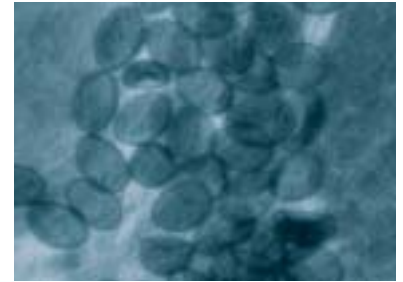
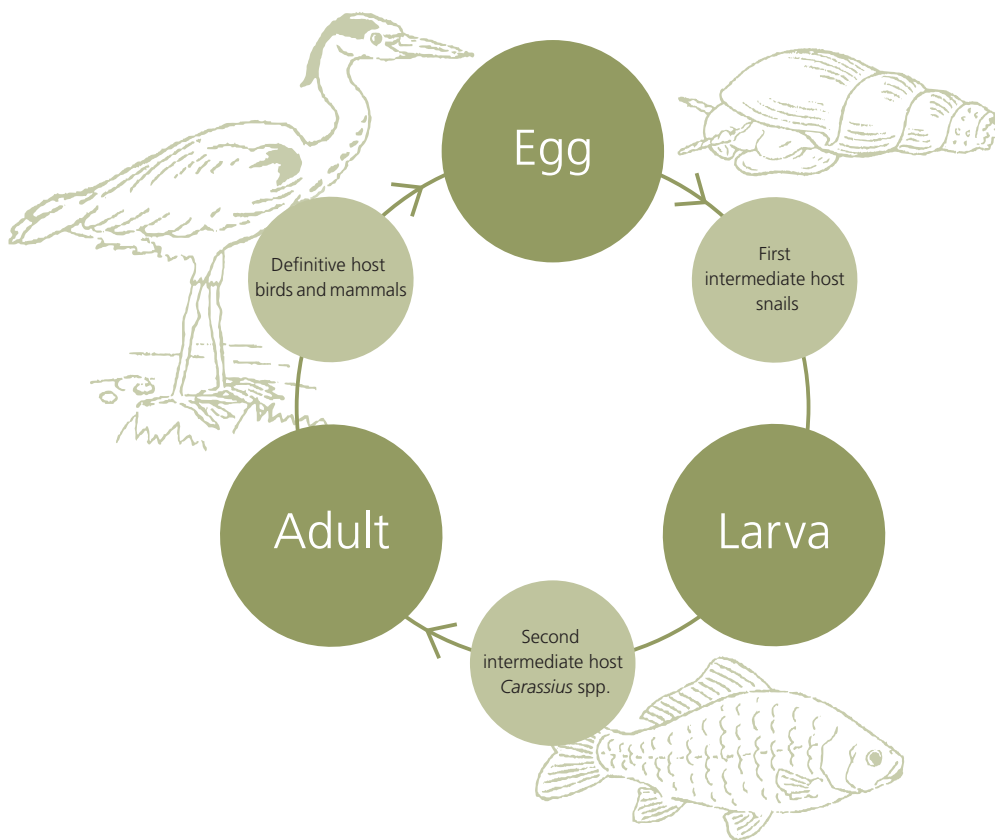


# Investigating the movement of fish using parasites as a living tag

## Parasites are an indicator of an animal's movement (e.g. *Metagonimus takahashii*)



Egg



*Cercaria*  
(migrates from the snail to a fish)



Adult  
(lives in the intestine of birds and mammals)

## Investigating the life cycle of parasites in order to understand the ecological movements between streams

Most parasitic animals (of platyhelminthes, nematodes, acanthocephalans, etc.) have complicated life cycles and change their hosts twice or three times during their lifetime. Animals to which larval parasites are infected are called intermediate hosts, and those to which adults are infected, definitive hosts. Parasites migrate to next-stage hosts (host alteration) through the food chain of the hosts and the fact that the intermediate and next-stage hosts share a habitat. Thus, parasites can be used to obtain information on the feeding habitats and moving ranges of their hosts.



A *Carassius* fish infected by *Metagonimus takahashii*. Melanocytes gather around the parasite and can be seen as a black spot.

Using parasites of such a life cycle as biological tags, studies have, since the summer of 2001, been conducted on the movement of fish between the experimental streams of the Aqua Restoration Research