## Appendix C

### Major introduced marine pests detected in Australia

***Asterias amurensis*** **(northern Pacific seastar)**

Populations in Victoria and Tasmania

- ?? major predator on wide range of marine species, including commercial shellfish
- ?? impacts on shellfish farms and temperate reef habitats
- ?? major threat to endangered species such as spotted handfish
- ?? recent invader that is rapidly spreading (established in Port Phillip Bay in 1998, population now estimated at 15,000,000 individuals)
- ??

***Carcinus maenas*** **(European shore crab)**

Populations in New South Wales, Victoria, Tasmania, South Australia and Western Australia

- ?? major predator on native bivalves and farmed shellfish species
- ?? forms dense populations and alters ecosystem function

***Mytilopsis sallei*** **(black-striped mussel)**

Isolated outbreak in Northern Territory in 1999 with local densities of 24,000 $m^2$.

- ?? similar to zebra mussel (annual control cost in the USA of $US 30 million)
- ?? population explodes forming massive monocultures (15 cm thick,100 $kg/m^2$)
- ?? grows on a wide range of substrates including water intake piping
- ?? out-competes native and farmed species and alters nutrient flows
- ?? directly threatens shellfish, shipping and other maritime industries

***Sabella spallanzanii*** **(Mediterranean fanworm)**

Populations in New South Wales, Victoria, South Australia, and Western Australia. Detected in Tasmania but may not have established

- ?? competes for phytoplankton food with native bivalves and other shellfish
- ?? changes the marine environment, affecting water circulation, nitrification, fish breeding, seagrass beds
- ?? impacts on fishing operations

***Undaria pinnatifida*** **(Undaria seaweed, wakame)**

Populations in Tasmania and Victoria

- ?? forms massive stands that out-compete native species for space and light
- ?? impacts on abalone and other shellfish farms by invading suitable habitat; fouls fish farm cages and equipment
- ?? recent invader that is rapidly spreading

***Codium fragile tomentosoides*** **(broccoli weed)**

Populations in Victoria

- ?? smothers and competes with native species

***Musculista senhousia* (Asian mussel)**

Populations in Tasmania, Victoria, South Australia and Western Australia.
Recently detected on a recreational vessel in Darwin (1999)

- ?? can form major outbreaks that out-compete other shellfish and native species

***Corbula gibba* (European clam)**

Populations in Victoria and Tasmania

- ?? can form major outbreaks that out-compete other shellfish and native species

***Caulerpa* species (caulerpa)**

Populations of *C. scapelliformes* and *C. filiformis* in New South Wales.
Populations of *C. taxifolia* in Queensland, New South Wales and Western Australia

- ?? grows quickly and out-competes native sea grass, an important marine habitat
- ?? the *C. taxifolia* aquarium hybrid (not yet in Australia) aggressively overgrows native species to form massive monocultures, is toxic to browsing fish and invertebrates, and has no known controls

***Maoricolpus roseus* (New Zealand screwshell)**

Populations in New South Wales, Victoria and Tasmania

- ?? forms concentrations of up to 1,000 $m^2$ on the continental shelf and in some inshore areas, and is likely to be Australia's most numerous marine invader
- ?? impacts on fishing operations (eg scallop trawling)
- ?? huge biomass suggests possible role in demise of native shellfish and changes to water and nutrient flows

***Crassostrea gigas* (feral Pacific oyster)**

Farmed and feral populations in Tasmania, New South Wales and South Australia.

- ?? causes loss of aesthetic and amenity value (alteration of the appearance of shores; faeces from dense colonies enrich sediments; sharp edges of shells injure coastal users and damage equipment)
- ?? competes for space and nutrients with native species
- ?? can pass on a parasitic copepod (*Mytilocola orientalis*) to commercial mussels

***Gymnodinium* and *Alexandrium* species (toxic dinoflagellates, red tides)**

Widespread in algal blooms; more prevalent in southern Australia

- ?? impacts on human health through paralytic shellfish poisoning
- ?? leads to closures of fisheries and marine farms