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SHORT COMMUNICATION

Artisanal fishery and seahorses (Genus: *Hippocampus*) in Turkey

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Abstract

This paper presents the first attempt to use an ethnoecological approach to examine issues relevant to seahorse conservation and management in Turkey. Between 1999 and 2008, we visited 32 localities, and interviewed 394 people involved in artisanal fishery. We considered the following aspects as positive for the conservation of seahorses and their habitats: fishers were willing to dialogue with researchers (100%); they recognized the importance of reproduction to the maintenance in the wild (84%), and expressed concern over population declines (76%). Large seahorses are captured because they are accepted by buyers in turictic places. Further researches needed to find out the absolute interactions between seahorses and artisanal fishery to manage seahorses and their habitats.

Keywords: Seahorse, *Hippocampus*, artisanal fisheries, conservation.

Introduction

Most fisheries policy and management practices around the world have been prompted by industrial fisheries, but there are increasing calls to develop new paradigms based on artisanal fisheries (Vincent *et al.* 2007). Ruddle (1996) pointed out the great potential value of local knowledge as an information base for local management of marine environments and resources where conventionally used data were usually scarse to non-existent. Turkey has been involved in the seahorse trade and has been a minor exporter of dried or live seahorses at least since the 1980s (Filiz and Taşkavak 2011). A few studies, therefore, have been done in Turkey on seahorses (trade, fisheries, utilization *etc.*). However, no study has been found either seahorse conservation or

importance of fishers' knowledge to the conservation of those fishes in the Turkey.

This paper presents the first attempt to use an ethnoecological approach to examine issues relevant to seahorse conservation and management in Turkey. Its aims were to explore collaborative approaches to seahorse conservation and management in Turkey; to assess fishers' perception on seahorse biology and ecology, in the context evaluating potential management options; to increase fishers' involvement with seahorse conservation in Turkey.

Materials and Methods

Three seahorse species (genus *Hippocampus*) occur in the Turkish waters (Filiz and Taşkavak 2011). International and national conservation status of them is shown in Table 1.

Table 1. Seahorse species in Turkey and their conservation status in intenational and national conventions and reguraltions

	Seahorse species		
	H. hippocampus	***H. guttulatus***	***H. fuscus***
CITES	Appendix II[A]	Appendix II[A]	Appendix II[A]
BERN CONVENTION	Appendix II[B]	Appendix II[B]	----
BARCELONA CONVENTION	Appendix II[C]	Appendix II[C]	----
IUCN Red List status (Global)	DD[D]	DD	----
IUCN Red List status (Mediterranean)[*]	NT[E]	NT	----
NOTIFICATION 2/1	Article 16[F]	----	----
NOTIFICATION 2/2	Article 9[F]	----	----

[CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora (1975); BERN CONVENTION: Convention on the Conservation of European Wildlife and Natural Habitats (1979); BARCELONA CONVENTION: Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (1976, amended in 1995), Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SAP-Bio) (1995); IUCN: International Union for Conservation of Nature (2011); NOTIFICATION 2/1: Republic of Turkey Ministry of Agriculture and Rural Affairs, Notification 2/1 Regulating Commercial Fishing, Published in the Official Gazette date: 21.08.2008-26974, Notification Number: 2008-48; NOTIFICATION 2/2: Republic of Turkey Ministry of Agriculture and Rural Affairs, Notification 2/2 Regulating Amateur (Sportive) Fishing, Published in the Official Paper: 21.08.2008-26974, Notification Number: 2008-49]

[A] Species not currently threatened with extinction but trade must be controlled in order to avoid utilization incompatible with the survival of the species; [B] Strictly protected fauna species; [C] List of endangered or threatened species; [D] Data Deficient; [E] Near Threatened; [F] Species that are prohibited to be fished; [*]Taken from Abdul Malak *et al.* (2011).

The survey was carried out between 1999 and 2008 in six cities in the south coast (1577 km length; Mersin, Antalya and Mugla) and the west coast (2805

km length, except islands; Izmir, Balikesir and Canakkale) of Turkey. We visited major fishing ports and fishing villages, and interviewed people involved in small-scale fisheries in each area (Figure 1).

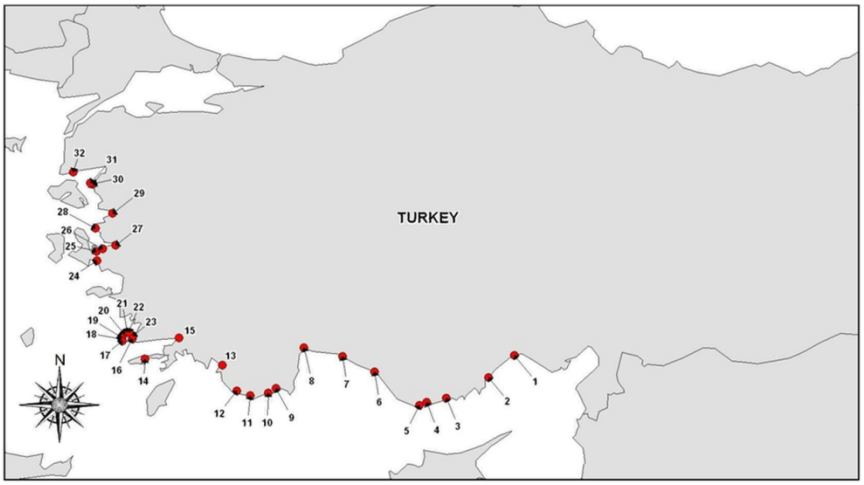

Figure 1. Study sites in on the west and south coast of Turkey (Prepared by S. Can AKCINAR) [1 Mersin; 2 Kızkalesi; 3 Aydincik; 4 Bozyazi; 5 Anamur; 6 Alanya; 7 Side; 8 Antalya; 9 Finike; 10 Kale; 11 Kas; 12 Kalkan; 13 Fethiye; 14 Datca; 15 Akyaka; 16 Bodrum; 17 Turgutreis; 18 Kadikalesi; 19 Gumusluk; 20 Yalikavak; 21 Gundogan; 22 Golturkbuku; 23 Torba; 24 Sigacik; 25 Urla; 26 Guzelbahce; 27 Kemeralti; 28 Eskifoca; 29 Yenisakran; 30 Alibey Island; 31 Ayvalik; 32 Behramkale]

Ethnoecological data were gathered through semi-structured questionnaires and semi-directive interviews, with some questions left open-ended. Interviews were conducted on a one-to-one basis. We cross-checked responses extensively by asking variations of the same question at different stages during an interview, and by asking the same questions of people at the same and different levels of trade. Discussions lasted as long as respondents were willing to talk, from a few minutes to a few hours.

Results and Discussion

We visited 32 localities (Figure 1), and interviewed 394 (47.2%) of 835 registered artisanal fishers in visited localities.

In summary, we consider the following aspects as positive for the conservation of seahorses and their habitats in Turkey: (i) Fishers were willing to dialogue with researchers (100%); (ii) Although capture and/or trade of brooding seahorses occurred, most interviewees recognized the importance of reproduction to the maintenance of seahorses in the wild (84%), and expressed concern over population declines (76%); (iii) Fishers associated the presence of

a ventral pouch with reproduction in seahorses (regardless of them knowing which sex bears the pouch) (44%), and this may facilitate the construction of collaborative management options designed to eliminate captures of brooding specimens; and (iv) Fishers recognized the importance of microhabitats for the maintenance of seahorse wild populations (38%).

We also determined 7 objectives (1, To identify threats to seahorses populations; 2, To determine those populations targetted by fisheries, the incidental capture in fisheries, and other sources of mortality; 3, To identify economic incentives that threaten seahorse wild populations; 4, To reduce the incidental capture and mortality of seahorses in nets; 5, To establish necessary measures to protect and conserve seahorse habitats, through the identification of critical habitats; 6, To gather information on seahorse populations and their habitats; 7, To initiate and/or continue long-term monitoring of priority seahorse populations) of potential uses of the information provided by fishers. Examples of how information provided by fishers can be used to manage seahorses and their habitats in Turkey are:

(i) Population declines through overharvesting and bycatch; habitat damage (for objectives 1 and 2)
(ii) Large seahorses are captured because they are accepted by buyers in touristic places; No control of seahorses caught as bycatch in commercial nets; specimens enter the dried trade (for objective 3);
(iii) Fishers detain broad knowledge of seahorses' habitats and main areas of occurrence (for objectives 4 and 5),
(iv) Fishers do not identify species from each other (for objectives 6 and 7).

Our analysis of ethnoecological/local information provides a fisheries-based knowledge for seahorses. Also, an awareness was created to increase fishers' involvement in seahorse conservation.

Küçük ölçekli balıkçılık ve deniz atları (Genus: *Hippocampus*)

Özet

Bu çalışmada ülkemizde küçük-ölçekli balıkçıların denizatlarının biyoloji ve ekolojileri ile ilgili sahip oldukları bilgi ilk defa sorgulanmakta ve Türkiye'de denizatı koruması konusunda işbirlikçi bir yaklaşım ortaya konulmaktadır. 1999-2008 yılları arasında Türkiye'nin güney ve batı sahillerini içeren, balıkçılık faaliyetlerinin var olduğu ve turizmin geliştiği 32 lokalite ziyaret edilmiş ve küçük-ölçekli balıkçılık ile ilgili 394 kişi ile görüşülmüştür. Denizatları ve onların habitatlarının korunması konusunda pozitif olarak yorumlanabilecek şu noktalar açığa çıkmıştır: balıkçılar araştırıcılar ile konuşmaya gönüllü olmuştur (%100), görüşme yapılan kişilerin çoğu doğada denizatı sürekliliği için üremenin önemli olduğunun (%84) ve zamana karşı bir populasyon azalması olduğunun farkındadır (%76). Talep nedeniyle, özellikle turistik bölgelerde ağlara hedef-dışı av olarak yakalanan denizatları tutulmaktadır. Denizatları ve onların habitatlarının

korunabilmesi için küçük balıkçılar ile denizatları arasındaki etkileşimleri tam olarak ortaya koyacak çalışmalara ihtiyaç vardır.

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