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Biology Department Receives Grant to Assess Juvenile Horseshoe Crab Populations in Long Island Sound

Mark Beekey, *Sacred Heart University*

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A juvenile horseshoe crab

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The Sacred Heart University Biology Department has received a $103,000 grant commitment from Connecticut Sea Grant and the National Oceanic and Atmospheric Administration to assess the demographics and habitat requirements of juvenile horseshoe crabs in Long Island Sound over the next two years. The grant work will be overseen by Associate Professor Mark Beekey and Professor Jennifer Mattei of the Biology Department. The grant includes $16,000 per year for graduate student support and $7,000 per year for undergraduate research support.

Horseshoe crabs, Beekey explains, provide a backdrop for one of the most interesting marine resource-management issues along the Atlantic coast. In addition to their role as a food source for birds, horseshoe crabs provide bait for commercial American eel and conch fisheries along the coast. Their unique blood is used by the biomedical industry to produce Limulus Amoebocyte Lysate (LAL), an enzymatic derivative used to detect endotoxins in drugs and medical implants.

“Atlantic States Marine Fisheries Commission stock assessments have clearly identified that horseshoe crabs in the New England and New York regions continue to decline,” Beekey says. “While Connecticut has taken limited steps to protect spawning adults and habitats—including establishing no-harvest zones at Sandy Point, West Haven, Milford Point, Milford and Menunketesuck Island in Westbrook—additional conservation and management efforts will be required to rebuild horseshoe crab stocks in Long Island Sound.”

According to Mattei, a key component of long-term sustainable management is to identify and characterize the types of habitats immature horseshoe crabs need to survive the 10 to 12 years before reaching maturity. “The goal of this two-year project is to learn where juvenile horseshoe crabs are residing, feeding and growing during the first few years of their lives, and then determine if there are specific characteristics that optimize juvenile horseshoe crab growth and survival,” she says.

To help achieve this goal, Beekey and Mattei will use volunteers participating in Project *Limulus*, their citizen science horseshoe crab-tagging program. Participants will search the Connecticut coast to identify marshes and intertidal flats containing juvenile horseshoe crabs. SHU graduate and undergraduate students will then visit these habitats to collect data on sediment type, wave action, depth, temperature, vegetation type, water quality and food availability. This data will be analyzed to develop a model that will assist *Connecticut's* Department of Energy and Environmental Protection (CT *DEEP*) in determining if particular habitats should be targeted for additional conservation measures.

"Due to federal budget cuts, the horseshoe crab tagging program managed by the U.S. Fish and Wildlife Service has been reduced along the Atlantic coast," Mattei observes. "This project will give our Project *Limulus* volunteers additional opportunities to participate in the ongoing efforts to rebuild horseshoe crab populations in Long Island Sound as well as gather critical data that will help us understand the growth and habitat requirements of juvenile horseshoe crabs." SHU students, she says, will gain valuable experience conducting research over the next two years as the grant provides funds for graduate students in the Department of Biology's Environmental Science & Management Professional Science Master's Program and for undergraduate biology majors.

For more information, visit www.sacredheart.edu/esm/ or www.projectlimulus.org.