MARINE PESTS OF NSW

DEFINITION OF MARINE PESTS:

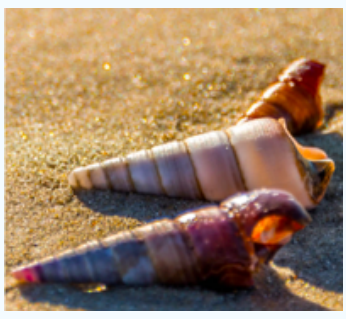
NON-NATIVE PLANTS OR ANIMALS THAT HARM OR HAVE THE POTENTIAL TO HARM NATIVE SPECIES, OR THE SOCIO-ECONOMICS RELATED TO THE ECOSYSTEM IF INTRODUCED OR SPREAD

CAULERPA TAXIFOLIA / AQUARIUM CAULERPA

Features: bright green (more pale when growing in colder waters), fan-like feathered leaves that grow directly opposite each other, leaves curved upwards, ~3-25 cm
Habitats: bays, estuaries, coastal lagoons (can also survive in cooler temperatures)

Concerns: damage to native species and their habitats, outgrowth of native species, entanglement in boat anchors and nets
Introduction: dumping of aquarium plants into the ocean
Dispersal: distributed once tangled in nets or anchors, or by more dumping of aquarium plants
Sources:
https://www.marinebiosecurity.org.nz/caulerpa-taxifolia/
https://www.marinepests.gov.au/pests/identify/aquarium-caulerpa
https://www.dpi.nsw.gov.au/fishing/aquatic-biosecurity/pests-diseases/marine-pests/seaweed/caulerpa-taxifolia

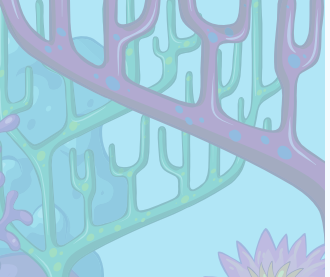
MAORICOLPUS ROSEUS / NEW ZEALAND SCREW SHELL



Features: brown to purple or white smooth cone shaped shell, up to 18 "whorls", normally ~6 cm but can be up to 9 cm
Habitats: under sand or mud within crevices, also found in shallow waters or near the shore

Concerns: alter native species habitats by carpeting seabeds, high densities of this species takes up the space where other native species may create habitats, might be attributing to the local extinction of native screw shells through competition
Introduction: live shipments of oysters and rocks introduced the species from NZ to Tasmania and Australia
Dispersal: population growth across areas where the species has been introduced
Sources:
- https://www.marinepests.gov.au/pests/identify/new-zealand-screw-shell
- https://reeflifesurvey.com/species/maoricolpus-roseus/
-http://www.mesa.edu.au/marine_pests/marine_pests07.asp
- https://www.cabi.org/isc/datasheet/115490
-https://www.derwentestuary.org.au/species/new-zealand-screw-shell/

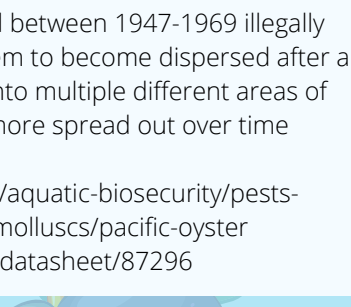
SABELLA SPALLANZANII / EUROPEAN FAN WORM



Features: flexible leathery brownish "tubes" from which the spiral fan comes from, fan is light yellow or white with red or brown bands, tube grows up to 40 cm long, fan grows to 20 cm long
Habitats: burrowed in shallow waters up to ~30 cm deep, usually found around rocks or shells in muds and sands, sheltered locations

Concerns: potential to alter native species ecosystems and habitation, overgrows native seagrass species, competition of food sources with native filter feeders, reduction of native fish populations
Introduction: uncertain, known to be native to the Mediterranean and eastern Atlantic Coast European countries
Dispersal: distributed by traveling vessels, also by fisheries and other forms of aquaculture, larvae is easily dispersible
Sources:
- http://www.mesa.edu.au/marine_pests/marine_pests11.asp
- https://en.wikipedia.org/wiki/Sabella_spallanzanii
- https://www.dpi.nsw.gov.au/fishing/aquatic-biosecurity/pests-diseases/marine-pests/other-marine-pests/european-fan-worm
- https://www.marinepests.gov.au/pests/identify/european-fan-worm
-https://eol.org/pages/586849

CARCINUS MAENAS / EUROPEAN GREEN SHORE CRAB



Features: smooth brownish green shell with pale orange underside ~7 cm width, 5 spines on each side of eyes, back legs are sharp with slightly flattened tips, no swimming paddles on hind legs
Habitats: shallow waters and shorelines, commonly found burrowed in mud or sand, or around mangroves and rocky reefs

Concerns: predator of native species and competitor for food and habitats, carry parasites, produce between 185,000 - 200,000 fertilized eggs at a time, impacts some shellfish industries
Introduction: unknown, likely by traveling on vessels, possibly intentional introduction for human consumption
Dispersal: distributed by fisheries, aquaculture and vessel travel, larvae diapered through water currents whilst "free swimming" for 90 days
Sources:
- https://www.marinebiosecurity.org.nz/carcinus-maenas/
- https://www.pir.sa.gov.au/biosecurity/aquatics/aquatic_pests/search_aquatic_pest_species/european_green_shore_crab
- https://vfa.vic.gov.au/__data/assets/pdf_file/0010/337708/European-shore-crab.pdf
- https://www.marinepests.gov.au/pests/identify/european-green-shore-crab
- https://www.dpi.nsw.gov.au/fishing/aquatic-biosecurity/pests-diseases/marine-pests/crustaceans/european-shore-crab

CRASSOSTREA GIGAS / PACIFIC OYSTER

Features: thin shell, no hinge teeth inside upper shell, purple or brown kidney shaped adductor muscle, with a black edged mantle, average size of adults is 150-200 cm, radial ribs present on both sides, whitish with purple spots
Habitats: varied hard substrates, up to 3 m below surface, thriving in brackish sheltered estuaries but can survive in waters with varying salinity levels, one side of the shell is usually cemented to a hard substrate, highly dense populations found in intertidal zones

Concerns: extremely high growth rates as well as reproduction rates (up to 40 million eggs per spawning), basically impossible to contain in favorable conditions, competition for food sources with native species, potential impact on other species in the area due to habitat modification
Introduction: deliberately introduced between 1947-1969 illegally
Dispersal: free floating larvae allows them to become dispersed after a spawning, they were also introduced into multiple different areas of Australia so they've likely become more spread out over time
Sources:
-https://www.dpi.nsw.gov.au/fishing/aquatic-biosecurity/pests-diseases/marine-pests/bivalve-molluscs/pacific-oyster
- https://www.cabi.org/isc/datasheet/87296

ACANTHOGOBIUS FLAVIMANUS / YELLOWFIN GOBY

Features: light brown to dark brown blotchy pattern with spots on both back and belly, heads wider than body with a maximum total length of approximately 31cm
Habitats: muddy and sandy estuaries, bays and river mouths

Concerns: competes with native species for space and food resources
Introduction: larvae carried by international cargo ships in ballast water-located in Hawkesbury and Hunter river estuaries
Dispersal: juveniles can swim as free-swimming larvae
Sources:

Kanou, K., Kohno, H. and Sano, M., 2004. Morphological and functional development of characters associated with settlement in the yellowfin goby, Acanthogobius flavimanus. Ichthyological Research, 51(3), pp.213-221..

Department of Primary Industries NSW. 2020. https://www.dpi.nsw.gov.au/.

DIDEMNUM VEXILLUM / INVASIVE EXOTIC COLONIAL SEASQUIRT

Features: spongy texture, orange, yellow or cream in colour, veiny surface with small pores
Habitats: hard surfaces and artificial structures like wharves, pilings and boat hulls

Concerns: overgrow and suffocating marine animals like mussels and oysters, impacts to agricultural farms and marine infrastructure such as wharves
Introduction: attach to marine infrastructure- in March 2010 this species was located in Twofold Bay NSW
Dispersal: carried by international cargo ships from various marine infrastructure
Sources:

Cottier-Cook, E.J., Minchin, J.D., Giesler, R., Graham, J., Mogg, A.O., Sayer, M.D. and Matejusova, I., 2019. Biosecurity implications of the highly invasive carpet sea-squirt Didemnum vexillum Kott, 2002 for a protected area of global significance. Management of biological invasions, 10(2), pp.311-323.

Department of Primary Industries NSW. 2020. https://www.dpi.nsw.gov.au/.

PERNA VIRIDIS / THE ASIAN GREEN MUSSEL

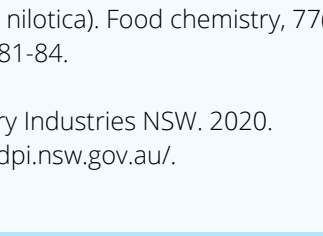
Features: bright green, dark green or brown shells with green edges, 8-10cm in length reaching up to 16cm
Habitats: tropical to warm waters, found in estuarine and marine habitats and on a variety of surfaces such as vessels, wharves, buoys and fish farm equipment

Concerns: easily outcompetes native species and gathers a high concentration of toxins like heavy metals that if eaten by humans, can cause shellfish poisoning
Introduction: international vessels arriving in Australian waters - in 2006 there was an isolated population in NSW that was eradicated quickly
Dispersal: distributed via vessel hulls, ballast water, ropes and in internal seawater systems
Sources:

Rajagopal, S.V.P.V., Venugopalan, V.P., Van der Velde, G. and Jenner, H.A., 2006. Greening of the coasts: a review of the Perna viridis success story. Aquatic ecology, 40(3), pp.273-297.

Department of Primary Industries NSW. 2020. https://www.dpi.nsw.gov.au/.

CHARYBDIS JAPONICA / THE ASIAN PADDLE CRAB



Features: red, purple, orange, pale green, and white with 6 spines on either side of their eyes, shell width can be up to 13cm in length
Habitats: hidden in sand and mud and can live in either estuarine and marine territories

Concerns: easily outcompetes with native species including the blue swimmer crab, for food and habitat and can transport the white spot syndrome virus which can affect native prawns and crabs
Introduction: international vessels arriving in Australian waters - in 2015, this species was located at Matilda Bay, NSW
Dispersal: bio fueling on vessels or equipment
Sources:

Liu, G., Yang, L., Fan, T., Cong, R., Tang, Z., Sun, W., Meng, X. and Zhu, L., 2006. Purification and characterization of phenoloxidase from crab Charybdis japonica. Fish & shellfish immunology, 20(1), pp.47-57.

Department of Primary Industries NSW. 2020. https://www.dpi.nsw.gov.au/.

OREOCHROMIS MOSSAMBICUS / MOZAMBIQUE TILAPIA

Features: dark olive to silver grey depending on age and environment with pronounced lips and jaw
Habitats: reservoirs, lakes, ponds, rivers, creeks, drains and, in muddy and well vegetated areas

Concerns: competition with native species for food and space, and predation on juvenile and eggs of native species
Introduction: anciently imported into Australian waters as aquarium fish - in 2014, this species was located in Cudgen Lake on the NSW far North Coast
Dispersal: carrying eggs and larvae in their mouths for up to 2 weeks
Sources:

Jamilah, B. and Harvinder, K.G., 2002. Properties of gelatins from skins of fish—black tilapia (Oreochromis mossambicus) and red tilapia (Oreochromis nilotica). Food chemistry, 77(1), pp.81-84.

Department of Primary Industries NSW. 2020. https://www.dpi.nsw.gov.au/.