It has been observed that some solutions to the inverse radiation treatment planning problem by iterative algorithms may result in excessive fluxes in some radiation beams, particularly at the edges of a treatment volume. This is often the case in the recently published results obtained with the Maximum Likelihood (MLE) or with the Dynamically Penalized Likelihood (DPL) methods. Those effects are typical in ill-posed inverse problems at sharp edges. This paper will report on the application of Bayesian smoothing to the inverse radiation treatment planning problem, borrowed from Positron Emission Tomography image reconstruction techniques. It will show that, for cases with inversion by the MLE and DPL methods, smoother beam flux profiles are obtained without significant loss in the quality of the dose delivered to the treatment volume or any substantial increase in the doses delivered to sensitive tissue areas. The Bayesian smoothing constraint applied to the target function penalizes solutions that result in large differences in beam fluxes in selected neighborhoods. There is one parameter that controls the strength of the constraint and the algorithms are stable within a substantial range of that parameter, allowing solutions that extend from no smoothing to those that are excessively smooth and show deterioration in the dose distributions.