(English only / Únicamente en inglés / Seulement en anglais)

Response from IUCN SSC Seahorse, Pipefish and Stickleback Specialist Group regarding AC27 Doc 25.1: REPORT OF THE SPECIALIST ON ZOOLOGICAL NOMENCLATURE with respect to item 2: *Hippocampus* taxonomy

Australia requested at AC27 that eight species of seahorse described in Kuiter 2001 be recognized as valid species under CITES: *H. bleekeri, H. dahlia, H. elongatus, H. kampylotrachelos, H. planifrons, H. taeniopterus, H. tristis*, and *H. tuberculatus*. The IUCN Seahorse, Pipefish and Stickleback Specialist Group (IUCN SPS SG) has long been aware of this challenge of the Australian *Hippocampus* without having the resources to address it directly. We have now brought together all available evidence to support the Nomenclature Specialist in making decisions about Australia's proposal to revise the species list for the genus *Hippocampus*.

Seahorses are notoriously difficult to identify. However, each species should represent a monophyletic lineage and, as the Nomenclature Specialist noted during the Nomenclature Working Group at AC27, have diagnostic features (preferably morphological and genetic) that clearly separate it from other species. This would be particularly true in the CITES context, of course, where Parties are required to identify species rapidly and reliably.

After careful review, the IUCN SPS SG concludes that none of the eight species proposed in Kuiter 2001 stands up to scrutiny and all eight species synonymise with pre-existing species. We make three core points:

1. A trained seahorse taxonomist with a PhD in the field, Dr. Sara Lourie (SL in Table 1), could not distinguish the new species in Kuiter 2001 from pre-existing species. This bodes ill for CITES implementation.
2. Any paper that has subsequently explored the species proposed in Kuiter 2001 – including those that use genetics – has found no basis for these new species.
3. Dr. Lourie examined the type specimens used in generating Kuiter 2001 and found numerous difficulties. For example, (i) the type for *H. kampylotrachelos* was in poor condition, (ii) the type for *H. planifrons* uses the absence of spots as a distinguishing feature but the specimen had been bleached, and (iii) the type for *H. tristis* came from Melbourne fish market (and was then inferred to be an Australian species although it could have come from elsewhere).

We summarize our main points with respect to each species in Table 1, below.

Kuiter 2001 species name	**IUCN SPS SG recognised species name / pre-existing species**	**IUCN SPS SG key explanation**	**Distribution of proposed species from Kuiter 2001**	**Details of explanation**
H. bleekeri	***H. abdominalis***	Published evidence supports *H. bleekeri* as a synonym with *H. abdominalis*. There are no distinguishing features, morphometric nor genetic. Three references confirm this view: Armstrong (2001); Nickel and Cursons (2012); Lourie et al. (2004).	southeastern Australia	Nickel and Cursons (2012) state: High morphological variability of *H. abdominalis* provoked uncertainty in regards to its taxonomic classification. In 2001, Kuiter suggested that *H. abdominalis* is comprised of multiple species, with the South Australian and Victorian populations being *H. bleekeri* and the Tasmanian and New Zealand populations *H. abdominalis*. This finding was refuted by Armstrong (2001) using a combined meristic genetic study with a primary focus on a 357 bp region of the mitochondrial gene cytochrome b and Lourie et al. (2004) who conducted a morphometric review of the genus.
H. dahli	***H. trimaculatus***	Sara Lourie (SL) examined specimens and found no distinct features; Chang et al. (2013) did study on trimaculatus genetics and lists *H. dahli* as synonym.	northeastern Australia	Based on morphological examination of 10 specimens from the Museum and Art Gallery of the Northern Territory that Kuiter identified as *H. dahli*, SL couldn't find any features that distinguished them from *H. trimaculatus*; Kuiter gives no distinguishing features for these species, and therefore no evidence for resurrecting this name.
H. elongatus	***H. subelongatus***	All consulted sources (including "Catalogue of Fishes" by Eschmeyer and Fricke) list *H. elongatus* as a synonym of *H. subelongatus*.	southwestern Australia	Lourie et al 2004, Global Biodiversity Information Facility, FishBase, Catalogue of Life, and Catalogue of Fishes list *H. elongatus* as a synonym of *H. subelongatus*.

Kuiter 2001 species name	**IUCN SPS SG recognised species name / pre-existing species**	**IUCN SPS SG key explanation**	**Distribution of proposed species from Kuiter 2001**	**Details of explanation**
H. kampylotrachelos	***H. trimaculatus***	SL examined specimens and found no distinct features. The type specimen of *H. kampylotrachelos* in poor condition	south Indonesia: Sumatra (type locality), Bali and Timor Sea.	The specimen referred to by Kuiter as *H. kampylotrachelos* from the Museum and Art Gallery of the Northern Territory was in poor condition when examined by SL – and she found no evidence to separate it from H. trimaculatus; Kuiter gives no distinguishing features for these species, and therefore no evidence for resurrecting this name.
H. planifrons	***H. trimaculatus***	SL examined specimens and found no distinct features. Indeed the type specimens were bleached and thus the distinctive *trimaculatus* spots would not have been visible.	northeastern Australia (2 localities)	Having examined specimens subsequently referred to as *H. planifrons* by Kuiter for Lourie et al., 1999, SL found no evidence to separate them from *H. trimaculatus*. The type specimens are bleached and thus the distinctive 'split-spot' markings of *H. trimaculatus* would not have been visible. However, the name *H. planifrons* was initially used for a species found in Shark Bay and it is possible that this name should apply to what Kuiter is calling *H. biocellatus*.
H. taeniopterus	***H. kuda***	SL examined specimens and found no distinct features	western Pacific	Having morphologically examined specimens subsequently referred to as *H. taeniopterus* by Kuiter for Lourie et al., 1999, SL found no evidence to separate them from *H. kuda*.
H. tristis	***H. kuda***	Kuiter resurrected the name, but applied it to specimens that do not share the meristic and morphometric characters of the type specimens of *H. tristis*. Type locality for *H. tristis* (Melbourne fish market) gives no clue about the specimens origin.	East Australia? The extent of the range of *H. tristis* is unclear.	Based on the type specimens of *H. tristis* examined for Lourie et al., 1999, SL found no evidence to support their distinctness from *H. kuda*. The type locality (Melbourne fish market) gives no clue about the specimens origin and it may have come from Asian waters. Kuiter has resurrected the name, but applied it to specimens that do not share the meristic and morphometric characters of the type specimens of *H. tristis* (Lourie et al., 1999).

Kuiter 2001 species name	IUCN SPS SG recognised species name / Pre-existing species	IUCN SPS SG key explanation	Distribution of proposed species from Kuiter 2001	Details of explanation
H. tuberculatus	***H. breviceps***	SL examined specimens and found no distinct features	Western Australia	Having morphologically examined specimens subsequently referred to as *H. tuberculatus* by Kuiter for Lourie et al., 1999, SL found no evidence to separate them from *H. breviceps.*

References:

Armstrong (2001). Genetic and morphological variation in pot-bellied seahorses (*Hippocampus adominalis*): is there evidence for two species? B.Sc. (Hons.) thesis, University of Tasmania.

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J. Nickel & R. Cursons (2012) Genetic diversity and population structure of the pot-belly seahorse *Hippocampus abdominalis* in New Zealand, New Zealand Journal of Marine and Freshwater Research, 46:2, 207-218.

S.A. Lourie, A.C.J. Vincent & H.J. Hall (1999). The taxonomy of Vietnam's exploited seahorses (family Syngnathidae). Biological Journal of the Linnean Society 66: 231-256.

S.A. Lourie, S. J. Foster, E.W.T. Cooper & A.C.J. Vincent (2004). A guide to the identification of seahorses. Project Seahorse and TRAFFIC North America, Washington DC, University of British Columbia and World Wildlife Fund. 22-23.

Databases:

Catalogue of Life. www.catalogueoflife.org

Catalogue of Fishes. Eschmeyer and Fricke. http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp

FishBase. www.fishbase.org

GBIF. Global Biodiversity Information Facility Database. www.gbif.org