Appendix 15: Effect of Climate Change on Masting *Chionochloa* spp

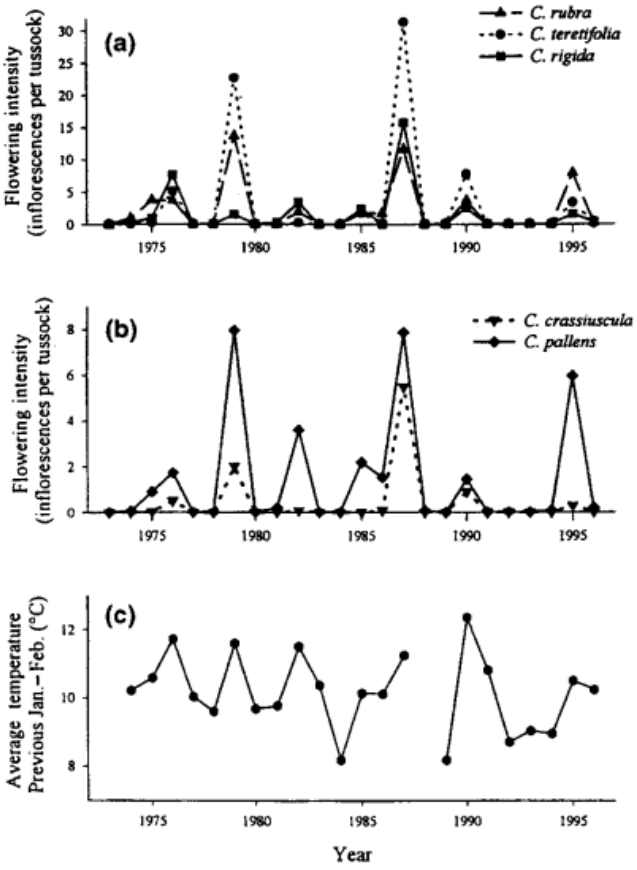

Fig. 1 Flowering rate for five species of *Chionochloa* (a, b) and average temperature (c) between 1973 and 1996 at Takahe Valley, Fiordland National Park, New Zealand. Year of flowering is designated by the year at the end of summer, e.g. the 1979–80 summer is labelled 1980. Temperature shown is the average daily temperature (mean of maximum and minimum for the day) for January and February. Average temperature is shown for the previous year (when flowering is induced) so that flowering intensity is aligned with temperature during the season of flowering induction, e.g. the temperature labelled 1980 shows the average temperature in January and February of 1979. Daily temperature data were missing for part of 1987 so 1988 is not shown.

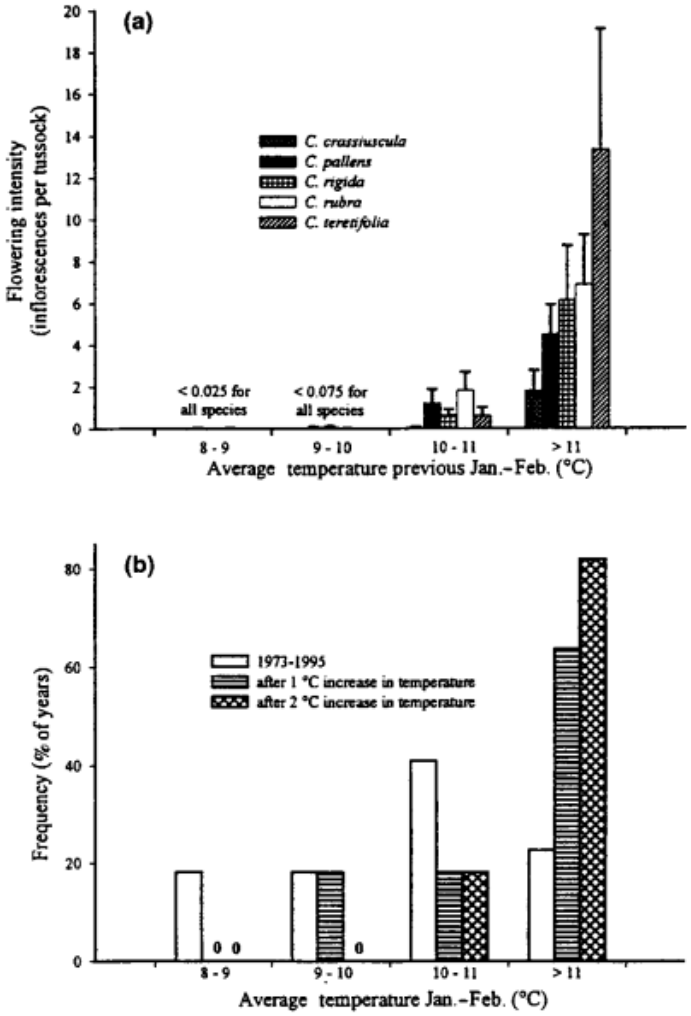

Fig. 2 (a) The effect of temperature on *Chionochloa* flowering at Takahe Valley from 1973 to 1995. Temperature is the average daily temperature (mean of maximum and minimum for the day) for January and February of the year before flowering was measured, since floral induction occurs in the season before flowering. Error bars show one SE above the mean flowering intensity. (b) Frequency of different summer temperatures from 1973 to 1995 and if temperatures increased by either 1 or 2 °C, as predicted by many models of global warming. Summers with average temperatures below 10 °C are the proximal cause of nonflowering years, and would be rare or absent after the predicted climate change.

Source: McKone, M. J. Kelly, D. and Lee, W. G. (1998). 'Effect of climate on mast-seeding species: frequency of mass flowering and escape from specialist insect seed predators' Global Change Biology (1998) vol 4, pp 591-506
http://www.biol.canterbury.ac.nz/masting/pdfs/McKone&c98GCB.pdf