. The house sparrow feeds mainly on seeds and insects, and is a frequent visitor at feeding stations and bird boxes. Nests are bulky masses in tree cavities or buildings, and sometimes are found in tree branches or bird boxes; four to seven eggs are usually laid. House sparrows are nonmigratory, and often seen in flocks.

FAMILY ICTERIDAE, Blackbirds and Orioles

Twelve species from this family are found in the study area. These are usually medium to large songbirds eating such foods as insects, small fruits, seeds, waste grain, and tiny aquatic animals. Preferred habitats

include meadows, fields, marshes, swamps, cultivated lands, towns, lawns, farms, woodlands, thickets, and orchards. Some species walk on the ground; others are arboreal. Nests may be shallow or domed cups in grass, fastened to reeds or tree branches, or basketlike pouches hanging from tree limbs. One species, the cowbird, lays its eggs in the nests of other species of songbirds; the young rapidly displace its foster siblings soon after hatching. The most common species in the Millstone area are probably the red-winged blackbird and the common grackle. The red-winged blackbird migrates south for the winter.

FAMILY FRINGILLIDAE, Grosbeaks, Finches, Sparrows, and Buntings

This very large family of common songbirds consists of small species with heavy conical beaks well adapted for cracking seeds, the major component of their diet. Additionally, some species eat insects and small fruits. Preferred habitats include open forests, woods, river thickets, towns, several types of trees, hedgerows, shores, fields, salt marshes, wires, roadsides, gardens, and farms. Nests may be found in trees, shrubs, weeds, or on the ground, containing three to six eggs. Families such as this, composed of birds consuming large quantities of seeds, are at least partially responsible for the appearance of young plants. Viable material in bird feces is carried to new and arable regions, permitting the survival of many types of bushes, trees, grasses, and shrubs.

The best known members of this family are year-round residents in

the Millstone area; these include cardinals, purple finches, song sparrows, chipping sparrows, and the towhee. The house finch is now found in the east and is increasing in numbers. The sharp-tailed sparrow and the seaside sparrow are common year-round residents along the coast of Connecticut.

3. Reptiles

FAMILY CHELYDRIDAE

The most common member of this family is the snapping turtle. It is found in any permanent body of freshwater and on occasion enters brackish water. Snapping turtles are ugly in disposition as well as appearance. They are omnivorous and prey on invertebrates, fish, other reptiles, amphibians, birds, and small mammals. In addition, they eat carrion and aquatic plants. Snapping turtles are abundant even in very small ponds in thickly settled areas. They are extremely hardy and adaptable. Snapping turtles can be eaten.

The stinkpot or musk turtle may be present in the vicinity of Millstone Point. This species is less common than the snapping turtle and prefers larger streams and lakes.

FAMILY TESTUDINAE

The best known member of this family is the box turtle. Box turtles are "dry-land turtles" that close their shells tightly when threatened. Sometimes these turtles soak themselves in mud or water.

During dry, hot summer weather, they often hide under logs or burrow in rotting vegetation; after showers they come out in numbers. The box turtle is omnivorous and very adaptable and therefore is often kept as a pet. They often reach ages of 30 to 40 years. The eastern box turtle is present in most wooded areas.

The eastern painted turtle is probably also found at Millstone Point. Painted turtles prefer shallow water with a soft, muddy bottom. They feed on aquatic vegetation, insects, crayfish, and small molluscs.

The northern diamondback terrapin is found along the coast from Cape Cod to Cape Hatteras. Terrapins are the most common turtles in salt marshes and in brackish water. They are found within their range in almost any unpolluted body of sheltered salt or brackish water. Terrapins eat fish, crustaceans, molluscs, and insects. When properly prepared, terrapins are good eating. Terrapin was a popular gourmet item; market hunting seriously reduced their numbers, but in recent years the terrapin population has made a comeback.

The spotted turtle lives in marshy meadows, swamps, and near shallow bodies of freshwater. They are seen most frequently in the spring. Spotted turtles may be present in the Millstone Point area.

FAMILY COLUBRIDAE

Snakes are shy animals and probably many species live in the Millstone area but are rarely observed. The snakes of the family Colubridae that are most likely to be encountered in coastal Connecticut are the eastern garter snake, eastern ribbon snake, northern water snake, eastern

worm snake, northern brown snake (DeKay's snake), eastern milk snake, and black rat snake. Other snakes of this family, including the eastern hog-nosed snake, northern ring-neck snake, black racer, and smooth green snake may also be present, though less common, in the area. In general, snakes are beneficial because they help to control rodent and insect populations.

Water snakes are present in almost every marsh, swamp, or bog within their range. These snakes are harmless and feed on animals caught in the water, such as frogs, salamanders, fish, and crayfish. Some fishermen dislike water snakes because they feed on fish, but usually the watersnakes only catch sick or weak fish and thus may help to keep fish populations healthy.

The northern brown snake is small and secretive but very abundant. It is frequent in urban areas as well as rural. It prefers moist habitats where it feeds on slugs, earthworms, and soft-bodied insects.

Two members of the genus Thamnophis, the garter snake and the ribbon snake, are likely to be encountered in the Millstone Point area. Garter snakes are common almost everywhere in the east where they occupy a variety of habitats. They feed on frogs, toads, salamanders, fish, earthworms, leeches, small mammals and birds, and carrion. In contrast to the garter snake, the ribbon snake is semiaquatic and feeds mostly on amphibians and small fish.

The worm snake is small and inconspicuous--(it resembles an earthworm in appearance), but common. Worm snakes are usually found under stones and boards where they hunt for earthworms and small insects. In

dry weather, worm snakes hide underground.

Two constrictors, the black rat snake and the milk snake, may be present. Black snakes are good climbers and may hunt in trees. Adults are large and feed on small mammals and birds; the young black snakes prey on tree frogs. The milk snake is commonly seen around farm buildings where they hunt for mice and rats. Milk snakes eat other snakes, lizards, birds, bird and turtle eggs, as well as rats and mice. In general, milk snakes are beneficial to man because they help to control rodent populations.

FAMILY VIPERIDAE

Two poisonous snakes, the northern copperhead and the timber rattlesnake, are found in New England. However, these species are not likely to be encountered on Millstone Point because they prefer rocky hillsides and mountains.

FAMILY SCINCIDAE

The only endemic lizard in Connecticut is the five-lined skink. Skinks are terrestrial lizards that hunt during the day. At night or in bad weather, they hide under stones and logs and in debris. Insects and spiders are their chief food. Skinks are especially common in damp disturbed areas such as cut-over wood lots, rock piles, and decaying debris.

4. Amphibians

FAMILY PROTEIDAE

The mud puppy may be present in the pond in the wildlife management area. Mud puppies, unlike most salamanders, remain in a larval stage throughout their life. Mud puppies never lose their gills; therefore, they remain submerged. They will eat almost anything--fish, fish eggs, crayfish, aquatic insects, molluscs, etc. The mud puppy can reach a length of 17 inches.

FAMILY AMBYSOMIDAE

Three mole salamanders may be present in the Millstone Point area: the Jefferson salamander, spotted salamander, and the marbled salamander. These species live underground during most of their lives and therefore are hard to find. On rainy nights they prowl around hunting for small invertebrates. During the breeding season they congregate for courtship and egg laying. The Jefferson salamander and the spotted salamander breed in early spring and lay their eggs in pools. The marbled salamander is a fall breeder; it lays its eggs in depressions. The eggs do not begin development until rain covers them with water.

FAMILY SALAMANDRIDAE

The red-spotted newt is probably present in the pond and surrounding woodlands. Newts are essentially aquatic but usually go through a ter-

restrial eft stage. The larvae transform into efts but, after living ashore for one to three years, efts are transformed into aquatic adult newts. In coastal areas, such as Millstone Point, the terrestrial stage may be omitted from the life cycle. Newts prey upon insects, leeches, earthworms, small snails and crustaceans, frog eggs, and other amphibians. However, newts have few predators because their skin is coated with a secretion irritating to other animals.

FAMILY PLETHODONTIDAE

The family Plethodontidae consists of the lungless salamanders; they respire through their skin and the linings of their mouths. The lungless salamanders include the dusky salamanders, woodland salamanders, spring salamanders, and brookside salamanders. The northern dusky salamander is very abundant, especially along the edges of small streams. The coloration of this species is very variable; therefore, it is often difficult to identify. Woodland salamanders are abundant and widespread; they are most commonly seen after spring and fall rains. During hot, dry weather they estivate or seek optimum moisture conditions. Woodland salamanders usually hide during the day under stones or logs, but prowl around at night or on rainy days hunting insects and earthworms. Woodland salamanders lay their eggs in damp logs or in damp moss; there is no aquatic larval stage. Three members of this group are probably found in the woods at Millstone Point:

the red-backed salamander, the four-toed salamander, and the spring (purple) salamander. The most common brookside salamander in the vicinity is the two-lined salamander. These salamanders live near streams or in saturated areas near springs; in warm wet weather, they may wander into surrounding woodlands. Unlike the woodland salamanders, brookside salamanders go through an aquatic larval stage.

FAMILY PELOBATIDAE

The only member of this family in Connecticut is the eastern spadefoot toad. Like frogs, toads eat mostly insects and other small invertebrates. Spadefoot toads prefer sandy or loose soils. During dry periods they hide underground and only come out on damp nights. During the summer they may suddenly appear in great numbers after heavy rains.

FAMILY BUTONIDAE

True toads feed on insects and other small invertebrates. The skin gland secretions of toads are irritating to the mucous membranes of most other animals. The American toad and Fowler's toad are probably present in the Millstone area. Toads are found in varied habitats; they require shallow bodies of water in which to breed in spring, moist hiding places, and lots of insects. Fowler's toads often appear in great numbers after warm, heavy rains.

C. RARE OR ENDANGERED SPECIES

Some birds of prey, such as the osprey and the bald eagle, are now considered to be rare and/or endangered species. A pair of ospreys may be nesting within the Millstone Point site. The bald eagle is very rare, but occasionally specimens are observed in the vicinity. Several species of hawks, which are declining in numbers but are not presently considered endangered, are also found in the area.

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APPENDIX A

SOURCE MATERIAL

APPENDIX A

SOURCE MATERIAL

A. ORGANIZATIONS

State Capitol, Hartford, Connecticut

1. State Library
2. State Office Building
 - a. E. Zell Steever, Department of Environmental Protection.
A survey of marshlands, coastal and marine section water resources.
 - b. Whit Beals
 - c. Ted Bampton, Deputy Commissioner
 - d. Cole Wilde, Assistant
 - e. Dr. Hugo Thomas, Department of Environmental Planning
 - f. Dennis de Carli, Director of Wildlife
 - g. Arthur Roque, Environmental Analyst for Planning and Standards

Connecticut State Natural History Survey

Dr. Joe Webb Peoples, Director (geologist), Wesleyan University,
Middletown, Connecticut

University of Connecticut, Storrs, Connecticut

1. Dr. Douglas Jordan, State Archeologist, Museum Building
2. Natural Sciences Building
 - a. Dr. James Slater

- b. Dr. Michael Lefor, Wetlands Survey
 - c. Dr. David Miller, Natural Resources
 - d. Dr. Peter Delighar
 - e. Dr. Gratzner
 - f. Dr. Robert McDowell, Wildlife Department, rabbits and deer
3. Dr. Kersting, Director, Agricultural Extension
 4. Mr. Ferrill, Agricultural Conservation
 5. Dick Akeroid, Reference Librarian

Connecticut College, New London, Connecticut

1. Dr. William Niering, Director of Connecticut Arboretum
2. Sally Taylor, Conservationist, Department of Botany

Yale University, New Haven, Connecticut

1. Dr. Tom Siccama, Department of Forestry
2. Dr. Herbert Bormann, Department of Forestry, heavy metals in marsh organisms

Connecticut Forest and Park Association, 1010 Main Street, Hartford, Connecticut 06108

The association is involved in computerizing Connecticut resources and in identifying endangered areas.

1. Floyd Callward, President
2. John E. Hibbard, Secretary
3. Rosalind Bachelor, Clerk

Connecticut Wildlife Federation, Inc., 82 Sorries Court, South Meriden, Connecticut 06450

Walter Hylwa, President

Audubon Society of Connecticut, 2325 Burr Street, Fairfield, Connecticut 06430

Paul Mooney, President

Connecticut Association of Conservation Commission, P.O. Box 177, West
Hartford, Connecticut 06107

Gay Ewing, President

Connecticut Audubon Council, Orchard Hill Road, Harwinton, Connecticut 06790

Gordon Loery, President

Long Island Sound Study Group, 270 Orange Avenue, New Haven, Connecticut

Long Island Sound Association, Box 496, Westport, Connecticut

Barlow C. Wotton, Director

Dennison Nature Study Group, Mystic, Connecticut

Waterford Conservation Commission, Waterford, Connecticut

Michael Sherb, L.L.D., Chairman

East Lyme Conservation Commission, East Lyme, Connecticut

Art Carlson, Chairman

Southeast Connecticut Environmental Protection Association, Norwich,
Connecticut

Richard Erickson, Director

Photo interpretation of wetlands

Dr. Robert Hillman, W. F. Clapp Laboratory, P.O. Box 1637, Duxbury,
Massachusetts 02332

Survey consultant on aquatic ecology of Millstone Point, Connecticut

Connecticut Conservationist, Inc., Mystic, Connecticut

Richard M. Bowers

Connecticut Conservation Association, Old Saybrook, Connecticut

Cornelia Chapin

Thames Science Society, Inc., Gallows Lane, New London, Connecticut

Records and Publisher of local natural history

Connecticut Arboretum Association, Connecticut College, New London,
Connecticut

B. AVAILABLE REPORTS AND DOCUMENTS

Naturalist Notebook

Thames Science Center, Inc., New London, Connecticut, December 1972, Volume 8, Number 10. Its natural science articles, especially about Connecticut, include annual local bird counts in the New London area.

Connecticut Arboretum Publications

1. Bulletins issued periodically. Survey of plants of the New London area.
2. Research papers. Studies of herbicides and economic botany for the Connecticut Arboretum area.
3. Special publications. Miscellaneous papers on flora and some fauna.

Connecticut State Natural History Survey

1. Bulletins 1-115. Geology, climatology, plants, and animals of Connecticut. Mainly geological bulletins.
2. Miscellaneous series, Numbers 1-10. Reprints on Connecticut from other journals.
3. Reports of investigations, Numbers 1-5. Geology
4. Guide books, Numbers 1-3. Additional geology.
5. Ecology surveys of specific areas, Numbers 1-3. Vegetation of Connecticut's natural areas.

Connecticut Wildlife Conservation Bulletin

These eight-page bimonthly bulletins on law enforcement and wildlife biology are designed for the layman, hunter, and fisherman. They include one-or two-page articles on the natural history of individual species.

Tidal Wetlands Surveys

Prepared for the Department of Environmental Protection by consultant groups and by many people of varying degrees of proficiency, these surveys appear to lack a great many plants and animals which are expected to occur in the area. The quoted references are not of the quality expected for such a survey, and former surveys and state bulletins are overlooked. Although these are the only current major surveys, they lack sufficient reliability.

APPENDIX B

LISTS OF SPECIES OBSERVED AT MILLSTONE POINT

Table B-1

Species Actually Observed at Millstone Point
(Grouped According to Observed Habitats)

A. FLORA

Forest Area

Trees

<u>Quercus rubra</u>	Red oak
<u>Quercus alba</u>	White oak
<u>Betula lenta</u>	Black birch
<u>Carya sp.</u>	Hickory
<u>Betula populifolia</u>	Gray birch
<u>Sassafras albidum</u>	Sassafras
<u>Acer rubrum</u>	Red maple
<u>Prunus serotina</u>	Black cherry
<u>Fagus grandifolia</u>	Beech
<u>Castanea dentata</u>	American chestnut
<u>Fraxinus americana</u>	White ash
<u>Platanus occidentalis</u>	Sycamore
<u>Carpinus caroliniana</u>	Musclewood
<u>Betula lutea</u>	Yellow birch

Understory

<u>Rhodora sp.</u>	Azalea
<u>Parthenocissus quinquefolia</u>	Virginia creeper
<u>Smilacina racemosa</u>	False Solomon's seal
<u>Vitis sp.</u>	Grape
<u>Smilax rotundifolia</u>	Green briar
<u>Sambucus canadensis</u>	Elderberry
<u>Lindera benzoin</u>	Spicebush
<u>Viburnum sp.</u>	Arrowwood
<u>Rubus sp.</u>	Raspberry
<u>Kalmia latifolia</u>	Mountain laurel
<u>Vaccinium corymbosum</u>	Blueberry
<u>Smylocarpus foetidus</u>	Skunk cabbage
<u>Lycopodium complanatum</u>	Ground pine
<u>Maianthemum canadense</u>	Canada mayflower
<u>Myrica pennsylvanica</u>	Bayberry

Table B-1 (cont.)

Noncultivated Fields

Natural Growth

Dactylis glomerata
Solidago sp.
Aster sp.
Cirsium sp.
Juncus effusus
Ambrosia artemisifolia
Cyperaceae
Onoclea sensibilis
Impatiens capensis

Orchard grass
Goldenrod
Aster
Thistle
Rush
Ragweed
Sedge
Sensitive fern
Jewelweed

Hedges

Smilax rotundifolia
Parthenocissus quinquefolia
Spiraea latifolia
Prunus serotina
Viburnum sp.
Rhus glabra

Green briar
Virginia creeper
Meadow sweet
Black cherry
Arrowwood
Smooth sumac

Nursery Plants

Rhododendron sp.
Acer sp.
Pyrus aucuparia
Taxus sp.
Juniperus sp.

Rhododendron
Copper maple
Mountain ash
Yews
Cedars

Beach Area

Solidago sp.
Salicornia sp.
Rhus toxicodendron
Celastrus scandens

Seaside goldenrod
Saltwort
Poison ivy
Bittersweet

Picnic Area

Rhus glabra
Juniperus virginiana
Prunus sp.

Smooth sumac
Red cedar
Cherry

Table B-1 (cont.)

Transmission Line Right-of-Way

<u>Rubus allegheniensis</u>	Blackberry
<u>Solidago sp.</u>	Goldenrod
<u>Aster sp.</u>	Aster
<u>Eupatorium purpureum</u>	Joe-pye weed
<u>Cyperaceae sp.</u>	Sedge
<u>Phragmites communis</u>	Reed grass
<u>Impatiens capensis</u>	Jewelweed
<u>Alnus sp.</u>	Alder
<u>Juncus effusus</u>	Rush
<u>Typha latifolia</u>	Cattail
<u>Populus sp.</u>	Poplar
<u>Sparganium sp.</u>	Bur reed
<u>Betula populifolia</u>	Gray birch
<u>Onoclea sensibilis</u>	Sensitive fern
<u>Osmunda cinnamomea</u>	Cinnamon fern
<u>Osmunda regalis</u>	Royal fern
<u>Pteridium aquilinum</u>	Bracken fern
<u>Phytolacca americana</u>	Pokeweed
<u>Fraxinus americana</u>	White ash
<u>Acer rubrum</u>	Red maple
<u>Viburnum sp.</u>	Arrowwood
<u>Prunus serotina</u>	Black cherry
<u>Rubus sp.</u>	Raspberry
<u>Sphagnum sp.</u>	Sphagnum moss
<u>Convolvulus sepium</u>	Great bindweed

Freshwater Pond

<u>Nymphaea odorata</u>	White pond lily
<u>Decodon verticillatus</u>	Swamp loostrife
<u>Althaea officinalis</u>	Marsh mallow
<u>Cephalanthus occidentalis</u>	Buttonbush
<u>Juncus sp.</u>	Sedges
<u>Eleocharis sp.</u>	Rush
<u>Alnus sp.</u>	Alder

Brackish Marsh

<u>Spartina patans</u>	Cord grass
<u>Phragmites communis</u>	Reed grass
<u>Myrica pennsylvanica</u>	Bayberry
<u>Althaea officinalis</u>	Marsh mallow
<u>Rhus toxicodendron</u>	Poison ivy

Table B-1 (cont.)

Solidago sp.
Scirpus validus
Distichlis spicata
Juncus gerardii

Seaside goldenrod
 Softstem
 Marsh grass
 Black rush

B. FAUNA

Birds

Nycticorax nycticorax
Butorides virescens
Cygnus olor
Anas platyrhynchos
Phalacrocorax auritus
Larus argentatus
Sterna hirundo
Pandion haliaetus
Mimus polyglottos
Sturnus vulgaris
Quiscalus quiscula
Zenaidura macroura
Cyanocitta cristata
Megaceryl alcyon
Colaptes auratus
Tyrannus tyrannus
Falco sparverius
Passerculus sandwichensis
Turdus migratorius

Black-crowned night heron
 Little green heron
 Mute swan
 Mallard
 Double-crested cormorant
 Herring gull
 Common tern
 Osprey
 Mockingbird
 Starling
 Purple grackle
 Mourning dove
 Bluejay
 Belted kingfisher
 Flicker
 Kingbird
 Kestrel
 Savannah sparrow
 Robin

Mammals

Marmota monox
Mephitis mephitis
Procyon lotor
Sciurus carolinensis
Sylvilagus floridanus

Woodchuck
 Striped skunk
 Raccoon
 Gray squirrel
 Cottontail rabbit

Reptiles

Chrysemys picta

Painted turtle

Amphibians

Rana palustris
Rana clamitans
Hyla crucifer

Pickrel frog
 Green frog
 Spring peeper

Table B-2

Species Recorded in Connecticut and Which May Frequent
The Millstone Area (Grouped According to Families)

A. FLORA

Family Equisetaceae (Horsetail)

Equisetum arvense L.

Common horsetail

Family Lycopodiaceae (Club moss)

Lycopodium clavatum L.

Running club moss

Lycopodium complanatum L., var.

Ground pine

flabelliforme FernLycopodium inundatum L.Lycopodium obscurum L.

Ground pine

Lycopodium tristachyum Pursh.

Family Selaginellaceae (Spikemoss)

Selaginella rupestris (L.)

Family Ophioglossaceae (Adder's-tongue)

Botrychium dissectum Spreng. forma obliquum
(Muhl.) Fern.

Family Osmundaceae (Flowering fern)

Osmunda cinnamomea L.

Cinnamon fern

Osmunda claptoniana L.

Interrupted fern

Family Polypodiaceae (Fern)

Athyrium filix-femina (L.) Roth var.

Lady fern

Michauxii (Spreng.) Farw. formarubellum (Gilbert) Farw.Dennstaedtia punctilobula (Michx.) Moore

Hay-scented fern

Dryopteris marginalis (L.) Gray

Marginal shield fern

Dryopteris noveboracensis (L.) Gray

New York fern

Dryopteris thelypteris (L.) Gray
Onoclea sensibilis L.
Polystichum acrostichoides (Michx.) Schott
Pteridium aquilinum (L.) Kuhn var.
latiusculum (Desv.) Underw.

Marsh fern
 Sensitive fern
 Christmas fern
 Brake, bracken

Family Pinaceae (Pine)

Juniperus communis L.
Juniperus communis L., var. depressa Pursh.
Juniperus virginiana L.
Pinus rigida Mill.

Common juniper
 Prostrate juniper
 Red cedar
 Pitch pine

Family Typhaceae (Cattail)

Typha angustifolia L.
Typha latifolia L.

Narrow-leaved cattail
 Common cattail

Family Juncaginaceae (Arrow grass)

Triglochin maritima L.

Arrow grass

Family Gramineae (Grass)

Agropyron repens (L.) Beauv.
Agrostis alba L.
Agrostis scabra Willd.
Andropogon gerardi Vitman.
Andropogon scoparius Michx.

Witchgrass
 Redtop

Andropogon virginicus L.
Anthoxanthum odoratum L.
Aristida dichotoma Michx.
Aristida longespica Poir. var. geniculata
 (Raf.) Fern.
Arrhenatherum elatius (L.) Mert. & Koch.
Cinna arundinacea L.
Dactylis glomerata L.
Danthonia spicata (L.) Beauv.

Broom beardgrass, little
 bluestem
 Broom sedge
 Sweet vernal grass
 Poverty grass

Deschampsia flexuosa (L.) Trin.
Digitaria filiformis L.
Digitaria ischaemum (Schreb.) Muhl.
Digitaria sanguinalis (L.) Scop.
Distichlis spicata (L.) Greene
Echinochloa crusgalli (L.) Beauv.
Elymus virginicus L.
Eragrostis capillaris (L.) Nees.
Eragrostis megastachya (Koel.) Link.
Eragrostis spectabilis (Pursh.) Nees.
Festuca capillata Lam.
Festuca elatior L.

Tall oat grass
 Wood reedgrass
 Orchard grass
 Poverty grass, wild
 oat grass
 Common hairgrass
 Slender crabgrass
 Crabgrass
 Crabgrass
 Spike grass
 Barnyard grass
 Terrell grass
 Lace grass
 Snake grass
 Tumble grass

Meadow fescue

<u>Festuca rubra</u> L.	Fescue
<u>Glyceria canadensis</u> (Michx.) Trin.	Rattlesnake grass
<u>Glyceria striata</u> (Lam.) Hitchc.	Fowl-meadow grass
<u>Lolium perenne</u> L.	Common darnel
<u>Muhlenbergia frondosa</u> (Poir.) Fern.	
<u>Muhlenbergia mexicana</u> (L.) Trin.	
<u>Muhlenbergia schreberi</u> J. F. Gmel.	Dropseed
<u>Panicum agrostoides</u> Spreng.	Panic grass
<u>Panicum columbianum</u> Scribn. var. <u>oricola</u> (Hitch. & Chase) Fern.	
<u>Panicum depauperatum</u> Muhl.	
<u>Panicum dichotomum</u> L.	
<u>Panicum lanuginosum</u> Ell. var. <u>fasciculatum</u> (Torr.) Fern.	
<u>Panicum lanuginosum</u> Ell. var. <u>implicatum</u> (Scribn.) Fern.	
<u>Panicum lanuginosum</u> Ell. var. <u>Lindheimeri</u> (Nash.) Fern.	
<u>Panicum lanuginosum</u> Ell. var. <u>septentrionale</u> Fern.	
<u>Panicum linearifolium</u> Scribn. var. <u>Wernerii</u> (Scribn.) Fern.	
<u>Panicum meridionale</u> Ashe.	
<u>Panicum sphaerocarpon</u> Ell.	
<u>Paspalum ciliatifolium</u> Michx. var. <u>Muhlenbergii</u> (Nash.) Fern.	
<u>Phragmites communis</u> Trin.	Reed grass
<u>Poa compressa</u> L.	Canada bluegrass
<u>Poa pratensis</u> L.	Kentucky bluegrass, spargrass
<u>Setaria glauca</u> (L.) Beauv.	Foxtail
<u>Sorghastrum nutans</u> (L.) Nash.	Indian grass
<u>Spartina alterniflora</u> Loisel.	Saltwater cord grass
<u>Spartina patens</u> (Ait.) Muhl.	Salt-meadow grass
<u>Vulpia octaflora</u> (Walt.) Rydb.	Sixweeks fescue

Family Cyperaceae (Sedge)

<u>Bulbostylis capillaris</u> (L.) C. B. Clarke var. <u>capillaris</u> (L.) Britt.
<u>Bulbostylis capillaris</u> (L.) C. B. Clarke var. <u>crebra</u> Fern.
<u>Carex arctata</u> Boott.
<u>Carex brevior</u> (Dew.) Mackenz.
<u>Carex digitalis</u> Willd.
<u>Carex pensylvanica</u> Lam.
<u>Carex scoparia</u> Schkuhr.
<u>Carex swanii</u> (Fern.) Mackenz.
<u>Carex virescens</u> Muhl.
<u>Carex vulpinoidea</u> Michx.
<u>Cyperus filiculmis</u> Vahl. var. <u>macilentus</u> Fern.
<u>Cyperus rivularis</u> Kunth.

<u>Eleocharis calva</u> Torr.	Spike rush
<u>Scirpus americanus</u> Pers.	Bulrush, three-square
Family Araceae (Arum)	
<u>Arisaema atrorubens</u> (Ait.) Blume.	Jack-in-the-pulpit
Family Commelinaceae (Spiderwort)	
<u>Commelina communis</u> L.	Common dayflower
<u>Tradescantia ohioensis</u> Raf.	Spiderwort
Family Juncaceae (Rush)	
<u>Juncus gerardi</u> Loisel	Black grass
Family Liliaceae (Lily)	
<u>Allium canadense</u> L.	Wild garlic
<u>Lilium superbum</u> L.	Turk's-cap lily
<u>Maianthemum canadense</u> Desf.	Wild lily of the valley
<u>Polygonatum biflorum</u> (Walt.) Ell.	Solomon's seal
<u>Polygonatum canaliculatum</u> (Muhl.) Pursh.	Solomon's seal
<u>Polygonatum pubescens</u> (Willd.) Pursh.	Solomon's seal
<u>Smilacina racemosa</u> (L.) Desf.	False spikenard, false Solomon's seal
<u>Smilax glauca</u> Walt.	Sawbrier
<u>Smilax rotundifolia</u> L.	Bullbrier, catbrier
<u>Uvularia sessilifolia</u> L.	Bellwort, wild oats
Family Amaryllidaceae (Amaryllis)	
<u>Hypoxis hirsuta</u> (L.) Coville.	Stargrass
Family Iridaceae (Iris)	
<u>Iris versicolor</u> L.	Blue flag
Family Orchidaceae (Orchis)	
<u>Cypripedium acaule</u> Ait.	Stemless lady's slipper
Family Salicaceae (Willow)	
<u>Populus alba</u> L.	White poplar
Family Myricaceae (Wax myrtle)	
<u>Comptonia peregrina</u> (L.) Coult.	Sweet fern
<u>Myrica gale</u> L.	Sweet gale
<u>Myrica pennsylvanica</u> Loisel.	Bayberry

Family Juglandaceae (Walnut)

Carya cordiformis (Wang.) K. Koch.
Carya glabra (Mill.) Sweet.
Carya ovata (Mill.) K. Koch.

Bitternut, swamp hickory
 Pignut
 Shagbark hickory

Family Fagaceae (Beech)

Castanea dentata (Marsh.) Borkh.
Fagus grandifolia Ehrh.
Quercus alba L.
Quercus coccinea Muenchh.
Quercus ilicifolia Wang.
Quercus palustris Muenchh.

American chestnut
 American beech
 White oak
 Scarlet oak
 Bear or black scrub oak
 Pin oak

Family Ulmaceae (Elm)

Celtis occidentalis L.
Celtis occidentalis L. var. pumila
 (Pursh) Gray.
Ulmus rubra Muhl.

Hackberry
 Dwarf hackberry

Slippery elm

Family Urticaceae (Nettle)

Urtica urens L.

Burning nettle

Family Polygonaceae (Buckwheat)

Polygonum aviculare L.
Polygonum cespitosum Blume, var. longisetum
 (DeBruyn) Stewart.
Polygonum convolvulus L.
Polygonum ramosissimum Michx.
Rumex acetosella L.
Rumex crispus L.

Knotweed
 Common smartweed

Black bindweed
 Bushy knotweed
 Sheep sorrel
 Yellow dock

Family Chenopodiaceae (Goosefoot)

Atriplex patula L., var. hastata (L.) Gray.
Chenopodium album L.
Chenopodium ambrosioides L.
Salicornia europaea L.
Suaeda linearis (Ell.) Moq.
Suaeda maritima (L.) Dumort.

Pigweed, lamb's-quarters
 Mexican tea
 Saltwort
 Sea blite
 Sea blite

Family Amaranthaceae (Amaranth)

Acnida cannabina L.
Amaranthus retroflexus L.

Water hemp
 Pigweed

Family Phytolaccaceae (Pokeweed)

Phytolacca americana L.

Pokeweed

Family Portulacaceae (Purslane)

Claytonia virginica L.

Spring beauty

Family Caryophyllaceae (Pink)

Arenaria lateriflora L.

Sandwort

Dianthus armeria L.

Deptford pink

Lychnis alba Mill.

White campion

Saponaria officinalis L.

Bouncing bet, soapwort

Scleranthus annuus L.

Knawel

Silene antirrhina L.

Sleepy catchfly

Stellaria media (L.) Cyrillo.

Common chickweed

Family Ranunculaceae (Crowfoot)

Actaea pachypoda Ell.

White baneberry, doll's-eyes

Anemone quinquefolia L.

Wood anemone

Anemonella thalictroides (L.) Spach.

Rue anemone

Clematis virginiana L.

Wild clematis

Ranunculus acris L.

Tall or common buttercup

Ranunculus abortivus L.

Kidney-leaf buttercup

Ranunculus bulbosus L.

Bulbous buttercup

Thalictrum polygamum Muhl.

Tall meadow rue

Family Berberidaceae (Barberry)

Berberis vulgaris L.

Common barberry

Family Magnoliaceae (Magnolia)

Liriodendron tulipifera L.

Tulip tree, tulip poplar

Family Lauraceae (Laurel)

Sassafras albidum (Nutt.) Nees.

Sassafras

Family Papaveraceae (Poppy)

Chelidonium majus L.

Celandine

Family Rosaceae (Rose)

Prunus gravesii Small.

Graves beach plum

Prunus maritima Marsh.

Beach plum

Prunus serotina Ehrh.

Wild black cherry

Prunus virginiana L.

Choke cherry

Pyrus americana (Marsh) DC.

American mountain ash

Pyrus floribunda Lindl.

Purple chokeberry

Pyrus malus L.

Apple

Rosa carolina L.

Wild rose

Rosa virginiana Mill.

Wild rose

Rubus alumnus Bailey.

Blackberry

Rubus flagellaris Willd.
Rubus multispinus Blanch.
Rubus pensylvanicus Poir.
Spiraea tomentosa L.

Dewberry
 Blackberry
 Blackberry
 Steeplebush

Family Leguminosae (Pea)

Baptisia tinctoria (L.) R. Br.
Desmodium canadense (L.) DC.
Desmodium glabellum (Michx.) DC.
Desmodium perplexum Schub.
Gleditsia triacanthos L.
Lespedeza capitata Michx.
Lespedeza intermedia (S. Wats.) Britt.
Robinia pseudo-acacia L.
Trifolium agrarium L.
Trifolium pratense L., var. sativum (Mill.)
 Schreb.
Trifolium repens L.
Vicia cracca L.

Wild indigo
 Tick trefoil

 Honey locust
 Bush clover
 Bush clover
 Black locust
 Yellow or hop clover
 Red clover

 White clover
 Tufted vetch

Family Oxalidaceae (Wood sorrel)

Oxalis stricta L.

Wood sorrel

Family Euphorbiaceae (Spurge)

Acalypha gracilens Gray.
Euphorbia polygonifolia L.
Euphorbia supina Raf.

Three-seeded mercury
 Seaside spurge
 Milk purslane

Family Anacardiaceae (Cashew)

Rhus copallina L.
Rhus glabra L.
Rhus radicans L.
Rhus typhina L.

Shining sumac
 Smooth sumac
 Poison ivy
 Staghorn sumac

Family Aquifoliaceae (Holly)

Ilex glabra (L.) Gray.
Ilex opaca Ait.
Ilex verticillata (L.) Gray.
Ilex verticillata (L.) Gray var. fastigiata
 (Pursh) Gray.
Nemopanthis mucronata (L.) Trel.

Inkberry
 American holly
 Black alder winterberry

Mountain holly

Family Celastraceae (Staff tree)

Celastrus orbiculatus Thunb.

Oriental bittersweet

Family Aceraceae (Maple)

Acer negundo L.
Acer rubrum L.

Box elder
 Red maple

Family Vitaceae (Vine)

Parthenocissus quinquefolia (L.) Planch.
Parthenocissus tricuspidata (Sieb. & Zucc.)
 Planch.
Vitis aestivalis Michx.

Virginia creeper
 Boston ivy
 Pigeon grape

Family Tiliaceae (Linden)

Tilia americana L.

Basswood

Family Malvaceae (Mallow)

Hibiscus palustris L.
Malva neglecta Wallr.

Marshmallow
 Common mallow

Family Guttiferae (St.-John's-wort)

Hypericum punctatum Lam.

Family Cistaceae (Rockrose)

Helianthemum bicknellii Fern.
Helianthemum canadense (L.) Michx.
Hudsonia ericoides L.
Lechea villosa Ell.

Frostweed
 Frostweed
 Golden or false heather
 Pinweed

Family Nyssaceae (Sour gum)

Nyssa sylvatica Marsh.

Tupelo, pepperidge, sour gum

Family Onagraceae (Evening primrose)

Circaea quadrisulcata (Maxim.) Franch & Sav.
 var. canadensis (L.) Hara.
Oenothera biennis L.
Oenothera biennis L., var. hirsutissima Gray.
Oenothera parviflora L.

Evening primrose

Family Araliaceae (Ginseng)

Aralia nudicaulis L.

Wild sarsaparilla

Family Umbelliferae (Parsley)

Daucus carota L.
Heracleum maximum Bartr.
Hydrocotyle americanum L.

Queen Anne's lace
 Cow parsnip
 Water pennywort

Family Cornaceae (Dogwood)

Cornus alba L.
Cornus alternifolia L. f.

Tartarian dogwood
 Alternate-leaved dogwood,
 pagoda dogwood

Cornus amomum Mill.
Cornus rugosa Lam.
Cornus stolonifera Michx.

Silky cornel
 Round-leaved dogwood
 Red osier dogwood

Family Clethraceae (White Alder)

Clethra alnifolia L.

Sweet pepperbush

Family Pyrolaceae (Wintergreen)

Monotropa hypopithys L.
Monotropa uniflora L.
Pyrola rotundifolia L., var. americana
 (Sweet) Fern.

Pinesap
 Indian pipe
 Shinleaf, wintergreen

Family Ericaceae (Heath)

Chamaedaphne calyculata (L.) Moench. var.
angustifolia (Ait.) Rehd.
Gaylussacia baccata (Wang.) K. Koch.
Gaylussacia dumosa (Andr.) T. & G.
Kalmia angustifolia L.
Kalmia latifolia L.
Lyonia mariana (L.) D. Don.
Rhododendron nudiflorum (L.) Torr.
Vaccinium angustifolium Ait. var. nigrum
 (Wood.) Dole.
Vaccinium corymbosum L.
Vaccinium macrocarpon Ait.
Vaccinium vacillans Torr.

Leatherleaf
 Common or black huckleberry
 Dwarf huckleberry
 Sheep laurel
 Mountain laurel
 Staggerbush
 Pinxter flower
 Low sweet blueberry
 Highbush blueberry
 American cranberry
 Low blueberry

Family Primulaceae (Primrose)

Lysimachia quadrifolia L.
Lysimachia terrestris (L.) BSP.

Whorled loosestrife
 Swamp loosestrife

Family Plumbaginaceae (Leadwort)

Limonium carolinianum (Walt.) Britt.

Sea lavender, marsh rosemary

Family Oleaceae (Olive)

Fraxinus americana L.
Fraxinus nigra Marsh.
Fraxinus pennsylvanica Marsh.
Syringa vulgaris L.

White ash
 Black ash
 Red ash
 Common lilac

Family Gentianaceae (Gentian)

Bartonia virginica (L.) BSP.

Family Apocynaceae (Dogbane)

Apocynum androsaemifolium L.

Spreading dogbane

<u>Apocynum cannabinum</u> L.	Indian hemp
<u>Vinca minor</u> L.	Myrtle
Family Asclepiadaceae (Milkweed)	
<u>Asclepias syriaca</u> L.	Common milkweed
Family Convolvulaceae (Convolvulus)	
<u>Convolvulus arvensis</u> L.	Field bindweed
<u>Convolvulus sepium</u> L.	Hedge bindweed, wild morning glory
Family Verbenaceae (Vervain)	
<u>Verbena hastata</u> L.	Blue vervain
<u>Verbena urticifolia</u> L.	White vervain
Family Labiatae (Mint)	
<u>Collinsonia canadensis</u> L.	Horse balm, richweed
<u>Mentha piperita</u> L.	Peppermint
<u>Prunella vulgaris</u> L.	Heal-all
Family Scrophulariaceae (Figwort)	
<u>Chelone glabra</u> L.	Turtlehead, balmony
<u>Gerardia purpurea</u> L.	Gerardia
<u>Gerardia tenuifolia</u> Vahl.	
<u>Linaria canadensis</u> (L.) Dumont.	Old-fields toadflax
<u>Linaria vulgaris</u> Hill.	Butter-and-eggs
<u>Melampyrum lineare</u> Desr. var. <u>americanum</u> (Michx.) Beauverd.	Cowwheat
<u>Mimulus ringens</u> L.	Monkey flower
<u>Pentstemon digitalis</u> Nutt.	Beardtongue
<u>Verbascum thapsus</u> L.	Common mullein
<u>Veronica arvensis</u> L.	Corn speedwell
<u>Veronica officinalis</u> L.	Speedwell
Family Plantaginaceae (Plantain)	
<u>Plantago lanceolata</u> L.	English plantain, ribgrass
<u>Plantago lanceolata</u> L., var. <u>sphaerostachya</u> Mert. & Koch.	
<u>Plantago major</u> L.	Plantain
<u>Plantago rugelii</u> Domin.	Plantain
Family Rubiaceae (Madder)	
<u>Galium circaezans</u> Michx. var. <u>hypomalacum</u> Fern.	Wild licorice
<u>Galium pilosum</u> Ait.	
<u>Galium triflorum</u> Michx.	Sweet-scented bedstraw
<u>Galium verum</u> L.	Yellow bedstraw

Family Caprifoliaceae (Honeysuckle)

<u>Diervilla lonicera</u> Mill.	Bush honeysuckle
<u>Lonicera japonica</u> Thunb.	Japanese honeysuckle
<u>Lonicera morrowi</u> Gray.	
<u>Lonicera xylosteum</u> L.	Fly honeysuckle
<u>Sambucus canadensis</u> L.	Common or American elder
<u>Viburnum acerifolium</u> L.	Maple-leaved viburnum
<u>Viburnum cassinoides</u> L.	Witherod
<u>Viburnum recognitum</u> Fern.	Arrowwood

Family Campanulaceae (Bluebell)

<u>Lobelia inflata</u> L.	Indian tobacco
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Family Compositae (Composite)

<u>Achillea millefolium</u> L.	Common yarrow
<u>Ambrosia artemisiifolia</u> L.	Ragweed
<u>Anaphalis margaritacea</u> (L.) C. B. Clarke var. <u>intercedens</u> Hara.	Pearly everlasting
<u>Antennaria neglecta</u> Greene.	Everlasting, pussy's toes
<u>Antennaria neodioica</u> Greene var. <u>chlorophylla</u> Fern.	Everlasting, pussy's toes
<u>Antennaria plantaginifolia</u> (L.) Hook.	Everlasting, pussy's toes
<u>Aster cordifolius</u> L.	Aster
<u>Aster ericoides</u> L.	
<u>Aster herveyi</u> Gray.	
<u>Aster linariifolius</u> L.	
<u>Aster patens</u> Ait.	
<u>Aster pilosus</u> Willd.	
<u>Aster simplex</u> Willd.	
<u>Aster tenuifolius</u> L.	
<u>Aster umbellatus</u> Mill.	
<u>Aster vimineus</u> Lam.	
<u>Baccharis halimifolia</u> L.	Sea myrtle
<u>Cirsium discolor</u> (Muhl.) Spreng.	Thistle
<u>Cirsium vulgare</u> (Savi.) Tenore.	Common or bull thistle
<u>Erigeron annuus</u> (L.) Pers.	Daisy fleabane
<u>Erigeron pulchellus</u> Michx.	Robin's plantain
<u>Erigeron strigosus</u> Muhl.	Daisy fleabane
<u>Eupatorium hyssopifolium</u> L., var. <u>calcaratum</u> Fern. & Schub.	
<u>Eupatorium maculatum</u> L.	Joe-Pye weed
<u>Eupatorium pubescens</u> Muhl.	
<u>Galinsoga ciliata</u> (Raf.) Blake.	
<u>Gnaphalium obtusifolium</u> L.	Catfoot
<u>Hieracium canadense</u> Michx.	Hawkweed
<u>Hieracium pilosella</u> L.	Mouse-ear
<u>Hieracium pratense</u> Tausch.	King devil
<u>Hieracium scabrum</u> Michx.	
<u>Iva frutescens</u> L.	Marsh elder
<u>Lactuca canadensis</u> L.	Wild lettuce
<u>Lactuca hirsuta</u> Muhl. var. <u>sanguinea</u> (Bigel.) Fern.	

Prenanthes trifoliata (Cass.) Fern.

Rudbeckia hirta L.

Rudbeckia serotina Nutt.

Senecio aureus L.

Sericocarpus asteroides (L.) BSP.

Solidago graminifolia (L.) Salisb.

Solidago graminifolia (L.) Salisb. var.

polycephala Fern.

Solidago rugosa Ait.

Solidago sempervirens L.

Sonchus arvensis L.

Taraxacum officinale Weber.

Gall of the earth

Coneflower

Black-eyed susan

Golden ragwort

White-topped aster

Goldenrod

Seaside goldenrod

Field sow thistle

Dandelion

B. FAUNA

1. Amphibians

ORDER CAUDATA

Family Salamandridae

Diemictylus viridescens

Common newt

Family Ambystomidae

Ambystoma jeffersonianumAmbystoma maculatumAmbystoma opacumAmbystoma tigrinumJefferson's salamander
Spotted salamander
Marbled salamander
Tiger salamander

Family Plethodontidae

Desmognathus fuscusEurycea bislineataGyrinophilus porphyriticusHemidactylium scutatumPlethodon cinereusPlethodon glutinosusPseudotriton ruberDusky salamander
Two-lined salamander
Purple salamander
Four-toed salamander
Red-backed salamander
Slimy salamander
Red salamander

Family Proteidae

Necturus maculosus

Mud puppy

ORDER SALIENTIA

Family Hylidae

Gryllus acrisHyla cruciferHyla versicolorCricket frog
Spring peeper
Common tree frog

Family Ranidae

Rana catesbianaRana clamitansRana palustrisRana pipiensRana septentrionalisRana sylvaticaBull frog
Green frog
Pickereel frog
Leopard frog
Mink frog
Wood frog

Family Pelobatidae

Scaphiopus holbrooki

Eastern spadefoot toad

Family Bufonidae

Bufo americanusBufo woodhousei fowleriAmerican toad
Fowler's toad

2. Reptiles

ORDER CHELONIA (TURTLES, TERRAPINS, AND TORTOISES)

Family Testudinidae

Chelydra serpentinaChrysemis pictaClemmys guttataClemmys insculptaEmys blandingiiKinosternon subrubrumMalaclemys terrapinSternotherus odoratusTerrapene carolina

Common snapping turtle

Painted turtle

Spotted turtle

Wood turtle

Blanding soft-shelled turtle

Mud turtle

Diamondback terrapin

Musk turtle

Eastern box turtle

Family Cheloniidae

Chelonia mydasCoretta corettaDermochelys coriaceaLepidochelys kempfi

Atlantic green turtle

Atlantic loggerhead turtle

Atlantic leatherback turtle

Atlantic ridley turtle

ORDER SQUAMATA (SNAKES AND LIZARDS)

Family Colubridae

Coluber constrictorCorphophis amoenusDiadophis punctatusElaphe obsoletaHeterodon platyrhinosLamtopeltis doliataNatrix sipedonOpheodrys aestivusOpheodrys vernalisStoreria dekayiStoreria occipitomaculataThamnophis sauritusThamnophis sirtalis

Northern black racer

Eastern wormsnake

Eastern ring-necked snake

Black rat snake

Eastern hog-nosed snake

Eastern milk-snake

Northern water snake

Rough green snake

Eastern smooth green snake

DeKay's snake

Red-bellied snake

Eastern ribbon snake

Eastern garter snake

Family Viperidae

Agkistrodon contortrix mokesonCrotalis horridus

Copperhead

Eastern timber rattlesnake

Family Scincidae

Eumeces fasciatus

Five-lined skink

3. Birds

ORDER GAVIIFORMES (LOONS)

Gavia immer
Gavia stellata

Common loon
Red-throated loon

ORDER PODICIPEDIFORMES (GREBES)

Podiceps auritus
Podiceps grisegena
Podilymbus podiceps

Horned grebe
Red-necked grebe
Pied-billed grebe

ORDER PROCELLARIIFORMES (TUBENOSES)

Family Hydrobatidae (Storm petrels)

Oceanites oceanicus

Wilson's petrel

ORDER PELECANIFORMES (PELICANS AND ALLIES)

Family Phalacrocoracidae (Cormorants)

Phalacrocorax auritus
Phalacrocorax carbo

Double-crested cormorant
Great cormorant

ORDER ANSERIFORMES (WATERFOWL)

Family Anseridae (Waterfowl)

Anas sponsa
Anas acuta
Anas carolinensis
Anas discors
Anas platyrhynchos
Anas rubripes
Anas strepera
Aythya affinis
Aythya americana
Aythya collaris
Aythya marila
Aythya valisineria
Branta bernicla
Branta canadensis
Bucephala albeola
Bucephala clangula
Chen caerulescens
Chen hyperborea
Clangula hyemalis
Cygnus olor
Lophodytes cucullatus

Wood duck
Pintail
Green-winged teal
Blue-winged teal
Mallard
Black duck
Gadwall
Lesser scaup
Redhead
Ring-necked duck
Greater scaup
Canvasback
Brant
Canada goose
Bufflehead
Common goldeneye
Blue goose
Snow goose
Oldsquaw
Mute swan
Hooded merganser

<u>Mareca americana</u>	American widgeon
<u>Mareca penelope</u>	European widgeon
<u>Melanitta deglandi</u>	White-winged scoter
<u>Melanitta perspicillata</u>	Surf scoter
<u>Mergus merganser</u>	Common merganser
<u>Mergus serrator</u>	Red-breasted merganser
<u>Oidemia nigra</u>	Common scoter
<u>Olor columbianus</u>	Whistling swan
<u>Somateria mollissima</u>	Common eider
<u>Spatula clypeata</u>	Shoveler

ORDER FALCONIFORMES (VULTURES, HAWKS, AND FALCONS)

Family Cathartidae (Vultures)

<u>Cathartes aura</u>	Turkey vulture
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Family Accipitridae (Kites, hawks, and eagles)

<u>Accipiter cooperii</u>	Cooper's hawk
<u>Accipiter gentilis</u>	Goshawk
<u>Accipiter striatus</u>	Sharp-shinned hawk
<u>Buteo jamaicensis</u>	Red-tailed hawk
<u>Buteo lagopus</u>	Rough-legged hawk
<u>Buteo lineatus</u>	Red-shouldered hawk
<u>Buteo platypterus</u>	Broad-winged hawk
<u>Circus cyaneus</u>	Marsh hawk
<u>Falco columbarius</u>	Pigeon hawk
<u>Falco peregrinus</u>	Peregrine falcon
<u>Falco sparverius</u>	Sparrow hawk
<u>Haliaeetus leucocephalus</u>	Bald eagle
<u>Pandion haliaeetus</u>	Osprey

ORDER GALLIFORMES (GALLINACEOUS BIRDS)

Family Tetraonidae (Grouse)

<u>Bonasa umbellus</u> *	Ruffed grouse
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Family Phasianidae (Quails, partridges, and pheasants)

<u>Colinus virginianus</u>	Bobwhite quail
<u>Phasianus colchicus</u>	Ring-necked pheasant

ORDER CICONIIFORMES (HERONS AND ALLIES)

Family Ardeidae (Herons and bitterns)

<u>Ardea herodias</u>	Great blue heron
<u>Botaurus lentiginosus</u>	American bittern
<u>Bubulcus ibis</u>	Cattle egret
<u>Butorides virescens</u>	Green heron
<u>Casmerodius albus</u>	Common egret

Florida caerulea
Hydranassa tricolor
Ixobrychus exilis
Leucophoyx thula
Nyctanassa violacea
Nycticorax nycticorax

Little blue heron
Louisiana heron
Least bittern
Snowy egret
Yellow-crowned night heron
Black-crowned night heron

Family Threskiornithidae (Ibises)

Eudocimus albus
Plegadis falcinellus

White ibis
Glossy ibis

ORDER GRUIFORMES (CRANES AND ALLIES)

Family Rallidae (Rails, gallinules, and coots)

Fulica americana
Gallinula chloropus
Porzana carolina
Rallus limicola
Rallus longirostris

American coot
Common gallinule
Sora rail
Virginia rail
Clapper rail

ORDER CHARADRIIFORMES (SHOREBIRDS, GULLS, AND ALCIDS)

Family Charadriidae (Plovers, turnstones, and surfbirds)

Arenaria interpres
Calidris canutus
Catoptrophorus semipalmatus
Charadrius melodus
Charadrius semipalmatus
Charadrius vociferus
Crocethia alba
Ereunetes pusillus
Erolia alpina
Erolia fuscicollis
Erolia maritima
Erolia melanotos
Limnodromus sp.
Micropalama himantopus
Squatarola squatarola
Totanus flavipes
Totanus melanoleucus

Ruddy turnstone
Knot
Willet
Piping plover
Semipalmated plover
Killdeer
Sanderling
Semipalmated sandpiper
Dunlin
White sandpiper
Purple sandpiper
Pectoral sandpiper
Dowitcher
Stilt sandpiper
Black-bellied plover
Lesser yellowlegs
Greater yellowlegs

Family Scolopacidae (Sandpipers, woodcocks, and snipes)

Actitis macularia
Capella gallinago
Numenius phaeopus
Philohela minor
Tryngites subruficollis

Spotted sandpiper
Common snipe
Whimbrel
American woodcock
Buff-breasted sandpiper

Family Phalaropodidae (Phalaropes)

Phalaropus fulicarius
Steganopus tricolor

Red phalarope
 Wilson's phalarope

ORDER CHARADRIIFORMES (GULLS AND TERNS)

Family Laridae (Gulls and terns)

Chlidonias niger
Larus argentatus
Larus atricilla
Larus delawarensis
Larus glaucoides
Larus marinus
Larus philadelphia
Sterna paradisaea

Black tern
 Herring gull
 Laughing gull
 Ring-billed gull
 Iceland gull
 Great black-back gull
 Bonaparte's gull
 Common tern

Family Rynchopidae (Skimmers)

Rynchops nigra

Black skimmer

Family Alcidae (Auks and relatives)

Plautus alle

Dovekie

ORDER COLUMBIFORMES (PIGEONS AND DOVES)

Family Columbidae (Pigeons and doves)

Columba livia
Zenaidura macroura

Rock dove
 Mourning dove

ORDER CUCULIFORMES (CUCKOOS)

Coccyzus americanus
Coccyzus erythrophthalmus

Yellow-billed cuckoo
 Black-billed cuckoo

ORDER STRIGIFORMES (OWLS)

Family Tytonidae (Owls)

Aegolius acadicus
Asio flammeus
Asio otus
Bubo virginianus
Nyctea scandiaca
Otus asio
Strix varia

Saw-whet owl
 Short-eared owl
 Long-eared owl
 Great horned owl
 Snowy owl
 Screech owl
 Barred owl

ORDER CAPRIMULGIFORMES (GOATSUCKERS)

Family Caprimulgidae (Goatsuckers)

Caprimulgus vociferus
Chordeiles minor

Whippoorwill
Common nighthawk

ORDER APODIFORMES (SWIFTS)

Family Apodidae (Swifts)

Chaetura pelagica

Chimney swift

ORDER APODIFORMES (HUMMINGBIRDS)

Family Trochilidae (Hummingbirds)

Archilochus colubris

Ruby-throated hummingbird

ORDER CORACIIFORMES (KINGFISHERS)

Family Alcedinidae (Kingfishers)

Megaceryle alcyon

Belted kingfisher

ORDER PICIFORMES (WOODPECKERS AND FLICKERS)

Family Picidae (Woodpeckers and flickers)

Centurus carolinus
Colaptes auratus
Dendrocopos pubescens
Dendrocopos villosus
Dryocopus pileatus
Melanerpes erythrocephalus
Sphyrapicus varius

Red-bellied woodpecker
Yellow-shafted flicker
Downy woodpecker
Hairy woodpecker
Piliated woodpecker
Red-headed woodpecker
Yellow-bellied sapsucker

ORDER PASSERIFORMES (PERCHING BIRDS)

Family Tyrannidae (Flycatchers, kingbirds, and phoebes)

Contopus virens
Empidonax minimus
Empidonax traillii
Empidonax virescens
Myiarchus crinitus
Sayornis phoebe
Tyrannus tyrannus

Eastern wood pewee
Least flycatcher
Traill's flycatcher
Acadian flycatcher
Great-crested flycatcher
Eastern phoebe
Eastern kingbird

Family Alaudidae (Larks)

Eremophila alpestris

Horned lark

Family Hirundidae (Swallows)

Hirundo rustica
Iridoprocne bicolor
Petrochelidon pyrrhonota
Progne subis
Riparia riparia
Stelgidopteryx ruficollis

Barn swallow
 Tree swallow
 Cliff swallow
 Purple martin
 Bank swallow
 Rough-winged swallow

Family Corvidae (Jays and crows)

Corvus brachyrhynchos
Corvus ossifragus
Cyanocitta cristata

Common crow
 Fish crow
 Blue jay

Family Paridae (Chickadees and titmice)

Parus atricapillus
Parus bicolor

Black-capped chickadee
 Tufted titmouse

Family Sittidae (Nuthatches)

Sitta canadensis
Sitta carolinensis

Red-breasted nuthatch
 White-breasted nuthatch

Family Certhiidae (Creepers)

Certhia familiaris

Brown creeper

Family Troglodytidae (Wrens)

Telmatodytes palustris
Thryothorus ludovicianus
Troglodytes aedon
Troglodytes troglodytes

Long-billed marsh wren
 Carolina wren
 House wren
 Winter wren

Family Mimidae (Mockingbirds and thrashers)

Dumetella carolinensis
Mimus polyglottos
Taxostoma rufum

Catbird
 Mockingbird
 Brown thrasher

Family Turdidae (Thrushes and bluebirds)

Hylocichla fuscescens
Hylocichla guttata
Hylocichla minima
Hylocichla ustulata
Sialia sialis
Turdus migratorius

Veery
 Hermit thrush
 Gray-cheeked thrush
 Wood thrush
 Swainson's thrush
 Eastern bluebird
 Robin

Family *Slyviidae* (Gnatcatchers and kinglets)*Polioptila caerulea**Regulus calendula**Regulus satrapa*Blue-gray gnatcatcher
Ruby-crowned kinglet
Golden-crowned kingletFamily *Motacillidae* (Pipits and wagtails)*Anthus spinoletta*

Water pipit

Family *Bombycillidae* (Waxwings)*Bombycilla cedrorum*

Cedar waxwing

Family *Laniidae* (Skrikes)*Lanius ludovicianus*

Loggerhead shrike

Family *Sturnidae* (Starlings)*Sturnus vulgaris*

Starling

Family *Vireonidae* (Vireos)*Vireo flavifrons**Vireo gilvus**Vireo griseus**Vireo olivaceus**Vireo philadelphicus**Vireo solitarius*Yellow-throated vireo
Warbling vireo
White-eyed vireo
Red-eyed vireo
Philadelphia vireo
Solitary vireoFamily *Parulidae* (Wood warblers)*Dendroica caerulescens**Dendroica castanea**Dendroica coronata**Dendroica discolor**Dendroica fusca**Dendroica magnolia**Dendroica palmarum**Dendroica pensylvanica**Dendroica petechia**Dendroica pinus**Dendroica striata**Dendroica tigrina**Dendroica virens**Geothlypis trichas**Helmitheros vermivorus**Icteria virens**Mniotilta varia**Parula americana**Seiurus aurocapillus**Seiurus motacilla*Black-throated blue warbler
Bay-breasted warbler
Myrtle warbler
Prairie warbler
Blackburnian warbler
Magnolia warbler
Palm warbler
Chestnut-sided warbler
Yellow warbler
Pine warbler
Blackpoll warbler
Cape May warbler
Black-throated green warbler
Yellowthroat
Worm-eating warbler
Yellow-breasted chat
Black and white warbler
Parula warbler
Ovenbird
Louisiana waterthrush

Seiurus noveboracensis
Setophaga ruticilla
Vermivora chrysoptera
Vermivora lawrencei
Vermivora peregrina
Vermivora pinus
Vermivora ruficapilla
Wilsonia canadensis
Wilsonia citrina
Wilsonia pusilla

Northern waterthrush
 American redstart
 Golden-winged warbler
 Lawrence's warbler
 Tennessee warbler
 Blue-winged warbler
 Nashville warbler
 Canada warbler
 Hooded warbler
 Wilson's warbler

Family Ploceidae (Weaver finches)

Passer domesticus

House sparrow

Family Icteridae (Blackbirds and orioles)

Agelaius phoeniceus
Dolichonyx oryzivorus
Euphagus carolinus
Icterus galbula
Icterus spurius
Molothrus ater
Piranga ludoviciana
Piranga olivacea
Piranga rubra
Quiscalus quiscula
Sturnella magna
Xanthocephalus xanthocephalus

Redwinged blackbird
 Bobolink
 Rusty blackbird
 Baltimore oriole
 Orchard oriole
 Brown-headed cowbird
 Western tanager
 Scarlet tanager
 Summer tanager
 Common grackle
 Eastern meadowlark
 Yellow-headed blackbird

Family Fringillidae (Grosbeaks, finches, sparrows, and buntings)

Acanthis flammea
Acanthis hornemanni
Ammodramus savannarum
Ammodramus caudacuta
Ammodramus maritima
Calcarius lapponicus
Carpodacus mexicanus
Carpodacus purpureus
Hesperiphona vespertina
Junco hyemalis
Loxia curvirostra
Loxia leucoptera
Melospiza georgiana
Melospiza lincolni
Melospiza melodia
Passerculus princeps
Passerculus sandwichensis
Passerella iliaca
Passerina cyanea
Pheucticus ludovicianus
Pinicola enucleator
Pipilo erythrophthalmus
Plectrophenax nivalis

Common redpoll
 Hoary redpoll
 Grasshopper sparrow
 Sharp-tailed sparrow
 Seaside sparrow
 Lapland longspur
 House finch
 Purple finch
 Evening grosbeak
 Slate-colored junco
 Red crossbill
 White-winged crossbill
 Swamp sparrow
 Lincoln's sparrow
 Song sparrow
 Ipswich sparrow
 Savannah sparrow
 Fox sparrow
 Indigo bunting
 Rose-breasted grosbeak
 Pine grosbeak
 Rufous-sided towhee
 Snow bunting

Poocetes gramineus
Richmondna cardinalis
Spinus pinus
Spinus tristis
Spiza americana
Spizella arborea
Spizella passerina
Spizella pusilla
Zonotrichia albicollis
Zonotrichia leucophrys

Vesper sparrow
 Cardinal
 Pine siskin
 American goldfinch
 Dickcissel
 Tree sparrow
 Chipping sparrow
 Field sparrow
 White-throated sparrow
 White-crowned sparrow

Based on the literature available, the above species have been observed in the area between the Lymes and Groton, Connecticut, extending from the shoreline to approximately five miles inland. As very few birds, except for those restricted to a watery habitat, can be expected to limit their feeding or nesting to particular zones within such a small area, it may be anticipated that all of the above species may, at one time or another, be sighted within the study area of this project.

Sage, Bishop, and Bliss (1913) report a total of 334 species of birds from the entire state of Connecticut. The above list of 257 recently observed species (within the last five years) includes residents (those spending their entire lives in the area), summer residents, winter residents, transient visitors, and accidental visitors.

4. Mammals

ORDER MARSUPIALIA

Family Didelphiidae (Opossums)

Didelphis virginiana

Virginia opossum

ORDER INSECTIVORA

Family Talpidae (Moles)

Condylura cristata

Star-nose mole

Scalopus aquaticus

Eastern mole

Family Soricidae (Shrews)

Blarina brevicauda

Large short-tailed shrew

Sorex cinereus

Cinereous shrew

Sorex fumeus

Smoky shrew

ORDER CHIROPTERA

Family Vespertilionidae (Typical bats)

Eptesicus fuscus

Big brown bat

Lasionycteris noctivagans

Silver-haired bat

Lasiurus borealis

Northern red bat

Lasiurus cinereus

Hoary bat

Myotis keenii

Eastern long-eared little brown bat

Myotis lucifugus

Little brown bat

Myotis sodalis

Pink bat

Myotis subulatus

Least brown bat

Pipistrellus subflavus obscurus

New York pipistrelle

Pipistrellus subflavus subflavus

Georgian bat

ORDER CARNIVORA

Family Procyonidae (Raccoons)

Procyon lotor

Eastern raccoon

Family Mustelidae (Weasels, otters, and skunks)

Nephtis nigra

Eastern skunk

Mustela noveboracensis

New York weasel

Family Canidae (Wolves, coyotes, and foxes)

Urocyon cinereoargenteus

Eastern gray fox

Family Phocidae (Hair seals)

Phoca vitulina

Atlantic Harbor seal

ORDER RODENTIA

Family Sciuridae (Squirrels)

Claucomys volansMarmota monaxSciurus carolinensisSciurus hudsonicusTamias striatusSmall eastern flying squirrel
New England woodchuck
Northern gray squirrel
Southern red squirrel
Fisher chipmunk

Family Cricetidae (American rats and mice)

Microtus pennsylvanicusMus musculusOndatra zibethicaPeromyscus leucopusPitymys pinetorumRattus norvegicusEastern meadow mouse
House mouse
Common muskrat
Northern white-footed mouse
Mole pine mouse
Norway rat

Family Zapodidae (Jumping mice)

Zapus hudsonius

Hudson Bay jumping mouse

ORDER LAGOMORPHA

Family Leporidae (Hares and rabbits)

Lepus americanusSylvilagus floridanusSylvilagus transitionalisVirginia varying hare
Eastern cottontail
New England cottontail

ORDER ARTIODACTYLA

Family Cervidae (Deer)

Dama virginianus

Northern white-tailed deer