Science Spotlight: Can Protected Areas Change Fish Behavior?

A new study published in the journal Biological Conservation offers evidence that fish could behave differently inside a no-take area compared to outside. A research team in New Zealand studied snapper across an area that encompassed a no-take MPA (Leigh Marine Reserve) and adjacent fished waters, using acoustic telemetry tags to monitor the fishes' movement. In general, the fish exhibited two types of home ranges. One was relatively small (about 900 m in linear distance) and all of the fish tagged within the reserve exhibited this home range behavior. The other home range type was significantly larger (2100 m on average), and half of the fish tagged in non-reserve waters exhibited this home range behavior.

Darren Parsons of the National Institute of Water and Atmospheric Research, who led the study, says it suggests that some aspect of the reserve environment may encourage extreme residency. Perhaps the reserve effectively "selects" for individuals with a predisposition for a smaller home range, he says. In other words, the individuals with larger ranges end up spilling over to the fished areas and are caught.

"The findings of this paper add weight to the use of reserves as biodiversity conservation tools," says Parsons. "Our findings are more neutral with respect to using reserves for fisheries management." He cautions against interpreting the study as a case against the long-term promise of spillover from reserves as a fisheries tool. "If reserves encourage or select for highly residential individuals, this does not preclude spillover from happening. Spillover is likely to operate via home range shifts. The evidence we present provides no indication of whether home range shifts are more or less likely for residential vs. more mobile animals." He adds that, beyond the spillover effect, reserves offer other significant fishery management benefits, including as insurance against stock collapses and as a fishery regulation tool in areas of otherwise unregulated extraction.

For more information:

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The paper "Responses to marine reserves: Decreased dispersion of the sparid Pagrus auratus (snapper)" is in the September 2010 issue of *Biological Conservation*.