Ecology of *Margaritifera margaritifera* in Scotland

Thursday 24th October 2013
Scottish Freshwater Group

A project supported by the European Union's INTERREG IVA Programme managed by the Special EU Programmes Body

- Introduction to *Margaritifera margaritifera*
- Life history of *Margaritifera margaritifera*
- Project question
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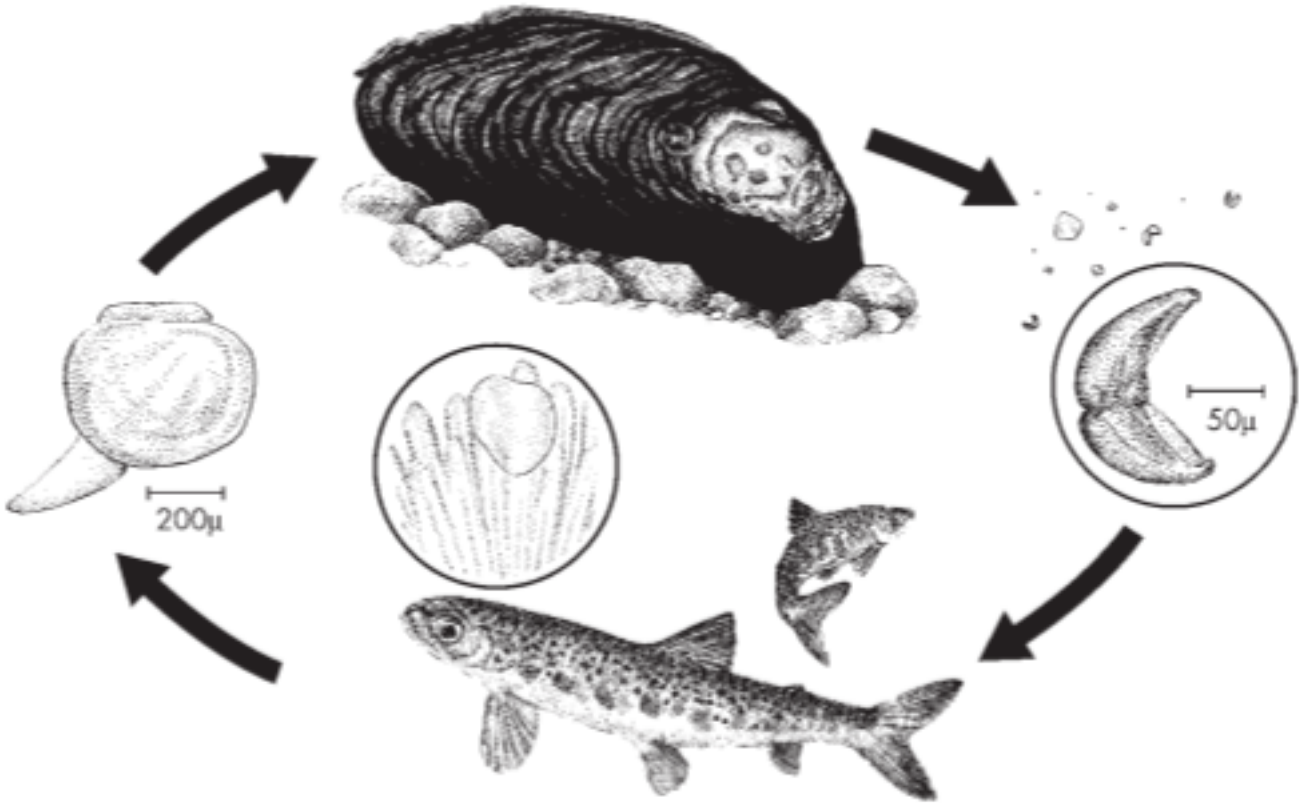
- Discussion

‘*The freshwater pearl mussel is widely regarded as an indicator, flagship, umbrella and keystone species (Geist, 2010)’*

- Margaritifera margaritifera one of the longest lived invertebrates in the world, with a life span of up to 210 years (Ziuganov et al. 2000)
- Once thought to be the worlds most abundant freshwater bivalves in ancient rivers of the northern hemisphere
- Exploitation, management and conservation as been documented since pre-roman times
- Trade in pearls from Scotland around Europe as early as the 12th century and by the 16th century there was a significant trade across Britain and Ireland
- 2011 *M.margaritifera* joined the list of the 365 most endangered species in the world!

Rapid decline . . . But a Scottish stronghold

- The decline in *M.margaritifera* world wide has been widely documented
- In the 80's it was reported that only 3 of the 12 rivers in southern Europe still contained live *M.margaritifera*
- By the 90's only one river in England and one river in Wales were thought to hold viable recruiting populations
- In 2000 it was reported that 65% of Scotland's rivers known to have *M.margaritifera* no longer had functional populations, but Scotland remains a global stronghold for the species



Sarah Wroot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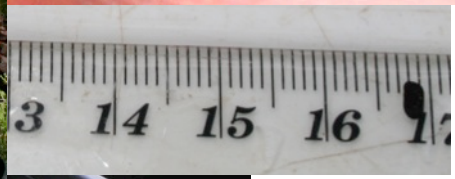
Field Work

Field work



Results

Site	Total number of fish:	Number of infected *S.trutta*:	Number of uninfected *S.trutta*:	Number of infected *S.salar*:	Number of uninfected *S.salar*:	X^2	Mean fork length *S.trutta* (mm):	Mean fork length *S.salar* (mm):
a	42	22	18	0	2	2	106.31	139.5
b	255	15	8	0	232	234	90.96	74.26
c	57	0	1	34	21			
d	46	0	0	14	32			
e	90	0	0	0	0			
f	143	4	17	0	122	134	101.57	76.7
g	117	29	84	0	4	21	114.25	114.25
h	81	4	32	0	45	67	98.31	88.22

Discussion

- The results from this initial study do not correspond with the current understanding in Scotland that where *S.salar* are present then they will be the fish infected with *M.margaritifera* and in rivers with a low proportion of *S.salar, S.trutta* will be the main host.(Hastie & Young 2001)(Skinner, Young, & Hastie, 2003.)
- In Central Europe *S.trutta* are known to be the primary host of *M.margaritifera* and in 2010 Taeubert *et al* looked at the suitability of different salmonid strains as hosts
- The most suitable hosts were *S.trutta* from within the natural distribution of *M.margaritifera.* Taeubert suggested that there could be a possible host specific adaptation, that the immunological rejection reaction could be more effective in fish from rivers with no *M.margaritifera*
- *M.margaritifera* is a long live species and the success or otherwise of it's obligatory parasite phase as glochidia on the gills of salmonids may have been affected by changes in salmonid populations. In turn this may have been artificially exacerbated by management actions primarily to improve fish stocks or accidentally by escapees from fish farm

The end…

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