***Asterias amurensis*, the Northern Pacific seastar, was accidentally introduced into Australia in the 1980s. It is found in the Derwent Estuary in Tasmania and Port Phillip Bay, Victoria, where it displaces native marine life.** CSIRO Marine and Atmospheric Research

Invasive alien species threaten global biodiversity

The implications of climate change for biodiversity have been widely recognised, but the insidious effect of invasive alien species (IAS) on global biodiversity has received little attention. That is why this year's theme for the United Nations' International Day for Biological Diversity is invasive alien species and their impacts.

The International Convention on Biological Diversity (CBD) is a treaty to sustain the diversity of life on Earth. In 2006, the CBD recognised invasive alien species as 'one of the greatest threats to biodiversity, and to the ecological and economic well-being of society and the planet'.

Since then the threat of disruption from the migration of non-native species has continued to rise. Currently, invasive species are among the top three causes of biodiversity loss along with climate change and habitat destruction.

New threats come from a wide variety of plants and animals across both terrestrial and marine environments, and include diseases.

CSIRO is now putting considerable resources into research on invasive alien species and their effect on Australia's biodiversity, as well as actively participating in international groups such as DIVERSITAS (an international collaboration program on biodiversity science) and the Global Invasive Species Programme (an international partnership aiming specifically to conserve biodiversity and sustain livelihoods by minimising the spread and impact of invasive species).

According to CSIRO Biodiversity Research Director, Dr Mark Lonsdale, all the efforts made to manage the impact of climate change on biodiversity could be brought undone by invasive species.

'Climate change is putting our ecosystems under great stress and one consequence of this will be an influx of new pests, weeds and diseases.

'Increasing globalisation has led to greater movement of new species around the world, and native species killed or stressed by climate change will all too often be replaced by these weeds and feral animals.'

It is estimated that alien invertebrate and vertebrate pests and weeds cost Australia at least $7 billion a year; globally, the costs of invasive alien species are around US$350 billion. Already, 25 per cent of food product costs to consumers are due to invasive weeds, pests and diseases.

Protecting Australia's biosecurity is not just a matter of stopping things at the border – it requires a well coordinated quarantine continuum of pre-border, border and post-border prevention of invasive species.

Current CSIRO research targets invasive species already here as well as trying to anticipate and avert the next generation of invaders. The threats are diverse and hard to predict so excellence in risk-based research to make sense of the complexity is also essential.

CSIRO research ranges from weeds, rabbits, carp and risk analysis of potential invasive species to biological collections that underpin much of the research.

Weeds research, for example, is investigating individual weeds such as lantana as well as the impact of cyclones and climate change on current and potential weeds. The Australian National Herbarium, with its collection of native and exotic plants, underpins much of Australia's weeds research and provides a vital resource when a new invasive plant species is found.

CSIRO itself is the custodian of a number of collections of animal and plant specimens that contribute to national and international biological knowledge.

Invasive alien species are, therefore, a global problem and managing them will take efficient collaborative efforts at national and international levels, using the latest technology.

In Australia, the national Wealth from Oceans Flagship collaboration is building a management system for conserving marine biodiversity that will lead to environmental, economic and social benefits.

Similarly, the Invasive Animals Cooperative Research Centre (CRC) and the CRC for National Plant Biosecurity bring together the expertise of a number of organisations, including CSIRO, to focus efforts on forestalling new as well as current animal and plant pest threats.

More information:
International Convention on Biological Diversity, www.cbd.int

DIVERSITAS, www.diversitas-international.org

Global Invasive Species Programme, www.gisp.org/about/index.asp

Invasive Animals CRC, www.invasiveanimals.com