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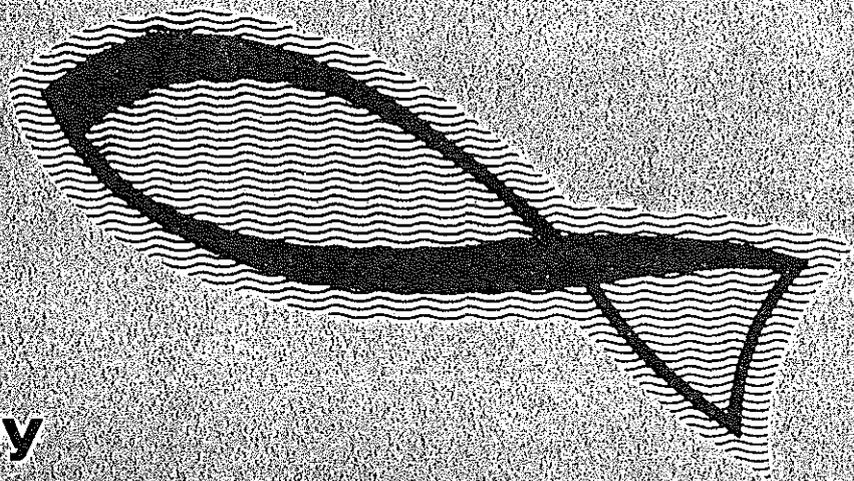


**Fishery Leaflet  
Number 98  
1979**

**an roinn  
iascaigh agus  
foraoiseachta**

**Recaptures of Adult Salmon  
tagged as smolts at  
Carrigadroghid**

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Recaptures of Adult Salmon tagged as Smolts at  
Carrigadroghid

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Abstract. A total of 2936 salmon were tagged at Carrigadroghid Co Cork in January 1973. From this tagging there were 34 recaptures, a return rate of 1.16%. In 1975 the number of salmon smolts tagged was 4860 and 18 were recovered, representing a return rate of 0.37%. Details of the recaptures resulting from these two tagging operations are given.

Introduction Considerable effort has been put into smolt tagging over the last few years and it is important that fishermen are familiar with the types of tag being used because their efforts in returning tags is vital to the programmes. A number of tags are in use, but the two most commonly used on smolts are the Floy tag and the Neal tag.

The Floy tag consists of a plastic bar that locks into the internal part of the dorsal fin rays and a streaming plastic tube, usually yellow, with a printed legend and number (Fig. 1). The legend identifies the country or organisation using the tag; IRL identifies the user as the Fisheries Research Centre, Ireland, and the number identifies the individual fish. The tag is inserted level with the front of the dorsal fin and streams alongside the fin. The tags are manufactured in cartridges of 50 and are injected with a specially designed gun (Fig. 1). The main advantages of the Floy system are the speed at which the fish can be tagged and the relatively small amount of handling necessary to tag the fish.

The Neal tag is a small 5 x 5 mm plastic diamond, mounted on a stainless steel wire. A swivel (first used by Garlin, a Swedish scientist), is generally inserted along the wire to allow some flexibility (Fig. 2). The two strands of wire coming from the swivel are inserted by twin hypodermic needles in front of the dorsal fin. The wires are twisted to hold the tag in position and the surplus wire ends are cut as the needles are withdrawn. One side of the tag bears the identification of the agency using the tag (IRL in the case of Ireland) and the reverse side bears a number identifying the individual fish.

Materials and Methods In January 1973/2,936 salmon smolts were tagged at the Electricity Supply Board's salmon rearing station at Carrigadroghid, Co Cork. Floy tags were used on 1936 smolts and 1,000 were marked using Neal tags. The mean length of the fish tagged was  $13.7 \pm 0.07$  cm. No fish under 12.5 cm fork length was tagged and only clean healthy fish were selected.

In February 1975 a further 4960 fish were tagged using Floy tags: a random sample of 50 fish were measured out of every 1000 fish tagged, and the mean length was  $13.8 \pm 0.84$  cm. In 1975 the tagged fish were held in the hatchery until their normal release time in April. Only 1 tagged fish died during this period.

Discussion The areas of recovery of fish tagged during 1973 and 1975 at Carrigadroghid range from the North West coast of Ireland to the North East coast of Scotland and to Greenland. Fig. 3 gives the approximate locations of fish recovered with tags. The main concentration of recoveries is on the south coast including the River Lee. There were 50 recoveries for which details of location are available, and of these 29 or 58% were recovered between Castletownbere and the River Lee. The North Mayo Coast accounted for 6 recoveries or 12%, while the south coast from Ballycotton Bay to Helvick Head accounted for 8%. The Greenland Fishery accounted for 5 fish or 10% of the recoveries. The areas of recoverys are similar in both years.

Details of the recaptures are given in Table 1 for the 1973 tagging and in Table 2 for the 1975 tagging. A total of 34 fish (1.16%) were recaptured from the 1973 tagging; of the 34 tags recovered 76.4% were recovered in Irish waters. Floy tags had a higher return rate (1.29%) than Neal tags (0.9%). The return rate for Floy tags however is only marginally better if we compare only tags returned from home waters (0.9% for Neal tags and 1.03% for Floy tags). The Floy tag may be more visible than the Neal tag where large numbers of fish are being handled, as at Greenland. The drift net fishery caught 55.9%, the rod and line fishery caught 8.8%, the draft nets caught 5.9% and a further 5.9% was returned by the hatchery. A total of 18 fish (0.37%) were recaptured from the 1975 tagging. All of these tags with the exception of one returned from Greenland were recovered from Irish waters, that is 94.4%. The drift net fishery accounted for 61.1%, draft nets took 5-6% and 27.8% were taken at the hatchery. Table 3 summarises the percentages caught by various means from the 1973 and 1975 taggings.

It is obvious (Table 3) that there was a very poor return of tags from the 1975 tagging. Table 4 shows the expected and actual numbers of tags returned from various sectors based on the 1973 percentage returns.

The poor return of tags is difficult to explain as the areas of exploitation are similar from both tagging years (Fig. 3 ). The poor return of tags can only be explained by "mortality". This mortality includes tag loss, deaths due to tagging, non reporting of tags, deaths due to predation etc. If the figures for return of Floy tags are compared, the tag and the person applying the tag were the same in 1973 and 1975 so that mortalities due to the tag should be similar for each year. The other factors such as tag loss and non-reporting of tags should remain relatively constant from year to year. If it is assumed that the effort exerted by each fishing method was the same in 1973 and 1975 then because of the poor returns from Greenland (1 tag), where an expected number of 7 recoveries was estimated (Table 4), it would appear that the mortality had effect at the migration stage. Either conditions in the river or in the sea were not suitable for the migrating smolt with subsequent high mortality. The fishing effort between 1973 and 1975 almost certainly increased so that <sup>actual</sup> the mortality was greater than suggested by table 4. The increase in the percentage of fish taken by the hatchery from the 1975 tagging would indicate that a high proportion of the returning adults arrived to the fishery after the fishing season. The expected number to be taken by the hatchery from the 1975 tagging was 3 (Table 4) whereas in fact the actual number was 5. This increase has to be viewed in the light of the overall decrease in expected numbers i.e. 18 returns instead of the expected 58.

Conclusions Floy tags may be more visible than Neal tags when large numbers of fish are being examined.

The areas of exploitation of adult Carrigadroghid salmon appear to be similar from year to year.

Regardless of the absolute numbers of smolts migrating from a particular fishery in any year the proportion (%) surviving to become adults can be very variable from year to year.

The survival of various components of the stock (for instance late run fish) may vary from year to year.

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Acknowledgements

We would like to thank the Electricity Supply Board for making the fish available and thank the staff of the Garrigadroghid Salmon rearing station for their help and co-operation.

Table 1. Details of Recaptures of Salmon Tagged as Smolts at Carrigadroghid in January 1973.

Tag Number	Sex	Date of Recapture	Location of Recapture	Length in centimetres	Weight in kilograms	Method of Recapture
16	♂	4.5.74	Unken Hill	-	2.0	Drift
11	♂	17.5.74	Blackrock, Cork	-	2.3	Red
1	♂	18.5.74	North Mayo Coast	70.5	3.5	Drift
2	♂	23.5.74	Donegal Coast	-	3.2	Drift
17	♂	27.5.74	North Mayo coast	-	2.6	Drift
1	♂	June '74	Cork Coast	-	-	Drift
2	♂	2.7.74	Unken Hill	-	3.6	Drift
21	♂	4.7.74	North Mayo Coast	72.4	4.0	Drift
534	♂	6.7.74	Bellinaghy, Co. Mayo	-	2.4	Drift
734	♂	8.7.74	Ballyvaughan Bay	-	3.2	Drift
1818	♂	17.7.74	Arduara Bay	-	2.0	Drift
15	♂	17.7.74	Ballyvaughan Bay	-	-	Drift
9	♂	17.7.74	River Lee	-	5.2	Red
69	♂	21.7.74	Caanleaghmore	-	2.3	Drift
610	♂	27.7.74	River Lee	63.5	3.2	Drift
66	♂	27.7.74	River Lee	66.1	4.1	Drift
67	♂	30.7.74	Caanleaghmore	-	5.2	Drift
18	♂	31.7.74	North Mayo Coast	-	5.4	Drift
2	♂	July/Aug	Edinburgh, Scotland	64.2	2.9	Drift
15	♂	1.8.74	Unken Hill	-	-	Drift
13	♂	2.8.74	Edinburgh, Co. Durham	-	-	Drift
2	♂	Aug'74	West Greenland	-	-	-
1270	♂	Aug'74	West Greenland	63.0	2.1	-
6348	♂	Aug'74	Cork Coast	-	3.6	Drift
6347	♂	Summer'74	Cork Coast	-	2.3	Drift
809	♂	Autumn'74	West Greenland	-	-	-
732	♂	Autumn'74	West Greenland	-	-	-
6378	♂	20.11.74	River Lee	64.8	2.2	Hatchery
6379	♂	21.11.74	River Lee	62.7	2.0	Hatchery
6407	♂	March'75	Cork Coast	-	4.1	Drift
1537	♂	April'75	River Lee	-	5.1	Red
6406	♂	June '75	Arrensore, Co. Donegal	-	-	Drift
1977	♂	-	Cold Store	-	-	-
639	♂	-	Cold Store	-	-	-

Table 2. Recaptures from Smolts tagged at Carrigadroghid,  
Co Cork in 1975.

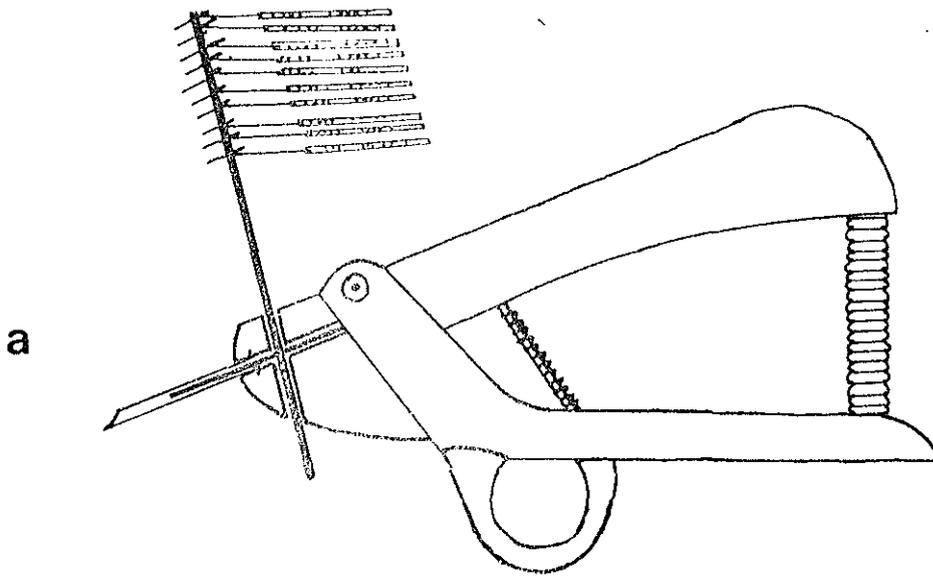
Tag No.	Type of Tag	Date	Location of Recapture	Length in cm	Weight in kg	Method of Recapture
9698	Floy	3.7.76	Skibbereen	-	22.6	Drift
5417	Floy	13.7.76	Helvick Head	66.1	2.26	Drift
6656	Floy	20.7.76	Burtonport	65.4	2.95	Drift
5161	Floy	20.7.76	North Mayo Coast	61.0	2.72	Drift
8244	Floy	20.7.76	Dingle	59.7	2.26	Drift
6042	Floy	4.8.76	Cork Harbour	-	-	Drift
7348	Floy	4.8.76	Kinsale	-	-	Drift
8288	Floy	4.8.76	Kinsale	-	-	Drift
5795	Floy	28.7.76	Knockadoon Hd	71.1	2.94	Drift
8905	Floy	31.7.76	Cork Coast	-	-	Drift
5290	Floy	9.8.76	Cork Coast	-	3.63	Drift
9860	Floy	18.11.76	Carrigadroghid	66.1	2.50	Hatchery
9261	Floy	21.10.76	Carrigadroghid	66.1	2.15	Hatchery
6296	Floy	19.11.76	Carrigadroghid	67.5	2.72	Hatchery
9044	Floy	25.11.76	Carrigadroghid	62.9	2.04	Hatchery
8621	Floy	2.12.76	Carrigadroghid	61.6	2.04	Hatchery
5704	Floy	21.8.76	At Angsnih, Greenland	70.0	3.00	-
9242	Floy	24.5.77	Ringabella, Cork	-	-	Bag Net

Table 3. The number and percentages of fish with tags taken by various methods and from various areas.

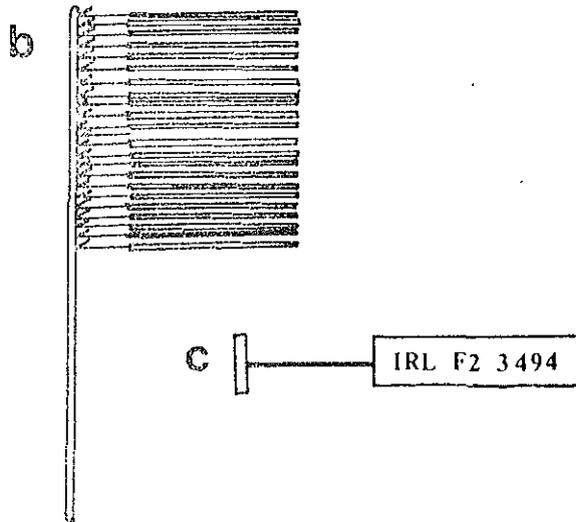
Method or area of capture	1973 tagging		1975 tagging	
	No. of Fish	%	No. of Fish	%
Drift nets	19	55.9	11	61.1
Draft and Bag nets	2	5.9	1	5.6
Rod and line	3	8.8	-	-
Taken at the hatchery	2	5.9	5	27.8
Other recoveries	2	5.9	-	-
Returns from Greenland	4	11.8	1	5.6
Returns from the United Kingdom	2	5.9	-	-
Total	34	100.1	18	100.1
Recapture Rate	34	1.16	18	0.37

Table 4. Expected number of tag returns by various methods and from various areas for 1975 based on the percentage returns for the 1973 tagging.

Method or area of capture	No. Returns 1973	% Return 1973	Expected Nos 1975	Actual Nos 1975
Drift nets	19	0.64%	32	11
Draft or bag nets	2	0.07%	3	1
Rod and line	3	0.10%	5	-
Taken at the hatchery	2	0.07%	3	5
Other Recoveries	2	0.07%	3	-
Returns from Greenland	4	0.14%	7	1
Returns from United Kingdom	2	0.07%	3	-
Total	34	1.16	58	18



a Floy tag gun with cartridge



b Tag cartridge showing tags.

c Enlarged individual tag. Not to scale

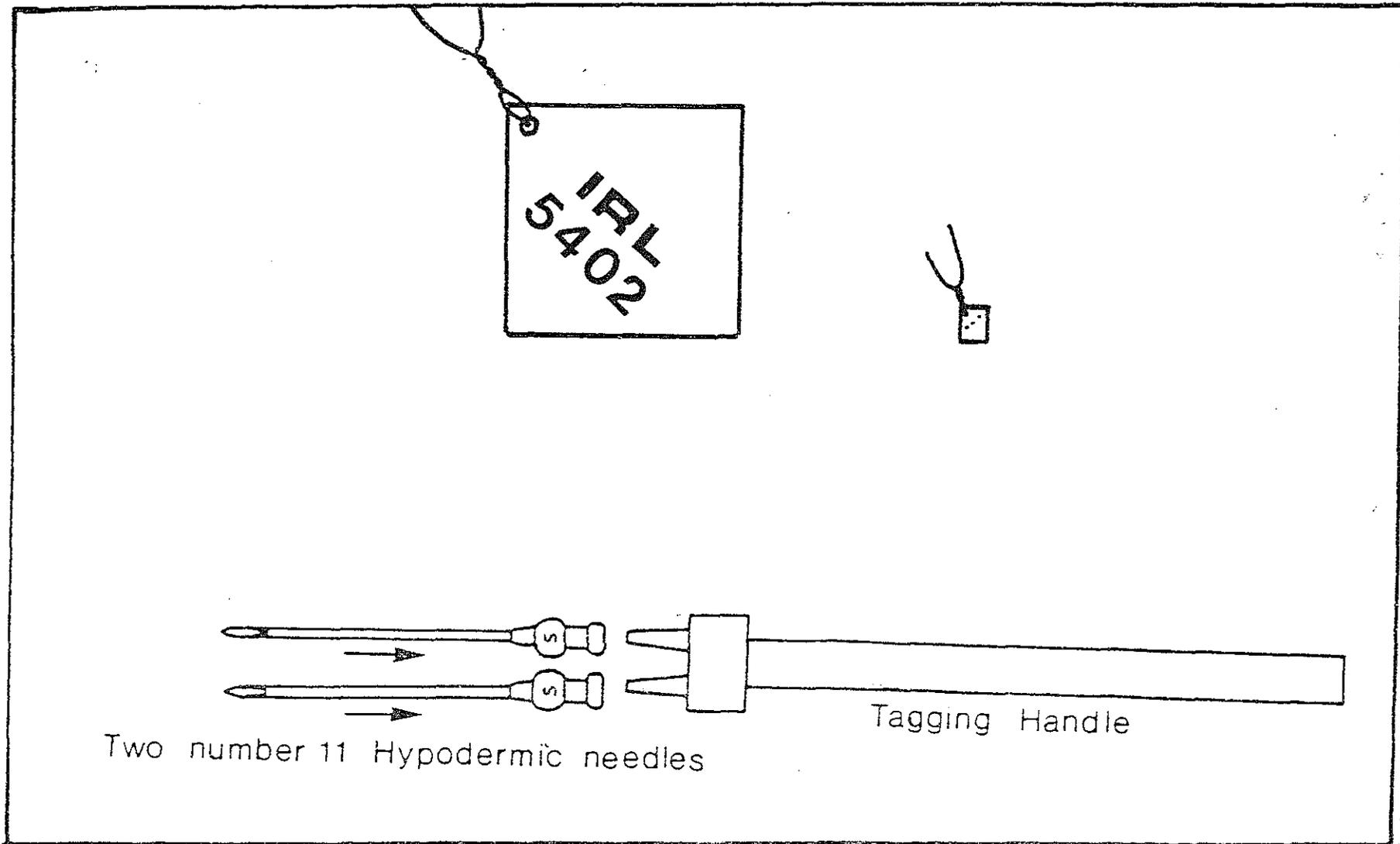


Fig. 2 The Neal tag with mounted needles for inserting the wires.

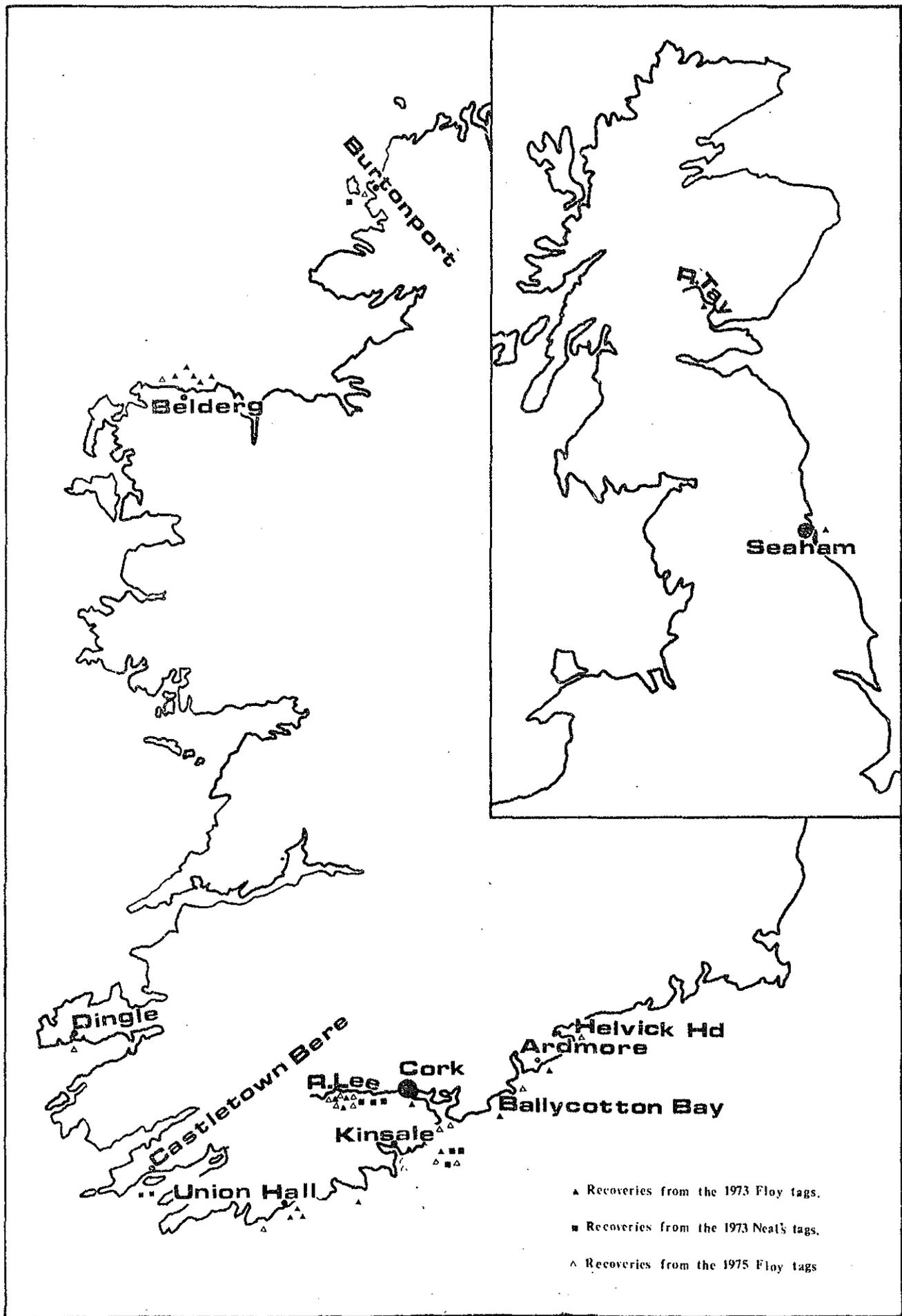


Fig. 3

Showing approximate areas of recoveries of tags in 1973 and 1975.