

## ***Interactive comment on “Soil microbiological properties and enzymatic activities of long-term post-fire recovery in dry and semiarid Aleppo pine (*Pinus halepensis* M.) forest stands” by J. Hedo et al.***

**Anonymous Referee #2**

Received and published: 22 November 2014

The research paper entitled “Soil microbiological properties and enzymatic activities of long-term postfire recovery in dry and semiarid Aleppo pine (*Pinus halepensis* M.) forest stands” by J. Hedo, M. E. Lucas- Borja, C. Wic, M. Andrés Abellán, and J. de Las Heras has been revised for publication in Solid Earth.

The topic of the manuscript falls within the scope of the journal. The recovery of natural forest affected by wildfires is an issue of concern mostly in sensitive areas to the impacts of climate change (e.g. increasing temperatures and frequency of drought which may enhance the risk of wildfires). The MS was written in good English and it

C1328

is well structured. However, there are several queries from this referee that must be addressed prior being considered for publication in a scientific journal.

Major comments:

• There are contradictory statements in the abstract that may lead to misunderstanding of the key message of this piece of work. It is said that “the long-term consequences and post-fire silvicultural management in the form of thinning have a significant effect on the site recovery after fire.”, however, at the same time authors are ending the abstract with, to my understanding, the main outcome of their study: “We conclude that total vegetation restoration normalises microbial parameters, and that wildfire and post-fire silvicultural treatments are not significant factors of soil properties after 17 years.”

Please, rewrite the abstract trying to be coherent with your conclusions.

• The hypothesis must be reformulated. As it is stated now, it seems that authors were just referring to their own results after getting them.

• My main concern in the design of the experiment is referred to stationarity of the study. Can the authors of this work justify the decision of carrying out the experiment in winter? Why did you choose this season? Logistics may be? Are there scientific reasons for this choice?

• Some statements in the Discussion section should be extended:

“Furthermore, Bastida et al. (2008) indicated that seasonality affects enzymatic activities or microbial biomass, and in this work only we sampled in early winter, so it would be suitable to conduct sampling in different seasons.” Please, indicate why you choose winter.

“Wic-Baena et al. (2013) have recently shown that soil enzymatic activities did not diminish 6 years after thinning.”

Please, extend your discussion at this point and try to support your findings with more

C1329

sources of information available in the scientific literature.

“(.. .) Our results also indicate lower C/N values at Yeste, but no significant differences among treatments.” Could you explain why?

“Lower C/N rates have been associated with higher respiration rates and microbiological properties (Schmitz et al., 1998).”

Please, extend your discussion. Is there any limitation with the use of words that avoids you to do so?

The last sentence of the Conclusions section is again confusing about the main outcomes of your work:

“Forest management guidelines should consider the effect of thinning treatments and forest site in order to preserve soil quality under the adaptative forest management context.”

I may point out that forest site play a very important role in forest recovery after wild-fire. Therefore, forest management policies should have aspect into account when designing (and budgeting) restoration plans.

Minor comments:

• Abstract:

I am not sure if “normalises” is a good term to be used here.

“(.. .) wildfire and post-fire silvicultural treatments are not significant factors of soil properties after 17 years”. Substitute “of” by “affecting”.

• Introduction:

I do not understand the term “exposed” within this context.

Please, add a sentence about the importance of your work in the context of climate change and the vulnerability of natural forests against wildfires in sensitive (to the con-  
C1330

sequences of Climate Change) Mediterranean areas.

“thinning in young”, Is there a “more scientific” term to refer to this practice.

“physical–chemical”. Use “Physicochemical” and be uniform within your MS. Please, add a more recent reference to “Nannipieri et al., 1990”. You said that “Some long-term studies appreciated that soil organic matter and microbial communities can recover to the pre-fire levels (Guénon et al., 2013).” Please, rephrase this statement indicating the differences with your study and their singularities. Otherwise, it seems that the work was already done.

“It is noteworthy 5 that we define recovery as a scenario which returns to the same soil functioning activity levels between the burnt or thinned and mature plots.” I see this sentence more as “Materials and Methods information”.

Section 2.3. Add a reference to “organic matter (OM) was inferred by multiplying the TOC content by 1.728.”

Was a weather station placed in the experimental sites during the campaign?

• Section 3.1.

In “Soil texture (Table 1) and electrical conductivity (Table 2) were also similar for both study sites and for the different treatments.” Delete “also” to give coherence to the entire paragraph.

“In relation to the experimental treatments, enzymatic activities presented similar values in the “BT”, “MAT” and “BNOT” plots (Fig. 1).” I guess this was already mentioned at the beginning of the sub-section.

• Section 3.3. Delete “and also among the microbiological variables,”

• Discussion

“Gutknecht et al. (2010) recently showed” Delete “recently”. “(.. .) soil moisture and

temperature showed no significant differences in the “BT”, “MAT” and “BNOT” plots,”  
Change “in” by “between”.

Please, look for a different term to avoid “a large part” or rephrase the sentence.

There two times in the discussion in which you refer to “15 years”. This is confusing  
since you mentioned a period of 17 years before. Please, clarify this point.

“This long-term study demonstrated that soil parameters might recover to the pre-fire  
levels 15 years after the fire event and thinning operations.” Please, add “at least”  
before “15 years” and change “15” by “17”.

Based on the stated above, I conclude that a major revision is needed prior considering  
the paper to be published in Solid Earth.

Yours sincerely,

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Interactive comment on Solid Earth Discuss., 6, 3025, 2014.