CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

Nineteenth meeting of the Animals Committee
Geneva (Switzerland), 18-21 August 2003

Seahorses and other members of the family Syngnathidae (Decision 12.54)

# UNIVERSAL MINIMUM SIZE LIMIT FOR SEAHORSES

1. This document has been prepared by the Chairman of the working group on Syngnathids.

2. Decision 12.54, adopted at the 12th meeting of the Conference of the Parties and directed to the Animals Committee, states that:

> *The Animals Committee shall identify a minimum size limit for specimens of all* Hippocampus *species in trade as one component of an adaptive management plan, and as a simple precautionary means of making initial non-detriment findings in accordance with Article IV of the Convention.*

3. A universal minimum permissible size of 10 cm (height) should be set for all seahorses in international trade, thus greatly facilitating the job of making interim non-detriment findings (NDFs) under their new Appendix-II listing.

4. The ultimate goal of an Appendix-II listing is to ensure that international trade is not detrimental to wild populations of a listed species. For seahorses (*Hippocampus* spp.), meeting such a goal may take considerable time and effort because of uncertainty about trade levels, population status, and management options. The global community can, however, immediately adapt and adopt general conservation and management paradigms as important interim measures toward NDFs. Such approaches set up a model of adaptive management, whereby new information contributes to revising the way in which Parties regulate their international trade, eventually allowing confidence in NDFs.

5. A universal minimum permissible height (minHt) appears to be both biologically appropriate and socially acceptable as a means of making interim NDFs for seahorses, until Parties are able to define management tools more specifically. Ideally, the minHt should be set so as to allow animals to reproduce before being caught, thus reducing the problem of recruitment overfishing (Nowlis, 2000). Currently, the number of older juvenile seahorses in trade, particularly for use as curios or in patent medicines, bodes poorly for population recovery from overexploitation. Indeed, detailed studies of *Hippocampus comes* in the central Philippines make a clear case for recruitment overfishing (Vincent *et al.*, unpublished data). Consultation with multiple stakeholders and managers[1] has revealed that most favoured minimum permissible size limits as a means of regulating seahorse fisheries (K. Martin-Smith *et al.*, in review).

6. The recommendation to propose 10 cm as the minHt reflects a compromise between the need to avoid recruitment overfishing, and the desire to sustain trade for dependent people. Plotting maximum reported

[1] Fishermen in the Philippines, traditional Chinese medicine traders in Hong Kong SAR, aquarium professionals in North America, a technical working group in the Philippines, international fisheries biologists, and a CITES technical workshop on the conservation of seahorses and other syngnathids held in 2002

height at maturity ($Ht_m$)[2] beside the maximum reported height for all species of seahorses indicates that a minHt of 10 cm height should be sufficient to permit reproduction in 27 of 32 species[3], including all six species listed on Appendix II under Article II, paragraph 2(a) of the Convention (*H. barbouri, H. comes, H. erectus, H. ingens, H. reidi* and *H. spinosissimus;* Figure 1). Such a minHt would also permit continued trade in 22 species (Figure 1). A universal 10 cm minHt would, therefore, permit both reproduction and continued trade in 17 species, including many of the most heavily exploited species and all six species listed under Article II, paragraph 2(a) of the Convention at CoP12. This proposed minHt is slightly above the currently inferred maximum size at maturity for most species, in order to allow reproduction to occur.

7. Further research is needed to determine whether the five larger species would be fully supported by this minHt. The $Ht_m$ for the five large species (*H. jayakari*, *H. kelloggi, H. kuda, H. subelongatus* and *H. trimaculatus*) are currently estimated to be greater than 10 cm but the data are unreliable, drawn from very small sample sizes. Indeed, such $Ht_m$ are likely to fall below 10 cm with further research, because $Ht_m$ increases with increasing maximum height of the species (Figure 2), and the largest of the seahorse species with better data (*H. abdominalis* and *H. ingens*) have $Ht_m$ that are well below 10 cm. In the meantime, however, the minHt would offer a first step towards management.

8. It is probable that the 10 smaller species of seahorses (maximum adult height less than 10 cm) would be excluded from international trade if this proposed minHt were adopted. Five of the ten species are not found in international trade at present: *H. bargibanti, H. fisheri, H. lichtensteinii, H. minotaur,* and *H. sindonis.* The other five very small species are very seldom found in international trade as it is: *H. breviceps* and *H. zosterae* (live trade), *H. zebra* (dried trade), *H. camelopardalis* and *H. mohnikei* (live and dried trades). Indeed almost all trade in *H. zosterae* is domestic, within the United States.

9. In recognition that it can be difficult to measure seahorse height when the tail is curled, we propose that the minHt of 10 cm be translated into a metric that is more easily assessed in all traded forms: the distance between the tip of the coronet and the posterior edge of the dorsal fin (trade height – Figure 3) for a seahorse of 10 cm height.

10. It should be noted that precedent has been set for this recommendation of a universal minimum size limit for many closely related species. In Australia's Great Barrier Reef, for example, all but one species of coral trout are managed under a single minimum size limit; the exception matures at a substantially larger size than the others so has its own limit (QFMA, 1999). Such an exception might also work for seahorses if further research showed that one or two species were particularly different in their size at maturity, especially if they were morphologically distinctive or geographically isolated.

Future research

11. Further analysis and assessment would greatly enhance the effectiveness of the Appendix-II listing for seahorses when it is implemented in May 2004. Support should be found to undertake brief trade surveys of dried seahorses in a few large markets, in order to:

    a) determine the sizes of seahorses in trade, so as to establish baseline data prior to the implementation of a minimum size limit and evaluate its biological and economic impact;

    b) collect data on heights at maturity and at reproduction (judged by full brood pouches) for species with inadequate data, especially the five larger species; and

    c) develop conversion factors to translate seahorse heights into trade heights, for easier management.

12. The results of the proposed brief new market surveys could be submitted at AC20 (early 2004) and used to reconsider decisions taken at AC19 about an appropriate universal minimum height or trade height in making non-detriment findings. Such analysis could also provide additional information to Parties wishing to embark (in the short or long term) on more specific and localized management for their national seahorse populations, the universal minimum height across all species serving as an effective but nonetheless interim means of making non-detriment findings.

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[2] See Appendix 1 for notes on methodology

[3] Only the 32 species mentioned in CoP12 Prop. 37 were used for this analysis. Data will need to be sought for new species, as these will also be included in Appendix II.

References

Cai, N., Xu, Q., Yu, F., Wu, X., and Sun, G. 1984. Studies on the reproduction of the seahorse *Hippocampus trimaculatus*. Studia Marina Sinica 23: 92-100.

Froese, R., and Pauly, D. Editors. 2003. FishBase. World Wide Web electronic publication. www.fishbase.org, version 06 May 2003.

Kanou, K. and Kohno, H. 2001. Early life history of a seahorse, *Hippocampus mohnikei*, in

Tokyo Bay, Japan. Ichthyological Research 48: 361-368.

Long, N.V. and Hoang, D.H. 1996. Biological parameters of two exploited seahorse species in a Vietnamese fishery. 1st International Conference in Marine Conservation, Hong Kong.

Lourie, S.A., Vincent, A.C.J. & Hall, H.J. 1999. *Seahorses: An identification guide to the world's species and their conservation*. London: Project Seahorse.

Martin-Smith, K.M., Samoilys, M.A, Meeuwig, J.J. and Vincent, A.C.J. in review. Collaborative development of management options for an artisanal fishery: seahorses in the central Philippines.

Nowlis, J.S. 2000. Short- and long-term effects of three fishery-management tools on depleted fisheries. Bulletin of Marine Sciences. 66: 651-662.

QFMA (Queensland Fisheries Management Authority). 1999. Queensland Coral Reef Fin Fish Fishery. Draft management plan and regulatory impact statement**.** Prepared by the Queensland Fisheries Management Authority with the Reef Fishery Management Advisory Committee.

Further resources

Lourie, S. 2003. Measuring Seahorses. Project Seahorse technical bulletin no.4. Version 1.0, May 2003. (available at www.projectseahorse.org).

Lourie, S.A., Vincent, A.C.J. and Hall, H.J. 1999. *Seahorses: An identification guide to the world's species and their conservation*. London: Project Seahorse. (available at www.nhbs.com).

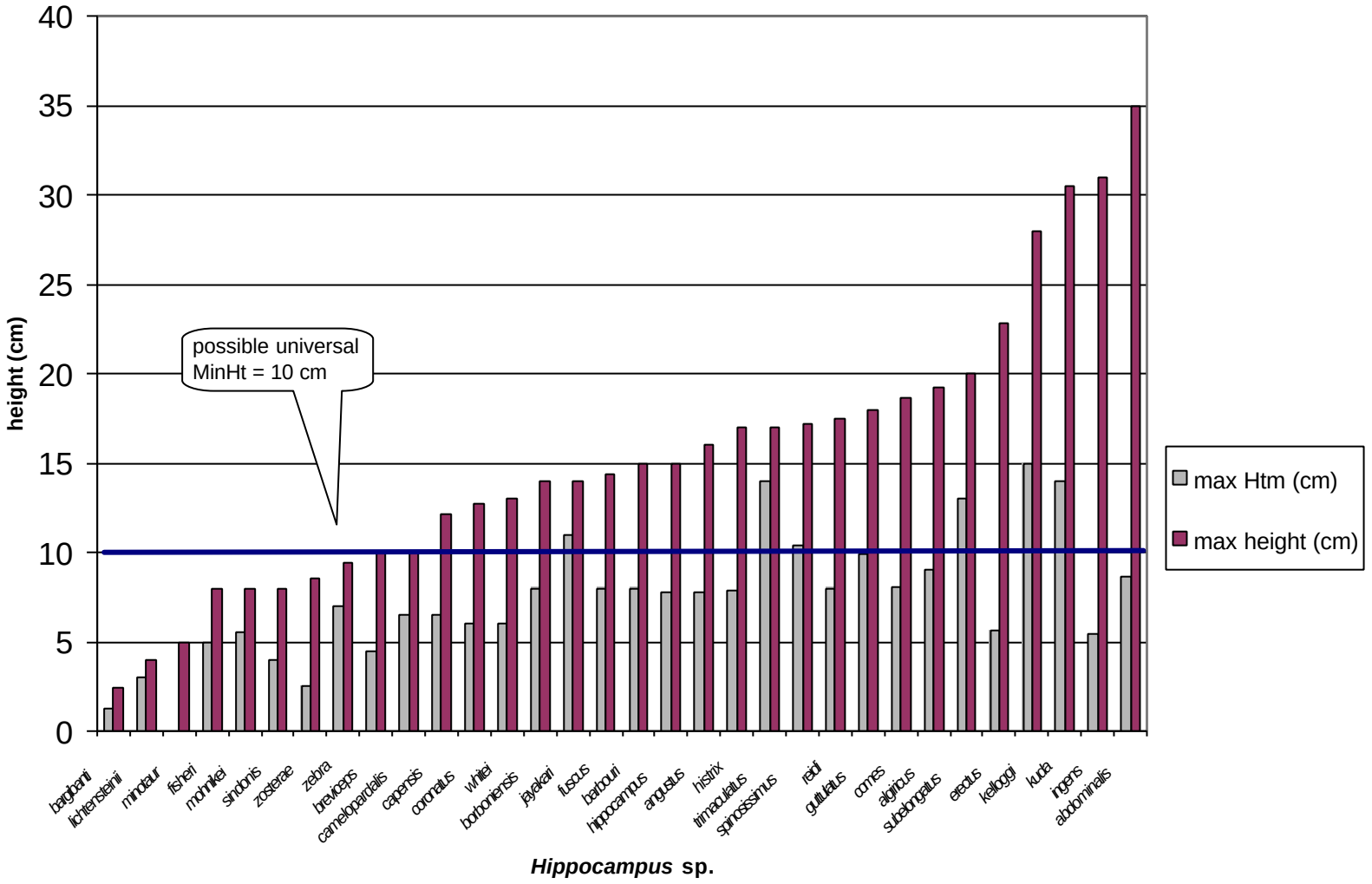


Figure 1. Maximum recorded height and height at maturity ($Ht_m$) for 31 seahorse species (no data available on $Ht_m$ for *H. minotaur*). The horizontal line indicates a possible universal size limit (MinHt) of 10 cm for the exploitation and trade of seahorse species.

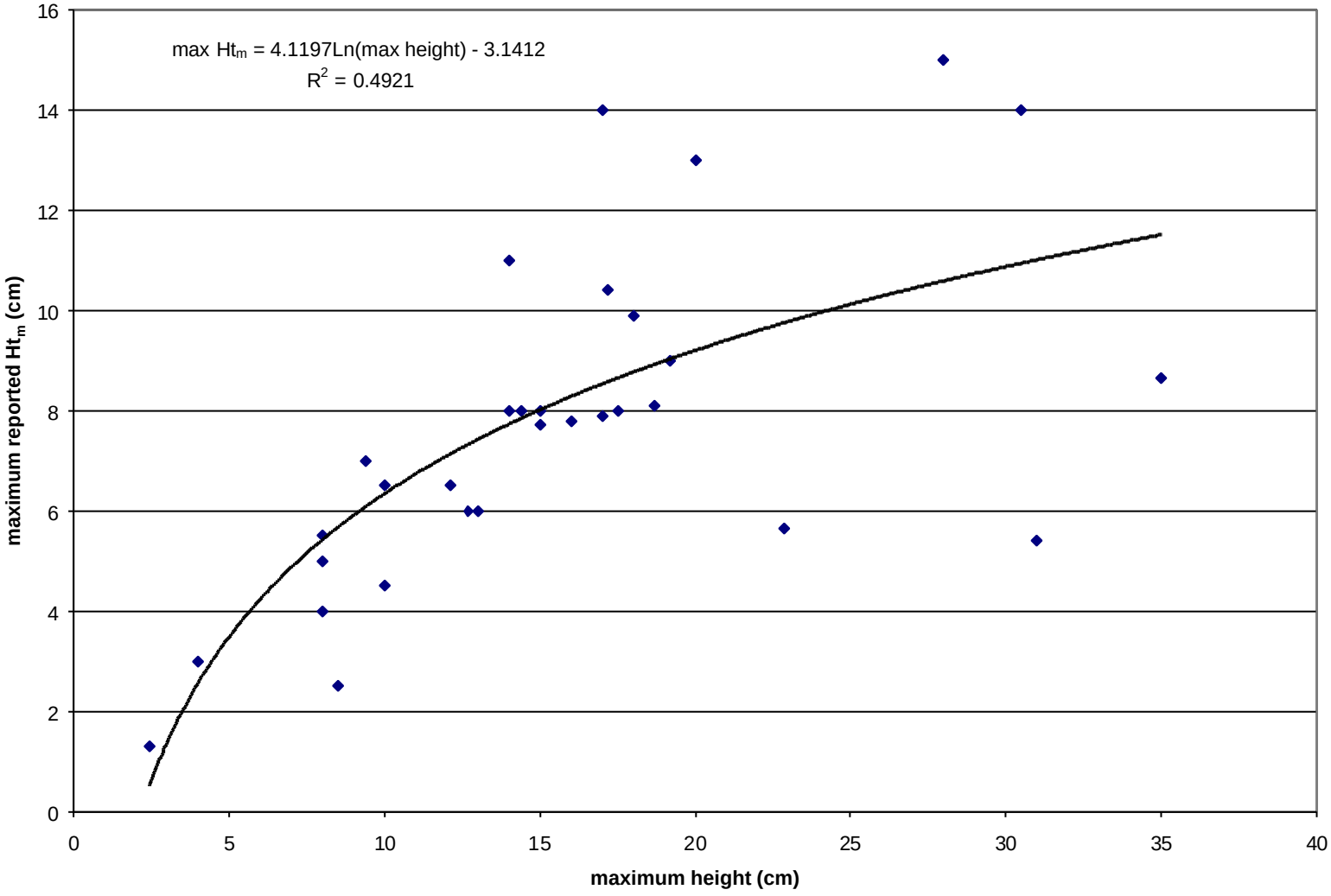


Figure 2. Maximum reported height at maturity ($Ht_m$) versus maximum height for 31 species of seahorse (*Hippocampus* spp.; no data available on $Ht_m$ for *H. minotaur*). $Ht_m$ increases with the maximum height of the species. The data for the five species with $Ht_m$ = 11 cm (*H. jayakari*, *H. kelloggi, H. kuda, H. subelongatus* and *H. trimaculatus*) are unreliable (see text).

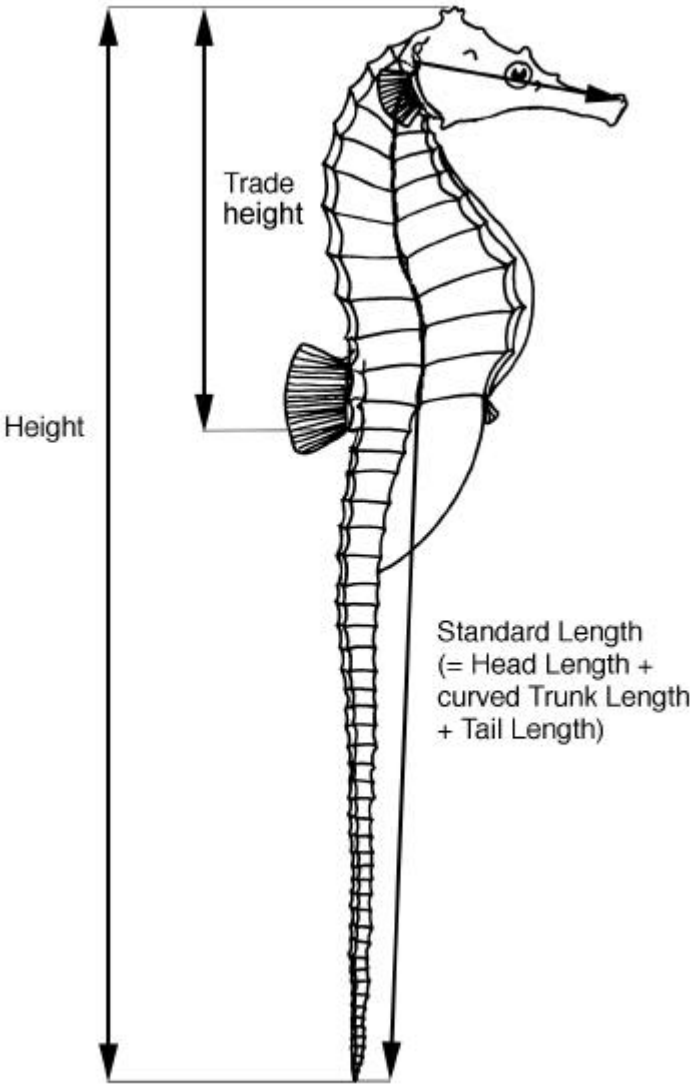


Figure 3. Standard length, height and trade height as measured on a seahorse.

Methodological notes

Data on size at maturity for seahorses are somewhat patchy and imprecise. Where studies differed in their results, we took the largest value in an attempt to be precautionary. $Ht_m$ in our analyses is therefore the maximum recorded $Ht_m$ cited in any report on the species. Where clear data on size at maturity were lacking, we inferred height at maturity ($Ht_m$) to be the smallest recorded adult size (usually from Lourie *et al.*, 1999).

In seahorses, maturity is commonly inferred too young. In general, size at maturity for a species or population is the size at which 50% of the animals have reached maturity (developed ripe gonads, Froese and Pauly, 2003). A problem for seahorses, however, is that the most commonly used (and somewhat subjective) determinant of sexual maturity is the presence of a fully developed brood pouch in the males. A second problem is that a developed brood pouch need not indicate physiological maturity. In *H. trimaculatus*, the first fully developed brood pouch appeared at 80-90 mm but dissection of the testes revealed the size at maturity to be 120 mm (Cai *et al.*, 1984). A third problem arises with using smallest recorded pregnant males as a proxy of size at sexual maturity (e.g. Nguyen and Do, 1996); males may have matured some time before they mate, especially in exploited populations where seahorse densities may be low or the sex ratio skewed.

So few studies reported sex-specific lengths at maturity that we have had to assume that both sexes mature at much the same size. Methods for determining female maturity are even more varied than those for males, and include the size at which ovaries appear (e.g. Kanou and Kohno, 2001), the smallest recorded female with hydrated eggs (e.g. Nguyen and Do, 1996), and the smallest recorded female to release her eggs (e.g. Cai et al., 1984).