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# VARIATIONS IN ELVER ABUNDANCE AT EUROPEAN CATCHING STATIONS FROM 1938 TO 1985

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**ABSTRACT.** — Annual figures are presented for total catch or abundance of glass eels, elvers and young eels from nine countries. The dominant feature and the only one in which the data from all participating countries agree is a severe decline in abundance during the years 1981 to 1985 inclusive. A similar decline was observed in the Netherlands from 1946 to 1950 but no data are available for this period from the other countries. Close agreement is reported between fluctuations in catch in the River Ems in Germany and the abundance of larval eels off the western coast of Europe but in other cases the results are remarkable in the absence of correlation in annual abundance between catching stations.

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**RESUMÉ.** — Les prises totales ou abondance de civelles et d'anguillettes concernant 9 pays sont présentées. La caractéristique principale commune à tous ces pays consiste en une diminution d'abondance de 1981 jusqu'à fin 1985. La même diminution a été observée aux Pays-Bas de 1946 à 1950 mais il n'existe pas de données disponibles dans les autres pays pour la même période. Une étroite correspondance, entre les variations des captures dans la rivière Ems en Allemagne et l'abondance des larves sur les côtes européennes occidentales a été mise en évidence, mais dans les autres cas on note une absence de relation d'abondance annuelle entre les divers sites de capture.

## INTRODUCTION

In an attempt to study the fluctuations in the numbers of ascending glass eels and elvers *Anguilla anguilla* in Europe and Africa, the Working Party on Eel of the European Inland Fisheries Advisory Commission (FAO) has gathered data from different countries and localities. At the present stage of collection it seems reasonable to publish these data. This is especially desirable because many locations have shown a downward trend in numbers of ascending young eels during the past few years.

This report gives results from nine countries not only on glass eels and elvers but also on young eels. For one country, the Netherlands, they go back as far as 1938. The other time series are rather shorter. In the case of the Netherlands, the catches given are

the geometric means (as recommended by Dekker, this issue), of sample catches. The other figures represent total catches made either by commercial fisheries or at research stations. The term "elver" is used to include both glass eels and O+ elvers.

## RESULTS

### *Localities and general trends of young eel ascent*

**Norway.** On the River Imsa in the south-west all ascending eels are collected at an eel ladder and the quantities have been measured by volume annually since 1975.

Small eels, presumably elvers, were not measured

separately until 1983. The data given in Table I show poor catches in 1978/79 and again 1983/84.

Table I. — Catch of ascending eels in River Imsa.

Year	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Litres	20.5	23.2	13.6	5.8	1.2	16.6	7.4	20.85	7.0	3.2
Litres of "small eels"									4.5	1.32

In his study of the details of the figures Hvidsten (1985) was able to show a good correlation between water temperature in June and July and size of catch, the best catches coinciding with the warmest summers.

**Sweden.** Recent data are given in Table II for five localities. The 1984 catch in the River Viskan (Fig. 1) was the lowest since records began in 1971 and the other stations also showed a decline.

The dramatic fall in catch in the Viskan from 1983 to 1984 was reflected in a reduction in the numbers of glass eels caught in the Skaggerak and Cattegaut in the month of February.

Table II. — Annual catch (kg) of elvers in Swedish rivers

	1982	1983	1984
South coast (Baltic) Lagan	47.4	2.9	17
West coast (Kattegat) Nissan	2.7	27	2.5
Morupsan	14.6	11	1.5
Tvaakers kanal	7.2	10.4	0
Viskan	472	308.4	20.7
Total	543.9	359.7	41.7

**Denmark.** Elver catches at the Vida/Hojer sluice in southwest Jutland (Fig. 1) were exceptionally low in

Table III. — Catches of young eels (kg) at Danish trapping stations.

	W Stadil Fjord West Jylland	Holstebro Power Station West Jylland	Kattingevaerk North Sjaelland	Frederiksvaerk North Sjaelland	Ballum Sluice SW Jylland
1967			1 292	10 720	
1968		170	1 500	6 202	
1969	350	258	1 470	2 376	
1970	298		3 290	12 248	
1971	134		4 066	8 090	
1972	170		2 843	10 266	
1973	157		1 648	10 998	
1974	65	386	744	9 414	
1975	107	213	1 183	8 249	
1976	300	622	1 135	6 393	
1977	530	425	2 187	10 630	
1978	70	274	1 675	6 418	
1979		104	3 304	6 371	
1980	27	320	3 527	6 378	635
1981	200	135	1 778	5 872	756
1982	47	140	3 048	5 899	450
1983	0	63	905	4 392	1 668
1984	132	58	2 721	2 996	706

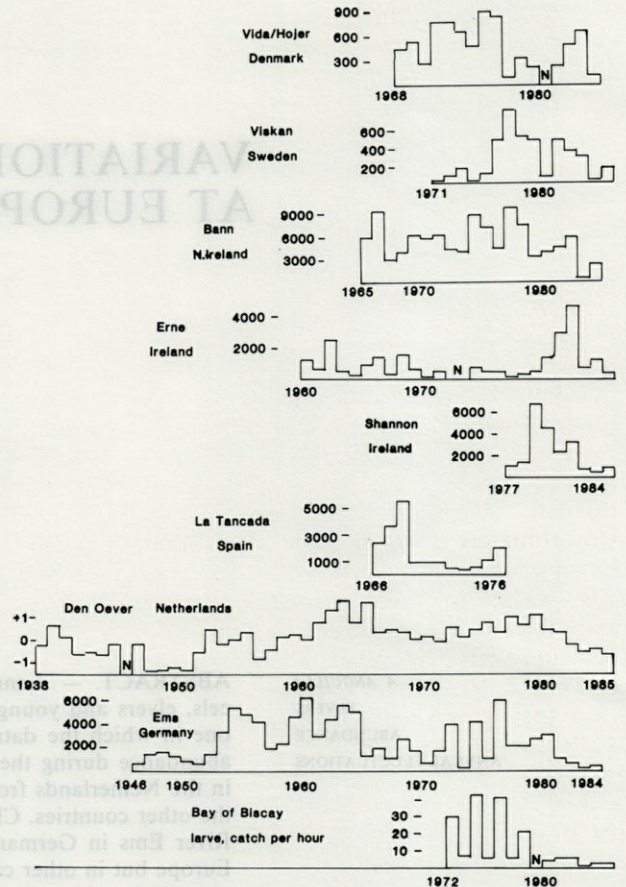


Fig. 1. — Catch per hour of larval eels in Bay of Biscay; "year effect" on glass eel sampling at Den Oever; catch (kg) of glass eels and elvers at other sites.

1977 and in 1984. Catches of young eels from five localities (Table III) show marked but apparently independent fluctuations.

**Germany.** Catches in the River Ems at Hebrum, near Aschendorf, (Fig. 1) have been abnormally low since 1981. Fluctuations in catch follow closely fluctuations in larval catch in the eastern Atlantic (Fig. 1).

**Netherlands.** Data accumulated since 1938 at Den Oever on the north coast (Fig. 1) have shown two periods of decline: the current one and one lasting from 1946 to 1950.

**Ireland.** Data from three stations are given in Fig. 1: River Bann (north coast), River Erne (northwest coast), both giving complete catches of elvers and River Shannon (west coast) with incomplete catch of elvers. Poor catches in general have been observed over the past few years.

**England.** Estimated catch from the River Severn (west coast) was high in 1979, medium 1980-82 and extremely low 1983-85 inclusive.

**France.** Catch per unit effort in the Loire and Vilaine (west coast) declined steadily and severely from 1978 to 1984 (Guérault *et al.*, 1985).

**Spain.** Glass eel catches from Tancada lagoon in the Ebro delta on the east coast (Fig. 1) were obtained from Demestre *et al.*, (1977).

## DISCUSSION

Figure 1 gives a graph of the variations in elver catch in seven fisheries and in larval eel catch in the eastern Atlantic from Tesch *et al.*, (this issue). Two features are of particular interest. The first is that catches have been even worse than at present. Unfortunately only one time series, that from Den Oever in the Netherlands, goes back long enough to demonstrate this. The second is perhaps more remarkable. It is the failure of the peak catches to coincide with each other. Even within the confines of Ireland where three series are available, it is quite clear that one fishery can experience a record catch while another, less than 100 km farther south, has a relatively low one. Dekker (this issue) has shown within the Netherlands annual fluctuations which are similar to one another at four stations but significantly different from a fifth.

Considering the fact that past records have shown low periods of as long as six years, five-year total catches were calculated where possible with results shown in Table IV.

Table IV. — Total quantities (kg) of elvers caught in five year periods by constant method.

	Den Oever	Ems	Bann	Erne
1940-44	19.2			
1945-49				
1950-54	34.38	11,754		
1955-59	52.08	17,735		
1960-64	67.03	24,440	46,500	4,954
1965-69	39.59	8,776	27,700	4,782
1970-74	37.07	10,805	29,150	
1975-79	55.18	14,019	31,684	1,723
1980-84	34.90	5,308	16,700	10,701

This gives the surprising result that only two of the four stations for which data are available have shown their lowest elver run.

Tesch *et al.*, (this issue) have provided data since 1972 on the results of larval sampling in the Bay of Biscay. The annual variations coincide remarkably well with the catch in the River Ems in the following year. However, similar relationships cannot be esta-

blished between the Bay of Biscay figures and the elver catches in other countries (Fig. 1).

## CONCLUSIONS

The only definite conclusion is that more extensive observations are required and that they must be continued for many years. There are strong indications that recruitment in the course of the years 1982 — 1985 has been very poor, starting with a decline at nearly all stations in 1979, and that this may be associated with low stocks of larval eels in front of the respective coastal areas. All correspondents have remarked on the effects of physical conditions such as weather, temperature and water flow on the recruitment of elvers. This reduces the reliability of elver catches as indicators of breeding success or of survival in the course of the oceanic migration of the larvae. From this point of view oceanic sampling of larvae has much to recommend it even though it, too, must be influenced by variations the areas sampled.

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