Development of the oil sands has led to increasing atmospheric N deposition, with values as high as 17 kg N ha-1 yr-1; regional background levels <2 kg N ha-1 yr-1. Bogs, being ombrotrophic, may be especially susceptible to increasing N deposition. To examine responses to N deposition, over five years, we experimentally applied N (as NH4NO3) to a bog near Mariana Lakes, Alberta, at rates of 0, 5, 10, 15, 20, and 25 kg N ha-1 yr-1, plus controls (no water or N addition). In May of each year, we collected mixed vascular plant tissue and Sphagnum fuscum peat and placed homogenized mixtures in nylon bags and placed them approximately 10 cm below the peat surface in early June. Bags were collected again in October of each year, cleaned, dried, and weighed. Decomposition of Sphagnum moss and mixed vascular plant litter was affected by N inputs, on average losing 8 and 38 % of initial mass, respectively, over 5 months of decomposition. Water addition alone had no significant effect on decomposition of cellulose, Sphagnum, or vascular plant litter (p > 0.15).