

Chapter 3: Threats Affecting Species of Greatest Conservation Need (GCN) or their Habitats

Threats affecting GCN species or their habitats were determined based on a review of the best available information and sources. Over 120 existing conservation programs and plans were evaluated (Appendices 1a and 1e). Threats were compiled from these sources and from stakeholders and partners through surveys and workshops. An iterative consultation process was used to refine and link the threats to conservation actions. Appendix 3 identifies these threats by GCN species and taxon. Appendix 3 lists these compiled threats as they pertain to key habitats, sub-habitats, and their associated vegetative communities. Appendix 4 lists conservation actions identified by DEP staff, Endangered Species Scientific Advisory Committee (ESSAC) members, and stakeholders to address threats to GCN species.

A formal comprehensive statewide assessment of threats has never before been conducted in Connecticut for wildlife and habitat. The foundation for the process of identifying threats/problems impacting GCN species and key habitats was a comprehensive review of existing conservation programs and plans developed by the DEP, other agencies, and stakeholders organizations.

Threats identified in these plans were evaluated and prioritized by DEP staff. For example, threats to water quality were evaluated by reviewing biological monitoring data collected on Connecticut's rivers, lakes, and estuaries by the Inland Fisheries Division and the Water Bureau (CT DEP Water Bureau, Reports 305b and 303d, 2004a). In addition, The Nature Conservancy (TNC) Threats Assessment and Viability Analysis (TNC 2000) for its ecoregional target species was reviewed. A summary of threat assessments from Partners in Flight (PIF) conservation plans for the state's three Bird Conservation Regions and other related regional/international bird plans applicable to Connecticut was reviewed and integrated into this process (Rosenberg 2004, USFWS R 5) (Appendix 1d). Finally, a survey of DEP staff and a wide variety of stakeholders was conducted to capture their input on problems affecting wildlife species and key habitats (Appendix 8c).

After compiling results, additional input was sought through follow-up workshops with the ESSAC and staff from all divisions of the DEP. Threats to GCN species are shown in Table 3.1. A summary of the threats associated with the 12 key habitats is presented in Table 3.2. Some threats were specific to one habitat or applied only to closely related key habitats, whereas others were applicable to several habitats across Connecticut.

Table 3.1 Threats to Species of Greatest Conservation Need

All species:

- Insufficient scientific knowledge regarding wildlife, as well as freshwater, diadromous and marine fish species, and their habitats (distribution, abundance and condition)
- Loss, degradation, or fragmentation of habitats from development or changes in land use
- Degradation of habitats by non-native invasive species (e.g., *phragmites*, purple loosestrife, mute swan)
- Lack of resources to maintain/enhance wildlife habitat
- Lack of landscape-level conservation efforts
- Public indifference toward conservation
- Delayed recovery of species with depressed populations due to limited reproductive potential, dispersal ability, or other factors

Terrestrial species:

- Loss of early successional habitats through natural succession
- Lack of wildlife conservation on most private lands
- Illegal collection/poaching of wildlife species
- Lack of data exchange (access to and submission of information) for the public and scientific community

Marine species:

- Disturbance, destruction, alteration, or loss of critical habitat structure or function
- Effects of residual contaminants in sediments and water such as, nutrients, and pesticides
- Adverse impacts from temperature shifts, including widespread long-term (e.g., global warming) and local short-term impacts (e.g., temporary power plant shutdowns)
- Predation, competition, displacement from habitat, and or disease transmission, especially from non-native species
- Unintentional damage, injury, or mortality due to fishing (e.g., incidental catch, injuries from fishing gear)

Freshwater and diadromous species:

- Degradation, alteration, and loss of habitat due to stream channel modifications, dams, channelization, filling, dredging, development, sedimentation, vegetation control, and shoreline modification
- Impacts to prey species from predation by striped bass in the Connecticut River

- Fragmentation of populations and loss of access to upstream and spawning habitat due to impediments to fish movements, such as dams, barriers, culverts, and tide gates
- Impacts of point and non-point source pollution
- Impacts of excessive boat activity (wake wash, sediment suspension, propeller scarring)
- Instream flow alterations and increasing temperatures caused by consumptive withdrawals of surface or ground water and wetland loss
- Impacts of water diversions that reduce stream flows resulting in fish mortality, loss of habitat, and interference with migration
- Impacts to fish habitats due to ineffective or insufficient land use regulations among towns
- Adverse impacts to fish from lake manipulations (e.g., excessive vegetation control, water level manipulation, dredging)
- Loss of oxygenated hypo-limnetic and meta-limnetic zone due to excessive nutrient run-off and vegetation control
- Disruption of fish migrations due to dredging and development
- Loss of coldwater habitat due to decreased groundwater input or increased warming (e.g., wetlands filling, impoundment, removal of riparian vegetation)
- Impacts to coldwater habitats from beaver dams that result in ponding and warming, fragmentation of habitat, and increased sedimentation and nutrient loading.

Table 3.2 Threats to Key Habitats, Sub-habitats, and their Associated Vegetative Communities

- Lack of fire needed to maintain certain habitats
- Unauthorized use of motorized vehicles, which disturb wildlife (e.g., ATVs, jet skis)
- Lack of stand age and structural diversity and understory diversity among upland forests
- Degradation of habitat from over-browsing by deer
- Degradation of habitat from insects and disease
- Loss of large forest blocks (e.g., 2,000+ acres) with unbroken canopy
- Loss of wetland habitat from historic filling, dredging, and ditching
- Loss of habitat value due to hydrologic impacts from development, new roads, impervious surfaces, and culverts
- Impacts from development to upland buffers
- Impacts from development to upland migration corridors associated with vernal pools
- Impacts to and loss of riparian habitat for wildlife corridors and insufficient buffer requirements to protect streams
- Impacts from human disturbance
- Adverse effects from hypoxia and other water quality impairments, and habitat alterations in Long Island Sound
- Impacts to micro-climate caused by habitat alterations (e.g., tree cutting)

A recurring theme throughout these lists of threats is the loss and degradation of wildlife habitat in Connecticut from development and other anthropogenic impacts. Connecticut's natural landscape has been and continues to be significantly altered by human population increase and associated human activities.

Prior to European settlement, 95% of Connecticut's 3.1 million acres were forested, but by 1820, only 25% remained forested. After 1830, farm abandonment across New England resulted in the return of forests to much of Connecticut. From 1953 to 1998, the human population grew by 51% to 3.3 million, making it the fourth most densely populated state in the United States. However, Connecticut ranks 13th in percentage of forest cover. Few places on earth have so many people living as densely within an area of forest (CT DEP 2004c).

Land cover changes from 1985 through 2002 have been determined through satellite-based remote sensing images by the University of Connecticut's Center for Land Use Education And Research (CLEAR) program (Table 3.3). CLEAR data show that since 1985 the state has lost 18 acres a day to high-density development, which includes buildings, parking lots, and roads. Many of these developments are concentrated around already established cities and towns (Swift 2004). There is consensus among natural resource managers that the loss and degradation of habitats from our increasing human population and development is the primary threat to GCN species.

Table 3.3 Land Cover Changes in Connecticut 1985-2002

Class Descriptions	1985 Land Cover (sq. miles)	1985-1990 Change (sq. miles)	1990-1995 Change (sq. miles)	1995-2002 Change (sq. miles)	2002 Land Cover (sq. miles)
Developed	811	63.3	21.0	34.3	930
Turf and Grass	223	-1.8	1.3	0.1	223
Other Grasses and Agriculture	553	14.4	13.0	14.8	595
Deciduous Forest	2,483	-73.6	-36.8	-46.0	2,327
Coniferous Forest	462	-6.8	-3.7	-5.2	446
Water	164	-0.5	-4.9	-7.6	151
Non-forested Wetlands	12	6.4	2.0	3.4	23
Forested Wetlands	187	-7.9	-3.4	-1.5	174
Tidal Wetlands	23	0.1	0.1	0.3	24
Barren	35	6.6	11.4	7.5	61
Utility-right-of-way	15	-0.3	0.0	-0.1	15

Despite the high percentage of forest cover in Connecticut, fragmentation of habitat from development renders the remaining habitat functionally less valuable or unsuitable to many species of wildlife that require large blocks of contiguous forest. The CLEAR program indicates that fragmentation of forest in Connecticut continues

at a high rate. Trends in Connecticut's forest fragmentation also have been monitored by the University of Connecticut's Natural Resources Management and Engineering (NRME) Laboratory for Earth Resources Information Systems (LERIS). This program is working to develop a forest fragmentation index to better quantify the rate of forest change in Connecticut.

Impacts to forest habitats pose a difficult challenge to wildlife managers because so much of Connecticut's forests are in private ownership. More than 102,000 individuals and private enterprises own 84% of Connecticut's forestland. State, federal, and other public owners hold only 16%. Private and public water utilities own some of the largest forested tracts; however, the number of private landowners with fewer than 50 acres of forestland has increased by 68% since 1975. Three-quarters of the private forest landowners have fewer than 10 acres. These small tracts are primarily home sites (CT DEP 2004c). Thus, it is apparent that forest fragmentation poses a major threat to many GCN species and, if the CWCS is to succeed, participation by private forest landowners is critical.

For aquatic species, the loss of wildlife habitat from hydrologic impacts, such as road construction, increasing amounts of impervious surfaces, and expanded beaver activity, were identified as the primary threats affecting many habitats throughout Connecticut. Increased sedimentation and pollution from adjacent land-use changes and development also were identified as multi-habitat problems needing attention (CT DEP 2004a).

Impacts to water quality were identified as a threat to many GCN species. Declines in water quality have been well-documented, as important aquatic systems and habitats continue to degrade and become unsuitable for fish and wildlife (Figure 3.3). Trends in water quality and the aquatic life of rivers and streams have been monitored through the cooperative efforts of Inland Fisheries Division and Bureau of Water Management (CT DEP 2004a). Specifically, the Ephemeroptera, Plecoptera, Trichoptera Taxa Richness Index (EPT) and Hilsenhoff Biota Index (HBI) are commonly used methods of indicating poor quality or polluted waters that threaten the aquatic systems of Connecticut (Figure 3.4).

The Connecticut Lakes and Ponds Survey monitors and maps trends in water quality, depth and aquatic vegetation in inland lakes and ponds statewide (CT DEP 2004a; www.dep.state.ct.us/cgnhs/lakes/lakepond.htm). The Long Island Sound Program (LISP) continues to work collaboratively at the local, state, and regional levels to monitor water quality in tidal waters (US EPA OLISP 2004).

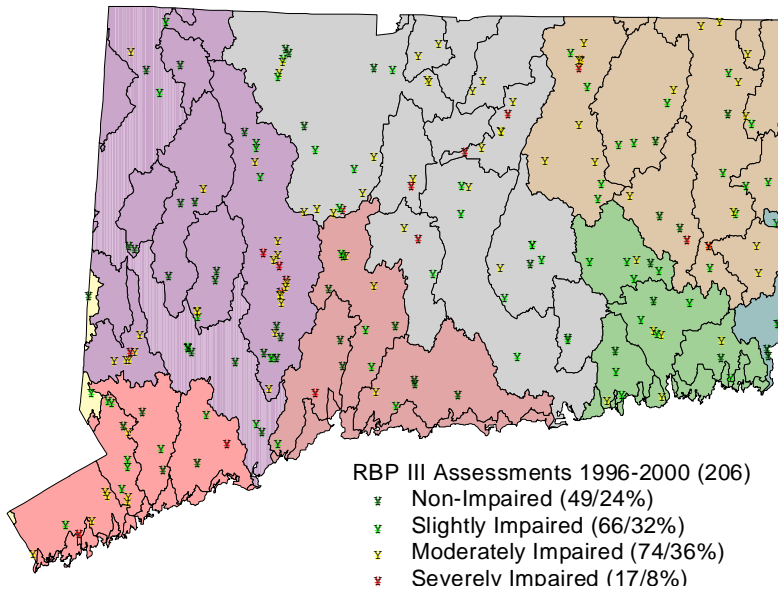


Figure 3.1 Connecticut's Water Quality (Source: CT DEP BWM Rotating Basin Strategy, 1999)

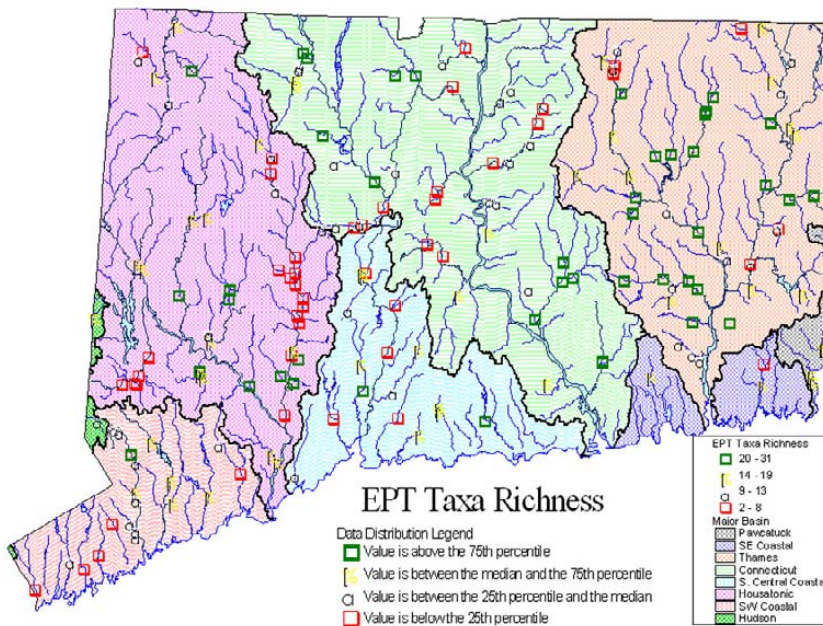


Figure 3.2 Connecticut's Water Quality EPT Indicator (Source: CT DEP BWM Rotating Basin Strategy, 1999)

The threats identified from the compilation of existing plans and programs described above were confirmed and validated iteratively by DEP staff and stakeholder input throughout the development of this CWCS. Once these threats were identified, the next step was to develop conservation actions that addressed them. The next Chapter describes how the Connecticut DEP Bureau of Natural Resources developed conservation actions to address the identified threats.