Thanks to mathematical models, it is well-understood that the interaction between predator and prey populations can lead to periodic multi-annual oscillations in both populations. In this talk, I will look at what we can learn from models where the classical modelling approach is amended in two different ways. First, I will investigate how our understanding of predator-prey cycles is extended when we examine a model with multiple predators. Second, I will allow the predator-prey relationship to vary structurally between seasons. That is, I will consider a predator with a functional response that is of one type in the summer, and a different type altogether in the winter. The shifts in perspective that I offer in this talk shed new light on predator-prey systems, and can also help us rethink the functional relationships between entities in other models.