

Science for Environment Policy

Gulf of Mexico oil spill exposed Peregrine falcon species to harmful hydrocarbons

Migrating tundra peregrine falcons (*Falco peregrinus tundrius*) experienced increased levels of harmful hydrocarbons in their blood following the 2010 Deepwater Horizon oil spill in the Gulf of Mexico, a new study finds. Blood from juvenile females was found to have the highest levels of contamination.

The Deepwater Horizon oil spill, which lasted from April 20 to July 15 2010, dumped 4.9 million gallons of oil into the [Gulf of Mexico](#). Crude oil contains a group of chemical compounds called [polycyclic aromatic hydrocarbons](#), which are toxic to birds.

Tundra peregrine falcons can be exposed directly – by coming into contact with the oil, or indirectly – through eating contaminated prey. It is through this second process that chemicals can [accumulate in species](#) higher up in the food chain. The falcons are apex predators, helping to keep the populations of other species in check. The Gulf of Mexico is a stopping point for them during their migration from the Arctic to areas around Latin America.

To investigate the concentrations of hydrocarbons in the blood, the researchers captured and took blood samples from 933 falcons in coastal areas in Maryland and Texas, USA. The Maryland location served as a control area since there was no oil spill there. The study looked at 16 forms of polycyclic aromatic hydrocarbons, each identified as a pollutant by the United States [Environmental Protection Agency](#). These chemicals are also found at low levels globally.

Five months after the oil spill the average blood residues of all hydrocarbons studied was approximately 11.49 nanograms per gram (ng/g) — almost four times higher than the control group. The levels varied by age, sex, and the specific hydrocarbons found. Juveniles possessed approximately 16.28 ng/g on average, which was three times higher than adults at 5.41 ng/g. Additionally, juvenile females showed the highest levels.

In 2011, the migrants tested showed a return to basal levels of these hydrocarbons — between approximately 2 and 4 ng/g. This is because birds have the ability to process hydrocarbons relatively quickly into substances they can excrete.

The differences in blood concentrations between age groups can be accounted for by the juvenile's migration and feeding habits. Studies show that juvenile falcons tend to stay for approximately five days in the Gulf of Mexico, while adults stay for only two days. Furthermore, juveniles are more exploratory during migration, which may cause them to wander closer to contaminated areas and consume prey there.

Polycyclic aromatic hydrocarbons are known to cause acute poisoning and lower the success of reproduction. They also have the ability to modify DNA. This study is one of the first to study contamination levels in peregrine falcons in a non-harmful manner, as most other methods require freshly killed birds or potentially damaging surgery.

The researchers say this study underscores the oil spill's impact on this important bird species. Furthermore, the method used to draw and analyse blood provides an effective means of quickly and effectively testing birds for oil exposure in the future. This method could be deployed in the biomonitoring of an ecosystem to assess impact following a polluting event.



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Contact:
wsseegar@aol.com

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