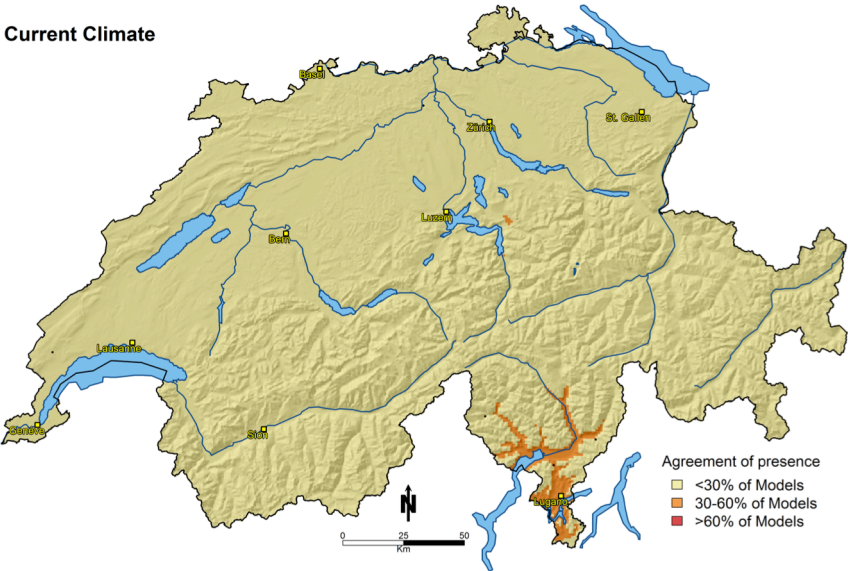


# Corylus avellana (tree form)

## Description of model and ensemble projections

The current distribution of the tree form of *Corylus avellana* is modelled to cover primarily the lower altitudes of the Ticino, while north of the Alps we primarily expect the shrub form that does not reach the forest canopy. The model does not have a high degree of certainty, but captures the general distribution given by LFI observations.

Under expected climate change using the A1B scenario, combinations of statistical and regional climate models predict a spread of *C. avellana* within the Ticino to higher altitudes, and also a spread of the tree (canopy) form of the species to the north of the Alps. Yet, it does not spread really well across the whole plateau and rather remains simulated with uncertainty between central Northern Switzerland and the Reuss valley. None of the simulations really reaches high levels of certainty.



**Figure 1.** Current distribution (black dots) from the Swiss National Forest inventory (LFI 1) and simulated habitat suitability under current climate as calibrated from LFI forest inventory data of Switzerland.

## Synthesis and Conclusions

The rather uncertain model fits the distribution of the canopy form of *C. avellana* in the Ticino comparably well, and can be considered a somewhat useful model to project the future habitat suitability of *C. avellana*. Yet, no sufficiently high certainty is reached to have high trust in the projections. The ensemble models project a 100% overlap between the current and the future range in Switzerland. No similar statistics is available for Europe. Also, the tree form of *C. avellana* is projected to increase its range considerably (more than 10-fold), and is expected to also occur north of the Alps. This reflects likely conditions of *Q. pubescens* or *Q. petraea* forests, where *C. avellana* can reach canopy height in a warmer and drier climate.

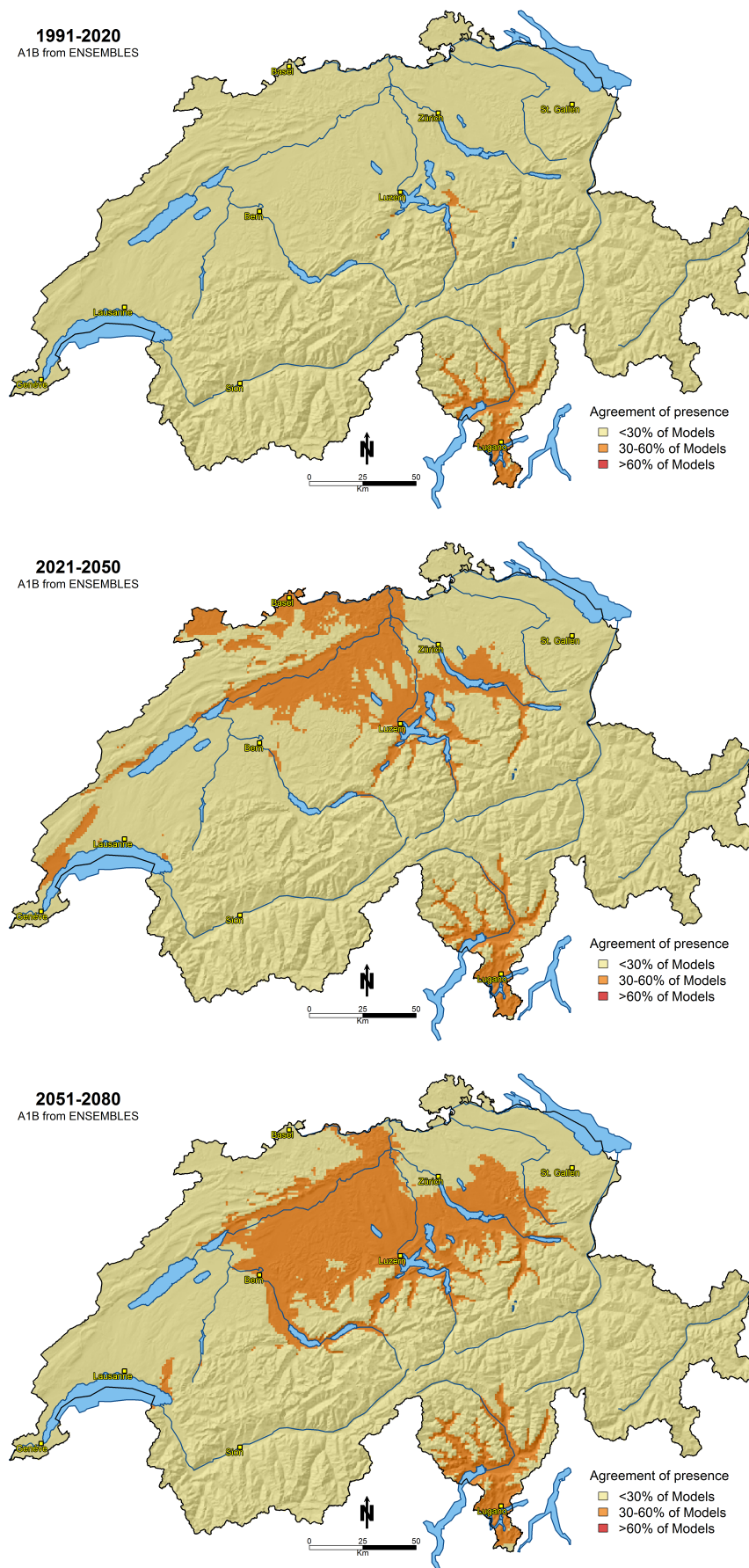
Yet, all simulations are only available with very high uncertainty. Also, the species has no economic value, yet has high importance for many small rodents as a food source. The species will have no problem adjusting to climate change. It is quite insensitive to browsing and coppicing, and regenerates quickly after disturbance. It was one of the fastest migrating and earliest spreading species after the retreat of the glaciers during the early Holocene spread of larger woody plants in Europe (Huntley & Birks 1983; Lang 1994). Due to the high model uncertainties and the low economic or conservation value, we do not further discuss this species.

Range change statistics		
	CH	Europe
Current range size [km²]	619	–
Future (2080) range size	8572	–
Range Change 2080/2000 [%]	>999%	–
Overlap 2000/2080 [km²]	619	–
Overlap/current range [%]	100%	–

## References

Huntley B, Birks HJB (1983) *An atlas of Past and Present Pollen Maps for Europe: 0 - 13000 years ago* Cambridge University Press, Cambridge, UK.

Lang G (1994) *Quartäre Vegetationsgeschichte Europas: Methoden und Ergebnisse* Fischer, Jena [etc.].



**Figure 2:** Ensemble of projected future ranges of suitable habitat as modeled from six RCMs and six statistical models. Light yellow colors indicate that all climate & statistical model combinations project absence of the species, while dark red colors indicate presence. Orange colors indicate uncertainty regarding habitat suitability.