

SPECIES OF CONSERVATION CONCERN

BioMap2 Components

Core Habitat: Species of Conservation Concern
Critical Natural Landscape: Tern Foraging

RARE AND OTHER SPECIES OF CONSERVATION CONCERN

Although Massachusetts is a small state, it is extremely varied. From the beaches and salt marshes of Cape Cod, to the rich habitats of the Connecticut River Valley, to the forests and ridgetops of the Taconic Mountains, the Commonwealth supports a remarkable diversity of plant and animal species. Many of these species are of conservation concern within the state as they face threats of direct habitat loss, loss due to climate change, and other threats to their populations.

The Massachusetts Natural Heritage & Endangered Species Program and The Nature Conservancy's Massachusetts Program developed *BioMap2* in 2010 as a conservation plan to protect the state's biodiversity. *BioMap2* is designed to guide strategic biodiversity conservation in Massachusetts over the next decade by focusing land protection and stewardship on the areas that are most critical for ensuring the long-term persistence of rare and other native species and their habitats, exemplary natural communities, and a diversity of ecosystems.

BioMap2 employs a combination of fine-filter and coarse-filter approaches. The fine-filter approach targets the conservation needs of individual species, especially those that are currently rare or uncommon, as well as those that may be threatened in the coming decades.

COMPONENTS OF *BIOMAP2*: *BioMap2* **Core Habitat** identifies specific areas necessary to promote the long-term persistence of rare species, other Species of Conservation Concern, exemplary natural communities, and intact ecosystems. *BioMap2* **Critical Natural Landscape** was created to identify and prioritize intact landscapes in Massachusetts that are better able to support ecological processes and disturbance regimes, and a wide array of species and habitats over long time frames. *BioMap2* uses specific data and sophisticated mapping and analysis tools to spatially define each of these components, calling on the latest research and understanding of species biology, conservation biology, and landscape ecology.



Figure 1: The Spotted Turtle (*Clemmys guttata*) is a Species of Conservation Concern in Massachusetts

SPECIES OF CONSERVATION CONCERN: In *BioMap2*, Species of Conservation Concern includes those species that meet the criteria for listing under the Massachusetts Endangered Species Act, as well as a number of species that do not meet these criteria for listing, but are considered to be of conservation concern within Massachusetts.

Rare Species: A critical source of fine-filter information for *BioMap2* was the Natural Heritage & Endangered Species Program (NHESP) database for the 435 native plant and animal species listed under the Massachusetts Endangered Species Act (MESA). For inclusion on the MESA List, a species must meet strict criteria based on rarity, population trends, and threats to survival. Species on the MESA List are categorized as Endangered, Threatened, or Special Concern depending on their likelihood of extinction or extirpation. Information on these species is stored in a database containing nearly 10,000 rare species records that are geographically referenced. These records are based on field observations and undergo rigorous evaluation for inclusion into the system.

Using the observation records in the NHESP database, Natural Heritage biologists with expertise regarding these species delineated the extent of the critical habitat associated with each record, following species-specific mapping guidelines.

Thus, a Species Habitat delineated for a plant whose seeds are dispersed only locally by ants will be significantly smaller and much more limited by human infrastructure (e.g., roads and buildings) than a Species Habitat delineated for a rare dragonfly that can quickly traverse large distances regardless of fragmentation by roads. Because *BioMap2* is a statewide conservation prioritization tool, not every location where a MESA-listed species occurs is included as Core Habitat. While every part of the natural landscape contributes to the biodiversity of the state in some way, *BioMap2* is intended to identify the highest quality sites within the Commonwealth to help guide land protection and stewardship over the next decade. Therefore, it was necessary to evaluate every rare species habitat to determine which are most likely to persist over time. To do so, NHESP staff employed standard Natural Heritage methodology to rank each site based on size, condition, and landscape context. No records that were more than 25 years old were included in *BioMap2*.

Other Species of Conservation Concern: Another suite of fine-filter conservation targets in *BioMap2* was derived from the State Wildlife Action Plan (SWAP). This plan was developed by the Division of Fisheries and Wildlife (DFW) in 2005 to help guide wildlife conservation in Massachusetts in the coming decades. This document identifies 257 wildlife species and 22 natural habitats most in need of conservation within the Commonwealth.

In addition to species on the MESA List described previously, SWAP identifies other wildlife species that are of significant regional conservation concern but do not meet the requirements for inclusion in the regulatory framework of the Massachusetts Endangered Species Act. Of the nonlisted Species of Conservation Concern highlighted in SWAP, 27 species are directly mapped for inclusion in *BioMap2*. A variety of techniques were



Figure 2: Northeastern Beach Tiger Beetle (*Cicindela dorsalis dorsalis*), Endangered



Figure 3: Plymouth Gentian (*Sabatia kennedyana*), Special Concern

used to delineate species-specific habitat footprints. For 14 mammal, bird, amphibian, reptile, and invertebrate species, an approach similar to the creation of rare Species Habitats was used in which individual observations were compiled and a species-specific habitat footprint was added to Core Habitat. For the remaining 13 species, such as the Whip-poor-will, mapping of all individual occurrences was impractical. Instead, exemplary habitats, identified through expert knowledge of the distribution and biology of each species, were added to Core Habitat.

ACHIEVING STRATEGIC CONSERVATION WITH *BioMap2*: In *BioMap2*, the Core Habitat and Critical Natural Landscape are complementary and overlapping, and were delineated based on separate criteria. Each represents a different scale of biodiversity in Massachusetts, yet the protection of both is important to conserve the full suite of biodiversity in the state.

Both land protection and stewardship may be necessary to protect the biodiversity represented by the various Species of Conservation Concern. For example, many species are dependent on open habitats such as grasslands and shrublands, which can easily be overtaken by forest over time. Such areas may need regular thinning, mowing, or burning to maintain the open character of the habitats. In other areas, and for other species, simple land protection with no management can serve to protect these species and their habitats for the long term.