

## Supporting local fisheries and saving turtles with circular hooks.

With the help of Alana Helbig, one of our ISV volunteers from the Southern Hemisphere Season 2010-2011 who raised and donated US\$2500, we are able to support and advise local fishermen to improve their fishing methods to protect marine resources. The initiative is the use of circular hooks as a method to reduce incidental catch of sea turtles in the San Juanillo fishing community while promoting at the same time a sustainable fishing area with best practices.

### The community of San Juanillo stands for responsible fishing.

San Juanillo community is located in Cuajiniquil of Santa Cruz in Guanacaste province. Their main source of income is artisanal fishing and the people are organized in fishing households with small amounts of capital and energy as well as relatively small fishing vessels that make short fishing trips close to shore. In 1996 the ASOPESJU (Association of Artisanal Fishers of San Juanillo) was officially created and in 2009 the fishermen of the organization agreed to establish a responsible fishing area with the objective of protecting the marine resources to guarantee the continuity of the fishing stocks.

In this coastal area responsible fishing is especially important due to the closeness to Ostional beach, a wildlife refuge considered the second most important nesting beach for the olive ridley (*Lepidochelys olivacea*) turtles in the world (Valverde 2007). These turtles synchronize for nesting in spectacular displays known as *arribadas* – Spanish for arrival – where thousands come ashore to nest together over a period of just a few days. Today olive ridley *arribadas* are only witnessed on a handful of beaches along the Central American Pacific coast, and Ostional is one of these. Not only olive ridleys nest here, but also the much endangered Pacific leatherback, a turtle which population size reduced to 10% over the last 20 years. Males and females of



Olive ridleys arribada in Ostional Beach.  
Photo: Diana Solís

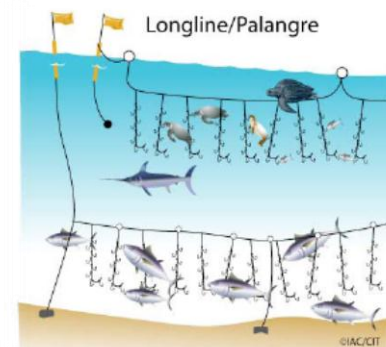


Critically endangered leatherback sea turtle nesting at Ostional beach. Photo: Luis Corea.

both species linger during the season in the coastal area around the refuge breeding and feeding; a situation that makes them especially vulnerable to fishing activities. The fishermen in San Juanillo have identified the opportunity to use circular hooks as a better fishing method to be enforced in the responsible fishing area of San Juanillo, this will help reduce the mortality of turtles by incidental fishing and promote responsible fishing. The circular hooks not only help turtles, but the shape reduces catch of dolphins and rays.

### Incidental catch, turtles and the fishing dilemma.

The food and Agricultural Organization (FAO) defines incidental catch or bycatch as the capture of animals other than the species targeted by the fishing effort. In many cases the animals captured are discarded by fisherman because they are too small, an illegal species or a species of low economic



value (Secretaria CIT 2006). Usually this portion of animals is discarded at sea dead or injured to an extent that death is the most likely outcome (Alverson *et al.* 1994). This bycatch produces a big waste of resources and affects species populations of highly endangered animals like sharks, rays, dolphins and turtles (Secretaria CIT 2006)

Marine turtles are in danger of extinction as a result of the impact of many human activities but, fisheries **bycatch might be the biggest population threat worldwide**. This happens in different fishing methods commonly used by traditional Costa Rican fishers, like seining, long lining and trammel netting (Secretaria CIT 2006). In the case of the bottom line used by the inshore fishers the turtles not only bite the bate but also get tangled in the line. In many cases turtles are recovered alive but in others, depending of the depth of the lines, the turtles die. The bottom line uses a long line, called the main line, with baited hooks attached at intervals by means of branch lines. In Costa Rica the artisanal fishers use bottom longlines with J hooks, the combination of these two methods is incredibly prone to incidental catching of turtles and other species (Mug *et al.* 2008). This raises the dilemma on how to keep the catching rates but reduce the incidental catch especially of sea turtles.

### **BITE THE BATE. J hooks vs. Circular hooks. Decreasing turtle mortality rate is possible!**

In sport, artisanal and commercial fishing the most commonly used hook is the J hook. This type of hook is not very selective and it is prone to attracting and catching a wide variety of incidental animals. Scientist and biologist are constantly researching new designs of hooks that help reduce catching and mortality rates of incidental species. Part of this research has led to encourage fisherman towards using the circular hook in their lines to diminish the turtle bycatch.



**The J hook in the left is the traditional hook used in commercial and sport fishing. The circular hook in the right is the viable option to diminish bycatch.**

These hooks have been tested in fisheries in several parts of Latin America with the purpose of evaluating the effect of the circular hook in fishing success of target species and in turtle survival rate. There is evidence that this hook does not affect the fishing success of target species, in El Salvador the circular hook doubled the fishing success rate of target species (Division de pesquerias, 2006). Experiments made in South America reveal that the turtle catch rate decreases considerably for circular hooks (Mug *et al.* 2008). WWF Colombia report that turtle survival rate between J hook size 7 and circular hook size 12 (the most commonly used sizes in artisanal fishing) increases by 11%.



In the left, the J hooks piercing the throat and guts of a sea turtle.

In the right dead turtles in a long line. The estimate for the last year is 2 million dead turtles by the current fishing methods.



All of these reasons support the need of more research especially in testing it in field conditions. The incidental catch can be reduced if there is modification on the fishing methods, only if we make these methods available to the fishermen, and now with the support for this project, we will start working together with the San Juanillo Artisanal Fishermen to decrease the incidental capture of sea turtles and promote a Responsible Fishing Area without affecting their catch rate for target species.

**Budget: Circle hooks Project and Research.**

Detail	Number
Number of fishing boats	12
Number of hooks needed per boat	1000
Cost of circle hooks full package per boat (size 11/0)	U\$200
Total	U\$2400
Extra hooks for the fisherman store (3 packages)	U\$600
Total	U\$3000
Supported by Alana Helbig - ISV Donation Program*	80% cost
<b>FINAL TOTAL</b>	<b>U\$2400</b>



San Juanillo fisherman releasing a bottom longline. Photo: Felipe Gómez

\*This donation will support 80% costs of circle hooks and the San Juanillo Fishermen Association will cover the other 20%.

**Bibliography**

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