

sDiv working group meeting summary

"sTraitChange 2"

During our second workshop we discussed the results obtained so far, the encountered issues that required group decisions, and the next steps. In particular, we focused the first day of the meeting on our focal project, analysis of the empirical data to assess how climate-driven changes in traits propagate to demographic rates, and in turn, population dynamics across animal species worldwide. The presentations were given on: i) the current state of the assembled dataset (Carys Jones), ii) the results of the climatic windows analyses so far and the decisions made, followed by the discussion of the raised issues / needed adjustments (Carys Jones), iii) the results of structural equation modelling (SEM), the decisions made and the encountered issues (Radchuk Viktoriia). We spent the afternoon discussing the raised issues and agreeing on the best ways to tackle them. Some of the suggestions regarding the structure of the SEM were then directly implemented in R and the results presented and discussed during the two following days, so that we reached a final agreement on the best SEM structure to use given the variety of studies and their heterogeneity.

On the second day of the meeting we had presentations of other sub-projects: i) assessing the impact of climate on traits and demographic rates for the species for which data on multiple populations are available (Martijn van de Pol); ii) results of using agent-based models (ABM) to test the assumptions of SEM (Thomas Banitz); iii) results of an ABM developed to disentangle the effects of climatic mean vs climatic variation on the population dynamics, as mediated by traits (Guillaume Chero). We discussed the presented results and the plans for the next steps. The use of an ABM to test SEM was found very helpful because it allowed investigating the possible ways to account for density-dependence in our SEM analyses of the empirical data, and revealed the limitations of the goodness of fit metrics.

Additionally to the projects focused on the analyses of empirical and simulated data, we had a brainstorming on the conceptual idea brought up by Holger Schielzeth during the first meeting. He presented the concept of keystone phenotypes in detail and we had a plenary discussion on the usefulness of concept and its applicability. Finally, we agreed that it would be worth writing an opinion paper describing this

concept, and Holger, as the leader of this sub-project, divided the tasks among the participants.

The highlight of the meeting was the talk given by Steve Beissinger to the whole iDiv community 'Climate Change, Range Shifts, and Traits - The Long View'. Steve presented some of the key findings from his own work, while nicely incorporating the work we are doing within the sTraitChange.

The balance between work on outputs/ general brainstorming and information exchange / participants presentations was approximately 15% / 55 % / 30%. Discussions were very stimulating and inspired some new ideas. In particular, Tom Reed has got a research question that may be (partially) answered with the data assembled within the sTraitChange. We have discussed his idea during the meeting and agreed to follow up on it in the future (we assigned the tasks of who would assemble the data in the necessary format and conduct preliminary analyses). The meeting was very fruitful, strengthening some of the existing collaborations and establishing new ones. Again, as during the first meeting, the friendly and pleasant working atmosphere was possible due to the constant support from the sDiv organizing team. sDiv team assisted us in very diverse matters: from setting up the Skype meetings to friendly changing the reservation for a dinner place to a restaurant that the participants liked a lot from the first meeting.

On the last day of the meeting we assigned the tasks needed to finalize the main core project of the sTraitChange, as well as those related to the sub-projects. We have agreed on the time line for the tasks completion. A group has spent quite some time discussing the possibilities for the future funding as we agreed that it would be great to continue working on further ideas as a collaborative network.