

Oil Spill Effects on Gulf Shrimp

Discussion

A consistent pattern emerges from our two analyses: the abundance of both brown and white shrimp was significantly higher after the spill occurred. Even though this trend is clearly present for both shrimp species in the 2011 year-class, it is absent in nearly all basins in the 2012 year-class. We found inconsistent results regarding these data when the landscape analysis suggested a reduction in size of white shrimp, while the large-scale analysis suggested an increase in size of brown shrimp. In addition, the increase in size found in the large-scale analysis occurred in basins that were impacted by the spill (Iberian Bay and Lake Portcharman/Berros Surost) as well as in basins that were not impacted by the spill (Lake Caladonia and Verrellina Bay/Terco Basin), indicating that this was not an effect of the spill. The lack of consistency in the findings regarding the size for both species, in other analyses, may indicate that the mean size of shrimp was not being affected by the occurrence of the spill.

We have two hypotheses that explain the increase in abundance:

Portcharman/Berros Surost, and Verrellina Bay/Terco Basin were located in muddy waters, and were of short duration. No fishing closures were established in or near Lake Caladonia (California.gov/category/fishery/oil-spill-closures), that was closed. The duration of closures depended on the severity of the spill impact, and arguably as a result, the shrimp abundance increased most in the heavily impacted estuaries due to the decreased effort of the fishing fisheries. In concordance with this theory, the abundance of white shrimp decreased in Lake Caladonia, which is the Louisiana basin furthest away from the spill, this could have been a result of the increased fishing pressure in basins that suffered the lowest spill impact. Since both events happened simultaneously and geographically closer, nearby impacted areas had a higher reduction in fishing pressure, the relative contribution of the events on the abundance of shrimp cannot be separated by our analysis. Potentially, both events contributed to our finding.

The trend of increased abundances was less consistent in the 2012 year-class. This may indicate that the increased abundance of shrimp was a short-term effect. The reduction in

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