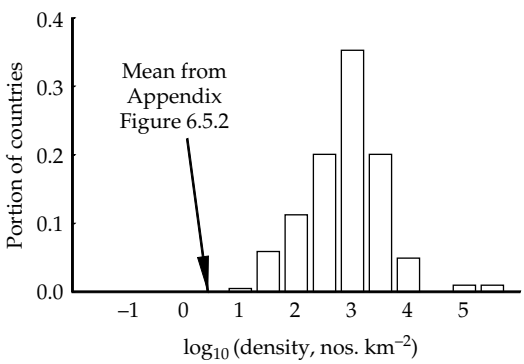
Appendix 6.5

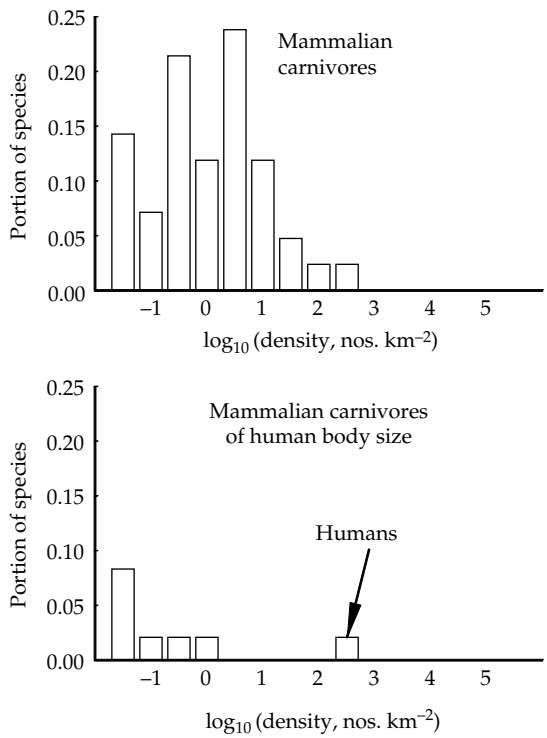
The following material is Appendix 6.5 for Chapter 6 of: Fowler, C.W. 2009. Systemic Management: Sustainable Human Interactions with Ecosystems and the Biosphere. Oxford University Press

1 The challenge of population at the national level

The problem of overpopulation is not restricted to any one country (Appendix Fig. 6.5.1). There are countries that have populations that are close to the mean among nonhuman herbivorous species, but the complexity of reality dictates that we not rush to conclusions as those countries that have the least people often include a great deal of uninhabitable land, such as deserts. Canada is a sparsely populated country by comparison to many but requires a great deal of energy to heat homes and maintain what are considered an acceptable life style today (assuming that such a life style is sustainable independent of population size, which of course it is not). As with all systemic issues (and all issues are systemic) the question of sustainable population must be addressed with information on habitat characteristics (rainfall, mean annual temperature and temperature variation, primary production, latitude, and other abiotic factors), and density of nonhuman species with human



Appendix Figure 6.5.1 The frequency distribution of the population densities of the world's countries in comparison to the mean population density of nonhuman herbivorous mammals of human body size from the lower panel of Appendix Figure 6.5.2. (Data from the Population Reference Bureau, 1875 Connecticut Ave., NW, Suite 520, Washington, DC 20009.)



Appendix Figure 6.5.2 The frequency distribution is shown in Figure 2.36, here shown with the density of humans in comparison with carnivorous species of mammals of a similar body size. Note the larger gap between humans and carnivorous mammals than observed when compared to herbivorous species as shown in Figure 6.21.

qualities (e.g., body size and trophic level). Because carnivores show lower population density than do herbivores of similar body size (Marquet 2002), factoring in the matter of trophic level would widen the gap between humans and the mean for other species as shown in the distribution of Appendix Figure 6.5.2.

Are problems solved in redistributing people? It is easy to see that such mitigation, as with all mitigation, only transfers problems from one realm to another—here from one area to a different area, from one nation to another. For example, one country might export people to make its density correspond to the mean for density among nonhuman species. But doing so moves people to other countries to result in higher densities, densities that were already above that for nonhuman species. Thus, problems are solved in one place and magnified in others. There is no way to move people from one country to another so as to change the gap between the mean of the distribution of humans among countries and the mean among nonhuman species. Only through a cooperative international recognition of the problem in general can we hope for progress. The economic, political, religious, social, and ethnic components to such progress (if it can happen at all) attest to the complexity involved.

Reference

Marquet, P.A. 2002. Of predators, prey, and power laws. *Science* 295: 229–230.