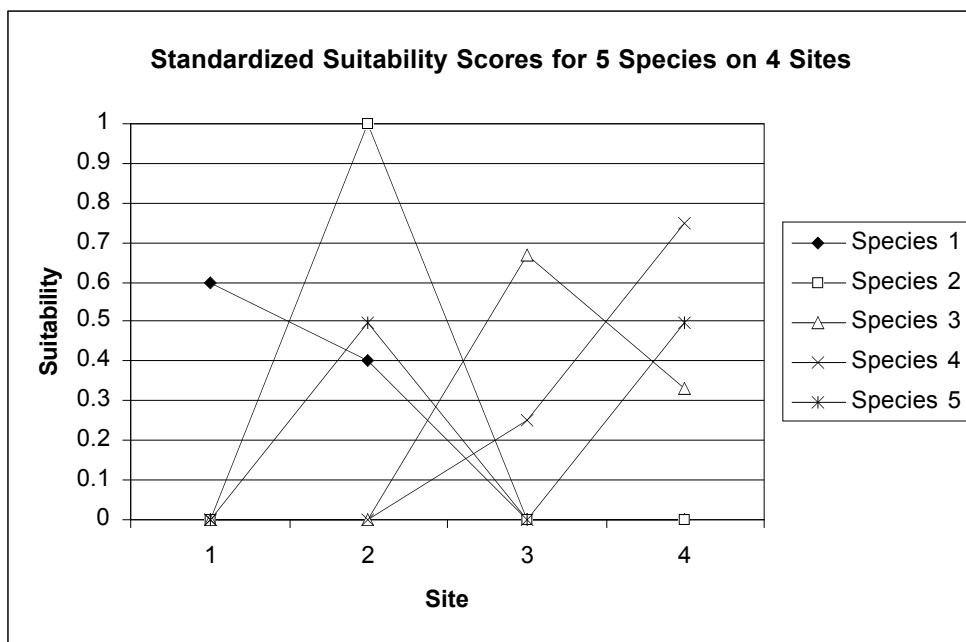


Answers to Exercise 32

Triage: Prioritizing Species and Habitats

1. Sites 2 and 3 were selected to be purchased. You might have come to this same conclusion with some thought. Keeping in mind that species 2, 4, and 5, were identified as the species of highest conservation priority and the suitabilities of the different sites shown below, site 2 will benefit species 2 and 5, while site 3 will benefit species 3 and 4. Although site 4 would be valuable for both species 4 and 5, it has a low probability of development and thus is likely to be conserved to some extent even if it is not purchased. Site 1 is of value only to species 1, which is not a high-priority species.



2. It appears that the model is fairly robust to slight changes in the prioritization scheme, given the values entered in the model. This is because the decision to purchase a site not only depends on the prioritization scores, but also the probability of development. We could not find a solution that would recommend that site 4 be purchased. Even by making species 1 the highest conservation priority, site 1 is not purchased because it has little value to the other species.
3. Only when the probability of development reaches 0.8 for site 4 does the Solver select that site for purchase. At that point, site 4 is the only site that can be purchased because it is an expensive acquisition.

4. In many cases, higher densities at a site indicate that the habitat there is of better quality. However, if you have completed the Source-Sink or Ecological Traps Exercise, you know that at times density can be high even though habitat quality is low. In such cases, suitability would better be estimated by measuring a demographic variable associated with fitness (birth and death rates).
5. If populations vary significantly from year to year (due to demographic or environmental stochasticity), suitability models based on a single sampling session may be misleading. If the year-to-year variation is small, single sessions may be beneficial because funding that is used for developing suitability indices may be spent on other conservation needs. If you have completed the exercise on Island Biogeography, you realize that distance to other sites, as well as size, is important in considering the location of reserves. Such information on spatial arrangements should ultimately be considered in reserve selection.