

A social approach to assess sea turtle bycatch by artisanal fisheries in two coastal communities of the Costa Rican Pacific

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One of the main threats to the survival of Costa Rican sea turtles is their unintended catch or bycatch, and eventual mortality using unselective fishing gear. Thus, information regarding sea turtle catch rates across fisheries is essential for highlighting conservation priorities. We hereby aim to assess sea turtle bycatch by two organized groups of fishers that operate in the Southern Nicoya Peninsula, the Association of Coyote Fishers (ASPECOY) and the Fisher Association of Bejuco (ASOBEJUCO). We combined anecdotal reports from fishers after their fishing activity (as bycatch sea turtles are not brought to the fishing ports) issued from 2007-2019, with in-depth semi-structured interviews with local fishers conducted in 2019. Catch reports included information on species identification, sex, stage of maturity, fishing area, and fishing method. We conducted 7 informal semi-structured interviews with artisanal fishers selected by targeted sampling.

According to landing reports, a total of 28 sea turtles were caught as bycatch over the 13-year period, most of which (61%) were documented by ASPECOY. According to the fishers the Olive Ridley turtle (*Lepidochelys olivacea*) was most commonly caught species (n=25), followed by Green turtles (*Chelonia mydas*) (n=2) and single Hawksbill turtle (*Eretmochelys imbricata*) (n=1). All Olive Ridley reported were perceived to be adults, 32% of which were classified as males (20% as females, and 48% were unclassified). The Green turtle consisted of adult and a juvenile of unknown sex, while the only hawksbill turtle was considered a juvenile. Most of the total turtle catch (79%) was caught using bottom longlines with 600-800 J-style hooks) followed by 300 m 4 inch mesh monofilament gillnets (21%). The 2019 semi-structured interviews showed that 86% of the interviewees had witnessed dead sea turtles trapped in their fishing gear, although they claimed that most turtles are released alive. Nevertheless, 14% assured that they try to remove the hook, whereas the rest didn't, and complained about the lack of equipment to do so. The 7 interviewees are well aware that sea turtles are threatened species and express that bycatch is unintentional. One of the interviewees estimated an average of 50 turtles caught every year. According to the interviewees there are 6 main fishing spots, and the highest bycatch (71%, n=5) occurs in front of Corozalito, a nesting beach with Olive Ridley mass nesting (arribadas). This estimate contrasts however, with information provided by the fisheries reports, where Coyote fishing port showed the highest Olive Ridley bycatch. Additionally, the complementary use of interviews reveals that bycatch rates could be higher than data reported by fishers after their fishing activity.

Although artisanal fishing is less harmful than large-scale fisheries, it is vitally important to try to remedy the impact caused on sea turtles, which can be done by avoiding fishing operations in areas of high bycatch, as well as by promoting the use of dehooking devices that mitigate impact and damage inflicted when removing hooks. It is necessary to continue monitoring bycatch to enforce management and regulations in the area.