

## Size composition of male and female South Coast rock lobsters per season and area

J.P. Glazer and D.S. Butterworth

### Introduction

Area-disaggregated assessments for South Coast rock lobster are currently being developed. An important input to these assessments is the size composition data. This paper presents sex- and area-disaggregated size distributions per fishing season (a period that generally starts in October of one year and ends in September the following year). For the sake of convenience, fishing season will be referred to as “year” throughout the rest of this paper.

### The data

The analyses are restricted to data for the period 1996<sup>1</sup> – 2006. The numbers of lobster sampled are recorded in 5mm intervals and are sex-disaggregated. The fishing grounds have historically been separated into four areas. However, based on recent analyses conducted by Gaylard and Bergh (2007), the four areas have been revised to three (Figure 1). The size composition data have therefore been separated into 12 area/quarter cells, where the quarter categories comprise the months October-December, January-March, April-June and July-September respectively.

### Methodology

The proportions by number of lobsters sampled per length class and sex within an area-quarter cell for a particular year were defined such that  $\sum_{s,l} p_{y,s,l}^{A,q} = 1$ , where  $A$  is the area,

$q$  the quarter,  $s$  the sex,  $l$  the length class. Catch-weightings were applied to the proportions in each area-quarter cell, and these were then summed across quarters to obtain area- and sex-specific size composition estimates for each year, i.e.

$$p_{y,s,l}^A = \sum_q w_y^{A,q} p_{y,s,l}^{A,q}$$

$$\text{where } w_y^{A,q} = \frac{C_y^{A,q}}{\sum_q C_y^{A,q}}.$$

The catches ( $C_y^{A,q}$ ) were obtained from the commercial catch and effort dataset used in the GLM standardization of the CPUE data.

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<sup>1</sup> The year 1996 refers to the 1995/96 fishing season

## **Results**

Table 1 summarizes the information collected from each area-quarter cell for the entire time period being analyzed. The resultant area- and sex-specific size compositions per year are shown in Tables 2-4 and Figures 2-4 respectively.

## **Reference**

Gaylard, J.D. and M.O. Bergh. 2007. A clustering of South Coast rock lobster fishing grid blocks based on similarity of CPUE trend. 9pp. South Coast rock lobster task group document (May 2007).

**Table 1: Mean carapace length (CL) and sample size (n) per sex in each area/quarter cell per year. The catch (C) taken in each cell is also shown. Un-sampled cells are indicated by the shaded areas. Carapace length units are mm and catch units are kg.**

| <b>1996</b> | Oct-Dec   | Jan-Mar  | Apr-June  | July-Sep  |
|-------------|---|--|---|---|
| Area 1      | C: 52106.38<br>CL <sub>M</sub> : 75.4<br>CL <sub>F</sub> : 73.9<br>n <sub>M</sub> :166<br>n <sub>F</sub> :302 | C: 23476.9<br>CL <sub>M</sub> : 76.5<br>CL <sub>F</sub> : 74.5<br>n <sub>M</sub> :2808<br>n <sub>F</sub> :3306 | C: 31147.12<br>CL <sub>M</sub> : 70.8<br>CL <sub>F</sub> : 68.6<br>n <sub>M</sub> :160<br>n <sub>F</sub> :249 | C: 10919.27<br>CL <sub>M</sub> : 78.2<br>CL <sub>F</sub> : 74.1<br>n <sub>M</sub> :2961<br>n <sub>F</sub> :1589 |
| Area 2      | C: 37574.05<br>CL <sub>M</sub> :76.2<br>CL <sub>F</sub> :74.0<br>n <sub>M</sub> :2447<br>n <sub>F</sub> :2784 |  | C: 62699.26<br>CL <sub>M</sub> :77.4<br>CL <sub>F</sub> :75.3<br>n <sub>M</sub> :195<br>n <sub>F</sub> :232   | C: 18927.6<br>CL <sub>M</sub> :75.4<br>CL <sub>F</sub> :70.3<br>n <sub>M</sub> :191<br>n <sub>F</sub> :192      |
| Area 3      | C: 36011.14<br>CL <sub>M</sub> :76.6<br>CL <sub>F</sub> :78.0<br>n <sub>M</sub> :1362<br>n <sub>F</sub> :1463 | C: 64503.39<br>CL <sub>M</sub> :66.1<br>CL <sub>F</sub> :64.1<br>n <sub>M</sub> :2325<br>n <sub>F</sub> :2224  |   | C: 15913.53<br>CL <sub>M</sub> :81.9<br>CL <sub>F</sub> :78.8<br>n <sub>M</sub> :1229<br>n <sub>F</sub> :743    |

| <b>1997</b> | Oct-Dec   | Jan-Mar   | Apr-June  | July-Sep |
|-------------|---|---|---|----------|
| Area 1      |   |   | C: 39300.77<br>CL <sub>M</sub> : 76.0<br>CL <sub>F</sub> : 73.0<br>n <sub>M</sub> :11684<br>n <sub>F</sub> :15140 |          |
| Area 2      | C: 23126.96<br>CL <sub>M</sub> :74.5<br>CL <sub>F</sub> :73.4<br>n <sub>M</sub> :3653<br>n <sub>F</sub> :6029 | C: 60113.53<br>CL <sub>M</sub> :65.5<br>CL <sub>F</sub> :62.0<br>n <sub>M</sub> :96<br>n <sub>F</sub> :76     | C: 55690.19<br>CL <sub>M</sub> :80.6<br>CL <sub>F</sub> :76.6<br>n <sub>M</sub> :2084<br>n <sub>F</sub> :2430     |          |
| Area 3      | C: 34424.34<br>CL <sub>M</sub> :81.4<br>CL <sub>F</sub> :78.3<br>n <sub>M</sub> :2562<br>n <sub>F</sub> :2100 | C: 48780.49<br>CL <sub>M</sub> :72.5<br>CL <sub>F</sub> :71.8<br>n <sub>M</sub> :3543<br>n <sub>F</sub> :3727 |   |          |

**Table 1 continued: Mean carapace length (CL), catch (C) and sample size (n) for each area/quarter cell per fishing season. Un-sampled cells are indicated by the shaded areas. Carapace length units are mm and catch units are kg.**

| <b>1998</b> | Oct-Dec  | Jan-Mar   | Apr-June  | July-Sep  |
|-------------|--|---|---|---|
| Area 1      |  | C: 33979.42<br>CL <sub>M</sub> :74.2<br>CL <sub>F</sub> :72.1<br>n <sub>M</sub> :3307<br>n <sub>F</sub> :3942 | C: 29487.91<br>CL <sub>M</sub> :77.7<br>CL <sub>F</sub> :74.2<br>n <sub>M</sub> :2771<br>n <sub>F</sub> :2252 |   |
| Area 2      |  |   |   | C: 14628.18<br>CL <sub>M</sub> :70.8<br>CL <sub>F</sub> :67.9<br>n <sub>M</sub> :1742<br>n <sub>F</sub> :1357 |
| Area 3      | C: 16462.5<br>CL <sub>M</sub> :77.2<br>CL <sub>F</sub> :76.0<br>n <sub>M</sub> :6235<br>n <sub>F</sub> :6998 | C: 61023.18<br>CL <sub>M</sub> :73.2<br>CL <sub>F</sub> :74.1<br>n <sub>M</sub> :1727<br>n <sub>F</sub> :1914 | C: 45681.36<br>CL <sub>M</sub> :77.9<br>CL <sub>F</sub> :74.3<br>n <sub>M</sub> :2146<br>n <sub>F</sub> :2126 |   |

| <b>1999</b> | Oct-Dec  | Jan-Mar   | Apr-June  | July-Sep  |
|-------------|--|---|---|---|
| Area 1      |  | C: 22765.28<br>CL <sub>M</sub> :77.6<br>CL <sub>F</sub> :76.2<br>n <sub>M</sub> :309<br>n <sub>F</sub> :550   |   | C: 23505.26<br>CL <sub>M</sub> :76.3<br>CL <sub>F</sub> :72.0<br>n <sub>M</sub> :2245<br>n <sub>F</sub> :2001 |
| Area 2      | C: 11437.12<br>CL <sub>M</sub> :77.1<br>CL <sub>F</sub> :72.4<br>n <sub>M</sub> :108<br>n <sub>F</sub> :91   | C: 2779.21<br>CL <sub>M</sub> :76.0<br>CL <sub>F</sub> :75.7<br>n <sub>M</sub> :8772<br>n <sub>F</sub> :12699 |   | C: 13845.13<br>CL <sub>M</sub> :79.9<br>CL <sub>F</sub> :78.7<br>n <sub>M</sub> :687<br>n <sub>F</sub> :695   |
| Area 3      | C: 18405.6<br>CL <sub>M</sub> :74.7<br>CL <sub>F</sub> :73.5<br>n <sub>M</sub> :1097<br>n <sub>F</sub> :1050 | C: 56327.15<br>CL <sub>M</sub> :71.0<br>CL <sub>F</sub> :71.3<br>n <sub>M</sub> :7011<br>n <sub>F</sub> :7329 | C: 14994.29<br>CL <sub>M</sub> :75.8<br>CL <sub>F</sub> :75.1<br>n <sub>M</sub> :1619<br>n <sub>F</sub> :1567 | C: 15681.95<br>CL <sub>M</sub> :55.3<br>CL <sub>F</sub> :54.2<br>n <sub>M</sub> :179<br>n <sub>F</sub> :163   |

| <b>2000</b> | Oct-Dec | Jan-Mar  | Apr-June  | July-Sep |
|-------------|---------|--|---|----------|
| Area 1      |         |  | C: 34943.92<br>CL <sub>M</sub> :71.0<br>CL <sub>F</sub> :68.5<br>n <sub>M</sub> :1236<br>n <sub>F</sub> :1617 |          |
| Area 2      |         |  |   |          |
| Area 3      |         | C: 42923.6<br>CL <sub>M</sub> :65.2<br>CL <sub>F</sub> :64.4<br>n <sub>M</sub> :3055<br>n <sub>F</sub> :2854 |   |          |

**Table 1 continued: Mean carapace length (CL), catch (C) and sample size (n) for each area/quarter cell per fishing season. Un-sampled cells are indicated by the shaded areas. Carapace length units are mm and catch units are kg.**

| <b>2001</b> | Oct-Dec | Jan-Mar   | Apr-June | July-Sep  |
|-------------|---------|---|----------|---|
| Area 1      |         | C: 36810.51<br>CL <sub>M</sub> :70.0<br>CL <sub>F</sub> :67.9<br>n <sub>M</sub> :1334<br>n <sub>F</sub> :1732 |          | C: 35807.1<br>CL <sub>M</sub> :79.7<br>CL <sub>F</sub> :76.3<br>n <sub>M</sub> :3015<br>n <sub>F</sub> :2176  |
| Area 2      |         | C: 2837.64<br>CL <sub>M</sub> :85.8<br>CL <sub>F</sub> :95.0<br>n <sub>M</sub> :6<br>n <sub>F</sub> :1        |          | C: 11042.09<br>CL <sub>M</sub> :79.2<br>CL <sub>F</sub> :76.4<br>n <sub>M</sub> :6767<br>n <sub>F</sub> :5226 |
| Area 3      |         | C: 67850.16<br>CL <sub>M</sub> :72.9<br>CL <sub>F</sub> :72.4<br>n <sub>M</sub> :5497<br>n <sub>F</sub> :5695 |          |   |

| <b>2002</b> | Oct-Dec | Jan-Mar   | Apr-June   | July-Sep  |
|-------------|---------|---|--|---|
| Area 1      |         | C: 36436.73<br>CL <sub>M</sub> :76.9<br>CL <sub>F</sub> :73.7<br>n <sub>M</sub> :3442<br>n <sub>F</sub> :2874 | C: 21204.01<br>CL <sub>M</sub> :74.3<br>CL <sub>F</sub> :71.1<br>n <sub>M</sub> :1745<br>n <sub>F</sub> :1480  |   |
| Area 2      |         | C: 16940.94<br>CL <sub>M</sub> :77.4<br>CL <sub>F</sub> :74.6<br>n <sub>M</sub> :2288<br>n <sub>F</sub> :2394 | C: 64315.43<br>CL <sub>M</sub> :77.4<br>CL <sub>F</sub> :76.2<br>n <sub>M</sub> :5051<br>n <sub>F</sub> :10474 | C: 17103.18<br>CL <sub>M</sub> :80.3<br>CL <sub>F</sub> :77.2<br>n <sub>M</sub> :9606<br>n <sub>F</sub> :6584 |
| Area 3      |         |   |  |   |

| <b>2003</b> | Oct-Dec  | Jan-Mar   | Apr-June  | July-Sep  |
|-------------|--|---|---|---|
| Area 1      | C: 39615.3<br>CL <sub>M</sub> :73.8<br>CL <sub>F</sub> :73.6<br>n <sub>M</sub> :3979<br>n <sub>F</sub> :2331 | C: 69985.45<br>CL <sub>M</sub> :76.3<br>CL <sub>F</sub> :73.9<br>n <sub>M</sub> :4851<br>n <sub>F</sub> :4334 | C: 61455.12<br>CL <sub>M</sub> :83.1<br>CL <sub>F</sub> :79.8<br>n <sub>M</sub> :2787<br>n <sub>F</sub> :1954 | C: 25335.51<br>CL <sub>M</sub> :79.9<br>CL <sub>F</sub> :76.9<br>n <sub>M</sub> :3874<br>n <sub>F</sub> :1733 |
| Area 2      | C: 4807.1<br>CL <sub>M</sub> :81.6<br>CL <sub>F</sub> :80.4<br>n <sub>M</sub> :4082<br>n <sub>F</sub> :4542  | C: 29467.89<br>CL <sub>M</sub> :77.3<br>CL <sub>F</sub> :76.9<br>n <sub>M</sub> :1692<br>n <sub>F</sub> :1852 | C: 26628.57<br>CL <sub>M</sub> :76.9<br>CL <sub>F</sub> :74.3<br>n <sub>M</sub> :8607<br>n <sub>F</sub> :9634 |   |
| Area 3      | C: 27633.3<br>CL <sub>M</sub> :80.9<br>CL <sub>F</sub> :80.0<br>n <sub>M</sub> :798<br>n <sub>F</sub> :865   | C: 30000.84<br>CL <sub>M</sub> :63.0<br>CL <sub>F</sub> :60.5<br>n <sub>M</sub> :709<br>n <sub>F</sub> :595   |   |   |

**Table 1 continued: Mean carapace length (CL), catch (C) and sample size (n) for each area/quarter cell per fishing season. Un-sampled cells are indicated by the shaded areas. Carapace length units are mm and catch units are kg.**

| <b>2004</b> | Oct-Dec   | Jan-Mar   | Apr-June  | July-Sep  |
|-------------|---|---|---|---|
| Area 1      | C: 67152.78<br>CL <sub>M</sub> :77.8<br>CL <sub>F</sub> :74.4<br>n <sub>M</sub> :3882<br>n <sub>F</sub> :1763 | C: 59991.53<br>CL <sub>M</sub> :81.7<br>CL <sub>F</sub> :78.6<br>n <sub>M</sub> :2688<br>n <sub>F</sub> :2408   | C: 44501.27<br>CL <sub>M</sub> :77.0<br>CL <sub>F</sub> :74.5<br>n <sub>M</sub> :2197<br>n <sub>F</sub> :1232 | C: 14022.58<br>CL <sub>M</sub> :76.4<br>CL <sub>F</sub> :73.3<br>n <sub>M</sub> :2554<br>n <sub>F</sub> :1355 |
| Area 2      | C: 4075.14<br>CL <sub>M</sub> :79.2<br>CL <sub>F</sub> :79.0<br>n <sub>M</sub> :2802<br>n <sub>F</sub> :4571  | C: 49496.57<br>CL <sub>M</sub> :78.1<br>CL <sub>F</sub> :75.5<br>n <sub>M</sub> :13358<br>n <sub>F</sub> :18573 | C: 35372.93<br>CL <sub>M</sub> :82.3<br>CL <sub>F</sub> :<br>n <sub>M</sub> :35<br>n <sub>F</sub> :0          | C: 22072.03<br>CL <sub>M</sub> :78.1<br>CL <sub>F</sub> :74.4<br>n <sub>M</sub> :433<br>n <sub>F</sub> :139   |
| Area 3      | C: 5407.74<br>CL <sub>M</sub> :76.5<br>CL <sub>F</sub> :77.8<br>n <sub>M</sub> :3255<br>n <sub>F</sub> :3171  | C: 11566.39<br>CL <sub>M</sub> :63.4<br>CL <sub>F</sub> :63.9<br>n <sub>M</sub> :1865<br>n <sub>F</sub> :1509   |   |   |

| <b>2005</b> | Oct-Dec   | Jan-Mar   | Apr-June  | July-Sep  |
|-------------|---|---|---|---|
| Area 1      | C: 38447.56<br>CL <sub>M</sub> :74.1<br>CL <sub>F</sub> :73.2<br>n <sub>M</sub> :1830<br>n <sub>F</sub> :1239 | C: 50208.29<br>CL <sub>M</sub> :76.5<br>CL <sub>F</sub> :75.6<br>n <sub>M</sub> :384<br>n <sub>F</sub> :625   | C: 48844.72<br>CL <sub>M</sub> :88.6<br>CL <sub>F</sub> :86.1<br>n <sub>M</sub> :3944<br>n <sub>F</sub> :3176   | C: 24395.99<br>CL <sub>M</sub> :77.9<br>CL <sub>F</sub> :74.0<br>n <sub>M</sub> :3803<br>n <sub>F</sub> :1589 |
| Area 2      | C: 43764.16<br>CL <sub>M</sub> :77.8<br>CL <sub>F</sub> :76.8<br>n <sub>M</sub> :3413<br>n <sub>F</sub> :4532 | C: 61203.52<br>CL <sub>M</sub> :77.5<br>CL <sub>F</sub> :77.3<br>n <sub>M</sub> :6090<br>n <sub>F</sub> :7740 | C: 40529.62<br>CL <sub>M</sub> :78.5<br>CL <sub>F</sub> :76.5<br>n <sub>M</sub> :11253<br>n <sub>F</sub> :13318 |   |
| Area 3      |   | C: 21755.18<br>CL <sub>M</sub> :63.0<br>CL <sub>F</sub> :63.3<br>n <sub>M</sub> :134<br>n <sub>F</sub> :137   | C: 16424.78<br>CL <sub>M</sub> :76.7<br>CL <sub>F</sub> :75.5<br>n <sub>M</sub> :7884<br>n <sub>F</sub> :7505   |   |

| <b>2006</b> | Oct-Dec   | Jan-Mar   | Apr-June  | July-Sep   |
|-------------|---|---|---|--|
| Area 1      | C: 31025.37<br>CL <sub>M</sub> :77.6<br>CL <sub>F</sub> :77.4<br>n <sub>M</sub> :1039<br>n <sub>F</sub> :1015 |   | C: 44432.43<br>CL <sub>M</sub> :82.5<br>CL <sub>F</sub> :77.9<br>n <sub>M</sub> :1410<br>n <sub>F</sub> :1526 |  |
| Area 2      | C: 22756.27<br>CL <sub>M</sub> :74.1<br>CL <sub>F</sub> :72.0<br>n <sub>M</sub> :257<br>n <sub>F</sub> :213   | C: 53448.61<br>CL <sub>M</sub> :76.4<br>CL <sub>F</sub> :74.0<br>n <sub>M</sub> :11717<br>n <sub>F</sub> :13851 | C: 33826.88<br>CL <sub>M</sub> :78.1<br>CL <sub>F</sub> :73.8<br>n <sub>M</sub> :1950<br>n <sub>F</sub> :1449 | C: 14315.8<br>CL <sub>M</sub> :79.7<br>CL <sub>F</sub> :74.2<br>n <sub>M</sub> :7575<br>n <sub>F</sub> :5485 |
| Area 3      |   | C: 33593.34<br>CL <sub>M</sub> :77.5<br>CL <sub>F</sub> :78.4<br>n <sub>M</sub> :5826<br>n <sub>F</sub> :7501   | C: 31938.12<br>CL <sub>M</sub> :82.7<br>CL <sub>F</sub> :80.6<br>n <sub>M</sub> :707<br>n <sub>F</sub> :684   |  |

**Table 2: Proportional size distributions of male and female lobsters per year in Area 1.**

| <b>Males</b> |               |                |                |                |                |                |                |                |                |                |                |
|--------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| size         | 1996          | 1997           | 1998           | 1999           | 2000           | 2001           | 2002           | 2003           | 2004           | 2005           | 2006           |
| 45           | 0.00065       | 0.00086        | 0              | 0.00057        | 0.00035        | 0              | 0              | 0              | 0              | 0              | 0              |
| 50           | 0.00004       | 0.00723        | 0              | 0.00184        | 0              | 0.00033        | 0.00011        | 0.00008        | 0.00002        | 0              | 0.0002         |
| 55           | 0.0011        | 0.01842        | 0.00176        | 0.0028         | 0.00105        | 0.00043        | 0.00041        | 0.00022        | 0.00026        | 0.00078        | 0.00761        |
| 60           | 0.01046       | 0.02364        | 0.02567        | 0.02068        | 0.03155        | 0.00624        | 0.00401        | 0.00313        | 0.00612        | 0.00852        | 0.01742        |
| 65           | 0.06359       | 0.02964        | 0.05313        | 0.05872        | 0.12373        | 0.07068        | 0.03964        | 0.02766        | 0.03483        | 0.02857        | 0.02524        |
| 70           | 0.13023       | 0.07881        | 0.10201        | 0.09538        | 0.13074        | 0.14685        | 0.15205        | 0.11843        | 0.10852        | 0.09455        | 0.04388        |
| 75           | 0.08858       | 0.09376        | 0.13674        | 0.08918        | 0.07536        | 0.11952        | 0.16524        | 0.15936        | 0.1541         | 0.11452        | 0.07515        |
| 80           | 0.04532       | 0.07135        | 0.08485        | 0.06314        | 0.03715        | 0.06964        | 0.09662        | 0.11878        | 0.14115        | 0.10084        | 0.11382        |
| 85           | 0.02671       | 0.04958        | 0.0425         | 0.04063        | 0.01717        | 0.03908        | 0.04354        | 0.07858        | 0.08978        | 0.07319        | 0.09079        |
| 90           | 0.0184        | 0.02997        | 0.02267        | 0.02638        | 0.00841        | 0.02716        | 0.0212         | 0.04305        | 0.05088        | 0.05013        | 0.07417        |
| 95           | 0.01343       | 0.01819        | 0.01485        | 0.01756        | 0.00456        | 0.01299        | 0.00995        | 0.02329        | 0.02234        | 0.02693        | 0.02706        |
| 100          | 0.00594       | 0.0104         | 0.00986        | 0.01589        | 0.0014         | 0.00776        | 0.00624        | 0.00847        | 0.00869        | 0.01838        | 0.01203        |
| 105          | 0.00549       | 0.00239        | 0.00398        | 0.00777        | 0.0014         | 0.0038         | 0.00327        | 0.00459        | 0.00291        | 0.00998        | 0.002          |
| 110          | 0.00156       | 0.00123        | 0.00183        | 0.00246        | 0.00035        | 0.00161        | 0.00081        | 0.00158        | 0.00191        | 0.00427        | 0.0004         |
| 115          | 0.00115       | 0.00007        | 0.00026        | 0.00096        | 0              | 0.00057        | 0.00043        | 0.00075        | 0.00038        | 0.00198        | 0.0006         |
| 120          | 0.00005       | 0.00004        | 0.00044        | 0.00138        | 0              | 0.00028        | 0              | 0.0002         | 0.0002         | 0.0002         | 0.0004         |
| 125          | 0             | 0              | 0              | 0.00024        | 0              | 0              | 0              | 0.00014        | 0              | 0.00021        | 0              |
| <b>Total</b> | <b>0.4127</b> | <b>0.43558</b> | <b>0.50055</b> | <b>0.44558</b> | <b>0.43322</b> | <b>0.50694</b> | <b>0.54352</b> | <b>0.58831</b> | <b>0.62209</b> | <b>0.53305</b> | <b>0.49077</b> |

| <b>Females</b> |                |                |                |                |                |                |                |                |                |                |                |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| size           | 1996           | 1997           | 1998           | 1999           | 2000           | 2001           | 2002           | 2003           | 2004           | 2005           | 2006           |
| 45             | 0              | 0.00168        | 0              | 0.00115        | 0              | 0              | 0              | 0              | 0              | 0              | 0              |
| 50             | 0.00012        | 0.00939        | 0.00017        | 0.00241        | 0              | 0.00017        | 0              | 0.00008        | 0.00007        | 0              | 0.0008         |
| 55             | 0.00094        | 0.02233        | 0.00604        | 0.00676        | 0.0028         | 0              | 0.0001         | 0              | 0.0004         | 0.00029        | 0.00741        |
| 60             | 0.01801        | 0.02416        | 0.03646        | 0.02788        | 0.08587        | 0.02412        | 0.00902        | 0.00561        | 0.00542        | 0.0069         | 0.01482        |
| 65             | 0.13857        | 0.06792        | 0.0701         | 0.09742        | 0.18647        | 0.13904        | 0.07412        | 0.04551        | 0.03244        | 0.03835        | 0.03707        |
| 70             | 0.19091        | 0.15445        | 0.13873        | 0.12882        | 0.16474        | 0.15633        | 0.16727        | 0.10005        | 0.085          | 0.09962        | 0.07436        |
| 75             | 0.119          | 0.12724        | 0.12677        | 0.10861        | 0.07781        | 0.08874        | 0.12588        | 0.10952        | 0.1095         | 0.10516        | 0.11984        |
| 80             | 0.05444        | 0.07918        | 0.06858        | 0.0806         | 0.034          | 0.04492        | 0.04542        | 0.07095        | 0.08183        | 0.088          | 0.11404        |
| 85             | 0.03471        | 0.04399        | 0.02978        | 0.052          | 0.01122        | 0.02295        | 0.0213         | 0.04272        | 0.03756        | 0.05618        | 0.07656        |
| 90             | 0.0156         | 0.02196        | 0.01394        | 0.02135        | 0.0014         | 0.01073        | 0.00826        | 0.02318        | 0.01735        | 0.0374         | 0.03928        |
| 95             | 0.00869        | 0.00802        | 0.00492        | 0.01638        | 0.00105        | 0.0033         | 0.00367        | 0.00959        | 0.00566        | 0.01989        | 0.01462        |
| 100            | 0.00328        | 0.00295        | 0.00263        | 0.00382        | 0.00105        | 0.0018         | 0.00101        | 0.00285        | 0.00152        | 0.00929        | 0.00681        |
| 105            | 0.00274        | 0.00071        | 0.00113        | 0.0031         | 0.00035        | 0.00066        | 0.0002         | 0.00131        | 0.00039        | 0.00395        | 0.002          |
| 110            | 0.00023        | 0.00026        | 0.00009        | 0.00057        | 0              | 0.00019        | 0.0001         | 0.00029        | 0.00034        | 0.00133        | 0.0006         |
| 115            | 0.00005        | 0.00011        | 0.00009        | 0.00184        | 0              | 0              | 0.0001         | 0.00007        | 0.00039        | 0.00055        | 0.0008         |
| 120            | 0              | 0.00007        | 0              | 0.00057        | 0              | 0.00009        | 0              | 0              | 0.00006        | 0.00004        | 0.0002         |
| 125            | 0              | 0              | 0              | 0.00115        | 0              | 0              | 0              | 0              | 0              | 0              | 0              |
| <b>Total</b>   | <b>0.58729</b> | <b>0.56442</b> | <b>0.49943</b> | <b>0.55443</b> | <b>0.56676</b> | <b>0.49304</b> | <b>0.45645</b> | <b>0.41173</b> | <b>0.37793</b> | <b>0.46695</b> | <b>0.50921</b> |

**Table 3: Proportional size distributions of male and female lobsters per year in Area 2.**

| <b>Males</b> | <b>1996</b>    | <b>1997</b>    | <b>1998</b>    | <b>1999</b>    | <b>2000</b> | <b>2001</b>    | <b>2002</b>    | <b>2003</b>    | <b>2004</b>   | <b>2005</b>    | <b>2006</b>    |
|--------------|----------------|----------------|----------------|----------------|-------------|----------------|----------------|----------------|---------------|----------------|----------------|
| <b>size</b>  |                |                |                |                |             |                |                |                |               |                |                |
| 45           | 0              | 0.00005        | 0              | 0.00215        |             | 0              | 0              | 0              | 0             | 0.00021        | 0              |
| 50           | 0              | 0.00069        | 0.00032        | 0.00117        |             | 0              | 0.00012        | 0.00046        | 0.0001        | 0.00056        | 0.00004        |
| 55           | 0              | 0.01948        | 0.00452        | 0.00804        |             | 0              | 0.00168        | 0.00577        | 0.0002        | 0.00234        | 0.00046        |
| 60           | 0.01377        | 0.08335        | 0.0455         | 0.04236        |             | 0.00643        | 0.01899        | 0.0206         | 0.0057        | 0.01831        | 0.00999        |
| 65           | 0.07153        | 0.11903        | 0.14714        | 0.08048        |             | 0.04033        | 0.05584        | 0.05781        | 0.04677       | 0.039          | 0.05388        |
| 70           | 0.09871        | 0.07983        | 0.17264        | 0.0799         |             | 0.14199        | 0.09462        | 0.09389        | 0.08398       | 0.07688        | 0.12666        |
| 75           | 0.08718        | 0.04667        | 0.09551        | 0.0401         |             | 0.09181        | 0.0946         | 0.09336        | 0.15241       | 0.08791        | 0.11724        |
| 80           | 0.07615        | 0.04316        | 0.0597         | 0.04941        |             | 0.07867        | 0.08828        | 0.07076        | 0.14525       | 0.0875         | 0.08696        |
| 85           | 0.05994        | 0.03307        | 0.02227        | 0.06053        |             | 0.05672        | 0.06045        | 0.04669        | 0.07431       | 0.05635        | 0.06053        |
| 90           | 0.03033        | 0.02536        | 0.00936        | 0.05555        |             | 0.07166        | 0.03887        | 0.03359        | 0.09616       | 0.039          | 0.03172        |
| 95           | 0.01702        | 0.01384        | 0.00323        | 0.04481        |             | 0.11123        | 0.02334        | 0.02087        | 0.03883       | 0.01864        | 0.01666        |
| 100          | 0.00432        | 0.01188        | 0.00097        | 0.02217        |             | 0.01347        | 0.01155        | 0.01494        | 0.01723       | 0.00922        | 0.00817        |
| 105          | 0.0036         | 0.00506        | 0.00097        | 0.01249        |             | 0.0067         | 0.00749        | 0.00916        | 0.00422       | 0.00354        | 0.0038         |
| 110          | 0.00024        | 0.00262        | 0              | 0.0036         |             | 0.00292        | 0.00365        | 0.00347        | 0.00287       | 0.00182        | 0.00229        |
| 115          | 0.00141        | 0.00445        | 0              | 0.0037         |             | 0.00133        | 0.00217        | 0.00189        | 0.00126       | 0.00048        | 0.00095        |
| 120          | 0.00129        | 0.00055        | 0              | 0.00005        |             | 0.00066        | 0.00068        | 0.00078        | 0.00021       | 0.0002         | 0.00047        |
| 125          | 0.00135        | 0.00028        | 0              | 0.00042        |             | 0.0002         | 0.00035        | 0.00063        | 0.0001        | 0.00008        | 0.00006        |
| <b>Total</b> | <b>0.46684</b> | <b>0.48937</b> | <b>0.56213</b> | <b>0.50693</b> | <b>0</b>    | <b>0.62412</b> | <b>0.50268</b> | <b>0.47467</b> | <b>0.6696</b> | <b>0.44204</b> | <b>0.51988</b> |

| <b>Females</b> | <b>1996</b>    | <b>1997</b>    | <b>1998</b>    | <b>1999</b>    | <b>2000</b> | <b>2001</b>    | <b>2002</b>    | <b>2003</b>    | <b>2004</b>    | <b>2005</b>    | <b>2006</b>    |
|----------------|----------------|----------------|----------------|----------------|-------------|----------------|----------------|----------------|----------------|----------------|----------------|
| <b>size</b>    |                |                |                |                |             |                |                |                |                |                |                |
| 45             | 0              | 0.00002        | 0              | 0.00014        |             | 0              | 0.00006        | 0              | 0.00002        | 0.00018        | 0              |
| 50             | 0              | 0.00035        | 0.00032        | 0.0033         |             | 0              | 0.00021        | 0.00112        | 0.00003        | 0.00062        | 0.00003        |
| 55             | 0.00054        | 0.03566        | 0.01065        | 0.00642        |             | 0.00013        | 0.00306        | 0.00579        | 0.00061        | 0.00332        | 0.00104        |
| 60             | 0.02778        | 0.08641        | 0.08035        | 0.04306        |             | 0.00988        | 0.02573        | 0.02996        | 0.00809        | 0.01988        | 0.0179         |
| 65             | 0.12164        | 0.13125        | 0.13875        | 0.07508        |             | 0.04391        | 0.06889        | 0.0711         | 0.03867        | 0.05352        | 0.079          |
| 70             | 0.11982        | 0.07579        | 0.11681        | 0.06868        |             | 0.0727         | 0.10037        | 0.10878        | 0.08374        | 0.10212        | 0.13615        |
| 75             | 0.09416        | 0.05969        | 0.05776        | 0.08274        |             | 0.079          | 0.10296        | 0.10421        | 0.08535        | 0.12662        | 0.12383        |
| 80             | 0.05404        | 0.04416        | 0.02097        | 0.07817        |             | 0.06156        | 0.08261        | 0.07894        | 0.05523        | 0.11367        | 0.06718        |
| 85             | 0.06611        | 0.03443        | 0.00678        | 0.05947        |             | 0.03642        | 0.05098        | 0.05212        | 0.02802        | 0.06853        | 0.02967        |
| 90             | 0.03033        | 0.02088        | 0.00323        | 0.04091        |             | 0.02381        | 0.02976        | 0.03365        | 0.01559        | 0.03966        | 0.01566        |
| 95             | 0.01267        | 0.01166        | 0.00129        | 0.02035        |             | 0.04128        | 0.01616        | 0.01994        | 0.0086         | 0.01892        | 0.00628        |
| 100            | 0.00459        | 0.00692        | 0.00097        | 0.00812        |             | 0.00537        | 0.00844        | 0.01141        | 0.00402        | 0.00706        | 0.00198        |
| 105            | 0.00135        | 0.00211        | 0              | 0.00302        |             | 0.00133        | 0.0046         | 0.00524        | 0.00161        | 0.00253        | 0.00088        |
| 110            | 0.00012        | 0.00067        | 0              | 0.00143        |             | 0.00027        | 0.00215        | 0.00198        | 0.00063        | 0.00109        | 0.00033        |
| 115            | 0              | 0.00042        | 0              | 0.00165        |             | 0.0002         | 0.00094        | 0.00089        | 0.00013        | 0.0002         | 0.00013        |
| 120            | 0              | 0.00012        | 0              | 0.00044        |             | 0              | 0.00032        | 0.00005        | 0.00007        | 0.00005        | 0.00003        |
| 125            | 0              | 0.00009        | 0              | 0.00008        |             | 0              | 0.00007        | 0.00017        | 0.00001        | 0.00001        | 0.00002        |
| <b>Total</b>   | <b>0.53315</b> | <b>0.51063</b> | <b>0.43788</b> | <b>0.49306</b> | <b>0</b>    | <b>0.37586</b> | <b>0.49731</b> | <b>0.52535</b> | <b>0.33042</b> | <b>0.55798</b> | <b>0.48011</b> |



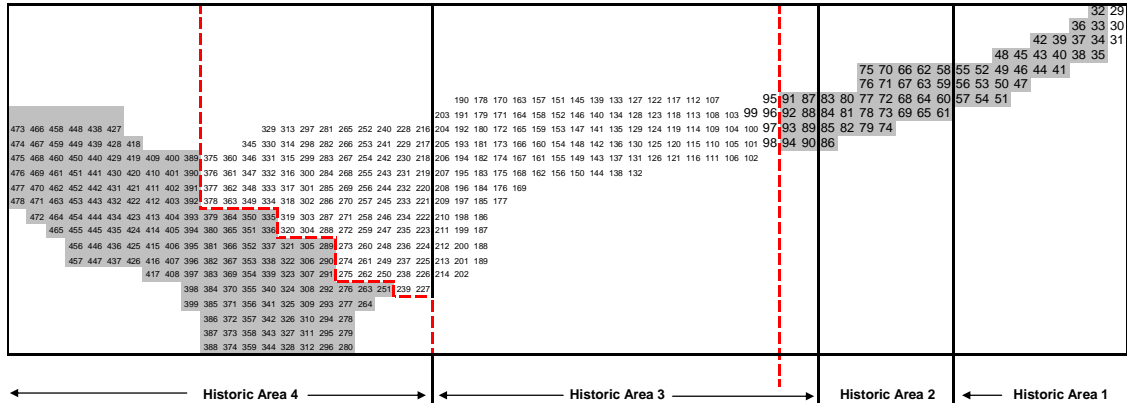
**Table 4: Proportional size distributions of male and female lobsters per year in Area 3.**

| <b>Males</b> |                |                |                |                |                |                |          |                |                |                 |                 |
|--------------|----------------|----------------|----------------|----------------|----------------|----------------|----------|----------------|----------------|-----------------|-----------------|
| size         | 1996           | 1997           | 1998           | 1999           | 2000           | 2001           | 2002     | 2003           | 2004           | 2005            | 2006            |
| 45           | 0              | 0              | 0.00011        | 0.00415        | 0.00017        | 0.00018        |          | 0              | 0.0004         | 0               | 0               |
| 50           | 0.00118        | 0.00081        | 0.00043        | 0.02122        | 0.00169        | 0.00223        |          | 0.00319        | 0.00934        | 0.00036         | 0.001701        |
| 55           | 0.01747        | 0.00936        | 0.00524        | 0.04265        | 0.03317        | 0.01439        |          | 0.04238        | 0.0801         | 0.02762         | 0.009513        |
| 60           | 0.11158        | 0.06618        | 0.06636        | 0.09812        | 0.18514        | 0.08506        |          | 0.12721        | 0.16907        | 0.16853         | 0.050047        |
| 65           | 0.14543        | 0.09119        | 0.12844        | 0.11081        | 0.1865         | 0.13045        |          | 0.10734        | 0.11549        | 0.15071         | 0.071031        |
| 70           | 0.06933        | 0.06079        | 0.0679         | 0.07008        | 0.04908        | 0.08068        |          | 0.05877        | 0.04771        | 0.03931         | 0.046747        |
| 75           | 0.03372        | 0.05582        | 0.03959        | 0.03188        | 0.01523        | 0.03878        |          | 0.03928        | 0.02058        | 0.01404         | 0.038857        |
| 80           | 0.03573        | 0.06651        | 0.03804        | 0.02954        | 0.01472        | 0.03091        |          | 0.02513        | 0.0175         | 0.013           | 0.044327        |
| 85           | 0.02952        | 0.0568         | 0.0353         | 0.02639        | 0.0154         | 0.03065        |          | 0.03267        | 0.01669        | 0.01924         | 0.046793        |
| 90           | 0.02462        | 0.04208        | 0.02965        | 0.02557        | 0.0088         | 0.02573        |          | 0.02779        | 0.01956        | 0.021218        | 0.049241        |
| 95           | 0.01962        | 0.03039        | 0.02447        | 0.01569        | 0.00406        | 0.01805        |          | 0.02473        | 0.01804        | 0.021224        | 0.042469        |
| 100          | 0.01294        | 0.01804        | 0.02138        | 0.01003        | 0.00152        | 0.01376        |          | 0.01053        | 0.00967        | 0.014928        | 0.0334          |
| 105          | 0.0067         | 0.00556        | 0.01118        | 0.00597        | 0.00068        | 0.00911        |          | 0.00559        | 0.00509        | 0.007017        | 0.020396        |
| 110          | 0.00254        | 0.00323        | 0.0067         | 0.00379        | 0.00068        | 0.00491        |          | 0.00339        | 0.00389        | 0.002795        | 0.00958         |
| 115          | 0.0022         | 0.00254        | 0.00423        | 0.0017         | 0.00017        | 0.0025         |          | 0.00126        | 0.0025         | 0.001118        | 0.003256        |
| 120          | 0.00313        | 0.0016         | 0.0026         | 0.00159        | 0              | 0.00089        |          | 0.00126        | 0.00105        | 0.000671        | 0.002402        |
| 125          | 0.00176        | 0.00218        | 0.00269        | 0.00143        | 0              | 0.00286        |          | 0.00257        | 0.00135        | 0.000363        | 0.002055        |
| <b>Total</b> | <b>0.51747</b> | <b>0.51308</b> | <b>0.48431</b> | <b>0.50061</b> | <b>0.51701</b> | <b>0.49114</b> | <b>0</b> | <b>0.51309</b> | <b>0.53803</b> | <b>0.502144</b> | <b>0.471815</b> |

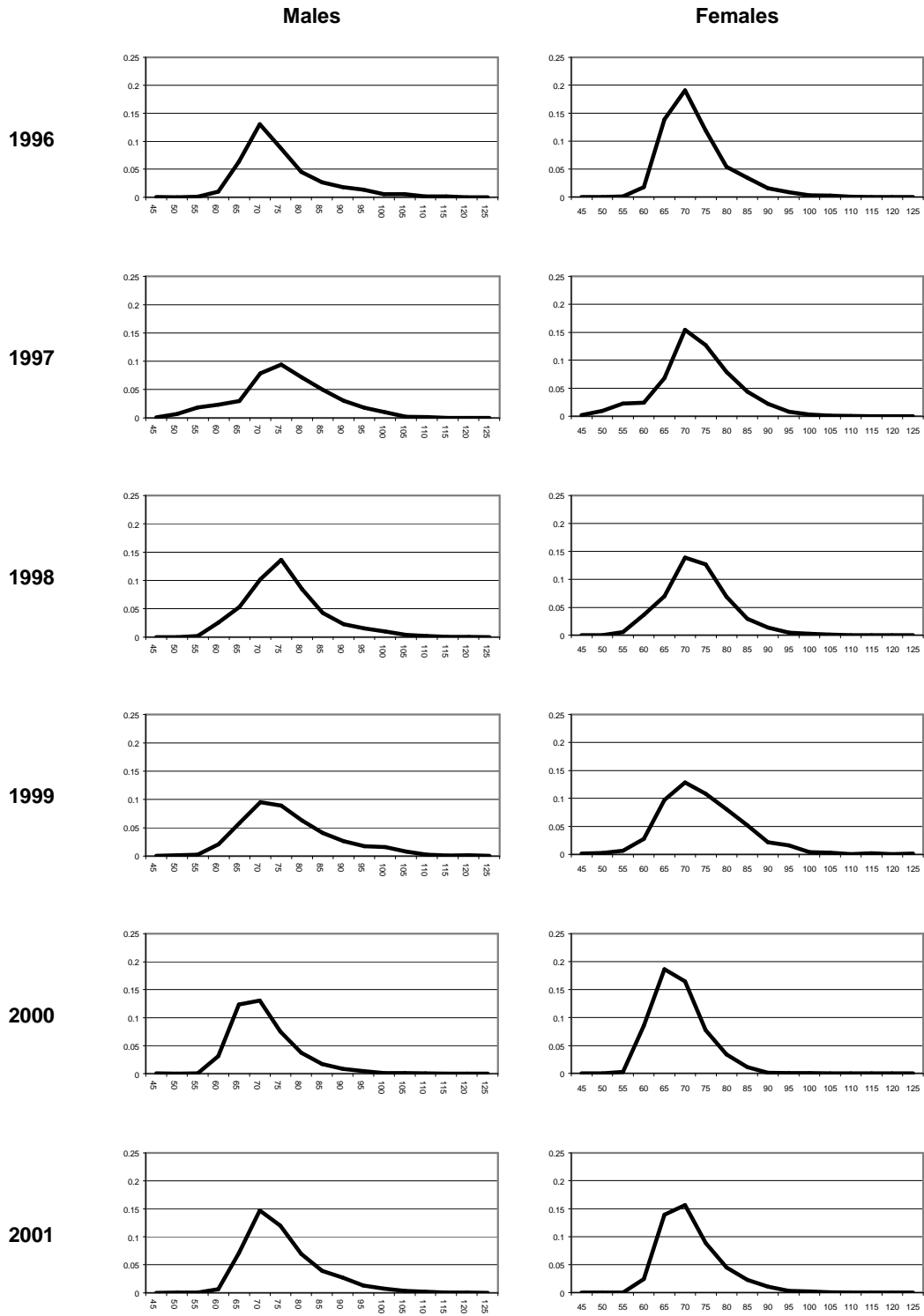
  

| <b>Females</b> |                |               |                |                |                |                |          |                |                |                 |                 |
|----------------|----------------|---------------|----------------|----------------|----------------|----------------|----------|----------------|----------------|-----------------|-----------------|
| size           | 1996           | 1997          | 1998           | 1999           | 2000           | 2001           | 2002     | 2003           | 2004           | 2005            | 2006            |
| 45             | 0.00012        | 0             | 0.00016        | 0.0104         | 0.00034        | 0.00009        |          | 0.0004         | 0              | 0.00003         | 0               |
| 50             | 0.00219        | 0.00169       | 0.00074        | 0.01596        | 0.00372        | 0.00366        |          | 0.00628        | 0.0111         | 0.00322         | 0.001231        |
| 55             | 0.02393        | 0.02097       | 0.01319        | 0.0525         | 0.06312        | 0.02475        |          | 0.05711        | 0.07954        | 0.05415         | 0.014842        |
| 60             | 0.13226        | 0.07818       | 0.08694        | 0.09977        | 0.19513        | 0.10373        |          | 0.12153        | 0.13371        | 0.16444         | 0.058556        |
| 65             | 0.12581        | 0.07964       | 0.10499        | 0.09488        | 0.11965        | 0.11624        |          | 0.08543        | 0.07435        | 0.09488         | 0.060458        |
| 70             | 0.04767        | 0.06126       | 0.06244        | 0.04997        | 0.03419        | 0.05799        |          | 0.03928        | 0.02622        | 0.05331         | 0.041858        |
| 75             | 0.02898        | 0.0601        | 0.05024        | 0.03887        | 0.01862        | 0.03833        |          | 0.0344         | 0.0173         | 0.0179          | 0.048994        |
| 80             | 0.0284         | 0.05814       | 0.05465        | 0.0412         | 0.01794        | 0.04771        |          | 0.03107        | 0.0228         | 0.0196          | 0.060589        |
| 85             | 0.03247        | 0.04965       | 0.04896        | 0.03286        | 0.01422        | 0.03824        |          | 0.0381         | 0.02826        | 0.02982         | 0.074144        |
| 90             | 0.02876        | 0.03604       | 0.04286        | 0.02762        | 0.00914        | 0.03172        |          | 0.03695        | 0.02758        | 0.027038        | 0.07784         |
| 95             | 0.01443        | 0.01798       | 0.02489        | 0.01639        | 0.00355        | 0.02109        |          | 0.0177         | 0.01932        | 0.020223        | 0.048708        |
| 100            | 0.00748        | 0.00991       | 0.01265        | 0.00851        | 0.00169        | 0.01287        |          | 0.01096        | 0.01419        | 0.008079        | 0.02564         |
| 105            | 0.0035         | 0.00575       | 0.00531        | 0.00486        | 0.00102        | 0.00617        |          | 0.00271        | 0.0048         | 0.003299        | 0.009598        |
| 110            | 0.00257        | 0.00391       | 0.00384        | 0.00348        | 0.00034        | 0.00241        |          | 0.00242        | 0.00189        | 0.00109         | 0.00259         |
| 115            | 0.00213        | 0.00293       | 0.00206        | 0.0014         | 0.00034        | 0.00152        |          | 0.00173        | 0.00045        | 0.000447        | 0.001859        |
| 120            | 0.00062        | 0.00059       | 0.00142        | 0.00043        | 0              | 0.00152        |          | 0.00029        | 0.00045        | 0.000252        | 0.000735        |
| 125            | 0.00122        | 0.00016       | 0.00038        | 0.00027        | 0              | 0.0008         |          | 0.00058        | 0              | 0.000084        | 0.000543        |
| <b>Total</b>   | <b>0.48254</b> | <b>0.4869</b> | <b>0.51572</b> | <b>0.49937</b> | <b>0.48301</b> | <b>0.50884</b> | <b>0</b> | <b>0.48694</b> | <b>0.46196</b> | <b>0.497862</b> | <b>0.528185</b> |

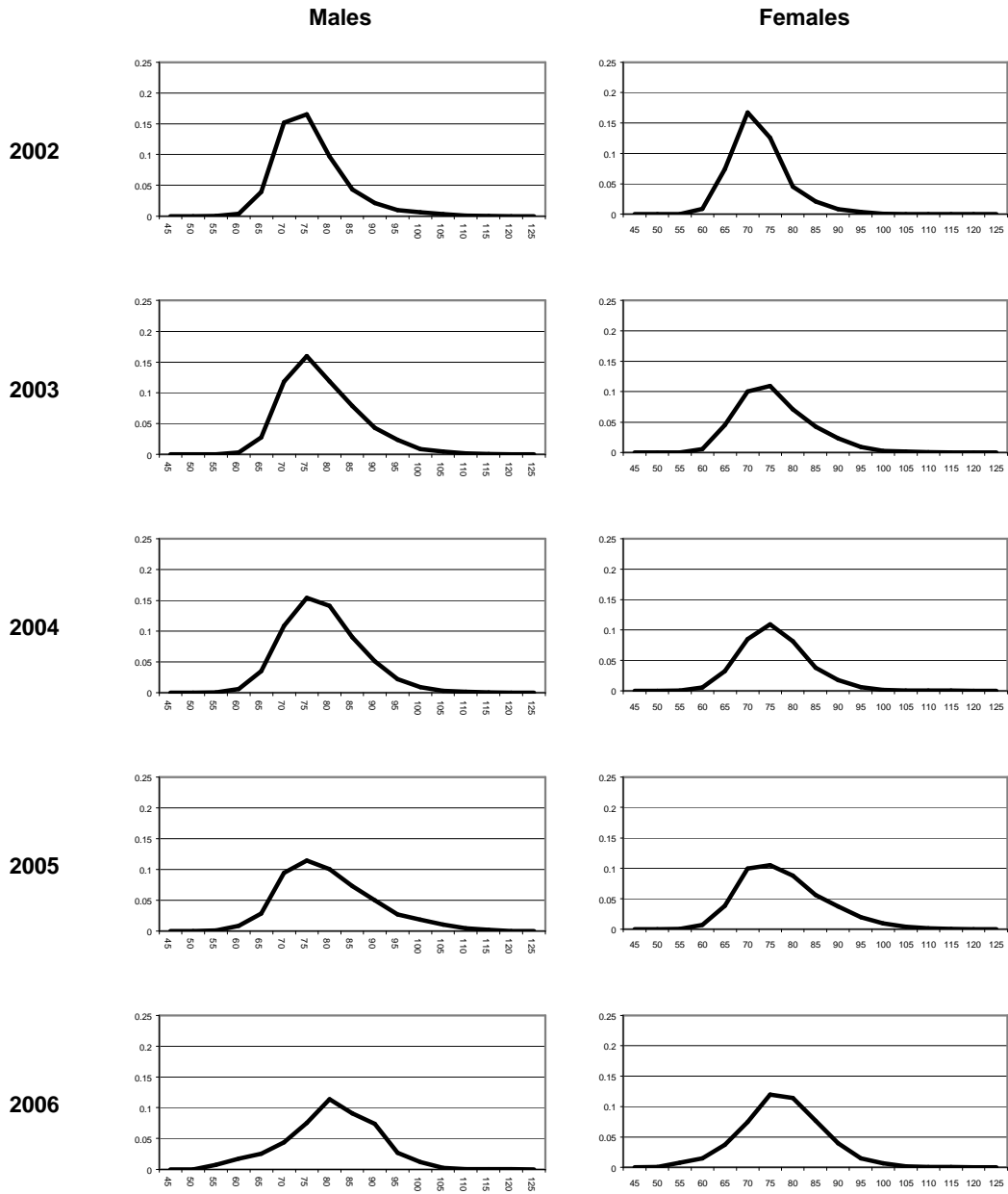
**Figure 1: Historic (solid lines) and revised (dashed lines) area definitions of the South Coast rock lobster fishing grounds.**



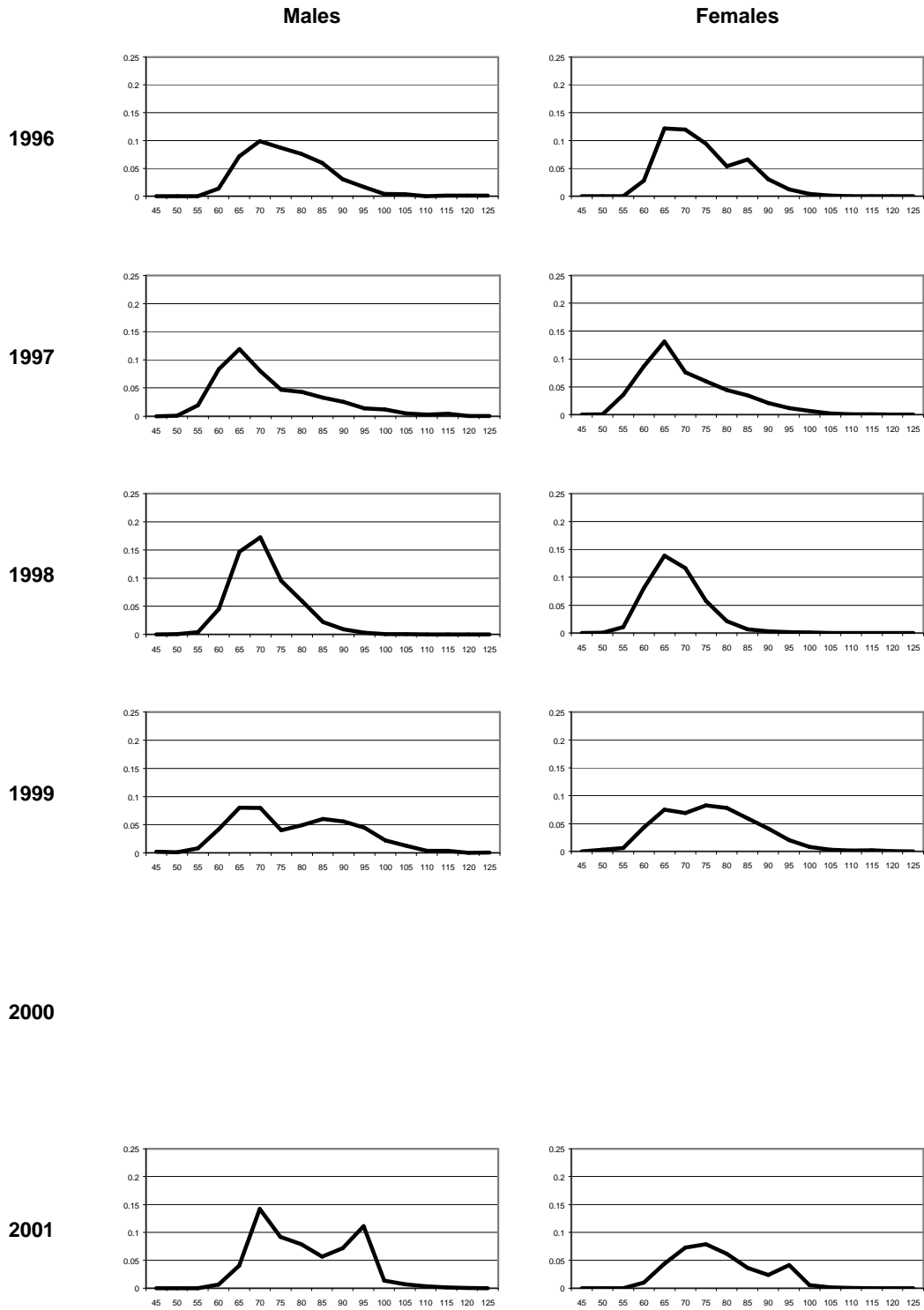
**Figure 2: Proportional size distributions of male and female lobsters per year in Area 1.**



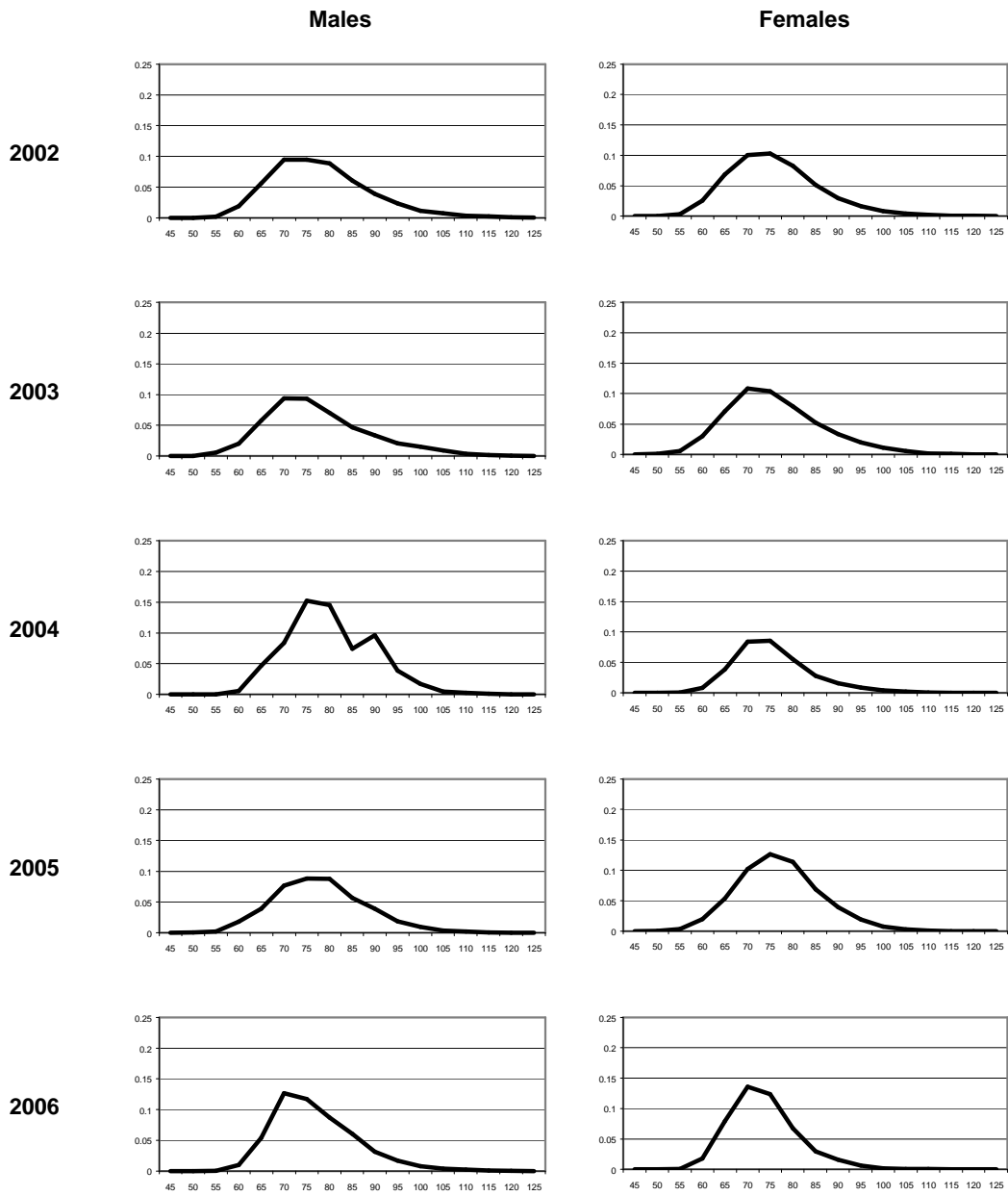
**Figure 2 cont.: Proportional size distributions of male and female lobsters per year in Area 1.**



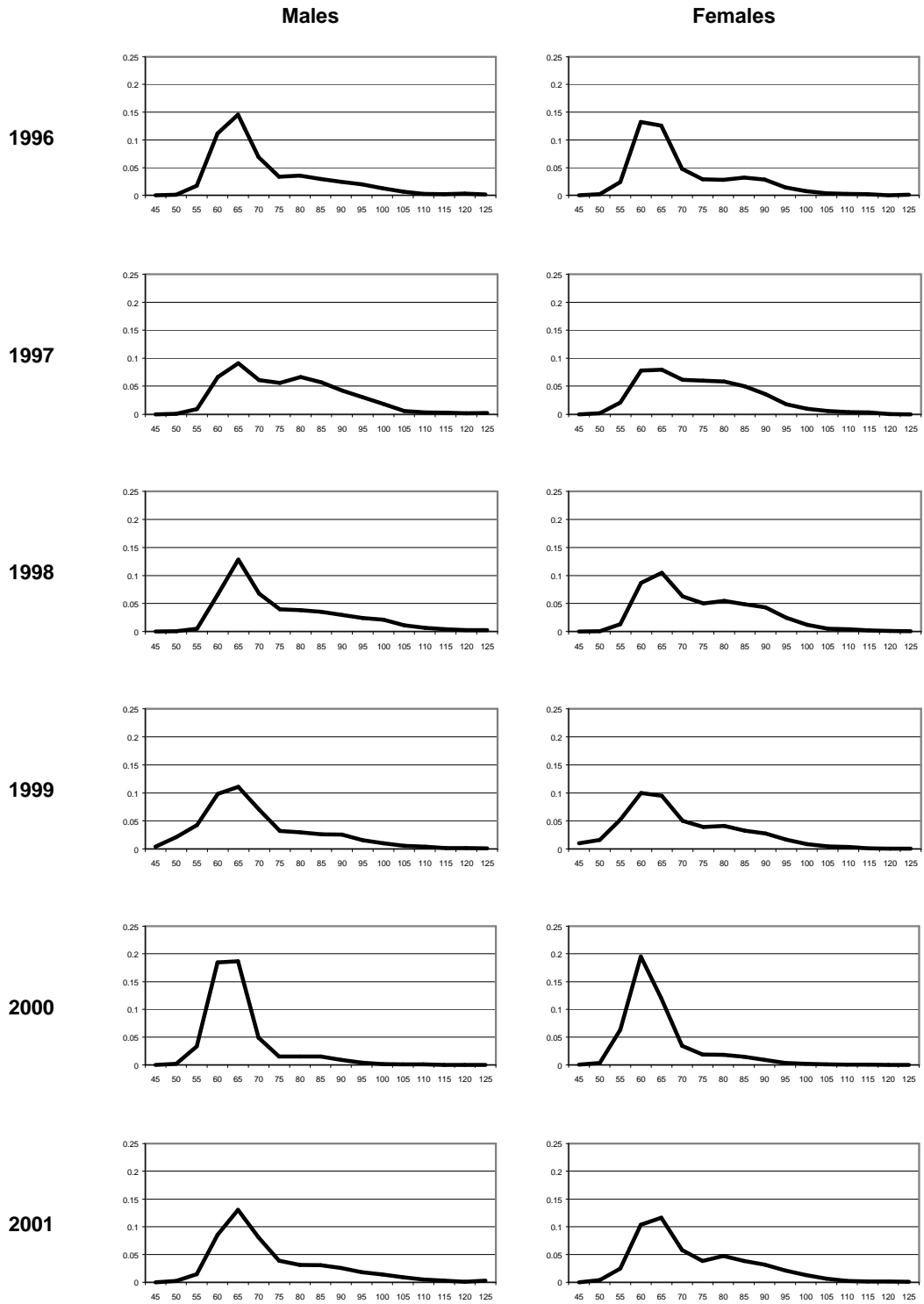
**Figure 3: Proportional size distributions of male and female lobsters per year in Area 2.**



**Figure 3 cont.: Proportional size distributions of male and female lobsters per year in Area 2.**



**Figure 4: Proportional size distributions of male and female lobsters per year in Area 3.**



**Figure 4 cont.: Proportional size distributions of male and female lobsters per year in Area 3.**

