Post-tagging behaviour and long-term survivorship in three species of non-native fish: *Lepomis gibbosus* (Centrarchidae), *Pseudorasbora parva* (Cyprinidae), *Sander lucioperca* (Percidae)

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Introduction

To address the dearth of information on post-operation behaviour, tag retention and long-term survival of tagged fish, especially species introduced outside their native ranges, laboratory and field investigations were undertaken on representatives of three freshwater fish families: pumpkinseed *Lepomis gibbosus* (Centrarchidae), topmouth gudgeon *Pseudorasbora parva* (Cyprinidae), and pikeperch *Sander lucioperca* (Percidae). Post-tagging survivorship in the field is also given for brown trout (*Salmo trutta*) with radio tags.

The types of tags used were coded-wire (CW), passive integrated transponder (PIT), radio (RT) and/or acoustic (AT) tags.

Topmouth gudgeon
Pseudorasbora parva (Cyprinidae)
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Pumpkinseed
Lepomis gibbosus (Centrarchidae)

Pikeperch *Sander lucioperca* (Percidae)

Brown trout *Salmo trutta*

Table 1: Experimental results for pumpkinseed, topmouth gudgeon and pikeperch:

includes growth comparisons (Students' t-test) against the control; †S = *Saprolegnia* sp., U = unknown, V = various, C = damage to circulatory system; ¥ Onset of feeding was delayed because appropriate (live) food was not offered by technician until day 12 of experiment.

	Pumpkinseed				Topmouth gudgeon					Pikeperch	
Variable	Con	CW	PIT	RT	Con	CW	PIT-1	PIT-2	PIT-3	Con	AT
n =	20	27	20	20	25	25	20	20	20	20	20
Tag weight/body weight (%)	-	<0.1	<0.05	0.7-1.9	-	<1.0	2.7-6.3	2.5-6.2	4.6-9.3	-	0.7-1.8
Mortality (no. specimens)	0	0	2	1	0	0	3	20	1	3	2
Mortality (%)	0	0	10	5	0	0	15	100	5	15	10
Day of mortality	-	-	7	11	-	-	9,11,18	1-3	15	4, 6	4
Mortality reason†	-	-	S	U	-	-	V	C	S	S	S
Day first tag shed	-	-	-	-	-	-	9th	-	14th	-	-
Tag shedding (no. specimens)	-	0	0	0	-	0	13	-	7	-	0
Tag shedding (%)	-	0	0	0	-	0	65	-	35	-	0
Feeding observed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-	Yes	Yes¥	Yes¥
Mean growth (%)	-0.1	2.3	0.3	0.2	2.9	3.2	0.7	-	4.7	-0.9	1.1
Mean growth (g)	-0.03	0.49	0.08	0.06	0.04	0.04	0.02	-	0.06	-3.29	-4.23
Growth comparison	-	NS	NS	NS	-	NS	NS	-	NS	-	NS

Table 2: Field tagging, survivorship and recapture results:

includes recapture rate of fish with big tags: i.e. tag was >2% of their body weight; includes growth comparisons, Students' t-test, against untagged fish of same age class caught at same time.

	Pumpkinseed			Pikeperch	Brown trout
Variable	PIT	CW	RT	AT	RT
n =	414	2467	25	24	24
Tag weight/body weight (%)	0.1-3.4	<0.1	0.8-4.8	<1	0.3-2.1
% of tagged fish tracked during study	-	-	100	96	100
Recapture	182	143	15	2	19
Recapture (%)	44	5.8	60	8.3	79
Recapture rate of fish with big tags	35	5.3*	64	-	100
Growth comparison with non tagged†	NS	NS	NS	-¥	NS

Conclusions

In the laboratory: High post-tagging survival was observed in all species, with a resumption of feeding within 24-48 h post-tagging. The few mortalities observed were attributed to an unrelated outbreak of fungal infection. Tag retention was high for pumpkinseed and pikeperch but short (<10 days) for topmouth gudgeon (which was thus excluded from field studies).

In the field: Long-term post-tagging survival was high in both pumpkinseed and pikeperch. In pumpkinseed, 100% of R-tagged fish survived three 24-30 day tracking intervals; 44 % of PIT-tagged fish were recaptured at least once in a range of intervals (2, 3, 4, 6, 8, 12 and >18 months) post-tagging; and a number of small CW-tagged fish (0.38 g weight at tagging) were captured up to a year after tagging. In pikeperch, all but one of the AT-tagged fish survived their full expected tracking period (i.e. tag life), and the single lost specimen (the smallest tagged fish) survived >50% of the tracking period.

Post-surgery indications: No sign of tag shedding through the body wall was observed in any of the recaptured fishes, and all but one recaptured fish (an RT-tagged pumpkinseed) showed good wound healing and no signs of infection.

Related bibliography

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This project was funded by:
UK Defra
EC Marie Curie
UK Environment Agency
UK NERC
NATO

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