

Review of the petition to list the American horseshoe crab (*Limulus polyphemus*) under the Massachusetts Endangered Species Act (MESA)

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The petitioners are advocating to list the horseshoe crab as Special Concern Species as defined by the MESA. The relevant definitions in the MESA listing guidance are:

Special Concern – with reference to any species of plant or animal, means documented by biological research and inventory to have suffered a decline that could threaten the species if allowed to continue unchecked, or occurring in such small numbers, or with such a restricted distribution, or specialized habitat requirements, that it could easily become Threatened within Massachusetts (321 CMR 10.03).

Threatened – with reference to any species of plant or animal, means likely to become endangered within the foreseeable future throughout all or a significant portion of its range, or to be declining or rare as determined by biological research and inventory, and likely to become Endangered in Massachusetts in the foreseeable future (321 CMR 10.03).

Endangered – with reference to any species of plant or animal, means in danger of extinction throughout all or a significant portion of its range, or in danger of extirpation from Massachusetts, as documented by biological research and inventory (321 CMR 10.03).

Much of the petitioners' documentation focuses on the role or function of horseshoe crabs at high densities within the ecosystem. However, the listing criteria under the MESA relates to the risk of extinction or extirpation. The available research and data as presented by the petitioners, or that I am otherwise aware of, do not show that the horseshoe crabs' status could easily become Threatened', which is to say easily become 'likely to become in danger of extirpation from Massachusetts'.

Recently, the IUCN Species Specialist Group for Horseshoe Crabs completed a Green Status Assessment (GSA) for *Limulus polyphemus*. The GSA, unlike the Red List Assessment, includes a category for ecological functionality as a metric for species recovery. The horseshoe crabs' role in the ecosystem, which is density dependent, was evaluated in the GSA within spatial units throughout the species' range. The peer-reviewed finding was that the horseshoe crab populations in the spatial unit that includes Massachusetts (i.e., the mid-Atlantic: Northeast unit) fall short of functioning appropriately from an ecological standpoint because of population declines. However, the GSA also concluded that the populations currently are in a 'viable' state, which for the purposes of the GSA is applied when the population is not threatened because they are either stable or increasing. Thus, it's unlikely that horseshoe crabs will be extirpated from Massachusetts in the foreseeable future under current threats and conservation, which seems to be the finding most relevant to the MESA petition.

Smith, D., J. Brockmann, R. Carmichael, E. Hallerman, W. Watson, and J. Zaldívar-Rae. 2022. "*Limulus polyphemus* (Green Status assessment)." The IUCN Red List of Threatened Species 2022. ([www.iucnredlist.org/species/11987/80159830#green-assessment-information](http://www.iucnredlist.org/species/11987/80159830#green-assessment-information))