COMMISSION OF THE EUROPEAN COMMUNITIES

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COM(1998) 16 final

Report of the Commission to the Council and European Parliament

Measures Taken pursuant to Council Directive 91/676/EEC concerning the Protection of Waters against Pollution caused by Nitrates from Agricultural Sources

Summary of Reports submitted to the Commission by Member States under Article 11

1. INTRODUCTION

According to Article 10 of the Nitrates Directive[1] Member States are required to submit a report to the European Commission containing the information specified in Annex V (see Table 1 below) of the Directive every four years. The first report, which covers the period from 19.12.1991 to 19.12.1995, was due to be submitted to the Commission by 20.12.1996. The information to be included in the report covers the main obligations that the Directive places on Member States, namely monitoring, the designation of vulnerable zones, the drawing up and promotion of codes of good agricultural practice and the action programmes.

Table 1: The Requirements of Annex V

Annex V - Information to be Contained in Reports under Article 10
1. A statement of the preventive action pursuant to Article 4
2. A map showing the following:
(a) waters identified in accordance with Article 3(1) and Annex I indicating for each water which of the criteria in Annex I was used for the purpose of identification;
(b) the location of the designated vulnerable zones, distinguishing between existing zones and zones designated since the previous report.
3. A summary of the monitoring results obtained pursuant to Article 6, including a statement of the considerations which led to the designation of each vulnerable zone and to any revision of or addition to designations of vulnerable zones.
4. A summary of the action programmes drawn up pursuant to Article 5 and, in particular:
(a) the measures required by Article 5(4)(a) and (b):
(b) the information required by Annex III(4);
(c) any additional measures or reinforced actions taken pursuant to Article 5(5);
(d) a summary of the results of the monitoring programmes implemented pursuant to Article 5(6);
(e) the assumptions made by the Member States about the likely timescale within which the waters identified in accordance with Article 3(1) are expected to respond to the measure in the action programme, along with an indication of the level of uncertainty incorporated in these assumptions.

Article 11 of the Directive requires the Commission to publish a summary report on the basis of the information submitted by Member States within six months of receiving the reports from Member States. This "Summary Report" has then to be communicated to

[1] OJ L 375 31.12.1991, p1, Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources

the European Parliament and to the Council of Ministers. This document constitutes that Summary Report.

Given the timetable stated in the Directive this document would ideally have been communicated to the aforementioned institutions by 20.12.1996. This was not possible due to the tardy submission of reports from the Member States. indeed by 20.6.1996 only Ireland had submitted its report. It was therefore considered appropriate to wait for a sufficient number of reports before the report could be published, a position that was considered to have been reached on 28.2.1997. Nevertheless three Member States. Belgium, Italy and Spain have still to submit the report to the Commission as required by Article 10, therefore these countries have been omitted from this report.

The quality of the information received has been highly variable. particularly in the degree of detail. Indeed, for some Member States certain requirements of Annex V were not fulfilled. This is either through omission. in which case the Commission has requested the Member State to rectify the situation. or because the relevant measures still remain to be taken in the Member State, despite the deadline having passed. This is particularly the case for information pertaining to the action programmes. However the main reason for the differing standards of information provided can be attributed to the degree of flexibility with which Annex V can be interpreted. A summary can be construed as being anything from one sentence to several pages. As the main purpose of this report is to provide information that is of use to the citizen this lack of consistency is to be regretted. It is therefore necessary, in the opinion of the Commission. for a common reporting format to be adopted by the Council and used for the next report. which will be due on 21.6.2000. To this end the Commission will propose a reporting format which will enable the next "Summary Report" to be of even greater utility than this one.

1.1 Format of the Report

This report is divided into two distinct sections. The first provides a brief overview of the measures taken in the Member States for which information is available. The second presents each Member State in turn. For the second section the Commission has attempted to present the information using a common outline in an attempt to facilitate user friendliness. This information has been checked by the Member State. The Commission has not added any information to each country except where this is clearly stated in order to provide clarity. Overall, some of the information provided by the Member State may have been omitted, or presented in a different way. The fact that the information presented in this section of this Commission document should not be taken as a sign that the approach adopted (or not adopted) by a Member State in the implementation of the Directive is approved by the Commission.

1.2 Relationship to the Implementation Report

On 1 October 1997 the Commission published a report to the Council and European Parliament on the Implementation of Council Directive 91/676/EEC concerning the Protection of Waters against Pollution caused by Nitrates from Agricultural Sources[2]. This "Implementation Report" highlights the significant lack of progress made by Member States in their application of the Directive and the status of legal proceedings against the Member States.

2. OVERVIEW OF MEASURES TAKEN

2.1 Identification of Waters and Designation of Vulnerable Zones

Of the 12 Member States who submitted reports 5 have designated the whole of their territory according to Article 3(5), namely Austria, Denmark, Germany, Luxembourg and the Netherlands, and so are not covered by Annex V.3 as this pertains explicitly to Article 6. The remaining seven did include information on the Article 6 monitoring.

Figure 1 shows the areas identified as vulnerable zones or according to Article 3(5) of the Directive.

2.1.1 Fresh Surface Waters

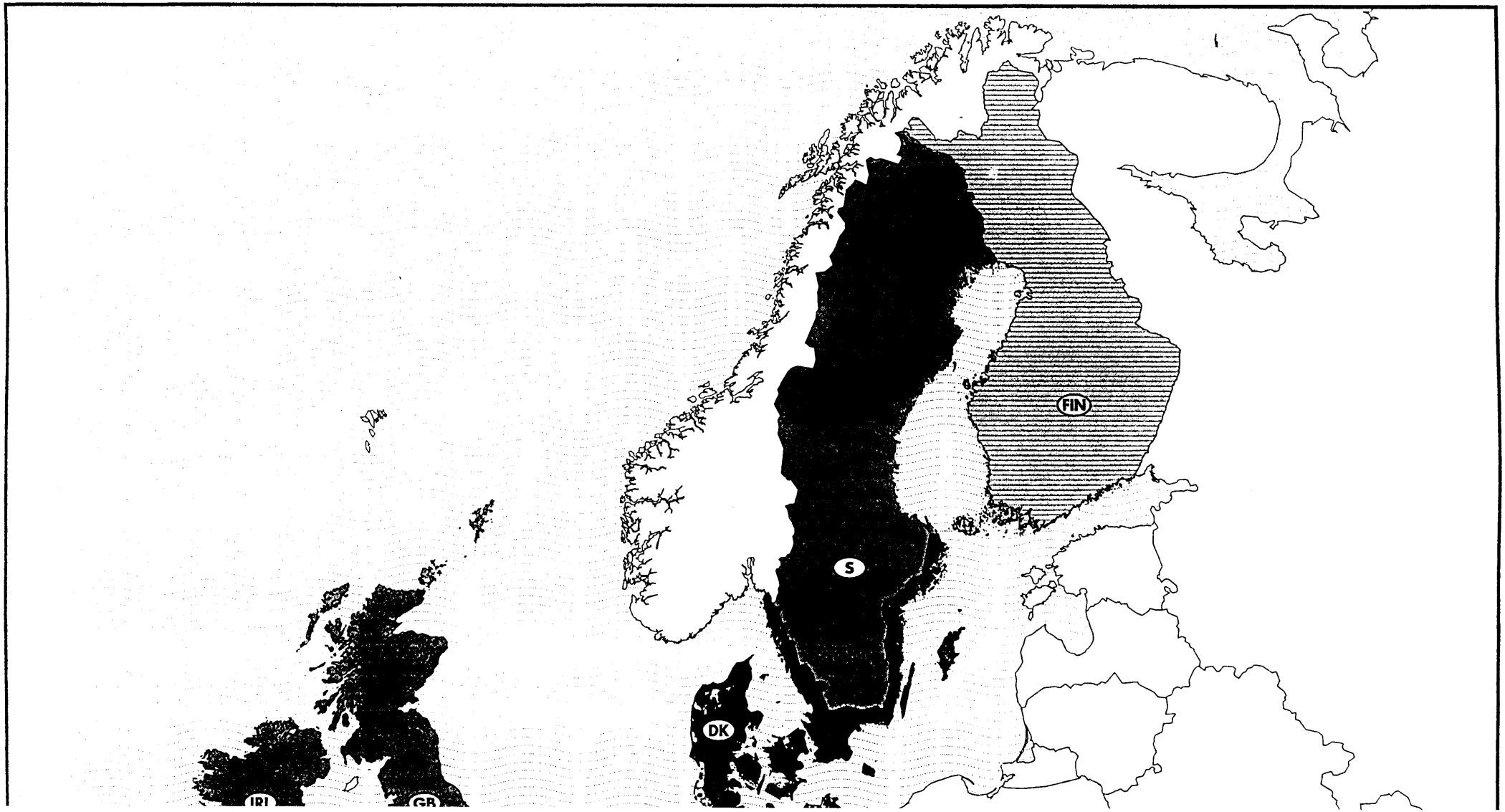
Greece stated that between 1989 and 1992 the nitrate content of 18 rivers and 21 lakes had been examined. In Portugal surface waters were only measured where they were also drinking water abstraction points. All these points complied with the 50 mg/l level. In Sweden the quality of freshwaters is measured in reference lakes and water courses. For fresh surface waters it has been shown that 90% of the sampling points have a nitrate concentration below 9 mg/l and all sampling points are below 50 mg/l. For lakes, 90% had a nitrate content of below 2 mg/l and all had concentrations of below 50 mg/l. In the UK 1,122 surface water abstraction sites were monitored leading to the designation of 6 vulnerable zones covering 9 surface water catchments. In Ireland, fresh surface waters were monitored with certain rivers having concentrations above 40 mg/l yet under 50. France and Finland submitted no summary of results of the fresh surface water monitoring for nitrate concentrations.

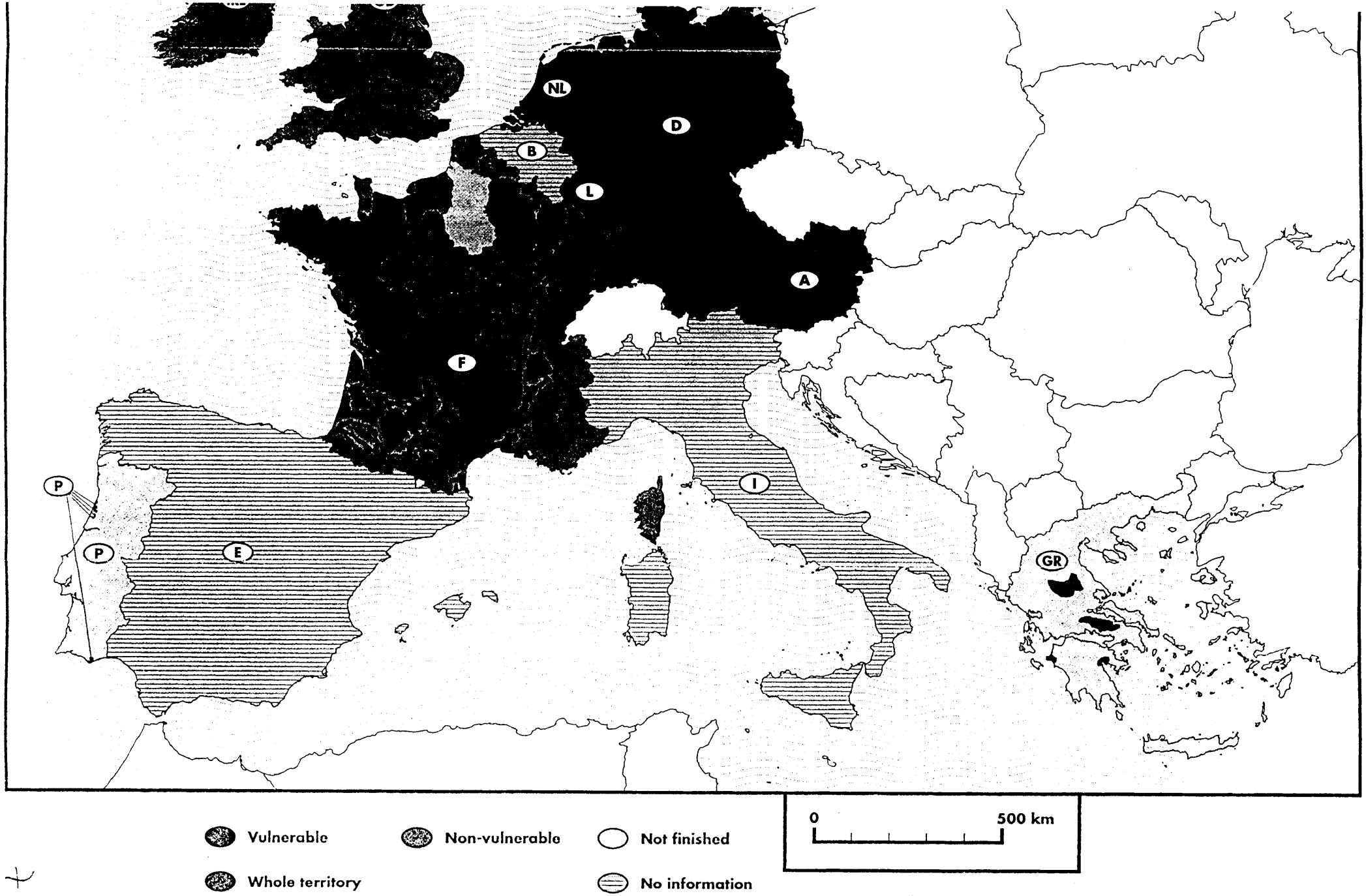
2.1.2 Groundwaters

Finland stated that for the purposes of the Directive it is their intention to designate groundwaters with a nitrate concentration of over 15 mg/l. This will mean that four areas

[2] COM (97) 473 final

Figure 1: Areas identified as Nitrate Vulnerable Zones or according to Article 3(5) of Directive 91/676/EEC




NL
D
B
L
A
F
P
P
E
I
GR
Vulnerable
Non-vulnerable
Not finished
Whole territory
No information
0
500 km

with a concentration of over 25 mg/l will be designated, and seven with a nitrate content of over 15 mg/l. Greece has conducted a study of groundwaters, but due to the statistical sample of the measurements being poor these have not been used as the basis for designations. Four "potentially vulnerable zones" have been designated, but it is not clear on the basis of which of the criteria in Annex I. In Ireland monitoring revealed that a small number of groundwater sources had concentrations of nitrate above 40 mg/l, however these were not designated as they were considered to be due to "bad housekeeping practices" such as the incorrect sitings of silage or slurry pits and seepage from septic tanks. In Portugal groundwaters have only been monitored at abstraction sites and this is likely to lead to five zones being designated. The UK has monitored 461 sources of groundwater of which 148 were designated in 63 vulnerable zones. From its monitoring Sweden found it had no concentrations above 50 mg/l for groundwater supplies (with most being below 5 mg/l). For wells 44 mg/l is exceeded in 5% of dug wells and 1% of drilled wells. France did not submit information summarising the results of groundwater monitoring for nitrates or on the range of concentrations.

2.1.3 Eutrophication

Sweden identified a significant proportion of its coast as eutrophic, in addition to the lake "Ringsjön". The waters draining into these have been designated as vulnerable zones. In Finland the lakes have been assessed for eutrophication according to the criteria listed in section 5.1 of this report. The marine areas of the Gulf of Finland, the Saaristomeri and the Selkämeri have been identified as eutrophic. In Greece several gulfs have eutrophication problems (Saronikos, Thermaikos, Pagastikos, Amcrakikos and Southern Evvoikos). Portugal has not designated any estuarial, coastal or marine waters as there is no monitoring information on which they could be based. Ireland attributed its inland eutrophication problems to phosphorus and its tidal waters to sources not coming under the remit of the Nitrates Directive. They did, however, acknowledge the need for a more detailed estuarine and coastal waters monitoring programme. The UK did not designate any areas according to the eutrophication criterion. The French report did not provide a summary of the results.

2.2 Codes of Good Agricultural Practice

Codes of good agricultural practice have been drawn up in all of the Member States which submitted reports with the exception of Portugal. In most cases these constitute a single document. However, some Member States, such as Denmark and Sweden already had all the measures contained in the codes in existing legislation. Others, such as Germany and Luxembourg which have designated their whole territory have combined the measures in the codes and the action programmes in one law as well as drawing up separate codes.

Most countries have provided some type of information concerning the manner in which the code is being promoted. These include measures such as the provision of advisors, training courses, colloquiums and written information.

2.3 Action Programmes

The information required in Annex V.4 was received from the countries which have already drawn up action programmes, namely Austria, Denmark, Germany, Luxembourg, the Netherlands and Sweden. In addition France provided some information on the mode and state of implementation. As Ireland has not designated any vulnerable zones there is no requirement in the Directive for action programmes therefore no information on this section was submitted. It is also important to note that although at the time of the report being submitted by the Netherlands they had submitted an action programme to the Commission the action programme was subsequently withdrawn.

2.3.1 The measures required by Article 5(4) (a) and (b)

The approach to this section has varied amongst the Member States submitting information. Some, such as Austria have simply stated that the measures required by the Directive have been included in the action programme, while others, such as Germany have provided a detailed breakdown of the measures taken pursuant to this Article. More details of each can be found in the relevant sections.

2.3.2 Information Required under Annex III(4)

Austria, Germany and Luxembourg are applying Annex III(4) on the basis of kg N/ha/yr while Denmark and Sweden have opted to use livestock units corresponding to these amounts. France has stated that it will use the kg N/ha/yr figures, and that it will not seek a derogation from these quantities.

2.3.3 Additional Measures or Reinforced Actions taken Pursuant to Article 5(5)

All the Member States submitting information on this point considered that it was too early to state if these measures are necessary. Most mentioned a commitment to take the further measures if they become necessary.

2.3.4 Monitoring Programmes implemented pursuant to Article 5(6)

Article 5(6) consists of two requirements. The first is that all Member States should monitor the effectiveness of their action programmes. Various schemes have been put in place to ensure this. Austria considers it sufficient to monitor changes in farming practices through fertilisation statistics and livestock figures. Denmark undertakes

detailed monitoring for this in six catchment areas including practices with livestock manure and chemical fertilisers as well as micro and macro biological factors in various parts of the hydrological cycle. The Netherlands intends to monitor the agricultural nitrogen balance. Sweden monitors nitrate leaching to waters and uses a complex model. Germany and Luxembourg did not include any information on this point.

Member States who have chosen to apply Article 5 across the whole of their territory are also required to monitor the nitrate content of waters (surface and groundwater) at selected measuring points which make it possible to establish the extent of nitrate pollution in the waters from agricultural sources. From the information received there appear to be considerable variations between the Member States as to the monitoring conducted. Austria measures groundwater at 2000 points and surface-freshwater at 244 for nitrate concentrations. No monitoring for eutrophication is conducted under the Directive as it is considered to be phosphorus limited. Germany uses 186 measuring points to monitor groundwater 15 points to monitor fresh surface waters for the extent of nitrate pollution in waters from agricultural sources. For coastal waters five measuring points are used. Luxembourg measures the nitrate concentration of groundwaters at four points which are considered to give adequate coverage of the nation's aquifers and of surface waters at one point. Eutrophication is measured at two points. The Netherlands provided a summary of the subject fields measured, but no specific information as to their location, frequency of sampling, parameters measured, etc.. Denmark measures the nitrate content of groundwaters and fresh surface waters nation-wide. For fresh surface waters 260 streams and 58 brooks are assessed as well as 37 lakes. Fauna classes are also assessed. Groundwaters are also assessed but no summary was provided of the number of sites used. Marine waters are also monitored (see Section 4.3.4.4).

2.3.5 Likely response time of waters to the measures taken, and the level of uncertainty contained in such predictions

Sweden was the only Member State to provide an estimation of when the measures contained in the action programme would be likely to have an effect. They estimate that they will achieve the 50% reduction goal in the anthropogenic nitrogen load in marine waters by 2005.

3. AUSTRIA

The report was submitted to the Commission on 11 November 1996.

3.1 Identification of Waters and Designation of Vulnerable Zones

The whole territory is designated according to Article 3(5) of the Directive. This decision was taken in order further to ensure that a high-level of water protection is maintained throughout Austria.

3.2 Codes of Good Agricultural Practice

The Code of Good Agricultural Practice entered into force on 1 January 1996. The Code is promoted by the agricultural advisory service. Chambers of Agriculture and union representatives.

3.3 Action Programmes

The action programme has been drawn up on a Federal level and has to be implemented by the Länder.

3.3.1 The measures required by Article 5(4) (a) and (b)

The action programme contains the measures required by the Directive. In addition it sets a maximum, annual level of fertilisers that can be applied of 210 kg N/ha. This includes both livestock manure and chemical fertiliser.

3.3.2 Information required under Annex III(4)

For the period of the first action programme the maximum level of manure that can be applied is 210 kg N/ha for grassland and arable land with green cover during winter and 175 kg N/ha for cultivated land without green cover during winter.

3.3.3 Additional Measures or Reinforced Action

At this stage it is considered too early to judge whether reinforced action in the context of the Directive will be required.

3.3.4 Monitoring Programmes under Article 5(6)

The monitoring network in Austria is based on 244 surface-freshwater measuring points and 2000 groundwater measuring points. Important water courses are examined 12 times per year and groundwater 4 times.

In surface waters, of the 4,536 measurements carried out between 1991 and mid-1995 98.4% were below 25 mg/l. The 50 mg/l threshold was only exceeded twice, ie 0.04%.

Eutrophication in surface freshwaters (there are no marine waters in Austria) is considered to be phosphorus limited, and therefore not covered by the Directive.

For groundwaters, between 1991 and mid-1995 85% of all 18,277 samples were below the 50 mg/l threshold.

This monitoring network is considered sufficient to follow the changes in water quality according to Article 5(6). In addition farming practices are monitored through fertilisation statistics and livestock figures.

3.3.5 Assumptions of when the Objectives of the Directive will be Met

It is estimated that for surface waters the objectives of the Directive are already met. For groundwaters the action programme should prevent further deterioration in the groundwater quality.

It is noted that the national average fertilisation intensity is 49 kg N/ha of agricultural land for livestock manure and 33 kg N/ha for chemical fertiliser. This implies that if future applications of livestock manure were to reach 210/170 kg N/ha throughout Austria there would be a considerable deterioration in groundwater quality.

Austria also considers that in order to achieve the targets laid down in the Directive the following additional measures are needed:

- further extension of the agri-environment payments;
- focusing of the EU agriculture policy on sustainability;
- implementation, without exceptions, of the maximum fertilisation limits in all Member States in order to mitigate any existing distortions of competition.

4. DENMARK

The report was submitted to the Commission on 20 December 1996.

4.1 Identification of Waters and Designation of Vulnerable Zones

The whole territory is designated according to Article 3(5) of the Directive.

4.2 Codes of Good Agricultural Practice

This is covered in the action programme section below. Farmers are informed and the codes promoted through detailed guideline materials sent to farmers and through the local advisory service centres. The Agricultural Advisory Centre assists the individual farmer through, for example, the preparation of crop rotation and fertiliser plans and calculation of sufficient storage capacity.

4.3 Action Programmes

4.3.1 The Measures Required by Article 5(4) (a) and (b)

The Danish action programme consists of five main elements which are considered in turn:

4.3.1.1 Provisions for the abatement of discharges from farm waste

Mandatory standards are set such as for manure storage facilities, farmyards, milking parlours and effluent outlets. For example, to abate ammonia volatilisation from storage facilities, liquid manure containers without solid floating cover must be closed with alternative solid covers. Open slurry containers must be fitted with a subsurface inlet secured against liquid running backwards, while other filling systems must be designed so that the floating cover is not broken.

4.3.1.2 Provisions for the land application of manure

These set down the time periods during which the land application of manure may not occur. They also state time periods within which the manure should be ploughed into the soil: for example, that liquid manure and silage effluent applied on bare soil shall be incorporated as quickly as possible, and within 12 hours, in order to reduce ammonia volatilisation.

4.3.1.3 Mandatory crop rotation, fertiliser planning and fertiliser accounting

Danish farmers have had to draw up mandatory crop rotation and fertiliser plans since 1988 covering the period August 1 to July 31. Some crops, including winter grain cereals, catch crops and crops with long growing seasons are defined as 'green crops'. 65% of the agricultural area of the farm must be constituted of these. In the fertiliser plans the farmers are required to calculate their estimated need for nitrogen and

phosphorus applications according to economically optimal dosages, and state what types of fertiliser will make up the total. These plans have to be made available to the authorities and must be revised if any subsequent changes are made. The total fertiliser application, including the effective portion of nitrogen contained in the animal manure must not exceed the level defined by the authorities for that particular crop. In addition the minimum utilisation efficiency of nitrogen in animal manure and other organic fertilisers must be observed. Examples of these are given in Table 2 with the numbers denoting the first year effect and the second year effect (residual effect from the first year) being denoted by the numbers in brackets:

Table 2: The Minimum Utilisation Efficiency of Nitrogen in Animal Manure and other Organic Fertilisers.

Type of Livestock Manure	Date from	Minimum Utilisation Efficiency
Pig Slurry	1.8.97	50 % (+10)
Cattle Slurry	1.8.97	45 % (+10)
Deep Litter	1.8.96	15 % (+15)
Other Types of Manure	1.8.95	40 % (+10)

A resolution of the Danish Parliament states that these minimum utilisation efficiencies shall always be increased according to that which is technically possible.

Fertiliser accounting was introduced in 1993 and requires each farmer to assess the total crop demand and use of nitrogen fertiliser on their farm, the utilisation efficiency of the total nitrogen in animal manure and the amount of total nitrogen stored on the farm. These reports have to be submitted to the authorities on request. Both fertiliser plans and fertiliser accounts must be based on nominal values for the nutrient content of animal manures as a function of housing system and use of bedding material. Alternatively the nitrogen content may be assessed by an authorised laboratory.

4.3.1.4 Storage Capacity for Manure

The minimum manure storage capacity is 6 months. However, as the storage capacity must be sufficient to ensure that application of manure takes place in accordance with the provisions for field application, and the utilisation efficiency of the nutrient content of the manure laid down by the authorities, this usually translates to nine months.

4.3.2 Information required by Annex III(4)

The fifth part of the action programme consists of the establishment of maximum limits of livestock manure applied to the land each year. These are established on the basis of animal numbers. Until 19 December 1999 one livestock unit corresponds to one dairy cow of large stock. The application rates are as in Table 3

Table 3: Maximum Application Rates for Livestock Manure

Type of Holding	Livestock Units	Corresponding to kg N/ha/yr
Cattle	2.3	265-300
Pig	1.7	136-180
Poultry	2.0	160-190
Mixed Cattle/Pig	2.0	230

These differences are justified on the basis of the crops typically grown within each particular type of farm. From 19 December 1999 one livestock unit is defined as 100 kg of nitrogen, and the maximum limit is set to 2.1 LU/hectare per year and from 19 December 2003 the limit is further reduced to 1.7 LU/hectare per year. Special rules apply to holdings with more than 50% of the area available for manure application cropped with beet and grass.

Leasing agreements can be used to dispose of manure off the farm holding.

4.3.3 Additional Measures or Reinforced Actions

Denmark has committed itself to attaining a reduction of 50% for nitrate leaching losses by 2000. Provisions exist for further measures to be taken depending on the progress made towards attaining the 50% target. The regional authorities have been asked to designate areas of particular value for drinking water abstraction from groundwaters from 1997.

4.3.4 Results of the Monitoring Programmes under Article 5(6)

There is a comprehensive system of monitoring and of reporting. A summary of the information is provided below for each type of water.

4.3.4.1 Streams and Brooks

From measurements of 260 streams and 58 brooks the nitrogen concentrations were between 1.5 and 10.2 mg/l of nitrogen (equivalent to between 6 and 45 mg/l of nitrate). No significant changes in these were detected in the period 1989-94. Fauna class II and II-III were found in 74% of all assessments in 1994, and 10% of all assessments had class III or more.

4.3.4.2 Groundwater

The nitrate content of groundwaters varies greatly according to location and depth. Within classes A and B of groundwater about 25% of the analyses exceed 50 mg/l. The problem is greatest in the sandy aquifers, but still pronounced in the limestone aquifers. Although significant advances have been made in reducing the nitrate concentrations of water supplied for human consumption, so much so that 71% of these waters now have nitrate concentrations of less than 5 mg/l, this is mainly due to the relocation of water

abstraction points to less polluted aquifers, rather than because of any improvement in groundwater quality.

4.3.4.3 Lakes

37 lakes are monitored, being considered to be representative. In these there has been a significant decrease in the annual average phosphorus concentration of lake water from 0.206 to 0.154 mg P/litre. There have been no changes in the nitrogen inflow to these lakes, or the nitrogen concentrations of the lakes themselves. However, the eutrophic state has been judged to have improved.

4.3.4.4 Marine Waters

The monitoring programme is designed to detect changes in the following parameters:

- zoo- and plant occurrence in various subsections of the marine waters:
- biological and physical-chemical gradients from land through coastal waters to marine waters;
- biological and physical-chemical gradients along the coast of Jutland and:
- biological and physical-chemical gradients through the inner waters.

No major changes in the winter and summer average nitrogen concentrations have occurred in the period since the start of the monitoring programme. However, there has been a significant decrease in phosphorus concentrations in most fjords and coastal waters, mainly because of reduced point source emissions.

4.3.4.5 Land Monitoring

Six catchment areas dominated by agricultural land are the subject of detailed monitoring of agricultural emissions and practices. In addition to nitrogen, many additional macro- and micro concentrations in various compartments of the hydrological cycle are monitored, for example the rooting zone of agricultural land, in drainage water, various depths of groundwater and in surface and stream water. In addition the agricultural practices concerned with livestock manure and chemical fertilisers are also covered.

The studies have shown that the leaching losses for the catchments as a whole were reduced by 14% during the period 1989/90 to 1994/5. This is considered to be the result of improved farming practices, such as the more timely application of animal manures.

4.3.5 Assumptions of when the objectives of the Directive will be met

It is envisaged that when the 50% reduction target is met that the aims of the Directive with respect to ground and surface freshwaters will be met. For marine eutrophication the situation is less clear, but estimates suggest that this level of reduction will protect them against eutrophication. The target for achieving this goal is the year 2000. Existing measures have produced a reduction but it is uncertain whether these measures will have to be further tightened in the future. This will be ascertained after a review in 1998. In any case the Danish Parliament remains committed to achieving this target and has urged further measures on the Government.

5. FINLAND

The report was submitted to the Commission on 19 September 1996.

5.1 Identification of Waters and Designation of Vulnerable Zones

In order to assess the waters in accordance with the eutrophication criterion a system has been drawn up by the Finnish Environmental Institute which has been used to propose areas for designation to the Ministry of the Environment. These criteria are as follows (not all are appropriate for each water):

- chlorophyll-a averages more than 2.5 µg/l between May and September or passes a maximum concentration of 8 µg/l in three samples during the growing period:
- the area of the lake is greater than 1 km^2;
- the median of the nitrogen/phosphorus ratio is less than 5 during the period from May to September in at least three N and P samples taken at the same time:
- agriculture is the most significant source of nitrogen inputs:
- the nutrient ratio balance of nitrogen and phosphorus in the sea area is greater than 1:

Zones have yet to be designated officially, but it is expected that 10-15% of the agricultural area will be designated. For the purposes of the Directive groundwater vulnerable to nitrates will be defined as those areas where the nitrate content is over 15 mg/l, and where the pollution is caused by discharges from agricultural sources, such as fertilisers and livestock farming. It is likely that this will mean that four areas are designated as they have a nitrate content of over 25 mg/l, and seven with a nitrate content of over 15 mg/l. In addition the Gulf of Finland, the Saaristomeri and the Selkämeri have been identified as nitrate vulnerable marine areas.

5.2 Codes of Good Agricultural Practice

One Code of Good Agricultural Practice has been produced and distributed to all farmers in the country in 1994. There is a comprehensive agri-environment training and information scheme and the knowledge of the measures contained in the Code is considered to be good.

5.3 Action Programmes

No action programme has been submitted.

6. FRANCE

The report was submitted to the Commission on 23 December 1996.

6.1 Identification of Waters and Designation of Vulnerable Zones

The identification of waters was based on Decree 93-1038 of 27 August 1993. The exercise was co-ordinated on a river-basin level and involved the establishment of working groups in each 'département' and a high-level of consultation. Thus far 90 out of 96 départements have completed the identification exercise. In 69 of these départements vulnerable zones have been designated covering roughly 12 million hectares constituting about half of the French utilised agricultural area. These zones can be seen in Figure 2. The six départements that have yet to complete the identification and designation exercise are where particular problems are experienced due to their 'périurbain' nature.

The report contains no indication of which of the criteria were used to designate each vulnerable zone.

6.2 Codes of Good Agricultural Practice

The Code of Good Agricultural Practice was completed on 22 November 1993 and has been disseminated by the National Government, the Steering Committee for the Reduction of Water Pollution by Nitrates, Phosphates and Plant Protection Products (CORPEN), the Chambers of Agriculture and professional organisations.

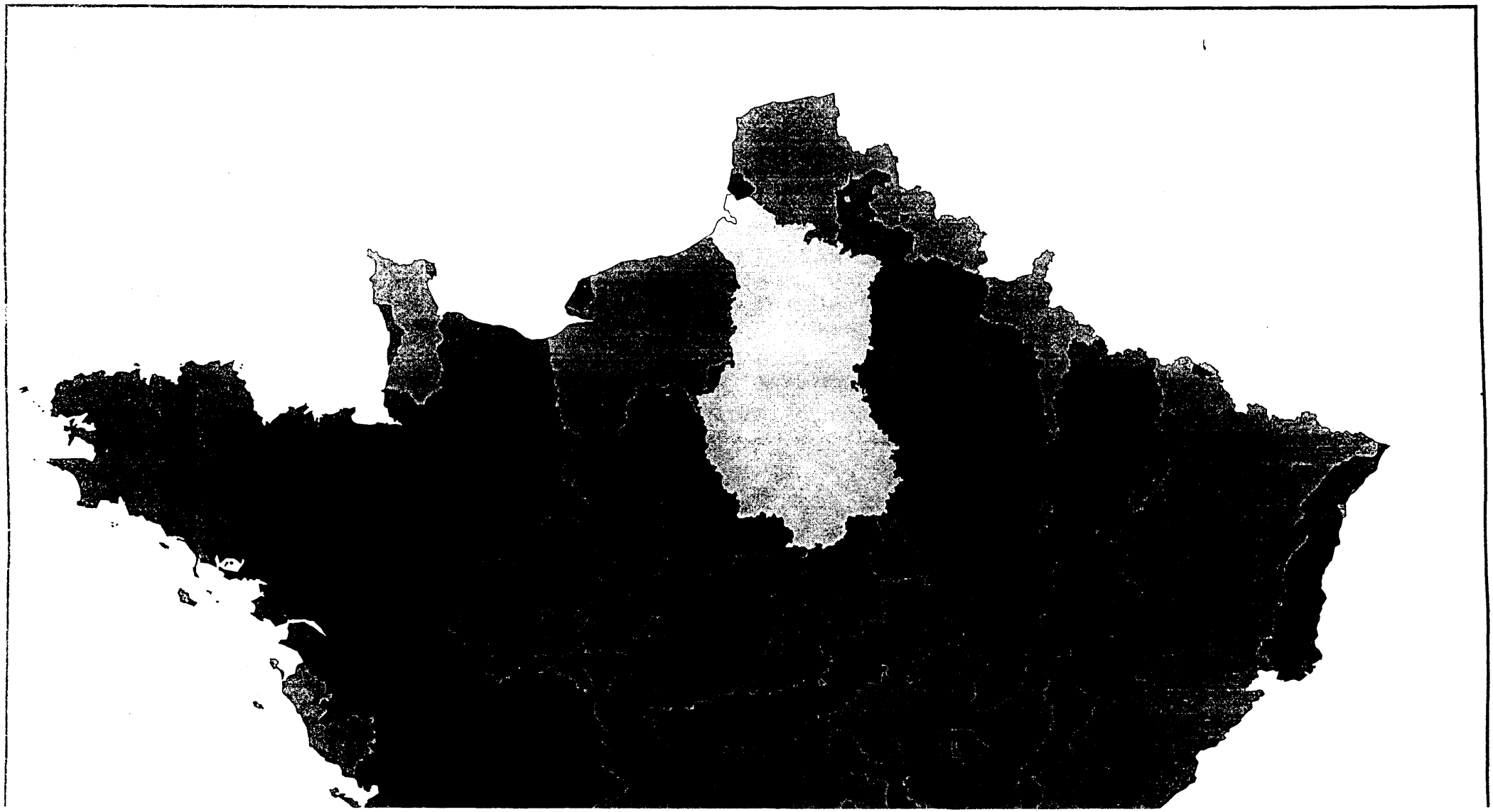
The promotion of the Code is being carried out through meetings, colloquiums and conferences at both the national and regional level. Training courses have been organised for the agricultural advisors. Research is also being undertaken both in the field, on experimental farms and on a theoretical level. Further actions are planned once the action programmes are in place.

6.3 Action Programmes

According to the Ministerial Circular of 24 January 1995 each département that contains a vulnerable zone has to elaborate an action programme based on the requirements of Decree 96-163 of 4 March 1996. In the action programmes the measures in the Code of Good Agricultural Practice are to be included taking into account local conditions and prioritising the risks of certain agricultural practices.

The quantities of 210 and 170 kg N/ha/yr will be adhered to in France with each level being reached in the final year of the first and second action programme respectively. There will not be a derogation from these quantities.

Figure 2: Nitrate Vulnerable Zones in France
(As of 28.2.97 this exercise has not been completed)



Vulnerable

Non-vulnerable

Not finished

0 100 km 200 km

In the Decree of 4 March 1996 each département was instructed to take additional or reinforced actions pursuant to Article 5(5), if such actions are necessary and detail them in the individual action programmes. On a national level measures have been taken to prohibit the construction of new installations and increases in grazing density in areas where there is a structural exceedance of manure due to livestock farming. These areas are predominantly in Brittany, but also in parts of Loire Region, and Rhône Alpes. These will form an integral part of the action programmes.

In order to monitor the effects of the action programmes a variety of indicators will be used. These will include both monitoring of the hydrological situation and of the changes in agricultural practice, and will take place at a variety of levels. During the action programmes the monitoring of the agricultural practices will be the responsibility of the Chambers of Agriculture with the assistance of the relevant governmental bodies and the Water Agencies.

No date by which the waters in vulnerable zones will respond to the measures in the action programmes is given. However the likely variability is highlighted with the comment that at least in the short term the levels of nitrate in waters is a product of past agricultural practices and will be influenced significantly by the winter rainfall totals and the consequent aquifer recharge. The most serious difficulty in achieving the objectives of the Directive will be to ensure that livestock farms, the agri-food industry and waste water treatment plants have the necessary storage capacity.

7. GERMANY

The report was submitted to the Commission on 6 November 1996.

7.1 Identification of Waters and Designation of Vulnerable Zones

The whole territory has been designated according to Article 3(5) of the Directive.

7.2 Codes of Good Agricultural Practice

This requirement is covered by the action programme. In addition the Länder have introduced more comprehensive codes which farmers are to implement on a voluntary basis. Responsibility for training and information lies with the Länder where advisory services have been established by agricultural administrations. These provide advice, organise lectures and visits and publish brochures and factsheets. In addition trade journals also play a role.

7.3 Action Programmes

7.3.1 The Measures Required by Article 5(4) (a) and (b)

These measures are established in the Fertiliser Order (Düngeverordnung) of 26 January 1996.

7.3.1.1 Annex III, No 1.1

The periods when the land application of fertilisers is prohibited are defined in Section 2 (1) of the Fertiliser Order. This provides that fertilisers may not be applied to land when not required by the plants. Given the considerable regional differences in climate and soil conditions in Germany, it is not possible to prescribe set periods when no fertilisers may be applied. However, Section 3(4) of the Fertiliser Order prohibits the land application between 15 November and 15 January of farm manure where the available nutrients are released gradually and depending on the temperature. The Länder may allow exemptions or ban fertiliser application for longer periods depending on particular local conditions.

7.3.1.2 Annex II, A.5 and Annex III, No 1.2

The Länder are responsible for introducing regulations on storage vessels for farm manure. These have not been completed by all the Länder.

7.3.1.3 Annex III, No 1.3

The rules of good agricultural practice in Section 4(1) of the Fertiliser Order provide that, in addition to the nutrient requirements of the crops, account must be taken of the nutrients present in the soil and available during crop growth and of the nutrients supplied through management measures and the application of waste materials for the purposes of

calculating fertiliser requirement. This ensures a balance between nitrogen requirements and nitrogen supply to crops.

7.3.1.4 Annex III, No 2 and 4

Section 3(7) of the Fertiliser Order prescribes the maximum limit of 210 kg N per hectare and year laid down in Annex III for the first action programme. The reference base is the farm average. The provisions of Section 2(1) of the Fertiliser Order prevent the application of excessive amounts of farm manure on individual plots.

7.3.1.5 Annex II, A.2 and A.4

Section 2(3) of the Fertiliser Order specifies that direct inputs or run-off of fertilisers to surface waters must be avoided during land application. Account must be taken of the nature of the land, i.e. no applications to wide strips on steeply sloping ground. The competent regional authorities may make special provision in individual cases, e.g. by specifying minimum distances from surface waters.

7.3.1.6 Annex II, A.3

The land application of fertiliser to saturated, flooded, frozen or snow-covered ground is prohibited pursuant to Section 2(4) of the Fertiliser Order.

7.3.1.7 Annex II, A.6

The procedures for land application are laid down mainly in Section 2 and 3 of the Fertiliser Order. They meet the requirements of Annex II.A.6.

7.3.1.8 Annex II, B.8 and B.9

The Fertiliser Order also makes mandatory the optional requirements in B.8 and B.9 of Annex II of the Nitrates Directive.

7.3.1.9 Annex II, B.8

Section 2(1) of the Fertiliser Order provides that, if autumn crops are not sown, catch crops should ideally be cultivated to utilise the residual nitrogen in the soil.

7.3.1.10 Annex II, B.9

Section 5 of the Fertiliser Order provides for the keeping of records on nutrient supply and its removal with the harvested product, so permitting the establishment of a nutrient balance and hence monitoring of fertiliser application.

7.3.2 Information pursuant to Annex III(4)

This is covered above.

7.3.3 Additional Measures or Reinforced Actions

There are no plans for measures in addition to those already taken. This will be reevaluted following the end of the first action programme.

7.3.4 Results of Monitoring Programmes pursuant to Article 5(6)

These will be available following the end of the first action programme in 1999. However information is provided on the water quality monitoring. This is presented below:

7.3.4.1 Groundwaters

186 measuring points to monitor groundwater were selected at which samples were taken between two and four times every year. These points should not be considered as representative of nitrate pollution as they have been selected to establish the extent of nitrate pollution in waters from agricultural sources.

7.3.4.2 Surface Waters

Nitrate concentrations in surface waters are measured on the major German rivers whose catchment areas cover most of the country (Danube, Elbe, Ems, Mosel, Oder, Rhine, Ruhr, Weser). This approach is sensible because the action programmes to reduce water pollution by nitrogen compounds pursuant to Article 5 are implemented throughout the country, therefore the overall impact of these measures can be observed at a few measuring points. 15 measuring points are used. The average nitrate concentration is currently less than 25 mg/l at all the measuring points listed. There has been no reduction in nitrate pollution since the beginning of the 1980s.

In future the causes of nitrate pollution of surface water for the purposes of reporting will be determined using a model with the aim of distinguishing between nitrate inputs from diffuse sources (agriculture) and points sources (municipal discharges). The greatest potential for reducing inputs is from agriculture.

7.3.4.3 Coastal Waters

There are five measuring points for coastal waters, in the North Sea and in the Baltic. For the North Sea, marine waters are not taken into account. For the Baltic, both the inner and outer coastal waters are represented. There is unlikely to be any reduction in nitrate loading of coastal waters in the short term, due to the slow groundwater flow to surface water.

7.3.5 Assumptions of when the objectives of the Directive will be met

Due to geological factors it is likely that there will be a substantial time lag before the effects of the measures taken are known.

8. GREECE

The report was submitted to the Commission on 19 November 1996. Further information was submitted on 29 January 1997.

8.1 Identification of Waters and Designation of Vulnerable

For surface waters a study was conducted between 1989 and 1992 which analysed the nitrate content as well as NH_4-N and P of waters in 18 rivers and 21 lakes. No problems were found in any of the lakes. The results for rivers showed that only the Rema Soulou exceeded the 50 mg/l level for nitrates but that this was due to industrial waste. The River Evros exceeded 25 mg/l, but not 50 mg/l.

With respect to eutrophication all the Gulfs studied (Saronikos, Thermaikos, Pagastikos, Amvrakikos and Southern Evvoikos) revealed eutrophication problems.

For groundwaters a study was completed in October 1996 which indicated that the statistical sample of measurements was poor and that there are seasonal fluctuations in the concentration of nitrates in groundwater. These concentrations, it is stated, are insufficient to justify measures being taken to change agricultural practices.

The Ministry of the Environment reports that they have identified four 'potential' vulnerable zones where the adoption of measures will be decided on in consultation with the other departments responsible provided that it is confirmed that these zones are actually vulnerable. These are shown in Figure 3.

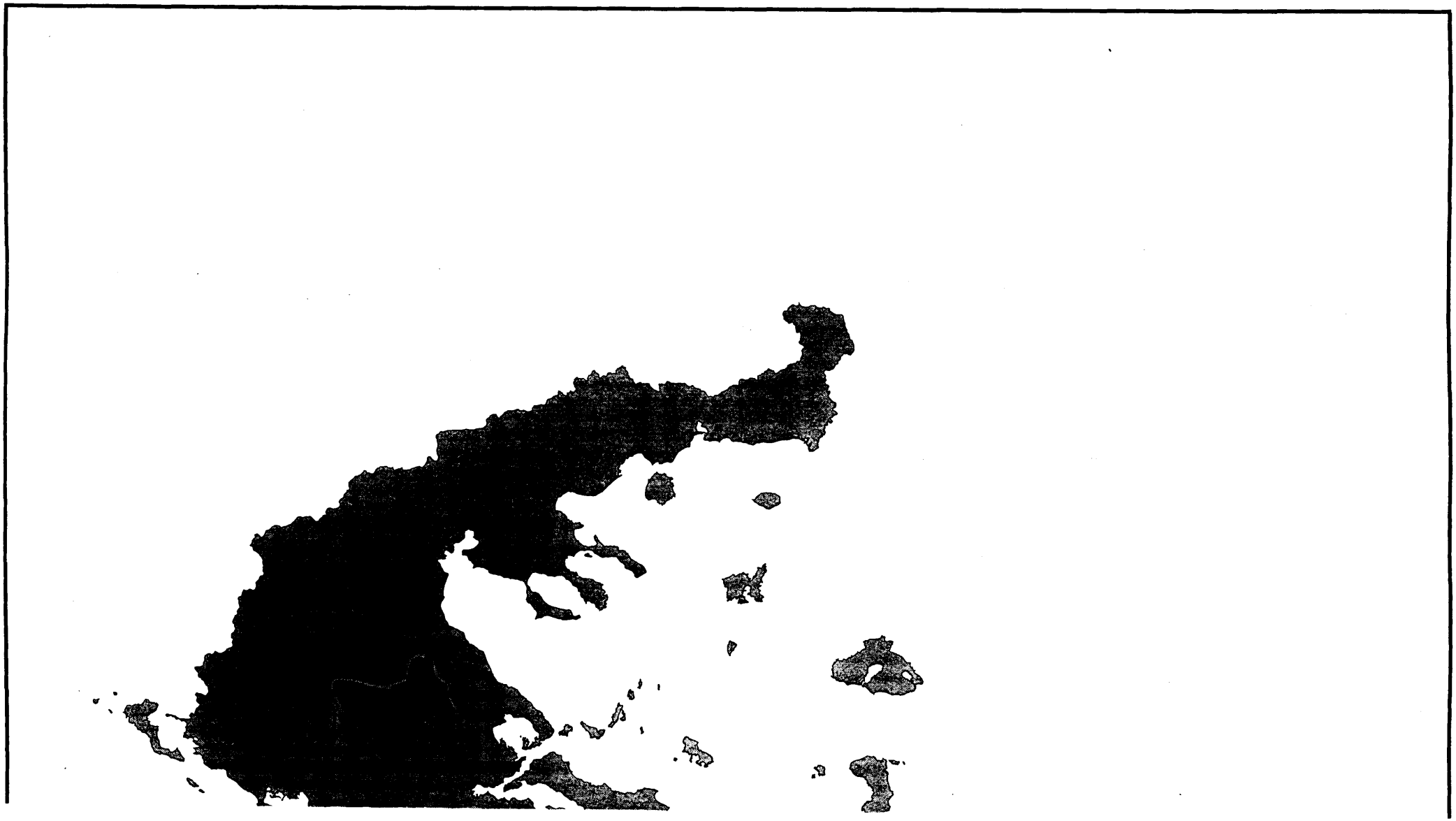
8.2 Codes of Good Agricultural Practice

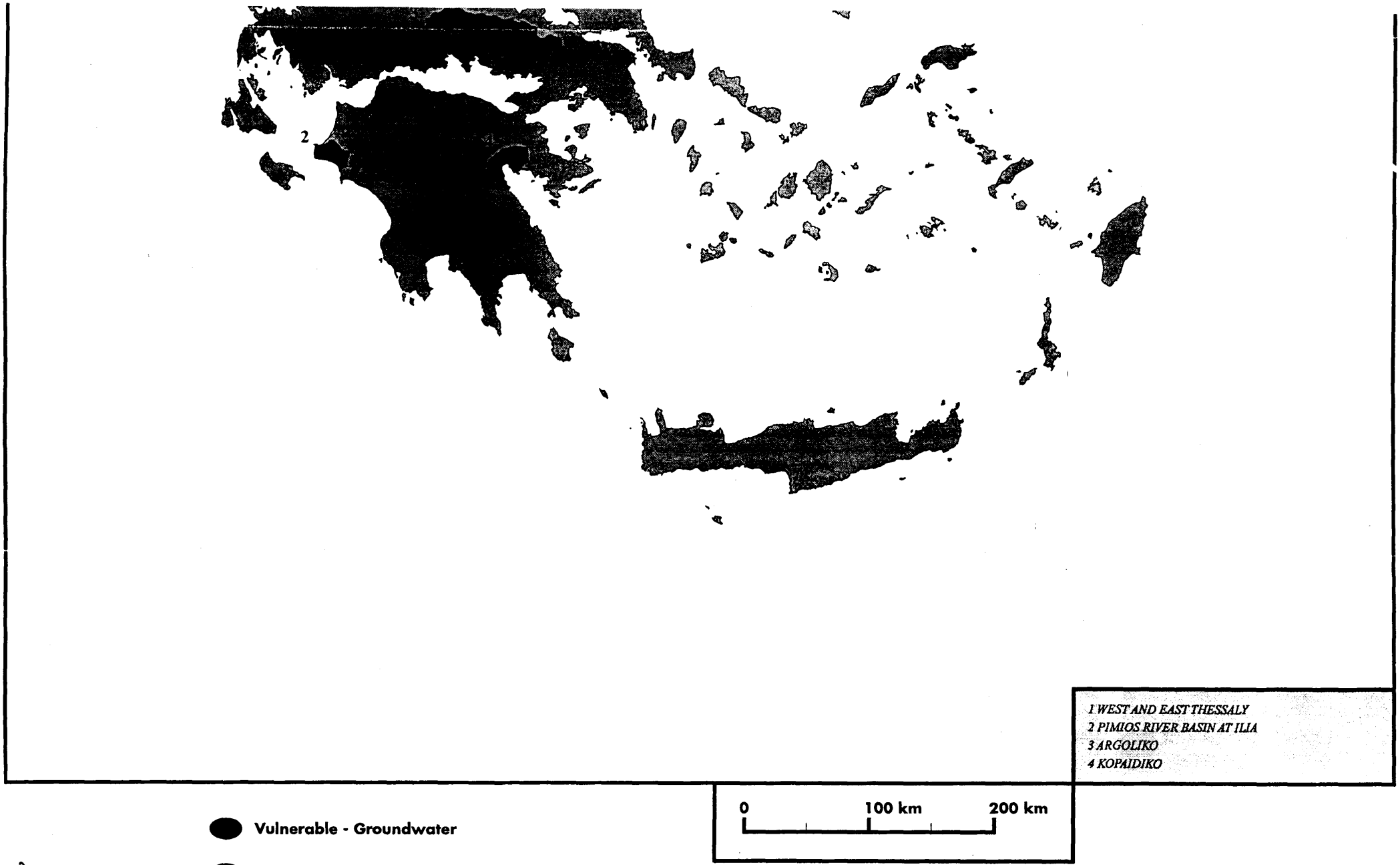
The Code of Good Agricultural Practice was provided in 1994, however no summary of it has been provided in the report.

8.3 Action Programmes

No action programmes have been submitted.

Figure 3: Nitrate Vulnerable Zones in Greece
(As of 28.2.97 this exercise has not been completed)




2
1 WEST AND EAST THESSALY
2 PIMIOS RIVER BASIN AT ILIA
3 ARGOLIKO
4 KOPAIDIKO
0
100 km
200 km
Vulnerable - Groundwater
Non-vulnerable

9. IRELAND

The report was submitted to the Commission on 17 July 1995, five months before the end of the reporting period, and eleven months before the official date for submissions.

9.1 Identification of Waters and Designation of Vulnerable Zones

In October 1992 Local Authorities were instructed to monitor waters for the purposes of the Directive. Specific guidance was given on particular aspects of the monitoring. This included an instruction to cease monitoring for the purposes of the Nitrates Directive if evidence came to light in the course of monitoring and investigation that the source of the nitrate was non-agricultural or from an agricultural point source.

Following analysis of the results of this monitoring by local authorities, and other information, such as published reports and geographic information systems for farming intensity, and following consultation with the Environmental Protection Agency, the Department of the Environment concluded that no waters coming within the terms of Article 3.1/Annex I had been identified, and, in the circumstances, the designation of vulnerable zones was not required at the time. Nevertheless there remain areas of concern. For certain rivers such as Aghalona, Munster Blackwater, Lerr, Moyle, Owenduff and Stoneyford Stream concentrations of nitrate are above 40 mg/l. These rivers have been targeted for careful examination at the next review. For a small number of groundwater sources concentrations of nitrate are above 40 mg/l. However these are considered to be due to what are described as "bad housekeeping practices" such as incorrect sitings of silage or slurry pits and seepage from septic tanks. Although there are eutrophication problems in some Irish lakes these are not considered to be due to nitrogen compounds, rather to increased supply of phosphorus.

For estuarine, coastal and marine waters the assessment relied on the Environmental Research Unit's review covering the period 1987 to 1990. This concluded that for the sixteen tidal waters assessed serious pollution is of very limited occurrence and any problems identified are not caused by sources coming under the remit of the Nitrates Directive. The Irish Authorities acknowledge that there is a need for a more detailed estuarine and coastal waters monitoring programme.

9.2 Codes of Good Agricultural Practice

At the time of submission of the report the Irish Authorities had not submitted a Code. This was received by the Commission on 20 August 1996.

9.3 Action Programmes

As no zones have been designated, there is no obligation under the Directive to draw up action programmes.

10. LUXEMBOURG

The report was submitted to the Commission on 4 February 1997.

10.1 Identification of Waters and Designation of Vulnerable Zones

The whole territory is designated according to Article 3(5).

10.2 Codes of Good Agricultural Practice and Action Programmes

The Code of Good Agricultural Practice and Action Programme follow the form laid down in the Directive. They are promoted by the Agricultural Advisory Service (*Chambres d'Agriculture)* which put in place targets for manure produced on the farm and imported into the farm and providing information on the quantities of fertilisers to use following analysis of the soil nutrients.

The 170 kg N/ha/yr limit was supposed to have been reached by 31 December 1996, six years before the date required by the Directive. In addition, still stricter measures are required in drinking water protection zones including the prohibition of fertiliser in the immediate vicinity and the limiting of organic fertilisers to 130 kg N/ha/yr in the wider area.

Monitoring conducted according to the Directive is carried out for surface waters and groundwaters. Surface waters abstractions for drinking water are monitored for nitrate at one station where the average level in 1995 was 16.7 mg/l. The 50 mg/l was never exceeded. Eutrophication is measured at two points, one on the River Syre and one on the River Sûre. The Syre had an average level of 20.4 mg/l of nitrates and 0.61 mg/l of phosphorus. For the Sûre the figures were 20.6 mg/l and 0.38 mg/l, for chlorophyll-a the level was less than 17µg/l.

For groundwaters the monitoring was conducted at four points from where the waters were abstracted for drinking, but from where it was considered that adequate coverage was given of the nation's aquifers. In 1995 the averages from these four points were 36.8 for Sources du Riedergronn, 12.8 for the Sources de Siwebueren, 44.8 for the Sources de Schrassig and 2.4 for the Source de la Commune de Mertzig.

11. THE NETHERLANDS

The report was submitted to the Commission on 9 July 1996.

11.1 Identification of Waters and Designations of Vulnerable Zones

Following the analysis of the available information from the monitoring network on the nitrate concentrations of groundwater, fresh surface waters and the eutrophication of marine and fresh surface waters the whole territory was designated according to Article 3(5) of the Directive. The fact that the coastal waters had been identified as eutrophication problem areas and the whole of the territory drained into these areas was significant in the adoption of the Article 3(5) approach, as were the eutrophication of fresh surface waters and groundwater pollution.

11.2 Codes of Good Agricultural Practice

A Code of Good Agricultural Practice has been drawn up for the whole of the territory. This has been put into practice through legal measures and through advice, information and education. The Code been supported by an ongoing programme of training and information called the COMMA project (Communication on Manure and Ammonia Policy) which seeks to keep farmers up to date with developments in existing and planned legislation. It works through publications and information meetings. In addition, DLV - the agricultural information service assists farms with establishing mineral balances and improving feeding and fertilisation in addition to its general advice giving capacity. Other organisations also provide advice to farmers. In 1994 the advice on the use of animal manures was improved with the aim of ensuring that less manure was used and that which was, was used in a more accurate way. Nutrient management is increasingly being integrated into education at many levels.

11.3 Action Programmes

An action programme was submitted to the Commission on 22 December 1995, incorporating a derogation. Both were subsequently withdrawn by the Netherlands authorities on 12 November 1996. Another action programme has yet to be submitted to the Commission.

In the report it is stated that in order to assess the effectiveness of the action programme several information sources will be used. These include, amongst others, the national agricultural nitrogen balance, the results of surface and groundwater monitoring of nitrate concentrations and eutrophication causing factors.

12. PORTUGAL

The report was submitted to the Commission on 8 October 1996.

12.1 Identification of Waters and Designation of Vulnerable Zones

Considerable difficulties have been experienced in the identification of waters due to the lack of monitoring networks in some places and insufficient data. The monitoring of surface freshwaters and groundwaters has been limited to those where water is abstracted for drinking water. On the basis of this information five zones have designated according to the groundwater criterion[3]. No designations of zones according to the surface freshwater criterion have been made due to the monitoring showing that the waters comply with 50 mg/l. No freshwaters have been considered for designation according to the eutrophication criterion due to phosphorus usually being the limiting factor of these waters. In addition, no designations of estuarial, coastal or marine waters have been made as there is no data on which they could be based. The designations are shown in Figure 4. The report also commented that the Directive did not indicate a level of nitrate at which waters could be considered eutrophic.

12.2 Codes of Good Agricultural Practice

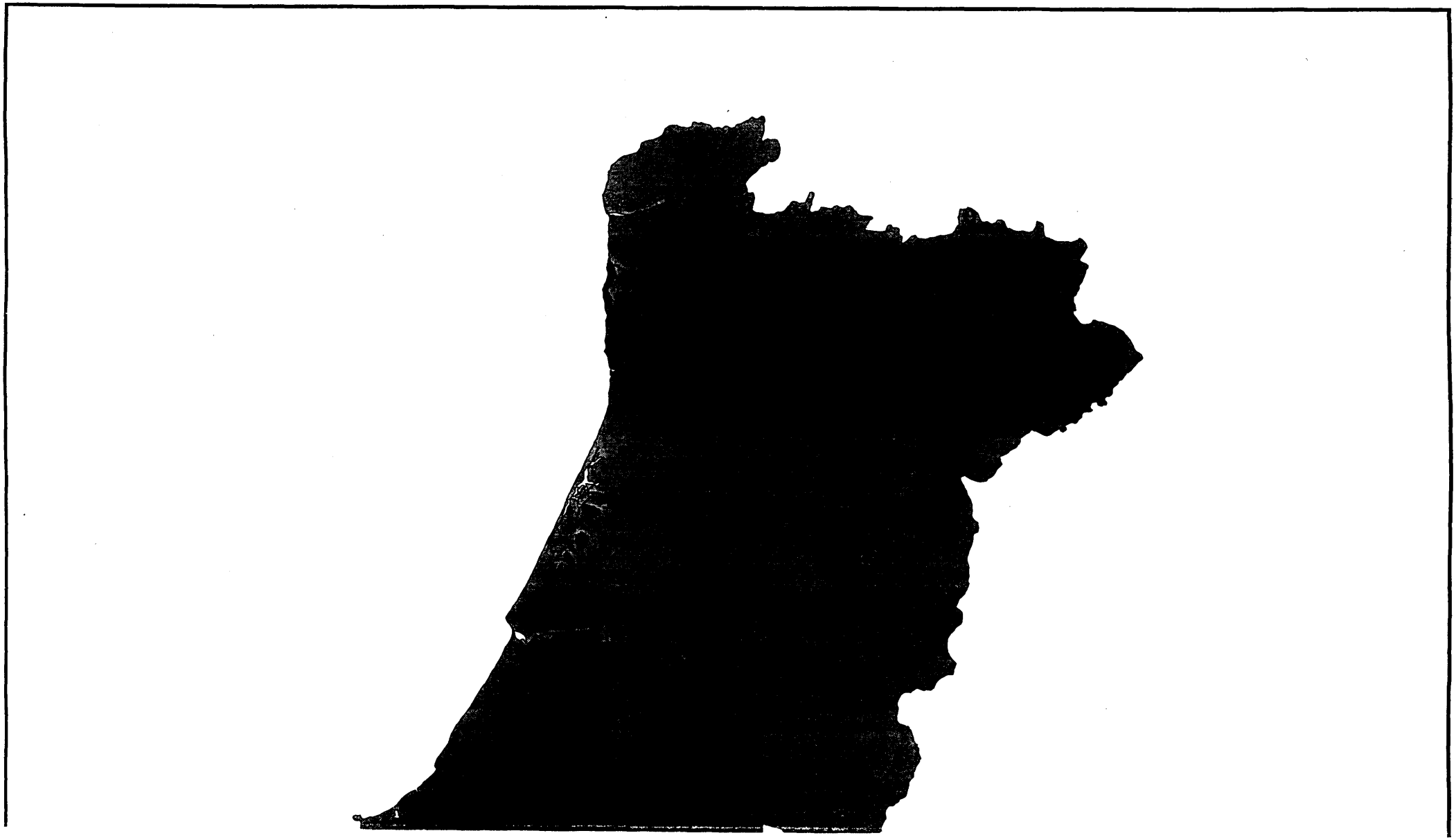
A Code of Good Agricultural Practice has yet to be completed. However, work is underway and a draft of the first two chapters was included in the report. There is an ongoing programme of training and information for farmers covering all aspects of nitrate pollution from agricultural sources.

12.3 Action Programmes

No action programme has been submitted.

[3] These have yet to be transposed into national law.

Figure 4: Nitrate Vulnerable Zones in Portugal
(As of 28.2.97 this exercise has not been completed)



1 *UNCONFINED AQUIFER BETWEEN ESPOSENDE AND VILA DO CONDE*
2 *AVEIRO QUATERNARY AQUIFER*
3 *VAGOS QUATERNARY AQUIFER*
4 *MIRA QUATERNARY AQUIFER*
5 *CAMPINA DE FARO MIOCENE, JURASSIC AQUIFER*

0 100 km

Vulnerable - Groundwater

Not finished

13. SWEDEN

The report was submitted to the Commission on 4 September 1996.

13.1 Identification of Waters and Designation of Vulnerable Zones

Monitoring for eutrophication is carried out at a number of different levels: national, regional and local. Marine waters are sampled at outstations and at the coast. In addition, nitrogen transport to coastal waters from the larger estuaries is measured and calculated. The condition of freshwater is monitored, *inter alia*, in reference lakes and water courses selected at national level. The effects of agriculture activities are measured and calculated in small drainage areas, so-called representative areas, and at observation sites. There are different measurement programmes for surface water and groundwater supplies and for private wells.

For fresh surface waters it has been shown that 90% of the sampling points have a nitrate concentration below 9 mg/l and all sampling points are below 50 mg/l.

In 1995, the analysis of lakes found that 90% had a nitrate content of below 2 mg/l and all had concentrations below 50 mg/l.

For groundwaters no site has a concentration of nitrate above 50 mg/l, and most are below 5 mg/l. For dug and drilled wells 44 mg/l is exceeded in 5% of dug wells and 1% of drilled wells.

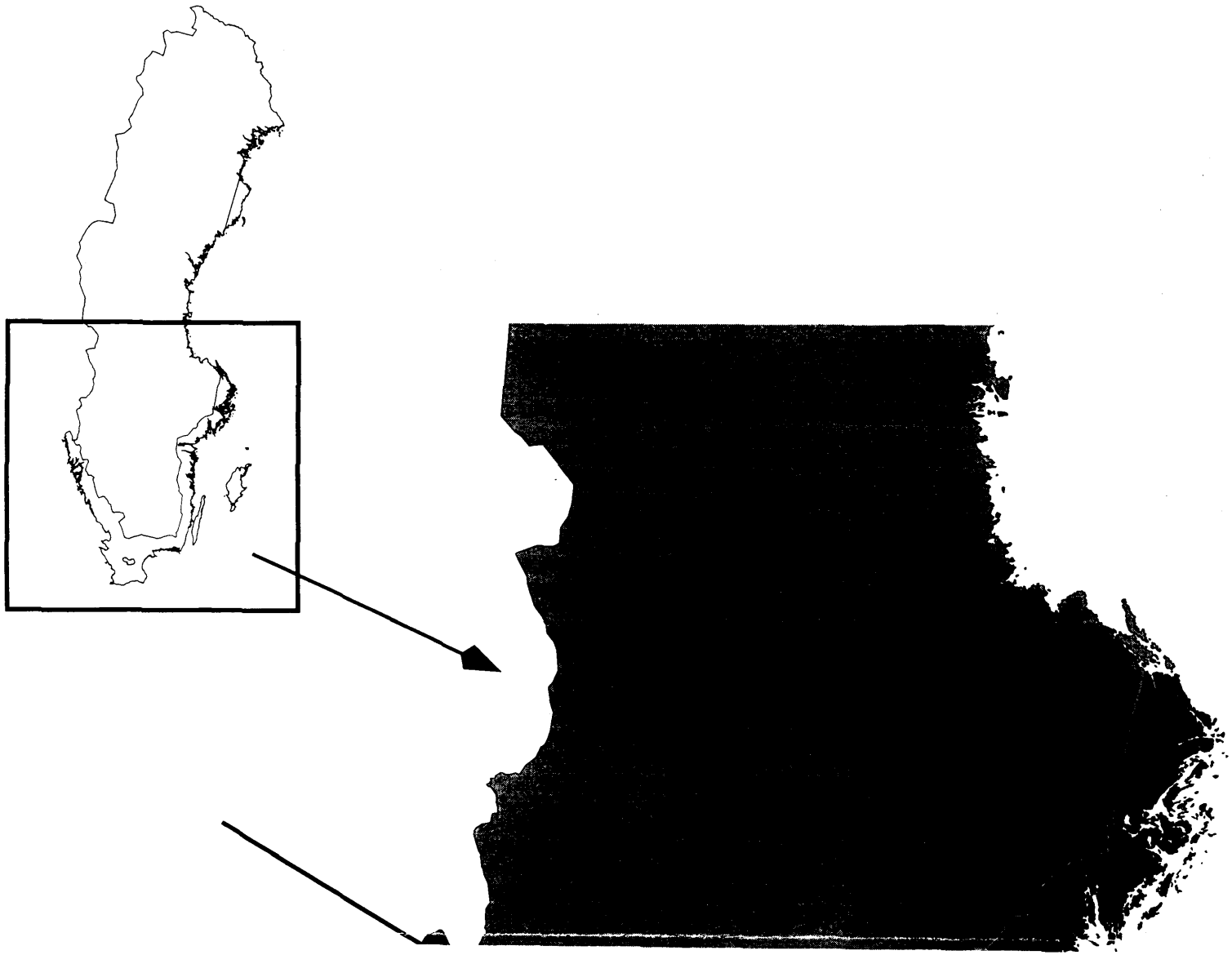
The monitoring of the nutrient salt run-off from some agricultural areas has also been monitored and found that at some sites nitrate concentrations were found to exceed 50 mg/l.

For coastal waters the measurements of the nutrient salt and oxygen concentrations show that they are often eutrophic. Where this is the case they have been designated according to Article 3(2) of the Directive. In addition, the lake Ringsjön, has been found to be eutrophic, and as a result, designated. The vulnerable zones are designated in Figure 5.

13.2 Codes of Good Agricultural Practice

All requirements pursuant to Annex II.A are incorporated in existing general advice or statutes. The information and advice has been provided to farmers on environmental improvement measures in agriculture and this has been supported by a programme of research and development projects. Advice is given on subjects which include manure application techniques, nutrient balances, storage capacity assessments and fertilisation recommendations. Financing is also available at various levels of government to provide advice, study tours, demonstrations, field trips and information free of charge to farmers. There are also grants for the training of advisers.

Figure 5: Nitrate Vulnerable Zones in Sweden



1 SKAGERACK
2 KATTEGAT
3 LAHOLMSBUKTEN
4 RINGSJÖN
5 ÖSTERSJÖN

0 100 200 km

Vulnerable - eutrophication

Non-Vulnerable

13.3 Action Programmes

13.3.1 Article 5(4)(a) and (b)

Since a Government Report declared Swedish coastal and marine waters to be at serious risk in 1987 there has been a concerted effort to reduce nutrient concentrations in these areas. For the coastal zones a target was set of obtaining a 50% reduction in nutrient salt loads on 1985 levels by the year 2000. This date was subsequently brought forward to 1995. One of the sectors targeted was agriculture where it was interpreted as requiring a 50% reduction in nitrogen leaching from agriculture by 1995 based on 1985 levels. Sweden has also set targets to reduce the use of chemical fertilisers containing nitrogen by 20% by the year 2000 taking 1986 as the base year and to reduce ammonia emissions by 25% in Southern Sweden between 1990 and 1995.

To achieve this level of reduction it was considered necessary, amongst other factors to:

- ensure nutrient supply matched plants' needs;
- require a higher proportion of vegetation cover on intensively farmed arable land near the coast;
- reduce farming intensity (including limiting livestock quantities on holdings);
- restrict the spreading of livestock manure during autumn and winter;
- increase storage capacity requirements for livestock manure. (eight months is stipulated for cattle, horse, sheep or goat manure in the designated vulnerable zone. Ten months is required for other livestock including pigs and poultry);

These requirements were translated into laws from 1988 in the form of an action programme to reduce nutrient run-off from agriculture (and by subsequent extensions to include ammonia losses from agriculture).

In addition to statutory requirements, comprehensive advisory activities and research and development programmes have been carried out. Economic instruments have also been used to reduce the environmental impact of agriculture. These have included grants for catch-crop cultivation and the extension of manure storage facilities and environmental taxes on nitrogen. Environmental support is also available for cultivation of catch crops, creation of wetlands, establishment of protection zones alongside watercourses and extensive grassland farming.

13.3.2 Information required by Annex III(4)

Sweden has chosen to implement the measures of Annex III(2) of the Directive by introducing rules on the maximum permitted livestock density on farms. The figures

required under Annex V.4(b) for the nutrient content of livestock manure, kg N/ha and year is provided in Table 4 below, with maximum permitted animal density. The nitrogen quantity per hectare is corrected for losses in the housing and during storage. No deduction is made for housing and storage losses during the grazing season.

Table 4: The Nutrient Content of Animal Manure and Permitted Livestock Densities

Stock type	Assumed grazing season (months)	Maximum permitted livestock density animal/ha	kg N/ha and year	
			slurry	solid manure and urine
Dairy cows 6000 kg	4	1.6	154	138
Dairy cows 8000 kg	4	1.6	160	143
Dairy cows 10000 kg	4	1.6	169	151
Heifers, bulls, steers 2-12 mths*	3	5.8	115	101
Heifers, bulls, steers 12-24 mths*	5	4.6	200	182
Suckler cows	6	2.3	138	150
Sows	-	2.2	54	45
Fattening pigs	-	10.5	84	70
Laying hens	-	100	56	49
Pullets	-	250	60	52
Broilers	-	470	117	103
Turkeys	-	140	70	61
Horses	5	3	-	106
Sheep and goats	6	15	-	142

* The category heifers, bulls, steers must be judged on the basis of the category "Heifers, bulls, steers 2-24 months". The number of heifers, bulls and steers on a holding is usually evenly distributed between the age categories 2-12 and 12-14 months.

13.3.3 Additional or Reinforced Actions

There is an ongoing review of the regulatory system in place to minimise nutrient losses. This has resulted in proposals to tighten many of the rules in what are considered to be the action programmes. In addition various working parties have been set up, one of

these concerns the drawing up of an action programme to achieve a 50% reduction in ammonia losses from agriculture compared with the 1990 level.

13.3.4 Results of Monitoring Programmes carried out under Article 5(6)

Since nutrient loss depends upon the amount and distribution of rainfall throughout the year, a method has been devised of calculating nutrient loss from standard data. This simulation model is based on results from the regular environmental monitoring programme, climate data, data on crops and fertiliser use, etc. The model provides figures for leaching form the root zone of arable land to the groundwater or drainage water in ad standard year. In addition, nitrate leaching to water is monitored. It has been calculated that between 1985 and 1994 the nitrogen losses from agricultural land due to anthropogenic activity has diminished by about 30% over the last ten years. There are, however, regional variations. The reduction in South West Sweden where there is high rainfall, the soil is often coarse and agriculture is intensive has only been of the order of 10%, whereas in Svealand the reduction has been of the order of 40%. The overall 30% drop in anthropogenic loading between 1985 and 1994 has been calculated to be 10% due to a reduction in the area of agricultural land; 50% due to an increase in grassland area and 40% due to improved nitrogen uptake as a result of improved cultivation techniques, changes in fertilisation and improved crop varieties.

13.3.5 Assumptions of when the objectives of the Directive will be met

It is predicted that the goal of a 50% reduction in the anthropogenic nitrogen load in marine waters will be achieved by 2005. However individual years may not be representative due to climatic variations. As a result it is unlikely that the full impact on the pollution of all the measures taken by agriculture will be felt.

14. UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND

The report was submitted to the Commission on 9 January 1997.

14.1 Identification of Waters and Designation of Vulnerable Zones

The monitoring to be used for the first round of designations was undertaken, for groundwaters, surface freshwaters, estuarial and coastal waters during 1992. For surface waters a total of 1,122 abstraction sites were monitored and for groundwater sources 461 sources.

On the basis of this information 9 surface water catchments were designated and 148 groundwater sources. No zones were designated according to the eutrophication criterion, although one, the Ythan Estuary, was initially considered as a candidate for designation but was not designated because there were a number of possible causes of the situation. The position will be reviewed in 1997. Overall, 69 catchments were designated, of which 6 are based on surface waters. No zones have been designated in Northern Ireland. The vulnerable zones are shown in Figure 6.

14.2 Codes of Good Agricultural Practice

Three Codes of Good Agricultural Practice have been produced to fulfil this requirement: one for England and Wales; one for Scotland and one for Northern Ireland. In England and Wales and Scotland these Codes have a status which, whilst remaining voluntary, means that should a farmer be prosecuted for causing pollution their failure to adhere to the measures in the Code may be taken into account.

The Codes are available free of charge. In addition a variety of initiatives have been pursued to promote the application of the Codes. These include press articles, presentations to farmers and other interest groups and the provision of education packs to colleges and universities. Copies of the Codes have also been provided to farmers as part of the agricultural advisory services' activities across the UK. These services have also sought to promote Good Agricultural Practice through farm visits to assess pollution and prevent serious pollution events.

14.3 Action Programmes

At the time of submission of the report the UK had yet to implement the Action Programmes. A draft statutory instrument for the action programme was appended to the report.

Figure 6: Nitrate Vulnerable Zones in the United Kingdom of Great Britain and Northern Ireland

1 *BRIDLINGTON*
2 *RIVER HULL*
3 *MILINGTON SPRINGS*
4 *SPRINGWELLS*
5 *COTTINGHAM*
6 *BRAYTON*
7 *CARLTON*
8 *POLLINGTON*
9 *HATFIELD*
10 *NORTH LINCOLNSHIRE*
11 *NORTH NOTTINGHAMSHIRE*
12 *LONCOLN*
13 *RIVER WITHAM*
14 *HUSBANDS BOSWORTH*
15 *KELSALL*
16 *SWYNNERTON*
17 *TELFORD*
18 *BEDNALL*
19 *SHIFNAL*
20 *LICHFIELD*
21 *OAKELEY*
22 *TOM HILL*
23 *HINKSFORD*
24 *KINVER*
25 *WILDMOOR*
26 *ASTLEY*
27 *HASELEY*
28 *BROMSBERROW*
29 *SNOWSHILL*
30 *STOW-ON-THE-WOLD*
31 *GARWAY*
32 *CHELTENHAM*
33 *THE SLAUGHTERS*
34 *FAIRFORD*

35 *RIVERS LEAM, CHERWELL, AND GREAT OUSE*
36 *WIGHTON*
37 *GREAT BIRCHAM*
38 *SWAFFHAM*
39 *LYNG FORGE*
40 *WROXHAM*
41 *RIVER WAVENEY*
42 *MOULTON*
43 *BURY ST EDMUNDS*
44 *FULBOURN*
45 *LINTON*
46 *FOWLMERE*
47 *SLIP END*
48 *WESTON*
49 *GREAT OFFLEY*
50 *KINGS WALDEN*
51 *RIVERS BLACKWATER AND CHELMER*
52 *OLD CHALFORD*
53 *LEWKNOR*
54 *OGBOURNE ST GEORGE*
55 *COMPTON*
56 *TWYFORD*
57 *DORNEY*
58 *BOXLEY*
59 *THURNHAM*
60 *MINSTER*
61 *EGFORD*
62 *CASTLE CARY*
63 *MILBOURNE WICK*
64 *BEAMINSTER*
65 *OTTER VALLEY*
66 *DUCKALLER*
67 *DYSERTH*
68 *TRELECH*
69 *BALMALCOLM*

0 100 km 200 km

Vulnerable - Groundwater

Vulnerable - Surface Water

Non-vulnerable

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