Decision maker analysis fact sheet
Invasive Species

New Zealand burrowing isopod
(Sphaeroma quoyanum)

First identified in Coos Bay in 1995. Introduced through ship-fouling or ship-boring.

The New Zealand burrowing isopod is well named – it is a prodigious burrower. Its preference for firmer sediments characteristic of those found in the upper intertidal areas of estuaries encourages it to burrow extensively in dikes, levees and the walls of tidal channels. It can burrow in mud, peat or sandstone and even Styrofoam or soft wood. Thousands of isopods, which look like common pill bugs or sow bugs, can concentrate in a square meter.

The burrowing isopods' small tunnels can perforate the banks of waterways and channels like Swiss cheese, weakening dikes, levees or sediments, and causing or contributing to collapses of the levees. They seem to prefer firmer sediments located in the brackish upper waters of the estuary – areas that, in estuaries such as Coos Bay, are often characterized by artificial or altered channels reinforced with levees and dikes.

Photographs by Tim Davidson, Oregon Institute of Marine Biology

New Zealand burrowing isopods are visible in the sandstone sediment sample. Each individual is about a quarter-inch to a half-inch in length.

The New Zealand burrowing isopod is one of about 4,000 species of ovoid-shaped crustaceans known as isopods. Isopods are characterized by having many pairs of similar legs (iso-pods = equal legs). The vast majority of isopods are marine animals that burrow in mudflats and salt marshes or live in plankton.

Burrowing isopods have been found among accumulations of organisms that collect on the hulls of ships, commonly referred to as ship-fouling organisms. Ship-fouling species can become invasive when they are carried to new waters, causing millions of dollars in environmental damage and economic loss.

Burrowing isopods grow up to 0.6" (15mm) long and are sandy dark brown to dark gray in color, often with mottled blackish patterns. They have stout, thick-bodied, sharp serrated paddle-like appendages in the hind region. They roll up into a ball when disturbed. They bore into soft wood or hard sediments using powerful mandibles to pull chunks of sediment from the burrow walls, which then float away. They feed on algae.

Since their arrival around 1995, scientists from the University of Oregon's Institute of Marine Biology have been studying burrowing isopods to learn more about their abundance, distribution and impact in Coos Bay. Burrowing isopods were known to be present in the Coalbank Slough area of Coos Bay, a neighborhood which experienced significant flooding following heavy rains in winter, 2006. It is unknown whether the presence of the isopods contributed to the collapse of a levee that caused the flooding.

However, studies of California bays indicate the effects of habitat alteration are likely to increase in severity in the coastal zone as these ecosystems become degraded by the isopods' activity.

Burrows of New Zealand burrowing isopods are seen in the peat soil of a stream bank.

In the California studies, isopod densities were found to be as high as 8,000 individuals per square meter. They constructed dense networks of burrows in the banks, like Swiss cheese in appearance, each burrow averaging 6 mm wide and 2 cm long. The isopods favored firm banks containing lots of decaying vegetation. Erosion is a natural process on the banks of salt marshes. But the California studies demonstrated that isopod-burrowing can increase erosion of the banks. In areas infested with *S. quoyanum*, soil losses may exceed 100 centimeters (about 39 inches) of marsh edge per year.

The U.S. Army Corps of Engineers considers the burrowing isopod a signficant threat to salt marsh restoration. Since the California study indicates the isopods seem to prefer vertical and overhanging banks, the Corps is now considering whether sloping the banks of restored salt marshes might reduce their appeal to isopods.

References

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Compiled January 2006 by the South Slough National Estuarine Research Reserve Coastal Training Program to assist decision makers in understanding the impacts that aquatic invasive species may have on important habitats, species and economic resources of the Oregon coast. For more information about the impacts of invasive species, contact the South Slough Reserve at 541.888.5558.

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