

Ostrya carpinifolia

Description of model and ensemble projections

The current distribution of *Ostrya carpinifolia* is modelled to cover primarily the low altitude regions of the Ticino. The model captures the general distribution of the species well, despite missing some specific pixels where the species obviously is present. The species naturally inhabits the colline region South of the Alps, and is profiting there primarily from coppice forest management.

Under expected climate change using the A1B scenario, most combinations of statistical and regional climate models predict a rapid spread of *Ostrya* within the Ticino into more Northern valleys and to higher altitudes. This means that these regions represent soon climate conditions, under which presence of *Ostrya* is currently being observed. Some "Foen" (=chinook) regions (Upper Reuss valley) and otherwise specifically favored regions in the lower Valais seem to become suitable as well.

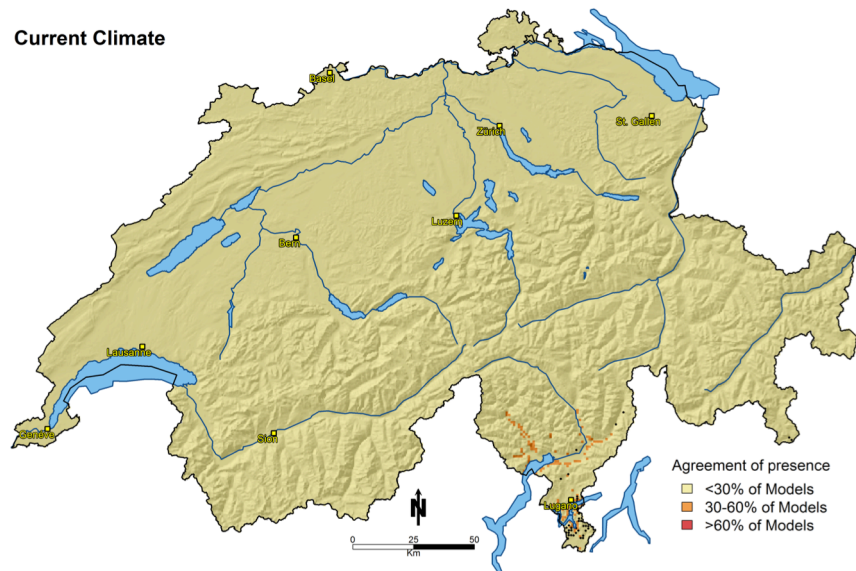


Figure 1. Current distribution (black dots) from the Swiss National Forest inventory (LFI 1) and simulated habitat suitability under current climate as calibrated from forest inventory data across the Alps (MANFRED project).

Synthesis and Conclusions

The model fits the distribution of *Ostrya carpinifolia* comparably well, and can be considered a credible model to project the future habitat suitability of *Ostrya*. The ensemble models project a 98% overlap between the current and the future range in Switzerland and still a high overlaps (73%) in Europe. This is a very high overlap between current and projected future distribution and suggests that this species is not much at risk in the future.

Moreover, the species likely increases its distribution range considerably in Switzerland +562%, while in Europe it likely can maintain the current range size. This means that the species is not particularly threatened, and will still find sufficient suitable habitat, both in Switzerland and in Europe under future climate conditions. However, it might depend largely on coppice forest practice, and may not easily be able to migrate into the beech or spruce forests the currently colonize the higher altitudes that will become suitable habitats for this species. This is a general problem for light demanding species such as *Ostrya*, which currently profit considerably from traditional forest management practice. Only if the climate becomes significantly drier, it might be able to migrate to those regions on its own.

The fact that the model does not depict well the spatial details of the current distribution of *Ostrya* in the Ticino likely originates from the pan-Alpine data basis, which is not necessarily the best source to predict exactly the Ticino distribution at its cold, Northern distribution range limit in Southern Switzerland. Still, we consider the general pattern of the distribution range to be well covered by the model, and therefore we believe that the projections are credible for this species.

Range change statistics

	CH	Europe
Current range size [km²]	112	22'062
Future (2080) range size	742	22'155
Range Change 2080/2000 [%]	662%	100.4%
Overlap 2000/2080 [km²]	110	16'044
Overlap/current range [%]	98.2%	72.7%

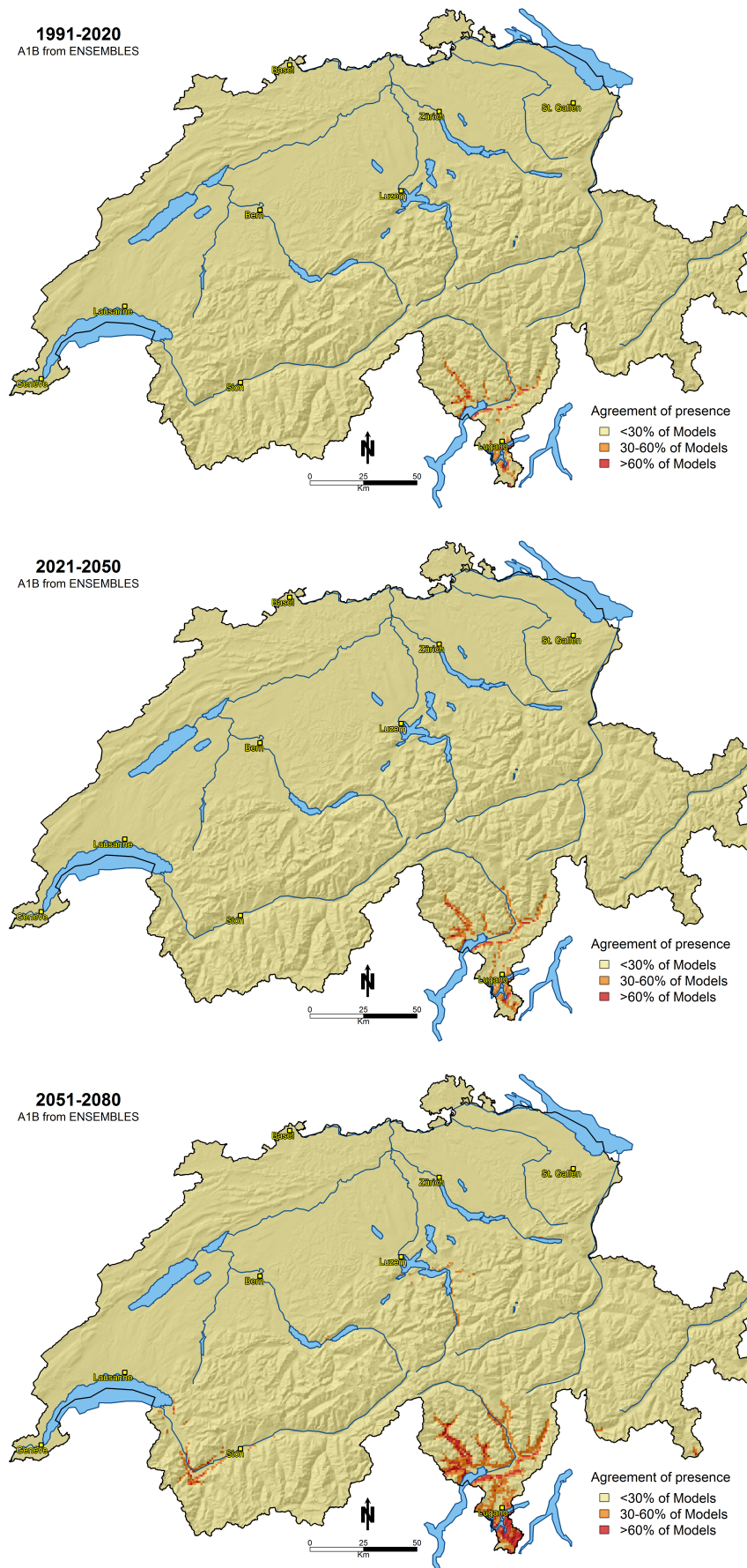


Figure 2: Ensemble of projected future ranges of suitable habitat as modeled from six RCMs and six statistical models. Light yellow colors indicate that all climate & statistical model combinations project absence of the species, while dark red colors indicate presence. Orange colors indicate uncertainty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