

INCIDENTAL CATCHES MADE BY AMERICAN
TUNA SEINERS IN THE ATLANTIC OCEAN, 1967-1975

by

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SUMMARY

Incidental catches of bigeye tuna (Thunnus obesus), albacore (T. alalunga), little tuna (Euthynnus alletteratus), frigate tuna (Auxis thazard) and bullet mackerels (A. rochei), and rainbow runner (Elegatis bipinnulatus) that were made in 1968-1975 by American tuna seiners in the tropical Atlantic Ocean are reviewed. Estimates of catch and sizes of fish caught are made, and the spatial-temporal distribution of the catches is discussed. All of the incidental catches were made in the eastern tropical Atlantic, off Africa where fishing effort of the fleet has been concentrated.

RESUME

Le présent document fait état de prises accidentelles de thon obèse (Thunnus obesus), germon (Thunnus alalunga), thonine (Euthynnus alletteratus), auxide (Auxis thazard), "bullet mackerel" (Auxis rochei), et "rainbow runner" (Elegatis bipinnulatus) effectuées en 1968-75 par les senneurs américains dans l'Atlantique Tropical. Des estimations de la prise et de la taille du poisson capturé sont fournies, et la distribution spatio-temporelle des prises est commentée. Toutes ces prises accidentelles ont eu lieu dans l'Atlantique Tropical Oriental, au large des côtes africaines, où se concentre l'effort de la flottille de pêche.

RESUMEN

Se revisan las capturas fortuitas de patudo (Thunnus obesus), atún blanco (Thunnus alalunga), bacoreta (Euthynnus alletteratus), melva (Auxis thazard), "bullet mackerel" (Auxis rochei), y "rainbow runner" (Elegatis bipinnulatus) obtenidas por los cerqueros americanos en la zona tropical del Atlántico, durante el período 1968-1975. Se hacen estimaciones de captura y talla, así como un estudio de la distribución espacio/temporal de las capturas. El esfuerzo de pesca de la flota estuvo concentrado en el Atlántico tropical oriental, frente a la costa africana, por lo que las capturas fortuitas tuvieron lugar en dicha zona.

INTRODUCTION

Bigeye tuna (*Thunnus obesus*), albacore (*T. alalunga*), little tunny (*Euthynnus alletteratus*), frigate (*Auxis thazard*) and bullet (*Auxis rochei*) mackerels, and rainbow runner (*Elagatus bipinnulatus*) are sometimes caught by American tuna seiners while fishing for yellowfin (*T. albacares*) and skipjack (*Katsuwonus pelamis*) tunas in the tropical Atlantic Ocean. These catches are generally recorded in the vessel's logbook if they are about a ton or more but they are not always landed. Bigeye tuna and albacore catches are usually landed because they are canned for human consumption and are high priced. Catches of the other species, however, are infrequently landed. They are often discarded at sea because in the U.S. they are processed into pet food and are low priced.

American participation in the tropical tuna fishery of the Atlantic Ocean was reviewed by Sakagawa and Lenarz (1972) and Sakagawa (1974). Statistics on the principal species, yellowfin and skipjack tunas, caught by American seiners were analyzed by them. In this report, statistics on the incidental catches are examined. The statistics were compiled from logbook and landing records and samples of fish measured for length at ports of landing. Data were collected by the Inter-American Tropical Tuna Commission through a National Marine Fisheries Service contract.

ESTIMATED CATCHES

Data from logbooks and landing records were used to estimate the incidental catches by species for the American fleet. In 1967-1975, most of the incidental catches were bigeye tuna, followed by little tunny, albacore, and the mackerels in that order (Table 1). Rainbow runner catches were small and tonnages were not recorded in the logbooks.

Table 1. Incidental catches by species caught by American tuna seiners in the eastern Atlantic while fishing for yellowfin and skipjack tunas

| Year | Catch (metric tons) | | | | Total |
|------|---------------------|--------------|----------|------------------------------|-------|
| | Bigeye | Little tunny | Albacore | Frigate and bullet mackerels | |
| 1967 | - | - | - | - | 0 |
| 1968 | 18 | - | - | - | 18 |
| 1969 | 148 | - | - | - | 148 |
| 1970 | 195 | 10 | - | 2 | 207 |
| 1971 | 544 | - | - | - | 544 |
| 1972 | 212 | 76 | 10 | 24 | 322 |
| 1973 | 113 | 14 | - | 4 | 136 |
| 1974 | 865 | 42 | 12 | - | 919 |
| 1975 | 67 | 64 | 1 | 3 | 135 |

Bigeye tuna is caught either in single-species schools or in mixed-species schools with yellowfin tuna. The American catch ranged from 0 to 865 metric tons in 1967-1975 (Table 1). These are minimal estimates of bigeye catches because bigeye tuna, particularly those less than 10 kg are difficult to differentiate from yellowfin tuna and American fishermen generally record and land them as yellowfin tuna. Research is currently underway to determine the extent of this practice and to devise procedures to estimate the amount of mixing of bigeye tuna in yellowfin tuna landings.

Albacore were caught only in 1972, 1974 and 1975 and the catches were not large. They were all taken from single-species schools.

American fishermen usually catch little tunny and frigate and bullet mackerels in mixed-species schools with skipjack tuna. Only occasionally are these species caught in single-species schools, and often unintentionally as the schools are sometimes mistaken for skipjack tuna. Catches for the American fleet range from 0 to 76 metric tons of little tunny (Table 1) and 0 to 24 metric tons of mackerels (Table 1). Probably these catches are underestimates because fishermen frequently discard little tunny and mackerels and do not report tonnages of discards.

SPATIAL-TEMPORAL DISTRIBUTION OF CATCHES

Logbook records for 1967-1975 were used to summarize the catches of each species by quarter of the year and 5° x 5° area. The results (Figures 1-4) show that the incidental catches were all made in the eastern tropical Atlantic, off Africa where fishing effort of the American fleet has been concentrated (Sakagawa and Lenarz, 1972).

Bigeye tuna are generally caught with longline gear and are unavailable in large quantities to surface gears. In the Atlantic Ocean, all of the American catches of bigeye tuna were made in the third and fourth quarters of the year in the Gulf of Guinea and off Angola (Figure 1). Currently the Gulf of Guinea is the only region of the Atlantic where significant numbers of bigeye tuna are caught with surface gears.

Albacore is a temperate tuna that does not normally occur in dense concentration and are seldom caught with purse seines. Only a few tons were caught by the American fleet from the Atlantic in 1967-1975 (Table 1). Catches were made in the second and fourth quarters of the year, all south of the equator off Pointe Noire, Zaire (Figure 2). These catches are unusual because they were made with purse seines and in the tropical Atlantic which is generally considered too warm for albacore.

Favorable surface water temperatures (17° to 22°C) for albacore, however, occur along the coast from South Africa to about Pointe Noire during the summer and fall months (LeGuen, Poinard and Troadec, 1965) and a thermal dome of favorable water temperatures occur close to the surface off Pointe Noire during the other months (Mazeika, 1967). These

Samples of little tunny were collected only in 1975. Sizes of fish in the catch ranged from 35 cm to 61 cm long, with a strong mode at 49 cm (Table 4).

oceanographic conditions cause albacore to be available in the surface waters off Pointe Noire during particular seasons of the year. And the seasons probably correspond to the period of albacore migration into the surface fishery (baitboat and sport) off South Africa and along the African coast. Albacore caught in the Pointe Noire region therefore appear to belong to the South Atlantic stock.

Little tunny inhabit coastal waters of the tropical Atlantic Ocean and are apparently quite abundant. The American catch from the eastern Atlantic, however, has been small, ranging from 0 to 76 metric tons annually (Table 1). For the combined years 1967-1975, incidental catches were reported in all quarters of the year from the Gulf of Guinea (Figure 3).

Frigate and bullet mackerels are found in the coastal tropical and subtropical waters of the Atlantic. Catches of these species by American tuna fishers are not separated by species. Incidental catches have been reported from the Gulf of Guinea and off Angola in the third and fourth quarters of the year (Figure 4).

SIZES OF FISH IN THE CATCH

The American catch of Atlantic tunas are routinely sampled for length measurements at ports of landing. Fifty fish samples are collected from the boat wells and priority is given to yellowfin and skipjack tunas, which make up the bulk of the American catch (Sakagawa, Coan and Holzappel, 1976).

In 1967-1975 few species, other than yellowfin and skipjack tunas, were sampled (Table 2). Only bigeye tuna and little tunny samples were collected and the largest number was eight samples of bigeye tuna in 1974.

Table 2. Number of length-frequency samples of incidental species caught by American tuna seiners in the eastern tropical Atlantic

| Year | Bigeye tuna | | Little tunny | |
|------|-------------------|----------------|-------------------|----------------|
| | Number of samples | Number of fish | Number of samples | Number of fish |
| 1968 | 2 | 22 | - | - |
| 1971 | 5 | 244 | - | - |
| 1972 | 3 | 148 | - | - |
| 1973 | 3 | 150 | - | - |
| 1974 | 8 | 361 | - | - |
| 1975 | 4 | 200 | 4 | 200 |

Sizes of bigeye tuna and little tunny caught by the American fleet were estimated from the samples with a procedure described by Sakagawa et al. (1976). The results indicate that between 500 and 41,200 bigeye tuna were caught by the American fleet in 1968-1975 (Table 3). Sizes range from 39 cm to 171 cm long with four major modal groups (39 to 51 cm, 52 to 73 cm, 74 to 105 cm, and 106 to 131 cm) represented in the catches.

Table 4. Estimated length composition of little tunny caught by American purse seiners in the eastern tropical Atlantic

| Midpoint length (cm) | Number of fish |
|----------------------|----------------|
| | 1975 |
| 35.0 | 627 |
| 37.0 | 2,507 |
| 39.0 | 313 |
| 41.0 | 4,811 |
| 43.0 | 1,315 |
| 45.0 | 1,063 |
| 47.0 | 6,202 |
| 49.0 | 11,868 |
| 51.0 | 5,544 |
| 53.0 | 725 |
| 55.0 | 384 |
| 57.0 | 584 |
| 59.0 | 314 |
| 61.0 | 157 |
| Total | 36,414 |

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Table 3. Estimated length composition of bigeye tuna caught by American purse seiners in the eastern tropical Atlantic

| Midpoint length (cm) | Number of fish by year | | | | | |
|----------------------|------------------------|-------|-------|-------|-------|------|
| | 1968 | 1971 | 1972 | 1973 | 1974 | 1975 |
| 39.0 | 0 | 0 | 0 | 70 | 126 | 0 |
| 41.0 | 0 | 315 | 0 | 140 | 478 | 0 |
| 43.0 | 22 | 567 | 0 | 0 | 353 | 0 |
| 45.0 | 0 | 158 | 0 | 0 | 364 | 0 |
| 47.0 | 0 | 166 | 0 | 0 | 655 | 0 |
| 49.0 | 0 | 329 | 0 | 0 | 496 | 0 |
| 51.0 | 0 | 0 | 204 | 140 | 227 | 0 |
| 53.0 | 0 | 175 | 392 | 71 | 642 | 0 |
| 55.0 | 0 | 175 | 1794 | 211 | 914 | 0 |
| 57.0 | 0 | 1032 | 2390 | 493 | 787 | 0 |
| 59.0 | 0 | 1449 | 5163 | 1262 | 581 | 0 |
| 61.0 | 22 | 175 | 8116 | 1546 | 2372 | 0 |
| 63.0 | 0 | 420 | 3972 | 848 | 2517 | 0 |
| 65.0 | 0 | 646 | 1191 | 992 | 2187 | 0 |
| 67.0 | 44 | 158 | 400 | 284 | 792 | 0 |
| 69.0 | 22 | 472 | 0 | 284 | 1342 | 0 |
| 71.0 | 22 | 154 | 0 | 0 | 943 | 0 |
| 73.0 | 0 | 158 | 0 | 0 | 624 | 0 |
| 75.0 | 0 | 235 | 0 | 140 | 844 | 0 |
| 77.0 | 0 | 88 | 0 | 213 | 738 | 0 |
| 79.0 | 0 | 0 | 0 | 210 | 304 | 0 |
| 81.0 | 0 | 0 | 0 | 281 | 738 | 161 |
| 83.0 | 0 | 79 | 196 | 70 | 1477 | 128 |
| 85.0 | 22 | 0 | 204 | 282 | 1463 | 64 |
| 87.0 | 44 | 77 | 604 | 421 | 2070 | 32 |
| 89.0 | 44 | 158 | 400 | 417 | 643 | 161 |
| 91.0 | 0 | 79 | 799 | 701 | 867 | 32 |
| 93.0 | 0 | 312 | 791 | 566 | 1240 | 63 |
| 95.0 | 22 | 235 | 1574 | 142 | 661 | 63 |
| 97.0 | 0 | 471 | 196 | 142 | 204 | 0 |
| 99.0 | 0 | 548 | 196 | 71 | 325 | 0 |
| 101.0 | 0 | 236 | 587 | 0 | 394 | 112 |
| 103.0 | 0 | 315 | 0 | 0 | 482 | 160 |
| 105.0 | 0 | 166 | 0 | 71 | 238 | 128 |
| 107.0 | 0 | 245 | 0 | 0 | 41 | 223 |
| 109.0 | 0 | 235 | 0 | 0 | 755 | 144 |
| 111.0 | 0 | 465 | 0 | 71 | 430 | 16 |
| 113.0 | 26 | 954 | 0 | 0 | 1624 | 96 |
| 115.0 | 26 | 469 | 0 | 71 | 1028 | 127 |
| 117.0 | 26 | 940 | 0 | 0 | 1186 | 175 |
| 119.0 | 0 | 1656 | 0 | 71 | 803 | 111 |
| 121.0 | 26 | 1179 | 0 | 0 | 388 | 63 |
| 123.0 | 0 | 866 | 0 | 0 | 364 | 78 |
| 125.0 | 26 | 630 | 0 | 71 | 172 | 47 |
| 127.0 | 26 | 550 | 0 | 71 | 107 | 31 |
| 129.0 | 0 | 235 | 196 | 0 | 107 | 16 |
| 131.0 | 26 | 0 | 0 | 0 | 41 | 31 |
| 133.0 | 26 | 77 | 0 | 0 | 705 | 63 |
| 135.0 | 26 | 0 | 0 | 0 | 315 | 0 |
| 137.0 | 0 | 0 | 0 | 0 | 344 | 0 |
| 139.0 | 0 | 77 | 0 | 0 | 41 | 0 |
| 141.0 | 0 | 0 | 0 | 0 | 587 | 32 |
| 143.0 | 0 | 158 | 0 | 71 | 376 | 0 |
| 145.0 | 0 | 0 | 0 | 71 | 842 | 32 |
| 147.0 | 0 | 156 | 0 | 71 | 270 | 0 |
| 149.0 | 0 | 79 | 0 | 0 | 1079 | 0 |
| 151.0 | 0 | 232 | 0 | 0 | 0 | 0 |
| 153.0 | 0 | 77 | 0 | 0 | 235 | 0 |
| 155.0 | 0 | 232 | 0 | 0 | 0 | 0 |
| 157.0 | 26 | 0 | 0 | 0 | 0 | 0 |
| 159.0 | 0 | 154 | 0 | 0 | 0 | 0 |
| 161.0 | 0 | 154 | 0 | 0 | 41 | 0 |
| 163.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 165.0 | 0 | 77 | 0 | 0 | 0 | 0 |
| 167.0 | 0 | 154 | 0 | 0 | 102 | 0 |
| 169.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 171.0 | 0 | 88 | 0 | 0 | 270 | 0 |
| Total | 524 | 19687 | 29365 | 10636 | 41239 | 2389 |

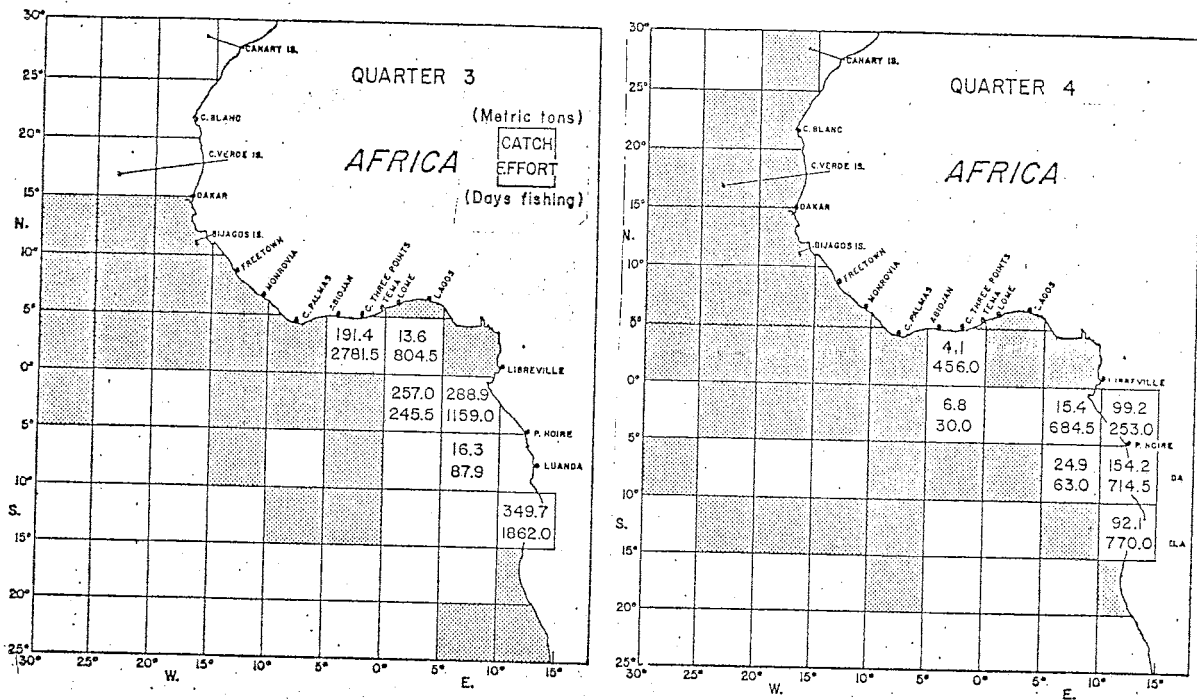


Figure 1. Incidental catch of bigeye tuna and fishing effort by 5°x5° areas for American tuna seiners that fished in the Atlantic in the third (July-September) and fourth (October-December) quarters of the combined years, 1967-1975. Areas in which fishing took place, but no catches made, are shaded. No catches were recorded in the first and second quarters.

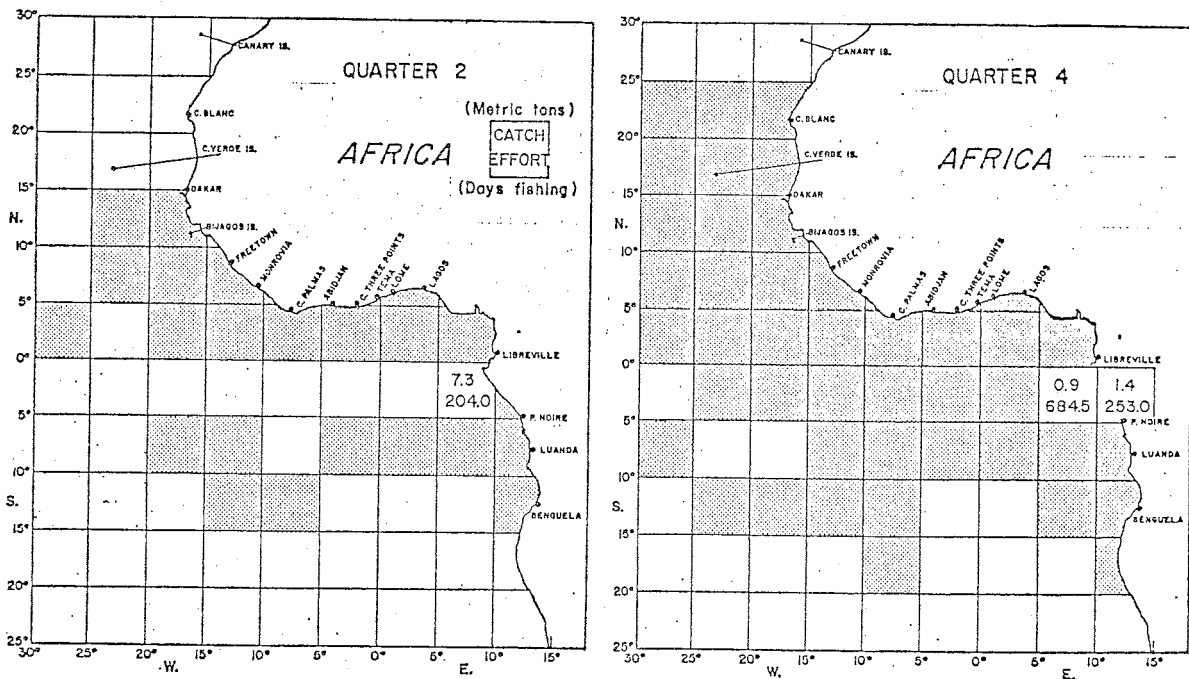


Figure 2. Incidental catch of albacore and fishing effort by 5° x 5° areas for American tuna seiners that fished in the Atlantic in the second (April-June) and fourth (October-December) quarters of the combined years, 1967-1975. Areas in which fishing took place, but no catches made, are shaded. No catches were recorded in the first and third quarters.

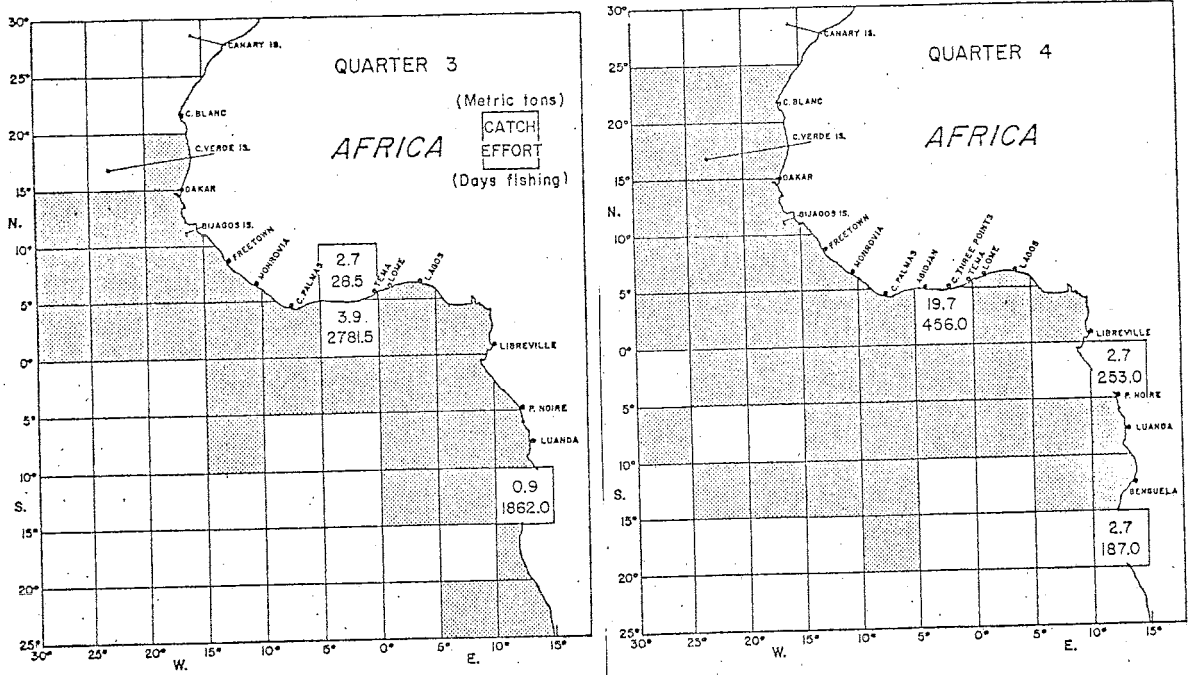


Figure 4. Incidental catch of frigate and bullet mackerels and fishing effort by 5°x5° areas for American tuna seiners that fished in the Atlantic in the third (July-September) and fourth (October-December) quarters of the combined years, 1967-1975. Areas in which fishing took place, but no catches made, are shaded. No catches were recorded in the first and second quarters.

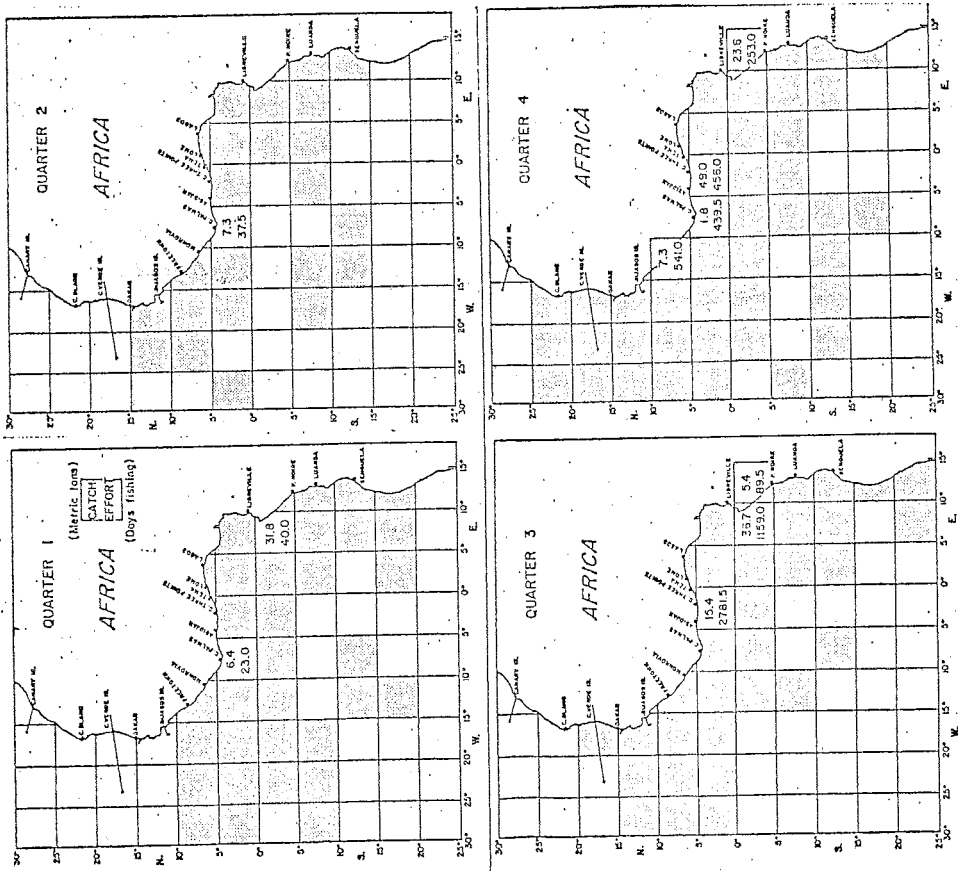


Figure 3. Incidental catch of little tunny and fishing effort by 5°x5° areas and quarters for American tuna seiners that fished in the Atlantic in the combined years, 1967-1975. Areas in which fishing took place, but no catches made, are shaded.