

## Thirteen of Connecticut's Most Imperiled Ecosystems

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This document grew out of an effort to provide the Governor's Blue Ribbon Task Force on Open Space with a list of those ecosystems that we perceived as being in greatest need of protection. To a large extent, our selections were motivated by the numbers of Federal- or State-listed plants and animals that we believed to be associated with each ecosystem.

*This is not a comprehensive accounting of all of Connecticut's imperiled communities and ecosystems, rather it is a preliminary compilation of those that we believe are faced with immediate threats. We recognize that there are many other habitat types which have a need for protection, e.g., large unfragmented forests, old-growth stands, and unstocked ponds. It is our intention to expand this document to include all of the State's freshwater and terrestrial community types.*

### **Beaches, Dunes and Other Coastal Communities**

Distribution: Immediate coastal areas.

Exemplary Occurrences: Hammonasset Beach State Park, Milford Point, Bluff Point Coastal Reserve, and Hatchett's Point.

Conservation Status: Most sandy beaches are under private ownership. Some sandy beaches need to be targeted for limited access. Breeding sensitivity of two federally protected birds, and one federally protected beetle (historic), turtles, etc.

Imperiled Elements:

Plants: Seabeach amaranth (*Amaranthus pumilis*, USFWS endangered, CT historic), beach needlegrass (*Aristida tuberculosa*, CT threatened), Sickle-leaved golden aster (*Chrysopsis falcata*, CT endangered), sea-coast angelica (*Coelopleurum lucidum*, CT endangered), bushy rockrose (*Helianthemum dumosum*, CT historic), seabeach sandwort (*Honkenya peploides*, CT special concern), beach heather (*Hudsonia tomentosa*, CT threatened), New England blazing star (*Liatris scariosa* var. *novae angliae*, CT special concern), Scotch lovage (*Ligusticum scoticum*, CT endangered), panic grass (*Panicum amarum*, CT threatened), Grave's beach plum (*Prunus maritima* var. *gravesii*, CT endangered), sand dropseed (*Sporobolus cryptandrus*, CT endangered), coast violet (*Viola brittoniana*, CT endangered).

Invertebrates: Northeastern beach tiger beetle (*Cicindela dorsalis*, USFWS threatened, CT historic), noctuid moth (*Euxoa pleuritica*, CT historic), mayfly (*Leptophlebia bradleyi*, CT special concern), borer moth (*Papaipema maritima*, CT historic), seaside goldenrod borer (*Papaipema duovata*, CT special concern), and noctuid moth (*Schinia spinosae*, CT

special concern).

Vertebrates: Piping plover (USFWS endangered, CT threatened), least tern (CT threatened), least shrew (CT endangered), Ipswich sparrow (CT special concern), glossy ibis (CT special concern), roseate tern (USFWS endangered, CT endangered), willet (CT threatened), common tern (CT special concern), osprey (CT special concern), American oystercatcher (CT special concern), seaside sparrow (CT special concern), sharp-tailed sparrow (CT special concern), horned lark (CT threatened), and purple martin (CT special concern).

### **Sandplain Grasslands**

Distribution: Coastal counties primarily but historically north to Hartford.

Exemplary Occurrences: George Dudley Seymour State Park, Windsor sand dunes, and numerous airports around the state. Historically: North Haven-Wallingford sandplains.

Conservation Status: One of the two most impacted terrestrial habitats in Connecticut.

Imperiled Elements:

Plants: Sandplain gerardia (*Agalinis acuta*, USFWS endangered, CT endangered), bushy rockrose (*Helianthemum dumosum*, CT historic), low frostweed (*Helianthemum propinquum*, CT endangered), golden-heather (*Hudsonia eriocoides*, CT endangered), New England blazing star (*Liatris scariosa* var. *novae angliae*, CT special concern), and sandplain flax (*Linum intercursum*, CT historic).

Invertebrates: Second only to pitch pine-scrub oak barrens in numbers of imperiled invertebrates: Noctuid moth (*Agrotis stigmata*, CT historic), noctuid moth (*Apamea burgessi*, CT special concern), noctuid moth (*Euclyptocnemis fimbriaris*, CT special concern), noctuid moth (*Euxoa pleuritica*, CT historic), violet dart moth (*Euxoa violaris*, CT historic), phyllira tiger moth, *Grammia phyllira* (CT historic), Leonard's skipper (*Hesperia leonardus*, CT special concern), frosted elfin (*Incisalia irus*, CT special concern), noctuid moth (*Lepidolys perscripta*, CT special concern), and regal fritillary (*Speyeria idalia*, CT historic).

Vertebrates: Northern harrier (CT endangered), grasshopper sparrow (CT endangered), savannah sparrow (CT special concern), upland plover (CT endangered), Eastern hognose snake (CT special concern), horned lark (CT threatened), vesper sparrow (CT endangered), purple martin (CT special concern), American kestrel (CT special concern), Eastern meadowlark (CT special concern), and Eastern spadefoot toad (CT endangered),

### **Pitch Pine-Scrub Oak Barrens**

Distribution: Eastern and central Connecticut, historically north to Hartford; also including acidic, dry rocky summits throughout Connecticut.

Exemplary Occurrences: Oneco, Pachaug State Forest, Meshomasic State Forest. Historically: North Haven-Wallingford sandplains, Shaker Pines, Mansfield Hollow State Park, and Windsor Locks sandplains.

Conservation Status: Most impacted terrestrial habitat in Connecticut. We estimate that over

95% of our barrens have been developed or otherwise degraded.

**Imperiled Elements:**

Plants: Many species associated with Sandplain grasslands above.

Invertebrates: Pitch pine-scrub oak barrens are home to the largest portion of imperiled invertebrates of any of the State's community types. Not all are listed here: Albarufan dagger moth (*Acronicta albarufa*, CT historic), New Jersey tea inchworm (*Apodrepanulatrix liberaria*, CT special concern), Gerhardt's underwing (*Catocala herodias*, CT historic), precious underwing moth (*Catocala pretiosa*, CT historic), noctuid moth (*Chaetoglaea cerata*, CT historic), mottled duskywing (*Erynnis martialis*, CT historic), Persius duskywing (*Erynnis persius*, CT endangered), slender clearwing (*Hemiaris gracilis*, CT historic), buck moth (*Hemileuca maia*, CT endangered), hoary elfin (*Incisalia polios*, CT historic), noctuid moth (*Psectraglaea carnosus*, CT special concern), noctuid moth (*Zale curema*, CT threatened), noctuid moth (*Zale obliqua*, CT special concern), and noctuid moth (*Zale submediana*, CT special concern).

Vertebrates: Whip-poor-will (CT special concern), Eastern Hognose Snake (CT special concern), and Eastern Spadefoot Toad (CT endangered).

**Surface Springs, Cold Headwater Streams, and Seeps**

Distribution: Throughout.

Exemplary Occurrences: Lime Rock (Sharon), Squabble Brook (North Canaan), and Dismal Swamp (Milford).

Conservation Status: Surface springs were captured for their water supply by early colonists. Likely more than 95% of our springs have been modified. It's rare to find surface springs with year round runs of more than 50 feet.

**Imperiled Elements:**

Plants: White adder's mouth (*Malaxis brachypoda*, CT endangered).

Invertebrates: Tiger Spiketail, *Cordulegaster erronea* (CT Threatened), superb jewelwing (*Calopteryx amata*, CT special concern), and mayfly (*Cicygmula subaequalis*, CT special concern).

Vertebrates: Spring salamander (CT threatened). Native brook trout are associated with cold water, spring-fed streams.

**Calcareous Uplands**

Distribution: Western Connecticut, primarily in Litchfield and northern Fairfield Counties.

Exemplary Occurrences: Bulls Bridge area, Point of Rocks, Tom's Hill, and areas in Salisbury, Canaan, Sharon, and Kent.

Conservation Status: Most calcareous areas have been heavily impacted by agriculture with nearly all of the abandoned mesic sites dominated by exotic shrubs (e.g., *Lonicera*); other areas have been impacted by quarrying for marble and limestone. Few dry upland areas have good representative native vegetation.

**Imperiled Elements:**

Plants: Roundleaf shadbush (*Amelanchier sanguinea*, CT endangered), wall-rue spleenwort (*Asplenium ruta-muraria*, CT threatened), side-oats gamma-grass (*Bouteloua curtipendula*, CT endangered), sedge (*Carex backii*, CT endangered), slender cliff-brake

(*Cryptoamma stelleri*, CT endangered), whitlow-grass (*Draba reptans*, CT special concern), stiff gentian (*Gentiana quinquefolia*, CT endangered), sharp-lobed hepatica (*Hepatica nobilis* var. *acuta*, CT special concern), yellow flax (*Linum sulcatum*, CT special concern), red mulberry (*Morus rubra*, CT endangered), gravel-weed (*Onosmodium virginicum*, CT endangered), smooth cliff-brake (*Pellaea glabella*, CT endangered), seneca snakeroot (*Polygala seneca*, CT endangered), stiff goldenrod (*Solidago rigida*, CT endangered), dropseed (*Sporobolus asper*, CT special concern), sand dropseed (*Sporobolus cryptandrus*, CT special concern), yellow pimpernel (*Taenidia integerimma*, CT endangered), and Northern white cedar (*Thuja occidentalis*, CT endangered).

Invertebrates: Northern metalmark (*Calephelis borealis*, CT endangered) and giant swallowtail (*Papilio cresphontes*, CT special concern).

Vertebrates: Timber rattlesnake (CT endangered) and five-lined skink (CT threatened).

### **Calcareous Fens and Associated Wetlands**

Distribution: Restricted to the marble valleys of western Connecticut (Fairfield and Litchfield counties).

Exemplary Occurrences: Beeslick Pond, Sucker Brook, Robbins Swamp, Mudge Pond fen, Moore Brook fen, and others.

Conservation Status: Historically the State's fens were impacted by damming, draining, nutrient input, and other consumptive land use practices. Although many of these wetlands are now under the protection of The Nature Conservancy, the open fens are presently threatened by invasive species (*e.g.*, *Phragmites*) and natural succession. Nutrient input from non-point sources and poor agricultural practices also remains a threat.

Imperiled Elements:

Plants: Orange foxtail (*Alopecurus aequalis*, CT threatened), swamp birch (*Betula pumila*, CT special concern), Purple cress (*Cardamine douglassii*, CT special concern), sedge (*Carex aquatilis* var. *altior*, CT special concern), Crawe's sedge (*Carex crawei*, CT endangered), cyperus-like sedge (*Carex pseudo-cyperus*, CT endangered), Schweinitz's sedge (*Carex schweinitzii*, CT endangered), dioecious sedge (*Carex sterilis*, CT special concern), rigid sedge (*Carex tetanica*, CT special concern), little green sedge (*Carex viridula*, CT endangered), devil's bit (*Chamaelirium luteum*, CT endangered), sweet coltsfoot (*Petasites frigidus* var. *palmatus*, CT threatened), and beaked corn-salad (*Valerianella radiata* var. *fernaldii*, CT historic), and northern bog violet (*Viola nephrophylla*, CT endangered)

Invertebrates: Sedge skipper (*Euphyes dion*, CT threatened), twin spotted skipper (*Euphyes bimacula*, CT threatened), bronze copper (*Lycaena hyllus*, CT special concern), and eyed brown (*Satyroides eurydice* CT special concern)

Vertebrates: Bog turtle (USFWS threatened, CT endangered) and sedge wren (CT endangered).

### **Grassy Glades and Balds, Traprock Ridge, and Associated Communities (*e.g.*, vernal pools)**

Distribution: Restricted to the Triassic/Jurassic valley in Central Connecticut (Hartford, Middlesex, New Haven counties) and the Pomperaug outlier in Litchfield/New Haven

County.

Exemplary Occurrences: Onion Mountain, West Rock Ridge, Higby Mountain, Sleeping Giant, and others.

Conservation Status: Although many of the ridge tops are in either state or non-profit conservation ownership, recreational use has had a major impact in the summits and glades. Some areas have had a substantial increase in residential development during recent years and others have had along history of mining for coarse aggregate.

Imperiled Elements:

Plants: Virginia snakeroot (*Aristolochia serpentaria*, CT threatened), sedge (*Carex hirtusella*, CT special concern), hairy lip-fern (*Cheilanthes lanosa*, CT endangered), pale corydalis (*Corydalis flavula*, CT threatened), long-leaved bluet (*Houstonia longifolia*, CT endangered), long-awn hairgrass (*Muhlenbergia capillaris*, CT endangered), basil mountain-mint (*Pycnanthemum clinopioides*, CT endangered), Torry's mountain-mint (*Pycnanthemum torreyi*, CT endangered), ragwort (*Senecio pauperculus*, CT endangered), and Northern-dropseed (*Sporobolus heterolepis*, CT endangered).

Invertebrates: Red-bellied tiger beetle (*Cicindela rufiventris*, CT special concern), columbine duskywing (*Erynnis lucillius*, CT special concern), columbine borer moth (*Papaipema leucostigma*, CT special concern), and orange sallow moth (*Rhodesia aurantiago*, CT special concern).

Vertebrates: Timber rattlesnake (CT endangered) and five-lined skink (CT threatened)

### **Large Rivers and Associated Riparian Communitites**

Included Community Types: floodplain forests, erosional banks, sand bars, alluvial marshes.

Aquatic communities: large open water and deep water. Areas with sandy bottoms appear to be especially critical for imperiled elements.

Distribution: Throughout Connecticut.

Exemplary Occurrences: The Connecticut River is our best example. Areas of the Housatonic, Shetucket, and the Farmington rivers hold promise.

Conservation Status: Numerous rare taxa have turned up in and along the Connecticut River over the last decade, indicating that the river was not as impacted as once believed. Water quality has improved significantly over the last twenty years. Riverside development, diversion, and discharges are the major threat to our larger river ecosystems. There is a special need to protect sandy beaches and exposed banks and bluffs along these rivers.

Imperiled Elements:

Plants: Cursed-crowfoot (*Ranunculus sceleratus*, CT special concern), and sandbar willow (*Salix exigua*, CT threatened),

Invertebrates: Puritan tiger beetle, (*Cicindela puritana*, USFWS threatened, CT endangered), midland clubtail (*Gomphus fraternus*, CT special concern), cobra clubtail (*Gomphus vastus*, CT special concern), skillet clubtail (*Gomphus ventricosus*), tide-water mucket (*Leptodea ochracea*, CT threatened), and riverine clubtail (*Stylurus amnicola*, CT special concern).

Vertebrates: Shortnose sturgeon (USFWS endangered, CT endangered), and Atlantic sturgeon (CT threatened).

## **Undammed Streams and Rivers**

Included Community Types: Anadromous fish runs, riffle, and rapid communities, waterfalls, native trout runs. Areas with sandy bottoms appear to be especially critical for imperiled elements.

Distribution: Throughout Connecticut

Exemplary Occurrences: Hollenbeck River, Moore Brook, Eight-Mile River, Moodus River, and Natchaug River.

Conservation Status: Nearly all of the State's rivers have been influenced by damming and the regulation of discharges and diversions. There are no large undammed rivers in the State. Damming changes sedimentation patterns and seasonal water flow. Evidently the former is critical to the welfare of many freshwater mussels. Floodplain vegetation and sediment deposition also are impacted by regulated water flow.

Imperiled Elements:

Plants: Greater St. John's-wort (*Hypericum pyramidatum*, CT threatened), winged monkey-flower (*Mimulus alatus*, CT special concern), and threadfoot (*Podostomum ceratophyllum*, CT special concern).

Invertebrates: Dwarf wedge mussel (*Alasmodonta heterodon*, USFWS endangered, CT endangered), brook floater (*Alismodonta varicosa*, CT endangered), mayfly (*Baetisca laurentina*, CT special concern), rapids clubtail (*Gomphus quadricolor*), harpoon clubtail (*Gomphus descriptus*), mayfly (*Heptagenia marginalis*), and mayfly (*Paraleptophlebia assimilis*, CT special concern), and ski-tailed emerald (*Somatochlora elongata*, CT special concern).

Vertebrates: American Brook Lamprey (CT special concern) and bluntnose minnow (*Pimephales notatus*).

## **Atlantic White Cedar Swamps**

Distribution: Eastern Connecticut with scattered occurrences in Middlesex and New Haven counties.

Exemplary Occurrences: Pachaug Great Meadow, Bethany Bog, Bell Cedar Swamp, and others.

Conservation Status: Although the state has many scattered Atlantic white cedar swamps, few escaped impacts by the colonists who manipulated water levels and managed the stands for lumber. The highly tannic wood was heavily favored as a source of fenceposts.

Imperiled Elements:

Plants: Creeping snowberry (*Gaultheria hispidula*, CT threatened).

Invertebrates: Horsefly (*Hybromitra trepida*, CT special concern), Lemmer's noctuid moth (*Lithophane lemmeri*, CT historic), Hessel's hairstreak (*Mitoura hesseli*, CT endangered), and banded bog haunter (*Williamsonia lintneri*, CT endangered).

Vertebrates: none presently identified.

## **Bogs**

Distribution: Primarily in Litchfield County with a few scattered occurrences in New Haven and Hartford counties.

Exemplary Occurrences: Beckley Bog, Tobey Pond Bog, Congamond Bog, and Bethany Bog.

Conservation Status: Most Connecticut bogs have escaped serious degradation with the exception of nutrient input from surrounding development. Beaver impoundment may threaten some occurrences.

Imperiled Elements:

Plants: Andromeda (*Andromeda glaucophyllum*, CT endangered), dwarf mistletoe (*Arecetobium pusillum*, CT endangered), arethusa (*Arethusa bulbosa*, CT endangered), sedge (*Carex perpercula*, CT endangered), bog sedge (*Carex limosa*, CT endangered), bog huckleberry (*Gaylussaccia dumosa* var. *bigeloviana*, CT threatened), creeping snowberry (*Gaultheria hispidula*, CT threatened), Labrador tea (*Ledum groenlandicum*, CT threatened), white-fringed orchid (*Platanthera blephariglottis*, CT endangered), bog willow (*Salix pedicellaris*, CT endangered), pod-grass (*Scheuchzeria palustris*, CT endangered), three-leaved Solomon's -seal (*Smilacina trifolia*, CT threatened), Northern yellow-eyed grass (*Xyris montana*, CT endangered), and other historic species.

Invertebrates: Ground beetle (*Agonum darlingtoni*, CT special concern), noctuid moth (*Anarta luteola*, CT endangered), pitcher plant moth (*Exyra fax*, CT special concern), Bog tiger moth (*Grammia speciosa*, CT endangered), horse fly (*Hybromitra frosti*, CT threatened), horse fly (*Hybromitra longiglossa*, CT endangered), horse fly (*Hybromitra typhus*, CT special concern), crimson-ringed whiteface (*Leucorrhinia glacialis*, CT threatened), bog copper (*Lycaena epixanthe*, CT special concern), pitcher plant borer moth (*Papaipema appassionate*, CT endangered), and banded bog haunter (*Williamsonia lintneri*, CT endangered).

Vertebrates: Southern bog lemming (CT special concern).

### Coastal Plain Ponds

Distribution: Coastal Middlesex and New London counties and inland into the Connecticut Valley in Hartford County

Exemplary Occurrences: Glastonbury Great Pond, Uncas Pond, and Simsbury Great Pond.

Conservation Status: Most of the coastal plain ponds have been impacted by waterfront development, recreational beach development, and water level manipulation.

Particularly impacted are the sandy shorelines. For example, the shores of Beach Pond are not longer acceptable for many of its former coastal plain residents.

Imperiled Elements:

Plants: Bur-head (*Echinodorus parvulus*, CT endangered), dwarf bulrush (*Hemicarpha micrantha*, CT endangered), Carolina redroot (*Lachnanthes caroliniana*, CT endangered), toothcup (*Rotala ramosior*, CT endangered), nutrush (*Scleria reticularis*, CT endangered), hyssop-leaved hedge-nettle (*Stachys hyssopifolia*, CT endangered), warty panic-grass (*Panicum verricosum*, CT historic), bladderwort (*Utricularia resupinata*, CT endangered), and Small's yellow-eyed grass (*Xyris smalliana*, CT endangered).

Invertebrates: Martha's pennant (*Celithemis martha*), Doubleday's bluet (*Enallagma doubledayi*, CT special concern), little bluet (*Enallagma minusculum*, CT threatened), little corporal (*Ladona deplanata*, CT special concern), and common sanddragon (*Progomphus obscurus*, CT threatened).

Vertebrates: Eastern spadefoot toad (CT endangered).

**Off-Shore Islands:**

Distribution: Long Island Sound

Exemplary Occurrences: Faulkner's Island, Menunketesuck Island, Charles Island, Norwalk Islands

Conservation Status: These islands have been preferentially developed and highly impacted, nevertheless they are critically important for the breeding success of many shorebirds, and represent important stopover sites for migratory species.

**Imperiled Elements:**

Plants: See beaches above

Invertebrates: All the coastal strand taxa listed above, with the additional undescribed maritime subspecies of the northern pine looper moth, *Caripeta pinitata*. At least five migratory butterflies are known to use these islands in the fall: Monarch (*Danaus plexippus*), Eastern snout butterfly (*Libytheana carinenta*), fiery skipper (*Hylephilus phyleus*), Ocola skipper (*Panoquina ocola*), and whirlabout (*Polites vibex*).

Vertebrates: Critically important sites for the breeding of shore birds, especially those that are uninhabited and without rodent or small mammal populations.