Results of measurements of CO₂ emission fluxes in grassland ecosystem on a peat-muck soil are presented in the paper. The studies were carried out in the Noteć River valley in the years 2008–2011. CO₂ fluxes were measured with the method of closed static chambers using a diffusive meter. Total ecosystem respiration activity TER and net ecosystem exchange NEE were measured. Total respiration activity of grassland ecosystem on peat-muck soil was on average 2240 mg·m⁻²·h⁻¹, whereas net ecosystem exchange value – 767 mg·m⁻²·h⁻¹. Calculated plant uptake during the growing season was on average 78.9 Mg·ha⁻¹ of CO₂, whereas CO₂ emission from the ecosystem was 90.8 Mg·ha⁻¹. It was found that grassland ecosystem was a net emitter of CO₂. Carbon losses expressed in CO₂ equivalent were on average 21.8 Mg·ha⁻¹ during the study period. This means a loss of 5.9 Mg·ha⁻¹ of carbon or a loss of 10.6 Mg·ha⁻¹ of organic mass with a carbon content of 56%.