Robert J. Craig

the rare vertebrates of connecticut

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
STORRS, CONNECTICUT

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by Robert J. Craig

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Foreword

The USDA Soil Conservation Service is required by the Endangered Species Act of 1973, to participate in the conservation and protection of endangered and threatened species.

The USDA Soil Conservation Service, on the other hand, has responsibility for assisting private landowners in applying conservation practices to their land. In doing so, wildlife habitat is often directly or indirectly affected. The Soil Conservation Service, in preparing this report, hopes to provide a working document that will prevent further loss of habitat valuable to the threatened and endangered species.

Landusers receive help from the Soil Conservation Service through the eight soil and water conservation districts in Connecticut. Through this unique relationship, the Soil Conservation Service is capable of playing a vital role in the conservation and protection of the threatened and endangered species and their habitats.

The Connecticut Department of Environmental Protection has the statutory responsibility for data collection on rare, threatened, and endangered species within Connecticut. They have published a state inventory of these species and their habitats. The Connecticut Geological and Natural History Survey is presently involved in an Ecoregion (bio-geoclimatic regions) Program which will identify critical habitat for unique species of flora and fauna as well as many other ecological parameters. Through this approach, a sound basis for management techniques of these species can be established. The State Endangered Species Program is a continual program with planned, periodic updates.

This publication, The Rare Vertebrates of Connecticut, is the result of field studies and literature research. It represents one of the most complete sources of technical information on Connecticut's rare vertebrates.

The materials are designed to aid in conserving the State's vertebrate fauna, particularly by preserving and managing the habitats they occupy.

John W. Tippie
State Conservationist

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INTRODUCTION

This report has been prepared to add supplementary material to the 1976 state publication, Rare and Endangered Species of Connecticut and Their Habitats, by Joseph Dowhan and Robert Craig. Its purpose is to provide technical information on Connecticut's rare vertebrates. It is hoped that it will be of use to those involved in making wildlife management and land planning decisions.

For every taxon (species or subspecies) mentioned in this report, a "data sheet" has been prepared. Each data sheet is divided into a number of sections which provide specific types of information. These sections are described below:

Taxon name: The scientific and common name is given. The most recent official terminology is used in all cases. Subspecific designations are listed for those groups (reptiles and amphibians) in which subspecies are generally recognized in the field and in which distinct common names are used for subspecies. Other groups are for the most part listed only by species.

Status: Five categories are used to designate the status of the taxon in Connecticut (see the end of the introduction for detailed descriptions of these categories). This method of defining status, originally developed by Dowhan for characterizing the status of rare New England plants, is substantially different from that used by Dowhan and Craig. They only used such terms as rare, declining, or endangered to describe status. It is felt that this new approach offers a more precise definition of a taxon's status. It also serves as a brief summary of all information presented in the data sheet.

Although assigning taxa to the various categories is generally straightforward, a certain amount of judgment had to be used in some cases. It would be appreciated if those readers who have differing opinions on any taxon's status would send their comments to the USDA Soil Conservation Service, Mansfield Professional Park, Storrs, Connecticut 06268.

It should be pointed out that the status assigned does not necessarily indicate priority for protection. For example, a taxon that occurs entirely within ruderal habitats in Connecticut, even though threatened with statewide extinction, would be less important to protect than one which has declined because of human persecution. To assess the priority of protection of any one taxon, it is, therefore, necessary to examine all the data available.

Habitat: This section describes the type of habitat used. Depending on the taxon, breeding habitats, habitat used on migration, or wintering habitat is discussed. Both literature and field data have been drawn upon to prepare these discussions. An attempt to provide an exhaustive survey of all available habitat information has not been made, however. Instead, the data included were chosen to provide pertinent facts on the taxon's habitat requirements in Connecticut. A note on food habits is also included in most reports, as the source of food is an essential habitat feature.

Range: The geographic range of the taxon is described in a general manner. For sedentary taxa the entire range is given, while for most migratory taxa only the breeding range is outlined. In some cases information on migration and winter range is also given. More precise range data may be obtained by consulting the references listed at the end of this section. Where subspecies have not been previously mentioned, those occurring in Connecticut are named.

Notes: This section attempts to make note of all those features of the taxon's biology, historical status, and relationship to man which are of significance in terms of its conservation. Any management techniques that might be available are also included here.

Connecticut records: All distributional data known to the author are included for each taxon on a town basis, with the emphasis being placed on "recent" records (arbitrarily defined as 1950 or later, except in the case of the Osprey). Records for towns where no recent reports have been made are included under old records. (see map, pages 167, 168, 169)

In the case of most of the birds, the distributional information is concerned with breeding. For a breeding record to be confirmed a nest, eggs, or young must have been observed by experienced individuals. Suspected breeding evidence includes situations where summering adults have been located but nesting has not been proven. For those bird taxa in the report which occur in the state only as migrants or wintering individuals, confirmed records are considered to be those where experienced individuals have observed them. Because of the advanced state of field identification of birds and because of the impracticality of collecting specimens in most cases, specimens are deemed unnecessary for establishing distributional records.

For taxa other than birds, all existing specimens are considered confirmed distributional records. Sight reports are generally classified as suspected records except in the cases of the Bog Turtle and Timber Rattlesnake. In these instances, the sight records of acknowledged experts currently studying these taxa are listed as confirmed.

Where old records have been provided for any taxon, the source is listed. If no supporting evidence exists for the record, this is also indicated. The purpose of including these old records is to add some historical perspective to a taxon's distribution in Connecticut. In many cases, the taxon may no longer be present in the area because urbanization has obliterated its former habitat or because ecological change has rendered the area unsuitable, although in some instances it might have escaped detection because of a lack of field work in the area.

References: Included here are all those references mentioned in the report and, in some cases additional pertinent references. This listing is not meant to be an exhaustive summary of all articles dealing with the taxon, however.

It should be noted that the data sheets do not attempt to provide descriptions of the taxa. The various field guides that are generally available should be consulted for this type of information. References to appropriate field guides are made in many of the data sheets.

Several changes in taxon status have already become apparent as a result of the research conducted in association with this project. Several taxa originally listed by Dowhan and Craig should be deleted from the list of rare taxa. These include the following (see data sheets of these taxa for details):

Mudpuppy
Keen's Bat

In addition, on the basis of available data on population trends, the following taxa may be candidates for removal from the list in the near future (see data sheets):

Four-toed Salamander
Goshawk
Red-shouldered Hawk
Red-bellied Woodpecker
Acadian Flycatcher
Horned Lark

Several taxa have also been proposed as additions to the list. These include:

Snowy Egret
Louisiana Heron
Hoary Bat

NOTE: At press time data sheets for the rare fishes of Connecticut had not as yet been completed. In order to facilitate publication of the large amount of data already compiled, it has been decided that materials on the fishes will be published as a supplement at a later date.

ACKNOWLEDGMENTS

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I especially thank Joseph Dowhan, also of the Connecticut Department of Environmental Protection, who aided me in innumerable ways. Finally, I thank my wife, Susan, who critically reviewed the entire manuscript and who has been my constant field companion.

Robert J. Craig

CLASSIFICATION OF RARE VERTEBRATES OF CONNECTICUT

I. Mode of occurrence in Connecticut-"rarity":

A. Rare: small populations and/or individuals widespread over Connecticut, but limited in overall frequency of occurrence in relation to other animal taxa.

B. Local: taxa occurring in only one or a few very restricted localities where, however, they may be abundant.

C. Rare and local: individuals or small populations occurring in one or a few highly restricted localities.

D. Indeterminate: sufficient data for determining the degree of rarity is not available. Very secretive, poorly known taxa would fall into this category.

E. Apparently absent: not currently known from the state and probably not present. Taxa which are probably extinct or which occur only very sporadically would fall into this category.

II. Degree of threat in Connecticut-"endangerment":

A. Vulnerable: taxa that, although not currently in danger of extinction, (and whose numbers may even be stable or increasing), are nonetheless sufficiently rare to warrant concern. Their rarity may render them extremely vulnerable to unrestricted exploitation, unplanned development, or uncontrolled pollution.

B. Threatened:

1. State threatened: 1/ taxa whose numbers have been undergoing a long-term, non-cyclic decline in Connecticut. They are becoming depleted to the point where they are approaching "endangered" status. Natural or man-caused events may be responsible for their decline.

2. U.S. threatened: taxa that are likely to become endangered throughout all or a significant portion of their range within the foreseeable future.

C. Endangered:

1. State endangered: 1/ taxa that have declined in numbers in Connecticut, as a result of natural or man-caused phenomena, to the point of being in danger of extinction.

2. U.S. endangered: taxa that are in danger of extinction throughout all or a significant portion of their range.

1/ These are not officially recognized by Connecticut law, but are descriptions of species occurence.

D. Possibly extinct: not rediscovered or relocated in many years (greater than 25), and generally presumed to be extinct. Serious efforts to locate individuals have not been made, however. Obscure, secretive taxa might fall into this category.

E. Probably extinct: same as above, except that extensive searches have been conducted but have failed to locate any individuals (in only a very few instances is it possible to say with certainty that a taxon is extinct, even when efforts to establish its presence have failed).

F. Indeterminate: the degree of threat is unknown, due to a lack of information. Taxa that have recently colonized the state and about which little is known, obscure and secretive taxa, and taxa that have not been located in a number of years although probably still present, might fall into this category.

G. No danger: taxa that, although currently rare, are in no immediate danger of being reduced in numbers. Those taxa that have recently extended their ranges into the state and for which there is ample habitat, would fall into this category.

III. Population trend in Connecticut-"vigor":

A. Increasing: numbers have increased in recent years as a part of a regular upward trend.

B. Stable: estimates or counts indicate that numbers have remained essentially unchanged in recent years or have only fluctuated normally, such as in a cyclic manner.

C. Recent decline: numbers are known to have slightly or moderately declined in recent years (last decade), although the decline has generally been of too short a duration to accurately predict population trends. In instances of rather severe declines, historical records may reveal a cyclic history of large population fluctuations.

D. Long-term decline: numbers have undergone a significant reduction of several years duration. Decline appears to be of a non-cyclic nature.

E. Approaching extinction: estimates or counts indicate a long-term reduction in numbers to the point where, if the trend continues, extinction in the foreseeable future seems likely.

F. Possibly extinct: see II D (same definition).

G. Probably extinct: see II E (same definition).

H. Sporadic: occurs only irregularly (probably not every year). This category applies primarily to breeding birds that do not appear to nest in the state every year.

I. Indeterminate: no estimates or counts of former population size exist to compare with present levels, or recent information on population trends is not available.

IV. General distribution-entire geographic range:

A. Widespread:

1. Widespread and regular (regular): taxa with an extensive and relatively continuous range, in which they are common or at least regularly occurring over a significant portion.

2. Widespread and rare (rare): same as above, but occurring rarely throughout all or most of their range.

B. Disjunct: those taxa having a disjunct distribution. At least 75 km separates populations in Connecticut from the main range or nearest population.

C. Restricted:

1. Regional endemic: taxa with a total geographic range of about the size of New England or smaller.

2. State endemic: occurring only in Connecticut.

D. Indeterminate: entire distribution of the taxon is incompletely known.

V. Principal reason (not necessarily the only reason) for rarity in Connecticut:

A. Peripheral: the limit of the geographic range is reached.

B. Relict: occurring as a remnant of a formerly more widespread and abundant population. Such taxa have become restricted to one or a few localities in Connecticut as a result of long term environmental change (e.g. glaciation). These taxa may occur as disjuncts from their major range, or they may be broken into a number of disjunct populations throughout their range.

C. Extremely restricted natural range: includes all groups of endemics.

D. Habitat-restricted:

1. Naturally habitat restricted (natural): required ("critical") habitat is naturally scarce.

2. Habitat restricted because of human activity (human): critical habitat is in short supply because of the activities of man. Rarity resulting from outright habitat destruction (e.g. development, filling, draining, logging), or habitat degradation (e.g. pollution) falls into this category.

3. Habitat restricted because of both natural and human-associated factors (natural and human): 1 and 2 above.

E. Exploited: populations being decimated through commercial exploitation, hunting, collection for pets, persecution as pests, or similar activities.

F. Other: disease, competition with alien species, fire, taxonomic uncertainties, etc.

G. Unknown: cause of rarity not yet determined.

NOTE:

Some peripheral species such as the Common Merganser, Hooded Merganser, and Common Snipe may be common in Connecticut during migration but are rare as breeders because they are at the limit of their geographical breeding range.

Game species listed as "vulnerable" are monitored by the Federal Government and are not subject to over-exploitation by hunting as might be implied by the description of the classification.

CLASSIFICATION SCHEME FORMERLY USED

U.S. Endangered Taxon: (U.S. Endangered)

In immediate danger of extinction throughout all or most of its range; normally occurring in Connecticut during at least a portion of the year. Listed as "endangered" in Report on Endangered and Threatened Plant Species of the United States (Smithsonian Institution, 1975). United States Fish and Wildlife Service reports (U.S. Department of the Interior, 1975b, 1976a, b), or United States List of Endangered Fauna (U.S. Department of the Interior, 1974).

U.S. Threatened Taxon: (U.S. Threatened)

Likely to become endangered in the near future throughout all or most of its range; normally occurring in Connecticut during at least a portion of the year. Listed as "threatened" in Report on Endangered and Threatened Plant Species of the United States (Smithsonian Institution, 1975), United States Fish and Wildlife Service reports (U.S. Department of the Interior, 1975b, 1976a), or Threatened Wildlife of the United States (U.S. Department of the Interior, 1973).

State Endangered Taxon: (State Endangered)

In danger of extinction in Connecticut as a reproducing taxon; rare or very local throughout all or much of its range, or having a relatively restricted geographic range.

State Declining Taxon: (Declining)

A threatened taxon, whose populations are currently undergoing a prolonged, noncyclic decline in Connecticut and in many other parts of its range and is either approaching rarity or is already very rare in the state. These taxa are likely to become extirpated from the state in the near future.

State Rare Taxon: (Rare)

Populations and/or individuals occurring in very low numbers relative to other similar taxa in the state, although common or regularly occurring throughout much of their ranges. They may be found in a restricted geographic region or occur sparsely over a wider area. Although rare, populations are apparently stable. Also included in this category are migrant or wintering birds that regularly occur in Connecticut, although they are rare throughout all or much of their range.

Taxon of Indeterminate Status: (Indeterminate)

One whose population status within the state is unclear or unknown at this time; further investigation and additional information is necessary. This category includes those taxa that have not been collected or observed in a great many years and which may now be extinct in the state.

CHECKLIST OF RARE BIRDS OF CONNECTICUT

GAVIIDAE

Gavia immer	Common Loon

ARDEIDAE

Ardea herodias	Great Blue Heron
Florida caerulea	Little Blue Heron
Bubulcus ibis	Cattle Egret
Casmerodius albus	Great Egret
Nyctanassa violacea	Yellow-crowned Night Heron
Botaurus lentiginosus	American Bittern

THRESKIORNITHIDAE

Plegadis falcinellus	Glossy Ibis

ANATIDAE

Lophodytes cucullatus	Hooded Merganser
Mergus merganser	Common Merganser

ACCIPITRIDAE

Accipiter striatus	Sharp-shinned Hawk
A. cooperii	Cooper's Hawk
A. gentilis	Goshawk
Buteo lineatus	Red-shouldered Hawk
Haliaeetus leucocephalus subsp.	Bald Eagle
Circus cyaneus	Marsh Hawk

PANDIONIDAE

Pandion haliaetus	Osprey

FALCONIDAE

Falco peregrinus subsp.	Peregrine Falcon

RALLIDAE

Coturnicops noveboracensis	Yellow Rail
Laterallus jamaicensis	Black Rail

CHARADRIADAE

Charadrius melodus	Piping Plover

SCOLOPACIDAE

Capella gallinago	Common Snipe
Bartramia longicauda	Upland Sandpiper
Catoptrophorus semipalmatus	Willet

LARIDAE

Sterna dougallii	Roseate Tern
S. albifrons	Least Tern

TYTONIDAE

Tyto alba	Barn Owl

STRIGIDAE

Asio otus	Long-eared Owl
A. flammeus	Short-eared Owl

CAPRIMULGIDAE

Caprimulgus carolinensis	Chuck-will's Widow

PICIDAE

Melanerpes erythrocephalus	Red-headed Woodpecker
M. carolinus	Red-bellied Woodpecker
Sphyrapicus varius	Yellow-bellied Sapsucker

TYRANNIDAE

Empidonax virescens	Acadian Flycatcher

ALAUDIDAE

Eremophila alpestris	Horned Lark

HIRUNDINIDAE

Petrochelidon pyrrhonota	Cliff Swallow
Progne subis	Purple Martin

TROGLODYTIDAE

Cistothorus platensis	Short-billed Marsh Wren

TURDIDAE

Catharus ustulatus	Swainson's Thrush
Sialia sialis	Eastern Bluebird

SYLVIIDAE

Regulus satrapa	Golden-crowned Kinglet

PARULIDAE

Parula americana	Northern Parula
Dendroica magnolia	Magnolia Warbler
D. coronata	Yellow-rumped Warbler
D. cerulea	Cerulean Warbler
D. pinus	Pine Warbler
Oporornis formosus	Kentucky Warbler

FRINGILLIDAE

Hesperiphona vespertina	Evening Grosbeak
Passerculus s. sandwichensis	Savannah Sparrow
P. s. princeps	Ipswich Sparrow
Ammodramus henslowii	Henslow's Sparrow
A. savannarum	Grasshopper Sparrow
Pooecetes graminus	Vesper Sparrow

CHECKLIST OF RARE MAMMALS OF CONNECTICUT

SORICIDAE	
Cryptotis parva	Least Shrew
VESPERTILIONIDAE	
**Myotis keeni*	Keen's Bat
M. subulatus	Small-footed Myotis
M. sodalis	Indiana Bat
SCIURIDAE	
Glaucomys sabrinus	Northern Flying Squirrel
CRICETIDAE	
Peromyscus maniculatus	Deer Mouse
Neotoma floridana	Eastern Woodrat
Synaptomys cooperi	Southern Bog Lemming
URSIDAE	
Ursus americanus	Black Bear
MUSTELIDAE	
Martes pennanti	Fisher
FELIDAE	
Felis concolor cougour	Eastern Cougar

*Deleted - see text.

CHECKLIST OF RARE REPTILES AND AMPHIBIANS OF CONNECTICUT

CHELYDRIDAE	
Kinosternon s. subrubrum	Eastern Mud Turtle
Clemmys muhlenbergi	Bog Turtle
Emdoidea blandingi	Blanding's Turtle
SCINCIDAE	
Eumeces fasciatus	Five-lined Skink
COLUBRIDAE	
Storeria o. occipitomaculata	Red-bellied Snake
Opheodrys aestivus	Rough Green Snake
O. v. vernalis	Eastern Smooth Green Snake
VIPERIDAE	
Crotalus h. horridus	Timber Rattlesnake
PROTEIDAE	
**Necturus m. maculosus*	Mudpuppy
PLETHODONTIDAE	
Plethodon g. glutinosus	Slimy Salamander
Hemidactylium scutatum	Four-toed Salamander
Gyrinophilus p. porphyriticus	Northern Spring Salamander
PELOBATIDAE	
Scaphiopus h. holbrooki	Eastern Spadefoot

*Deleted - see text.

Gavia immer Common Loon

Status: I, Rare and local; II, Vulnerable; III, Sporadic; IV, Widespread (regular); V, Peripheral

Breeding habitat: Large or small freshwater lakes surrounded by either forested or open terrain. Nests are usually placed on tiny islands, although lake shores are also used. Floating nests are built on occasion. Proximity to open water is a more important criterion than density of cover in nest site selection; nests will be built as close as possible to the water's edge (Palmer 1962, Bull 1974).

In Alberta, loons were found nesting on boreal lakes (primarily on islands, many less than one ha. in size) surrounded by mixed forests of Balsam Poplar (Populus balsamifera), Quaking Aspen (P. tremuloides), White Spruce (Picea glauca), Black Spruce (P. mariana), Jack Pine (Pinus banksiana), and White Birch (Betula papyrifera). Very shallow lakes and sloughs were not used for nesting; instead lakes frequented by fishermen (and therefore known to be productive of fish, the Loon's major prey) were preferred. The number of islands present on the lake was discovered to be directly related to nesting density and, while nests were generally built within four feet of the water, they were placed in sheltered localities. Sheltering the nests prevented wave damage (Vermeer 1973).

In New York, loons nest primarily on remote lakes in heavily forested, mountainous regions of the northern portions of the state. Nests have been found on sloping rocky ground near lake shores, on boggy islands, floating free, in stands of pond lily (Nuphar spp.), and on floating cranberry (Vaccinium spp.) bogs (Bull 1974).

Breeding range: Aleutian Islands and Greenland to northeastern California and Connecticut. Also in Iceland and Bear Is. No subspecies are recognized (A.O.U. 1957).

Notes: The encroachment of civilization upon wilderness lakes is forcing the Common Loon to retreat from much of its southern breeding range. Increased use of these lakes and their shores for motor boating, camping, and the construction of summer homes is resulting in nest desertion by this very shy species. (Bull 1974, Vermeer 1973).

In Connecticut, where it is at its southeastern range limit, the Common Loon has always been a very rare breeder (see also Sage et al. 1913). In spite of Connecticut's dense population, it continues to nest, with fair regularity (although apparently not every year), on some of the state's most remote and undisturbed lakes. As long as these lakes are protected from recreational and residential development, the Loon should continue to nest locally.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
New Hartford		Colchester-1948 (Yale Univ.)
Ansonia		East Hampton-no details (Merriam 1877)
Barkhamsted		East Haven-1890, 1878 (Sage et al. 1913)
		Winchester-no details (Job 1908, cited in Kuerzi and Kuerzi 1934)

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Ardea herodias Great Blue Heron

Status: I, Rare and local; II, Vulnerable; III, Increasing?; IV, Widespread (regular); V, Habitat-restricted (natural and human)

Breeding habitat: Nests may be placed in a variety of sites, including marshes, rock ledges, cliffs, and trees (Palmer 1962). In the northeast, however, nesting is confined primarily to trees. Trees chosen are often very tall, in remote inaccessable places, and in close proximity to a large body of water (Bent 1926, Bull 1974).

In New Jersey, Great Blue Herons have bred in Atlantic White Cedar (Chamaecyparis thyoides) swamps, groves of large Pin Oaks (Quercus palustris) situated in swamps, stands of dead Atlantic White Cedar surrounded by water (Stone 1957), dune forests composed of American Holly (Ilex opaca, Bull 1964), deciduous upland woods, pine (Pinus spp.) groves, and deciduous swamps (Bent 1926). Breeding in New York has occurred in swamps on small river islands vegetated by American Elm (Ulmus americanus), Red Maple (Acer rubrum), Red Oak (Q. borealis), and White Ash (Fraxinus americana, Parker and Maxwell 1969), inland hardwood swamps of ash, elm, and maple, forested ridges where large American Beech (Fagus grandifolia) and oaks occur, and dead trees surrounded by water (Benning 1969, Bull 1974). In Connecticut, breeding has occurred recently in a remote Beaver (Castor canadensis) swamp bordered by dead oaks. They have also attempted nesting in a forested island in the middle of a large lake (Proctor pers. comm.).

Feeding habitat consists of shallow waters and shores of lakes, bays, and streams, salt and freshwater marshes, wooded swamps, and tidal mud-flats. In these areas Great Blue Herons find their major prey--fish (Palmer 1962).

Breeding range: Southeastern Alaska and southern Quebec to southern Mexico and the West Indies; also Galapagos Islands. The subspecies herodias breeds in Connecticut (AOU 1957).

Notes: Although the Great Blue Heron is seen regularly in Connecticut throughout the year, it is rare and local as a breeder. Appparently this has always been the case; Sage et al. (1913) list only one known nesting site for it. As it breeds commonly in many of the states surrounding Connecticut, its rarity seems related to a lack of suitable nesting habitat. Known nesting takes place only in more remote, undisturbed portions of the state.

There is some evidence that the Great Blue Heron has increased as a breeder in recent years. This is perhaps related in part to an increase in Beaver activity, which has resulted in the creation of additional habitat.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Union	Litchfield-Morris	Winchester-about 1900 (Sage et al. 1913)
Derby	Portland	
Barkhamsted		
Canaan		
Sterling		
Woodstock		
Eastford		

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Florida caerulea Little Blue Heron

Status: I, Rare and local; II, Vulnerable; III, Increasing?; IV, Widespread (regular); V, Habitat-restricted (natural and human)

Breeding habitat: The Little Blue Heron is a bird of freshwater inland areas throughout much of its range (Palmer 1962). Northeastern breeders are usually associated with coastal localities, however (Bull 1974, Finch 1976). Breeding areas are often isolated from surrounding lands by expanses of water or marsh but upland sites are also used (Bull 1974, Meanley 1955, Stone 1937). The preference for isolation is related to the reduced possibility of nest predation from upland mammals, such as Raccoons (Procyon lotor, Peterson 1965). Nesting occurs colonially, often in association with other species of herons. Nests are usually built in groves of shrubs or low trees. (Palmer 1962).

On Long Island, New York breeding colonies of Little Blue Herons occur on upland "islands" in tidal marshes, barrier beaches, and coastal islands. In these areas they inhabit low scrub thickets of catbriar (Similax spp.), Virginia Creeper (Parthenocissus quinquefolia), Poison Ivy (Rhus radicans), Bayberry (Myrica pennsylvanica), cherry (Prunus spp.), Beach Plum (Prunus maritima), and sumac (Rhus spp.), and planted stands of Japanese Black Pine (Pinus thunbergii; Bull 1974, Post et al. 1970). New Jersey birds also nest on barrier beaches; one colony inhabits a dense, vine-covered stand of low trees and shrubs similar in vegetative composition to the Long Island scrub thickets. Inland nesting has been recorded near estuarine marshes in a stand of low trees, mostly Red Maples (Acer rubrum), surrounded by farmland (Stone 1937).

Many New England colonies, including Connecticut's, occur on coastal islands (Finch 1976). The Connecticut heronry occupies a stand of low (1-2 m.), shrubby vegetation densely overgrown with vines. Dominant shrub species include Black Cherry (P. serotina), Bayberry, and Morrow's Honeysuckle (Lonicera morrowi), while the most abundant vines include Japanese Honeysuckle (L. japonica) and Bittersweet (Celastrus orbiculata). Forming "islands" within this low thicket are stands of taller (20 m. or more) trees, including such species as Black Cherry and Sassafras (Sassafras albidum, Dowhan 1976).

Feeding habitat for the Little Blue Heron is quite varied and includes coastal marshes and tidal mudflats, freshwater lakes, marshes, meadows, and marshy stream banks. Food consists of fishes, frogs, reptiles, and various invertebrates. (Palmer 1952, Stone 1937). In the northeast most breeding birds feed near the coast.

Breeding range: Southeastern U.S., north along the coast to New Hampshire (possibly Maine). Also Mexico, Central America, the Carribean, and South America. No subspecies are recognized (Bull 1974, Finch 1976, Palmer 1962).

Notes: In the nineteenth and early twentieth century, a number of species of North American herons were hunted heavily for their plumes, which were used in the millinery trade. As a result, they declined

dramatically over much of their range and probably would have become extinct in North America had federal legislation not put an end to the hunting in 1913. The Little Blue Heron was among these species and, although not as severely affected as some of the others, it was considerably reduced in numbers. Since the end of market hunting, the herons have made a remarkable recovery. They have recolonized many areas in which they had been eliminated, including the northeast (Bull 1974, Stone 1937).

In Connecticut, breeding by the Little Blue Heron is restricted to the southwestern portion of the state. At best, only several pairs are currently nesting. Because of the limited supply of suitable heronry sites, it is doubtful whether it will ever be appreciably more common than it is now. Continued destruction and pollution of coastal feeding habitats will also act to limit any future potential for population growth.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Norwalk		

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Bubulcus ibis Cattle Egret

Status: I, Rare and local; II, Vulnerable; III, Increasing?; IV, Widespread (regular); V, Peripheral

Breeding habitat: In the U.S. the Cattle Egret typically nests colonially with other species of herons, either along the coast or at inland localities. Breeding areas are often isolated from surrounding lands by expanses of water or marsh (Bull 1974, Palmer 1962). The preference for isolation is related to the reduced possibility of nest predation from upland mammals, such as Raccoons (Procyon lotor, Peterson 1965). Nests are usually built in groves of shrubs or trees (Palmer 1962).

On Long Island, New York breeding colonies of Cattle Egrets occur on barrier beaches and coastal islands. In these areas they inhabit low scrub thickets of catbriar (Milax spp.), Virginia Creeper (Parthenocissus quinquefolia), Poison Ivy (Rhus radicans), Bayberry (Myrica pennsylvanica), cherry (Prunus spp.), Beach Plum (Prunus maritima), and sumac (Rhus spp.). In Ontario, they have bred on an island at the extreme eastern end of Lake Ontario (Bull 1974). New Jersey birds also nest on barrier beaches; one colony inhabits a dense, vine-covered stand of low trees and shrubs similar in vegetative composition to the Long Island scrub thickets.

In Connecticut, Cattle Egrets breed on a coastal island. They occupy a stand of low (1-2 m.), shrubby vegetation densely overgrown with vines. Dominant shrub species include Black Cherry (P. serotina), Bayberry, and Morrow's Honeysuckle (Lonicera morrowi), while the most abundant vines include Japanese Honeysuckle (L. japonica) and Bittersweet (Celastrus orbiculata). Forming "islands" within this low thicket are stands of taller (20 m. or more) trees, including such species as Black Cherry and Sassafras (Sassafras albidum, Dowhan 1976).

Unlike many other species of North American herons, Cattle Egrets shun wetland habitats for feeding. Instead they feed in open pastures, fields, and other types of open, grassy or weedy areas. Their food consists primarily of insects (Palmer 1962).

Breeding range: Throughout the warmer regions of the world (Palmer 1962). In the U.S. the subspecies ibis breeds north to Rhode Island on the coast (Finch 1973) and to southern Ontario inland (Bull 1974).

Notes: The Cattle Egret has undergone an explosive expansion of its breeding range in the past hundred years. Originally found in the old world, it began to colonize South America in the late nineteenth century. By the early 1940's it had colonized Florida, and in 1971 it bred in Connecticut for the first time (Bull 1974, Palmer 1962).

In Connecticut the Cattle Egret is currently restricted as a breeder to the southwestern portion of the state, where several pairs nest annually. Because of the limited supply of suitable heronry sites, however, it is doubtful if it will ever become appreciably more common.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Norwalk		

References:

Buckley, P. A., and F. G. Buckley. 1975. Guidelines for the protection and management of colonially nesting waterbirds. North Atlantic Regional Office, National Park Service. 54p.

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Casmerodius albus Great Egret

Status: I, Rare and local; II, Vulnerable; III, Increasing?; IV, Widespread (regular); V, Habitat-restricted (natural and human)

Breeding habitat: Primarily a bird of fresh and brackish water areas (Palmer 1962). Northeastern breeders are usually associated with coastal localities (Bull 1974, Finch 1976). Breeding areas are often isolated from surrounding lands by expanses of water or marsh, but upland sites are also used (Bull 1974, Meanley 1955, Stone 1937). The preference for isolation is related to the reduced possibility of nest predation from upland mammals, such as Raccoons (Procyon lotor, Peterson 1965). Nesting often occurs colonially in association with other species of herons, but solitary nestings also occur. Nests are usually built in groves of shrubs or trees (Palmer 1962).

On Long Island, New York breeding colonies of Great Egrets occur on upland "islands" in tidal marshes, barrier beaches, and coastal islands. In these areas they inhabit low scrub thickets of catbriar (Smilax spp.), Virginia Creeper (Parthenocissus quinquefolia), Poison Ivy (Rhus radicans), Bayberry (Myrica pennsylvanica), cherry (Prunus spp.), Beach Plum (Prunus maritima), and sumac (Rhus spp.); groves of Black Gum (Nyssa sylvatica); and planted stands of Japanese Black Pine (Pinus thunbergii; Bull 1974, Post et al. 1970). New Jersey birds also nest on barrier beaches; one colony inhabits a dense, vine-covered stand of low trees and shrubs similar in vegetative composition to the Long Island scrub thickets. Inland nesting has been recorded near estuarine marshes in a forested swamp vegetated by tall Red Maples (Acer rubrum) and Sweetgums (Liquidambar styraciflua, Stone 1937).

Many New England colonies, including Connecticut's, occur on coastal islands (Finch 1976). The Connecticut heronry occupies a stand of low (1-2 m.), shrubby vegetation densely overgrown with vines. Dominant shrub species include Black Cherry (P. serotina), Bayberry, and Morrow's Honeysuckle (Lonicera morrowi), while the most abundant vines include Japanese Honeysuckle (L. japonica) and Bittersweet (Celastrus orbiculata). Forming "islands" within this low thicket are stands of taller (20 m. or more) trees, including such species as Black Cherry and Sassafras (Sassafras albidum). Many of the Great Egrets choose these taller trees as nest sites (Dowhan 1976).

Fairly open situations, such as fresh and brackish marshes and tidal mudflats are preferred for feeding. Openings in swamps, streams, and ponds are also used. Food consists of fishes, frogs, snakes, and various invertebrates (Palmer 1962, Stone 1937). In the northeast most breeding birds feed along the coast.

Breeding range: Locally throughout the warmer regions of the world. In the U.S. the subspecies egretta breeds north to Maine on the east coast (Bull 1974, Palmer 1962).

Notes: In the nineteenth and early twentieth century a number of species of North American herons, including the Great Egret, were hunted heavily for their plumes. The plumes were used in the millinery trade. As a result, they declined dramatically over much of their range, and probably would have become extinct in North America had federal legislation not put an end to the hunting in 1913. Since the end of market hunting, the herons have made a remarkable recovery. They have recolonized many areas in which they had been eliminated, including the northeast (Bull 1974, Stone 1937). The first modern Connecticut breeding occurred in 1961 (Bull 1964).

In Connecticut, breeding by the Great Egret is restricted to the southwestern portion of the state. Only a small number of pairs are currently nesting. Because of the limited supply of suitable heronry sites, it is doubtful whether it will ever be appreciably more common than it is now. Continued destruction and pollution of coastal feeding habitats will also act to limit any future potential for population growth.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Norwalk		

References:

Buckley, P. A., and F. G. Buckley. 1976. Guidelines for the protection and management of colonially nesting waterbirds. North Atlantic Regional Office, National Park Service. 54p.

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Nyctanassa violacea Yellow-crowned Night Heron

Status: I, Rare and local; II, Vulnerable; III, Stable; IV, Widespread (regular); V, Habitat-restricted (natural and human)

Breeding habitat: Primarily a bird of fresh and brackish water areas (Palmer 1962). Northeastern breeders are usually associated with coastal localities (Bull 1974, Finch 1976, Stone 1937). Breeding areas are often isolated from surrounding lands by expanses of water or marsh, but upland sites are also used (Bull 1974, Stone 1937). The preference for isolation is related to the reduced possibility of nest predation from upland mammals, such as Raccoons (Procyon lotor, Peterson 1965). Nesting often occurs colonially in association with other heron species, but solitary nestings also occur. Nests are usually built in groves of shrubs or trees (Palmer 1962).

On Long Island, New York breeding colonies of Yellow-crowned Night Herons occur on barrier beaches, coastal islands, and upland "islands" in tidal marshes. In these areas they inhabit low scrub thickets of cherry (Prunus spp.), Beach Plum (Prunus maritima), Bayberry (Myrica pennsylvanica), sumac (Rhus spp.), Poison Ivy (Rhus radicans), catbriar (Smilax spp.), Virginia Creeper (Parthenocissus quinquefolia), and (rarely) pines (Pinus spp.). They also occur in swamps and upland forests consisting of such types of trees as maple (Acer spp.), oak (Quercus spp.), cherry, Black Gum (Nyssa sylvatica), Eastern Redcedar (Juniperus virginiana), and other deciduous species (Bull 1974). New Jersey birds also nest on barrier beaches; one colony inhabits a dense, vine-covered stand of low trees and shrubs similar in vegetative composition to the Long Island scrub thickets.

In Connecticut, breeding has occurred on offshore islands in dense thickets of low trees, shrubs, and vines. Dominant plant species present include Black Cherry (P. serotina), Bayberry, Morrow's Honeysuckle (Lonicera morrowi), Sassafras (Sassafras albidum), Bittersweet (Celastrus orbiculata), and Japanese Honeysuckle (L. japonica). It has also nested on the mainland.

Feeding habitat consists of tidal marshes and mudflats, freshwater marshes, and swamps. In the northeast most breeding birds feed along the coast. Unlike other herons, it feeds mainly on crustaceans (Palmer 1962, Bull 1974).

Breeding range: Southeastern U.S., the Carribean, coastal Mexico, Central America, and coastal South America. The subspecies violacea breeds north to Massachusetts along the Atlantic coast (AOU 1957, Palmer 1962).

Notes: This primarily southern species has been extending its breeding range north in recent years. The first confirmed nesting in Connecticut occurred in 1953 (Bull 1964). In Connecticut, it is currently restricted as a breeder to the southwestern portion of the state, where several pairs nest annually.

Although the Yellow-crowned Night Heron is now a regularly breeding species in the state, its continued presence is potentially threatened by the destruction of its feeding habitat. Pollution of estuarine areas and filling of tidal marshes and mudflats undoubtedly affect it adversely.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Norwalk		
Westport		

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Botaurus lentiginosus American Bittern

Status: I, Rare; II, State threatened; III, Long-term decline; IV, Widespread (regular); V, Habitat restricted (human)

Breeding habitat: Bitterns breed in salt and freshwater marshes, although less commonly in the former. They will also nest in open bogs in northern areas and, on occasion, in damp hayfields. Vegetative cover at marsh nest sites consists of stands of cattails (Typha spp.), bulrushes (Scirpus spp.), Reeds (Phragmites communis), Tall Cord Grasses (Spartina pectinata), bur-reeds (Sparganium spp.), and similar tall herbaceous species (Bull 1964 and 1974, Palmer 1962, Brewer 1967). In Connecticut, breeding has taken place in salt and brackish marshes where stands of tall vegetation occur, and also in freshwater marshes with tall vegetative cover or at least patches of tall vegetation.

Feeding habitat consists of marsh creeks, riverbanks, lake borders, and the marshes themselves. In these areas American Bitterns find their main prey: frogs, salamanders, fish, aquatic insects, and crayfish (Palmer 1962).

Breeding range: Central British Columbia to Newfoundland and south to southern California and eastern Maryland. Also locally in northern Texas, Louisiana, and Florida. No subspecies are recognized (AOU 1957).

Notes: In recent years American Bitterns have been undergoing a serious decline in parts of their range (Arbib 1976). Marsh destruction has apparently been responsible to some extent. In addition, toxic chemicals which have been released into aquatic systems, particularly persistant pesticides, seem to be seriously interfering with their reproductive ability. Like some raptorial bird species, (Hickey 1969, Hickey and Roelle 1969), the bitterns are coming in contact with these chemicals through their food. While formerly a common summer resident in Connecticut (Sage et al. 1913), they must now be considered a rare breeder at best.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
	Litchfield-Morris	Ashford-1899
	Old Lyme-Lyme	(Jones 1931)
	Cromwell	
	Middletown-Cromwell	
	Waterford	
	Groton	
	Stonington	
	Portland	
	Chaplin	
	Tolland	

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A.O.U. Checklist Committee. 1957. Checklist of North American birds. 5th ed. Amer. Ornith'. Union. 691p.

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Sage, J. H., L. B. Bishop, and W. P. Bliss. 1913. The birds of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 20.

Plegadis falcinellus Glossy Ibis

Status: I, Rare and local; II, Vulnerable; III, Increasing?; IV, Widespread (regular); V, Habitat-restricted (natural and human)

Breeding habitat: Primarily a bird of fresh, brackish, and saltwater areas (Palmer 1962). Northeastern breeders are usually associated with coastal localities (Bull 1974, Finch 1976). Breeding areas are usually isolated from surrounding lands by expanses of water or marsh (Bull 1974, Palmer 1962), this preference being related to the reduced possibility of nest predation from upland mammals, such as Raccoons (Procyon lotor, Peterson 1965). Nesting usually occurs colonially in association with other heron species. Nests are often built in groves of shrubs or trees, although they may also be built on the ground among herbaceous vegetation (Palmer 1962).

On Long Island, New York breeding colonies of Glossy Ibises occur on barrier beaches, coastal islands, and upland "islands" in tidal marshes. In these areas, they inhabit low scrub thickets of cherry (Prunus spp.), Beach Plum (Prunus maritima), Bayberry (Myrica pennsylvanica), sumac (Rhus spp.), catbriar (Smilax spp.), Virginia Creeper (Parthenocissus quinquefolia), and Poison Ivy (Rhus radicans), and planted stands of Japanese Black Pines (Pinus thunbergii; Bull 1974, Post et al. 1970). New Jersey birds also nest on barrier beaches; one colony inhabits a dense, vine-covered stand of low trees and shrubs similar in vegetative composition to the Long Island scrub thickets.

Many New England colonies, including Connecticut's, occur on coastal islands (Finch 1976). The Connecticut heronry occupies a stand of low (1-2 m.), shrubby vegetation densely overgrown with vines. Dominant shrub species include Black Cherry (P. serotina), Bayberry, and Morrow's Honeysuckle (Lonicera morrowi), while the most abundant vines include Japanese Honeysuckle (L. japonica) and Bittersweet. Forming islands within this low thicket are stands of taller (20 m. or more) trees, including such species as Black Cherry and Sassafras (Sassafras albidum, Dowhan 1976).

Feeding habitat includes fresh, brackish, and saltwater areas, such as marshes, swamps, tidal mudflats, and shallow bays and lakeshores. Food consists primarily of invertebrates (Palmer 1962). In the northeast most breeding birds feed along the coast.

Breeding range: Throughout the warmer regions of the world. In the U.S., the subspecies falcinellus breeds north to Maine on the east coast (Bull 1974, Palmer 1962).

Notes: The Glossy Ibis has undergone an explosive expansion of its breeding range in North America since the early 1950's (Palmer 1962). Prior to 1940 it was not known to nest north of Florida, but it is now found all along the east coast. The first confirmed Connecticut nesting occurred in 1971 (Bull 1974). In Connecticut, it is currently restricted as a breeder to the southwestern portion of the state, where several pairs nest annually.

Although the Glossy Ibis is now a regularly breeding species in the state, its continued presence is potentially threatened by the destruction of its feeding habitat. Pollution of estuarine areas and filling of tidal marshes and mudflats undoubtedly affect it adversely.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Norwalk		

References:

Buckley, P. A., and F. G. Buckley. 1976. Guidelines for the protection and management of colonially nesting waterbirds. North Atlantic Regional Office, National Park Service. 54p.

Bull, J. 1974. Birds of New York State. Doubleday, Garden City. 655p.

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Post, W., F. Enders, and T. H. Davis, Jr. 1970. The breeding status of the Glossy Ibis in New York. Kingbird 20:3-8.

Lophodytes cucullatus Hooded Merganser

Status: I, Rare and local; II, Vulnerable; III, Stable; IV, Widespread (regular); V, Habitat-limited (natural)
(Not on public list; a game species in Connecticut)

Breeding habitat: Nests in forested regions, in close proximity to fresh water. Flooded shorelines of ponds and streams where dead trees are found are often used. Streams chosen are often fast-moving and with gravelly or cobbly bottoms. Swamps also provide suitable nesting habitat. As it is a cavity nester, the presence of tree holes (such as those often present in dead trees) are an essential habitat requirement (Palmer 1976).

In Wisconsin, Hooded Mergansers with broods are found to be most closely associated with fast moving (0.2-0.3 m/sec.), wide (12-15m), moderately deep (0.3-0.6m) cobble-bottomed rivers with heavily forested shores. They also use Beaver (Castor canadensis) ponds, although less frequently (Renouf 1972). New York nestings have also taken place in Beaver ponds, as well as in swamps and quiet stretches of water in forested areas, particularly where dead trees are abundant (Bull 1974). Connecticut birds have been found breeding along fast-moving, deep streams in forested country.

Feeding habitat consists of the wetland areas where the birds nest. In these areas, they feed mainly upon small fishes, insects, crayfish, and other crustaceans (Palmer 1976).

Breeding range: Alaska and New Brunswick to Louisiana and Florida. No subspecies are recognized (AOU 1957).

Notes: In the earlier part of this century Hooded Mergansers were greatly reduced in numbers, primarily as a result of overhunting and the cutting of wooded nest sites. Since the 1930's, however, they have become increasingly common. Habitat destruction is still a threat to their continued increase, but nest boxes are proving to be suitable artificial nest sites (Palmer 1976).

In Connecticut, Hooded Mergansers have apparently always been rare as breeders (Sage et al. 1913); habitat-limitation is probably responsible. As Beaver activity continues to increase statewide, however, more pairs may find suitable nesting sites.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Haddam	Canaan	Farmington-1937 (Hartford Audubon Soc. pers. comm.)
Litchfield	Sharon	
Lyme	Granby	Winchester-about 1893 (Sage et al. 1913)
Portland		

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NOTE:

Peripheral species such as the Hooded Merganser may be common in Connecticut during migration but are rare as breeders because they are at the limit of their geographical breeding range.

Game species listed as "vulnerable" are monitored by the Federal Government and are not subject to over-exploitation by hunting as might be implied by the description of the classification.

Mergus merganser Common Merganser

Status: I, Rare and local; II, Vulnerable; III, Sporadic; IV, Widespread (regular); V, Peripheral
(Not on public list-migrants are game birds)

Breeding habitat: Clear streams and lakes of the northern forests are used. Areas with muddy or weedy water are not suitable because good visibility is needed for catching fish-the Common Merganser's major prey. Nests are usually constructed in tree cavities, although sheltered sites on the ground or in cliffs are also used (Palmer 1976).

In British Columbia nesting birds are confined to rivers and lakes that are part of main waterways; they are apparently absent from isolated lakes (Palmer 1976). In New York, breeding occurs in heavily forested lake country in the mountainous northern portions of the state. Nests have been found among roots under overhanging stream banks, in thin alder (Alnus sp.) cover among sedges (Carex stricta), on lake islands in both Northern White Cedars (Thuja occidentalis) and deciduous forests, and in old American Elms (Ulmus americana, Bull 1974).

Breeding range: Throughout the boreal regions of much of the northern hemisphere. The subspecies americanus breeds from Newfoundland to Connecticut in eastern North America (A.O.U. 1957, Carleton 1962).

Notes: The Common Merganser has declined in parts of its southern range, largely because of the encroachment of civilization upon wilderness streams and lakes. Motor boating, construction of summer homes along waterways, and development of stream or lakeside camping areas have all contributed toward forcing this species to retreat to more remote, northern locations. There is also a possibility that pesticide poisoning may be affecting it in some areas (Bull 1974).

In Connecticut, the Common Merganser has only been known as a breeder since 1962 (Carleton 1962). Sage et al. (1913) make no mention of it breeding. It now appears to be an extremely rare and somewhat sporadic breeder on undisturbed lakes in mountainous, heavily forested portions of northwestern Connecticut. As long as its breeding sites remain undisturbed, it should continue to nest in the state.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Colebrook	New Hartford	
Barkhamsted		

References:

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NOTE:

Peripheral species such as the Common Merganser may be common in Connecticut during migration but are rare as breeders because they are at the limit of their geographical breeding range.

Game species listed as "vulnerable" are monitored by the Federal Government and are not subject to over-exploitation by hunting as might be implied by the description of the classification.

Accipiter striatus Sharp-shinned Hawk

Status: I, Rare and local; II, State endangered; III, Approaching extinction; IV, Widespread (regular); V, Habitat-restricted (human)

Breeding habitat: Woodlots or extensive forests. Areas of edge, such as brooks or clearings, are preferred in the latter. It is found more frequently in coniferous or mixed forests than in deciduous forests (Wattel 1973).

Most nesting in New York occurs in Hemlocks (Tsuga canadensis), although pines (Pinus spp.) and Eastern Redcedars (Juniperus virginiana) are also used (Bull 1974). In eastern Massachusetts dense groves of medium-sized White Pines (P. strobus) are often occupied. In addition, Pitch Pine (P. rigida)-oak (Quercus spp.) forests are used, as are Hemlocks (Bent 1937). In the boreal zones of Canada, where this species is most common, forests of spruce (Picea spp.), fir (Abies spp.), aspen (Populus spp.), birch (Betula spp.) are inhabited (Wattel 1973).

Feeding habitat consists of forest openings, such as streams, clearings, and agricultural land. Extensive forests are generally not preferred. In these habitats it preys chiefly upon birds (Bent 1937).

Breeding range: Much of North and South America. The subspecies velox breeds primarily in the boreal zone of North America, although it ranges into the southern U.S. (Wattel 1973).

Notes: The Sharp-shinned Hawk has apparently always been an uncommon breeder in Connecticut (Bull 1964, Sage et al. 1913). However, in recent years it has declined dramatically in parts of its range (Hickey 1969) and it is now nearly extinct as a breeder in Connecticut (Mersereau and Hopkins pers. comm.). Contamination of the environment with toxic chemicals, particularly persistent pesticides, appears to be at least partly responsible for its decline. These chemicals, which it ingests with its food, have been implicated in causing reproductive failures in a number of raptorial birds (Hickey 1969).

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Eastford	Litchfield-Morris	Cromwell-1889, 1893 (Univ. Conn. Mus.)
	New Milford	Portland-1889 (Univ. Conn. Mus.)

References:

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Hickey, J. J. 1969. (editor). General discussion: population biology and significance of trends. p. 523-549. In Peregrine Falcon populations: their biology and decline. Univ. Wisconsin Press, Madison. 596p.

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Accipiter cooperii Cooper's Hawk

Status: I, Rare and local; II, State endangered; III, Approaching extinction; IV, Widespread (regular); V, Habitat-restricted (human)

Breeding habitat: In the northeast farm woodlots, upland forests near clearings, extensive forested tracts, swamps, and floodplain forests are used. Nests, which are usually placed no closer than one km. apart, may be built in either deciduous or coniferous trees (Bull 1974).

In eastern Massachusetts White Pine (Pinus strobus) groves are often selected for nest sites, although oak (Quercus spp.), American Chestnut (Castanea dentata-formerly a forest constituent) and mixed White Pine-oak-chestnut forests are also used (Bent 1937). New York nests have been found in deciduous swamps and floodplain forests. In addition, American Beech (Fagus grandifolia)-Sugar Maple (Acer saccharum)-Hemlock (Tsuga canadensis) forests and oak-chestnut-hickory (Carya spp.) forests are used. White Pine groves are occupied on rarer occasions (Bull 1974). In western Pennsylvania forests of oak, maple, and cherry (Prunus spp.) with nearby farmland and houses have been used for nesting (Schriver 1969).

Feeding habitat consists of extensive forests or clearings bordering forests. Rivers, which serve as breaks in the forest vegetation, are also used. In these areas Cooper's Hawks hunt their main prey-birds and small mammals (Bull 1974, Meng 1959).

Breeding range: Southern British Columbia and Nova Scotia to Baja California and central Florida. No subspecies are recognized (AOU 1957).

Notes: There is evidence that Cooper's Hawks have been declining slowly in at least parts of their range for many years (Bent 1937). In the past 30 years, however, they have largely dissappeared in portions of their range (including Connecticut) where they were formerly common (Arbib 1976, Finch 1976, Schriver 1969). Several factors, including direct human disturbance, changing land use patterns, natural factors, and chemical pollution of the environment may be involved.

Heavy hunting of Cooper's Hawks during fall migration formerly drained many birds from the population (Stone 1937). Although this is no longer practiced, many birds are still shot because of their reputation as predators of chickens. Schriver (1969) describes several instances of nesting Cooper's Hawks being shot. He also mentions that severe winters may result in mass mortality, although this factor would not seem to adequately account for long-term population declines. The decline of agriculture and subsequent regrowth of the forests in the northeast may have also adversely affected Cooper's Hawks by decreasing the amount of feeding habitat. However, the onset of the dramatic decline in these birds appears to be most closely associated with the advent of the widespread use of persistent pesticides. These chemicals, which the birds pick up through their food, have been implicated in causing re-

productive failures in a number of species of raptorial birds (Hickey 1969).

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Sharon Mansfield	Litchfield-Morris	Guilford-1949-no details (Mackenzie 1961) South Windsor-no date (Merriam 1877) Portland-1892, 1911 (Univ. Conn. Mus.) East Hampton-1875 (Univ. Conn. Mus.)

References:

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Accipiter gentilis Goshawk

Status: I, Local; II, Vulnerable; III, Increasing; IV, Widespread (regular); V, Peripheral

Breeding habitat: In North America this species is primarily associated with the boreal zone. It breeds in heavily timbered, often mountainous areas, particularly those with coniferous or mixed coniferous-hardwood forests. Nesting habitat usually contains small forest openings and tall trees in which nests can be built (Bull 1974, Wattel 1973).

In the northeast nesting has been recorded in forests of spruce (Picea spp.) and Balsam Fir (Abies balsamea), White Pine (Pinus strobus), and Hemlock (Tsuga canadensis). Mixed forests of White Pine, Sugar Maple (Acer saccharum), Yellow Birch (Betula lutea), American Beech (Fagus grandifolia), and Red Oak (Quercus borealis) are used near the southern limit of its breeding range, including New York, Massachusetts, and Connecticut (Bent 1937, Bull 1974, Mersereau and Hopkins pers. comm.).

Feeding habitat consists of forest openings, such as streams, ponds, or clearings. Forested areas are also used. In these habitats the Goshawk preys upon birds and small mammals (Bent 1937, Wattel 1973).

Breeding range: Much of the northern hemisphere. In North America, the subspecies atricapillus breeds primarily in the boreal zone, although it ranges south in the Appalachian Mountains to western Maryland (Wattel 1973).

Notes: The Goshawk is presently a local but increasing breeder in Connecticut (Mersereau and Hopkins pers. comm., see also Finch 1976). It has also been increasing in other parts of the northeast recently. Its increase may be associated with the decline of the Cooper's Hawk (A. cooperii), as the Cooper's Hawk probably competitively excluded the Goshawk from the northeast in former years (Bull 1974).

Although the Goshawk is currently doing well in Connecticut, it is threatened by human activities. Falconers and vandals destroy a number of nests each year, either by robbing nestlings or killing adults (Mersereau and Hopkins pers. comm.), and encroaching urbanization in the wilder parts of the state continues to reduce the amount of suitable breeding habitat.

While contamination of the environment with persistent pesticides appears to have adversely affected population levels of the smaller North American accipiters, the Cooper's and Sharp-shinned (A. striatus) Hawks, no corresponding decline has been noted in Goshawk populations. The smaller hawks feed heavily upon insectivorous birds and are thus associated with long food chains. Such long food chains allow for great biological magnification of toxic substances. In contrast, Goshawks generally prey upon herbivorous mammals and birds, and are therefore feeding from short food chains in which little pesticide accumulation takes place (Hickey 1969).

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Cornwall	Fairfield	Winchester-about 1893 (Sage et al. 1913)
Litchfield	Hampton-Eastford	
Simsbury	West Hartford	
Granby		
Sherman		
Sharon		

References:

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Buteo lineatus Red-shouldered Hawk

Status: I, Local; II, Vulnerable; III, Increasing; IV, Widespread (regular); V, Habitat-restricted (human)?

Breeding habitat: Throughout much of their range Red-shouldered Hawks prefer moist, well-drained forests, floodplain forests, and swamps. They tend to be more common in lowlands than in mountainous areas. Clearings, such as agricultural lands, are often in close proximity to nest sites (Bull 1974, Stewart 1949).

On the Maryland coastal plain nesting has been recorded in extensive floodplain forests with adjacent clearings. The floodplain forests are vegetated by such tree species as Pin Oak (Quercus palustris), Red Maple (Acer rubrum), Yellow Poplar (Liriodendron tulipifera), American Beech (Fagus grandifolia), Sweetgum (Liquidambar styraciflua), River Birch (Betula nigra), and Hornbeam (Carpinus caroliniana). The hawks are largely absent from nearby upland Virginia (Pinus virginiana) and Pitch Pine (P. rigida) forests, however (Stewart 1949).

In southeastern Massachusetts Red-shouldered Hawks have nested in mixed hardwood forests of American Chestnut (Castanea dentata, formerly a forest constituent), Red Oak (Q. borealis), White Oak (Q. alba), Scarlet Oak (Q. coccinea), Swamp White Oak (Q. bicolor), maple, and White Pine (P. strobus). In northern portions of the state White Pine forests have been used (Bent 1937). New York nests are often found in swamps, forested river bottoms, and dense woodlots near farmlands and towns (Bull 1974). In Connecticut, recent nestings have been largely associated with river bottoms, swamps, and upland forests near marshes or Beaver (Castor canadensis) ponds (Mersereau and Hopkins pers. comm.). On upland sites both oak-hickory (Carya spp.) and White Pine-hardwood-Hemlock (Tsuga canadensis) forests have been used.

Breeding range: Northern California to Baja California; eastern Nebraska and southern Quebec to Mexico and south Florida. The subspecies lineatus occurs in Connecticut (AOU 1957).

Notes: Red-shouldered Hawks, formerly very common woodland hawks, have dramatically declined in large portions of their range in recent years (Bull 1974, Hickey 1969). Brown (1971) demonstrated that from 1950 to 1969 Christmas bird count reports of these birds dropped by 75 to 94 percent in much of the northeast and midwest. Reasons why this decline has taken place are difficult to assess, although some evidence exists that contamination of the environment with persistent pesticides may be at least partly responsible. These chemicals, which the birds ingest with their food, (small mammals, birds, reptiles, amphibians, and various invertebrates; Bent 1937), have been implicated in causing reproductive failures in a number of species of raptorial birds (Hickey 1969).

Within the past few years, a reversal in the downward trend in population numbers has been noted, and the Red-shouldered Hawk is again becoming common in some areas (Arbib 1975). This may be the result of dropping levels of pesticide residues in the environment, although it has also been

suggested that recent increases in Beaver activity may be resulting in more suitable nesting areas being created (Mersereau and Hopkins pers. comm.).

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Old Lyme	Litchfield-Morris	Norwich-1884 (Sage et al. 1913)
Chaplin	Canton	New London-1899 (Sage et al. 1913)
Hartland	Granby	Portland-1888-1917;many (Univ. Conn. Mus.)
	Barkhamsted	Wethersfield-1891-1899; many, (Univ.Conn.Mus.)
	Sharon	Orange-1894-1895 (Univ. Conn. Mus.)
	Lyme	Hartford-1892-1899;many (Univ. Conn. Mus.)
	Bloomfield	Hamden-1894 (Univ. Conn. Mus.)
	Simsbury	W. Hartford-1898 (Univ. Conn. Mus.)
	Somers	Newington-1899, 1900 (Univ. Conn. Mus.)
	Mansfield	
	Guilford	
	Union	
	Voluntown	
	Greenwich	

References:

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Arbib, R. 1976. The blue list for 1977. Amer. Birds 30:1037-1039.

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Haliaeetus leucocephalus Bald Eagle

Status:

H. l. leucocephalus (Southern Bald Eagle) I, Rare: II, U. S. endangered; III, Approaching extinction; IV, Widespread (rare); V, Habitat-restricted (human)

H. l. alascanus (Northern Bald Eagle) I, Rare and local; II, U. S. endangered; III, Approaching extinction; IV, Widespread (regular); V, Habitat-restricted (human)

Habitat:

Breeding: A variety of sites are used in the northeast, including remote, heavily forested mountainous areas, extensive open country (such as agricultural areas) where scattered tall trees occur, extensive coastal plain forests, and coastal areas near estuaries. Eagle breeding areas are usually characterized by the presence of an elevated nest site (often a large tree) and proximity of the nest site to a large body of water such as a river, lake, or estuary (Bull 1964 and 1974, Stone 1937).

In New Jersey, nesting has taken place in large Red Maple (Acer rubrum) swamps, Pitch Pine (Pinus rigida) forests, along estuaries, and in mountainous, heavily forested areas near large rivers and lakes (Bull 1964, Stone 1937). Deleware nests have been found near Deleware Bay where broad expanses of marsh occur and dead trees line the bordering upland (Stone 1937). New York nest sites include islands off eastern Long Island, mountain forests near rivers and lakes, and extensive, open agricultural land with scattered trees. Nesting in Connecticut has also taken place in mountainous forested country near large lakes.

Feeding habitat consists of the watercourses mentioned previously: lakes, rivers, and estuarine areas. In these areas Bald Eagles find their major prey-fish. Shallow bodies of water provide the most productive feeding areas (Bull 1974, Spofford 1962).

Migration and winter: Wintering sites include lakes, rivers, and estuarine areas. Migrants often follow mountain ridges (Bull 1974). In Connecticut, Bald Eagles are regularly seen migrating along the trap rock ridges of the central portion of the state. Wintering birds occur along some of the state's largest lakes, and especially along the coast near large estuaries, such as the lower Connecticut River.

Range:

Breeding: Throughout most of North America but very local. Also in northeastern Siberia. The Southern Bald Eagle breeds north to Virginia (AOU 1957).

Migration and winter: Winters throughout all but the northern extremes of its breeding range. The Southern Bald Eagle wanders to the northern U.S. border after the breeding season (AOU 1957).

Notes: Until about 80 years ago Bald Eagle populations had been declining slowly for many years. This has been attributed to habitat destruction from urbanization and direct human persecution (in the forms of shooting, egging, and deliberate cutting of nest trees; Sprunt 1969, Stone 1937). A more rapid decline was noted in much of its eastern range starting about 30 years ago, however, and contamination of the environment with persistent pesticides and industrial wastes seems to have been at least partly responsible. These chemicals, which the eagles accumulate through their diet of fish, can severely interfere with reproductive success. (Hickey and Roelle 1969, Sprunt 1969).

In Connecticut, Bald Eagles have been essentially extirpated as a breeding bird for many years (see also Sage et al. 1913). However, suitable nesting habitat still exists in parts of the state, particularly at such sites as the large, undisturbed tracts surrounding Barkhamsted and Colebrook Reservoir and the lower Connecticut River. If levels of toxic environmental pollutants diminish in the east and these habitats are protected from development, Bald Eagles may again colonize the state.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Barkhamsted	Colebrook	Winchester-1896 (Sage et al. 1913)
Southbury		Hamden-no date, no details (Merriam 1877)
		East Haven-no date (Merriam 1877)
		Derby area-no date (Merriam 1877)
		near Kent-as late as 1933 (Kuerzi and Kuerzi 1934
		Stratford-Milford area, no date, no details. (Merriam 1877)

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Circus cyaneus Marsh Hawk

Status: I, Rare and local; II, State endangered; III, Approaching extinction; IV, Widespread (regular); V, Habitat-restricted (human)

Breeding habitat: The Marsh Hawk is almost exclusively a bird of open country. In the northeast nesting occurs in large marshes, bogs, shrub swamps, and grassy meadows. Farther west grasslands are used more commonly. Nests are placed on the ground in either dry or wet situations (Bent 1937, Bull 1974).

In eastern Massachusetts nests have been found in Sphagnum bogs vegetated by low huckleberries (Gaylussacia spp.), small Larches (Larix laricina), Speckled Alders (Alnus rugosa), and Swamp Honeysuckles (Lonicera oblongifolia). In addition, shrub swamps densely overgrown with alders, Swamp Azaleas (Rhododendron viscosum) huckleberries, and other shrubs, in which the central portion consists of low, scattered bushes and herbaceous vegetation, have been used as breeding sites. Nests have also been discovered in cut-over woodlands near meadows or marshes (Bent 1937).

In New Jersey breeding has occurred in salt and freshwater marshes. Patches of High Tide Bush (Iva frutescens) or Reed (Phragmites communis) are chosen for nest placement in salt marshes (Bent 1937, Bull 1964), and freshwater marshes used are vegetated by such plants as Cattails (Typha latifolia), sedges (Carex spp.), shrubs, and Wild Rice (Zizania aquatica, see Jervis 1969 for a description of Troy Meadows, one place Bull 1964 mentions as a breeding site).

New York nesting sites are characteristically Cattail marshes, although meadowlands, open glades in spruce (Picea spp.) bogs, and openings among scrub oaks (Quercus spp.) on the coastal plain have also been used (Bull 1974). In Wisconsin, sedge-willow (Salix spp.) swales and upland grasslands have been used for nesting (Hamerstrom 1969). Connecticut breeding has occurred in salt marshes (Hickey 1969) and probably also in brackish and freshwater Cattail (T. angustifolia, T. latifolia) marshes.

Feeding habitat consists of marshes and open sites. Marsh Hawks prey upon rodents and small birds in these areas (Bent 1937).

Breeding range: Much of the northern hemisphere. In eastern North America the subspecies hudsonius breeds south to Virginia (AOU 1957).

Notes: Marsh Hawks have recently been undergoing a serious decline in parts of their range (Arbib 1975, Bull 1974, Hamerstrom 1969), including Connecticut. Although formerly a fairly common breeder in the state, (Sage et al. 1913), they have now nearly disappeared. Strong evidence suggests that the decline is largely a result of contamination of the environment with persistent pesticides. These chemicals, which the hawks ingest with their food (particularly small birds), have been implicated in causing reproductive failures in a number of raptorial bird species (Hamerstrom 1969, Hickey 1969). In addition to pesticide poisoning, destruction of nesting habitat has undoubtedly also affected Marsh Hawks.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
	Old Lyme	Warren-1900 (Sage et al. 1913)
	Portland	East Hampton-1896 (Univ. Conn. Mus.)
	Guilford	Eastford (area)-1893 (Jones 1931)
	Lyme	

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Pandion haliaetus Osprey

Status: I, Rare and local; II, State threatened; III, Long-term decline; IV, Widespread (regular); V, Habitat-restricted (human)

Breeding habitat: Seacoasts and estuaries; more rarely inland along rivers and lakes. Nests are usually placed on dead trees, telephone poles, or similar structures, although they are also built on sand dunes, fallen logs, ground debris, and salt meadow grasses (Spartina patens; Bull 1964, Ames and Mersereau 1964).

Coastal feeding habitat consists of marsh creeks and large areas of shallow water. Both of these can often be found in bays or estuaries. Such areas support numerous fish-the Osprey's main prey. Low water turbidity also appears to be an important requirement of the feeding habitat. In areas of high turbidity, such as the waters of western Connecticut, prey apparently cannot be located and caught easily (Spitzer pers. comm.).

Breeding range: Along seacoasts, rivers, and lakes throughout much of the world. The subspecies carolinensis breeds in North America (AOU 1957).

Notes: Formerly, the Osprey was locally abundant along the Connecticut coast, with most birds nesting from the Connecticut River to Stonington. In the 1940's, however, population levels (then about 200 pairs) began to drop precipitously. As of 1976 only nine nesting pairs remained. Contamination of the marine environment with toxic chemicals, particularly persistent pesticides and PCB's, appears to have been largely responsible for this drastic decline. Ospreys come in contact with these chemicals through their diet of fish. The chemicals may affect the birds by interfering with their reproductive ability or by directly poisoning them (Ames and Mersereau 1964, Wiemeyer et al. 1975).

In addition to environmental pollution, heavy commercial fishing in the feeding grounds of Ospreys may limit prey availability. In areas off eastern Long Island where this has occurred, there is evidence that adult Ospreys experience difficulty in providing food for their young (Spitzer pers. comm.).

In areas where Osprey populations are still fairly stable, such as in Chesapeake Bay, experiments have demonstrated that the placement of artificial nesting platforms increases nesting success. Such platforms protect the birds from having ground nests innundated by storm tides. Ospreys readily accept the platforms over ground nest sites (Rhodes 1972). Ames and Mersereau (1964) also point out that nest platforms minimize predation and human disturbance.

Connecticut nesting:

1976 records:	Records prior to 1976:
East Lyme	Litchfield County-no date, no details (Sage et al. 1913)
Waterford	Guilford-1942 (Mackenzie 1961)
Groton	Lyme-1950's-60's, no details (Ames and Mersereau 1964)
Stonington	Old Saybrook-1950's-60's, no details (Ames and Mersereau 1964)
Old Lyme	Westbrook-1950's-60's, no details (Ames and Mersereau 1964)
	near New Haven-no date (Merriam 1877)
	Thames River-no date nesting about 12 mi. up river, no details (Sage et al. 1913)
	Hartford-1892 (Univ. Conn. Mus.)
	Union-about 1958 (Proctor pers. comm.)

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Falco peregrinus Peregrine Falcon

Status: F. p. anatum (American Peregrine Falcon) I, Rare; II, U. S. endangered; III, Approaching extinction; IV, Widespread (rare); V, Habitat-restricted (natural and human)

F. p. tundrius (Tundra Peregrine Falcon) I, Rare; II, U. S. endangered; III, Approaching extinction; IV, Widespread (rare); V, Habitat-restricted (human)

Habitat:

Breeding: In the northeast Peregrines typically nest on high, sheer cliffs, particularly cliffs near rivers or other bodies of water. Limestone cliffs are probably ideal because natural rest cavities occur in the rock. Cliffs of other geologic materials such as basalt (all Connecticut nestings have occurred on basalt cliffs), are also suitable. In recent years, city skyscrapers have provided artificial "cliffs" for nest sites. Nests, consisting merely of scrapes in the soil or vegetation mat, are placed on ledges or in rock cavities (Hickey 1942, Hickey and Anderson 1969).

Feeding habitat consists primarily of open areas surrounding the cliff nest sites. Rivers and similar breaks in the forest vegetation are used, while large, unbroken stretches of forest are generally avoided. Birds are preyed upon for the most part. At city nest sites the readily available supply of pigeon prey makes the urban environment a suitable feeding area (Herbert and Herbert 1965, Hickey and Anderson 1969).

Migration and Winter: Migrating birds tend to concentrate along the coast (Ward and Berry 1972). In the east, wintering sites are similar to breeding sites, and cliffs or man-made structures are used for roosting (Herbert and Herbert 1965).

Range:

Breeding: The subspecies anatum formerly occurred very locally throughout most of North America. In the U.S. it is now apparently extinct as a breeding bird east of the Mississippi River. Other subspecies of the Peregrine occur throughout many parts of the world (Berger et al. 1969, Hickey and Anderson 1969).

Migration and Winter: Most Peregrines migrating through the northeast are tundra-nesting birds, believed by some to belong to the separate subspecies tundrius (Bull 1974). F. p. anatum winters from the northern U.S. border to the Gulf of Mexico (Hickey and Anderson 1969).

Notes: Peregrine Falcons began declining drastically in numbers in the late 1940's and are now extinct over large portions of the U. S. They have not bred in Connecticut since 1940. Contamination of the environment with toxic chemicals, such as persistent pesticides, appears to be largely responsible for this decline. These chemicals, which the birds ingest with their food, have been implicated in causing reproductive failures (Hickey and Roelle 1969). Human disturbance of nest sites is probably also involved to some extent, however (Herbert and Herbert 1965). In particular, egg collecting, shooting, recreational activities (including hiking and picnicing near nests), and capturing nestlings for falconry have all adversely affected nesting success.

Although Peregrines are now extirpated from Connecticut, potential nesting habitats still exist. The high, sheer cliffs of several of the basalt ridges of central Connecticut seem to provide favorable sites. Perhaps some of the skyscrapers in Hartford or New Haven would even be suitable. The Travelers Tower in Hartford, for example, was a favorite winter roost of Peregrines for many years (Mersereau pers. comm.), and it could possibly also support a nest. If levels of environmental contaminants decline in the future, perhaps Peregrines will recolonize the state, or perhaps captive-reared birds could be released into appropriate habitats. Captive breeding experiments aimed at reintroduction are currently underway at Cornell University (Peregrine Fund Newsletter 1976).

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records: (Sage et al. 1913, Hartford Audubon Soc. pers. comm.)
		Meriden-1919-1940
		Avon-1861-1934
		Hamden-1888-1914
		Berlin-1931, 1935

Migration and Winter: Potentially present anywhere in the state during migration, but most often seen along the coast (Hopkins and Mersereau 1976). Wintering birds are also potentially present anywhere.

References:

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Herbert, R. A., and K. G. S. Herbert. 1965. Behavior of Peregrine Falcons in the New York City region. Auk 82:62-94.

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Coturnicops noveboracensis Yellow Rail

Status: I, Rare; II, State threatened?; III, Long-term decline?; IV, Widespread (rare); V, Habitat-restricted (natural and human?)

Habitat:

Breeding: "Drier parts of freshwater marshes of grass and sedge; damp hayfields" (Harrison 1975). In these habitats the Yellow Rail feeds upon various small invertebrates, including snails (Bent 1926).

Migration: Areas similar to its breeding habitat are used. In the New York City area, it has been found "at the extreme upland edge of salt marshes, away from tide water" (Bull 1964). Birds have been discovered during migration in Connecticut in freshwater tidal marshes vegetated by River Bulrush (Scirpus fluviatilis) and Wild Rice (Zizania aquatica). Fall migrants in Massachusetts have occurred in wet meadows with grass about 20 cm. tall (Bent 1926).

Range:

Breeding: Not well known. Primarily southern Canada from eastern Alberta to New Brunswick; also south (rarely) to northeastern Ohio (Bull 1974).

Migration and winter: Eastern birds winter chiefly in the Gulf states (Bull 1974). In Connecticut, the Yellow Rail is a migrant species occurring most regularly in the fall (September to November) although spring migrants (March) have also been recorded (Sage et al. 1913). It has occurred on Long Island four times in winter (Bull 1974), and therefore should also occur in Connecticut at this season, although very rarely.

Notes: This extremely secretive species appears to be rare throughout its range. Because of its extreme elusiveness, the Yellow Rail's present migratory status and distribution in Connecticut are almost unknown. It does appear, however, that it is even less common in the state today than it was in former years. Sage et al. (1913) list a number of records for it, while very few sightings have been made in recent years.

A supposed breeding record for the Yellow Rail in Middletown is undoubtedly incorrect, as Sage et al. (1913) and Bull (1964) point out.

Connecticut records since 1950:

Confirmed:	Suspected:	Old records:
Lyme	Ashford	Middletown-Cromwell-1894 (Sage et al. 1913); 1911, 1912 (Univ. Conn. Mus.)
Madison		Milford-no date (Merriam 1877)
		Stratford-no date (Merriam 1877)
		New Milford-1888 (Sage et al. 1913)
		New Haven-North Haven-Hamden-1894-1908 (Sage et al. 1913)
		South Windsor-1920-1936 (Bagg and Eliot 1937)
		New Haven-no date (Merriam 1877)

References:

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Harrison, H. 1975. A field guide to bird's nests. Houghton Mifflin Co., Boston. 257p.

Merriam, C. H. 1877. A review of the birds of Connecticut. Tuttle, Morehouse, and Taylor, New Haven. 165p.

Sage, J. H., L. B. Bishop, and W. P. Bliss. 1913. The birds of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 20.

Laterallus jamaicensis Black Rail

Status: I, Rare and local?; II, State threatened?; III, Long-term decline?; IV, Widespread (regular); V, Peripheral

Breeding habitat: Along the Atlantic coast Black Rails breed primarily in salt and brackish marshes, although in other parts of their range (Florida, Central U.S.) they breed in freshwater marshes. Their greatest breeding density is reached in coastal salt marshes, however, particularly those in New Jersey and Maryland (Bull 1964). In these habitats they feed upon seeds and various small invertebrates (Bent 1926).

In Connecticut, Black Rails have been discovered breeding in drier portions of salt marshes vegetated by Salt Meadow Grass (Spartina patens, Clark 1884). On southern Long Island, birds have been found to make use of wetter marshes vegetated by Salt Marsh Grass (Spartina alterniflora) and also stands of Reed (Phragmites communis), although their activities tended to center around patches of Salt Meadow Grass (Post and Enders 1969).

Breeding range: The race jamaicensis breeds along the Atlantic coast from Connecticut to the Carribean, inland in Florida, and from Kansas to Ohio. Other races occur along the Pacific coast from southern California to Baja California, and along the coasts of Peru and Chile (AOU 1957).

Notes: Black Rails have not been recorded as nesting in Connecticut since 1884, when they bred at Great Island near the mouth of the Connecticut River (Clark 1884). They do summer at Oak Beach, Long Island, however, (Buckley et al. 1975), and have been sighted in Connecticut recently (Davis and Buckley 1974). It is probable that nesting occurs in the state fairly regularly, but goes unrecorded because of the elusiveness of this species.

Recent observations at Oak Beach, Long Island indicate that eastern Black Rail populations may have suffered as a result of salt marsh ditching for mosquito control. Oak Beach, a recently formed marsh, is unique among Long Island marshes in that it has never been ditched. It has been suggested that unditched marshes possess a better food supply and thus are more attractive to the rails (Post and Enders 1969, see also Cottam and Bourn 1952). It is interesting that Black Rails are now apparently absent from the salt marshes of Connecticut River, all of which were ditched in the early twentieth century.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
	Milford	Old Lyme-1884 (Clark 1884)
	Stonington	Old Saybrook-1876 (Clark 1884)
		Guilford-1945, 1947, seen; no breeding proven (Mackenzie 1961)
		Essex-1904, 1 collected; no breeding proven (Sage et al. 1913)

References:

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Bent, A. C. 1926. Life histories of North American marsh birds. U. S. Nat. Mus. Bull. 135.

Bull, J. 1964. Birds of the New York area. Harper and Row, New York. 540p.

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Cottam, C., and W. S. Bourn. 1952. Coastal marshes adversely affected by drainage and drought. Trans. No. Amer. Wildl. Conf. 17:414-420.

Davis, T. H., and P. A. Buckley. 1973. Hudson-St. Lawrence region. Amer. Birds 28:28-33.

Mackenzie, L. 1961. The birds of Guilford, Connecticut. Peabody Museum of Natural History, New Haven. 110p.

Post, W., and F. Enders. 1969. Reappearance of the Black Rail on Long Island. Kingbird 19:189-191.

Sage, J. H., L. B. Bishop, and W. P. Bliss. 1913. The birds of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 20.

Charadrius melodus Piping Plover

Status: I, Rare and local; II, State threatened; III, Long-term decline; IV, Widespread (regular); V, Habitat-restricted (natural and human)

Breeding habitat: On the east coast nesting generally occurs on sandy beaches where little or no vegetation exists. The dry, upper portions of the beach between the high tide line and the primary dunes are used, as are storm-damaged sections of dunes where the vegetation has been stripped away. Bare, sandy patches as small as 65 to 100 m. long are suitable, although more extensive areas are preferred. Maximum nesting density is roughly one pair per 30 m. of beach front (Wilcox 1959).

In Connecticut current nesting sites include sandspits, mainland beaches, and beaches of offshore islands. Both fine sand and coarser pebbles seem suitable as a nesting substrate.

On Atlantic beaches feeding habitat consists of tidal sandflats and the beach itself. Mudflats are rarely used (Stone 1937). In Connecticut, mudflats are used in some localities, notably Bluff Point, as are intertidal areas covered with small stones (cobbles). In these habitats the Piping Plover feeds upon various small marine invertebrates (Bent 1929).

Breeding range: The subspecies melodus breeds along the Atlantic coast from southern Canada to Virginia. An inland race, circumcinctus, occurs along lakes and major rivers of the eastern and midwestern U.S. and southern Canada (AOU 1957).

Notes: Extensive development of coastal beaches for recreational and residential uses has severely limited the amount of breeding habitat available for the Piping Plover (Bull 1964, Arbib 1976). This is particularly true in Connecticut, where apparently less than 20 nesting pairs remain.

Because it nests in exposed situations, this bird is particularly susceptible to human disturbance. People and pets in the vicinity of nests can disrupt breeding, and "dune buggy" traffic is prone toward running over hatchling plovers, who use dune buggy tracks as hiding places (Anderson pers. comm.). Regulations that would close off nesting areas during the breeding season (late April to mid-July, Bull 1964) are advisable, as is fencing off these areas to keep out dogs.

Nesting sites for the Piping Plover may be created with sandy dredge spoils. Dredge islands constructed in close proximity to good feeding habitat can provide a suitable nesting substrate and isolation from human disturbance and natural predators.

Connecticut nesting since 1950:

Confirmed:	Suspected:	Old records:
Stratford	Clinton	Old Saybrook-
Westport	Groton	no dates,
Westbrook	Waterford	no details;
Norwalk	Old Lyme	(Merriam 1877)
Guilford		
West Haven		
Milford		

References:

A.O.U. Checklist Committee. 1957. Checklist of North American birds. 5th ed. Amer. Ornith. Union. 691p.

Arbib, R. 1976. The blue list for 1976. Amer. Birds 29:1067-1072.

Bent, A. C. 1929. Life histories of North American shorebirds. Part 2. U. S. Nat. Mus. Bull. 146.

Bull, J. 1964. Birds of the New York area. Harper and Row, New York. 540p.

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Stone, W. 1937. Bird studies at Old Cape May. Vol. 1. Delaware Valley Ornith. Club. 484p. (republished by Dover Publications Inc., New York).

Wilcox, L. 1959. A twenty-year banding study of the Piping Plover. Auk 76: 129-152.

This NOTE pertains to the Common Snipe, page 60.

NOTE: Peripheral species such as the Common Snipe may be common in Connecticut during migration but are rare as breeders because they are at the limit of their geographical breeding range.

Game species listed as "vulnerable" are monitored by the Federal Government and are not subject to over-exploitation by hunting as might be implied by the description of the classification.

Capella gallinago Common Snipe

Status: 1, Rare and local?; 11, Vulnerable; 111, Stable?; IV, Widespread (regular); V, Peripheral

Breeding habitat: Wet meadows, marshes, and open bogs; the nest is often placed in grass or tussocks of sedge (Carex spp., Bull 1974). In Quebec nests have been found at the edge of marshes on dry, grassy ground beneath Bayberry (Myrica pennsylvanica) bushes and on wet marshy ground with low brush and grassy tussocks. In Pennsylvania nesting has been recorded in marshes vegetated by cattails (Typha spp.), grasses, and ferns (Bent 1927). Although not recorded as definitely nesting in Connecticut in recent years, summering birds have been discovered in a slightly brackish, grassy marsh and in tussocky marsh through which a small stream heavily overgrown with smartweeds (Polygonum spp.) flows.

The Common Snipe feeds primarily on earthworms, insects, and various invertebrates. Seeds of marsh plants are also easten (Bent 1927).

Breeding range: Throughout much of the northern hemisphere. In eastern North America the subspecies delicata breeds from central Labrador to northern New Jersey (AOU 1957).

Notes: The Common Snipe has apparently always been an extremely rare breeder in Connecticut. Sage et al. (1913) lists only one nesting locality for it. Although no confirmed nesting has been recorded in many years, it most probably breeds in several marshy spots around the state. Like most of our marsh-nesting species, nests are placed in areas that are difficult to explore and therefore few people attempt to find them.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Glastonbury	Wethersfield	Portland-1874 (Sage et al. 1913)
Marlborough	Litchfield-Morris	
Old Lyme	Portland	

References:

A.O.U. Checklist Committee. 1957. Checklist of North American birds. 5th ed. Amer. Ornith. Union. 691p.

Bull, J. 1974. Birds of New York State. Doubleday, Garden City. 655p.

Bent, A. C. 1927. Life histories of North American marsh birds. Part 1. U. S. Nat. Mus. Bull. 142.

Sage, J. H., L. B. Bishop, and W. P. Bliss. 1913. The birds of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 20.

NOTE: Refer back to page 59.

Bartramia longicauda Upland Sandpiper

Status: I, Rare and local; II, State endangered; III, Approaching extinction; IV, Widespread (regular); V, Habitat-restricted (natural and human)

Breeding habitat: The Upland Sandpiper, an insect and seed-eating species (Bent 1929), inhabits natural grasslands and to a lesser extent croplands, hayfields, and pastures. In North Dakota prime nesting habitat consists of areas with moderately tall grass (15.6-30.8 cm.) and moderately dense cover. Natural mixed-species prairies best fulfill these requirements, particularly those managed by burning at three-year intervals. Nesting density on grazed prairies is less than on ungrazed sites, however, and it is still less on land tilled annually for crops. In addition, few pairs find seeded grass-legume fields suitable, as such sites generally have vegetation that is too tall and dense (Higgins 1975, Kirsh and Higgins 1976).

In Wisconsin, Wiens (1969) found Upland Sandpipers nesting in pasturelands vegetated by such grasses as Timothy (Phleum pratense) and Kentucky Bluegrass (Poa pratensis), and various forbs, including fleabane (Erigeron spp.), clover (Trifolium spp.), Dandelion (Taraxacum officinale), thistle (Cirsium spp.), Milkweed (Asclepias syriaca), and Sweet Clover (Melilotus officinalis). In the northeast hayfields, pastures, drier parts of marshes, and unmowed areas on airport fields provide suitable breeding sites. Formerly, Upland Sandpipers also bred on the Hempstead Plains, a natural Little Bluestem (Andropogon scoparius) prairie that occurred on Long Island. This area has since been destroyed by urbanization (Bull 1964).

Breeding range: Alaska, northwestern Canada, the northern midwest, and the eastern U.S. On the east coast it breeds locally from Maine to Virginia (AOU 1957).

Notes: The Upland Sandpiper is declining throughout much of its range, largely because of habitat loss. In the northeast urbanization and the decline of agriculture have been largely responsible for this loss of habitat (Arbib 1975, Bull 1964). In the nineteenth century it was a common breeder in Connecticut (Sage et al. 1913), but it now occurs in only a few localities in the Connecticut River Valley, and even these are rapidly becoming unsuitable.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Suffield	Hartford	Newington-1941, suspected nesting (Yale Univ.)
Glastonbury	Windsor Locks	
	South Windsor	
?Rocky Hill-date unknown	Bloomfield	Winchester-1879 (Sage et al. 1913)
?Farmington- " " "		Litchfield-1904 (Sage et al. 1913)
?Salem- " " "		Torrington-1902 suspected
?West Hartford-" "		

nesting
(Sage et al. 1913)
Stamford-1897
(Bull 1964)

References:

A.O.U. Checklist Committee. 1957. Checklist of North American birds. 5th. ed. Amer. Ornith. Union. 691p.

Arbib, R. 1975. The blue list for 1976. Amer. Birds 29:1067-1072.

Bull, J. 1964. Birds of the New York area. Harper and Row, New York, 540p.

Higgins, K. F. 1975. Shorebird and game bird nests in North Dakota croplands. Wildl. Soc. Bull. 3:176-179.

Kirsh, L. M., and K. F. Higgins. 1976. Upland Sandpiper nesting and management in North Dakota. Wildl. Soc. Bull. 4:16-20.

Sage, J. H., L. B. Bishop, and W. P. Bliss. 1913. The birds of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 20.

Catoptrophorus semipalmatus Willet

Status: I, Rare and local; II, Vulnerable; III, Increasing?; IV, Widespread (regular); V, Exploited

Breeding habitat: Along the east coast the Willet is primarily a bird of salt marshes, tidal flats, and beaches. Nests are placed in marshes, at marsh edges, and on beaches. Upland sites are used rarely (primarily Nova Scotia), as are marshes other than salt marshes (brackish estuarine marshes are used on rare occasions). Ground higher than mean high tide is chosen for nest placement (Bent 1927, Tompkins 1965).

On Long Island, New York nests have been found among tufts of Dune Grass (Ammophila breviligulata) in a salt marsh island adjacent to a barrier beach (Davis 1968). In New Jersey they have been found in salt marshes (Stone 1937). Birds in Nova Scotia often nest in upland pastures near the shore. South Carolina birds have been recorded as nesting on salt marshes, beaches vegetated by Dune Grass and scattered myrtle (Myrica sp.) bushes, and on open, sandy beaches (Bent 1927). In Connecticut suspected breeders inhabit an extensive salt meadow (primarily Spartina patens) and tidal flat area that is fronted by a sand spit.

Feeding habitat consists primarily of tidal flats, salt marshes and, on occasion, beaches. In these areas they prey upon small crabs (Uca spp., Sesarma spp.) and other crustaceans (Tompkins 1965).

Breeding range: Eastern Oregon to southern Manitoba, south to northeastern California and eastern South Dakota. Also locally from southern Nova Scotia to Florida, the Gulf coast, and the Carribean. The subspecies semipalmatus occurs along the east coast (AOU 1957).

Notes: In the nineteenth century the Willet disappeared from much of its northeastern range, primarily because of overhunting and egg collecting (Bent 1927). In recent years it has begun to recolonize the northeast, and it now breeds commonly in southern New Jersey. It has also reappeared on Long Island in a few localities (Bull 1974), and it is believed to be breeding (nest not yet located) in Connecticut. Further north, nesting has recently been confirmed in Maine and Massachusetts (Finch 1975).

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
	Clinton-Madison	Stratford-no date, no details (Sage et al. 1913) Madison-1873 (Merriam 1877)

References:

A.O.U. Checklist Committee. 1957. Checklist of North American birds. 5th. ed. Amer. Ornith. Union. 691p.

Bent, A. C. 1927. Life histories of North American shorebirds. Part 2. U. S. Nat. Mus. Bull. 146.

Bull, J. 1974. Birds of New York State. Doubleday, Garden City. 655p.

Davis, T. H. 1968. Willet nesting on Long Island, New York. Wilson Bull. 80:330.

Finch, D. 1976. Northeastern maritime region. Amer. Birds 30:926-930.

Merriam, C. H. 1877. A review of the birds of Connecticut. Tuttle, Morehouse, and Taylor, New Haven. 165p.

Sage, J. H., L. B. Bishop, and W. P. Bliss. 1913. The birds of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 20.

Stone, W. 1937. Bird studies at Old Cape May. Vol. 1. Del. Valley Ornith. Club. 484p. (republished by Dover Publ. Inc., New York)

Tompkins, T. R. 1965. The Willets of Georgia and South Carolina. Wilson Bull. 77:151-167.

Sterna dougallii Roseate Tern

Status: I, Rare and local; II, State threatened; III, Long-term decline; IV, Widespread (regular); V, Habitat-restricted (natural and human)

Breeding habitat: Sandy or rocky coastal areas, including mainland beaches, island beaches, and rocky islands. Unlike other locally breeding terns, the Roseate Tern will nest in densely vegetated areas, including stands of Dune Grass (Ammophila breviligulata), Poison Ivy (Rhus radicans), and other low-growing coastal species (Bent 1921). It will also nest on rocks or in rock crevices, on exposed bedrock islands, and on islands of glacial till (Cooper et al. 1970, Duffy pers. comm.). More open, sandy beaches are also used on occasion. This species usually nests colonially, often in association with the Common Tern (S. hirudo) in the northeast (Cooper et al. 1970).

Feeding habitat consists of tide rips near shoals, tidal marsh creeks, tidal pools, salt ponds, and shallow water areas. Small fish often congregate or can be easily caught in these localities.

Breeding range: Primarily an old world species. In eastern North America the subspecies dougallii occurs very locally along the coast from Nova Scotia to Virginia. It also occurs in the Carribean. It reaches its greatest abundance in southern New England and Long Island (Bull 1964).

Notes: The Roseate Tern is a somewhat erratic breeder in our area (Bull 1964). It is subject to large annual population fluctuations due to a variety of factors, including storms and mammalian predation. The adverse impacts of man upon population levels outweigh the effects of such natural factors, however. While the effects of natural factors are often short-term, man's activities, including recreational and residential development, have permanently reduced the amount of available tern breeding habitat (Bull 1964).

In addition to recreational and residential development, other human activities have affected Roseate Terns in more subtle ways. Residues of persistent pesticides and industrial chemicals in the marine environment have been implicated in the production of birth defects in terns (Hays and Risebrough 1972). The terns come in contact with these chemicals through their diet of fish. Furthermore, the dramatic increase of Herring (Larus argentatus) and Great Black-backed (L. marinus) Gulls in recent years, which is apparently related to the increase of garbage dumps and sewage outfalls, has resulted in serious competitive pressure for nest sites between the gulls and terns. In some localities gulls have succeeded in evicting terns from nesting grounds (Bull 1964).

Considering that some of the major breeding areas of the Roseate Tern in the U.S. occur in southern New England and Long Island, it is imperative that the remaining colonies in Connecticut be vigorously protected from human disturbance. There are currently less than 100 breeding pairs in the state.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Guilford		Guilford-1941, 1600 pairs (Bull 1964)
Norwalk		
Stratford		
Waterford		
New London		
Branford		

References:

Bent, A. C. 1921. Life histories of North American gulls and terns. U.S. Nat. Mus. Bull. 113.

Bull, J. 1964. Birds of the New York area. Harper and Row, New York. 540p.

Cooper, D. H., H. Hays, and C. Pessino. 1970. Breeding of the Common and Roseate Terns on Great Gull Island. Proc. Linnaean Soc. New York 71:83-104.

Hays, H., and R. W. Risebrough. 1972. Pollutant concentrations in abnormal young terns from Long Island Sound. Auk 89:19-35.

Sterna albifrons Least Tern

Status: I, Rare and local; II, State threatened; III, Long-term decline; IV, Widespread (regular); V, Habitat-restricted (natural and human)

Breeding habitat: In the east, a sand or pebble substrate with little or no vegetation is required for nesting. Mainland beaches, island beaches, and even coastal sand flats built from the deposition of dredge spoils can provide suitable nest sites. On rare occasions gravel roofs have been used. Reproductive success tends to be low on these artificial sites, however (Fisk 1975).

On natural beaches, nests are usually placed on the upper beach above mean high tide but below the primary dunes. The nest consists of a shallow depression in the substrate and may be surrounded by pebbles and shells to help camouflage the eggs. In fact, the presence of many pebbles or shells on a beach may make it a more attractive nest site (Burt pers. comm.). Nesting often occurs colonially.

Tidal marsh creeks, tidal pools, salt ponds, tide rips near shoals, and shallow water areas provide excellent feeding grounds for Least Terns. Small fish congregate or can be easily caught in these localities. Connecticut's nesting colonies are generally located in close proximity to these types of feeding habitats.

Breeding range: Locally thrcughout much of the world. On the east coast of the U.S. the subspecies antillarum breeds from Massachusetts to Texas (AOU 1957).

Notes: The Least Tern has become severely habitat-limited throughout much of its range, largely because of extensive recreational and residential development of coastal beaches (Fisk 1975, Arbib 1976). Suitable nesting sites are already rare in Connecticut, and development of the remaining few could result in the extirpation of this species from the state. Less than 150 pairs, mostly within two colonies, nested in the state in 1976.

Because Least Terns nest in exposed situations, they are particularly vulnerable to human disturbance. People and pets in the vicinity of nests can disrupt breeding, and thus closing off nesting areas during the breeding season (early May to mid-July) is advisable, as is fencing the areas to keep out dogs. Such procedures have increased colony sizes markedly at some locations (Varza pers. comm.).

In addition to human disturbance natural phenomena, such as storm tides, can destroy many nests in breeding colonies. While this may depress the colony's annual production of young, many birds can successfully re-nest after such an occurrence (Varza pers. comm.). Such natural phenomena have essentially short term effects on population levels, however (Dasmann 1964), and would not be expected to result in the steady declines brought about by human disturbances.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Groton		
Clinton		
Old Lyme		
Milford		
Stratford		
Guilford		
Westport		
Westbrook		
Norwalk		

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Tyto alba Barn Owl

Status: I, Rare and local; II, State endangered; III, Approaching extinction; IV, Widespread (regular); V, Peripheral

Breeding habitat: This highly adaptive species nests in a variety of sites in the northeast, often in close association with man. Agricultural lands, suburbs, urban areas, river bottoms, and localities along the coast are all suitable. Nest sites include cavities or protected spots, such as tree or cliff holes, barns, old buildings, and church steeples (Bull 1964, Wallace 1948). Birds will even nest in offshore duck blinds and range lights in bays (Reese 1972). In Connecticut Barn Owls have nested in farmlands and cities.

Feeding habitat primarily consists of open country, including open fields, meadows, garbage dumps, and even urbanized areas (Bent 1938, Bull 1964). Over much of the northern U. S. suitable feeding grounds seem to exist wherever Meadow Voles (Microtus pennsylvanicus), a principal food source, are common (Wallace 1948).

Breeding range: Throughout much of the world, although absent from the colder regions. In eastern North America the subspecies pratincola generally breeds north to Massachusetts, although it has nested as far north as Quebec (AOU 1957, Godfrey 1966).

Notes: Early in this century the Barn Owl expanded its range into southern New England (Bull 1964). In more recent years, it has retreated south and it is now nearly absent as a breeder north of Long Island. These population fluctuations are probably due largely to climatic factors. The relatively sedentary Barn Owl is subject to heavy mortality during severe winters in the northern part of its range (Kieth 1964, Wallace 1948). Other factors, such as the decline of agriculture and regrowth of forests in New England, may have also contributed to its local decline by decreasing the amount of feeding habitat.

In Connecticut, the Barn Owl has been found breeding primarily in the Connecticut River Valley and along the coast. Several pairs still nest in these areas.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Windsor	Manchester	Westport-1944, no details (Yale Univ.)
North Haven	East Hartford	South Windsor-1942, no details (Yale Univ.); 1921-1935 (Bagg and Eliot 1937)
Rocky Hill	Glastonbury-Marlborough	Winchester-1892, 1893 (Sage et al. 1913)
New Haven		Cromwell-1920, no details (Bagg and Eliot 1937)
Eastford		
Colchester		
Portland		
Plainville		

References:

A.O.U. Checklist Committee. 1957. Checklist of North American birds. 5th ed. Amer. Ornith. Union. 691p.

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Sage, J. H., L. B. Bishop, and W. P. Bliss. 1913. The birds of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 20.

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Asio otus Long-eared Owl

Status: I, Rare and local?; II, State threatened?; III, Long-term decline?; IV, Widespread (regular); V, Habitat-restricted (natural and human)?

Breeding habitat: Dense conifer stands, wooded swamps, and open woods are used, particularly the former. Clearings, such as agricultural land and old fields, are often in close proximity to nest sites (Armstrong 1958, Bull 1964 and 1974).

In Michigan nests have been found in dense White Pine (Pinus strobus) stands that average 11 m. in height and are surrounded by old fields and orchards. Nesting has also been recorded in similar dense White Pines bordered by oak (Quercus spp.)-hickory (Carya spp.) forest, a thick growth of small trees, and cultivated clover (Trifolium spp.)-Alfalfa (Medicago sativa) fields (Armstrong 1958). In Montreal Black Spruce (Picea mariana) bogs and Northern White Cedar (Thuja occidentalis) swamps have been used for nesting. Massachusetts nesting areas include dense upland White Pine stands, swampy mixed forests composed mostly of White Pine, old fields with scattered large White Pines, deciduous upland forests with some White Pines, and old apple orchards (Bent 1938). In New York nests have been found in dense Hemlock (Tsuga canadensis)-White Pine stands, Pitch Pine (P. rigida) forests, and abandoned apple orchards (Bull 1964 and 1974). A Connecticut nest was discovered at a Hemlock stand (Manter 1975).

Old fields are heavily used by Long-eared Owls for feeding. In these areas cover is relatively sparse and Meadow Voles (Microtus pennsylvanicus), a principal prey species, can be readily caught. Marshes, although often containing a large population of Meadow Voles, have dense vegetative cover and are therefore less suitable as hunting grounds (Getz 1961). Woodlands are also used as feeding habitat (Armstrong 1958).

Breeding range: Through much of the northern hemisphere. In eastern North America the race wilsonianus breeds from Nova Scotia to Virginia (AOU 1957).

Notes: The Long-eared Owl appears to have declined in Connecticut since the early twentieth century. Merriam (1877) described it as "a common resident" in Connecticut, and Sage et al. (1913) listed five breeding localities for it, but no confirmed nesting sites are currently known. Its disappearance may be related to the decline of agriculture and subsequent regrowth of forest vegetation. This has probably reduced the amount of prime feeding habitat. A few pairs apparently still breed in Connecticut but, because of the extreme difficulty of locating their nests, this is difficult to prove.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Bethany	Litchfield-Morris	Berlin-no date (Merriam 1877)
	Fairfield	Ellington-1880 (Sage et al. 1913)
	Chaplin	Bristol-1881 (Sage et al. 1913)
		Woodbridge-1886 (Sage et al. 1913
		North Branford-1890 (Sage et al. 1913)
		Eastford-1898 (Manter 1975)

References:

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Asio flammeus Short-eared Owl

Status: I, Apparently absent; II, Probably extinct; III, Probably extinct; IV, Widespread (regular); V, Habitat restricted (human)

Breeding habitat: The Short-eared Owl is an inhabitant of open country. It will nest in either upland areas or marshes. In the latter it seeks drier portions to build its small ground nest, which would be inundated if built in wetter locations (Clark 1975).

In Manitoba, where the Short-eared Owl breeds commonly, breeding territories may include agricultural stubble fields, sedge (Carex spp.)-rush (Juncus spp.)-bulrush (Scirpus spp.) marshes, moist grasslands vegetated by Wild Barley (Hordeum jubatum) and Scratch Grass (Muhlenbergia asperifolia), drier meadows of Kentucky Bluegrass (Poa pratensis) and Quack Grass (Agropyron repens), very dry sites containing Western Snowberry (Symphoricarpos occidentalis) and Prickly Rose (Rosa acicularis), and permanently wet sites vegetated by willows (Salix spp., Clark 1975). New York nestings have occurred on sandy coastal areas sparsely vegetated with Dune Grass (Ammophila breviligulata), low, marshy tracts vegetated in part with Cattails (Typha latifolia), and uncultivated fields with Alfalfa (Medicago sativa) and Wheat (Triticum aestivum) stubble (Bull 1974). In New Jersey it has been recorded as nesting in salt marshes (Bull 1964).

The Short-eared Owl's nesting territory is also used for feeding. The size of the territory is largely dependant upon prey (small mammal) density, and it has been recorded as ranging from 17.8 to 137.2 ha (Clark 1975).

Breeding range: Throughout much of the world. In eastern North America the subspecies flammeus breeds from Newfoundland to Virginia (AOU 1957).

Notes: The Short-eared Owl has declined greatly in parts of its range (Arbib 1976, Bull 1964). In Connecticut Merriam (1877) described it as a "not uncommon" resident about salt marshes. However, Sage et al. (1913) listed only two nesting localities for it. It is now apparently extinct as a breeder in the state. The reasons for its decline are not completely clear, although urbanization, wetland destruction, environmental pollution, and the decline of agriculture are probably involved. In spite of this, adequate nesting habitats apparently do still exist, and it is highly possible that this species may recolonize Connecticut in the near future.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records: (Sage et al. 1913)
		South Windsor-no date
		Groton-1876, suspected nesting

References:

A.O.U. Checklist Committee. 1957. Checklist of North American birds. 5th ed. Amer. Ornith. Union. 691p.

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Caprimulgus carolinensis Chuck-will's Widow

Status: I, Indeterminate; II, Vulnerable; III, Increasing; V, Widespread (regular); V, Peripheral

Breeding habitat: Characteristically a bird of open, dry woodlands in much of its range. It inhabits farm woodlots, oak (Quercus spp.)-hickory (Carya spp.) groves, pine (Pinus spp.) groves, pine-oak woods, and old field margins. In these areas it feeds upon insects (Mengel 1965, Sprunt 1940).

In Maryland, Deleware, and Virginia, Chuck-will's Widows occur in the sandy coastal plain woodlands dominated by open stands of Loblolly Pine (P. taeda, Meanley 1975). In Connecticut they may nest on off-shore islands vegetated by open stands of oak, hickory, Black Cherry (Prunus serotina), and Sassafras (Sassafras albidum).

Breeding range: Eastern Kansas and southern New Jersey to central Texas and southern Florida. No subspecies are recognized (AOU 1957).

Notes: The Chuck-will's Widow, primarily a bird of the deep south, has been slowly extending its range northward for a number of years. In Kentucky the range extension has been coincident with the clearing of heavily forested land for agriculture (Mengel 1965), but the reasons for its increase in the northeast are less well understood. Although breeding has yet to be proven north of New Jersey, nesting will undoubtedly be detected on Long Island and southern Connecticut in the near future.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
	Norwalk	
	Branford	

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Melanerpes erythrocephalus Red-headed Woodpecker

Status: I, Rare and local; II, State endangered; III, Approaching extinction; IV, Widespread (regular); V, Habitat-restricted (natural and human)

Breeding habitat: The Red-headed Woodpecker, a species which feeds upon various types of insects, larvae, small fruits and nuts, is primarily a bird of open country. It inhabits woodlots with surrounding farmland, open woods, suburban areas, parks, open wooded wetlands, and prairie areas with scattered trees or fence posts. Nest cavities are constructed in live or dead trees, utility poles, or fence posts (Bent 1939, Bull 1974, Harrison 1975).

In New York Red-headed Woodpeckers occur in two distinct habitats: 1) "in river bottoms, Beaver (Castor canadensis) ponds, and open wooded swamps where dead trees and stumps are plentiful"; and 2) "in open savannah-like country with extensive grassland areas; also in cleared upland areas such as on golf courses, around farms, open groves in pastures, and along roadsides" (Bull 1974). Birds have also been found in logged over areas, old burned forests, and in "tracts of half-dead forest where the live trees are scattered and dead stubs are in abundance". Maryland birds have nested in open White Oak (Quercus alba) groves surrounded by short grasslands (Bent 1939). In Connecticut nests have recently been found in a Beaver swamp (Proctor pers. comm.).

Breeding range: Southern Saskatchewan and southern Quebec to northern New Mexico and Florida. The subspecies erythrocephalus breeds in Connecticut (AOU 1957).

Notes: In the early nineteenth century Red-headed Woodpeckers were a common resident in Connecticut. By the close of the century, however, they were a rare breeder (Sage et al. 1913), and they have not been common since. A similar decline in New York has been attributed to the automobile, which often hits the birds as they swoop across roads to catch insects. In addition, nesting competition from Starlings (Sturnus vulgaris) is thought to have been partly responsible (Bull 1974). As Connecticut's birds disappeared before either of these factors could have had any significant effects on their population levels, it is likely that other factors were responsible for their decline. Apparently the decline of agriculture in the state and the subsequent regrowth of forests was largely responsible, as Red-headed Woodpeckers do not find heavily forested areas to be suitable breeding habitat.

Connecticut breeding since 1950:

Confirmed:

Sharon
Pomfret

Suspected:

Litchfield-Morris
New Milford
Farmington
Enfield

Old records:

South Windsor-before 1853 (Sage et al. 1913); about 1842, more numerous than the Flicker (Merriam 1877)
Portland-1882 (Sage et al. 1913)
Guilford-before 1880 (Sage et al. 1913)
New Haven-1893, 1909 (Sage et al. 1913); abundant resident until 1840 (Merriam 1877)
East Windsor-rare and local after 1925; also 1934, 1937-no details (Hartford Audubon Soc. pers. comm.); no details (Merriam 1877)
Granby-1934, suspected nesting (Hartford Audubon Soc. pers. comm.)
Suffield-1942, 1943, 1949, suspected nesting (Hartford Audubon Soc. pers. comm.)
Newington-1917-1928, suspected nesting (Hartford Audubon Soc. pers. comm.)
Saybrook-no details (Merriam 1877)

References:

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Sage, J. H., L. B. Bishop, and W. P. Bliss. 1913. The birds of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 20.

Melanerpes carolinus Red-bellied Woodpecker

Status: I, Rare and local; II, No danger; III, Increasing; IV, Widespread (regular); V, Peripheral

Breeding habitat: The Red-bellied Woodpecker, a species which feeds upon various insects, larvae, small fruits, and nuts, is a bird of deciduous swamps, river bottoms, and forest clearings in much of its range. It also inhabits southern pine woodlands (Pinus spp.), orchards, and suburban areas. Nesting cavities are built in dead trees, live trees, or even utility poles. Nest boxes can also be used (Bent 1939, Harrison 1975).

In western New York breeding habitat consists of 1) "flooded, wooded swamps; 2) openings in mature oak (Quercus spp.) forests; 3) roadside Sugar Maples (Acer saccharum) and Shagbark Hickories (Carya ovata) in open pastureland; 4) forested stream bottoms; and 5) dry upland maple-Beech (Fagus grandifolia) woodland" (Bull 1974). A Pennsylvania nest was found in a large White Oak (Q. alba) in a wooded ravine that was adjacent to an old field (Bent 1939).

Breeding range: Southeastern Minnesota to Connecticut and south to southern Texas and the Florida Keys (AOU 1957, Carleton 1963). The subspecies carolinus apparently occurs in Connecticut.

Notes: This primarily southern species was formerly an accidental visitor to Connecticut. Since about 1955, however, occurrences of the Red-bellied Woodpecker have increased markedly in the northeast (Bull 1964). The first confirmed breeding in southeastern New York occurred in 1964 (Bull 1974), and in Connecticut they were first found nesting in 1963 (Carleton 1963). It is now firmly established in south-western Connecticut and has bred sporadically throughout the rest of the state.

A probable explanation for the northward range expansion of this species is the presence of many dead and dying American Elms (Ulmus americana) over much of the northeast, particularly along river bottoms. These trees, which attract large numbers of insects, provide the woodpeckers with an abundant source of food (Bull 1974). The elms are dying as a result of a widespread fungal disease.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Simsbury		
Old Lyme		
Greenwich		
Lebanon		
Farmington		

References:

A.O.U. Checklist Committee. 1957. Checklist of North American birds. 5th ed. Amer. Ornith. Union. 691p.

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Sphyrapicus varius Yellow-bellied Sapsucker

Status: I, Rare and local; II, Vulnerable; III, Stable; IV, Widespread (regular); V, Peripheral

Breeding habitat: The Yellow-bellied Sapsucker, a species which feeds upon tree cambium, sap, insects, small fruits, and nuts (Tyler 1939), is primarily a bird of the boreal zone where it occurs in a variety of habitats. In Ontario Lawrence (1967) states that sapsuckers select breeding sites largely on the basis of nest-site availability rather than on forest characteristics. In Maine, however, forest trimming operations are purported to increase the amount of available nesting habitat for sapsuckers (Finch 1976). Most Ontario nests are constructed in live trees, especially aspens (Populus tremuloides, P. grandidentata; Lawrence 1967).

Nesting sites in Ontario include open areas off the forest's edge, dense climax stands of conifers (e. g. White Spruce, Picea glauca; White and Red Pine, Pinus strobus, and P. resinosa; Balsam Fir, Abies balsamea), dry escarpments, and wooded Beaver (Castor canadensis) ponds (Lawrence 1967). Near the southern portions of its breeding range in New York, nests have been found in deciduous and mixed deciduous-coniferous forests, Hemlock (Tsuga canadensis) stands, mature conifer plantings, wooded Beaver ponds, and (occasionally) old orchards (Bull 1974). In Connecticut recent nests have been found in elm stubs back from the edge of wooded swamps (Finch 1976). An older record indicates that nesting may have also taken place in a Hemlock stand (Bull 1974).

Breeding range: Southeastern Alaska and Newfoundland to southern California (in mountains) and Connecticut. Also in the Appalachians to northern Georgia (AOU 1957, Finch 1976).

Notes: The Yellow-bellied Sapsucker has apparently always been a rare breeder in Connecticut (Sage et al. 1913)-the southeastern limit of its range. All known breeding is confined to the mountainous northwestern corner of the state.

Although seven nesting pairs of sapsuckers were discovered in one small section of Connecticut in 1976 (Finch 1976), chances are that this does not indicate a long term population increase. Rather, it probably is associated with unusually high population levels in the major portion of the breeding range. In years following high nestling productivity surplus birds may range further south in order to find unoccupied breeding sites. These normally unoccupied sites are probably less than optimum for nesting.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Sharon	Torrington	Winchester-about 1893 (Sage et al. 1913)
	Goshen	Greenwich-1929-1930, suspected nesting (Bull 1974)
	Litchfield-Morris	

References:

A.O.U. Checklist Committee. 1957. Checklist of North American birds. 5th ed. Amer. Ornith. Union. 691p.

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Emphidonax virescens — Acadian Flycatcher

Status: I, Rare and local; II, No danger; III, Increasing; IV, Widespread (regular); V, Peripheral

Breeding habitat: Moist, shady deciduous forests situated in ravines and along stream bottoms are frequented in much of the range of this insect-eating species (Bull 1964). In Wisconsin it inhabits forested ravines with rocky stream beds, Tamarack (Larix laricina) swamps, and heavily forested river bottoms. Near Lake Erie in southern Ontario it has been found in Black Ash (Fraxinus nigra) swamps, heavily forested river bottoms, and breeding sites in southwestern Pennsylvania are characterized by the occurrence of ravines vegetated by deciduous forest (Christy 1942). Recent breeding in Connecticut has taken place in a mature Hemlock (Tsuga candensis)-hardwood forest situated in a moist, shady ravine, and other pairs are suspected of nesting in deciduous forests along stream bottoms.

A detailed study of nesting birds in Ohio provided the following information about the nesting habitat of Acadian Flycatchers. The birds inhabited a flat stream valley roughly 100m wide that was bordered by steep slopes. Dominant tree species on the slopes included Red Oak (Quercus borealis), American Beech (Fagus grandifolia), Yellow Poplar (Liriodendron tulipifera), White Ash (F. americana), and American Elm (Ulmus americana). Witch Hazel (Hamamelis virginiana) formed a dense understory in the area. The nest was placed in a Witch Hazel halfway down the north slope of the valley (Newman 1958).

Researchers in Michigan have found Acadian Flycatchers nesting in river bottoms vegetated by Silver Maple (Acer saccharinum), Red Maple (A. rubrum), Hemlock, American Elm, White and Black Ash, and Basswood. In addition, moist, unpastured beech-maple-hemlock forests, with some Yellow Birch (Betula lutea), White Oak (Q. alba), Black Oak (Q. velutina), Red Oak, American Beech, and American Elm were found to provide suitable habitat. Some birds were also found nesting in drier forests vegetated by beech, maple, oak, elm, hickory (Carya spp.), and Black Cherry (Prunus serotina). Understory plants in these drier sites consisted of Flowering Dogwood (Cornus florida) and various other shrubs and vines. All sites studied had forest canopies that were almost completely closed (Walkinshaw 1966).

Breeding range: Southeastern South Dakota to (casually) Vermont; south to the Gulf coast and central Florida. No subspecies are recognized (AOU 1957).

Notes: The Acadian Flycatcher is near the northeastern limit of its breeding range in Connecticut. In the early twentieth century it was a rare summer resident along the coast, occurring most commonly west of Stamford (Sage et al. 1913). After the early 1900's, however, it disappeared from nearly all of the northeast. The reason for its decline is not clear, but it may be significant that other bird species reaching their northeastern limits in Connecticut declined during the same period (Bull 1964).

After a long period of apparent extinction in Connecticut (last confirmed nesting 1906, Sage et al. 1913), Acadian Flycatchers were again found breeding in southeastern Connecticut in 1968 (Finch 1968). Since that time, they appear to have begun recolonizing the state, as well as extending their range to Massachusetts and Rhode Island (Finch 1976). It still is a rare and local (although rapidly increasing) summer resident, however.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
East Haddam	Ashford	Stamford-1875, 1894, 1906 (Sage et al. 1913)
Guilford	Mansfield	Danbury-1903, suspected nesting (Sage et al. 1913)
	Greenwich	South Windsor-1931, suspected nesting (Bagg and Eliot 1937)
	Litchfield	Enfield-1874, suspected nesting (Merriam 1877)
	Eastford	
	North Stonington	

References:

A.O.U. Checklist Committee. 1957. Checklist of North American birds. 5th ed. Amer. Ornith. Union. 691p.

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Eremophila alpestris Horned Lark

Status: I, Rare; II, No danger; III, Increasing; IV, Widespread (regular); V, Peripheral

Breeding habitat: The Horned Lark, an insect and weed seed-eating species, is associated with sparsely vegetated sites in open country in the east and midwest. The presence of bare ground is an important habitat requirement. Variations in habitat moisture, soils, elevation, and temperature will all be tolerated as long as bare ground is present (Pickwell 1942).

Nesting often takes place in such barren habitats as stubble-covered fields, pastures, and golf courses (Bull 1964, Benson and Franks 1974). In addition to agricultural land and airports, Connecticut's breeding birds inhabit coastal sand dunes vegetated by Dune Grass (Ammophila breviligulata).

Breeding range: Throughout much of the northern hemisphere. The subspecies praticola breeds from Minnesota to Nova Scotia and south to eastern Kansas and North Carolina.

Notes: In the late nineteenth century E. a praticola, the "Prairie" Horned Lark, began to extend its breeding range eastward as agricultural land replaced forests in the eastern U.S. It was originally confined to the midwestern prairies (Pickwell 1942). In the past 30 years it has become increasingly common in the northeast (Bull 1964) and it is now found sparingly throughout Connecticut.

The Horned Lark often nests early because of its requirement for barren sites (Pickwell 1942). It has been recorded as nesting in late February in the northeast (Bull 1964). Once the growing season has begun many potential nest sites become too thickly vegetated to be suitable (Pickwell 1942).

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Clinton	South Windsor	Torrington-1891 (Sage et al. 1913)
Stratford	Westport	Litchfield-1905; no details (Sage et al. 1913)
Guilford	Fairfield	Watertown-1904 no details (Sage et al. 1913)
Simsbury	Bridgeport	Danbury-1908 (Sage et al. 1913)
	Milford	Mansfield-1947 (Manter 1975)
	Windham	Goshen-suspected nesting (Job 1908, cited in Kuerzi and Kuerzi 1934)
	Groton	
	West Haven	

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Petrochelidon pyrrhonata Cliff Swallow

Status: I, Rare and local; II, State threatened; III, Long-term decline; IV, Widespread (regular); V, Habitat-limited (natural and human)

Breeding habitat: Three habitat features must be present for Cliff Swallows to nest: an open foraging area for catching insects, a vertical substrate with an overhang for nest attachment, and a supply of mud for nest-building. The foraging area is generally a grassy field, although the birds will also feed over lakes. Nest sites include barns, bridges, dams, river bluffs, sand banks, and rock cliffs. Mud for nest construction may be obtained as far as one half mile from the nest site (Emlen 1954).

In the northeast most nesting is confined to man-made sites, although cliffs are used on occasion. Cliff Swallows are essentially absent from coastal plain areas, preferring instead hilly interior locations. They may be found nesting near agricultural lands or in association with lakes (Bull 1964).

Birds nesting in West Virginia have been found to nest both outside and inside barns. For them to nest inside, however, a wide entranceway (e.g. open barn door) must be present (Samuel 1971). In Connecticut Cliff Swallows have recently been found nesting under a concrete bridge on a large lake and on the sides of barns in farming country.

Breeding range: Throughout much of North America; from Alaska to central Mexico. A local breeder in the east. The subspecies pyrrhonata occurs in Connecticut (Bull 1964).

Notes: The Cliff Swallow has declined greatly in the northeast since the late nineteenth century (Bull 1964). The decrease in the amount of land used for agriculture and the destruction of suitable breeding sites (i.e. barns) appears to have been partly responsible. There is also some evidence that the painting of barns may have diminished the availability of nest sites, because painted surfaces seem too smooth for attaching nests (Bull 1964). However, western Cliff Swallows often build nests on painted barns (Emlen 1954). Another factor influencing Cliff Swallow declines is competition for nest sites with the introduced House Sparrow (Passer domesticus). House Sparrows are known to evict Cliff Swallows from their nests (Samuel 1969).

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Colebrook	Willington	Harwinton-1942
New Milford	Simsbury	Meriden-1885 (Sage et al. 1913)
Canaan	Stamford	Windsor-1830, no details (Merriam 1877)
Ashford		Western Litchfield County-Locally common (Kuerzi and Kuerzi 1934)
Chaplin		Seymour-1888 (Univ. Conn. Mus.)
		Hebron-1891 (Univ. Conn. Mus.)
		Farmington-1900 (Univ. Conn. Mus.)

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Progne subis Purple Martin

Status: I, Rare and local; II, State threatened; III, Long-term decline; IV, Widespread (regular); V, Competition

Breeding habitat: In eastern North America the colonially-nesting Purple Martin breeds almost exclusively in multi-chambered nest boxes commonly called martin houses. Natural sites, consisting primarily of tree holes, are still used to a large extent in the west (Allen and Nice 1952).

In Kentucky the Purple Martin is described as not requiring large open spaces or ponds near nesting sites; the smallest forest clearing where nest sites are provided seem suitable (Mengel 1965). In contrast, Bull (1964) states that in the New York City area nesting sites near water are preferred. Similarly, New Jersey colonies have been described as occurring near salt marshes (Stone 1937). In Connecticut, nesting colonies are found on the coast and on agricultural lands, with at least one occurring adjacent to a farm pond. Presumably such open areas as the coast, farm fields, and ponds provide good foraging habitat for these insectivorous aerial feeders.

Breeding range: Southwestern British Columbia to Baja California, Sonora, and Arizona; also from northeastern British Columbia and central Nova Scotia to the Gulf coast and southern Florida. The subspecies subis occurs in Connecticut (AOU 1957).

Notes: The Purple Martin has declined in Connecticut since the nineteenth century, when it was a common breeder in the state (Sage et al. 1913). It has also decreased in other parts of the northeast (Arbib 1976, Bull 1964), with nest site competition from House Sparrows (Passer domesticus) and Starlings (Sturnus vulgaris) being described as the major cause (Bull 1964, Sage et al. 1913). In Connecticut, competition probably has been an important factor in the decline of this species, but a decrease in the amount of prime feeding habitat (i.e. agricultural lands) in recent years may also be involved.

In an extensive study of nesting Purple Martins, House Sparrows, and Starlings in eastern North America, Jackson and Tate (1974) concluded that:

> "1) Significant geographic variation occurs in the rate of occupancy of apartment houses by Purple Martins and House Sparrows; 2) height of apartments has no significant effect on the rate of occupancy by any of the species; 3) apartments farther than 30 m from the newest building had significantly fewer martins than closer apartments; 4) there may be fewer martins and more sparrows occupying apartments as height of vegetation increases; 5) in Mississippi, martins show a significant preference for and sparrows a significant avoidance of gourds as nest sites; 6) Starlings may avoid aluminum houses; 7) martins may prefer white apartments while Starlings may favor darker ones; 8) martins tend to prefer apartments that have not been cleaned out after a previous occupancy; 9) suburban have significantly fewer martins than do urban or rural colonies and rural tend to have fewer sparrows than do suburban or urban colonies; 10) the presence of a pond, lake or stream

within sight of the apartments may result in a greater occupancy by martins; 11) the presence of other apartment houses within one-half mile has no significant effect on occupancy by martins, but may result in a greater occupancy by sparrows; 12) significantly fewer apartments are occupied the first year by martins than in subsequent years; 13) competition between martins and sparrows may result in significantly fewer martins occupying a colony, but the Starling is not a serious nest-site competitor."

In addition to competition for nest sites, the Purple Martin is adversely affected by prolonged cold spells, cold spring rains, and excessive heat. The former two factors hamper aerial foraging and can result in massive die-offs (up to 80%) of adults and young from starvation. Prolonged hot, dry weather can also result in heavy nestling mortality (Allen and Nice 1952, Benton and Tucker 1968).

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Glastonbury	Waterford	Stamford-1905 (Sage et al. 1913)
Portland		New Haven-until 1893, no details (Sage et al. 1913)
New Milford		Madison-1904 (Sage et al. 1913)
Guilford		Windsor Locks-1904 (Bagg and Eliot 1937)
Windsor		Old Lyme-currently present (Bagg and Eliot 1937)
Mansfield		

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Cistothorus platensis Short-billed Marsh Wren

Status: I, Rare and local; II, State endangered; III, Approaching extinction; IV, Widespread (regular); V, Habitat-restricted (natural and human)

Breeding habitat: The insectivorous Short-billed Marsh Wren (Bent 1948) nests primarily in damp grasslands that are either natural or agricultural in origin. Sedge (e. g. Carex spp. or Eleocharis spp.) meadows, drier parts of salt (Spartina patens) marshes, hayfields, (Bull 1964, Harrison 1975) and Switchgrass (Pancium virgatum) meadows are used in the east (Burt pers. comm.). Cattail (Typha spp.) marshes are not suitable, however (Bull 1964).

The Short-billed Marsh Wren is exceedingly particular about the moisture conditions present in its breeding habitat. Prime nesting grounds are "damp" but have little or no standing water present (Bull 1964). In Connecticut, damp hayfields used for nesting have small rivulets flowing through them and a water table roughly at the soil surface.

Breeding range: Eastern North America to southern South America; very local throughout its range. The subspecies stellaris breeds from Maine to Virginia on the east coast (AOU 1957, Bull 1964).

Notes: Urbanization, drainage, burning of marshes, and the reversion of farmland to forest have resulted in the decline of this species in parts of its range (Bull 1964). In Connecticut it was formerly common in Litchfield County (Sage et al. 1913).

The Short-billed Marsh Wren is unusual in that it often breeds in August (Stone 1937). This may be tied to its specific habitat requirements. Levels of water in marshes and wet meadows tend to decline in late summer and thus breeding may not be possible until then. Also, vegetative cover may not be great enough until late summer. The birds will also abandon a breeding site used in previous years if moisture conditions become unsuitable (Bull 1964).

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
	Salisbury	Fairfield area, possible nesting by numerous pairs (Saunders 1950)
	Danbury	Litchfield-1891, 1907 (Sage et al. 1913)
	Old Lyme-Lyme	Bethel-1890 (Sage et al. 1913)
		East Windsor-1854, no details (Bagg and Eliot 1937)
		Suffield-no date, no details (Merriam 1877)
		South Windsor-currently present, no details (Bagg and Eliot 1937)

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Catharus ustulatus Swainson's Thrush

Status: I, Rare and local; II, Vulnerable; III, Stable?; IV, Widespread (Regular); V, Peripheral

Breeding habitat: A bird of the northern forests of the east. It primarily inhabits spruce (Picea spp.)-fir (Abies sp.) forests, although mixed forests are used in the southern portions of its range. It appears to prefer moist sites, such as the vicinity of woodland streams, but it also uses drier sites. The presence of at least some conifers seems to be a habitat requirement, as nests are usually built in conifers. In these habitats it feeds mainly upon insects and small fruits (Bent 1949, Dilger 1956).

In New York Swainson's Thrushes occur in areas of low elevation that are vegetated by American Beech (Fagus grandifolia), Sugar Maple (Acer saccharum), and Hemlock (Tsuga canadensis), At higher elevations, mature forests of Red Spruce (P. rubens) and Balsam Fir (A. balsamea) are inhabited (Bull 1974, Dilger 1956). In northern New England and eastern Canada they also occur in spruce-fir forests, although they are most common in young forests with Balsam Firs and spruces mixed with birches (Betula spp.) and other deciduous trees. West Virginia birds inhabit mature spruce forests and second-growth brush where spruce is regenerating. They are also found in Hemlocks and mixed forests (Bent 1949). In Connecticut summering birds are confined to mixed hardwood-White Pine (Pinus strobus)-Hemlock forests in the more mountainous portions of the state.

Breeding range: Central Alaska and Newfoundland to California and West Virginia. The subspecies swainsoni occurs in Connecticut (AOU 1957).

Notes: Although breeding south along the Appalachian Mountains, the Swainson's Thrush is essentially at its southern range limit in Connecticut. It was not known to breed in the state in earlier years (Sage et al. 1913), but has probably always occurred here in small numbers. It has recently been found nesting in the northwestern portion of the state, and intensive field work may also prove that it nests in the state's mountainous northeastern corner.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Salisbury	Barkhamsted	

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Sialia sialis Eastern Bluebird

Status: I, Local; II, State threatened; III, Long-term decline; IV, Widespread (regular); V, Competition

Breeding habitat: Open areas such as farmlands, shrubby fields, parks, cemetaries, old orchards, and open woodlands are preferred. Expanses of flat, treeless areas are generally not suitable. Next boxes or cavities in dead trees, fence posts, etc. must also be present for breeding to occur (Bull 1964, Kibler 1969). Another important feature of the nesting habitat appears to be the presence of some shrubs, low branches, or forbs. Bluebirds use these as perches from which to catch prey (primarily insects; small fruits are also eaten when available, however, Bent 1949). In Connecticut, nesting birds have also been found in open swamps and weedy fields where tree nest sites were available, and in suburban-rural settings where numerous nest boxes had been erected.

Breeding range: Southwestern Nova Scotia to southern Saskatchewan; south to Nicaragua and southern Florida. The subspecies sialis occurs in Connecticut (AOU 1957).

Notes: The Eastern Bluebird has declined over much of the eastern U.S. in recent years (Bull 1964, Wallace 1959), and in Connecticut it is now somewhat locally distributed. Competition for nest sites with the introduced Starling (Sturnus vulgaris) and House Sparrow (Passer domesticus) is partly responsible for its decline, although loss of habitat is also involved. The reversion of abandoned farmland to forest (particularly in the northeast) has been one of the major factors contributing to habitat loss. In addition, removal of dead trees, pruning of orchard trees, and replacement of wooden farm fences with metal ones has reduced the availability of nest sites. Pesticide poisoning has also affected bluebirds, at least on occasion. (Bent 1949, Conner and Adkisson 1974, Wallace 1959).

Bluebird populations have been managed successfully through programs of forest clearcutting. Conner and Adkisson (1974) report that in Virginia bluebirds regularly nest in recent (1-12 years old, 9-32 ha in size) forest clearcuts where dead snags have been retained. In addition to providing nesting habitat, Starlings and House Sparrows are absent from these areas and thus nesting competition from them is eliminated.

Programs of erecting nest boxes in otherwise suitable habitats have also been successful in increasing bluebird numbers. Kibler (1969) discusses the details of instituting and maintaining a nest box program.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Mansfield	Canann	Essex-1876 (Sage et al. 1913)
Coventry	Norwich	Guilford-1882 (Sage et al. 1913)
Union	Old Lyme	Stamford-1892 (Sage et al. 1913)
New Milford	Hampton	Newtown-1898 (Sage et al. 1913)
Greenwich		Portland-1884, 1889 (Univ. Conn. Mus.)
Sharon		
Litchfield-Morris		
Canton		
Willington		
Chaplin		
New Canaan		
Windham		
Eastford		
Bristol		

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Regulus satrapa Golden-crowned Kinglet

Status: I, Rare and local; II, Vulnerable; III, Stable; IV, Widespread (regular); V, Peripheral

Breeding habitat: Primarily a bird of northern coniferous forests, although it occurs in mixed hardwood-conifer forests in the southern portions of its range. Spruce (Picea spp.) stands seem to be its preferred habitat. Both mature and second growth forests are used, either in upland or boggy situations. In these habitats it feeds upon insects and their larvae and eggs (Bent 1949, Bull 1974).

In Massachusetts the Golden-crowned Kinglet inhabits dense forests of White Pine (Pinus strobus) and spruce, as well as second growth stands of scattered spruce mixed with Balsam Fir (Abies balsamea) and White Birch (Betula papyrifera). It has also been found in other types of coniferous forests, including dense growths of tall Eastern Redcedars (Juniperus virginiana) mixed with deciduous trees. One nest was described as occurring in a Black Spruce (P. mariana) bordered on one side by dry, rather open woods and on the other by an extensive Sphagnum swamp. Another was found in a glen on high land between two ridges, vegetated by a dense stand of tall spruce and Hemlock (Tsuga canadensis, Bent 1949).

In New York nesting has occurred in Northern White Cedar (Thuja occidentalis) bogs and forests of spruce, Balsam Fir, Hemlock, and Tamarack (Larix laricina). Mature forests, well-established second growth, and young second growth spruce 3-5 m. high have all been used (Bull 1974). In addition, conifer plantations south of the bird's normal range have been used since about 1949. Plantations of spruce, either pure Norway Spruce (P. abies) or White Spruce (P. glauca) are usually occupied, although mixed stands of these species with the former predominating have also been used. On several occasions mixed Red Pine (P. resinosa) and spruce plantations have been colonized. Stands chosen are generally extremely dense and contain trees 10 to 20 m. or greater in height. Size of stands range from one to 24 ha, and almost half of those containing kinglets are less than 4 ha in size. The stands tend to have a microclimate that is somewhat cooler and moister than surrounding areas, and this is thought to favor kinglets (Andrie 1971).

Nesting in Connecticut has taken place in fairly open, old growth tracts of White Pine and Hemlock. They have also been noted in summer in mature Black Spruce (P. mariana) bogs and dense spruce plantations.

Breeding range: Southern Alaska and Newfoundland to southern California, Guatemala, and western North Carolina (AOU 1957). The subspecies satrapa occurs in Connecticut.

Notes: Although breeding south along the Appalachian Mountains, the Golden-crowned Kinglet is essentially at its southern range limit in Connecticut (although it has bred on Long Island recently, Bull 1964). It was not known to breed in the state in earlier years (Sage et al. 1913), but it has probably always occurred here in small numbers. It is currently known to nest primarily in the mountainous northwestern and northeastern portions of the state.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Litchfield	Ashford	Salisbury-1933, 1934- suspected nesting (Kuerzi and Kuerzi 1934)
Union	Cornwall	
Greenwich		

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Parula americana Northern Parula

Status: I, Rare and local; II, State endangered; III, Approaching extinction; IV, Widespread (regular); V, Habitat-restricted (human)

Breeding habitat: The insectivorous Northern Parula is often associated with deciduous and coniferous swamps although it also uses upland forests. The presence of epiphytic growths upon trees, such as beard moss (Usnea spp.-a lichen) or Spanish Moss (Tillandsia usneoides-a flowering plant), seems to be an important habitat requirement in much of its range. Where present, these epiphytes are extensively used for nest construction (Bent 1953).

Breeding in Maine has occurred in forests of Red (Picea rubens) and White (P. glauca) Spruce, primarily at forest openings. Only rarely does it venture into unbroken tracts (Morse 1967). In New York it has been found nesting in moist to dry deciduous woods, Hemlock (Tsuga canadensis)-spruce bogs, ravines, and deciduous swamps vegetated by Black Gum (Nyssa sylvatica), Red Maple (Acer rubrum) and oaks (Quercus spp., Bull 1964 and 1974). In Massachusetts it has nested in abandoned, overgrown apple orchards; along the edges of swamps, ponds, and slow-moving streams; and in an Atlantic White Cedar (Chamaecyparis thyoides) swamp adjacent to a lake (Bent 1953). Breeding in Connecticut has apparently taken place recently in an Atlantic White Cedar swamp. In all these sites, beard moss was a common species.

Breeding range: Southeastern Manitoba and northern Nova Scotia to eastern Texas and central Florida. There are no subspecies recognized (AOU 1957).

Notes: The Parula Warbler has declined greatly in parts of the northeast in recent years. The decline appears to be directly related to the almost complete disappearance of beard moss in many areas (Bull 1974). Yapp (1972) points out that lichens are generally absent from localities with heavily polluted air (such as industrialized areas), and thus, it seems possible that air pollution is largely responsible for the decrease in beard moss.

Although formerly a regular nester (Sage et al. 1913) the Parula Warbler is currently extremely rare and local in Connecticut. It is possible that it may increase its numbers in the future if air quality is improved.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
	Voluntown	Norwich-1800's, no details (Rawson 1888, cited in Bent 1953)
	Kent	Portland-no details (Merriam 1877)
		New Haven-no details (Merriam 1877)
		Cornwall-no details (Kuerzi and Kuerzi 1934)

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Dendroica magnolia Magnolia Warbler

Status: I, Rare and local; II, Vulnerable; III, Stable; IV, Widespread (regular); V, Peripheral

Breeding habitat: The Magnolia Warbler most commonly inhabits open coniferous and mixed conifer-hardwood forests, particularly young second growth (Bent 1953, Bull 1964). In these habitats it feeds upon various types of insects (Bent 1953).

In Maine and the northeastern maritime provinces of Canada, Magnolia Warblers have been found nesting in small spruces (Picea spp.) and Balsam Firs (Abies balsamea) growing in old clearings, in reclaimed boggy pastures, and at coniferous forest edges (Bent 1953). In New York it occurs in mixed evergreen-deciduous forests at higher elevations, gorges vegetated by American Beech (Fagus grandifolia), Yellow Birch (Betula lutea), and Sugar Maple (Acer saccharum), young spruce plantations, and mature Hemlock (Tsuga canadensis) groves (Bull 1974). In Connecticut, birds have been known to summer in pine (Pinus spp.) groves on hillsides; Black Spruce (P. mariana) bogs (Kuerzi and Kuerzi 1934), and in young, open spruce plantations where oak (Quercus spp.), Gray Birch (B. populifolia), and aspen (Populus spp.) saplings have invaded.

Breeding range: Southwestern Mackenzie and southwestern Newfoundland to central British Columbia, northeastern Minnesota and southern Ontario; locally south to northeastern Ohio, West Virginia, northeastern Pennsylvania, northwestern New Jersey and northern Connecticut. No subspecies are recognized (AOU 1957, Kuerzi and Kuerzi 1934).

Notes: The Magnolia Warbler occurs further south in the Appalachian Mountains, but is essentially at its southern range limit in Connecticut. Although suspected of nesting in the state for many years (Sage et al. 1913), the first confirmed breeding was reported in 1934 (Kuerzi and Kuerzi 1934; note that Carleton's 1964 nesting record is not, as he states, the first confirmed breeding). It has since been found summering at other localities in the mountainous northwestern and northeastern portions of the state.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records: (Kuerzi & Kuerzi 1934)
Barkhamsted	Canton	Cornwall-1934
Litchfield	Hampton	Salisbury-1934, suspected nesting
	Ashford	
	Morris	
	Canaan	

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Dendroica coronata Yellow-rumped Warbler

Status: I, Rare and local; II, Vulnerable; III, Stable; IV, Widespread (regular); V, Peripheral

Breeding habitat: The insectivorous Yellow-rumped Warbler is primarily a bird of northern coniferous forests. Forest openings are apparently preferred for nesting. Conifer plantations have also been used in recent years (Bent 1953, Bull 1974).

In Maine, Yellow-rumped Warblers have been found nesting in thickets of conifers near roads, open pastureland containing clumps of evergreens, small thickets of evergreens along streambanks or lakeshores, in rows of trees in rural areas, and in orchards. New York birds nest in spruce (Picea spp.) and Balsam Fir (Abies balsamea) at high elevations and in plantations of spruce and Red Pine (Pinus resinosa) at lower elevations (Bull 1974). In Connecticut birds have summered in mountainous areas vegetated by mature White Pine (Pinus strobus) forests growing on dry sites, and by mature White Pine and Hemlock (Tsuga canadensis) forests growing on hillsides near ponds and large marshy streams.

Breeding range: Northern Alaska and Newfoundland to northern British Columbia, northern Minnesota, and Connecticut. The subspecies coronata occurs in Connecticut (AOU 1957, Hartford Audubon Soc. pers. comm.).

Notes: The Yellow-rumped Warbler is at its southeastern range limit in Connecticut. It was not known to breed in the state in earlier years (Sage et al. 1913), although it probably always has. Nesting has been known to occur since at least 1946 (Hartford Audubon Soc. pers. comm.). It is restricted to the mountainous northwestern and northeastern portions of the state during the breeding season.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Litchfield	Union	New Hartford-1946, 1948 (Hartford Audubon Soc. pers. comm.)
	Cornwall	
	Morris	
	New Hartford	

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Dendroica cerulea Cerulean Warbler

Status: I, Rare and local; II, No danger; III, Increasing; IV, Widespread (regular); V, Peripheral

Breeding habitat: Mature, open deciduous woodlands in moist situations are inhabited by the insectivorous Cerulean Warbler. The nest is generally placed in a tree over a forest opening (Bent 1953, Harrison 1975).

In New York nesting birds have been found in mixed growths of oak (Quercus spp.), maple (Acer spp.), birch (Betula spp.), and hickory (Carya spp.); woodlands vegetated by large American Elms (Ulmus americana), Red Maples (A. rubrum), and Black Ash (Fraxinus nigra, Bent 1953); swamps; deciduous forests along stream bottoms; and along lake and river shores where tall trees are abundant (Bull 1974). Maryland birds have been found in tall, open woodlands with little shrub growth (Bent 1953). In Quebec summering birds have occurred in mature deciduous woods dominated by Sugar Maple (A. saccharum), Red Oak (Q. borealis), and American Beech (Fagus grandifolia, Ouellet 1976). Breeding birds in Connecticut have occupied moist, open woodlands dominated by Red Oak, White Ash (F. americana), hickory, Sugar Maple, Black Birch (B. lenta), and Bigtooth Aspen (Populus grandidentata) where shrub cover is largely absent below the nest tree.

Breeding range: Southeastern Nebraska, southeastern Canada, and Connecticut to eastern Texas and Deleware. No subspecies are recognized (AOU 1957, Boyajian 1972, Ouellet 1967).

Notes: The Cerulean Warbler is chiefly a southern and midwestern bird. Since the early twentieth century, however, it has been extending its range northward and eastward (Bull 1974, Ouellet 1967). Although suspected of nesting in Connecticut for many years (see Sage et al. 1913, Kuerzi and Kuerzi 1934), the first confirmed nesting occurred in 1972 (Boyajian 1972). After this date nesting was not demonstrated again until 1977, when it increased dramatically and roughly 15 pairs were found breeding in the state. It will be necessary to follow population trends over the next several years to see if this increase will continue.

Connecticut breeding since 1950:

Confirmed:		Suspected:	Old records:
Canton	East Haddam	Ledyard	Winchester-suspected nesting (Kuerzi and Kuerzi 1934)
Chaplin	Lyme	Salisbury	
Kent			

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Dendroica pinus Pine Warbler

Status: I, Local; II, No danger; III, Increasing; IV, Widespread (regular); V, Habitat-restricted (natural)

Breeding habitat: Throughout its range the Pine Warbler is chiefly a bird of dry, open pine (Pinus spp.) woodlands, where it feeds on various insects. It is most common on the coastal plain in the northeast (Bent 1953, Bull 1964).

In Massachusetts, New York, and New Jersey, the Pine Warbler is most typical of the Pitch Pine (P. rigida) "barrens" that occur in these states. These barrens are characterized by an almost pure but open forest canopy of Pitch Pines and an understory of scrub oaks (Quercus illicifolia and Q. prinoides predominantly). The soils in these areas are extremely dry and sandy (Bent 1953, Bull 1974).

New York birds are also known to occur in groves of Red (P. resinosa) and White (P. strobus) Pines on occasion, and in open Pitch-Red Pine "sand plains" as well (Bull 1974). In Connecticut, they have summered in Red and White Pine stands and in mixed White-Pitch Pine woodlands. Common understory plants in these areas include scrub oaks and Bracken Fern (Pteridium aquilinum), and the soils are characteristically dry and gravelly or rocky.

Breeding range: Southeastern Alberta and central Maine to southeastern Texas, Florida, and the Carribean. The subspecies pinus occurs in Connecticut (AOU 1957).

Notes: The Pine Warbler has apparently always been rare as a breeder in Connecticut (Sage et al. 1913). Its rarity has undoubtedly been related to the scarcity of suitable habitat. In recent years, however, more habitat has become available for it, particularly in Pachaug State Forest. The dry, gravelly/rocky soil in this area has been heavily managed for pine production, and extensive tracts of White, Red, and mixed White-Pitch Pine are now present. Selective thinning of the stands probably further enhances the stands' attractiveness for Pine Warblers. Although scattered pairs seem to occur throughout the state, the Pachaug area apparently holds the only population of any size.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records: (Sage et al. 1913)
Glastonbury	Plainville	East Haven-1893, 1909
	Litchfield-Morris	Windsor-1906, suspected nesting
	Voluntown	
	Mansfield	
	New Hartford	
	Wallingford	

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Oporornis vespertina Kentucky Warbler

Status: I, Indeterminate; II, Indeterminate; III, Increasing?; IV, Widespread (regular); V, Peripheral

Breeding habitat: The insectivorous Kentucky Warbler prefers to nest in moist, shady, usually hilly mature forests with a dense shrub cover. Areas chosen often contain ravines with stream bottoms. Nests are built on or near the ground among dense vegetation (Bull 1964, Mengel 1965).

In Kentucky, which is near this species' center of abundance, nesting occurs in a variety of mature forest associations, including even dry pine (Pinus spp.) and pine-oak (Quercus spp.) communities on occasion. It is most abundant in moister deciduous forests, however (Mengel 1965). Birds in the New York City area were found, in former years, in swampy woods (Greenwich, CT and Riverdale, NY) and in a heavily forested ravine with a stream running through it (Ossining, NY; Bull 1964). A recent nest on Long Island was discovered in a dense honeysuckle (Lonicera spp.) thicket in moist, second-growth woodland (Bull 1974).

Breeding range: Southeastern Nebraska and southwestern Connecticut (formerly) to central and eastern Texas and northwestern Florida. No subspecies are recognized (AOU 1957).

Notes: Since about 1900 the Kentucky Warbler has disappeared from the northeastern portion of its breeding range. The reasons for its disappearance are unknown, but it may be significant that the Acadian Flycatcher, also at its northeastern range limit, declined during the same period (Bull 1964).

There is some evidence that this species has been reclaiming portions of its northeastern breeding range in recent years. It bred in New York for the first time in 30 years in 1973 (Bull 1974), and in 1962 it was suspected of breeding in central Connecticut. It has since summered several times in Connecticut, but breeding has not been proven.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
	Bloomfield-Simsbury	Greenwich-1892 (Sage et al. 1913)
	New Britain	
	Farmington	

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Hesperiphona vespertina Evening Grosbeak

Status: I, Rare and local; II, No danger; III, Sporadic; IV, Widespread (regular); V, Peripheral

Breeding habitat: Primarily a bird of the coniferous forests of the boreal zone. Nests are built in both coniferous and deciduous trees, including spruce (Picea spp.), pine (Pinus spp.), Balsam Fir (Abies balsamea), Northern White Cedar (Thuja occidentalis), White Birch (Betula popyrifera), willow (Salix spp.), aspen (Populus spp.), elm (Ulmus spp.), Saskatoon (Amelancher spp.), and maple (Acer spp; Bull 1974, Speirs 1968). Forest openings seem to be preferred. In these habitats it feeds upon various types of seeds, fruits, buds, and insects (Speirs 1968).

Nesting in Ontario has occurred in mixed second growth forests of White Pine (P. strobus), Black (P. mariana) and White (P. glauca) spruce, Balsam Fir, and birch along a recently constructed road (Speirs 1968). Minnesota birds have been found summering (breeding not proven) in open, burnt-over country and in Northern White Cedar and spruce swamps (Roberts 1935). In Michigan nesting has occurred in a one-acre White Pine grove several hundred feet from the north shore of Lake Superior. Surrounding vegetation included Red (P. resinosa) and Jack (P. banksiana) Pines and a young growth of mixed hardwoods and conifers (Ligon 1923).

Breeding range: North-central British Columbia and northern New Brunswick to central California, northern New Jersey and Connecticut (AOU 1957, Bull 1964).

Notes: The Evening Grosbeak, formerly a more western, boreal species, began dramatically expanding its breeding range east and south in the mid-nineteenth century. In the past 25 years it has become established as a breeder on the Atlantic coast. Several factors are attributed to this increase, including the widespread planting of Boxelders (Acer negundo) in the north, the seeds of which are an important food source for this species, and the increase in the feeding of sunflower seeds (Belknap 1973). Other factors are undoubtedly involved, however. Perhaps logging has increased the amount of suitable breeding habitat.

The first confirmed nesting in Connecticut occurred in 1962 (Carleton 1962). Since that time breeding has not been proven, but as the Evening Grosbeaks' range continues to expand, it should again establish itself in the state.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Glastonbury		

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Passerculus sandwichensis Savannah Sparrow

Status: I, Local; II, State threatened; III, Long-term decline; IV, Widespread (regular); V, Habitat-restricted (natural and human)

Breeding habitat: The Savannah Sparrow, an insect and seed-eater (Baird 1968), selects low-lying, moist grasslands with scattered forbs and a dense ground layer (grasses and accumulated litter) as nesting sites throughout much of its range. Moisture in itself is not a habitat requirement, but it often stimulates the development of dense, low vegetation, which is an important requirement of this species. Forbs and/or fenceposts, which serve as singing perches, form another important feature of the habitat in the east and midwest. Eastern and midwestern birds do not find fields with small trees or shrubs suitable for nesting, however (various authors, cited by Wiens 1969).

In the northeast Savannah Sparrows are known to breed on coastal sand dunes vegetated by Dune Grass (Ammophila breviligulata), salt marshes, hayfields, pastures, airport fields, and filled-in grassy areas adjacent to the shoreline. On Long Island, many pairs formerly bred on the Hempstead Plains, a natural Little Bluestem (Andropogon scoparius) prairie (Bull 1964, Welsh 1975, Wiens 1969). Most of Connecticut's breeding birds inhabit hayfields and pastures.

Breeding range: Throughout much of North America and south to Guatemala. The race savanna breeds from Labrador and Quebec to Maryland and West Virginia, although locally south of Long Island (Bull 1964).

Notes: The Savannah Sparrow is a victim of the decline of agriculture in Connecticut. It still breeds fairly regularly in suitable areas scattered throughout the state, but it is declining as farmlands revert to woodlands and urbanization expands into rural areas. Although it is strongly associated with agricultural lands, the Savannah Sparrow has probably always been present in the state, inhabiting such areas as sand dunes, salt marshes, and the Switchgrass (Panicum virgatum) meadows that occur adjacent to tidal marshes.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
	South Windsor	Madison-no details (Sage et al. 1913)
	Sharon	Stratford-no details (Sage et al. 1913)
	Litchfield-Morris	New Haven-North Haven-Hamden-no details (Sage et al. 1913)
	Mansfield	Cornwall-no details (Kuerzi and Kuerzi 1934)
	Milford	Canaan-no details (Kuerzi and Kuerzi 1934)
	Stonington	

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Passerculus sandwichensis princeps — Ipswich Sparrow

Status: I, Rare and local; II, U. S. threatened; 1/ III, Long-term decline; IV, Restricted (endomic breeder, Nova Scotia); V, Restricted Range

Habitat:

Breeding: Grassy and shrubby coastal areas (McLaren 1968).

Migration and winter: Almost exclusively along the coast on sand dunes vegetated by Dune Grass (Ammophila breviligulata). In winter the seaward "primary" dunes are occupied most heavily, although back dunes are also used. Salt marsh edges are used on rarer occasions (Elliot 1968, Stobo and McLaren 1971).

Three of the most important features of the Ipswich Sparrow's wintering habitat include relief of the dunes, vegetative cover, and the availability of fresh water. The generally higher primary dunes appear to afford the birds a greater amount of shelter. A dense cover of Dune Grass provides not only shelter but also food in the form of seeds. Fresh water ponds present among the dunes supply the birds with drinking water (Stobo and McLaren 1971).

Range:

Breeding: Primarily on Sable Island, Nova Scotia, but also reported on the Nova Scotia mainland (Finch 1971).

Migration and winter: Migrates from Sable Island to as far south as Georgia. It winters from Sable Island to Georgia, with most birds occurring from New Jersey to Virginia (Elliot 1968, Stobo and McLaren 1971).

Notes: Because of the gradual erosion of Sable Island, the primary breeding area for the Ipswich Sparrow is slowly being destroyed. In addition, the amount of wintering habitat is decreasing because of residential and recreational development of beaches. The decline in wintering habitat in the Middle Atlantic States has had a particularly severe impact on the sparrows because the majority of them winter in this region. The decrease in wintering habitat may ultimately prove to be the greatest conservation problem for this subspecies, as the erosion of Sable Island can probably be controlled (Stobo and McLaren 1971).

In Connecticut, the Ipswich Sparrow may be expected to occur from mid-October to mid-April (Bull 1964). However, because of the scarcity of adequate habitat few birds can now be accomodated, and unless natural beach habitats are preserved it will disappear as a visitor to the state.

1/ As of May 1979 the Ipswich Sparrow is no longer classified as U. S. threatened. It is currently recognized as a subspecies of the Savannah Sparrow.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Stratford		West Haven-1884, 1911 (Sage et al. 1913)
?Guilford-undated (Yale Univ.)		Madison-1883 (Sage et al. 1913)
Milford		Bridgeport-1892 (Sage et al. 1913)
?Westport-undated (Yale Univ.)		Norwalk-1917 (Bull 1964)
?Old Saybrook-undated (Yale Univ.)		
Old Lyme		
?New Haven-undated (Yale Univ.)		

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Ammodramus henslowii Henslow's Sparrow

Status: I, Rare and local; II, State endangered; III, Approaching extinction; IV, Widespread (regular); V, Habitat-restricted (natural and human)

Breeding habitat: The Henslow's Sparrow, an insect and seed-eating species, inhabits open fields (often surrounded by forests) where vegetation is comprised of a dense growth of grass, weeds, or clover (Trifolium spp.), and tall forb stalks project a foot or two above the surrounding cover. Scattered shrubs may be present, but extensive shrubby growth makes fields unsuitable. Wet meadows most often exhibit these types of vegetation patterns, although moisture in itself is not a habitat requirement. Dry fields are also used where the vegetation structure is suitable. Marshy areas with standing water are generally not used, however (Hyde 1939, Wiens 1969).

In Wisconsin, Wiens (1969) found Henslow's Sparrows nesting in pastures vegetated by such grasses as Kentucky Bluegrass (Poa pratensis) and Timothy (Phleum pratense) and various forbs, including fleabane (Erigeron spp.), clover, Dandelion (Taraxacum officinale), thistle (Cirsium spp.), Milkweed (Asclepias syriaca), and Sweet Clover (Melilotus officinalis). In the northeast Henslow's Sparrows have been known to occur in weedy pastures and hayfields, old weedy fields, wet meadows vegetated by sedges (Scirpus cyperinus, Carex spp.), rushes (Juncus effusus), and grasses (Agrostis stolonifera, Poa palustris), fields of seedling pines (Pinus sp.) with an understory of Sweet Vernal Grass (Anthoxanthum odoratum) and Common Daisy (Chrysanthemum leucanthemum), meadows dominated by Hellbore (Veratrum viride), drier upland portions of salt marshes vegetated by grasses (Spartina pectinata, S. patens, Agrostis sp., Pancium virgatum) and Bayberry (Myrica pennsylvanica), and various other types of weedy (dry or moist) fields. Salt marsh edges were probably among the most important nesting habitats on the Atlantic coast in primeval times (Elliot 1941, Hyde 1949).

Breeding range: Eastern South Dakota to Southern New Hampshire, and south to eastern Kansas and North Carolina. The poorly defined subspecies susurrans occurs in Connecticut (AOU 1957, Bull 1974).

Notes: The Henslow's Sparrow is declining throughout much of its range, and habitat destruction through wetland drainage, urbanization, and the decline of agriculture appears to be largely responsible (Arbib 1975, Bull 1964, Clark pers. comm.). In addition to habitat destruction, certain agricultural practices seem to be adversely affecting it. Smith (1963) indicates that birds will abandon nesting sites in hayfields if mowing is carried out during the breeding season. It was locally a common breeder in Litchfield County, Connecticut in the early twentieth century (Sage et al. 1913), but it has nearly disappeared in recent years.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Kent		Litchfield County-locally common (Sage et al. 1913) Danbury-1905 (Sage et al. 1913) North Branford-1890-no details (Sage et al. 1913) Norwich-1882 (Sage et al. 1913) Eastford-1881-no details (Sage et al. 1913) West Hartford-1939-no details (Yale Univ.)

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Ammodraums savannarum Grasshopper Sparrow

Status: I, Rare and local; II, State threatened; III, Long-term decline; IV, Widespread (regular); V, Habitat-restricted (natural and human)

Breeding habitat: The Grasshopper Sparrow, an insect and seed-eating species (Smith 1968), chooses dry, well-drained grasslands with short and fairly dense vegetation throughout much of its range. A good supply of taller forbs is usually also present (various authors, cited by Wiens 1969), although heavy shrub cover is shunned. In Georgia, old fields growing up to 35% shrubs were abandoned by Grasshopper Sparrows (Johnston and Odum 1956).

In much of the midwest lush hayfields of clover (Trifolium spp.) and Alfalfa (Medicago sativa) are used for nesting, as are large tracts of tall-grass prairie in Minnesota and Iowa. In Oklahoma short-grass prairie and sparsely vegetated pasturelands are chosen. Georgia breeding sites characteristically occur in old fields 3 to 15 years of age where low grasses are moderately dense and forbs are abundant (various authors, cited by Wiens 1969). Wisconsin birds have been found in pasturelands vegetated by such grasses as Kentucky Bluegrass (Poa pratensis) and Timothy (Phleum pratense) and such forbs as fleabane (Erigeron spp.), Milkweed (Asclepias syriaca), and Sweet Clover (Melilotus officinalis, Wiens 1969). Birds in Pennsylvania have nested in pastures of Orchard Grass (Dactylis glomerata), Alfalfa, and clover, and in old fields of Wild Oat Grass (Danthonia spicata), bramble (Rubus spp.), and bluestem (Andropogon spp., Smith 1963). On Long Island, New York, Grasshopper Sparrows inhabited the Hempstead Plains, a natural Little Bluestem (A. scoparius) prairie which has since been destroyed through urbanization. Aside from the natural nesting area on Long Island, most northeastern birds nest in pastures, hayfields, or on the drier upland borders of salt marshes (Bull 1964, Sage et al. 1913).

Breeding range: Southern Canada to Ecuador. The subspecies pratensis occurs in Connecticut (AOU 1957).

Notes: The Grasshopper Sparrow is declining in portions of its range, particularly in the northeast, as agricultural lands are abandoned and urbanization extends into rural areas (Arbib 1975, Bull 1964). It was a common breeder in Connecticut in the early twentieth century (Sage et al. 1913), but it has declined greatly since then.

The Grasshopper Sparrow, unlike some other grassland-breeding birds, can persist in hayfields that are mowed during the breeding season. Because it builds its nest at or near ground level the nest is usually not destroyed by mowing. The loss of cover does reduce nesting success, however, and populations of Grasshopper Sparrows are generally lower in mowed fields than in unmowed fields (Smith 1963).

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
New Haven	?New Fairfield-no date	Enfield-1874 (Bagg and Eliot 1937)
	?Old Lyme-no date	Saybrook-no details (Merriam 1877)
	?South Windsor-no date	Stratford-no details (Merriam 1877)
	?Glastonbury-no date	Milford-no details (Merriam 1877)
	?Groton-no date	Portland-no details (Merriam 1877)
	?Stonington-no date	Milford-1894 (Univ. Conn. Mus.)
	Sharon	
	East Granby	
	Hartford	
	Simsbury	
	?Guilford-Madison no date	

References:

A.O.U. Checklist Committee. 1957. Checklist of North American birds. 5th ed. Amer. Ornith. Union. 691p.

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Johnston, D. W., and E. P. Odum. 1956. Breeding bird populations in relation to plant succession on the piedmont of Georgia. Ecol. 37:50-62.

Merriam, C. H. 1877. A review of the birds of Connecticut. Tuttle, Morehouse, and Taylor, New Haven. 165p.

Sage, J. H., L. B. Bishop, and W. P. Bliss. 1913. The birds of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 20.

Smith, R. L. 1963. Some ecological notes on the Grasshopper Sparrow. Wilson Bull. 75:159-165.

_____. 1968. Grasshopper Sparrow. p. 725-745. In O. L. Austin (editor). Life histories of North American grosbeaks, buntings, towhees, finches, sparrows and allies. Part 2. U. S. Nat. Mus. Bull. 237.

Wiens, J. A. 1969. An approach to the study of ecological relationships among grassland birds. Orn. Monogr. 8.

Pooecetes gramineus Vesper Sparrow

Status: I, Rare and local; II, State threatened; III, Long-term decline; IV, Widespread (regular); V, Habitat-limited (natural and human)

Breeding habitat: The Vesper Sparrow, an insect and seed-eating species (Berger 1968), inhabits dry, grassy fields throughout much of its range. Vegetative cover in nesting areas is generally sparse and contains grasses, forbs, and widely scattered shrubs or small trees. Shrubs and trees are often used as singing perches (various authors, cited by Wiens 1969).

In Wisconsin, Wiens (1969) found Vesper Sparrows nesting on pastureland vegetated by such grasses as Kentucky Bluegrass (Poa pratensis) and Timothy (Phleum pratense), and various forbs, including fleabane (Erigeron spp.), clover (Trifolium spp.), Dandelion (Taraxacum officinale), thistle (Cirsium spp.), Milkweed (Asclepias syriaca), and Sweet Clover (Melilotus officinalis). In these pastures the Vesper Sparrows inhabited the portions which, in addition to being dry and sparsely vegetated, had relatively low vegetation, a dense ground cover, and a high density of short forbs compared to total vegetation density. In addition, portions of the nesting territories were occupied by short, lawn-like vegetation. Territories were found to occur along fence lines, but farther away from woodlands than other grassland-nesting birds in the area.

In the northeast Vesper Sparrows inhabit agricultural lands primarily, including grainfields, pastures, and hayfields. They also occur in weedy old fields and on coastal sand dunes vegetated by Dune Grass (Ammophila breviligulata, Berger 1968). The Hempstead Plains, a natural Little Bluestem (Andropogon scoparius) prairie that existed on Long Island, was also used by Vesper Sparrows but this area has since been destroyed through urbanization (Bull 1964).

Breeding range: Central British Columbia and Nova Scotia to Central Arizona and North Carolina. The race gramineus occurs in Connecticut (AOU 1957).

Notes: The Vesper Sparrow has declined greatly throughout the northeast in recent years. Habitat loss through urbanization and the decline in agriculture are largely responsible (Bull 1964). It is still a common breeder in much of Canada and the western U. S., however. It bred commonly in Connecticut in the nineteenth century (Sage et al. 1913) but it has largely disappeared since then.

Connecticut breeding since 1950:

Confirmed:	Suspected:	Old records:
Glastonbury	South Windsor	Fairfield County-before 1944 (Yale Univ. Mus.)
	Sharon	
	Litchfield-Morris	Milford-1894 (Univ. Conn. Mus.)
	Simsbury	
	East Granby	Portland-1891 (Univ. Conn. Mus.)

References:

A.O.U. Checklist Committee. 1957. Checklist of North American birds. 5th ed. Amer. Ornith. Union. 691p.

Berger, A. J. 1968. Eastern Vesper Sparrow. p. 858-882. In O. L. Austin (editor). Life histories of North American cardinals, grosbeaks, buntings, towhees, finches, sparrows, and allies. Part 2. U. S. Nat. Mus. Bull. 237.

Bull, J. 1964. Birds of the New York area. Harper and Row , New York. 540p.

Sage, J. H., L. B. Bishop, and W. P. Bliss. 1913. The birds of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 20.

Wiens, J. A. 1969. An approach to the study of ecological relationships among grassland birds. Orn. Monogr. 8.

Cryptotis parva Least Shrew

Status: I, Indeterminate; II, Indeterminate; III, Indeterminate; IV, Widespread (regular); V, Peripheral

Habitat: Open grassy areas, sometimes with scattered shrubs; marshes are also used (Burt and Grossenheider 1975). Other habitats in which it commonly occurs include power lines, old fields, and roadsides (Golley et al. 1965).

Along the Virginia coast the Least Shrew is a regular inhabitant of tidal marshes and offshore islands, particularly in the vicinity of tidal creeks. Characteristic vegetation in areas where it is found includes dense growths of Spike Grass (Distichlis spicata), Salt Marsh Grass (Spartina alterniflora), and Glasswort (Salicornia europa). Marsh Elder (Iva frutescens) and Groundsel Tree (Baccharus halmifolia), growing in drier parts of the marsh, apparently serve as cover for nests on occasion (Hamilton 1944).

In Ohio the Least Shrew has been found in weedy old fields two to five years in age. In these areas, dead sticks and rotted plant material form a thin ground cover and taller weeds and grasses form a sparse canopy about a meter above the ground. Common plant species present include goldenrod (Solidago spp.), aster (Aster spp.), ground cherry (Physalis spp.), speedwell (Veronia spp.), ragweed (Ambrosia spp.), plantain (Plantago spp.), nightshade (Solanum spp.), bramble (Rubus spp.), oat grass (Dactylis spp.), foxtail grass (Setaria spp.), bluegrass (Poa spp.), brome grass (Bromus spp.), and wild rye (Elymus spp.). Dead stalks of Timothy (Phleum pratense) and Corn (Zea mays) still remain from when the fields were cultivated (Gottschang 1965).

In New York Least Shrews have been found in orchards, in open fields with dense grass cover, and in weedy gardens. Forested areas are generally avoided, although they have been collected in moist woods near a clearing in northern Indiana. In the Great Smokey Mountains they are known to occur in fallow fields at low elevations and in open grassy patches along the forest edge at elevations as high as 881m (Hamilton 1944). A specimen from Connecticut was collected from under a log at the upland border of a salt meadow (Goodwin 1942).

Similarly to other shrews, the Least Shrew is a primarily carnivorous. It preys upon insects, worms, centipedes, molluscs, and similar animals. It also eats some vegetable matter (Hamilton 1944). In salt marsh habitats it undoubtedly eats various marine invertebrates.

Range: Central South Dakota and southwestern Connecticut to eastern Mexico and Florida (Burt and Grossenheider 1976, see also Jarrel 1965). The subspecies parva occurs in much of the range, including Connecticut (Hall and Kelson 1959).

Notes: The Least Shrew reaches its extreme northeastern range limit along the western Connecticut shore, where it has only been recorded on two occasions (a third record for Salisbury is incorrect-see Jarrel 1965). It has not been collected at all in recent years, and its current status in the state is unknown. Most likely it is still present, but has gone unreported because of insufficient field work in areas where it might occur. Intensive trapping might be needed to detect its presence, as several authors (eg. Barbour and Davis 1974, Hamilton 1944) state that it is difficult to trap.

Connecticut records since 1950:

Confirmed:	Suspected:	Old records:
		Darien-1800's existence of specimen unknown (Lindsey 1842).
		Westbrook-1941 (Goodwin 1942)

References:

Barbour, R. W., and W. H. Davis. 1974. Mammals of Kentucky. Univ. Press of Kentucky, Lexington. 322p.

Burt, W. H., and R. P. Grossenheider. 1976. A field guide to the mammals. 3rd ed. Houghton Mifflin Co., Boston. 289p.

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Jarrel, G. H. 1965. A correction on the range of Cryptotis parva in New England. J. Mammal. 46:671.

Lindsey, J. H. 1842. A catalogue of Mammalia of Connecticut. Amer. J. Sci. 43:345-355.

Myotis keeni Keen's Bat

Status: Deleted, formerly considered rare

Habitat: "Mine tunnels, caves, buildings, hollow trees, storm sewers, forested areas" (Burt and Grossenheider 1975).

Range: Western Saskatchewan and Newfoundland to southern Nebraska, eastern Oklahoma, northwestern Florida, and eastern North Carolina. Also from the Alaska panhandle to western Washington, and in southeastern Arizona, southwestern New Mexico, and northwestern Mexico (Burt and Grossenheider 1976). The subspecies septentrionalis occurs in the east and midwest (Hall and Kelson 1959).

Notes: On the basis of comments provided by Mr. Robert Dubos, Curator of Vertebrates at the University of Connecticut, the Keen's Bat is deleted from the list of rare Connecticut mammals (see also Choate and Dubos 1971). Data which are currently available indicate that this species occurs regularly throughout the state, although it is perhaps not as common as some of Connecticut's bats. Part of the confusion concerning its status arose because some specimens in the University of Connecticut collection were previously misidentified and cataloged as Little Brown Bats (M. lucifugus).

Connecticut records since 1950:

Confirmed:

Westport
Salisbury
Mansfield
Tolland
Roxbury
East Hampton

Suspected:

Old records: (Goodwin 1935)

Hamden-existence of specimens unknown.
New Haven-existence of specimens unknown.

References:

Burt, W. H., and R. P. Grossenheider. 1976. A field guide to the mammals. 3rd ed. Houghton Mifflin Co., Boston 289p.

Choate, J. E., and R. E. Dubos. 1971. Distributional status of four species of Connecticut mammals. Univ. Conn. Occas. Papers. 2:17-20.

Goodwin, G. G. 1935. The mammals of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 53.

Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. Vol. 1. Ronald Press Co., New York. 546p.

Myotis subulatus Small-footed Myotis

Status: I, Indeterminate; II, Indeterminate; III, Indeterminate; IV, Widespread (regular); V, Habitat-restricted (natural)?

Habitat:

Winter: Caves and mines are the only known hibernating sites. It is a particularly hardy species, not moving into northeastern caves until mid-November and leaving again by March. It is even found in drafty mines and caves; it hibernates near the entrance where winter temperatures go well below freezing and humidity is relatively low. Northeastern individuals often hibernate in narrow crevices in the caves, including cracks in the floors. It has even been found under cave floor rocks (Barbour and Davis 1969).

Summer: Summer roosting occurs in buildings, under rock slabs, beneath stones, under tree bark, in caves, and in crevices in rock or soil. Maternity colonies have been found beneath wallpaper in an abandoned California house (Barbour and Davis 1969).

Like most North American bats, the Small-footed Myotis is a nocturnal insect feeder (Barbour and Davis 1969).

Range: Southern British Columbia, southern South Dakota, and New Brunswick to northern Baja California and Maryland (Burt and Grossenheider 1976). The subspecies leibii occurs in the east (Hall and Kelson 1959).

Notes: The Small-footed Myotis has been described by several authors as being rare in the east (e.g. Barbour and Davis 1969, Davis et al. 1965). One author, however, states that evidence accumulated over the years suggests that it is considerably more common in the east than had been previously thought (Krutzsch 1966). He feels that it has not been detected more frequently because it selects relatively inconspicuous roosting places.

Only two old records exist for the Small-footed Myotis in Connecticut. No specimens have been reported in recent years. It most probably still occurs in the state but is overlooked because of its secretive habits. Negative evidence of its presence obtained during many collecting expeditions would suggest that it is rare, however (Dubos pers. comm).

Connecticut records since 1950:

Confirmed:	Suspected:	Old records:
		Greenwich-1912; 82 individuals; no specimens collected (Seton 1922)
		Roxbury-1939?; existence of specimen unknown (Griffin 1940)

References:

Barbour, R. W., and W. H. Davis. 1969. Bats of America. Univ. Press of Kentucky. 286p.

Burt, W. H., and R. P. Grossenheider. 1976. A field guide to the mammals. 3rd ed. Houghton Mifflin Co., Boston. 289p.

Davis, W. H., M. D. Hassell, and C. L. Rippy. 1965. Myotis leibii leibii in Kentucky. J. Mammal. 46:683-684.

Griffin, D. R. 1940. Notes on the life histories of New England cave bats. J. Mammal. 21:181-186.

Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. Vol. 1. Ronald Press Co., New York. 546p.

Krutzsch, P. H. 1966. Remarks on Silver-haired and Leib's Bats in eastern United States. J. Mammal. 47:121-122.

Seton, E. T. 1922. A roving band of Say's Bats. J. Mammal. 3:52.

Myotis sodalis Indiana Bat

Status: I, Indeterminate; II, U. S. Endangered; III, Long-term decline? IV, Widespread (rare); V, Habitat-restricted (natural and human)

Habitat:

Winter: Caves and mines are inhabited for roosting and hibernating. They are used from September to early May. Mating takes place in the caves in early October, and the winter months are spent in hibernation (Barbour and Davis 1969).

Apparently few caves are suitable for Indiana Bats. About 90 percent of the known population (400,000 individuals) winter in two caves in Kentucky and in a cave and mine in Missouri. The bats inhabit the warmest part of the caves in autumn, but as the season progresses they move to cooler parts of the caves. Favored hibernation sites are generally 3^{o} to 5^{o} C and have a humidity ranging from 66 to 95 percent. In spring this process is reversed (Barbour and Davis 1969).

Summer: Little is known of the summer habits of Indiana Bats. It is believed that they summer singly or in small groups in hollow trees, beneath loose bark, under bridges, and occasionally in buildings. As they are intolerant of high temperatures such sites as hot attics, frequently used by Little Brown Bats (M. lucifugus), do not appear to be suitable roosting sites (Barbour and Davis 1969).

An apparent nursery colony, previously unreported for this species, has recently been found in northwestern Missouri in a 25-acre ungrazed virgin forest. The forest is adjacent to a small pond and bisected by a small stream. Dominant tree species include oaks (Quercus spp.), hickories (Carya spp.), and Basswood (Tilia americana). Farmland surrounds the forests. Nine (six pregnant) females were collected in the vicinity of this forest, but none were found in searches of a number of disturbed forest tracts. A single pregnant female was also collected near another very similar virgin tract. It therefore seems that mature forest growth is an important habitat requirement for females preparing to give birth (Easterla and Watkins 1969).

The Indiana Bat, like most North American bats, is a nocturnal insect feeder (Burt and Grossenheider 1976). Easterla and Watkins (1969) collected foraging individuals over a tiny pool in a wooded ravine containing numerous waterholes, over a small pond, and over woodland streams.

Range: Southern Wisconsin and eastern New Hampshire to eastern Oklahoma and northwestern Florida. No subspecies are recognized (Hall and Kelson 1959, see also Barbour and Davis 1969).

Notes: The Indiana Bat has declined precipitously through much of its range in recent years. Populations that inhabited caves and mines in New England, New York, and Pennsylvania thirty years ago have all but disappeared. Colonies in West Virginia, Indiana, and Illinois have also nearly disappeared since the 1950's, and several populations in Missouri have been seriously depleted in numbers (Barbour and Davis 1969).

In a study of survival rates of Indiana Bats, Humphrey and Cope (1977) found that undisturbed hibernating populations had a high rate of survival. Habitat destruction by man is described as primary cause of the species' decline. One instance is cited where the construction of a rock wall in a cave decreased the cave's carrying capacity by increasing its winter temperature. They state "at higher temperatures, hibernating bats presumably metabolized their fat reserves more rapidly, emerged in spring in poorer condition, and suffered greater mortality while attempting to migrate."

Indiana Bats have only been recorded in Connecticut at one locality. Griffin (1940) reported 224 hibernating in an old mine in Roxbury. This mine has since been sealed off (Dubos pers. comm.). While no recent specimens have been taken, it is possible that they still winter in limestone solution caves in western Connecticut or in caves formed from great boulders in the state's northwestern corner. Summering individuals and nursery colonies might also occur in the state, as suitable mature forests are present in many localities, but as yet this has not been proven.

Connecticut records since 1950:

Confirmed:	Suspected:	Old records:
		Roxbury-1939? existence of specimens unknown (Griffin 1940)

References:

Barbour, R. W., and W. H. Davis. 1969. Bats of America. Univ. Press of Kentucky. 286p.

Burt, W. H., and R. P. Grossenheider. 1976. A field guide to the mammals. 3rd ed. Houghton Mifflin Co., Boston. 289p.

Griffin, D. R. 1940. Notes on the life histories of New England cave bats. J. Mammal. 21:181-186.

Easterla, D. H., and L. C. Watkins. 1969. Pregnant Myotis sodalis in northwestern Missouri. J. Mammal. 50:372-373.

Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. Vol. 1. Ronald Press Co., New York. 546p.

Humphrey, S. R., and J. B. Cope. 1977. Survival rates of the endangered Indiana Bat, Myotis sodalis. J. Mammal. 58:32-36.

Glaucomys sabrinus Northern Flying Squirrel

Status: I, Rare and local; II, Vulnerable; III, Indeterminate; IV, Widespread (regular); V, Peripheral

Habitat: Primarily associated with the coniferous forests of the boreal zone. In the east it is also known to inhabit Hemlock (Tsuga canadensis)-Yellow Birch (Betula lutea) forest associations (Banfield 1974).

Little recent literature seems to exist on the habitat requirements of this species in the eastern parts of its range. In northern New York it has been found on a river island vegetated by oaks (Quercus spp.) and hickories (Carya spp.), where surrounding mainland vegetations consist of American Beech (Fagus grandfolia), birch, and maple (Acer spp, Werner 1956). In the Adirondack Mountains it is believed to occur above tree line (Gordon 1962). Connecticut specimens have come from the mountainous northwestern and northeastern portions of the state where the dominant forest vegetation includes White Pine (Pinus strobus), Hemlock, and the northern hardwoods.

Northern Flying Squirrels feed upon epiphytic lichens, buds, leaves, seeds, fruits, and nuts. It also eats insects, birds, and eggs (Banfield 1974).

Range: Central Alaska and Newfoundland to southern California (in mountains), southern Utah (in mountains), central Saskatchewan, western Pennsylvania, western North Carolina (in mountains), and western Massachusetts. The subspecies macrotis occurs in Connecticut (Hall and Kelson 1959).

Notes: The Northern Flying Squirrel apparently reaches its southern range limit in the mountainous regions of the northern portions of the state (Choate and Dubos 1971). It has only been collected on two occasions, however, and its status is poorly known. It apparently occurs as a regular but very rare and local resident.

Connecticut records since 1950:

Confirmed:	Suspected:	Old records:
Union		
Barkhamsted		

References:

Banfield, A. W. 1974. The mammals of Canada. Univ. Toronto Press, Toronto. 438p.

Choate, J. R., and R. E. Dubos. 1971. Distributional status of four species of Connecticut mammals. Univ. Conn. Occas. Papers. 2:17-20.

Gordon, D. C. 1962. Adirondack record of Flying Squirrel above timber line. J. Mammal. 43:262.

Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. Vol. 1. Ronald Press Co., New York. 546p.

Werner, W. E., Jr. 1956. Mammals of ths Thousand Islands region, New York. J. Mammal. 37:395-406.

Peromyscus maniculatus Deer Mouse

Status: I, Local; II, Vulnerable; III, Stable?; IV, Widespread (regular); V, Peripheral

Habitat: The Deer Mouse inhabits nearly all terrestrial habitats in its vast range. Forests, grasslands, and a mixture of the two are used in various areas. It does appear to prefer dry sites, however (Burt and Grossenheider 1976, Banfield 1974).

In northern Vermont the Deer Mouse has been found inhabiting forested areas vegetated by Balsam Fir (Abies balsamea), White Spruce (Picea glauca), Hemlock (Tsuga canadensis), Sugar Maple (Acer saccharum), and American Beech (Fagus grandifolia). Coniferous cover compromises 54 percent of the total tree cover in these areas. Shrub cover is less than 10 percent, although the lower limbs of the conifers (within 0.5 to 2.0 m. of the surface) cover 75 percent of the level ordinarily occupied by shrub crowns. Herbaceous cover averages 15 percent and litter cover is relatively heavy (Miller and Getz 1977).

Deer Mice in central New York are found to occur predominantly in forested areas vegetated by Hemlock-White Pine (Pinus strobus)-northern hardwood associations. Characteristic northern hardwoods include Yellow Birch (Betula lutea), American Beech, Black Maple (A. nigrum), and Striped Maple (A. pennsylvanicum). Dominant fern species include Christmas Fern (Polystichum acrostichoides), New York Fern (Thelypteris noveboracensis), Spinulose Wood Fern (Dryopterisi austriaca), and Marginal Shield Fern (D. marginalis). The mice appear to be most closely associated with "an edaphic climax association which is said to occur in habitats of dry soil and cooler-than-normal climate" (Klein 1960).

In Connecticut the Deer Mouse has been collected in forested areas in the mountainous northwestern portion of the state. Both mixed forests and Red Pine (P. resinosa) plantations are known to be inhabited. Similarly to the Deer Mouse in New York (Klein 1960), it appears to be completely absent from oak (Quercus spp.)-hickory (Carya spp.) forests.

The Deer Mouse feeds primarily upon seeds. Winter food consists of various nuts, seeds, and acorns, which it stores near its nest. In summer it eats a variety of grass and forb seeds, as well as fruits and mushrooms. In spring, it eats seeds from trees, buds, and young leaves. Animal matter is also eaten, including various insects, larvae, and spiders (Banfield 1974).

Range: Central Alaska and Newfoundland to Baja California, Mexico, southern Texas, northeastern Georgia, and western Massachusetts (Burt and Grossenheider 1976). The subspecies gracilis occurs in Connecticut (Hall and Kelson 1959).

Notes: The Deer Mouse, an abundant species in much of its range, is currently believed to be of only very local distribution in Connecticut. All specimen records are from the northwestern corner of the state, where it apparently reaches its eastern range limit (a previous record from Pomfret in northeastern Connecticut was based on an incorrectly identified specimen; Waters 1962). Where it occurs in the state, it may be fairly common or even abundant, but as with any species that is highly localized in its

distribution, it is vulnerable to habitat destruction through suburban development or similar activities.

Connecticut records since 1950:

Confirmed:	Suspected:	Old records:
Goshen		
Barkhamsted		
Kent		
Winchester		

References:

Banfield, A. W. 1974. The mammals of Canada. Univ. Toronto Press, Toronto. 438p.

Burt, W. H.,and R. D. Grossenheider. 1976. A field guide to the mammals. 3rd ed. Houghton Mifflin Co., Boston 289p.

Choate, J. R. 1973. Identification and recent distribution of the White-footed Mice (Peromyscus) in New England. J. Mammal. 54:41-49.

Hall, E. R. and K. R. Kelson. 1959. The mammals of North America. Vol. II. Ronald Press Co., New York. 536p.

Klein, H. G. 1960. Ecological relationships of Peromyscus leucopus noveboracensis and P. manculatus gracilis in central New York. Ecol. Monogr. 30:387-407.

Miller, D. H., and L. L. Getz. 1977. Comparisons of population dynamics of Peromyscus and Clethryonomys in New England. J. Mammal. 58:1-16.

Waters, J.H. 1962. Range of Peromyscus maniculatus in southern New England. J. Mammal. 43:102.

Neotoma floridana Eastern Woodrat

Status: I, Rare and local?; II, Vulnerable?; III, Indeterminate; IV, Widespread (regular); V, Peripheral

Habitat: Rocky cliffs are inhabited in the northeast. In contrast, southeastern woodrats are found in swamps, hummocks, and areas vegetated by Cabbage Palmettos (Sabal palmetto). In the west they are associated with growths of yuccas (Yucca spp.) and cacti (Burt and Grossenheider 1976).

Eastern Woodrats in the Allegheny Mountains of Pennsylvania are characteristically associated with rock ledges, clefts, and rock slides. Bare rock patches on mountain slopes consisting of large boulders of weathered sandstone are used extensively. Numerous deep crevices and galleries, often extending to a great depth, exist in such areas and serve as nesting sites (Poole 1940).

Rock formations like those in Pennsylvania are also used in other parts of the northeast. The basalt ridges along the Hudson River (the Palisades) and the limestone cliffs and caves of Ohio, Indiana, Kentucky, Tennessee, and Virginia all provide suitable habitat for woodrats (Poole 1940). In Connecticut, the Eastern Woodrat is believed to occur in similar rock slide areas in mountainous country.

Eastern Woodrats feed upon various types of plant materials, including nuts, fruits, green fungi, lichens, shoots, and leaves (Poole 1940).

Range: Southwestern South Dakota, Kentucky, and southeastern New York to central Texas and central Florida. The subspecies magister occurs in the northeast (Hall and Kelson 1959).

Notes: The presence of the Eastern Woodrat is usually detected easily by the presence of large mounds of sticks and debris that are piled at the entrance of its rock crevice, cave, or ledge nest site. The nest itself is placed further back in a protected spot (Barbour and Davis 1974).

Although several authors list it as occurring in Connecticut, including Goodwin (1935) and Hall and Kelson (1959), no definite proof exists that the Eastern Woodrat has ever been present in the state. Intensive field work by the University of Connecticut in the extreme western portions of the state (the supposed northeastern range of the species) has also failed to produce conclusive evidence of its presence (Dubos pers. comm.). However, sightings of stick mounds and of individuals continue to be reported by reliable observers, and therefore, it still seems highly possible that it does inhabit some of the more remote mountains of the western part of the state.

Connecticut records since 1950:

Confirmed:	Suspected:	Old records:
	Cornwall	Kent-no date, existence of specimens unknown (Goodwin 1935)

References:

Barbour, R. W., and W. H. Davis. 1974. Mammals of Kentucky. Univ. Press of Kentucky, Lexington. 322p.

Burt, W. H., and R. P. Grossenheider. 1976. A field guide to the mammals. Houghton Mifflin Co., Boston. 289p.

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Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. Vol. 2. Ronald Press Co., New York. 536p.

Poole, E. L. 1940. A life history sketch of the Allegheny Woodrat. J. Mammal. 21:249-270.

Newcombe, C. L. 1930. An ecological study of the Allegheny Cliff Rat. J. Mammal. 11:204-211.

Synaptomys cooperi Southern Bog Lemming

Status: I, Local; II, Vulnerable; III, Stable?; IV, Widespread (regular); V, Habitat restricted (natural)

Habitat: The Southern Bog Lemming inhabits low, damp spots with a heavy growth of vegetation, particularly such sites as open bogs and wet meadows. Sphagnum moss is often abundant in areas where it occurs. Other types of habitats where it has been recorded include Beech (Fagus grandifolia)-maple (Acer spp.), oak (Quercus spp.)-hickory (Carya spp.), pine (Pinus spp.), and spruce (Picea spp.)-fir (Abies spp.) forests, Bluegrass (Poa pratensis) fields, orchards, weedy fields, and marshes (Burt and Grossenheider 1976, Conner 1959).

In the southern New Jersey pine barrens, the chief requirement of the Southern Bog Lemming (subspecies stonei) appears to be the presence of green, succulent monocots, primarily grasses and sedges, which serve as a source of food. Sphagnum bogs with ericaceous shrubs, particularly Leatherleaf (Chamaedaphne calyculata), and sizeable stands of sedge, especially Carex spp., are the most characteristic habitats used during the summer months. Mature bogs vegetated by dense stands of Atlantic White Cedar (Chamaecyparis thyoides) are not inhabited, however. During fall and winter the bog lemmings leave the wetlands for the most part and move into the adjacent pine woodlands and fields. They generally move 15 to 18m. (49m. max.) into the uplands (Conner 1959).

Habitats used in Ontario (subspecies cooperi) are often similar to those occupied in New Jersey. Sphagnum, Leatherleaf, and Carex are important constituents of the plant communities at many of the localities where the bog lemming occurs (Conners 1959). It has also been found at various times of the year in dense Black Spruce (Picea mariana)-Sphagnum bogs, dry Red (P. resinosa) and White (P. strobus) pine forests, and dry hilltops among grasses and lichens. Maple-birch (Betula spp.)-Hemlock forests with a dense understory of Red Maple (A. rubrum) seedlings and a thick leaf litter have been inhabited as well (Coventry 1942).

In northwestern Connecticut the bog lemming has been found in shaded, cool, wet pockets in dense forests where the floor is overgrown with ferns, Sphagnum, and other mosses (Goodwin 1932). In the eastern part of the state it has been found at various times of the year in low, wet thickets of shrubs and matted grass, Alder (Alnus rugosa) thickets, sedge stands in swamps along woodland streams (vegetated by forbs and graminolds), and in upland forests. It probably also occurs in Atlantic White Cedar swamps in eastern Connecticut, although no specimens have as yet been taken in them.

Range: Southeastern Manitoba and Nova Scotia to southern Kansas and eastern North Carolina (Burt and Grossenheider 1976). The subspecies cooperi occurs in northwestern Connecticut and the subspecies stonei occurs in eastern Connecticut (Wetzel 1955).

Notes: The Southern Bog Lemming has only been collected in Connecticut on several occasions, and little in known concerning its current status. This lack of records is undoubtedly due to its relative rarity compared to the state's other small mammals, although intensive field studies in appropriate habitats may reveal that it is somewhat more widespread than currently thought. It is doubtful, however, that it will ever be considered a common inhabitant of the state.

Connecticut records since 1950:

Confirmed:	Suspected:	Old records:
Ashford		
Windham		
Griswold		
Mansfield		
Kent		

References:

Burt, W. H., and R. P. Grossenheider. 1976. A field guide to the mammals. 3rd ed. Houghton Mifflin Co., Boston. 289p.

Conner, P. F. 1959. The Bog Lemming Synaptomys cooperi in southern New Jersey. Michigan St. Univ. Publ. 1(5).

Coventry, A. F. 1942. Synaptomys cooperi in forested regions. J. Mammal. 23:450-451.

Goodwin, G. G. 1932. New records and some observations on Connecticut mammals. 13:36-40.

_____. 1935. The mammals of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 53.

Wetzel, R. M. 1955. Speciation and dispersal of the Southern Bog Lemming, Synaptomys cooperi (Baird). J. Mammal. 36:1-20.

Ursus americanus Black Bear

Status: 1, Rare and local; II, Vulnerable; III, Increasing?; IV, Widespread (regular); V, Exploited

Habitat: Forested areas are used in the east. Both coniferous and deciduous forests are suitable, as are swamps and berry patches. Where Black Bears hibernate (northern portions of their range), they choose such sites as caves, rock crevices, hollow logs, windthrown stumps, holes beneath trees or roots, and even mossy hollows beneath low tree branches as denning sites (Banfield 1974, Burt and Grossenheider 1976).

The home range of Black Bears in areas where they occur regularly has been estimated to be roughly 202 square km. There is a great deal of overlap in home ranges, however (apparently without conflict), and bear density in suitable habitat may be one per 14.5 square km. Older bears are believed to range farther than younger ones-up to 24 km from their home base (Banfield 1974).

In Michigan Black Bears have been found in autumn in the following habitats: hardwood swamps, conifer swamps, mixed swamps, upland hardwoods, upland conifers, mixed forests, mixed swamp and upland, marshes, orchards, dumps, and open fields. They are most frequently associated with conifer swamps, mixed swamps, and upland hardwoods. Winter denning sites usually consist of holes dug beneath logs or stumps or holes dug in into hillsides (Erickson et al. 1964). On one occasion a tree cavity in a swamp vegetated by Northern White Cedar (Thuja occidentalis), spruce (Picea spp.), and White Pine (Pinus strobus) was noted to have been used (Switzenberg 1955).

Although Black Bears have been reported from a number of spots around Connecticut, it is too difficult to detect any specific habitat preference at present. Judging from the data presented above, probably all extensive forested areas in the state are suitable.

Black Bears are omnivorous. When first emerging from hibernation spruce needles, buds, herbaceous plants, insects, and even carrion are eaten. Later in summer fruits, nuts, and roots are important items in the diet. In fall insects, fruits, and nuts are eaten. Small mammals and fish are preyed upon to some extent, and garbage will be eaten where it is available (Banfield 1974).

Range: Northern Alaska and Newfoundland to southern California (in mountains), northern Mexico (in mountains), southern Saskatchewan, eastern New York, northern Georgia (in mountains), and western Massachusetts. Also from the lower Mississippi River Valley and Gulf Coast to Florida (Burt and Grossenheider 1976). The subspecies americanus occurs in Connecticut (Hall and Kelson 1959).

Notes: The Black Bear was apparently extirpated from Connecticut in the nineteenth century, largely because of overhunting. In addition, habitat destruction through forest clearing and intensive use of the land for agriculture was probably responsible to some extent (Goodwin 1935).

In recent years bears have apparently begun to reestablish themselves in Connecticut, as they have now been sighted in a number of spots around the state. The Connecticut bears are most likely descendants from populations that managed to persist in more remote northern portions of New England. These remnant populations apparently have increased and expanded their ranges south as hunting pressure has decreased and abandoned farmlands have reverted to forest (see also Cardoza 1973).

In Connecticut Black Bears probably occur most frequently in the remote mountainous parts of the northwestern portion of the state (see also Cardoza 1973). However, there is evidence that they occur (although very rarely and locally) throughout the state. There is also some evidence that breeding is taking place.

Connecticut sightings since 1950:

Confirmed:	Suspected:		Old records:
	Westbrook	Norfolk	Kent-1934 sighting (Goodwin, 1935)
	Vernon	Old Saybrook	
	Woodstock	Groton	
	Salisbury	Killingly	
	Union	Coventry	
	Chaplin		

References:

Banfield, A. W. 1974. The mammals of Canada. Univ. Toronto Press, Toronto. 438p.

Black, H. C. 1958. Black Bear research in New York. Trans. North Amer. Wildl. Conf. 23:443-461.

Burt, W. H., and R. P. Grossenheider. 1976. A field guide to the mammals. 3rd ed. Houghton Mifflin Co., Boston. 289p.

Cardoza, J. E. 1973. Bay State bruins-past and present. Mass. Wildl. 24:10-14.

Erikson, A. W., J. Nellor, and G. A. Petrides. 1964. The Black Bear in Michigan. Michigan St. Univ. Agr. Expt. Sta. Res. Bul 4.

Goodwin, G. G. 1935. The mammals of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 53.

Hall, E. R. and K. P. Kelson. 1959. The mammals of North America. Vol. II. Ronald Press Co., New York. 536p.

Switzenberg, D. A. 1955. Black Bear denning in trees. J. Mammal. 36:459.

Jonkel, C. J. and I. M. Cowan. 1971. The Black Bear in the spruce-fir forest. Wildl. Monogr. 27.

Martes pennanti Fisher

Status: I, Indeterminate; II, Indeterminate; III, Increasing?; IV, Widespread (regular); V, Exploited

Habitat: The Fisher is primarily an inhabitant of the extensive forested regions of northern North America and the Rocky Mountains. It occurs in climax coniferous forests and in deciduous growth, including hardwood timber and subclimax deciduous stands. Although preferring heavily forested tracts, it also frequents open, second growth woodlands and recently burnt areas vegetated by such species as willow (Salix spp.), birch (Betula spp.), and aspen (Populus spp.). In parts of its range it appears to prefer lowlands near streambanks and low wet ground (Banfield 1974, Hagmeier 1956).

Maine Fishers inhabit vast, mountainous wilderness areas averaging over 320m elevation (approx. 1613m max.) and vegetated by spruce (Picea spp.)-fir (Abies spp.)-northern hardwood forests. In recent years they have also colonized second growth hardwood forests, old fields, and second growth forests interspersed with farms and villages. They have not invaded the comparatively flat coniferous forests containing a high proportion of boggy terrain, however (Coulter 1950). This contrasts with their habitat preferences in other portions of their range.

In Ontario the Fisher occurs in coniferous, mixed, and maple (Acer spp.)-Yellow Birch (B. lutea) forests. In Connecticut the Fisher may inhabit the northern hardwood-Hemlock (Tsuga canadensis) forests in remote, mountainous portions of the state.

Range: Northern British Columbia and southern Labrador to southern California (in mountains), northwestern Wyoming (in mountains), and southern Maine (Burt and Grossenheider 1976). The subspecies pennanti occurs in the east (Hall and Kelson 1959).

Notes: The Fisher was formerly more abundant and widespread than it is at the present time. Intensive fur trapping eliminated it from much of the northeastern U.S. and the maritime provinces of Canada by 1930. However, with legal protection it has begun to increase and expand into areas where it had been extirpated. The first signs of recovery in the northeast were noted in the 1940's, and by the 1950's it had spread from remote strongholds into portions of New York, New Hampshire, Maine, and New Brunswick (Coulter 1960).

Although the Fisher apparently occurred in Connecticut originally, it seems to have been extirpated by the early twentieth century (Goodwin 1935). Heavy trapping pressure and the nearly complete logging of forested areas were undoubtedly responsible for its disappearance. As yet unconfirmed evidence has indicated, however, that the Fisher may be recolonizing the state. This seems likely, as much of the land has regrown to forest and an important prey species, the Porcupine (Erethizon dorsatum), has increased greatly in numbers in Connecticut. It is believed that the Fisher now occurs in the northwestern portion of the state.

Connecticut records since 1950:

Confirmed:

Suspected:

Old records:

124 trapped in Conn. in 1924-no localities given (Goodwin 1935)

References:

Banfield, A. W. F. 1974. The mammals of Canada. Univ. Toronto Press, Toronto. 438p.

Burt, W. H., and R. P. Grossenheider. 1976. A field guide to the mammals. 3rd ed. Houghton Mifflin Co., Boston. 289p.

Coulter, M. W. 1960. The status and distribution of Fisher in Maine. J. Mammal. 41:1-9.

Goodwin, G. G. 1935. The mammals of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 53.

Hagmeier, E. M. 1956. Distribution of Marten and Fisher in North America. Can. Field Nat. 70:149-158.

Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. Vol. 2. Ronald Press. Co., New York. 536p.

Felis concolor cougar Eastern Cougar

Status: I, Indeterminate; II, U. S. Endangered; III, Increasing?; IV, Indeterminate; V, Exploited

Habitat: Little is known of the habitat requirements of this subspecies. The species as a whole is described as now being largely restricted to rugged mountainous localities. However, a wide variety of other habitats, including swamps, wooded river valleys, dense coniferous forests, prairies, and salt marshes are known to have been frequented in North America. It has been recorded from sea level to 3,550m in elevation in California. Dens may be placed in caves, in crevices among rocks, under overhanging banks or trees, in hollow stumps, or in thickets (Banfield 1974, Young and Goldman 1946).

Although little information exists on habitat use by the Eastern Cougar, the available evidence suggests that it originally occurred throughout the northeastern forests from sea level to high elevations. It was apparently most abundant in mountainous areas. In New York it was described as being most common in the Adirondack Mountains; in Pennsylvania it was considered most common in the Allegheny Mountains; and in Virginia the Blue Ridge and Allegheny Mountains were reported to provide ideal habitat for it. At lower elevations, the Great Dismal Swamp of Virginia and North Carolina was described as supporting a number of cougars (Young and Goldman 1946). In Connecticut a number of recent sightings have occurred on the heavily forested traprock ridges.

Originally, the most important habitat requirement for the Eastern Cougar was probably the presence of its major prey-the White-tailed Deer (Odocoileus virginicus-see Banfield 1974). The cougars distribution and abundance was likely most closely associated with the distribution and abundance of the deer rather than with features of the terrain or forest type.

Winter home range size of cougars in Idaho ranges from 13 to 52 square km in females. Males utilize even larger areas. Male home ranges apparently do not overlap with other males, while female home ranges may overlap with either sex (Hornocker 1969).

Range: Formerly from southeastern Ontario and Nova Scotia to southern Tennessee and central South Carolina (Hall and Kelson 1959). Its current distribution is largely unknown, although it has been reported from a number of spots in its former range (eg. Banfield 1974, Linzey and Linzey 1971). The species as a whole was originally found throughout much of North and South America; in North America it now occurs regularly only in the far west (Burt and Grossenheider 1976, Young and Goldman 1946).

Notes: The Eastern Cougar was nearly brought to extinction in the nineteenth century, largely because it was heavily hunted to protect livestock, game, and people from being attacked. Undoubtedly the near extermination of the White-tailed Deer during the same time period also affected it adversely. For a while it was believed to have actually become extinct (Young and Goldwan 1946), but more recent evidence indicates that it has survived in at least several areas (eg. Banfield 1974, Linzey and Linzey 1971). The secretive and solitary nature of the cougar has apparently allowed it to escape complete extirpation.

Although originally occurring in Connecticut, the Eastern Cougar was apparently extirpated by the early nineteenth century (Goodwin 1935). In recent years, however, a number of sightings have been reported, and at least some of the reports are probably correct. While it is unlikely that any indigenous stock of cougars remains in Connecticut, it is possible that individuals from remnant populations in remote northern areas have begun to range south. Such populations may now be expanding their ranges as a result of little or no hunting pressure, increased deer populations, and the abandonment of northeastern farmland. The reversion of farmland to forest, while perhaps not benefiting cougars directly, has reduced the potential for human contact. With vast areas of the northeast now heavily forested and containing large deer populations, it would seem that an ample supply of suitable habitat is currently available.

Connecticut sightings since 1950:

Confirmed:	Suspected:	Old records:
	Canton	Northern Connecticut, particularly Litchfield County-formerly present (Goodwin 1935).
	Avon	
	Stafford	
	Middletown	
	New Hartford	
	Rocky Hill	
	Winchester	
	Barkhamsted	
	Granby	

References:

Banfield, A. W. 1974. The mammals of Canada. Univ. Toronto Press, Toronto. 438p.

Burt, W. H., and R. P. Grossenheider. 1976. A field guide to the mammals. 3rd ed. Houghton Mifflin, Co., Boston. 289p.

Goodwin, G. G. 1935. The mammals of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 53.

Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. Vol. II. Ronald Press Co., New York. 536p.

Hornocker, M. G. 1969. Winter territoriality in Mountain Lions. J. Wildl. Manage. 33:457-464.

_____, W. W. Wiles, and J. P. Messick. 1973. Mountain lion social organization in the Idaho Primitive Area. Wildl. Monogr. 35.

Robinette, W. L., J. S. Gashwiler, and O. W. Morris. 1959. Food habits of the Cougar in Utah and Nevada. J. Wildl. Manage. 23:261-273.

Young, S. P., and E. A. Goldman. 1946. The Puma-mysterious American cat. Amer. Wildl. Institute, Washington, DC. 358p.

Linzey, A. V., and D. W. Linzey. 1971. Mammals of Great Smokey Mountains National Park. Univ. Tennessee Press, Knoxville. 102p.

Kinosternon s. subrubrum Eastern Mud Turtle

Status: I, Indeterminate; II, Indeterminate; III, Indeterminate; IV, Widespread (regular); V, Peripheral?

Habitat: Slow-moving, shallow waters in swamps, marshes, wet meadows, ponds, and ditches are inhabited throughout its range. It is tolerant of mildly saline water, and may be found abundantly at the upland border of salt marshes and on offshore islands. Nests are built in open ground near water. Sandy loamy soils are preferred for nesting, but piles of dead plant materials are also used. In these habitats, it eats invertebrates and small vertebrates (Conant 1975, Ernst and Barbour 1972).

In southern Illinois, Mud Turtles are most characteristic of swamps dominated by Swamp Cottonwood (Populus heterophylla) and Buttonbush (Cephalanthus occidentalis). Other common plants present include Pin Oak (Quercus palustris), Swamp White Oak (Q. bicolor), Baldcypress (Taxodium distichum), and Black Willow (Salix nigra). In spring standing water is commonly 15-45 cm. deep in the swamps. The water, although clear in early spring, becomes covered with dust and algae by the end of April. The soil in these areas is hard and covered with a thick layer of leaves (Skorepa and Ozment 1968).

Mud Turtles on Long Island, New York have been found inhabiting an area of shallow, freshwater creeks with muddy bottoms that flow into a brackish bay (Nichols 1947). In New Jersey they have been collected crossing earth dikes that separate shallow freshwater marsh impoundments from slightly brackish Wild Rice (Zizania aquatica) marshes.

Range: Southern Illinois, northern Georgia, and Long Island, New York to southern Mississippi and northern Florida. An isolated population exists in northeastern Illinois (Conant 1975). Although Conant (1975) also reports them as occurring in southwestern Connecticut, no definite evidence exists that they have ever been present in the state.

Notes: At the present time, no native populations of Mud Turtles are known to exist in Connecticut. Specimens previously reported as being collected at East Haven (now in the Peabody Museum of Yale University) are all misidentified Musk Turtles (Sternotherus odoratus). Another recent report of a Mud Turtle in Bethel is, while correctly identified, almost undoubtedly a released specimen. This turtle was captured in the vicinity of a garbage dump where a sea turtle had also been found recently (Klemmens pers. comm.).

While a native population has yet to be found in Connecticut, the proximity of colonies in neighboring New Jersey and New York suggest that it possibly does inhabit the western portion of the state. However, because of its small size and inconspicuous appearance, intensive field work will be necessary to locate it.

Connecticut records since 1950:

Confirmed:	Suspected:	Old records:

References:

Conant, R. 1975. A field guide to reptiles and amphibians of eastern and central North America. 2nd ed. Houghton Mifflin Co., Boston. 429p.

Ernst, C. H., and R. W. Barbour. 1972. Turtles of the United States. Univ. Press of Kentucky, Lexington. 347p.

Nichols, J. T. 1947. Notes on the Mud Turtle. Herpetologica 3:147-148.

Skorepa, A. C., and J. E. Ozment. 1968. Habitat, habits, and variation of Kinosternon subrubrum in southern Illinois. Trans. Ill. State Acad. Sci. 61:247-251.

Clemmys muhlenbergi Bog Turtle

Status: I, Rare and local; II, State threatened; III, Long-term decline; IV, Regional endemic; V, Habitat restricted (natural and human)

Habitat: "Sphagnaceous bogs, swamps, and wet meadows traversed by clear, slow-moving streams" are the habitats most commly used by the Bog Turtle. Mucky soils and grassy or mossy cover are also characteristic features of the habitat. Nesting occurs on grass tussocks, in moss, and in well-drained soil with a southerly exposure (Barton and Price 1955, Warner 1975).

Bog Turtles in northern New York have been found in marl (calcareous) ponds, while on Staten Island they were reported to occur in "marshy borders of small, clear streams" (Barton and Price 1955). In New Jersey they are known to inhabit a wet meadow dissected by a small, fast moving stream and tiny rivulets (Warner 1974).

In southeastern Pennsylvania Bog Turtles occur in a small swamp through which a small stream flows and where a number of small springs give rise to rivulets. Vegetation in the southern part of the swamp consists of Sphagnum moss and such shrubs as Poison Sumac (Rhus vernix), Sweetbay Magnolia (Magnolia virginiana), Speckled Alder (Alnus rugosa), Juneberry (Amelanchier spicata), Swamp Azalea (Rhododendren viscosum), and Highbush Blueberry (Vaccinium corymbosum). A variety of grasses, sedges, and other herbaceous plants also occur. Trees are largely absent. The northern part of the area is marshy, being vegetated by grasses, sedges, and various other herbaceous plants (Barton and Price 1955).

Connecticut turtles have been found in marshes and very open swamps vegetated by sedges, grasses, Skunk Cabbage (Symplocarpus foetidus), Cattails (Typha latifolia), and Marsh Marigold (Caltha palustris). Water in these areas is shallow and clear, and the substrate is composed of soft, deep mud. Sites inhabited vary from "half-acre swamps to ten-mile long watercourses" (Warner 1975). All of Connecticut's colonies are apparently confined to calcareous wetlands.

Bog Turtles are omnivorous and feed upon insects and their larvae, berries, seeds, and snails (Barton and Price 1955).

Range: East-central New York to northern Maryland and southern New Jersey; also western Virginia to western North Carolina. In addition, isolated populations exist in west-central New York and western Pennsylvania. A record for Rhode Island is not generally accepted (Barton and Price 1955, Conant 1975, Warner 1975).

Notes: Although apparently never common, the Bog Turtle has been disappearing from many areas as a result of habitat destruction. Numerous sites formerly inhabited by this species have been drained, filled, or built upon. In addition, the Bog Turtle has been heavily collected for the pet trade, resulting in its extirpation even from areas where suitable habitat remains (Ernst and Barbour 1972, Warner 1975).

Even where it occurs regularly the Bog Turtle is difficult to find. Much of its life is spent buried in mud or concealed beneath thick vegetation. It is most easily detected in spring (April) before vegetation has grown up and when it tends to be particularly active (Barton and Price 1955, Warner 1975).

In Connecticut this turtle is confined to the western portion of the state. Intensive field work in this area by Warner (1975) and Zovickian (pers. comm.) has resulted in the discovery of a number of colonies, and it is hoped that further work in the Housatonic River Valley will result in the discovery of additional colonies (Warner 1975).

Connecticut records since 1950:

Confirmed:	Suspected:	Old records:
9 towns	1 town	

References:

Barton, A. J., and J. W. Price. 1955. Our knowledge of the Bog Turtle, Clemmys muhlenbergi, surveyed and augmented. Copeia 1955:159-165.

Conant, R. 1975. A field guide to reptiles and amphibians of eastern and central North America. 2nd ed. Houghton Mifflin Co., Boston. 429p.

Ernst, C. H., and R. W. Barbour. 1972. Turtles of the United States. Univ. Press of Kentucky, Lexington. 347p.

Warner, J. 1974. Demise of the Muhlenberg? Conn. Herp. Soc. Bull. 5:1-2.

_____. 1975. The Bog or Muhlenberg Turtle, Clemmys muhlenbergi, in Connecticut. Conn. Herp. Soc. Bull. March:2-5.

Emydoidea blandingi Blanding's Turtle

Status: I, Indeterminate; II, Indeterminate; III, Indeterminate; IV, Disjunct?; V, Relict?

Habitat: Chiefly an aquatic species, inhabiting marshes, ponds, bogs, and small streams. Shallow wetlands with a soft, muddy bottom and dense aquatic vegetation are preferred. It is also known to spend some time on land, but it seldom wanders far from an aquatic habitat. Upland areas with sandy soil are preferred for nesting (Conant 1975, Ernst and Barbour 1972).

Blanding's Turtles in Ohio are found in shallow water areas, including ditches, streams, bogs, swamps, marshy portions of lakes, and the extensive marshes bordering Lake Erie. On several occasions they have also been found on rocky islands in Lake Erie (Conant 1951).

In Michigan Blanding's Turtles have occurred in a marshland and a highly eutrophic lake. The marsh, 30.4 ha. in size with 5.7 ha. of open water, is densely vegetated by such aquatic plant species as Coontail (Ceratophyllum demersum), Chara sp., duckweed (Spirodela polyrhiza, Lemna minor), and water lilly (Nymphaea odorata, Nuphar advena). Emergent plants include Cattail (Typha latifolia), Swamp Loosestrife (Decodon verticillatus), Tuckahoe (Peltandra virginica), Bulrush (Scirpus validus), and Arrowhead (Saggitaria latifolia). Various grass and sedge (Carex spp.) species also occur at the upland border. The lake is approximately 8 ha. in size and less than 7 m. deep at its maximum. Vegetation around the lake edges includes water lillies, Coontail, and Pondweed (Potomogeton pectinatus). Several wet swales (usually less than 1 m. of water) are connected to the lake by a channel (Gibbons 1968a, see also Gibbons 1968b).

Blanding's Turtles are omnivorous and feed upon a variety of snails, earthworms, crayfish, fish, carrion, and plant material (Conant 1951).

Range: Central Nebraska, northern Minnesota, and southern Quebec to central Illinois and northeastern Pennsylvania. Isolated populations exist in southern Nova Scotia, southeastern New York, and from southern Maine to southeastern Massachusetts (Conant 1975).

Notes: Although both Lamson (1935) and Conant (1975) list Blanding's Turtle as occurring in Connecticut, apparently no specimen material exists to confirm their statements. At the present time no indigenous populations are known to exist, and the few specimens which have been found in recent years are, on the basis of the circumstances under which they were located, apparently all escaped pets. However, because of the close proximity of known native populations to the Connecticut border, it is highly possible that it may yet turn up in the northeastern or southwestern portions of the state.

Connecticut records since 1950:

Confirmed: Suspected: Old records:

References:

Conant, R. 1951. The reptiles of Ohio. 2nd ed. Univ. Notre Dame Press, Notre Dame. 284p.

_____. 1975. A field guide to reptiles and amphibians of eastern and central North America. 2nd ed. Houghton Mifflin Co., Boston 429p.

Ernst, C. H., and R. W. Barbour. 1972. Turtles of the United States. Univ. Press of Kentucky, Lexington. 347p.

Gibbons, J. W. 1968a. Reproductive potential, activity, and cycle in the Painted Turtle, Chrysemys picta. Ecol. 49:399-409.

_____. 1968b. Observations on the ecology and population dymamics of the Blanding's Turtle, Emydoidea blandingi. Can. J. Zool. 46:288-290.

Lamson, G. H. 1935. The reptiles of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 54.

Eumeces fasciatus Five-lined Skink

Status: I, Rare and local; II, Vulnerable; III, Indeterminate: IV, Widespread (regular); V, Peripheral

Habitat: Throughout much of its range, this species selects woodlands where rotting stumps and logs are abundant, such as cutover woodlots. Rock piles and abandoned piles of boards or sawdust are also frequented. Moist areas are preferred. In these habitats it feeds upon spiders, insects, small snails, small lizards, and baby mice (Barbour 1971, Conant 1975).

In Kentucky and Ohio, where it is common and widespread, the Five-lined Skink is often found inhabiting old buildings, cutover woods, and piles of debris. Moist situations in valleys are favored over drier ridges (Barbour 1971, Conant 1951). On the coastal plain of North Carolina, specimens have been collected in piles of debris at the edge of moist deciduous forests (not far from a stream) and in piles of wood in Longleaf Pine (Pinus australis) forests. Connecticut specimens have been collected in moist woods, but details of its local habitat preferences are not currently available.

Range: Northeastern Michigan and northeastern New York to southeastern Texas and northern Florida. Isolated populations occur in Minnesota, Iowa, and (possibly) Massachusetts and Rhode Island (Conant 1975).

Notes: The Five-lined Skink is at its northeastern range limit in Connecticut. It has apparently always been very rare and it is only known to occur in the state's southwestern corner. Even there it has only been found on several occasions. Climatic factors would seem to be the most important agents limiting the abundance of this species, since many adequate habitats appear to be present. However, the expanding human population in the Skink's Connecticut range potentially threatens it through extensive habitat destruction.

Connecticut records since 1950:

Confirmed:	Suspected:	Old records:
Oxford	Woodbridge	New Haven-1870 (Yale Univ. Museum)

References:

Barbour, R. W. 1971. Amphibians and reptiles of Kentucky. Univ. Press of Kentucky, Lexington. 334p.

Conant, R. 1951. The reptiles of Ohio. 2nd ed. Univ. Notre Dame Press, Notre Dame. 284p.

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Fitch, H. S. 1954. Life history and ecology of the Five-lined Skink, Eumeces fasciatus. Univ. Kansas Publ. Mus. Nat. Hist. 8:1-156.

Timmerman, W. Jr. 1975. The Five-lined Skink in Connecticut. Conn. Herp. Soc. Bull. March;1.

Storeria o. occipitomaculata — Red-bellied Snake

Status: I, Rare and local; II, Vulnerable; III, Indeterminate; IV, Widespread (regular); V, Peripheral

Habitat: Inhabits a wide variety of habitats, from sea level to the mountains, but seems to be most often found in high, hilly, stony, wooded areas. It also occurs at forest borders and at the edges of wetlands. It is usually found below rocks, logs, debris, or in abandoned buildings. In these habitats it feeds upon earthworms, slugs, and insects (Barbour 1971, Conant 1975, Wright and Wright 1957).

The Red-bellied Snake has been described as occupying heavily forested areas, shady rocky woods, dry upland woods, open oak (Quercus spp.)-hickory (Carya spp.) woods, pine (Pinus spp.) barrens, pine ridges, pine woods, hilly forested regions, aspen (Populus spp.) stands, and Hemlock (Tsuga canadensis) groves. The topography and substrate of areas inhabited by this species include sandy ridges, hilly regions, flat dry sites, stony ground, limestone rocks, and limestone hills. It has also been found in wet sites on occasion, including damp meadows, lakeshores, Sphagnum mats, swamp edges, bog edges, marshy areas, and near rivers. Other habitats in which it may occur include forest openings, such as roads and old fields (Wright and Wright 1957).

Range: Southern Manitoba and Nova Scotia to eastern Texas and southern Georgia (Conant 1975).

Notes: The Red-bellied Snake is a secretive species of spotty distribution in much of its range. It is most common in some of the mountainous areas of the northeast (Conant 1975).

In Connecticut this species has only been collected on several occasions. Very little is known about it, and the reasons for its apparent rarity cannot currently be assesed. It is probable that it is somewhat more widely distributed than is now known, as its small size, inconspicuous appearance, and secretive nature make it difficult to find, but it is highly unlikely that it is very common. Extensive field investigations performed in recent years by University of Connecticut herpetologists should have resulted in the discovery of additional specimens if it were appreciably more common.

Connecticut records since 1950:

Confirmed:	Suspected:	Old records:
Barkhamsted	Canton	
Chaplin	Wethersfield	
Simsbury	Ellington	
Canaan		
Union		
Washington		

References:

Conant, R. 1975. A field guide to reptiles and amphibians of eastern and central North America. 2nd ed. Houghton Mifflin Co., Boston. 429p.

Barbour, R. W. 1971. Amphibians and reptiles of Kentucky. Univ. Press of Kentucky, Lexington. 334p.

Wright, A. H., and A. A. Wright. 1957. Handbook of snakes. Vol. 2. Comstock Publ. Assoc, Ithaca. 540p.

Opheodrys aestivus Rough Green Snake

Status: I, Indeterminate; II, Indeterminate; III, Indeterminate; IV, Widespread (regular); V, Peripheral?

Habitat: This insectivorous species often frequents stream and lake borders where vegetation is dense. Other types of areas where it has been found include wooded rocky hillsides, wooded canyons, scrubby growth, wooded meadows, wooded pastures, tree savannahs, fence rows, forest glades, pastures, grasslands, marsh edges wooded river bottoms, and swamps. It is primarily an arboreal species, and is most often found on trees or shrubs (Conant 1975, Wright and Wright 1957).

On the Virginia coast the Rough Green Snake has been found inhabiting wooded islands, sandbars and spits vegetated by coarse grass and myrtle (Myrica sp.) bushes (Wright and Wright 1957). In southern Ohio it is described as occurring in deciduous or coniforous woods, open meadows and prairies, where it is found on low trees, shrubs or on the ground (Conant 1951).

Range: Northeastern Nebraska and central New Jersey to eastern Mexico and the Florida Keys (Conant 1975).

Notes: Although it has been reported from Connecticut (Lamson 1935), the existence of an indigenous population of Rough Green Snakes has never been confirmed. Aside from the 1935 record, no other specimens have ever been collected in the state, and it is highly possible that Lamson's snakes were simply escaped pets. On the other hand, it could be that the snakes were from a tiny relict population. If this is the case, then perhaps other relict populations also exist. Because of the inconspicuous nature of the Rough Green Snake, it is conceivable that such small populations could go undetected. Further field work, particularly in the southern portions of the state, will be needed to clarify the status of this species.

Connecticut records since 1950:

Confirmed:	Suspected:	Old records:
		Waterbury-no date, existence of specimen unknown (Lamson 1935)

References:

Conant, R. 1951. The reptiles of Ohio. 2nd ed. Univ. Notre Dame Press, Notre Dame. 284p.

_____. 1975. A field guide to reptiles and amphibians of eastern and central North America. 2nd ed. Houghton Mifflin Co., Boston. 429p.

Lamson, G. H. 1935. The reptiles of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 54.

Wright, A. H., and A. A. Wright. 1957. Handbook of snakes. Vol. 1. Comstock Publ. Assoc., Ithaca. 564p.

Opheodrys v. vernalis Eastern Smooth Green Snake

Status: I, Rare; II, State threatened; III, Long-term decline; IV, Widespread (regular); V, Habitat restricted (natural and human)

Habitat: Usually occurring at higher altitudes, where it frequents grassy or rocky meadows. Other habitats which it uses include low shrub and vine-covered areas, fields, old fields, forest clearings, cultivated lands, dry open woods, sandy ridges, aspen (Populus spp.) bordered fields, open aspen stands, pond margins, marshes, and Sphaghum bogs. It may be found on the ground, beneath logs, rocks, etc., or in shrubs (Conant 1975, Wright and Wright 1957).

In Ontario, Smooth Green Snakes have been found inhabiting an area of sandy loam soil, which is vegetated by grasses, Sweet Clover (Melilotus officinalis and Queen Anne's Lace (Daucus carota). Other common plants present include Butterfly-weed (Asclepias tuberosa), Viper's Bugloss (Echium vulgare), Red Clover (Trifolium pratense), Alfalfa (Medicago sativa), Yarrow (Achillea millefolium), and Toadflax (Linaria vulgaris). By August vegetation in the area is up to 1 1/2 m. tall. Adjoining this grassy area is a large gravel pit (Judd 1960). Another site at which this species occurs consists of a pastureland of open deciduous woods and clearings. Through one of the clearings a small stream runs which, at one spot, forms a pond. Several rotting logs near the pond are used as nest sites (Cook 1964).

Connecticut Smooth Green Snakes have been recently discovered near a wetland vegetated in part by shrubs and in part by herbaceous plants. The uplands surrounding the wetlands are covered by forests, old fields, cultivated fields, and meadowlands.

Range: Northwestern Minnesota and Nova Scotia to southern Michigan, western Virginia, and Long Island, New York. Isolated populations occur further south in the Applachian Mountains (Conant 1975).

Notes: Although still common in many parts of its range, in recent years the Smooth Green Snake has declined considerably in Connecticut. The decline is apparently related in part to the disappearance of suitable habitat. Many open grassy areas, such as hayfields and pasturelands, have reverted to forest as agricultural land use has diminished. Others have been destroyed through urbanization. Another factor which is probably responsible for its decline is the use of power mowing equipment. Mowers often kill snakes inhabiting grassy areas. As the Smooth Green Snake is insectivorous, it has been suggested that pesticides have been adversely affecting it. However, there is currently no evidence to support this idea.

Connecticut records since 1950:

Confirmed:	Suspected:	Old records:
Chaplin		New Haven-1873, 1880 (Yale Univ. Mus.)
Barkamsted		
Ashford		
Eastford		
Stonington		
Union		
Bethany		

Clinton
Hampton
Litchfield
Manchester
Old Lyme
Mansfield
Columbia
Stafford
Tolland

New Britain-1946

References:

Conant, R. 1975. A field guide to reptiles and amphibians of eastern and central North America. 2nd ed. Houghton Mifflin Co., Boston. 429p.

Cook, F. W. 1964. Communal egg laying in the Smooth Green Snake. Herpetologica 20:206.

Judd, W. W. 1960. Observations on the habitat, food, reproductive state, and intestinal parisites of the Smooth Green Snake at London, Ontario. Can. Field Nat. 74:100-106.

Wright, A. H., and A. A. Wright. 1957. Handbook of snakes. Vol. 1. Comstock Publ. Assoc., Ithaca. 564p.

Crotalus h. horridus Timber Rattlesnake

Status: I, Rare and local; II, State threatened; III, Long-term decline; IV, Widespread (regular); V, Exploited

Habitat: Characteristically found in second growth forests. In the eastern portions of their range they prefer rocky, mountainous areas with fairly light forest cover. Denning areas usually consist of wooded, rocky ledges with southern exposures, where the snakes can sun themselves in spring and fall (Conant 1975, Klauber 1972).

In eastern Pennsylvania, the Timber Rattlesnake is described as preferring mountainous areas with ledges of broken rock, but also inhabiting Sphagnum bogs, swamps, and farmlands (while hunting) in the eastern portion of the state and further south. Rattlesnakes in the Great Smokey Mountains have most commonly been found in second growth clearings, rocky slopes, and oak (Quercus spp.)-pine (Pinus spp.) woods. Habitats used in other eastern states are generally described as rocky, wooded mountainous areas (Klauber 1972).

During the spring and fall, when they are closely associated with their denning areas, Connecticut's Timber Rattlesnakes are found in remote, mountainous areas with numerous ledges and rock slides. Dens consist of deep caverns in rocks of southern exposure, with slabs of rock usually covering the area surrounding the entrance to the den. Quartz or limestone are generally the predominant geologic materials at denning sites. Vegetative cover near the dens is characterized by deciduous trees and occasional conifers, and common understory plants include Mountain Laurel (Kalmia latifolia) and blueberry (Vaccinium spp.). A nearby source of water is also an important habitat feature. In summer, most snakes descend from the mountains and go to lower elevations (probably a mile or two at most) to feed at such sites as stone walls, pasture edges, crop fields, and stream banks (Peterson 1970).

Timber Rattlesnakes feed on a variety of small mammals and also small birds, eggs, frogs, toads, and snakes. They primarily prey upon small mammals, however (Klauber 1972).

Range: Southern Minnesota, southern Ohio, and central New Hampshire to northeastern Texas, southern Illinois, and northern Georgia. Isolated populations exist in southern New Jersey, eastern Massachusetts, Rhode Island, and northern Ohio (Conant 1975).

Notes: Timber Rattlesnakes have declined or been totally eliminated over much of the northeast. In Connecticut only a few remnant populations remain (Peterson 1970). The reasons for their disappearance include direct persecution by man and habitat destruction. Because of their reputation as a serious threat to man, rattlesnakes have historically been killed on sight. A number of states, including Connecticut, have had bounties on rattlesnakes until fairly recently. New York State still has a bounty. Denning sites have also been sought out in order to destroy the snakes, or in many cases, to collect them for the exotic food and pet trades. The practice of raiding dens continues in Connecticut even today (Peterson pers. comm.).

Habitat destruction has occurred largely as a result of increasing urbanization. Some areas of Connecticut formerly inhabited by Timber Rattlesnakes are now covered by suburban development. In other areas, even though the former mountain denning sites remain intact, a combination of direct persecution and suburban development in the adjacent lowlands (summer feeding grounds) has eliminated the snakes.

Contrary to their reputation, Timber Rattlesnakes are not aggressive snakes, and will normally not bite a man. In any event, because of their very limited distribution in Connecticut and their nocturnal habits during the summer months, the chances of even coming across a Timber Rattlesnake is very slim. Should one bite, the chance of death resulting is remote (except for the ill or very young), as the venom is not highly toxic. A bite should be considered serious, however, because the venom can cause tissue damage. Immediate medical treatment should be sought after any bite (Peterson 1970).

Connecticut records since 1950:

Confirmed:	Suspected:	Old records:
Kent	North Canaan	Meriden-1943 (Yale Univ. Museum)
Sharon	Cornwall	North Branford-no date (Yale Univ. Museum)
Glastonbury	Marlborough-locality on Univ. of Conn. specimens may be in error	Southington-1879 (Yale Univ. Museum)
Portland		Weston-verbal report, questionable (Peterson pers. comm.)
East Hampton		Roxbury-see comment for Weston
Salisbury		Union-see above
Canaan		Somer-see above

References:

Conant, R. 1975. A field guide to reptiles and amphibians of eastern and central North America. 2nd ed. Houghton Mifflin Co., Boston. 429p.

Klauber, L. M. 1972. Rattlesnakes, Vol. 1. 2nd ed. Univ. California Press, Berkeley. 740p.

Peterson, R. 1970. Connecticut's venomous snakes. Conn. Geol. Nat. Hist. Surv. Bull. 103.

Necturus m. maculosus Mudpuppy

Status: Deleted; formerly considered to be of indeterminate status

Habitat: An aquatic species, occuring in lakes, ponds, streams, and similar permanent bodies of water. Places that it inhabits are often muddy or weedy (Conant 1975).

Range: Southeastern Manitoba and southern Quebec to eastern Kansas, northern Alabama, and western North Carolina. Introduced at several New England localities (Conant 1975).

Notes: On the basis of statements by Babbit (1937), Vinegar and Friedman (1957), and Warfel (1936), it appears certain that the Mudpuppy is introduced in Connecticut. A series of introductions into a tributary of the Connecticut River near Amherst College, Massachusetts, has been cited as the source of specimens collected in the river. The possibility that Mudpuppies had been present before the introductions is very unlikely, as intensive previous use of the river had not resulted in any discoveries. It is equally unlikely that the Mudpuppies migrated from the Hudson River system, where native populations do exist, because mountains and an intervening watershed (the Housatonic River) are present between the Connecticut and Hudson River systems (Warfel 1936).

Although Babbit (1937) suggested that native Mudpuppies might be found in northwestern Connecticut, no authenticated specimens have yet been discovered. That they have not, in spite of intensive fishing (Mudpuppies are often caught by fishermen where they occur) and herpetological field work in the area, strongly indicates that no indigenous populations are present. The intervening mountains between northwestern Connecticut and the Hudson River Valley have undoubtedly served as an effective barrier to the eastward expansion of the species.

Considering the findings discussed above, it is recommended that the Mudpuppy be deleted from the list of rare species of Connecticut.

Connecticut records since 1950:

Confirmed:	Suspected:	Old records: (Babbit 1937)
East Windsor		East Hartford-1933 Windsor-1936 Shepaug River-early 1930's, verbal report

References:

Babbitt, L. H. 1937. The amphibia of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 57.

Conant, R. 1975. A field guide to the reptiles and amphibians of eastern and central North America. 2nd. ed. Houghton Mifflin Co., Boston 429p.

Vinegar, A., and M. Friedman. 1967. Necturus in Rhode Island. Herpetologica. 23:51.

Warfel, H. E. 1936. Notes on the occurrence of Necturus maculosus (Rafinesque) in Massachusetts. Copeia 1936:237.

Plethodon g. glutinosus — Slimy Salamander

Status: I, Rare and local; II, Vulnerable; III, Indeterminate; IV, Widespread (regular); V, Peripheral

Habitat: Primarily an inhabitant of wooded ravines and hillsides. In these areas it is found in rock crevices and beneath logs, stones, humus, and leaf litter. Localities where it occurs are also usually moist. Both adults and juveniles are terrestrial (Barbour 1971, Bishop 1941, Conant 1975).

In New York, Slimy Salamanders are most abundant in shale banks bordering roads and forest clearings. They are also found beneath logs and stones in forests and along the sides of gullies and ravines (Bishop 1941). New Jersey specimens have been taken at the top of a ravine through which a large mountain stream flows. The ravine is vegetated by Hemlock (Tsuga canadensis), which grades into moist deciduous forest at the top. Rotting logs are abundant on the forest floor. Connecticut specimens have also been found in forested ravines.

Adult Slimy Salamanders feed upon a variety of slugs, sowbugs, earthworms, millipedes, spiders, and insects and their larvae (Bishop 1941).

Range: Eastern Oklahoma, northeastern Ohio, and east-central New York to southeastern Louisiana and central Florida. Isolated populations occur in southern New Hampshire, central Texas, northern Louisiana, and possibly northern Indiana (Conant 1975).

Notes: The Slimy Salamander is near its northeastern range limit in Connecticut. It is confined to the extreme western border of the state, where is has been found on only two occasions. The reasons why it is so rare are difficult to assess, although regional climatic patterns, microhabitat factors, and/or competitive interaction with other species might be involved.

Connecticut records since 1950:

Confirmed:	Suspected:	Old records:
New Fairfield Sherman	Canaan	Greenwich-1945, whereabouts of specimens unknown (Greenwich Audubon Center pers. comm.)

References:

Barbour, R. W. 1971. Amphibians and reptiles of Kentucky. Univ. Press of Kentucky, Lexington.

Bishop, S. C. 1941. The salamanders of New York. N.Y. St. Mus. Bull. 324.

Conant, R. 1975. A field guide to the reptiles and amphibians of eastern and central North America. 2nd ed. Houghton Mifflin Co., Boston. 429p.

Highton, R. 1962. Geographic variation in the life history of the Slimy Salamander. Copeia 1962:597-613.

Powders, V. N., and W. L. Tietjen. 1974. The comparative food habits of sympatric and allopatric salamanders, Plethodon glutinosus and Plethodon jordoni in eastern Tennessee and adjacent areas. Herpetologica 30:167-175.

Hemidactylum scutatum Four-toed Salamander

Status: I, Indeterminate; II, Indeterminate; III, Indeterminate; IV, Widespread (regular); V, Habitat-restricted (natural)

Habitat: Usually found in association with Sphagnum moss. It often breeds in wet patches of Sphagnum or in boggy ponds, which are directly adjacent to forested land. In spring and fall adults may be found some distance from water in upland situations, such as forested areas and open woods. Mats of moss, rotting wood, and stones are used for cover. Juveniles, however, are strictly aquatic (Bishop 1941, Conant 1975).

In New York, Four-toed Salamanders most often nest in localities where Sphagnum is found. Typical sites include deep, shaded situations in mixed forests of Hemlock (Tsuga canadensis), pine (Pinus spp.), and hardwoods; poen Larch (Larix laricina) meadows, and Sphagnum-heath associations bordering bog ponds. In one bog, the common shrubs include Red-osier Dogwood (Cornus stolonifera), Hoary Alder (Alnus incana), and shadbush (Amelanchier sp.). Common herbaceous plants include Tall Meadow Rue (Thalictrum polygamum), Sweet White Violet (Viola blanda), Touch-me-not (Impatiens biflora), and Water Pennywort (Hydrocotyle americana). In open water areas March Marigold (Caltha palustris) is common. It is among the dense growths of Sphagnum and other mosses that cover the roots and bases of the shrubs that the eggs are laid (Bishop 1941).

A nesting site in Michigan is described as a small tract of oak (Quercus spp.) woods adjacent to a wet grassland that borders a stream. A small pond stretches across the woodland-grassland ecotone, and is vegetated about its edges by barious grasses, sedges, mosses, and shrubs. Duckweed (Lemna spp.) covers the pond surface and aquatic plants grow densely in the water. Sphagnum is abundant in spots, and the pond is largely shaded by overhanging oaks (Blanchard 1922).

In Connecticut, Four-toed Salamanders have been collected in a Sphagnum swamp that borders a pond (Reed 1955). Others have been found at the edge of a shrubby marsh that contains a dense growth of grasses and sedges in the wet portions and scattered aspens (Populus spp.) in the drier portions. The presence of Sphagnum does not appear to be as important a habitat feature as elsewhere (S. Craig pers. comm.).

Adult Four-toed Salamanders feed upon a variety of insects, spiders, and worms (Bishop 1941).

Range: Minnesota and southern Maine to western Tennessee and central Alabama. Isolated populations exist in Nova Scotia and in a number of spots south and west of the major range (Conant 1975).

Notes: The Four-toed Salamander is a secretive species and, as such, it is more difficult to locate than many of Connecticut's other species of salamanders. It is therefore difficult to assess its population status. Several authors, including Babbit (1937) and Reed (1955), have expressed the opinion that it is fairly rare in the state. More recent data obtained from herpetological field surveys performed by the University of Connecticut also indicate that the species is rare, although widespread in its occurence. Undoubtedly, it will be found in additional localities in the future, and there is a possibility that further field studies will determine that it is quite regularly occurring (although perhaps not common) throughout the state.

Connecticut records since 1950:

Confirmed:		Suspected:	Old records:
Mansfield	Clinton		West Hartford-1925, 1936 (Babbit 1937)
Willington	Ansonia		Salisbury-1926, 1928 (Babbit 1937)
Canton			Old Lyme-no date (Babbit 1937)
Ashford			Newington-1932 (Babbit 1937)
Ledyard			North Branford-no date (Yale Univ. Museum)
Hampton			
Woodbridge			
Branford			
Hamden			
Torrington			

References:

Bishop, S. C. 1941. The salamanders of New York. N.Y. State Mus. Bull. 324.

Blanchard, F. N. 1922. Discovery of the eggs of the Four-toed Salamander in Michigan. Occ. Papers, Mus. Zool. Univ. Mich. 126.

Conant, R. 1975. A field guide to reptiles and amphibians of eastern and central North America. 2nd ed. Houghton Mifflin Co., Boston. 429p.

Reed, C. F. 1955. Notes on salamanders from western Connecticut, with especial reference to Plethodon cinereus. Copeia 1955:253-254.

Smith, S. L. 1974. A relict population of the Four-toed Salamander Hemidactylium scutatum (Schlegel) in Jersey County, Illinois. Trans. Ill. Acad. Sci. 67:163-165.

Wood, J. T. 1955. The nesting of the Four-toed Salamander, Hemidactylium scutatum (Schelegel) in Virginia. Amer. Mid. Nat. 53:381-389.

Gyrinophilus p. porphyriticus Northern Spring Salamander

Status: I, Rare and local; II, Vulnerable; III, Indeterminate; IV, Widespread (regular); V, Peripheral

Habitat: Adult Spring Salamanders usually inhabit clear, cold springs and mountain streams. They also occur in wet depressions in surrounding forested areas where they are found under logs, stones, or leaves. Juveniles (larvae) are totally aquatic (Conant 1975, Bishop 1941).

In New York Spring Salamanders are most often found near the source of spring-fed streams. They frequent the water's edge and are usually found beneath stones or logs at such localities. In certain limestone regions where the streams contain an abundance of flat rocks, they are particularly common. Other types of areas where they have been found include swamps, lake margins, and streams in cool ravines. They do not appear to be completely confined to forested areas, as specimens have also been found in springs or streams on hillside meadows. However, they are absent from warm, muddy, or polluted waters (Bishop 1941).

Spring Salamanders in Virginia have been found in a small spring located in a spruce (Picea sp.)-fir (Abies sp.) forest at an elevation of 1600m. In this spring the water flow is roughly 61m. long, and the water depth varies from 5 to 20 cm. The bed and banks are composed of granitic bedrock and smaller rocks with mud filling the spaces between the larger rocks. The forest canopy above the spring is dense and the ground is covered by a thick growth of ferns and mosses (Organ 1961).

In other areas, including Quebec (Hall 1947), Maine (Fowler and Sutcliffe 1952), and Maryland (Fowler 1944), Spring Salamanders have been collected in shallow, clear, cold streams and springs. Recent specimens taken in Connecticut come from similar habitats in the mountainous northeastern and northwestern portions of the state, where tiny (generally less than 1m. wide) streams are inhabited (S. Craig pers. comm.).

Adult Spring Salamanders feed upon a variety of insects and also earthworms, snails, spiders, salamanders, and small frogs (Bishop 1941).

Range: Southeastern Quebec and central Maine to northeastern Mississippi and central Alabama. An isolated population may exist in southeastern Ontario (Conant 1975).

Notes: The Spring Salamander is a common and characteristic inhabitant of streams in the Appalachian Mountains. In Connecticut, however, it is restricted to the coldest streams in the mountainous northwestern and northeastern corners of the state. Adequate habitat is very limited and therefore, it occurs only rarely and locally.

Even in streams where it is known to occur in Connecticut, the Spring Salamander is difficult to find with regularity. Although it is large and brightly colored, it is probable that it can inhabit underground seepages and therefore seem to disappear from areas for a time. If this is true, then the Spring Salamander may prove to be somewhat more widely distributed in the state than currently thought, although it is doubtful that it is much more common than now known (S. Craig pers. comm.). Intensive field work will be necessary to clarify its distributional status.

Connecticut records since 1950:

Confirmed:	Suspected:	Old records:
Hartland	Canton	Mansfield-no date (Babbit 1937)
Watertown	Eastford	
Barkhamsted		
Tolland		
Salisbury		

References:

Babbit, L. H. 1937. The amphibia of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 57.

Bishop, S. C. 1941. The salamanders of New York. N.Y. St. Mus. Bull. 324.

Conant, R. 1975. A field guide to the reptiles and amphibians of eastern and central North America. 2nd ed. Houghton Mifflin Co., Boston. 429p.

Fowler, J. A. 1944. Records of the Purple Salamander in Maryland. Copeia. 1944:60.

_____., and R. Sutcliffe. 1952. An additional record of the Purple Salamander, Gyrinophilus p. porphyriticus, from Maine. Copeia 1952:48-49.

Hall, C. E. 1947. The Purple Salamander. (Gyrinophilus p. porphyriticus) in Quebec. Copeia 1947:68.

Organ, J. A. 1961. The eggs and young of the Spring Salamander, Pseudotriton porphyriticus. Herpetologica 17:53-56.

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Scaphiopus h. holbrooki Eastern Spadefoot

Status: I, Rare and local; II, Indeterminate; III, Indeterminate; IV, Widespread (regular); V, Peripheral

Habitat: Adults are found in wooded areas, old fields, and cultivated lands where the soil is sandy or at least loose. The juveniles (larvae) are totally aquatic. Breeding usually occurs in temporary ponds (Barbour 1971, Conant 1975).

In northern Florida, where the Eastern Spadefoot is abundant, it has been found in flat coastal plain areas dominated by pine (Pinus spp.) woods, deciduous forests, areas of shrubby growth, ecotonal areas at the margins of deciduous forests, old fields, pastures, and various types of clearings. The soils in these areas are typically well-drained, loose, sandy, and with little accumulation of organic material. A number of lakes, prairies, and sink holes are also present at these localities (Pearson 1955).

Connecticut spadefoots have been found breeding in temporary ponds (Ball 1936) and glacial kettle holes. Deep deposits of sandy soil are present in these areas. Little is known of spadefoot habitat use outside the breeding season other than that they have been found burrowed into sandy soil near their breeding sites (Ball 1936).

Adult Eastern Spadefoots feed upon a variety of insects, arachnids, and myripods (Pearson 1955).

Range: Southeastern Missouri and eastern Massachusetts to southeastern Louisiana and the Florida Keys (Conant 1975).

Notes: The Eastern Spadefoot is a largely subterranean species, coming above ground only at night and during the breeding season. Breeding takes place after heavy rains in warm weather. The young have evolved to develop rapidly in order to escape their temporary ponds before the ponds disappear (Barbour 1971, Pearson 1955). Ponds used for breeding one year may not be inhabited again for several years and, in some cases, they are apparently never used again (Morris 1944).

Although the Eastern Spadefoot is common and easily found in the southern portions of its range, northern populations tend to be erratic in their occurrence and are seldom seen outside of the breeding season (Ball 1936, Morris 1944). In Connecticut it has only been reported on several occasions. In each case it occurred in ponds in which it had not been noted previously (although possibly present in small numbers), and after several years it completely disappeared from these localities, not to be recorded again (Ball 1936, Lawyer and Lawyer 1973).

While it is impossible to determine the exact population status of the Eastern Spadefoot in Connecticut, it undoubtedly occurs only rarely and locally, and it has probably always been rare in the state. Its rarity is due in part to its requirement for deep, sandy soils, which are of only local occurrence. In addition, regional climatic factors are probably involved. Man has most likely been responsible for at least some decline in the spadefoot through destruction of breeding ponds (Ball 1936), but the ephemeral nature of breeding site use by this species is apparently natural and not related to changes brought about by man. Should habitat destruction occur on a large scale, however, man's influence might result in the extirpation of the spadefoot from the state.

Connecticut records since 1950:

Confirmed:	Suspected:	Old records:
Manchester	Ridgefield	Ansonia-1933,34,35 (Yale Univ. Museum)
		New Haven-1879 (Yale Univ. Museum)
		Hamden-1934 (Yale Univ. Museum)

References:

Ball, S. C. 1936. The distribution and behavior of the Spadefoot Toad in Connecticut. Trans. Conn. Acad. Arts and Sci. 32:351-379.

Babbit, L. H. 1937. The amphibia of Connecticut. Conn. Geol. Nat. Hist. Surv. Bull. 57.

Barbour, R. W. 1971. Amphibians and reptiles of Kentucky. Univ. Press of Kentucky, Lexington. 334p.

Conant, R. 1975. A field guide to reptiles and amphibians of eastern and central North America. 2nd ed. Houghton Mifflin Co., Boston. 429p.

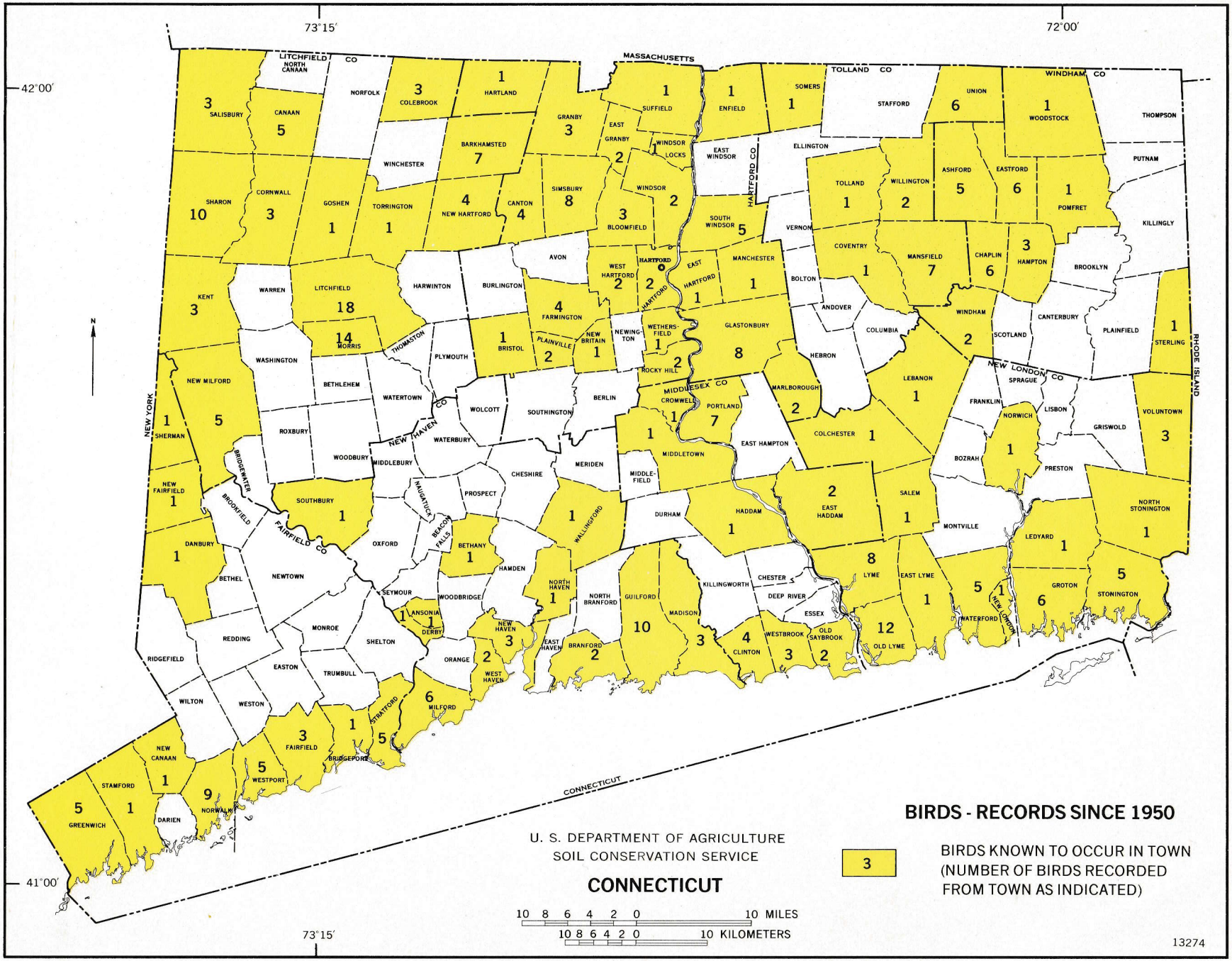
Lawyer, D., and P. Lawyer. 1973. The Spadefoot expedition. Conn. Herp. Soc. Bull. 4:8.

Morris, P. A. 1944. They hop and they crawl. Jaques Cattell Press, Lancaster. 253p. (republished by Dover Publ., New York).

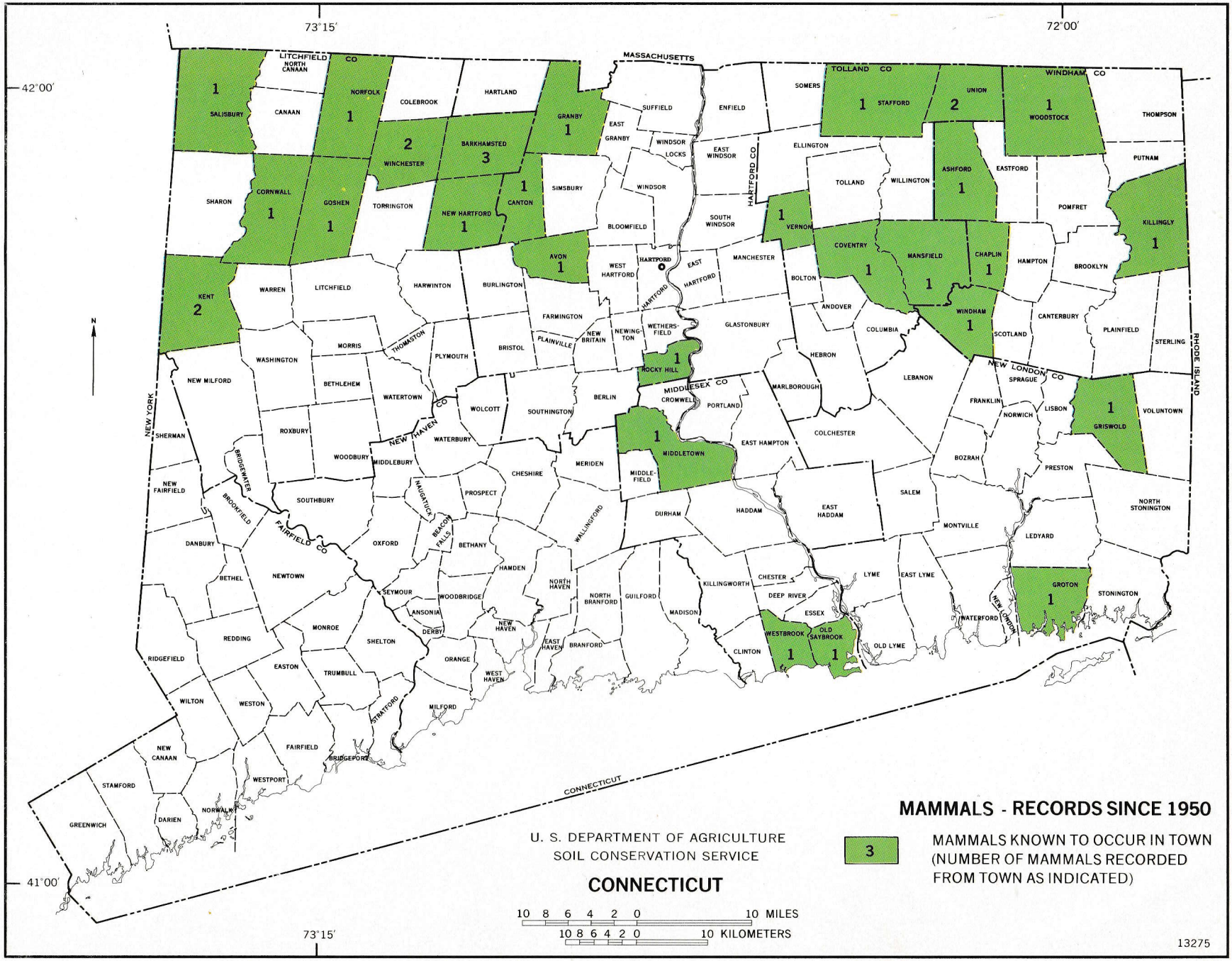
Pearson, P. G. 1955. Population ecology of the Spadefoot Toad, Scaphiopus h. holbrooki (Harian). Ecol. Monogr. 25:233-267.

DISTRIBUTION MAP

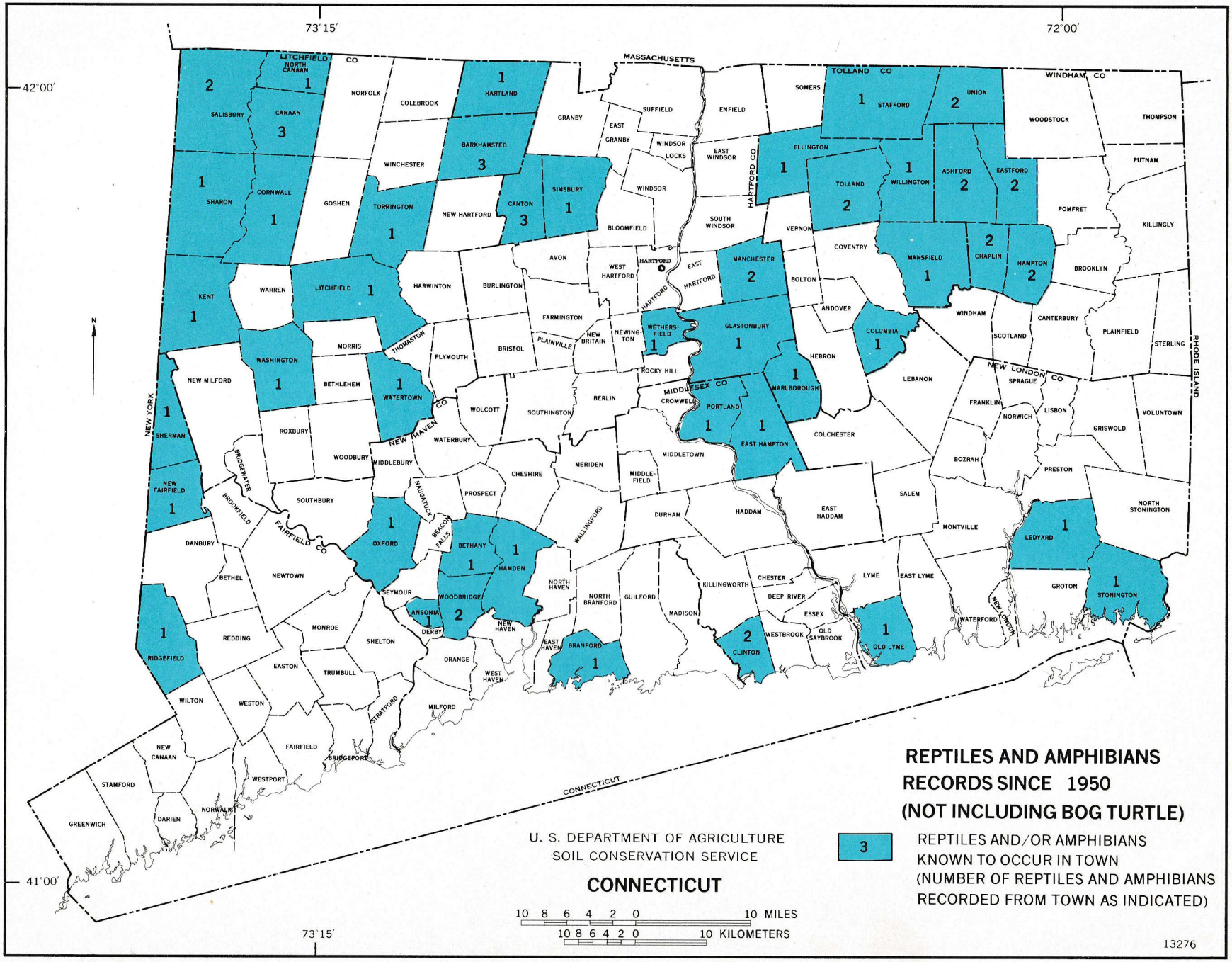
The following maps show distribution data known to the author for each taxon on a town basis, with the emphasis being placed on recent records (arbitrarily defined as 1950 or later, except in the case of the Osprey). Records for towns where no recent reports have been made are included under old records. See page 2 for more detailed explanation of the Connecticut records.



USDA-SCS HYATTSVILLE, MD. 1978



USDA-SCS HYATTSVILLE, MD. 1978



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HADDAM	Agricultural Center Haddam 06438 Phone 345-4511
LITCHFIELD	Agricultural Center Litchfield 06759 Phone 567-8288
NORWICH	562 New London Tpk. Norwich 06360 Phone 887-4163
ROCKVILLE	Agricultural Center Vernon 06066 Phone 875-3881
WALLINGFORD	Agricultural Center Wallingford 06492 Phone 269-7509
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