The southwest Atlantic (SWA) is an area of development, feeding and reproduction of loggerhead turtles. The major nesting areas are located in southeastern and northeastern Brazil (Marcovaldi and Chaloupka, 2007). During this part of the life cycle females and hatchlings are mostly threatened by intense coastal development. Mark-recapture data and satellite tracking studies showed that female loggerheads that nest on beaches of Brazil migrate to multiple foraging areas off the coast of South America (Marcovaldi et al. 2010, González-Carman et al. 2011, Barceló et al. 2013). In addition, juvenile loggerheads are mainly found along the slope and oceanic waters off southern Brazil and Uruguay. Both adults and juveniles are subject to a high fishing pressure from multiple fisheries that operate throughout coastal and oceanic environments.

To better understand and quantify main impacts to loggerhead populations in the SWA we conducted a threat analysis. Our analyses were modified from the study conducted by Bolten et al. (2011). Threats were identified and classified for the different life stages and ecosystems inhabited by the sea turtles. For the construction of the matrix we considered 8 life stages, nesting females, eggs, hatchlings, juveniles neritic, juvenile oceanic, adult neritic, adult oceanic. We grouped all identified threats into six main threat categories: fisheries bycatch, resource use (direct and indirect use), habitat alteration, pollution, species interaction and climate change. Additionally, as threats vary depending on the ecosystem inhabited by the turtles, we incorporated 3 environments: 1) terrestrial (beach), 2) neritic and 3) oceanic. Annual mortality was estimated for each life stage/ecosystem, with respect to each specific threat. As the information is very heterogeneous and it is difficult to assign actual mortality rates we used a range of mortality values based on the best available information (e.g. published data, projects database information and expert opinion). Mortality range estimates were classified as follows: 0 (no evidence of mortality); >0 (mortality has been documented or is likely to occur, however data are insufficient to estimate mortality); 1-100 (low mortality); 101-1000 (medium mortality); >1000 (high mortality). Sub-lethal effects for certain threats and life stages (which may result in reduced fitness) were also highlighted in the spreadsheets.

Results pointed out that fisheries bycatch represent a major threat for loggerheads in the SWA. The trawl fishery was identified as the main source of mortality for neritic juvenile and adult turtles while juveniles in oceanic areas mostly impacted by the surface longlines (Table 1). In addition, egg and hatchlings are subject to mortality by beach erosion and light pollution, respectively, and both of these stages by the increasing number of natural predators such as foxes and armadillos at nesting beaches (Table 1). After adjusting the summed mortality estimates within each life stage with the relative reproductive value (RRV) of that life stage (see Table 2 as an example), we were able to compare annual mortality for each life stage/ecosystem and threat category (Table 3) as well as for each threat within a threat category (Table 4). However, loggerheads in the SWA should be considered as entirely conservation-dependent, because the reduced mortality for several life stages within the terrestrial zone is the result of decades of intense conservation programs, especially at nesting sites (Marcovaldi and Chaloupka 2007).

Table 1. Annual mortality for each life stage/ecosystem for each type of threat within the different threat categories.

Table 2. Threat category: fisheries bycatch – estimated annual mortality for each type of fisheries bycatch.

Table 3. Annual mortality for each life stage/ecosystem for each threat category adjusted by relative reproductive values (does not include sub-lethal effects).

Table 4. Annual mortality for each threat within a threat category summed for all life stages/ecosystems and adjusted for RRV for each life stage/ecosystem.

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Literature Cited: