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Summer Distribution of Regulated Species on Georges Bank with Reference to the 1988 Experimental Whiting Fishery

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EXECUTIVE SUMMARY

An evaluation of the likely impact of a small-mesh whiting (silver hake) fishery on regulated species from the Georges Bank area, based on an analysis of historical catch statistics, was performed. Recent commercial landings of regulated species from the Experimental Whiting Fishery area have been relatively low. Bottom trawl survey data indicate that the northwestern portion of the bank, where the 1988 Experimental Whiting Fishery took place, may be an important summer nursery area for Atlantic cod, haddock, and American plaice (dab).

INTRODUCTION

Between July 1 and November 4, 1988, an experimental fishery for whiting (silver hake, *Merluccius bilinearis* Mitchill) was conducted on Georges Bank by vessels from four New England ports (see Almeida *et al.* 1989). The primary objective of the 1988 Experimental Whiting Fishery (hereafter called the Experimental Fishery) was to determine the feasibility of conducting a small-mesh fishery for whiting in the offshore waters of Georges Bank (where large-mesh (greater than 5-1/2 inches) trawl gear is currently required of all vessels) by determining its impact on species regulated by the Northeast Multispecies Fishery Management Plan (hereafter called regulated species).

METHODS

We evaluated the likely impact of the small-mesh fishery on regulated species in terms of the quantity and size composition of the regulated species by-catch, based on an analysis of historical catch statistics during July-September from the Georges Bank area. Commercial landings data for each regulated species for 1982-87 were used to represent current conditions in the Georges Bank fishery. Northeast Fisheries Center (NEFC) research vessel bottom trawl data from summer surveys, 1977-81, indicated a period of higher overall abundance of regulated species on the bank. Survey data were used for the earlier period since comprehensive detailed landings data do not exist for many species prior to 1982.

Landings data were collected from the commercial fishery through the standard NEFC weighout system. Landings from all vessel classes and mesh sizes combined, originally reported by quarter-degree square (30' latitude by 30' longitude square), were allocated to 10-minute squares (10' latitude by 10' longitude) based on detailed catch information obtained from vessel captains interviewed by NEFC port agents at dockside (after Wigley 1987).

To examine the effects of the Experimental Fishery on separate size categories of regulated species, we subdivided monthly landings into "large" and "small" using market categories (*i.e.*, landings from the smaller categories such as snapper and scrod were considered "small" and the larger categories considered "large") (Table 1). The data were then summarized and plotted with monthly Experimental Fishery "windows" overlaid.

Catches from summer bottom trawl surveys conducted during 1977-81 were subdivided into "legal/adult" and "sub-legal/juvenile" categories based on length-frequency data. For regulated species with specified minimum legal sizes, those values were used as cutoff lengths between categories (*e.g.*, Atlantic cod and haddock "sub-legals" were defined as individuals less than 19 inches in total length, "legals" as individuals greater than or equal to 19 inches). Otherwise, catches of species without minimum

legal sizes (*e.g.*, white hake, redbfish, and windowpane flounder) were subdivided into "juveniles" and "adults" using approximate biological cutoff lengths between the categories. These data were also summarized by 10-minute square (all surveys combined) and plotted with windows overlying the area in which the Experimental Fishery was conducted.

RESULTS

Figures 1-54 show the monthly distribution of commercial landings prorated between "large" and "small" categories of each regulated species; Figures 55-74 show the summer survey distribution of the "legal/adult" and "sub-legal/juvenile" categories of each species.

Within the confined area in which the 1988 Experimental Whiting Fishery was conducted, the effects of this small-mesh fishery on regulated species appeared relatively insignificant. The distributional plots demonstrate that the area is not a region from which large commercial fishery landings (*i.e.*, averaging greater than about 100 tons per year) of any of the regulated species have been taken in the last five years (1982-87). This was supported by relatively low catches and landings of regulated species by the Experimental Fishery in 1988 (68,000 lb or 1.1 percent of the total, and 37,000 lb or 0.6 percent of the total, respectively) (Almeida *et al.* 1989).

Research vessel survey data, used to indicate the distribution of regulated species during a period of generally higher abundance (Conservation & Utilization Division, Northeast Fisheries Center 1988), showed similar results. Most species were not abundant in the area in which the Experimental Fishery was prosecuted. Important exceptions were "legal" and "sub-legal" Atlantic cod (Figures 55 and 56), "sub-legal" haddock (Figure 58), and "legal" and "sub-legal" American plaice (Figures 69 and 70). It is apparent that during the summer months, the northwestern portion of Georges Bank is an important nursery area for these species.

REFERENCES CITED

- Almeida, F.P., T.S. Burns, and S. Chang. 1989. The 1988 experimental whiting fishery: a NMFS/industry cooperative program. *NOAA Tech. Mem. NMFS-F/NEFC-69*. 16 p.
- Conservation & Utilization Division, Northeast Fisheries Center. 1988. Status of the fishery resources off the northeastern United States for 1988. *NOAA Tech. Mem. NMFS-F/NEFC-63*. 135 p.
- Wigley, S.E. 1987. Data preparation and report summary guide for prorating commercial interviewed landings in 82-format. Unpublished report available from National Marine Fisheries Service, Woods Hole Laboratory, Woods Hole, MA 02543.

Table 1. Market categories and minimum legal lengths (total length) used to define age categories in distribution plots

Species	Commercial Landings		Minimum Legal Size for Survey Data
	Large	Small	
Atlantic cod	Whale Large Market Steaker (dressed) Unclassified	Scrod Snapper	49 cm (19 in) ¹
Haddock	Large Unclassified	Scrod Snapper	49 cm (19 in) ¹
Pollock	Large (round/drawn) Steaker Unclassified (round/drawn)	Small (round)	49 cm (19 in) ¹
White hake	Large (round/dressed) Medium (round/dressed) Unclassified	Small (round/dressed)	38 cm (15 in)
Redfish	Large Unclassified	Small	20 cm (8 in)
Winter flounder	Medium Large Large/Mix Lemon sole XLarge Unclassified	Peewee Small	27 cm (11 in) ¹
Witch flounder	Medium Large Jumbo Unclassified	Peewee Small	36 cm (14 in) ¹
Yellowtail flounder	Large Unclassified	Small	31 cm (12 in) ¹
American plaice	Medium Large Jumbo Unclassified	Peewee Small	31 cm (12 in) ¹
Windowpane flounder	Unclassified		27 cm (11 in)

¹Minimum legal sizes (Multispecies FMP, 50 CFR Part 651, Section 651.23)

FIGURES 1 - 54

Monthly (July-September) distribution of commercial landings (1982-87) of "large" and "small" categories of each regulated species. (Each square represents 10' latitude by 10' longitude. The bold lines describe the region where the Experimental Fishery occurred.)

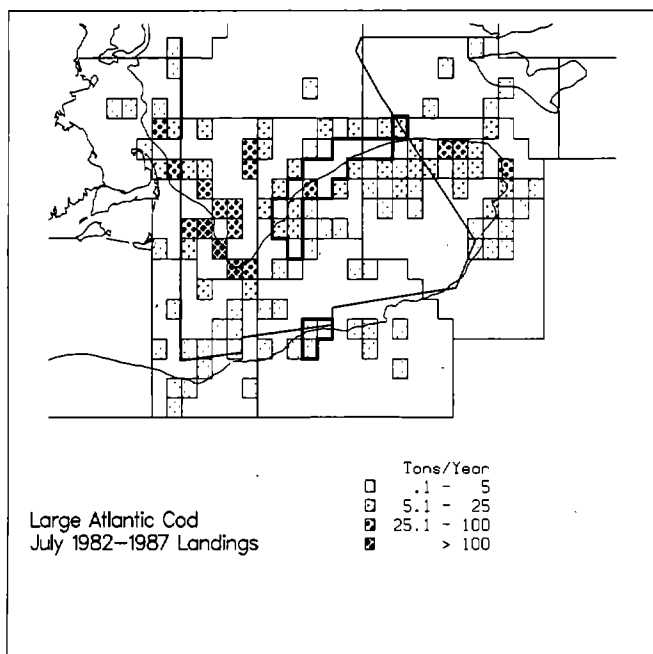


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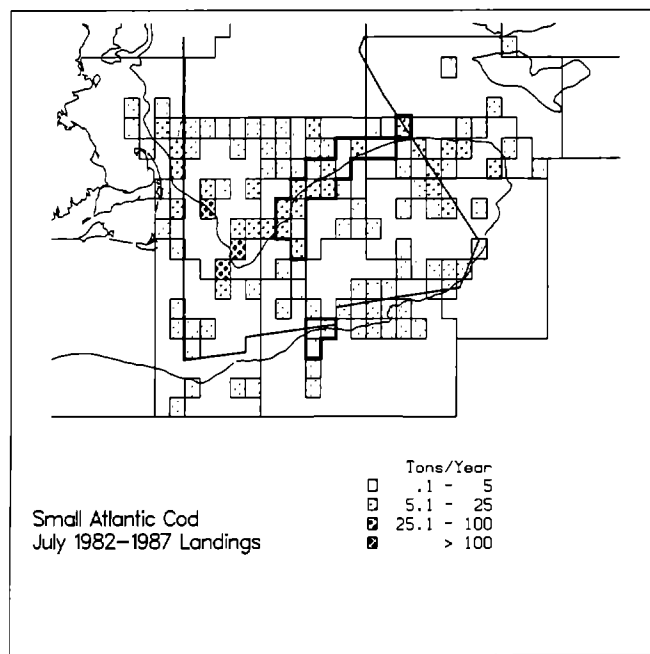


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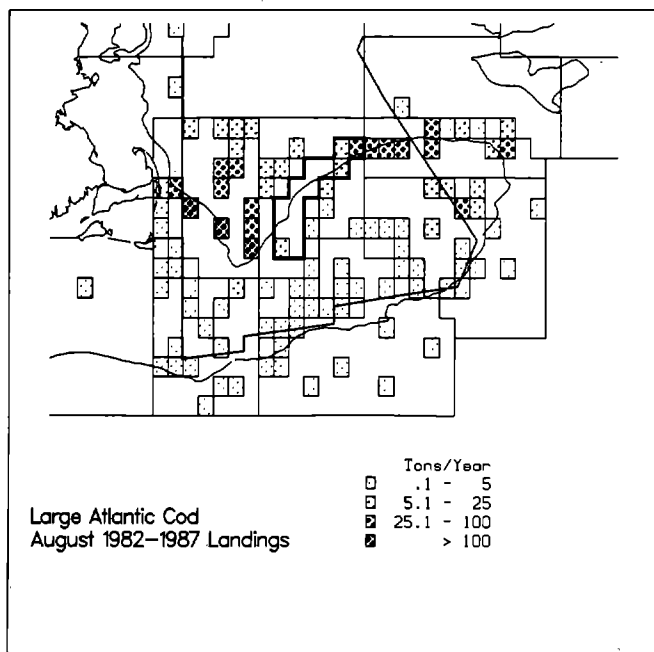


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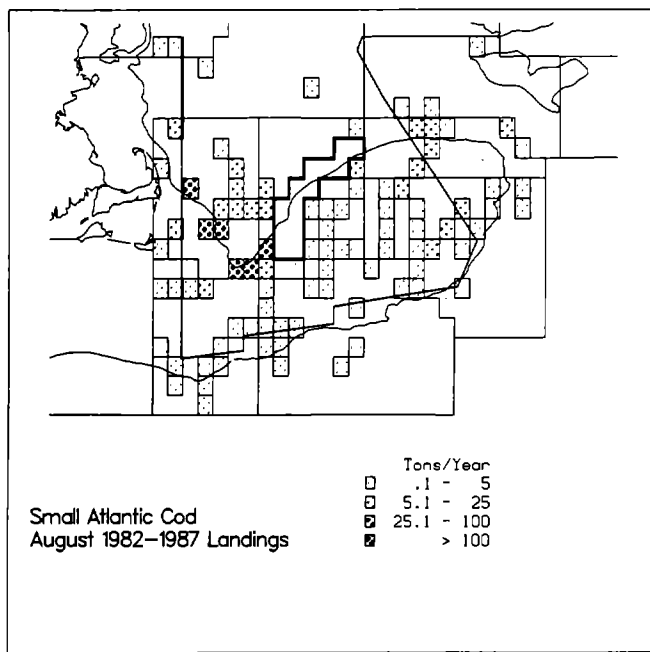


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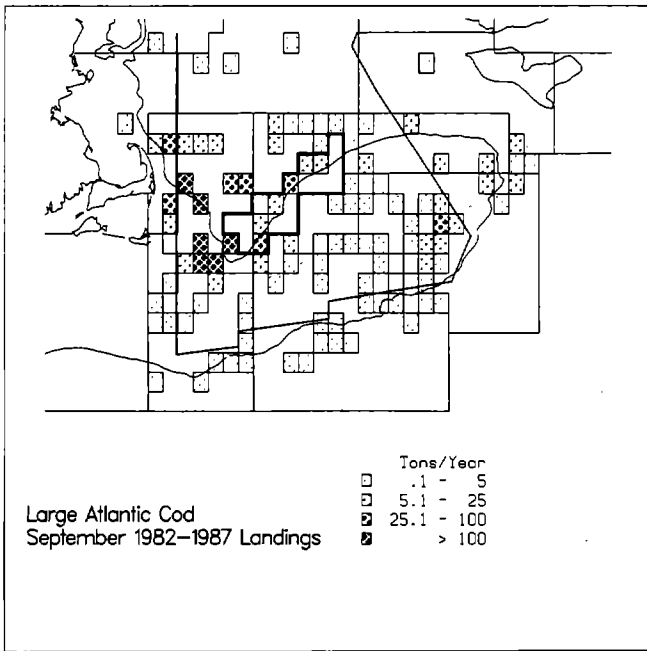


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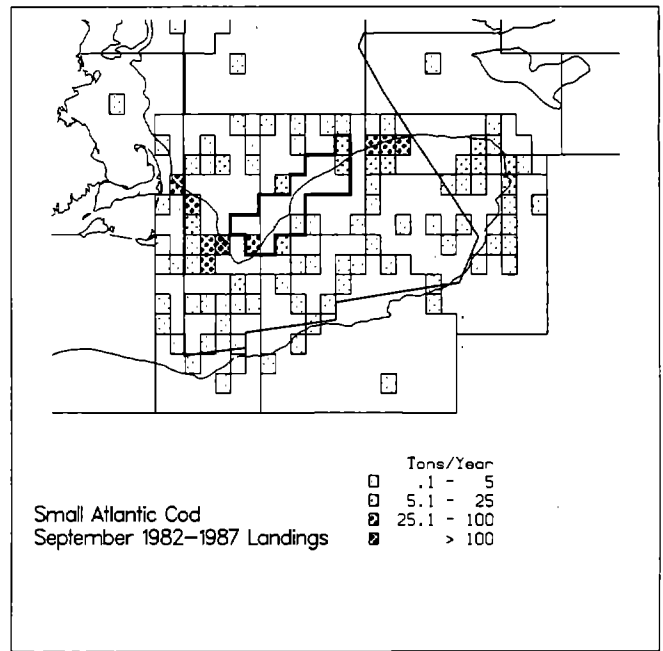


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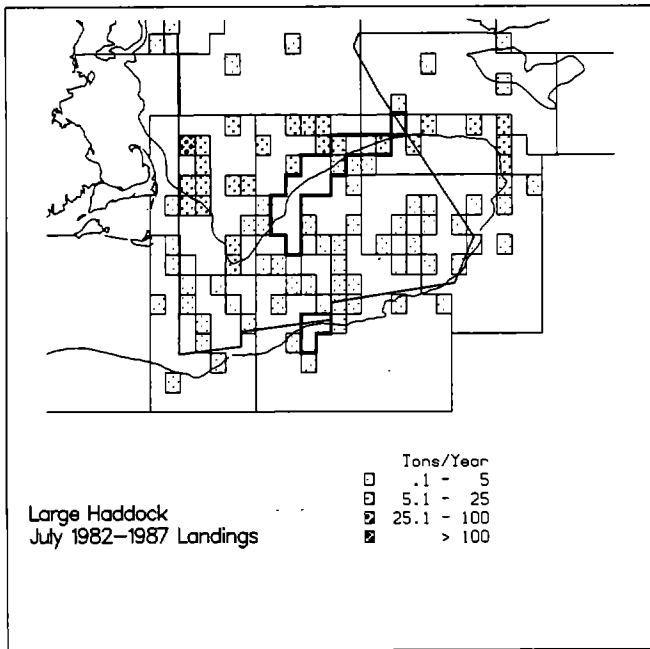


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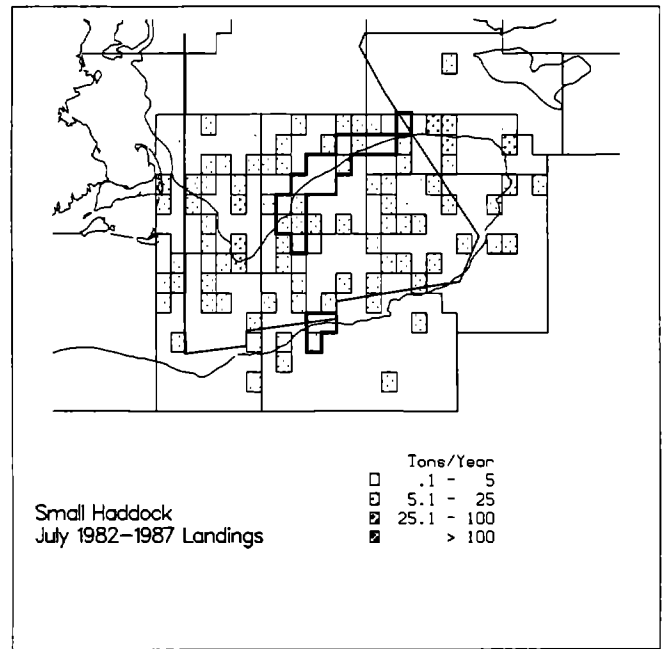


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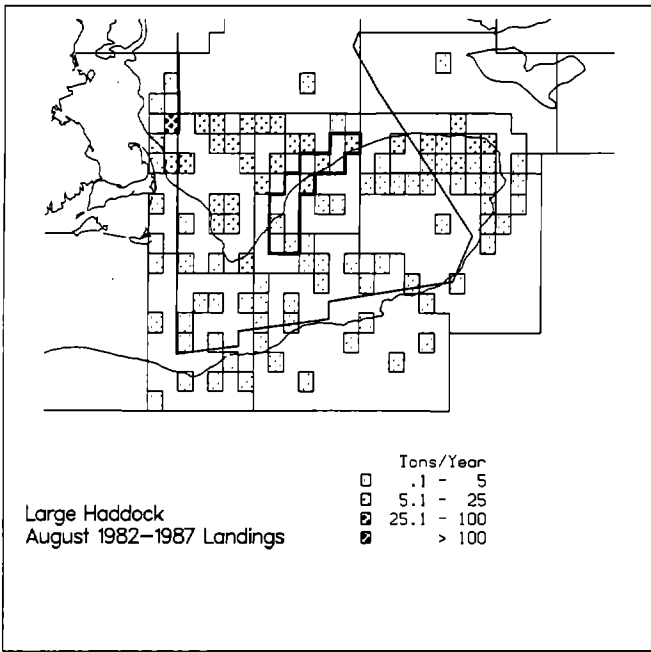


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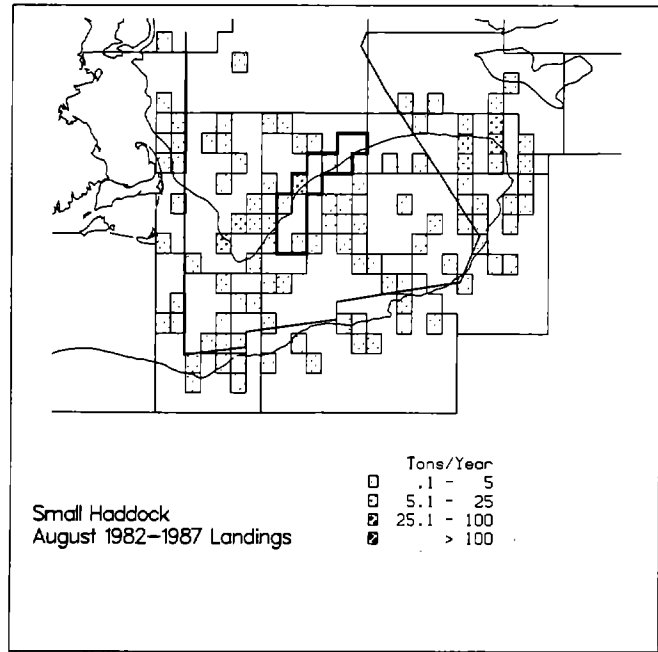


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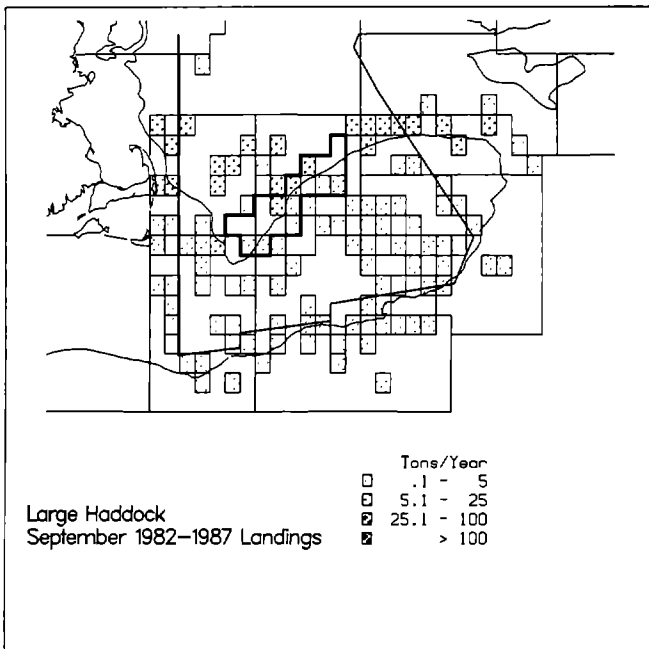


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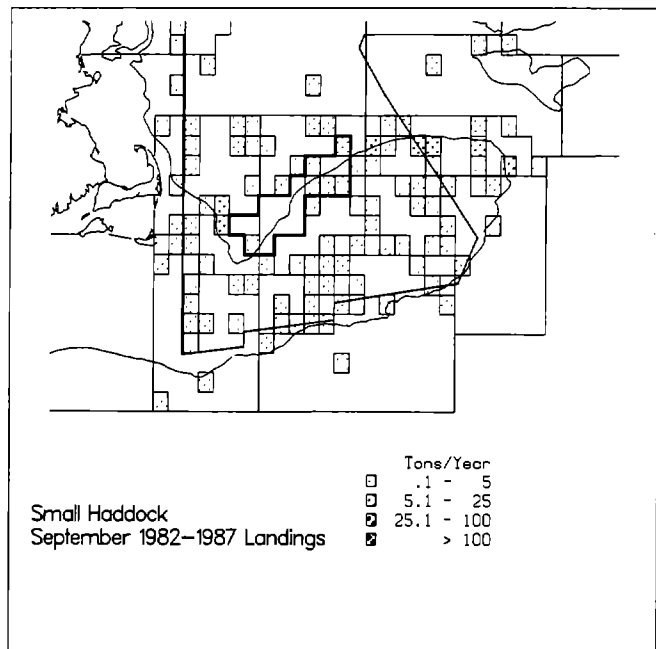


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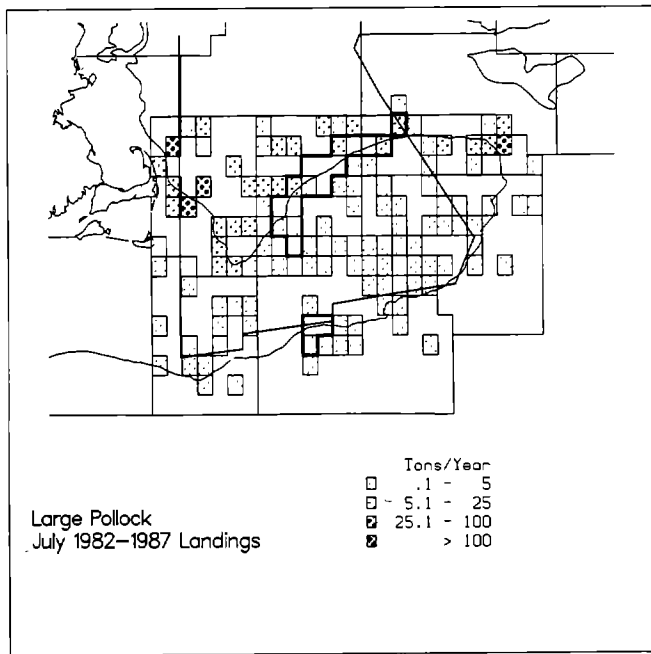


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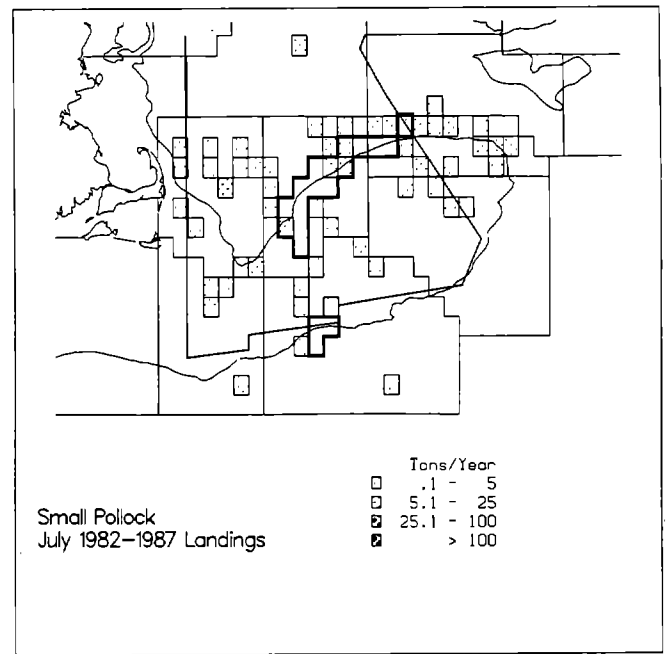


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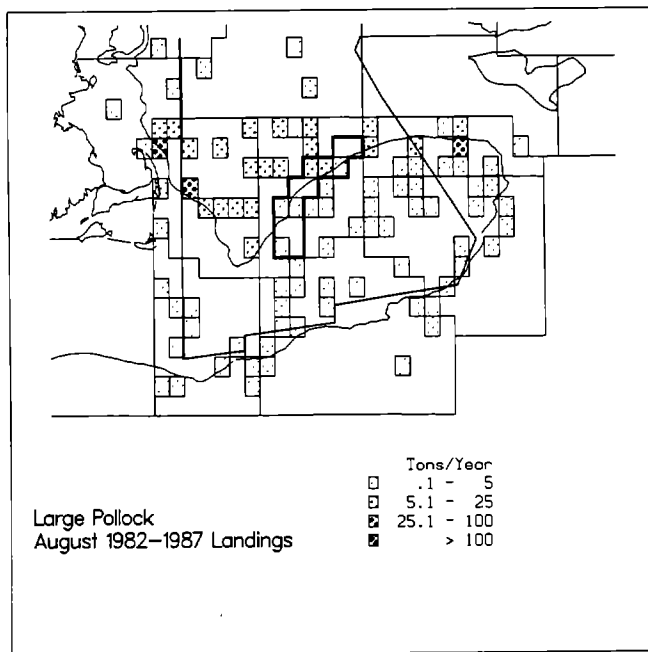


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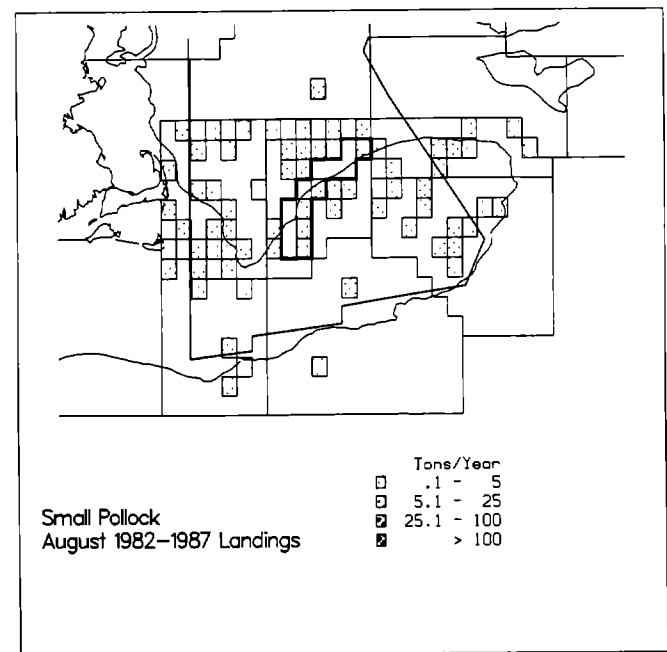


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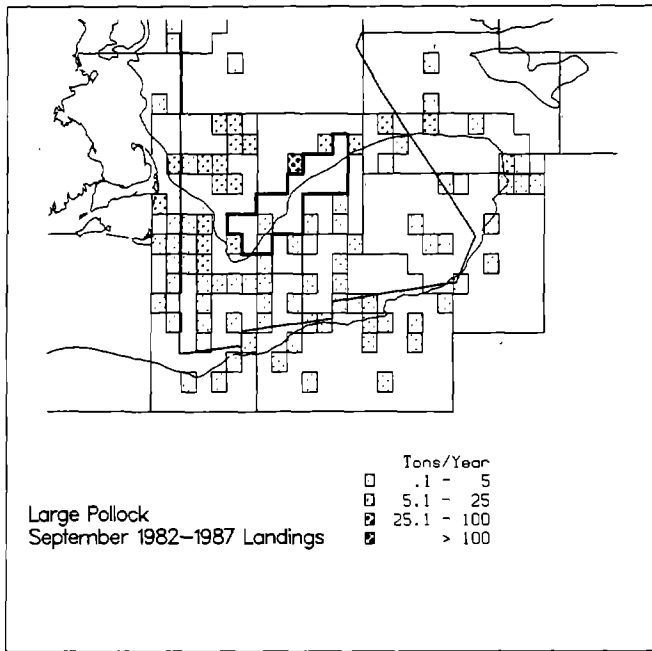


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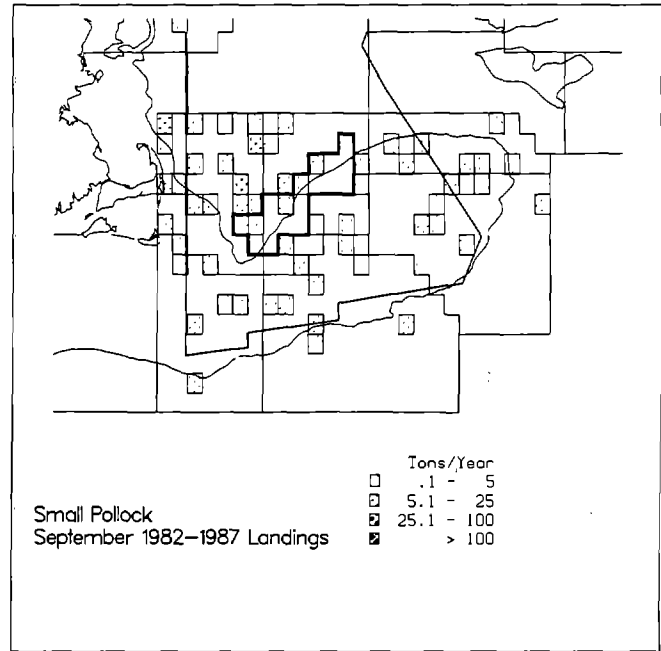


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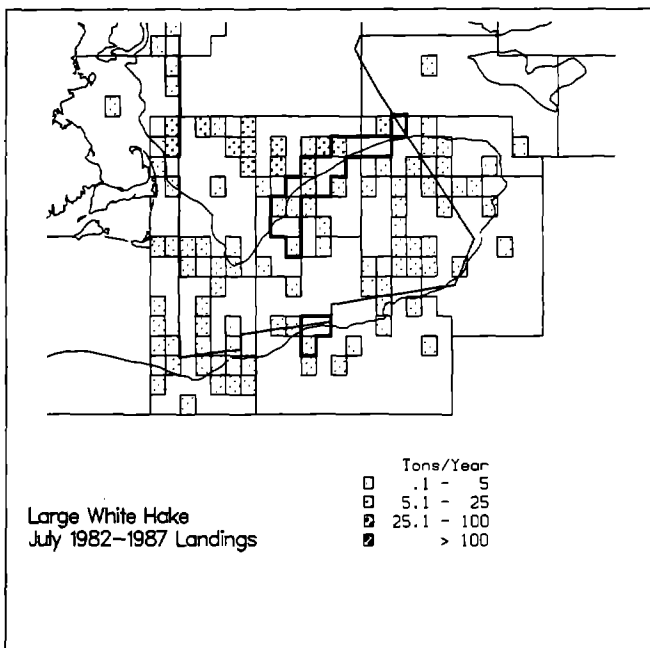


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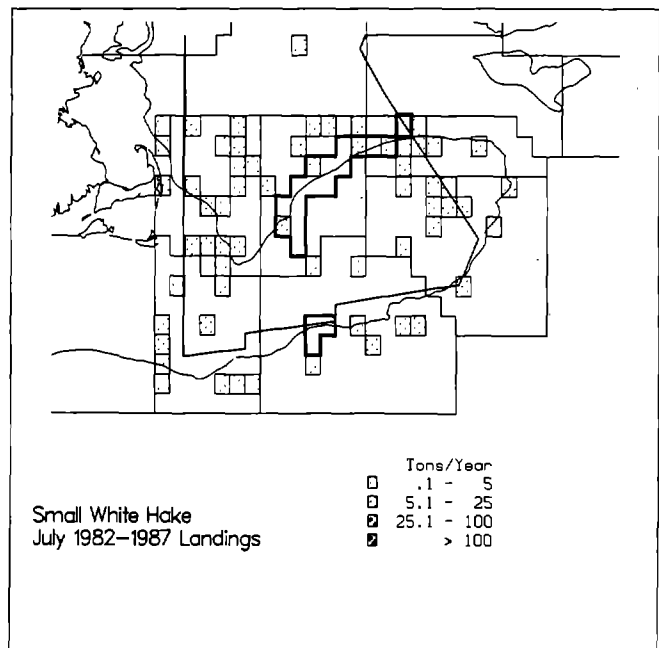


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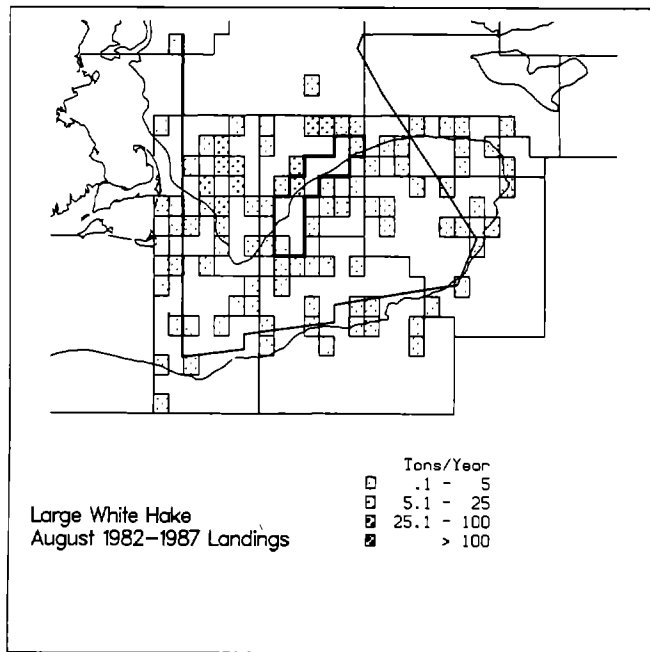


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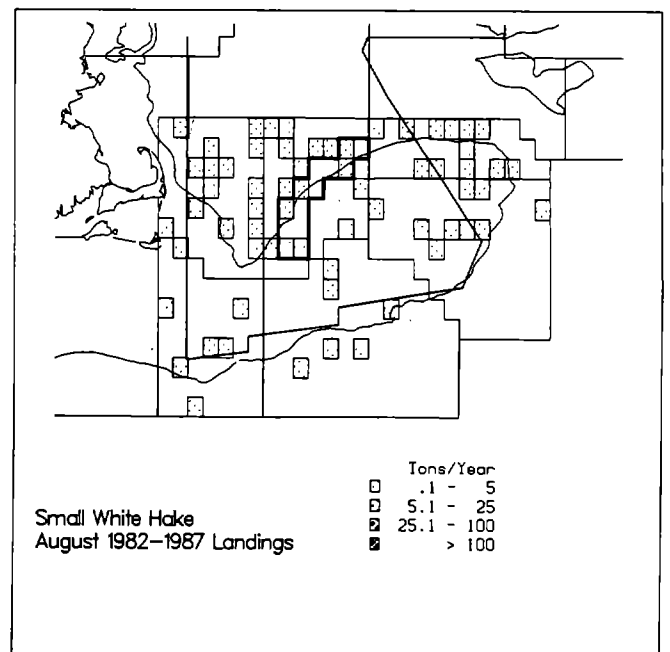


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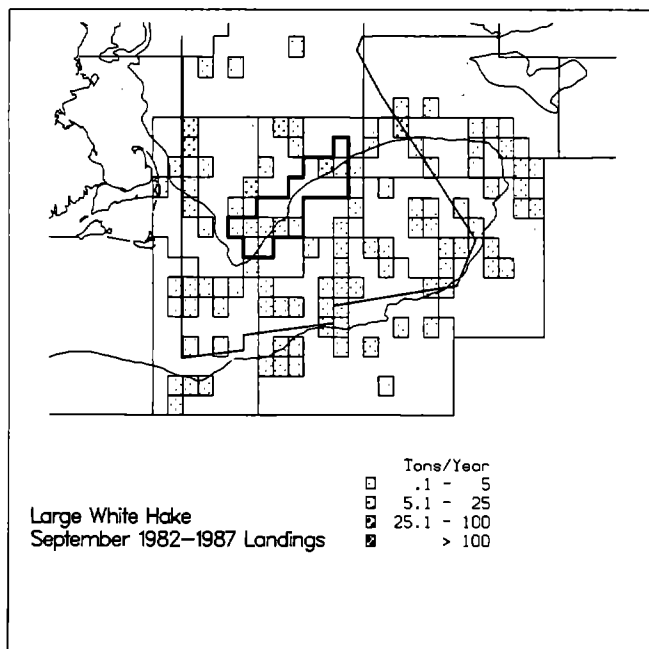


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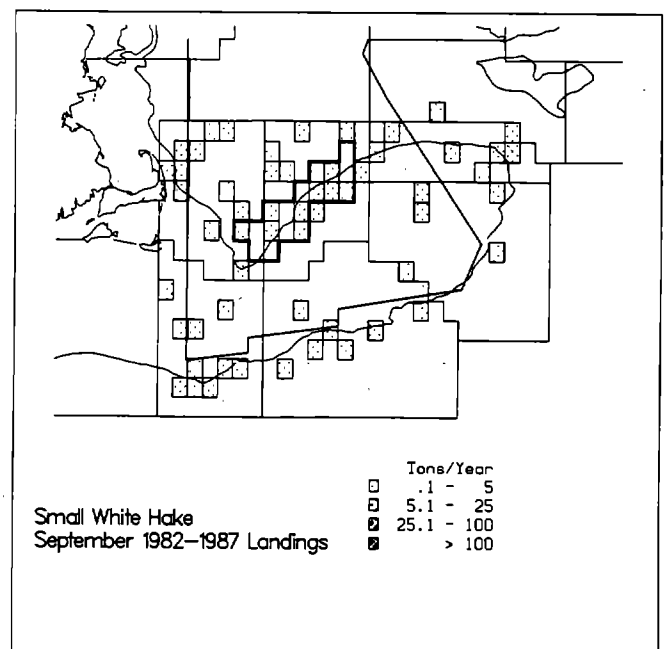


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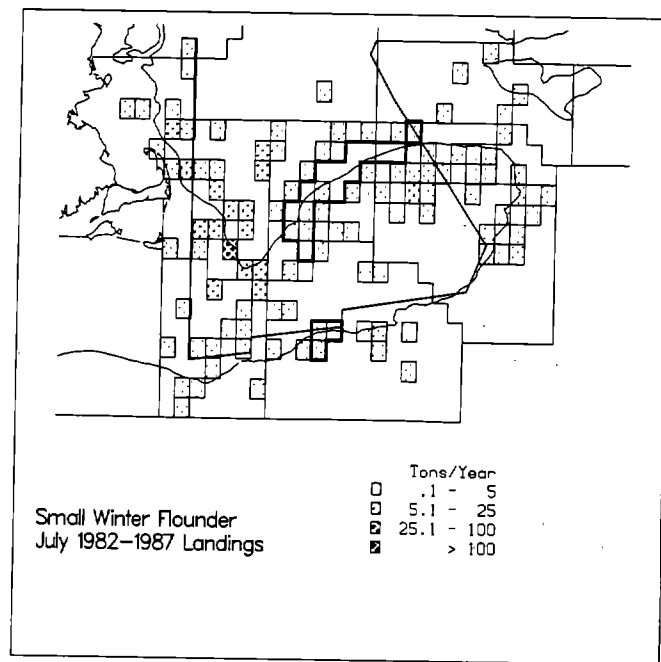
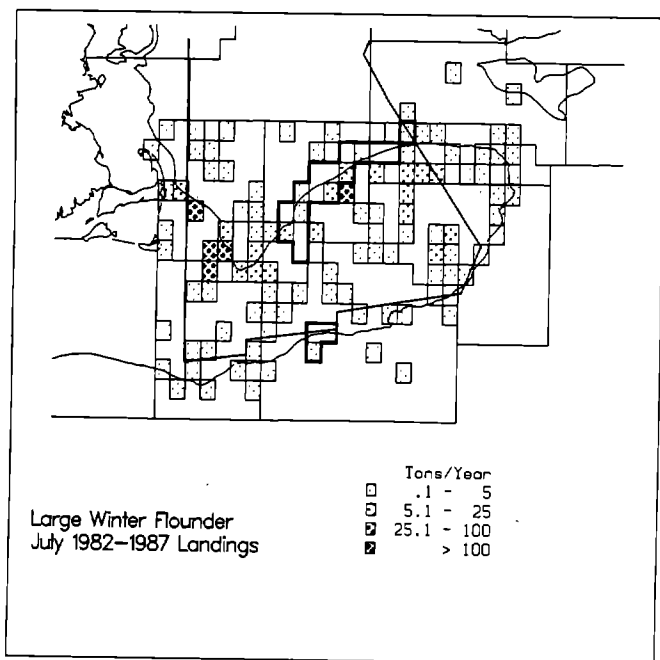


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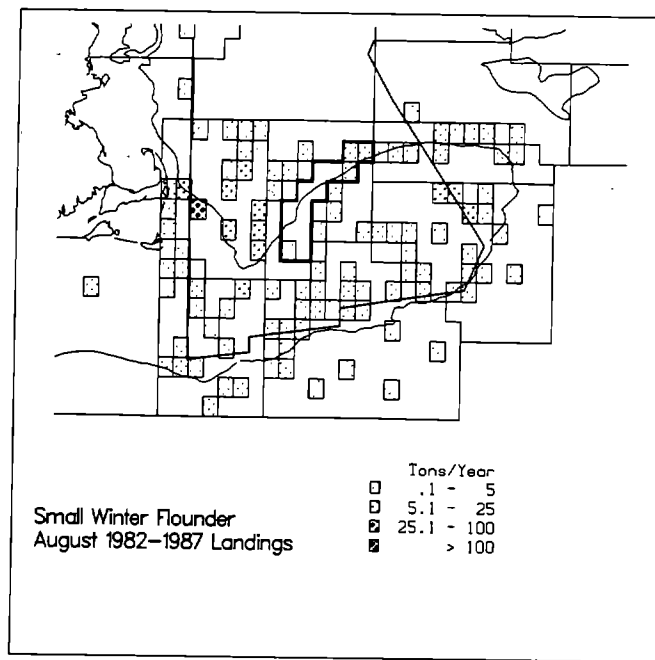
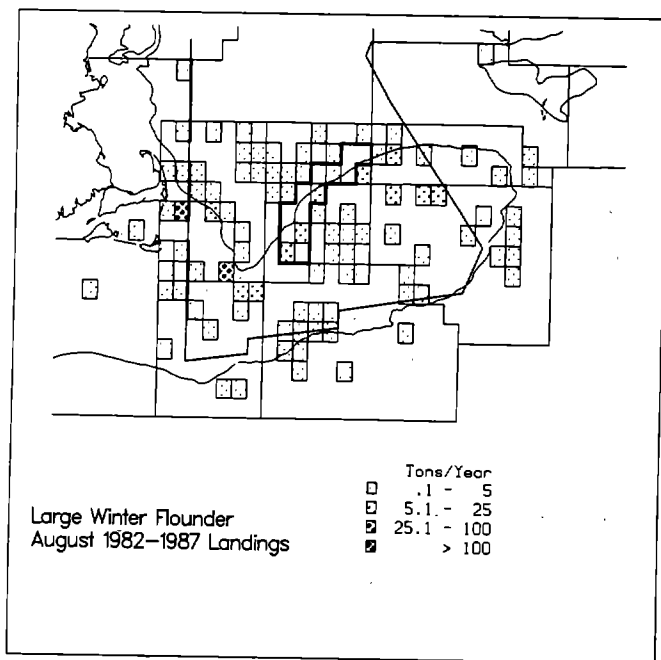


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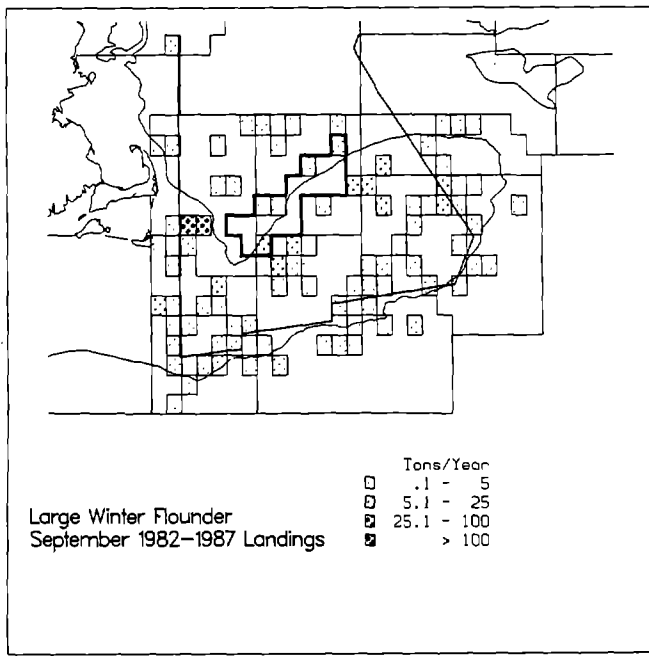


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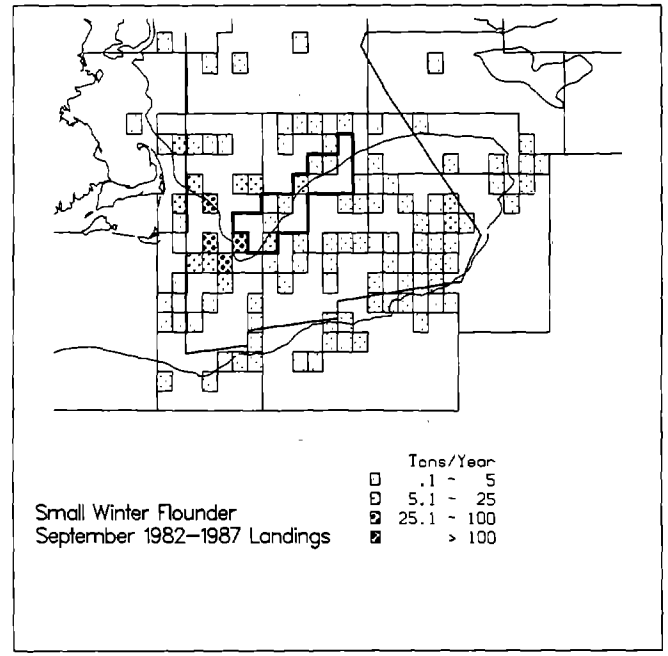


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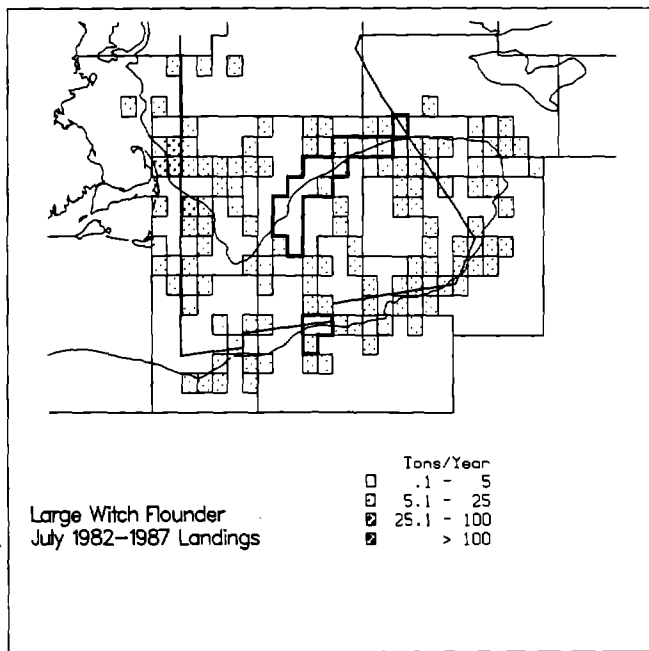


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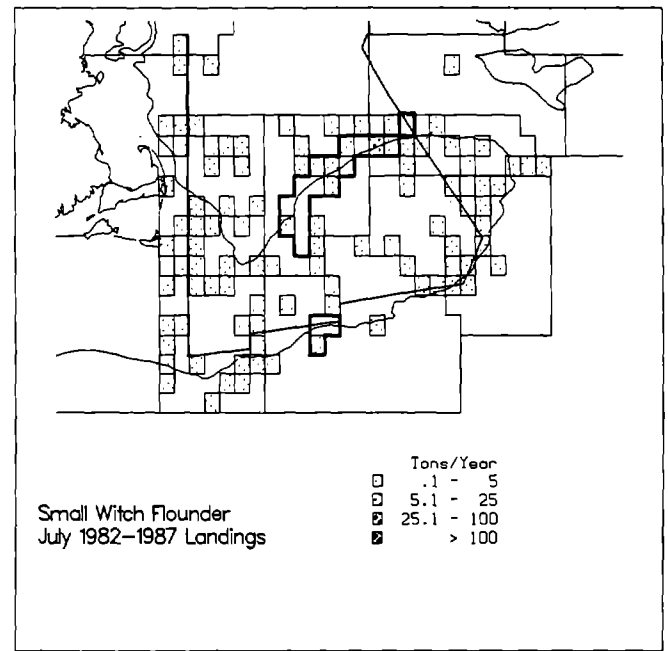


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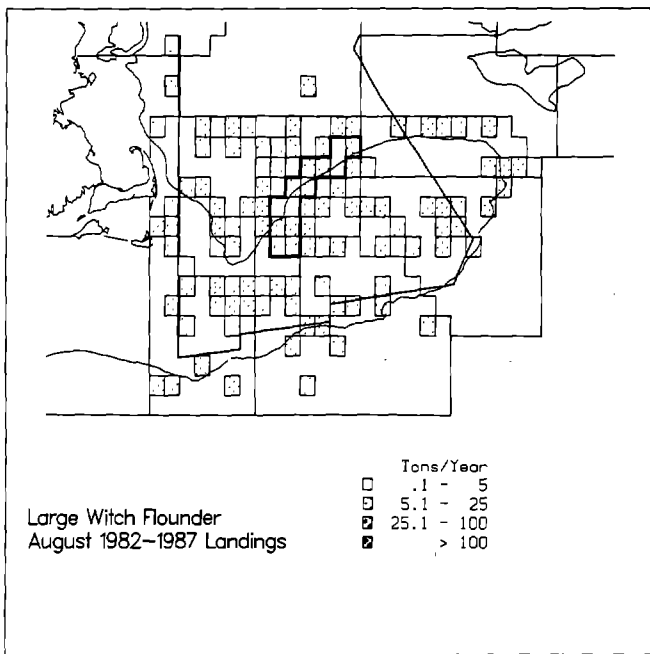


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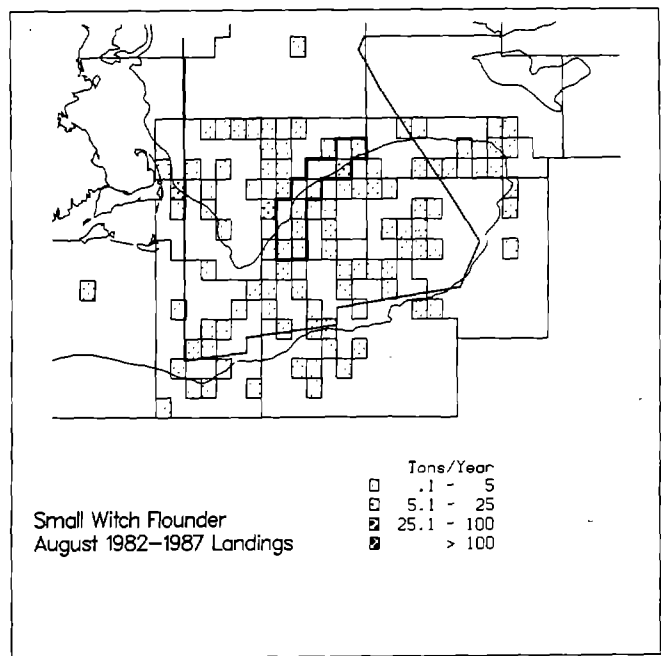


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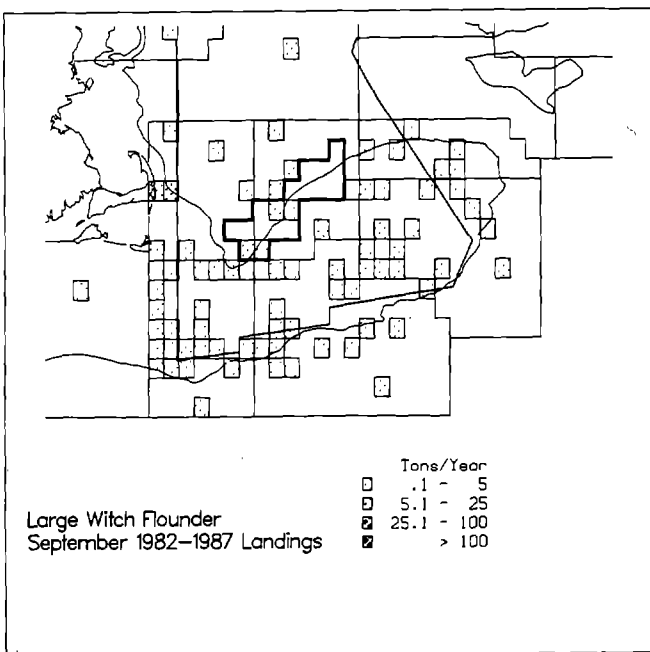


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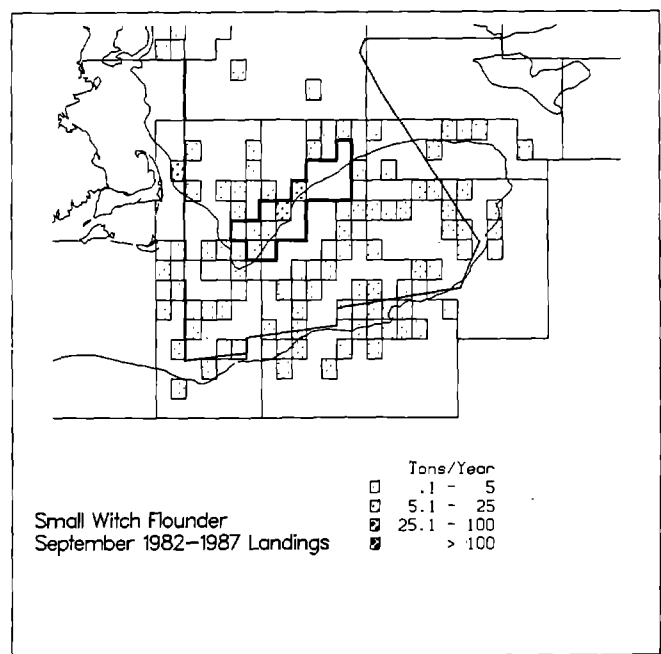


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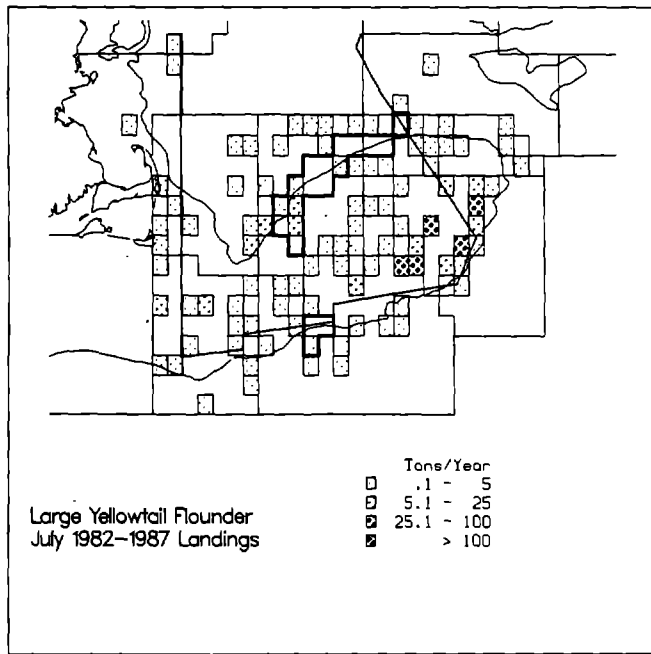


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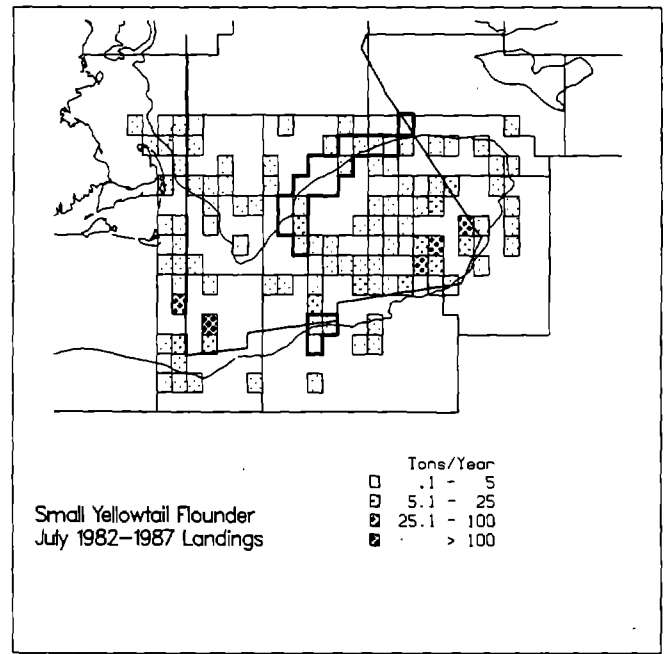


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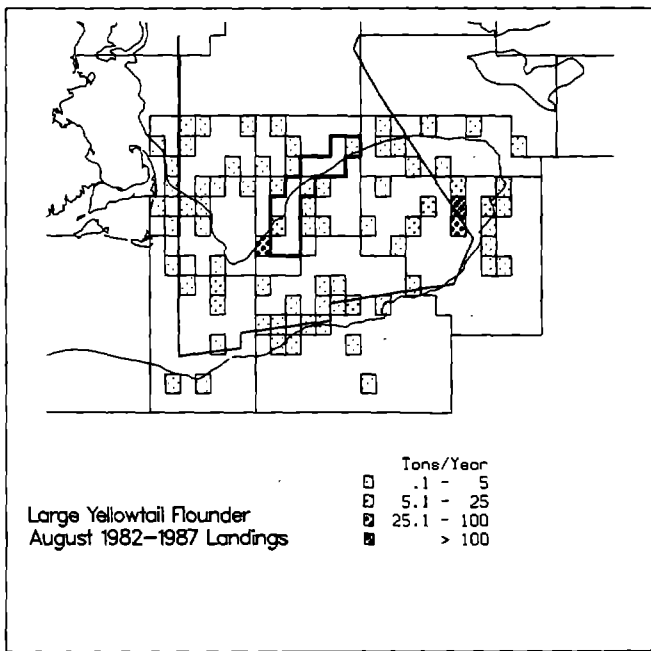


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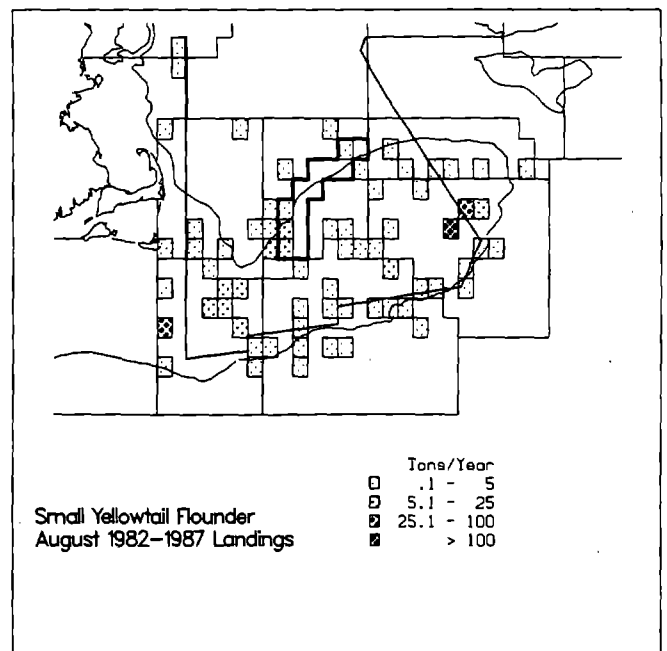


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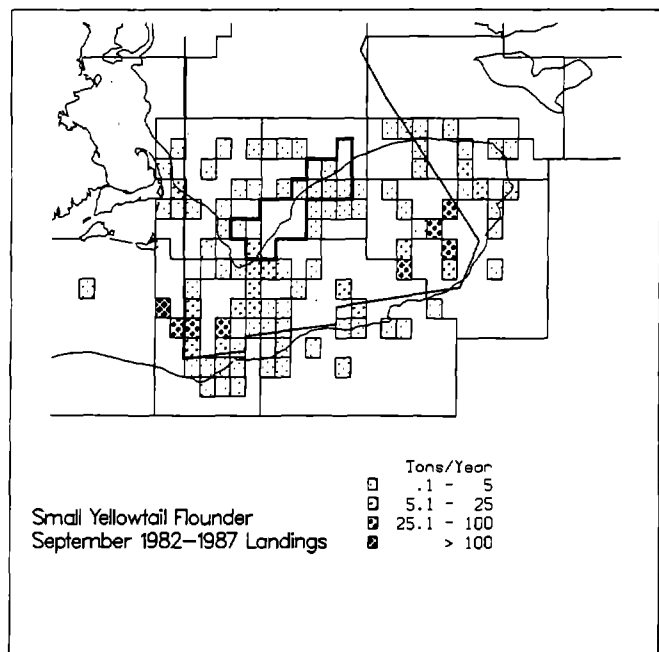
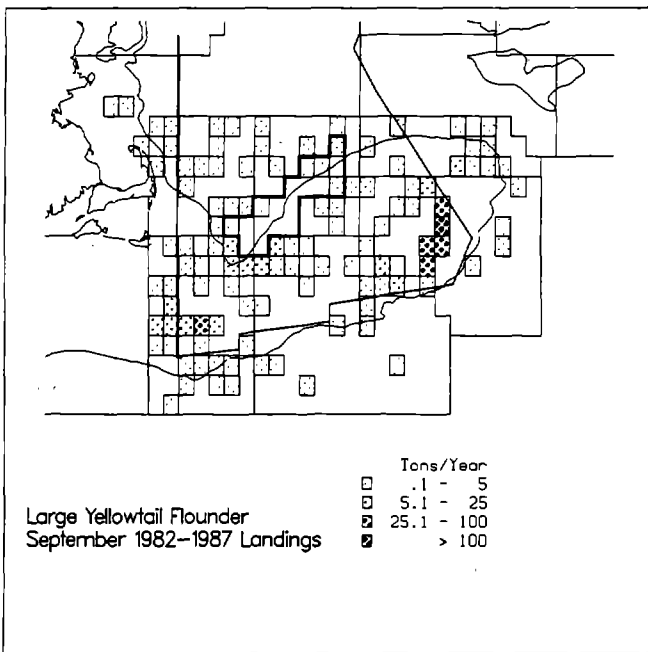


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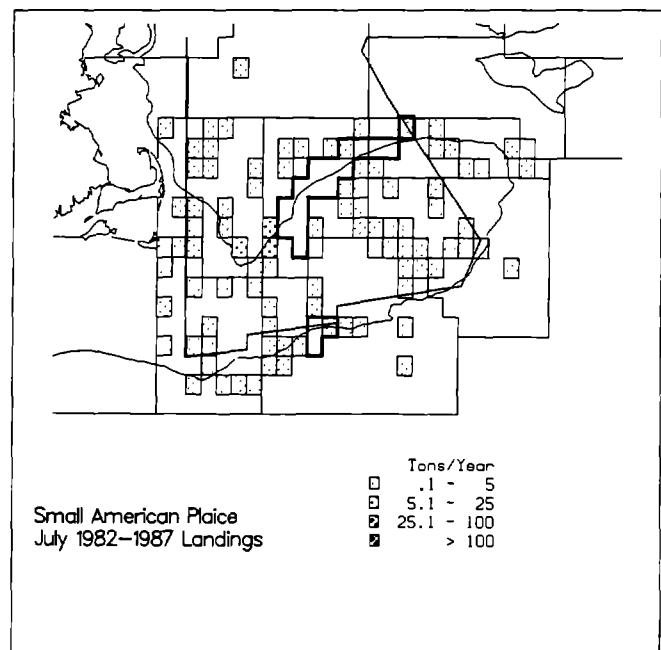
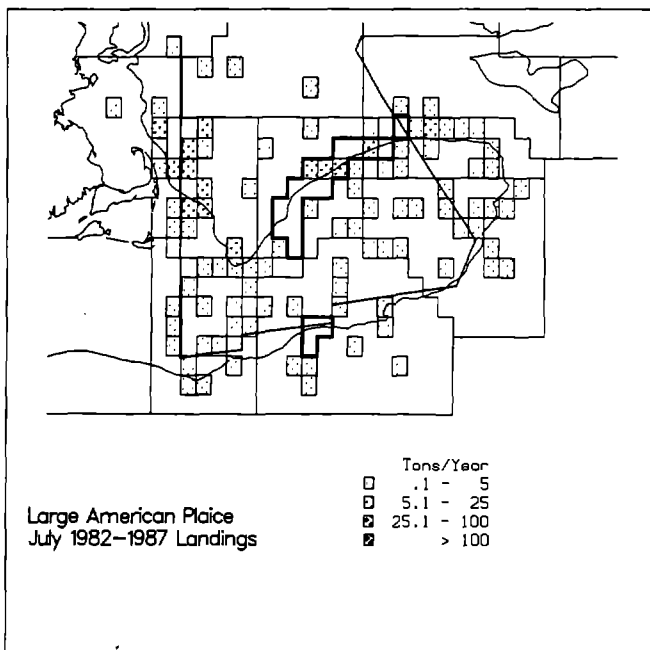


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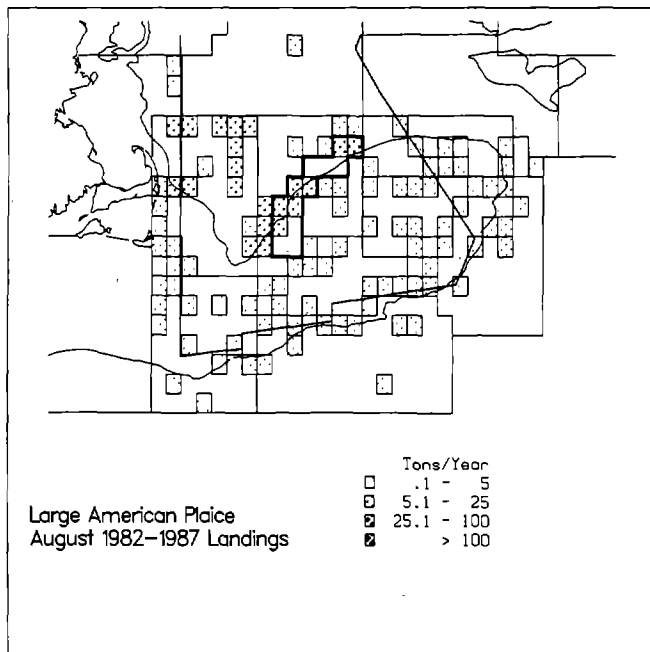


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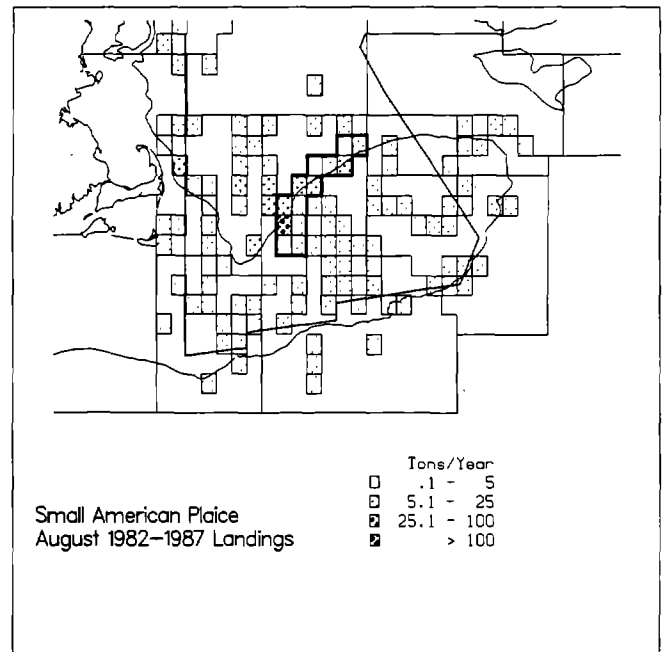


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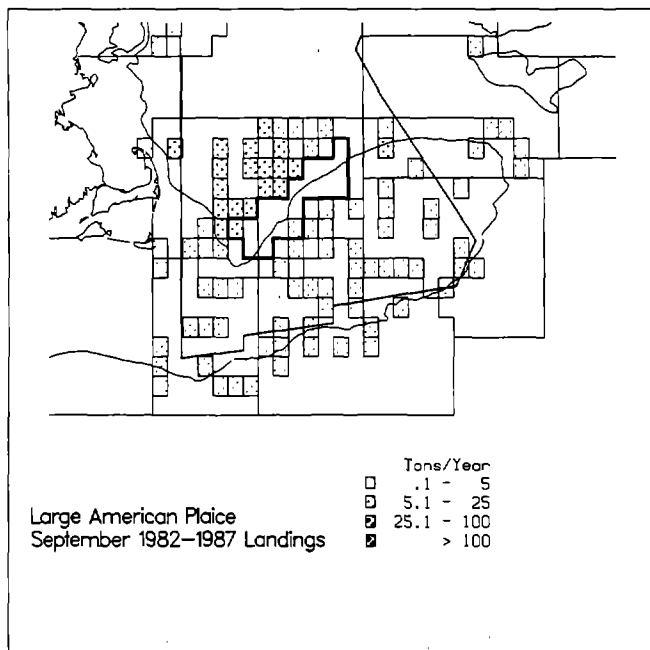


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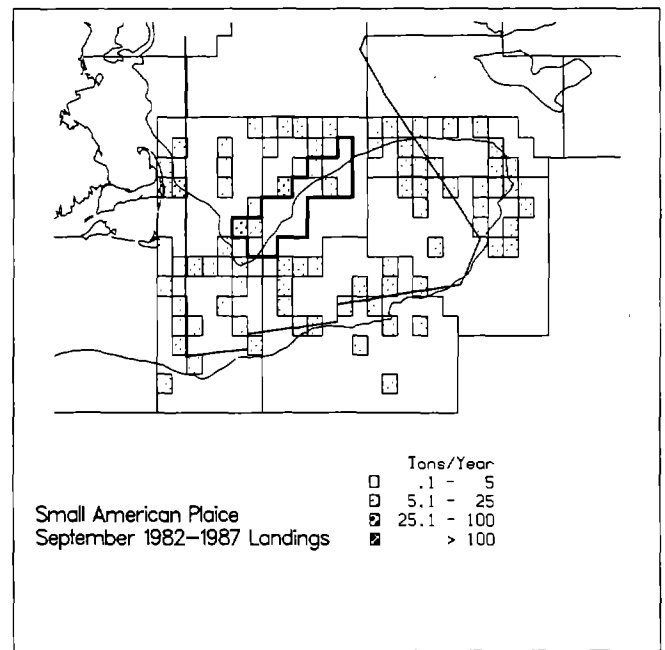


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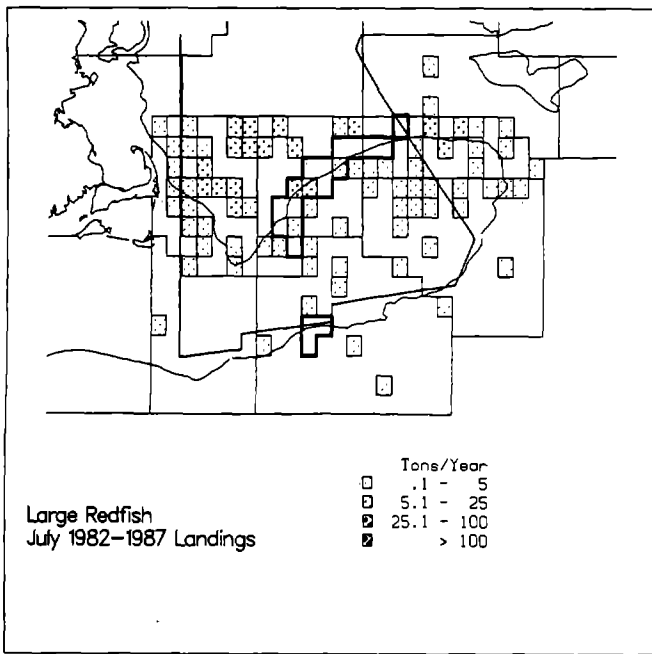


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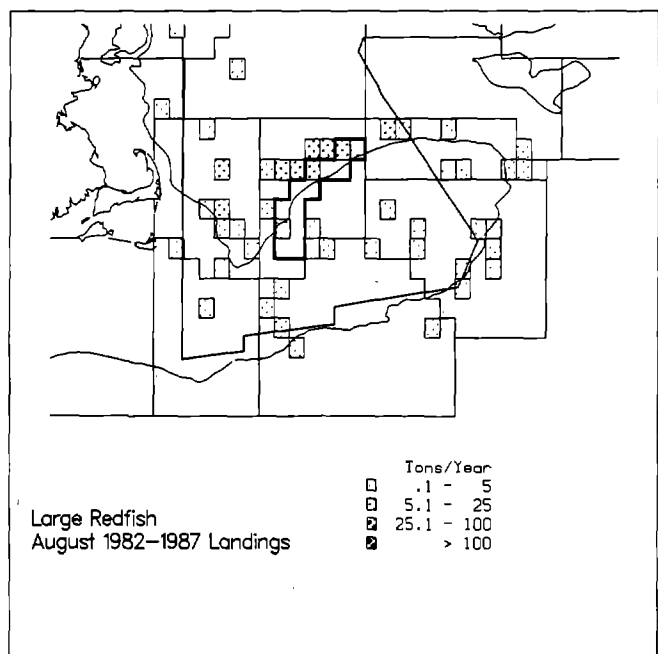


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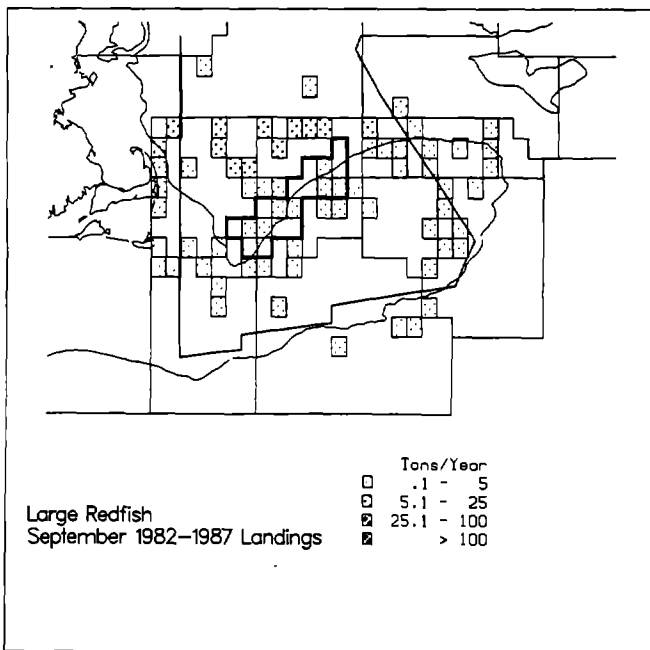


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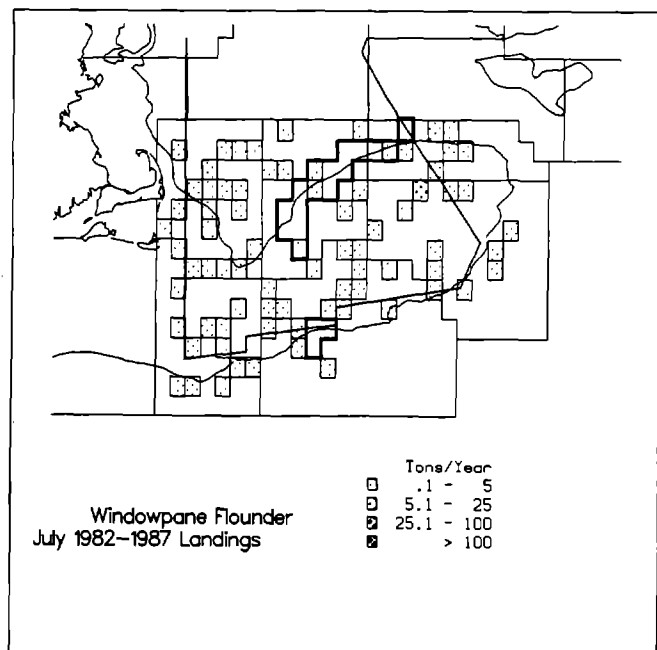


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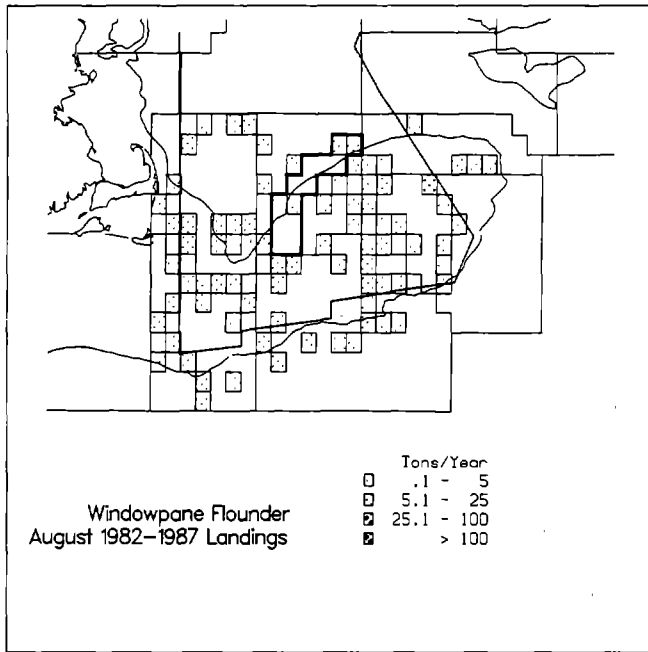


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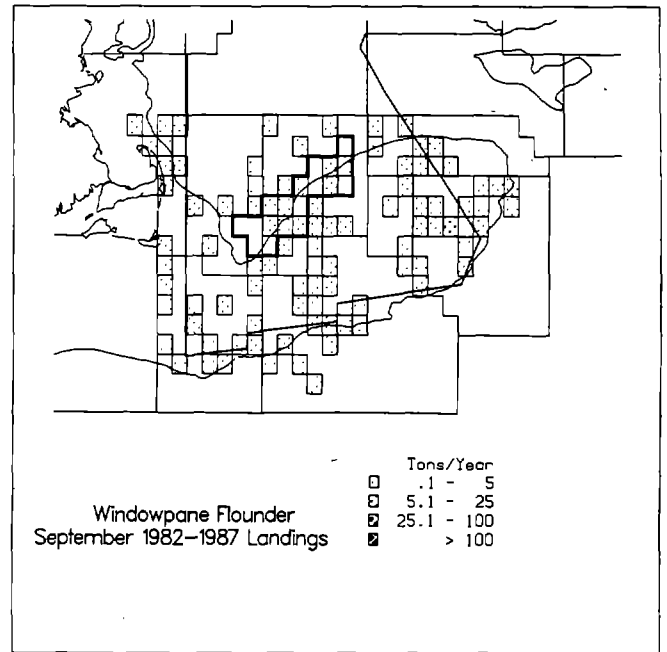


Figure 54

FIGURES 55-74

Summer distribution of NEFC bottom trawl survey catches (1977-81 mean) of "legal/adult" and "sub-legal/juvenile" categories of each regulated species. (Each square represents 10' latitude by 10' longitude. The bold lines describe the region where the Experimental Fishery occurred.)

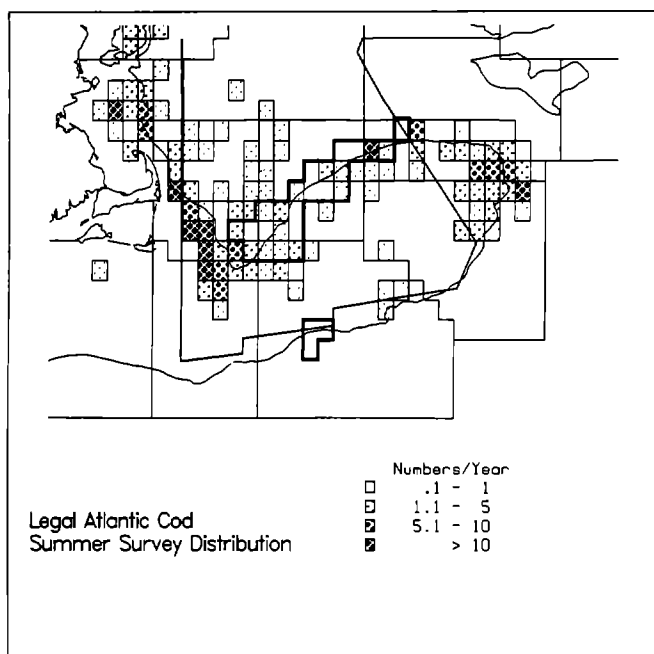


Figure 55

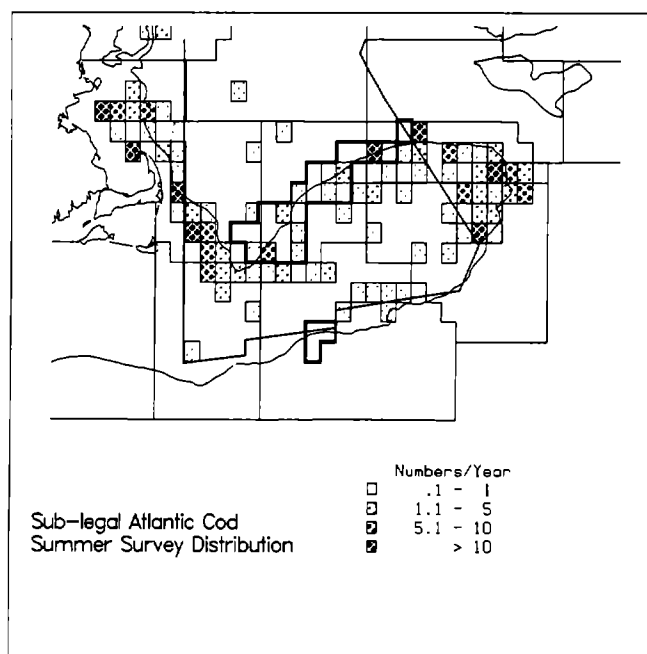


Figure 56

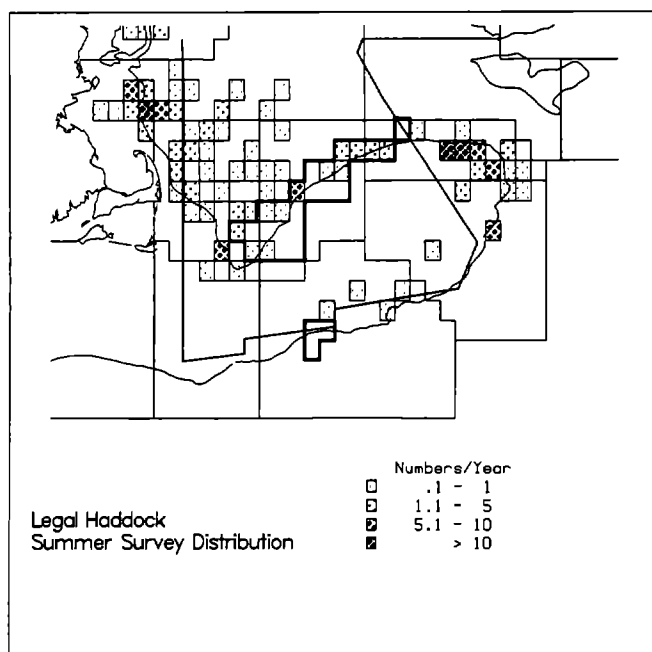


Figure 57

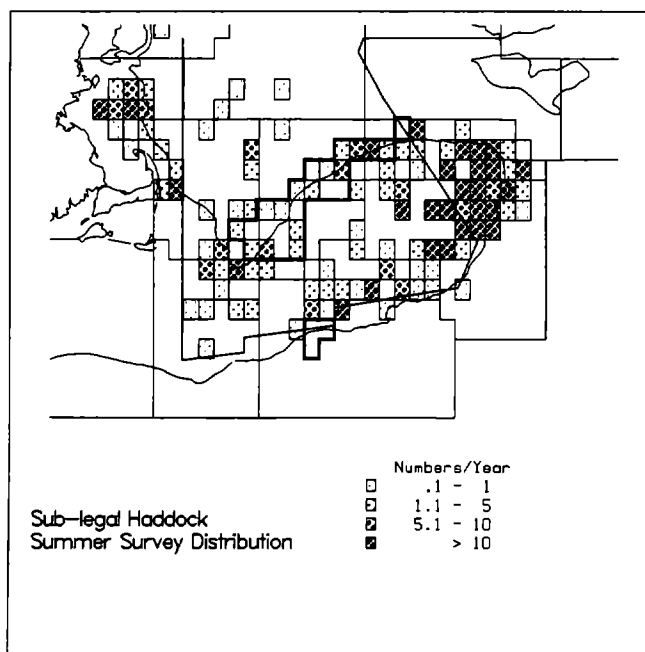


Figure 58

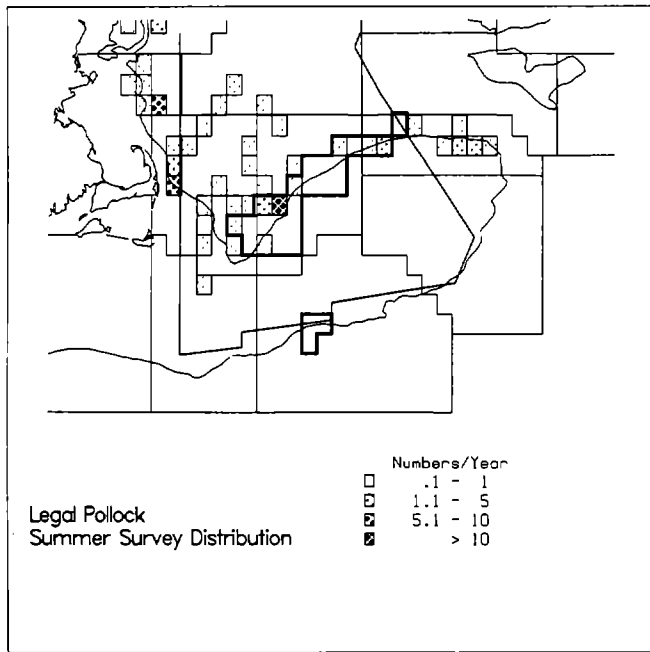


Figure 59

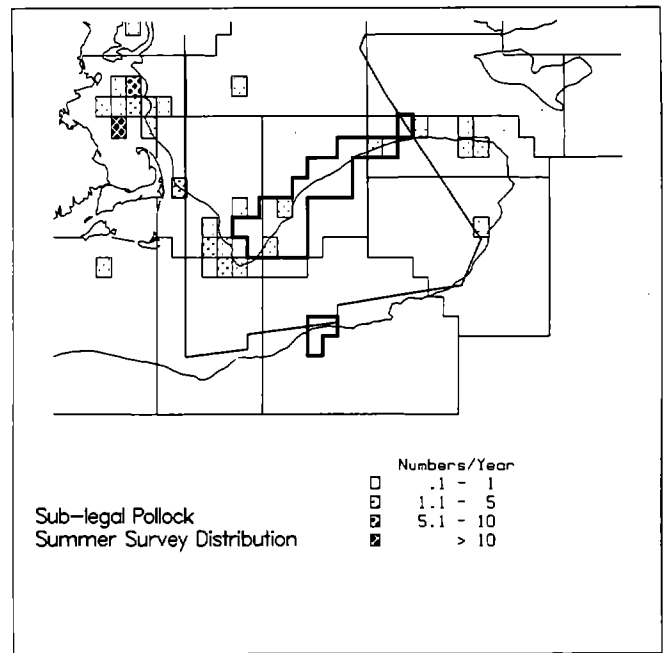


Figure 60

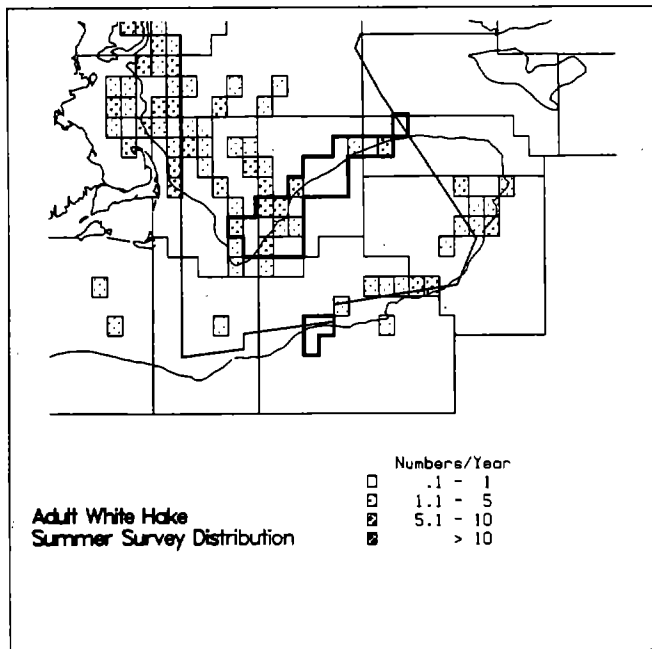


Figure 61

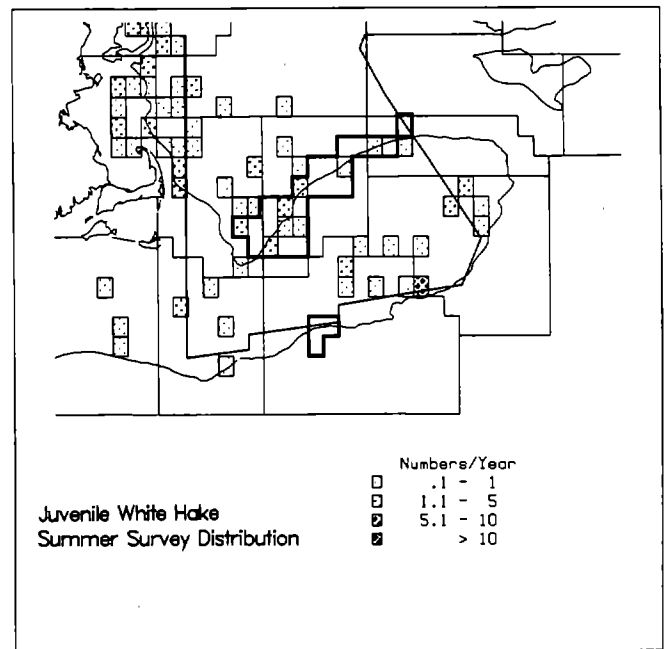


Figure 62

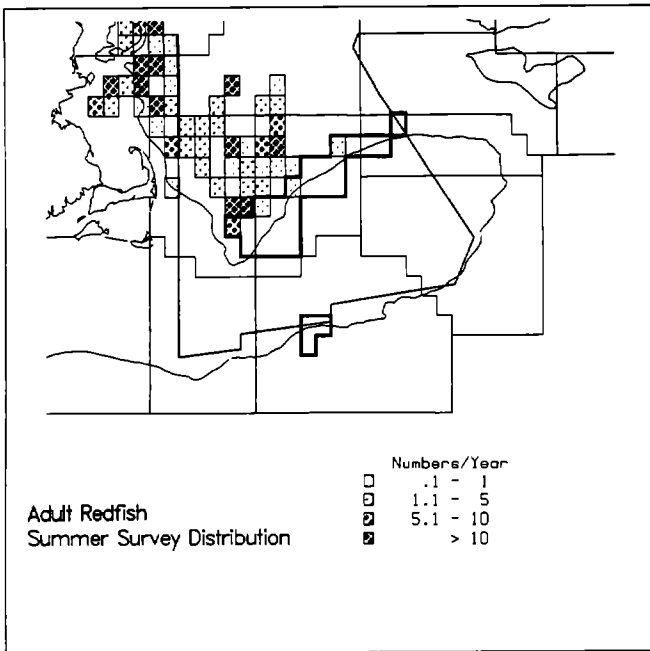


Figure 63

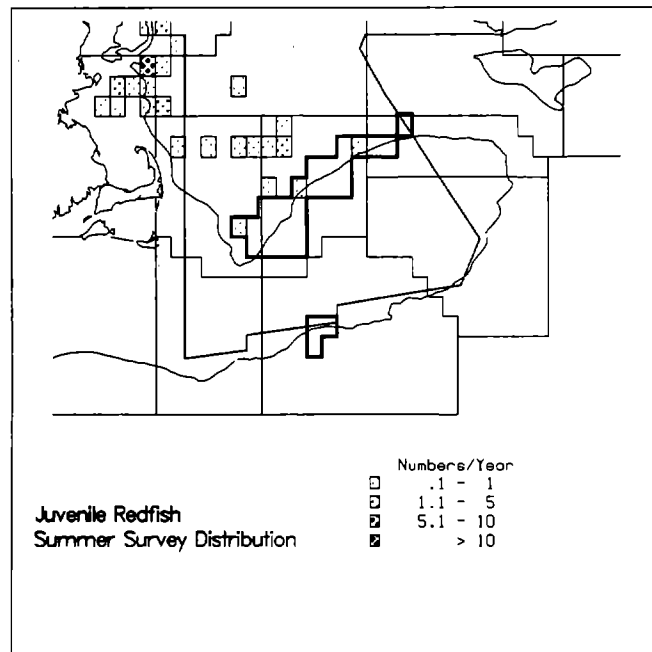


Figure 64

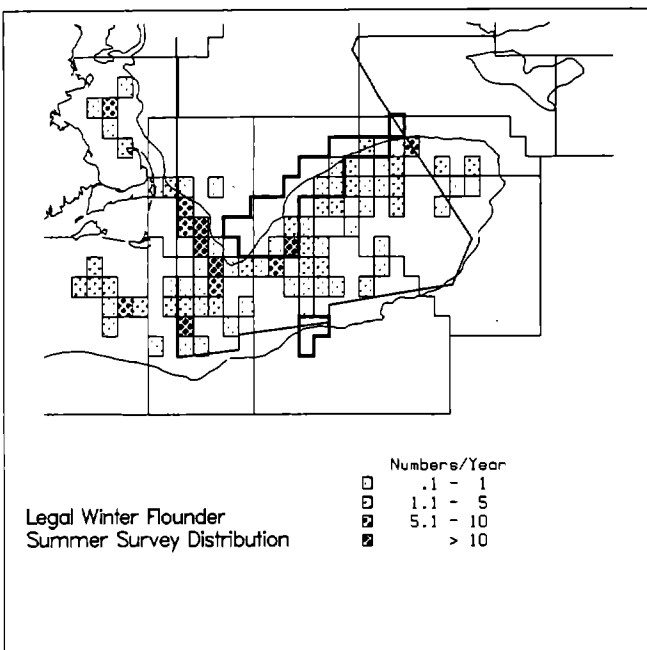


Figure 65

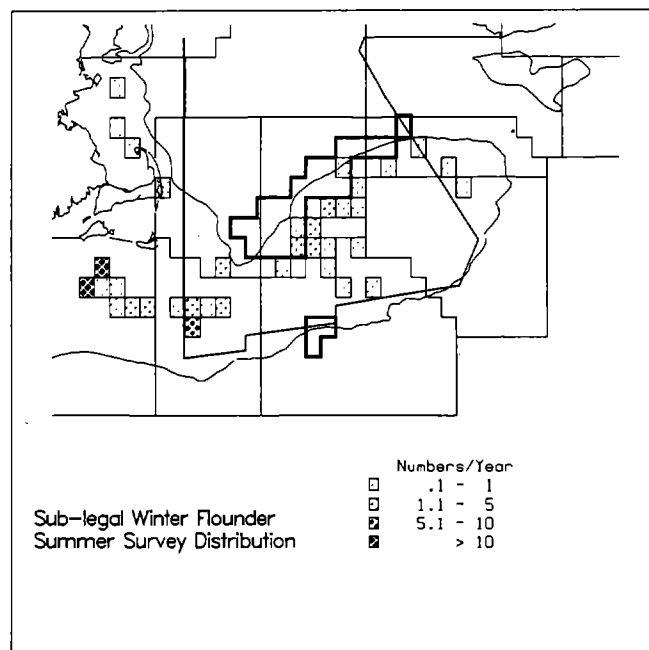


Figure 66

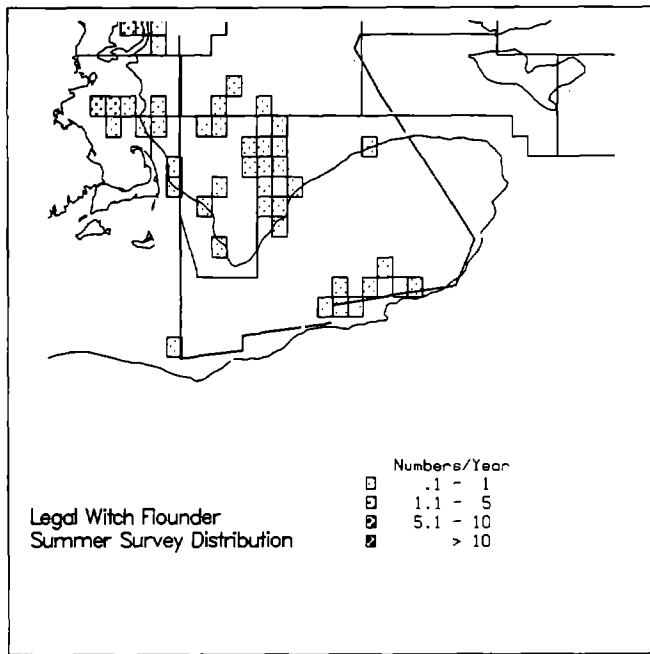


Figure 67

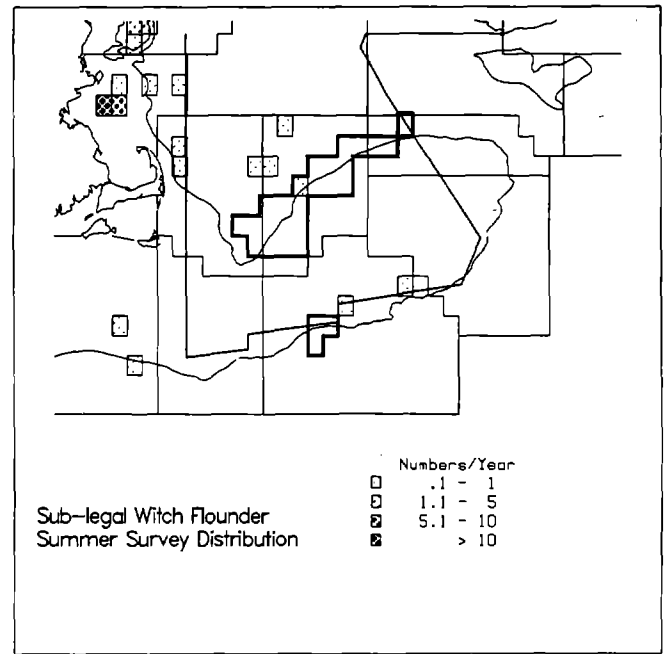


Figure 68

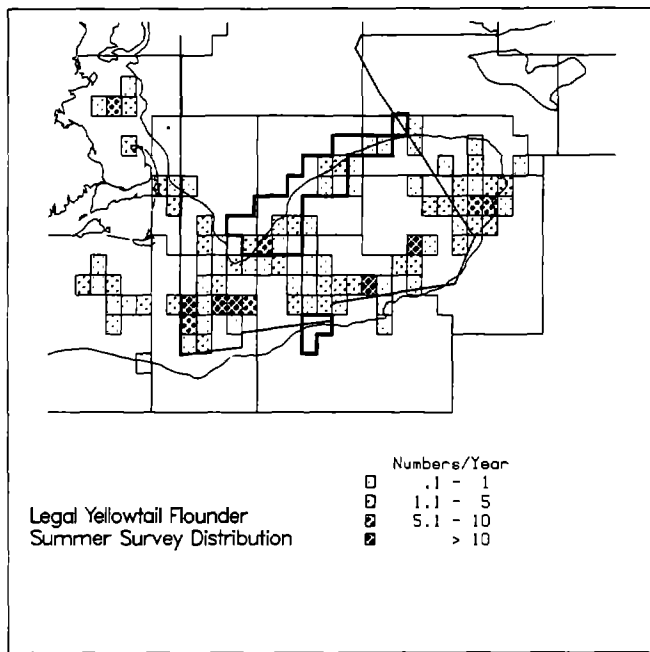


Figure 69

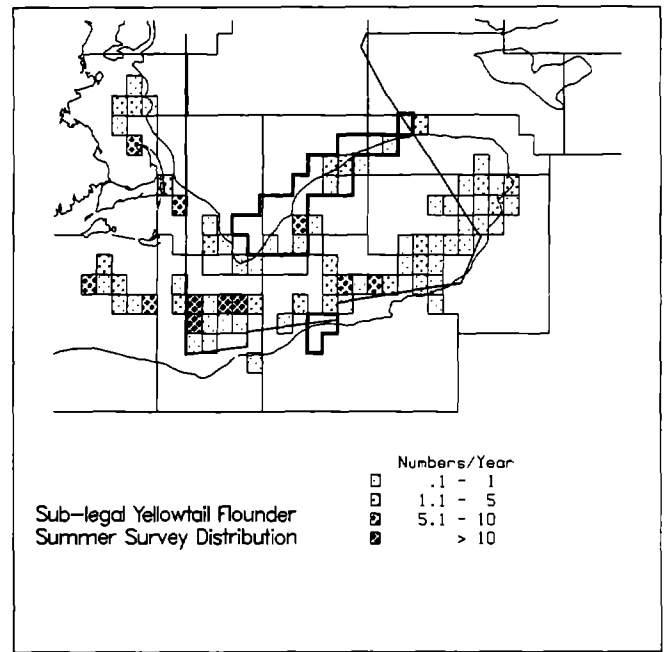


Figure 70

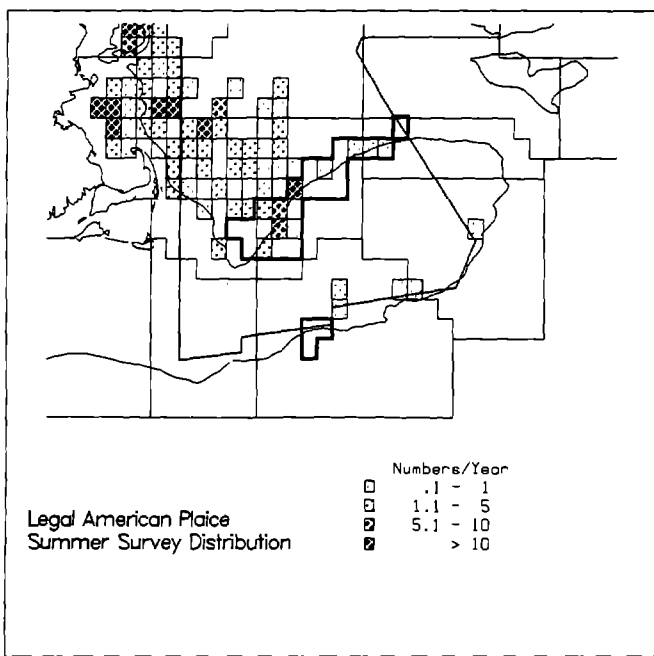


Figure 71

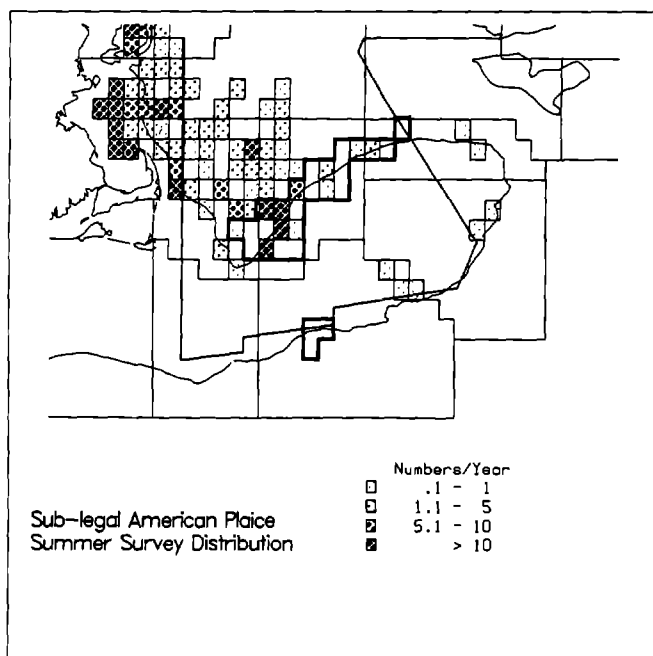


Figure 72

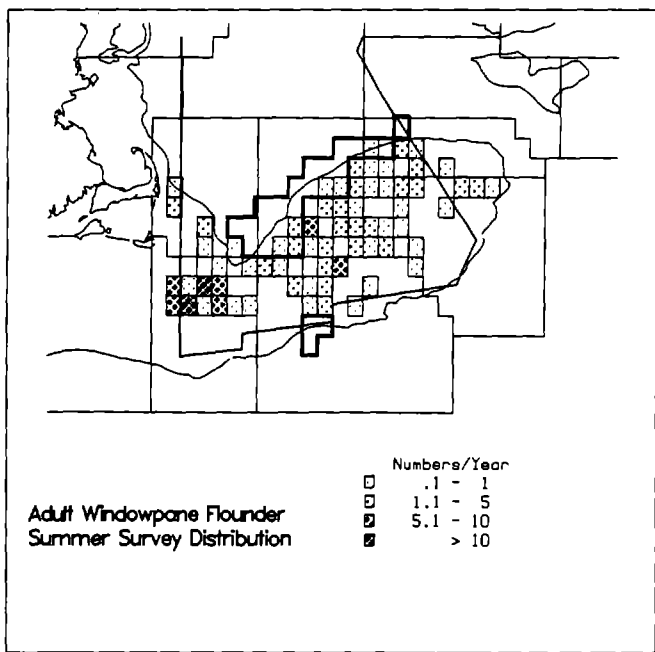


Figure 73

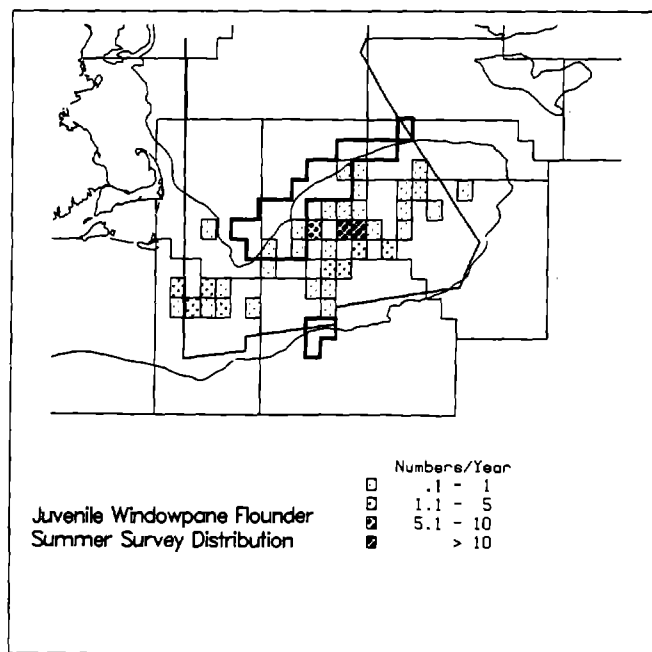


Figure 74

