

Dead sea turtles on the Montenegrin coast

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ABSTRACT

This paper presents findings of dead sea turtles on the Montenegrin coast. We started to collect data regarding sea turtles in 2012 and now we have data on four dead individuals. Three of them were loggerhead turtles, while for one individual we could not determine species.

Key words: sea turtles, threats, loggerhead turtle, Montenegrin coast

INTRODUCTION

Sea turtle populations are in decline in the whole world (Eckert, 1995). There are seven sea turtle species which are divided in two families. All seven species are included on the Conservation on International Trade in Endangered Species (CITES) appendices and the World Conservation Union's (IUCN) *Red Data Book* lists (Crowder *et al.*, 1994). Three species live in the Mediterranean: the loggerhead turtle (*Caretta caretta*), green turtle (*Chelonia mydas*) and leatherback turtle (*Derموchelys coriacea*). The loggerhead and the green turtle are listed as endangered, while the leatherback turtle is listed as vulnerable (IUCN, 2014,3). Sea turtles actually do not have any natural enemy except while they are juveniles. The biggest threats for them are human activities like: direct exploitation, habitat degradation, bycatch, boat strikes, and pollution (Margaritoulis *et al.*, 2003). Climate changes also have an impact on their populations (Mazaris *et al.*, 2008).

MATERIAL AND METHODS

In 2012 we started collecting data about appearance of dead sea turtles on the Montenegrin coast. Data were collected by walking routes along the shore and on the information obtained from locals. We did not take any morphometric measurements about recorded specimens and only data on locality, finding date and geographic coordinates were recorded. The determination of species was done according to Arnold & Burton (1978).

RESULTS AND DISCUSSION

Of the four sea turtle carcasses found, three were identified as loggerhead turtles (*C. caretta*), and one could not be identified as it was in advanced stages of disintegration.

The first dead turtle was found on October 7th 2013 in Budva, on the Slovenska beach (Slovenska plaža) in front of the restaurant "Porto" (42°16'53" N, 18°50'17" E; Fig. 1). Turtle was in advanced stages of decomposition, so we could not determine the species. The carcass of dead turtle was on the beach for several days until people from relevant institutions picked it up.



Figure 1. Dead sea turtle of undetermined species in front of restaurant “Porto”, Budva

During 2014, we found three dead individuals. All of them were Loggerhead turtles, *Caretta caretta*. One of these three individuals washed up on shore on June 28th in Bar, on the Žukotrlica beach (42°06'48" N, 19°04'58" E; Fig. 2). Turtle was alive but died in next 5–10 minutes. Relevant institutions came on field after two hours.



Figure 2. Dead loggerhead turtle on the Žukotrlica beach, Bar

On October 15th in Budva, in Sveti Stefan settlement (42°15'20" N, 18°53'15" E) we found dead turtle floating on the water surface (Fig. 3). The turtle's neck was cut.



Figure 3. Dead loggerhead turtle in Sveti Stefan settlement, Budva

On October 17th also in Budva, on the Slovenska beach, in front of the restaurant “Kairos” (42°17'05.87" N, 18°51'04.24" E), we found dead individual with a rope around its neck (Fig. 4). The turtle was left on the beach for the following three days until the people from relevant institutions came to collect it.

On figure 5 we gave map with points where turtles have been found on coast.



Figure 4. Dead loggerhead turtle in front of restaurant “Kairos”, Budva



Figure 5. Map with points where dead turtles have been found. Red circle – dead turtles from Budva (restaurant “Porto” and restaurant “Kairos”); Black circle – dead turtle from Sveti Stefan settlement, Budva; Orange circle – dead turtle from Žukotrlica beach, Bar

Loggerhead turtle is the most common turtle in the Adriatic Sea, which is one of the most important areas for feeding and wintering of this species, especially the north Adriatic (Argano *et al.*, 1992; Lazar *et al.*, 2000; Lazar & Tvrtkovic, 2003; Casale *et al.*, 2003). The biggest problem, which has the strongest impact on sea turtle populations is fishing (Kopsida *et al.*, 2002; Panagopoulos *et al.*, 2003; Kaska *et al.*, 2004; Tomás *et al.*, 2008; Casale *et al.*, 2010). When a turtle is caught in a net, it dies because of suffocation. Hooks with baits are a problem because turtles eat bait and swallow hooks, which can cause internal bleeding. So, incidental catches present the biggest problem which should be reduced or the sea turtle populations may become extinct. The reduction of incidental catches should be one of the major challenges of modern – sustainable fisheries. The other most common cause of turtle mortality are collisions with boats (Casale *et al.*, 2010). Collisions with boats can cause fractures or cuts on carapace, head or limbs.

Plastic waste presents a very big problem for turtles because they are prone to eat plastic scraps which resemble plankton animals (e.g. jellyfish) on which they feed on (Casale *et al.*, 2010). Oil pollution also can have an impact on turtles. They can be covered by tar, which can cause health problems and problems with movement (Lutcavage *et al.*, 1997). Killing of turtles is not rare and happens because turtle meat is considered a delicacy, and because turtles are seen as competitors for fish (Casale, 2008; Kopsida *et al.*, 2002; Panagopoulos *et al.*, 2003). Different harmful substances like heavy metals, trace elements,

chlorbiphenyls and organochlorine pesticides have been found in tissues of dead animals along Italian coast (Russo *et al.*, 2003; Storelli *et al.*, 2005; Storelli & Marcotrigiano, 2000).

There are several solutions which may help in protection and reduction of killing of sea turtles. For example, using the delivery systems on nets which may help turtles escape from them (*Turtle Excluder Device* — *TED*). Using circle hooks instead of traditional J-shaped hooks may prevent swallowing because circle hooks are wider and much less likely to be swallowed by turtles. Protection of sandy beaches which are main breeding places for sea turtles, establishing centers for turtle's care and protection, and regulation of waste that is dumped in the sea as well as chemical pollutants are also important solutions which may help in protection and conservation of sea turtles.

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