Farms and estates which support lowland game birds are prone to become reservoirs for infections of *Syngamus trachea*. We have evidence that these infections are a major hurdle to wild breeding game birds on many types of shoots in Lowland Britain. The presence of this parasite on these estates affects the birds survival and ability to breed. This has major effects for the shoots in terms of their need to release but also their attitude to encouraging wild breeding through sympathetic habitat management.

The GWCT wants shoots to rely less on releasing pheasants and partridges for shooting and more on wild birds (including the released birds that survive shooting) to breed. We believe encouraging shoots to become interested in wild breeding is a corner stone of future sustainable game management in lowland Britain. An interest in wild birds encourages a raft of land management practices that are good for woodland hedgerow and farmland habitats and other wildlife on shoot holdings. Having some wild breeding birds in the stock reduces the need to release so this will usually lead to improvements in habitat quality. The sustainability credentials of lowland game bird shooting relies on improving the balance between reducing the potential unwanted impacts of the released birds themselves and maximizing their potential for good habitat management. To do this wild breeding needs to be an achievable objective. *Syngamus trachea* may be a major obstacle to this in many situations.

This PhD explores the idea that there are both pathogenic and non-pathogenic processes by which significant infections of the common round worm *Syngamus trachea* can become the dominant cause of poor breeding amongst lowland game bird populations and possibly other birds. Previous work by GWCT suggests there is scope for reducing the effect of this parasite on breeding birds but this requires a much greater understanding of its ability to persist in the environment and how infections build up there and in hosts.

We will study pheasants but the work has implications for other nesting birds. We hypothesise that breeding adult female pheasants become especially vulnerable to malnutrition, and to detection and hence predation by foxes following significant gapeworm infection. Foxes are the main cause of failed breeding amongst many ground nesting birds. The main objective of the study is to identify what is a significant (to breeding birds) gapeworm infection in the environment and how to avoid this.

Study plan:
Yr 1 and 2. How many of these worms are required to cause these effects in adult birds. We will build on early studies but undertake more detailed post mortem examinations of worm burdens and their effects on birds recovered from estates.
Yr 1 and 2. The uptake by parasite free birds in the spring. The number of *S. trachea* worms that establish in a host can increase only by the ingestion of successive single infective
larvae. We would use free-living or penned birds occupying discrete areas and compare post mortem worm counts with worm counts in soil samples.
Yr 2 and 3. The relative importance of *S. trachea* larvae in the soil compared to those in transport hosts (slugs snails), in particular the longevity of infective larvae in each.
Yr 2 and 3. The relative spatial distribution of infective larval burdens and pheasants on estates and the potential to spatially manipulate the latter to suppress significant gapeworm infection.

The Director of Studies will be Professor Simon Leather. The studentship is funded by the BBSRC and Game Conservancy and Wildlife Trust.