Authors:
We thank the ***Anonymous Referee #2*** for his comments and suggestions. We are grateful for interesting suggestions allowing for manuscript improvement.

Anonymous Referee #2
The manuscript deals with an application of RUSLE model to a burned area to assess soil losses during the first year following fire, considering different scenarios without mitigation treatments application or with different emergency stabilization actions.
Those soil losses are an important issue in the Mediterranean areas, frequently subjected to forest fires and subsequent erosive and hydrological risks.
The authors have used a detailed description of hydro-geomorphology to obtain a better resolution in the RUSLE model application to the study-area.
The authors have tried to estimate how fire can affect the C coeffcent in the RUSLE equation and similarly, how different stabilization treatments can modify the P coefficient in the same equation. This is a crucial point in the use of the above equation in burned areas. In fact, as Larsen and MacDonald (2007) have stated, there is a ack of information on how these coefficients are modified due to fire impact and post-fire activities. I suggest the authors try to better justify the selected values for these parameters.
Some of the aplication patterns for the considered treatments do not seem to be very realistic (e.g. it is not usual to treat all the burned area) and it would be convenient the authors clarify that is partially due to they have proposed an exercise of the RUSLE application. It would be good a comment emphasizing the relevance of soil burn severity in the modification of RUSLE parameters and the incertitude introduced in this study, due the lack of that information. Also, a comment about the importance of fire severity for prioritizing the intervention areas would be welcomed.
I kindly encourage the authors to make these changes in the text to take a broader perspective of the problem and gain applicability in their interesting contribution

Specific comments
Abstract
Maybe the first paragraph can be shortened and a bit more information about the results to be neccesary.
Authors:
More information about the results have been added in the abstract.

ABSTRACT

Severe wildfires are often followed by significant increase in runoff and erosion, due to vegetation damages and changes in physical and chemical soil properties. Peak flows and sediment yields can increase up to two orders of magnitude becoming dangerous for human lives and ecosystem, especially in the wildland-urban interface. Watershed post fire rehabilitation measures are usually used to mitigate the effects of fire on runoff and erosion, by protecting soil from splash and shear stress detachment and enhancing its infiltration capacity. Modeling post fire erosion and erosion mitigation strategies can be useful in selecting the effectiveness of a rehabilitation method. In this paper a distributed model based on Revised Universal Soil Loss Equation (RUSLE), properly parameterized for a Mediterranean basin located in Sardinia , is used to determine soil losses for six different scenarios describing both natural and post-fire basin condition, the last accounting also for the single and combined effect of different erosion mitigation measures. Fire effect on vegetation and soil properties have been mimed by changing soil drainage capacity and organic matter content, and RUSLE factors related to soil cover and protection measures.
Model results, validated using measured data on erosion rates from the literature and in situ field campaigns, show the effect of the analyzed rehabilitation treatments in reducing the amount of soil losses with the peculiar characteristics of the spatial distribution of such changes. In particular, the mulching treatment substantially decrease erosion both in its mean value and in the spatially

distribution of the erosion levels over the burned area. On the contrary, the breaking up of the hydrophobic layer decreases post fire mean soil losses of about the 14%, although it strongly influences the spatially distribution of the erosion levels.

Anonymous Referee #2
Study Area (lines 17-22).Please, revise the figures, they seem to be not consistent (more than 100%).
Authors:
The figure have been revised.

Anonymous Referee #2
Material and Methods
Page 10885. APAT is not in the references list
The pedological map of Sardinia reference is lacking.
Page 10886. Moore and Burch (1986) is not referenced.
Page 10889,please change log terraces by log barriers.
Authors:
The references have been checked and the changes have been done.

Reviewer 2
Discussion
This section would improve if the part corresponding the pre-fire values (firts two pages) is significantly shortened.
Authors:
The authors acknowledged the suggestion. In the new version of the manuscript comments concerning the "pre fire values" have been moved to the "validation paragraph"

3. Results and discussion
Table 3 shows the summary of results where simulated soil loss main statistics, corresponding to the six studied scenarios, are reported. In particular, the statistical analysis of erosion in natural condition (scenario 1) has been reported both for Rio Mannu basin and for the sub-area subjected to treatments (47 km^2). Soil losses corresponding to basin sub-area under treatments have been analyzed for scenarios 2-6.

Scenario1: pre-fire estimated erosion and model validation
Mean soil loss calculated over the whole basin amounts to 1.9 t/ha*year (Table 5), that lies in the range of measured erosion data in Sardinia, South Italy and the Mediterranean Europe
Zonal statistic underlines significant differences in soil losses among areas having different soil condition. Mean soil loss ranges from 0.12 t/ha*year on land classified as pasture, to 4.5 ÷ 5.6 t/ha*year on areas cultivated with vines or olive trees, up to 20.5 t/ha*year in areas with little or no vegetation cover. The analysis shows values greater than 30 t/ha*year occurring in very few cells of the basin (0.24 %). In addition, the 99^{th} percentile of the whole area soil loss is 19.4 t/ha*year, and 90% is 5.05 t/ha*year (Figure 4).
In detail, peak simulated soil losses in Rio Mannu basin corresponds to areas with spare vegetation, olive groves or vineyards. For these land use classes, zonal statistics provide peak soil losses of 55.4 t/ha*year, 13.72 t/ha*year and 10.9 t/ha*year, respectively. Indeed, peak values of 55.4 t/ha*year occur in very few cells (0.2%) where the combination of steep slopes, high LS factor and C factor lead to such maxima. Cerdan et al., (2010), during their field experiments in Mediterranean environment, observed erosion on bare soil of 9.05 t/ha*year and on vineyards of 8.62 t/ha*year.

Model performances in reproducing soil losses in selected soil uses as pasture, forage crops, cereals have been assessed by comparison with Ottava field campaigns measurements.
Model results have been further compared with measurements of Ottava, the field site in the northern part of the Rio Mannu basin.
Model simulations have been carried out both for a sub area located in the proximity of Ottava study site and for the whole Rio Mannu basin by using rainfall input being the measured rainfall in the same time period of when the experiment took place. Data coming from Sassari raingauge, the closest to Ottava, were used for sub area simulation, while for Rio Mannu 7 raingauges data properly spatialized formed the model input. Results, reported in detail in Table 6, show a good agreement with measurements especially among sub area simulations and second experiment results reporting mean erosion of 1.08 and 0.86 t/ha*year respectively. The model, despite its simplicity, adequately reproduces observed soil loss for the different land uses.

The authors thank very much ***Anonymous Referee #3*** for his review allowing for manuscript improvement.