

## sDiv writing retreat summary

### “sPhy writing retreat”

The sPhy working group met in Leipzig in 2013 and 2014 to look at the use and meaning of phylogenetic diversity measures in ecology and conservation. Four members of the original group – Silvia Carvalho, Simon Ferrier, Rich Grenyer and Dan Rosauer – reconvened in Leipzig on 4-7 December 2017.

The purpose of the workshop was to work on an exciting question relating to conservation of phylogenetic diversity, which had arisen at the earlier meetings.

#### Focus of the meeting

A number of studies on planning protected areas for the conservation of phylogenetic diversity (PD) – the branches of the Tree of Life – have tested the effectiveness of species conservation as a surrogate for PD conservation. If the priority in conservation is to minimize losses of phylogenetic diversity, it is still possible, if species diversity serves as a strong surrogate for PD in this situation, that choosing areas for species conservation may be a good way to achieve PD conservation without the need to assess PD directly. Some studies have analyzed this relationship, but support for high surrogacy has been equivocal.

Tests of the relationship between PD and species conservation so far, have not considered the question the cost of land for conservation. Value of land for human uses is an important factor in real-world conservation decisions. If land cost is structured on environmental dimensions which also determine the evolutionary radiation of clades into different environments, then it should affect their phylogenetic distribution with respect to cost, with some clades being concentrated in either high or low value land.

*We therefore hypothesized that conservation planning strategies designed to protect species at minimum cost, would tend to be biased towards clades which occupy less valuable environments and regions, and thus not serve as a good surrogate for PD which requires good sampling across all clades.*

The purpose of the workshop was to review and write up results testing this hypothesis at global and regional scales.

#### Presentations and discussion

- Dan Rosauer presented global results testing this hypothesis for mammals globally. Implications for the hypothesis were discussed, along with follow-up analyses
- Silvia Carvalho presented results for amphibia of the Iberian Peninsula.

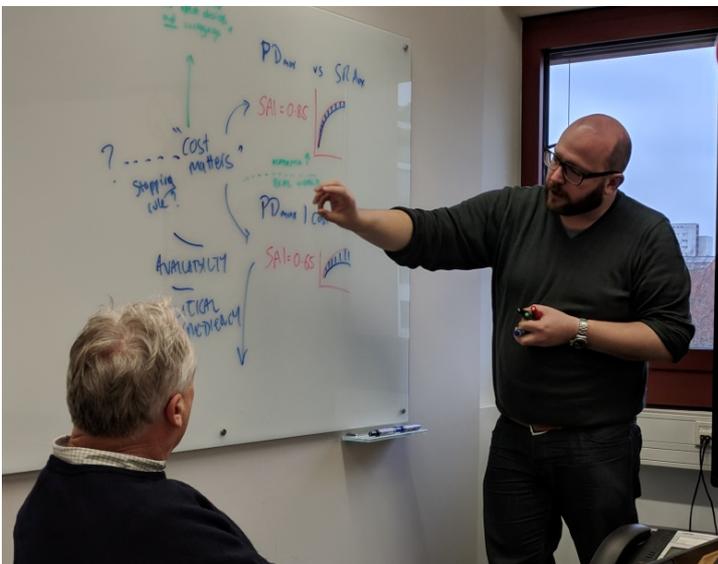
Major topics of discussion included:

- The differences and relative strengths and weaknesses for this study, of different global models of land value

- Interpretations and implications of the results
- Further analyses which could help to reveal and explain the relationship conservation costs and PD-species surrogacy.



*Rich Grenyer, Silvia Carvalho and Simon Ferrier in discussion*



*Rich Grenyer makes a point*

### Steps undertaken at the workshop

- Parts of the manuscript for this study were written
- Results and figures were generated using two alternative global cost models
- A new global analysis for the five largest mammal orders was designed and commenced
- A simulated analysis – using data created to produce the strongest possible effect – was designed and commenced

- A test based on randomized conservation reserves was proposed.

The workshop thus spent roughly equal amounts of time on discussion, manuscript writing and data analysis.

### **Next steps**

The new analyses proposed at the workshop will be completed, and their results will determine the shape of the final manuscript, which will be submitted to a journal with interests spanning both conservation and evolution, such as *Methods in Ecology & Evolution* or *Ecography*.

### **Atmosphere**

The four participants already have a strong working relationship from previous iDiv meetings and collaborations, and this translated to a really productive and enjoyable atmosphere in the workshop.

The familiar arrangements for iDiv support worked well, including our lovely accommodation at the Balance Hotel. The 15 minute walks between the Hotel and iDiv proved a fertile time for discussing ideas related to the workshop.

No further meeting are planned for this specific topic, although future collaborations are likely.

Dan Rosauer

(for Silvia Carvalho, Simon Ferrier, Rich Grenyer and Dan Rosauer)