



Australian Government

Department of Sustainability, Environment,  
Water, Population and Communities



# Species group report card – bony fishes

Supporting the marine bioregional plan  
for the North Marine Region

prepared under the *Environment Protection and Biodiversity Conservation Act 1999*

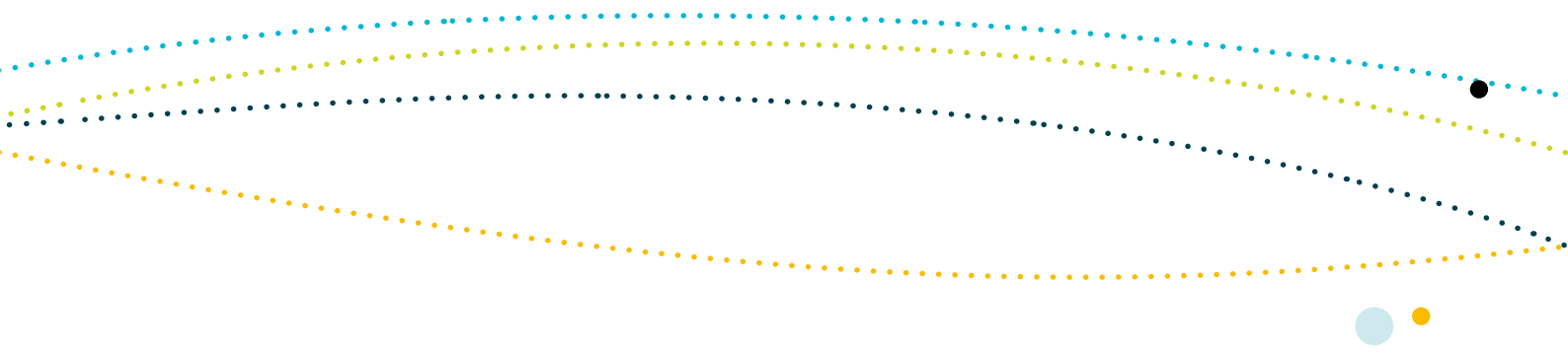
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Yellowstripe Snapper – Robert Thorn and DSEWPaC, A gorgonian with polyps extended – Geoscience Australia, Crested Tern fishing – R.Freeman, Nautilus – A.Heyward and M.Rees, Morning Light – I.Kiessling, Soft corals – A.Heyward and M.Rees, Customs boat – Australian Customs, Freshwater sawfish – R.Pillans, CSIRO Marine and Atmospheric Research, Hard corals – A.Heyward and M.Rees



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# SPECIES GROUP REPORT CARD – BONY FISHES

Supporting the marine bioregional plan for the North Marine Region prepared under the *Environment Protection and Biodiversity Conservation Act 1999*

## Report cards

The primary objective of the report cards is to provide accessible information on the conservation values found in Commonwealth marine regions. This information is maintained by the Department of Sustainability, Environment, Water, Population and Communities and is available online through the department's website ([www.environment.gov.au](http://www.environment.gov.au)). A glossary of terms relevant to marine bioregional planning is located at [www.environment.gov.au/marineplans](http://www.environment.gov.au/marineplans).

Reflecting the categories of conservation values, there are three types of report cards:

- species group report cards
- marine environment report cards
- protected places report cards.

While the focus of these report cards is the Commonwealth marine environment, in some instances pressures and ecological processes occurring in state waters are referred to where there is connectivity between pressures and ecological processes in state and Commonwealth waters.





## Species group report cards

Species group report cards are prepared for large taxonomic groups that include species identified as conservation values in a region; that is, species that are listed under Part 13 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and live in the Commonwealth marine area for all or part of their lifecycle. All listed threatened, migratory and marine species and all cetaceans occurring in Commonwealth waters are protected under the EPBC Act and are identified in the relevant marine bioregional plans as conservation values.

Species group report cards focus on species for which the region is important from a conservation perspective; for example, species of which a significant proportion of the population or an important life stage occurs in the region's waters.

For these species, the report cards:

- outline the conservation status of the species and the current state of knowledge about its ecology in the region
- define biologically important areas; that is, areas where aggregations of individuals of a species display biologically important behaviours
- assess the level of concern in relation to different pressures.



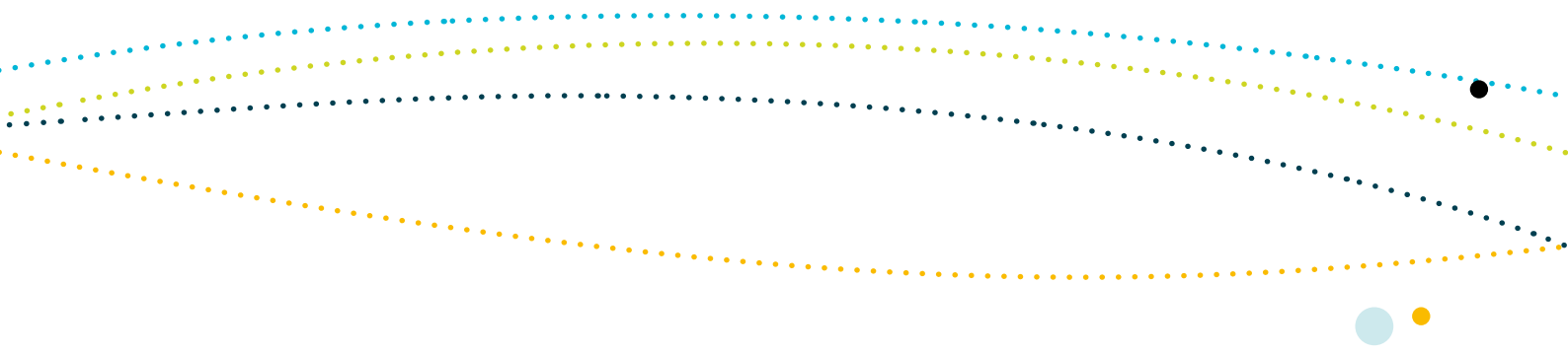
## 1. Bony fishes of the North Marine Region

The family Syngnathidae is a group of bony fishes that includes seahorses, pipefishes, pipehorses and sea dragons. Australia has the highest recorded diversity of syngnathids in the world, with an estimated 25–37 per cent of the 330 syngnathid species currently described (Pogonoski et al. 2002). Along with syngnathids, members of the related Solenostomidae family (ghost pipefish) are also found in the North Marine Region.

Approximately 28 species of syngnathids and 2 species of solenostomids are known to occur in the North Marine Region (see Table 1 and Table A1 in Attachment 1), and a further 35 species may infrequently occur in the region (DEWHA 2008; see Table A2 in Attachment 1). New syngnathid species have been discovered in recent years (Foster & Gomon 2010; GBRMPA 2000; Kuitert 2003; Scales 2010). The taxonomy of some syngnathid species is still in flux; however, molecular tools have provided much-needed clarification (DEWHA 2008; Scales 2010). This report card focuses on the 30 syngnathid and solenostomid species known to occur in the North Marine Region. See Attachment 1 for a full list of scientific names.

Seahorses and pipefishes are a diverse group and occupy a wide range of habitats. The species considered in this report card generally display a preference for seagrass and macroalgal beds, coral reefs, mangroves and sponge gardens (Foster & Vincent 2004; Lourie et al. 2004; Scales 2010). Species within the syngnathid family have distinct characteristics, with differing habitats, distribution and relative abundance patterns across the region. Some species are apparently rare and localised, such as the big-head seahorse (*Hippocampus grandiceps*), which is considered likely to be endemic to the region; other species are widely distributed and very common, such as the Pacific short-bodied pipefish (*Choeroichthys brachysoma*) (Kuitert 2001; Pogonoski et al. 2002).

Habitat that supports syngnathid populations is generally patchy, so populations of syngnathid species may be dispersed and fragmented (CITES 2001). Some groups of syngnathids— notably the seahorses with their limited swimming capabilities—have particular microhabitat preferences and often occupy protected environments such as the edges of seagrass, kelp bed, algae, mangrove and coral reef habitats (CITES 2001; Scales 2010). Syngnathids are typically carnivorous, feeding in the water column on or near the sea floor. Their diet consists mainly of small crustaceans such as copepods; small invertebrates, such as mysids in the zooplankton; small amphipods; and occasionally larval fish (CITES 2001; Gronell 1983; Kendrick & Hyndes 2005; Martin-Smith 2008).



No syngnathids or solenostomids are listed as threatened or migratory under the EPBC Act; however, they are listed as marine species under section 248 of the Act (DEWHA 2008; DSEWPaC 2011). The EPBC Act controls international trade in all wild capture and aquarium-raised Australian syngnathid and solenostomid species. Within the Syngnathidae family, the entire genus *Hippocampus* (seahorses) are listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (CITES 2008; Scales 2010). This genus is traded internationally in dried form for traditional medicine and ornaments, as well as live for aquarium display (Bruckner et al. 2005; Martin-Smith & Vincent 2006; Scales 2010). As a signatory to CITES, Australia is obliged to manage international trade in seahorses to ensure the persistence of wild populations. Licences are granted under CITES for trade in these species. Seahorse overexploitation in target and bycatch fisheries, and in international trade, is placing increasing pressure on these charismatic bony fish (Bruckner et al. 2005; Martin-Smith & Vincent 2006; Scales 2010).

### Biologically important areas

Biologically important areas are areas that are particularly important for the conservation of the protected species and where aggregations of individuals display biologically important behaviour such as breeding, foraging, resting or migration. The presence of the observed behaviour is assumed to indicate that the habitat required for the behaviour is also present. Biologically important areas have been identified for some EPBC Act listed species found in the North Marine Region, using expert scientific knowledge about species' distribution, abundance and behaviour in the region. The selection of species was informed by the availability of scientific information, the conservation status of listed species and the importance of the region for the species. The range of species for which biologically important areas are identified will continue to expand as reliable spatial and scientific information becomes available.

Biologically important areas have not yet been identified for seahorse and pipefish species in the North Marine Region.



## 2. Vulnerabilities and pressures

### Vulnerabilities

Many syngnathids, particularly seahorses, are vulnerable to overexploitation as a result of their biology. Syngnathids are characterised by relatively low population densities; low mobility and small home range sizes; dependency at birth and offspring dependence on the survival of the males; monogamous breeding (a ‘widowed’ partner may stop reproducing until another mate is found); small brood sizes; and strong association with preferred habitats (CITES 2001; Foster & Vincent 2004; Scales 2010; Vincent 1996). The life expectancy for many syngnathids is unknown, but they are believed to be short-lived (Barrows et al. 2009; Kuitert 2009). Syngnathids have specific habitat preferences within small home range area, which reduces their ability to find and adapt to new habitats. *Hippocampus* species and *Solegnathus* species are among the site-associated genera whose life histories might render them vulnerable to overfishing, or other disruptions such as habitat damage (Martin-Smith & Vincent 2006; Pogonoski et al. 2002). Habitat protection is one of the most important factors in protecting seahorses (Kuitert 2001).

In contrast, a number of pipefish species that live in coastal waters have high population densities and live in unstable habitats subject to damage from storms and dramatic changes in temperature or salinity. These species can quickly colonise patches of suitable habitat. Many *Doryrhamphinae* species of pipefish breed readily in captivity when given enough shelter, and can live for up to 10 years (Kuitert 2009). However, Gronell (1983) suggests that *Corythoichthys* species are monogamous and mate for life, which may increase the vulnerability of the species to anthropogenic pressures.

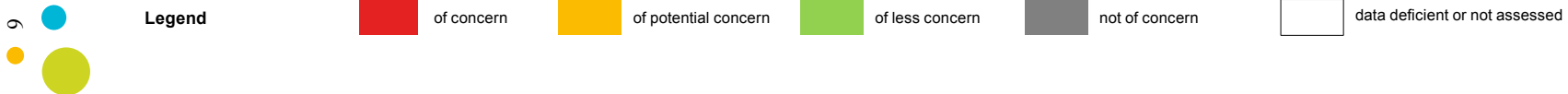
### Analysis of pressures

On the basis of current information, pressures have been analysed for the 30 seahorse and pipefish species discussed in this report card. A summary of the pressure analysis for seahorses and pipefishes is provided in Table 1. Only those pressures identified as *of concern* or *of potential concern* are discussed in further detail below. An explanation of the pressure analysis process, including the definition of substantial impact used in this analysis, is provided in Part 3 and Section 1.1 of Schedule 1 of the plan.



**Table 1: Outputs of pressure analysis of selected seahorse and pipefish species for the North Marine Region**

Pressure	Changes in sea temperature	Ocean acidification	Chemical pollution/ Contaminants	Nutrient pollution	Light pollution	Physical habitat modification	Extraction of living resources		Bycatch	Collision with vessels	Invasive species
Source	Climate change	Climate change	Onshore and offshore mining	Agricultural activities, urban development	Onshore and offshore activities	Dredging, fishing gear (active and derelict)	Commercial fishing (domestic)	IUU (domestic or non-domestic)	Commercial fishing	Shipping, fishing vessels, vessels (other)	Land-based activities, shipping, vessels (other)
Species											
<b>Seahorses</b>											
Big-head seahorse											
Hedgehog seahorse											
High-crown seahorse											
Kellogg's seahorse											
Northern spiny seahorse											
Three-spot seahorse											
Western spiny seahorse											
Winged seahorse											
Yellow seahorse											
<b>Pipefishes</b>											
Banded pipefish											
Blue-finned ghost pipefish											
Brock's pipefish											
Cleaner pipefish											
Double-ended pipehorse											
Girdled pipefish											
Günther's pipehorse											
Harlequin ghost pipefish											

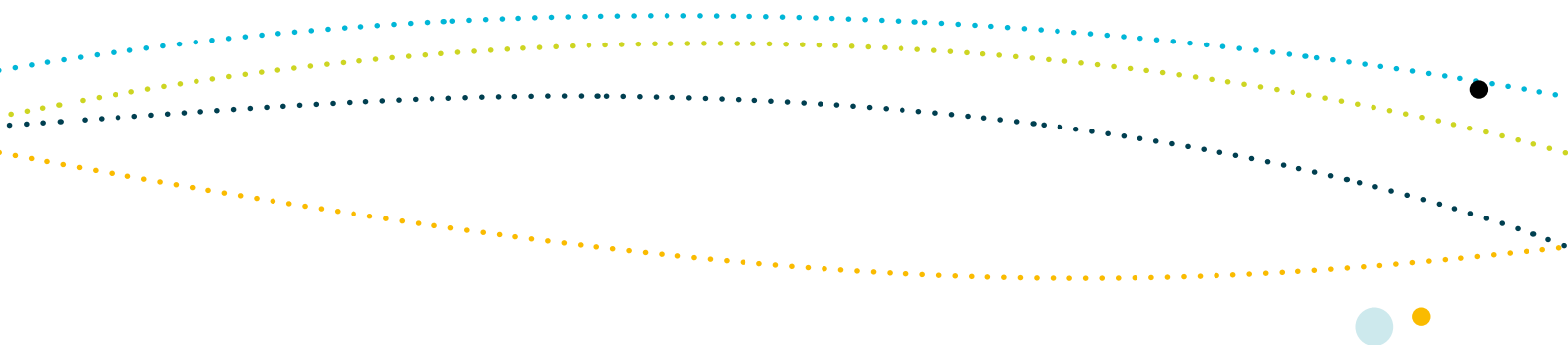


**Table 1 continued: Outputs of pressure analysis of selected seahorse and pipefish species for the North Marine Region**

Pressure	Changes in sea temperature	Ocean acidification	Chemical pollution/Contaminants	Nutrient pollution	Light pollution	Physical habitat modification	Extraction of living resources		Bycatch	Collision with vessels	Invasive species
Source	Climate change	Climate change	Onshore and offshore mining	Agricultural activities, urban development	Onshore and offshore activities	Dredging, fishing gear (active and derelict)	Commercial fishing (domestic)	IUU (domestic or non-domestic)	Commercial fishing	Shipping, fishing vessels, vessels (other)	Land-based activities, shipping, vessels (other)
Species											
Long-nosed pipefish											
Mud pipefish											
Pacific short-bodied pipefish											
Pallid pipehorse											
Pig-snouted pipefish											
Red-banded pipefish											
Reef-top pipefish											
Ribboned seadragon											
Ridge-nose pipefish											
Short-pouch pygmy pipehorse											
Three-keel pipefish											
Tidepool pipefish											
Yellow-banded pipefish											

**Legend**

- of concern
- of potential concern
- of less concern
- not of concern
- data deficient or not assessed



### **Physical habitat modification – dredging; fishing gear (active and derelict)**

Physical habitat modification is assessed as *of potential concern* for all 30 seahorse and pipefish species assessed. Habitat loss and degradation are probably the greatest conservation concerns for most Australian coastal species of syngnathids (Pogonoski et al. 2002). Degradation of estuaries and coastal lakes, declines in seagrasses, loss of mangroves and salt marshes, unsustainable coastal development, effects of fishing, introduction of foreign organisms and population increases in native species all pose problems for syngnathids (Martin-Smith & Vincent 2006).

Dredging activities and industrial development anticipated in and adjacent to the North Marine Region have potential for degradation and loss of inshore habitat. Minor population declines in seahorses and pipefishes, particularly endemic species, are possible (DEWHA 2008). *Hippocampus* species and *Solegnathus* species are among the site-associated fish genera that may be vulnerable to overfishing or other disruptions, such as habitat damage (Martin-Smith & Vincent 2006; Pogonoski et al. 2002; Vincent et al. 2005). Mobile fishing gear (such as trawl) can crush, bury or expose marine animals and structures on and in the substratum, sharply reducing structural diversity (Watling & Norse 1998). Syngnathids associated with soft bottom substrates (such as the big-head seahorse) are particularly susceptible to the effects of dredging and trawl activity (Pogonoski et al. 2002).

### **Bycatch – commercial fishing**

Bycatch is assessed as *of potential concern* for the pallid pipehorse (*Solegnathus hardwickii*), Günther's pipehorse (*Solegnathus lettiensis*), long-nosed pipefish (*Trachyrhamphus longirostris*) and ribboned seadragon (*Haliichthys taeniophorus*). Syngnathids have been recorded in the trawl bycatch of the Northern Prawn Fishery, including *Haliichthys taeniophorus* and *Trachyrhamphus longirostris* (Stobutzki et al. 2000). Griffiths et al. (2004) identified two species caught as bycatch in trawl fisheries, including the Günther's pipehorse and pallid pipefish. *Solegnathus* spp. are among the largest syngnathids, growing up to 50 centimetres long (Dawson 1985), so are likely to be caught in demersal fishing gear. Information available on the catch rate of syngnathids suggests it is very low and is being addressed by the bycatch monitoring program for the Northern Prawn Fishery (AFMA 2007).

Syngnathid species taken from deepwater trawling operations, such as *Solegnathus* species, are unlikely to survive if returned to the water (Connolly et al. 2001; Dodt 2005, 2006). Syngnathids taken from shallow water trawl or dredging activities may survive if returned to the water, especially if the trawl duration is relatively short (A. Mednis pers. comm. in Pogonoski et al. 2002).



### 3. Relevant protection measures

The 30 seahorse and pipefish species discussed in this report card are listed as marine species under the EPBC Act. Under the Act, it is generally an offence to kill, injure, take, trade, keep or move listed marine, migratory or threatened species on Australian Government land or in Commonwealth waters without a permit.

Alongside the EPBC Act, a broad range of sector-specific management measures to address environmental issues and mitigate impacts apply to activities that take place in Commonwealth marine areas. These measures give effect to regulatory and administrative requirements under Commonwealth and state legislation for activities such as commercial and recreational fishing, oil and gas exploration and production, ports activities and maritime transport. In some instances, as in the case of shipping, these measures also fulfil Australia's obligations under a number of international conventions for the protection of the marine environment from pollution and environmental harm.

#### International measures

Australia is a signatory to the following international agreements for the conservation of seahorses and pipefishes:

- Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)—[www.cites.org](http://www.cites.org)

For more information on conservation listings under the EPBC Act, and related management objectives and protection measures, visit:

- [www.environment.gov.au/coasts/species/marine-species-list.html](http://www.environment.gov.au/coasts/species/marine-species-list.html)  
(listed marine species)
- [www.environment.gov.au/cgi-bin/sprat/public/sprat.pl](http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl)  
(species profile and threats database)



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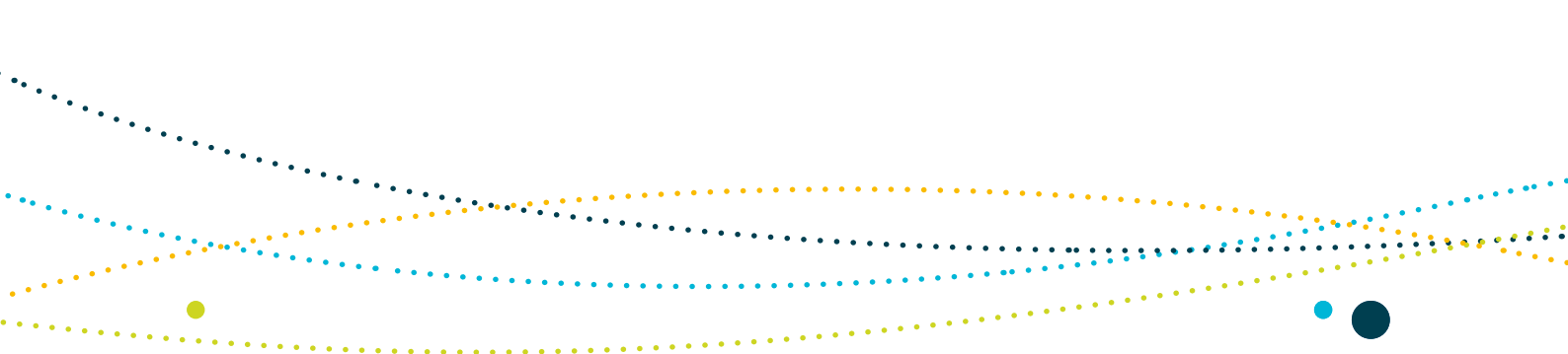
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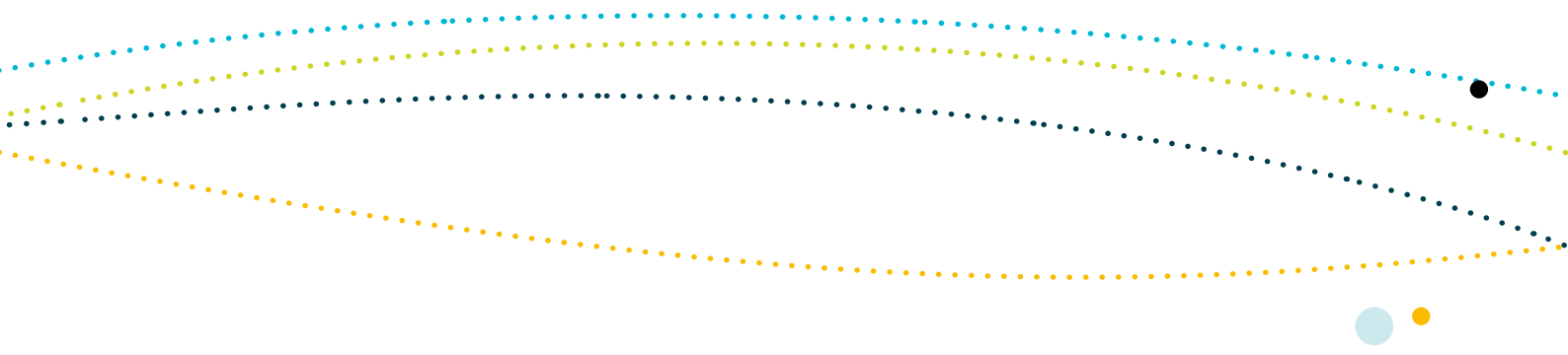
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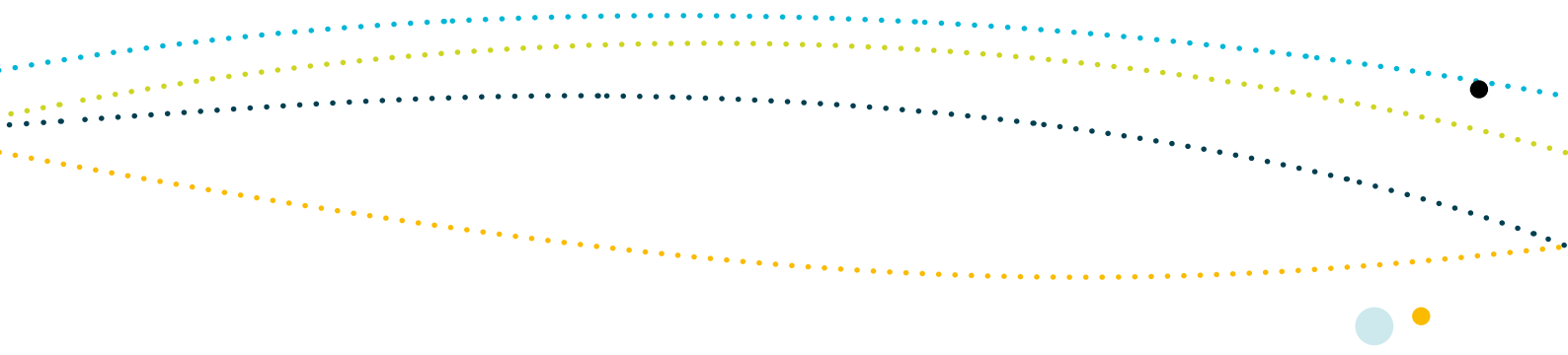
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# ATTACHMENT 1: BONY FISH SPECIES OCCURRING IN THE NORTH MARINE REGION

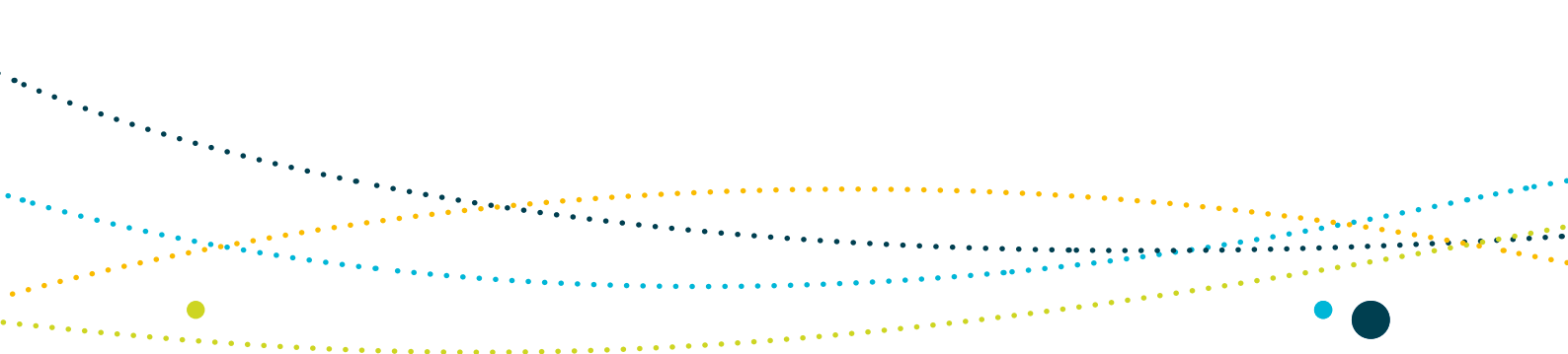
**Table A1: Seahorse and pipefish species known to occur in the North Marine Region**

Species (common name/ scientific name)	Conservation status
<b>Seahorses</b>	
Common seahorse <i>Hippocampus taeniopterus</i>	Marine Listed under CITES (Appendix II)
Big-head seahorse <i>Hippocampus grandiceps</i>	Marine Listed under CITES (Appendix II)
Hedgehog seahorse <i>Hippocampus spinosissimus</i>	Marine Listed under CITES (Appendix II)
High-crown seahorse <i>Hippocampus procerus</i>	Marine Listed under CITES (Appendix II)
Kellogg's seahorse <i>Hippocampus kelloggi</i>	Marine Listed under CITES (Appendix II)
Northern spiny seahorse <i>Hippocampus multispinus</i>	Marine Listed under CITES (Appendix II)
Three-spot seahorse <i>Hippocampus trimaculatus</i>	Marine Listed under CITES (Appendix II)
Western spiny seahorse, narrow-bellied seahorse <i>Hippocampus angustus</i>	Marine Listed under CITES (Appendix II)
Winged seahorse <i>Hippocampus alatus</i>	Marine Listed under CITES (Appendix II)
Yellow seahorse, spotted seahorse <i>Hippocampus kuda</i>	Marine Listed under CITES (Appendix II)





Species (common name/ scientific name)	Conservation status
<b>Pipefishes</b>	
Banded pipefish, ringed pipefish <i>Dunckerocampus dactyliophorus</i>	Marine
Blue-finned ghost pipefish, robust ghost pipefish <i>Solenostomus cyanopterus</i>	Marine
Brock's pipefish <i>Halicampus brocki</i>	Marine
Cleaner pipefish, Janss' pipefish <i>Doryrhamphus janssi</i>	Marine
Double-ended pipehorse, alligator pipefish <i>Syngnathoides biaculeatus</i>	Marine
Girdled pipefish <i>Festucalex cinctus</i>	Marine
Günther's pipehorse, Indonesian pipefish <i>Solegnathus lettiensis</i>	Marine
Harlequin ghost pipefish, ornate ghost pipefish <i>Solenostomus paradoxus</i>	Marine
Long-nosed pipefish, straightstick pipefish <i>Trachyrhamphus longirostris</i>	Marine
Mud pipefish, Gray's pipefish <i>Halicampus grayi</i>	Marine
Pacific short-bodied pipefish <i>Choeroichthys brachysoma</i>	Marine
Pallid pipehorse, Hardwick's pipehorse <i>Solegnathus hardwickii</i>	Marine
Pig-snouted pipefish <i>Choeroichthys suillus</i>	Marine
Red-banded pipefish, brown-banded pipefish, Fijian banded pipefish, Fijian pipefish <i>Corythoichthys amplexus</i>	Marine
Reef-top pipefish <i>Corythoichthys haematopterus</i>	Marine

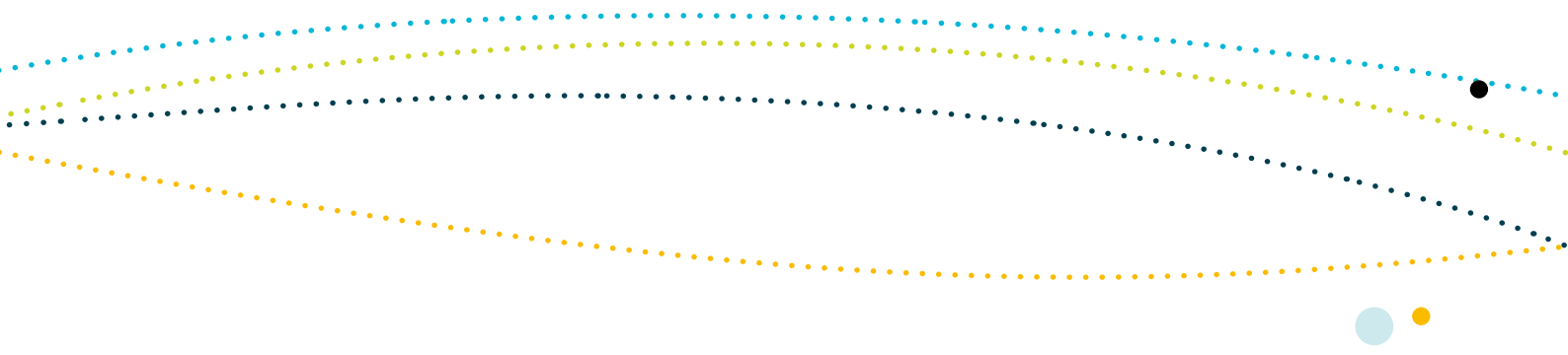


Species (common name/ scientific name)	Conservation status
Ribboned seadragon, ribboned pipefish <i>Haliichthys taeniophorus</i>	Marine
Ridge-nose pipefish, red-hair pipefish, Duncker's pipefish <i>Halicampus dunckeri</i>	Marine
Short-pouch pygmy pipehorse <i>Acentronura breviperula</i>	Marine
Three-keel pipefish <i>Campichthys tricarinatus</i>	Marine
Tidepool pipefish <i>Micrognathus micronotopterus</i>	Marine
Yellow-banded pipefish <i>Corythoichthys flavofasciatus</i>	Marine

**Table A2: Seahorse and pipefish species known to occur in the North Marine Region on an infrequent basis**

Species (common name/ scientific name)	Conservation status
<b>Seahorses</b>	
Common seahorse <i>Hippocampus taeniopterus</i>	Marine Listed under CITES (Appendix II)
Denise's seahorse <i>Hippocampus denise</i>	Marine Listed under CITES (Appendix II)
Flat-face seahorse <i>Hippocampus planifrons</i>	Marine Listed under CITES (Appendix II)
Low-crown seahorse <i>Hippocampus dahl</i>	Marine Listed under CITES (Appendix II)
Pygmy seahorse, gorgonian seahorse <i>Hippocampus bargibanti</i>	Marine Listed under CITES (Appendix II)





Species (common name/ scientific name)	Conservation status
Zebra seahorse <i>Hippocampus zebra</i>	Marine Listed under CITES (Appendix II)
<b>Pipefishes</b>	
Anderson's pipefish, shortnose pipefish <i>Micrognathus andersonii</i>	Marine
Australian messmate pipefish, banded pipefish <i>Corythoichthys intestinalis</i>	Marine
Beady pipefish, Steep-nosed pipefish <i>Hippichthys penicillus</i>	Marine
Belly-barred pipefish, banded freshwater pipefish <i>Hippichthys spicifer</i>	Marine Listed under CITES (Appendix II)
Bend stick pipefish, bentstick pipefish, short-tailed pipefish <i>Trachyrhamphus bicoarctatus</i>	Marine
Blue-speckled pipefish, blue-spotted pipefish <i>Hippichthys cyanospilos</i>	Marine
Corrugated pipefish, barbed pipefish <i>Bhanotia fasciolata</i>	Marine
Davao pughead pipefish <i>Bulbonaricus davaoensis</i>	Marine
Delicate ghost pipefish <i>Solenostomus leptosomus</i>	Marine
Gibbs' pipefish <i>Festucalex gibbsi</i>	Marine
Glittering pipefish <i>Halicampus nitidus</i>	Marine
Halimeda ghost pipefish <i>Solenostomus halimeda</i>	Marine
Indian blue-stripe pipefish, blue-stripe pipefish <i>Doryrhamphus excisus</i>	Marine
Madura pipefish, reticulated freshwater pipefish <i>Hippichthys heptagonus</i>	Marine

Species (common name/ scientific name)	Conservation status
Maxweber's pipefish <i>Cosmocampus maxweberi</i>	Marine
Offshore pipefish <i>Micrognathus natans</i>	Marine
Orange-spotted pipefish, ocellated pipefish <i>Corythoichthys ocellatus</i>	Marine
Paxton's pipefish <i>Corythoichthys paxtoni</i>	Marine
Roughridge pipefish <i>Cosmocampus banneri</i>	Marine
Rough-snout ghost pipefish <i>Solenostomus paegnius</i>	Marine
Samoan pipefish <i>Halicampus mataafae</i>	Marine
Sculptured pipefish <i>Choeroichthys sculptus</i>	Marine
Short-keeled pipefish <i>Hippichthys parvicarinatus</i>	Marine
Short-tailed pipefish, short-tailed river pipefish <i>Microphis brachyurus</i>	Marine
Shultz's pipefish <i>Corythoichthys schultzi</i>	Marine
Spiny-snout pipefish <i>Halicampus spinirostris</i>	Marine
Thorn-tailed pipefish <i>Micrognathus brevirostris</i>	Marine
Tiger pipefish <i>Filicampus tigris</i>	Marine
Whiskered pipefish, ornate pipefish <i>Halicampus macrorhynchus</i>	Marine

