

**A QUESTIONNAIRE SURVEY OF INSHORE CATCHES OF
SHAD, SMELT AND STURGEON IN SCOTLAND**

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INTRODUCTION

Current work on allis shad *Alosa alosa* and twaite shad *Alosa fallax* in the Solway area has shown that both these species are relatively common there, at least during the spring and summer months (April to September). The shad are taken as a by-catch in coastal salmon nets (mostly stakenets) and over the six-year period of the study (1989-94), 132 allis shad and 150 twaite shad have been collected in these nets and retained by the netsmen for this project.

Shad are taken occasionally by commercial fishermen at sea and records of these are kept by SOAFD and MAFF. However, there appear to be no records kept of shad taken along parts of the coast, other than the Solway, and it was decided to initiate a preliminary investigation of this by issuing a questionnaire to netsmen all round the Scottish coast.

In addition to asking for records of shad, it was determined to include smelt *Osmerus eperlanus* in the questionnaire, as this species is also part of the current project in the Solway. Also, the questionnaire included sturgeon *Acipenser sturio* - now one of the rarest fish in western Europe and on the verge of extinction. Any records of this species are important in trying to develop restoration strategies for this magnificent fish.

QUESTIONNAIRE

Questionnaires are not always welcomed by the recipients who may regard the information requested to be of little relevance to them. Therefore to maximise returns, simplicity, interest and convenience were required. An example of the questionnaire sent to fisheries is given in Figure 1.

A covering letter briefly explained the reasons and requirements for the questionnaire. Few specific questions were asked, but these included the essential points regarding location, frequency and quantity of catches of these fish. The opportunity to elaborate and provide further information was included however.

Allis and twaite shad, and smelt (spearling is a Scottish name for smelt) are now uncommon in Scotland, so to aid identification and to stimulate interest, a colour photograph (Figure 2) of these species was sent with the questionnaire. Sturgeon are highly distinctive and easily recognised.

A stamped, addressed envelope was also included for the return of the questionnaire to minimise effort and incur no cost on the part of the recipients.

DISTRIBUTION OF QUESTIONNAIRES

Questionnaires were sent primarily to members of the Salmon Net Fishing Association of Scotland who are located all around the Scottish coast (see below). However, in the recent past the numbers of coastal, estuarine and lower river salmon fisheries has declined. Some are now not viable due to declining catches, others have been bought out by salmon angling interests. In addition to salmon fishing, some of these concerns also net for other species, e.g. sprat and herring. The types of netting used includes: coastal fixed stakenets or bag nets, net and coble fishing in estuaries and lower rivers, and a few coastal trawl nets for sprat and herring.

The Solway coast, SW Scotland, was not included in this survey (except for two fishing owners who had not previously been contacted) since this area is the subject of a separate study of the status of shad and smelt which are known to be found there (Maitland and Lyle, 1995).

In total, 63 questionnaires were sent out in December 1994.

RESULTS AND DISCUSSION

Of the 63 questionnaires sent out, 37 (59%) were returned by 1 March 1995. Of the latter, 21 fisheries reported that no catches of any of these species had ever been made. The locations of these fisheries is shown in Figure 3. Figure 4 shows the locations of fisheries which made positive returns of shad or smelt catches. Table 1 gives notes of information taken from the questionnaires for the latter sites.

Shad

Although both species of shad are illustrated in Figure 2, confident identification between allis and twaite shad requires specialised knowledge and they can easily be confused without a detailed inspection of gill rakers. Since this was unlikely to have been done by all of who reported catching them, references to either species are considered collectively as shad.

Thirteen of the questionnaires returned reported by-catches of shad species. Predominantly these were from east coast fisheries. Numbers are very low. Many of these records report total

numbers of less than 10 shad taken throughout the last 20 or 30 years, and that they have declined in the last decade or so.

From Figure 4 it is clear that shad are found along most of the east Scottish coast. There are three principal areas of interest, viz. the mouth of the River Tweed, the coast near Aberdeen (particularly around the estuary of the River Ythan) and the firths north of Inverness. Of these, the River Tweed fisheries presently report regular catches of shad and would appear to be the most relevant and reliable site for shad (apart from the Solway coast (see Maitland and Lyle, 1995)). There is also a record from the River Tweed of an allis shad being caught by an angler *ca* 50km upstream from Berwick (R.N.B. Campbell, personal communication). For other sites, shad records are less regular and interpretation of results is not helped by the shortage of up-to-date information from sites where fisheries ceased to operate some years ago (see Table 1). It is interesting to note however, that prior to the last decade, shad were taken in the River Tay some 3 to 5km above the tidal limit.

On the west coast, shad are only reported from the vicinity of the Island of Mull and Loch Linnhe. The numbers and frequencies of catches are similar to most of the east coast fisheries. However, it generally seems that the gentler physical characteristics of the east coast rivers and estuaries are the more likely locations for shad, which are perhaps searching for suitable spawning grounds.

The general scarcity of shad species is also indicated in Figures 3 and 4 by the geographical coincidence of negative and positive reports of their occurrence. In addition, amongst those fishermen who reported positively, some were unaware of the correct identification of these fish in their catches until seeing the photograph (Figure 2) enclosed with the questionnaire. In such cases shad were taken to be a type of herring and named 'shore herring' or 'Jerusalem herring', if named at all. The general lack of knowledge of shad (and smelt) is further exemplified by nil returns from two fishery owners on the Solway coast who were unaware that both shad species (and smelt) regularly occur in that area.

Smelt

Although the distribution of smelt in Scotland is relatively well known (Maitland and Lyle, 1992), the opportunity for further information through the questionnaire was taken.

Two returns from fisheries in the River Tay estuary confirmed the continued presence of smelt there as a by-catch in sprat and herring fishing. There is also a fishery specifically for smelt in the estuary.

There is some very tentative evidence that smelt may have previously occurred in the estuaries north of Inverness, where one questionnaire referred to a memory of such fish being caught in this area, again as a by-catch.

Sturgeon

None of the 37 questionnaires returned gave any evidence that sturgeon had been, or were being caught by these fisheries. (One verbal report suggested that sturgeon had been seen in the Beaully Firth, north of Inverness, in recent years).

CONCLUSION

This exercise has been extremely useful in showing that shad species have occurred extensively around the Scottish coast, but that they are now increasingly uncommon. However, it is demonstrated that low numbers of shad still occur in some locations, and that further investigation of their status there, particularly in the River Tweed, should be undertaken. The questionnaire results also show that smelt are presently confined to their previously known locations, viz; the Forth and Tay estuaries, plus the River Cree estuary on the Solway coast. It is also clear that sturgeon are now extremely rare here.

For present and future studies of the biology, ecology and conservation of shad in Scotland, this short survey provides useful historical and geographical information of their distribution. As such the study will contribute to a fuller account of the status and conservation of shad in Scotland currently being reported by the authors to Scottish Natural Heritage (Maitland and Lyle, 1995).

REFERENCES

Maitland, P.S. and Lyle, A.A. 1995. Shad and Smelt in the Cree Estuary. Report to Scottish Natural Heritage.

Table 1: Notes taken from questionnaire returns which recorded information on catches of shad and smelt. For site locations see Figure 4.

SITE	NOTES
1.	Several shad taken in the lower River Tweed in recent years.
2.	Two to four shad taken three times in 25 years - none in last 10 years.
3.	About one shad taken each year.
4.	About six shad taken during 1964-1988.
5&6	Several shad caught in the past - close to river mouths.
7.	Two to 12 shad per year during 1944 - 1964. (Retired fisherman)
8.	A few shad caught in the past. No fishing since 1982.
9.	Six or seven over many years, but irregular.
10.	Five or six over many years, but irregular.
11.	Twelve shad taken in the last 27 years, one in 1994.
12.	Six shad in a thirty year period. (Retired fisherman)
13.	Four shad (one each time) taken between 1966-1977 (prawn trawl).
14.	Good catches of smelt earlier this century, but have now stopped*.
15.	Many boxes of smelt taken in the past*.
16.	Smelt mixed with herring and sprat catches, in the past. Fishing now closed.

(*There still is a commercial smelt fishery in the Tay Estuary).

FIGURE LEGENDS

- Figure 1:** An example of the questionnaire sent to fisheries.
- Figure 2:** The colour photograph of allis shad, twaite shad and smelt (to scale) sent with the questionnaire to aid identification.
- Figure 3:** The location of fisheries which gave nil returns for any of the four species requested.
- Figure 4:** The locations of fisheries which gave positive records of shad species, or smelt being caught presently, or in the past. The site numbers refer to notes given in Table 1.

FIGURE 1

Dr Peter S Maitland
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Tel & Fax: 0786 451312

12 December 1994

Mr Alex A Lyle
Institute of Freshwater Ecology
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Tel: 031 445 4343

Dear Sir

SURVEY OF SHAD, SMELT AND STURGEON

We are presently carrying out research on SHAD and are anxious to collect as much information as possible on the occurrence of this fish around our shores and in estuaries or lower rivers. In addition we are keen for information on SMELT (also known as SPARLING) and the now very rare STURGEON.

We are writing to ask for your help in our work by letting us know if you have seen or heard of any of these fish in your area during your lifetime.

We have tried to make our questionnaire (overleaf) as simple as possible so that it does not take up too much of your time and we would be most grateful if you can take a few minutes to complete it, even negative records are useful. A stamped-addressed envelope is provided for you to return the questionnaire and we would be obliged if you could do so as soon as is convenient to you.

A photograph of SHAD and SMELT is enclosed for your information.

We look forward to hearing from you.

Best wishes,

Yours sincerely

Peter Maitland & Alex Lyle

To:

FISHERY OWNERS'
NAME AND ADDRESS

SURVEY OF SHAD, SMELT AND STURGEON

During your experience of fishing have you ever caught or seen these fish species:

SHAD (ALLIS or TWAITE)

Where

How often

How many

How caught

Remarks

.....

SMELT (SPARLING)

Where

How often

How many

How caught

Remarks

.....

STURGEON

Where

How often

How many

How caught

Remarks

.....

We would be grateful for any other comments of interest or the name and address of others you may think may be able to help our study.

FIGURE 2

ALLIS SHAD

TWAITE SHAD

SPARLING
(SMELT)



FIGURE 3

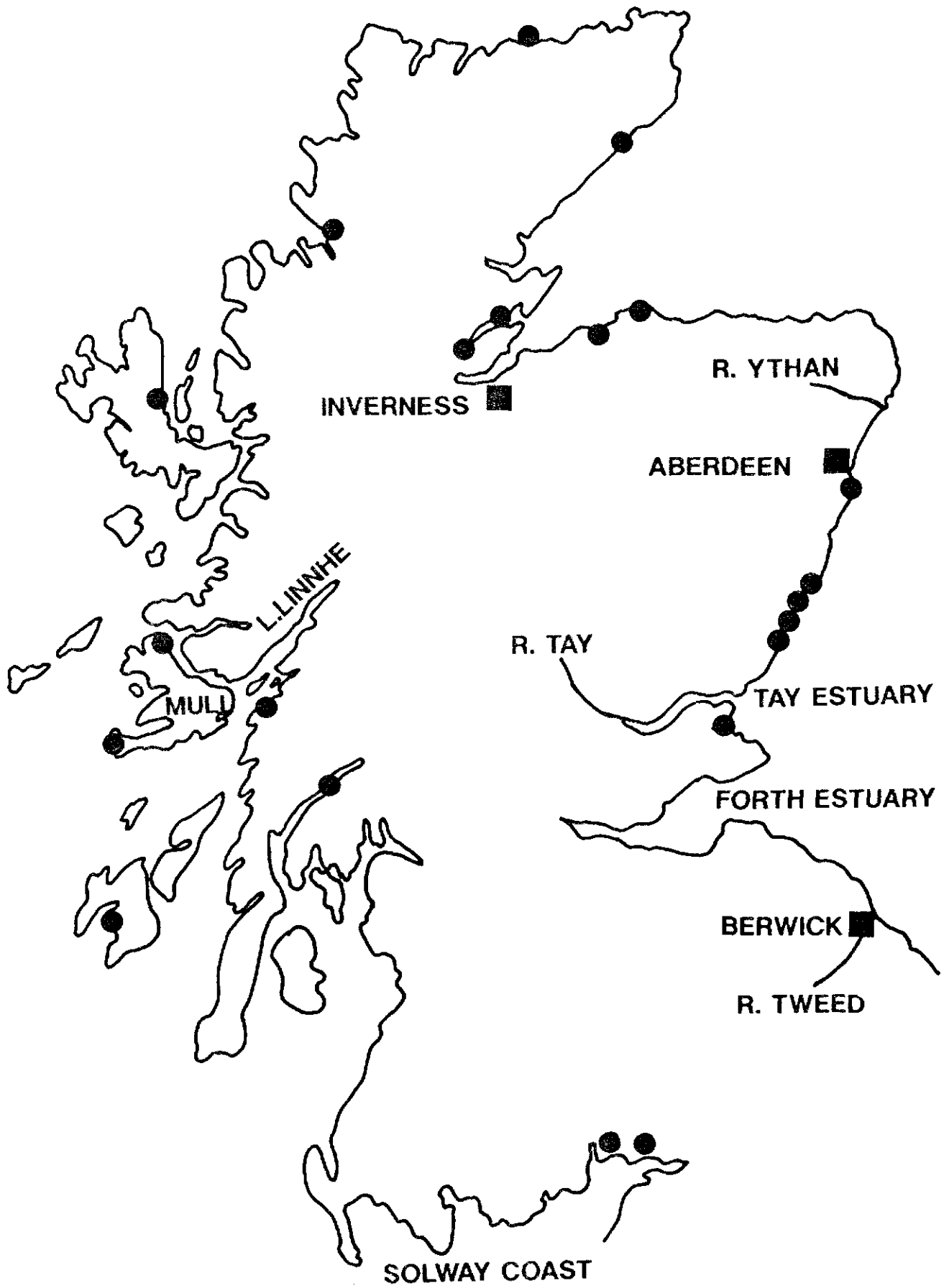


FIGURE 4

