

FOREST FERTILIZATION

Effects on Wildlife¹

Forest fertilization may affect wildlife directly by exposure to nutrients in their concentrated form immediately after application, and indirectly through growth enhancement of plant species. In addition, fertilization may increase the potential for wildlife feeding damage to conifer seedlings and saplings.

Direct Effects of Fertilization on Wildlife

Acute toxicity levels have been documented for many vertebrates. Amphibians and domestic animals appear to be the most susceptible to urea poisoning. The mechanism of toxicity is the conversion of urea to ammonia and carbon dioxide in the presence of the enzyme urease. This enzyme is produced by bacteria found in the digestive systems of both ruminants and simple-stomached animals.

At low doses, however, urea is not harmful to domestic animals. In fact, low concentrations of urea (up to 3%) are used as a nitrogen supplement to ruminant feeds because it is an inexpensive nontoxic protein for animal production.

Considering that urea must be consumed for several days to produce reversible toxic symptoms, and it dissipates rapidly under field conditions, forest fertilization with urea is unlikely to adversely affect wildlife. Also, studies have shown that the acceptance of pelletized urea by mice and gallinaceous birds (e.g., grouse) is extremely low.

Availability of urea in the forest environment determines its potential hazard to wildlife and domestic animals. Fertilizer spills at storage or transfer sites are probably the greatest potential hazard, especially with cattle. Several instances of cattle having died after feeding on exposed piles of urea are known in the PNW and have also been reported in the literature in other countries. These situations are easily avoided with careful handling and storage and prompt cleanup of spilled fertilizer.

Indirect Effects of Fertilization on Wildlife

Indirect effects arise from fertilization-induced changes in vegetation.

1. Increased forage production

- several studies have reported increases in forage production, especially when fertilization is combined with thinning.

2. Improved nutritive quality

- most studies have reported improvement in some parameters of nutritive quality of

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forage following fertilization.

- crude protein content more than doubled and reached 20% in dry matter in reindeer after forest fertilization in Sweden.

3. Forage Selection and Tree Damage

- palatability of plants as wildlife food often improves following fertilization. This is a desirable goal from a wildlife management perspective but may interfere with forest productivity if tree growth and survival are adversely affected.

Many studies have documented a clear preference by various mammals (e.g., rodents, ungulates) for fertilized seedlings and trees. In stands with a high risk of damage, fertilization should be avoided or postponed until the trees have grown beyond the stage most susceptible to damage.

Information Sources

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