



CRITICAL HABITATS & WILDLIFE

With its large tracts of forest and steep rocky outcrops, its meandering streams and numerous ponds, open fields and overgrown pastures, Kent hosts many varieties of habitats and a diversity of wildlife species to match. Such biodiversity should be cherished and encouraged, for it enriches our lives and keeps the whole ecosystem in balance.

We cannot cover all the examples of biodiversity found in Kent but we will try to identify some examples of unique and/or fragile areas deserving of special attention and protection. Conservation efforts can then be undertaken before threats arise rather than belatedly when development is already proposed and comprehensive assessment is no longer practical. Map #11 shows the geographic distribution of many of these areas of ecological importance. (Some of the information depicted on this map was obtained with remote sensing technology such as aerial photography and satellite imagery, not by on-ground field investigation. Land use activities proposed within known or potential areas should be reviewed on site to determine whether thorough ecological assessment by a qualified field biologist or ecologist is warranted.)

What is a Habitat?

A habitat is simply the place where an organism lives. It includes both biotic (living) and abiotic (nonliving) components. Habitats may be identified according to many different criteria but the classification system endorsed by the Connecticut Association of Conservation and Inland Wetlands Commissions (CACIWC) serves nicely for our purposes. It recognizes four general categories: Forests and Woodlands, Shrublands, Grasslands/Meadows, and “Special” Habitats.

- Forests are defined as extensive clusters of trees with crowns overlapping, generally forming 60-100% cover. Woodlands are open stands of trees with crowns, not usually touching, generally forming 25-60% cover.
- Shrublands consist of shrubs generally greater than 0.5 meters tall with individuals or clumps overlapping to not touching, generally forming more than 25% canopy coverage; tree cover generally less than 25%
- Grasslands/Meadows are dominated by forbs and herbs (herbaceous soft-tissue flowering plants), graminoids (all grasses and grass-like plants such as sedges and rushes), and ferns, generally forming at least 25% cover. Trees, shrubs, and dwarf shrubs generally provide less than 25% cover.
- Special Habitats include vernal pools, bedrock ledges, seeps and other special areas that do not fit into the above habitat types, have unique characteristics that are different from the others, and consequently have narrowly-defined habitat-based management needs of their own.

Basic Description of Kent Habitat

Kent is located in Connecticut’s Northwest Uplands eco-region, an area characterized by extremes in topography ranging from wide, open valleys to some of the highest elevations in the state. It is considered by many to be part of the most visually beautiful area in the state. But beyond the beauty there is also tremendous ecological content. Thanks to the combination of rugged terrain and the presence of limestone—bedrock geology that is rare east of the Appalachian Mountains—this is one of the most biologically diverse areas in New England. Many northern and southern species reach their range limits here while other species are at or near their easternmost range limits.

Other contributing factors include a diversity of water resources and a largely unfragmented landscape. Unlike most areas of Connecticut, where dense matrices of roads and development confine nature to small, isolated islands of habitat, Kent and its surrounding landscape is still ecologically functional.

The Natural Diversity Data Base

The Connecticut Department of Environmental Protection conducts a variety of research and management programs to protect and restore endangered, threatened and special concern species in Connecticut. The Connecticut DEP thus serves as the primary source of information on the status of rare plant and animal species throughout the state. Locations of species and natural communities, as well as other relevant data, are collected by the Connecticut Geological & Natural History Survey, other units of the DEP, private conservation groups and the scientific community and compiled by scientists working for the Department's Natural Diversity Data Base (NDDB).



Established in 1983, the NDDB currently contains information on the status of nearly 2,000 species of plants and animals down to the smallest insects, and 45 natural community types. The known locations of rare or endangered species are marked as circles (also known as “blobs” or “bull’s eyes”) on NDDB maps, which are updated twice yearly. Each circle is one-half mile in radius and may contain more than one species or rare habitat. This convention is used to flag the presence of sensitive areas or listed species without divulging exact locations, thereby protecting the habitat’s integrity, which might otherwise draw collectors or the merely curious.

Any town land use commission can apply to the agency for more detailed information on a need-to-know basis when considering a building application in an area marked by one of the blobs. Some of these NDDB circles in Kent are located within state parks and land trust properties. Other critical habitats are privately owned, some of which are at risk of development. Presuming Kent’s commitment to conservation of its natural resources, recognition of these habitat areas will be extremely useful to Kent’s land use commissions, which must become more and more selective in determining where and what kind of development may proceed. To see the currently identified critical habitats in Kent, go to the Critical Habitat Map # 11.

These so-called “listed species” are further categorized according to their viability in the current environment, using the following terms:

- Endangered species (E)** are documented to be at risk of elimination throughout all, or a significant portion of, the state.
- Threatened species (T)** are documented to be in the process of becoming endangered in the foreseeable future.
- Species of Special Concern (SC)** are designated by the state as deserving special protection because they are rare and therefore could also lose viability if not specifically protected.

The habitats of listed species and of significant natural communities are considered to be “critical habitats.” The state’s list is far from complete—many more areas assuredly exist but have not been documented—but thanks to the occasional extensive biological survey, such as was undertaken during the successful effort to preserve the Skiff Mountain Preserve, additions are sometimes made. So, too, amateur naturalists and conservation groups submit information as they find it. For example, the presence of the golden-winged warbler (and other avian species) has been documented by Laurie Doss, Science Department Chair at the Marvelwood School, and her students. Several other rare species are believed to be right at our doorstep awaiting the necessary documentation. A good example is the numerous amateur sightings of mountain lions (*Felix concolor*) in Kent which await DEP recognition.

Plants and animals can be rare for a variety of reasons, the most common being habitat loss from outright destruction, habitat change due to natural succession and over-collecting. The introduction of non-native invasive species can also cause species declines by direct competition for resources and alteration of habitat. Some species are restricted to

rare habitat types and are therefore regionally rare. One example is Labrador tea (*Ledum groenlandicum*), a plant abundant in New England during the last ice age that has been restricted to peat bogs since glacial retreat.

Developing a basic understanding of Kent's diverse habitats and what they look like is a good place to begin meaningful conservation of those most sensitive sites. See the Appendix for several pages of listed species found in Kent.

The state DEP has designated a number of Priority Habitats and Imperiled Natural Communities for which it has made funding available under the Connecticut Landowner Incentive Program (LIP). Projects on private lands designed to benefit these habitats and communities are eligible for technical advice and cost assistance under LIP. Included are: freshwater wetlands, riparian zones, early successional habitats such as grasslands, old fields and sapling stands, as well as surface springs, cold headwater streams and seeps, large rivers and associated riparian communities, undammed streams and rivers, Atlantic white cedar swamps, bogs, calcareous fens and associated wetlands, calcareous uplands, and grassy glades and balds.

Rock Outcrops and Calcareous Uplands

Many of Kent's important habitat communities are associated with limestone bedrock. The areas marked as "rock outcrop" on Map #11 include rocky balds and ledges on sparsely vegetated hilltops. Grassy glades are often associated with rocky balds and may be present on either acidic or neutral bedrock. Characteristic vegetation includes low-growing grasses, herbs, and shrubs such as huckleberry (*Gaylussacia baccata*) and low bush blueberry (*Vaccinium angustifolium*). An example can be found at the Pond Mountain Preserve. Unfortunately, this uncommon plant community has been so negatively affected by recreational activities including the trampling of hikers and dirt bikes that few intact representatives remain in Connecticut.

Ledge areas can support interesting plant communities. Unusual ferns such as the "threatened" wall rue (*Asplenium ruta-muraria*) and maidenhair spleenwort (*Asplenium trichomanes*) are restricted to limestone bedrock, growing out of moist cracks. Acidic ledges can also support unique flora. A good example is mountain spleenwort (*Asplenium montanum*), another threatened species.

Ledges are also used by animals, providing important nesting sites for birds of prey (raptors) such as the turkey vulture (*Cathartes aura*) and the endangered peregrine falcon (*Falco peregrinus*), which prefers the protection afforded by high elevations. The warming ledges create columns of air called thermals that raptors can ride without expending much energy in their search for food. The five-lined skink (*Eumeces fasciatus*), New England's only lizard, also prefers open, rocky outcrop and ledge areas; this skink is known from only one location in Kent and is listed as state-threatened.

Areas at the base of limestone bedrock slopes are often collecting places for moist, pH-neutral (limestone-derived) soils. These can support rare calcareous forests, with sugar maple (*Acer saccharum*), red oak (*Quercus rubra*), red cedar (*Juniperus virginiana*), tulip tree (*Liriodendron tulipifera*) and white ash (*Fraxinus Americana*). Kent has representative examples. Another imperiled upland community is the red cedar glade, which is dominated by red cedar, with some hop hornbeam (*Ostrya virginiana*) and hickory (*Carya glabra*), low shrubs and a unique assemblage of herbaceous plants. It is restricted to dry, open sites with excessively drained limestone-derived soils. The uncommon eastern smooth green snake (*Liochlorophis vernalis*), an insectivorous species believed to have declined in its meadow habitats due to the effects of pesticides and power mowers, may be found here.

Perhaps one of the most unusual and sensitive habitats is the relict prairie plant community present in the Bull's Bridge area. During the so-called Hypsithermal Interval—a warming trend that occurred between

7,000 and 5,000 years ago—prairie plants expanded their range eastward into New England. As temperatures adjusted back to current levels this remnant population managed to hang on, owing to the warmer soils, despite the regional demise of other companion vegetation. Sadly, the continued survival of this rare prairie plant community is now threatened by



non-native invasive species and forest succession.

The dry oak forest is another natural community associated with excessively drained, shallow soils. Usually found on limestone bedrock or summits, the dry oak forest can sometimes exist at lower elevations, as well. The community is characterized by various species of oak, with some pine present, and an understory dominated by low-bush blueberry and huckleberry. The dry oak forest community is present in other parts of the state, but most examples are only remnants and are of poor quality. It is possible that high-quality examples remain in Kent.

Talus Slopes

Talus deposits form when the physical weathering of rock faces cause rock debris to fracture and fall, typically in large, angular chunks that sit with moderate stability in great piles at the base of cliffs and ledges. Over the centuries, the debris accumulates as a mix of rocks, rich soil and other organic matter, collectively known as colluvium. Deposits can range in steepness and depth depending on rock size, terrain and the quantity of material present. Orientation, canopy cover, and the presence or absence of water from seeps and intermittent watercourses determine the moisture regime of a talus area. Dry sites can



provide hospitable over-wintering sites for various animals. The black rat snake (*Elaphe obsoleta*) is known to spend the winter in communal hibernation with other species such as the copperhead (*Agkistrodon contortrix*) and the endangered timber rattler (*Crotalus horridus*) deep within the talus. Present only in a few locations in our state, including a few sites in Kent, the rattler prefers forested, rocky slopes. Black bear (*Ursus americanus*) will also hibernate in talus areas, sometimes simply between the rocks, fully exposed to the elements.

The quantity and arrangement of rocks creates pockets of differing microclimates, which in rich soils often support a diverse community of flora. Cool sites can support northern plant communities comprising species such as sharp-lobed hepatica (*Hepatica acutiloba*), Canada violet (*Viola Canadensis*), and Hobblebush (*Viburnum lantanoides*). Talus areas are, like ravines, places where old growth forests can be present, yet their age can easily go undetected because of their small stature, resulting from stressful growing conditions between rocks where nutrients and water are limiting factors.

The cove forest, characteristically dominated by sugar maple and white ash (*Fraxinus americanus*), is another example of a unique community that grows in moist talus deposits. The rich nutrients needed to support this community are provided primarily by surficial run-off from the mineral-rich slope and/or from enriched groundwater discharge.

Ravines

Ravines are narrow valleys with moderately steep to very steep, rocky sides, usually shaded by trees and often associated with cold, fast flowing streams, although sometimes the water flow can be intermittent. A ravine that is deep and carved out of rock by fast-flowing water is called a gorge. A good example is found at Bull's Bridge where the Housatonic River cuts through the limestone bedrock.

Streams in the ravines of Northwestern Connecticut are usually cold, highly oxygenated and associated with pools in the stream bed, a habitat preferred by our native brook trout (*Salvelinus fontinalis*). Heavy forest cover, usually dominated by hemlock (*Tsuga canadensis*), helps maintain a cool microclimate. Ravines may also support old growth forest—one of New England's rarest habitats. Though there is no hard evidence to date that any remain in Kent, it is possible that such may exist at some site where the terrain has prevented logging and other human activities.

Grassland Habitats

Grasslands are an early successional habitat. They can range widely in plant composition and structure, from

predominantly grass as in hayfields, to the early stages of forest succession in which shrubs, trees and other woody growth like vines are becoming established (old fields). They provide critical habitat for grassland-dependent birds and certain other wildlife.

Historically, natural grasslands in the Connecticut forested landscape were mostly restricted to floodplains, salt marshes, beaver meadows, and coastal sand plains. Grasslands might also have been the result of burning by lightning strike or of intentional burning practiced by Native Americans to clear vegetation and make hunting easier. But as settlers began to develop the land and to cut back the forests, these natural areas gave way to larger expanses of open landscapes, with a consequent change in wildlife composition.

Eventually, erosion, depletion of farmland soils and the prospect of better economic opportunities in cities caused the descendants of the early farming generations to abandon farms in Northwestern Connecticut. As the agricultural lands reverted to forest or were developed, the grassland habitats in Connecticut decreased markedly. As a result seven out of the 10 grassland birds in this region have declining populations. Those grasslands that remain in Kent are generally small and isolated.

One of the rare examples of extensive acreage remaining is found up on Skiff Mountain, an area that stretches from just south of the Marvelwood School property north to utility lands managed by the Connecticut DEP. This large network of fields supports a breeding population of bobolinks, which are a Connecticut Species of Special Concern. Not yet documented here, but considered a probable resident because of this habitat, is the eastern meadowlark, another grassland specialist. Grassland and other early successional species tend to be good colonizers because of the ephemeral nature of their habitat, so it is probable that some additional species, the brown thrasher, may eventually find and use areas like this in Kent. Another grassland area is found within the Cobble Preserve, managed by Weantinoge Heritage.



It is important to note that grassland habitats are not limited to avian fauna. They are also critical to other organisms. Certain species of butterflies and moths, as well as dragonflies, require these habitats for the completion of their life-cycle. Many plants, especially wild flowers, also depend on grasslands as habitat.

Grasslands and other early successional habitats are not depicted on the Critical Habitat map as they would make the map visually too busy to be useful. Please refer to the Farmland Map #10 instead.

Seeps and Springs

Groundwater discharge sites in the form of seeps and springs can occur on slopes as well as on flat terrain and may also support limestone-dependent communities. Sometimes a direct connection to limestone is not readily apparent. Water passing through limestone bedrock, dissolving calcium and other minerals on its way, can surface in areas away from the bedrock.

Seeps tend to be highly ephemeral wetland pockets. During most of the growing season they are identifiable solely by plant species and not by indicator wetland soils, which are not necessarily present. Consequently, seeps are easily overlooked and omitted from both conservation-related and land-use surveys and could not be included on our map.

Some more significant groundwater discharge sites are readily detectable as the origin of streams and can be easily located on topographic and water resource maps. Often manifested as springs, they can remain open in winter, with water flowing year round. This is particularly important for wildlife during the winter months when other upland water sources are either frozen or absent altogether. Springs can also provide a late-winter food source for birds and small mammals as insects can sometimes be observed congregating around the unfrozen spots. Non-calcareous, cold water discharge sites in steep, dark rocky areas may support rare plants such as the Appalachian weft fern (*Trichomanes intricatum*), a bizarre filamentous gametophyte believed to remain in a perpetual juvenile stage.

Cold springs and seeps and well-oxygenated brooks percolating from hillsides are the favored habitats of the northern spring salamander (*Gyrinophilus porphyriticus*), a species reaching the southern limit of its range in Northwestern Connecticut. State-listed as threatened, it is highly intolerant of disturbance and thermal pollution.

Streams and Riparian Corridors

Low-gradient and consequently slow-moving perennial streams are the preferred habitat of the wood turtle (*Clemmys insculpta*), a species of special concern. The wood turtle hibernates underwater and by the end of spring disperses into adjacent flood plains, upland woods and meadows. Its large home range, which is linear in shape due to its corresponding riparian habitat, makes the wood turtle particularly sensitive to landscape fragmentation and it has consequently been extirpated from many areas in New England. Low reproductive rates, habitat loss and road mortality are also contributing factors to the wood turtle's decline. Considered to be an intelligent and agile climber, the wood turtle is reportedly capable of scaling a six-foot chain link fence to get where it is going.

Cold, fast-moving, well-oxygenated streams and rivers are preferred by the native brook trout (*Salvelinus fontinalis*). This rare species is present in both East and West Aspetuck Rivers. The Housatonic River north of the village is also a native brook trout habitat. The river's well-drained, nutrient-rich soils along its riparian corridor support a unique diversity of plant communities, including floodplain forests and alluvial swamps, as do the dry, limestone outcrops above their banks. A succession of migratory waterfowl also passes through in spring and fall.

Wetland Habitats

There are many different kinds of wetland habitats in Kent, so much so that the various communities cannot be represented according to type on our map. Swamps and marshes are the most common types of wetland. Swamps are generally defined as wetlands dominated by trees and shrubs. Basin swamps are found in depressions and are characterized by slow-moving water over peat and muck soils. They can be acidic or nearly neutral in pH, with eastern hemlock (*Tsuga canadensis*) dominating acidic basin swamps, and northern white cedar or arborvitae (*Thuja occidentalis*) the primary tree in calcareous basin swamps.

Seepage swamps can also be acidic or circum-neutral but have minimal peat accumulation, are seasonally flooded and develop on gently sloping to sloping hillsides with surface flow. The dominant tree cover in seepage swamps is red maple (*Acer rubrum*) but the understory varies.

An environmental and botanical survey conducted in 2002 found the pine swamp on Skiff Mountain to support a large population of red spruce (*Picea rubens* Sarg.), listed by the State of Connecticut as a species of Special Concern. In addition to the presence of red spruce itself, the western portion of the pine swamp qualifies as an occurrence of a red spruce swamp community, previously referred to as an "acidic red spruce basin swamp" or in more recent, vegetation-based classification, a "*Picea rubens/Nemopanthus mucronatus* community". Determination of this community type in the field was based on the following criteria: (1) a predominance of *Picea rubens* (50% or more of canopy trees) within the core area of the swamp; (2) highly characteristic vegetation structure (variably open to closed canopy, a patchy, occasionally dense shrub layer, and hummocky ground layer with few herbs and a nearly continuous cover of mosses and liverworts); (3) species composition (*i.e.*, the predominance of many characteristic species, notably the shrub *Nemopanthus mucronatus*, the sedge *Carex trisperma*, and liverwort *Bazzania trilobata*).

The area covered by the spruce swamp was estimated to be approximately 15 to 20 acres. Although the actual number of red spruce swamp communities in Connecticut at present is not known, only two have been mapped and fully documented to date (2002). Red spruce is a long-lived species, often reaching ages greater than 350 years.

In contrast to swamps, marshes are dominated by herbaceous vegetation. Basin marshes are, like basin swamps, found in depressions and again, depending on pH, are dominated by indicator plants such as swamp loosestrife (*Dodecadon verticillatus*) or tussock sedge (*Carex stricta*). Seasonally flooded grasslands with tussock sedge as a dominant species are common throughout Connecticut, but seasonally flooded grasslands with hairy sedge (*Carex lacustris*) and cattail (*Typha spp.*) are rare, and limited to pond shores in the limestone region.

Two other variations on wetlands in Kent are the bog and the fen. Bogs are groundwater influenced and develop on poorly decomposed acid peats. An example of a forested bog is the black spruce-tamarack community found in the Spectacle Lake area, at the transition between the aquatic environments and the uplands. Fens, on the other hand, are influenced by limestone-enriched water and can be dominated by shrubby cinquefoil (*Dasiphora floribunda*) or woolly fruit sedge (*Carex lasiocarpa*). It is likely that the wetlands that exist near the intersection of South Kent and Camps Flat roads, an area of limestone bedrock, were originally a fen. Commercially excavated for its peat for several decades, its

character is now compromised.

Groundwater discharge sites with minimal peat accumulation in open woodlands are also considered to be a type of fen. Referred to as spring fens, they, too, can be either acidic or circum-neutral. Acidic spring fens are dominated by golden saxifrage (*Chrysosplenium americanum*), while inland sedge (*Carex interior*), bristly-stalked sedge (*Carex leptalea*) and yellow sedge (*Carex flava*) dominate circum-neutral spring fens.

The Leonard Pond/Hatch Pond ecosystem of South Kent hosts a diversity of natural wetlands communities making it another ecologically significant area. A known habitat within this area is the swamp that supports a thriving blue heron (*Ardea herodias*) rookery. The hognose snake (*Heterodon platirhinos*) has been recently documented from the watershed. This interesting reptile has an upturned nose that allows it to dig into sandy soils for toads, its prime food source. When threatened, the hognose snake turns over on its back to play dead. It is listed as a species of special concern in Connecticut.

Vernal Pools

Vernal pools are temporary woodland ponds that usually emerge in spring. They are fed directly by precipitation, snowmelt, surface run-off and/or rising groundwater and typically lack a permanent inlet or outlet. Most are less than 100 feet in diameter and are generally less than a foot deep. They cannot sustain breeding fish populations because they tend to dry out in summer. Free from fish predation, they have a distinctly different life cycle from other kinds of pools. They are highly vulnerable to damage, as are the species that rely on them for short periods.

Unlike lakes and ponds where microscopic green plants (algae) form the basis of the food chain, vernal pools derive most of their energy from decaying leaf litter provided by the surrounding forest. Invertebrate “shredders” (insects) feed on the leaf litter and are in turn eaten by higher order organisms such as salamander larvae. Energy from decomposing leaf litter cycles back out into the forest in the form of the metamorphosed larvae. The adult salamanders return each year to their natal pools to breed, thus completing the cycle. Many frogs have similar site fidelity.

Vernal pools are extremely diverse and biologically productive. Mole salamanders and wood frogs spend more than 90% of their adult lives in the surrounding upland forest, returning to the pools only to breed. Insects, as well as other invertebrates dependent on vernal pools for parts of their life-cycle, abound as well, attracting and sustaining a diversity of insectivorous forest dwelling songbirds. In addition, vernal pools serve as watering holes for other types of animals such as mammals in what may otherwise be dry uplands.

Species whose entire existence depends on these ephemeral waters are known as “obligate” or “indicator” species. Finding them in the area is taken as an indication that a vernal pool exists. Good examples of obligate species are the wood frog (*Rana sylvatica*) and the fall-breeding marbled salamander (*Ambystoma opacum*). The latter is an uncommon species in Kent, which is near the northern limit of its range. The Jefferson salamander (*A. jeffersonii*), state-listed as of special concern, has also been documented in Kent. Other species associated with vernal pools are termed “facultative,” meaning that they use vernal pools for resting and foraging but are able to exist without them if necessary.



Vernal pools are, unfortunately, among the most difficult areas to protect from development due to their ephemeral nature and the fact that their inhabitants are so inconspicuous. Only through repeat visits in all four seasons can they be absolutely identified, but conservation groups and environmental protection agencies are increasingly focusing on increasing awareness of their existence and providing protection. Though Connecticut state regulations have extended Inland Wetlands’ jurisdiction to the regulation of vernal pools since 1995, standards of implementation vary widely. To assist in this protection in Kent, the environmental sciences department of the

Marvelwood School, with the support of the Kent Conservation Commission, launched a research program in 2006 to locate and classify Kent's vernal pools according to their ecological importance.

Starting with an analysis of stereo aerial photos by Connecticut Ecosystems LLC taken early in spring before trees leafed out, 95 sites in Kent were identified as of potential importance. "Ground-truthing," or inspection and assessment on foot, which is possible only in spring, has followed. The largest concentration of vernal pools appears to be in the high wooded areas of Macedonia, Preston Mountain, Skiff Mountain and above Kent Falls, so initial studies are focused in these locations. As the on-the-ground assessments continue, each vernal pool is mapped with global positioning system (GPS) tools and



rated for biological value (high value goes to sites having any species state-listed as endangered, threatened or of special concern). Vernal pools are also studied for evidence of species breeding and for size of egg masses at the conclusion of the breeding season.

The condition of the terrestrial habitat—how much of the surroundings are undeveloped—is also being assessed. Scored according to the answers, each pool is rated in descending order from Tier I (exemplary) to Tier IV (beyond practical restoration efforts), with ratings

presumably becoming reference material for Inland Wetland and Planning and Zoning commissions when considering building applications and planning for the future. To date the student teams have identified 95 potential vernal pools within Kent's borders, with another 56 just over its borders in neighboring towns and thus linked to Kent's wildlife. Of the 95 noted in Kent, the Marvelwood students had confirmed 14 vernal pools, cited another seven as either "probable" or in need of further study, and declared three others as not qualified by the end of 2008.

Additionally, nine Tier 1 pools have been identified just over the Sharon town line between the Kent riding stables and Peck's Pond. Another 71 potential sites remain to be "ground-truthed." Map #11 shows the potential vernal pools from the aerial survey as well as the vernal pools confirmed.

Kent's Bird Population

The Housatonic River and its numerous perennial and seasonal streams, combined with Kent's extensive forested tracts, wetlands, and early-successional habitats, attract a wide variety of resident, breeding and migratory birds. In fact, much of Kent, especially the forests and riparian areas bordering the Housatonic River, is a critical migration corridor, allowing migrating birds ample opportunity to rest and refuel before continuing their journeys to their breeding or wintering grounds. As a result of the tremendous habitat and large tracts of unfragmented forests, Kent is a refuge for many species of birds, including several species of conservation concern.

According to the Connecticut Ornithological Association (COU) there are 417 species of birds documented in the State of Connecticut. Published birding guides and observational records from Kent residents familiar with bird identification, indicate that at least 172 species (includes resident, migratory, exotic, domestic and rare visitors) can be found in Kent during various times of the year. (See the Appendix)

Since 2001, Marvelwood School students have managed to mist net and band, or to capture in artificial nesting structures, 75 different species of birds, just within a three-mile radius of the school campus atop Skiff Mountain in Kent. According to the IUCN list, Kent is home to four globally threatened species: the cerulean warbler (*Dendrocia cerulean*) golden-winged warbler (*Vermivora chrysoptera*), northern bobwhite (*Colinus virginianus*) now believed to be extirpated in Connecticut, and the red-headed woodpecker (*Melanerpes erythrocephalus*), which has been reported in various bird guides primarily during the migratory season. Based on the 2004 version of the Connecticut Department of Environmental



Protection Endangered, Threatened, and Special Concern Species List, Kent has 21 listed species. Nine species observed in Kent are currently on the Connecticut Audubon Society Conservation Priority Top Species List for 2009. Several bird species sighted in Kent in the last 10 years have been classified as species of conservation concern by other reputable national organizations.

Among Kent's threatened and endangered bird species that reside, breed, or use the area as a critical migratory stop over corridor, are several birds of prey, including the Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), American kestrel (*Falco sparverius*), northern harrier (*Circus cyaneus*), bald eagle (*Haliaeetus leucocephalus*) and golden-winged warbler (*Vermivora chrysoptera*).

Harriers and kestrels require open fields to search for prey. Most of our farms have long ago been reclaimed by forest, so keeping fields and pastures mowed regularly can help reestablish the populations of these birds, as it will also maintain hospitable habitats for meadowlarks (*Sturnella magna*), bobolinks (*Dolichonyx oryzivorus*), purple martins (*Progne subis*), and American woodcock (*Scolopax minor*).

Some species of birds that traditionally spend summers in Kent are threatened not because of events in Kent but because they are losing their winter habitats in other parts of the world. Among these are a number of neotropical songbirds that breed in North America but winter in the tropics. The amazing variety of migrating warblers passing through our area every spring is truly breathtaking. Sometimes 20 different warbler species can be identified in one (neck-wrenching) day. Some warblers such as the golden-winged and blue-winged need early Successional habitat which is diminishing in Kent.

Orioles, thrushes, warblers, vireos and many other migratory species may currently have suitable woodland in Kent to return to every year, but habitat fragmentation is common elsewhere in our region. Often their winter habitat in the Caribbean and Central and South America is threatened by extensive logging, by slash-and-burn agriculture and the development of land for housing and resorts. The wood thrush (*Hylocichla mustelino*) population has been declining by nearly 2% every year since 1966. Its melodic, flutey song, once common in our woodlands, is regrettably heard far less often today.

One tool for monitoring successes and failures in avian conservation are the surveys created annually by professional scientists and conservation organizations, including the International Union for Conservation of Nature (IUCN), the National Audubon Society, and Partners in Flight (PIF). "The Watchlist," for example, is a joint effort of Audubon and the American Bird Conservancy to draw data from several sources, including Christmas Bird Counts and Breeding Bird Surveys. It identifies birds in the continental United States in need of immediate conservation assistance and seeks to initiate management programs to assist them.



The American Bird Conservancy and the National Audubon Society also produce a watchlist of birds in decline which are not necessarily on federal or state endangered species lists. Kent boasts eleven species on this national watchlist. These include the red-headed woodpecker, willow flycatcher, wood thrush, blue-winged warbler, Canada warbler, chestnut-sided warbler, golden-winged warbler, Kentucky warbler, worm-eating warbler, and prairie warbler.

Partners in Flight is another influential organization, launched in 1990 in response to growing concerns about declines in the populations of many land bird species, particularly those not covered by existing conservation initiatives. The initial focus was on neotropical migrants, species that breed in the Nearctic (North America) and winter in the Neotropics (Central and South America). However, their surveys have since widened to include most land birds and other species requiring terrestrial habitats. The central premise of PIF has been that the resources of public and private organizations in North and South America must be combined, coordinated, and increased to achieve success in conserving bird populations in this hemisphere. For more on the birds passing through Kent that PIF deems of conservation concern see its web site.

Finally, Jeffery Wells' *Birders' Conservation Handbook: 100 Birds at Risk*, widely respected as a birders' resource, has cited eight at-risk bird species relevant to Kent. (see Appendix)

Birding Hotspots in Kent

Kent is blessed with several pristine and easily accessible places in which to view birds. River Rd. is ranked by the Connecticut Ornithological Association (COA) as one of the top 10 birding hotspots in the state. The organization comments on its web site, "Great spring migrant area. Woodland near New York border features migrants and nesters not common to state such as Saw-Whet Owl, Cerulean Warbler, Black Vulture, Golden-Winged Warbler, and Yellow-Throated Warbler." In a recent edition of *The National Geographic News*, River Rd. was called "Connecticut's Warbler Mecca." Skiff Mountain is another part of Kent with exceptional birding opportunities. See the table below for details.

Location	Directions	Peak Season(s)
Bulls Bridge Rd. (Appalachian Trail)	~5 miles <u>SOUTH</u> of Kent <u>just over Bull's Bridge</u> . Trails start near the parking lot. There are two trails to the north and south of the lot.	Spring
River Rd.	~1.5 miles <u>NORTH</u> of Kent. From Rtes. 7 & 341, travel 0.3 miles west on Rte. 341 over the bridge. Turn right on Skiff Mountain Rd. immediately after crossing the bridge and travel 1.2 miles until road forks to the right. River Rd. is the dirt road to the right along the river.	Spring Summer Fall Winter
Skiff Mountain Area	~4.8 miles <u>NORTH</u> of Kent. From Rtes. 7 & 341, travel 0.3 miles west on Rte. 341 over the bridge. Turn right on Skiff Mountain Rd. immediately after crossing bridge and travel 4.5 miles until Marvelwood School sign. Look for any of several habitat areas and park nearby. Land Trust trails are to the north and south of School.	Spring Summer Fall
Iron Mountain Preserve	~5 miles <u>EAST</u> from Kent. At intersection of Rtes. 341 and 7 travel east on 341 for 3.3 miles. Turn right on South Rd. for 0.9 mile. Turn left on Flat Rock Rd. for 0.4 mile. Turn right on Treasure Hill Rd. and go 0.1 mile to Preserve entrance and parking area on right.	Spring Early Summer
Kent Falls State Park	~5 miles <u>NORTH</u> from the center of Kent (Rte. 7 and 341). Travel north on Rte. 7 for 4 miles. Park entrance is on right.	Spring Summer
Pond Mountain Preserve	~3.5 miles <u>NORTHWEST</u> of Kent. At intersection of Rtes. 7 & 341 drive west 1.6 miles on Rte. 341. Turn right on Macedonia Brook Rd. and drive .9 miles. Turn right on Fuller Mountain Rd. and drive approx. 1 mile to Pond Mountain Natural Area parking on right.	Spring Summer
Schaghticoke Road	~0.7 miles <u>WEST</u> of Kent center. From Rtes. 7 & 341, travel west on Rte. 341. Turn left on Schaghticoke Rd.	Spring Summer Early Fall
Macedonia Brook State Park	~2.0 miles <u>WEST</u> of Kent center. From Rtes 7 & 341, travel west on Rte. 341 to Macedonia State Park on right. In the park travel along the road that follows Macedonia Brook, stopping to bird at various points along the way.	Spring Summer Early Fall

Backyard Habitats

Another important habitat is right in our own backyards. The habitat can be as simple as a bird bath or feeder, or as extravagant as a man-made waterfall and pond; the enhancement will often be used to advantage by wild creatures. And while that chickadee is on its way to enjoy a free lunch, it will opportunistically preen neighboring trees for stray bugs.

Such partnerships can be encouraged by the choices made in the garden. Planting bright yellow and red flowers will attract butterflies and hummingbirds that assist in pollination. Leaving an unmowed area of taller grasses, sedges and wildflowers to flourish nearby can provide important habitat for honey bees and parasitic wasps that play beneficial

roles as pollinators and predators of destructive insects. Amphibians, birds, and small mammals will find cover and shelter in these “wild” areas. Buffer zones of taller grasses are especially important around streams and wetlands, where they additionally help to filter runoff, prevent erosion and provide shade and cover.

Frequent clipping or removal of invasive species such as multiflora rose can help maintain native species population. Equally important is the reduction or elimination of all chemical fertilizers and pesticides, which will improve the survival chances of all native plants and animals. Honey bees are especially sensitive to pesticides, even those considered organic, so pesticides should be avoided in the backyard garden.



The National Wildlife Federation (www.nwf.org) and the Connecticut College website (www.conncoll.edu) are two of the numerous online sites offering good information on how to make the backyard more attractive to wildlife.

Invasive Plants, Insects, Diseases

Certain species of plants and animals, including various insects, zebra mussels and starlings, are listed by the State as invasive. Invasive plants are defined by the Connecticut Invasive Plants Council as non-indigenous (alien) to the state but naturalized to it, with the demonstrated ability to become rapidly and widely dispersed and established in natural environments, possibly in high numbers and over wide regions of the state. Invasive species are by definition very vigorous in their growth and have few if any predatory species to hold them in check; consequently they become effective competitors for native species that have existed happily in their own niche for eons.

By out-competing native plants invasives can create small monocultures (single plant communities). As a hierarchy of different plants is part of a larger web of life, such monocultures severely limit what other forms of life can survive in an area, thus reducing biodiversity in certain habitats. For example, invasive phragmites or common reeds (*Phragmites australis*) have little value to wildlife besides providing cover, whereas the native cattails they replace are a rich food source, with tuberous roots, shoots, flowers and seeds that support a myriad of wildlife.

State legislation has belatedly stepped in to ban the sale and spread of many invasive plants, some of which have been sold in Connecticut nurseries and extensively planted. Nonetheless, the impact of these plants will continue for generations as they continue to spread by runners or disperse seeds and plant fragments by wind, moving water and animals (not to mention the dispersal caused by roadside scraping and mowing equipment).

The best time to limit the spread of invasive plants is early on, when a particular species is first recognized as a potential danger, because invasives multiply rapidly once they have established a foothold. Mechanical removal and destruction of invasives is labor intensive and time consuming. Chemical control is quicker, but it has its own problems. Biological controls are not widely available yet. But control is necessary if healthy populations of native shrubs and wildflowers are to survive this onslaught on both protected and privately owned lands.

Among the numerous invasive plants of current concern in Connecticut are:

- Purple loosestrife (*Lythrum salicaria*) and common reed (*Phragmites australis*) are colonizing wetlands
- Honeysuckle (*Lonicera sp.*), autumn olive (*Elaeagnus umbellata* Thunb), multiflora rose (*Rosa multiflora*) and barberry (*Berberis sp.*) are overrunning some fields, pastures, woodlands
- Asiatic bittersweet (*Celastrus orbiculatus*) and honeysuckle vines choke some woodlands and hedgerows
- Eurasian Milfoil (*Myriophyllum spicatum* L) is congesting the the shorelines of lakes and ponds
- Goutweed (*Aegopodium podagraria* L) and garlic mustard (*Alliaria petiolata*) are popping up in cultivated gardens and woodlands
- Japanese knotweed (bamboo) (*Polygonum cuspidatum*) is taking over roadsides, the margins of fields and stream banks
- Burning bush (*Euonymus alatus*), introduced as a colorful Asian ornamental, quickly showed itself to be a plant capable of establishing vast colonies of young shoots in wooded areas and fields
- Mile-a-minute vine (*Persicaria perfoliata*) is a recent Asian import that now threatens to take over roadsides, edges of woodlands, and stream banks in towns south of Kent.

A number of alien insects are also causing havoc. The work of the chestnut and elm tree borers is old history, having participated in the destruction of New England's favorite ornamental trees decades ago, but botanists are currently very concerned about the hemlock wooly adelgid (*Adelges picere*) that threatens area hemlocks; the emerald ash borer (*Agrilus planipennis*) that attacks local ash trees; and two relative newcomers—the Asian long-horned beetle (*Anoplophorus glabripennis*) and the sirex wood wasp (*Sirex noctilio*)—found in numbers in the New York metropolitan area.

Wildlife Corridors and Habitat Fragmentation

Large and contiguous parcels of open space are more valuable to wildlife than isolated pockets of protected land. When these parcels are extensive enough, especially if they connect with protected land in neighboring towns, a wildlife corridor can be established that gives plants and animals more uninterrupted room to roam, allowing them to adjust to seasonal changes by changing their latitude or altitude. Our predominantly north/south ridges and valleys form natural migratory routes for our raptors, shorebirds, ducks and neotropical migrants.

The Housatonic River, Appalachian Trail lands, Pond Mountain Preserve, Macedonia State Park, Preston Mountain Club, Kent Land Trust's Southern Gateway along Rte. 7, and the state Wildlife Management Area in North Kent create sizeable wildlife corridors, providing riparian (shoreline), upland and grassland habitat. Any available lands adjoining these areas thus have a high conservation priority.

A major threat to biodiversity is habitat fragmentation, in which development, road construction, and especially linear sprawl, lead to the break-up of large natural areas, of seasonal migratory routes, and of the interconnectedness between the various habitats that wildlife species use during their lifetime. Isolated islands of habitat, however carefully they are maintained, cannot provide the critical mass of space and other features that many species need to flourish.

RECOMMENDATIONS

1. As part of screening land use applications, check existing maps for "known" resources and where appropriate require professional field examinations at developer's cost to ensure that any significant but previously undocumented habitats and natural communities are recorded and protected. Wherever possible consider Kent land-use decisions in the context of larger regional conservation plans.
2. Implement the recommendations proposed in the Comprehensive Wildlife Conservation Strategy (CWCS) for Connecticut, issued in 2005 by the Connecticut Department of Environmental Protection.
3. Initiate advanced screening of any areas with known and potential ecological importance considered vulnerable to development at a later date. Have four-season assessments done by a biologist or ecologist who is familiar with the ecology of the region. Provide applicants with specific review standards and research protocols.
4. Develop and incorporate effective land-use strategies into Kent's Plan of Conservation and Development and land-use regulations. These include specific strategies and incentives to protect vernal pools, especially those that are of high quality and of greatest ecological importance.
5. Adopt "best land use" practices as recommended by Calhoun and Klemens (2002). Examples include lot-clearing restrictions, maintaining forest corridors between vernal pools, and prohibiting detention ponds in critical upland areas.
6. Require forestry plans for land development in headwater and other fragile wetland areas, especially on adjacent slopes, to protect not only water quality but habitat. Prohibit clear-cutting and removal of understory, shrub and herbaceous layers. These strata, when allowed to remain intact, are effective in filtering pollutants, slowing storm run-off, retarding soil erosion that can negatively affect habitat quality and kill wildlife, and in maintaining cooler water temperatures, especially important to sensitive species such as amphibians and native brook trout.
7. Make the identification and management of early successional habitats in Kent a community priority to protect Kent's eminence as a birding area. Similarly make an effort to maintain existing open farm fields, grasslands, old fields and shrub lands to halt the decline in species that depend on these habitats.
8. Encourage active management of protected properties (especially those owned by the town and land trusts) to maintain or create high quality habitats.

9. Pre-application review of development proposals (i.e. before the applicant becomes too heavily invested in the outcome) by land use commissions is the best way to adapt proposals to the sustainability of the land and the needs of the community.
10. Give large forest blocks, large open areas, and large wetland areas high priority in protection, because many of the rarer and declining animal and plant species are found in the interior zones of large ecosystems. (Edge habitats, because they are associated with human habitation, tend to harbor over-abundant and invasive species.)
11. In the updating of the Town Plan of Conservation and Development make sure that natural resources data are woven into all facets of the plan and that provisions are included to help preserve and improve important natural habitats.
12. The Conservation Commission should pursue the designation of River Rd., Cobble Rd. and the Skiff Mountain area as “Nationally Important” bird areas. Also as part of a town-wide bird conservation strategy, property owners should be encouraged to retain dead “snags” as nesting and roosting sites for many birds.
13. Continue “ground-truthing” Kent’s remaining vernal pools and make findings available to land use commissions. Protection of confirmed pools should include buffer zones of 700 to 1,000 feet, with adjacent wooded areas and their leaf cover left undisturbed.

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