**Discussion Questions**

to accompany

***Animal Behavior,* Eleventh Edition**

by Dustin Rubenstein and John Alcock

**Chapter 7**

**Territoriality and Migration**

7.1 In some songbirds, a nonterritorial pair establishes a nest unobtrusively within the territory defended by another pair of the same species. Develop a game theoretical hypothesis to analyze why there are any nonterritorial pairs of this sort. Come up with both a two-strategies hypothesis and a conditional strategy with alternative tactics hypothesis. What predictions follow from your two hypotheses? What significance do you attach to the findings that nonterritorial birds either do not breed at all (Smith 1978) or, if paired, fledge fewer offspring on average than the owners of the territories they live in (Dhondt and Schillemans 1983)?

7.2 The dear enemy effect has been explained in terms of familiarity (individuals learn who their neighbors are, and as they become familiar with these others, they become less aggressive toward them). An alternative explanation can be labeled the threat level hypothesis, which states that the dear enemy effect results from the reduced threat to the fitness of a territory holder offered by neighbors that no longer challenge the territory owner next door. Could both of these hypotheses be right? The banded mongoose (*Mungos mungo*) is a group-living, territorial mammal in which individuals react more aggressively to members of neighboring bands than to strangers (Müller and Manser 2007). If the threat level hypothesis is right, what prediction can you make about the nature of interactions between two neighboring bands versus the band and an intruding stranger?

7.3 In one study of brown bears (*Ursus arctos*) in Sweden, 15 of 16 males left their mothers and natal territories behind while only 13 of 32 females dispersed. Older and heavier females were less likely to be part of the dispersing cohort (Zedrosser et al. 2007).So here, as in Belding’s ground squirrels and many other mammals, males disperse while most females remain on or near their natal territories (see Box 7.2). Given the information above, do the explanations given for the pattern of ground squirrel dispersal also apply to brown bears? What other information would be useful in order to evaluate these hypotheses?

7.4 Data on the travel routes of migrating birds today largely come from extremely lightweight radios, geolocators, and satellite tags, which can be safely attached to individual birds.The use of geolocator backpacks has revealed that migrant wood thrushes and purple martins take much longer to travel from Pennsylvania to the Amazon basin in the fall than they do when going in the opposite direction in the spring (Stutchbury et al. 2009). For example, one martin completed its spring migration in about 2 weeks, which required an average trip of 600 kilometers each day. Why the difference in speed of travel between the fall and spring migrations?

7.5 For some whale species that migrate from the Arctic or Antarctic Ocean to give birth in warmer water nearer the equator, food cannot provide a benefit, since the adults do not feed on the calving grounds. Therefore, other hypotheses for whale migration have been advanced, such as the idea that whale calves can gain weight more quickly in subtropical waters, where they need to invest less energy in keeping warm. Alternatively, some scientists have suggested that infant whales in these waters are less likely to be attacked by predators, especially killer whales (Corkeron and Connor 1999, Clapham 2001). How would you test these hypotheses, given the practical difficulties of directly measuring the metabolic costs of thermoregulation by whale calves or of actually observing killer whale attacks in any environment?

7.6 Imagine that there are other places in Mexico or the southern United States where monarch butterflies (*Danaus plexippus*) could overwinter even more safely and successfully than they do in their current Mexican wintering grounds. Imagine that the only reason the butterflies do not utilize these locations is that the mutations that are needed to change their migratory route have not occurred. In other words, the accidents of monarch history are responsible for their present migratory choices. Does this mean that the adaptationist approach to monarch migration is flawed in this instance because the migratory behavior of today’s monarch butterflies could be more efficient than it is?

7.7 Sonia Altizer and colleagues have found that the monarch butterflies that travel the longest distances have the lowest levels of infection by a protozoan parasite, whereas the prevalence of these parasites is highest in the nonmigratory populations of the butterfly (Altizer et al. 2011). They suggest that because badly infected individuals cannot reach distant destinations, migration has the beneficial effect of culling parasite carriers, which keeps the species healthier than it would be otherwise. According to this hypothesis, who benefits from the removal of infected monarchs? From a theoretical perspective, why does this matter?

7.8 Some males of the white-ruffed manakin (*Corapipo altera*) of Costa Rica move temporarily to lower areas while others skip migration to stay in the higher-elevation breeding locations. Birds that stay have greater mating success than those that leave (Boyle et al. 2011). So why do any males migrate? Use conditional strategy theory to make some predictions about the age and condition of the birds that leave the breeding area.

References

Altizer, S., Bartel, R., and Han, B. A. 2011. Animal migration and infectious disease risk. *Science* 331: 296–302.

Boyle, W. A., Guglielmo, C. G., Hobson, K. A., and Norris, D. R. 2011. Lekking birds in a tropical forest forego sex for migration. *Biology Letters* 7: 661–663.

Clapham, J. 2001. Why do baleen whales migrate? A response to Corkeron and Connor. *Marine Mammal Science* 17: 432–436.

Corkeron, P. J., and Connor, R. C. 1999. Why do baleen whales migrate? *Marine Mammal Science* 15: 1228–1245.

Dhondt, A. A., and Schillemans, J. 1983. Reproductive success of the great tit in relation to its territorial status. *Animal Behaviour* 31: 902–912.

Müller, C. A., and Manser, M. B. 2007. “Nasty neighbours” rather than “dear enemies” in a social carnivore. *Proceedings of the Royal Society B* 274: 959–965.

Smith, S. M. 1978. The "underworld" in a territorial species: Adaptive strategy for floaters. *American Naturalist* 112: 571–582.

Stutchbury, B. J. M., Tarof, S. A., Done, T., Gow, E., Kramer, P. M., et al. 2009. Tracking long-distance songbird migration by using geolocators. *Science* 323: 896.

Zedrosser, A., Støenm, O.-G., Saebø, S., and Swenson, J. R. 2007. Should I stay or should I go? Natal dispersal in the brown bear. *Animal Behaviour* 74: 369–376.