

NETCET EXTRAORDINARY MEETING
“Emergency of mass stranding”
PADUA (ITALY)
13/11/13

1. List of participants

N.	Name	Surname	Organisation
1.	Lisa	Poppi	University of Padua
2.	Erica	Marchiori	University of Padua
3.	Sandro	Mazzariol	University of Padua
4.	Antonio	Socci	Natural History Museum - Venice
5.	Sauro	Pari	Cetacean Foundation
6.	Valeria	Angelini	Cetacean Foundation
7.	Carla Rita	Ferrari	ARPA Emilia Romagna
8.	Francesco	Zuppa	WWF (Miramare)

2. Summary

An extraordinary meeting took place on the 13th of November in Legnaro (Padua) for North Adriatic NetCet partners, in order to respond to the emergency of mass stranding occurring in these weeks in the region.

Counting from the 1st of October more than 150 turtles have been found stranded along the Italian coast of North Adriatic sea, in two sections of the coastline: the northernmost in front of the city of Grado - 45°41'0"N 13°24'0"E – (15 km long) and the southernmost along Emilia Romagna coast, between Lido di Volano - 44°47'44"N 12°15'46"E - and Riccione - 44°0'0"N 12°39'0"E. One hundred-twenty and more out of these carcasses were found in Emilia Romagna, the number still growing every day. Number of strandings along the Venetian coast, located between these two areas, remained practically unvaried, if compared with the same period of last years. The phenomenon that started in October in Emilia Romagna continued with waves of strandings that still go on (1st at the beginning of October, 2nd second half of October, 3rd up to now). Curviline Carapace Length of turtles range from about 30 cm to more than 70.

Since turtles were found in two small segments of coast, where currents likely pushed carcasses in these months, and since the decomposition condition was similar in all turtles of each “wave”, we can suspect a common provenience of all animals and a common moment of death. And since turtles are not gregarious



animals, we can suspect they concentrated in the same place for foraging activity.

Carcasses were submitted to necropsies at the University of Padua (10 from Grado and 4 from Ferrara), Veterinary Institute of Udine (13), at the Veterinary Institute of Ferrara (15) and at the University of Bologna (3). Necropsies held in Padua showed similar lesions in both the analyzed groups, suggesting an acute death from a systemic illness: hemorrhagic oedemas, mostly in the pectoral muscles, in the ventral neck region and around kidneys; hemorrhagic effusions, enteritis, congestion of liver and kidneys. Though guts were almost empty (with moderate catarrhal hemorrhagic content), all the animals were in a good nutritional condition, confirming their previous healthy status and the sudden death. The University of Bologna referred fractures and traumatic lesions that could be attributed to bycatch activities. Necropsies held at the Veterinary Institute of Ferrara showed some similar lesions corresponding to those seen in Padua, such as congestion of the organs, multifocal hemorrhagic oedemas in muscles, celomic wall and ventral neck region, hemorrhagic effusions in pericardial sacs; the main difference consists in the presence of alimentary content in the guts.

Researches for a bacterial agent at the Padua University gave interesting results: intracardiac swabs of some turtles gave positive results for *Photobacterium damsela* sp., confirming the death for septicemia, while almost all tested turtles have completely sterile intestines, with no growing bacterial colonies at all. These results are shared between the group from Grado and from Emilia Romagna. Studies upon the gastrointestinal content are still going on; in particular the suspect fell on biotoxins, but it seems quite improbable that turtles got poisoned from these substances, since they don't use to eat a great quantity of bivalves. Guts of the first group of turtles, both from Grado and from Ferrara, moreover, had really small content, resulting from a long fasting (about 15-20 days). Anyway biological analysis of gut content will be done to identify the kind of preys ingested by the turtles, in order to try to locate a hypothetic common foraging ground.

Chemical agents are quietly improbable responsables for the phenomenon, since in this case we would expect an increased mortality even in fishes and in marine mammals, thing that did not happen. However samples for toxicological exams have been taken. Environmental changes are always under the control of A.R.P.A. and no alterations in chemical substances concentrations have been detected until now.

A check for radioactivity was made on the carcasses, in the suspect of military activities brought on in the basin, but results for the presence of beta and gamma rays were negative.

Suspect of seismic surveys effects is not confirmed by lesions. No physical damages are described in literature in this case, nor for turtles nor other species, apart from hearing impairment. Typical lesions found are not consistent with mechanical damages from sound waves.

Coprological and histological exams held in Padua revealed the presence of small globular particles both in the faeces (flotation exam) and in the intestinal mucosa. In the faeces the capsulated particles are about 10 µm diameter, and have been found in many turtles from Grado (fig. 1), exams in turtles from Emilia Romagna are in progress. In histological slides, round particles of different measures are visible, single or in group, apparently with a more dense structure inside (fig. 2); this "foreign bodies" are present mostly on/in the villa or in the mucus, where they assume different aspect (fig. 3). Suspect on the identity of these particles fell on unicellular algae and yeasts but more exams are needed to confirm that.

-Fishing activities:

Mortalities due to bycatch are included in the group, and traumatic lesions, such as fractures and hematomas, have been found in some of the carcasses from Bologna and Ferrara. However, this is consistent with the usual mortality due to bycatch, and their number correspond to the usual number of dead turtles in this period. Even the only three alive turtles that were found and rescued by Fondazione



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Cetacea had been caught by trawlers. But, focusing on the common lesions, shared among turtles inside the big group, we can exclude that bycatch is the responsible for the mass-event.

In this period, in fact, no significant changes in the fishing activities, as long as we know, are taking place; only in the sea in front of Grado a different gillnet of 2 m of length, 40 centimeters of stitch was in use. Fisherman confirm a high number of caught turtles in this net but we suspect that bycatch just brought to light another phenomenon, catching turtles that were already suffering for other problems, as the lesions in the carcasses confirm. In Emilia Romagna and in Grado the usual iron toothed dredge for the fishing of rhombus ("rampone") are in use, as usual for this period. This trawl that works very fast and rakes the bottom can be a real threat to turtles; however, even this kind of fishing gear is usually functioning in this season, so it cannot explain such an extraordinary number of strandings.

-Environmental features:

Currents and winds in the first period, at the time of first strandings in Ferrara, were coming from the North (Bora); then turned from South (Scirocco) in the second period (strandings in Grado), and again from North (third stranding wave, 'til now, in Emilia Romagna). Strong tidal changes happened, generating strong currents towards the coast, maybe forcing weak turtles to get into fishing nets. Again, nets cannot explain the extraordinary mortality but would be just the way for the problem to get into light (what caused the weakening of turtles?? Are they usually pushed by normal currents towards the shore?).

Temperatures of the sea were similar to those of last years, with some degrees less in Emilia Romagna and 2 more in Grado; typical seasonal point decreases of sea water temperature did not occur. Has this a consequence in turtles migrating habits?

Until October, a diffuse anoxia near the coast of Emilia Romagna pushed all fishes to move offshore, towards Croatian waters. Were all turtles eating there at the end of September before the event started?

-On the other Adriatic coast (TelCo):

In the meantime, on the other side of the Adriatic no changes in the number of strandings took place (Peter, Jasna, Vilma); on the contrary, no turtles strandings at all were registered in Losinji from the beginning of October (Peter). No changes in fishing activities seem to be happening neither in this country and fish catch is regular for the season (Jasna, Peter).

As long as it concern lesions linked to seismic activities (Bojan, Drasko), heads have been sectioned in order to sample brain and no hemorrhages nor hematomas were found. Histological exams of the ears were not made since they would be useless, considering the decomposition state (no fresh carcasses). Modified epithelial cells (like sensory epithelial) are in fact fragile and delicate and get decomposed very soon after death.

There are not any references in literature concerning damages in turtles organs coming from this kind of surveys; according to literature on fishes, lesions related to damage from air guns are quite ambiguous (Mc Cauley R.D. 2012, Popper A.N. 2013).

