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HABITAT AVAILABILTY FOR THE MEDITERRANEAN MONK SEAL *MONACHUS MONACHUS* IN MONTENEGRO

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INTRODUCTION

The current world population of the critically endangered Mediterranean monk seal (*Monachus monachus*) is estimated to consist of 500-600 individuals, of which about 250-300 live in the Mediterranean basin (GFCM 2011). The species' former distribution extended throughout the Mediterranean, the Black Sea and the Atlantic coasts of NW Africa including the Cabo Verde Islands, Madeira and the Azores Islands (GFCM 2011). Nowadays, actively reproducing populations within the Mediterranean basin are found mainly in Greece and Turkey (GFCM 2011). Apart of the above well known populations, the species was considered extinct in most of its former range. However, recent sightings indicate that the species may still exist throughout its ancient habitat where it is considered extinct or of unknown status (Bundone *et al*. 2013a). Such areas are defined as "low density areas" characterized inter alia by the potential presence of monk seal populations and habitat availability (GFCM 2011). Most countries adjacent to the Adriatic Sea, i.e. Croatia, Italy and Albania, are among these "low density areas" (Bundone *et al*. 2013b, Mo 2011, White *et al*. 2005).

MATERIAL AND METHODS

From 16 to 22 September 2013, we systematically surveyed a coastline of ca. 35 km between cape Arza on the peninsula of Lustica and cape Platamuni on the peninsula of Donji Grbalj in Northern Montenegro coast using the boat of the IMB Kotor "Nemirna" and the institute's diving equipment, GPS and underwater camera. Whenever a marine cave with an entrance visible above sea level was noted, coordinates were taken with the GPS (a Garmin 76) and notes were taken on a nautical map. The caves were then carefully entered by snorkeling or diving. Wherever an internal beach was found, making the cave a potential monk seal habitat for reproduction and resting, the beach was inspected for seal evidence and the following additional data were noted: name of the specific coastline, exposure of the cave's entrance, dimensions of the cave, dimensions of the beach, type of beach (sand, pebbles, rock), sea conditions and general geomorphological characteristics of the cave.

Fig. 1. Caves in the study area marked as potential habitat for the species' resting and reproduction.

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RESULTS AND RECOMMENDATIONS

Like all Pinnipedia, the Mediterranean monk seal needs to come onto the shore for resting and reproduction. The pups are suckled and need to learn how to swim and find their own food. Due to the disturbance by man over numerous open beaches, monk seals have mostly retreated into sea caves with a patch of beach. Thus, marine caves with a beach inside are imperative for the survival of the species.

The current situation in Montenegro with respect to monk seal presence and habitat availability was unknown. In September 2013, we systematically surveyed a part of the coastline in Montenegro for the first time and registered suitable terrestrial habitats.

Altogether 45 caves were entered. We did not find evidence of seal presence but nineteen caves had a beach inside: 1 with a sandy beach, 14 with pebbles and 4 with flat rocks. We also registered one cave with an underwater entrance known to us from the past. From these 19 caves, 11 had a beach suitable at least for resting – the other 8 were too small to be considered as a suitable monk seal habitat. It is worth mentioning here that the shape of the beaches changes according to sea currents and the general weather conditions over the years. Two caves were located between cape Žukovac and cape Platamuni where an MPA is planned to be established by the Ministry of Sustainable Development and Tourism of Montenegro

Thus, there are at least 11 caves in the study area suitable for the species' resting and reproduction. The presence of monk seals in this region until at least the 70's is well documented. The last known seal was killed in the area of Herceg Novi in the northwest of the peninsula of Luštica in the early 70's (photos above). Additionally, one marine cave further south of our study area is generally known as the "Seal Cave" ("Tuljanova pecina") indicating the former presence of seals in the greater area. It is also worth noting that an unverified sighting of a monk seal was reported in the local news from the wider area off the Bay of Kotor on the 4th of September 2008.

Single surveys may not detect seal evidence even in areas well known for their stable seal population, such as in the Northern Sporades, Greece, for instance (Harwood *et al*. 1984). Thus, further systematic surveys of our current study area in northern coast of Montenegro as well as the coast in Southern Montenegro and the involvement of the coastal residents for reporting potential seal sightings are strongly recommended in order to establish the real present situation.

The presence of monk seals in neighbouring Croatia is nowadays well documented including the southern part adjacent to our study area and also in Italy and Albania. Furthermore, there is an actively reproducing population in the Greek Ionian Sea (Panou 2009, Panou *et al*. 1993). Considering the ability of the species to travel over long distances within a short time (Adamantopoulou *et al*. 2011), we strongly believe that the area of study may be recolonized if appropriate protection measures are implemented.

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