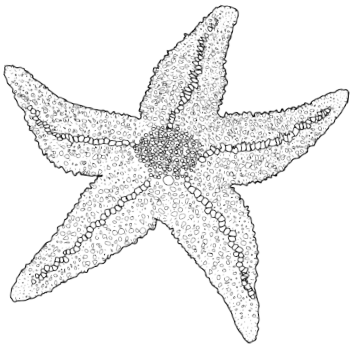
Sea Stars (Asteriidae)

Population Ecology and Availability of Specimens



Dissecting sea stars is an exciting, hands-on activity to help students understand structure and function. No doubt many students find dissection one of the most memorable parts of their science experience. Flinn Scientific believes in providing these opportunities while also being responsible stewards of the Earth. For that reason, at times sea stars may not be available for purchase because of shortages in supply.

All preserved sea stars are field-collected, meaning they are removed from the wild. This practice is regulated by the USDA to ensure sea star populations are not impacted in the long term. Historically, populations have been abundant and collection was not a major concern. Recently, though, millions of sea stars along the Pacific Coast have succumbed to sea star wasting syndrome, a degenerative condition that results in lesions, followed by loss of limbs, hemorrhaging of internal organs, and death.

Sea star wasting syndrome is caused by a densovirus that weakens the immune system, allowing bacterial infections. The virus has been around for at least 70 years and periodically impacts local populations. Typical outbreaks impact only a few species and mortality is usually isolated to specific geographic regions. By contrast, the 2014–2015 outbreak extends from Baja California, Mexico to Alaska and, as of January, 2015, has impacted 20 species. Within a 1-year time period, the proportion of observation sites experiencing high levels of wasting syndrome along the California coast rose from 39% to 87%.

Sea star wasting syndrome affects species from the family Asteriidae. *Pisaster brevispinus* (giant pink star) and *Pisaster ochraceus* (ochre/purple star), two of the most commonly harvested species, have experienced high rates of mortality. Flinn Scientific is commited to helping maintain healthy ecosystems; therefore, we will only offer sea stars when populations are stable and field collection is unrestricted.

Scientists are still collecting data and trying to understand why this outbreak is taking place. Research is under way to examine whether rising sea temperatures, ocean acidification, pollution, or other factors may be part of the larger issue. No effective means of controlling the spread of the virus exist at this time; however, there are encouraging signs that the virus does not affect the polyp stage of development.

Sea stars are considered a keystone species in the intertidal ecosystem, meaning they have a disproportionately large impact on the ecosystem's health. Sea stars are carnivores that feed primarily on mussels. When sea stars are removed from an area, the mussel population increases, while many species of algae and invertebrate species that thrive in the algae decline in population or are excluded. The algae are not able to compete with the mussels for space on the rocks. Diversity decreases and resiliency of the ecosystem is impaired.

Sstudents can learn about a variety of topics by studying the ecology of sea stars and the reasons behind the current shortage of dissection specimens. If sea stars are unavailable, take the opportunity to teach about ecosystem dynamics. Data and research updates on the 2014–2015 outbreak may be found at www.seastarwasting.org (accessed January, 2015). The site includes pictures, maps, data, and information about participating in monitoring activities for those who live near one of the research sites.

Publication No. 11274
061616