

Eumida sanguinea

OERSTED / 1843



E. STIKVOORT

Morphology

A species with a stout, dorsally convex body, up to 30 mm in length and made up of 60-140 segments. The uniform segments have distinct parapodia bearing a dorsal lamella. The head has two fairly large black eyes and five antennae. The colour is variable, ranging from greyish white with brown spots through yellowish green to reddish brown with white transverse bands (Hartmann-Schröder, 1971; Hayward & Ryland, 1990).

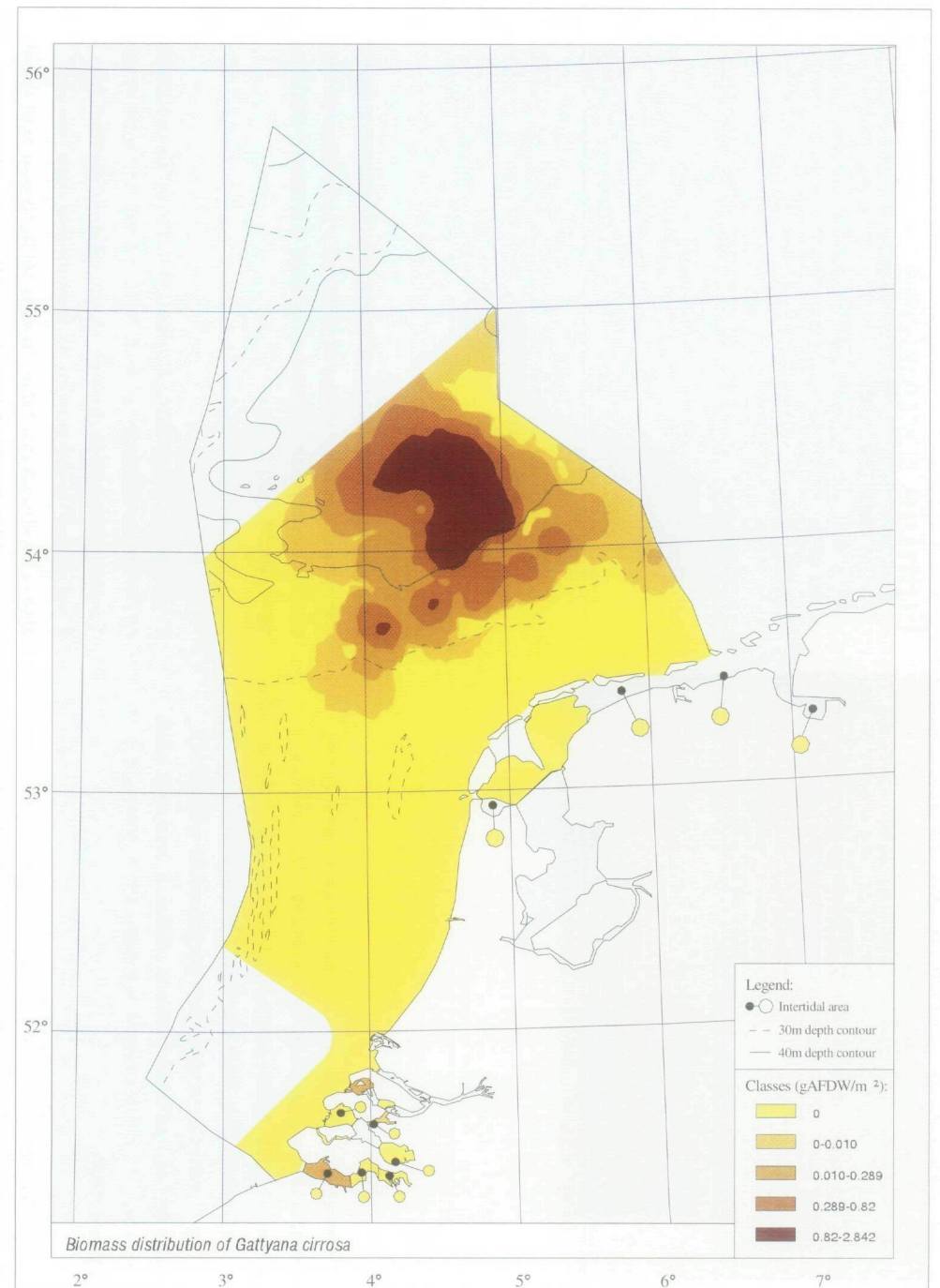
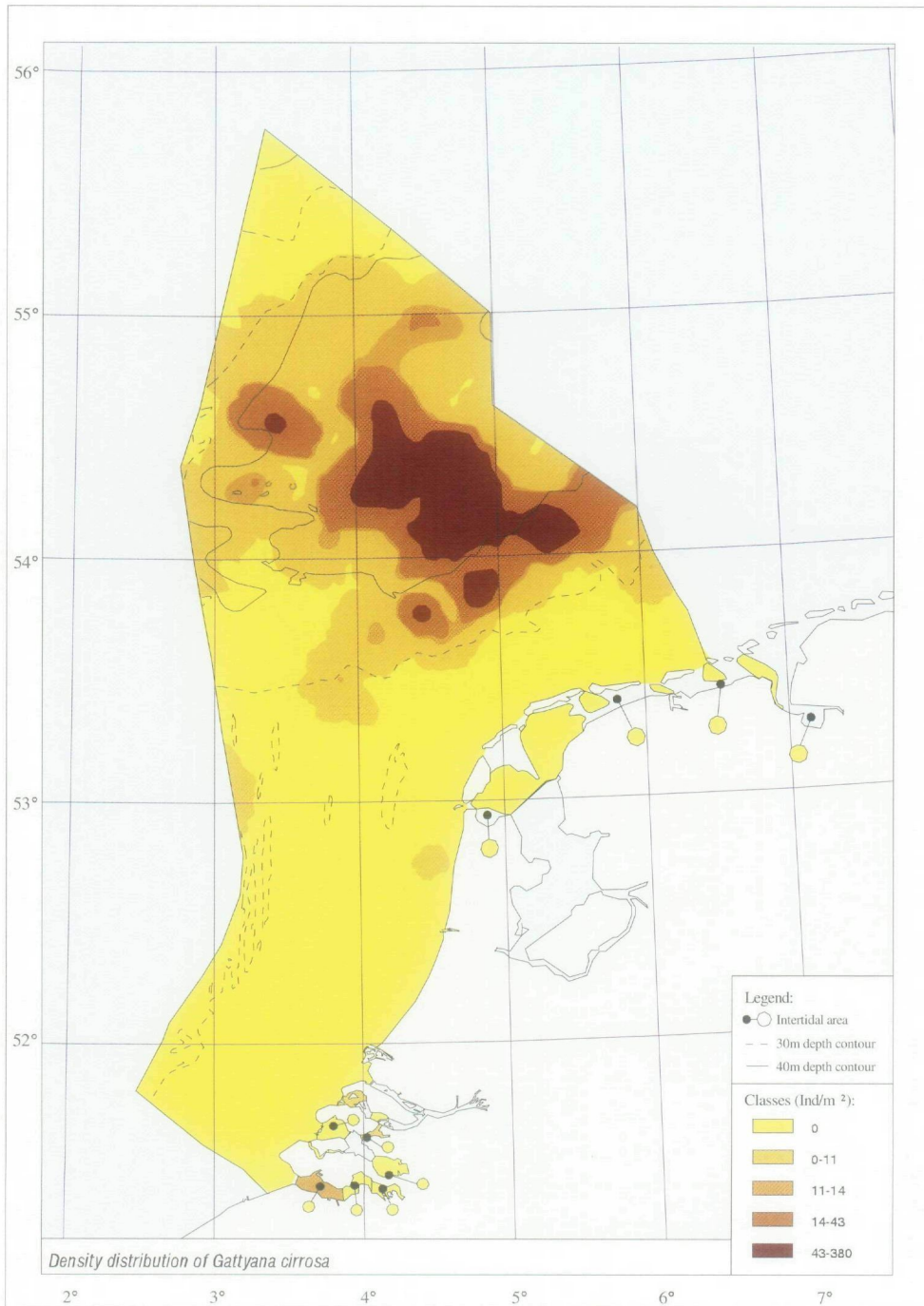
Biology

E. sanguinea breeds in early summer and has planktonic larvae. In the estuarine Delta area juvenile benthic stages are mainly observed in June-July.

E. sanguinea is a predatory carnivore and is itself eaten by fish. The species has been observed to live as a commensal of the tubicolous polychaete *Lanice conchilega* (Hartmann-Schröder, 1971; Wolff, 1973).

Distribution

E. sanguinea has a patchy distribution in the sandy sediments of the Dutch Continental Shelf. It is furthermore found in the Oosterschelde and in the eastern and western Wadden Sea. *E. sanguinea* has been reported from muddy sand, among algae and also under stones, in kelp holdfasts and among old shells (Hartmann-Schröder, 1971; Wolff, 1973; Hayward & Ryland, 1990).



Gattyana cirrosa

PALLAS / 1766

Dutch

Gekroesde zeerups

J. VAN DER HOEK



Morphology

This species has a flattened body that is oval in outline. It is composed of up to 38 segments and reaches 40 mm in length. The dorsal surface is covered with fifteen pairs of soft scales (elytra). These elytra are covered with minute spines and have a fringe of papillae along the outer edge. The head bears four eyes, one median and two lateral antennae. The elytra have a distinct dark spot in the centre (Hartmann-Schröder, 1971; Hayward & Ryland, 1990).

Biology

Breeding probably takes place in spring (March-June) and the larvae develop in the water column. The species spawns several times during its life. It can reach an age of at least 4-5 years.

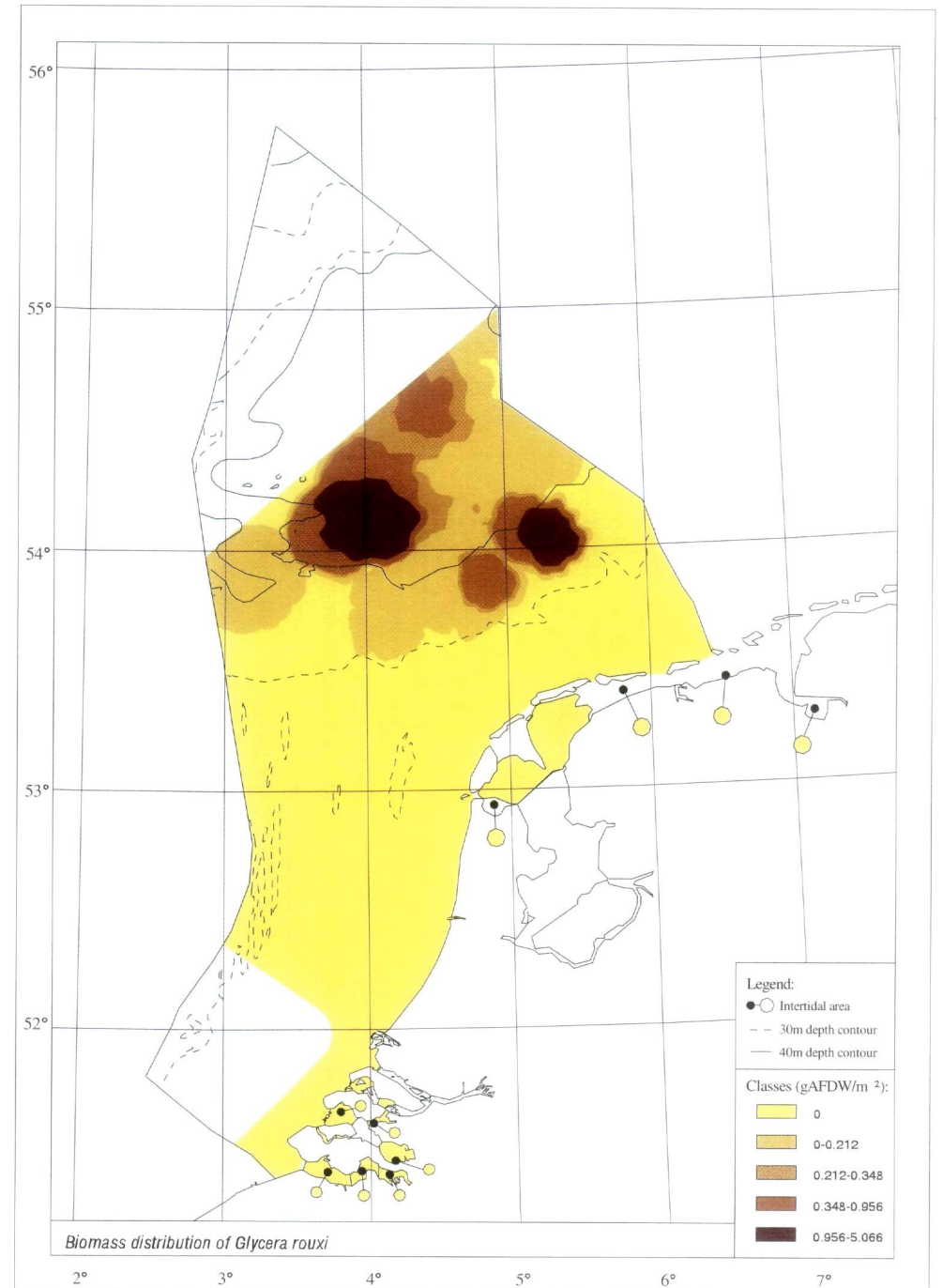
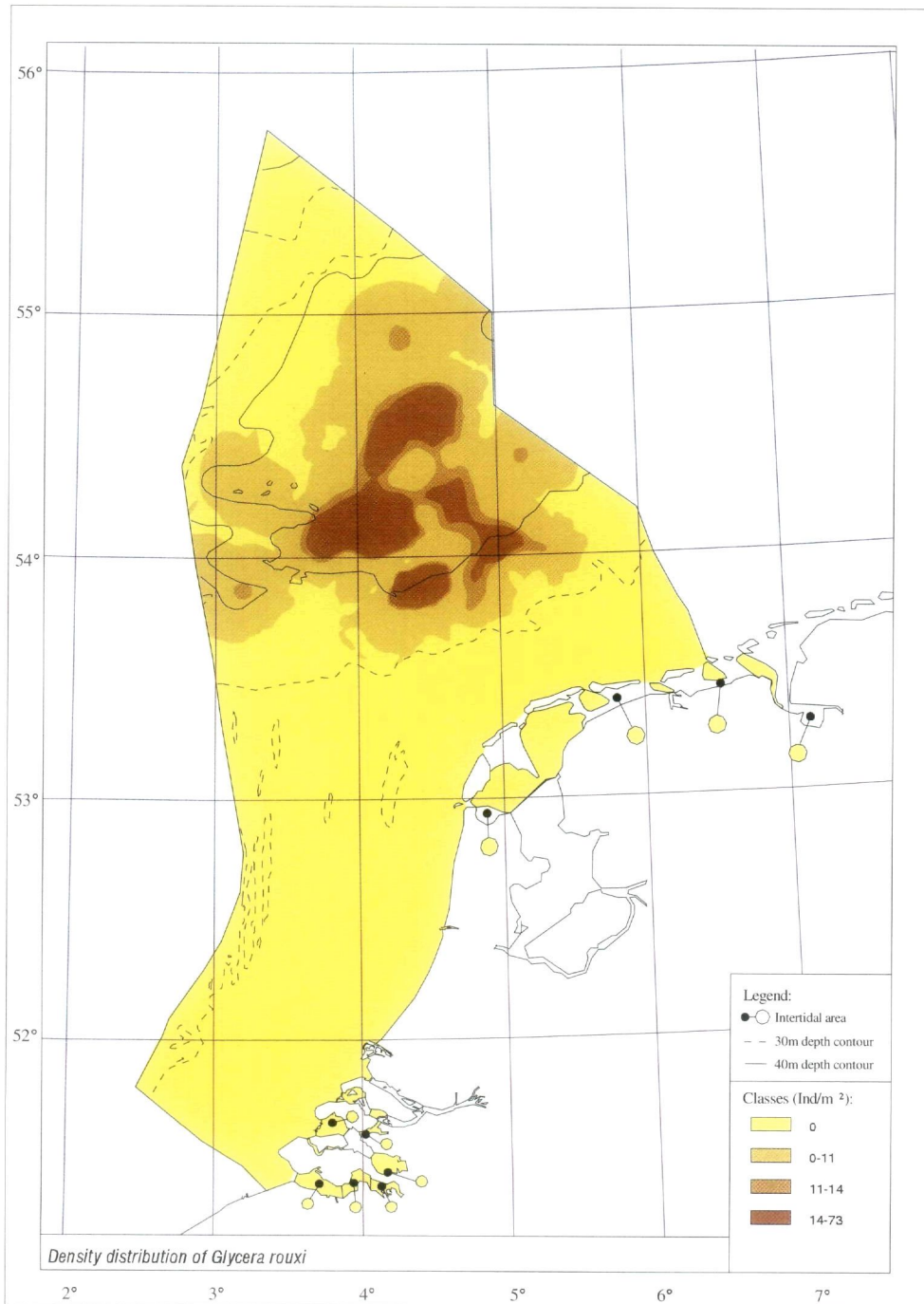
In the subtidal parts of the area, *G. cirrosa* is almost exclusively found in the tubes of the polychaete *Chaetopterus*

variopedatus. Other studies have recorded the species from (empty) tubes of other polychaetes such as *Lagis koreni* and *Amphitrite johnstoni*, and in *Arenicola* burrows. *G. cirrosa*, like all polynoids, is considered a predatory carnivore. Small crustaceans, echinoderms, polychaetes, gastropods, sponges and hydroids have been mentioned as prey items. (Hartmann-Schröder, 1971; Wolff, 1973; Curtis, 1977; Fauchald & Jumars, 1979; Hayward & Ryland, 1990).

Distribution

This species is very abundant at the Oyster Ground, where it forms a substantial part of the infaunal biomass. *G. cirrosa* also occurs in the Delta area (Grevelingenmeer, Ooster- and Westerschelde). The species is (almost) absent from the Southern Bight and the Wadden Sea.

G. cirrosa shows a preference for the muddier types of sediment as found in the Oyster Ground.



Glycera rouxi

AUDOUIN & MILNE-EDWARDS / 1833



J. VAN DER HOEK

Morphology

Like all glycerids, this species has an elongate, cylindrical and muscular body with two strongly tapered ends. Normally this species is 50-80 mm in length. The pointed head bears no visible appendages.

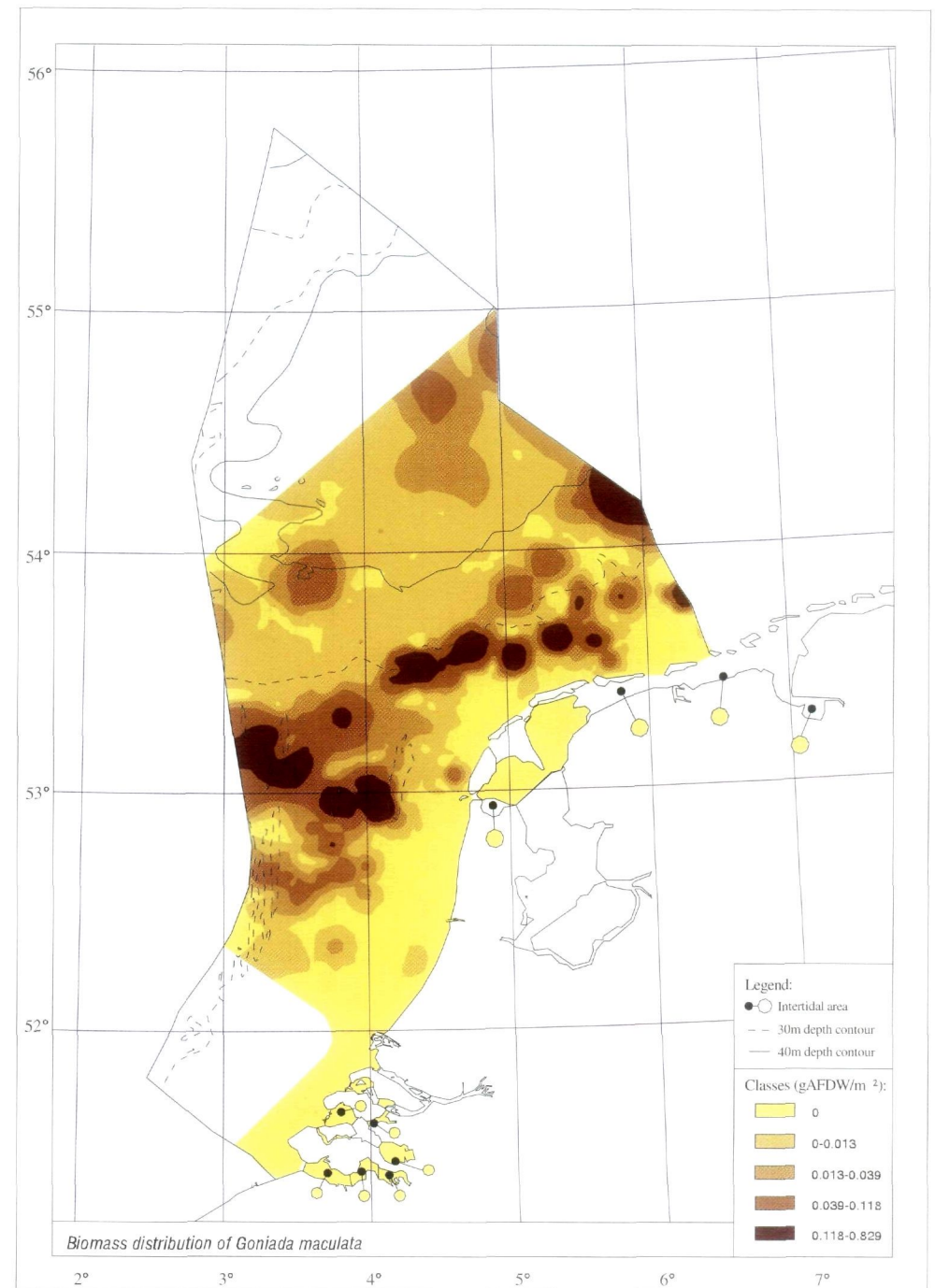
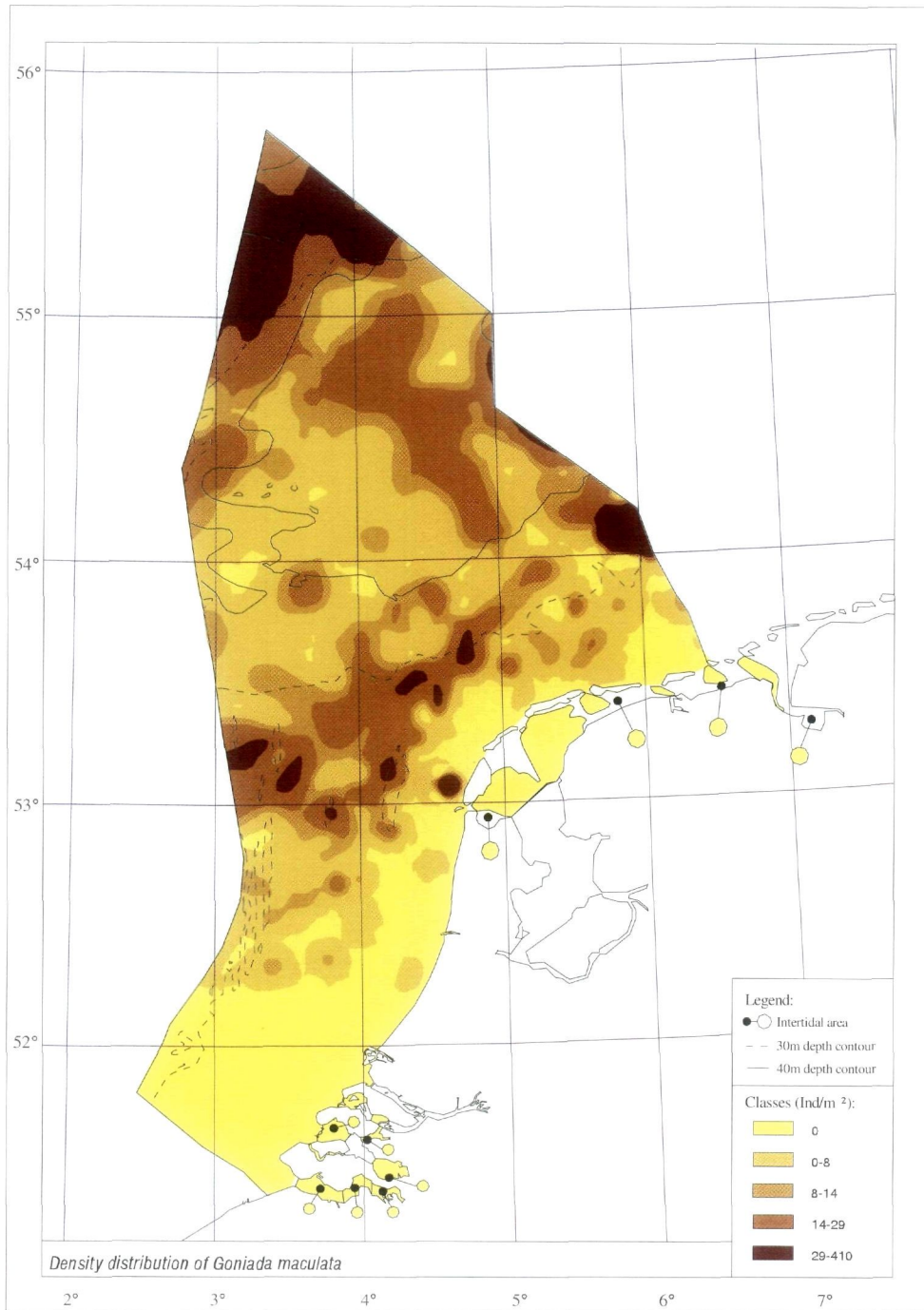
The segments are uniform and have prominent parapodia with retractile, finger-like gills. *G. rouxi* is reddish in colour (Hartmann-Schröder, 1971; Fauchald & Jumars, 1979; Hayward & Ryland, 1990).

Biology

The reproduction of *G. rouxi* takes place in autumn (Hartmann-Schröder, 1971). The species is a burrowing predator. Its enormous eversible pharynx is tipped with four large jaws (Hartmann-Schröder, 1971; Fauchald & Jumars, 1979).

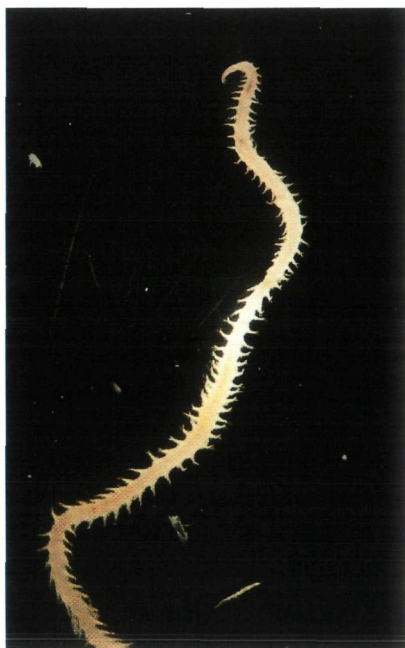
Distribution

In the area *G. rouxi* is exclusively found offshore in the muddy fine sands of the Oyster Ground.



Goniada maculata

OERSTED / 1843



D.B. EDWARDS / MINISTRY OF AGRICULTURE, FISHERIES AND FOOD

Morphology

This species resembles *Glycera rouxi*, i.e. body elongate and cylindrical with strongly tapered head and tail. It is however smaller with a length of around 50 mm and about 200 segments. Two body regions can be discerned with different types of parapodia. The colour is pale green or yellowish, becoming orange posteriorly, and often flecked with brown (Hartmann-Schröder, 1971; Hayward & Ryland, 1990).

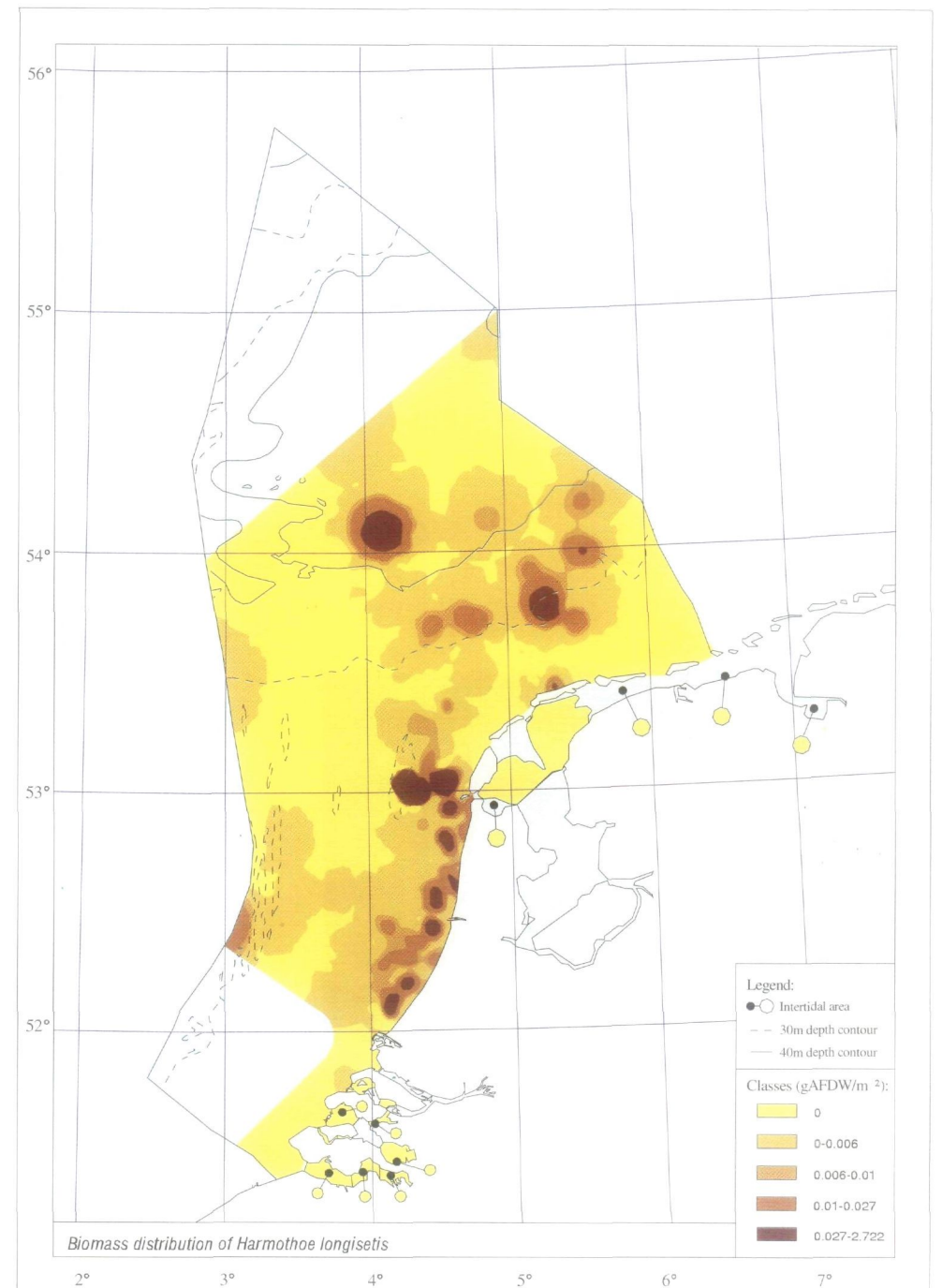
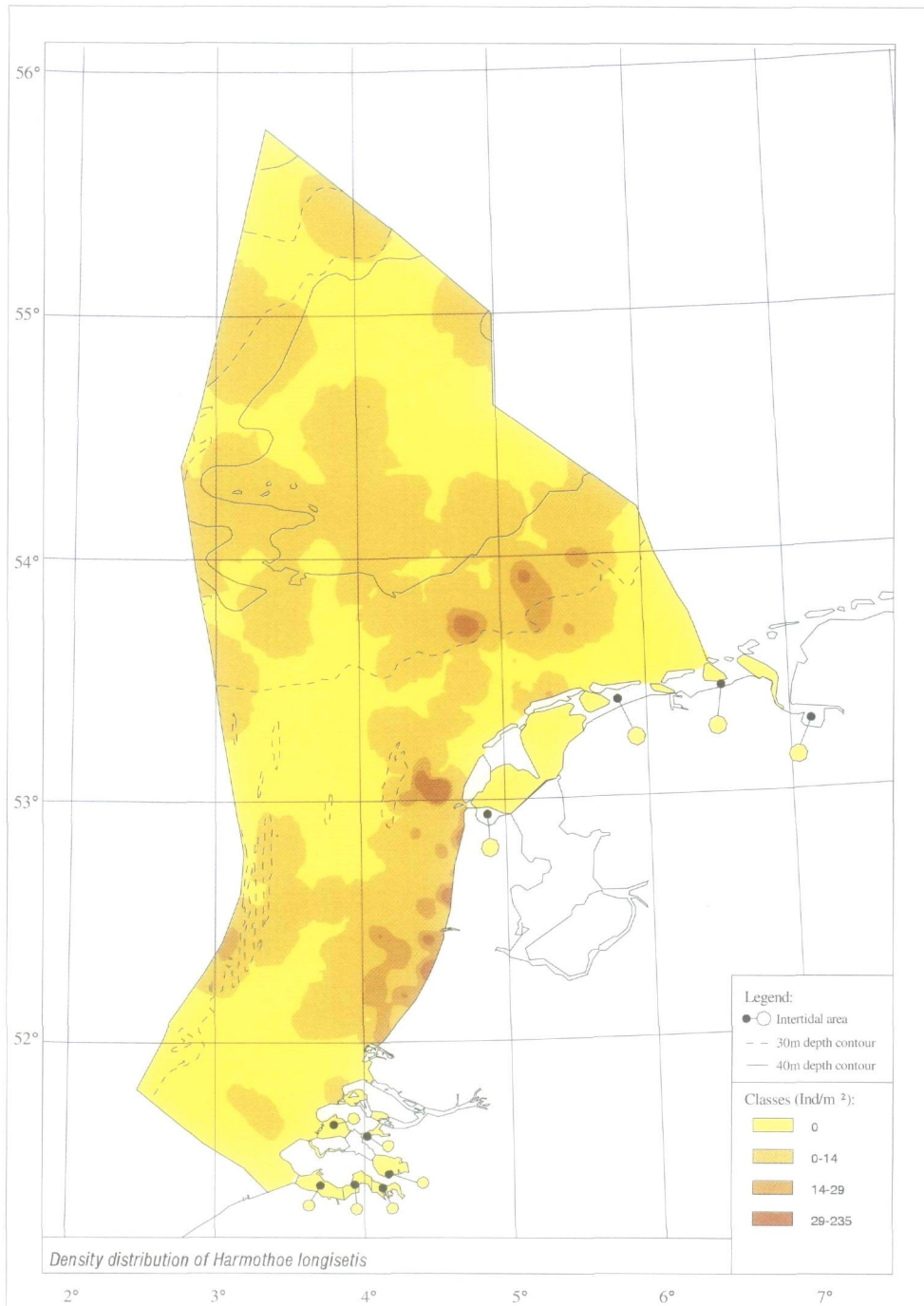
Biology

Breeding of *G. maculata* occurs around July, probably with a non-pelagic development of the larvae. Goniadids have an eversible pharynx tipped with series of small jaws.

All species are considered predatory carnivores. *G. maculata* is eaten by fish, especially haddock, cod and flatfish (Hartmann-Schröder, 1971; Wolff, 1973; Fauchald & Jumars, 1979).

Distribution

Except for the coastal zone and southernmost part of the Southern Bight, the species is found throughout the entire area. It is furthermore absent from brackish waters. *G. maculata* seems to prefer a substrate composed of fine sand mixed with some mud. Other authors report the species to settle on various substrates ranging from pure mud to coarse sand and mixtures of these. *G. maculata* sometimes occurs in empty tubes of other polychaetes (Hartmann-Schröder, 1971).



Harmothoe longisetis

GRUBE / 1863

Synonym(s)

Harmothoe glabra



M. LAVALLEYE

Morphology

The species bears some resemblance to *Gattyana cirrosa*, i.e. a flattened body, oval in outline and dorsally covered by soft and smooth scales (elytra). It has 38-39 segments and reaches 30-50 mm in length. The head bears a median and lateral antenna and four big eyes. The parapodia have a tuft of hair-like chaetae that are characteristically thin and long, giving it the appearance of a pencil. The back is pale, sometimes with transverse brown bands. The elytra are pale yellow or colourless (Hartmann-Schröder, 1971; Fauchald & Jumars, 1979; Hayward & Ryland, 1990).

Biology

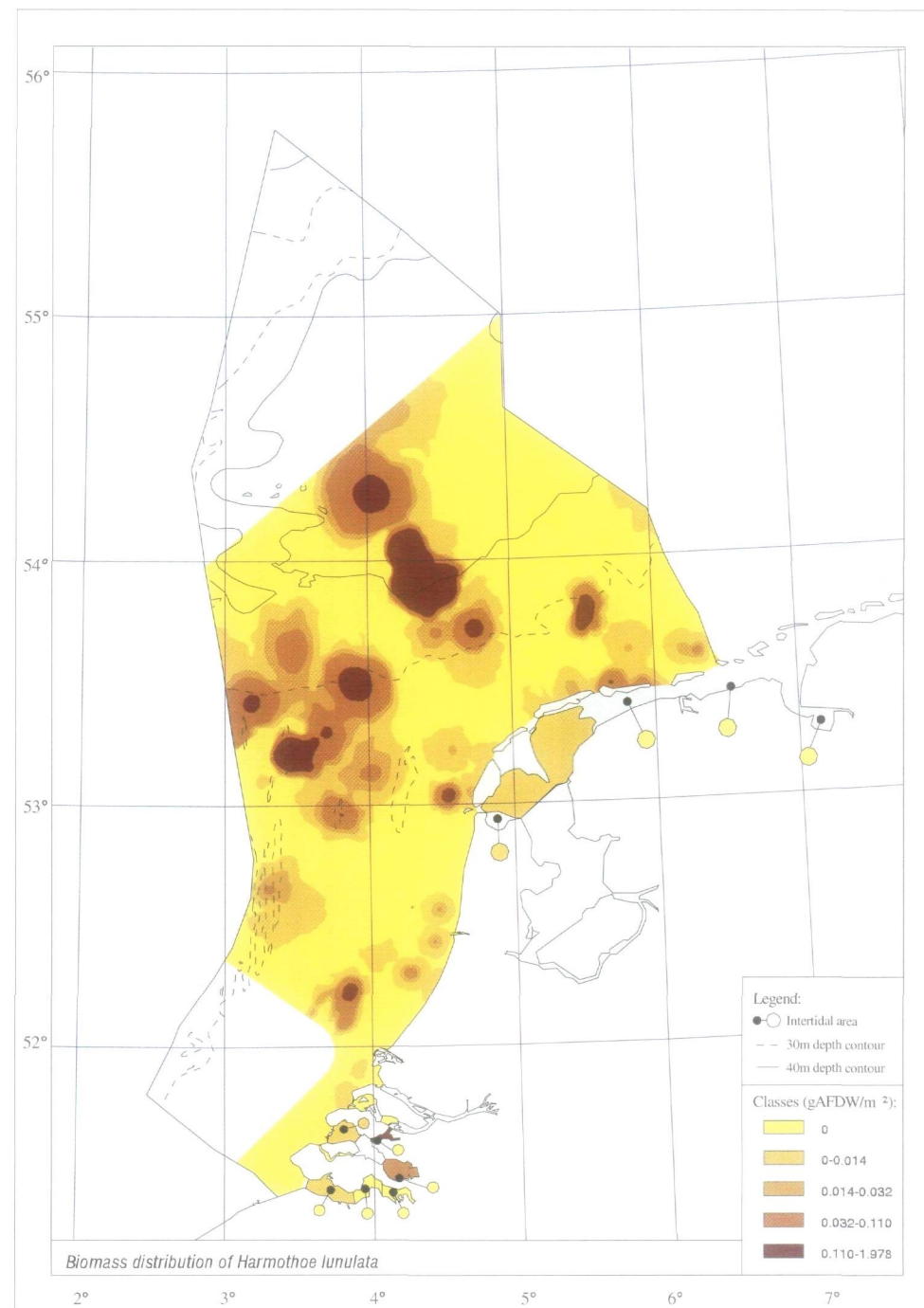
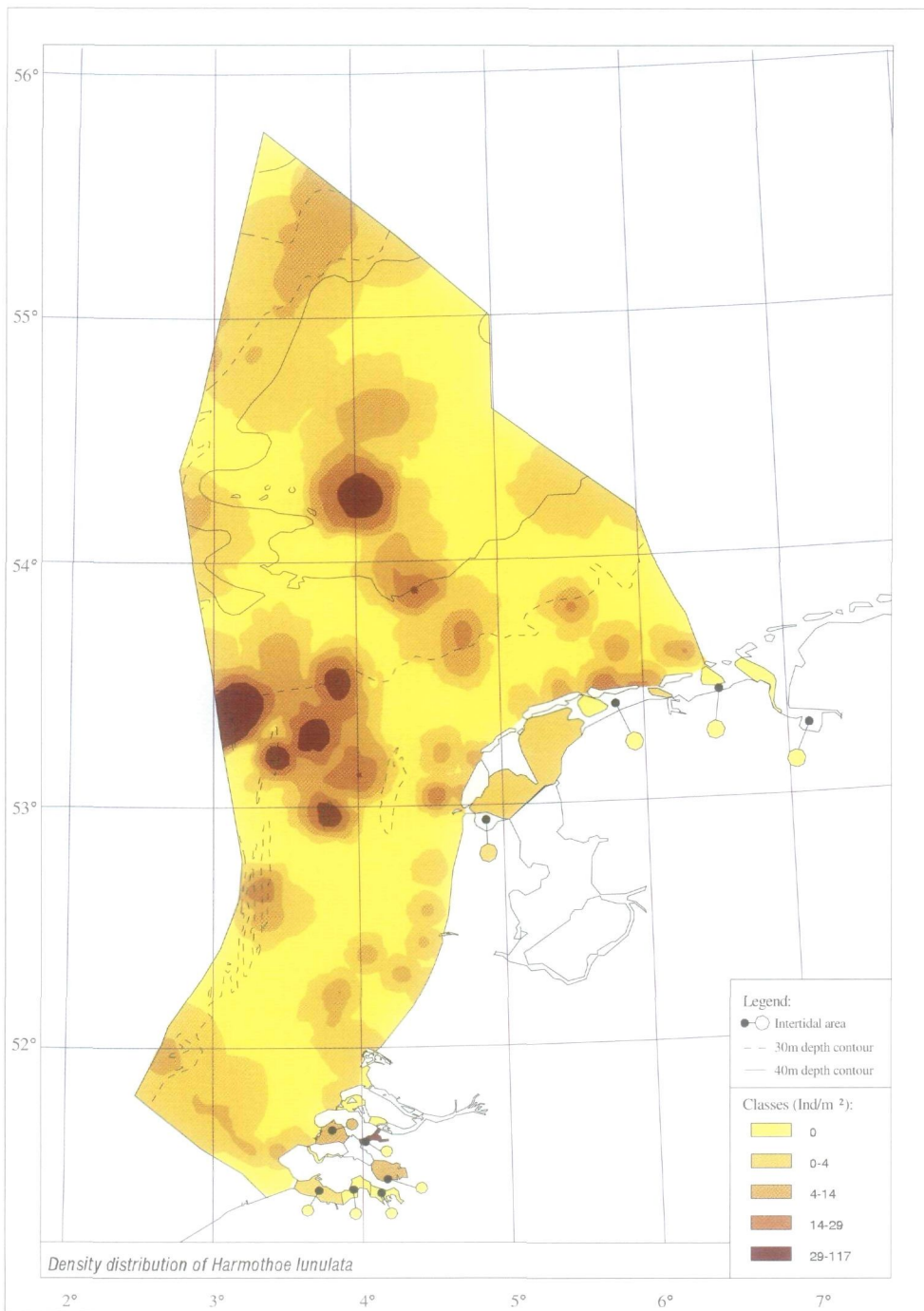
Polynoids, *Harmothoe* species included, are considered carnivores, feeding on a variety of small infaunal and epifauna invertebrates. The species has been found in the gut of fish,

3 notably cod and haddock. Like other Polynoid species, *H. longisetis* has been found associated with other infaunal organisms, viz. the lugworm *Arenicola marina* and various terebellid and chaetopterid polychaetes (Hartmann-Schröder, 1971; Wolff, 1973; Fauchald & Jumars, 1979).

Distribution

The species is found scattered throughout the entire area, viz. Broad Fourteens, Brown Bank, Oyster Ground, the Cleaver and Dogger Bank. Patches with relatively high densities are found near the coast. The species is not found in the brackish waters in the area, but according to other studies it occurs in brackish waters as well.

H. longisetis lives in fine-medium sand. The species has also been found under stones (Hartmann-Schröder, 1971; Wolff, 1973; Hayward & Ryland, 1990).



Harmothoe lunulata

DELLE CHIAJE / 1841



M. LAVALLEYE

Morphology

Body of similar form and size as that of *H. longisetis*. The antennae and tentacles are relatively short and the hair-like chaetae are stout. The elytra are smooth and unfringed, with a very variable colour pattern (Hartmann-Schröder, 1971; Hayward & Ryland, 1990).

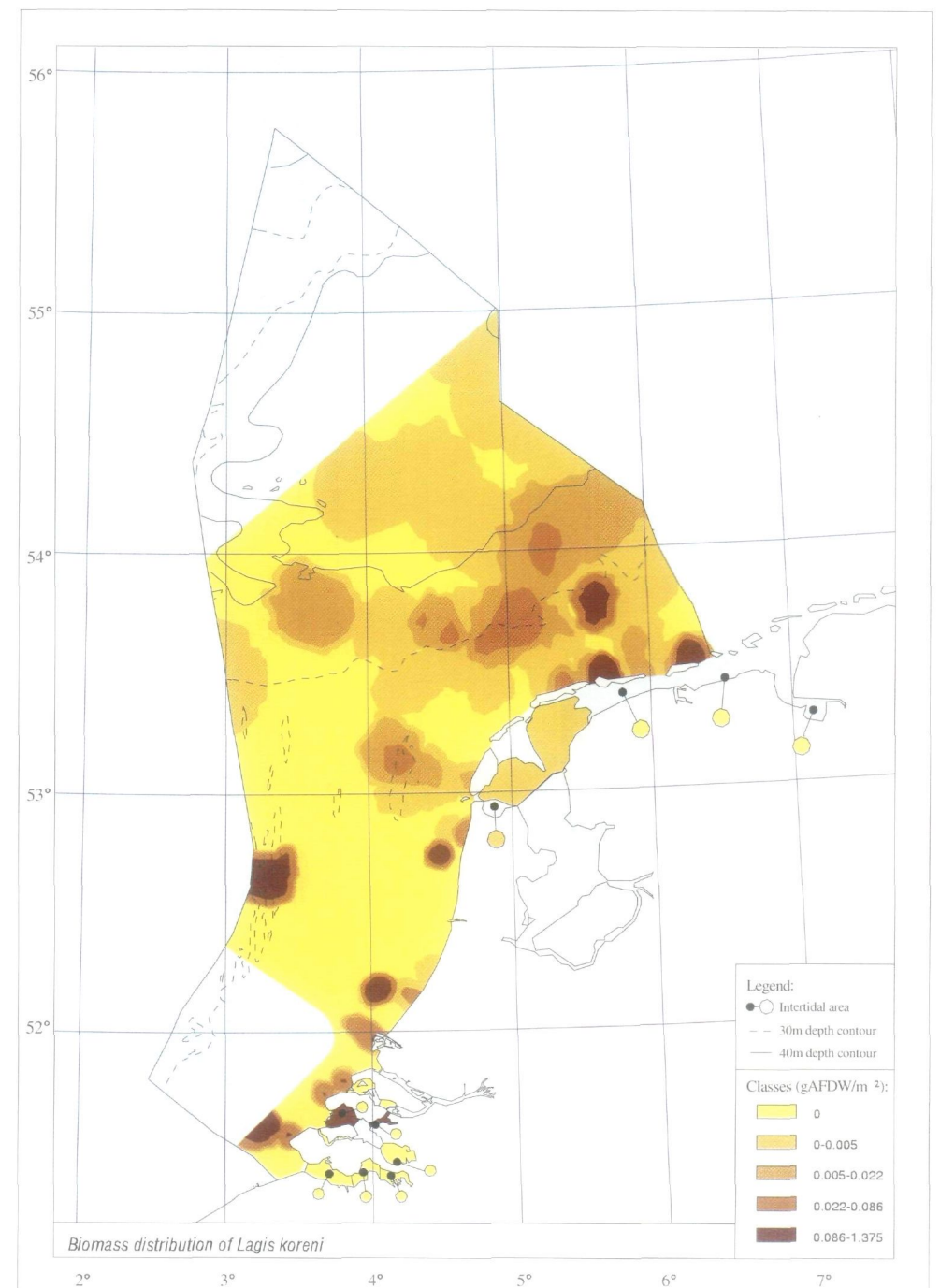
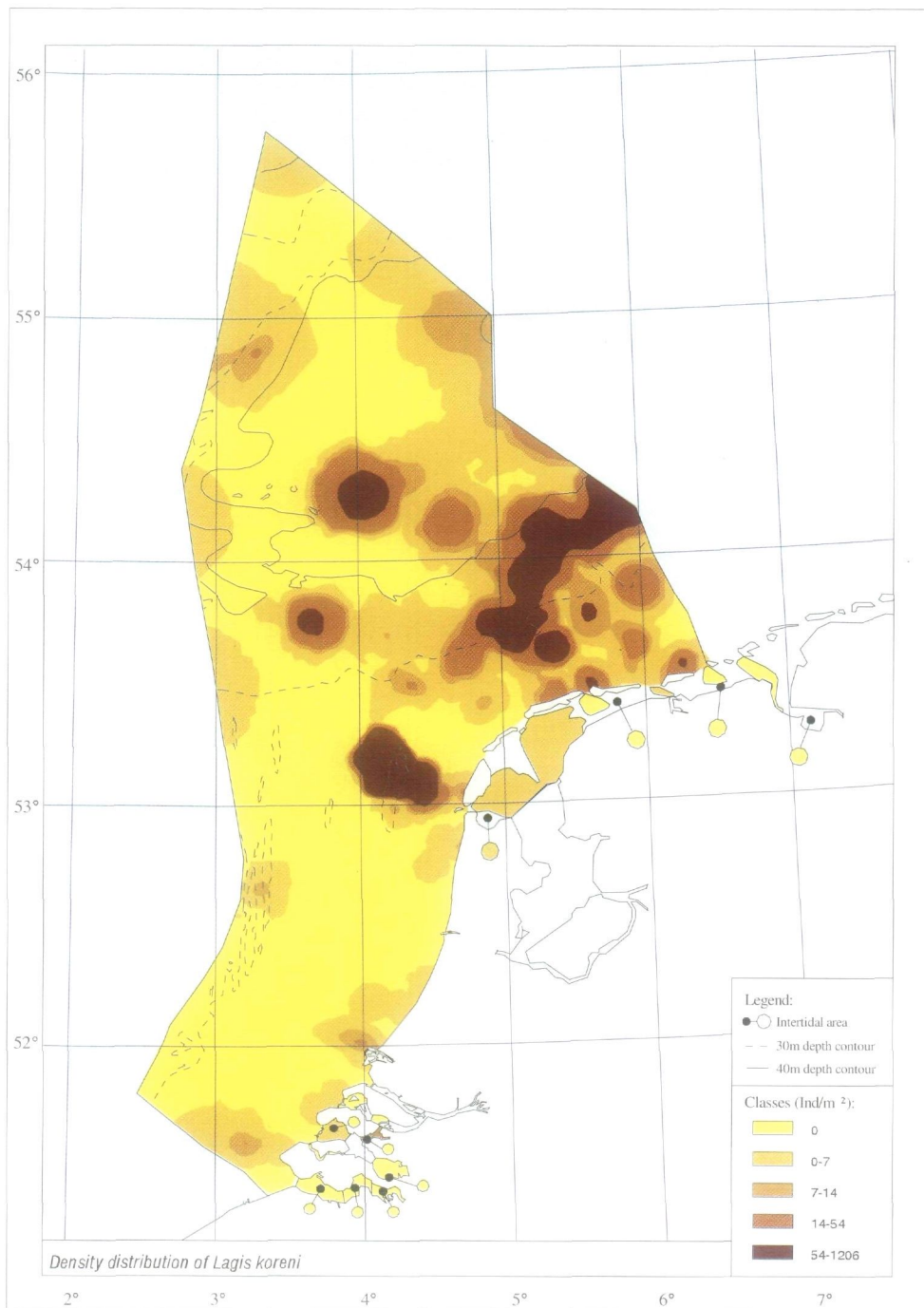
Biology

Polynoids are generally considered predators of small infaunal and epifauna invertebrates. *H. lunulata* lives as a commensal in the tubes of the polychaetes *Lanice* and *Chaetopterus*, and in the burrows of *Arenicola* (Hartmann-Schröder, 1971; Wolff, 1973; Fauchald & Jumars, 1979).

Distribution

The distribution of *H. lunulata* in the area is very patchy and will partly depend on the occurrence of suitable hosts. In contrast to *H. longisetis* this species also lives in the brackish waters of the Delta area, with highest densities in the northern part of the Oosterschelde. In the western part of the Wadden Sea it is only found after mild winters and in that case with only a few individuals.

H. lunulata is found in a variety of sediment types and shows no preference for a special type in particular. It has also been found under stones and in crevices (Hartmann-Schröder, 1971; Wolff, 1973; Hayward & Ryland, 1990).



Lagis koreni

MALMGREN / 1865

English

Trumpet worm

Dutch

Goudkammetje

Kamkielworm

German

Köcherwurm

Synonym(s)

Pectinaria koreni

J. VAN DER HOEK

Morphology

This species has a short, conical body, tapering towards the tail. The truncated head bears a characteristic row of large golden spines and a tuft of filiform tentacles. The worm is up to 50 mm long and divided into 14 segments. Its characteristic tube is slightly curved and composed of agglutinated fine sand grains. It is open at both ends. The worm is colourless to pink with red gills (Hartmann-Schröder, 1971; Holthe, 1986; Fish & Fish, 1989; Hayward & Ryland, 1990).

Biology

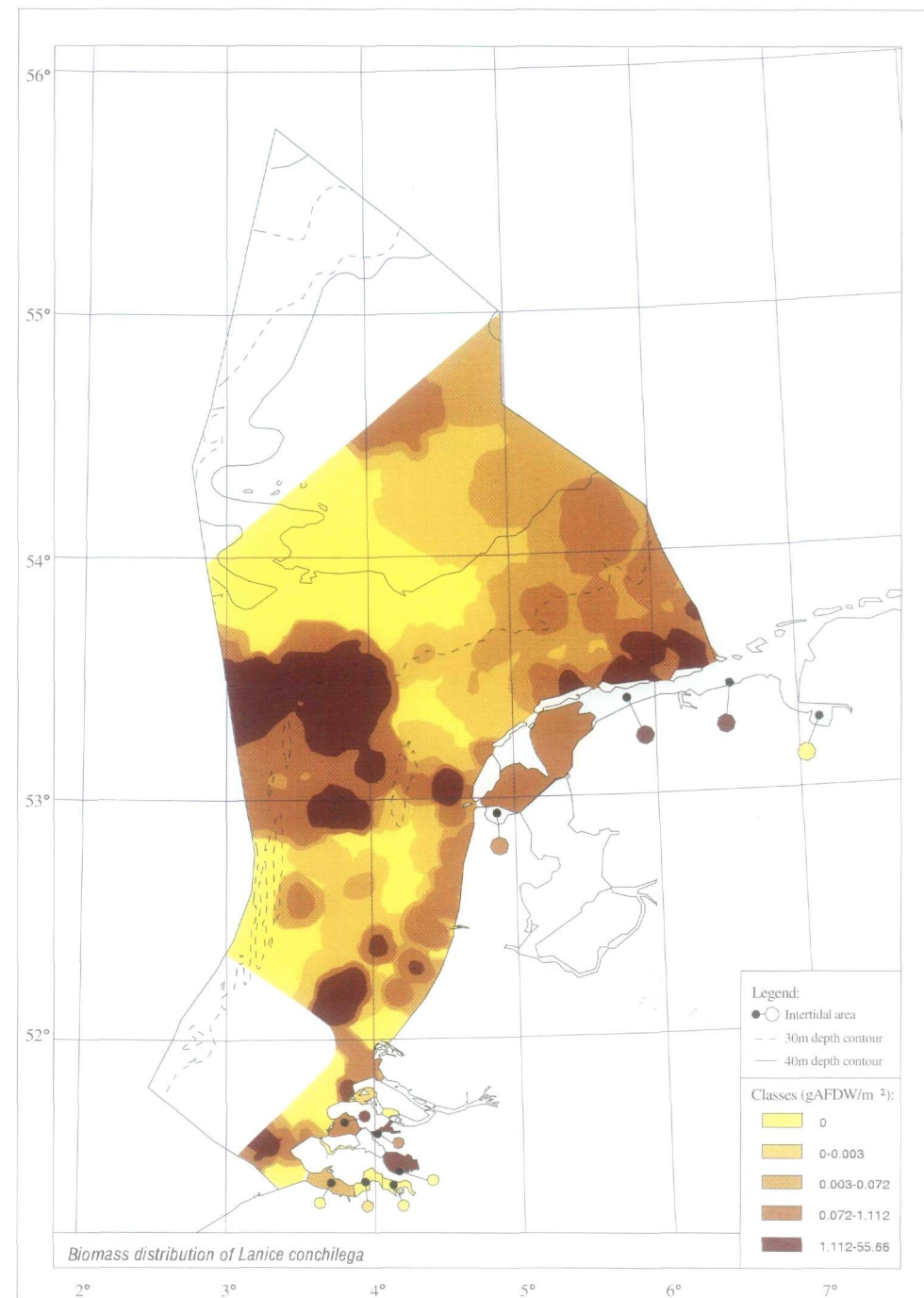
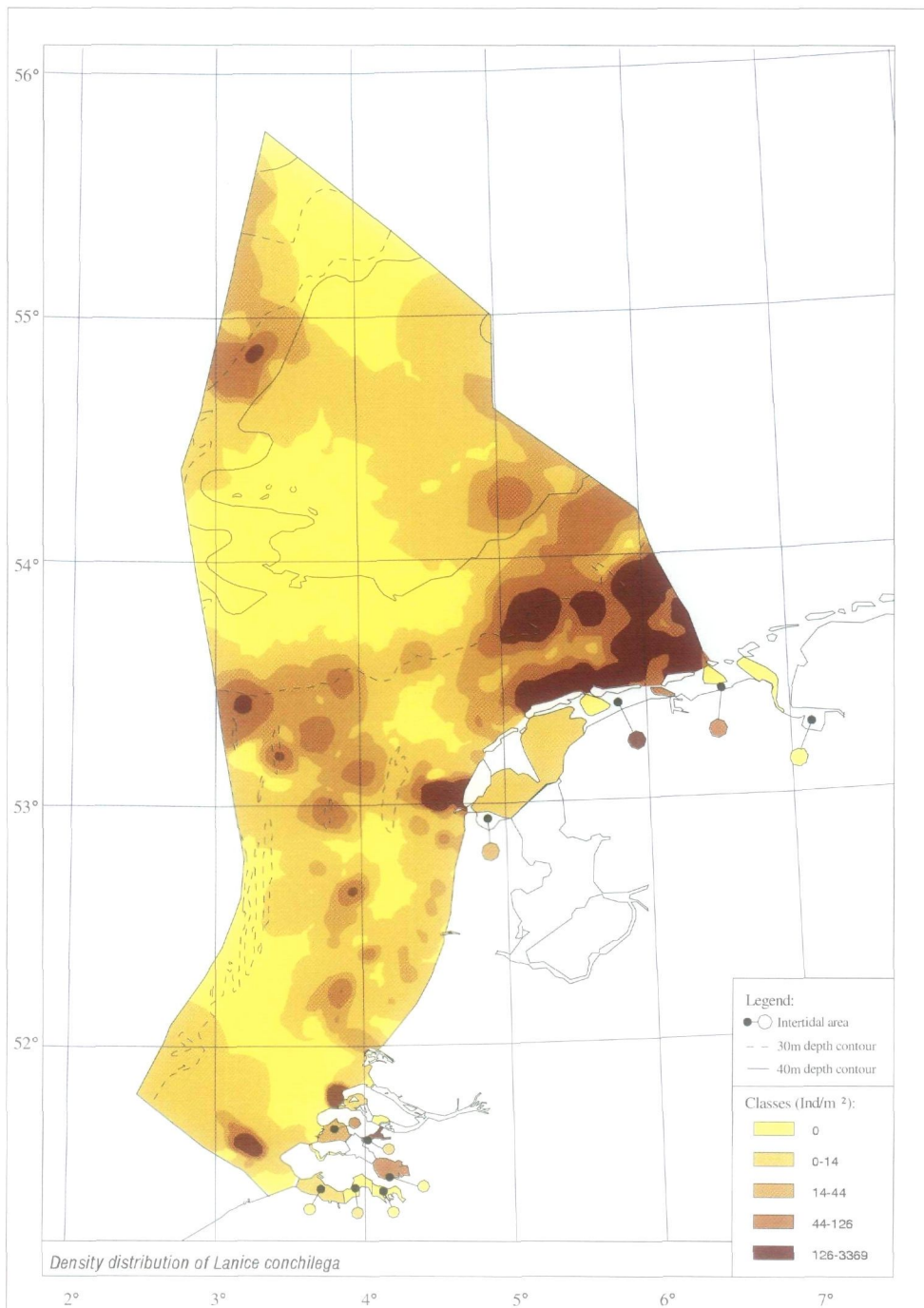
The sexes are separate and breeding occurs in the period between spring and summer. The species has pelagic larvae. Its life span is thought to be about one year and the animals breed once in a life time. The life cycle strategy shows rapid growth following settlement. These attributes, are commonly associated with species that thrive in unstable environments. *L. koreni* is a head down deposit feeder, digging with its stout chaetae and sorting with its tentacles.

During this action the tube is diagonally or vertically oriented in the sediment with the tail end projecting from the surface. The subsurface feeding void is in contact with the surface through a small channel, which limits the activity of the worm to the upper 10 cm of the sediment. U-shaped burrows are formed when the animal lives in organic-rich, oxygen-poor,

fine sediment. Higher motility is associated with well oxygenated, coarse sediment, relatively poor in organics. The gut contents suggest that the species selectively ingests micro-organisms like ciliates, foraminiferans, algae and little crustaceans. Adults cannot construct a new tube when the old one is lost (Hartmann-Schröder, 1971; Wolff, 1973; Kirkegaard, 1978; Fauchald & Jumars, 1979; Holthe, 1986; Fish & Fish, 1989; Witbaard, 1989; Irlinger *et al.*, 1991; Rees & Dare, 1993).

Distribution

The species shows clear patches with high densities in the south-eastern part of the Oyster Ground, north of the Dutch Wadden islands. Areas with elevated densities are also found in the central part of the Oyster Ground and north-west of the island of Texel. *L. koreni* is almost absent from the more southern part of the Southern Bight and the northern part of the Oyster Ground. It is completely missing in the brackish waters, although reports suggest it tolerates low salinities. *L. koreni* lives in many types of sediment, ranging from silt to coarse sand. It is most abundant in mixed bottoms of fine sand and silt. The species is also found in black anoxic sediments and between oysters or together with the polychaete *Sabellaria* (Hartmann-Schröder, 1971; Holthe, 1986; Irlinger *et al.*, 1991; Rees & Dare, 1993).



Lanice conchilega

PALLAS / 1766

English

Sand mason

Dutch

Schelpkokerworm

German

Muschelsammlerin



J. VAN DER HOEK

Morphology

L. conchilega has an elongated body, consisting of two regions. The swollen front region has hair-like as well as hooked chaetae; the long, slender tail region only hooked ones. The species can reach a length of up to 150 mm with up to 300 segments. The head bears a dense tuft of long, thin tentacles. The first segment projects forwards, forming two lobes at both sides of the head. The next three segments carry branched gills. The worm is yellowish, pink or brown coloured with blood-red gills and white tentacles. *L. conchilega* builds a characteristic tube, consisting of cemented sand grains and shell fragments and with a typical fringe at the top end (Hartmann-Schröder, 1971; Holthe, 1986; Fish & Fish, 1989; Hayward & Ryland, 1990).

Biology

The sexes are separate and breeding occurs in spring and summer. The larvae have a long planktonic life, lasting about two months, and have been found in the period between April and August.

This polychaete lives in its straight tube that protrudes several centimetres from the sediment. The long tentacles are extended from the top for collecting particles. During collecting they are supported by fringe-like extensions of the tube. In case of danger *L. conchilega* quickly retracts in the tube. When damaged or covered by sediment, the animal

rebuilds or extends its tube. This enables *L. conchilega* to survive in unstable deposits or areas with strong sedimentation. *L. conchilega* is a selective deposit feeder, ingesting foraminiferans, ciliates, copepods, algae and faeces of echinoderms and molluscs. Laboratory experiments revealed that filter feeding also plays a very important role in its nutrition.

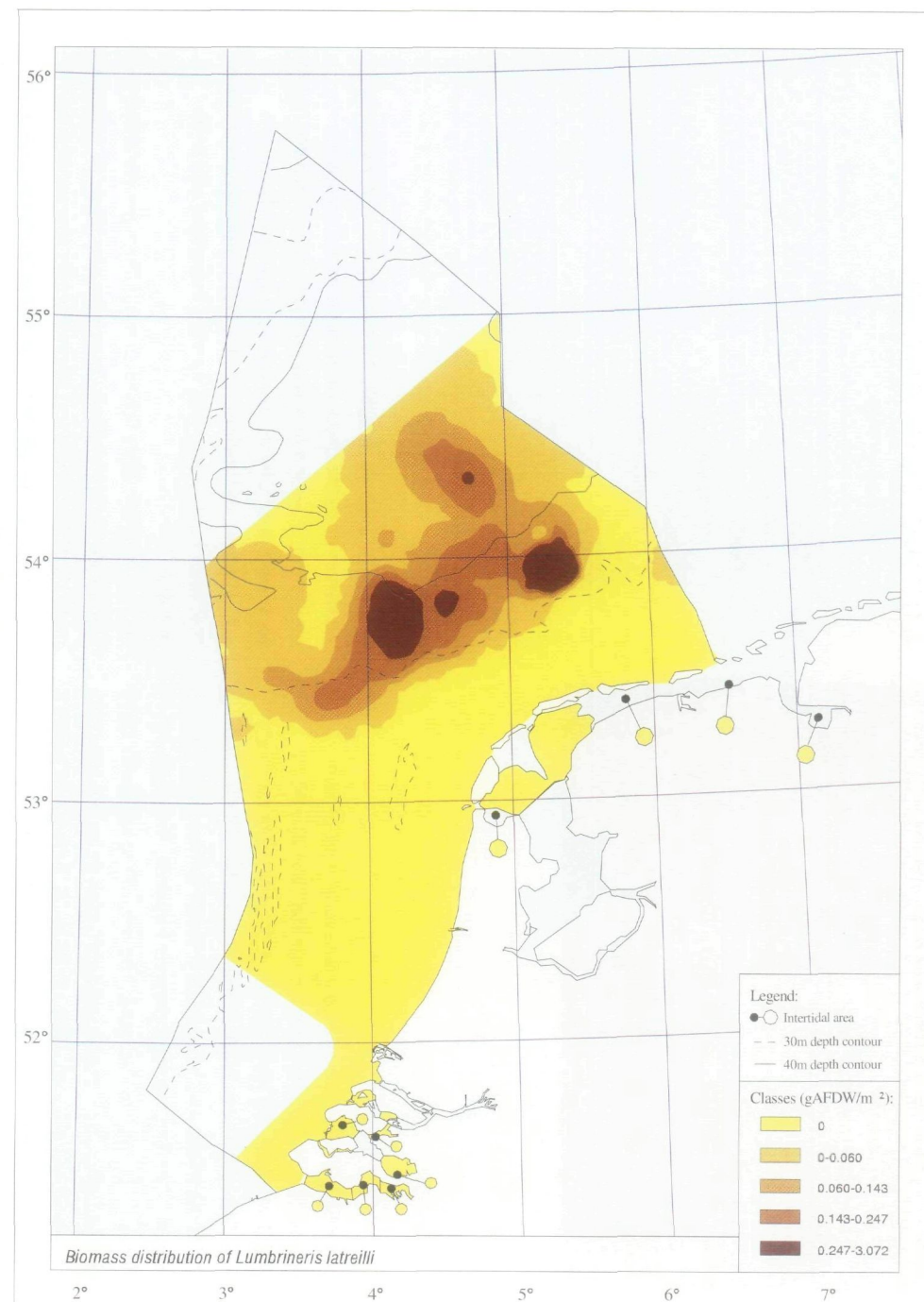
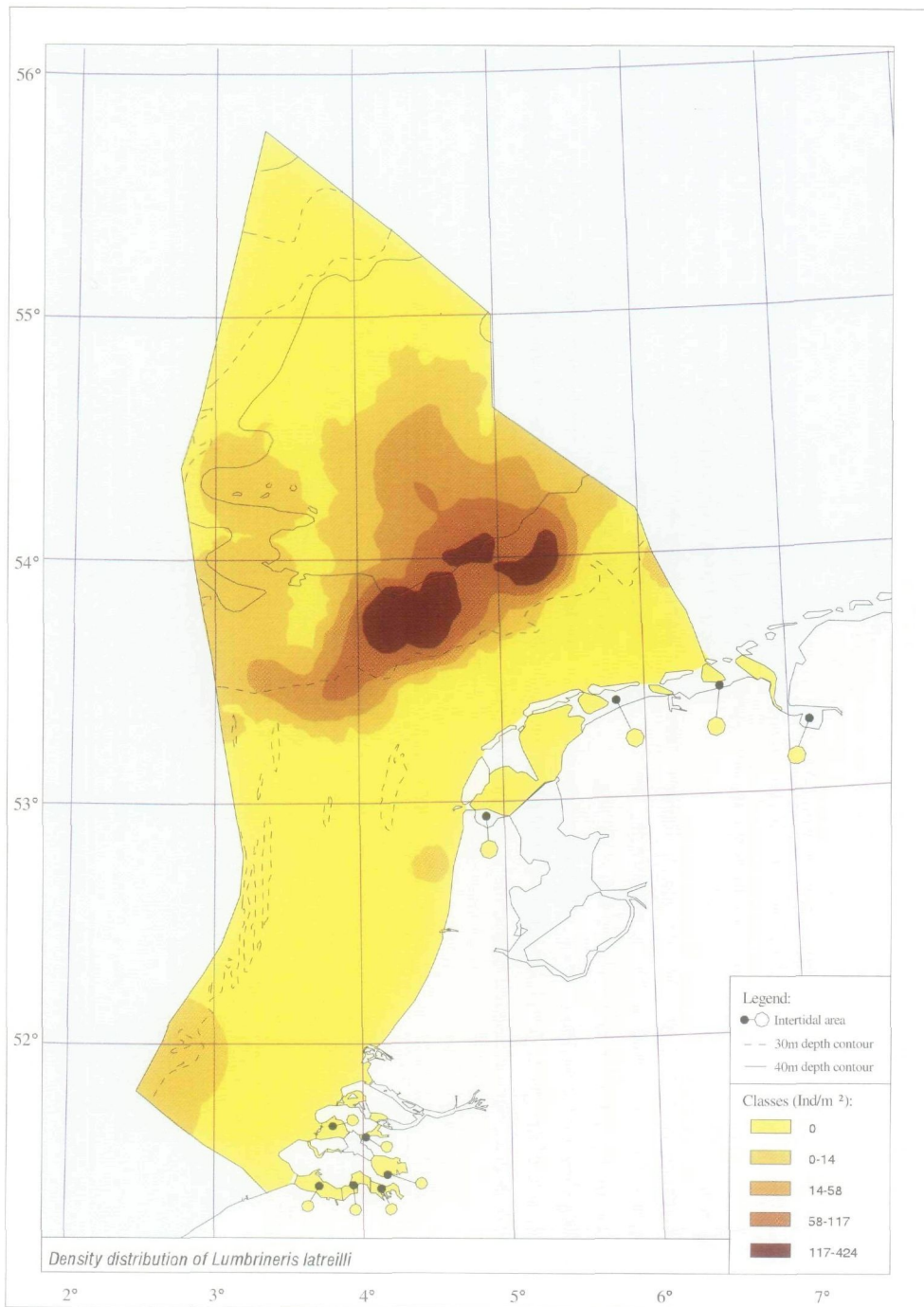
High population densities of *L. conchilega* are attributed to the combination of periodically high concentrations of suspended matter and the ability to utilize different sources of food.

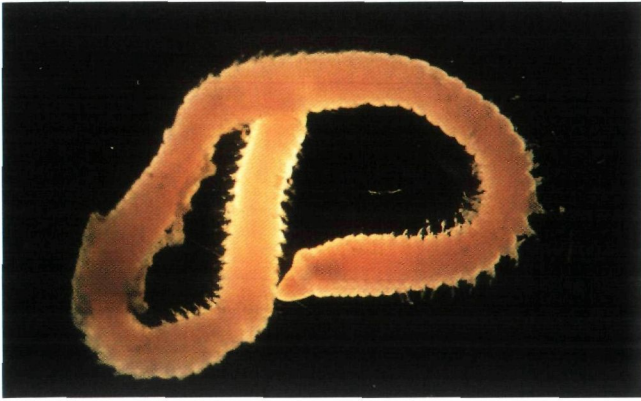
L. conchilega is sensitive to low temperatures and therefore shows low densities in the area of the Wadden Sea after cold winters (Hartmann-Schröder, 1971; Wolff, 1973; Buhr, 1976; Buhr & Winter, 1977; Beukema, 1979; Fauchald & Jumars, 1979; Beukema & Essink, 1986; Fish & Fish, 1989).

Distribution

L. conchilega is widely distributed in the area, i.e. from the tidal estuaries to the Dogger Bank in the north. Locally it is found with extremely large numbers (over 3000 ind./m²). The highest densities are found north of the Wadden islands, from Terschelling to the eastern boundary of the Dutch sector of the North Sea. When living in dense patches, the species can form an important part of the total biomass of an area.

L. conchilega mainly lives in mixed sand bottoms and rarely in muddy bottoms.





Lumbrineris latreilli

AUDOUIN & MILNE-EDWARDS / 1834

Morphology

This species has a slender, cylindrical body made up of many identical segments with simple, bilobed parapodia. The body is rarely longer than few centimetres. The head has no appendages and is rounded to oval. It has an eversible proboscis covered with jaws. This worm is pink, orange, or brown in colour (Hartmann-Schröder, 1971; Fauchald & Jumars, 1979; Hayward & Ryland, 1990).

Biology

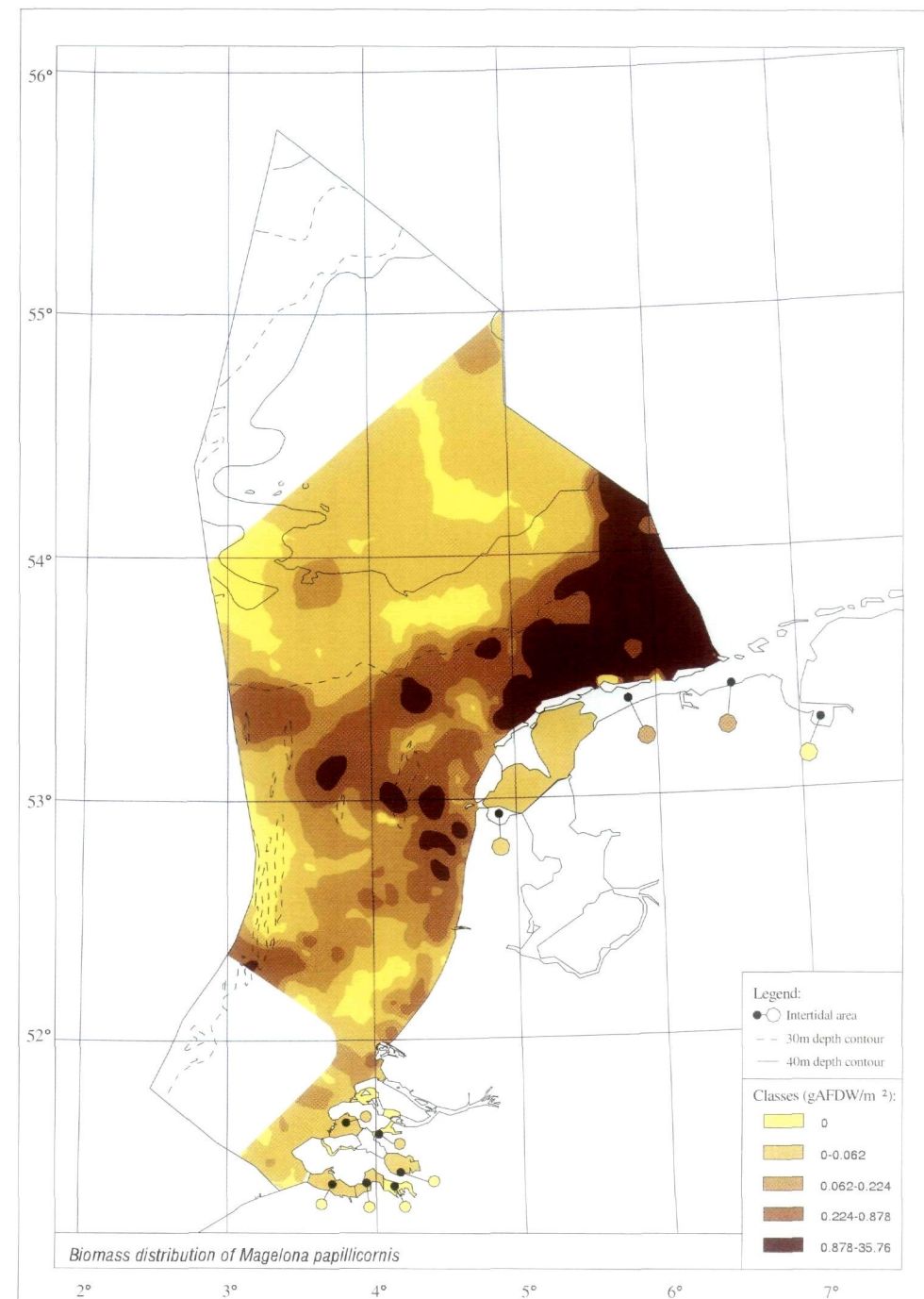
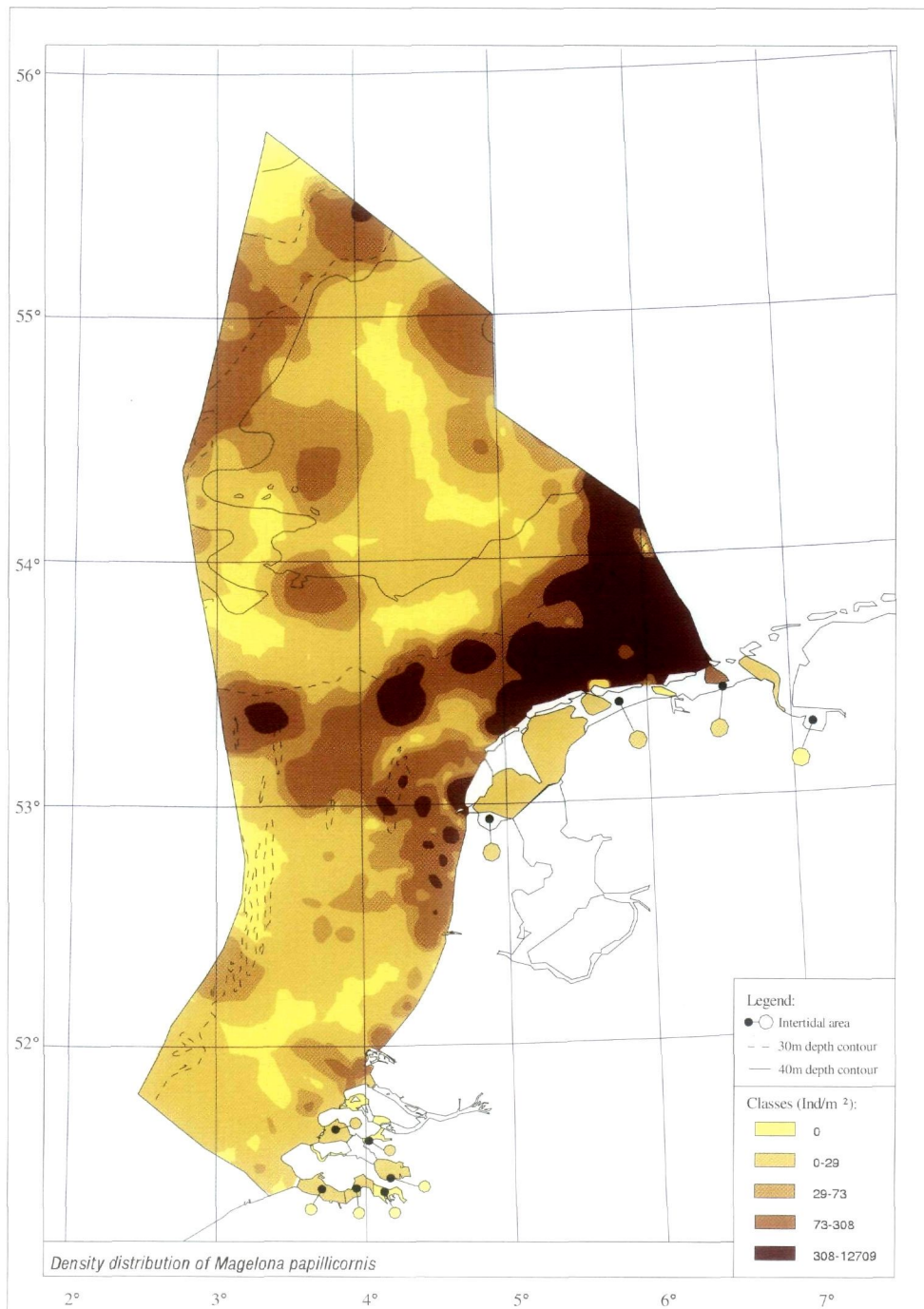
L. latreilli probably has a non-pelagic development.

Because of its jaws *L. latreilli* is recorded as a predator just as most other lumbrinerids (Wolff, 1973; Fauchald & Jumars, 1979).

Distribution

L. latreilli is very numerous in the Frisian Front area. The species also occurs in the south-western part of the Southern Bight and in the area of the Cleaver Bank.

The species shows a preference for muddy fine sand, but is also recorded from coarse sand, gravel, among sea grass and in black mud under stones (Hartmann-Schröder, 1971; Hayward & Ryland, 1990).



Magelona papillicornis

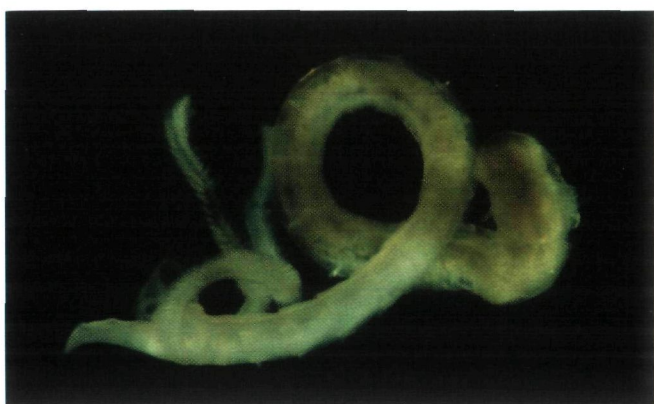
F. MÜLLER / 1858

German

Warzenmagelone

Synonym(s)

Magelona mirabilis



E. STIKVOORT

Morphology

A long, threadlike species that is usually a few centimetres long and composed of up to 150 segments. Two body regions can be discerned, both with short parapodia. The characteristic flattened head bears a pair of very long palps covered with numerous papillae. The palps and anterior region are pink, while the posterior region is greenish grey with white blotches (Hartmann-Schröder, 1971; Hayward & Ryland, 1990).

Biology

The larvae of this species occur in the plankton of the North Sea from April-May to August and sometimes as late as October.

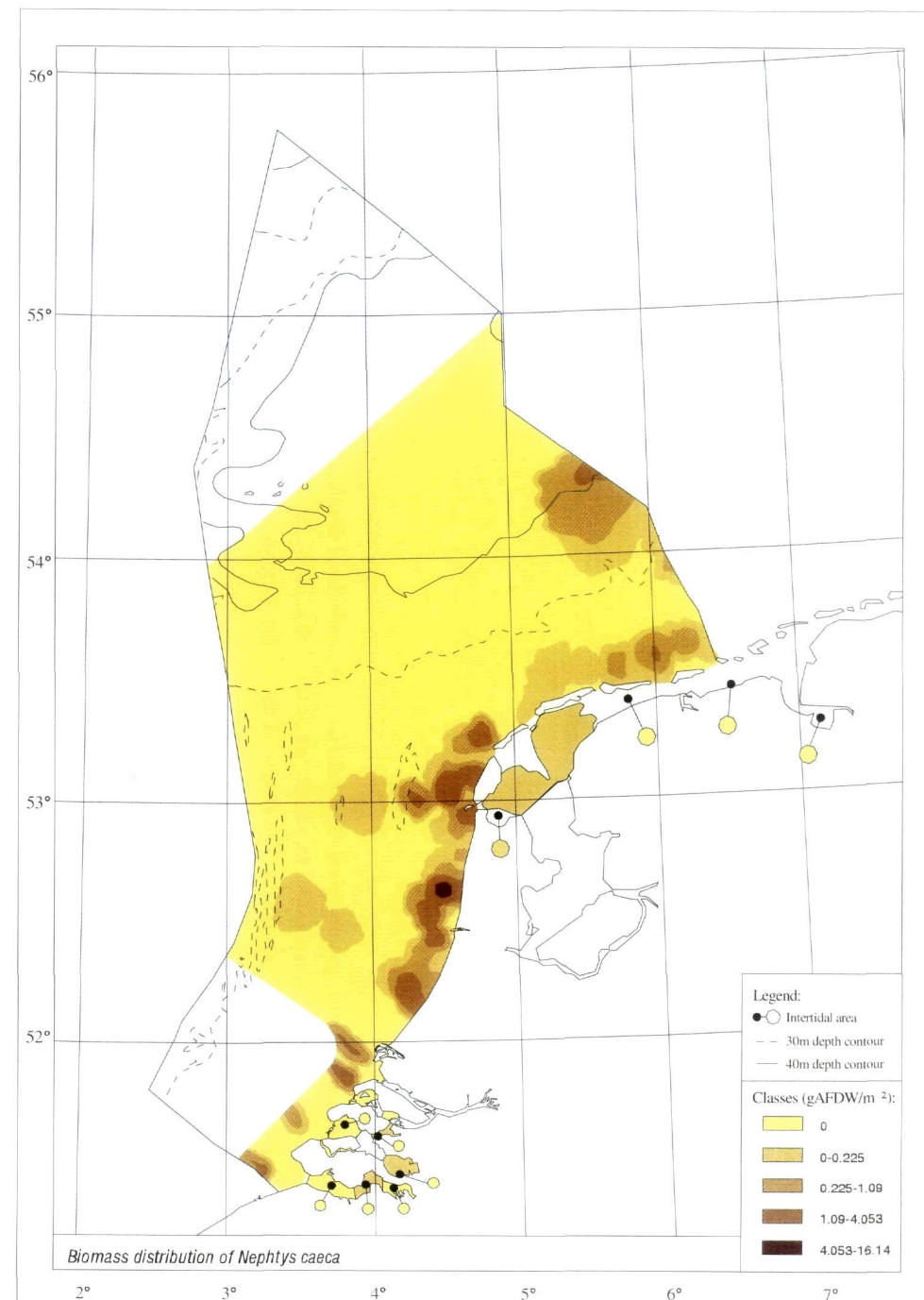
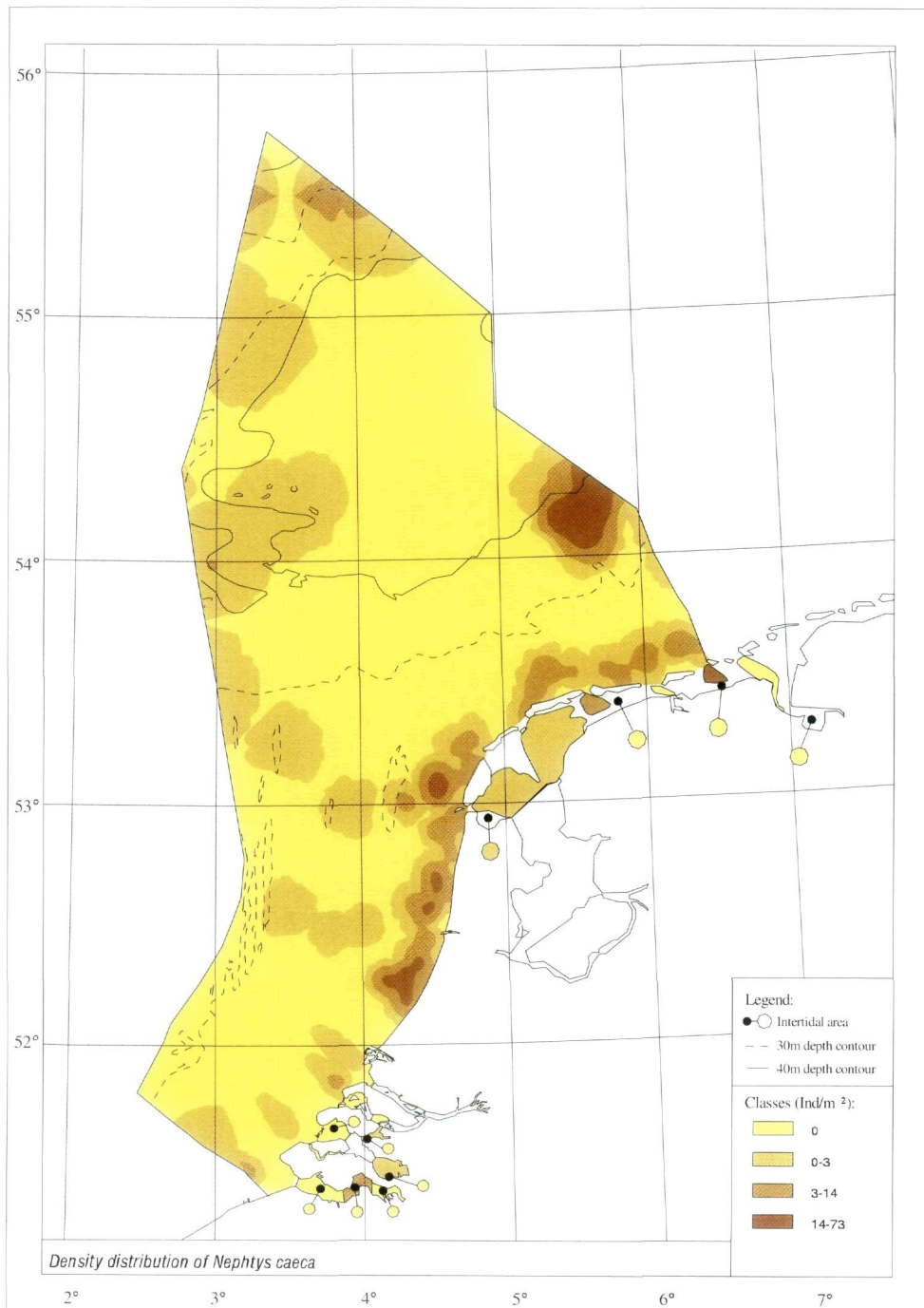
M. papillicornis can burrow down to a substantial depth, probably without making a permanent tube. The species is

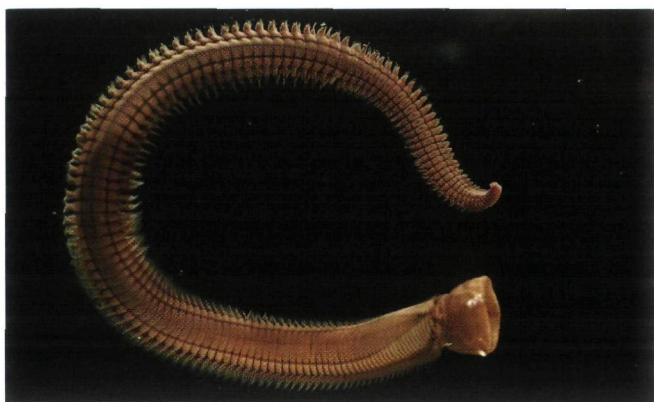
moreover able to swim temporarily. *M. papillicornis* selectively collects suspended and deposited particles, e.g. diatoms and all kinds of detritus. It forms a common food item for juvenile fish (Hartmann-Schröder, 1971; Wolff, 1973; Fauchald & Jumars, 1979; Hayward & Ryland, 1990).

Distribution

M. papillicornis occurs in almost the entire area, in the North Sea as well as in the estuarine areas. The species is very abundant in the area south of the Oyster Ground, but is scarce in the southern part of the Southern Bight and at the central Oyster Ground. The highest biomass values are found in the eastern part of the area.

The species prefers fine sands, but also occurs in medium sand mixed with mud (Hartmann-Schröder, 1971; Wolff, 1973).





J. VAN DER HOEK

Nephtys caeca

FABRICIUS / 1780

German

Blindwurm

Morphology

A member of the family Nephtyidae that can reach a considerable size, viz. maximally 200 mm long with up to 150 segments. The head is relatively small and rectangular, with short antennae on the frontal corners giving it a T-shape. Like all nephtyids it has a large eversible, muscular proboscis with internal jaws. The first segment is reduced and bears two pairs of finger-like cirri. The rest of the body is square in cross section with prominent, powerful bilobed parapodia with curved gills in between the lobes. The body is whitish to greenish brown, with a lightly iridescent cuticle and red gills (Hartmann-Schröder, 1971; Sips, 1988; Fish & Fish, 1989; Hayward & Ryland, 1990; Rainer, 1991).

Biology

The sexes are separate and individuals breed several times over a number of years in the periods April-May and August. The larvae are planktonic. *N. caeca* starts reproducing in its second

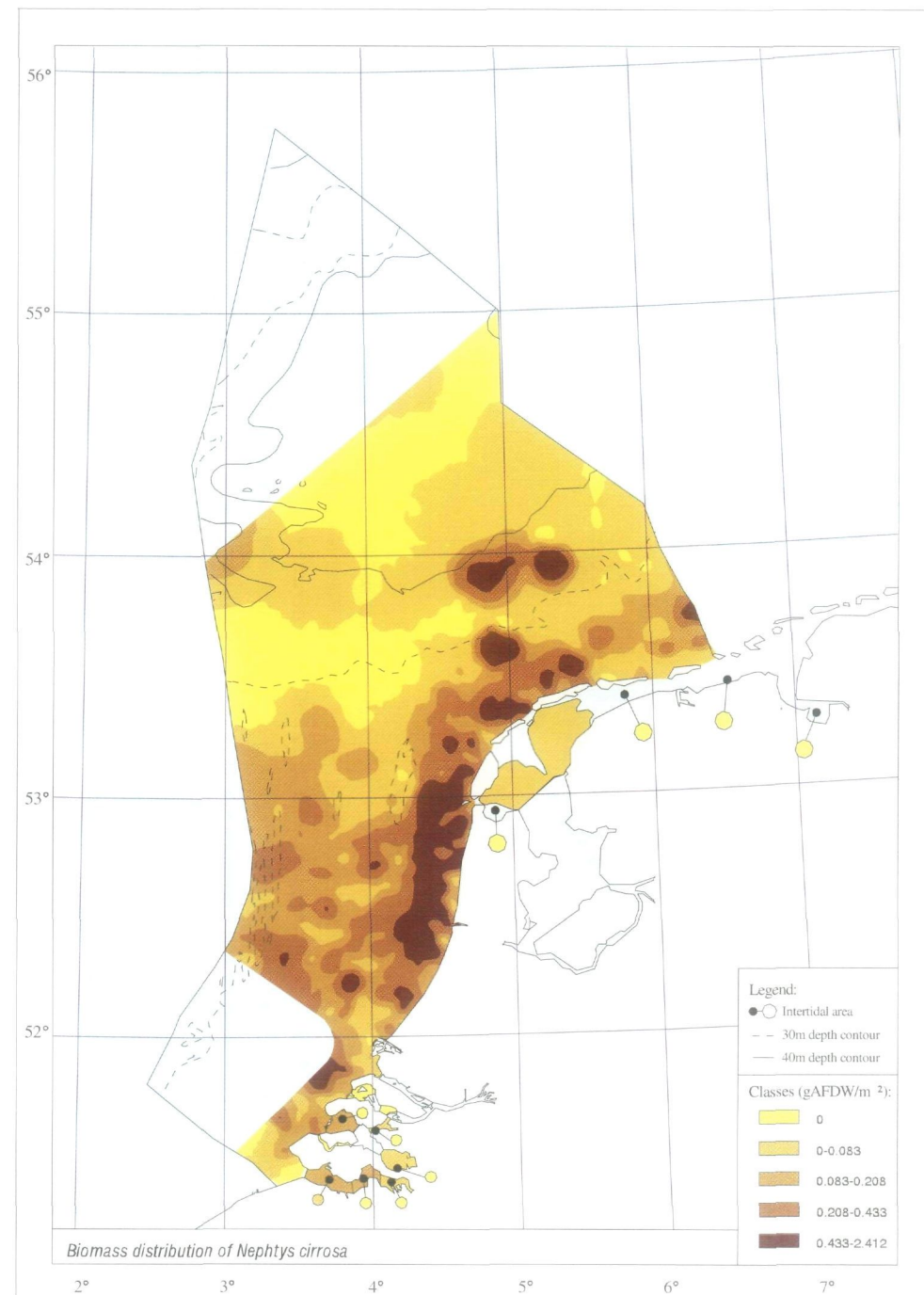
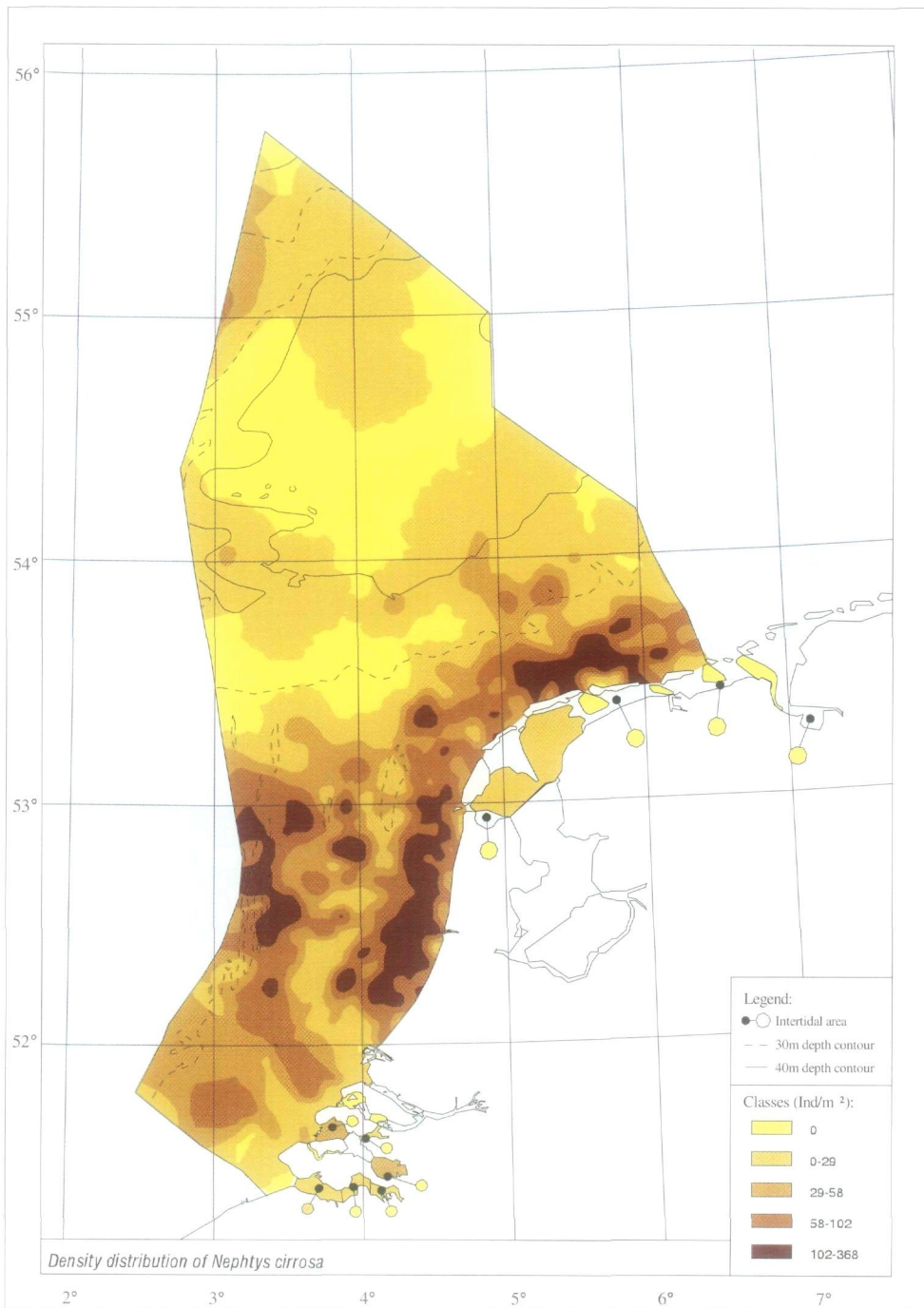
year of life and lives for a period of about 7 years.

N. caeca is a predator moving through the top layer of the sediment in search for molluscs, crustaceans and other polychaetes. The species is eaten by juveniles of haddock and thornback (Hartmann-Schröder, 1971; Wolff, 1973; Curtis, 1977; Fauchald & Jumars, 1979; Sips, 1988; Fish & Fish, 1989; Olive & Morgan, 1991).

Distribution

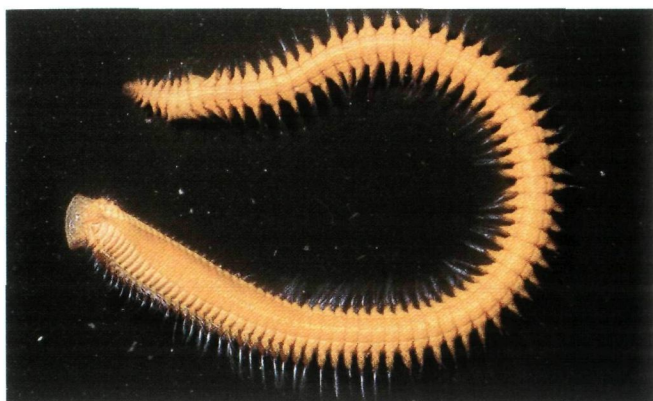
N. caeca occurs in small numbers in a broad region parallel to the coast. It is even more scarce in the offshore part of the Dutch Continental Shelf, where it is only recorded from the Dogger Bank, the Cleaver Bank and the eastern part of the Oyster Ground. The species also occurs in the low intertidal zone of the Delta area and the Wadden Sea. Because of its size the biomass of *N. caeca* can be locally important.

The species occurs in a wide variety of sediments ranging from coarse to fine muddy sand.



Nephtys cirrosa

EHLERS / 1868



M. LAVALLEYE

Morphology

A relatively slender nephtyid polychaete of a few centimetres long and about 95 segments. Apart from its dimensions, *N. cirrosa* differs from the other *Nephtys* species by the absence of dorsal cirri, the serrated sculpture of the chaetae and the small size and shape of the gills. It is yellowish white with red gills (Wolff, 1973; Sips, 1988; Hayward & Ryland, 1990; Olive & Morgan, 1991).

Biology

Breeding occurs in March and August. The species presumably has planktonic larvae.

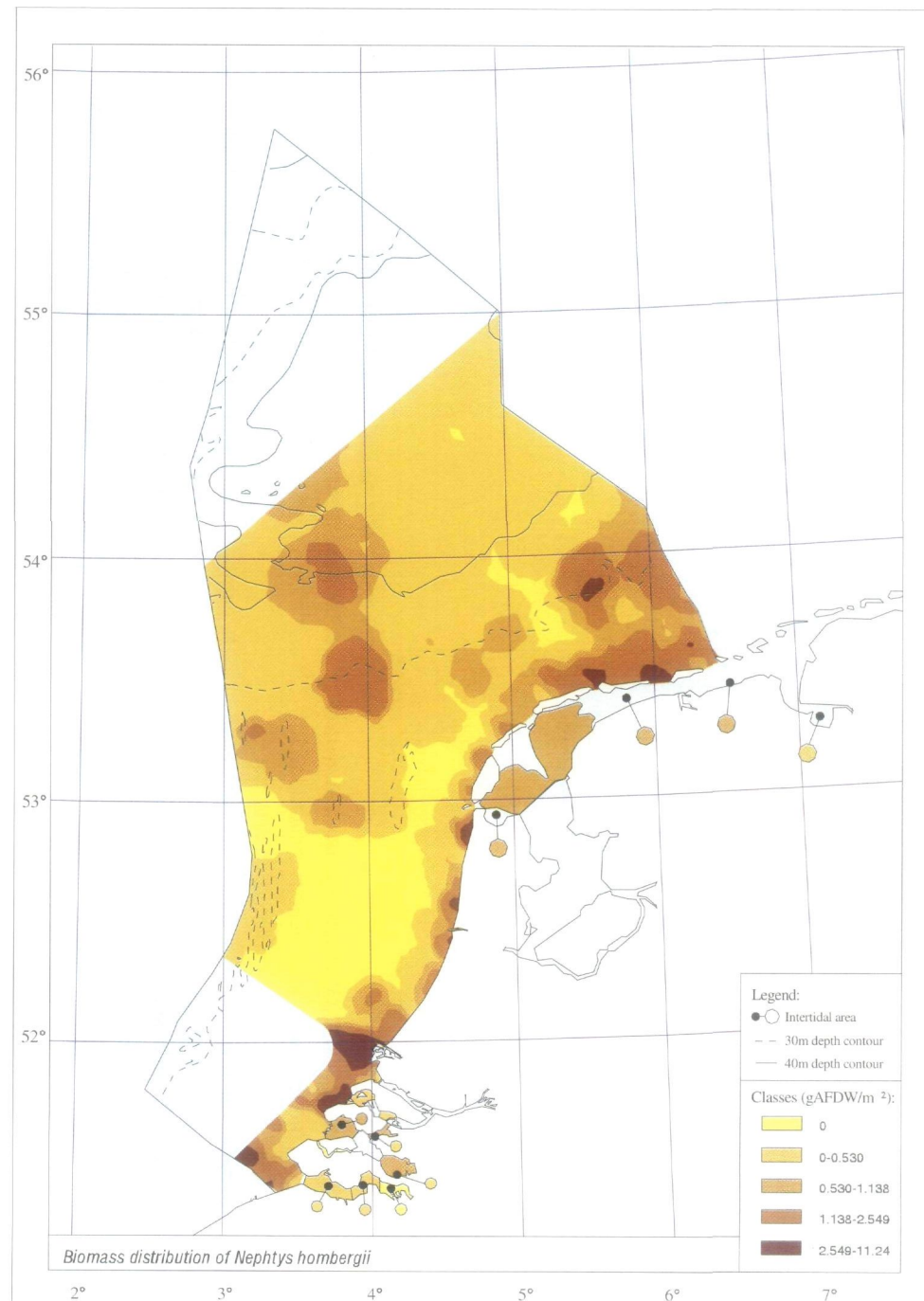
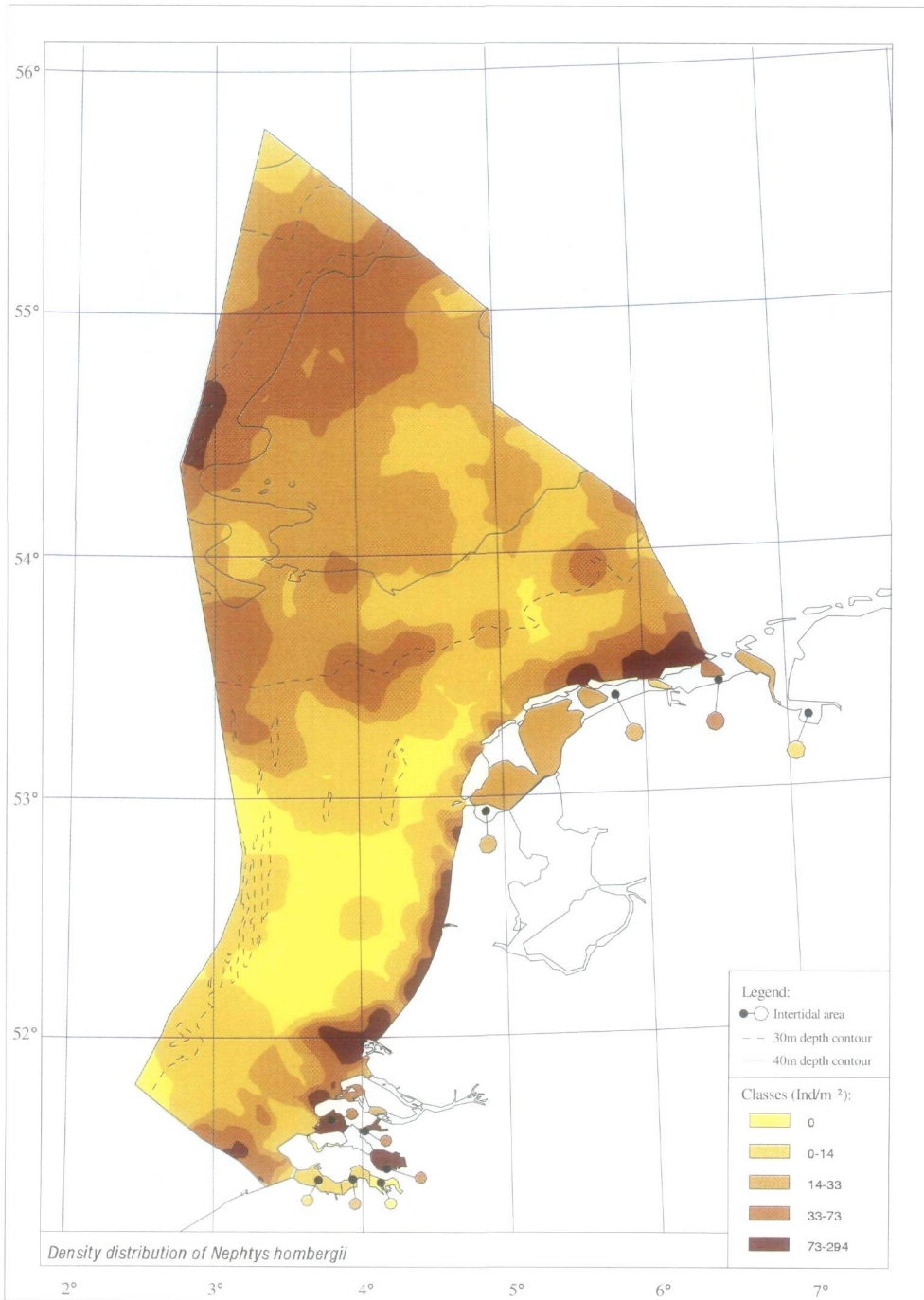
Analyses of its gut contents has shown this species to be a predator of small invertebrates (Clark, 1962; Hartmann-

Schröder, 1971; Wolff, 1973; Fauchald & Jumars, 1979; Olive & Morgan, 1991).

Distribution

N. cirrosa is a dominant species in the Southern Bight with high densities at the Brown Bank and near the coast. It is furthermore common at the Dogger Bank. Only few individuals are found in the Oyster Ground. Low densities are furthermore reported from the Delta area and the western Wadden Sea.

The distribution of *N. cirrosa* appears to be strongly related to the grain size of the sediment, i.e. it prefers clean, coarse to fine sandy sediments as found in the Southern Bight (Rainer, 1991).



Nephtys hombergii

SAVIGNY / 1818

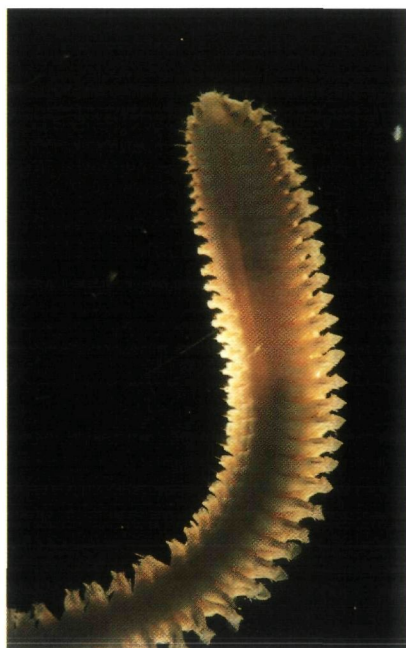
English

Catworm

Dutch

Zandzager

D. B. EDWARDS / MINISTRY OF AGRICULTURE, FISHERIES AND FOOD



Morphology

A robust nephtyid that is markedly rectangular in cross section. Differences with other the *Nephtys* species are the combination of lacking dorsal cirri, incised parapodial lobes and distinctly curved gills. The body is maximally 150 mm long with 200 segments. It is pink to flesh-coloured, with a pearly sheen and red gills (Fish & Fish, 1989; Hartmann-Schröder, 1971; Sips, 1988; Hayward & Ryland, 1990; Rainer, 1991).

Biology

The sexes are separate and individuals breed several times over a number of years. Generally, the females breed once each year, beginning in their second year. Breeding takes place between April and June and the larvae are planktonic.

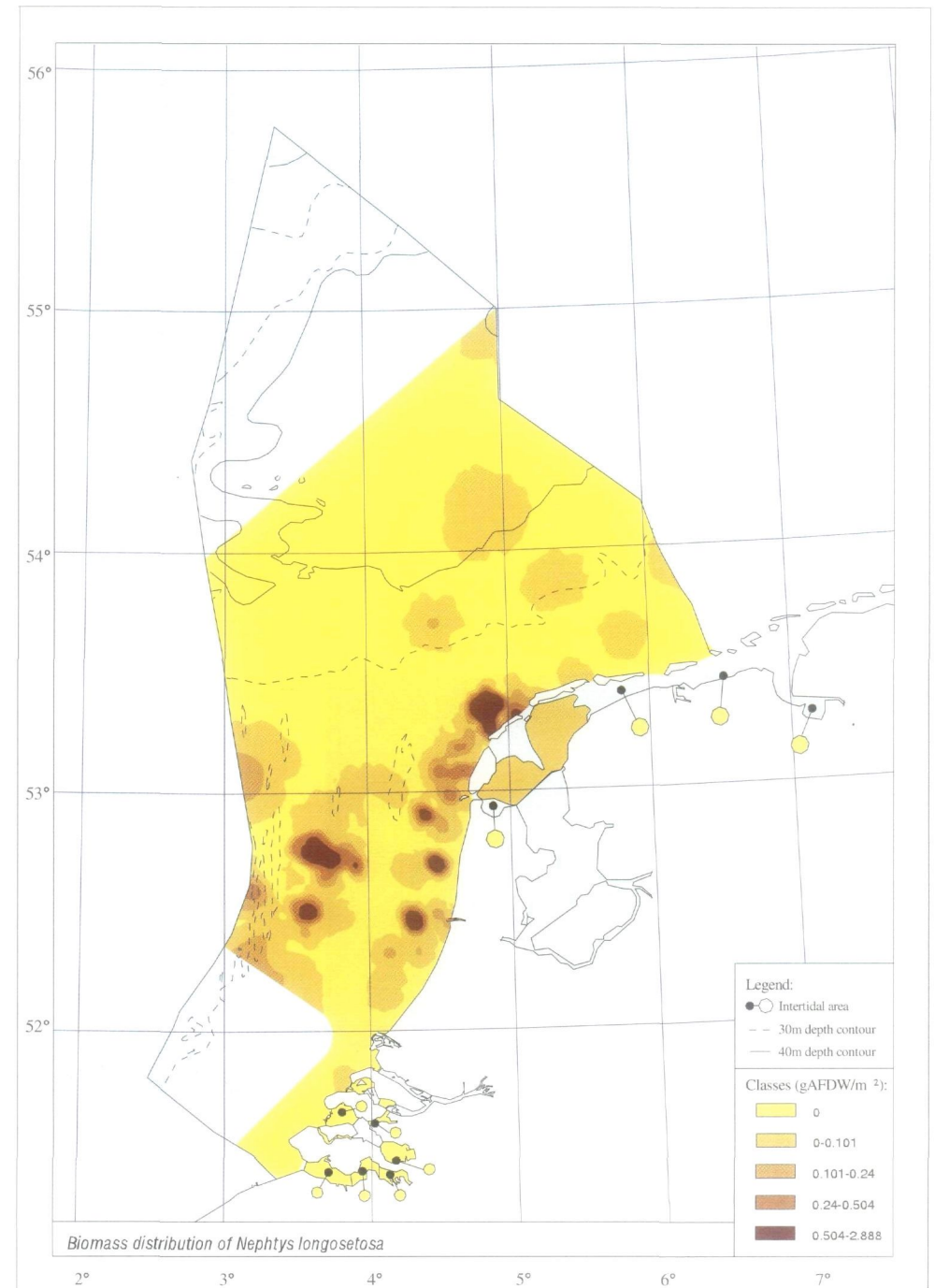
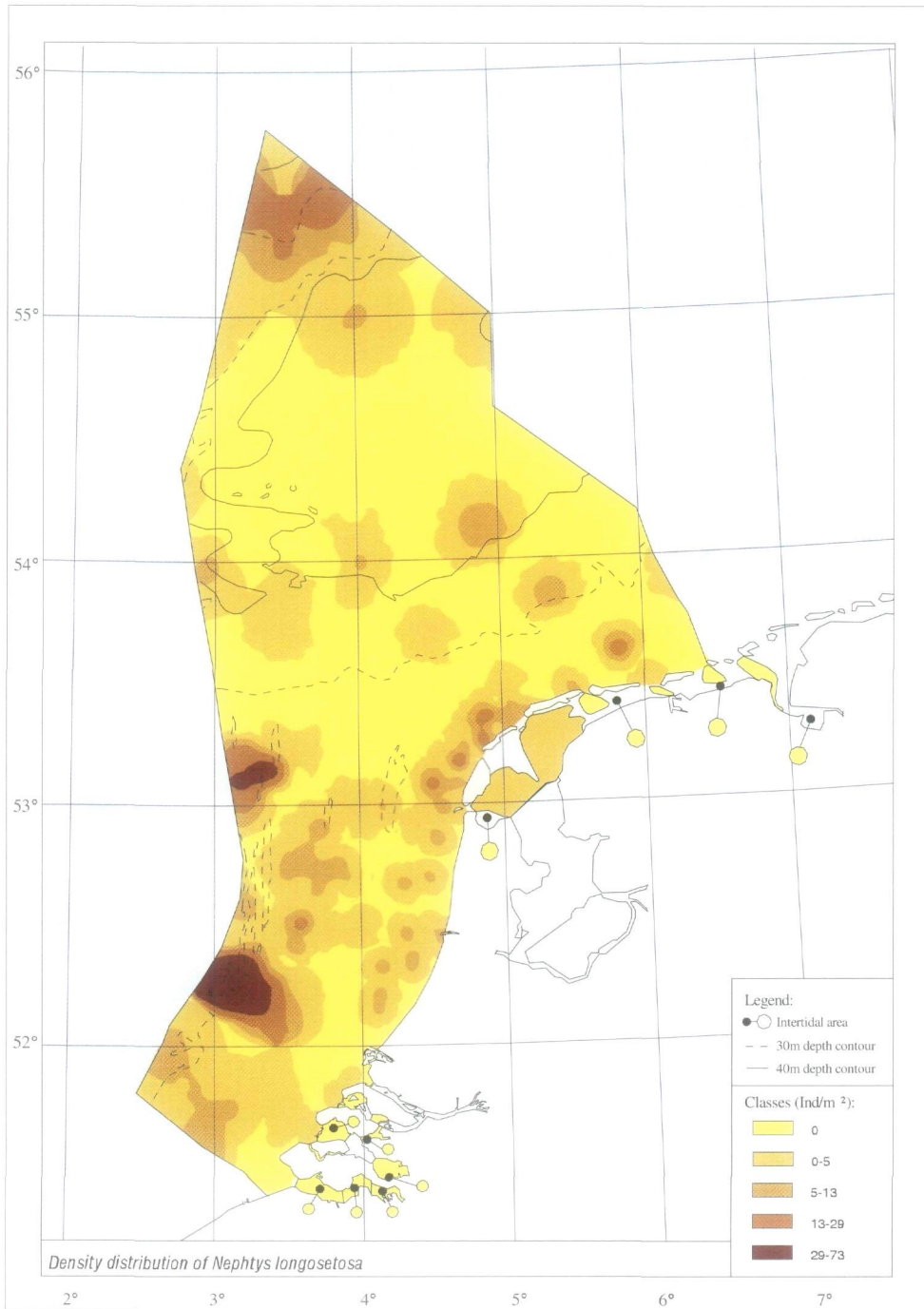
N. hombergii is potentially a long-lived species, viz. up to 5 years, as determined from the annual rings in its jaws.

N. hombergii is a burrowing predator of juvenile molluscs, crustaceans and other polychaetes. It also feeds on carrion, diatoms and detritus. Studies in the Wadden Sea have shown

this species to be sensitive to low winter temperatures. After cold winters the reduced population showed an increase in production (Clark, 1962; Hartmann-Schröder, 1971; Wolff, 1973; Kirkegaard, 1978; Beukema, 1979; Fauchald & Jumars, 1979; Beukema & Essink, 1986; Sips, 1988; Fish & Fish, 1989; Mathivat-Lallier & Cazaux, 1991; Olive & Morgan, 1991; Rainer, 1991).

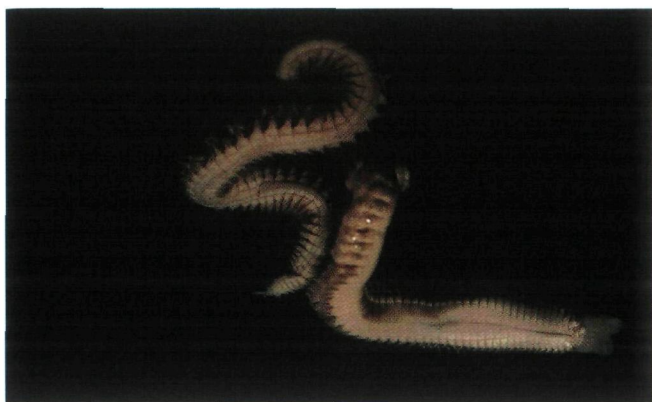
Distribution

The species is common near the coast, in the Wadden Sea and almost the entire Delta area, with high densities in the Oosterschelde. *N. hombergii* is furthermore abundant in the southern part of the Dogger Bank. It is not found in the clean sandy substrates in the Southern Bight, in contrast to *N. cirrosa* and *N. longosetosa*. Other studies, however, have reported it from sand, muddy sand, mud and gravel. The species seems to dominate at locations with regularly or permanently low oxygen concentrations (Fallesen & Jørgensen, 1991).



Nephtys longosetosa

OERSTED / 1843



J. VAN DER HOEK

Morphology

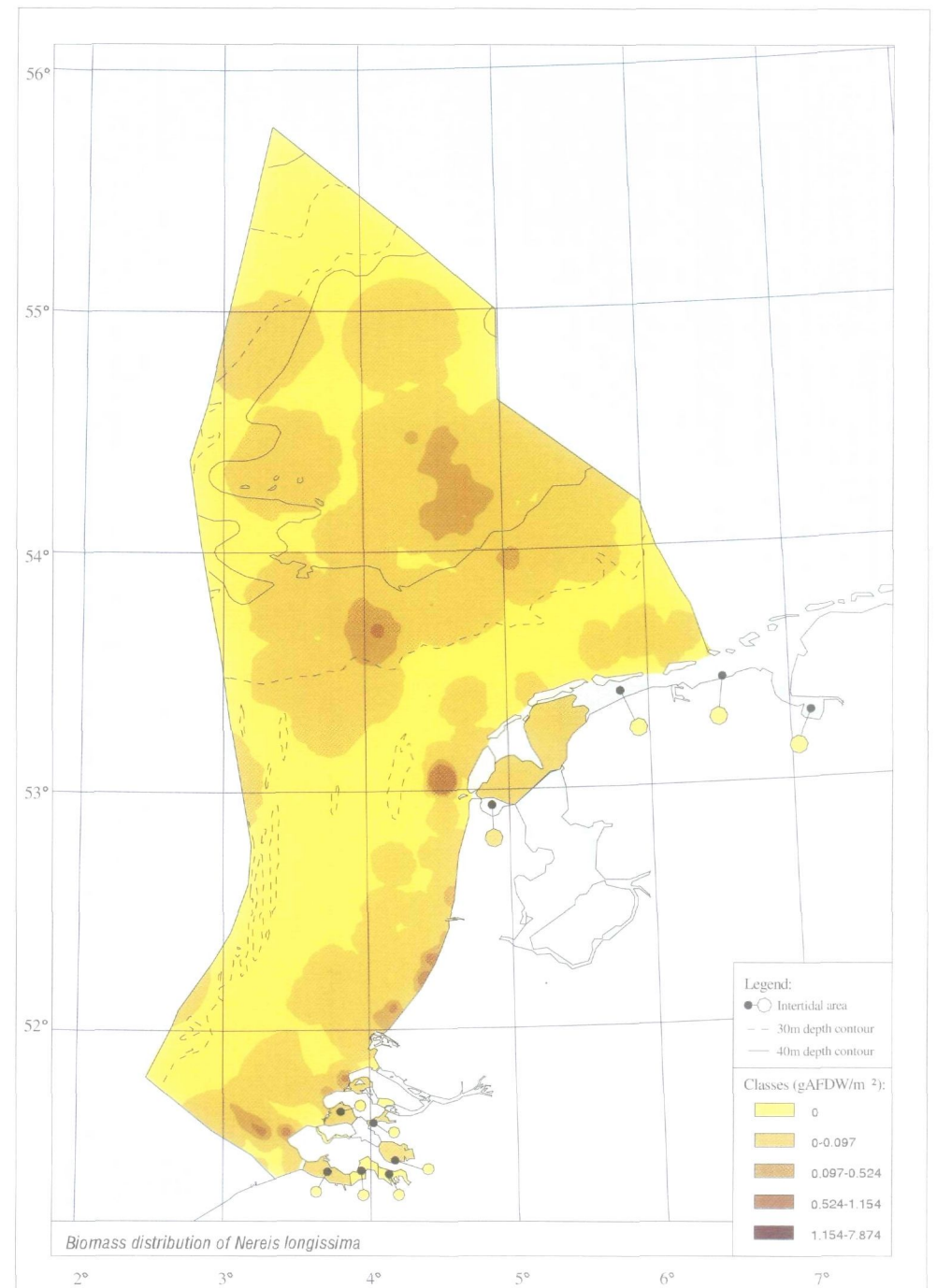
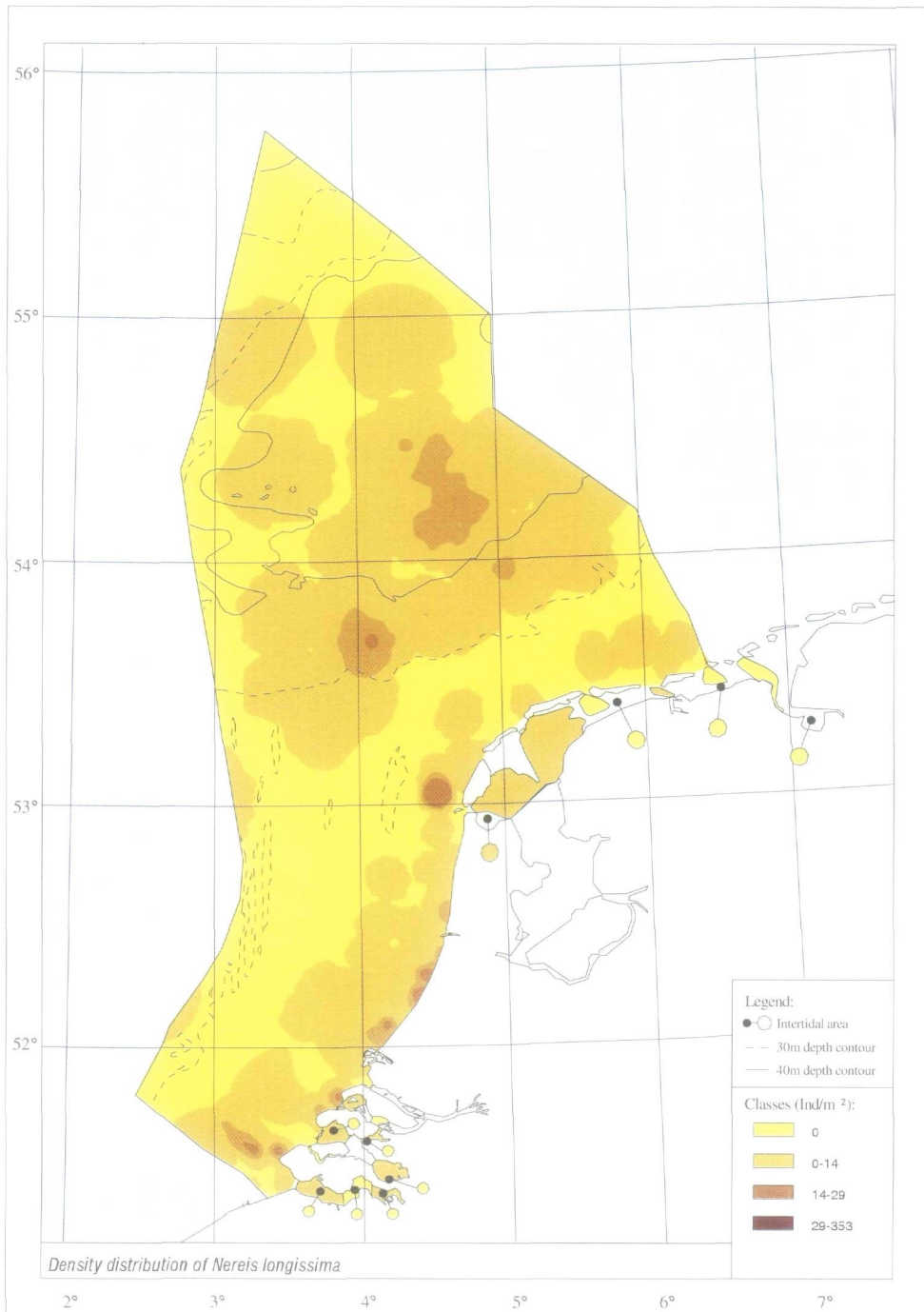
A slender nephtyid, resembling *N. cirrosa* macroscopically, but differing from it by the presence of dorsal cirri and by details of the parapodial lobes and gills. The body measures up to 150 mm in length with 120 segments. It is cream-coloured to colourless (Hartmann-Schröder, 1971; Sips, 1988; Hayward & Ryland, 1990; Rainer, 1991).

Biology

N. longosetosa breeds from January to early spring and seems to have planktonic larvae. The species is a carnivorous predator, feeding on small invertebrates (Wolff, 1973; Fauchald & Jumars, 1979; Olive & Morgan, 1991).

Distribution

The species occurs in the sublittoral zone of the western Wadden Sea, in the shallow waters along the coast and in the Southern Bight down to a depth of 50 m. *N. longosetosa* is also common at the Dogger Bank, but is absent from the central Oyster Ground. It has not been observed in the Delta area. Although reported from a wide variety of sediments, e.g. gravel to coarse sand, on oyster banks and among tubes of *Lanice conchilega*, in the study area it shares a preference for the fine to medium sand with *N. cirrosa*. In this respect *N. longosetosa* clearly differs from *N. hombergii*, which seems to prefer muddier substrates.



Nereis longissima

JOHNSTON / 1840

Synonym(s)

Eunereis longissima

E. STIKVOORT



Morphology

A species with a long, rather flattened body of up to 150 mm in length, with over 200 segments. The head is conical, truncate, with two frontal antennae, two biarticulate palps and four relatively small eyes. The first segments bears four pairs of cirri. Like all nereids, the species has an eversible proboscis and two terminal jaws. The small number of teeth on the proboscis are characteristic for this species. The body segments are rather uniform, with prominent, powerful parapodia bearing distinct lamellae. It is blue-grey, reddish or pinkish in colour (Hartmann-Schröder, 1971; Hayward & Ryland, 1990).

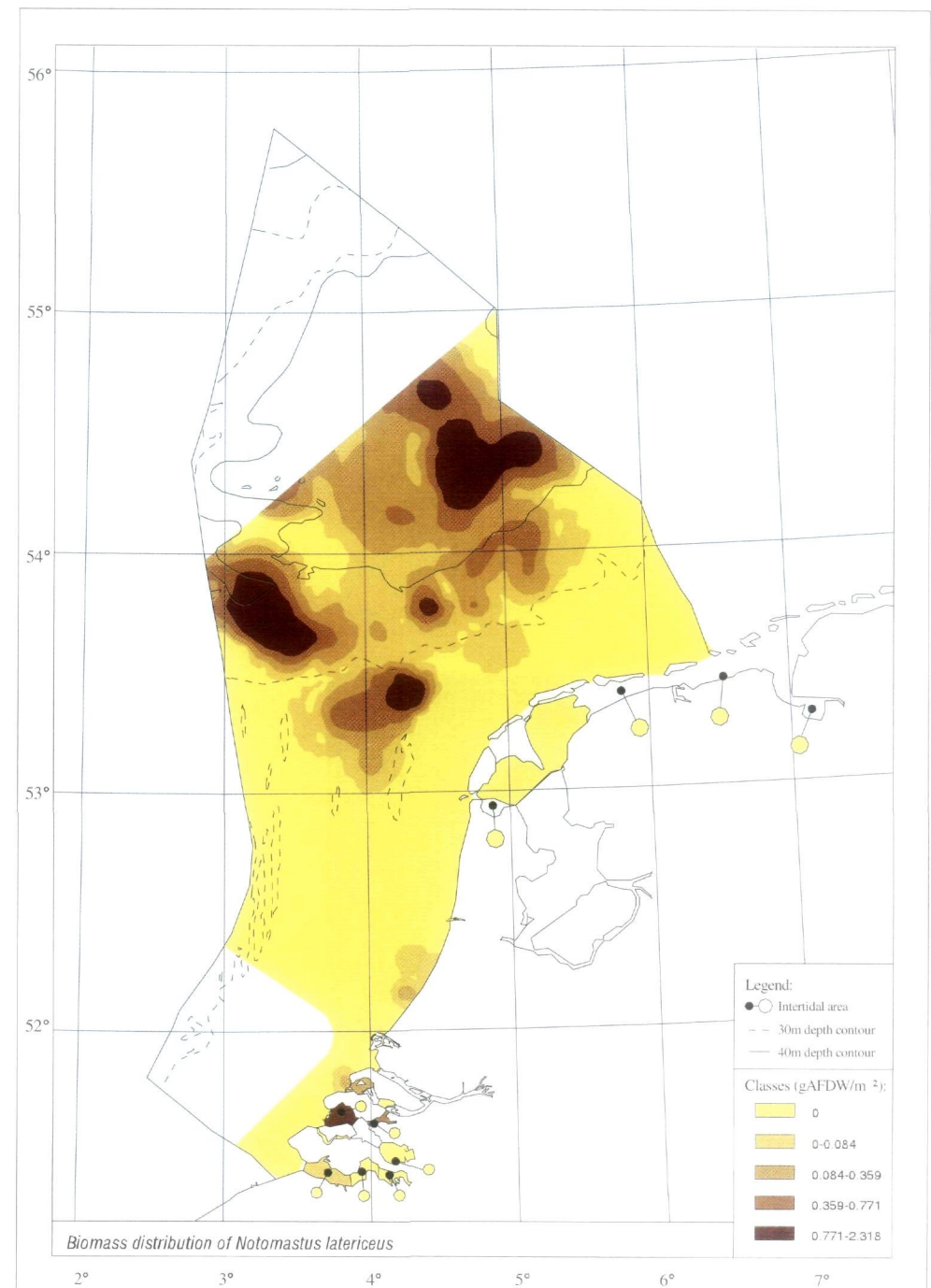
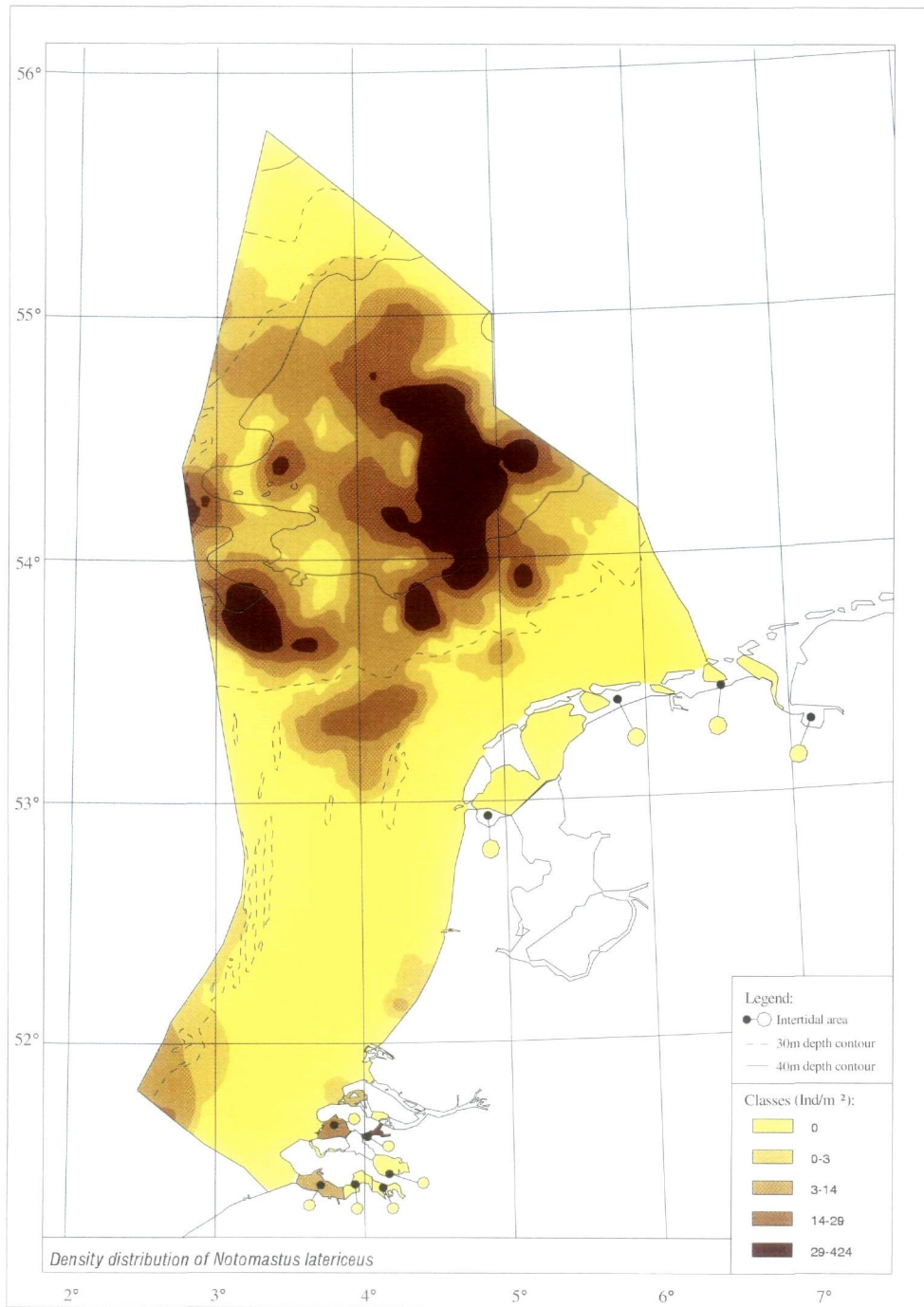
Biology

Sexually ripe specimens have been observed in April and May. Most probably the larvae have a planktonic development.

N. longissima lives in burrows. When conditions become unfavourable it will rapidly and repeatedly move and set up a new tube at other locations. *N. longissima* is mainly a non-selective deposit feeder, feeding on algae and dead animals. The species itself is eaten by flatfish (Hartmann-Schröder, 1971; Wolff, 1973; Fauchald & Jumars, 1979).

Distribution

N. longissima occurs from the subtidal zone of the Wadden Sea and the Delta area down to a depth of 50 m in the Oyster Ground, where it is quite abundant. In the offshore part of the Southern Bight *N. longissima* is almost absent. Its density distribution suggests a preference for substrates with an admixture of mud.



Notomastus latericeus

SARS / 1851



M. LAVALLEYE

Morphology

Like most members of the Capitellidae this is a species with a simple, smooth body, lacking any appendages other than short chaetae. The head is short, triangular and smooth. The species has an eversible sac-like pharynx. The body is relatively long, up to 150 mm, and made up of 150 segments, which are of two types and divided over two body regions. The anterior region is relatively thick, cylindrical and purple or dark red. The tail region is more slender and bright red or yellowish (Hartmann-Schröder, 1971; Hayward & Ryland, 1990).

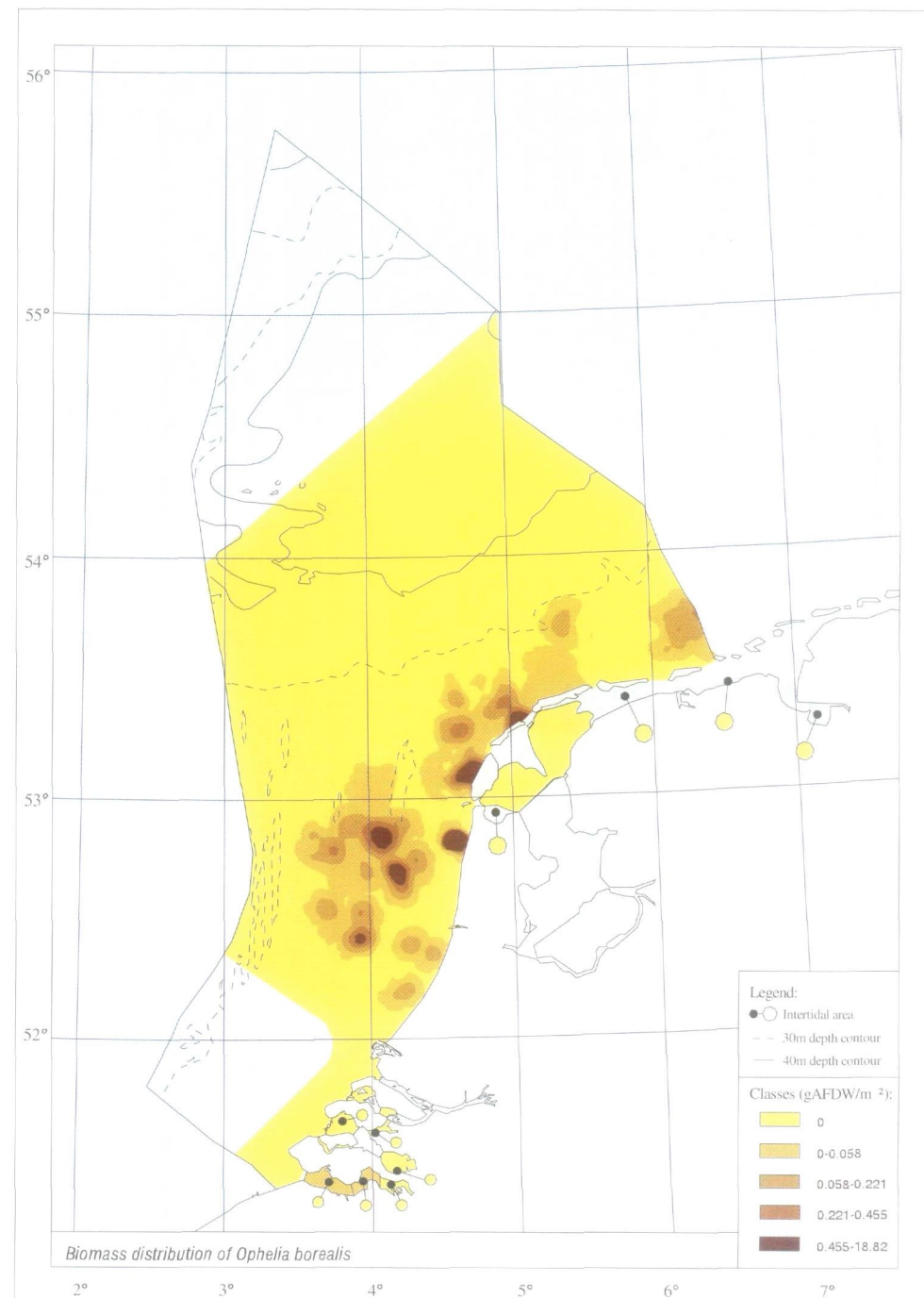
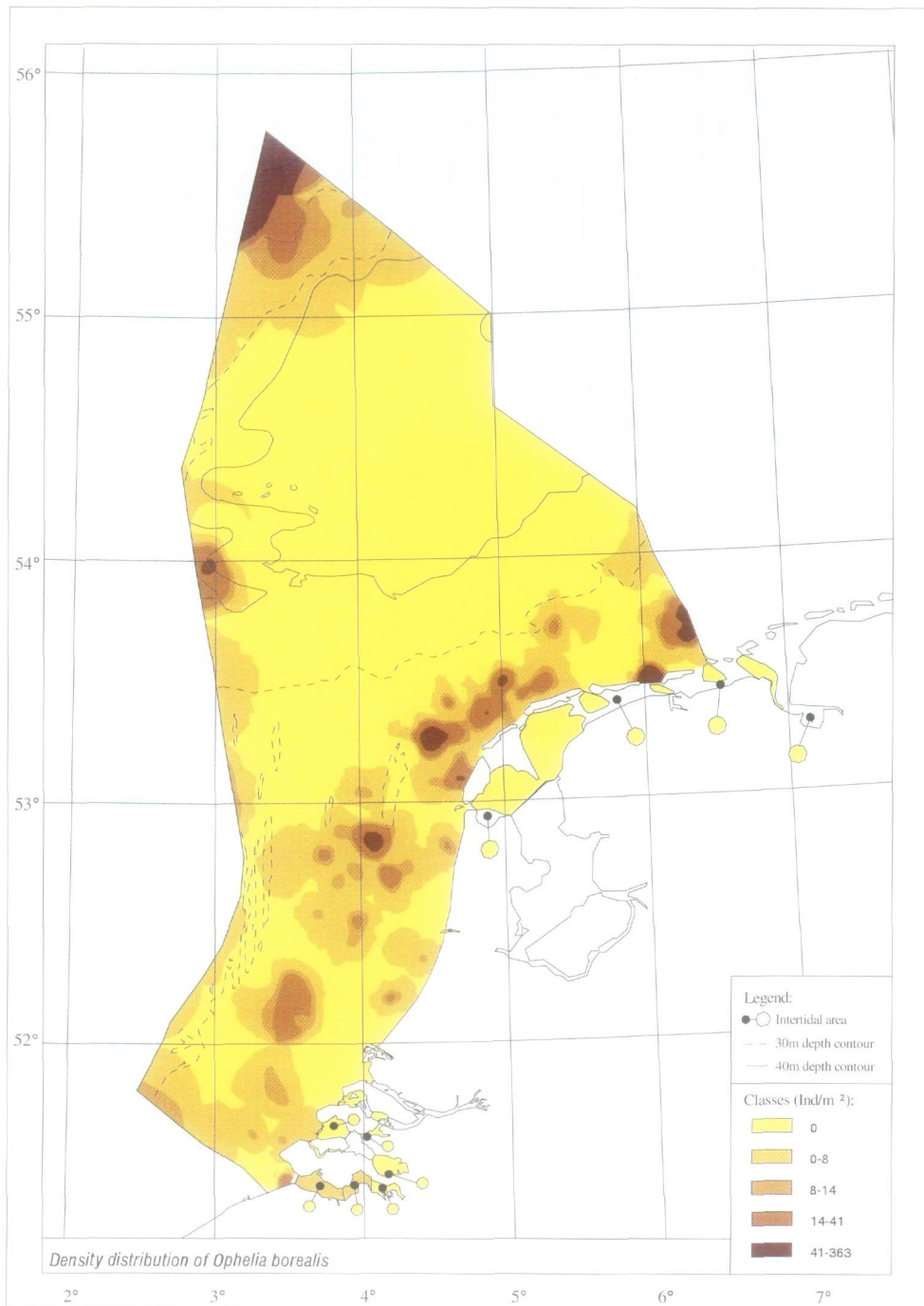
Biology

Pelagic larvae have been found in December, February and April, whereas settling has been observed in August-October. The settling larvae prefer mud and sand above clean shell gravel and are not very tolerant to low salinities. *N. latericeus* is tubicolous as a juvenile, but free-living when

adult. Adult specimens build partially spiralled burrows that maintain integrity for sometime after construction, but lack a distinct wall structure. Capitellids are mentioned to be non-selective deposit feeders, although *N. latericeus* may prove to be more selective as suggested by its gut contents. The species is recorded living as a commensal with the entoproct *Loxosoma singulare* (Hartmann-Schröder, 1971; Wolff, 1973; Fauchald & Jumars, 1979).

Distribution

This species is quite common at the Oyster Ground. *N. latericeus* also occurs at a few locations in the south-western part of the Southern Bight, near the coast and in the marine part of the Delta area. In the study area *N. latericeus* shows a clear preference for fine muddy sand. In the southernmost part of the Southern Bight the species is found in coarse sand.



Ophelia borealis

QUATREFAGES / 1865

Synonym(s)

Ophelia limacina

J. VAN DER HOEK



Morphology

Body short, thick and spindle-shaped. Body maximally 50 mm in length and divided into 40 segments. The front part is cylindrical, while the hind part of the body has a ventral groove. The head is pointed, without appendages. Parapodia are inconspicuous and bear finger-like gills on the posterior part of the body. *O. borealis* is pink to flesh-coloured (Hartmann-Schröder, 1971).

Biology

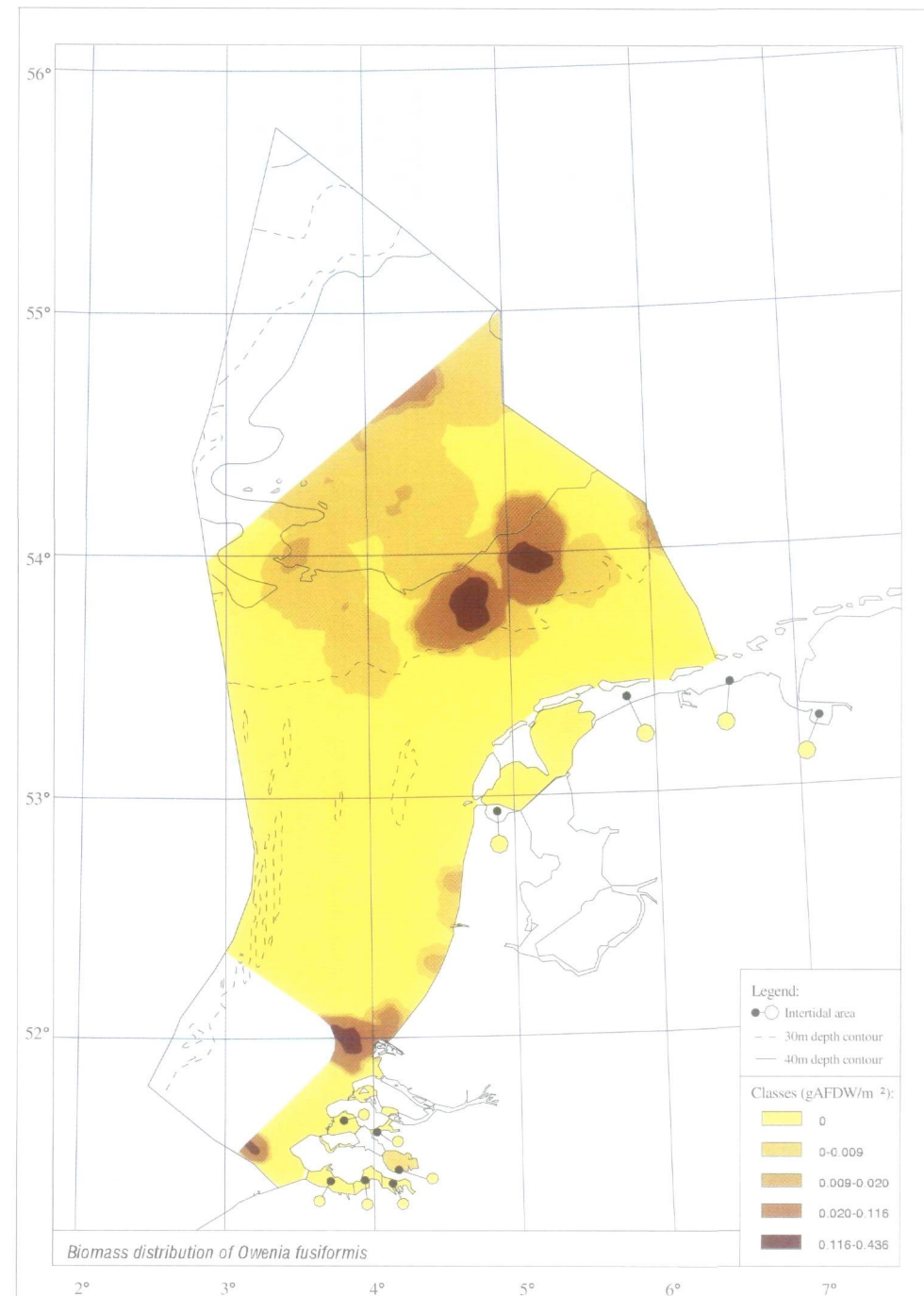
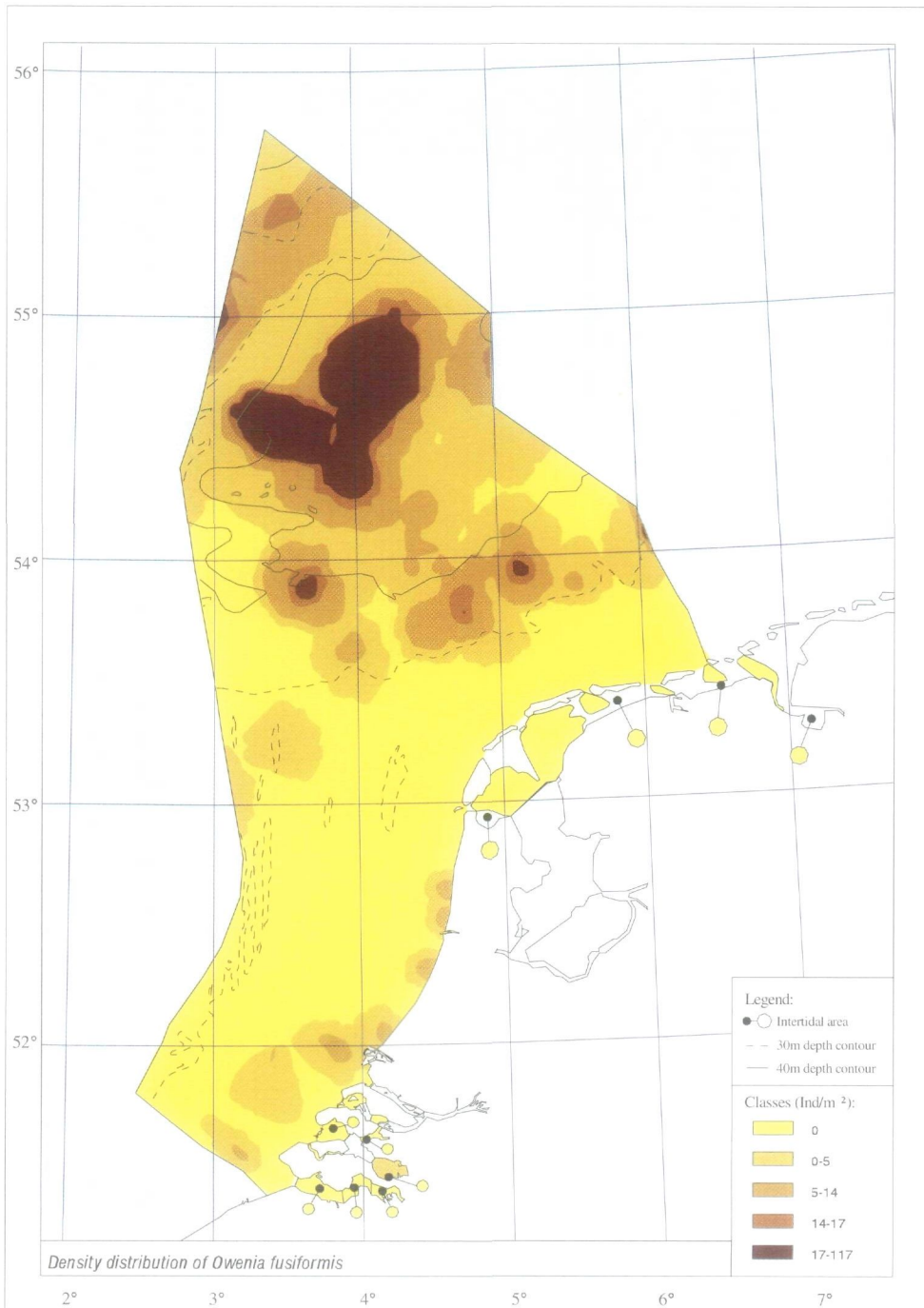
Females with ripe eggs have been observed in spring and summer. The planktonic larvae occur in waters with a salinity down to 13‰.

O. borealis is a typical non-selective deposit feeder.

The lack of food specialisation of adults contrasts sharply with the selectivity of juveniles for certain types of substrate. The species is food for demersal fish (Hartmann-Schröder, 1971; Wolff, 1973; Curtis, 1977; Kirkegaard, 1978; Fauchald & Jumars, 1979).

Distribution

O. borealis is found in the Southern Bight, its distribution extending into the marine and central part of the Westerschelde. The polychaete also occurs north of the Wadden islands, at the Cleaver Bank and more offshore at the Dogger Bank, but is absent from the Oyster Ground. The species prefers medium to coarse sands mixed with gravel or shell fragments. Muddy sediments seem to be avoided.



Owenia fusiformis

DELLE CHIAJE / 1841

German

Spindelförmige Owenie



J. VAN DER HOEK

Morphology

A species with a long, cylindrical body lacking parapodia. The frontal end of the body consists of a circle of short, fringed tentacles. The maximum length amounts to 50 mm with 30 segments. The body is greenish or yellowish, with paler transverse bands. The tube is characteristic, tapering towards one end and composed of overlapping shell fragments or sand grains (Fager, 1964; Fish & Fish, 1989; Hartmann-Schröder, 1971; Hayward & Ryland, 1990).

Biology

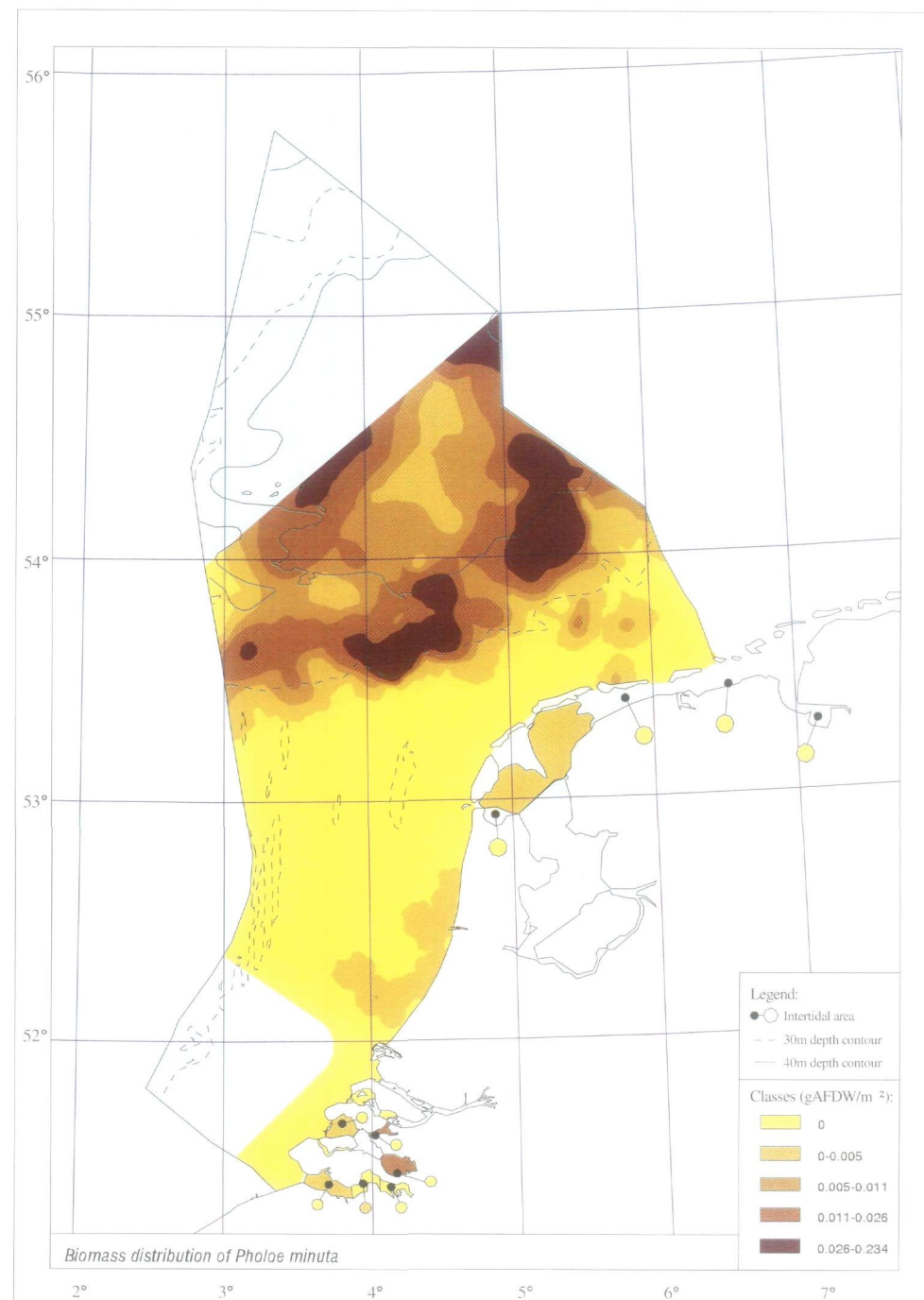
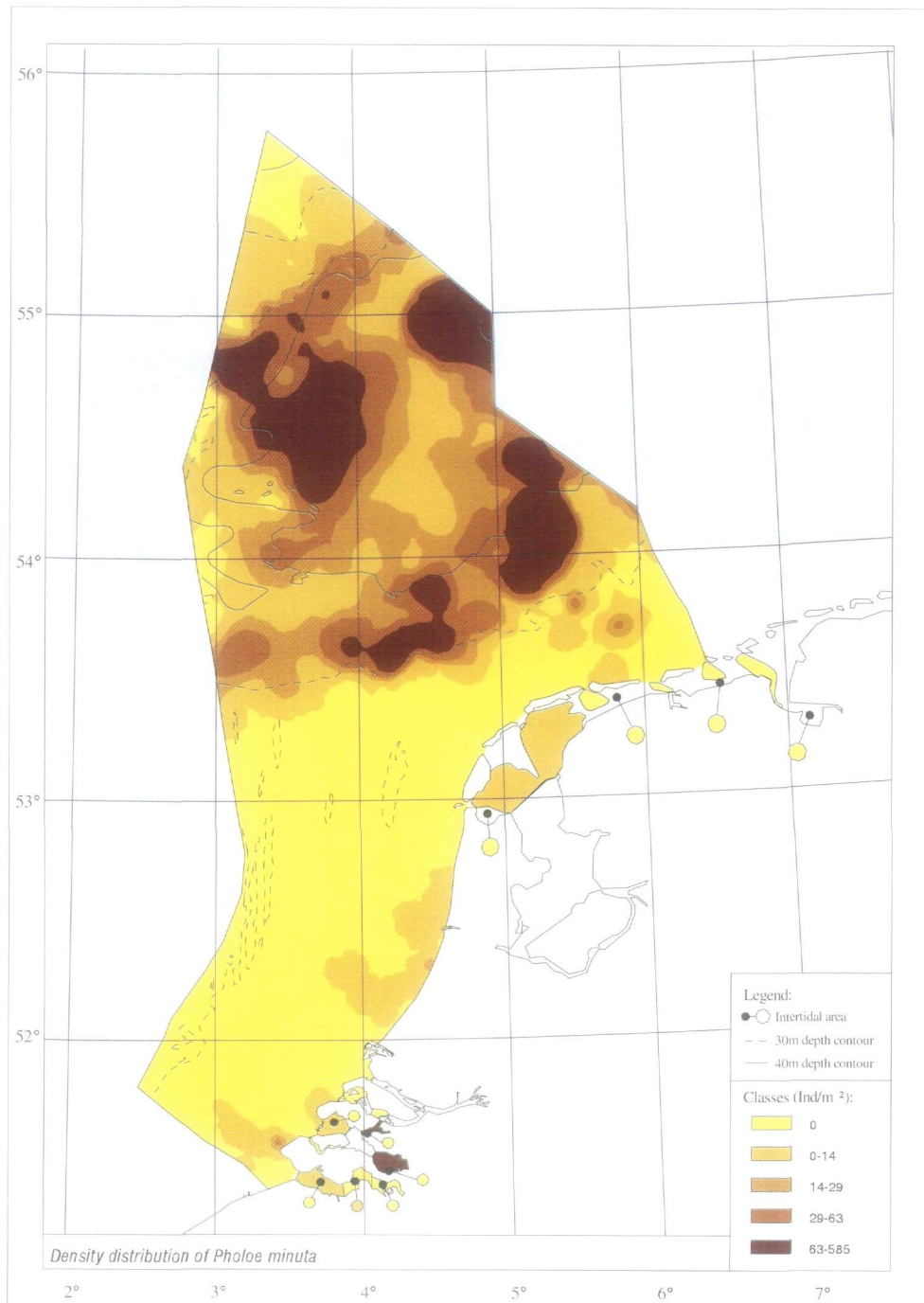
Main spawning period is short, *viz.* from June to July. The larvae remain in the plankton for at least four weeks. This species seems able to adapt its reproductive strategy to different environmental conditions. In more temperate waters *O. fusiformis* produces a distinctive type of planktotrophic larva and breeding occurs in autumn. *O. fusiformis* lives in tubes that are partly buried in the sediment and partly extend from the sediment. It is able to live in low oxygen concentrations for a short time.

O. fusiformis selectively ingests suspended and deposited particles. It feeds by means of the lobed tentacular crown, either in an upright position or bent over to the sediment surface, thereby exposing its anterior part. The species is often found in stomachs of flatfish, haddock and cod (Hartmann-Schröder, 1971; Wolff, 1973; Curtis, 1977; Fauchald & Jumars, 1979; Fish & Fish, 1989; Gentil *et al.*, 1990).

Distribution

O. fusiformis mainly occurs north of the 30 m isobath up to the Dogger Bank, with the highest densities in the northern part of the Oyster Ground. The species is also found in the southern part of the study area, *viz.* near the coast and in the easternmost part of the Oosterschelde.

In the study area *O. fusiformis* is predominantly found in substrates composed of fine sand with a high mud content, such as occur in the Oyster Ground. The distribution of this species is thought to be determined by temperature (Wolff, 1973).



Pholoe minuta

FABRICIUS / 1780

Synonym(s)

Pholoe inornata

Pholoe synophthalmica



M. LAVALEYE

Morphology

A small species, usually not more than 1 cm long. The body is flat, oblong and on the dorsal side covered with soft scales (elytra). In contrast to *Harmothoe* species the elytra leave the mid-dorsal part of the body free. The head bears four small eyes and one median antenna. The 40-60 elytra show concentric rings. The worm is black and pale pink, the elytra speckled with rusty brown (Hartmann-Schröder, 1971; Hayward & Ryland, 1990).

Biology

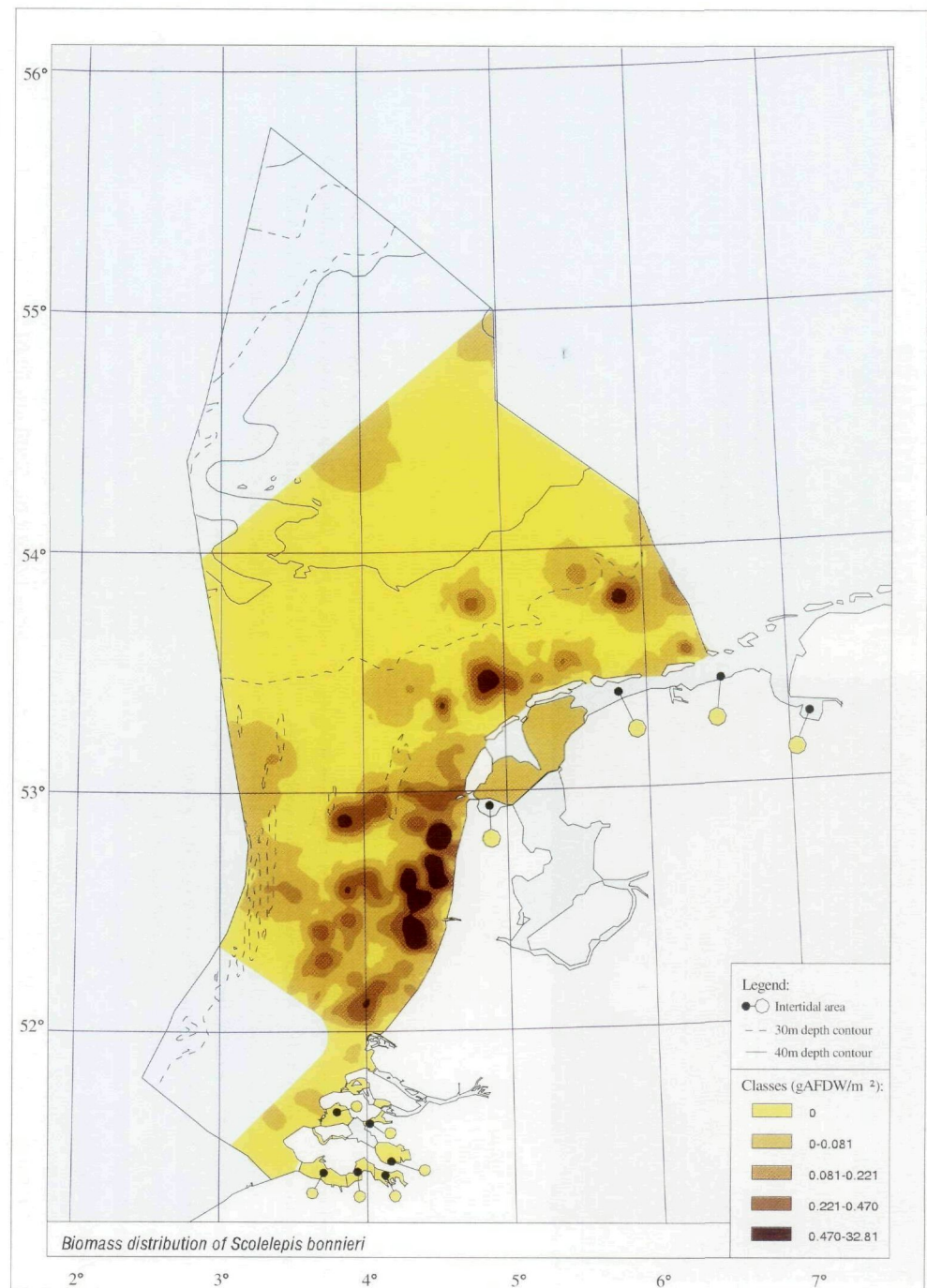
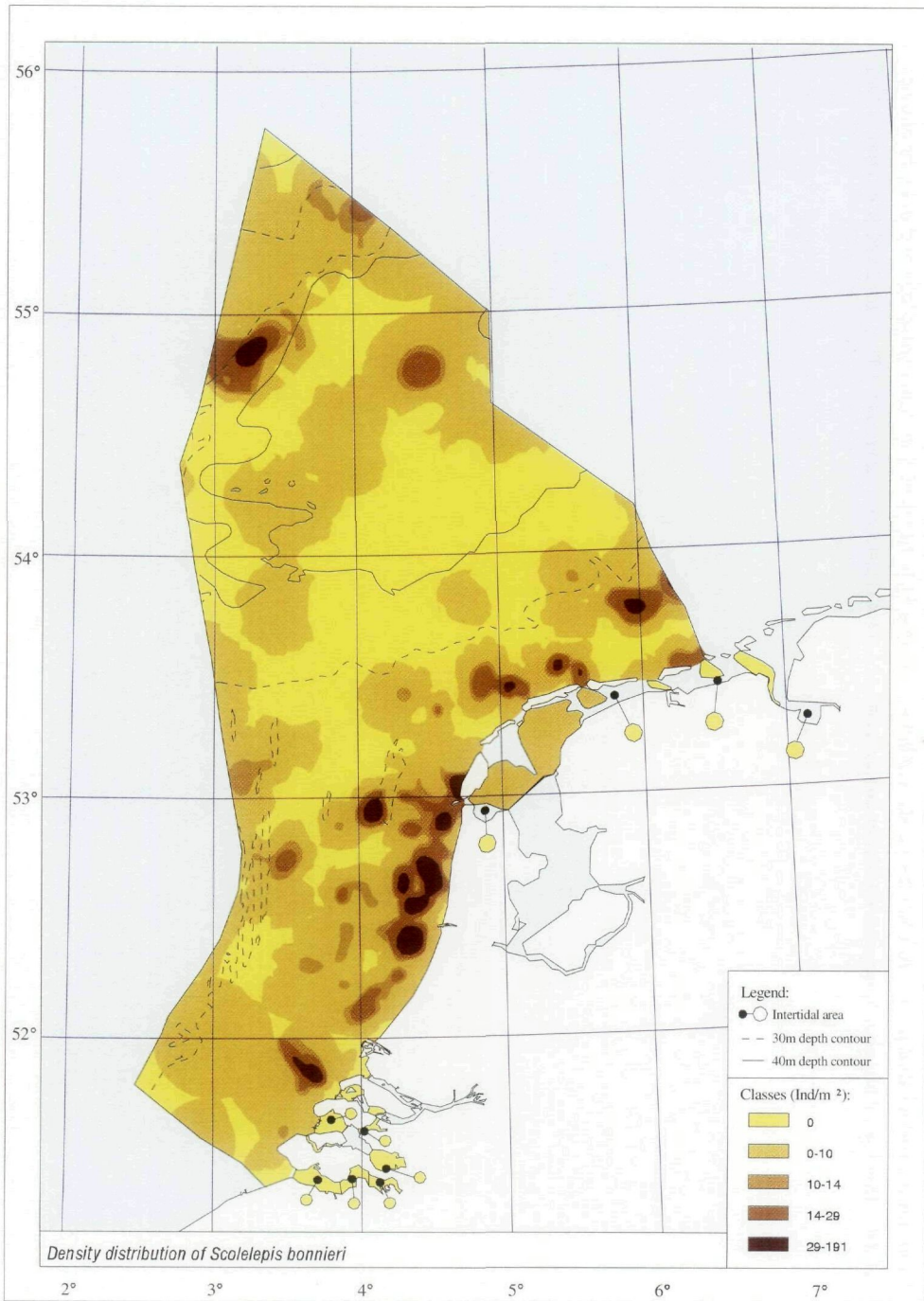
Reproduction takes place in spring and summer. The species has planktonic larvae. *P. minuta* is considered to be an opportunistic species that prefers to colonize newly available habitats, thereby taking advantage of a relatively fast growth.

All members of the family Sigalionidae, including this species, are active, free-living predators taking a variety of small invertebrates (Hartmann-Schröder, 1971; Wolff, 1973; Curtis, 1977; Fauchald & Jumars, 1979; Bosselmann, 1991).

Distribution

The distribution of *P. minuta* in the area comprises the brackish waters of the Delta area and the Wadden Sea, the coastal zone and the Oyster Ground, where the species is quite abundant. It is absent from the clean sandy substrates in a large part of the Southern Bight.

P. minuta prefers to live in very fine sand with more than 10% mud. It is also recorded from under stones, among old shells, in empty tubes of *Sabellaria spinulosa* and in black anoxic mud (Hartmann-Schröder, 1971; Hayward & Ryland, 1990).



Scolelepis bonnieri

MESNIL / 1896



J.A. VAN DALESEN

Morphology

Body cylindrical, with a maximum length of 40 mm and up to 90 segments. The head is pointed and bears two palps and a short median antenna of which the tip is free. The parapodia have distinct lobes on all segments and gills from one of the first segments onwards. The gills are fused with the upper lobe of the parapodia. The colour of the worm is pink (Hartmann-Schröder, 1971).

Biology

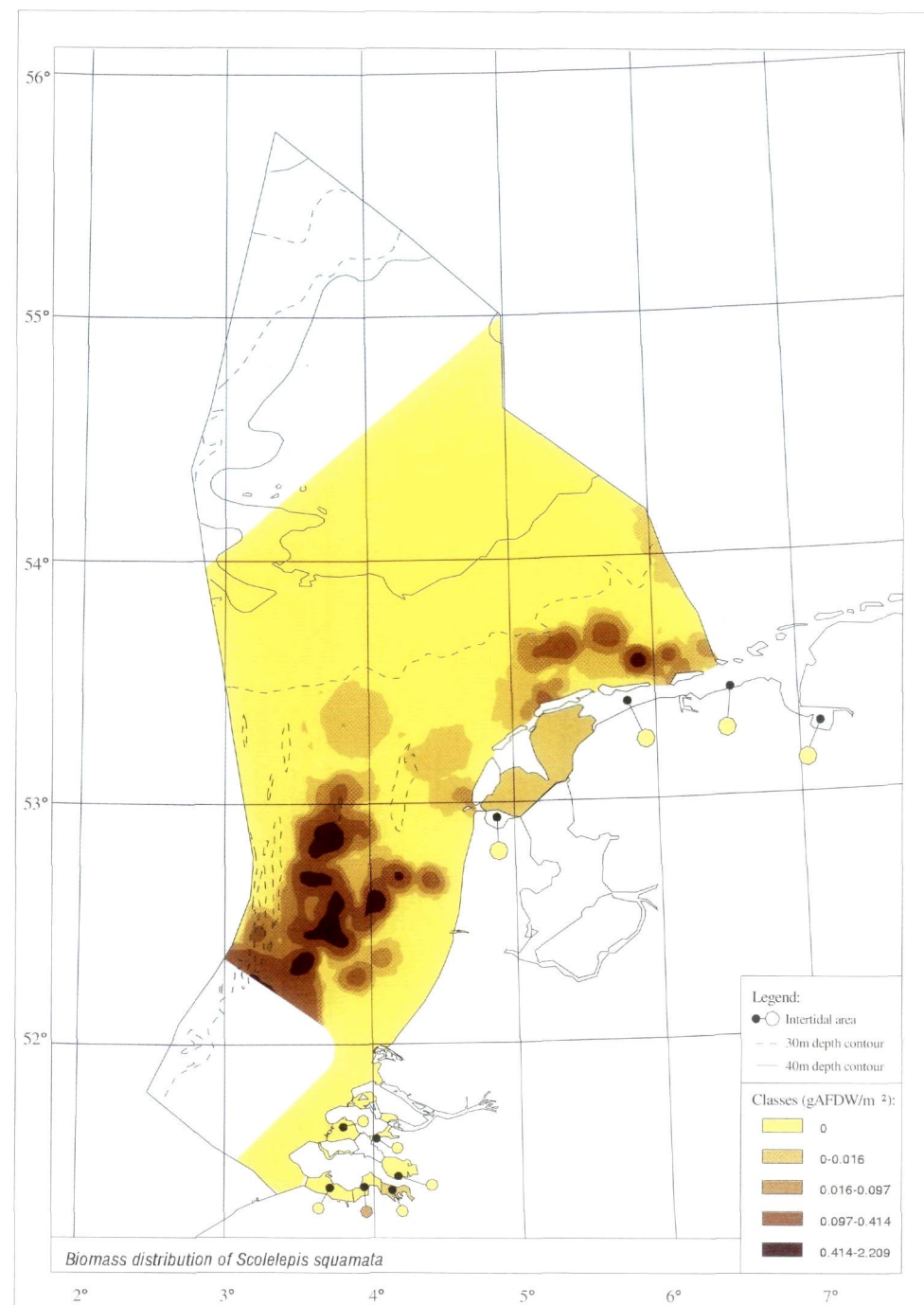
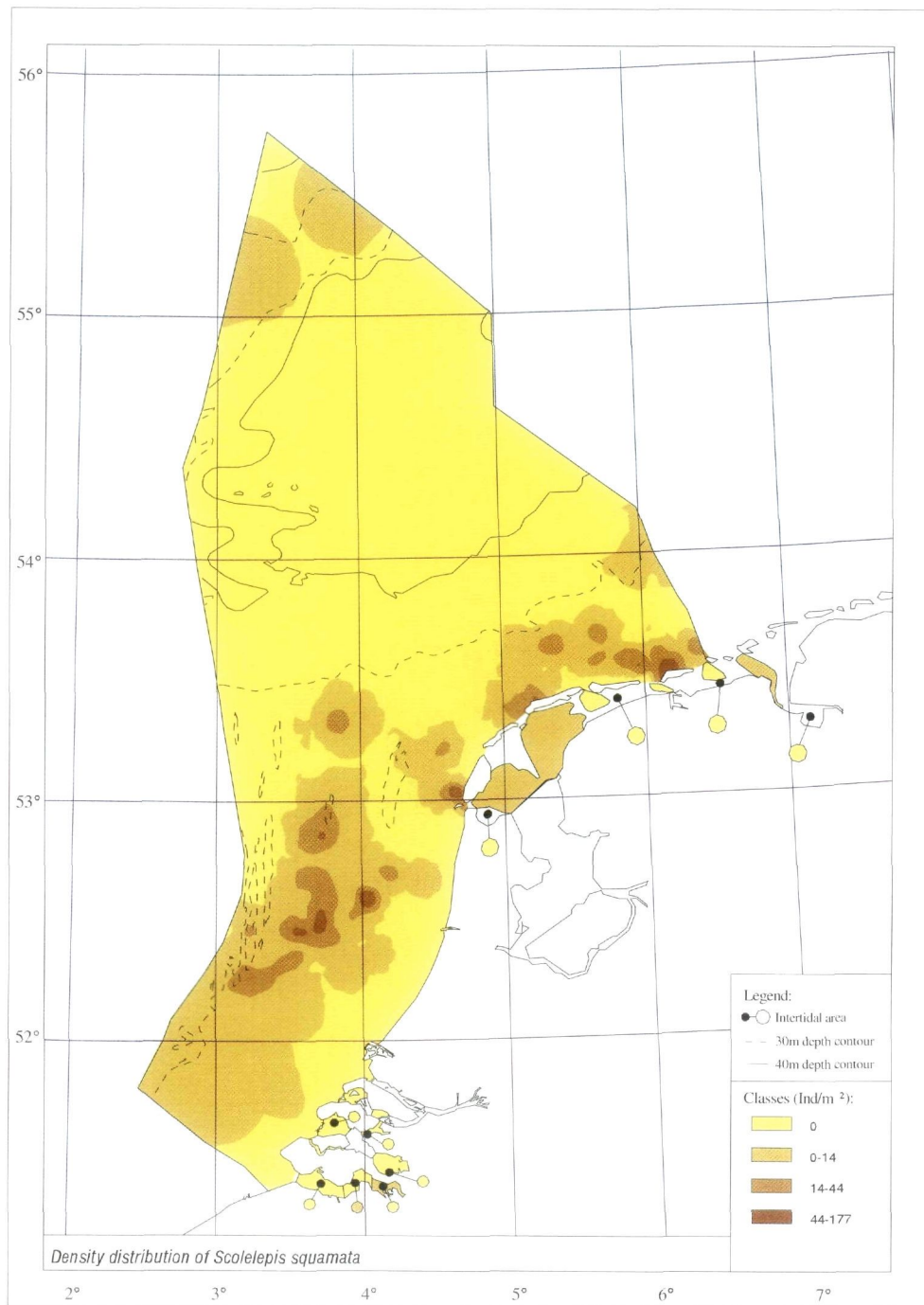
In spite of its common occurrence there is little information available on its life history or behaviour. *S. bonnieri* lives in mobile sands and builds loosely constructed burrows or is

free-living. Members of the family Spionidae are generally considered surface deposit feeders, using their ciliated palps to select food particles (Fauchald & Jumars, 1979).

Distribution

A widespread species occurring in the subtidal zone of the western Wadden Sea, the Southern Bight, part of the Oyster Ground and at the Dogger Bank. Highest densities are found near the coast. It is absent from the Delta area and the central Oyster Ground.

S. bonnieri lives in a wide range of sediment types but seems to avoid substrates with a high mud content.



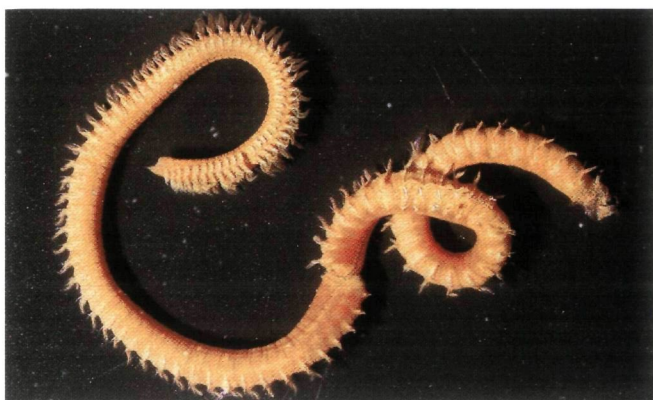
Scolelepis squamata

MÜLLER / 1789

Dutch

Gemshoornworm

Synonym(s)

Netrine cirratulus

M. LAVALEVE

Morphology

This species closely resembles *S. bonnieri*, but differs from that species by the median antennae, which forms a low ridge without a free tip, and the gills, which are free of the upper parapodial lobes in the hind region of the body. The maximum length is 50 mm with around 200 segments. It is bluish green in colour and the gills are red (Hartmann-Schröder, 1971; Fish & Fish, 1989; Hayward & Ryland, 1990).

Biology

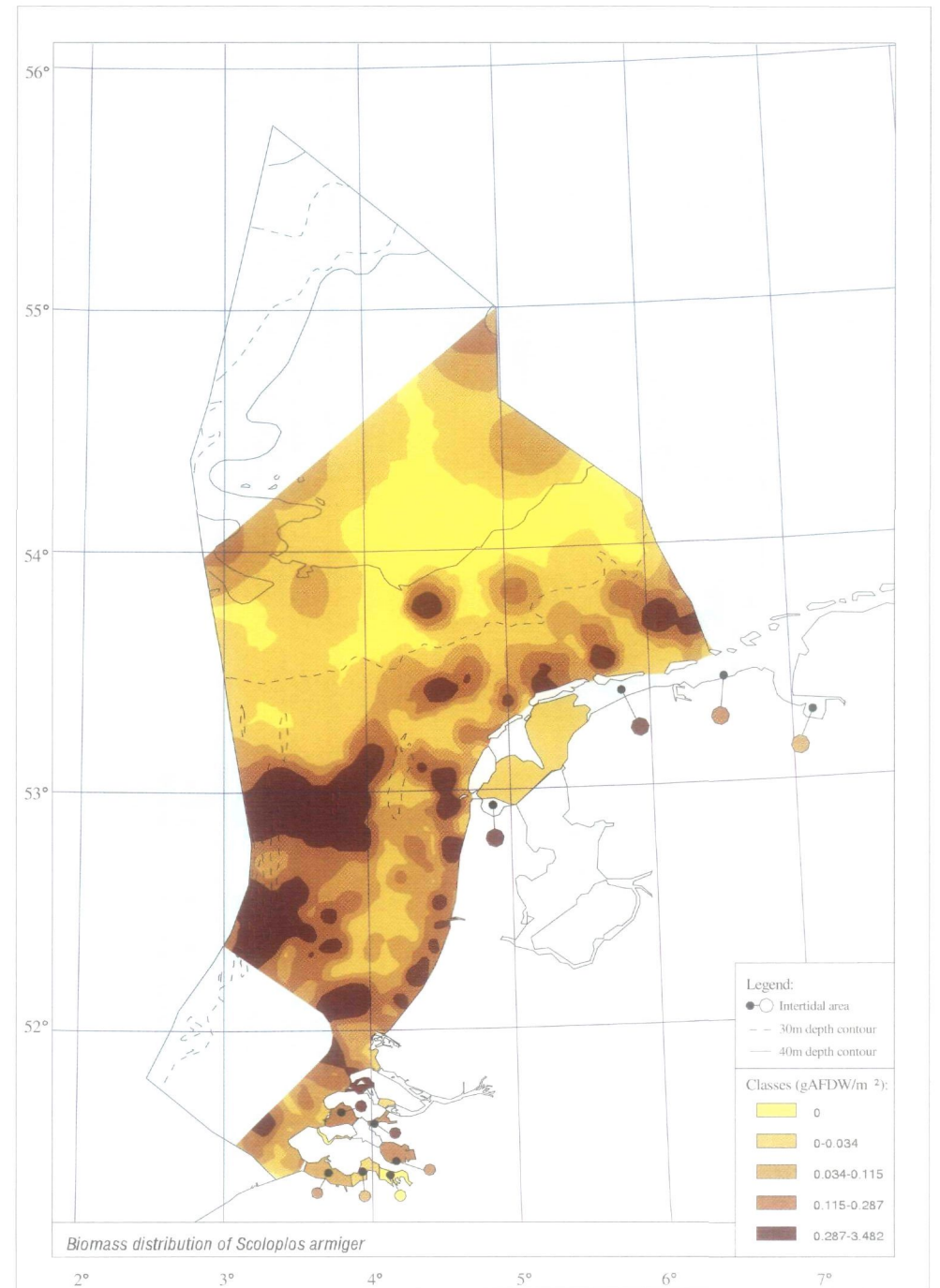
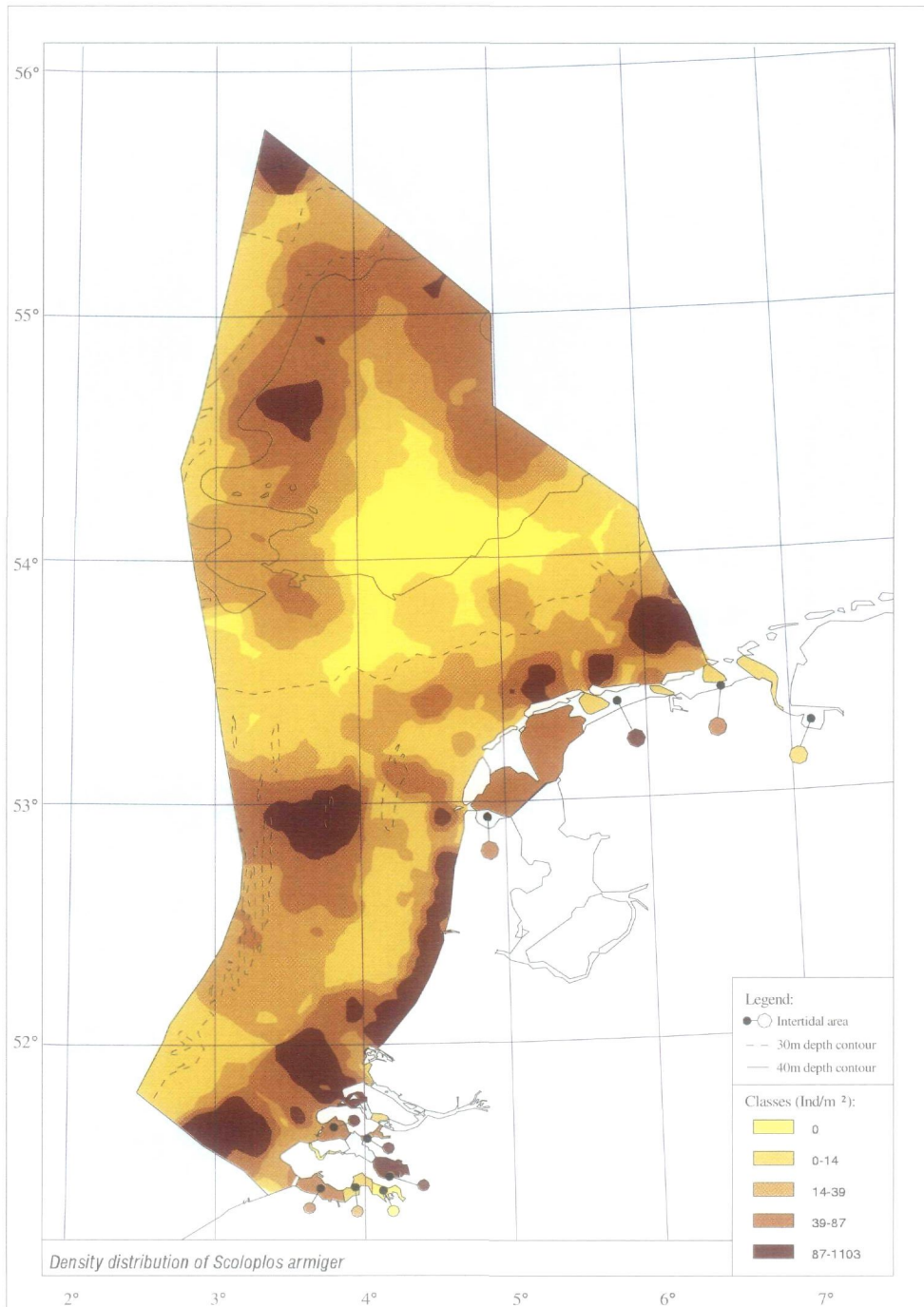
The larvae of this species have been recorded from March to July, with highest numbers in May-July. Fertilization is external and the larva is free-swimming for approximately five weeks before it settles. Although spionids generally are considered deposit feeders, *S. squamata* almost exclusively acts as a suspension feeder, using its long palps to catch floating particles. The species is a common food item for demersal fish

and is also eaten by birds. It lives at depths of about 40 cm in the sediment inside vertical, loosely constructed burrows lined with mucus. It has also been observed free-living, swimming in spirals (Hartmann-Schröder, 1971; Wolff, 1973; Fauchald & Jumars, 1979; Dauer, 1983; Fish & Fish, 1989; Hayward & Ryland, 1990).

Distribution

S. squamata is mainly found in the offshore part of the Southern Bight and north of the Wadden islands, and occasionally at the Dogger Bank. It is absent from the Oyster Ground. *S. squamata* furthermore occurs in the western and eastern Wadden Sea as well as in the Delta area, viz. in the eastern part of the Westerschelde.

The species lives in fine to medium sand and sometimes in slightly muddy sand. It shows a very strong preference for well sorted sediments (Wolff, 1973).



Scoloplos armiger

O.F. MÜLLER / 1776

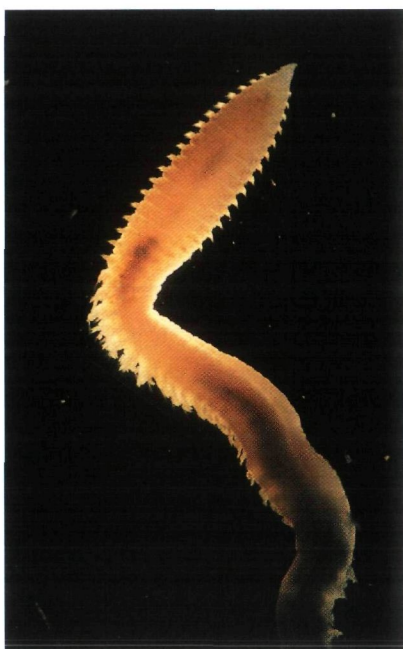
Dutch

Wapenworm

German

Bewehrter Pfahlwurm

D.B. EDWARDS / MINISTRY OF AGRICULTURE, FISHERIES AND FOOD



Morphology

The species superficially resembles a *Scolecopsis*. The head is pointed sharply, smooth and lacks antenna or palps. The body is thin, fragile and reaches a maximum length of 80 mm with more than 200 segments. Parapodia in the front region have simple, short lobes. Those in tail region are more complex with more prominent lobes and dorsal gills. Gills are present on the dorsal surface from about the 12th segment onward. The colour is bright orange-pink or red, with the main blood vessels clearly visible (Hartmann-Schröder, 1971; Fish & Fish, 1989; Hayward & Ryland, 1990).

Biology

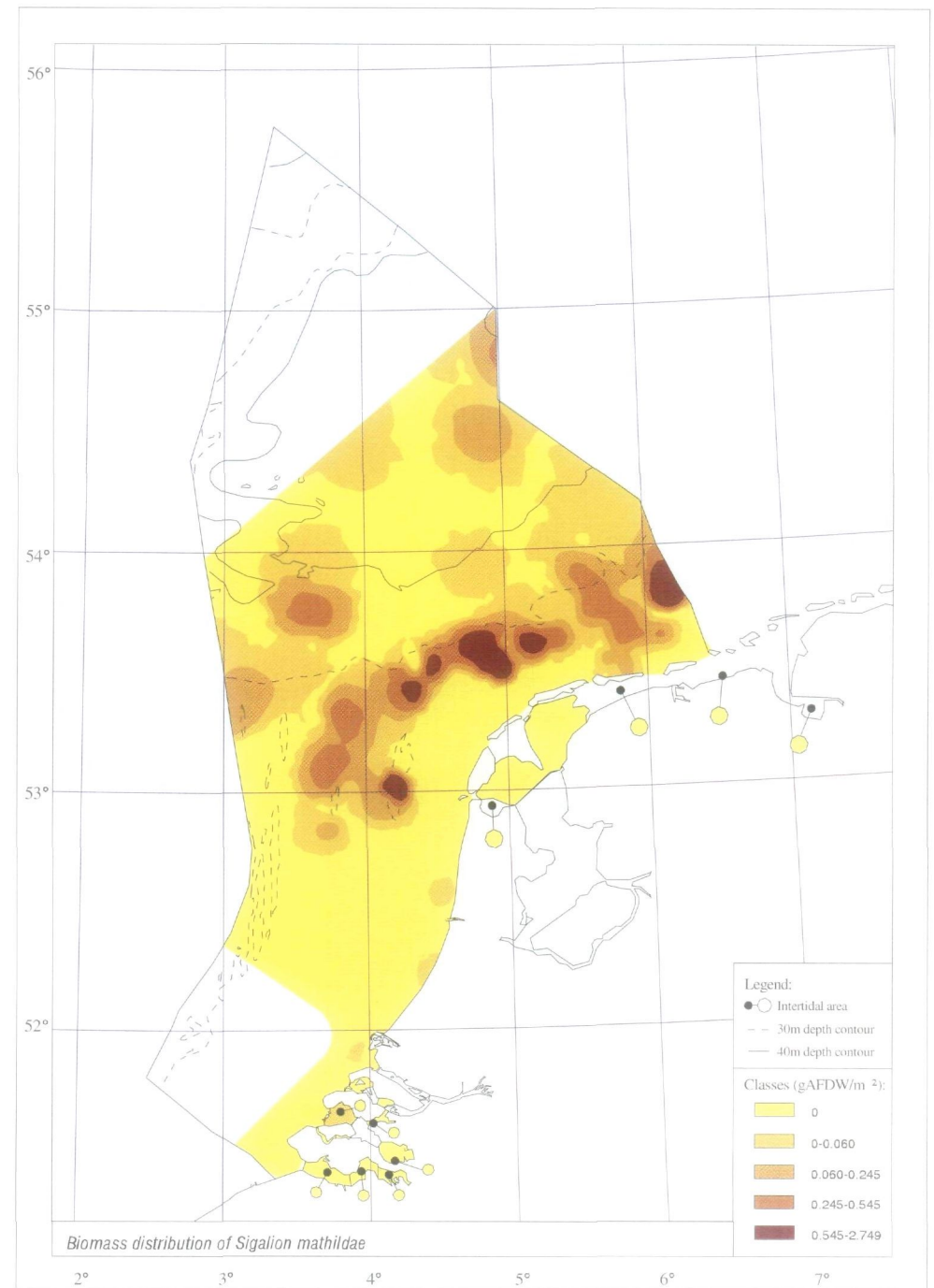
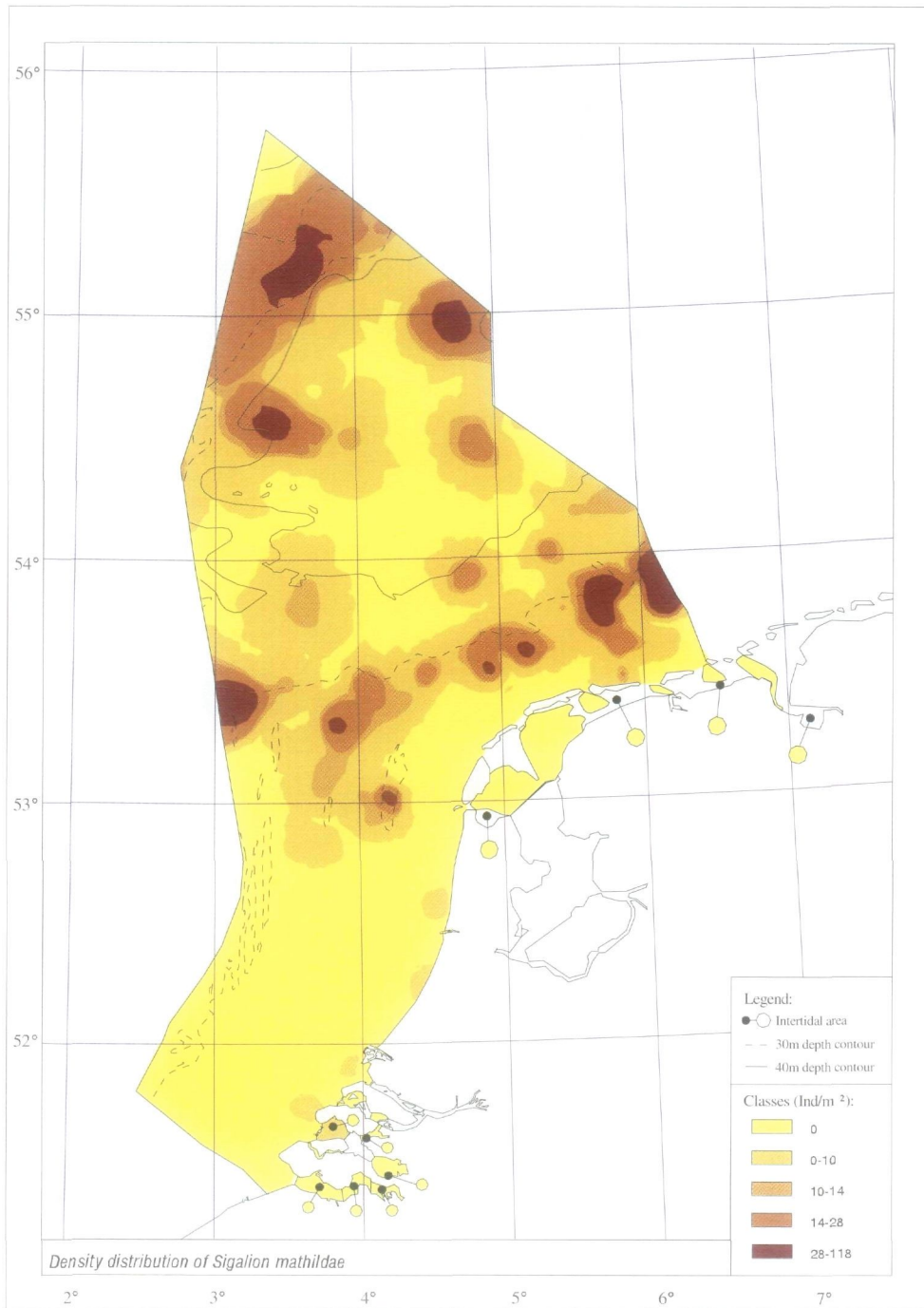
The sexes are separate. No breeding is observed below water temperatures of 5 °C. Breeding occurs in early spring and is synchronized with spring tides. There also exist reports of a second breeding period. In some habitats the larvae probably have a benthic development and in other places a short planktonic stage. *S. armiger* is a fast growing species, breeding for the first time in its second year and living for about four years.

S. armiger builds a burrow system in the upper 10-15 cm of the sediment and crawls through the top layer as well. It does not roam on the sediment surface. *S. armiger* is relatively tolerant to low winter temperatures. This species shows a distinct and identifiable food preference for organic detritus (Hartmann-Schröder, 1971; Wolff, 1973; Curtis, 1977; Kirkegaard, 1978; Beukema, 1979; Fish & Fish, 1989; Bosselmann, 1991).

Distribution

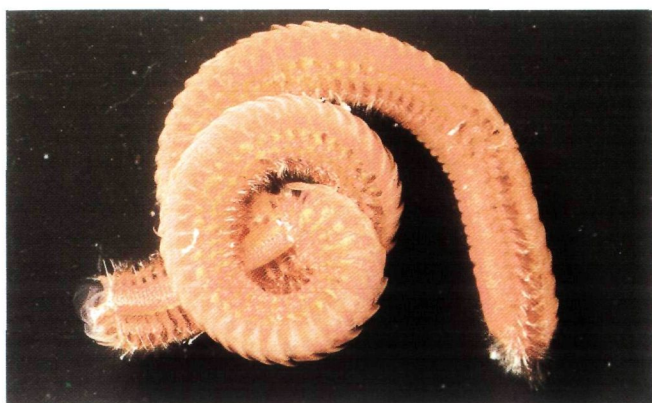
S. armiger occurs in almost the entire area, except for the central part of the Oyster Ground. The polychaete is also abundant in the Wadden Sea and in almost the whole Delta area.

The species inhabits a wide range of sediment types, ranging from coarse to fine sand. In the study area it prefers substrates composed of fine sand. *S. armiger* is also known to occur in anoxic sediments and in sea grass beds (Hartmann-Schröder, 1971; Wolff, 1973; Hayward & Ryland, 1990).



Sigalion mathildae

AUDOUIN & MILNE-EDWARDS / 1832



M. LAVALLEYE

Morphology

S. mathildae has a long, robust body with a maximum length of 100 mm and about 200 segments. The body is dorsally covered by soft scales (elytra) of which the outer edges have a characteristic fringe of pinnate papillae. The head bears a pair of minute lateral antennae and four small eyes. The body segments have prominent bilobed parapodia with complex chaetae. The first segment is directed alongside the head and has additional finger-like cirri. Two big palps project forwards from underneath the first segment. The worm is greyish white in colour, with an iridescent underside and a prominent red mid-ventral blood vessel (Hartmann-Schröder, 1971; Hayward & Ryland, 1990).

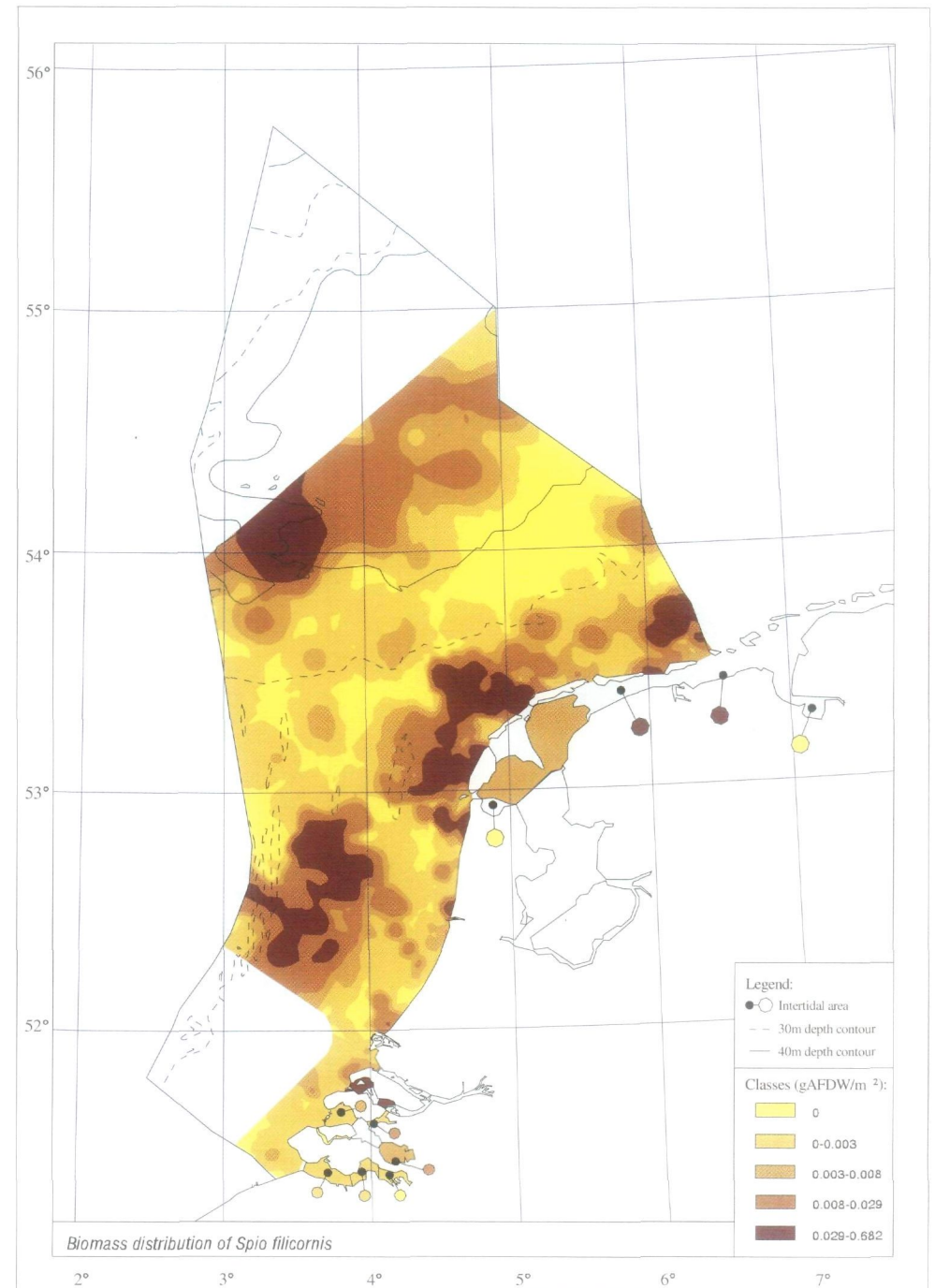
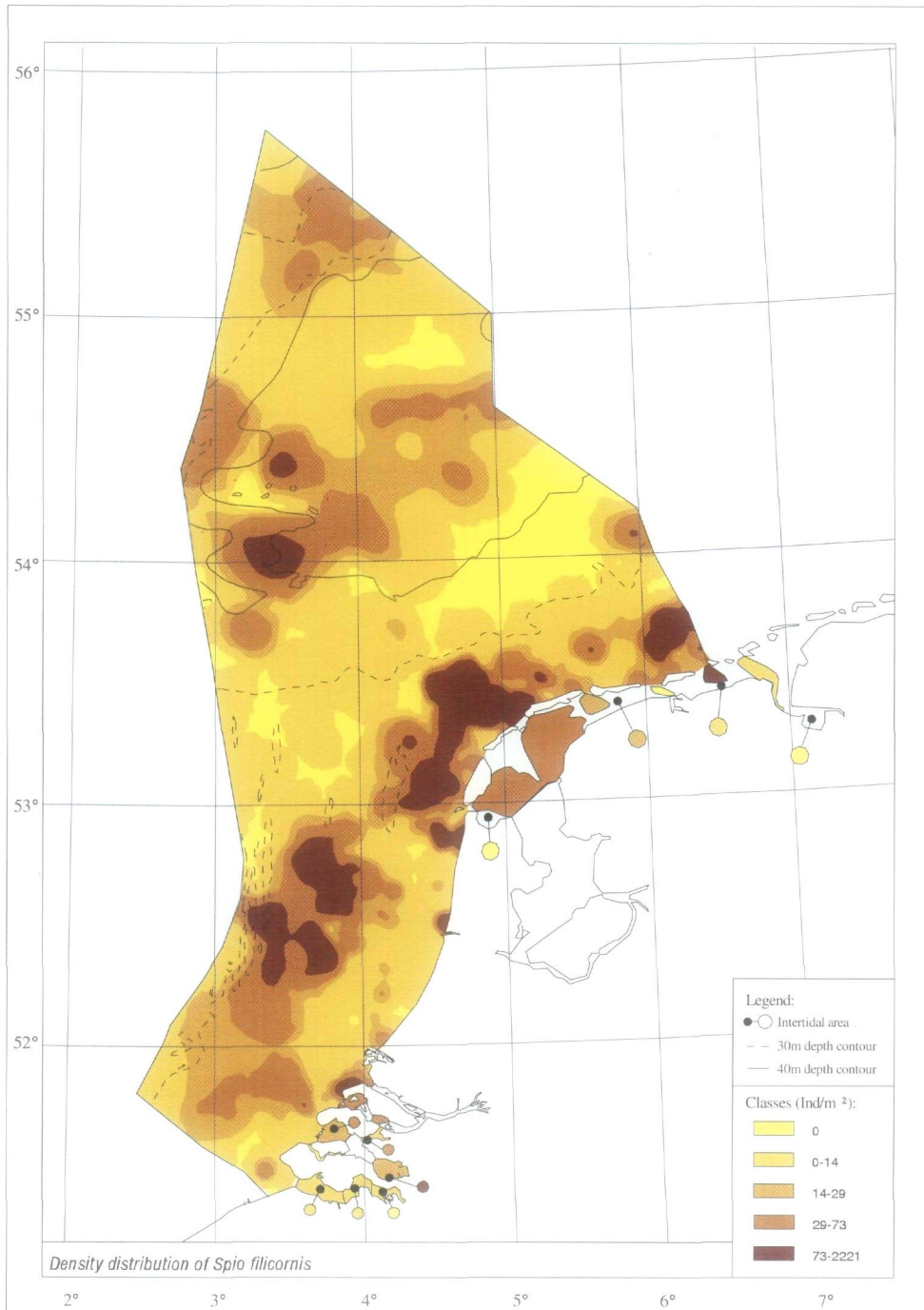
Biology

No information on this species' reproduction is available. *S. mathildae* lives 15 to 20 cm beneath the surface of the sediment. The sigalionids are generally considered active, free-living carnivores, feeding on a variety of small invertebrates. Specific information about *S. mathildae* is lacking (Fauchald & Jumars, 1979; Hayward & Ryland, 1990).

Distribution

S. mathildae is most abundant at the Dogger Bank and in a broad zone south of the Frisian Front. The species is absent from the central Oyster Ground and from the Southern Bight, except for occasional finds near the coast. *S. mathildae* is neither present in the Wadden Sea, whereas in the Delta area it occurs only in low numbers in the marine part of the Oosterschelde.

The species is most frequently found in fine to very fine sand with little or no mud.



Spio filicornis

O.F. MÜLLER / 1766



M. LAVALLEYE

Morphology

A thin and fragile species with a maximum length of 30 mm and about 2 mm wide. The body is composed of up to 90 uniform segments. The head bears four small eyes arranged in a square and two palps. Finger-like, dorsally curved gills are present from the first to almost the last segment. The colour of the body is bluish green with contrasting red blood vessels in the palps and the gills. Mature males are whitish, while females are brighter green (Hartmann-Schröder, 1971; Hayward & Ryland, 1990).

Biology

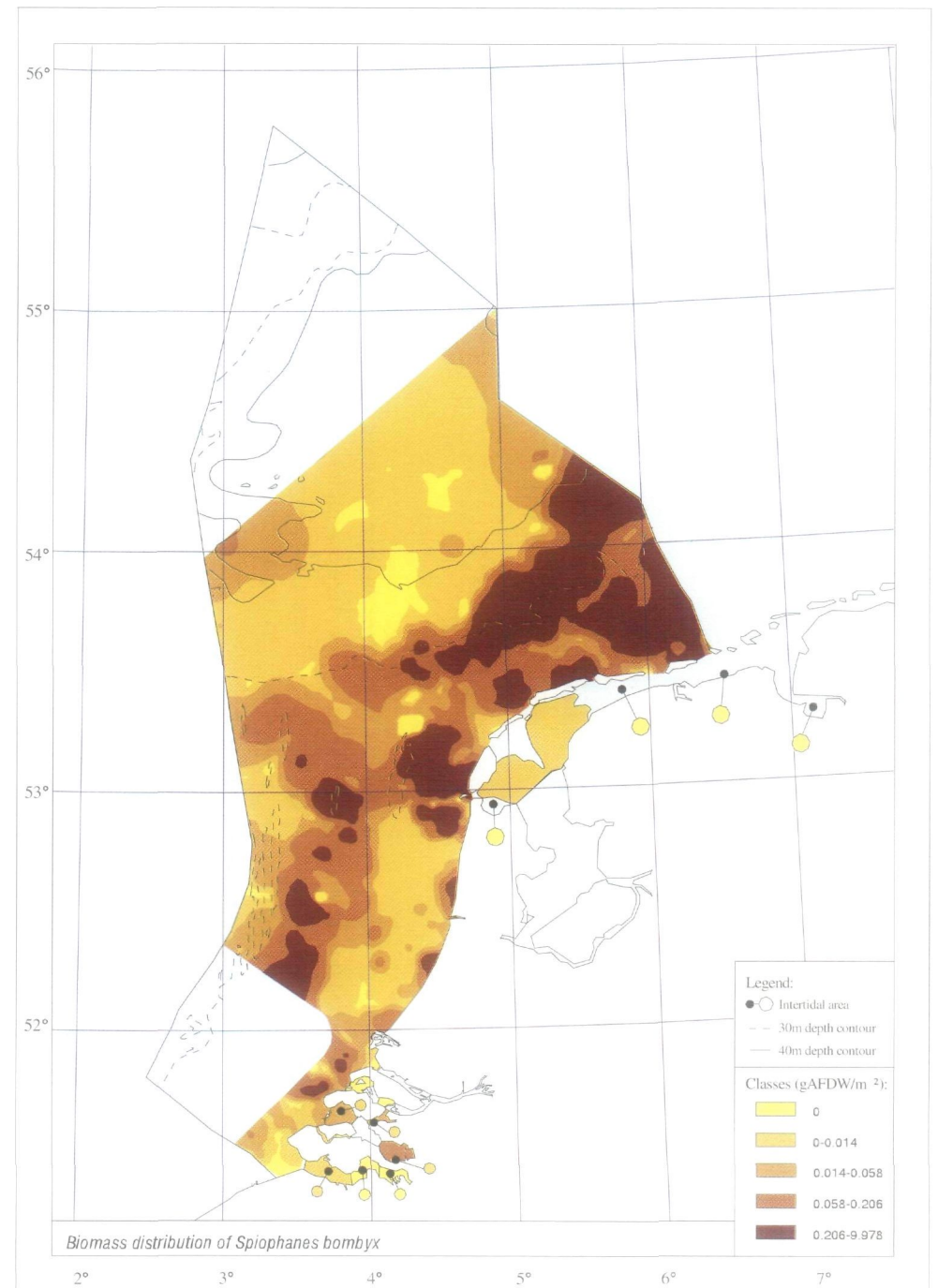
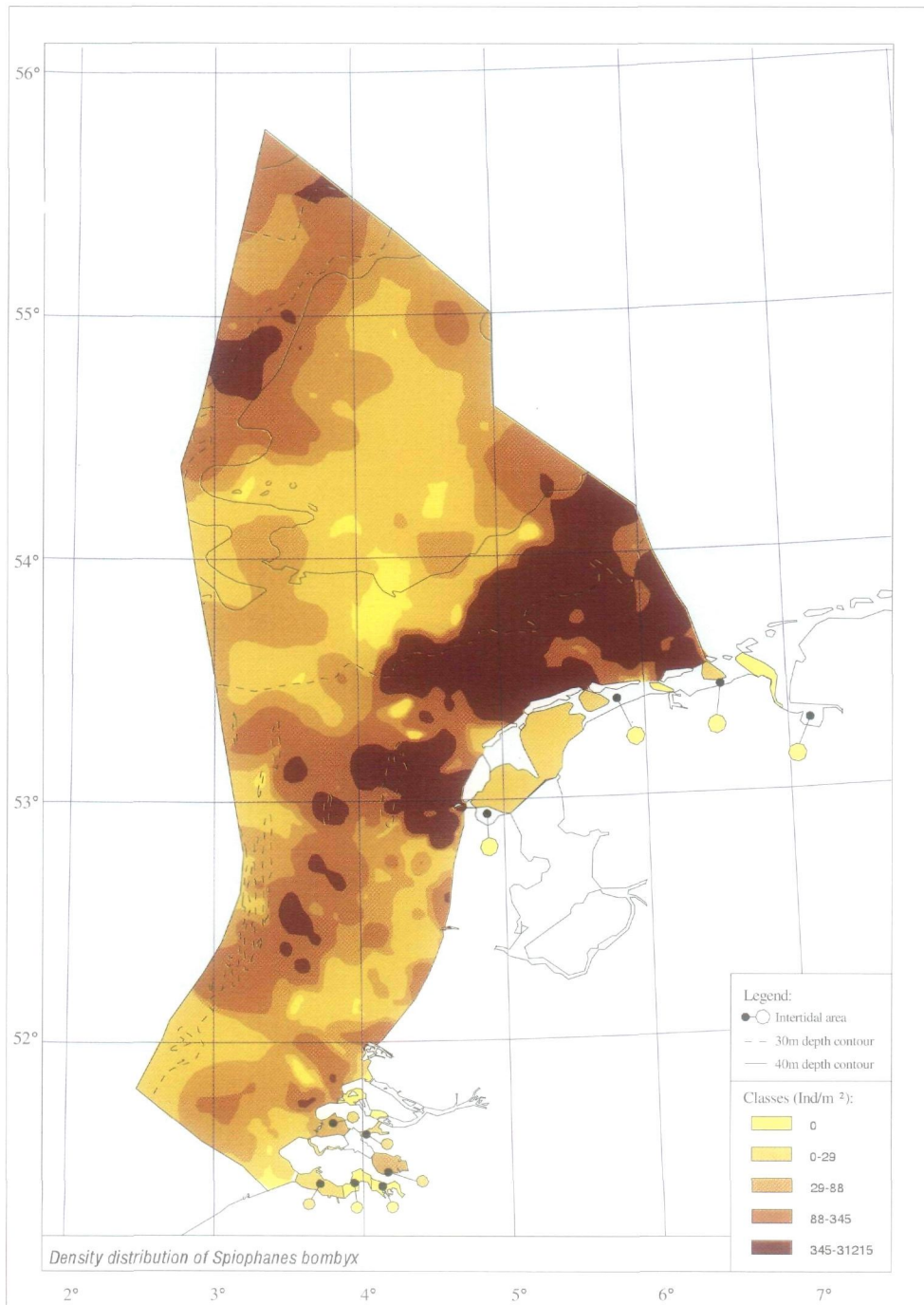
S. filicornis probably spawns in autumn or winter, releasing large eggs. Planktonic larvae are found from February to April. *S. filicornis* builds fragile tubes of sand fragments. It swims in

spirals when disturbed. Spionids are generally considered surface deposit feeders that use their large ciliated palps to select and pick up food particles (Hartmann-Schröder, 1971; Curtis, 1977; Hayward & Ryland, 1990).

Distribution

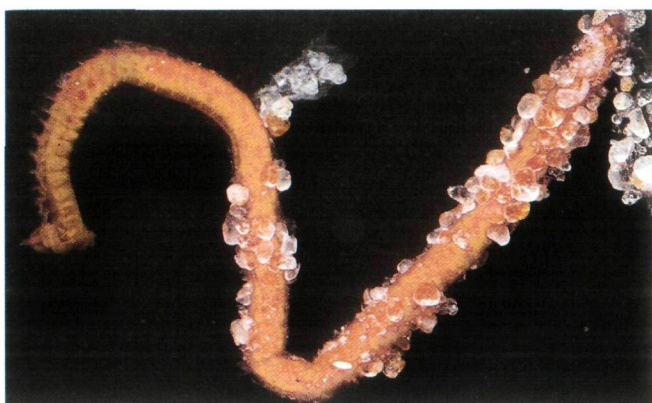
S. filicornis occurs throughout the whole area, with highest densities offshore in the Southern Bight and north of the Wadden islands. *S. filicornis* is found in the entire Delta area and in parts of the Wadden Sea as well.

The density distribution of this species suggests a preference for the sandy types of sediment with little mud, although other sediment types are inhabited as well. The species has for instance been reported from anoxic mud (Hartmann-Schröder, 1971; Hayward & Ryland, 1990).



Spiophanes bombyx

CLAPARÈDE / 1870



M. LAVALLEYE

Morphology

Like *Spio filicornis*, a thin and fragile species with a maximum length of 60 mm and about 180 segments. The head is T-shaped and bears two large palps and four eyes arranged in a square. The first segment has characteristic curved chaetae. Gills are absent. The dorsal lobes of the parapodia are markedly pointed. The worm is bright pink in front and darker red or greenish brown towards the posterior. The species builds stiff tubes composed of sand grains (Hartmann-Schröder, 1971; Hayward & Ryland, 1990).

Biology

The planktonic larvae of *S. bombyx* have been observed in the period April-December, with maximal numbers in May-June and August-September. The species lives in a tube that slightly protrudes from the surface.

S. bombyx probably is a selective deposit feeder, but specific observations are lacking (Hartmann-Schröder, 1971; Wolff, 1973; Fauchald & Jumars, 1979; Hayward & Ryland, 1990).

Distribution

S. bombyx is found at almost 50% of all stations sampled. Locally, i.e. to the west and north of the Wadden islands up to the Frisian Front, it is very abundant. In the central and northern part of the Oyster Ground the species is found in low densities. The distribution of *S. bombyx* extends far into the estuarine Delta area and it is also found in some parts of the Wadden Sea.

Although the species has been found in a variety of sediment types, its density distribution suggests a distinct preference for fine sandy substrates.

