ETHICS

Ultraviolet Illumination Warns Sea Turtles away from Fishing Nets

Ultraviolet LEDs help sea turtles avoid deadly encounters with fishing nets

By Rachel Nuwer on November 1, 2013

Every decade fishers looking to catch tuna, shrimp, snapper and other marine creatures unintentionally pull millions of sea turtles out of the oceans, according to one recent estimate, most of them vulnerable to extinction. This kind of accidental capture, researchers believe, is a leading cause of sea turtle mortality.

Because banning fishing altogether would do serious harm to local economies, conservationists have instead sought ways to warn sea turtles away from fishing nets. Studies have shown that the turtles can perceive light across the visible spectrum as well as into the ultraviolet, whereas the visual sensitivity of many fish drops off just before the UV range. “When we compare the visual spectrums, there's this disparity between what turtles and fish see,” says John Wang, a fisheries researcher at the University of Hawaii at Manoa. “That means there's a selective communication channel in the UV range where we could perhaps communicate to turtles but not to fish.”

Wang and his colleagues teamed up with fishers in Baja California Sur, Mexico, to experiment with reusable, battery-powered UV LEDs as a turtle deterrent. By securing UV lights at five-meter intervals on fishers' gill nets, they reduced accidental sea turtle capture, or bycatch, by around 40 percent, as compared with control nets with inactivated LEDs, the team recently reported in *Biology Letters*. Although the illuminated nets trapped slightly fewer fish than the control nets, the researchers found no significant difference in the financial value of the two catches.

The fishers, Wang says, were initially reluctant to participate in the research but soon “came to realize that we're not trying to save turtles at the expense of fishing communities.” In the long run, such technologies might even save fishers money. “Turtles wreak havoc on gear, so in some places [communities] have a strong incentive to implement bycatch-reduction solutions,” says Hoyt Peckham, a visiting scholar at Stanford University's Center for Ocean Solutions, who was not

involved in the research. The LEDs currently cost about two dollars each, but the price is dropping.

Potentially, Wang adds, it may be possible to use LEDs emitting different wavelengths of light to scare off turtles while luring in commercially desirable species. He plans to test that idea over the coming year in Mexico, Brazil and Indonesia.

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Credit: Nick Higgins