Chapter 1

Connecticut's Species of Greatest Conservation Needs and State Assessment Priority Species

Table of Contents

Summary

Connecticut is home to approximately 1,840 known wildlife species and 2,821 known plant species (1,706 natives and 1,115 naturalized non-natives); however, many more species are likely to be found here. Over the last couple of years, experts across Connecticut, within CT DEEP, our conservation partners, and Tribes have evaluated all of the known species and identified 288 wildlife species and 285 plant species they consider the Species of Greatest Conservation Need (SGCN) and 239 wildlife species and 276 plant species as State Assessment Priority Species (SAPS) due to ongoing population declines, emergent threats, cultural importance, lack of information, and other factors. These SGCN and SAPS represent approximately 29% of all wildlife species and 20% of all plant species in the state. Of Connecticut's SGCN, 13% of populations are rapidly declining (losing between 50% and over 90% over the last 200 years), 2% are declining (10-50%), 8% are stable or increasing, and 77% have unknown long-term trends. According to taxonomic experts, over the short term (three generations), approximately 12% of Connecticut's SGCN have populations that are rapidly declining (losing between 50% to over 90% over the last 200 years), 12% that are declining (10-50%), 10% that are stable or increasing, and 67% that are unknown or have insufficient data to decide.

This new 2025 list updates the 2015 SGCN list and now includes four additional species, totaling 573 (569 in the 2015 list). This small increase in the number of species is due to many factors, including more capacity to thoroughly evaluate and list more plants, adding 515 species to the new SAPS list (which was not part of the 2015 Wildlife Action Plan), evolving perspectives of species prioritization among conservation practitioners, intensifying threats, changes in population trajectory, and management successes. Since the 2015 revision of the Wildlife Action Plan, CT DEEP and other conservation stakeholder organizations have collaborated on numerous projects related to SGCN and its habitats. Yet, much work remains to stabilize and restore the populations of SGCN and learn more about SAPS populations within Connecticut over the next 10 years and beyond.

An Overview of Connecticut's Flora and Fauna

Despite our state's relatively small size, Connecticut is home to approximately 1840 known wildlife species and 2338 known plant species, though many fungi, microorganisms, and unknown species live here, too. Many rare and endangered species occur in Connecticut, giving our state an outsized role in global, national, and regional conservation efforts. This diversity is due to the state's range of landscapes, waterscapes, and habitats, from the coastal plain and Long Island Sound in the south to the mountains in the northwest (Dowhan and Craig, 1976; Kulik et al., 1984; Klemens, 1993; Metzler and Wagner, 1998).

Of the species that live in Connecticut, a handful are considered globally endangered, including the Wood Turtle, Saltmarsh Sparrow, and Eastern Pearlshell by the International Union for Conservation of Nature, and 12 species are listed under the U.S. Endangered Species Act, including the Roseate Tern, Long-eared Bat, Dwarf Wedgemussel, Puritan Tiger Beetle, and Shortnose Sturgeon, Bog Turtle, and Small Whorled Pogonia. Regarding regional significance, Connecticut supports several species at the northern or southern limit of their ranges. One hundred and thirteen (113) species that live in Connecticut are considered Regional Species of Greatest Conservation Need (RSGCN) for the northeastern United States (TCI & NEFWDTC, 2023; Starking et al., 2025), and 1089 species are listed as Species of Greatest Conservation Need (SGCN) or State Assessment Priority Species (SAPS) for Connecticut (see Table 1.1).

Table 1.1 – Conservation Status of Connecticut's Wildlife and Plant Diversity

Taxa	# of Species Occurring in CT	SGCN & SAPS	RSGCN	Federally-listed
Amphibians & Reptiles	50	35	13	3
Birds	301	107	24	3
Fish	126	46	34	2

Invertebrates	1288	309	49	2
Mammals	64	30	11	2
Plants	2338	561	0	2
Total	**4167**	**1088**	**113**	**12**

What are Species of Greatest Conservation Need and State Assessment Priority Species, and how were they identified?

Summary

Updating the SGCN and SAPS list for 2025 required three major steps. The first step of the process was to identify all sources of data and regional, national, and global vulnerability status for all species known to live in the state. Those results were compiled and shared with teams of scientific experts (hereafter, "Taxa Teams"). The second step involved and engaged Taxa Teams, which met multiple times in the Fall of 2023 to evaluate the data and vote on preliminary lists of SGCN and SAPS. The third and final step involved soliciting input and reviewing the SGCN/SAPS list at multiple levels within CT DEEP, the Mohegan and Pequot Tribes, and our conservation partners in Connecticut. The SGCN/SAPS list was posted on CT DEEP's website for public feedback in late 2023. Once revised based on input provided during the review process, the list was again sent to Taxa Teams, CT DEEP, Tribes, and partners and posted online for public input in early 2024 for a final review and finalization. The following sections provide details on each step of the process.

Definitions (SGCN / SAPS)

These terms are defined in the Northeast Lexicon (Crisfield and NEFWDTC, 2022).

Species of Greatest Conservation Need (SGCN) – Defined by each state fish or wildlife agency in its Wildlife Action Plan, typically a native species with declining populations or vulnerabilities expected to benefit from strategic conservation attention.

State Assessment Priority Species (SAPS) – Species for which more information is needed to fully understand status and trends to determine the level of conservation concern or SGCN status. These species, separate from SGCN, are a priority for additional assessment or survey to address data deficiency.

Step 1: Data identification and compilation

Identifying and compiling preliminary data before incorporating the Taxa Teams' feedback largely followed the regional methods developed by Starking et al. (2025) to ensure consistency across the Northeast region and update the database compiled during the 2015 Connecticut State Wildlife Action Plan revision process. The list of SGCN from Connecticut's 2015 Wildlife Action Plan served as a starting point. To that information, up-to-date information on species status and data were added from the following sources:

- Global
  - IUCN (link)
  - NatureServe (link)
  - WORMS (link)
- National
  - Federal (USFWS and NOAA-NMFS) Official Threatened and Endangered Species Lists
- Regional
  - Northeast Regional Conservation Synthesis for 2025 State Wildlife Action Plans (Terwilliger Consulting and NEFWDTC 2023 - link)
  - Northeast Regional Species of Greatest Conservation Need Database (link)
- State
  - 2015 Connecticut Wildlife Action Plan
  - Proposed CT DEEP Threatened and Endangered Species Lists

The lists of species were then standardized by categories (ITIS TSN, Scientific Name, Common Name, Taxonomic Synonyms, Taxon, Subtaxon) established in the Northeast Lexicon (Crisfield and NEFWDTC, 2022), developed by the Northeastern states, to ensure data consistency across the region. The taxa considered for SGCN/SAPS were Amphibians & Reptiles, Birds, Fish, Invertebrates, Mammals, and Plants. Other major groups of organisms, such as fungi and microorganisms, were not considered due to limited information and capacity.

Step 2: Taxa Team review and preliminary list creation

Taxa Teams were established for the six major taxonomic groups included in the SWAP: Amphibians & Reptiles, Birds, Fish, Invertebrates, Mammals, and Plants. The Taxa Team leaders were selected from among CT DEEP personnel with expertise in each taxonomic group. Taxa Team members were identified by contacting those from the 2015 SWAP for consistency and tasked with providing suggestions for members and replacements with sufficient expertise in their respective taxonomic groups. The Taxa Teams included 50 wildlife experts from academia, conservation stakeholder groups, and state agencies (See Appendix 1.1 for a complete list of Taxa Team members and their affiliations).

Once the Taxa Teams were constituted in August 2023, they were provided with all the data compiled in Step 1. For ease of use, spreadsheets were split into two lists: "Possible SGCN" included species listed previously as SGCN, state endangered or threatened, or Regional Species of Greatest Conservation Need. "Unlikely SGCN" included species that occur in Connecticut that are not listed as SGCN, threatened, or endangered, or regionally. CT DEEP and its consultants organized virtual workshops in September 2023. These workshops were designed to help them navigate existing data and supplement it with their localized expertise on current population trends and other relevant information affecting their status in the state (see Appendix 1.2 for an example datasheet of existing data considered by each taxa team). Taxa Teams considered the following categories:

- **SGCN and SAPS**:
    - SGCN: Defined by each state fish or wildlife agency in its Wildlife Action Plan, typically a native species with declining populations, or vulnerabilities expected to benefit from strategic conservation attention.
    - SAPS –Species for which more information is needed to fully understand status and trends to determine the level of conservation concern or SGCN status. These species, separate from SGCN, are a priority for additional assessment or survey to address data deficiency.
- **Importance Level**:
    - MOST IMPORTANT: G1 – G2 species with extant occurrences in Connecticut, Taxa that are rare throughout much of their restricted geographic range.
    - VERY IMPORTANT: G2G3 – G3 species with extant occurrences in Connecticut.
    - IMPORTANT: G1 – G3 species without known extant occurrences in Connecticut, G3G4 species with or without known occurrences in Connecticut, Selected G4 – G5 species which have experienced documented declines in Connecticut.
- **Short-Term Population Trend (within the state):** Quantitative assessments (10 years or three generations (up to 100 years) for taxa or 50 years for ecosystems)
- **Long-Term Population Trend (within the state):** Quantitative assessments (Over the past 200 years)
- **Climate Vulnerability Score:** Vulnerability assessment typically considers intrinsic properties of sensitivity and adaptive capacity, along with the magnitude of climate change the species is exposed to

Using the 2015 list as a starting point, each Taxa Team member assessed species under consideration as SGCN, SAPS, or not listed and included any data or information needed to justify their assessments when available. Members also evaluated the relative urgency of conservation action for each species (e.g., "Most Important, "Very Important," or "Important"). Since many

species lack long-term quantitative studies, some of the information provided by the Taxa Team is qualitative and based on the team's collective experience.

Once all Taxa Team members assigned SGCN categories, based on the best available data and their expertise, CT DEEP consultants collated the data and sent the results back to each Taxa Team. The teams met in October and November 2023 to discuss the results. During this meeting, members decided and assigned the final status by consensus. Because the taxa team members have specialized knowledge of the distribution, abundance, and conservation of species in Connecticut, taxa teams were given the freedom to treat the list as a prioritization document and to broaden or narrow it as they saw fit. Under this guidance, Taxa Teams chose to either reduce or maintain the number of species on their lists to focus conservation efforts where they would be most needed. As a result, the SGCN lists for birds, fish, invertebrates, and mammals were reduced in size from the 2015 list. The SGCN/SAPS list for Plants increased in number relative to the 2015 SGCN list.

Step 3: Review

The preliminary list of SGCN and SAPS was sent for internal review at CT DEEP, shared with conservation stakeholder groups and the two federally recognized tribes in Connecticut (the Mohegan and Mashantucket Pequot Tribes), and posted on CT DEEP's website alongside a feedback form designed to solicit public feedback in February of 2024. CT DEEP consultants updated the SGCN/SAPS list with input from each stakeholder group and the two federally recognized Tribal Nations and then sent the updated list to the Taxa Teams for review. Notably, based on feedback from the Mohegan Tribe, the Bald Eagle was added to the SGCN list for its cultural significance to the Tribe. Once the Taxa Teams finished their review of the changes, the SGCN/SAPS list was sent out for final review by CT DEEP, conservation stakeholder groups, and Tribes, and posted on CT DEEP's website for public review in May 2024. After this review, the list was finalized.

Please refer to Chapter 6 for more details on the outreach to conservation stakeholder groups and public engagement.

The 2025 SGCN and SAPS Lists

SGCN and SAPS

Of the 4650 species considered, 12% (573) were identified as SGCN, and 11% (515) were listed as SAPS (see Appendix 1.3 and 1.4 for the full list of SGCN and SAPS, respectively). Of the 573 SGCN, there are 32 Amphibians & Reptiles, 79 Birds, 34 Fish, 126 Invertebrates, 17 Mammals, and 285 Plants (Table 1.2). Of the 515 SAPS, there are 3 Amphibians &

Reptiles, 28 Birds, 12 Fish, 183 Invertebrates, 13 Mammals, and 276 Plants (Table 1.3, Figure 1.1).

Approximately 42% (242) of all 573 SGCN were identified as "Most Important," 20% (114) were listed as "Very Important," and 38% (217) were listed as "Important" (Table 1.3) while approximately 3% (16) of all 515 SAPS were identified as "Most Important," 22% (111) were listed as "Very Important," and 75% (388) were listed as "Important" (Table 1.3).

Table 1.2 - Connecticut's 2025 Species of Greatest Conservation Need (SGCN)

Taxa	Most Important	Very Important	Important	Total SGCN Species	SGCN percent of total species	Total CT Species
Amphibians & Reptiles	16	5	11	32	64%	50
Birds	20	30	29	79	26%	301
Fish	21	10	3	34	27%	126
Invertebrates	34	44	48	126	10%	1288
Mammals	13	3	1	17	27%	64
Plants	138	22	125	285	10%	2821
Total	**242**	**114**	**217**	**573**	**12%**	**4650**

Table 1.3 - Connecticut's State Assessment Priority Species (SAPS)

Taxa	Most Important	Very Important	Important	Total SAPS Species	SAPS percent of total species	Total CT Species
Amphibians & Reptiles	0	1	2	3	6%	50
Birds	0	5	23	28	9%	301
Fish	0	2	10	12	10%	126
Invertebrates	15	82	86	183	14%	1288
Mammals	0	3	10	13	20%	64
Plants	1	18	257	276	10%	2821
Total	**16**	**111**	**388**	**515**	**11%**	**4650**

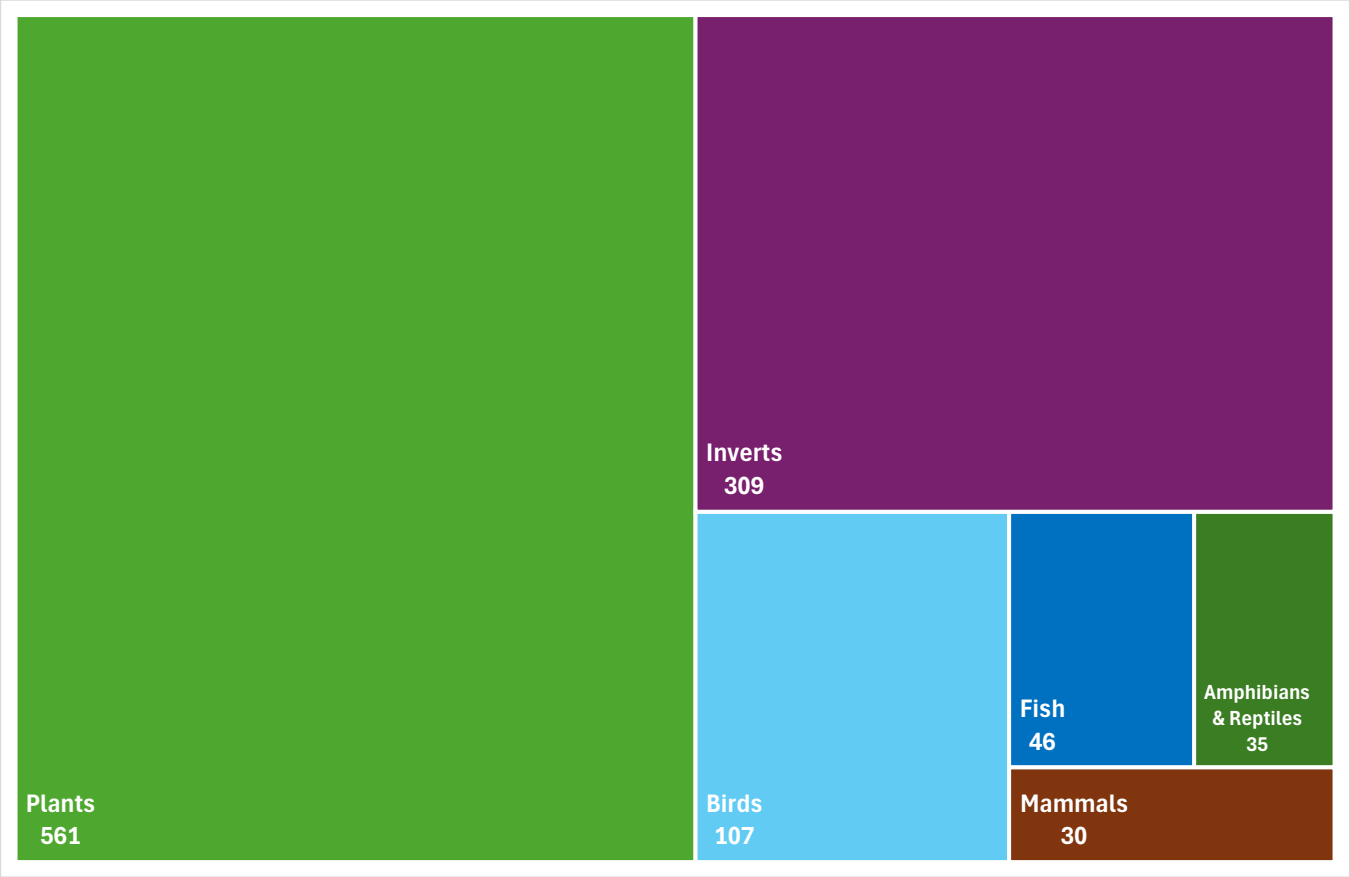

Figure 1.1 - Total number of species in each taxon that are listed as SGCN or SAPS

Differences between the 2015 and 2025 SGCN Lists

There are four more species on the 2025 SGCN list than the 2015 SGCN list; however, when considering both the SGCN and the new SAPS list together, the number of species considered by the 2015 SWAP increased from 569 to 1088 in this 2025 revision (Table 1.4). Aside from adding a SAPS list in 2025, the biggest change between the two lists is that fewer Bird and Fish species are included in the 2025 SGCN and SAPS Lists, while many more Plant species are included (Table 1.4). The primary reasons for these differences are:

1) The plant taxa team had more capacity and data in 2025 than in 2015, enabling a better evaluation of all 2338 species, with additions of 201 more SGCN and 276 more SAPS.

2) The number of wildlife SGCN decreased (except for Amphibians & Reptiles) because many wildlife species on the 2015 SGCN list that are not on the 2025 SGCN list were shifted to the

SAPS list due to a lack of data. In 2015, species could be designated as SGCN because they were data deficient, and those species were lumped together with SGCN on the same list.

3) Biologists and conservation stakeholders are shifting their perspectives to focus limited attention and resources on species that would benefit the most from conservation action, rather than listing all species that may be declining, but not necessarily at a point where intervention is as important as for other species being considered. This approach focuses on specific species that function as "indicator" or "umbrella" species for conservation action since these actions often benefit other declining species within the same habitats.

4) Some species, such as notable species of birds and fish, have either improved statuses (i.e., populations are recovering due to management action, like the Osprey) or have access to other, more considerable conservation focus and funding opportunities enabling resources to be directed where they are most needed (e.g., recreational and commercial fisheries).

Table 1.4 – Comparison of Connecticut's 2015 and 2025 SGCN Lists

		2015 SGCN		2025 SGCN		2025 SAPS		2025 SGCN & SAPS	
Taxa	**Species in CT**	**Total**	**% of CT Species**	**Total**	**% of CT Species**	**Total**	**%**	**Total**	**% of CT Species**
Amphibians & Reptiles	50	32	64%	32	64%	3	6%	35	70%
Birds	301	128	43%	79	26%	28	9%	107	36%
Fish	126	80	63%	34	27%	12	10%	46	37%
Inverts	1288	218	17%	126	10%	183	14%	309	24%
Mammals	64	25	39%	17	27%	13	20%	30	47%
Plants	2821	86	3%	285	10%	276	10%	561	20%
Total	**4167**	**569**	**12%**	**573**	**12%**	**515**	**11%**	**1088**	**23%**

SGCN Distribution and Abundance in Connecticut

SGCN are broadly distributed throughout the State and the Long Island Sound. However, data on distribution and abundance are sparse or non-existent for many species, especially small mammals, invertebrates, and plants. In these cases, the efforts needed to fill these data gaps are identified as priority research or survey needs, or conservation actions in Chapters 4 and 5. See the taxon-specific sections below for more specific distribution information for each taxonomic group.

Many of Connecticut's SGCNs have little information about their abundance and population trends, and some taxonomic groups have more data than others. Importantly, some population trend information provided in this chapter is based on the expertise of the Taxa Teams members, rather than long-term, empirical studies. However, 67% of SGCNs still lack data on their short-term population trends, measured over the species' last three generations —a period that can vary significantly between species (Figure 1.2). Even more SGCN (77%) do not have data for their long-term population trends (measured over the past 200 years; Figure 1.2). While the total number of SGCN with unknown population trends is high, this is primarily attributed to the lack of information on many plant species, which comprise half of all SGCN. Most SAPS had unknown population trajectories. While vertebrate groups had significantly lower percentages of missing data (except for mammals), the population trends of plants and invertebrates remain unknown within the state, highlighting the importance of data collection over the next decade (see Chapter 4).

Most of the remaining SGCNs with known population trends are declining, while a few are stable or increasing (Figure 1.2). Of particular note, 6% of all SGCN have seen population declines of 90% or more across the Northeast region, and over 13% of SGCN have lost over 50% or more of their populations over the last 200 years, while only 8% have been either stable or increasing over the same time frame (Figure 1.2). Overall, Connecticut's SGCN largely follows general global trends of population loss (WWF, 2024), as well as specific trends for each taxonomic group, detailed in the taxon-specific sections below.

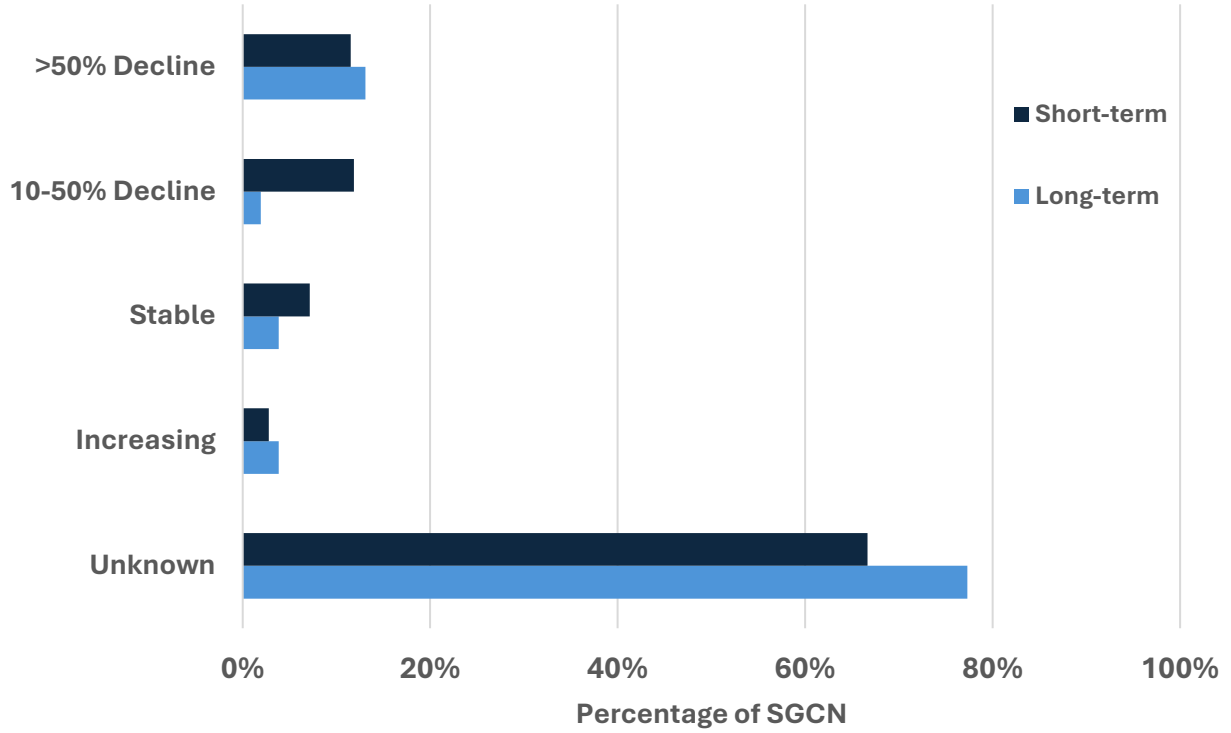

Figure 1.2 – Long- and Short-term Population Trajectories for Connecticut's SGCN. Short-term Population trends are based on three generations or 10 years, and long-term Population trends are based on the past 200 years.

Northeast Regional Context

Connecticut actively participates in the regional collaboration for fish and wildlife conservation in the Northeast. The thirteen northeastern states (Virginia north to Maine) and the District of Columbia have a long history of cooperation through the Northeast Association of Fish and Wildlife Agencies (NEAFWA). These states recognize that a cooperative effort is necessary to protect and manage many of our region's most endangered and threatened species.

Of 17,923 Northeast species, 7,270 were evaluated and prescreened using the NEAFWA RSGCN selection criteria and fell within the 20 Taxonomic Teams. The 2015 State Wildlife Action Plans list almost 27% (4,788 species) of these species as SGCN in the Northeast (Table 1.5). Of these SGCNs, approximately 693 invertebrates from other taxonomic groups and 230 plants were beyond the scope of the regional assessment due to data deficiency, a lack of current regional expertise across the entire taxon, or the scope of jurisdiction. Species that regularly occur in the region are included, and many invertebrate taxa are under review and, therefore, omitted from this analysis. The invertebrate list is incomplete; however, because the RSGCN process continues to evaluate them, the number of major invertebrate groups reviewed has increased from two in 2018 to 13 through the 2023 RSGCN process, and these are included in the analysis. Twenty

Taxonomic Teams identified 382 RSGCN, 37 Proposed RSGCN, 229 Watchlist Assessment Priority, and 62 Proposed Watchlist Assessment Priority (see the Northeast Wildlife Diversity website for more information). Results are presented in this order by category below. Of the total Northeast species considered for the RSGCN list, 5% warranted regional conservation needs and were assigned to one of the RSGCN list categories (Table 1.5). The RSGCN categories are:

- SGCN – Number of species identified as an SGCN in the 2015 Wildlife Action Plan for at least one of the states in the northeastern region
- RSGCN – Identified as an RSGCN during the 2023 regional update (TCI & NEFWDTC, 2023)
- Proposed RSGCN – Species proposed as RSGCN during the next regional update to the list
- Watchlist Assessment Priority – Species without sufficient information to fully determine their RSGCN status
- Watchlist Defer – RSGCN with less than 25% of regional responsibility that is deferred to an adjacent region to include on their RSGCN lists
- Watchlist Interdependent – Species that RSGCN require to survive or breed, but do not meet the criteria as an RSGCN (e.g., food source or host plant for laying eggs)

The large number of species included in these lists reflects the magnitude of the threats facing fish and wildlife species in the Northeast, as well as the commendable efforts of the individual Northeast states to ensure that their State Wildlife Action Plans were comprehensive in their coverage of species across major taxonomic groups. The percentage of vertebrate species identified as SGCN in one or more of the Northeast State Wildlife Action Plans approaches 48% of the total number of vertebrate species in the Northeast (Table 1.5). For Invertebrates, Northeast states identified 39% of invertebrate species as SGCN in State Wildlife Action Plans. Major taxonomic groups with the highest percentage of RSGCN in the Northeast include Freshwater Fish (12%), Birds (9%), and Terrestrial Snails (7%). Of the 806 RSGCN analyzed in Table 1.5, approximately 53% have high Regional Responsibility (>50% of their range occurs in the Northeast), and 50% have High or Very High Regional Concern (TCI & NEFWDTC, 2023).

Table 1.5 - Status of Wildlife Diversity in the Northeast considered by the Regional Taxa Teams (numbers are approximate)

	Northeast Species	SGCN	RSGCN (incl. Proposed)	Watchlist Assessment Priority	Watchlist Defer	WL Interdependent	All RSGCN/Watchlist Categories
Birds	426	284	28	30	12	0	70
Mammals	183	107	29	15	5	0	49
Amphibians	111	88	22	6	2	0	30
Reptiles	115	84	16	8	1	0	25

Fish – Fresh	336	213	47	34	16	0	97
Fish – Diadromous	28	14	9	2	0	0	11
Fish – Marine	661	102	27	12	3	2	44
Terrestrial Snails	268	182	32	24	4	0	60
Freshwater Bivalves	149	106	21	2	13	0	36
Crayfish	78	26	12	17	0	0	29
Fairy, Clam, & Tadpole Shrimp	17	5	3	2	0	0	5
Dragonflies and Damselflies	255	205	22	20	7	0	49
Butterflies and Skippers	224	134	26	12	5	0	43
Moths	2426	364	29	32	6	0	67
Tiger Beetles	40	35	8	4	1	0	13
Fireflies	44	13	13	6	0	0	19
Caddisflies	565	40	15	9	1	0	25
Mayflies	281	62	16	20	9	0	45
Stoneflies	253	67	31	2	0	0	33
Bumble Bees	23	17	3	3	4	0	10
Solitary Bees	400	131	5	21	6	1	33
Marine Invertebrates	466	95	4	9	0	0	13
Plants	6084	1785	n/a	n/a	n/a	n/a	n/a
Other species	4490	632	n/a	n/a	n/a	n/a	n/a
Total	17923	4788	418	290	95	3	806

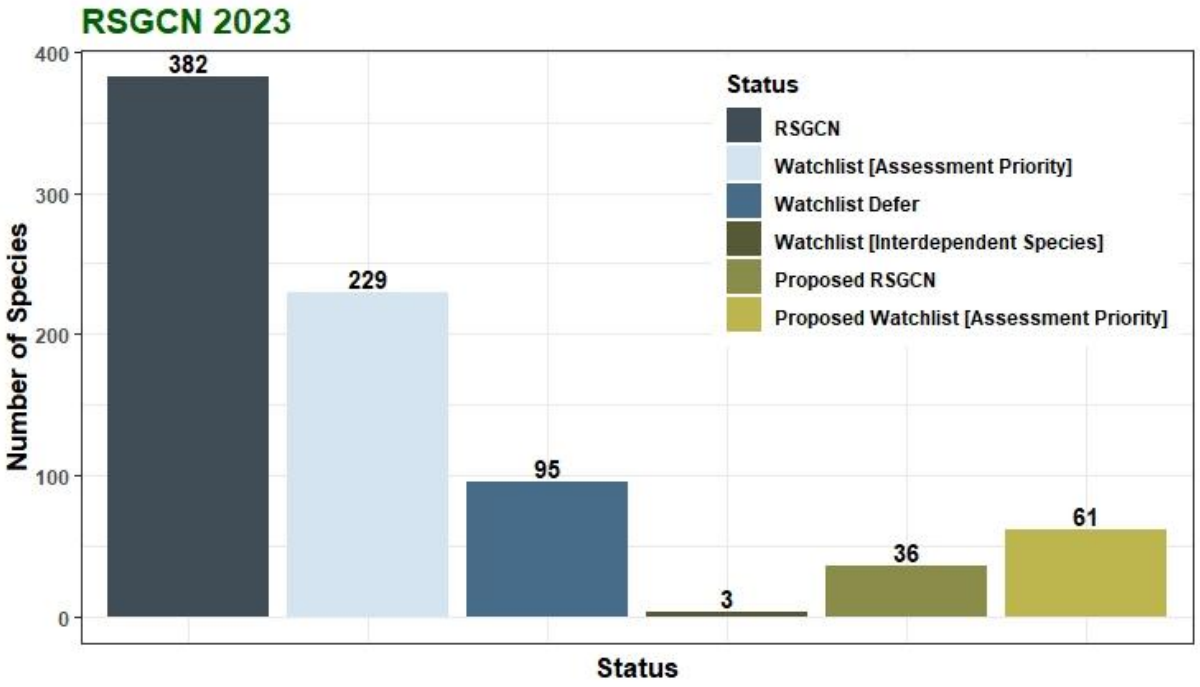

Figure 1.3 – Regional Species of Greatest Conservation Need. Proposed species were not SGCN in 2015 but now warrant assessment by states in the 2025 revisions. Status categories are: RSGCN – Identified as an RSGCN during the 2023 regional update (TCI & NEFWDTC, 2023), Proposed RSGCN – Species proposed as RSGCN during the next regional update to the list, Watchlist Assessment Priority – Species without sufficient information to fully determine their RSGCN status, Watchlist Defer – RSGCN with less than 25% of regional responsibility that is deferred to an adjacent region to include on their RSGCN lists, and Watchlist Interdependent – Species that RSGCN require to survive or breed, but do not meet the criteria as an RSGCN.

Taxon Overviews

SGCN Amphibians and Reptiles of Connecticut

Regional Context

The Northeast is home to 18 Amphibians that met the criteria for RSGCN, including three anurans and 15 salamanders. Sixteen Reptiles met the criteria as RSGCN, including seven freshwater turtles, five snakes, and four sea turtles. Connecticut is home to 3 RSGCN Amphibians and 9 RSGCN Reptiles; of these species, the Mid-Atlantic Coast Leopard Frog, Blue-spotted Salamander, Wood Turtle, and Northern Black Racer are Connecticut species considered to be of high regional responsibility for management, as well as high or very high regional conservation concern.

Across the region, amphibian trends vary, with some populations increasing in certain parts of their range while others decrease in other parts. This variation may be partly due to range shifts resulting from some species' response to changing environmental conditions. Many

amphibians are particularly vulnerable to habitat loss and shifting environmental conditions, especially those that inhabit specific hydrological conditions. These species are also facing threats from disease, as diseases like *Ranavirus* (especially in Connecticut; O'Connor et al., 2016) and *Chytridiomycosis* are causing worldwide population declines (TCI & NEFWDTC, 2023). For reptiles throughout the region, the biggest threats include habitat degradation and fragmentation, vulnerability to shifting environmental conditions, and poaching (especially of turtles). Sea turtles are vulnerable to vessel strikes, bycatch, and offshore wind development. Conservation efforts for reptiles of the Northeast are challenging due to the disjunct populations across their ranges (TCI & NEFWDTC, 2023). For more information about issues affecting Connecticut's Amphibians & Reptiles, see Chapter 3.

Connecticut Overview and Conservation Progress in Connecticut Since 2015

Connecticut's amphibians and reptiles recolonized the State after the last Pleistocene glaciations (i.e., within the last 8,000–12,000 years). Connecticut's amphibians and reptiles are diverse and have been thoroughly described by Lamson (1935), Babbitt (1937), Peterson (1970), Klemens (1991, 1993, and 2000), and Klemens et al. (2021). The present distribution of many of our species is directly a result of the pathways used to disperse back into the state following glaciations. Habitat plays a crucial role in determining the presence and distribution of species. Generally, amphibians and reptiles have limited dispersal abilities, and many are tied to very specific habitat types. While it is often thought that the more intense winter coldness found at higher elevations is the limiting factor for egg-laying reptiles, the coolness of summers, causing a too short season for the development of reptile eggs at higher latitudes and elevations, is a concern (Sommer et al. 2009). These natural factors have governed the distribution of Connecticut's amphibians and reptiles for thousands of years (Klemens et al. 2021).

Amphibian and reptile populations are declining worldwide (Gibbons et al., 2000; Araujo et al., 2006; Alroy, 2015), with amphibians and reptiles representing the most threatened of all vertebrate groups globally (Cordier et al., 2021; Luedtke et al., 2024). While habitat degradation and disease remain the primary threats, changing and shifting environmental conditions are emerging threat amplifiers for amphibians and reptiles, which have been and will continue to be a significant obstacle to recovery efforts for these species (Burgio et al., 2024; Lubeck et al., 2024). This is especially true for Connecticut since many of our species have restricted distributions due to being at or near their northeastern biogeographical range limits. The large number of peripheral species adds a special regional responsibility to the conservation of Connecticut's amphibians and reptiles that may not be apparent in many range-wide reviews. These range-edge species are the ones most likely to possess the genetic adaptations that will best prepare them to respond to the challenges of shifting environmental conditions. Therefore, conservation of range-edge species may be vital to the long-term resiliency of biodiversity in our region and beyond (Lesia and Allendorf, 1995; Fraser, 2000; Channell, 2004; Klemens et al., 2021).

Four species of marine sea turtles in Connecticut are included on the RSGCN list (Loggerhead, Green, Leatherback, and Kemp's Ridley Sea Turtles), all of which are protected under the United States Endangered Species Act. Due to their broad distributions and significant range-wide declines, these species are considered to be of low regional responsibility but of very high conservation concern. However, Burgio et al. (2024) point out that juvenile ocean-stage sea turtles (i.e., Green, Kemp's, and Loggerhead Sea Turtles) are projected to increase along the North Atlantic coast and in the Northern Atlantic Ocean based on simulated data from 1993 to 2017, making sea turtle conservation a priority along the Atlantic Coast due to climate change (Putman et al., 2020). A study testing the phenological shifts of four sea turtles, two of which are SGCN (Loggerhead and Green Sea Turtles), projected that these shifts will likely not be sufficient to overcome the negative impacts of warming sands on nesting grounds and seawater temperatures resulting from shifting environmental conditions (Fuentes et al., 2024). Sea turtles visit Connecticut's estuarine and marine waters during the warmer months. The Long Island Trawl Survey (LISTS) has incidentally captured sea turtles 6 times since its inception in 1984. There have been six Loggerhead interactions (1989, two in 2021, 2022, 2024) and one Kemp's interaction (2015). All six interactions occurred during the fall survey (September – October) when water temperatures are warm. The U.S. Fish and Wildlife Service, National Marine Fisheries Service (NMFS), and other partners collect information about their distribution, abundance, migratory movements, and population characteristics to help guide actions identified in Federal Recovery Plans.

For terrestrial turtles, water features such as lakes, vernal pools, rivers, and streams are crucial to the conservation of these species. Therefore, research exploring changing phenologies, range shifts, and climate refugia may be especially important in the future to identify potential adaptation strategies for these species. Additionally, terrestrial turtles need to travel between different habitats, making them vulnerable to habitat fragmentation and road mortality. Many turtles will likely be impacted due to their complex life history and long generational times, preventing them from adapting to a rapidly changing environment. Additional studies are needed to mitigate and minimize disturbance during hibernation and brumation periods under projected warming scenarios (Burgio et al., 2024).

Fourteen species of snakes and lizards are found in Connecticut, including two venomous species. One of these, the Timber Rattlesnake, is listed as endangered. Due to their low population numbers, the Eastern Ribbon Snake, Smooth Greensnake, and the Eastern Hognose Snake are designated state species of special concern. Habitat loss, when native habitats are converted to urban development, is the primary factor contributing to the decline of snake populations. Several reptile species in Connecticut have been identified as rare, declining, or of unknown population status.

Since 2015, CT DEEP and our conservation partners have been active in conservation efforts for our amphibian and reptile SGCN. The state and our partners have contributed to numerous region-wide initiatives aimed at better understanding and protecting our amphibian and reptile SGCN in the Northeast. Connecticut has been collaborating with other states and regional organizations on RCN grant projects, including one focused on the conservation of Timber Rattlesnakes, Diamond-backed Terrapins, Atlantic Coast Leopard Frogs, and various terrestrial turtle species. Additionally, Connecticut has been involved in multiple C-SWG-funded projects, including one on snake fungal disease, as well as initiatives focused on the Wood Turtle, Bog Turtle, and Spotted Turtle projects. For more details, refer to the subtaxon sections for information about species-specific projects conducted in the state.

At the state level, filling data gaps by collecting data on the distribution, demographics, habitat use, and abundance was identified as a high priority in the 2015 Wildlife Action Plan. The State and our partners have been especially active in conducting telemetry-based and other surveys, particularly for the Blue-spotted Salamander and other salamander species, the Eastern Spadefoot, the Atlantic Coast Leopard Frog, the Timber Rattlesnake, the Five-lined Skink, and most terrestrial turtle species. These studies have led to a better understanding of our state's species needs, and many of the results have been documented in Klemens et al. (2021). The research projects and surveys have also contributed to several legislative changes within the state aimed at helping to conserve SGCN amphibians and reptiles. These changes include adding Spotted Turtles to the list of turtles with no open season, starting in 2016, and adding Red-spotted Newts to the list of amphibians with no open season, beginning in 2020. Additionally, the results of these studies have been incorporated into numerous resources and technical assistance for municipalities, including road-crossing designs to help prevent vehicle strikes, right-of-way habitat management, and support for conservation agencies throughout the state.

Another need identified in the 2015 Wildlife Action Plan was to conserve habitat for Connecticut’s amphibians and reptiles. Of particular concern for amphibians are vernal pool breeding sites and their surrounding upland habitats. CT DEEP, UConn, and other institutions have conducted extensive research on how road salts, tree cover, shifting environmental conditions, and disease have impacted Connecticut’s species that rely on vernal pools, which has informed Connecticut’s Forest Management Plans (CT DEEP, 2015).

To promote public awareness of issues concerning Connecticut’s SGCN turtles, especially the Eastern Box Turtle and Wood Turtle, CT DEEP’s Outreach Team, the CT DEEP Wildlife Diversity Program, and conservation partners have collaborated on social media posts and magazine articles, radio and newspaper interviews, conference presentations, and published an authoritative book (Klemens et al. 2021). CT DEEP staff, in addition to Hank Gruner and many municipalities in the states, also took on a leadership role in the Collaborative to Combat Illegal Trade in Turtles (CCITT) to raise awareness of the negative impacts of poaching on turtle

populations in the region through social media posts, conference presentations, public talks, and appearing on the radio.

SGCN

Table. 1.6 – Number of SGCN by each subtaxon group by Importance Level

	Most Important	Very Important	Important	Grand Total
Amphibians	8	1	7	16
Snakes and Lizards	1	2	3	6
Turtles	7	2	1	10
Total	**16**	**5**	**11**	**32**

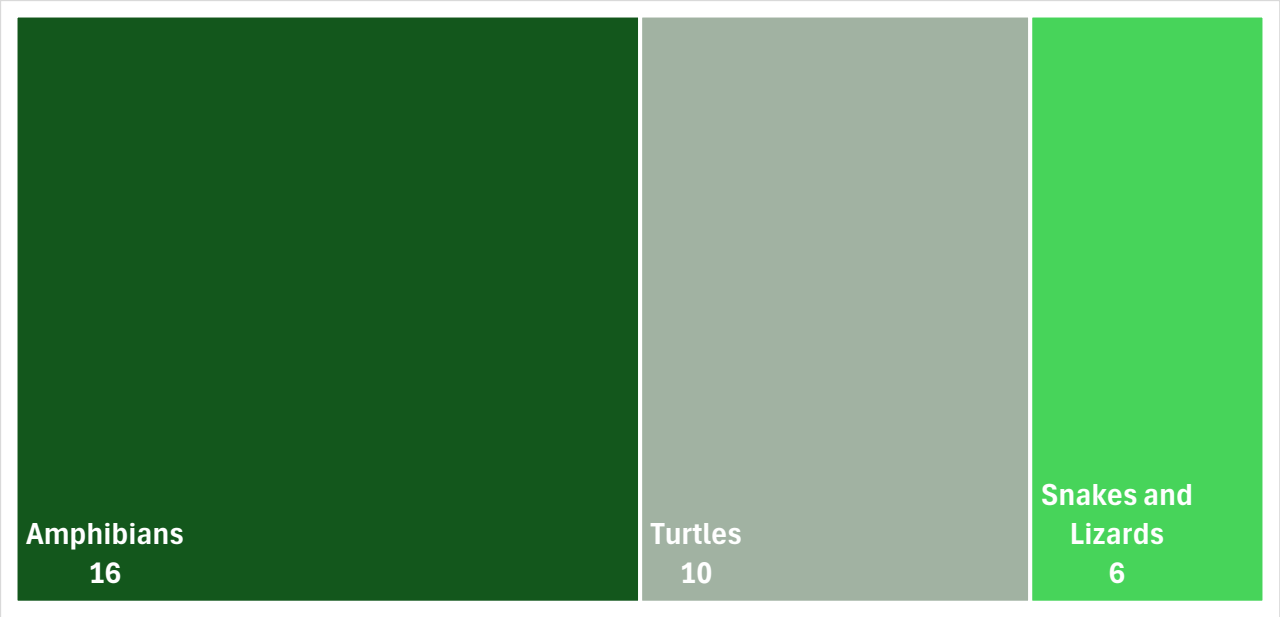

Figure 1.4 – Number of Amphibian & Reptile SGCN by each subtaxon group

Distribution and Abundance within Connecticut

In 2021, CT DEEP published an authoritative report on the status and distribution of Amphibians and Reptiles in the State (Klemens et al., 2021). Overall, elevation is a significant factor shaping the distribution of Amphibians and Reptiles in the state, leading to a greater number of species appearing in the western part of the state. The underlying bedrock geology and Pleistocene de-glaciation patterns, including the presence of glacial lake deposits, strongly influence the biogeographic range of many amphibians and reptiles in the state. Some, such as the Northern Slimy Salamander and Bog Turtle, are confined to bedrock geological formations that extend northwestward into Connecticut from much larger contiguous habitat areas to the west in New York and beyond. Other species, such as the Blue-spotted Salamander and the Eastern Spadefoot, show a strong affinity to former glacial lake beds. The Atlantic Coast Leopard Frog has

a coastal plain distribution, entering Connecticut via two different dispersal routes from non-glaciated coastal plain areas to the southwest.

Habitat fragmentation plays a major role in shaping the distribution and population sizes of Connecticut's amphibians and reptiles. While some species can persist in compromised and fragmented habitats, most of Connecticut's amphibians and reptiles suffer adverse effects from the impacts of habitat fragmentation caused by roads, habitat alteration, and a range of other effects associated with human settlement (Klemens et al., 2021). Klemens et al. (2021) provide a detailed discussion and distribution maps for each species.

Additionally, like other taxa in the state, CT DEEP's Natural Diversity Data Base (NDDB) provides some data on the distribution of threatened species. For other sources of distribution and abundance information, records from natural history collections worldwide, including those at the Peabody Museum at Yale and the UConn collection, have been digitized. This information can be found on the Global Biodiversity Information Facility (GBIF) and Vertnet. Another valuable resource for the distribution of Connecticut amphibians and reptiles can be found on the Map of Life website. Community-science surveys (e.g., the Connecticut Amphibian Monitoring Project, also known as CAMP, iNaturalist, FrogWatch USA, and UCONN's Amphibian Tracker) have significantly contributed to our understanding of the distribution of Connecticut's amphibians and reptiles over the past 20+ years. If you would like to contribute to these community-science efforts, we encourage you to click the links above to get involved.

As noted above, amphibians and reptiles have been undergoing worldwide population declines due to disease, habitat loss, and, more recently, the effects of shifting environmental conditions (for more info on threats to Connecticut amphibians and reptiles, see Chapter 3). Amphibians and reptiles are among the most threatened vertebrate groups worldwide (Cordier et al., 2021), and the population trends in Connecticut reflect a similar pattern of declining populations (Figure 1.5). Over the long term, approximately 55% of Connecticut SGCNs have been declining, with about 42% experiencing dramatic declines, characterized by population reductions of 50% or more over the last 200 years. Over the short term, these population declines appear to accelerate, with approximately 12% of SGCN having decreased by over 70% over the past few generations (Figure 1.5). Given the new threat of shifting environmental conditions, much remains to be done to stabilize these populations in the state. For more information on actions that can benefit Connecticut's amphibians and reptiles, see Chapter 4.

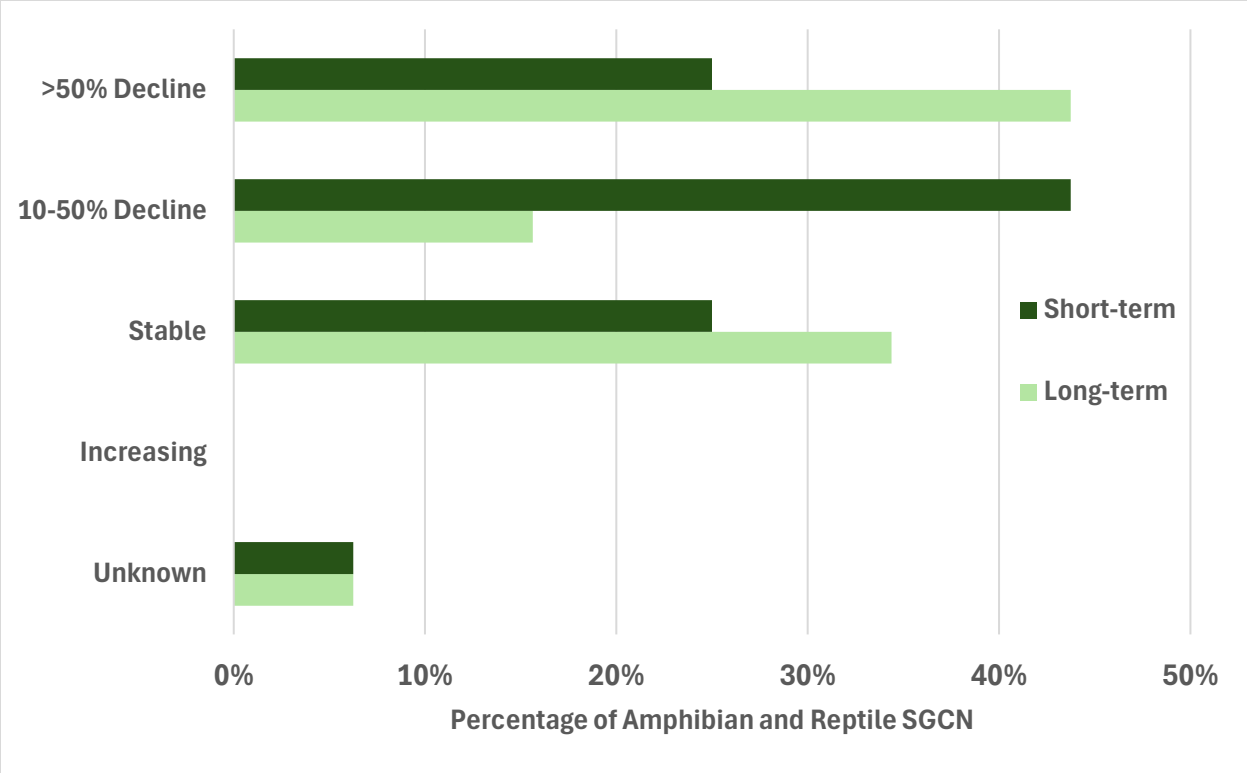

Figure 1.5 – Long- and short-term decline of Connecticut's Amphibian and Reptile SGCN Populations by Percentage. Long-term trends are based on the past 200 years, and Short-term trends are based on the last three generations.

Connecticut's Amphibians

Table 1.7 - SGCN Species Status

Subtaxon	Common Name	Scientific Name	Importance Level	Short Term Population Trend	Long Term Population Trend
Frogs and Toads	Fowler's Toad	*Anaxyrus fowleri*	IMPORTANT	30-50% Decline	50-70% Decline
Frogs and Toads	Mid-Atlantic Coast Leopard Frog	*Lithobates kauffeldi*	MOST	Unknown	30-50% Decline
Frogs and Toads	Northern Leopard Frog	*Lithobates pipiens*	VERY	10-30% Decline	50-70% Decline
Frogs and Toads	Wood Frog	*Lithobates sylvaticus*	IMPORTANT	30-50% Decline	10-30% Decline
Frogs and Toads	Eastern Spadefoot	*Scaphiopus holbrookii*	MOST	70-80% Decline	70-80% Decline
Salamanders	Jefferson Salamander	*Ambystoma jeffersonianum*	MOST	10-30% Decline	50-70% Decline
Salamanders	Jefferson x Blue-spotted Salamander Complex	*Ambystoma jeffersonianum x laterale*	MOST	10-30% Decline	50-70% Decline
Salamanders	Blue-spotted Salamander	*Ambystoma laterale*	MOST	70-80% Decline	50-70% Decline

Salamanders	Blue-spotted x Jefferson Salamander Complex	*Ambystoma laterale x jeffersonianum*	MOST	10-30% Decline	50-70% Decline
Salamanders	Spotted Salamander	*Ambystoma maculatum*	IMPORTANT	30-50% Decline	Relatively Stable
Salamanders	Marbled Salamander	*Ambystoma opacum*	IMPORTANT	Relatively Stable	Relatively Stable
Salamanders	Northern Dusky Salamander	*Desmognathus fuscus*	IMPORTANT	Unknown	Unknown
Salamanders	Northern Spring Salamander	*Gyrinophilus porphyriticus porphyriticus*	MOST	10-30% Decline	50-70% Decline
Salamanders	Four-toed Salamander	*Hemidactylium scutatum*	IMPORTANT	Unknown	Unknown
Salamanders	Red-spotted Newt	*Notophthalmus viridescens viridescens*	IMPORTANT	30-50% Decline	Relatively Stable
Salamanders	Northern Slimy Salamander	*Plethodon glutinosus*	MOST	10-30% Decline	10-30% Decline

Overview of Conservation Progress Since 2015

Extensive distributional mapping of SGCN has been conducted by Klemens et al. (2021), contributing valuable data to conservation efforts throughout the State. CT DEEP, UConn, and other partners have researched environmental stressors affecting amphibians, including studying the impacts of road salts (Steven Brady), shifting environmental conditions and canopy influence (David Skelly), the intersection of shifting environmental conditions and evolution (Mark Urban), and disease dynamics (Tracy Rittenhouse). CT DEEP has conducted several surveys targeting the Eastern Spadefoot Toad over the past few years. Similarly, Quinn Ecological has undertaken extensive work on this species, including surveys, habitat use studies, and land easement initiatives. Additionally, the Atlantic Coast Leopard Frog Regional Conservation Needs project, which ran from 2014 to 2017, provided critical insights into the species' conservation status. Further contributing to amphibian research, Sarah Anacleto, in collaboration with Central Connecticut State University and Quinn Ecological, completed a master's thesis on Mudpuppy genetics, enhancing understanding of this species' population structure and genetic diversity.

Connecticut's Lizards and Snakes

Table 1.8 - SGCN

Subtaxon	Common Name	Scientific Name	Importance Level	Short Term Population Trend	Long Term Population Trend

Lizards	Five-lined Skink	*Plestiodon fasciatus*	VERY	10-30% Decline	Relatively Stable
Snakes	Northern Black Racer	*Coluber constrictor constrictor*	IMPORTANT	10-30% Decline	30-50% Decline
Snakes	Timber Rattlesnake	*Crotalus horridus*	MOST	50-70% Decline	80-90% Decline
Snakes	Eastern Hog-nosed Snake	*Heterodon platirhinos*	VERY	50-70% Decline	70-80% Decline
Snakes	Smooth Greensnake	*Opheodrys vernalis*	IMPORTANT	Relatively Stable	Relatively Stable
Snakes	Ribbonsnake	*Thamnophis saurita saurita*	IMPORTANT	Relatively Stable	Relatively Stable

Overview of Conservation Progress Since 2015

Klemens, Gruner, and Quinn have conducted extensive surveys of Connecticut's lizards and snakes to document occurrences of several SGCN, including an investigation into unusual Skink occurrences (Klemens et al., 2021).

Timber Rattlesnake

Since 2015, the Connecticut Department of Energy and Environmental Protection and law enforcement have collaborated to focus on the conservation and research of the Timber Rattlesnake. CT DEEP hired a Timber Rattlesnake monitor (2015-2021) to minimize the disturbance and illegal trade of rattlesnakes. From May to mid-November, rattlesnake monitoring successfully prevented several illegal collections and helped prevent habitat destruction associated with unlawful all-terrain vehicle (ATV) use. CT DEEP also purchased land for habitat preservation and to minimize human disturbance to the species. To monitor population trends, department staff have conducted regular visual encounter surveys of a Timber Rattlesnake population since 2019 to assess general abundance. Since at least 2018, staff have also used trail cameras to monitor sensitive areas of multiple populations. In 2024, the department launched a radio-telemetry study to understand the species' habitat usage better. Anita Morzillo and graduate students Lindsay Keener-Eck and Abbey Dunn at the University of Connecticut have studied human perceptions and interactions with Timber Rattlesnakes in the state. Recognizing the need for public engagement and response, the department established a collaborative nuisance response team in 2015 to manage Timber Rattlesnake encounters on private properties. Staff also conduct extensive outreach, fielding dozens of public inquiries about the species each year.

Connecticut's Turtles

Table 1.9 - SGCN Species Status

Subtaxon	Common Name	Scientific Name	Importance Level	Short Term Population Trend	Long Term Population Trend
Sea Turtles	Loggerhead Sea Turtle	*Caretta caretta*	VERY	Relatively Stable	Relatively Stable
Sea Turtles	Green Sea Turtle	*Chelonia mydas*	VERY	Relatively Stable	Relatively Stable
Sea Turtles	Leatherback Sea Turtle	*Dermochelys coriacea*	MOST	Relatively Stable	Relatively Stable
Sea Turtles	Atlantic Hawksbill Sea Turtle	*Eretmochelys imbricata imbricata*	IMPORTANT	Relatively Stable	Relatively Stable
Sea Turtles	Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	MOST	Relatively Stable	Relatively Stable
Turtles	Spotted Turtle	*Clemmys guttata*	MOST	50-70% Decline	50-70% Decline
Turtles	Wood Turtle	*Glyptemys insculpta*	MOST	50-70% Decline	50-70% Decline
Turtles	Bog Turtle	*Glyptemys muhlenbergii*	MOST	80-90% Decline	80-90% Decline
Turtles	Northern Diamond-backed Terrapin	*Malaclemys terrapin terrapin*	MOST	10-30% Decline	50-70% Decline
Turtles	Eastern Box Turtle	*Terrapene carolina carolina*	MOST	10-30% Decline	30-50% Decline

Overview of Conservation Progress in Connecticut Since 2015

Bog Turtle

CT DEEP used regional monitoring protocols in 2016, 2017, and 2018 to track Bog Turtle populations at four sites classified as extant. During the summers of 2017 and 2018, a contracted hydrologist monitored water quality, flow, weather, and depth, providing critical environmental data. In 2018, staff conducted visual assessments and identified 11 additional Bog Turtles, bringing the total to 24 individuals that were radio-tracked across two sites. Since 2019, the CT DEEP and Quinn Ecological, with the latter conducting most of the work, have radio-tracked Bog Turtles at three sites to study movement patterns, habitat use, and responses to both small-scale and planned multi-pronged habitat management efforts. Additionally, both organizations contributed Bog Turtle DNA samples as part of a Competitive State Wildlife Grant project running from 2020 to 2025. As part of ongoing conservation efforts, Quinn Ecological, in collaboration with the department, has also surveyed several potential Bog Turtle sites, identifying and documenting suitable habitats.

Eastern Box Turtles

WDP staff assisted with radio-tracking 10 Box Turtles on average 1-2 times per week between May 2020 and November 2021, where biologists gained insight into preferred habitat, seasonal movement metrics, and surveyor “sweep” efficacy. A group of trained

volunteers captured, marked, and released Box Turtles at four sites to gather long-term demographic data throughout the state from 2021 to current. The landscape was surveyed using a combination of meander and transect surveys. Any turtles captured were marked or identified from prior markings, and morphometric data were gathered on each individual before release at the point of capture. Quinn Ecological has radio-tracked box turtles at a population impacted by a highway installation and related "turtle tunnel". Turtles from this population have been radio-tracked in the pre, short-term, and long-term post stages of the highway and tunnel installation. Habitat improvement (e.g. vegetation opening/invasive plant removal in nesting area) has also occurred at this site. CT DEEP and partners collected genetic samples from several box turtle populations to contribute to the regional database as part of a box turtle RCN from 2019-2021. DEEP staff and collaborators, including Quinn Ecological and members of the state-licensed wildlife rehabilitator community, have opportunistically collected and submitted samples for *Ranavirus* analysis since at least 2019.

Diamond Backed Terrapin

In 2018 through 2024 (aside from years affected by COVID), personnel from the Norwalk Aquarium, Western Connecticut State University, and CT DEEP coordinated project logistics to monitor roadway mortalities. This included using volunteer time to survey established road routes for turtles. One hotspot was selected for potential mitigations; further information will be used to find solutions. CT DEEP staff, Quinn Ecological, and Eric Davison initiated a radio telemetry study of terrapins in one population in 2021. The objectives of this study were to determine general habitat usage (especially overwintering habitat) to inform NDDB reviews. Secondarily, that project tested the efficacy of VHF radio transmitters in a saltwater environment on animals (terrapins) that had been documented moving long distances. Roughly 10 terrapins per year were radio-tracked weekly between 2021 and 2023. CT DEEP and Quinn Ecological collected blood samples from terrapins in 2019 for DNA analysis by partners in Rhode Island and Florida for regional population genetic comparisons and species/subspecies analysis, respectively (TCI & NEFWDTC, 2023).

Spotted Turtle

Between 2018 and 2021, WDP and Quinn Ecological participated in a Regional Conservation Needs grant to benefit turtles throughout the northeast, including genetics research on Spotted Turtles. CT DEEP also participated in C-SWG to create and implement standardized monitoring protocols for spotted turtles. CT DEEP WDP and Forestry Division also partnered with Dr. Michael Klemens and Quinn Ecological, using radio telemetry to determine habitat usage and movement patterns of a population during the 2023 and 2024 field seasons. Turtles were tracked twice weekly for both field seasons.

Wood Turtle

DEEP staff, Hank Gruner, and Dennis Quinn initiated volunteer-based surveys of wood turtles at three populations in the state in 2021, as part of a Competitive State Wildlife Grant initiated in 2020. The goal of this project was to collect demographic data at these populations from geographically disparate areas of Connecticut; these surveys will likely occur for numerous years to compile long-term data. Volunteers have submitted data in 2021, 2022, 2023, and 2024 as part of this effort. CT DEEP, Quinn Ecological, and partners also managed and monitored (using trail cameras) nesting habitat at one site in 2022 as part of the 2020 Competitive State Wildlife Grant.

Turtles (multiple species)

Connecticut's biologists participated in PARC Turtle Networking Team activities, which included regional collaboration, meetings (virtual and in-person), and discussion of turtle conservation issues, methods, and best management practices. To increase awareness, outreach pamphlets were revised, and information about best management practices was distributed (for more, please see NEPARC's website).

CT DEEP staff also joined the Collaborative to Combat Illegal Trade in Turtles (CCITT) in 2018 and assumed a co-chair role in 2022. CCITT formed in 2018 as biologists throughout the northeast agreed illegal trade and collection of North American turtles was a frequent and serious enough issue to merit formation of a group focused on the issue. The mission of CCITT is "advancing efforts to better understand, prevent, and eliminate the illegal collection and trade of North America's native turtles. For more information, see CCITT's website.

SGCN Birds of Connecticut

Regional Overview

Of the 426 bird species found in the Northeastern U.S., 273 were listed as SGCN in at least one of the fourteen 2015 Northeast Wildlife Action Plans. Twenty-eight of these bird species met the criteria as RSGCN, comprising 13 landbirds, nine waterbirds, five shorebirds, and one raptor. Forty-two birds are listed in one of the Watchlist categories. Many of the 28 Bird RSGCN are emblematic of an important and vulnerable Northeast habitat, including coastal beaches, coastal islands, salt marshes, early successional habitats, and unfragmented forests. Of the 28 Northeast RSGCN bird species, 15 are listed as SGCN in Connecticut, while two are listed as SAPS.

Connecticut Overview and Conservation Progress in Connecticut Since 2015

Merriam (1877), Sage et al. (1913), and Bevier (1994) have summarized the avian diversity in Connecticut. The Atlas of Breeding Birds of Connecticut (1982-1986) identified 173 species

nesting in the state, with an additional 14 species exhibiting breeding behavior (Bevier 1994). The Atlas provided distribution maps for each of Connecticut's breeding birds as well as a narrative account for each species with information about its migratory/non-migratory status, comparative breeding population abundance, and wintering areas in the state (Zeranski and Baptist, 1990; Bevier, 1994 and1996; and Perkins, 2001). More recently, a project led by the University of Connecticut and CT DEEP updated the Connecticut Bird Atlas, completed in 2024, and provided a systematic survey of Connecticut's breeding birds and their distributions and abundance within the state. The most current checklist of Connecticut birds, updated annually by the Connecticut Ornithological Association (COA, 2024), includes 450 species, some of which occur infrequently, while others are only present during migration or as overwintering species.

While species-specific progress is provided below in each subtaxon section, CT DEEP and conservation partner organizations have been active in regional conservation efforts for our states' landbirds, taking part in many regional initiatives, including the Saltmarsh CSWG Project, serving on the Atlantic Flyway Landbird Committee, participating in the Saltmarsh Sparrow and Black Rail Working Groups, and contributing to the National Audubon Society Flight Plan.

Connecticut has contributed to local and regional monitoring efforts to expand our knowledge base and assess the status of birds in our area. This has included increasing the Motus Receiver Network to sixteen towers, which helps monitor various bird species, including shorebirds and migratory landbirds. Perhaps most importantly, CT DEEP, UConn, and many of our conservation partners spearheaded a statewide effort to map the distribution and abundance of all of Connecticut's Breeding Birds, as well as continued involvement in the National Audubon Society's annual Christmas Bird Count (Audubon website) and USGS's Breeding Bird Atlas (USGS website) programs. Over the past decade, these efforts have addressed an important data gap identified in the 2015 Wildlife Action Plan, enabling a more comprehensive assessment of Connecticut's birds.

CT DEEP and its partners have managed a variety of habitats to benefit Connecticut's birds, including efforts to coastal restoration projects aimed at benefiting Saltmarsh Sparrows and other tidal marsh birds, prescribed burning and mowing to maintain grassland bird habitat, and early successional habitat that benefits American Woodcock and other shrubland-dependent species (for more, see the Yong Forest Initiative's website). Forest-dependent birds have benefited from various new programs, including the state's Bird-Friendly Maple Program, the Interior Bird Nesting Success Project, and the 2020 Connecticut Forest Action Plan.

CT DEEP and its partners have also participated in the Atlantic Flyway Initiative and the East Coast Marshes Business Plan, conducting shorebird disturbance surveys, collaborating with law enforcement to manage dog interactions around beach nesting sites, and utilizing community-based marketing to raise awareness about the issues surrounding coastal birds in the

state. This ongoing effort along the coast has involved the work of the Audubon Alliance, which provides approximately forty staff members each summer and between 100 and 150 volunteers annually. Advocacy efforts from our partners helped pass the Seabird and Shorebird Protection Bill (HB 6813) in 2023, which allows Connecticut to develop and implement a protection program and help beach-nesting birds by roping off nesting areas on public beaches. Additionally, our partners' advocacy helped pass another bill (HB 6484) in 2023 that bans the harvest of Horseshoe Crabs (an SGCN themselves), which will help species like the Rufa Red Knot that rely on their eggs for sustenance while they migrate to their breeding grounds in the Arctic.

In 1995, the National Audubon Society initiated the Important Bird Area (IBA) program in the United States, now overseen by BirdLife International. IBAs provide essential habitat for one or more species of birds and are usually discrete sites that stand out from the surrounding landscape. In recognition of Connecticut's importance for birds, Audubon Connecticut has identified 33 Important Bird Areas (IBAs) and seven landscape-scale IBAs, representing broader collections of state-owned and privately owned land blocks. Audubon Connecticut is developing individual conservation plans for each site. All current Important Bird Areas and conservation plans can be found at Important Bird Areas | Audubon Connecticut.

The state and our conservation partners have also been active in developing public awareness around the issues associated with reducing bird mortality from window-strikes and lighting, starting Lights Out Connecticut, an initiative that has helped create and provide outreach materials, led to a new state statute (HB 6607) in 2023 that eliminates unnecessary nighttime lighting on state-owned buildings throughout the year, and ongoing efforts to pass local ordinances to reduce lighting.

SGCN

Table 1.10 - Number of SGCN by each subtaxon group by Importance Level

	Most Important	Very Important	Important	Grand Total
Landbirds	7	19	11	37
Raptors	5	1	3	9
Shorebirds	3	1	6	10
Waterbirds	5	9	9	23
Total	**20**	**30**	**29**	**79**

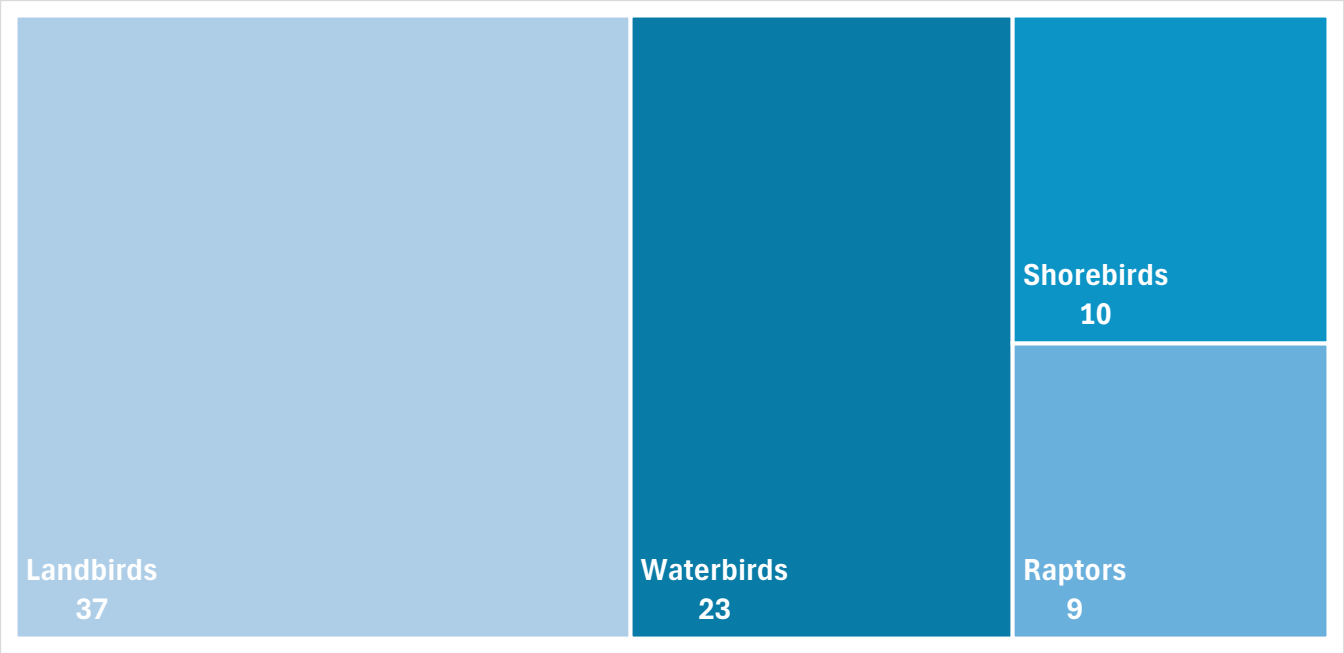

Figure 1.6 - Total number of SGCN bird species for each subgroup

Distribution and Abundance within Connecticut

Connecticut's 79 Bird SGCN are broadly distributed in the state and Long Island Sound. Birds are one of the world's most studied and well-known animal groups, so much is known about the distribution of our state's birds, especially after a recent Breeding Bird Atlas effort led by the University of Connecticut and other partners. For specific, species-level information for the distribution of Connecticut's Bird SGCN, please see CT's Breeding Bird Atlas.

Bird populations have been declining rapidly over the last 30 years, with estimates suggesting that 29% of the total abundance (~3 billion birds) has been lost since 1970 (Rosenberg et al., 2019). With 20% of Connecticut's bird SGCN showing a long-term decline of over 90% and over half of all SGCN declining (Figure 1.7), Connecticut's birds follow the same patterns of abundance loss as birds worldwide. Given the importance of birds in providing pollination, seed dispersal, and many other ecosystem services, identifying the most significant threats to birds (Chapter 3) and the actions we can take to protect them from further decline (Chapter 4) are vital. Birds represent one of the world's most studied groups of organisms, primarily due to their relative ease of study, as they are mostly active during the day and are conspicuous, making them of public interest. Despite long-term population trends being unknown for 78% of *all* SGCN, only 19% of bird SGCN remain unknown (but many SAPS are still unknown); however, this still highlights a need for more research, even in this relatively well-studied group.

Important sources of abundance and population trends for the birds found throughout the United States, in the Northeastern United States, and within Connecticut include The Breeding Bird Survey, run by the Eastern Ecological Science Center of the United States Geological Survey, which provides abundance estimates of ~400 bird species in North America based on data from 1966-2022 (USGS 2024), and the Audubon Society's Christmas Bird Count program which represents over 100 years of data and provides estimates of relative abundance for bird species found through North America and beyond from 1970 to 2021 (National Audubon Society 2024).

Additionally, like other taxa in the state, CT DEEP's Natural Diversity Data Base (NDDB) provides some data on the distribution of threatened species. For other sources of distribution and abundance information, records from natural history collections worldwide, including those at the Peabody Museum at Yale and the UConn collection, have been digitized. This information can be found on the Global Biodiversity Information Facility (GBIF) and Vertnet. Another valuable resource for the distribution of Connecticut's birds can be found on the Map of Life website. Bird distribution information can also be found in various community science applications and websites, including eBird and iNaturalist. If you want to contribute to these community-science efforts, we encourage you to click the links above to become involved.

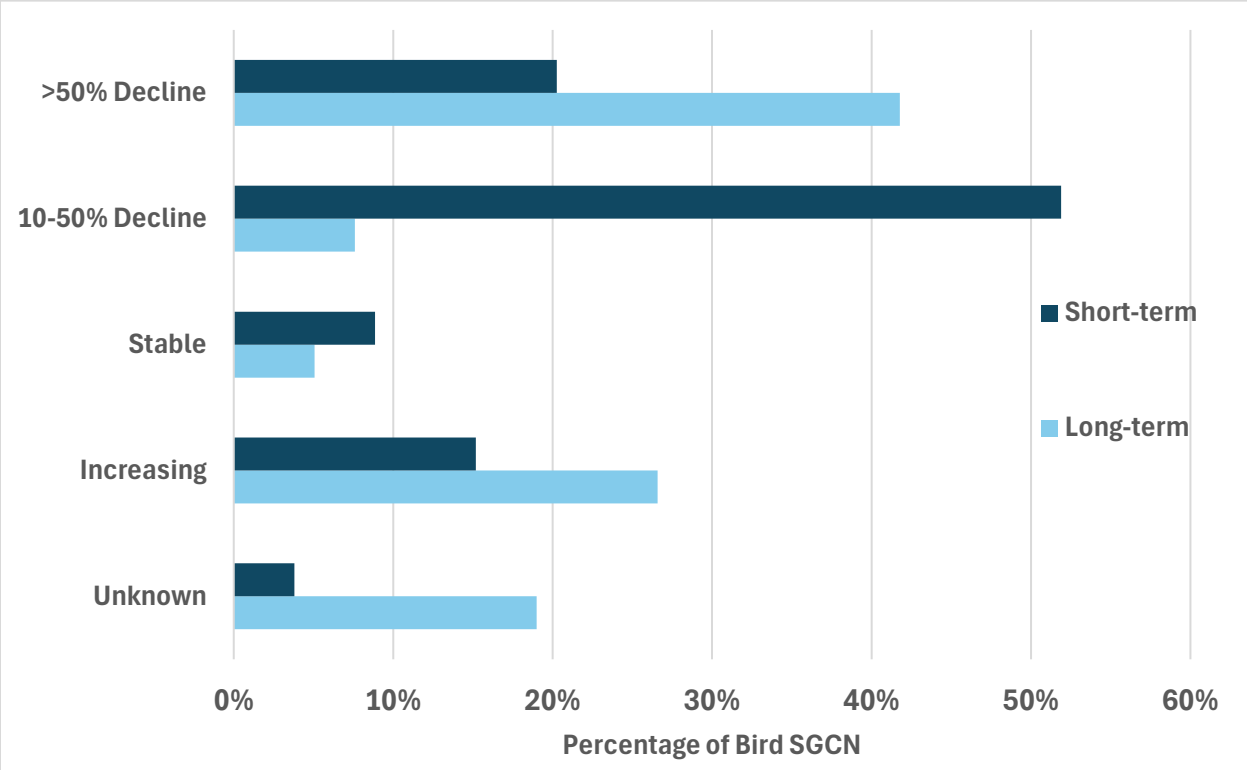

Figure 1.7 – Long- and Short-term Population Trajectories for Connecticut's Bird SGCN. Long-term trends are based on the past 200 years, and Short-term trends are based on the last three generations.

Connecticut's Landbirds

Table 1.11 - SGCN Status

Common Name	Scientific Name	Importance Level	Short Term Population Trend	Long Term Population Trend
Grasshopper Sparrow	*Ammodramus savannarum*	MOST	50-70% Decline	>90% Decline
Saltmarsh Sparrow	*Ammospiza caudacuta*	MOST	30-50% Decline	>90% Decline
Seaside Sparrow	*Ammospiza maritima*	VERY	Relatively Stable	10-30% Decline
Eastern Whip-poor-will	*Antrostomus vociferus*	MOST	70-80% Decline	10-30% Decline
Ruffed Grouse	*Bonasa umbellus*	VERY	70-80% Decline	>90% Decline
Canada Warbler	*Cardellina canadensis*	VERY	30-50% Decline	Unknown
Veery	*Catharus fuscescens*	IMPORTANT	30-50% Decline	>25% Increase
Brown Creeper	*Certhia americana*	IMPORTANT	50-70% Decline	10-25% Increase
Chimney Swift	*Chaetura pelagica*	VERY	10-30% Decline	70-80% Decline
Bobolink	*Dolichonyx oryzivorus*	VERY	30-50% Decline	>90% Decline
Least Flycatcher	*Empidonax minimus*	VERY	30-50% Decline	80-90% Decline
Horned Lark	*Eremophila alpestris*	MOST	Relatively Stable	>90% Decline
Purple Finch	*Haemorhous purpureus*	IMPORTANT	50-70% Decline	Unknown
Wood Thrush	*Hylocichla mustelina*	VERY	30-50% Decline	>25% Increase
Yellow-breasted Chat	*Icteria virens*	VERY	30-50% Decline	>90% Decline
Baltimore Oriole	*Icterus galbula*	IMPORTANT	10-30% Decline	Unknown
Belted Kingfisher	*Megaceryle alcyon*	VERY	Unknown	Relatively Stable
Northern Mockingbird	*Mimus polyglottos*	VERY	70-80% Decline	Unknown
Black-and-white Warbler	*Mniotilta varia*	IMPORTANT	30-50% Decline	70-80% Decline
Louisiana Waterthrush	*Parkesia motacilla*	IMPORTANT	10-25% Increase	Unknown
Savannah Sparrow	*Passerculus sandwichensis*	IMPORTANT	10-25% Increase	80-90% Decline
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	IMPORTANT	30-50% Decline	>25% Increase
Eastern Towhee	*Pipilo erythrophthalmus*	VERY	30-50% Decline	Relatively Stable
Scarlet Tanager	*Piranga olivacea*	VERY	10-30% Decline	>25% Increase
Purple Martin	*Progne subis*	IMPORTANT	10-25% Increase	>25% Increase
Bank Swallow	*Riparia riparia*	VERY	30-50% Decline	Unknown
Black-throated Blue Warbler	*Setophaga caerulescens*	VERY	Relatively Stable	10-25% Increase
Cerulean Warbler	*Setophaga cerulea*	VERY	10-30% Decline	>25% Increase
Prairie Warbler	*Setophaga discolor*	MOST	30-50% Decline	>25% Increase
Blackburnian Warbler	*Setophaga fusca*	IMPORTANT	10-30% Decline	Unknown
Chestnut-sided Warbler	*Setophaga pensylvanica*	VERY	30-50% Decline	>25% Increase
Field Sparrow	*Spizella pusilla*	VERY	30-50% Decline	Unknown

Eastern Meadowlark	*Sturnella magna*	MOST	70-80% Decline	>90% Decline
Brown Thrasher	*Toxostoma rufum*	VERY	70-80% Decline	70-80% Decline
Eastern Kingbird	*Tyrannus tyrannus*	VERY	10-30% Decline	Unknown
Blue-winged Warbler	*Vermivora cyanoptera*	MOST	30-50% Decline	>25% Increase
White-eyed Vireo	*Vireo griseus*	IMPORTANT	30-50% Decline	50-70% Decline

Overview of Conservation Progress in Connecticut Since 2015

Connecticut's landbirds include groups of birds that primarily breed in or use Connecticut's grasslands, forests, marshes, and shrublands. While many of the initiatives listed above benefit Connecticut's landbirds, the following species-specific conservation projects have addressed several of the actions identified in Connecticut's 2015 Wildlife Action Plan.

Purple Martin

Active Purple Martin colonies were banded annually from 2011 to 2018 by staff and volunteers to monitor population trends, primarily on state land. Adults were consistently banded, while only healthy juveniles between 5 and 25 days old were banded. From 2011 to 2018, the number of banded birds increased from 541 in 2011 to 1355 in 2017. However, due to fewer staff availability, only 765 were banded in 2018.

Ruffed Grouse

Based on drumming surveys and public and staff sightings from 2005 to 2020, CT DEEP staff concluded that Ruffed Grouse populations persist at low levels, as sightings have decreased over time.

Saltmarsh Sparrow

In 2021, a grant was approved to identify the most effective habitat restoration techniques for species that rely on salt marshes for reproduction, including the Saltmarsh Sparrow. The goal is to implement restoration techniques to 1,667 acres of varying salt marsh habitat across six states (Maine, Massachusetts, Rhode Island, Connecticut, Maryland, and Virginia) by 2025. An area of focus is the Sluice Creek Marsh in Guilford, where old tide gates allow water to leak through, but are insufficient to maintain a functioning tidal marsh. There is concern that replacing the gates will cause even less tidal flow. The proposed work entails excavating a channel that will bypass the gates to change the course of Sluice Creek. The excavated materials will increase the heights in adjacent parts of the marsh to combat rising tides.

Raptors

Table 1.12- SGCN

Common Name	Scientific Name	Importance	Short-term Population Trend	Long-term Population Trend
Northern Goshawk	*Accipiter gentilis*	Most Important	50-70% Decline	>90% Decline
Sharp-shinned Hawk	*Accipiter striatus*	Most Important	30-50% Decline	>90% Decline
Northern Saw-whet Owl	*Aegolius acadicus*	Important	30-50% Decline	Unknown
Broad-winged Hawk	*Buteo platypterus*	Very Important	50-70% Decline	70-80% Decline
Northern Harrier	*Circus hudsonius*	Most Important	Relatively Stable	>90% Decline
Peregrine Falcon	*Falco peregrinus*	Important	10-25% Increase	10-25% Increase
American Kestrel	*Falco sparverius*	Most Important	30-50% Decline	50-70% Decline
Bald Eagle	*Haliaeetus leucocephalus*	Important	>25% Increase	10-25% Increase
Eastern Screech-Owl	*Megascops asio*	Most Important	30-50% Decline	30-50% Decline

Overview of Conservation Progress in Connecticut Since 2015

Bald Eagle

The Connecticut Midwinter Eagle Survey was held annually from 1979 to 2018. Over that time, the number of observed eagles increased, from 20 in 1979 to 166 in 2018, and nest success rates also improved. In 2013, there were 25 successful nests, and 38 in 2018.

Osprey

While no longer an SGCN, conservation action over the past decade has helped their populations to the point where they no longer meet the requirements for listing. In partnership with the Connecticut DEEP Wildlife Division, the Connecticut Audubon Society launched the “Osprey Nation” community science project in 2014. Between then and 2021, there was an upward trend in the number of nest locations found (from 414 to 814), active nests (from 210 to 558), and the number of fledglings (from 307 to 858).

Peregrine Falcon

Since Peregrine Falcons often nest on human structures, Wildlife Division biologists provided technical assistance to the owners of buildings and bridges with falcon nests. Additionally, biologists closed areas where the falcons were at high risk of human disturbance or where they were in danger from aggressive territorial falcons. Biologists monitored the success of Peregrine Falcon nests and banded a handful of nestlings between 2017 and 2020.

Shorebirds

Table 1.13 - SGCN Status

Common Name	Scientific Name	Importance	Short-term Population Trend	Long-term Population Trend
Ruddy Turnstone	*Arenaria interpres*	Important	30-50% Decline	>25% Increase
Upland Sandpiper	*Bartramia longicauda*	Most Important	80-90% Decline	>90% Decline
Sanderling	*Calidris alba*	Important	30-50% Decline	Unknown
Dunlin	*Calidris alpina hudsonia*	Important	Unknown	Unknown
Purple Sandpiper	*Calidris maritima*	Important	Relatively Stable	Relatively Stable
Semipalmated Sandpiper	*Calidris pusilla*	Very Important	30-50% Decline	70-80% Decline
Piping Plover	*Charadrius melodus*	Most Important	>25% Increase	10-25% Increase
American Woodcock	*Scolopax minor*	Most Important	30-50% Decline	80-90% Decline
Lesser Yellowlegs	*Tringa flavipes*	Important	Unknown	Unknown
Willet	*Tringa semipalmata*	Important	Relatively Stable	30-50% Decline

Overview of Conservation Progress in Connecticut Since 2015

American Woodcock

CT DEEP conducted annual assessments to determine trends in the distribution and abundance of wintering and breeding migratory game birds. Those results are shown in the table above (Table 1.13). In 2022, a grant was approved to capture and place nanotags on American Woodcock to investigate habitat use, nesting success, survival, and vital rates. Data will be collected using MOTUS towers placed along the coastline from Westport to Stonington.

Piping Plover

In 2023, CT DEEP received a grant to help maximize the success of breeding Piping Plover populations. The grant supports monitoring population trends, productivity, and distribution across coastal Connecticut, as well as breeding activity at public beaches. Nesting chronology, location of nests, nest success, causes of nest loss, and productivity will be reported to CT DEEP staff along with volunteer efforts to fence and post areas used by breeding plovers, enforce pet restrictions, and prevent overall disturbance on beaches.

Connecticut's Waterbirds

Table 1.14 - SGCN

Common Name	Scientific Name	Importance	Short-term Population Trend	Long-term Population Trend

Great Egret	*Ardea alba*	Very Important	10-25% Increase	10-30% Decline
American Black Duck	*Anas rubripes*	Very Important	30-50% Decline	70-80% Decline
Great Egret	*Ardea alba*	Very Important	10-25% Increase	10-30% Decline
Greater Scaup	*Aythya marila*	Very Important	30-50% Decline	70-80% Decline
American Bittern	*Botaurus lentiginosus*	Most Important	50-70% Decline	>90% Decline
Long-tailed Duck	*Clangula hyemalis*	Important	50-70% Decline	80-90% Decline
Little Blue Heron	*Egretta caerulea*	Important	Relatively Stable	>25% Increase
Snowy Egret	*Egretta thula*	Very Important	10-30% Decline	>25% Increase
Common Gallinule	*Gallinula galeata*	Very Important	50-70% Decline	Unknown
Common Loon	*Gavia immer*	Important	10-25% Increase	80-90% Decline
American Oystercatcher	*Haematopus palliatus*	Very Important	>25% Increase	>25% Increase
Least Bittern	*Ixobrychus exilis*	Very Important	30-50% Decline	>90% Decline
Great Black-backed Gull	*Larus marinus*	Important	10-30% Decline	Unknown
White-winged Scoter	*Melanitta deglandi*	Very Important	70-80% Decline	50-70% Decline
Surf Scoter	*Melanitta perspicillata*	Important	70-80% Decline	50-70% Decline
Glossy Ibis	*Plegadis falcinellus*	Important	10-25% Increase	>25% Increase
Pied-billed Grebe	*Podilymbus podiceps*	Most Important	30-50% Decline	Relatively Stable
Sora	*Porzana carolina*	Important	10-30% Decline	50-70% Decline
Virginia Rail	*Rallus limicola*	Important	10-25% Increase	30-50% Decline
Clapper Rail	*Rallus longirostris*	Most Important	10-30% Decline	10-30% Decline
Black Skimmer	*Rynchops niger*	Important	>25% Increase	>25% Increase
Roseate Tern	*Sterna dougallii*	Most Important	10-30% Decline	>90% Decline
Common Tern	*Sterna hirundo*	Very Important	30-50% Decline	>90% Decline
Least Tern	*Sternula antillarum*	Most Important	30-50% Decline	>90% Decline

Overview of Conservation Progress in Connecticut Since 2015

Clapper Rail

Annual marsh surveys reveal a 13% decline in Clapper Rails, despite the species being one of the most abundant in 2010, when the surveys began. This could indicate a gradual decline in the quality and function of the systems they rely on. In 2016, CT DEEP, in partnership with the University of Connecticut, initiated a pilot study to develop capture techniques and assess the efficacy of nest monitoring before a project to evaluate Clapper

nesting success and adult survival. This project was implemented in 2017, continuing the nest success work and initiating an assessment of the seasonal and annual survival rates of adult Clapper Rails. Four radio towers along the coast were erected before any capture of the Rails. In 2017, 16 birds were captured and released with nanotags. In 2018, the nesting success portion of the study was finalized, and biologists continued to capture rails and deploy nanotags. A total of 24 rails were captured in 2018, with 21 of those detected between November and December. During the same period, 14 out of the 16 birds captured in 2017 were detected. In 2019, seven more rails were captured, and no nesting work was conducted. However, COVID-19 stopped all field operations during 2020.

SGCN Fish of Connecticut

Regional Overview

In the Northeast region, 78 out of the total 1,024 fish species have been identified as RSGCN. Of the 28 diadromous fish species found in the Northeast, 9 met the RSGCN criteria, two of which are federally listed as Endangered. Of the 335 freshwater fish found in the Northeast, 45 met the criteria as RSGCN, 6 of which are listed under the Endangered Species Act as Endangered or Threatened. Of the 661 marine fish species found in the Northeast, 24 met the criteria as RSGCN. These fish taxa include representatives of all major fish families found in the Northeast, migratory and non-migratory, with certain families (Percidae, Cyprinidae, Salmonidae) frequently listed. Associated habitats for these fish species span the full range of northeastern aquatic environments, including freshwater, estuarine, and marine systems (TCI & NEFWDTC, 2023).

Given the variety of habitats that fish occupy, regional conservation priorities focus on actions that help address threats and stabilize populations. Conducting surveys and research to fill data gaps and mitigate risks associated with rising freshwater and sea temperatures due to shifting environmental conditions are key actions for all fish subtaxon groups (TCI & NEFWDTC, 2023). The Northeast Continental Shelf is warming more rapidly than other water bodies worldwide (Gonçalves Neto et al., 2021). Coldwater refugia for freshwater fish and other species are expected to become more limited in the Northeast by the end of the century (See Burgio et al., 2024 for more details). This is likely to cause fish species to shift their ranges or become locally extinct (Burgio et al., 2024). For more information about the threats to Connecticut's fish, please see Chapter 3.

Connecticut Overview & Conservation Progress Since 2015

Freshwater, Marine, and Diadromous Species Overview

Connecticut's warmwater fisheries are important to the state's overall angling activity. Anglers spend approximately 3.3 million trips per year fishing for Largemouth Bass and Smallmouth Bass (2.1 million trips/year), and 1.2 million trips/year fishing for other warmwater

species such as Northern Pike, panfish, Walleye, and catfish. Our diverse coldwater fisheries attract many anglers, particularly those interested in trout fishing. Many coldwater fish are stocked for recreational fishing every year. Annually, trout are stocked in 200 Connecticut rivers and streams and over 100 lakes statewide. Many high-quality streams also have productive wild trout populations. Nevertheless, stocking Brook, Brown, Rainbow, and Tiger Trout, broodstock Atlantic Salmon, and Kokanee Salmon fry across the state, along with the monitoring of fry and fingerling stocking in many locations, comprises a statewide stocking program that enhances recreational freshwater fishing opportunities in Connecticut.

Connecticut Long Island Sound and its tributaries support a wide variety of marine life, which attracts over 125,000 licensed anglers and sustains a total recreational fishery of >$100 million and a commercial fishery of >$80 million annually. Because the watershed of Long Island Sound is also one of the most densely populated areas in the United States, human impacts have significantly affected fish habitats and populations. Overfishing during the 20th century led to the depletion of stocks in many fisheries. Additionally, changes in habitat availability and quality, resulting from shoreline development, led to diminished water quality and increased hypoxic events. Furthermore, fish stock productivity in Long Island Sound is also impacted by shifting environmental conditions, which has compounded the loss of fishing opportunities for species once considered abundant. Local and Regional Fisheries management bodies have incorporated harvest restrictions to mitigate population declines and to support increases in spawning stock biomass. The DEEP Fisheries Division conducts long-term resource monitoring surveys that are incorporated into fisheries stock assessments of the Atlantic States Marine Fisheries Commission (ASMFC). The ASMFC is an interstate compact of eastern U.S. states that cooperatively manages shared migratory fishery resources and protects and promotes Atlantic coastal fishery resources.

Connecticut's fish, regardless of habitat, are affected by human activities, and their populations face many threats as a result. Connecticut's estuarine and near-shore marine species are particularly affected by habitat destruction or modification, dam construction, stream channelization and navigational dredging, mining, sediment and toxic runoff, and riparian and coastal armoring. In some cases, pollution from point and non-point source contaminants in run-off reduces water quality to the point where only highly tolerant fish species survive. Sedimentation of fine particulates can also smother bottom substrates, causing declines in bottom-dwelling species and/or benthic forage species that require clean substrates and good water quality. During summer, eutrophication and resulting hypoxia make rivers, such as the Norwalk, and sections of western Long Island Sound unsuitable for sensitive species. Other threats include non-native species, disease, and parasitism. Lastly, over-harvesting for commercial, recreational, scientific, or educational purposes can affect some species, such as the federally endangered Shortnose and Atlantic Sturgeon.

As fish make distributional changes in range and phenology, primarily in response to warming sea surface and bottom temperatures, entire assemblages of species are reshuffling and reorganizing across Northeast coastal ecosystems (Weiskopf et al., 2020; Staudinger et al., 2021). Examples of changes in marine community structure resulting from altered species diversity, population size, and density have been documented in Long Island Sound (Snyder et al., 2019). Ensembles of warm-water-associated species are moving north into temperate habitats, generally replacing cold-water-associated species, which are migrating to deeper depths and higher latitudes in search of cold-water refugia (Friedland et al., 2020; Pershing et al., 2021).

Historically, Connecticut's streams have been impaired due to industrialization, development, and urban sprawl. Degradation and disturbance of aquatic habitats due to unintended spills, industrial releases, sewage, and other pollutants have affected water quality. Fragmentation of streams through construction, culverts, dams, flood control projects, and loss of forest canopy coverage and riparian management have affected many fish populations. Changes to lake ecosystems are caused by various factors, including docks, dam maintenance, winter lake drawdowns, aquatic plant control using aquatic herbicides, dredging, and the introduction of invasive species such as zebra mussels, as well as climatic factors. All of these threats have contributed to past declines and changes in freshwater fishing and aquatic habitat in Connecticut.

Diadromous fish migrate between saltwater and freshwater to spawn and are found in the fresh and estuarine waters of Connecticut and the Long Island Sound. Annual migrations of many diadromous species have supported both recreational and commercial fisheries for generations. Yet, many of these fisheries have disappeared or become marginal, and their management is regulated through the Atlantic States Marine Fisheries Commission (ASMFC) 's fisheries management plans. For example, American Shad was once one of Connecticut's five most economically important commercial finfish. Today, it is among the smallest in terms of total landings. Large-scale commercial fisheries for Alewives and Blueback Herring ended in the 1960s, and recreational and personal use bait fisheries for these species were closed by emergency declarations beginning in 2002. Diadromous species encounter a wide variety of threats while migrating through different habitats. Of the 14 diadromous species found in Connecticut waters (Whitworth, 1996), 13 are anadromous (migration from saltwater to freshwater to spawn), and one, the American Eel, is catadromous (migration from freshwater to saltwater to spawn). Dams on Connecticut's rivers and streams have substantially reduced the historic range of all diadromous SGCN because they block spawning migration routes and emigration. As a result, 8 of the 14 diadromous species are considered SGCN, and several have been identified as severely declining. Restoration of migratory routes is underway in many locations through the removal of dams and the construction of fishways. In addition to physical barriers, the spawning migration timing of anadromous Alewives (Citation?) has been altered, making them an important food source for numerous fish, birds, and mammals.

Conservation Progress Since 2015

Since 2015, the Fisheries Division's Inland Fisheries Program has continued to assess the potential for upgraded streams to support trout and other recreational fishing opportunities. Through information sharing with other CT DEEP agencies, municipalities, conservation commissions, and other stakeholders, Inland Fisheries has worked to mitigate impacts on headwater streams and watersheds, thereby conserving and protecting aquatic systems that support trout, other fish, and aquatic fauna. Other past and present efforts have included monitoring flow changes on the Shepaug and Housatonic Rivers, monitoring catch-and-release areas of the Farmington River, developing and monitoring Wild Trout Management Areas, reviewing allocation methods for stocked trout in streams and lakes, conducting angler surveys, and performing electrofishing surveys. Backpack electrofishing surveys are completed in cold water streams, and tow-behind shockers are used in larger streams to capture and collect trout to monitor and evaluate populations. Due to the variability of fish populations over time, the Fisheries Division Inland Fish Program directly monitors fish populations in various waterbodies throughout the state. Approximately 10-15 headwater stream sites are sampled annually via electrofishing. The EBTJV map serves as a guide to identify new sampling sites. Since 2015, warm-water fisheries have been sampled in selected lakes via night boat electrofishing during spring and fall. The sampled fish were counted and measured, and scale samples were taken for age-growth analyses. Ongoing evaluations since the early 2000s have shown variations in warmwater species abundance, recruitment, and distribution. Angler surveys are also conducted regularly, which determine angler catch, effort, catch rates, and attitudes. The data gained from direct population and angler surveys allow the Fisheries Division to make informed management decisions and implement management strategies and new tools that best support warmwater fisheries in Connecticut.

Other ongoing survey efforts include an open-water forage abundance analysis conducted by the Long Island Trawl Survey (LISTS), which encompasses 14 forage species and aims to measure the available food base that supports these species within Long Island Sound, including SGCN species such as Alewife, Blueback Herring, and American Shad. The geometric mean biomass is calculated using the aggregate of the 14 species per tow. The average forage biomass from 1992 to 2023 is 14.4 kg/tow (not including 2020 due to COVID-19). The highest biomass was seen in 2016 (30.9kg/tow). Biomass levels were below average from 2018 to 2021. In 2023, the forage biomass was just above average. The CT DEEP Water Monitoring Program monitors nutrient levels, dissolved oxygen, and algal blooms in Long Island Sound. The data collected is used to model nutrient transport to monitor the effects of eutrophication in the Long Island Sound.

The previous CT Wildlife Action Plans include the diadromous Atlantic Sturgeon and Shortnose Sturgeon, both US Endangered Species-listed species as SGCNs. The Sturgeon

Project at CT DEEP Marine Fisheries is an ongoing effort to monitor the populations of both sturgeon species. Biologists use mark/recapture surveys, egg mat surveys, and acoustic telemetry to establish habitat use and distribution of Sturgeon in Connecticut waters. In 2018, the DEEP Fisheries Division formed an agreement with the US Fish and Wildlife Service to use the Sport Fish Restoration Grant to restore and enhance salmonid and clupeid runs in Connecticut waters. New staff were hired to oversee this project. Other SGCN diadromous species, such as American Shad, River Herring, and American Eel, are monitored by CT DEEP Fisheries Division through Federal Wildlife Sportfish Restoration (WSFR) grants. Staff also served on various state, interstate, and regional committees and commissions related to fish passage programs and the restoration and conservation of diadromous fish. Additionally, emphasis was placed on public outreach to educate the public about the importance of diadromous fish. Outreach included public talks, fishway open house events, nine fishway/dam removal site tours, and the continuation of the Connecticut River Salmon in the Schools programs.

To address some of the many issues facing Connecticut's fish, CT DEEP installed a pair of self-regulating tide gates, which helped restore 50 acres of tidal wetland along the Long Island Sound and Cove River in New Haven and restored 34 acres of wetlands in Great Meadows Marsh in Stratford by removing fill that was dumped into wetlands in the 1950s and replacing it with clean sediment. The State also worked with NOAA to restore nearly 40 acres of salt marsh in the Stewart B. McKinney National Wildlife Refuge. To address problems caused by invasive aquatic species, CT DEEP administers an annual grant program that provides funding for municipalities, state agencies, and not-for-profit organizations engaging in projects related to the control and management of, education and outreach about, or research on aquatic invasive species.

SGCN

Table 1.15 – Number of SGCN by each subtaxon group by Importance Level

	Most Important	Very Important	Important	Grand Total
Diadromous Fish	6	2	0	8
Freshwater Fish	7	1	0	8
Marine Fish	8	7	3	18
Total	**21**	**10**	**3**	**34**

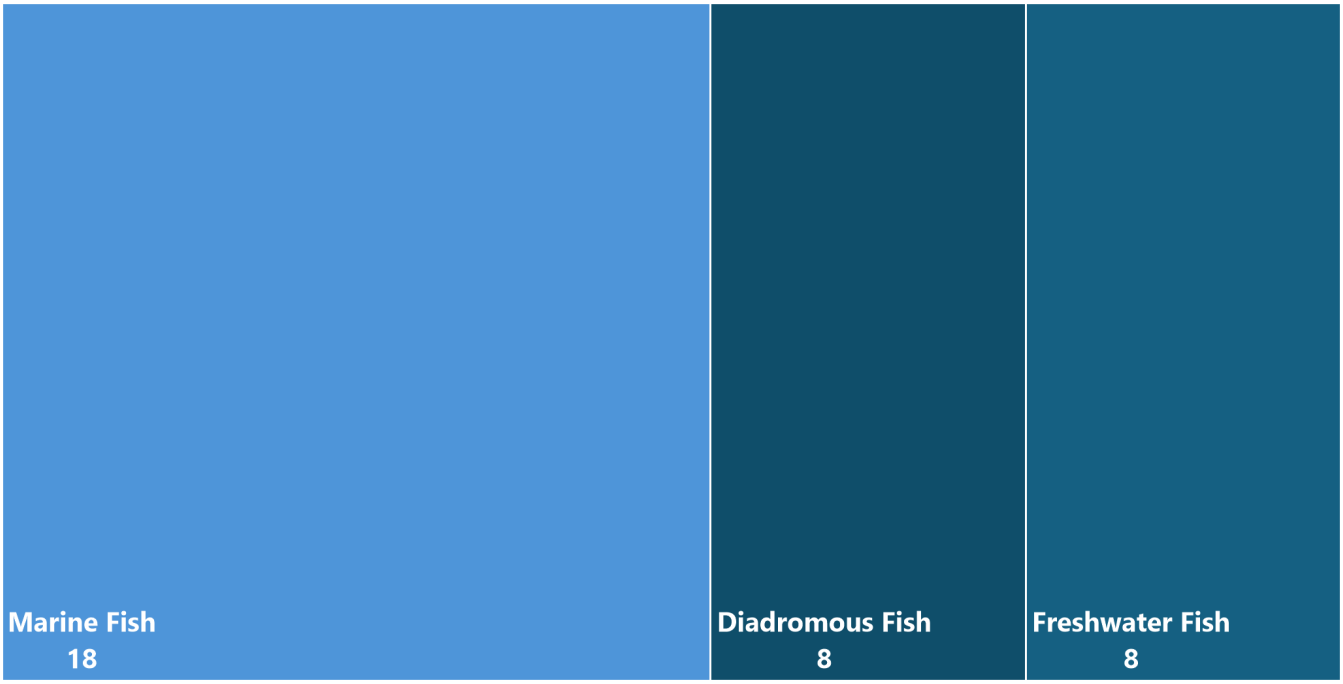

Figure 1.8 – Number of SGCN by Subtaxon Group

Distribution and Abundance within Connecticut

Whitworth (1996) and Thomson et al. (1971, 1978) described the distribution and abundance of the state's saltwater fish. The Fisheries Division's Marine Fisheries program conducts an annual Long Island Sound Trawl Survey (LISTS) to measure the abundance and distribution of living resources in the Long Island Sound. Since its inception in 1984, the survey has documented over 114 finfish species and 64 invertebrate taxa. Data on the distribution and abundance of Connecticut's marine and diadromous fishes can be found on the CT DEEP Fisheries website (e.g., 2020, 2022) and the Long Island Sound Study website. Estuarine fish are surveyed using a Seine Survey, conducted each September since 1988, which has documented 63 finfish species and 19 invertebrate taxa in Connecticut's sub-tidal habitat since it started. The most recent survey data can be found on CT DEEP's website. CT DEEP Marine Fisheries program also conducts an annual Connecticut River seine survey to monitor the juvenile alosine population, which includes American Shad, Alewife, and Blueback Herring. Since 1978, the survey has been conducted annually from summer to fall to determine the relative success of spawning in the Connecticut River, based on the juvenile fish population. More information on this survey and other American Shad monitoring efforts can be found on CT DEEP's American Shad Assessment website.

The abundance and distribution of freshwater fishes in Connecticut are described by Thorpe et al. (1968), Whitworth (1996), and Jacobs and O'Donnell (2009). There are 26

native freshwater fish species (three are extirpated). Observations indicate that 50 non-native freshwater species have been released into Connecticut waters or imported into the state. At least half of these non-native species lack viable reproductive populations (Whitworth 1996). The most recent data on the distribution and abundance of inland fish species can be found on CT DEEP's Website.

Additionally, like other taxon in the state, CT DEEP's Natural Diversity Data Base (NDDB) provides some data on the distribution of threatened species. For other sources of distribution and abundance information, records from natural history collections worldwide, including the Peabody Museum at Yale and the Biodiversity Research Collections at UConn, have been digitized. This information can be found on the Global Biodiversity Information Facility (GBIF), Vertnet, and FishBase. Another valuable resource for the distribution of Connecticut's fish can be found on the Map of Life website. Fish distribution information can also be found in various community science applications and websites, including iNaturalist. If you would like to contribute to these community-science efforts, we encourage you to click the links above to get involved.

Little information is known about the population trends of Connecticut's SGCN fish. (Figure 1.9). This lack of information is not unique to Connecticut; quantifying population changes in such wide-ranging, or difficult-to-access or sample, species is challenging. Approximately 75% of all global fish population trends remain unknown (Finn et al., 2023). Some studies reveal complex patterns of change, such as a worldwide increase in freshwater fish abundance, but decreases in species diversity and rapidly changing communities (e.g., Danet et al., 2024). The SGCN, with sufficient information for assessment, demonstrates declining long- and short-term trends (Figure 1.9). There are also larger trends of fish diversity declines along the East Coast of the U.S. (Finn et al. 2023). While CT DEEP conducts regular surveys across the three main fish habitats (marine, estuarine, and freshwater), surveying the health of our state's fish populations remains a high priority (see Chapter 4 for more information).

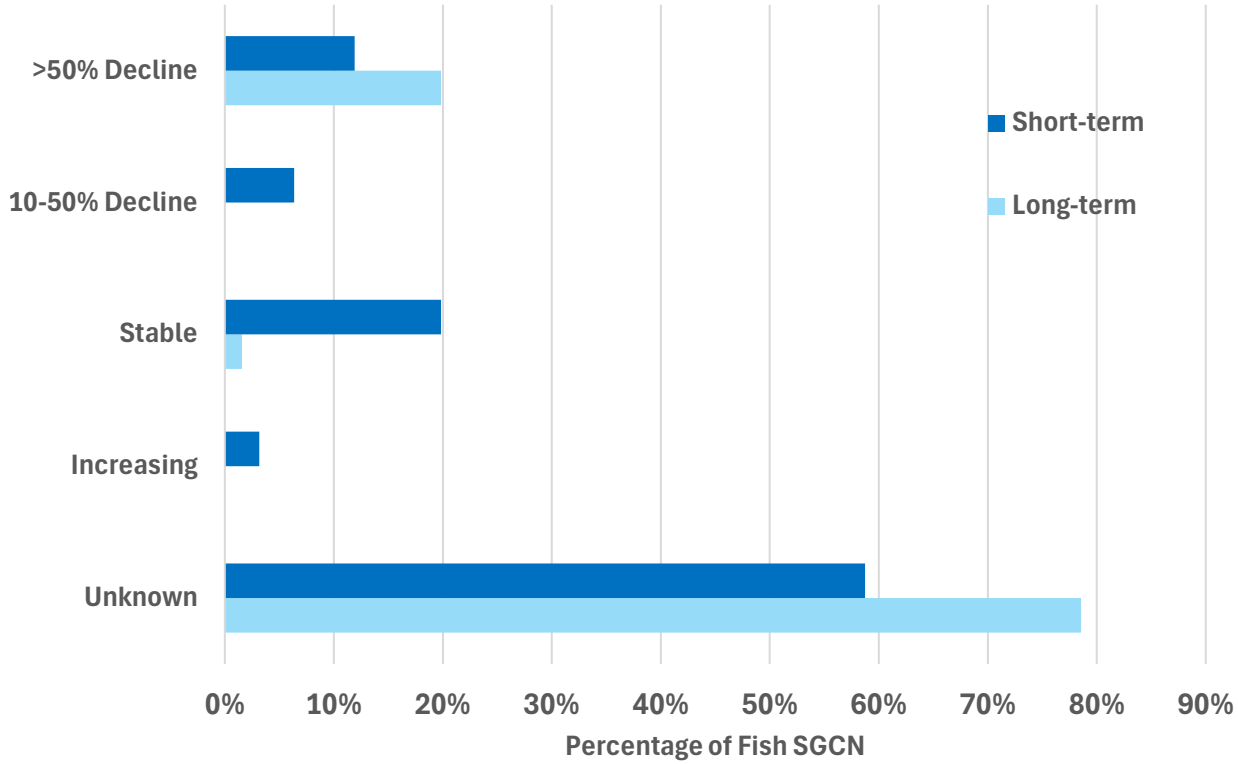

Figure 1.9 – Long- and Short-term Population Trajectories for Connecticut's Fish SGCN by percentage. Long-term trends are based on the past 200 years, and Short-term trends are based on the last three generations.

Connecticut's Diadromous Fish

Table 1.16 - SGCN

Common Name	Scientific Name	Importance	Short-term Population Trend	Long-term Population Trend
Shortnose Sturgeon	*Acipenser brevirostrum*	Most Important	70-80% Decline	Unknown
Atlantic Sturgeon	*Acipenser oxyrinchus oxyrinchus*	Most Important	70-80% Decline	Unknown
Blueback Herring	*Alosa aestivalis*	Most Important	80-90% Decline	Relatively Stable
Alewife	*Alosa pseudoharengus*	Most Important	70-80% Decline	Relatively Stable
American Shad	*Alosa sapidissima*	Very Important	70-80% Decline	Relatively Stable
American Eel	*Anguilla rostrata*	Most Important	70-80% Decline	Relatively Stable
Rainbow Smelt	*Osmerus mordax*	Most Important	80-90% Decline	Unknown
Sea Lamprey	*Petromyzon marinus*	Very Important	Relatively Stable	Relatively Stable

Overview of Conservation Progress in Connecticut Since 2015

Atlantic Salmon

Atlantic Salmon, a diadromous species with historic runs in the Connecticut River basin, experienced massive population declines due to industrialization and dam construction that impacted habitat and interfered with migration and spawning. Atlantic Salmon have been extirpated from the Connecticut River since the early 1800s due to anthropogenic changes in habitat. From 1967 to 2013, the Fisheries Division attempted to restore Atlantic Salmon populations to the Connecticut River basin. Still, the USFWS's decision to no longer raise salmon in its hatcheries to support the Connecticut River Restoration Program meant that CT DEEP needed to change its focus and approach to Atlantic Salmon. Since 2014, the Fisheries Division has maintained a small population in select streams within the Farmington and Salmon River watersheds, tributaries of the Connecticut River, by using fish raised at the Kensington Fish Hatchery and the Tripps Streamside Incubation Facility at the Tributary Mill Conservancy in Old Lyme and by cooperation with educational institutions through the Salmon in the Schools Program and other nonprofits.

In 2017, 177,882 salmon fry were released; however, this number increased in 2018 to a total of 197,175 fry and 8,492 parr stocked into selected streams. The West Branch of the Farmington River and in New Hartford and Barkhamsted also received 8,492 parr as surplus to Kensington Fish Hatchery broodstock needs. Fishways were also installed and operated at the Rainbow Fishway on the Farmington River in Windsor and the Leesville Fishway on the Salmon River, and fish passage was documented at the Rainbow Fishway using digital videography until it was closed for redesign in 2023. Fish at the Leesville dam were trapped, tagged, and released upstream. Fish returning to the Connecticut River basin were two in 2018 and 20 in 2017, with a five-year mean of 34. Adult domestic salmon have been spawned and held at the Kensington Fish Hatchery to produce eggs for releasable fry and adults for sport fishing, future broodstock, and educational purposes. The Fisheries Division recommendations include continuing past fry stocking, continuing observation and documentation of Atlantic Salmon at fishways, and continuing production of fish eggs and adult fish for stocking and various outreach, educational, and research programs.

Blueback Herring and Alewife (collectively “River Herring”)

In 2018, the Fisheries Division's restoration project aimed to reestablish shad and river herring in targeted tributaries of the Connecticut River and the Housatonic, Naugatuck, Quinnipiac, Shetucket, and Quinebaug Rivers. Although historically, River Herring runs existed in many streams, since the 1980s, they have experienced a sharp decline. In 2002, a moratorium on harvesting river herring from any state waters was implemented to mitigate declining populations; annual assessments of the stocks have continued. The assessment of the 2017 river herring runs led the DEEP Commissioner to continue the moratorium in all state waters through

March 31, 2019. The Inland Fisheries Program subsequently recommended extending this ban through 2020 because significant recovery has not occurred.

The Fisheries Division monitored runs in streams to evaluate river herring stocks in Connecticut, assess existing runs, and track progress toward restoration goals within each stream. In 2018, pre-spawned adults from healthy streams were transplanted into streams that required restoration; however, the process was limited to Alewives in 2018 as there were not enough blueback herring at the donor location to be transplanted. Alewives were also transplanted from Bride Lake into appropriate streams. Fishways established at many public and private dam sites were also monitored for fish passage. In comparison to the 2017 data, the Blueback Herring run strength increased at three monitored fishway sites and decreased at three sites, while remaining stable at one of the seven sites. Counts of Blueback Herring were below average at six of the seven fishways with long-term monitoring. Alewives fared better in 2018; 2018 data showed that Alewife run strength was greater than in 2017, with passage runs up at 11, decreased at 4, and remained stable at one fishway. Counts were above average in 9 of 11 fishways that received long-term monitoring.

The CT DEEP Fisheries Division continues to encourage stream connectivity to facilitate migration through the removal of dams and the development of fishways.. The Division will continue to monitor and assess river herring runs and counts to inform best management decisions, participate in meetings with other groups (TEWG, ASMFC Technical Committee) to develop and update coastal plans, and collaborate with and share biological data with outside researchers and scientists. Collaboration with other stakeholders and dam owners will lead to improved monitoring and assessment, and therefore, more effective plans for River Herring's restoration efforts.

Atlantic Sturgeon

The Atlantic Sturgeon is the largest anadromous fish native to coastal waters of eastern North America and once spawned in at least 35 river systems. However, extensive commercial harvesting during the 19th century, dam construction, and water pollution eliminated or greatly reduced most populations. Atlantic Sturgeon were listed under the Endangered Species Act and divided into Distinct Population Segments (DPS). Four of the DPSs (NY Bight, Carolina, South Atlantic, and Chesapeake Bay) are listed as endangered, and the Gulf of Maine DPS is listed as threatened.

Since 1984, the Fisheries Division/Marine Fisheries Program has captured Atlantic Sturgeon during survey monitoring in Long Island Sound and the Connecticut River. The Connecticut River once had a natal stock of Atlantic Sturgeon, but the population was thought to have become extirpated. Savoy et al. (2017) collected juvenile Atlantic Sturgeon in 2014 in the Connecticut River. These sturgeon were too small to have migrated from a neighboring river system. Genetic analysis of fin tissue determined that these juvenile Atlantic Sturgeon were more

closely related to southern DPSs. This contradicts the previous assumption that any spawning contributions would be from the NY Bight DPS. Decades of sturgeon monitoring by CT DEEP, using mark-recapture and acoustic telemetry, have demonstrated that habitats in Connecticut waters are important for all DPSs and that extensive migration and mixing of DPSs is ongoing. The survey data collected by CT DEEP Fisheries staff are shared with various sources, including NOAA Fisheries and the Atlantic States Marine Fisheries Commission (ASMFC). The data are used for stock and migratory assessments, as well as in-water project reviews. A critical monitoring goal is to continue the challenging sampling efforts to collect juvenile Atlantic Sturgeon. Juvenile sturgeons are difficult to locate due to their rarity and limited distribution knowledge.

Shortnose Sturgeon

Shortnose Sturgeon were first listed as endangered under the precursor to the Federal Endangered Species Act in 1967. The Connecticut River is home to a natal stock, but the population has not recovered from historic overharvest, bycatch, pollution, and habitat change. Recovery efforts have been unsuccessful due to life history vulnerabilities, including slow growth, delayed maturity, and non-annual spawning. While some information has been collected on adult Shortnose Sturgeon, including spawning locations, habitat preferences, and movements, little is known about juvenile sturgeons.

The Sturgeon Project at CT DEEP Marine Fisheries monitors populations of both sturgeon species. Biologists use mark-recapture surveys, egg mat surveys, and acoustic telemetry to establish habitat use and distribution in Connecticut waters. Since 1988, the CT DEEP Fisheries Division has been capturing and tagging Shortnose Sturgeon. Selected sturgeons are implanted with acoustic transmitters and monitored using acoustic receivers in the Connecticut River to study their movements and habitat use.

Research by CT DEEP focusing on the collection of fertilized Shortnose Sturgeon eggs and larvae at the Holyoke spawning site over consecutive years (2021-2022) has provided the most compelling evidence to date of repeated annual spawning by the lower river sturgeon stock. This evidence is further supported by documented activity of mature telemetered sturgeons in the area during April and May. This new scientific information was not previously available when formulating management policies. Given the evidence of regular spawning below Holyoke, a careful reevaluation of current upstream and downstream passage practices at the Connecticut River Holyoke Dam is warranted. Issues like adult mortalities associated with injurious activities, such as fish passage, further highlight the need to assess their impact on sturgeons.

Connecticut's Freshwater Fish

Table 1.17 - SGCN

Common Name	Scientific Name	Importance	Short-term Population Trend	Long-term Population Trend
Slimy Sculpin	*Cottus cognatus*	Most Important	50-70% Decline	Unknown
Banded Sunfish	*Enneacanthus obesus*	Most Important	30-50% Decline	Unknown
Eastern Creek Chubsucker	*Erimyzon oblongus*	Very Important	10-30% Decline	Unknown
Swamp Darter	*Etheostoma fusiforme*	Most Important	10-30% Decline	Unknown
American Brook Lamprey	*Lethenteron appendix*	Most Important	80-90% Decline	Unknown
Burbot	*Lota lota*	Most Important	>90% Decline	Unknown
Bridle Shiner	*Notropis bifrenatus*	Most Important	70-80% Decline	Unknown
Brook Trout	*Salvelinus fontinalis*	Most Important	50-70% Decline	Unknown

Overview of Conservation Progress in Connecticut Since 2015

Brook Trout

Historically, Brook Trout is the only native trout in Connecticut**.** Monitoring of sentinel streams showed that by 2015, many wild trout populations in CT, especially Brook Trout, had remained at their lowest documented levels. Brook Trout populations had disappeared from 30-36% of stream segments sampled from 1988 to 1995. A more recent sampling (2018-2019 and 2022) of previous Statewide Stream Survey locations revealed significant long-term declines in many additional Brook trout populations over the past 30 years.

2015 Freshwater Fish SGCN but no longer SGCN

Brown Trout

Brown Trout are not native to North America and were introduced into Connecticut in the mid-to-late 1800s. They were subsequently reared in state and private hatcheries for release into rivers and lakes. Hatchery-bred fish have done well in put-and-take fisheries but have not always survived well enough in the wild in certain waterbodies to contribute to catch-and-release fisheries. Past efforts focused on developing a “survivor strain” of Brown trout, which could thrive and naturally reproduce. These efforts were largely concentrated on the Farmington River, which also served as the source of broodstock for the selective breeding of superior genetic traits. Results from several different managed rivers or seasonal Trout Management Areas indicated that survivor strain brown trout outperformed other domesticated hatchery strains in all life.

An anadromous form of Brown Trout currently exists in Connecticut, as some trout migrate to the Long Island Sound to live and mature, then return to streams to spawn. Because they can thrive in the warmer waters of LIS and reach a large size, these “Sea-run Brown Trout” have become a popular sport fish with anglers. In the 1960s and 1970s, efforts were made to enhance the runs of Sea-run trout using strains of European fish

raised in Connecticut hatcheries; however, the results were often disappointing. Although efforts to use hatchery Sea-run trout were revived from 2001 to 2014, from 2014 to 2018, the Fisheries Division imported a strain of sea-run Brown Trout from the Iijoki River in Finland. These eyed eggs were hatched and reared at the Burlington State Fish Hatchery. Cohorts were released in 2015, 2016, 2017, and 2018. The 2016 cohort smolts were released in Latimer Brook and the Menunketesuck River above the Chapman Pond Fishway, and some parr of the 2018 cohort were released into suitable streams in targeted coastal areas; age 2+ smolts were marked with fin clips. As of 2018, the Fisheries Division conducted follow-up evaluations and assessments using electrofishing surveys, fishway traps, videos, and catch reports from anglers to evaluate the health, density, and size of these fish in streams. A digit imaging system, SalmonSoft©, was also installed above the Chapmans Pond Fishway and Menunketesuck River to monitor fish's upstream and downstream movement. Sampling in 2018 did not capture the 2016 cohort's adult fish, perhaps indicating that the fish had successfully moved to saltwater before the fall survey; 173 smolts were observed migrating through the Chapmans's Pond spillway, and sea runs of this cohort were expected to begin in 2020. Electrofishing in 2018 indicated that at least 1% of the 2017 cohort parr was released in the Farm and Shunock Rivers and survived until fall 2018. The aged 2+ fish were projected to begin migration in 2019, with cohorts released in 2019 into Latimer Brook and Menunketesuck River expected to start in 2021. Of the 2018 cohort, 12,494 parr were released into the Farm River with expected sea runs to start in 2022; the remaining 2018 cohort fish were retained in outside rearing ponds at Burlington State Fish Hatchery (2017 Annual Performance Report Diadromous Fish Restoration Job 4 Sea Run Trout Enhancement). However, this program has since been dropped due to poor results.

Stocked, holdover Brown Trout have also provided anglers with quality fishing in coldwater lakes that have excellent coldwater conditions throughout the summer and suitable forage fish (alewives, rainbow smelt). Fish that can survive more than one season can attain a large size. Previous management efforts have included establishing Trout Management Lakes and special regulations regarding size limits and season closures. However, these efforts have had variable success, primarily due to the fluctuating availability of alewives, the main food source for holdover Brown Trout, and poor over-summer habitat. Continued monitoring and assessment of current regulations, the forage base, and the availability of cold, oxygenated water for trout during the summer is important for this fishery. Special regulations for Brown Trout will continue, but be evaluated for Crystal and Highland Lakes; large trout (>12 inches) will be discontinued in early 2026.

Rainbow Trout

Rainbow Trout are non-native, hatchery-raised fish stocked in many Connecticut lakes, rivers, and streams. Because they prefer cold, well-oxygenated waters, Rainbow Trout normally does not survive the summer in Connecticut, and domestic strains are unsuitable for spawning here. Nevertheless, one documented self-sustaining population has been found in Hubbard Brook, Hartland. Rainbow Trout larger than 12 inches may be stocked in lakes that can no longer produce holdover fish to enhance trout fishery. However, this population has not been documented in some time and likely does not exist or remains at very low undetectable levels.

Kokanee Salmon

Kokanee Salmon is a nonnative, high-quality cold-water lake species, first introduced into East Twin Lake in Salisbury during the 1930s. Due to fishing pressure and limited natural reproduction, the fishery began to decline; mature adults were captured and spawned at Burlington State Fish Hatchery to maintain this fishery. Fry introduction back into East Twin Lake was successful, but other stocked lakes did not have suitable conditions for Kokanee Salmon. Two additional lakes, West Hill Pond in Barkhamsted and Lake Wononskopomuc in Salisbury, had habitat to support Kokanee Salmon. Still, the 1990s illegal introduction of alewife into Lake Wononskopomuc and East Twin Lake resulted in a collapse of this fishery. East Twin Lake and West Hill Pond have seen a resurgence of Kokanee salmon due to the disappearance of alewives from these lakes, but alewives remain in Lake Wononskopomuc. Kokanee Salmon remains a landlocked species representing a longstanding niche fishery in Connecticut. Popular with a small group of enthusiastic anglers, it is part of a successful put-grow-and-take fishery because of hatchery and stocking efforts.

Largemouth Bass and Smallmouth Bass

Along with Smallmouth bass, Largemouth bass remains the most popular lake and pond game fish. As large predators of forage fish (alewives, fathead minnow, and golden shiner) and panfish (bluegill, pumpkinseed, crappie, and yellow perch), Largemouth and Smallmouth bass help maintain the balance in predator-prey relationships in many fish communities. Ongoing angler surveys and monitoring of both bass species indicated that this fishery is experiencing less harvest and is becoming primarily catch-and-release.

Smallmouth bass appears to be declining in some Connecticut lakes and rivers despite reductions in harvest rates of bass statewide. Because fewer lakes in Connecticut have suitable Smallmouth Bass habitat, determining the reasons for this decline and whether it signifies a statewide trend will be essential to maintaining this fishery. Lower harvest rates also suggest that different management strategies besides length and creel

limits may need to be implemented to address the changes in bass populations, particularly in Connecticut's Bass Management Lakes.

Several studies conducted since 2007 have shown that angler harvest behavior may have led to genetic changes in bass in various lakes. Supplemental stocking of lake populations with fish from unfished waters such as reservoirs may be an important management strategy for improving bass fishing. A 2015 study between the DEEP Fisheries Division and UConn indicated that transplanted reservoir bass could successfully spawn and cross-breed with resident bass populations, thereby improving angler catch rates on at least a short-term basis. Continued sampling, population analysis, angler surveys, and monitoring of lake resources are important for effective management to protect and maintain bass populations for Connecticut's anglers.

Northern Pike

Northern Pike is a coldwater species and one of Connecticut's largest gamefish, an important predator of forage fish and panfish. Northern pike benefits fisheries by regulating the abundance of panfish, thereby improving growth rates and angling quality for these species. Since 2022, the Fisheries Division Inland Fish Program has continued to manage five Pike Management Lakes, which were originally supplemented by annual stockings of fingerlings from one spawning marshes in Connecticut; the Haddam area of the Connecticut River (thought these are currently shutdown for repairs), which has a self-sustaining population, is stocked with fingerlings as well. However, degradation through the siltation of pike spawning marshes and climatic changes has contributed to a decline in fingerling production to the point that most cannot provide enough to stock Pike Management Lakes adequately. The Fisheries Division has been purchasing fingerlings for direct stocking into lakes and acquiring fry from New Jersey, which are then stocked into a marsh for grow-out before being stocked into lakes.

Channel Catfish

Channel Catfish are a popular fishery in Connecticut, and the Connecticut River supports large numbers of resident populations. Since 2007, to diversify angling opportunities, over 20 lakes and ponds have been stocked annually with commercially raised catfish. Catfish Management Lakes have been stocked as put-and-take lakes with larger adult fish in small community fishing waters and put-and-grow lakes with smaller yearlings for larger lakes. Current angler surveys in Catfish Management Lakes will continue periodically to assess angler opinions, effort, and total catch, as resources permit. Electrofishing and netting sampling will continue as a means to evaluate the stocks and collect data on abundance, size structure, age structure, and growth rates, which are important assessment tools. Since 2011, angler use and harvest of catfish in the Connecticut River appear to have

declined, but this decline does not seem to be related to fishery degradation. The Fisheries Division will need to monitor the current status of this established population and determine whether increased management is necessary for this resource. New outreach opportunities may be utilized to promote catfish fisheries.

Connecticut's Marine Fish

Table 1.18 - SGCN

Common Name	Scientific Name	Importance	Short-term Population Trend	Long-term Population Trend
American Sand Lance	*Ammodytes americanus*	Most Important	Unknown	Unknown
Bay Anchovy	*Anchoa mitchilli*	Most Important	>90% Decline	Unknown
Fourspine Stickleback	*Apeltes quadracus*	Very Important	80-90% Decline	Unknown
Dusky Shark	*Carcharhinus obscurus*	Very Important	Unknown	Unknown
Sandbar Shark	*Carcharhinus plumbeus*	Very Important	Unknown	Unknown
Sand Tiger	*Carcharias taurus*	Most Important	>90% Decline	Unknown
Atlantic Herring	*Clupea harengus*	Important	Unknown	Unknown
Spotfin Killifish	*Fundulus luciae*	Most Important	Unknown	Unknown
Threespine Stickleback	*Gasterosteus aculeatus*	Very Important	Unknown	Unknown
Atlantic Seasnail	*Liparis atlanticus*	Most Important	>90% Decline	Unknown
Atlantic Silverside	*Menidia menidia*	Very Important	Unknown	Unknown
Atlantic Tomcod	*Microgadus tomcod*	Most Important	Unknown	Unknown
Summer flounder	*Paralichthys dentatus*	Important	Unknown	Unknown
Winter Flounder	*Pseudopleuronectes americanus*	Most Important	Unknown	Unknown
Windowpane	*Scophthalmus aquosus*	Very Important	Unknown	Unknown
Cunner	*Tautogolabrus adspersus*	Very Important	Unknown	Unknown
Hogchoker	*Trinectes maculatus*	Important	Unknown	Unknown
Radiated Shanny	*Ulvaria subbifurcata*	Most Important	>90% Decline	Unknown

Overview of Conservation Progress in Connecticut Since 2015

Summer Flounder

Summer flounder is a sought-after fish along the Atlantic coastline, attracting thousands of recreational anglers yearly. However, intensive recreational and commercial fishing led to depleted stocks and lost fishing opportunities during the 1980s-1990s. By the mid-to-late 1980s, summer flounder stocks had declined to record-low levels. As a result, restrictions were based on harvest. In 1993, Amendment 2 to the Summer Flounder Fisheries Management Plan (FMP) implemented coast-wide quota-based management for both recreational and commercial harvests.

As a result of restrictions and aggressive fisheries management by the DEEP Fisheries Division and coast-wide partners, summer flounder has shown an increase in relative abundance since 2019. DEEP Fisheries Division's Marine Fisheries Program continues to utilize a variety of strategies to monitor stock health and stability. The Marine Fisheries Program Volunteer Angler Survey has been continuous since 1979 and has provided supplemental catch, effort, and size composition data for summer flounder and other important recreational species. In addition, the Long Island Sound Trawl Survey (LISTS) has continued to sample summer flounder and other fish species to collect data for research and analysis. LISTS provides annual indices of counts, biomass, age-specific abundance, and has recorded environmental parameters. These data all contribute to fisheries management efforts to evaluate the effects of fishing and LIS conditions on the distribution and abundance of Summer Flounder and other sport fish.

Winter Flounder

The Winter Flounder is found in shoals along the northwest Atlantic coast. It often returns to natal estuaries to spawn but has a limited seasonal migration offshore. As with other popular sportfish species, intensive recreational and commercial fishing in the 1980s-1990s led to overfishing and depleted stock conditions for Winter Flounder. By the mid-1990s, Winter Flounder abundance had reached its lowest levels, resulting in lost fishing opportunities for commercial and recreational fishermen. In response to these declines, the CT DEEP imposed harvest restrictions, supporting the Atlantic States Marine Fisheries Commission's (ASMFC) Fisheries Management Plan (FMP) for Winter Flounder, which provided very restrictive harvest limits.

Despite aggressive fishery management, Winter Flounder remains seriously depleted, resulting from overfishing, loss of favorable habitat, unfavorable mild winter temperatures, and increased predation. The Marine Fisheries Program continues to assess and update stock assessments for this species through several strategies. The Marine Angler Survey (M-RIP), the Volunteer Angler Survey, Public Outreach efforts, and the Long Island Sound Trawl Surveys all have contributed to the understanding of annual abundance, recruitment patterns, mortality resulting from hook and release, and length and age composition data, which have routinely been used in stock assessments developed in support of regional FMPs.

2015 Marine Fish SGCN but no longer SGCN

Black Sea Bass

Over the past 30 years, Connecticut has contributed to the development of a coast-wide Fishery Management Plan (FMP) for Black Sea Bass and other species through its "A Study of Marine Recreational Fisheries" project. By contributing to regional stock

assessments and the fishery management process, Connecticut has helped ensure fishing opportunities for marine anglers that are also acceptable to Connecticut residents.

The Fisheries Division's Marine Fisheries Program has utilized various tools, including geospatial analyses through GIS mapping, to analyze and address environmental or fisheries-related data. The Fisheries Division has long utilized Marine Angler Surveys and Volunteer Angler Surveys to target catch, effort, and size composition for black sea bass and other species, with special emphasis on discard length measurements and mortality estimates. These data have enabled the Fisheries Division to develop a clearer picture of recruitment patterns and mortality-related age proportions resulting from hook-and-release mortality, informing stock assessments and FMP development. Since 1984, Connecticut has relied on the LISTS to provide indices of the annual abundance of more than 40 species, including black sea bass. The fisheries-independent data lists supplied to stock assessments and FMP development are fully representative of the trawlable habitat in LIS and lend insight into the population, unencumbered by gear, size, and landing regulations that commercial and recreational fishermen must adhere to.

Weakfish

The CT DEEP Fisheries Division has managed the Weakfish fishery in support of and compliance with plans prepared under the Atlantic States Marine Fisheries Commission (ASMFC). As detailed in the first ASMFC Fishery Management Plan (FMP) for Weakfish, written in 1985, their abundance has been highly variable. The commercial and recreational catch of Weakfish has declined since its peak in 1980; however, the exact cause of this decline remains under investigation. Over the past thirty years, amendments to the FMP have had varying degrees of success in improving Weakfish status. The goals continue to focus on the interstate management of the fishery to restore it to healthy levels that support both commercial and recreational harvests, as well as the restoration of essential Weakfish habitat.

The CT DEEP Fisheries Division's Marine Fisheries Program has employed a range of strategies to foster public support and gather data crucial for the management and research of Weakfish. As of 2024, these efforts include Volunteer Angler Surveys, public outreach events, the use of GIS mapping, and a statewide trawl survey. From its inception in 1984, the Long Island Sound Trawl Survey (LISTS) has continued to record environmental parameters in Long Island Sound. It provides indices of annual abundance (counts and biomass per standard tow) of 40+ species, including Weakfish, and monitors and records length-frequency distributions of weakfish and other LIS recreational fish. Through LISTS, Indices-at-age matrices have been developed for weakfish (Ages 0 and 1+) and other target species. Since the 2015 SWAP update, the regulations have remained unchanged, with a

100-pound trip limit for commercial fishing and a 1-fish creel limit for recreational fishing. These regulations aim to reduce Weakfish harvest without creating a large number of discards, which could increase fish mortality and hinder recovery efforts for this fishery.

Bluefish

Bluefish is an ecologically and economically important fish that attracts anglers to the state and contributes to LIS recreational fishery value in Connecticut. The Marine Fisheries Program manages Bluefish catch through recreational and commercial harvest limits geared to maintaining stock abundance and age/length distribution. The Volunteer Angler Survey is an important tool for promoting recreational fishing and collecting data for research and analysis. Annual logbooks were provided to fishers to collect basic fishing data, which were then returned to Marine Fisheries Program staff for data input and review. This process provided statistics on effort, discarding, and discard-length measurements. The Long Island Sound Trawl Survey also includes information on Bluefish abundance, length, weight, sex, and age on an annual basis since 1984. All of these data contributed to stock assessments, FMP development, and the implementation of fishery management decisions. The Connecticut Marine Fisheries Program also joined with other Atlantic Coast states to participate in the Atlantic Coastal Cooperative Statistics Program in its SAFIS e-logbook program, which allowed individual anglers to voluntarily enter their marine fisheries data electronically. The Marine Fisheries Program administered the Marine Trophy Fish Award Program to encourage recreational fishing and increase public awareness of efforts to enhance, restore, and protect marine fish populations and important habitats.

Tautog

A member of the wrasse family, Tautog is a popular commercial and recreational fish. Most are caught through recreational fishing in in-state waters. Tautog feeds on various shellfish and completes a seasonal migration that varies somewhat throughout their coastal distribution. Due to intensive recreational and commercial fisheries in the 1980s and 1990s, which led to overfishing and depressed stock conditions, Fishery Management Plans implemented quota-based management and restrictive harvest limits, helping to mitigate declining trends in tautog abundance. In 2020, overfishing continued to impact tautog in several regional management areas. However, recreational data from the Marine Recreational Improvement Program (M-RIP) indicated that the Tautog stock in the Long Island Sound region was not overfished and that overfishing was not occurring.

Through 2024, the CT DEEP Marine Fisheries Program has continued to take and revise population stock assessments using fishery and fishery-independent measures that include catch and effort statistics, age structure, growth, age at maturity, abundance, exploitation, size composition, and monitor the growing, restored predator populations and

their possible impact on forage fish. The Long Island Sound Trawl Survey remains an integral part of these management efforts, as well as GIS mapping, which informs research and restoration efforts. Evaluations of new technologies, gears, and methodologies to improve data collection are also underway. For example, a Tautog tagging program was initiated in 2021 in compliance with the ASMFC, aiming to reduce illegal harvest. Both these long-standing and new efforts will be used to inform the management of Tautog in Connecticut waters most effectively.

SGCN Invertebrates of Connecticut

Regional Overview

Of the approximately 300 mayflies in the Northeast region, 13 Mayflies were identified as meeting the criteria for RSGCN in the 2023 list. Of the 2,646 butterflies, skippers, and moths that inhabit the NEAFWA regional footprint, 55 met the criteria as RSGCN (26 Butterflies and Skippers and 29 Moths). 519 Bees live in the Northeast, and seven were included in the RSGCN list (3 Bumble Bees and 4 Solitary Bees). Of the 255 dragonflies and damselflies that inhabit the NEAFWA regional footprint, 20 met the criteria for RSGCN. Of the approximately 40 tiger beetle species, only eight ultimately met the requirements for RSGCN (TCI & NEFWDTC, 2023). Diverse in their habitat requirements, diets, and biology, the regional concerns for insects are equally diverse and usually taxon-specific – for instance, overabundant herbivores threaten many butterflies by threatening their host plant populations, and aquatic insects are particularly susceptible to pollution and sedimentation (for an overview, see TCI & NEFWDTC, 2023). However, all insect groups require more data collection since data for invertebrate species is lacking, especially when compared to vertebrate groups. For more information about the threats to Connecticut's insects, please see Chapter 3, and for actions, see Chapter 4.

The 2023 update to the Northeast RSGCN list marked the first time marine invertebrates were considered for assessment as RSGCN. At least 465 marine invertebrate species are known to occur within the state waters of the 11 Northeast states with coastal areas, yet only four species are currently designated as RSGCN. Jurisdiction for marine species often falls to separate state marine agencies rather than state wildlife agencies; therefore, many states lack expertise with marine invertebrates (TCI & NEFWDTC, 2023). The regional concerns for mollusks and marine invertebrates are just as diverse as those for insects, which makes sense since they live in many different habitats within the state. However, considering that many species depend on water, water quality is a concern that many of these species share, as well as the effects of shifting environmental conditions, since aquatic species are directly impacted by changing temperatures more than terrestrial species. In the marine environment, changing acidity levels, salinity fluctuations, and sea-level rise pose significant threats to many RSGCN (Burgio et al., 2024). Freshwater mussels are a moderately sized taxonomic group in the Northeast, with 118

species known to occur in the region. Of those species, 31 met the criteria for listing as RSGCN in 2023. While at least 268 terrestrial snails are known to occur in the 14 northeast states, only 21 met the requirements to be listed as RSGCN. For more information about threats to Connecticut's mollusks and marine invertebrates, please see Chapter 4.

Connecticut Overview and Conservation Progress in Connecticut Since 2015

Connecticut's invertebrate fauna is incredibly diverse. At least 20,000 species of invertebrates are present in the state, with many more likely to be present; however, very little information exists for the majority of them (CT DEEP, 2015). Many other species likely live here but have yet to be discovered. Due to a lack of information and capacity, invertebrate groups such as nematodes and ants have yet to be assessed as SGCNs. This lack of information and capacity isn't limited to Connecticut; invertebrates are underrepresented on national and global lists of rare species. As a result, many scientists support a landscape-level approach to the conservation of endangered invertebrates since so little data exists to support species-specific conservation actions. Species groups that have been assessed for this Wildlife Action Plan include insects (dragonflies and damselflies, butterflies and moths, bees, wasps, and flies), mollusks (freshwater and marine mussels and gastropods), crustaceans, and starfish. Invertebrates are among the least understood taxa, and efforts to acquire baseline information are vital to understanding their conservation needs.

Tiger beetles are a group of highly active, predatory beetles that have been the focus of conservation biologists for many years due to the wealth of data available regarding their distribution and ecology. One species is endemic to the Northeast Region: the federally listed Puritan Tiger Beetle, which is only found at sites along the Connecticut River and the Chesapeake Bay. Fourteen species of tiger beetles have been documented in the state of Connecticut. However, only ten of these are believed to still inhabit the state, according to a statewide tiger beetle survey conducted in 1996 (Sikes, 1997). Only three species of tiger beetles are considered secure, as most populations are localized in patches of habitat and have declined as these specialized beach and barren habitats have diminished. Some species have adopted abandoned sand and gravel extraction sites as alternative habitats.

Based on the high numbers of butterflies, skippers, and moths on SGCN lists in the Northeast, it is apparent that many of these species are declining. More than 1,000 species of moths have been documented in southern New England (TCI & NEFWDTC, 2023), with some groups receiving greater attention than others. Groups commonly represented in SGCN lists include Papaipema moths, sphinx or hawk moths, and giant silkworm moths. Among butterflies, two families predominate: the skippers (Family Hesperiidae) and the blues, coppers, and elfins (Family Lycaenidae). Many of the butterflies of these two families are found on the regional and state SGCN lists because they tend to be small-bodied, relatively weak fliers with very specific host plant requirements or exhibit other narrow

ecological specializations, such as association with specific vegetation communities. In Connecticut, examples of these butterflies and their host plants include Bog Copper (cranberry), Frosted Elfin (wild lupine and wild indigo), and Hoary Elfin (bearberry). In addition, the larvae of many species of Lycaenidae participate in symbiotic relationships with ants so that both the larval host plant and suitable ant partners must be available for the species to thrive.

Insects, including butterflies and moths, play a crucial role in ecosystems as pollinators and food sources; studying their interactions and the indirect effects of climate change on them is essential (Harvey, 2022). Lepidoptera are extremely sensitive to environmental changes and are threatened by herbicides, insecticides, habitat loss, pollution, and direct and indirect effects of shifting environmental conditions (Wagner, 2021). As ectotherms, shifting environmental conditions can be a major physiological stressor that can cause changes to misalignment with Lepidoptera host plants and emergence, shifts in range, behavior, development, and more (Hellmann et al., 2016; Patterson et al., 2019). Species with longer developmental overwintering stages, narrower diets, or restricted ranges may be more susceptible to decline or extinction due to changing temperatures and precipitation than generalist species (Patterson et al., 2019). Temperature increases have led to many species emerging earlier than host plants, with spring species advancing faster than summer species. Phenological mismatch can reduce survival when plants emerge before their host plant or after the host plant senesces (Patterson et al., 2019). The early emergence of adult butterflies could mean limited availability of nectar resources, late snowstorms, and freezing temperatures (Patterson et al., 2019). Asynchrony in some Lepidoptera larvae has shown increased rates of parasitism and predation (including cannibalism) due to mismatched timing of host plant emergence and the butterfly's life cycle (Despland, 2018).

In 2018, the implementation of the Revised Connecticut Wildlife Action Plan report indicated that minimal surveys, research, and management initiatives regarding invertebrates have occurred in Connecticut. Therefore, many invertebrate species are listed as state-endangered under the Connecticut Endangered Species Act. Many invertebrate species require specific habitats or specific host plant associations, making them vulnerable to a variety of threats. While shifting environmental conditions may have had global repercussions for invertebrates, the 2020 Implementation of the Revised Connecticut State Wildlife Action Plan indicates that in Connecticut, increased development and urbanization, and human interactions that degrade key habitats, such as habitat management practices, invasive plant introductions, pesticide use, pollution, water quality changes (water flow, turbidity levels, pH fluctuations) and lake drawdowns, have resulted in increased invertebrate mortality. Therefore, since 2015, developing baseline information on the population abundance and distribution of SGCN, as well

as developing and implementing recovery and management plans, have been the primary objectives for restoring terrestrial and aquatic SGCN in Connecticut.

Since the 2015 Implementation of the Connecticut Wildlife Action Plan, CT DEEP has added information regarding invertebrates in Connecticut through field surveys and the identification, cataloging, and curating of voucher specimens. CT DEEP has collaborated with state and federal agencies, local stakeholders, and regional conservation groups to identify and address the needs of species and habitats, providing technical assistance and information to municipalities, local land managers, and the public on best management practices for habitat and species conservation.

CT DEEP staff participated in the 2022 Northeast Association of Fish and Wildlife Agencies Regional Conservation Need (RCN) 2.0 Projects conference and the resulting 2023 RSGCN list revision that included seven bee species of Regional Conservation Need, with one additional species proposed and ten species on the watch list. CT DEEP has focused on six species: Fringed Loosestrife Oil-Bee, Macropis Cuckoo, American Bumble Bee, Ashton's Cuckoo Bumble Bee, Rusty-patched Bumble Bee, and Yellow-banded Bumble Bee. In 2021, CT DEEP provided the Connecticut Agricultural Experiment Station funds to document the bee species found in Connecticut historically and currently. A checklist of bee species for Connecticut was compiled using specimen records from museums, private collections, community science portals, scientific literature, and online digital databases. As of 2025, 386 bee species are reported to be in Connecticut, and at least 43 of those species have not been detected in the state since 2000. As with other SGCN invertebrates, bees have experienced limited distribution due to habitat loss and degradation (Zarrillo et al., 2025). Population status information is crucial for developing effective recovery or management plans.

Twenty-eight stoneflies were identified on the 2023 RSGCN list as species of greatest regional conservation need, with three additional species proposed for inclusion and two on the watch list. The list below indicates that little data may be available on the presence, abundance, and distribution of these species in Connecticut. However, since 2017, CT DEEP has recommended identifying key habitats to support these and other SGCN, as well as including this information in local resource management plans and the CT Comprehensive Wildlife Strategy. Since 2018, a key objective has been the development of baseline data for species to inform habitat management and restoration efforts more effectively, as well as to mitigate and avoid threats to species, particularly in the context of the environmental review process and overall habitat conservation efforts. Because stoneflies are found in freshwater systems and are often associated with water quality, management efforts for other aquatic SGCN that address changes in water flow, turbidity,

temperature, and pH will likely have a positive impact on stonefly species persistence in Connecticut waterways.

The 2023 RSGCN listed eight tiger beetle species, with four species on the regional watch list. Subsequently, the Wildlife Diversity Program identified habitats supporting tiger beetle populations and identified habitats for restoration or avoidance. The 2023 RSGCN also lists 55 butterflies, skippers, and moths as species of regional conservation need. In Connecticut, the Wildlife Diversity Program has contributed to butterfly conservation efforts through the documentation and archival submission of specimens to the UConn Biodiversity Research Collections, as well as ongoing habitat preservation and recovery efforts.

In 2019, CT DEEP initiated ongoing intensive surveys of damselflies and mayflies statewide to assess their abundance, distribution, and threats. Historical records have been reverified, fresh sites surveyed, and habitats mapped. As a result, data collection has enabled the refinement of adult flight periods. In 2020, WDP staff began collecting museum vouchers for state-listed Odonate species; individuals from these surveys are deposited at UConn Biodiversity Research Collections for curation. Since 2022, CT DEEP has worked to compile and disseminate information, including Best Management Practices (BMPs), to landowners and lake and pond associations, to manage water bodies that are essential for the survival and persistence of damselflies and mayflies.

The 2022 RSGCN conference Invertebrate Group and resulting 2023 RSGCN list revision listed 31 mussel species of Regional Conservation Need, with one species proposed and two species listed for the watchlist. However, in Connecticut, only twelve freshwater mussel species have been identified in Connecticut waters; of these, three species are listed as Endangered (Dwarf Wedgemussel, Brook Floater, and Yellow Lampmussel), and three species are also of Special Concern (Eastern Pearlshell, Eastern Pondmussel, and Tidewater Mucket). These freshwater mussels have been listed under the Connecticut Endangered Species Act due to their limited distribution, specific habitat requirements, and population declines resulting from habitat loss, pollution, and degradation associated with increased urbanization. Currently, the Alewife Floater is under petition to be considered as Special Concern and the Creeper is petitioned to be considered Threatened.

Since 2015, CT DEEP has identified key habitats that support SGCN mussels and focused on incorporating this information into resource management plans and the Connecticut Comprehensive Wildlife Strategy. CT DEEP continues to implement and monitor enhancement actions regarding freshwater mussels, update records on population status, assess and mitigate species threats, and provide technical assistance

to stakeholders regarding the conservation of SGCN mussel populations and key mussel habitats. CT DEEP also developed the NDDB Freshwater Mussel Areas screening map (for more information, click here). This map depicts waterways containing populations of State and Federally Listed freshwater mussels in CT. These waterways are particularly sensitive to certain stormwater and surface water discharges. This map enhances awareness and protection for freshwater mussels, supporting water quality monitoring, regulation, and permitting, particularly for surface water discharge activities. There are plans to update this tool to include other sensitive aquatic invertebrates, like odonates.

From 2018 to the present, the Wildlife Diversity Program has continued to assist the Fisheries Division with salvage activities where SGCN mussels are likely to occur. In 2020, DEEP investigated the impact of winter lake drawdowns on lake-dwelling mussels to inform the development of best management practices that would decrease the effects of drawdowns. In 2021, the Wildlife Diversity Program worked with other state agencies and partners on major infrastructure projects. For example, in 2021, the Wildlife Diversity Program promoted the relocation of state-listed mussels to nearby suitable habitats before a bridge replacement in Devil's Hopyard State Park's Dickinson Creek. Since 2021, CT DEEP staff have worked to develop a statewide mussel atlas through field surveys, the collection and identification of voucher specimens, updating records, and curating specimens for submission to biological collections at UConn. CT DEEP staff have also provided technical assistance to conservation partners, such as the Maritime Aquarium at Norwalk's 2021 community-science program, in which select volunteers were trained to locate and identify freshwater mussels in southeastern Connecticut.

SGCN

Table. 1.19 – Number of SGCN by each subtaxon group by Importance Level

	Most Important	Very Important	Important	Grand Total
Insects	28	37	26	91
Marine Crustaceans, Starfish, and Horseshoe Crabs	2	1	12	15
Mollusks	4	6	10	20
Total	**34**	**44**	**48**	**126**

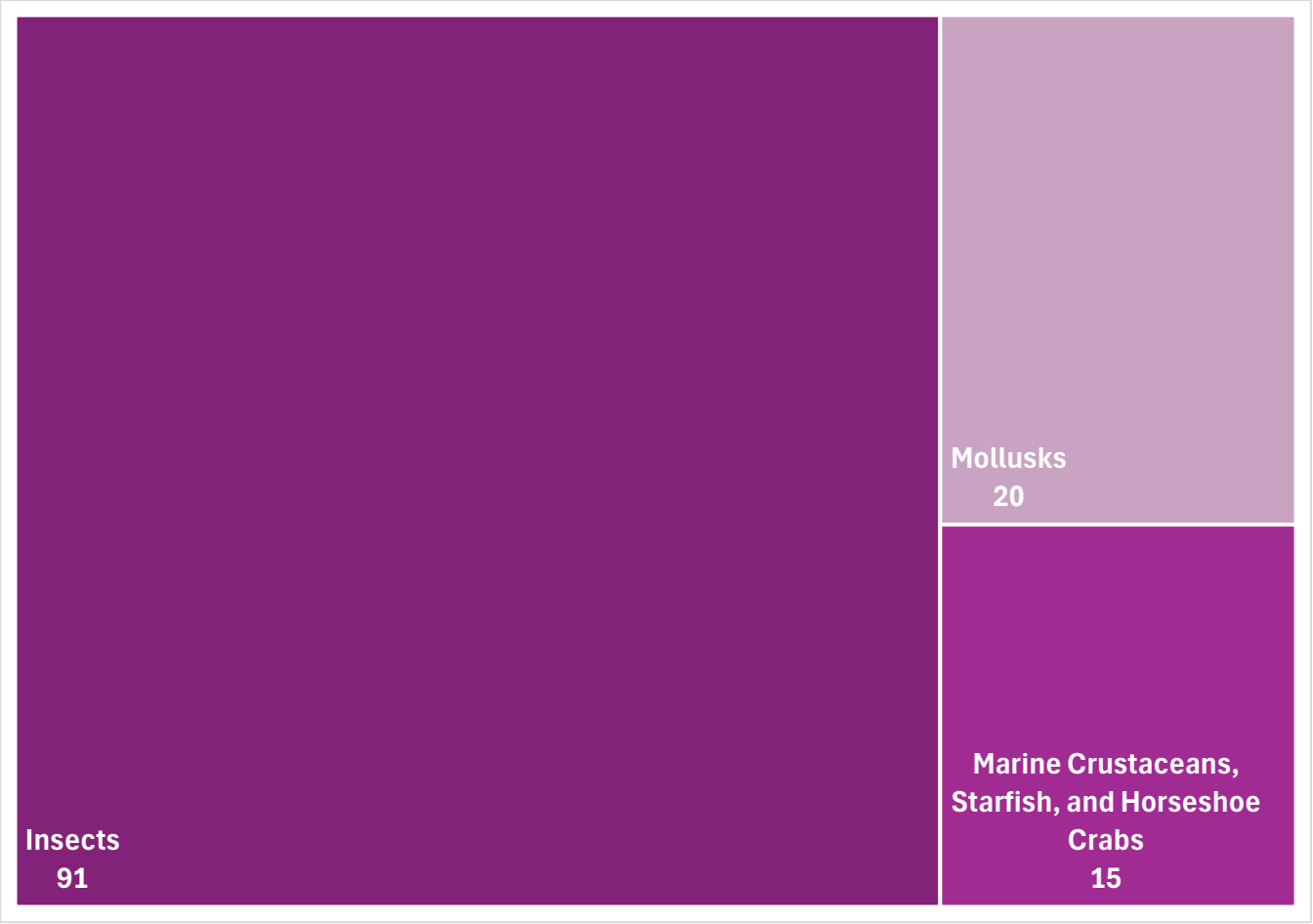

Figure 1.10 – Number of SGCN by Subtaxon Group

Distribution and Abundance within Connecticut

Like most aspects of invertebrate species biology, little is known about Connecticut's invertebrate SGCN distribution and abundance. Not many resources exist that quantify their distribution and abundance within the state. However, like other taxon in the state, CT DEEP's Natural Diversity Data Base (NDDB) provides some data on the distribution of threatened species, and there is an ongoing effort to map the distribution of Connecticut's butterflies, moths, and skippers, which can be accessed through the Connecticut Butterfly Atlas Project's website.

Data for the abundance and distribution of marine invertebrate species, especially crustaceans and mollusks, is tracked through The Marine Fisheries Program's annual Long Island Sound Trawl Survey (LISTS), which tracks 60 different invertebrate species and can be found on the CT DEEP Fisheries website (e.g., 2020, 2022) and the Long Island Sound Study website. For example, they have been tracking Horseshoe Crab abundance, American Lobster abundance, and overall invertebrate biomass in the Sound over time. Similarly, 19 invertebrate species are surveyed during the Seine Survey, conducted each

September since 1988 in Connecticut's sub-tidal habitat. The most recent survey data can be found on CT DEEP's website. Additionally, CT DEEP has created an interactive map highlighting the distribution of freshwater mussels (link) in the State.

For other sources of distribution and abundance information, records at natural history collections worldwide, including the Peabody Museum at Yale (Motz, 2025) the Arthropod Collection at the Connecticut Agricultural Experiment Station (CAES, 2025), and the Biodiversity Research Collections at UConn, have been digitized, and this information can be found on the Global Biodiversity Information Facility (GBIF) and at https://invertdb.uconn.edu/. Another valuable resource for the distribution of Connecticut's invertebrates can be found on the Map of Life website. Information on the distribution of invertebrate species can also be found in various community science applications and websites, including iNaturalist. If you would like to contribute to these community-science efforts, we encourage you to click the links above to get involved. Information on invertebrate species distributions can also be found in various community science applications and websites, including BugGuide.net and iNaturalist. If you would like to contribute to these community-science efforts, we encourage you to click the links above to get involved.

Insect populations are declining at an alarming rate worldwide (Wagner et al., 2021), which is concerning given their crucial role in pollinating flowering plants and crops, serving as a vital food source for other species (including threatened species), and linking food webs and nutrient cycling (Wagner, 2020). For other invertebrate groups, little quantitative data exist; however, global analyses of freshwater mollusks suggest that approximately 33% of all freshwater mollusk species are threatened with extinction due to pollution declines, largely associated with pollution and habitat modification (e.g., Bohm et al., 2020). While most of Connecticut's invertebrate SGCN are insects, little is known about the population trends of these species within our state. Almost 80% of all invertebrate SGCNs lack data for long-term population trends, and nearly 60% lack data for short-term trends (Figure 1.11). Despite the global decline in many invertebrate species, about 22% of CT's SGCN are either stable or increasing, but over 10% have population declines of over 90% in the long term (Figure 1.11), demonstrating that conservation action, especially in data collection and monitoring is very important for the persistence of our invertebrates. For more information about conservation actions that may benefit Connecticut's invertebrate SGCN, please see Chapter 4.

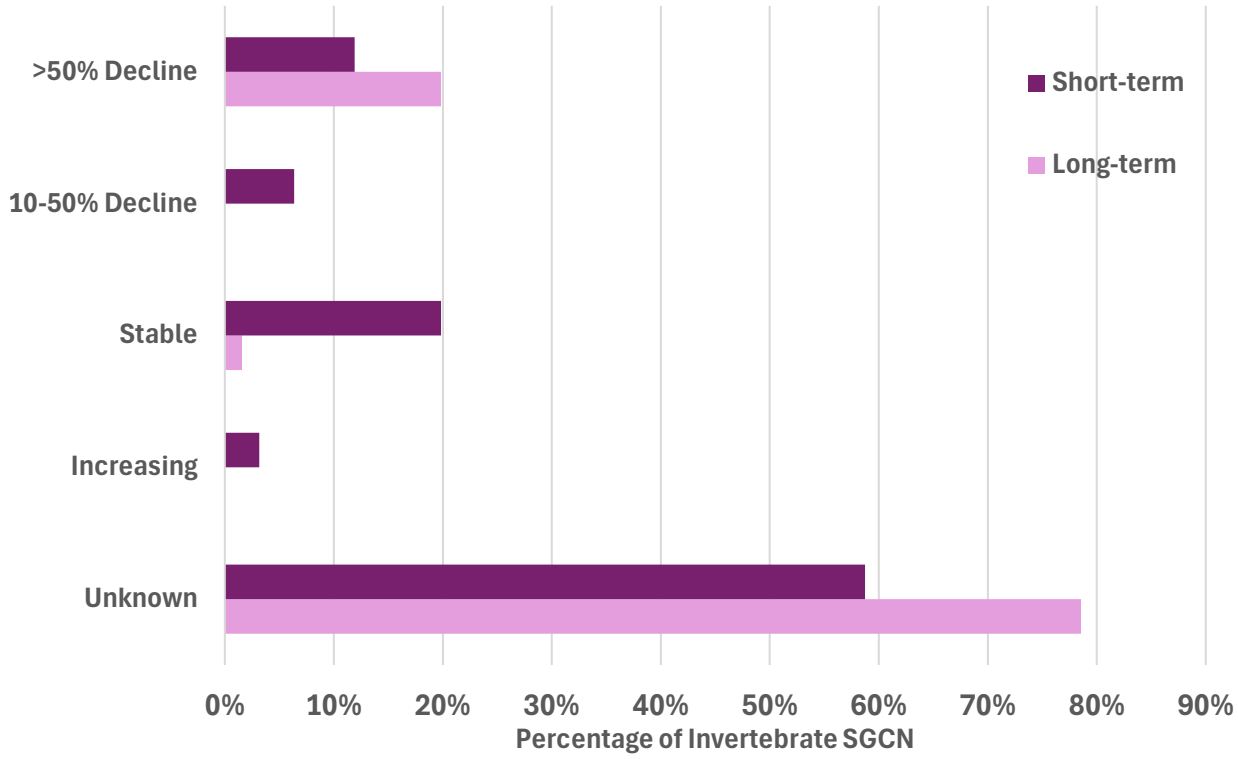

Figure 1.11 – Long- and Short-term Population Trajectories for Connecticut's Invertebrate SGCN by percentage. Long-term trends are based on the past 200 years, and Short-term trends are based on the last three generations.

Insects: Connecticut's Bees

Table 1.20 - SGCN

Subtaxon	Common Name	Scientific Name	Importance Level	Short Term Population Trend	Long Term Population Trend
Bumble Bees	Rusty-patched Bumble Bee	*Bombus affinis*	Important	Unknown	Unknown
Bumble Bees	Ashton Cuckoo Bumble Bee	*Bombus ashtonii*	Important	Unknown	Unknown
Bumble Bees	American Bumble Bee	*Bombus pensylvanicus*	Most Important	Unknown	80-90% Decline
Bumble Bees	Yellow-banded Bumble Bee	*Bombus terricola*	Very Important	Unknown	Relatively Stable
Solitary Bees	Parnassia Mining Bee	*Andrena parnassiae*	Most Important	Unknown	Unknown
Solitary Bees	Similar Carder Bee	*Dianthidium simile*	Important	Unknown	Unknown

Solitary Bees	Macropis Cuckoo Bee	*Epeoloides pilosulus*	Most Important	Unknown	Unknown
Solitary Bees	Southeastern Blueberry Bee	*Habropoda laboriosa*	Most Important	Unknown	Unknown
Solitary Bees	Fringed Loosestrife Oil-collecting Bee	*Macropis ciliata*	Very Important	Unknown	Unknown

Overview of Conservation Progress in Connecticut Since 2015

Rusty-patched Bumble Bee

Since 2017, Wildlife Diversity Program staff have continued to update records on occurrence and distribution.

Yellow-banded Bumble Bee

Technical assistance for avoiding and mitigating threats to bee species, as well as habitat management and restoration recommendations, remains the focus of CT DEEP's efforts to conserve bees and their habitats in Connecticut. In 2017, CT DEEP provided information and reviews of the Species Status Assessments of the Yellow-banded Bumble Bee to the US Fish and Wildlife Service. Since 2018, DEEP has provided information and recognition of the importance and role of host plants in pollinator restoration. The Wildlife Diversity Program has continued to support habitat and pollinator conservation. For instance, Yellow-banded Bumble Bees were recently found in Robbins Swamp Meadow, which is now being managed for the species. Efforts to update records of bees and other SGCN, assess important habitats, and develop recovery and management plans are ongoing. In line with recommendations from the 2022 NE Regional Conservation Needs conference, reference bee specimens have been archived at the University of Connecticut Invertebrate Collection.

Insects: Connecticut's Beetles

Table 1.21 - SGCN

Common Name	Scientific Name	Importance Level	Short-Term Population Trend	Long-Term Population Trend
Eastern Sand Tiger Beetle	*Cicindela formosa generosa*	Important	50-70% Decline	50-70% Decline
Ghost Tiger Beetle	*Ellipsoptera lepida*	Most Important	70-80% Decline	70-80% Decline
Puritan Tiger Beetle	*Ellipsoptera puritana*	Most Important	Relatively Stable	>90% Decline

Overview of Conservation Progress in Connecticut Since 2015

Dune Ghost Tiger Beetle

Dune Ghost Tiger Beetles are considered rare throughout the eastern part of their range as they depend on open sand dunes for all life/developmental stages. In 1999, Ghost dune tiger beetles were documented at two sites in Connecticut: a state-managed Natural Area Preserve (NAP) and private property. Sand dunes are currently threatened by development, forest succession, and the introduction of invasive species.

In 2016, the State Endangered Species/Wildlife Income Tax Check-off Grant enabled CT DEEP to manage vegetation around dunes in the NAP, thereby maintaining a viable habitat. Habitat management included herbicide treatment in 2017 to stump sprouts that threatened sand dune habitat, and an upland sand dune habitat restoration project was conducted for Dune Ghost Tiger Beetles in 2018. From 2017 to 2021, WDP staff conducted surveys and monitoring of Dune Ghost Tiger Beetles and invasive plants that threatened their habitat. In 2020, plans for Dune Ghost Tiger Beetle management included conducting surveys on the private parcel and conducting a mark-recapture study to determine the actual size of the beetle population. In 2022, Dune Ghost Tiger Beetles were recommended for inclusion in a prescribed burn plan to facilitate the management and restoration of their required habitat. Monitoring habitat management and enhancement actions for Dune Ghost Tiger Beetles involves ongoing efforts to assess habitats and threats, as well as update population records.

Puritan Tiger Beetle

Noted in its 2022 report, the CT DEEP Wildlife Diversity Program has taken measures to identify and protect populations of Puritan Tiger Beetles and other tiger beetle species (Saltmarsh Tiger Beetle, Purple Tiger Beetle) when found in representative habitats. Efforts to monitor populations at key sites on state lands, to survey sites for the establishment of invasive species, and to assess habitat quality are ongoing. From 2017 through 2022, WDP also conducted surveys of privately owned tiger beetle sites. Submission of voucher specimens for curation at UCONN Biological Collections continues to provide documentation of Puritan Tiger Beetles. Additionally, CT DEEP is involved in the Tiger Beetle RCN project, which is scheduled to begin in 2025 and is expected to conclude in 2028.

CT DEEP and its partners have also been involved in Puritan Tiger Beetle habitat enhancements, including vegetation removal, at all sites where the species occurs, as well as at some novel sites. Efforts also include a captive-rearing program for the species and have partnered with organizations outside the state to translocate Puritan Tiger Beetles to recovery sites in Massachusetts, helping to bolster the beetles' overall population.

Insects: Connecticut's Butterflies, Skippers, and Moths

Table 1.22 - SGCN

Subtaxon	Common Name	Scientific Name	Importance Level	Short-term Population Trend	Long-term Population Trend
Butterflies	Atlantis Fritillary	*Argynnis atlantis*	Most Important	>90% Decline	>90% Decline
Butterflies	Northern Metalmark	*Calephelis borealis*	Most Important	30-50% Decline	>90% Decline
Butterflies	Henry's Elfin	*Callophrys henrici*	Most Important	>90% Decline	50-70% Decline
Butterflies	Hessel's Hairstreak	*Callophrys hesseli*	Most Important	Relatively Stable	70-80% Decline
Butterflies	Frosted Elfin	*Callophrys irus*	Very Important	Relatively Stable	50-70% Decline
Butterflies	Appalachian Azure	*Celastrina neglectamajor*	Most Important	Unknown	50-70% Decline
Butterflies	Sleepy Duskywing	*Erynnis brizo*	Most Important	>90% Decline	>90% Decline
Butterflies	Columbine Duskywing	*Erynnis lucilius*	Most Important	Unknown	>90% Decline
Butterflies	Persius Duskywing	*Erynnis persius*	Most Important	>90% Decline	>90% Decline
Butterflies	Acadian Hairstreak	*Satyrium acadica*	Most Important	50-70% Decline	>90% Decline
Butterflies	Bog Copper	*Tharsalea epixanthe*	Very Important	Unknown	>90% Decline
Butterflies	Bronze Copper	*Tharsalea hyllus*	Important	80-90% Decline	50-70% Decline
Moths	Benjamin's Coastal Heathland Cutworm Moth	*Abagrotis benjamini*	Very Important	Unknown	Unknown
Moths	Corylus Dagger Moth	*Acronicta falcula*	Very Important	Unknown	>90% Decline
Moths	Bay Underwing	*Catocala badia*	Very Important	>90% Decline	>90% Decline
Moths	Herodias Underwing	*Catocala herodias*	Very Important	Relatively Stable	Relatively Stable
Moths	Atlantic Graphic Moth	*Drasteria graphica atlantica*	Most Important	Relatively Stable	>90% Decline
Moths	Fringed Dart Moth	*Eucoptocnemis fimbriaris*	Very Important	Unknown	Unknown
Moths	Blueberry Gray	*Glena cognataria*	Very Important	Unknown	Unknown
Moths	New England Buckmoth	*Hemileuca lucina*	Very Important	Unknown	>90% Decline
Moths	Eastern Buckmoth	*Hemileuca maia maia*	Very Important	Unknown	>90% Decline
Moths	Ashy-green Pinion	*Lithophane viridipallens*	Most Important	Relatively Stable	Unknown
Moths	Ash Sphinx	*Manduca jasminearum*	Most Important	>25% Increase	>90% Decline
Moths	Ash Borer Moth	*Papaipema furcata*	Most Important	>90% Decline	Unknown

Moths	Labrador Tea Leaf Miner	*Phyllonorycter ledella*	Very Important	Unknown	Unknown
Moths	Canadian Sphinx	*Sphinx canadensis*	Very Important	Relatively Stable	Unknown
Moths	Black-eyed Zale Moth	*Zale curema*	Very Important	Unknown	Unknown
Skippers	Two-spotted Skipper	*Euphyes bimacula*	Most Important	>90% Decline	>90% Decline
Skippers	Leonard's Skipper	*Hesperia leonardus*	Most Important	Unknown	>90% Decline

Overview & Conservation Progress in Connecticut Since 2015

Northern Metalmark

Northern Metalmark is a state-listed butterfly with specific habitat requirements (forest habitats with limestone outcrops interspersed with cedar glades and meadows) and host plants (Roundleaf ragwort). Its survival depends on sufficient nectar supplies for hatching caterpillars and adults. In 2018, the Wildlife Diversity Program staff formed a Steering Committee comprising a broad spectrum of conservation partners to establish annual objectives and plan habitat restoration for the Northern Metalmark. Participants included UCONN (Dr. David Wagner). the Appalachian Trail Conservancy (ATC), the National Park Service (NPS), the Appalachian Mountain Club (AMC), FirstLight Power Resources, Normadeau Associates, Earthtones Nursery, The Nature Conservancy, Limekiln Swimming Association, private landowners, and other cooperators. Since 2018, CT DEEP has funded surveys for the Metalmark butterfly conducted by UConn to continue these surveys in the future, especially during the Metalmark's flight period. Wildlife Diversity staff recommendations included conducting surveys for adults at known colonies and at potential metalmark sites.

In 2018, CT DEEP treated invasive Phragmites at the Limekiln Swimming Association Property (Bethel) to eliminate threats to the Northern Metalmark habitat and encourage the growth of essential host plants. CT DEEP developed a draft management plan for Limekiln to manage its grounds better, benefiting the metalmark butterflies. The draft was slated for review by the Steering Committee at its 2019 meeting to finalize the plan for the Metalmark colony in Bethel. CT DEEP staff continue to work with volunteer-based restoration efforts, emphasizing the management of invasive plants that degrade important butterfly habitats. As of 2017, WDP staff will explore the need for continued mark-recapture activities to document Northern Metalmark habitat use and distribution.

Frosted Elfin

The Frosted Elfin requires specific habitat and host plant requirements, specifically pitch pine and scrub oak, as well as sandplain barrens. Open sandy habitats support their larval host plants, wild lupine (*Lupinus perennis*) and wild indigo (*Baptisia tinctoria*). CT DEEP

Wildlife Division efforts have focused on providing technical assistance and information to conserve the Frosted Elfin and other SGCN, as well as their habitats. In 2017, the Wildlife Division reviewed and provided information on the Species Status Assessments of the Frosted Elfin for the US Fish and Wildlife Service.

During 2018, DEEP visited select extant Frosted Elfin sites and assessed them for habitat quality. The only known population of Frosted Elfin west of the Connecticut River is in a power line right-of-way (ROW). CT DEEP Wildlife Diversity Program identified ATV use as a serious threat to host plant populations in the ROW and cordoned off patches of lupine host plants, removed white pine saplings, and posted signs to discourage ATV activity through sensitive areas. These actions appeared to improve and protect the habitat quality and availability of wild lupines for Frosted Elfin. Continuation of fencing to protect host plants in critical areas of the habitat was recommended. During 2022, UConn researchers revisited 29 select Frosted Elfin sites in 16 towns to assess the potential for habitat management or restoration. Only four sites were considered to have high potential for Frosted Elfin to persist as is, but 12 sites were identified as having moderate potential for persistence. Fourteen of the sites were identified as having the potential to expand the habitat around the existing site. This work will be continued in 2025 to develop a Habitat Expansion Plan that enhances and extends the existing habitat of Frosted Elfins in Connecticut, as well as plans for a statewide assessment of current and potential populations

As of 2018, the CT DEEP Wildlife Diversity Program has recommended collaborating with the Connecticut Butterfly Association and its partners to assess all known and potential sites for this butterfly during its flight period. In 2022, a mark-recapture program was conducted at a single site in eastern Connecticut to investigate longevity and emergence. One hundred twenty-seven individuals were released in a highly localized area. Results were still pending; however, two individuals were collected as voucher specimens for UConn Biological Collections. Since 2022, Wildlife Diversity Program has actively identified habitats for avoidance or restoration and recommended considering Frosted Elfin in prescribed burn management plans to determine if host plants can be restored by prescribed burning in unsuitable but adjacent habitats. The Wildlife Diversity Program recommends continued collaboration with UConn on Frosted Elfin conservation efforts.

Monarch Butterfly

Since 2020, WDP has provided technical assistance to other agencies, landowners, and lake and pond associations on how to best manage habitats for the conservation of Monarch Butterflies and to identify habitats for avoidance or restoration efforts.

Insects: Connecticut's Cicadas

Table 1.23 - SGCN

Common Name	Scientific Name	Importance Level	Short-Term Population Trend	Long-Term Population Trend
Decula Periodical Cicada	*Magicicada septendecula*	Most Important	Unknown	Unknown
Northern Dusk-singing Cicada	*Megatibicen auletes*	Most Important	Unknown	50-70% Decline

Insects: Connecticut's Dragonflies and Damselflies

Table 1.24 - SGCN

Common Name	Scientific Name	Importance Level	Short-term Population Trend	Long-term Population Trend
Variable Darner	*Aeshna interrupta*	Very Important	Unknown	Unknown
Eastern Red Damsel	*Amphiagrion saucium*	Important	Relatively Stable	Unknown
Comet Darner	*Anax longipes*	Important	Relatively Stable	Unknown
Superb Jewelwing	*Calopteryx amata*	Important	30-50% Decline	Unknown
Sparkling Jewelwing	*Calopteryx dimidiata*	Important	Relatively Stable	Unknown
Martha's Pennant	*Celithemis martha*	Very Important	Relatively Stable	Unknown
Tiger Spiketail	*Cordulegaster erronea*	Important	>25% Increase	Unknown
Arrowhead Spiketail	*Cordulegaster obliqua*	Important	Relatively Stable	Unknown
Atlantic Bluet	*Enallagma doubledayi*	Important	30-50% Decline	Unknown
New England Bluet	*Enallagma laterale*	Important	Relatively Stable	Unknown
Little Bluet	*Enallagma minusculum*	Important	Relatively Stable	Unknown
Scarlet Bluet	*Enallagma pictum*	Important	Relatively Stable	Unknown
Pine Barrens Bluet	*Enallagma recurvatum*	Most Important	>25% Increase	Unknown
Taper-tailed Darner	*Gomphaeschna antilope*	Important	>25% Increase	Unknown
Midland Clubtail	*Gomphurus fraternus*	Very Important	Relatively Stable	Unknown
Cobra Clubtail	*Gomphurus vastus*	Very Important	Relatively Stable	Unknown
Skillet Clubtail	*Gomphurus ventricosus*	Very Important	>90% Decline	Unknown
American Rubyspot	*Hetaerina americana*	Very Important	>90% Decline	Unknown
Mustached Clubtail	*Hylogomphus adelphus*	Important	Relatively Stable	Unknown
Rambur's Forktail	*Ischnura ramburii*	Important	Relatively Stable	Unknown
Blue Corporal	*Ladona deplanata*	Important	Relatively Stable	Unknown
Emerald Spreadwing	*Lestes dryas*	Important	Unknown	Unknown
Crimson-ringed Whiteface	*Leucorrhinia glacialis*	Very Important	Relatively Stable	Unknown
Belted Whiteface	*Leucorrhinia proxima*	Important	Unknown	Unknown
Allegheny River Cruiser	*Macromia alleghaniensis*	Very Important	Relatively Stable	Unknown
Brook Snaketail	*Ophiogomphus aspersus*	Important	10-30% Decline	Unknown

Beaverpond Clubtail	*Phanogomphus borealis*	Important	Unknown	Unknown
Harpoon Clubtail	*Phanogomphus descriptus*	Very Important	30-50% Decline	Unknown
Rapids Clubtail	*Phanogomphus quadricolor*	Very Important	Relatively Stable	Unknown
Common Sanddragon	*Progomphus obscurus*	Very Important	50-70% Decline	Unknown
Ski-tipped Emerald	*Somatochlora elongata*	Very Important	>90% Decline	Unknown
Coppery Emerald	*Somatochlora georgiana*	Very Important	10-30% Decline	Unknown
Williamson's Emerald	*Somatochlora williamsoni*	Important	Relatively Stable	Unknown
Riverine Clubtail	*Stylurus amnicola*	Very Important	Relatively Stable	Unknown
Zebra Clubtail	*Stylurus scudderi*	Important	10-30% Decline	Unknown
Ringed Boghaunter	*Williamsonia lintneri*	Most Important	10-30% Decline	Unknown

Overview of Conservation Progress in Connecticut Since 2015

Ringed Boghaunter

Ringed Boghaunter is a rare species of dragonfly (endangered) that prefers acidic fens, bogs, and small wetlands dominated by sphagnum. It is sometimes associated with Atlantic white cedar forests, black spruce, or larch. Fewer than 60 populations are known, but primarily in these, they reside in the Northeast. Of the thirty-four sites visited in Odonate surveys conducted in 2021, the Ringed Boghaunter was only detected at one site.

Since 2022, CT DEEP has continued to verify records and search for new Ringed Boghaunter sites, including surveying previously unverified sites or aquatic locations that were insufficiently sampled. This has resulted in reconfirmation at all but one previously known site, and the detection of one new site. Submission of data and habitat maps to NDDB will provide updates to Connecticut's population and habitat status for this dragonfly species. CT DEEP staff also provide technical assistance for drawdowns. As noted in the 2022 Interim Performance report, Wildlife Diversity Program staff recommend continuing surveys, collecting voucher specimens, curation, and submitting specimens to the UConn Biological Collections as important strategies for identifying abundance, distribution, and habitat requirements important to both state and regional conservation of the Ringed Boghaunter.

Insects: Connecticut's Flies

Table 1.25 - SGCN

Subtaxon	Common Name	Scientific Name	Importance Level	Short Term Population Trend	Long Term Population Trend

Flies	Banded Tiger Fly	*Ceraturgus fasciatus*	Important	Unknown	Unknown
Flies	Shy Cleg	*Haematopota rara*	Most Important	Unknown	Unknown
Flies	Frost's Horse Fly	*Hybomitra frosti*	Very Important	Unknown	Unknown
Flies	White-cheeked Horse Fly	*Hybomitra longiglossa*	Most Important	Unknown	Unknown
Flies	Smoky Horse Fly	*Hybomitra typhus*	Very Important	Unknown	Unknown
Flies	Tawny-callused Horse Fly	*Tabanus fulvicallus*	Very Important	Unknown	Unknown
Robber Flies	N/A	*Laphria cinerea*	Very Important	Unknown	Unknown
Robber Flies	N/A	*Nicocles politus*	Most Important	Unknown	Unknown
Robber Flies	N/A	*Stichopogon argenteus*	Very Important	Unknown	Unknown

Insects: Connecticut's Mayflies

Table 1.25 - SGCN

Common Name	Scientific Name	Importance Level	Short Term Population Trend	Long Term Population Trend
a mayfly	*Acentrella nadineae*	VERY	Unknown	Unknown
Trinity Comb Minnow Mayfly	*Ameletus tertius*	VERY	Unknown	Unknown
Southeastern Prong-gilled Mayfly	*Neoleptophlebia assimilis*	VERY	Unknown	Unknown

Mollusks: Connecticut's Freshwater Mollusks

Table 1.26 - SGCN

Subtaxon	Common Name	Scientific Name	Importance Level	Short-term Population Trend	Long-term Population Trend
Freshwater Bivalves	Dwarf Wedgemussel	*Alasmidonta heterodon*	Most Important	Unknown	Unknown
Freshwater Bivalves	Triangle Floater	*Alasmidonta undulata*	Important	Unknown	Unknown
Freshwater Bivalves	Brook Floater	*Alasmidonta varicosa*	Most Important	Unknown	Unknown
Freshwater Bivalves	Yellow Lampmussel	*Lampsilis cariosa*	Very Important	Unknown	Unknown
Freshwater Bivalves	Tidewater Mucket	*Leptodea ochracea*	Very Important	Unknown	Unknown
Freshwater Bivalves	Eastern Pondmussel	*Ligumia nasuta*	Important	Unknown	Unknown
Freshwater Bivalves	Eastern Pearlshell	*Margaritifera margaritifera*	Important	Unknown	Unknown

Freshwater Bivalves	Creeper	*Strophitus undulatus*	Important	Unknown	Unknown
Freshwater Snails	Piedmont Elimia	*Elimia virginica*	Important	Unknown	Unknown
Freshwater Snails	Marsh Fossaria	*Galba humilis*	Important	Unknown	Unknown
Freshwater Snails	Woodland Pondsnail	*Stagnicola catascopium*	Important	Unknown	Unknown
Freshwater Snails	Mossy Valvata	*Valvata sincera*	Important	Unknown	Unknown
Freshwater Snails	Threeridge Valvata	*Valvata tricarinata*	Important	Unknown	Unknown

Overview of Conservation Progress in Connecticut Since 2015

Dwarf Wedgemussel

Since 2021, conservation efforts have focused on supplementing existing data on abundance and distribution. By updating records through visual surveys, identifying, cataloging, and submitting voucher specimens to the UConn Biological Collection, CT DEEP continues to attend to habitat improvement and restoration efforts that benefit the conservation of this mussel species.

Brook Floater

In 2020, CT DEEP representatives collaborated with representatives from Mass Wildlife and the USFWS in a Structured Decision-Making Workshop to develop the most effective strategies for restoring populations. The group planned to use CT and Massachusetts efforts as a model for prevention, given the likelihood of near-future extirpation in these two states. As indicated in the 2020 Implementation of Revised CT Wildlife Action Plan report, CT DEEP representatives continue to be part of and contribute to the established Brook Floater Working Group. Wildlife Diversity staff contributed to a report written by the Brook Floater Working Group in 2020 and have continued to participate in and contribute to monthly conference calls with the Brook Floater Working Group since 2021.

Yellow Lampmussel

In 2021-2022, the Wildlife Diversity Program responded to the University of Massachusetts's data-sharing requests regarding the Yellow Lampmussel.

Eastern Pondmussel

Aquatic pesticide application is necessary to control aquatic vegetation and harmful algal blooms in many state ponds and lakes, particularly those with state-listed freshwater mussels, including many populations of Eastern Pondmussels. The effects of pesticides on freshwater mussels are a continuing field of research, and it is known that these chemicals

can impact both juvenile recruitment and adult survival. Coordination between CT DEEP and partner organizations has tracked Eastern Pondmussel populations with concurrent aquatic pesticide use. CT DEEP is working to determine if pesticide applications or other environmental factors may be contributing to any observed population declines in specific waterbodies.

Mollusks: Connecticut's Marine Mollusks

Table 1.27- SGCN

Subtaxon	Common Name	Scientific Name	Importance Level	Short-Term Population Trend	Long-Term Population Trend
Marine Bivalves	Bay Scallop	*Argopecten irradians*	Most Important	Unknown	Unknown
Marine Bivalves	Eastern Oyster	*Crassostrea virginica*	Most Important	Unknown	Unknown
Marine Bivalves	Atlantic Jackknife Clam	*Ensis directus*	Important	Unknown	Unknown
Marine Bivalves	Soft Shell Clam	*Mya arenaria*	Very Important	Unknown	Unknown
Marine Bivalves	Blue Mussel	*Mytilus edulis*	Very Important	Unknown	Unknown
Marine Snails	Knobbed Whelk	*Busycon carica*	Very Important	Unknown	Unknown
Marine Snails	Channeled Whelk	*Busycotypus canaliculatus*	Very Important	Unknown	Unknown

Connecticut's Marine Crustaceans, Horseshoe Crabs, and Starfish

Table 1.28 - SGCN

Subtaxon	Common Name	Scientific Name	Importance Level	Short Term Population Trend	Long Term Population Trend
Horseshoe Crabs	Horseshoe Crab	*Limulus polyphemus*	Most Important	Unknown	Unknown
Marine Crustaceans	Green Crab	*Carcinus maenas*	Important	Unknown	Unknown
Marine Crustaceans	Sevenspine Bay Shrimp	*Crangon septemspinosa*	Important	Unknown	Unknown
Marine Crustaceans	Bristle-footed Ghost Shrimp	*Gilvossius setimanus*	Important	Unknown	Unknown
Marine Crustaceans	shrimp spp.	*Hippolyte spp.*	Important	Unknown	Unknown
Marine Crustaceans	American Lobster	*Homarus americanus*	Most Important	Unknown	Unknown
Marine Crustaceans	Portly Spider Crab	*Libinia emarginata*	Important	Unknown	Unknown

Marine Crustaceans	Ocellate Lady Crab	*Ovalipes ocellatus*	Important	Unknown	Unknown
Marine Crustaceans	Flat-clawed Hermit Crab	*Pagurus pollicaris*	Important	Unknown	Unknown
Marine Crustaceans	shrimp spp.	*Palaemonetes spp.*	Important	Unknown	Unknown
Marine Crustaceans	Mantis Shrimp	*Squilla empusa*	Very Important	Unknown	Unknown
Marine Crustaceans	fiddler crab spp.	*Uca spp.*	Important	Unknown	Unknown
Marine Crustaceans	Coastal Mud Shrimp	*Upogebia affinis*	Important	Unknown	Unknown
Marine Crustaceans	mud crab spp.	*Xanthidae spp.*	Important	Unknown	Unknown
Starfish and Brittle Stars	Starfish sp.	*Asteriid spp.*	Important	Unknown	Unknown

SGCN Mammals of Connecticut

Regional Overview

There are 183 mammal species found in the Northeast, of which 29 were recently identified as RSGCN. Twelve mammals in the region are federally listed as endangered. Those occurring in Connecticut are the Indiana and Northern Long-eared Bats. For bats and marine mammals, offshore wind development has been identified as a regional concern. Many aspects of the biology, status, and abundance of small mammals, like shrews, mice, and cottontails, largely remain unknown and will require a focused effort to monitor populations to gain a better understanding of the threats these species face and how best to conserve them going forward (TCI & NEFWDTC, 2023).

Connecticut Overview and Conservation Progress in Connecticut Since 2015

While Connecticut is home to 17 mammal SGCN, little is known about many of the species, especially the small mammals, which include rodents and shrews. Conservation actions for mammals in the state over the past 10 years have primarily focused on the New England Cottontail and bats. The New England Cottontail was once common throughout New England and eastern New York, but its range has declined by 86 percent since 1960, largely due to habitat loss and competition from the introduced Eastern Cottontail (Litvaitis et al., 2006). In 2004, the New England Cottontail was listed as a species of greatest conservation need in all the State Wildlife Action Plans in the Northeast, where the species still occurred (CT, RI, MA, NH, ME, and NY), and its listing continues. In 2006, the species was designated as a Candidate for Threatened or Endangered Status under the Federal

Endangered Species Act. Its designation triggered a sweeping conservation effort by state and federal agencies.

This regional conservation effort was formalized in 2011 with the organization of the Regional New England Cottontail Initiative. The groups involved included state and federal agencies, universities, and non-governmental organizations, all working together to develop the New England Cottontail Conservation Strategy (2012). This strategy outlined habitat and population goals, funding sources, and planned actions. For more information, see the Young Forest and Shrubland website. The Conservation Strategy identified Focus Areas throughout Connecticut where New England Cottontails were present or historically known to exist, and where conservation efforts to manage habitats and augment populations could be prioritized. Since 2000, CT DEEP has conducted active and passive surveillance to assess the statewide distribution and occurrence of this species. To date, it has been found in 65 of the 169 Connecticut towns. A formal monitoring program began in 2015 as part of the Regional New England Cottontail Initiative, aiming to detect trends in occupancy for each state and across the species' range. Survey efforts have revealed both new sites where the New England Cottontail was previously unknown to exist and instances where it could not be detected at locations where it was previously known to exist. To date, over 4,000 New England Cottontail records of over 400 individuals have been identified by evaluating specimens and DNA analysis of tissue and pellet samples. Since 2000, 4,092 of the collected tissue and pellet samples (~29% of all successfully processed samples) have been identified as New England Cottontail. These data can be used to assess the occupancy, abundance, and habitat suitability of the New England cottontail. Habitat management efforts have primarily focused on creating and enhancing young forest and shrubland habitat using silvicultural practices and mechanical treatments. More recent research and monitoring efforts aim to estimate abundance at specific sites and to understand better how to create suitable habitats using forest management practices. UConn has produced a statewide map of understory vegetation that quantifies the amount of New England Cottontail habitat regardless of property ownership (Rittenhouse et al., 2022). CT DEEP began monitoring changes in vegetation and New England Cottontail use in 2016 on 14 state and 17 private properties to assess habitat suitability further and develop more effective management practices to support their population growth.

Another small mammal that has been the subject of some conservation efforts in the state is the North American Least Shrew, and its only known population in Connecticut is located in coastal Guilford. To learn more about this small, secretive species, DEEP biologists initiated ongoing surveys in July 2023 using drift fence arrays and motion-sensor cameras to capture photos of shrews to determine their preferred habitat. To date, seven arrays have been deployed in a single coastal marsh in Guilford, CT that is managed as a state Wildlife Management Area, to assess low and high marsh, and upland coastal forest

habitats for shrew presence. Least shrews were detected in four of these arrays. Plans are underway in 2025 to expand the surveys to other coastal marshes across Connecticut's entire coastline.

While not a small mammal, Fishers were extirpated from Connecticut and considered absent through the 1980s. Fishers were reintroduced into northwestern Connecticut in 1989 and 1990 and are now found throughout the state. Although sightings, harvest, and vehicle kill data indicate the population is more abundant east of Interstate 91, relative abundance and distribution have been indexed from sighting reports since the 1980s. Fisher carcasses gathered from vehicle kills and trapper harvests have been necropsied to measure reproductive indices. Harvest has continued to decline over the last decade, with only 146 pelts tagged during the 2013 season. During the 2022 season, 5 Fisher were harvested. Vehicle-kills and public sightings have also declined across the state over the same period. Between 2018 and 2023, camera surveys for Fishers were carried out by collaborators from Central Connecticut State University. Fishers were detected throughout Connecticut, except in the southwestern part of the state; camera detections were also significantly greater in eastern Connecticut compared to the west.

Regionally, similar declines of Fisher populations have prompted other states to conduct more intensive research into their respective populations. CT DEEP biologists began a study in 2023, in partnership with the University of Connecticut, to investigate cause-specific mortality, reproduction, and habitat use. Over 40 Fisher were captured and fitted with a GPS collar between November 2023 and February 2025. Biological samples for disease surveillance and other ongoing projects were also collected during each capture. In addition to movement data from GPS, ground-based tracking efforts using radio telemetry were used to monitor for mortality events and identify female den sites. This project is ongoing, and data will be collected throughout the year.

CT DEEP and our partners have been actively involved in regional mammal conservation, particularly in initiatives related to bats. Mobile acoustic monitoring continues throughout Connecticut, with three new routes established. Acoustic data being collected by the state has been used in many regional efforts, including a project in conjunction with the U.S. Fish and Wildlife Service and Virginia Tech University to help develop habitat suitability models for the Northern Long-eared Bat, as well as contributing acoustic data to NABat (North American Bat Monitoring Program), a continent-wide effort to track bat distribution and abundance. In 2023, a grant was approved for the installation of stationary surveys, which resulted in three stations being built and installed in Stonington, New Fairfield, and North Branford. Stationary monitors allow CT DEEP biologists to gather year-round data on bat activity and species composition at these sites.

One of our partners used bat monitoring data in New Fairfield to determine the effects of artificial light on bat foraging activity (Seewagon et al., 2023). Connecticut has also expanded the number of Motus towers in the state to increase the radio tracking capacity, both at the state level and regionally, for birds and bats. Also, in 2023, a grant was approved for mist netting and radio telemetry of *Myotis* species to understand key habitat features and identify maternity roost locations. These efforts began in the Summer of 2024 and will continue.

In addition to monitoring, the 2015 Wildlife Action Plan identified the need for increased public outreach efforts to shed more light on bats in our state and decrease the spread of diseases affecting bats, including White-nose Syndrome. CT DEEP set up a Wildlife Diseases website as an education tool for those and many other diseases affecting Connecticut's flora and fauna. Additionally, the state created websites, such as "Living with Bats" and "Bats in Connecticut," to provide information on how to coexist with and protect Connecticut's bats, as well as a bat sighting program that helps the general public collect bat data within the State. In 2023, a live stream of a Big Brown Bat colony (known as the "Bat Cam") was established at White Memorial Conservation Center. This live stream is accessible online, allowing community members to participate in abundance monitoring. To further outreach efforts, Connecticut designated September 15th as Bat Appreciation Day, which involves an entire day of activities to increase awareness of bats within the state each year.

SGCN

Table 1.29 – Number of SGCN by each subtaxon group by Importance Level

	Most Important	Very Important	Important	Grand Total
Bats	8	1		9
Marine Mammals		1	1	2
Small Mammals, Rabbits, and Mustelids	5	1		6
Total	**13**	**3**	**1**	**17**

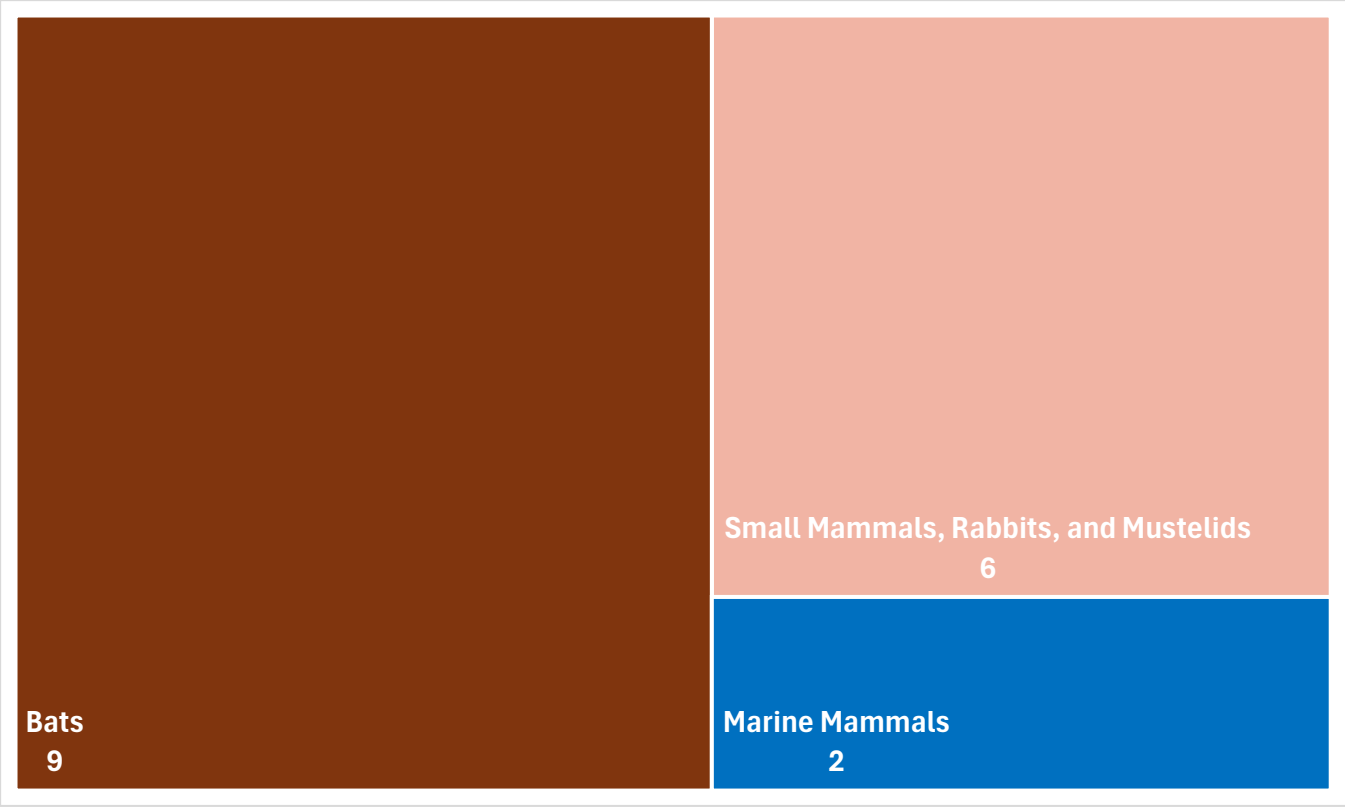

Figure 1.12 – Number of SGCN by Subtaxon Group

Distribution and Abundance within Connecticut

Unlike other groups, such as amphibians and birds, mammals do not have a comprehensive systematic survey atlas for the State. However, like other taxon in the state, CT DEEP's Natural Diversity Data Base (NDDB) provides some data on the distribution of threatened species and a map specifically for the Long-eared Bat. More broadly, a recent effort to update and digitize the distribution of all mammals worldwide (Marsh et al., 2022) can be found on the Map of Life website. The Long Island Sound Study surveys Marine Mammals in the Long Island Sound, and information on their distribution and abundance can be found on their website.

For other sources of distribution and abundance information, records at natural history collections worldwide, including the Peabody Museum at Yale and the collection at UConn, have been digitized. This information can be found on the Global Biodiversity Information Facility (GBIF), Vertnet, and the Mammal Diversity Database. Mammal distribution information can also be found in various community science applications and websites, including iNaturalist. If you want to contribute to these community-science efforts, we encourage you to click the links above to become involved.

Mammals are an outlier among terrestrial vertebrates in that a vast majority of Connecticut's mammal SGCN's population trends are unknown (over 80% of SGCN have

unknown long-term population trends and over 50% for short-term; Figure 1.13). Of the remaining SGCN with known population trajectories, most are declining dramatically, with over 90% of their populations disappearing over the short term (Figure 1.13). Since mammals, especially terrestrial mammals, are largely nocturnal and more difficult to study, it is unsurprising that many aspects of mammals' distribution and abundance are less well understood than those of other vertebrate groups, such as birds and amphibians. Since many of the known mammal SGCN populations appear to be declining precipitously, the need for more monitoring and surveys is urgent, especially for small mammals, to better understand the extent of their threat (see Chapter 4 for more on the research needs for Connecticut's mammals).

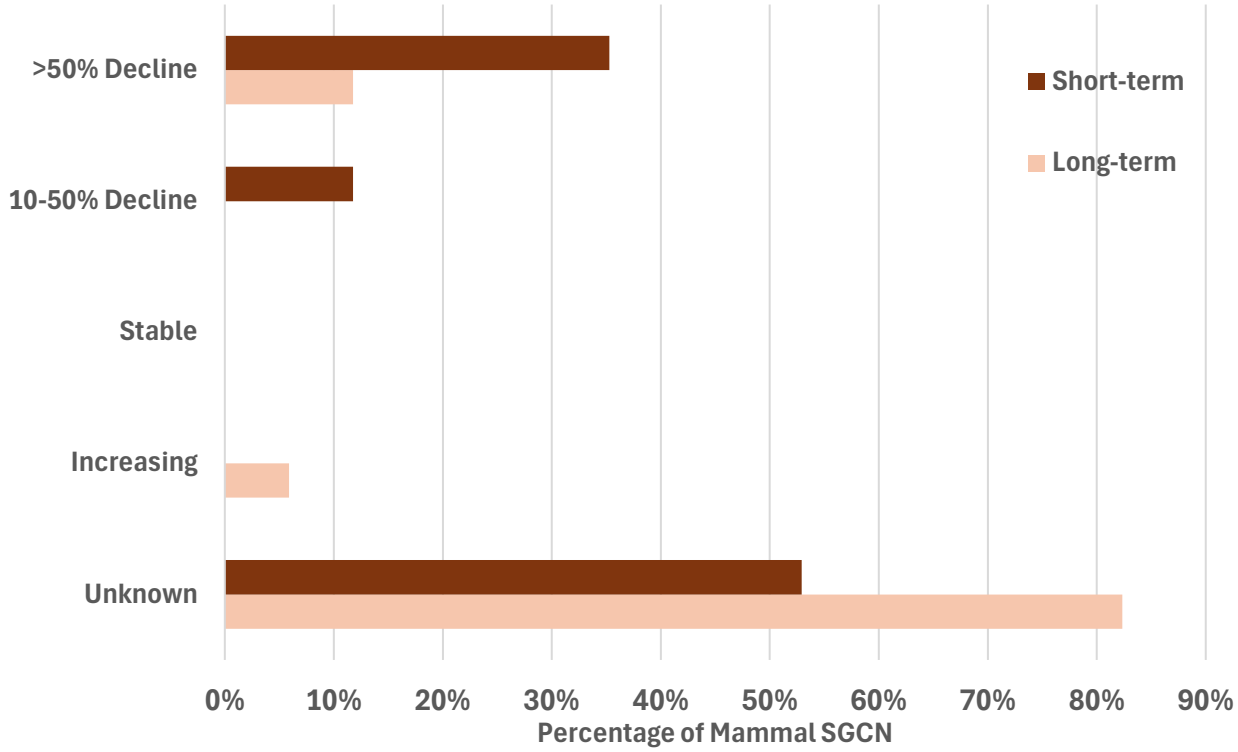

Figure 1.13 – Long- and Short-term Decline of Connecticut's Mammal SGCN Populations by Percentage. Long-term trends are based on the past 200 years, and Short-term trends are based on the last three generations.

Bats

Table 1.30 - SGCN

Common Name	Scientific Name	Importance Level	Short-term Population Trend	Long-term Population Trend
Big Brown Bat	*Eptesicus fuscus*	Very Important	30-50% Decline	Unknown
Silver-haired Bat	*Lasionycteris noctivagans*	Most Important	Unknown	Unknown

Eastern Red Bat	*Lasiurus borealis*	Most Important	Unknown	Unknown
Hoary Bat	*Lasiurus cinereus*	Most Important	Unknown	Unknown
Eastern Small-footed Myotis	*Myotis leibii*	Most Important	Unknown	Unknown
Little Brown Myotis	*Myotis lucifugus*	Most Important	>90% Decline	Unknown
Northern Long-eared Bat	*Myotis septentrionalis*	Most Important	>90% Decline	Unknown
Indiana Myotis	*Myotis sodalis*	Most Important	>90% Decline	Unknown
Tricolored Bat	*Perimyotis subflavus*	Most Important	>90% Decline	Unknown

Marine Mammals

Table 1.31 - SGCN

Common Name	Scientific Name	Importance Level	Short-term Population Trend	Long-term Population Trend
Harbor Seal	*Phoca vitulina*	Important	Unknown	Unknown
North Atlantic Harbor Porpoise	*Phocoena phocoena phocoena*	Very Important	Unknown	Unknown

Connecticut's Small Mammals, Rabbits, and Mustelids

Table 1.32 - SGCN

Subtaxon	Common Name	Scientific Name	Importance Level	Short-term Population Trend	Long-term Population Trend
Mustelids	Fisher	*Pekania pennanti*	Very Important	>90% Decline	>25% Increase
Rabbits and Hares	New England Cottontail	*Sylvilagus transitionalis*	Most Important	10-30% Decline	>90% Decline
Rodents	Northern Flying Squirrel	*Glaucomys sabrinus*	Most Important	Unknown	Unknown
Rodents	Southern Bog Lemming	*Synaptomys cooperi*	Most Important	Unknown	Unknown
Shrews	North American Least Shrew	*Cryptotis parva*	Most Important	>90% Decline	>90% Decline

SGCN Plants of Connecticut

Regional Overview

Of the 6,084 known Northeastern U.S. & Canada plant species, 2,821 (1,706 native and 1,115 naturalized non-natives) are known to occur within Connecticut. During the last five-year update, plants were not considered as a taxonomic group meeting the RSGCN criteria because most Northeast states did not list plants as SGCN in the 2015 Northeast Wildlife Action Plans. During

the 2025 SWAP revision, more states are considering plants; therefore, plants may be included in the next update of the regional species of greatest conservation need (TCI & NEFWDTC, 2023).

Connecticut Overview and Conservation Progress in Connecticut Since 2015

Plants comprise a significant proportion of Connecticut's biodiversity. Assessments of plant populations are crucial in determining the condition of the habitats in which these plants are found. Conserving Plant Diversity in New England (Clark, 2021) is an online tool and report produced through a collaboration between the Native Plant Trust and The Nature Conservancy. The report, "Conserving Plant Diversity in New England," identifies areas for plant conservation actions across New England (Anderson et al., 2021), listing 234 Important Plant Areas in New England and several in Connecticut (Figure 1.14).

The New England Plant Conservation Program (NEPCoP) submitted the second edition of Flora Conservanda: New England Plants Needing Conservation (Brumback & Gerke, 2013). The list included globally, regionally, and/or locally rare plants growing in New England. It also listed plants considered historic to New England (though they may exist elsewhere) and plants whose status in the region was undetermined but believed to be rare.

Originally published in 1996, Flora Conservanda was updated in 2012 (Brumback & Gerke, 2013), incorporating research accumulated over 15 years, including taxonomic studies and field research conducted by professionals and volunteers. Some species have been added to the list based on their rarity in the wild. Others have been removed because they are now known to be more common than previously understood, or because the taxonomic understanding of the species has changed, rendering it no longer considered rare in New England. Of the more than 500 species listed for New England, 265 have been documented in Connecticut. The Connecticut Natural Diversity Database maintains a list of rare plants at the state level, including 331 species, or roughly twenty percent of Connecticut's native flora. CT DEEP updated the State Listed Plants and Natural Communities by Town list in December 2024. It lists many endangered, threatened, or state-special concern plant species and significant natural communities within the township where they occur.

The threats to plants are similar to those affecting animals, especially in community types with limited distributions in the state, such as bogs and other small wetlands, pitch pine barrens, and tidal marshes. Herbaceous understory species represent the majority of plant diversity in forests region-wide. In Connecticut forests, diversity is slowly being diminished by the gradual loss of species due to habitat fragmentation (CT Forest Action Plan); meanwhile, Connecticut has a high responsibility for conserving northeastern Interior Dry-Mesic Oak Forest (Anderson et al., 2021). This phenomenon has been well-documented through more than 30 years of monitoring, thanks to the combined efforts of The Nature Conservancy, the State Natural Heritage Programs, the Connecticut Botanical Society, and numerous individual collaborators and surveyors affiliated with NEPCoP. For more information on habitat, see Chapter 2.

Since 2015, CT DEEP has created a Species Review sheet for the state-listed or SGCN plants, giving each species a rank. Under development are habitat circumscription spreadsheets, including habitat types, bloom times, and other relevant information, for these species, which will be used for environmental review. However, they are expected to be posted online so the public can do botanical assessments on their properties. The Natural Diversity Data Base (NDDB) map program in CT DEEP created a Survey 123 app for use on mobile devices and desktop computers for observers to report state-listed species observations, and it can also be used for non-state-listed SGCN and SAPS species in the future. NDDB has recently acquired very high-accuracy units for documenting SGCN species and Key Habitats. The Native Plant Trust volunteers collect local native seeds from SGCN and State-listed species. UConn Natural Resource Management and Environment Department's Frosted Elfin host plant habitat modeling project began in 2023. A list of Native Trees and shrubs is available to the public, along with programs promoting the sale and planting of native plants. There has been a huge growth in public and professional horticultural awareness since 2015. However, a universally accepted single definition of "native" does not yet exist and is needed. Since 2015, CT DEEP has acquired 6,942 acres, including 1,322 acres of easements.

In addition, the CT DEEP Open Space and Watershed Land Acquisition Grant Program has awarded grants to towns, private conservation groups, and water companies to protect between 13,800 and 14,800 acres since 2015. It is unknown how many occurrences of these acquisitions have protected 2015 SGCN plants, but we are reasonably confident that it is a large number, at least for the more common 2015 SGCN plants. It is known that several of the acquisitions have protected sites with rare 2025 SGCN plants, but the total number of sites and occurrences of 2025 SGCN plants protected is not known. This includes defining "wild types" instead of "nativars". “No herbicide” buffers have been added to the NBBD around some 2015 SGCN aquatic plants, with more buffers to be added. Invasive species management includes adding an aquatic invasive species manager position to the UConn Extension program, and there is also a need for a terrestrial invasive species manager. Many of these actions require tracking, and the new Connecticut Action Tracker (see Chapter 5) will fulfill this need by enabling CT DEEP and its partners to coordinate actions for plants and other species across the state.

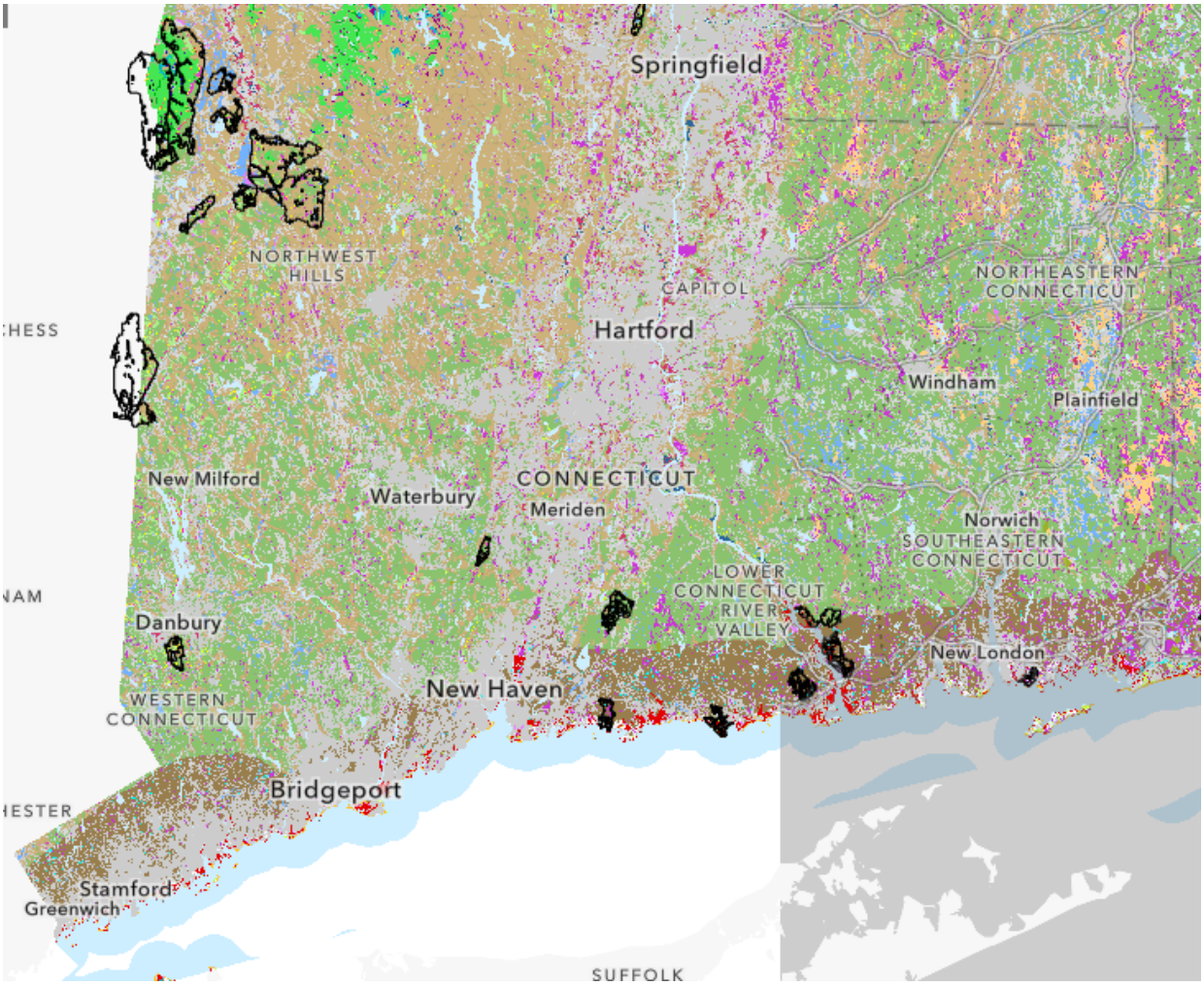

Figure 1.14: Important Plant Areas in black. There are 32 Important Plant Areas within Connecticut; three are protected, and zero are secured.

SGCN

Table. 1.33 – Number of SGCN by each subtaxon group by Importance Level

	Most Important	Very Important	Important	Grand Total
Conifers	2	2	1	5
Ferns, Clubmosses, and Horsetails	10	2		12
Flowering Plants	124	17	111	252
Liverworts and Mosses	2	1	13	16
Total	**138**	**22**	**125**	**285**

Figure 1.15 – Number of Plant SGCN by Subtaxon Group.

Distribution and Abundance within Connecticut

Little is known about Connecticut's plant SGCN distribution and abundance, and few resources exist that quantify their distribution and abundance within the state. However, like other taxa in the State, CT DEEP's Natural Diversity Data Base (NDDB) provides some data on the distribution of threatened species. Other sources of distribution and abundance information include records at natural history collections worldwide, such as the Peabody Museum at Yale and the collection at UConn, which have been digitized. This information can be found on the Global Biodiversity Information Facility (GBIF). Another valuable resource for the distribution of Connecticut's Plants can be found on the Map of Life website. Plant species distribution information can also be found in various community science applications and websites, including iNaturalist. If you would like to contribute to these community-science efforts, we encourage you to click the links above to get involved.

Considering little is known about the long-term and short-term population trajectories within the state (over 99% of SGCN are missing long-term data, and 99% are missing short-term data; Figure 1.16), Connecticut plants need more research and monitoring. As mentioned in the Conservation Progress section, many of these programs are already underway. For more details on these actions, please see Chapters 4 and 5.

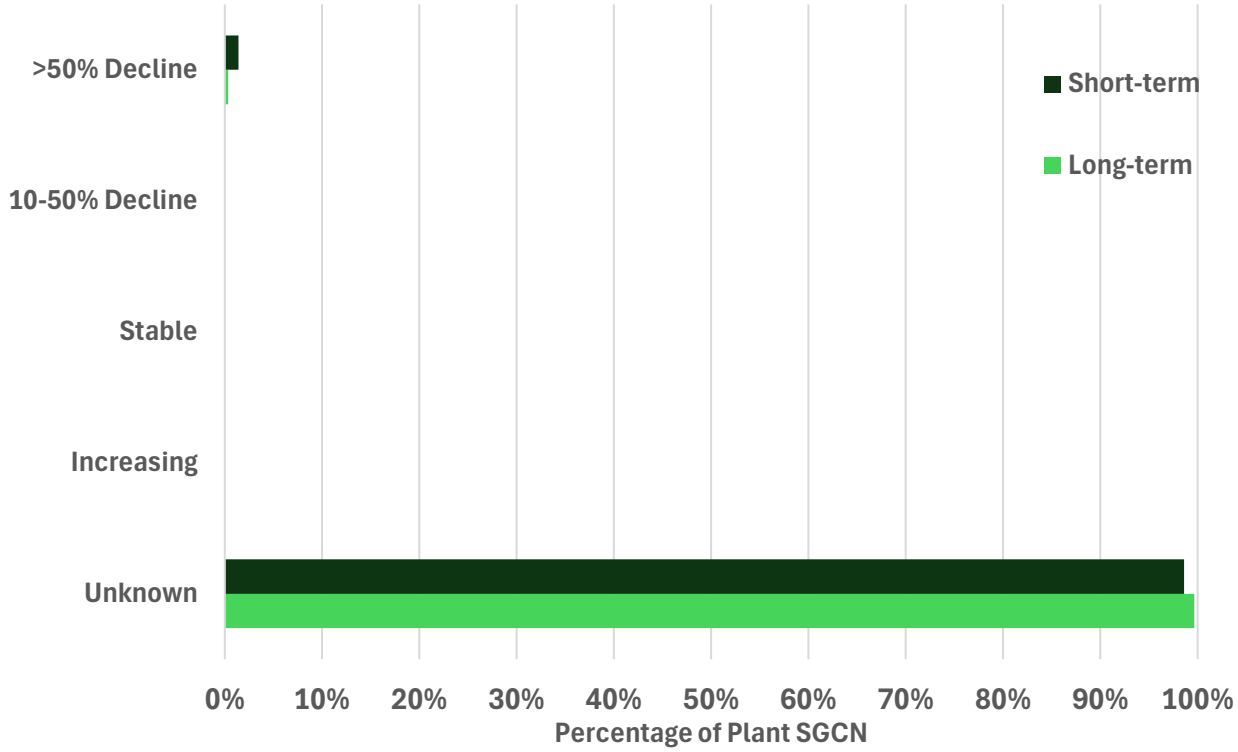

Figure 1.16 – Long- and short-term decline of Connecticut's Plant SGCN Populations by Percentage. Long-term trends are based on the past 200 years, and Short-term trends are based on the last three generations.

Connecticut's Ferns, Clubmosses, & Horsetails (Vascular Non-seeded Plants)

Table 1.34 - SGCN

Subtaxon	Common Name	Scientific Name	Importance Level	Short-Term Population Trend	Long-Term Population Trend
Clubmosses	Foxtail Bog Clubmoss	*Lycopodiella alopecuroides*	MOST	Unknown	Unknown
Ferns and Allies	Hairy Lipfern	*Cheilanthes lanosa*	MOST	Unknown	Unknown
Ferns and Allies	Slender Cliff-brake	*Cryptogramma stelleri*	MOST	Unknown	Unknown
Ferns and Allies	Laurentian Bladderfern	*Cystopteris laurentiana*	VERY	Unknown	Unknown
Ferns and Allies	Glade Fern	*Diplazium pycnocarpon*	MOST	Unknown	Unknown
Ferns and Allies	Mountain Woodfern	*Dryopteris campyloptera*	MOST	Unknown	Unknown
Ferns and Allies	Climbing Fern	*Lygodium palmatum*	VERY	50-70% Decline	Unknown
Ferns and Allies	Northern Adder's-tongue	*Ophioglossum pusillum*	MOST	Unknown	Unknown
Ferns and Allies	Southern Adder's-tongue	*Ophioglossum vulgatum*	MOST	Unknown	Unknown

Ferns and Allies	Smooth Cliffbrake	*Pellaea glabella*	MOST	Unknown	Unknown
Horsetails	Meadow Horsetail	*Equisetum pratense*	MOST	Unknown	Unknown
Horsetails	Dwarf Scouring-rush	*Equisetum scirpoides*	MOST	Unknown	Unknown

Connecticut's Flowering Plants (Angiosperms)

Connecticut's Flowering Plants represents the largest group of SGCN, with 252 species, which is 44% of all SGCN found within the state. For the full list of Flowing Plant SGCN and associated information about importance levels and population trends, please see Appendix 1.3.

Connecticut's Conifers (Gymnosperms)

Table 1.36 - SGCN

Common Name	Scientific Name	Importance Level	Short Term Population Trend	Long Term Population Trend
Balsam Fir	*Abies balsamea*	Most Important	Unknown	Unknown
Atlantic White-cedar	*Chamaecyparis thyoides*	Very Important	Unknown	Unknown
Red Pine	*Pinus resinosa*	Most Important	Unknown	Unknown
Pitch Pine	*Pinus rigida*	Very Important	Unknown	Unknown
Northern White-cedar	*Thuja occidentalis*	Important	Unknown	Unknown

Connecticut's Liverworts & Mosses (Non-vascular Plants)

Table 1.37 - SGCN

Subtaxon	Common Name	Scientific Name	Importance Level	Short Term Population Trend	Long Term Population Trend
Liverworts	N/A	*Cephaloziella elachista*	IMPORTANT	Unknown	Unknown
Liverworts	N/A	*Fuscocephaloziopsis loitlesbergeri*	IMPORTANT	Unknown	Unknown
Liverworts	N/A	*Heterogemma laxa*	IMPORTANT	Unknown	Unknown
Liverworts	N/A	*Kurzia pauciflora*	VERY	Unknown	Unknown
Liverworts	N/A	*Mannia triandra*	IMPORTANT	Unknown	Unknown
Liverworts	N/A	*Moerckia flotoviana*	IMPORTANT	Unknown	Unknown
Liverworts	Two-lobed Flapwort	*Nardia insecta*	IMPORTANT	Unknown	Unknown
Liverworts	N/A	*Riccia dictyospora*	IMPORTANT	Unknown	Unknown
Mosses	N/A	*Fissidens closteri*	MOST	Unknown	Unknown

Mosses	Varnished Hook Moss	*Hamatocaulis vernicosus*	IMPORTANT	Unknown	Unknown
Mosses	Sharpleaf Hookeria Moss	*Hookeria acutifolia*	IMPORTANT	Unknown	Unknown
Mosses	N/A	*Meesia triquetra*	IMPORTANT	Unknown	Unknown
Mosses	N/A	*Neckera besseri*	MOST	Unknown	Unknown
Mosses	N/A	*Palustriella commutata*	IMPORTANT	Unknown	Unknown
Mosses	Three-ranked Spear Moss	*Pseudocalliergon trifarium*	IMPORTANT	Unknown	Unknown
Mosses	Allen's Fern Moss	*Thuidium alleniorum*	IMPORTANT	Unknown	Unknown

References

Alroy, J., 2015. Current extinction rates of reptiles and amphibians. Proceedings of the National Academy of Sciences, 112(42):13003-13008.

Anderson, M., M. Piantedosi, W. Brumback. 2021. Conserving Plant Diversity in New England. Native Plant Trust and Nature Conservancy. (link)

Araújo, M.B., Thuiller, W. and Pearson, R.G., 2006. Climate warming and the decline of amphibians and reptiles in Europe. Journal of biogeography, 33(10): 1712-1728.

Babbitt, L.H. 1937. The amphibia of Connecticut. Connecticut Geological and Natural History Survey Bulletin 57:1-50.

Bevier, L.R., editor. 1994. The atlas of breeding birds of Connecticut. State Geological and Natural History Survey of Connecticut Bulletin No. 113:1-461. Connecticut Department of Environmental Protection, Hartford, Connecticut.

Bevier, L.R. 1996. The Connecticut rare records committee: an overview. Connecticut Warbler 16:26-30.

Böhm, M., Dewhurst-Richman, N.I., Seddon, M., Ledger, S.E., Albrecht, C., Allen, D., Bogan, A.E., Cordeiro, J., Cummings, K.S., Cuttelod, A. and Darrigran, G., 2021. The conservation status of the world's freshwater molluscs. *Hydrobiologia*, *848*(12), pp.3231-3254.

Brumback, W.E., J. Gerke. 2013. Flora Conservanda: New England 2012: The New England Plant Conservation Program List of Plants in need of Conservation. Rhodora. 115(964): 313-408.

Burgio, K.R., H. Higgins, A. Lubeck, M.D. Starking, T. Rice, H. Siart, K. Cruz, E. Murley, K. Terwilliger, and M.D. Staudinger. 2024. Biological Responses to Climate Impacts of the Northeast Regional Species of Greatest Conservation Need. In: DOI Northeast Climate Adaptation

Science Center Cooperator Report. https://www.sciencebase.gov/catalog/item/62866381d34e3bef0c9a813c

(CAES) Connecticut Agricultural Experiment Station. 2025. Connecticut Agricultural Experiment Station Arthropod Collection. Occurrence dataset https://doi.org/10.15468/nvkb6d accessed via GBIF.org on 2025-01-27.

Channell, R. "The conservation value of peripheral populations: the supporting science." In Proceedings: Species at Risk 2004 Pathways to Recovery Conference, Victoria, B.C., March 2–6, 2004. Anchorage: Alaska Resources Library and Information Services.

Crisfield, E., and (NEFWDTC) Northeast Fish and Wildlife Diversity Technical Committee. 2022. The 2022 Northeast Lexicon: Terminology conventions and data framework for State Wildlife Action Plans in the Northeast Region. Association of Fish and Wildlife Agencies. Washington, D.C.

Cordier, J.M, Ramiro Aguilar, Julián N. Lescano, Gerardo C. Leynaud, Andrea Bonino, Daniela Miloch, Rafael Loyola, Javier Nori. 2021. A global assessment of amphibian and reptile responses to land-use changes, Biological Conservation, 253:108863.

(CT DEEP) Connecticut Department of Energy and Environmental Protection. 2015. 2015 Connecticut Wildlife Action Plan. www.ct.gov/deep/cwp/view.asp?a=2723&q=329520&deepNav_GID=1719#Review.

Danet, A., Giam, X., Olden, J.D. *et al.* 2024. Past and recent anthropogenic pressures drive rapid changes in riverine fish communities. *Nat Ecol Evol* **8**, 442–453. https://doi.org/10.1038/s41559-023-02271-x

Despland, E. 2018. Effects of phenological synchronization on caterpillar early-instar survival under a changing climate. Canadian Journal of Forest Research, 48(3), 247–254.

Finn, C., Grattarola, F. and Pincheira-Donoso, D. 2023. More losers than winners: investigating Anthropocene defaunation through the diversity of population trends. Biol Rev, 98: 1732-1748.

Fraser, D.F. 2000. Species at the edge: the case for listing "peripheral" species. In Proceedings of a Conference on the Biology and Management of Species and Habitats at Risk, Kamloops, B.C., February 15–19, 2000, edited by L.M. Darling, Volume One (Feb. 1999). Victoria, B.C.: British Columbia Ministry of Environment, Lands and Parks.

Friedland, K. D., Langan, J. A., Large, S. I., Selden, R. L., Link, J. S., Watson, R. A., & Collie, J. S. (2020). Changes in higher trophic level productivity, diversity and niche space in a rapidly warming continental shelf ecosystem. Science of the Total Environment, 704(135270).

Fuentes, M. M. P. B., Santos, A. J. B., Abreu-Grobois, A., Briseño-Dueñas, R., Al-Khayat, J., Hamza, S., Saliba, S., Anderson, D., Rusenko, K. W., Mitchell, N. J., Gammon, M., Bentley, B. P., Beton, D., Booth, D. T. B., Broderick, A. C., Colman, L. P., Snape, R. T. E., Calderon-Campuzano, M. F., Cuevas, E. M., & R, J. (2024). Of sea turtles to climate warming: Will phenological responses be sufficient to counteract changes in reproductive output? Global Change Biology, 30, 16991.

Gibbons, J.W., D.E. Scott, T.J. Ryan, K.A. Buhlmann, T.D. Tuberville, B.S. Metts, J.L. Greene, T. Mills, Y. Leiden, S. Poppy, and C.T. Winne. 2000. "The global decline of reptiles, déjà vu amphibians." BioScience. 50(8): 653–666.

Gonçalves Neto, A., Langan, J.A. and Palter, J.B., 2021. Changes in the Gulf Stream preceded rapid warming of the Northwest Atlantic Shelf. Communications Earth & Environment, 2(1), p.74.

Harvey, J. A. (2022). Scientists' warning on climate change and insects. Ecological Monographs, 93(1).Harvey

Hellmann, J. J., Grundel, R., Hoving, C., & Schuurman, G. W. (2016). A call to insect scientists: Challenges and opportunities of managing insect communities under climate change. Current Opinion in Insect Science, 17, 92–97.

Klemens, M.W. 1991. Checklist of the amphibians and reptiles of Connecticut with notes on uncommon species. Connecticut Department of Environmental Protection, Bulletin No. 14:1-23. Hartford, Connecticut.

Klemens, M.W. 1993. Amphibians and reptiles of Connecticut and adjacent regions. State Geological and Natural History Survey of Connecticut. Bulletin No.112: 1-318. Hartford, Connecticut.

Klemens, M.W. 2000. Amphibians and reptiles in Connecticut: a checklist with notes on conservation status, identification, and distribution. Connecticut Department of Environmental Protection Bulletin 32:1-96. Hartford, Connecticut.

Klemens, M.W., H.J. Gruner, D.P. Quinn, E.R. Davison. 2021. Amphibians and Reptiles in Connecticut. Revision to State Geological and Natural History Survey Bulletin 112. ISBN No. 978-0-578-87182-0. Connecticut Department of Energy and Environmental Protection. Hartford, CT.

Lesica, P. and F.W. Allendorf. 1995. "When are peripheral populations valuable for conservation?" Conservation Biology. 9(4): 753–760.

Litvaitis, J.A., Tash, J.P., Litvaitis, M.K., Marchand, M.N., Kovach, A.I. and Innes, R., 2006. A range-wide survey to determine the current distribution of New England cottontails. Wildlife Society Bulletin, 34(4): 1190-1197.

Lubeck, A., H. Higgins, K. Terwilliger, K.R. Burgio, L. Thurman, T. Rice, A. D'Amato, T. Morelli, P. Armsworth, and M.D. Staudinger. 2024. Vulnerability of Northeastern U.S. Species of Greatest Conservation Need to Climate Change. In: DOI Northeast Climate Adaptation Science Center Cooperator Report. https://www.sciencebase.gov/catalog/item/62866381d34e3bef0c9a813c

Luedtke, J.A., Chanson, J., Neam, K. et al. 2023. Ongoing declines for the world's amphibians in the face of emerging threats. Nature 622, 308–314. https://doi.org/10.1038/s41586-023-06578-4

Marsh, C.J., Sica, Y.V., Burgin, C.J., Dorman, W.A., Anderson, R.C., del Toro Mijares, I., Vigneron, J.G., Barve, V., Dombrowik, V.L., Duong, M. and Guralnick, R., 2022. Expert range maps of global mammal distributions harmonised to three taxonomic authorities. Journal of Biogeography, 49(5):979-992.

Merriam, C. H. 1877. A review of the birds of Connecticut, with remarks on their habitats. Trans. Connecticut Academy of Arts and Science, 4:1-150.

Motz G. 2025. Entomology Division, Yale Peabody Museum. Yale University Peabody Museum. Occurrence dataset https://doi.org/10.15468/95waq3 accessed via GBIF.org on 2025-01-27.

Peterson, R.C. 1970. Connecticut's venomous snakes: timber rattlesnake and northern copperhead. Connecticut Geological and Natural History Survey Bulletin. 103:1-40.

O'Connor, K.M., T.A.G. Rittenhouse, J.L. Brunner. 2016. Ranavirus is common in wood frog tadpoles throughout Connecticut, USA. Herpetological Review. 47(3):394-397.

Patterson, T. A., Grundel, R., Dzurisin, J. D., Knutson, R. L., & Hellmann, J. J. 2019. Evidence of an extreme weather-induced phenological mismatch and a local extirpation of the endangered Karner Blue butterfly. Conservation Science and Practice, 2(1).

Perkins, S. 2001. Spring migration report: New England. North American Birds. 55:276.

Pershing, A. J., Alexander, M. A., Brady, D. C., Brickman, D., Curchitser, E. N., Diamond, A. W., & Wang, Y. (2021). Climate impacts on the Gulf of Maine ecosystem: A review of observed and expected changes in 2050 from rising temperatures. Elem Sci Anth, 9(1), 00076.

Putman, N. F., Seney, E. E., Verley, P., Shaver, D. J., López-Castro, M. C., Cook, M., Guzmán, V., Brost, B., Ceriani, S. A., Mirón, R. D. J. G. D., & Peña, L. J. (2020). Predicted distributions

and abundances of the sea turtle 'lost years' in the western North Atlantic Ocean. Ecography, 43(4), 506–517.

Rittenhouse, C.D., Berlin, E.H., Mikle, N., Qiu, S., Riordan, D. and Zhu, Z., 2022. An object-based approach to map young forest and shrubland vegetation based on multi-source remote sensing data. Remote Sensing, 14(5):WWF1091.

Rosenberg, K.V., et al. 2019. Decline of the North American avifauna. Science. 366:120-124. DOI:10.1126/science.aaw1313

Sage, J.H., and L.B. Bishop, assisted by W.P. Bliss. 1913. The birds of Connecticut. Connecticut Geological and Natural History Survey Bulletin 20:1-370.

Seewagon, C.L., J. Nadeau-Gneckow, A.M. Adams. 2023. Far-reaching displacement effects of artificial light at night in a North American bat community. Global Ecology and Conservation. 48:e02729.

Sikes, D.S. 1997. Connecticut tiger beetle status survey (Carabidae: Cicindelinae). Conservation status, taxonomy and ecology. Report for the Connecticut Chapter, The Nature Conservancy, Middletown, CT.

Starking, M.D., T.M. Rice, K. Terwilliger, D. Drummey, M. Frantz, C.D. Haffner, B. Hess, L. Holst, M. Marchand, and K.R. Burgio. 2025. Strategic Conservation Prioritization Through Creating and Updating the Regional Species of Greatest Conservation Need (RSGCN) List in the Northeastern U.S. bioRxiv preprint. DOI: https://doi.org/10.1101/2025.01.03.631241

Staudinger, M.D., A.J. Lynch, S. Gaichas, M. Fox, D. Gibson-Reinemer, J. Langan, A. Teffer, S.J. Thackeray, I.J. Winfield. 2021. How does climate change affect emergent properties of aquatic ecosystems? Fisheries, 46(9): 423-441. https://doi.org/10.1002/fsh.10606

(TCI) Terwilliger Consulting, Inc., (NEFWDTC) Northeast Fish and Wildlife Diversity Technical Committee. 2023. Northeast Regional Conservation Synthesis for the 2025 State Wildlife Action Plans. Association of Fish and Wildlife Agencies. Washington D.C.

Wagner, D. L. 2020. Insect declines in the anthropocene. Annual Review of Entomology, 65(1), 457–480.

Wagner, D. L. 2021. A window to the world of global insect declines: Moth biodiversity trends are complex and heterogeneous. Proceedings of the National Academy of Sciences, 118(2).

Wagner, D.L., and M.C. Thomas. 1999. The Odonata fauna of Connecticut. Bulletin of American Odonatology 5(4):59–85.

Wagner, D.L., Grames, E.M., Forister, M.L., Berenbaum, M.R. and Stopak, D., 2021. Insect decline in the Anthropocene: Death by a thousand cuts. *Proceedings of the National Academy of Sciences*, *118*(2), p.e2023989118.

Weiskopf, S. R., Rubenstein, M. A., Crozier, L. G., Gaichas, S., Griffis, R., Halofsky, J. E., Hyde, K. J. W., Morelli, T. L., Morisette, J. T., Muñoz, R. C., Pershing, A. J., Peterson, D. L., Poudel, R., Staudinger, M. D., Sutton-Grier, A. E., Thompson, L., Vose, J., Weltzin, J. F., & Whyte, K. P. (2020). Climate change effects on biodiversity, ecosystems, ecosystem services, and natural resource management in the United States. Science of the Total Environment, 733(137782).

Whitworth, W.R. 1996. Freshwater fishes of Connecticut. Second edition. State Geological and Natural History Survey of Connecticut, Department of Environmental Protection, Bulletin 114:1-243.

WWF. 2024. Living Planet Report 2024 – A System in Peril. WWF, Gland, Switzerland.

Zarrillo, T.A., Stoner, K.A. and Ascher, J.S., 2025. Biodiversity of bees (Hymenoptera: Apoidea: Anthophila) in Connecticut (USA). Zootaxa, 5586(1), pp.1-138.

Zeranski, J.D. and T.R. Baptist. 1990. Connecticut birds. University Press of New England, Hanover, New Hampshire.