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## **IMPACTS OF OIL AND GAS ACTIVITIES ON MIGRATORY BIRDS**

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# Impacts of Oil and Gas Activities on Migratory Birds

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**Abstract – Thousands of oil and gas platforms are currently operating in offshore waters globally, and this industry is expected to expand in coming decades. Although the potential environmental impacts of offshore oil and gas activities are widely recognized, there is limited understanding of their impacts on migratory and resident birds. The most frequently observed effect, for seabirds and land birds, is attraction and sometimes collisions associated with lights and flares; episodic events have caused the deaths of hundreds or even thousands of birds.**

**Keywords: Oil, gas, migratory birds, environment**

## INTRODUCTION

Impacts associated with oil and gas activities include hydrocarbon pollution, both from operational discharges and spills, and attraction to structures. We focus on mortality associated with operational discharges and attraction to structures. Additional mortality from accidental spills from production platforms or drilling rigs or illegal bilge water discharges from general shipping and tanker spills are not explicitly addressed because these activities are not part of normal operations of the offshore oil and gas industry. Operational discharges: Produced water is formation water from the oil-bearing substrata brought to the surface with the oil and gas and represents most of the waste discharged from offshore oil extraction production facilities.

## REVIEW OF LITERATURE:

Birds of prey, such as the montagu harrier, pale harrier, hen harrier and the pied harrier that usually come from Eastern Europe, Central, Northern Asia and Southeast Asia did not arrive in 2010. The biggest change has been observed in the migratory patterns of water birds. Due to changing crop pattern, the number of cranes coming to India over the years has reduced by as much as 75 per cent. As many as 4,000-5,000 bar-headed geese were sighted in the past. But in the last two years, flocks of only 40-50 of these birds were seen at one time. The number of geese has definitely reduced by 50 per cent (Agarwal 2011). The food of the birds varies and is different not only in respect of different birds, but also in respect of different seasons. The adaptive value of migration with fluctuating food sources has earlier been well documented (Alerstam et al. 2003). Survival challenges encountered on these

journeys may be responsible for a majority of annual adult mortality in land birds. Newton (2008) reported that there was increased mortality during long migrations of avifauna. The Terai region of Uttar Pradesh is a very important ecosystem for many threatened species of tall wet grasslands and swamps (Rahmani 1988) and is the topmost priority for conservation (Rahmani and Islam 2000).

## THREATS TO MIGRATORY BIRDS

Reserve pits containing oil or oil-based products (i.e. oil-based drilling fluids) can entrap and kill migratory birds and other wildlife. Birds, including hawks, owls, waterfowl, and songbirds, are attracted to reserve pits by mistaking them for bodies of water. Reserve pits also attract other wildlife such as insects, bats, small mammals, amphibians, and big game. Wildlife can fall into oil-covered reserve pits while attempting to drink along the pits' steep side slopes. The steep, synthetically-lined pit walls make it almost impossible for entrapped wildlife to escape. Insects entrapped in the oil can also attract songbirds, bats, amphibians, and small mammals. The struggling birds or small mammals in turn attract hawks and owls to the oil-covered pit. The sticky nature of oil entraps birds in the reserve pits and they die from exposure and exhaustion. Birds that do manage to escape die from starvation, exposure or the toxic effects of oil ingested during preening. Birds ingesting sublethal doses of oil can experience impaired reproduction. Cold stress can kill the animal if oil damages the insulation provided by feathers or fur. Animals not killed in the reserve pits can suffer ill effects later from contact with the oil and chemicals in the pits. If they absorb or ingest oil in less than acutely lethal amounts they may suffer a variety of systemic effects

and may become more susceptible to disease and predation. During the breeding season, birds can transfer oil from their feet and feathers to their eggs. In some cases, a few drops of oil on an egg shell can kill the embryo.

Well stimulation chemicals, such as corrosion inhibitors and surfactants, disposed into reserve pits, pose additional risk to migratory birds. Surfactants reduce the surface tension of water; thus, allowing water to penetrate through feathers and onto skin. This compromises the insulation properties of the feathers and subjects the bird to hypothermia. Furthermore, loss of water repellency in feathers due to reductions in surface tension will cause the bird to become water logged.

## IMPACT OF PESTICIDES AND CONTAMINANTS ON MIGRATORY BIRDS

Substantial quantities of pesticides and industrial contaminants are released into the environment every year, both intentionally and accidentally. Many of these chemicals become distributed over vast geographical regions either due to widespread usage or movement through environmental compartments. As a result, contamination or modification of many ecosystems occurs, with the subsequent potential for adverse effects on the biota inhabiting those ecosystems. Migratory bird species are potentially be exposed to a wider range of pollutants than non-migratory species, as their annual movements can bring them into contact with pollutants in breeding and wintering regions and on migration routes. However, our understanding of the contribution of pesticides and pollutants to population declines of neotropical migrants is hindered by a lack of knowledge on the extent to which migrants are exposed to these chemicals and the importance of pollutant-induced changes in mortality and reproductive success relative to other anthropomorphic or natural factors which may also affect population size.

## MODES OF EXPRESSION OF TOXIC EFFECTS

Pesticides and contaminants exert their toxic effects on birds in varying manners depending upon their chemical nature, environmental persistence, mode of action and methods by which they are metabolized in birds. Even within any class of contaminants, toxic effects may be expressed differently depending on the magnitude of exposure, and environmental conditions under which exposure occurs.

Acute toxic effects are exhibited following brief exposures to single or multiple doses of a chemical. Mortality is a typical response to acute doses of many pesticides, although other responses may include behavioral or reproductive alterations. Chronic effects are exhibited after a long period of uptake of small amounts of a toxicant. Chronic effects may be expressed in many forms including reproductive or

behavioral changes, immunological impairment, carcinogenesis, and teratogenesis. Chronic effects often do not become apparent until after the source pollutant has disappeared or may be a response to very low concentrations of a pollutant, therefore it may be more difficult to establish cause and effect relationships following chronic exposure than following acute poisonings.

Direct effects are changes induced in a bird following exposure to a xenobiotic, with increased mortality, decreased reproductive success, increased susceptibility to predation or behavioral impairment being among the most common. Indirect effects are responses to pesticide-induced changes in food resources, habitat structure and predator or competitor abundance. Since changes in habitat structure or animal abundance may not occur until a considerable period after the exposure event, the relationship between cause and effect may not be readily apparent.

## CONTAMINANTS OF CONCERN

There are five major classes of environmental contaminants which may be most likely to affect neotropical migrants:

1. Organochlorine pesticides and related industrial contaminant
2. Organophosphorus and carbamate insecticides
3. Herbicides
4. Acidic Precipitation

## CONCLUSION:

In this paper we found that the presence of small amounts of hydrocarbons, such as diesel, and condensate, can create sheens on the reserve pit fluid. The presence of visible sheens on reserve pit fluids is just as deadly to birds that come into contact with them. A light sheen will coat the bird's feathers with a thin film of oil. Although light oiling on a bird may not immediately immobilize the bird, it will compromise the feathers' ability to insulate the bird. Furthermore, the affected bird will ingest the oil when it preens its feathers and suffer acute or chronic effects.

## REFERENCES:

- Agarwal, M. (2011). Migratory birds in India: Migratory birds dwindling New Global Indian.
- Alerstam T., Hedenström, A. and Åkesson, S. (2003). Long-distance migration: evolution and determinants. *Oikos* 103: 247–260.

- Newton, I. 2008. The Ecology of Bird Migration. London: Academic Press.
- Newton, I. (2008). Migration ecology of birds, Academic Press, London, UK.
- Rahmani, A. R. (1988) Grassland Birds of the Indian Subcontinent: A Review. In: Ecology and Conservation of Grassland Birds
- Rahmani, A. R. and Islam, M. Z. (2000) Prioritization of the Indian Grasslands for Conservation of Biodiversity. In: Setting
- Rahmani, A. R., Kumar, S., Deori, P., Khan, J. A., Kalra, M., Belal, M. S., Khan, A.M., Khan, N.I., George, A., Srivastava, N., Singh, V.P., Rehman, F. and Muraleedharan, S. 2010. Migratory movements of waterbirds thorough Uttar Pradesh and the surveil-lance of avian diseases. Mumbai: Bombay Natural History Society.
- <http://www.ace-eco.org/vol8/iss2/art4/>